FINAL
ENVIRONMENTAL IMPACT REPORT

Northern California Reentry Facility and DeWitt Nelson Youth Correctional Facility Conversion Projects

CALIFORNIA DEPARTMENT OF CORRECTIONS AND REHABILITATION

STATE CLEARINGHOUSE NUMBER 2008022133

December 2010

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December 2010

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ACRONYMS AND ABBREVIATIONS

ACA	American Correctional Association
CDCR	California Department of Corrections and Rehabilitation
CHCF	California Health Care Facility
DEIR	draft environmental impact report
FEIR	final environmental impact report
NCRF	Northern California Reentry Facility
NCWF	Northern California Women's Facility
NCYCC	Northern California Youth Correctional Center
proposed projects	Northern California Reentry Facility project and DeWitt Nelson Youth Correctional Facility Conversion project
SJCOG	San Joaquin Council of Governments
SR 99	State Route 99

1 INTRODUCTION

1.1 DRAFT AND FINAL ENVIRONMENTAL IMPACT REPORT

On October 4, 2010, the California Department of Corrections and Rehabilitation (CDCR) distributed to public agencies and the general public a draft environmental impact report (DEIR) for the proposed Northern California Reentry Facility (NCRF) project and the proposed DeWitt Nelson Youth Correctional Facility Conversion project (proposed projects).

1.1.1 SUMMARY OF DEWITT NELSON PROJECT, INCLUDING MINOR REFINEMENTS TO PROJECT

The proposed DeWitt Nelson project includes the conversion and reuse of the existing DeWitt Nelson facility to a semi-autonomous adult male medical and mental health facility. The adjoining California Health Care Facility (CHCF) project is expected to provide primary administration and support for the proposed DeWitt Nelson facility. The proposed DeWitt Nelson project would include housing, programming, healthcare facilities, inmate visiting and some support facilities. The project would contain three new housing units and the potential renovation of four existing dormitory housing units for the proposed inmate population. The new housing units and four existing dormitories would house up to a maximum of 1,133 inmates.

The primary and fundamental objective of the DeWitt Nelson conversion project is to help provide, in an expeditious manner, constitutionally adequate mental health care for California prison inmates consistent with the *Coleman* court orders. Other objectives of the DeWitt Nelson project are to:

- Implement the goals set forth in AB900 to increase male adult inmate prison capacity and associated support and program space to reduce overcrowding and improve living conditions for inmates.
- Locate the medical and mental health facility in a geographic area which effectively serves the state prison populations.
- Locate the medical and mental health care facility in proximity to a metropolitan area where there is access to a large employment base to serve the facility, including areas with potential training facilities.
- Utilize existing facilities, infrastructure, and available state-owned land to provide needed facilities at the lowest cost to taxpayers.
- Size the facility to achieve the most efficient and optimal patient care while ensuring a secure facility.
- Design the facility in a manner that is conducive to optimal care, including patient access to diagnostic and treatment center, patient support areas, and outdoor areas.
- Provide efficiencies of care and treatment by locating the facility in the vicinity of CHCF.
- Provide a high level of security to protect the safety of the patients, correctional and medical staff, and the surrounding community.

CDCR, as lead agency, is proposing to consider a few minor refinements to the scope of the proposed project as described in the Draft EIR (Section 3.4). The refinements to the scope involve two elements of the proposed project. The first is the potential of making a minor change to the original alignment and orientation of the perimeter fence to achieve the goal of having a single continuous perimeter fence around the proposed DeWitt Nelson facility and the adjacent CHCF. This would occur by eliminating otherwise parallel, but closely proximal fencing at the interface of the two facilities.

Under the project as originally proposed, each facility would have its own separate secure perimeter fencing and attendant sallyports. With the refinements to the project, the shared continuous perimeter would allow CDCR to eliminate these redundant entrances and parallel perimeters.

The second refinement is to upgrade and slightly enlarge each of the four existing DeWitt Nelson housing units to meet American Correctional Association (ACA) space and program standards for adult correctional facilities. A total of approximately 40,000 square feet of additional space would be added to these housing units. This would not result in a change to inmate capacity (1,133 beds).

The combined perimeter option was described and analyzed in Alternative 1 of the DEIR (see DEIR Section 7.5.2). To allow CDCR to consider an enhancement to internal circulation between the two facilities and eliminate planned DeWitt Nelson access sallyports, the alignment of the combined perimeter fence would be slightly different than from that shown in Alternative 1 (DEIR Exhibit 7-1). The difference would be minor and would not alter the EIR's analysis or conclusions regarding Alternative 1 or the proposed project. Specifically, on the east side of the DeWitt Nelson site plan the perimeter fence would be extended north to the point of closure with the planned CHCF perimeter fence. On the east side of the project site the fence would first turn 90 degrees east at the south edge of the DJJ utility complex; at the point the fence reaches the eastern edge of the DJJ utility area the fence would then correspondingly turn 90 degrees north and run to the point of connection with the CHCF perimeter fence. Once connected the remaining section of cross fencing on the north side of the DeWitt Nelson perimeter could be removed along with the necessary sallyport(s). The revised combined perimeter fencing under this modified proposal would conform to the approximate boundaries of the open area immediately north and east of the DeWitt Nelson site plan. In contrast to the alignment of the combined perimeter fence in Alternative 1 this modified alignment would also eliminate the need to remove the east end of the maintenance building in the DJJ utility area (see upper left corner of DEIR Exhibit 7-1) and provides better sight lines for officers.

The potential change to the four housing units to ACA standards was also described and analyzed in Alternative 1 (see page 7-11 in the Draft EIR). The proposed enlargement of these buildings to allow adequate space for inmate programs is accurately described and analyzed in this alternative; if CDCR elects to approve the refined scope of the proposed project, the information provided in Alternative 1 remains an accurate depiction of the changes necessary for these older housing units to meet ACA adult correctional standards.

These combined potential refinements would result in a reduction in the overall footage of fencing, consolidation of sallyports, and only a slight increase in the area needed for building foundations. Staffing totals and inmate capacity would not change. The DEIR concluded that the impacts of Alternative 1 would be the same as the proposed project. Although the perimeter fencing under the proposed project refinements would be slightly different than analyzed under Alternative 1, the impacts of the proposed refinements to the perimeter fence would be the same as those of the project as originally proposed and of Alternative 1. CDCR believes these proposed refinements are minor; they do not incorporate all of the potential changes described in Alternative 1, and do not change any of the environmental effects of the project. Staffing and inmate capacity would be the same, the overall development footprint would not be substantially increased, and the number of buildings and their profiles (height, shape, etc.) would be virtually the same. However, this facility layout offers substantial operational efficiencies.

1.1.2 SUMMARY OF NCRF PROJECT

The proposed NCRF project would involve construction of a new medical building, as well as renovation of buildings for facility program support services, dining and receiving, family visiting, academic and vocational education, miscellaneous support, and a gymnasium at the former Northern California Women's Facility (NCWF). Existing structures contain 400 cells. Total planned inmate capacity for the reentry facility is 500 beds. To provide the additional capacity CDCR proposes to provide 100 double-bunked units; the balance of the housing facilities would remain single-bed units.

The NCRF project is intended to achieve the following project objectives:

- Implement the goals set forth in AB900 to increase male adult inmate prison capacity and associated support and program space to reduce overcrowding and improve living conditions for inmates.
- Provide vocational and other life-skill training to inmates in their final year of incarceration to better prepare them to succeed in society within San Joaquin, Amador and Calaveras counties.
- Utilize existing facilities, infrastructure, and available state-owned land to provide needed facilities at the lowest cost to taxpayers.
- Provide a high-level of security to protect the safety of inmates, correctional staff, and the surrounding community.

Draft and Final EIRs

The DEIR evaluated the environmental impacts associated with constructing and operating the primary components of each project separately, as well as both projects combined, and included mitigation measures and project alternatives to reduce the significance of impacts. Section 15205(d) of the California Environmental Quality Act Guidelines (State CEQA Guidelines) requires a 45-day period for public review of the DEIR. The 45-day review period for the DEIR began on October 4, 2010 and ended on November 29, 2010. State and local agencies, and the general public, commented on issues evaluated in the DEIR during the review period. In addition, on November 3, 2010, two public hearings were held at the San Joaquin Council of Governments (SJCOG) in Stockton, during which oral comments on the DEIR were received. Written comment letters and a transcript of oral testimony provided at the public hearing are provided in their entirety in Chapter 3, "Comments and Responses to Comments on the DEIR."

Comments received on the DEIR raise various environmental issues including project description, well abandonment, traffic and transportation, air quality, greenhouse gas emissions, fire protection service, solid waste disposal, water supply. Responses to each of the comments received are provided in this final environmental impact report (FEIR). Although some of the comments have resulted in changes to the text of the DEIR (see Chapter 4, "Corrections and Revisions to the DEIR"), because the comments consist of minor clarifications and insignificant modifications and do not result in new significant impacts or increase the severity of a previously identified significant impact, none of the changes constitute "significant new information," under CEQA Guidelines Section 15088.5, requiring recirculation of the DEIR.

The FEIR includes the following documents in their entirety:

- *Draft EIR NCRF and DeWitt Nelson Conversion Projects, including appendices*
- *Final EIR NCRF and DeWitt Nelson Conversion Projects, including appendices*

These documents are available for review online at http://www.cdcr.ca.gov/Reports_Research/Environmental/index.html. Hard copies are available at California Department of Corrections and Rehabilitation, Facilities Management Division, Environmental Planning Section, 9838 Old Placerville Road, Suite B Sacramento, and at the following additional locations:

Clerk-Recorder, Amador County
810 Court Street
Jackson, CA 95642

Clerk-Recorder, Calaveras County
891 Mountain Ranch Road
San Andreas, CA 95249

San Joaquin County Clerk
Pacific State Bank Building
6 South El Dorado Street, 2nd Floor
San Luis Obispo, CA 93408

San Joaquin County Library
605 N. El Dorado Street
Stockton, CA 95202

City Clerk, Stockton City Hall
425 N. El Dorado Street
Stockton, CA 95202

1.2 ORGANIZATION OF THE RESPONSES TO COMMENTS DOCUMENT

Chapter 2, "Summary of the Project Description," presents a summary of the project description from the DEIR, including changes to the project description since the release of the DEIR. Chapter 3, "Comments and Responses to Comments on the DEIR," contains all written and oral comments received on the DEIR and presents responses to significant environmental issues raised in the comments, as required by Section 15132 of the State CEQA Guidelines.

Several of the issues raised in comments on the DEIR address matters that do not require responses in the context of CEQA because they pertain to non-environmental issues, such as economic issues. Nevertheless, where feasible and relevant, responses have been provided to supply as much information as possible about the proposed project to the public, interested agencies, and decision makers.

All comment letters and comments by speakers at public hearings are labeled to correspond with an index table (Table 3-1, page 3-1) in Chapter 3. Each individual comment is assigned a number (e.g., 1-1) that corresponds with the response that follows the comment. Chapter 4, "Corrections and Revisions to the DEIR," presents specific changes that were made to the text of the DEIR in response to comments raised or new project information. Chapter 5, "References," identifies the documents and personal communications cited in this document. Chapter 6, "Report Preparers," identifies the preparers of this document. Note that due to the number of minor revisions and modifications to DEIR Section 4.11 "Transportation," a fully revised version of the section is included as Appendix A of this FEIR document. No new significant unavoidable impacts were identified.

For those comments that have resulted in corrections or revisions to the DEIR, the text of the DEIR is reproduced in the comment and in Chapter 4. Changes in the text are indicated by strikethrough (~~strikethrough~~) where text is removed and by double underline (double underline) where text is added.

1.3 COMMENTS THAT REQUIRE RESPONSES

Section 15088(c) of the State CEQA Guidelines specifies that the focus of the responses to comments shall be on the disposition of significant environmental issues. Responses are not required on comments regarding the merits of the project or on issues not related to the project's environmental impacts. Comments on the merits of the proposed project or other comments that do not raise environmental issues will be forwarded to CDCR for consideration before it either approves the proposed project, approves a modified project, or denies the project.

1.4 PROJECT DECISION PROCESS

The project decision process is discussed in the DEIR Chapter 2 "Introduction." Please refer to the DEIR for a discussion of the decision process.

2 SUMMARY OF THE PROJECT DESCRIPTION

2.1 PROJECT LOCATION

The DeWitt Nelson and the NCRF project sites are located less than two miles east of State Route 99 (SR 99) in unincorporated central San Joaquin County, immediately southeast of the Stockton city limits. They are approximately 6 miles northeast of the cities of Lathrop and Manteca, 21 miles northwest of Modesto, 17 miles northeast of Tracy, and 15 miles south of Lodi.

DEWITT NELSON CONVERSION

Formerly a youth correctional facility, the DeWitt Nelson facility is located on the Northern California Youth Correctional Center (NCYCC) property. The project site consists of 70 acres directly south of the California HealthCare Facility (CHCF) site and is currently accessed from Newcastle Road, which intersects with Arch Road to the north. Littlejohns Creek is located approximately 700 feet south of the project site and is located immediately adjacent to an existing retention basin that currently receives drainage from the NCYCC and other surrounding properties; Forward Landfill is located immediately south of Littlejohns Creek.

NCRF

The NCRF site consists of 134 acres of state-owned property at the southwest corner of the intersection of Arch Road and Austin Road. This is the location of the former Northern California Women's Facility (NCWF), constructed in 1987. The site is adjacent to the northeast corner of the NCYCC and immediately north of the CHCF site, which is located on the grounds of the NCYCC.

2.2 PROJECT OBJECTIVES

DEWITT NELSON CONVERSION

The primary and fundamental objective of the DeWitt Nelson conversion project is to help provide, in an expeditious manner, constitutionally adequate mental health care for California prison inmates consistent with the *Coleman* court orders. Other objectives of the DeWitt Nelson project are to:

- Implement the goals set forth in AB900 to increase male adult inmate prison capacity and associated support and program space to reduce overcrowding and improve living conditions for inmates.
- Locate the medical and mental health facility in a geographic area which effectively serves the state prison populations.
- Locate the medical and mental health care facility in proximity to a metropolitan area where there is access to a large employment base to serve the facility, including areas with potential training facilities.
- Utilize existing facilities, infrastructure, and available state-owned land to provide needed facilities at the lowest cost to taxpayers.
- Size the facility to achieve the most efficient and optimal patient care while ensuring a secure facility.
- Design the facility in a manner that is conducive to optimal care, including patient access to diagnostic and treatment center, patient support areas, and outdoor areas.
- Provide efficiencies of care and treatment by locating the facility in the vicinity of CHCF.

- Provide a high level of security to protect the safety of the patients, correctional and medical staff, and the surrounding community.

NCRF

This EIR has been prepared, in part, for the NCRF project to comply with the writ of mandate issued by the San Joaquin County Superior Court in *CCPOA v. CDCR* (San Joaquin County Superior Court Case No. 39-2008-00183975-CU-WM-STK). The NCRF project is intended to achieve the following project objectives:

- Implement the goals set forth in AB900 to increase male adult inmate prison capacity and associated support and program space to reduce overcrowding and improve living conditions for inmates.
- Provide vocational and other life-skill training to inmates in their final year of incarceration to better prepare them to succeed in society within San Joaquin, Amador and Calaveras counties.
- Utilize existing facilities, infrastructure, and available state-owned land to provide needed facilities at the lowest cost to taxpayers.
- Provide a high-level of security to protect the safety of inmates, correctional staff, and the surrounding community.

2.3 DEWITT NELSON CONVERSION PROJECT

DESCRIPTION OF THE PROPOSED DEWITT NELSON CONVERSION PROJECT

The proposed DeWitt Nelson project involves the conversion and reuse of the existing DeWitt Nelson facility to a semi-autonomous adult facility that would serve mental health and medical health care needs for approximately 1,133 adult male inmates. This project would include housing, programming, healthcare facilities, inmate visiting and some support facilities. Existing housing facilities would potentially be enlarged to meet American Correctional Association standards. In addition, a proposed firing range would be located south of the DeWitt Nelson boundary near the existing detention basin just north of the landfill. Additional stormwater storage facilities may be developed near the existing detention basin. Access to the DeWitt Nelson site would be at the entrance on Austin Road to be developed for the CHCF, a fully authorized project adjacent to the DeWitt Nelson site. Depending on the final construction plans all or a portion of the existing buildings may be renovated, modified, or removed and replaced. The adjoining CHCF project is expected to provide primary administration and support services for the proposed DeWitt Nelson facility. The secured perimeter fence, including a lethal electrified fence, would potentially encircle both the DeWitt and CHCF facilities (one fence around both) to facilitate more efficient operations between the two facilities.

A more detailed description of the DeWitt Nelson project components is provided in Section 3.4, “Description of the DeWitt Nelson Conversion Project,” of the DEIR, with refinements described in Section 1 or this FEIR document.

OPERATION CHARACTERISTICS, STAFFING, AND VISITORS OF THE DEWITT NELSON CONVERSION PROJECT

The DeWitt Nelson facility would employ approximately 453 employees, including correctional officers, medical and mental healthcare professionals, and other support staff working around the clock in three 8-hour shifts. The project would operate 24 hours per day, 7 days per week. Refer to Table 3-1 of the DEIR for projected DeWitt Nelson staff organized by shift.

Visitors would be processed at the new visitor's processing center at DeWitt Nelson's Visitor/Staff entry building. Visiting hours would be by appointment only from 8:00 a.m. to 9:00 p.m., seven days a week, and the average number of weekday visitors is estimated to be approximately 30 with weekend visitors estimated to be 100.

2.4 NCRF PROJECT

DESCRIPTION OF THE PROPOSED NCRF PROJECT

The proposed NCRF project involves the renovation and reuse of the former women's correctional facility. The project would consist of a 500-bed secure reentry facility for adult male inmates that are scheduled for parole to San Joaquin County, Amador County, and Calaveras County. The proposed conversion would involve construction of a new 16,500 square foot medical building, as well as renovation of existing buildings for facility program support services, dining and receiving, family visiting, academic and vocational education, and miscellaneous support services. Perimeter security would be enhanced to include a lethal electrified fence and three armed perimeter guard towers. Other improvements include the construction, repair, or replacement of the boundary line fencing, roads, parking, outer perimeter landscaping, inmate recreation yard improvements, site grading, site lighting, storm drainage improvements, and extension of utilities to each building.

A more detailed description of the NCRF project components is provided in Section 3.5, "Description of the Proposed NCRF Project," of the DEIR.

OPERATION CHARACTERISTICS, STAFFING, AND VISITORS OF THE NCRF PROJECT

The proposed NCRF facility would operate 24 hours a day, year-round, with three 8-hour shifts. An estimated 381 staff would be employed at the proposed facility and would include correctional officers, administrative, program staff (i.e., teachers, vocational staff) and other types of support staff. Refer to Table 3-1 of the DEIR for projected NCRF staff organized by shift.

Visiting hours would be from 8:00 a.m. to 9:00 p.m. on weekends, and by appointment Monday through Friday. All visits would be scheduled, and the anticipated average number of daily visitor trips would be 30 on weekdays and 150 on weekends. All visitors would be required to enter a visitor processing center for identification, screening, metal detection, and possible search.

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3 COMMENTS AND RESPONSES TO COMMENTS ON THE DEIR

This chapter of the FEIR contains comment letters received during the public review period for the DEIR, which concluded on November 29, 2010. In conformance with Section 15088(a) of the State CEQA Guidelines, written responses were prepared addressing comments on environmental issues received from reviewers of the DEIR.

3.1 LIST OF COMMENTERS ON THE DEIR

Table 3-1 below indicates the numerical designation for each comment letter received, the author of the comment letter, and the date of the comment letter.

Table 3-1
Comment Letters and Verbal Comments Regarding the DEIR: Matrix of Comments

Verbal Comment /Letter #	Entity	Author(s) of Comment Letter	Date
1	Montezuma Fire Protection District	Edward Martel, Fire Chief	11/03/10 (DEIR Hearing)
2	San Joaquin Regional Transit	Nathaniel Atherstone, Planning Manager	11/03/10 (DEIR Hearing)
3	N/A	Cary Martin, Stockton Resident and San Joaquin County Mental Health Board Member	11/03/10 (DEIR Hearing)
4	N/A	Gary Thomas, CDCR Electrician	11/03/10 (DEIR Hearing)
5	City of Stockton	Bob Deis, City Manager	11/16/2010
6	SJVAPCD	David Warner, Director of Permit Services	11/16/2010
7	San Joaquin County Environmental Health Department	Rodney Estrada, Lead Senior REHS	11/15/2010
8	San Joaquin LAFCo	James Glaser, Executive Officer	11/19/2010
9	N/A	Raul Sanchez, San Joaquin County Mental Health Board Member	11/29/2010
10	San Joaquin County Public Works	Mark Hopkins, Environmental Coordinator	11/30/2010
11	N/A	Gary Thomas	11/28/2010

3.2 COMMENTS AND RESPONSES ON THE DEIR

The verbal and written individual comments received on the DEIR and the responses to those comments are provided in this section of Chapter 3. The comment letters and verbal comments made at public meetings are reproduced in their entirety and are followed by the response(s). Where a commenter has provided multiple comments, each comment is indicated by a line bracket and an identifying number in the margin of the comment letter.

1

we're glad you're here. We have a court reporter here who is going to capture everything that you're going to say so we have a nice record of what is said. If you want to speak to us causally afterwards, that's fine too.

EDWARD MARTEL: Thank you very much for the invitation. My name is Edward Martel, Fire Chief with the Montezuma Fire Protection District. We're a special district within San Joaquin County. The Montezuma Fire District would like to express it's concerns regarding the fire district boundaries. Currently, at this time, there's two fire districts that provide services to the state facility, Montezuma Fire District, College Hill Fire District.

The concern here is that the District would like to see 100 percent jurisdictional authority of the state's property to include all facilities for a total of five and that's including the proposed medical facility.

Also, the District's concern is the future possible city of Stockton annexation requests and requirements. We would like to go on record that we object to any type of an annexation from the city of Stockton.

GARY JAKOBS: If I may ask, is your objection

1-1

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in general to an annexation or as it relates to fire services?

EDWARD MARTEL: Well, as it relates to fire services. When an annexation takes place, most generally, a city providing the incorporation will provide it's own fire services which then is detached from the fire district which is a major concern to Montezuma Fire. So any and all annexations, in my 20 years, we protest them all.

1-2

2

Thank you for your time.

NATHANIEL ATHERSTONE: My name is Nathaniel Atherstone, Planning Manager at San Joaquin Regional Transit. Regarding the Reentry Facility, is this modeled after another facility -- is there something in the nation that you can provide an example or an assessment of it's benefits from? I know that, after talking with your representative, this is the first one in the state. I'm just wondering, nationally, is there another one that you could look at and identify the impacts against?

2-1

BOB SLEPPY: Two things in response to that. The first one is, we are kind of experts at running prisons. We kind of know what the prison day is. We tend to have a good experience with the watches. We have three watches, pretty routine when people are

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Verbal Comment 1 Response	**Edward Martel, Fire Chief, Montezuma Fire Protection District** November 3, 2010 (2 p.m. DEIR Hearing)

1-1 The commenter's expressed desire for Montezuma Fire Protection District to serve 100% of the state's property in the vicinity of the project site (which would require Collegeville Fire Protection District to relinquish the portion of the state property within its service boundary) and the commenter's objection to annexation are noted. The DEIR discusses possible boundary changes between these two districts, on pages 4.10-10 through 4.10-12. Although there is a potential to annex the property to the City of Stockton, the intent of the annexation is to provide water services to the project site, not to alter fire service providers. As stated on page 2-4 of the DEIR, "(T)he…possible annexation is…not intended to alter the level of current fire services provided, but may result in changes to the service area of responding fire agencies. Fire services are currently provided by the Montezuma Fire District and the Collegeville Fire District." The analysis in the EIR is consistent with the concerns expressed by the commenter.

Concurrently with application for approval of Out-of-Agency water service to the CDCR Property, CDCR agreed to enter into a Deferred Annexation Agreement with the City, in implementation of City's Policy 900-1, to facilitate the provision of water service to the CDCR Property and to facilitate the City's policy of requiring annexation, when feasible, as a condition of agreeing to provide new water service to properties outside of the City.

The Deferred Annexation Agreement provides that the City, at its option, may apply to SJLAFCO for annexation of the CDCR Property at any time, but no sooner than five (5) years following the full occupancy of the CHCF. The term "full occupancy" is defined as the operation of the facility at 80% of total bed capacity (or 1585 beds of the total 1,722 beds). The CDCR Property may never be annexed and in the settlement agreement with the City, the City acknowledged and accepted that CDCR will advocate that the SJLAFCO refrain from detaching the CDCR property from the Montezuma Fire District and/or the Collegeville Fire District. Please also see response to comment 8-1, below, regarding fire district boundaries and annexation issues.

No environmental issues are raised by the commenter, so no further response is provided.

1-2 When asked to clarify the reasons for the objection to annexation, the commenter indicated that the City may try to take over fire protection service from the District; therefore, the District may protest the annexation on these grounds. Please see Response to Comment 1-1. No further response is necessary.

in general to an annexation or as it relates to fire services?

EDWARD MARTEL: Well, as it relates to fire services. When an annexation takes place, most generally, a city providing the incorporation will provide it's own fire services which then is detached from the fire district which is a major concern to Montezuma Fire. So any and all annexations, in my 20 years, we protest them all.

Thank you for your time.

1-2

2

NATHANIEL ATHERSTONE: My name is Nathaniel Atherstone, Planning Manager at San Joaquin Regional Transit. Regarding the Reentry Facility, is this modeled after another facility -- is there something in the nation that you can provide an example or an assessment of it's benefits from? I know that, after talking with your representative, this is the first one in the state. I'm just wondering, nationally, is there another one that you could look at and identify the impacts against?

2-1

BOB SLEPPY: Two things in response to that. The first one is, we are kind of experts at running prisons. We kind of know what the prison day is. We tend to have a good experience with the watches. We have three watches, pretty routine when people are

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1 coming to work, especially on the custody side and the
2 program side. We know how many folks we need for watch
3 per shift and what their job is at the facility. We
4 know when visitation is going to occur by the public,
5 which for the Reentry, is mostly likely on weekends.
6 There's a lot of talk in the nation about
7 reentry including here in California. San Diego and
8 Santa Barbara are talking about their own little tiny
9 programs. San Francisco, city and county of San
10 Francisco have initiated a small program. Certainly
11 everybody sees the potential benefits to reduce
12 recidivism because you're more prepared when you come
13 out. You've gotten to know your parole officer
14 beforehand as well as your parole services community
15 folks.
16 I don't know that there's absolutely a perfect
17 operating one that's comparable to ours. We are working
18 very hard to define the program inside there, what your
19 day is going to be in terms of treatment and your
20 educational opportunities. We feel very strongly, as
21 well as the folks that passed the bill, it's got to be
22 an improvement over an inmate coming out of Sacramento,
23 Folsom, Cocharan, Crescent City, out of 180 percent
24 overcrowded facility, two to a cell, no program space at
25 all, coming back home abruptly with 200 bucks in your

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pocket when you leave the prison door.

We tend to think that the transition of meeting your parole resources and your parole officer, and community resources, having a period of not being in such a horribly overly crowded facility, it's got to be beneficial. But I do not believe, sitting here, that we have the perfect model.

GARY JAKOBS: If I could add one thing to what Bob is saying. On the transportation side, these are actually fairly simple the way the projects operate. The correctional officers come and the administrative come to the site when their shift starts. They have to go through security. They have to get ready to do their shifts. They do their shift. They don't leave to go out to lunch or anything like that. This is based on the monitoring that we have done at a number of prisons. They just don't leave to go out to lunch. They leave when their shift is over.

We know how many deliveries, because that's all based on typical operations of the facility. It's fairily easy to model. Unfortunately, we found that there aren't national models that we have been able to find that predict transportation. But we also don't feel like we really needed them because this is fairly simple math.

NATHANIEL ATHERSTONE: My concern is not with the employees or the deliveries, it's with the wards that are being released. The percentage of wards that are being released that will require public transportation services once they are released.

With the county jail here, the San Joaquin County Jail, we have an have agreement with the jail system so that if there are wards that are being released and require public transportation, they get a free pass to wherever we go. It gets them to their location safely. It cuts down on the loitering. It gives them a start and the EIR does not address that and I was curious if -- 2-2

BOB SLEPPY: We'll have 500 maximum at a time. They would be released relative to their individual incremental schedule after 12 months. One thing we will not have them do is walk out the front door with their $200. Generally, the parole officer will pick them up and take them and/or they're close enough to family, so we don't see people walking down Arch Road you know, with their thumb out.

We already have a positive transport away from any prison, at least to the local bus station, to make sure they get on the bus. The officer stays until they get on the bus, so we probably wouldn't be calling on

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1 those services to have you haul them off. I can see why
2 you do that in an urban setting.
3 With all do respect, I don't see us imposing
4 on you too much, but I am glad to talk to you a little
5 more about that.
6 NATHANIEL ATHERSTONE: I guess understanding
7 that now, addressing that in the transportation chapter
8 in a little more detail, would negate any further
9 suggestion or concern.
10 BOB SLEPPY: Folks are pretty sensitive about
11 that so we have been trying to address that as we're
12 going out into the community.
13 NATHANIEL ATHERSTONE: Thank you.
14 CARY MARTIN: My name is Cary Martin. I
15 reside here in the county seat. Just for the purposes
16 of transparency, I work with veterans, and I also serve
17 on the county mental health board. I speak of no one
18 other than myself at this time. However, I suspect that
19 what I would say in the context of this meeting hasn't
20 already been expressed to other folks here in the
21 county.
22 My basic concern here is, since you asked,
23 what mitigating steps are instituted slash budgeted
24 towards the impacts on civilian medical facilities in
25 this region from these projects?

2-3

3

3-1

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Verbal Comment 2 Response	**Nathaniel Atherstone, Planning Manager, San Joaquin Regional Transit** November 3, 2010 (2 p.m. DEIR Hearing)

2-1 At the November 3rd DEIR Hearing, in response to the commenter's question regarding whether NCRF's impact analysis relied upon (or could rely upon) a similar facility as a model, Gary Jakobs (with Ascent Environmental—consultant to CDCR) indicated that the transportation scenario (i.e. employee arrivals and departures, deliveries, etc.) of prison facilities is fairly straightforward, as reflected by traffic monitoring performed at a number of prisons. Therefore, although no national models are available, because the prison traffic generation is so simple, a national model is not really needed.

2-2 The commenter specified that his primary concern is associated with increased demand for public transportation due to inmates who are released. Bob Sleppy (CDCR) responded by indicating there will be 500 maximum inmates at the NCRF. Inmates are released incrementally according to their individual schedule. Also, inmates requiring transit service would not require bus pick-up at the NCRF facility; rather, the parole officer would transport them to the local bus station, would assure that a bus pass is secured, and would stay until the released inmate gets on the bus. Based on these operational procedures, increases in demand for public transit service would not be likely.

2-3 Based on Mr. Sleppy's verbal response above, the commenter indicates that he understands the issue now and further indicates that adding detail to the transportation discussion in the EIR would negate further suggestion or concern. Therefore, in order to clarify the DEIR discussion, the following text has been added to the third full paragraph on page 4.11-14 of the DEIR (underline = additional text; ~~strikethrough~~ = deleted text):

> Because CDCR is a state agency, the proposed projects are not subject to local plans and policies related to alternative modes of transportation. The proposed projects are not located in the vicinity of a residential area (i.e., the nearest residential community is 2.3 miles to the northwest), and it is anticipated that very few employees would commute to work on bicycle. Because bicycle facilities are not located in the vicinity of the project sites, the proposed projects would not increase the demand for such facilities. In addition, transit service is currently not available to the project sites. San Joaquin Regional Transit District "hopper" bus Route 91 is the closest bus route, located more than 2 miles from the site, and no bus service is planned in the area. Further, the project would not be expected to increase demand for transit service. After completion of an inmate's sentence, any released inmate requiring bus service is transported to a bus station by a parole officer. This is done to ensure released inmates are transported to their proper destination. Further, releases are sporadic and would amount to an average of only 1-2 per day, not enough to warrant extension of bus service to the site. When transporting a released inmate to a bus station, the officer is required to wait for visual confirmation that the individual has boarded the bus. Inmates would not be released from custody until it is verified that they will be transported by their family or a parole officer will transport them to a bus terminal. Furthermore, state correctional facilities are not conducive to public transit for several reasons including: the broad geographical dispersion of employees would require multiple transfers for some riders; bus service is not available to serve employees with shift changes occurring at very late or early hours; correctional officers must arrive at the facility in uniform and must transport a substantial amount of equipment (such as guns, batons, other equipment). For these reasons, the proposed projects would not substantially increase the demand for transit service. CDCR will coordinate with the San Joaquin Regional Transit District regarding the potential for future bus or shuttle service to the site; however, bus service cannot be verified at this time. Impacts associated with alternative modes of transportation are not significant and are not discussed further.

The addition of the text above clarifies the discussion of public transportation demand in the DEIR and does not alter DEIR's conclusions or any mitigation measures. The additional text does not require recirculation of the DEIR.

those services to have you haul them off. I can see why you do that in an urban setting.

With all do respect, I don't see us imposing on you too much, but I am glad to talk to you a little more about that.

NATHANIEL ATHERSTONE: I guess understanding that now, addressing that in the transportation chapter in a little more detail, would negate any further suggestion or concern. 2-3

BOB SLEPPY: Folks are pretty sensitive about that so we have been trying to address that as we're going out into the community. 3

NATHANIEL ATHERSTONE: Thank you.

CARY MARTIN: My name is Cary Martin. I reside here in the county seat. Just for the purposes of transparency, I work with veterans, and I also serve on the county mental health board. I speak of no one other than myself at this time. However, I suspect that what I would say in the context of this meeting hasn't already been expressed to other folks here in the county. 3-1

My basic concern here is, since you asked, what mitigating steps are instituted slash budgeted towards the impacts on civilian medical facilities in this region from these projects?

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BOB SLEPPY: We have a rare situation in San Joaquin County. And in particular it comes out of the approved California Health Care Facility. The receiver -- as part of the litigation settlement, the receiver's office entered into an agreement with the county hospital for a guarded unit so that we would have beds we could take acute care inmates to to get medical services. It's called a guarded unit where there's only two officers to watch a whole ward of inmates, and that's good for us. It cuts down on the number of officers that we send out for the inmates, and it's very secured. It also means that there's a direct relationship that, through contract, we're going to pay the county health system to take care of those inmates. We're not just going to drop them off down there. As we need additional health care beds, we have contractual ways of going out and paying for those services directly to the provider. Once they are paroled, that's a different matter because it's not our responsibility.

CARY MARTIN: My concerns are a little more basic. I understand, and I do expect that the proposal, as I have understood it, will come to fruition. That lead us to somewhere around 3,000 beds for this region additionally, am I correct? 3-2

BOB SLEPPY: 2,800.

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CARY MARTIN: It's in the ballpark. To staff that requires a significant increase in professional staff for this region. That's the thrust of my question. We do not have that kind of additional stand-by professional staffing, how do you propose to obtain it without the negative impact on the community? 3-3

BOB SLEPPY: Both through our CHCF settlement, especially though the DeWitt project, because that's where you would get the mental health technicians brought in, we have three commitments. One of those is that the receiver is actively contributing funds to Delta College to enhance their psych technician program, to graduate more technicians in time for us to open up and operate these facilities. We have investigated and discovered that there's actually efficient nursing now because the economy is a little flat, and that's addressed, I believe, in the EIR especially about the nursing capacity. And then because we have to be able to open these up and run them, we too are faced with the same problem. And we need to have folks ready to go work. We have a very active recruitment commitment both nationwide as well as up and down the state to find the folks that we need to run this. We are not waiting to hire all the folks from San Joaquin County. We got a very robust recruitment plan for the doctors, psych,

1 mental health professionals. So we feel that we've
2 balanced that pretty well through these commitments that
3 we will get more trained individuals available. We'll
4 get -- nursing seems to be taking care of itself to some
5 a degree because of the current graduation and the
6 recruitment of those folks. Doctors and psychiatrists,
7 we're recruiting nationally as well as locally.
8 I tend to think we're really working hard on
9 that and not to expect to hire everybody from down the
10 street.
11 CARY MARTIN: I won't belabor the point.
12 BOB SLEPPY: It's fine.
13 CARY MARTIN: I really applaud the
14 Department's outreach toward, for instance, Delta
15 Community College. And I suggest that you should invest
16 further resources in that general direction. Now, I'm
17 aware that there will be a significant need for nursing
18 staffing over the next 8, 10, 12 years. I'm sure you've
19 seen the same stuff that I've seen. I know you're ahead
20 of me on that. It's a problem that I believe is very,
21 very real and needs to be addressed, and I would like to
22 see some commitments made towards mitigating that as it
23 comes on line because it will come. When we put those
24 beds out there, there will be a need for staffing.
25 There's no way around that. You guys have already faced

3-4

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1 the feds with respect to their demands for levels of
2 treatment, which I don't even understand, constitutional
3 levels of care. I can't find that anyplace. So you're
4 under that gun, and I don't expect that to decrease,
5 although it might. I don't expect it to. So I would
6 really appreciate it if you gave some thought towards
7 what comes on line and mitigating that and then
8 increasing support for professional staff training.
9 I thank you for listening to me.
10 EVELYN MATTEUCCI: I'm Evelyn Matteucci from
11 the receiver's office. We have a workforce analysis.
12 We have a document. I'm sorry, I didn't bring it with
13 me today. It is on our website, on the California
14 Prison Health Care Services website. If you give me
15 your address and e-mail, I can get it to you.
16 We have done an extensive analysis of how many
17 we need for the California Health Care Facility, how
18 many nurses we need, how many psych techs, how many
19 LVNs. All of that's in there. We have an analysis of
20 what the pay is here in the San Joaquin region as oppose
21 to what we pay. That's all in there and that will help
22 you a lot.
23 As Bob mentioned, we're in agreement with
24 Delta where we will ramp up the psych techs. We need
25 400 psych techs for this facility. We're going to ramp

3-4 cont'd

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up their program. Also, about 30 percent of our employees will come from other facilities so that will help too.

If you give me your contact information, there's a lot of information that I can give you that will help you get in contact with the right people when we're done.

BOB SLEPPY: Now, we're done.

(Whereupon the meeting was concluded at 3:06 p.m.)

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Verbal Comment 3 Response	**Cary Martin, Stockton Resident and San Joaquin County Mental Health Board Member** November 3, 2010 (2 p.m. DEIR Hearing)

3-1 The commenter's concern regarding potential impacts to civilian medical facilities (in Comment 3-1 through 3-4) were addressed verbally at the meeting by CDCR staff. Bob Sleppy (CDCR) began by explaining that a litigation settlement agreement involving CEQA documentation for a different but related project, the California Health Care Facility, Stockton, included provisions for a guarded unit at the county hospital to provide acute care to inmates. CDCR is contractually obligated to pay the County for caring for those inmates. The California Prison Health Care Services (CPHCS) and Delta College have entered into an agreement to contribute funds to Delta College to enhance their psychiatric technician program ($1,350,000) and, to graduate more technicians (270) in time for initiating facility operation. Mr. Sleppy also pointed to the DEIR's discussion of the nursing industry's current employment outlook. Page 4.4-9 of the DEIR explains that the nursing shortage reported several years ago has recently been narrowing and is expected to continue to narrow in years to come. Mr. Sleppy also indicated that recruitment for medical staffing will be conducted nationwide, not just locally. Evelyn Matteucci from CPHCS further explained that extensive analysis has been performed related to the specific numbers of medical staff needed for the now-approved CHCF Stockton facility. She also indicated that approximately 30 percent of the CHCF employees will come from other CDCR facilities, which would further reduce the draw from local medical facilities. Overall, the commenter's concerns related to the proposed projects affecting staffing levels at local medical facilities were thoroughly addressed at the DEIR hearing; however, it should be noted that these comments are related to economic and social issues and are not considered environmental issues, according to CEQA (*State CEQA Guidelines Section* 15064[e]). No further response is necessary.

3-2 The commenter clarified his statement in comment 3-1. Verbal responses to all of Mr. Martin's comments were provided at the DEIR hearing as described above in Response to Comment 3-1. Also as described under Response to Comment 3-1, these comments are related to economic and social issues and are not considered environmental issues, according to CEQA (*State CEQA Guidelines Section* 15064[e]). No further response is necessary.

3-3. The commenter further clarified his previous statements. Verbal responses to all of Mr. Martin's comments were provided at the DEIR hearing as described above in Response to Comment 3-1. Also as described under Response to Comment 3-1, these comments are related to economic and social issues and are not considered environmental issues, according to CEQA (*State CEQA Guidelines Section* 15064[e]). No further response is necessary.

3-4. This comment asked for CDCR to consider mitigation for the staffing impact to local medical facilities. Verbal responses to all of Mr. Martin's comments were provided at the DEIR hearing as described above in Response to Comment 3-1. Also as described under Response to Comment 3-1, these comments are related to economic and social issues and are not considered environmental issues, according to CEQA (*State CEQA Guidelines Section* 15064[e]). No further response is necessary.

(Whereupon the same previous PowerPoint presentation was then presented as the 2:00 o'clock PowerPoint presentation.)

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4

GARY THOMAS: Gary Thomas. Thank you. I was here -- my name is Gary Thomas. I'm an electrician with CDCR, Mule Creek, and I'm also a master trainer. You're going to see my angst here real quick because we have been battling with CDCR to do a proper job description, an IIPP and so forth for years.

Been working on a lethal fence since 1994, and we believe that some of the impacts that you're talking about here would be significant. You say they're significant if it was a burrowed owl or something like that, but we think that we might rate a little better than a burrowed owl, sometimes.

4-1

In your page 1.2, the section I'm talking about is the lethal electrified fence. The only new structure associated with the proposed NCRF are a medical facility building, guard towers and a lethal electrified fence which are necessary for the proposed Reentry Facility without seriously compromising on-site security, et cetera. That's probably a true statement,

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1 but what our concern is about is the electrical workers
2 and the other staff that you have responding to the
3 lethal electrified fence, and it raises some questions.
4 For years, we have been battling with CDCR to
5 have qualified electrical workers incorporated within
6 our job description, and that's an electrical worker
7 that has two years training and knows and understands
8 the hazards associated with the job. If you went and
9 became a master trainer in your class, you would be
10 instructed that it takes two qualified electrical
11 workers to go down and perform work on the fence line.
12 That's coming from downtown. I can't tell you their
13 names right now, the people that teach the lethal
14 electrified fence.
15 My question to you on the -- one of my
16 questions to you on the -- I love acronyms, I've got to
17 tell you -- NCRF Facility, how many qualified electrical
18 staff are you going to have for that, probably none.
19 You're probably just going to have one electrician. I
20 was not aware that -- it sounds like the DeWitt Nelson
21 is going to have an electrified fence as well. So
22 you're probably going to be using people that are
23 trained at each facility to work at each facility. They
24 cannot work on it unless they're trained at each site
25 because each one is specifically different and have

4-1 cont'd

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1 their own inherent hazards.
2 Anyway, we would ask that qualified electrical
3 workers gets incorporated into the job description of
4 electrician so that you don't get some guy who is just
5 doing house wiring outside and comes to CDCR, like we
6 have seen, and the next thing he knows he says, Yeah,
7 I'm on QEW -- and you've got some idiot, is the word --
8 out there performing work on something hazardous,
9 putting other people in danger.
10 So we're asking the state to at least look at
11 and comply with the certain state codes and regulations
12 for employment. And some of those would be Title 8,
13 CC&R. There's a section, 55080, which is specific to
14 the lethal fence. We're asking that a QEW be
15 incorporated in there, and that's the two-year high
16 voltage electrical job description, an IIPP provision,
17 which is an injury and illness and prevention program.
18 And we need to have that accurately reflect the jobs and
19 the hazards that are associated. It goes further than
20 that. When you start rippling out into the community,
21 now you have public personnel responding, whether it be
22 fire, police, emergency medical or something like that
23 who may have to respond within the fence are going to
24 need training as well.
25 A lot of these I brought up in your public

4-1 cont'd

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1 comments in September of 2009 at the first hearing
2 before the DeWitt Nelson alternative was put in there.
3 Anyway, we're asking -- I got to tell you
4 something about that DeWitt Nelson alternative. I
5 believe it's going to be in close proximity to youths
6 and so forth, so that may not be a good idea.
7 We understand some of the impacts with the
8 lethal fence and actually for electricians and the other
9 staff that are affected. We have people that are
10 landscapers, vector control, maintenance mechanics that
11 help us out. We believe that the impacts with the
12 lethal electrified fence are significant and are
13 avoidable. And CDCR in it's infinite wisdom just
14 continues to prolong a job description that is 30-plus
15 year old and does not reflect the hazards and the duties
16 associated.
17 We are asking that CDCR not proceed with the
18 project until the fence issues mitigated would affect
19 the employees such as electricians, maintenance
20 mechanics, vector control, landscapers, whoever. And I
21 think that it would be very easy to mitigate those
22 impacts and to ensure that the proper staff are there
23 and are properly trained as well as those out in the
24 public that may have to respond to such emergencies,
25 whether real or deemed emergencies.

4-1 cont'd

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Basically, that's probably about the end of my comment. They're just asking to comply with their own rules and regulations so you come up with an accurate job description.

Can I get a copy of my comments? I would appreciate that. I'm sorry to have to bring this up in this forum. I sat on the city council. I was a mayor of Ione for years. I'm now on the water agency.

I realize that this maybe not be the most appropriate place to bring this up, but, you know, we have been working on fences since 1994. I think we're all kind of grasping at straws. You know, to have somebody go in there and not be qualified on there. We have people that are inventing different ways to shut down and deenergize a fence continually. I was almost fired on a lethal fence years ago when we had a truck roll into the fence. And they decided to let the other guy go. He invented emergency after emergency, it was untrue and unfounded. There's just one way to do it. When you get into a lethal fence situation, it is just that, it's a lethal fence. There are no emergencies. But we need to have these -- we need to have people that understand the hazards and so forth.

There it is. I'll try to be quite, but no promises.

4-1 cont'd

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Verbal Comment 4 Response	**Gary Thomas, CDCR Electrician** November 3, 2010 (6 p.m. DEIR Hearing)

4-1 The commenter's concern appears to be related primarily to workplace safety related to working on and around the lethal electrified fence (LEF). CDCR complies with all mandatory OSHA requirements, State codes and regulations, and the appropriate CDCR Department Operations Manual section associated with the LEF. The LEF has several built in safety features to warn and protect the general public and CDCR staff not affiliated with the LEF from contact with the LEF. Based upon the above-mentioned statements Mr. Thomas' concerns are not an environmental issue under CEQA. The comment identifies a workplace safety issue, not an environmental issue.

5

CITY OF STOCKTON

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November 16, 2010

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CITY OF STOCKTON COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE PROPOSED NORTHERN CALIFORNIA REENTRY FACILITY AND DEWITT NELSON YOUTH CORRECTIONAL FACILITY CONVERSION

The City of Stockton submits this comment letter regarding the Draft Environmental Impact Report (EIR) for the proposed Northern California Reentry Facility (NCRF) and DeWitt Nelson Youth Correctional Facility Conversion. The proposed project site, which is within the existing Northern California Youth Correctional Center (NCYCC) complex, is located immediately outside City of Stockton boundaries, within unincorporated San Joaquin County.

The Draft EIR considers the effects of the proposed Northern California Reentry Facility project and the proposed conversion of the adjacent DeWitt Nelson Youth Correctional Facility (DeWitt Nelson) to a mental and medical health facility for adult male inmates, in a single EIR. The Draft EIR acknowledges the recent California Health Care Facility Settlement Agreement and its implications on the NCRF and DeWitt Nelson projects, including, but not limited to, the planned extension of water service, local traffic improvements, potential annexation to the City of Stockton, and implementation of a "Local Hire" outreach plan. The settlement provisions have been included within the baseline analysis of the two projects. 5-1

At this time, City staff offers the following comments:

1. **Section 4.10 Public Services:** When these facilities are operational, it may be necessary to enter into cooperative aid agreements with the Stockton Fire Department to provide assistance in the case of a widespread disaster. This should be discussed in the EIR.

2. **Exhibit 4.11-1 Study Area and Roadway Network, and Table 4.11-1 Study Intersections (pages 4.11-2, 4.11-6):** The SR99 and Arch Road interchange appears to have been evaluated as two separate intersections; however, the interchange is a single point diamond design, which operates as one intersection. This needs to be corrected to provide a valid level of service impact analysis. 5-2

3. **Page 4.11-14, fourth paragraph:** Contains the following statements:

   "In addition, transit service is currently not available to the project sites. San Joaquin Regional Transit District "hopper" bus Route 91 is the closest bus route, located more than 2 miles from the site, and no bus service is planned in the area. Because the proposed projects would not be served by bus, the proposed projects would not increase the demand for transit service. CDCR will coordinate with the San Joaquin Regional Transit District regarding the potential for future bus or shuttle service to the site; however, bus service cannot be verified at this time. Impacts associated with alternative modes of transportation are not significant and are not discussed further." 5-3

   Staff disagrees with the final statement. In fact, significant new demands on local transit services are anticipated due to visitor traffic. Transit service augmentation should be discussed and developed with the San Joaquin Regional Transit District.

4. **Mitigation Measure for Impact 4.11-1a, and Table 4.11-10 DeWitt Nelson Project – Mitigated Condition LOS C Summary (page 4.11-17):** Note that the City of Stockton operates and maintains the traffic signal at Newcastle and Arch Road. This traffic signal operates based on traffic demand (not coordinated with adjacent traffic signals). Therefore, the mitigation is not practical given the mode of operation that the traffic signal operates in. 5-4

5. **Exhibit 4.11-4 Location of Approved/Planned Projects, and Table 4.11-15 List of Projects in the Vicinity (pages 4.11-22 and 4.11-23):** The geographical locations of projects Nos. 1 and 3 are shown incorrectly and should be corrected.

   The Archtown Industrial Project located in the southwest quadrant of Arch Road and Newcastle Road is not listed in the Table or shown on the Exhibit. 5-5

   If traffic from these projects were assigned to the street network based on the incorrect locations (or omitted – as in the case of Archtown Industrial Project) it would result in significantly altered traffic projections.

6. **Exhibit 4.11-6 NCRF Project Trip Distribution and Trip Assignment (page 4.11-29):** The Exhibit does not reflect the assumed roadway improvements at the NCRF driveways – as described on Page 4.11-27 (Project Condition). NCRF east driveway should be right-in right-out. 5-6

7. **Table 4.11-19 NCRF Project Intersection Peak Hour LOS Summary, Intersection No. 6 (page 4.11-31):** The Table indicates the driveway was evaluated as unsignalized. However, the report indicates that the assumed control is with a traffic signal. 5-7

8. **Table 1-1 Summary of Impacts and Mitigation Measures, 4.11 Transportation, Impact 4.11-1, Construction Related Traffic Impacts, Mitigation Measure for Impact 4.11-1a, (page 1-65):** In general, the mitigation measures that recommend adjusting traffic signal timing to cycle lengths up to 150 seconds will inherently provide unacceptable levels of service, based on delays, related to those long cycle lengths. The unrealistically long cycle lengths are not practical and not acceptable as mitigation. The queue storage requirements for this length of cycle is not discussed or made a part of the mitigation. The analysis needs to identify geometric improvements that will provide acceptable levels-of-service under realistic cycle lengths. 5-8

Arch Road (middle section) exhibits some distress now. There is patching and cracking and we expect it to be damaged by construction traffic to the extent that it will require resurfacing upon project completion. The length is estimated at about 2,500 feet, and about 60 feet wide. Overlay cost are estimated at around $275,000 (note that this section is our roadway, but is County on the south side). 5-8 cont'd

9. **Appendix E:** Peak hours for HCM Signalized Intersection Capacity Analysis sheets do not include truck percentages (all study intersections east of Kingsley frontage road). Given the existing and projected truck volumes on Arch Road, this could significantly affect the results of the level of service analysis. The analysis needs truck percentages to be valid. 5-9

10. **Impact 4.12.2, "Impacts to Wastewater Treatment Facilities/DeWitt Nelson Only",** Add the following: "The discharge from the new, on-site DeWitt Nelson sewer pump station will be required to flow through a bar rack and meter prior to discharging into the 20-inch trunk sewer, in accordance with the *Agreement for Sewage Disposal*. 5-10

11. **Section 4.14.3 Environmental Impacts of the Projects/Water Sufficiency Analysis/Combined DeWitt Nelson and NCRF Facilities:** The figures in the first paragraph require revisions: The NCRF demand is 98 afy, as opposed to 70 afy, and the total demand for both projects is 320 afy (consistent with Table 4.14-7), as opposed to 358 afy. 5-11

Thank you for the opportunity to comment on this Draft Environmental Impact Report. Should you have any questions regarding this matter, please do not hesitate to contact me at 937-8294 or Community Development Director Mike Niblock at 937-8444.

BOB DEIS
CITY MANAGER

BD:MMN:ab:sis

cc: Kerry Sullivan, Community Development Director
San Joaquin County Community Development Department
1810 East Hazelton Avenue
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emc: Mayor and City Council
John Luebberke, City Attorney
Guy Petzold, Deputy City Attorney
Michael M. Niblock, Director, Community Development Department
Mark Madison, Municipal Utilities Director
Gregg S. Meissner, Deputy Director, Community Development Department/PES
Bob Murdoch, Director, Public Works Department
Matt Duaime, Fire Marshall

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5-1 CDCR typically enters into mutual aid agreements with local jurisdictions for both police and fire services. CDCR would do the same with the City of Stockton Fire Department (and Police Department). However, partnership with the City Fire Department is not necessary to mitigate any significant adverse environmental impacts related to fire protection; therefore, the comment requires no revision to the DEIR text.

5-2 The SR99 and Arch Road interchange is a single point interchange; this is acknowledged in the DEIR (see, for instance footnote a in Table 4.11-1). However the northbound off-ramp east of the interchange was analyzed separately per the recommendation of Caltrans. Northbound right turns from the SR-99 northbound off-ramp are controlled by a stop sign prior to turning onto Arch Road. For this reason, Caltrans requested the off-ramp to be analyzed separately to estimate potential vehicle delay and level of service. The level of service impact analysis is accurate.

5-3 No evidence is provided to indicate that there would be substantial transit demand associated with the proposed projects. Visitors would come from geographically diverse locations, which is not conducive to a centralized transit service. As stated in response to comment 9-7, CDCR will coordinate with San Joaquin Regional Transit District regarding the potential for future bus or shuttle service to the site, despite the DEIR's conclusion that the proposed projects would not result in a substantial increase in demand for bus service. See response to comment 9-7 for more information.

5-4 The mitigation does not require the intersection to have coordinated operation. The recommendation is to adjust the traffic signal timing to provide ample programmed green time during the construction period for the forecasted eastbound/westbound movements along Arch Road. It is assumed that the traffic signal controller can be programmed to adjust the amount of green, yellow, and red time given to east/west movements (Arch Road) and north/south movements (Newcastle Road).

5-5 The locations of Approved/Planned Project 1 (Airpark 599) and Project 3 (California Health Care Facility – CHCF) are correct. The Archtown Industrial Project was not included in the Background condition as this project's application was not yet accepted at the time of the DEIR analysis report. Per the City's guidelines, the Archtown project was included in the 2035 cumulative study scenarios. The analysis was checked and verified as correct, and these projects were assigned to the roadway network based on their actual locations. None of the conclusions of the DEIR would be affected by this change.

5-6 The comment is correct in noting the typographical error (the 11% westbound left turn at intersection #7 on Exhibit 4.11-6). The analysis was checked and verified as correct. The graphic has been edited to reflect the comment.. Please see Chapter 4, "Corrections and Revisions to the DEIR," for the revised exhibit. None of the conclusions of the DEIR would be affected by this change.

5-7 The intersection was analyzed with a signal and the typographic error on the table has been edited accordingly. None of the conclusions of the DEIR would be affected by this change.

5-8 The commenter referenced the wrong mitigation measure (Mitigation Measure to Impact 4.11-1a includes cycle lengths of up to 60 seconds, not 150 seconds). It is assumed that the commenter's intent was to reference Mitigation Measure 4.11-2a. According to the City of Stockton Traffic Impact Analysis Guidelines (Appendix D), the City of Stockton currently has no standard for maximum cycle lengths. Most signals run traffic signal cycle lengths of 130 seconds or less, but it is feasible to operate traffic signals at longer cycle lengths with acceptable levels of service and average delays per vehicle. Thus, the

recommended traffic signal cycle length modifications would provide adequate and feasible mitigation for the potentially impacted intersections. However, to address the commenter's concern, the revised DEIR Section 4.ll, included as Appendix A of this FEIR (See response to comment 5-9 below), includes revisions to the mitigation measures for City intersections, reducing the cycle lengths to 130 seconds or fewer. With the reduced cycle length these mitigation measures still appropriately mitigate the projects' impact to LOS and the conclusions remain consistent with the DEIR. Also, Appendix A includes attachments that provide the detailed intersection analysis, including delay, level of service, queuing and other measures. These revisions do not result in the need to recirculate the DEIR. Please see Appendix A for the specific text changes.

Regarding the disrepair of Arch Road, CDCR will evaluate the condition of Arch Road (in the vicinity of the project site) prior to construction and after construction is complete and will coordinate with the City of Stockton to provide a portion of the funds necessary to bring the affected section of Arch Road where it fronts the project site back to at least pre-construction conditions.

5-9 The commenter indicates that the peak hours for HCM Signalized Intersection Capacity Analysis sheets do not include truck percentages for study intersections east of Kingsley Road. The commenter is not correct. The traffic analysis performed for the EIR, by DKS Associates, transportation planning and engineering consultants, included a 2% allocation of traffic volumes for trucks (equivalent of 3 passenger autos per truck) at the intersections mentioned by the commenter. This percentage was based on professional observation, standard industry assumptions, and is consistent with two prior analyses prepared for State facilities in the area, the NCRF project (a negative declaration was prepared in February 2008; for reasons other than traffic, the negative declaration was found to be legally inadequate) and the CHCF Stockton EIR (Final EIR: March 2009). The City of Stockton reviewed these documents, as well as the NOP prepared for the proposed projects, and did not comment on the truck % allocation. Thus, the EIR reasonably assumed that the truck trip percentage allocation was reflective of current City assumptions and practice.

In direct response to this comment, DKS Associates contacted City of Stockton transportation staff. In response to the inquiry, the City provided DKS with truck percentages along Arch Road, from the City's 2009 Arch Industrial II traffic study. These truck percentages were applied to the NCRF and DeWitt Nelson EIR traffic analysis for all study intersections east of Kingsley Road for the Existing conditions scenario. For the Background, Project and Cumulative conditions, the truck percentages were reduced to account for residential and institutional projects (e.g., Mariposa Lakes, CDCR CHCF, and the proposed CDCR NCRF and DeWitt Nelson projects), as these projects would not contribute additional truck trips to Arch Road to the same extent as existing or proposed industrial developments, and because the truck percentages are applied to the entire volume in the modeling software, and thus it would be inaccurate to apply the same truck percentages to residential development volumes as it would overestimate truck traffic conditions.

Overall, the delay, under existing plus project and future cumulative growth conditions, generally increases for each Arch Road study intersection east of Kingsley Road for all peak hours analyzed. As a result of the revised analysis, the projects result in additional (to what was reported in the DEIR) exceedances of LOS significance thresholds at the following intersections, as outlined below:

- Newcastle Road/Arch Road
  - NCRF Project Condition AM and PM peak hours
  - DeWitt Nelson Project Condition AM and PM peak hours
  - NCRF and DeWitt Nelson Projects Condition AM and PM peak hours
  - 2035 plus DeWitt Nelson Project Condition PM peak hour
  - 2035 plus NCRF and DeWitt Nelson Projects Condition PM peak hour

- Logistics Drive/Arch Road
  - NCRF and DeWitt Nelson Projects Condition Midday and PM peak hours

The following feasible measures would mitigate the impacts such that the level of service at these two intersections would remain below the threshold of significance; the project would be responsible for payment of its fair-share to improvements at these locations:

- NCRF Project Only Condition
  - Newcastle Road/Arch Road
    - AM Peak Hour: Adjust traffic signal timing to optimize the splits.
    - PM Peak Hour: Adjust traffic signal timing to optimize the splits.

- DeWitt Nelson Project Only Condition
  - Newcastle Road/Arch Road
    - AM Peak Hour: Adjust traffic signal timing to optimize the splits and cycle length to 130 seconds.
    - PM Peak Hour: Adjust traffic signal timing to optimize the splits and cycle length to 130 seconds.

- NCRF and DeWitt Nelson Projects Together Condition
  - Newcastle Road/Arch Road
    - AM Peak Hour: Adjust traffic signal timing to optimize the splits.
    - PM Peak Hour: Adjust traffic signal timing to optimize the splits and cycle length to 130 seconds.
    - Provide a dedicated northbound left turn lane and eastbound right turn lane.

  - Logistics Drive/Arch Road
    - Midday Peak Hour: Adjust traffic signal timing to optimize the splits and cycle length to 130 seconds.
    - PM Peak Hour: Adjust traffic signal timing to optimize the splits and cycle length to 130 seconds and cycle length to 130 seconds.
    - Provide a dedicated northbound left turn lane.

- 2035 plus DeWitt Nelson Project Only Condition
  - Newcastle Road/Arch Road
    - PM Peak Hour: Adjust traffic signal timing to optimize the splits.

- 2035 plus NCRF and DeWitt Nelson Projects Together Condition
  - Newcastle Road/Arch Road
    - PM Peak Hour: Adjust traffic signal timing to optimize the splits.
    - Provide a dedicated westbound right turn lane.

Specific text changes have been made to throughout Section 4.11 of the DEIR to reflect these revisions.

CDCR proposes to implement these mitigation measures as follows. CDCR will monitor traffic at each of the above intersections for two years after the date on which the DeWitt Nelson and/or NCRF Project begins operations. If, based on those traffic data, the level of service at any of the above intersections exceeds the threshold of significance; CDCR will modify the signal cycles and/or construct the turn lanes that are necessary to reduce those traffic impacts to a less-than-significant level. In this way, notwithstanding the late change in methodology proposed by the City, the DeWitt Nelson and NCRF

projects, both individually and collectively, will not have a significant impact on traffic delays at the above intersections.

CDCR notes that the revised traffic analysis of these intersections indicates that traffic associated with the DeWitt Nelson and/or NCRF projects is a small proportion of the total traffic at those intersections (less than 10%). CDCR is agreeing to construct the necessary facilities at those intersections instead of waiting until either the City of Stockton or the County of San Joaquin collects the funds needed for such improvements. Nonetheless, in calculating CDCR's "fair share" obligation towards traffic improvements, CDCR will credit its "fair share" obligation by the amount it spends towards the above intersections in excess of its percentage contributions to traffic congestion at those intersections. In other words, if traffic for the DeWitt Nelson and NCRF facilities only contributes 5% of the traffic at a specific intersection, CDCR will treat 95% of the cost of mitigation at that intersection as part of its "fair share" obligation towards other traffic improvements and will reduce any other "fair share" payments accordingly.

Construction of the necessary improvements would not be expected to result in any new significant adverse environmental impacts; mitigation measures contained in the EIR that address all construction, including air quality and stormwater runoff, will apply to the construction of the necessary improvements. The dedicated northbound left turn lane and eastbound right turn lane for the Newcastle Road/Arch Road intersection would not result in any footprint related impacts (e.g., biological or agricultural resource impacts) because the lanes would be constructed within an area either already developed with roadway facilities (curbs, sidewalks, development pads) or on bare dirt.

5-10 In response to the commenter's request that additional text be inserted into Impact 4.12-2, the following text has been added to the second full paragraph under Impact 4.12-2 on page 4.12-9 (underline = additional text; ~~strikethrough~~ = deleted text):

> The sewer pump station would be designed so as to limit pumping rates to the City system to the permitted flow, and, per the Agreement for Sewage Disposal, would discharge through a bar rack and meter prior to the discharge entering the 20-inch trunk sewer, and would use automatic controls that would only allow pumping when the NCYCC facility is not pumping.

The addition of the text above provides additional detail related to the sewer pump station already approved as part of the CHCF project and does not alter the DEIR's conclusions or any mitigation measures. The additional text does not require recirculation of the DEIR.

5-11 As pointed out by the commenter, the DEIR includes a typographical error on page 4.14-18. The last paragraph on page 4.14-18 of the DEIR has been revised as follows to correct the error (underline = additional text; ~~strikethrough~~ = deleted text):

> As discussed above, the DeWitt Nelson Facility would result in the demand for 222 afy of water and the NCRF Facility would result in demand for ~~70~~ 98 afy of water. Total demand for water from both projects would be ~~358~~ 320 afy as shown in Table 4.14-7.

Note that this typographical error was confined to this paragraph; the correct numbers were utilized throughout the analysis. Therefore, this minor correction does not alter the conclusions regarding the significance of any environmental impacts, nor does it increase the severity of any impacts.

San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LI

6

November 16, 2010

Roxanne Henriquez
California Department of Corrections & Rehabilitation
Facilities Management Division
Environmental Planning Section
9838 Old Placerville Road, Suite B
Sacramento, CA 95827

Project: DEIR – Northern California Reentry Facility and DeWitt Nelson Youth Correctional Facility Conversion Projects
District CEQA Reference No: 20100707

Dear Mrs. Henriquez:

The San Joaquin Valley Unified Air Pollution Control District (District) has reviewed the Draft Environmental Impact Report (DEIR) for the Northern California Reentry Facility and DeWitt Nelson Youth Correctional Facility Conversion Projects, located east of Stockton in San Joaquin County, CA. The District offers the following comments:

6-1

1. Construction Emissions – The District concurs that project related construction emissions can be mitigated to a less than significant level with the implementation of Mitigation Measures for Impact 4.1-1a thru c.

2. The District concurs that the proposed project is subject to District Rule 9510 (Indirect Source Review) 6-2

4. The District appreciates your efforts to voluntarily mitigate the air quality impacts of your project by entering into a Voluntary Emission Reduction Agreement with the District. It is the District's experience that implementation of a VERA is a feasible mitigation measure which effectively achieves the emission reductions required by a lead agency, including mitigation of project related impacts on air quality to a less than significant level. A VERA is an instrument by which the project proponent provides monies to the District to fund emission reduction projects that achieve the level of mitigation required by the lead agency. VERA is implemented through the District's Strategy and Incentives Program. The District recommends starting the process as early as possible. Information concerning participation in a VERA can be obtained by calling (559) 230-6000 and asking to speak to a District CEQA staff member. 6-3

Seyed Sadredin
Executive Director/Air Pollution Control Officer

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www.valleyair.org www.healthyairliving.com

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5. The proposed project may be subject to District Rules and Regulations, including: Regulation VIII (Fugitive PM10 Prohibitions), Rule 4102 (Nuisance), Rule 4601 (Architectural Coatings), and Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations). In the event an existing building will be renovated, partially demolished or removed, the project may be subject to District Rule 4002 (National Emission Standards for Hazardous Air Pollutants). 6-4

6. The District recommends that a copy of the District's comments be provided to the project proponent. 6-5

If you have any questions or require further information, please call David McDonough at (559) 230-5920.

Sincerely,

David Warner
Director of Permit Services

for, Arnaud Marjollet
Permit Services Manager
DW:dm

Letter 6 Response

David Warner, Director of Permit Services, SJVAPCD

November 16, 2010

6-1 The commenter concurs with the DEIR's conclusions related to construction emissions. No further response is necessary.

6-2 The commenter concurs with the DEIR that the proposed projects are subject to District Rule 9510 (Indirect Source Review). No further response is necessary.

6-3 The District expresses appreciation to CDCR related to their efforts to voluntary mitigate emissions by entering into an emissions reduction agreement. As recommended by the commenter, CDCR will begin the process as early as possible. No further response is necessary.

6-4 The DEIR lists all the SJVAPCD rules applicable to project construction on page 4.1-14 through 4.1-16; the list in the DEIR includes all rules listed by the commenter. No further response is necessary.

6-5 These comments have already been provided to CDCR, the project proponent. No further response is necessary.

7

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November 15, 2010

Roxanne Henriquez, Senior Environmental Planner
Environmental Planning Section
Office of Facilities Planning, Construction and Management
Department of Corrections and Rehabilitation
9838 Old Placerville Road, Suite B
Sacramento, California 95827

RE: Northern California Reentry Facility and DeWitt Nelson Youth Correctional Facility Conversion Projects Draft Environmental Impact Report (DEIR)

The San Joaquin County Environmental Health Department (EHD) is supportive of this project in regards to the provisions of full public services. The EHD requests the following comments be added to the above project for consideration:

The EHD recommends that all existing well(s) not planned for reuse be destroyed under permit and inspection by the EHD. In addition the EHD recommends that any well(s) to be reused for this project not provide water for potable domestic consumption. 7-1

If you have any questions, please call Rodney Estrada, Lead Senior Registered Environmental Health Specialist, at (209) 468-0331.

Rodney Estrada
Lead Senior REHS

RE:tl

Letter 7 Response	Rodney Estrada, Lead Senior REHS, San Joaquin County Environmental Health Department November 15, 2010

7-1 The commenter expresses support of the projects and recommends that all existing wells not planned for reuse be destroyed under permit and inspection by the EHD. In addition, the EHD recommends that any wells to be reused should not provide water for potable domestic consumption. Inconsistent with the rest of the DEIR, page 4.7-5 indicates that CDCR will abandon the fourth well. This statement is corrected as follows:

> Three of the existing wells have already been shut down and CDCR ~~will soon properly abandon the~~ reserves the right, per the Settlement Agreement, that the fourth well can be used when additional hydrologic separation is included to assure that no backflow occurs into the City's new water connection. If the water is used for potable water CDCR will treat the water to potable drinking water standards. It is not CDCR's intent to utilize this water to serve the projects during operations, nor is such use reasonably foreseeable. .~~when City water supplies are delivered to the CDCR property~~.

CDCR will coordinate with EHD for proper abandonment of the three existing wells. The comment does not raise issues related to the adequacy of the DEIR. No further response is necessary.

8

SAN JOAQUIN
LOCAL AGENCY FORMATION COMMISSION

LAFCo

509 W. WEBER AVENUE SUITE 420 ☐ STOCKTON, CA 95203

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November 19, 2010

Roxanne Henriquez, Senior Environmental Planner
California Department of Corrections and Rehabilitation
Facilities Management Division
Environmental Planning Section
9838 Old Placerville Road, Suite B
Sacramento, CA 95827

Dear Ms. Henriquez:

San Joaquin Local Agency Formation Commission (LAFCo) has reviewed the draft Environmental Impact Report for the Northern California Reentry Facility and De Witt Nelson Youth Correctional Facility Conversion Projects. Our particular interest is focused on the discussion regarding the adequacy of fire service.

The report indicates that LAFCo may redraw the fire protection boundary such that one fire protection district provides service to the entire CDCR property. LAFCo cannot redraw the boundaries but may consolidate districts or respond to an application from the Districts (jointly) to amend the boundary. Alternatively, LAFCo will respond to an application request from the property owner (State) to detach and annex to a different district. The present situation with the boundary bisecting the property is not in the best interest of providing an efficient delivery of service. 8-1

The EIR should more fully explore the adequacy of fire service that can be provided by the two Districts. Collegeville, for example, is a volunteer department with a station that is not staffed. The report should reflect these characteristics and estimate the type and number of anticipated calls for service. Response times, training levels, and availability of resources (personnel, equipment, and mutual aid contracts) should be compared. A determination should be made on the adequacy of service based on a threshold of significance to determine if any impact exists and whether mitigation is

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required. The report seems to rely on the payment of fees as mitigation to any significant impact. We believe a more substantive evaluation is necessary. 8-1 cont'd

For your information, San Joaquin LAFCo has recently released its draft Municipal Service Review for the Rural Fire Protection Districts in San Joaquin County. The report can be found on our website at www.sjgov.org/lafco. This report may be helpful particularly with the issue of response times. 8-2

Please call if you have any questions.

Sincerely,

James E. Glaser

James E. Glaser
Executive Officer
San Joaquin LAFCo

James Glaser, Executive Officer, San Joaquin LAFCo

November 19, 2010

8-1 The commenter notes that either the fire districts jointly, or the property owner, must request a boundary change and that LAFCo can alter the boundaries upon such an application. This comment is noted. Once it determines which fire district can best serve the CDCR facilities, the State, if necessary, will file an application with LAFCo to amend fire district boundaries to clarify responsibility for fire protection.

The commenter notes that Collegeville is a volunteer fire department with a station that is not staffed, and that the EIR should estimate the characteristics and estimate the types and number of anticipated calls. Further, the commenter states that response times, training levels, and availability of resources (personnel, equipment and mutual aid contracts) should be compared, and that a determination should be made on the adequacy of services. The commenter further states that the DEIR relies on payment of fees as mitigation to any significant impact, and that a more substantive evaluation is necessary.

Most CDCR institutions include fire stations on site staffed by a fire chief, five fire captains, and a hazardous materials specialist, and are manned by fire personnel seven days per week, 24 hours per day. Inmate workers serve as fire fighters. The number of inmate workers depends on the size of the institution. The State determined that it would not build a fire station at either DeWitt Nelson or NCRF for the same reasons it elected not to build one at CHCF: there is not a sufficiently-sized inmate work crew to staff the station, and fire stations are expensive to build, equip, maintain and staff.

California State Prison, Los Angeles County (CSP-LAC) is the only state adult correctional institution in California that does not have a fire department. The facility has a fire chief and a fire captain who are responsible for fire prevention, training and inspection. Los Angeles County provides emergency response under a contract for services. According to Captain David Brittain at CSP-LAC, in the first six months of 2010, there were 40 calls to the LA County Fire Department, four in response to fire, and one in response to a gas leak. The balance of calls to the LA County Fire Department (35) were for emergency medical care or transport to LA County Hospital. Captain Brittain stated that the number and nature of calls were typical for the facility over a similar time period. CSP-LA houses 4,550 inmates.

It is difficult to estimate with precision the number of emergency calls that would be generated by DeWitt Nelson and NCRF. With a combined population of 1,633 inmates (1,133 at DeWitt Nelson and 500 at NCRF), the number would be approximately 29 calls per year, 12% for fire and 88% for emergency medical response or transport, assuming calls are proportionate to CSP-LA. Given the health care mission of the DeWitt Nelson facility, it will, by definition, have inmates with health problems, which may increase the incidence of medical emergencies. On the other hand, the facility will be staffed with a greater percentage of health care professionals, who will be better trained and equipped to address medical emergencies than the typical correctional facility. Personnel at DeWitt will be better trained and equipped to address medical emergencies, which might reduce the number of calls. Further, CDCR would enter into a separate contract with a private entity for ambulance services (see DEIR pages 4.10-6 and 4.10-7).

Both Collegeville and Montezuma fire protection districts provide Basic Life Support (BLS) services and have certified Emergency Medical Technicians (EMTs) on staff. Both have sufficient equipment and apparatus to serve the facility, especially in light of CDCR's plans to contract for these services. Because access to the NCYCC facility is located on Newcastle Road within Montezuma's district, it has historically provided services to the entire NCYCC campus. Collegeville provided emergency service to the Northern California Women's Facility during its operation between 1987 and 2003 and when the facility was used as a correctional officer training academy until it closed in 2008.

Both Montezuma and Collegeville provide fire protection, suppression and prevention, hazardous materials, and basic emergency medical services. Fire prevention and fire inspection services in state institutions cannot be contracted for with local fire districts. (See H & S Code 13108.) Therefore, DeWitt Nelson and NCRF would rely on one of the districts for emergency fire and medical response only; staff at the facilities would perform all prevention and maintenance.

Montezuma has eleven full-time firefighters and its two fire stations are staffed full time. According to Fire Chief Edward Martel, Montezuma would serve the site from its station at the Stockton Metropolitan Airport. The Airport station is staffed by a Fire Fighter/Engineer, a Fire Fighter and a Chief Officer. Similar to a volunteer station, it relies on reserve firefighters (15) who are called upon if needed during emergencies. Because Collegeville is a volunteer fire district, its station is not staffed full time. Fire fighters are on call during the day, and the station is staffed at night. Collegeville Chief Dennis Faist indicated that if Collegeville were to serve DeWitt Nelson and NCRF, Collegeville would request that the State pay the cost of two full-time employees to staff the station during the day, thereby staffing the station 24 hours per day. Montezuma Chief Edward Martel similarly indicated that if Montezuma were to serve the facilities, he would require funding from the state to add full-time staff. Its contract with Stockton Metropolitan Airport stipulates the number of fire fighters that must be present at the airport during airport during hours of operation. The Collegeville station is located 2.8 miles from the entrance to the NCRF and DeWitt. Montezuma would serve the site from its Stockton Airport station, which is 5.5 miles away.

The Insurance Service Office (ISO) is an independent organization that serves insurance companies, fire departments, insurance regulators and others by providing information about fire risk. ISO staff collect information about fire protection efforts throughout the US. The ISO assigns a Public Protection Classification (PPC) number from 1 to 10, Class 1 being exemplary service and class 10 indicating that the program does not meet the ISO's minimum criteria. There are three primary factors considered in assignment of PPC ratings: 10% is based on the dispatch communications system; 50% is based on the fire department; and 40% is based on the community's water supply.

As discussed in the DEIR (see page 4.10-2), and according to the Montezuma Fire Chief, Montezuma's ISO rating within its district is 5 (although the LAFCo's 2010 draft Municipal Service Review for the Rural Fire Protection (RFP) Districts ("LAFCo Report") indicates that Montezuma's rating is 5-9 (see page 165)) and according to the Collegeville Fire Chief, its ISO rating is 7 (although the LAFCo Report indicates that Collegeville's rating is 8b within 5 miles of the station (see page 88)). Both DeWitt Nelson and NCRF will be connected to municipal water service, which provides the most reliable level of highly pressurized water flow under the PPC rating system. The ISO ratings for Montezuma and Collegeville would both improve due to the quality of water supply on site. On the other hand, the distance between the Montezuma fire station and the entrance to DeWitt Nelson and NCRF would decrease its rating. According to Phil Steele, Senior Field Representative for the ISO, a site that is further than 5 all-weather miles from a station is Class 10.

Mutual aid agreements and automatic aid agreements are customarily executed by emergency agencies to define how assistance that exceeds local resources, such as a natural disaster or multiple-alarm fire, will be provided. Under a mutual aid agreement, the first responder requests the assistance of individual agreement signatories depending upon the nature of the emergency and the resources required. Under automatic aid agreements, signatories are automatically dispatched simultaneously with the first responder. All fire districts in San Joaquin County, including Montezuma and Collegeville, are signatory to the San Joaquin Mutual Aid Agreement. Montezuma belongs to and participates in Joint Power Authorities with French Camp-McKinley RFP, County Search and Rescue Team, County Fire Investigative Unit and the County Joint Radio Users Group. Collegeville recently negotiated an automatic aid agreement with Farmington Fire District, which is pending approval.

Payment of fees is suggested as mitigation for impacts to fire services because either district, Montezuma or Collegeville, would be required to augment its staff to provide fire protection services for the sites. The State continues to analyze which of the two districts would best be able to provide fire protection to DeWitt Nelson and NCRF and/or the possibility of the two districts entering into an automatic aid agreement to provide improved service coverage to the sites, as discussed in the LAFCo Report at pages 88, 161 and166. Regardless of the decision, payment of fees would adequately mitigate impacts related to service capacity to less than significant because the fees would appropriately compensate the District for any necessary staff augmentation.

8-2 This comment does not raise issues related to the adequacy of the DEIR. No further response is necessary.

9

Roxanne Henriquez, Senior Environmental Planner
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November 29, 2010

Subject: Comments on the draft environmental impact report for the Northern California Reentry Facility and DeWitt Nelson Youth Correctional Facility Conversion Projects.

I am Raul Sanchez and I am a member of the San Joaquin County Mental Health Board. The Board is advisory to the San Joaquin County Department of Behavioral Health Services. The comments below are my personal views and opinions.

Page 1-2

". . . although the approved CHCF includes medical facilities, these facilities are intended to serve more severe medical needs than the NCRF medical building, and would not have capacity to serve these more minor medical needs."

Comment:

Consider the option of using the funding for the Northern California Reentry Facility (NCRF) medical building for enhancing the California Health Care Facility to meet the more minor medical needs of the inmates at the NCRF. Perform a life-cycle cost analysis (construction plus building operations for the life of the structure plus the provision of medical services for the life of the structure) of adding additional capacity to the CHCF to address the medical needs of the inmates at the NCRF versus the life-cycle costs of constructing and operating a new medical unit on the grounds of the NCRF. 9-1

Page 2-1

"The proposed DeWitt Nelson project includes the conversion and reuse of the existing DeWitt Nelson facility to a semi-autonomous adult male medical and mental health facility. The adjoining California Health Care Facility (CHCF) project is expected to provide primary administration and support for the proposed DeWitt Nelson Facility. The proposed DeWitt Nelson project would include housing, programming, healthcare facilities, inmate visiting and some support facilities. The project would contain three new housing units and the potential renovation of four existing dormitory housing units for the proposed inmate population. The new housing units and four existing dormitories would house up to a maximum of 1,133 inmates. The NCRF proposed conversion project would involve construction of a new medical building, as well as renovation of buildings for facility program support services, dining and receiving, family visiting, academic and vocational education, miscellaneous support, and a gymnasium at the former Northern California Women's Facility (NCWF). " 9-2

1

Comment:
If the CHCF can provide primary administration and support for the proposed DeWitt Nelson health care facility, what is the significant obstacle preventing these two care facilities (CHCF and DeWitt Nelson) from providing medical and mental health care services to inmates at the NCRF? It may be possible to eliminate the construction of a new medical building at the NCRF (Page 3-14 states the NCRF medical building would be16,500 square feet and 35 feet in height). 9-2 cont'd

Page 2-2
"These mitigation measures, including a description of timing of implementation, agency responsibility, and monitoring requirements, will be described in two separate mitigation monitoring and reporting program (MMRPs) documents, one for each project. Once the EIR is finalized, CDCR will consider each of the MMRPs along with the EIR in the project approval process." 9-3
Comment:
Provide me with information on how to access the MMRPs in the future.

Page 2-4
"If CDCR certifies the final EIR and approves each project, the Receiver will consider taking the following steps for each project:"
Comment:
Consider adding the following item under the above text: "Adopt a resolution that states that the CDCR has prepared an EIR that adequately addresses the cumulative impacts of the CHCH, the Dewitt Nelson Facility, and the Reentry Facility" 9-4

Page 4.1-1
"The SJVAB can be considered a "bowl" open only to the north."
Comment:
At the northern end of the SJVAB (San Joaquin Valley Air Basin), it is also open to the west and air flows from the Bay Area through the Carquinez Straits and the Sacramento/San Joaquin River Delta to the SJVAB. Have there been studies to estimate the amount of air pollutants being imported to the SJVAB from the Bay Area? What have been the findings? 9-5

Page 4.4-9
"In response to the need to fill these positions, California Prison Healthcare Services has agreed to enter into a contract to provide partial funding to Delta Community College to help expand its existing accredited psychiatric technician program. Delta plans to ramp up its psychiatric technician program over three to four years, with a goal of graduating 255 students over the contract term. The largest class is expected to graduate the year the Stockton medical facilities are opened. The goal is to expand a program that currently enrolls 15 new students each year to one that could handle as many as 90. Over the course of the three-year grant period, the goal is to produce 216 licensed Psych Techs from an 9-6

2

overall enrollment objective of 255. CDCR has also been working with San Joaquin Delta College deans and faculty in support of Department of Labor (DOL) grants that would also be used to expand Psych Tech training at the college. CDCR and the Receiver worked actively on the grant proposal for Delta, and lobbied for support from the Department of Mental Health (DMH), and the Psych Tech union (CAPT). CDCR also garnered the support of San Joaquin Workforce Investment Board for the grant and to assist with the program such as helping to provide support to students with such things as child care assistance. As part of CDCR's contribution to the program, CDCR will provide clinical rotation sites, either at correctional facilities and/or DMH hospitals. Although specific sites, numbers of students that could be accommodated, and other considerations are not yet worked out in detail, CDCR is committed to supporting the expansion of Psych Tech educational programs, at Delta and at other colleges, as a proactive means of meeting the staffing requirements for the Stockton Facilities."

"As part of the implementation of the CHCF Stockton project and for these two projects, CDCR has committed to the following elements of the San Joaquin Local Human Resources Plan, required in the CHCF Settlement Agreement, as follows:

9-6 cont'd

► Conduct civil service job information and application workshops in Stockton and San Joaquin County.
► Provide Institution tours.
► Provide periodic job information releases to local newspapers and media outlets.
► Visit local schools to provide information and assistance in how to apply for state civil service positions.
► Attend local job fairs in order to provide information and assistance to prospective job candidates.
► Conduct spot testing for open (non-promotional) civil service examinations in the Stockton/San Joaquin County area.
► Designate a Community Resource Manager for implementation of local outreach and education.
► Work with local community colleges to establish training programs to supply licensed applicants to the state for hire (i.e., Psychiatric Technician, LVN, RN, etc.).
► Establish working partnership with the Stockton Employment Development Department (EDD) office in order to enhance local recruitment efforts.
► Establish a working partnership with city and county officials and community-based organizations, including the Greater Stockton Chamber of Commerce, in developing a localized recruitment effort."

"As stated in the Settlement Agreement, CDCR would continue to follow the plan for five years after construction of the project, and an additional five years (total of 10 years) unless the Citizens Advisory Committee (CAC) votes to discontinue."

3

Comment:
The above statement is a credit to CDCR in attempting to address the shortage in professional health care workers to be employed at the proposed prison facilities.

The need for additional professionals will only increase with the future construction and operation of the Veterans Affairs facility planned for San Joaquin County.

Due to salary disparities, local agency staff may choose to work for CDCR. Local agency staff will need to be replaced.

Consider outreach activities with the local school districts to promote the health care professions. Investigate educational and training options with the University of the Pacific, Stanislaus State University (Stockton), and Humphrey's College (has criminal justice program). Enter into planning activities with the Veterans Affairs Administration for possible collaboration activities in the treatment of the medical and mental health needs for veterans and inmates. 9-6 cont'd

Page 4.11-14
"Because the proposed projects would not be served by bus, the proposed projects would not increase the demand for transit service. CDCR will coordinate with the San Joaquin Regional Transit District regarding the potential for future bus or shuttle service to the site; however, bus service cannot be verified at this time. Impacts associated with alternative modes of transportation are not significant and are not discussed further."
Comment:
The requirements of the California climate change law, AB 32, should be considered when discussing transit services since transit services would reduce vehicle miles of travel. Refer to the settlement agreement between the City of Stockton and the California Attorney General and the Sierra Club with regards to the environmental impact report for the City of Stockton's 2035 General Plan and the requirements of AB 32. 9-7

Page 4.11-36
"While feasible mitigation is available, Caltrans is the agency that can and should implement this mitigation and it is unknown whether this mitigation would be implemented prior to operation of the project."
Comment:
A more proactive statement is suggested: "CDCR will enter into negotiations with Caltrans on the funding and scheduling of mitigation measures". 9-8

Similar statements to the one on Page 4.11-36 are on Pages 4.11-45, 4.11-46, 4.11-46 (with regards to San Joaquin County), 4.11-56, 4.11-56 (with regards to San Joaquin County). The same comment applies.

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Page 4.11-53, Comment on Table 4.11-37

For Arch Road between Newcastle Road and the NCRF, the existing peak hour directional roadway volumes are mostly below 100 vehicles per hour. For the background condition, the volumes range from about 1700 to 2300 vehicles per hour. For the project condition, the volumes range from about 1700 to 2700 vehicles per hour. There are eight development projects listed on Page 4.11-23. It would be of assistance to the reader to point this out again. Listing the development projects and providing the traffic generation volumes for this segment of Arch Road by each of the development projects would put the impact of the eight development projects in proper perspective. One of the eight projects is the California Health Care Facility (CHCF). 9-9

As a general concept, the funding for the mitigation measures should be in proportion to the traffic generated by the various development projects. For CDCR, the traffic generated by the CHCF, the DeWitt Conversion, and the NCRF in proportion to the traffic generated by the eight development projects (includes CHCF) plus DeWitt plus NCRF would be CDCR's share of the cost of the mitigation measures.

Comment on year 2035 traffic analysis

Why the detailed traffic analysis for the year 2035? The level of detail of the analysis should be somewhat commensurate with the certainty of the estimate of future conditions. 9-10

Page 4.12-3 Comment

The map on this page shows a piece of property with access via Austin Road that is owned by the San Joaquin County Board of Education. Does the Board currently own this property? If this is the case, has the Board been contacted to assess the impacts on its property? 9-11

Page 4.12-24

"Although the proposed project would increase generation of solid waste, both during construction and operation, the nearby landfill is projected to have capacity to accept the increased solid waste and the project would not consume a significant amount of the landfill's available capacity or result in the need to expand or construct new landfill facilities. Therefore, this impact would be less than significant. (Impact 4.12-5a)." 9-12

Comment:

The Forward Landfill immediately south of the DeWitt Facility issued an EIR on its proposed expansion with comments due March 16, 2010.

Page 4.14-9 Comment

Double check the numbers in Table 4.14-2 9-13

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Page 4.14-10 Comment
Check with the California Department of Water Resources on whether or not the 2010 California Water Plan has been completed. 9-14

Page 5-7
"The SJVAB is in nonattainment status for ozone. This is a result of past cumulative development in the basin, as well as transport of pollutants from other basins
Comment:
If available, provide information on the transport of pollutants from other basins 9-15

Page 5-8 Climate Change Comment
Refer to the settlement agreement between the City of Stockton and the California Attorney General and the Sierra Club with regards to environmental impact report for the City of Stockton's 2035 General Plan and the requirements of AB 32 (climate change legislation). A key provision of the settlement agreement is the reduction of vehicle miles of travel. The aggressive employee carpool and vanpool program describe on Page 5-14 is to be commended. 9-16

It is suggested to make use of telemedicine. The CHCF and/or DeWitt would be the centers of operation providing consultations with inmates and their doctors at prisons throughout California. This may reduce transporting inmates to prison health care facilities. This may even reduce the need for some additional prison health care facilities.

Page 5-20
"The DeWitt Nelson project and NCRF project would provide adequate stormwater drainage facilities on the CDCR property to accommodate stormwater demands of all existing, proposed, and approved CDCR facilities, including CHCF Stockton."
Comment:
Example of very clear statement that all three (DeWitt, NCRF, and CHCF) CDCR projects are included in the analysis. It is suggested that this example be utilized throughout the report where applicable. 9-17

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6

Raul Sanchez, San Joaquin County Mental Health Board Member

November 29, 2010

9-1 This comment raises issues related to the coordination between NCRF and CHCF Stockton to provide medical care, suggesting that construction of the new medical building at NCRF may not be necessary. The comment does not raise issues related to the adequacy of the DEIR. The CHCF facility is intended to serve more severe and different medical needs than the proposed NCRF medical building and is designed as a regional facility serving inmates with specified medical needs. The NCRF facility is designed as a stand-alone facility and the medical building will handle minor medical needs without requiring inmates to leave the facility's security enclosures. By analogy, using a hospital to treat a cold would be an inappropriate use of hospital resources, but a medical clinic would be appropriate. Where the DEIR states that the CHCF facility will not have "capacity" to serve these more minor medical needs, the word "capacity" in this instance is not suggesting that the facilities are not appropriately sized to handle the medical needs of NCRF, but rather, that the mission of the facility is different. The entire CHCF program is designed (or has the "capacity") to provide sub-acute medical and mental health services to inmates coming from other prisons across the state. The inmates being served by CHCF would generally be suffering from more severe, often chronic, even terminal ailments. CHCF is designed to provide intensive long-term treatment. Treatment of minor injuries and illnesses (such as would be provided by an outpatient health clinic) for a single prison facility would not fit within the CHCF program and would misdirect highly needed resources. This comment does not raise any specific environmental issues, so no further response is provided.

9-2 Similar to comment 9-1, this comment raises issues related to the coordination between the proposed NCRF project and CHCF Stockton to provide medical and mental health care, but the commenter additionally suggests that the proposed DeWitt Nelson project could also provide medical support to NCRF. Please see response to comment 9-1 above regarding the reasons why the CHCF Stockton facility would be inappropriate for providing medical care to NCRF. The program for the DeWitt Nelson facility would be supported by some CHCF services; however CHCF would be inappropriate to serve the medical needs of the NCRF facility. Please see response to comment 9-1 for more information. This comment does not raise any specific environmental issues, so no further response is provided.

9-3 A copy of the MMRP can be requested from CDCR, if the project is approved, at the following address:

California Department of Corrections and Rehabilitation
Office of Facilities Planning, Construction, and Management
Environmental Planning Section
9838 Old Placerville Road, Suite B
Sacramento, CA 95827
Contact: Roxanne Henriquez, Senior Environmental Planner

9-4 This comment is noted. If the Receiver finds that the EIR is adequate under CEQA and if the Receiver decides to approve one or both of the projects, the Receiver would adopt a resolution(s) similar to that requested by the commenter.

9-5 According to the SJVAPCD's website, the majority of the basin's air pollution is created locally. Data indicates that approximately 27 percent of the total air pollution in the northern portion of the District comes from the Bay Area. In the central portion of the District, the percentage drops to 11% and in the southern area, transport air pollution constitutes 9% of the total air pollution inventory (SJVAPCD 2010). This information does not conflict with any information in the DEIR.

9-6 This comment is noted. CDCR/California Prison Health Care Services (CPHCS) has been coordinating with local school districts, CSU Stanislaus, and University of the Pacific. The comment requests additional coordination due to the commenter's opinion that additional professionals may be needed in the future. These are social issues and do not raise environmental issues. Nevertheless, CDCR and CPHCS will continue to coordinate with these entities in the future. Please also refer to response to comment 3-1.

9-7 CDCR is a State agency and is not subject to the City of Stockton's settlement agreement with the Sierra Club. However, as indicated in the DEIR (in the passage to which the commenter refers) CDCR will coordinate with San Joaquin Regional Transit District regarding the potential for future bus or shuttle service to the site, despite the DEIR's conclusion that the proposed projects would not result in an increased demand for bus service. Please also refer to response to comment 2-3, which clarifies DEIR text related to project demand for bus service. Because the proposed project is not expected to result in substantial demand for transit service, providing public transit as mitigation would not be a reliable option for reducing project-related greenhouse gas emissions, and may even increase emissions as buses travel out of their way while providing very little service. AB32 was considered in the DEIR; see the discussion of climate change on pages 5-8 through 5-15, including mitigation measures included on page 5-14.

9-8 In stating that Caltrans is the agency that can and should implement the mitigation, the DEIR is disclosing that, because this mitigation is in Caltrans' jurisdiction and requires Caltrans approval and implementation, CDCR cannot guarantee the timely implementation of this mitigation measure. CDCR cannot base the conclusion of the analysis on a mitigation measure that ultimately lies out of CDCR's purview to approve. However, to the comment's point, the intent of this statement is not to suggest that CDCR would merely "hand off" the mitigation to Caltrans; rather, as with all mitigation measures in the EIR (and the Mitigation Monitoring and Reporting Program that will be adopted based on the EIR), CDCR is responsible for implementing the mitigation measures to the extent CDCR has jurisdiction to approve a measure. In those cases where a different agency has jurisdiction over a mitigation measure and where many projects contribute to the impact, CDCR will, as the commenter suggests, coordinate with that agency as closely as possible to ensure the mitigation measure is implemented as quickly as possible to reduce the project impacts. However, CDCR would only be able to pay its fair share to mitigate the impact to the extent it is caused by the project; CDCR cannot force Caltrans or the City to implement measures if they do not have adequate funding from other projects contributing to the impact, hence the uncertainty expressed in the mitigation language.

9-9 As the commenter points out, "Background Condition" is thoroughly defined on page 4.11-21 through 4.11-26 of the DEIR. After the DEIR defines background condition and project condition (p. 4.11-27), much of the remainder of Section 4.11 "Transportation" consists of a comparison between existing conditions, background conditions, and project conditions. It would be redundant to consistently redefine these terms for every table. Also, regarding mitigation funding, the mitigation measures pointed out by the commenter include the percent contribution required for the project's fair share (taking the other development into consideration, as noted by the commenter). CHCF is a different project, already approved and for which fair share mitigation fees have already been committed. Thus, it would not be useful to include the percent traffic from that project in the percent contributions of the projects under specific consideration in this EIR: NCRF and DeWitt Nelson.

9-10 While it is agreed that there is uncertainty when dealing with a long-term cumulative analysis, it is important to conduct a thorough study where planning documents and approved/proposed projects, and reasonably foreseeable future projects, provide enough information to do so. This ensures that a project's long-term cumulative impacts are analyzed as accurately as possible and any impacts are mitigated as fully and fairly as possible. Further, this is the planning horizon for the City of Stockton's General Plan (whose lands surround the project) and for the City's traffic model.

9-11 The County Board of Education is still the current property owner of the piece of land mentioned by the commenter. The DEIR evaluated all impacts of the project, including those related to the Board's property. With respect to consultation, CDCR provided notice consistent with the requirements of CEQA, including advertising the notice of availability of the DEIR in the Stockton Record, the Manteca Bulletin, the Calaveras Enterprise, and the Amador Ledger Dispatch. This meets the noticing requirements specified in CEQA Guidelines Section 15087(a). No comments were received from the County Board of Education.

9-12 The DEIR's cumulative analysis includes the Forward Landfill Expansion on Table 5-2 "List of Projects in the Vicinity." As indicated by the table the expansion project is currently on hold. It should be noted that expansion of the landfill's capacity would not adversely affect its ability to accept solid waste generated by the proposed projects.

9-13 The information in Table 4.14-2 has been reviewed against the source information (Table 2, page 10; *Water Supply Evaluations for the General Plan Update. Preferred Alternative* prepared for the City of Stockton in 2006 by MWH Americas). The information in the table correctly reflects the source. No further response is necessary.

9-14 The California Water Plan Update 2009 was released March 30, 2009. The second full paragraph of page 4.14-10 of the DEIR is therefore revised as follows:

> California water planners and managers have been among the first groups in the nation to seriously consider the implications of statewide and regional climate change (rather than global-scale changes) on the reliability and safety of their systems. The California Water Plan (Bulletin 160) first briefly addressed climate change in 1993. This analysis has most recently been expanded and refined in the ~~2005~~ 2009 update of the California Water Plan, which ~~explores a~~ builds on the 2005 update by revisiting (with an increased sense of urgency) a wide range of climate impacts and risks, including risks to water resources (can be accessed at ~~http://www.waterplan.water.ca.gov/previous/cwpu2005/index.cfm~~ http://www.waterplan.water.ca.gov//cwpu2009/index.cfm). The ~~2005~~2009 update also describes efforts that should be taken to quantitatively evaluate climate change effects for the next update of the California Water Plan.

The revised DEIR text provides an update to a document that was referenced for information purposes. The changes to the text do not alter any of the DEIR conclusions of mitigation measures. Recirculation of the DEIR is not required.

9-15 Transport of pollutants from other basins is described under response to comment 9-5. No further response is necessary.

9-16 Diagnostics and consultations are not primary functions of the CHCF Stockton or the proposed DeWitt Nelson facilities. As mentioned above under responses to comments 9-1 and 9-2, CHCF Stockton and DeWitt Nelson would provide medical and mental health care for inmates who have been diagnosed with illnesses requiring this type of treatment. Inmates would not routinely be sent to this facility for a typical diagnosis. It should be noted that CDCR encourages collaboration among its doctors and medical and mental health professionals; however, this would not result in a substantial reduction in project green house gas emissions. It should also be noted that the CPHCS is already practicing telemedicine for medical care and is currently exploring practices to most efficiently promote constitutionally adequate healthcare provision; telemedicine is one of the options being evaluated.

9-17 The example statement provided by the commenter cannot be utilized universally throughout the EIR. This example statement is employed throughout the cumulative discussion where the DEIR must consider the impacts from other planned and approved development, including the CHCF project, and evaluate how those impacts will coincide with the environmental effects of the proposed project. However, when

evaluating the environmental impacts of the individual NCRF and DeWitt Nelson projects, it is appropriate to only include discussions of those facilities, as they are the subject of this EIR. CHCF was addressed, and mitigated, in a prior EIR (certified in 2009). The DEIR discusses impacts of the CHCF Stockton project appropriately in the cumulative impact discussions.

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November 30, 2010

Roxanne Henriquez, Senior Environmental Planner
Facilities Management Division, Environmental Planning Section
California Department of Corrections and Rehabilitation
9838 Old Placerville Road, Suite B
Sacramento, California 95819

SUBJECT: NORTHERN CALIFORNIA REENTRY FACILITY AND DEWITT-NELSON YOUTH CORRECTIONAL FACILITY CONVERSION PROJECTS DRAFT ENVIRONMENTAL IMPACT REPORT (DEIR)

Dear Ms. Henriquez:

The San Joaquin County (County) Department of Public Works has reviewed the above referenced document and has the following concerns:

Transportation Planning Comments:

1. Page 1-65, Section 4.11-1: The mitigation for the Newcastle Road and Arch Road signal discusses coordination with the County. As this signal is within the City of Stockton's (City) jurisdiction, coordination would be required with the City, not the County. 10-1
2. Page 3-7, Exhibit 3-3: The map indicates two areas marked as private property. The northwest parcel marked as private is within the City limits and should be shown as such. The southeast parcel marked as private is owned by the California Youth Authority, along with the remainder of the DeWitt-Nelson project site, and should be marked accordingly. 10-2
3. Page 4.11-1: Under Regional Roadways, State Highway Route 99 (SR 99), the study claims SR 99 does not have a posted speed limit within the vicinity, and further states the California Highway Patrol will implement a 70 mph speed limit. This would appear to be incorrect, as SR 99 is signed 65 mph near the Mariposa Road interchange. 10-3
4. Page 4.11-2, Exhibit 4.11-1: Figure 8 shows a dedicated northbound right-turn lane where there is none. Correct the figures and verify that all existing scenario simulations reflect this accurately. 10-4
5. Page 4.11-2, Exhibit 4.11-1: Figures 6 and 7 show separate northbound left- and right-turn lanes, along with a southbound lane (assumed from the eastbound right- and westbound left-turn lanes shown). These driveways have room for only two lanes, not three. Correct the figures and verify that all existing scenario simulations reflect this accurately. 10-5
6. Page 4.11-2, Exhibit 4.11-1: Figure 10 shows a shared southbound through/right-turn lane. I believe the implementation of this driveway improvement by the previous CDCR project was proposed to have a separate southbound right-turn lane – verify and correct as necessary. 10-6
7. Page 4.11-4: The sentence "As defined by Caltrans, Class II bicycle routes are signed and should direct cyclist to the superior through route 4." is unclear. Clarify this statement, and note that SR 4 is identified by Stockton as a future Class II bicycle lane. 10-7

8. Page 4.11-8: The final paragraph under Existing Traffic Volumes and Levels of Service refers to intersection no. 5, Arch Road and Logistics Drive, as having a signal installed after counts were taken; however, Table 4-11.1 refers to intersection no. 9, Arch Road and Austin Road. Identify the correct intersection, ensure consistency of the two items, and confirm the simulations were run accurately. 10-8
9. Page 4.11-17: Mitigation Measure for Impact 4.11-1a incorrectly refers to Coordination with the County. As this signal is within the City's jurisdiction, coordination would be required with the City, not the County. 10-9
10. Page 4.11-25, Exhibit 4.11-5: This exhibit is intended to include all background project traffic including the CHCF traffic. The EIR for the CHCF showed significant traffic during the midday period for the 2:00 p.m. shift change that does not appear to be reflected at either intersection no. 8 or no. 9 on this exhibit. Clarify the location of the missing traffic, and confirm that the simulations were run correctly. 10-10
11. Page 4.11-45: The mitigation for the Austin Road and Arch Road intersection states that a dedicated northbound left-turn lane is required, but goes on to state that this mitigation may not be feasible due to either right-of-way or utility constraints. As the project controls the right-of-way along this leg of the intersection and being required to dedicate to the County, right-of-way should not be an issue. During discussions for the previous CHCF project, the possible need for this left-turn lane as a mitigation was considered, and the signal pole on the southwest quadrant was positioned back to accommodate this mitigation. As both identified issues appear to have been already addressed, this should be considered a feasible mitigation, and required by the project. 10-11
12. Page 4.11-46: The study states that it is unknown whether the County would implement the northbound Austin Road left-turn lane mitigation; as previously noted, there should be no major issues with the implementation of this improvement, and it should be the requirement of the project to implement, not the County. 10-12
13. Page 4.11-70, Table 4.11-52: This table, and other tables throughout Section 4.11, state that Intersections operating below acceptable LOS are in bold, but contain LOS E or LOS F conditions not in bold. Correct all tables as applicable. 10-13
14. Page 4.11-85: Table 4.11-68 is out of place – it should be located in Section 3. Austin Road and Arch Road, not in Section 4. where it is currently placed. 10-14
15. Page 4.11-86: Mitigation Measure for Impact 4.11-3c (4) appears to refer to changes to the Arch Road and Logistics Drive signal, and refers to the County as the responsible agency. If this is correct, that signal is within the City's jurisdiction; coordination would be required with the City, not the County. 10-15
16. Page 4.11-86: The final paragraph on this page refers to a 2035 scenario to widen SR 99 from six to 10 lanes, and then states this is consistent with Caltrans' plans for this facility. While the City's General Plan does call for 10 lanes north of Mariposa Road, the current General Plan appears to show only eight lanes south of Mariposa Road. In addition, it is unclear what document shows Caltrans as projecting 10 lanes – the current Transportation Concept Report dated November 2002 shows the 2025 concept facility as an eight-lane freeway, with a note for two segments north of Charter Way that states "10-lanes needed to meet the concept LOS." 10-16

17. Due to right-of-way restrictions, the concept facility is an eight-lane freeway." Clarify and document the manner in which the 10-lane conclusions were reached, or correct to eight lanes as necessary. 10-17

18. Page 4.11-88: Mitigation Measure 4.11-4a is identified as "Widen SR 99 from six lanes to eight lanes." The next paragraph states that "Caltrans has identified and is planning for this improvement and construction is projected to begin in 2011..." This is incorrect; the project currently being planned by Caltrans to be under construction in 2011/2012 is a widening from the existing four lanes to six lanes, not eight lanes. 10-18

19. Page 4.11-99: Mitigation Measure for Impact 4.11-5c refers to an Impact 4.11-6a. There does not appear to be an Impact 4.11-6a in this document. 10-19

Solid Waste Comments:

The San Joaquin County Solid Waste Division has reviewed the above referenced document and has comments specific to the narrative contained in Section 4.12-5: Impact to Solid Waste Facilities regarding solid waste materials disposal.

1. **Title 5, Division 2, Chapter 7, Section 5-2702 requires that all solid waste collected from the unincorporated areas of the County be deposited at a County-designated solid waste site.** Since both facilities (NCRF and DeWitt-Nelson) in question are located in the unincorporated San Joaquin County, the waste generated at these facilities is required to be deposited at County-owned solid waste sites. **Forward Landfill is a privately-owned solid waste site.** 10-20

2. **Further supporting this waste delivery requirement is Section 5-2954 of Chapter 14 of Division 2 of Title 5, which requires that all construction and demolition debris from unincorporated areas of San Joaquin County be deposited at County-owned solid waste sites.**

Due to Title 5, San Joaquin County believes the impacts would be of more significance than those indicated in the Draft Environmental Impact Report.

Thank you for the opportunity to be heard. Should you have questions or need additional information regarding the above comments, please contact me at (209) 468-3085.

Sincerely,

MARK HOPKINS
Environmental Coordinator

MH:TK:to
TE-10K049-T1

c: Desi Reno, Integrated Waste Manager
Firoz Vohra, Senior Engineer
Alison Hudson, Management Analyst III
Jeffrey Levers, Associate Engineer

10-1 The commenter is correct. Mitigation Measure for Impact 4.11-1a, on pages 1-65 and 4.11-16 of the DEIR is therefore revised as follows:

Mitigation Measure for Impact 4.11-1a.

Newcastle Road & Arch Road

The following mitigation measures have been identified to improve intersection operations. The project would contribute approximately 18% of the traffic (construction traffic / total traffic = %) to this intersection during the A.M. peak hour.

- Coordinate with the ~~County~~ City of Stockton to adjust the traffic signal timing to optimize the splits (balance of green and red signal time for each approach) during the A.M. peak hour. [. . .]

This revision clarifies the agency with whom CDCR must coordinate to implement the measure. The text change does not alter the effectiveness or the feasibility of the mitigation measure. The text change does not alter the conclusion in the DEIR. The text change does not result in the need to re-circulate the DEIR.

10-2 The California Youth Authority (C.Y.A.) is not the current property owner of the parcel in question. This parcel was sold to the County Board of Education. CDCR is able upon request to present the deed and agreement of sale. Regarding the city limits, Exhibit, 3-3 has been revised, to show the correct location of the City of Stockton city limit. Please see Chapter 4, "Corrections and Revisions to the DEIR," for the revised exhibit.

10-3 The commenter correctly indicates that the speed limit for this segment of SR 99 is not correctly described in the DEIR. The last paragraph on page 4.11-1 of the DEIR is therefore revised as follows:

SR 99 has an Annual Average Daily Traffic1 (AADT) (Caltrans 2010a) of about 73,000 vehicles north of the Arch Road interchange and approximately 68,000 south of the Arch Road interchange. The AADT volumes are based on 2009 traffic data collected by Caltrans north of the French Camp Road interchange and south of the Mariposa Road interchange (Appendix E). The Arch Road interchange lies between French Camp Road and Mariposa Road. SR 99 ~~does not have a~~ has posted speed limit of 65 mph within the vicinity of the study area. ~~However, the California Department of Transportation and the California Highway Patrol will implement a 70 mph speed limit (Caltrans 2010b).~~

This correction to the posted speed limit does not alter the DEIR's analysis or conclusions because the traffic analysis considers volume and capacity, not speed. The text change does not result in the need to re-circulate the DEIR.

10-4 Based on field reconnaissance it was determined that traffic on Austin Road widens into two lanes at the intersection, creating a de-facto northbound right turn lane at this intersection. Thus, it was analyzed in this manner to reflect the actual operation of the intersection. Also, the single northbound lane approach flares out and is wider at the intersection, with two separate stop bars (one for through and left turning traffic, and one for the northbound right turn movements).

10-5 The commenter is correct to point out the error in the graphics. The analysis assumed a single northbound left-right turn lane for all analysis scenarios, but the graphic indicates separate right and left turn lanes.

The analysis was checked and verified as correct. Please see Chapter 4, "Corrections and Revisions to the DEIR," for the revised exhibit. None of the conclusions of the DEIR would be affected by this change.

10-6 Exhibit 4.11-2 does not include a Figure 10. The only figure that shows a shared right turn lane is Figure 3. The commenter mentions a driveway improvement for the previous CDCR project. It should be noted that CDCR had previously approved the NCRF project, but the decision was set aside by the San Joaquin Superior Court in *California Correctional Peace Officers Association v. CDCR* (2008). This previous CDCR project proposed a dedicated northbound left turn lane which was accounted for in this DEIR. A dedicated southbound right turn lane was not assumed.

10-7 The last sentence of the first paragraph on page 4.11-4 is hereby revised, as indicated below:

> ~~As defined by Caltrans, Class III bicycle routes are signed and should direct cyclist to the superior through route 4.~~ As defined in the Caltrans Highway Design Manual, Class III bicycle routes are shared facilities which serve either to: (a) Provide continuity to other bicycle facilities (usually Class II bikeways (such as SR 4 in the City of Stockton, which has been identified as a future Class II bicycle lane); or (b) Designate preferred routes through high demand corridors.

None of the conclusions of the DEIR would be affected by this change.

10-8 The confusion of this DEIR text is due to a misplaced note in Table 4.11-1. Note "b" regarding the traffic control at intersection number 8 in Table 4-11.1 should be placed with intersection number 5. The analysis has been checked and verified as correct, and no further edits are required. Therefore, Table 4.11-1 on page 4.11-6 of the DEIR has been revised as follows:

Table 4.11-1
Study Intersections

#	Study Intersection Name	Traffic Control	Jurisdiction
1	SR 99 Southbound & Arch Road[a]	Signal	Caltrans
2	SR 99 Northbound off-ramp & Arch Road[a]	Signal	Caltrans
3	Kingsley Road –SR 99 Frontage Road & Arch Road	Signal	Caltrans
4	Newcastle Road & Arch Road	Signal	City of Stockton
5	Logistics Drive & Arch Road[b]	Signal	City of Stockton
6	NCRF West Driveway & Arch Road	Unsignalized	County
7	NCRF East Driveway & Arch Road	Unsignalized	County
8	Austin Road & Arch Road[~~b~~]	Unsignalized	County
9	Austin Road & Project Access Driveway (CHCF & DeWitt Nelson)	Unsignalized	County

Notes:
[a] Intersection operates as part of the Single Point Urban Interchange (SPUI) which includes the SR 99 northbound and southbound ramps.
[b] At the time traffic counts were conducted for this intersection, the intersections was unsignalized. This intersection has since been signalized
Source: DKS Associates, 2010.

This text change does not alter the analysis or conclusions of the DEIR and does not result in the need to re-circulate.

10-9 Please see the revisions to Mitigation Measure 4.11-1a identified in response to comment 10-1. No further response is necessary.

10-10 To be conservative, the projected CHCF PM peak hour volumes from the CHCF DEIR were utilized for the midday analysis in this EIR analysis, as shown on the figure. The analysis was checked and verified as correct.

10-11 The Austin Road/Arch Road intersection is projected to operate at LOS F under the Background Condition (see DEIR page 4.11-51). With the addition of the NCRF and Dewitt Nelson projects the intersection will continue to operate at LOS F with increases in the Midday and P.M. Delays. The increase in traffic by the projects has been identified as a significant impact which should be mitigated by the contribution of appropriate fees to San Joaquin County. The fees would be contributed towards the construction of a dedicated northbound left turn lane. Construction of this lane would likely require additional right of way acquisition and utility relocation. While the State controls the right of way on the southwest corner of the intersection it does not control the right of way on the east side. Also, there is an existing power pole line on the east side of the intersection which crosses to the northwest corner and may require relocation. Due to these constraints, and the uncertainty if the County will implement the intersection improvements as proposed, the impact is identified as potentially significant and unavoidable. It should be noted that in response to City of Stockton's comment 5-9, additional mitigation is required for this intersection. Please see response to comment 5-9 for the discussion and Appendix A for the revised DEIR text.

10-12 See response to comment 10-11.

10-13 Please see Appendix A "Revised Section 4.11 Transportation" for revised tables with correct highlights. However, while the tables were not highlighted correctly, the data used in the EIR was based on accurate LOS designations. None of the conclusions of the DEIR would be affected by these changes.

10-14 The table fell on the following page for formatting purposes and does not affect the analysis. No revisions to the EIR are necessary.

10-15 The commenter is correct. Mitigation Measure for Impact 4.11-3c (4), on pages 1-77 and 4.11-84 of the DEIR is therefore revised as follows:

4. <u>Arch Road – East of Newcastle Road and west of NCRF West Driveway (Roadway Segment)</u>

   The following mitigation measures have been identified to improve the roadway operations and achieve a difference in volume-to-capacity ratio equal to or less than the 2035 Cumulative No Project condition during the A.M., Midday, and P.M. peak hours. CDCR will contribute appropriate fees based on trip ends generated by the project to the ~~County of San Joaquin~~ <u>City of Stockton</u> to help fund implementation of this improvement. [. . .]

This revision clarifies the agency with whom CDCR must coordinate to implement the measure. The text change does not alter the effectiveness or the feasibility of the mitigation measure. The text change does not alter the conclusion in the DEIR. The text change does not result in the need to re-circulate the DEIR.

10-16 The 10 lane assumption on SR 99 is noted in the City of Stockton General Plan, and is consistent with assumed improvement noted in recent transportation studies conducted in the area (e.g., Mariposa Lakes EIR, CDCR CHCF EIR). This assumption is also included in the City of Stockton's Travel Forecast

Model, which is provided to the EIR consultants by the City of Stockton as a reference and to analyze 2035 traffic volume and roadway improvement assumptions.

10-17 See response to comment 10-16 above.

10-18 The commenter is correct. Page 4.11-88 of the DEIR is therefore revised as follows:

> Implementation of mitigation measure for Impact 4.11-4a would reduce the project's impacts to the northbound segment of SR 99 from Arch Road to Mariposa Road, including merge/diverge impacts, to a less-than-significant level. While feasible mitigation is available, Caltrans is the agency that can and should implement this mitigation. While Caltrans has identified and is planning for this improvement~~ and construction is projected to begin in 2011, it is unlikely that,~~ this improvement could not feasibly be implemented prior to operation of the project.~~ Acceleration of the schedule would not be feasible.~~ While this mitigation would reduce the project's impact to this freeway segment once implemented, for purposes of CEQA, this impact is concluded to be ***cumulatively significant and unavoidable*** and the project's contribution would be considerable in the interim period when the project is operational and the improvement is not complete.

The correction to this text does not change the conclusions of the DEIR. No re-circulation is necessary.

10-19 The Mitigation Measure should reference Impact 4.11-5f. Therefore, Mitigation Measure 4.11-5c, on page 4.11-99 of the DEIR, is revised as follows:

> Mitigation Measure for Impact 4.11-5c
>
> The following mitigation measures at the intersection of SR 99 SPUI & Arch Road have been identified to improve the operation of the intersection and balance the queue lengths.
>
> - Implement Mitigation Measure for Impact ~~4.11-6a~~4.11-5f.

The minor correction to this mitigation does not alter the measure's effectiveness or feasibility.

10-20 The commenter cites County Code sections requiring solid waste collected from unincorporated areas, such as the project sites, be disposed of in a County landfill, which Forward landfill is not (it is privately operated). CDCR is a department of the State of California and is not subject to local regulations, including municipal codes and ordinances; however, CDCR works closely with local jurisdictions to comply with their codes to the extent feasible. In this case, because Forward landfill is, by far, the closest landfill able to receive project waste, and because Forward landfill is currently utilized to dispose waste generated by NCYCC, CDCR will continue to dispose waste at Forward landfill. Disposing the project waste at a different landfill would unnecessarily increase pollutant and GHG emissions from increased miles traveled by garbage trucks and would not be cost effective for CDCR. Therefore, the commenter's assertion that with compliance with Title 5, "impacts would be of more significance than those indicated in the [DEIR]," is one of the primary reasons CDCR is opting to utilize Forward landfill. However, CDCR will continue to coordinate with the County to comply with other requirements of the County Code, as appropriate.

11

NOP DEIR NCRF & DeWitt 2010

TO: ROXANNE HENERIQUEZ
SENIOR ENVIRONMENTAL PLANNER
ENVIRONMENTAL PLANNING SECTION
OFFICE OF FACILITIES PLANNING

FROM: GARY THOMAS

SUBJECT: NOP EIR NCRF and DeWitt Nelson, Stockton CA.

The purpose of my letter is to inform you of our concerns with the conversion of the women's prison, NCWF, into a Re-entry prison and DeWitt Nelson youth facility into an adult prison. One concern is that your NOP claims that these projects have "NO IMPACT" to human beings. I believe this would be a true statement if the job classification performing work on the Lethal fence had a proper job description, incorporating the hazards involved, with an effictive Injury and Illness Prevention Program (IIPP) that addresses these concerns. To date, CDCR has failed to recognize the lethal fence in any job descriptions especially the Electrician CF classification series. CDCR has relied on Lethal fences for security since 1994. The Qualified Electrical Worker (QEW), as identified by CAL-OSHA as having 2 years high voltage electrical experience required to perform work on the Lethal Fence needs to be identified and incorporated in the job descriptions for those institutions with lethal Fences such as the proposed Re-entry prison and DeWitt Nelson and all prisons utilizing lethal fences. The current hiring practices of CDCR prevents canvassing for candidates who quailfy to work on high voltage or even lethal fences because it is not identified in the minimum qualifications for the position therefore raising many safety concerns. The hiring lists are being inundated with unqualified candidates. Please incorporate Master Trainer (for the lethal fence) in the Electrician CF job description as well. Another concern is what will be the staffing level for electricians at these facilities? Will 2 QEW's be required to perform work on the lethal fence together or will one QEW be allowed to work with another QEW in training? The women's prision has historically employed only one electrician at a time. How much additional time will be required from electricial staff to perform work on the lethal fences that take away from their normal duties? Please identify emergency work with regards to the lethal fence that would require de-energizing, and re-energizing, whether performing work on, around, or above that may place an electrician or other staff in a potential hazardous situation. Please identify who will work on the electric security doors and gates as well as the personel alarm systems necessary in a correctional institution providing security to staff and public. Since the Re-Entry facility nor DeWitt Nelson does not have its own fire department will those responders be trained with regards to the lethal fences? Will local Law Enforcement and responding emergency medical staff be trained with the lethal fence as well? 11-1

CDCR feels it is not obliged to address the concerns of its own workers let alone the public. Cal-OSHA and Title 8 should be adhered to especially since they are the states own requirements. I am asking that the lethal fences not be constructed at these facilities until all matters of safety are resolved and incorporated into proper job descriptions that are recognized in the Electrician CF series for safety reasons. The lethal fence should be considered a hazard that is potentially significant and needs to be mitigated within the scope of this DEIR. 11-2
There has been many safety concerns that have risen from trucks crashing into fences to boom trucks failing over fences and slowly lowering that one day will injure or kill one of the workers or staff.

Gary Thomas

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P.O. box 354
Ione, Ca. 95640

Page 1

11-1 Refer to response to comment 4-1, which addresses comments related to workplace conditions for CDCR staff that would perform work on the lethal electrified fences.

11-2 Refer to response to comment 4-1, which addresses comments related to workplace conditions for CDCR staff that would perform work on the lethal electrified fences.

4 CORRECTIONS AND REVISIONS TO THE DEIR

4.1 INTRODUCTION

This chapter presents specific text changes made to the DEIR since its publication and public review. The changes are presented in the order in which they appear in the original DEIR and are identified by the DEIR page number. Text deletions are shown in strikethrough (~~strikethrough~~), and text additions are shown in double-underline (double-underline).

4.2 CORRECTIONS AND REVISIONS

3, PROJECT DESCRIPTION

Chapter 3, "Project Description," Exhibits 3-2, 3-3, and 3-5 of the DEIR are hereby revised with the exhibits on the following pages, which correctly identify the City of Stockton city limits.

SECTION 4.7 HYDROLOGY AND WATER QUALITY

Section 4.7, page 4.7-5 of the DEIR is hereby revised as follows:

> Three of the existing wells have already been shut down and CDCR ~~will soon properly abandon the~~ reserves the right, per the Settlement Agreement, that the fourth well can be used when additional hydrologic separation is included to assure that no backflow occurs into the City's new water connection. If the water is used for potable water CDCR will treat the water to potable drinking water standards. It is not CDCR's intent to utilize this water to serve the projects during operation, nor is such use reasonably foreseeable. .~~when City water supplies are delivered to the CDCR property~~.

SECTION 4.11 TRANSPORTATION

Due to the number of minor corrections and modifications necessary to fully respond to the City of Stockton comment 5-9, DEIR text changes in response to comment 5-9 are not shown below; rather, a fully revised DEIR Section 4.11 "Transportation" is included as Appendix A to this EIR. As noted, these minor corrections do not constitute "significant new information" as defined under the State CEQA Guidelines Section 15088.5. All text changes to DEIR Section 4.11 "Transportation" made in response to other comments, or initiated by staff, are identified below and are also included in Appendix A. The modifications to the traffic chapter do not identify any new significant and unavoidable environmental impacts.

Section 4.11, page 4.11-1 of the DEIR is hereby revised as follows:

> SR 99 has an Annual Average Daily Traffic (AADT) (Caltrans 2010a) of about 73,000 vehicles north of the Arch Road interchange and approximately 68,000 south of the Arch Road interchange. The AADT volumes are based on 2009 traffic data collected by Caltrans north of the French Camp Road interchange and south of the Mariposa Road interchange (Appendix E). The Arch Road interchange lies between French Camp Road and Mariposa Road. SR 99 ~~does not have~~ has ~~-~~a posted speed limit of 65 mph within the vicinity of the study area. ~~However, the California Department of Transportation and the California Highway Patrol will implement a 70 mph speed limit (Caltrans 2010b).~~

Section 4.11, Exhibit 4.11-1 of the DEIR is hereby replaced with the exhibit on page 4-5.

Section 4.11, page 4.11-4 of the DEIR is hereby revised as follows:

> ~~As defined by Caltrans, Class III bicycle routes are signed and should direct cyclist to the superior through route 4.~~ As defined in the Caltrans Highway Design Manual, Class III bicycle routes are shared facilities which serve either to: (a) Provide continuity to other bicycle facilities (usually Class II bikeways (such as SR 4 in the City of Stockton, which has been identified as a future Class II bicycle lane); or (b) Designate preferred routes through high demand corridors.

Section 4.11, Table 4.11-1 on page 4.11-6 of the DEIR is hereby revised as follows:

Table 4.11-1
Study Intersections

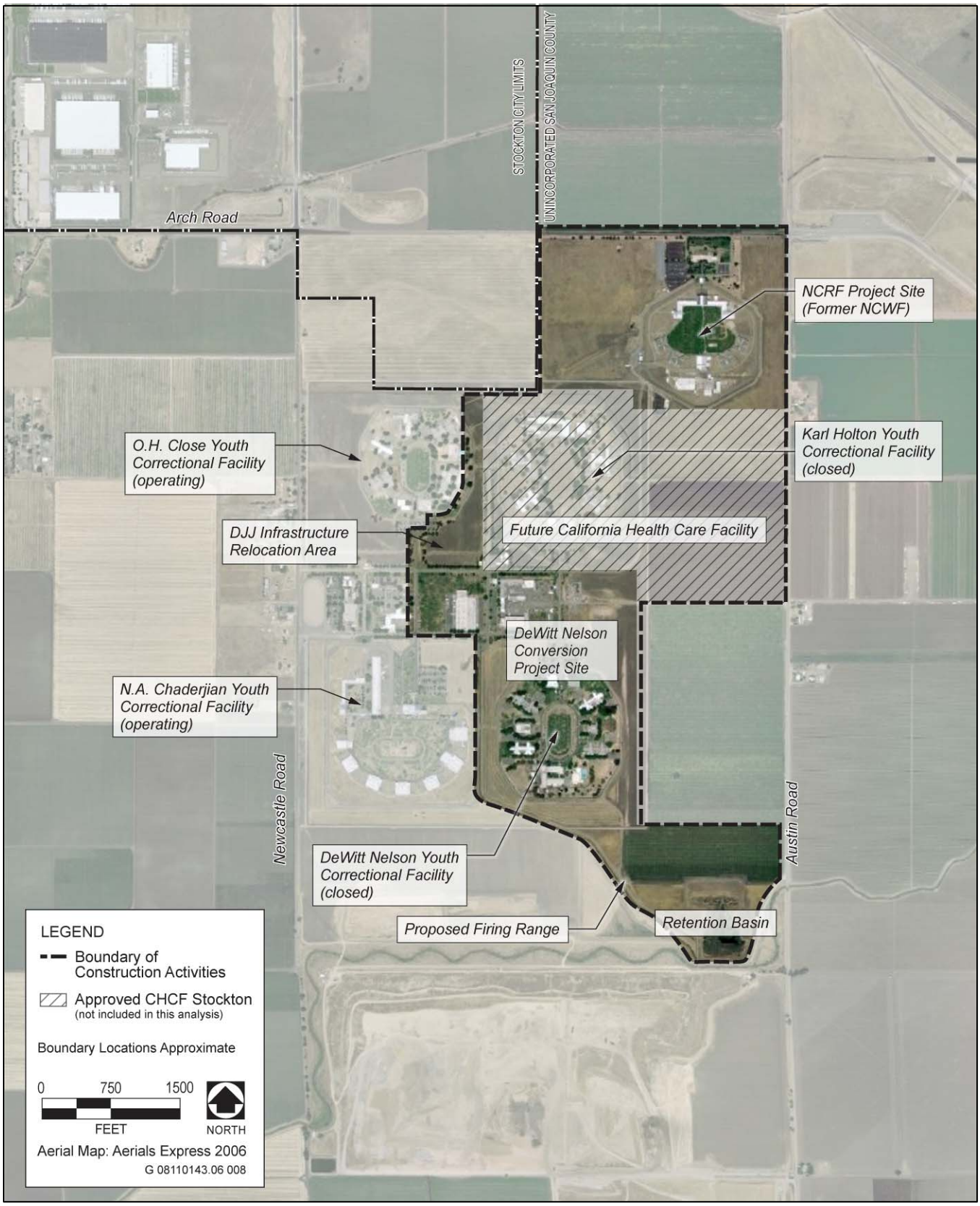
#	Study Intersection Name	Traffic Control	Jurisdiction
1	SR 99 Southbound & Arch Roada	Signal	Caltrans
2	SR 99 Northbound off-ramp & Arch Roada	Signal	Caltrans
3	Kingsley Road –SR 99 Frontage Road & Arch Road	Signal	Caltrans
4	Newcastle Road & Arch Road	Signal	City of Stockton
5	Logistics Drive & Arch Roadb	Signal	City of Stockton
6	NCRF West Driveway & Arch Road	Unsignalized	County
7	NCRF East Driveway & Arch Road	Unsignalized	County
8	Austin Road & Arch Roadb	Unsignalized	County
9	Austin Road & Project Access Driveway (CHCF & DeWitt Nelson)	Unsignalized	County

Notes:
[a] Intersection operates as part of the Single Point Urban Interchange (SPUI) which includes the SR 99 northbound and southbound ramps.
[b] At the time traffic counts were conducted for this intersection, the intersections was unsignalized. This intersection has since been signalized
Source: DKS Associates, 2010

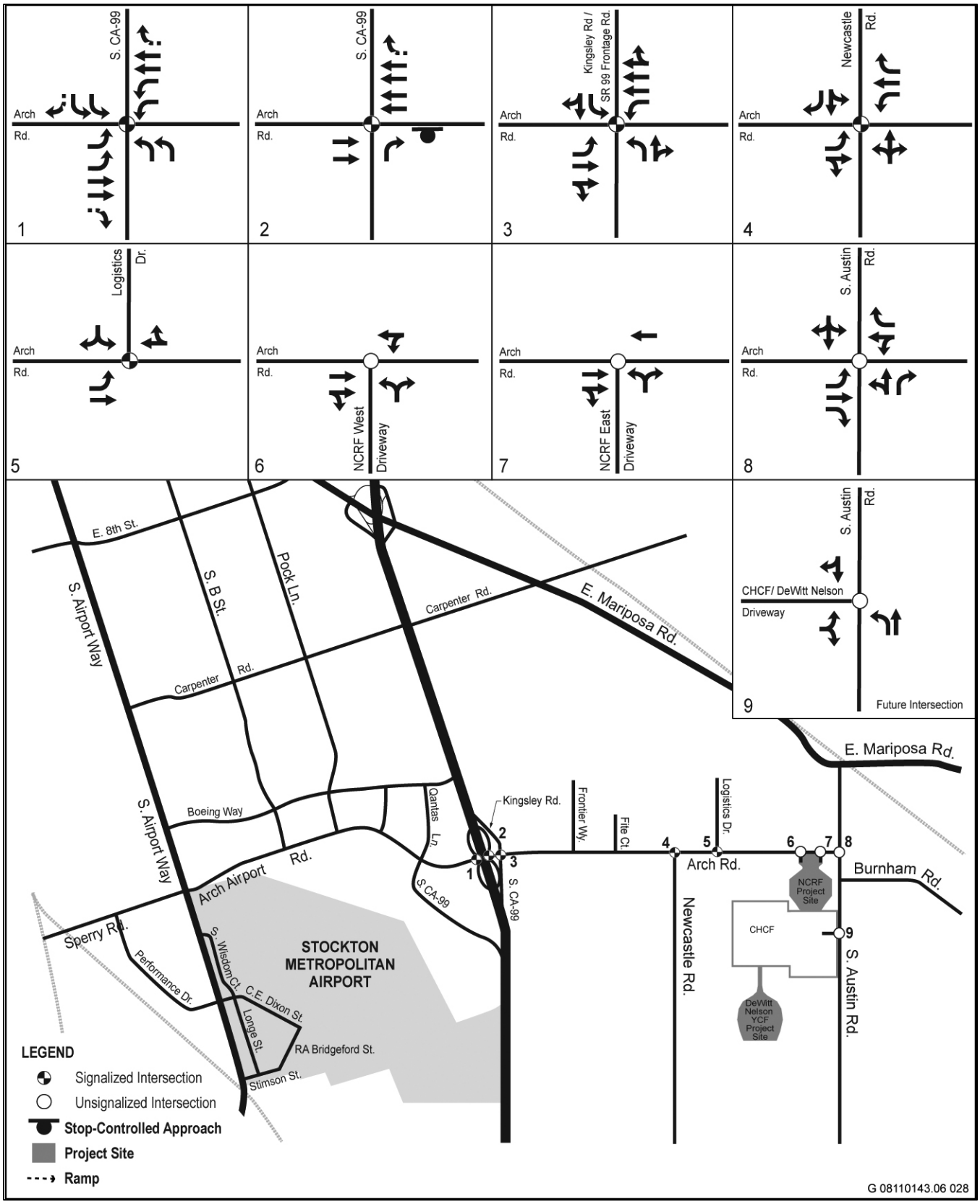
Section 4.11, page 4.11-14 of the DEIR is hereby revised as follows:

> Because CDCR is a state agency, the proposed projects are not subject to local plans and policies related to alternative modes of transportation. The proposed projects are not located in the vicinity of a residential area (i.e., the nearest residential community is 2.3 miles to the northwest), and it is anticipated that very few employees would commute to work on bicycle. Because bicycle facilities are not located in the vicinity of the project sites, the proposed projects would not increase the demand for such facilities. In addition, transit service is currently not available to the project sites. San Joaquin Regional Transit District "hopper" bus Route 91 is the closest bus route, located more than 2 miles from the site, and no bus service is planned in the area. Further, the project would not be expected to increase demand for transit service. After completion of an inmate's sentence, any released inmate requiring bus service is transported to a bus station by a parole officer. This is done to ensure released inmates are transported to their proper destination. Further, releases are sporadic and would amount to an average of only 1-2 per day, not enough to warrant extension of bus service to the site. When transporting a released inmate to a bus station, the officer is required to wait for visual confirmation that the individual has boarded the bus. Inmates would not be released from custody until it is verified that they will be transported by their family or a parole officer will transport them to a bus terminal. Furthermore, state correctional facilities are not conducive to public

Site Vicinity Aerial Map **Exhibit 3-2**



Proposed Construction Activity Area **Exhibit 3-5**



Study Area and Roadway Network **Exhibit 4.11-1**

transit for several reasons including: the broad geographical dispersion of employees would require multiple transfers for some riders; bus service is not available to serve employees with shift changes occurring at very late or early hours; correctional officers must arrive at the facility in uniform and must transport a substantial amount of equipment (such as guns, batons, other equipment). ~~Because the proposed projects would not be served by bus,~~For these reasons, the proposed projects would not substantially increase the demand for transit service. CDCR will coordinate with the San Joaquin Regional Transit District regarding the potential for future bus or shuttle service to the site; however, bus service cannot be verified at this time. Impacts associated with alternative modes of transportation are not significant and are not discussed further.

Section 4.11, Exhibit 4.11-6 of the DEIR is hereby replaced with the exhibit on the following page.

Section 4.11, Mitigation Measure for Impact 4.11-1a, on page 4.11-16 and 1-65 of the DEIR is hereby revised as follows:

Mitigation Measure for Impact 4.11-1a.

Newcastle Road & Arch Road

The following mitigation measures have been identified to improve intersection operations. The project would contribute approximately 18% of the traffic (construction traffic / total traffic = %) to this intersection during the A.M. peak hour.

- Coordinate with the ~~County~~ City of Stockton to adjust the traffic signal timing to optimize the splits (balance of green and red signal time for each approach) during the A.M. peak hour. [. . .]

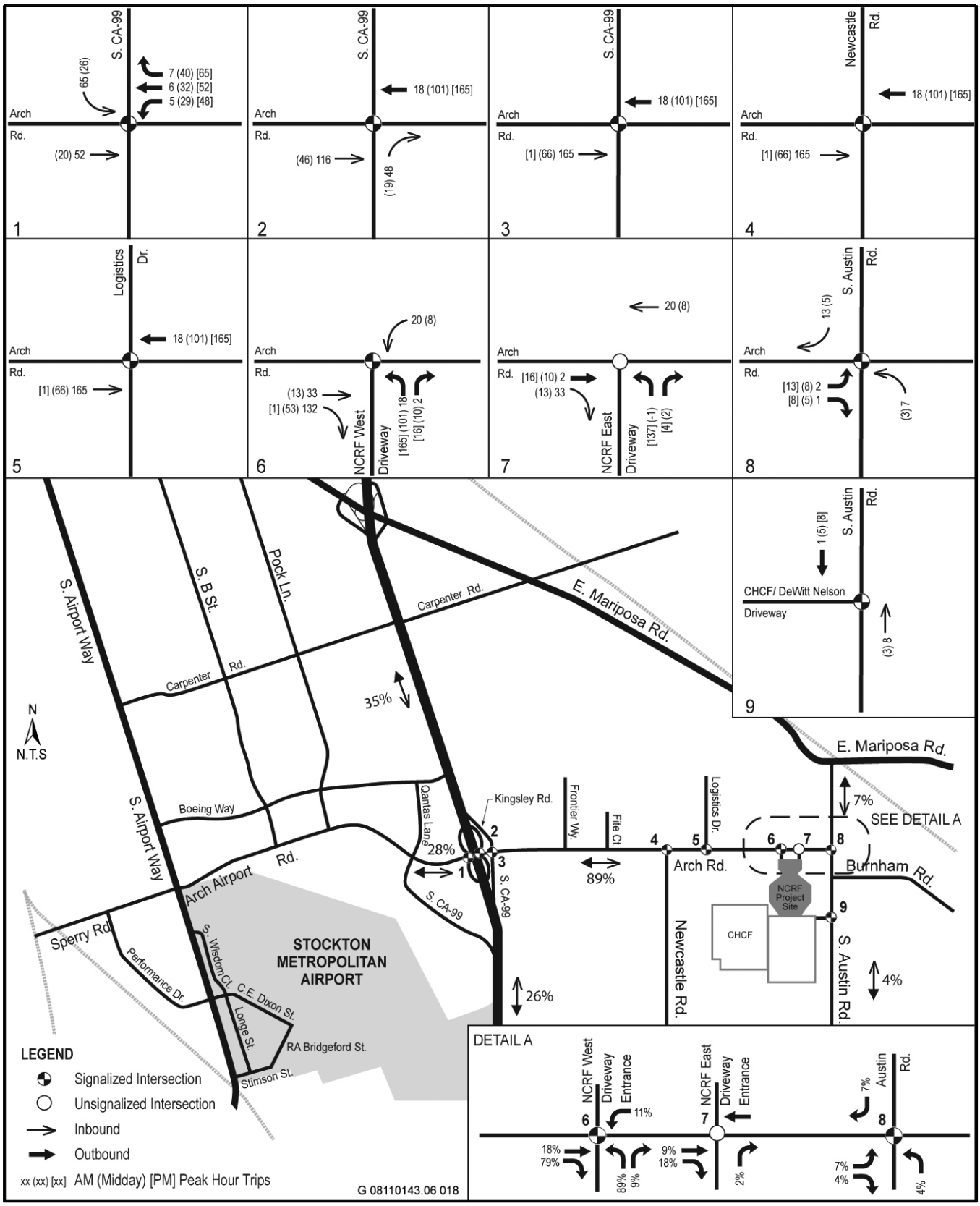
Section 4.11, Mitigation Measure for Impact 4.11-3c (4), on pages 4.11-84 and 1-77 of the DEIR is hereby revised as follows:

4. Arch Road – East of Newcastle Road and west of NCRF West Driveway (Roadway Segment)

   The following mitigation measures have been identified to improve the roadway operations and achieve a difference in volume-to-capacity ratio equal to or less than the 2035 Cumulative No Project condition during the A.M., Midday, and P.M. peak hours. CDCR will contribute appropriate fees based on trip ends generated by the project to the ~~County of San Joaquin~~ City of Stockton to help fund implementation of this improvement. [. . .]

Section 4.11, page 4.11-88 of the DEIR is hereby revised as follows:

Implementation of mitigation measure for Impact 4.11-4a would reduce the project's impacts to the northbound segment of SR 99 from Arch Road to Mariposa Road, including merge/diverge impacts, to a less-than-significant level. While feasible mitigation is available, Caltrans is the agency that can and should implement this mitigation. While Caltrans has identified and is planning for this improvement ~~and construction is projected to begin in 2011, it is unlikely that,~~ this improvement could not feasibly be implemented prior to operation of the project. ~~Acceleration of the schedule would not be feasible.~~ While this mitigation would reduce the project's impact to this freeway segment once implemented, for purposes of CEQA, this impact is concluded to be ***cumulatively significant and unavoidable*** and the project's contribution would be considerable in the interim period when the project is operational and the improvement is not complete.



NCRF Project Trip Distribution and Trip Assignment **Exhibit 4.11-6**

Section 4.11, Mitigation Measure 4.11-5c, on page 4.11-99 of the DEIR is hereby revised as follows:

Mitigation Measure for Impact 4.11-5c

The following mitigation measures at the intersection of SR 99 SPUI & Arch Road have been identified to improve the operation of the intersection and balance the queue lengths.

- Implement Mitigation Measure for Impact ~~4.11-6a~~4.11-5f.

4.12 Utilities and Service Systems

Section 4.12, page 4.12-9 of the DEIR is hereby revised as follows:

The sewer pump station would be designed so as to limit pumping rates to the City system to the permitted flow, and, per the Agreement for Sewage Disposal, would discharge through a bar rack and meter prior to the discharge entering the 20-inch trunk sewer, and would use automatic controls that would only allow pumping when the NCYCC facility is not pumping.

4.14 Water Supply

Section 4.14, page 4.14-10 of the DEIR is hereby revised as follows:

California water planners and managers have been among the first groups in the nation to seriously consider the implications of statewide and regional climate change (rather than global-scale changes) on the reliability and safety of their systems. The California Water Plan (Bulletin 160) first briefly addressed climate change in 1993. This analysis has most recently been expanded and refined in the ~~2005~~ 2009 update of the California Water Plan, which ~~explores a~~ builds on the 2005 update by revisiting (with an increased sense of urgency) a wide range of climate impacts and risks, including risks to water resources (can be accessed at ~~http://www.waterplan.water.ca.gov/previous/cwpu2005/index.cfm~~ http://www.waterplan.water.ca.gov//cwpu2009/index.cfm). The ~~2005~~2009 update also describes efforts that should be taken to quantitatively evaluate climate change effects for the next update of the California Water Plan.

Section 4.14, page 4.14-18 of the DEIR is hereby revised as follows:

As discussed above, the DeWitt Nelson Facility would result in the demand for 222 afy of water and the NCRF Facility would result in demand for ~~70~~ 98 afy of water. Total demand for water from both projects would be ~~358~~ 320 afy as shown in Table 4.14-7.

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5 REFERENCES

Chapter 1, "Introduction"

No references cited.

Chapter 2, "Summary of the Project Description"

No references cited.

Chapter 3, "Comments and Responses to Comments on the DEIR"

San Joaquin Valley Air Pollution Control District. 2010. Frequently Asked Questions. <http://www.valleyair.org/General_info/Frequently_Asked_Questions.htm#How%20much%20comes%20from%20other%20areas>. Accessed December 15, 2010.

SJVAPCD. *See* San Joaquin Valley Air Pollution Control District.

Chapter 4, "Corrections and Revisions to the DEIR"

No references cited.

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6 PREPARERS OF THE ENVIRONMENTAL DOCUMENT

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APPENDIX A

Revised DEIR Section 4.11 “Transportation,”
including attached modeling outputs

4.11 TRANSPORTATION

This section is based on a traffic impact analysis completed for the proposed projects by DKS Associates in September 2010. This section provides an evaluation of traffic and transportation issues associated with the DeWitt Nelson and NCRF projects. To ensure consistency with other traffic analyses prepared in this part of San Joaquin County, the analysis presented in this section and the impacts of the proposed projects were estimated using the current methodologies for levels of service (LOS) established by the City of Stockton (City), County of San Joaquin (County), and California Department of Transportation (Caltrans).

4.11.1 EXISTING CONDITIONS

The study area for this transportation analysis is bounded by State Route 99 (SR 99) to the west, Austin Road to the east, and Arch Road to the north. The traffic analysis study areas are comprised of those locations which have the greatest potential to experience traffic impacts due to the proposed projects. Abutting land uses consist of agricultural land uses to the west, south, and east of the project sites. The Stockton Intermodal Facility and Burlington Northern and Santa Fe Railway Company are located on Arch Road, east of Austin Road. Based on field observations, a high number of trucks enter and exit the facility during the day and travel along Arch Road.

The DeWitt Nelson and NCRF sites are currently under the jurisdiction of San Joaquin County, but are within the City of Stockton's Urban Service Area boundaries and within the City's Sphere of Influence.

EXISTING ROADWAY NETWORK

The roadway network is comprised of freeways, arterials, and local streets. Exhibit 4.11-1 illustrates the location of the project sites, study intersections, and roadway network. Regional access is provided via SR 99.

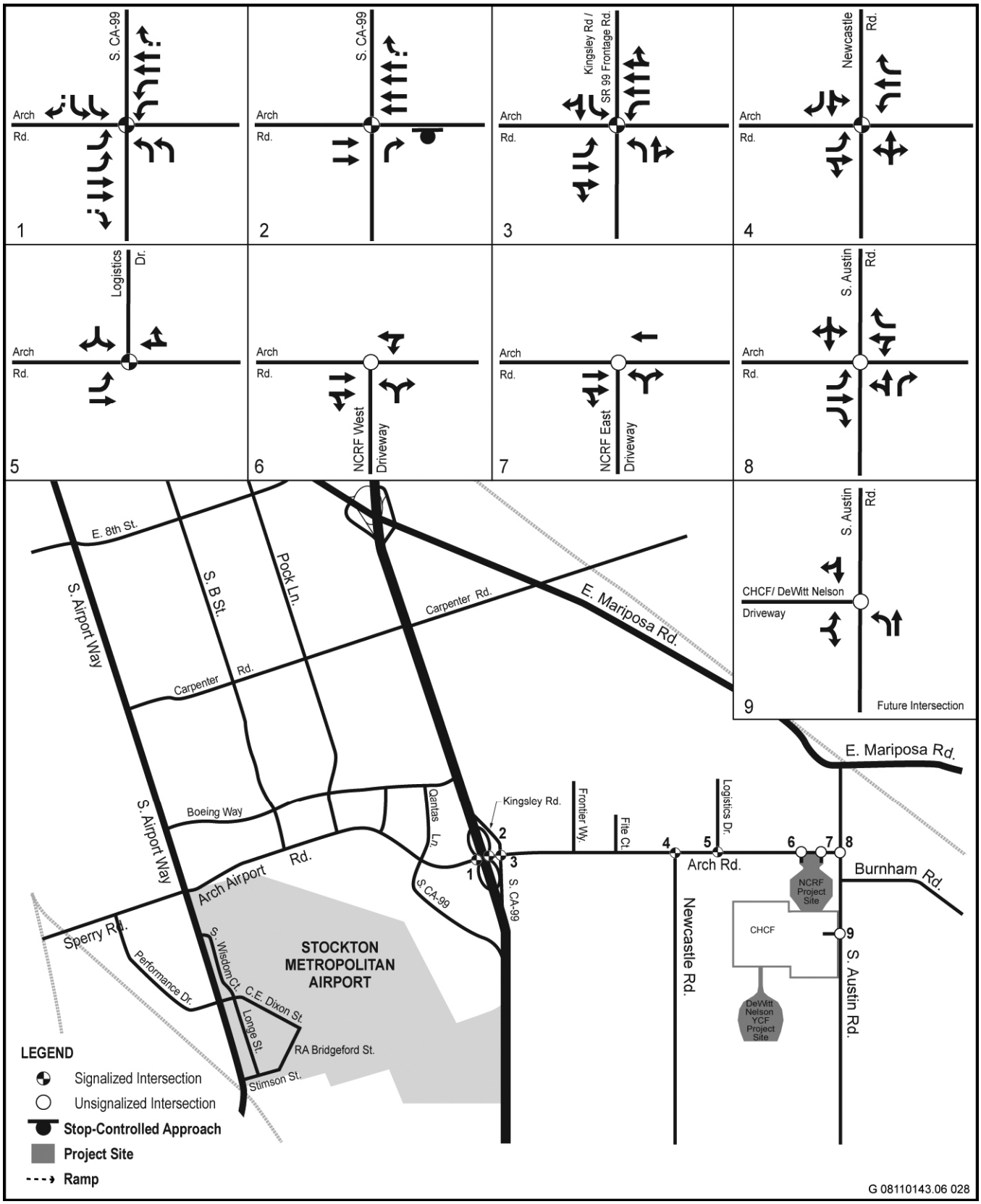
Descriptions of regional roadways are provided below.

Regional Roadways

State Route 99 (SR 99) – This facility extends from Red Bluff in the north to Wheeler Ridge in the south, near Interstate 5. In the vicinity of the project study area, SR 99 includes four travel lanes (two in each direction), runs in the north-south direction and provides access to the project study area via an interchange with Arch Road, west of the project site.

SR 99 has an Annual Average Daily Traffic[1] (AADT) (Caltrans 2010a) of about 73,000 vehicles north of the Arch Road interchange and approximately 68,000 south of the Arch Road interchange. The AADT volumes are based on 2009 traffic data collected by Caltrans north of the French Camp Road interchange and south of the Mariposa Road interchange (Appendix E). The Arch Road interchange lies between French Camp Road and Mariposa Road. SR 99 ~~does not have~~ has a posted speed limit of 65 mph within the vicinity of the study area. ~~However, the California Department of Transportation and the California Highway Patrol will implement a 70 mph speed limit (Caltrans 2010b).~~

[1] Annual average daily traffic is the total volume for the year divided by 365 days. The traffic count year is from October 1st through September 30th. Very few locations in California are actually counted continuously. Traffic counting is generally performed by electronic counting instruments moved from one location to another throughout the State in a program of continuous traffic count sampling. The resulting counts are adjusted to an estimate of annual average daily traffic by compensating for seasonal influence, weekly variation, and other variables which may be present. Annual ADT is used for presenting a statewide picture of traffic flow, evaluating traffic trends, computing accident rates, planning and designing highways, and other purposes.



Source: DKS 2010

Study Area and Roadway Network **Exhibit 4.11-1**

Local Access

Arch Road is a two-lane roadway that runs east-west and abuts the north frontage of the NCRF project site. It extends from Qantas Lane, just west of State Route 99 (approximately two miles west of the project sites) to Austin Road in the east. Arch Road is classified as a minor arterial and has a posted speed limit of 45 mph west of Logistics Drive and 30 mph east of Logistics Drive.

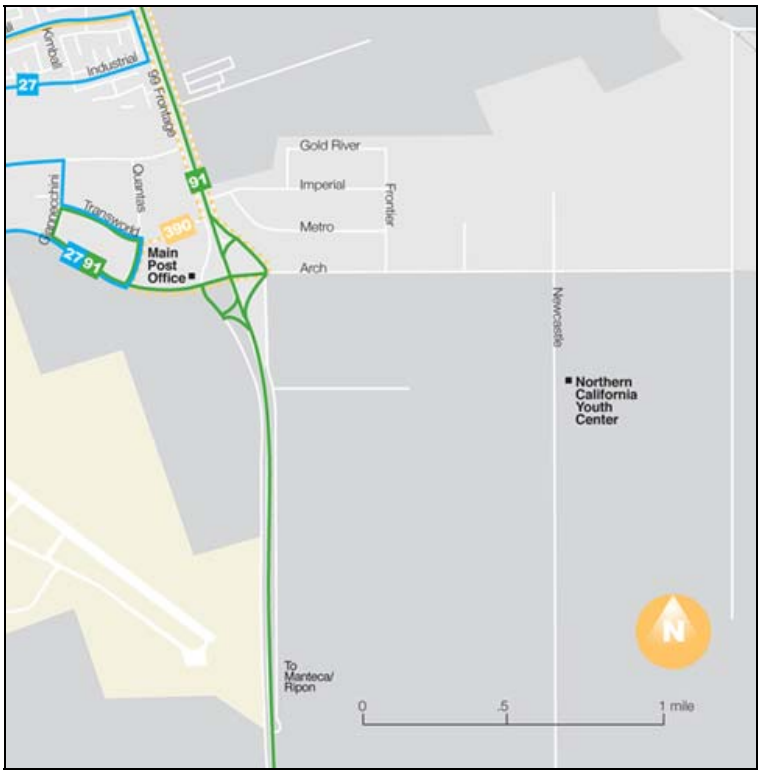
Austin Road is a two-lane local street that runs in a north-south direction. It extends from East Mariposa Road in the north to Caswell Memorial State Park (north of State Route 132) in the south. It would provide access to the DeWitt Nelson Facility via a shared driveway at the CDCR CHCF site. Austin Road has no posted speed limit within the vicinity of the study area. However, portions of Austin Road have a 55 mph speed limit.

Newcastle Road is a two-lane local street located west of the project sites and extends from just north of Arch Road to its terminus near the Austin Road Landfill, in the south. It runs in a north-south direction and has a posted speed limit of 45 mph south of Arch Road.

EXISTING TRANSIT NETWORK

San Joaquin Regional Transit District (2010) is the primary provider of local bus service in the study area and currently operates one route (Bus Route 91) within the study area.

Route 91 provides service between Ripon and San Joaquin Delta College and runs along State Route 99 and west of SR 99 near the Main Post Office at Arch/ Airport Road. It operates on weekdays between 5:45 a.m. to 9:33 p.m. in the northbound direction. In the southbound direction, service is provided between 7:14 a.m. and 10:30 p.m. The nearest bus stop is located about two miles to the west on Qantas Lane, north of Arch Airport Road Exhibit 4.11-2 illustrates the regional transit network.



Regional Transit Services **Exhibit 4.11-2**

BICYCLE AND PEDESTRIAN NETWORK

DKS conducted a field visit on August 13, 2010 to evaluate all existing pedestrian facilities within the vicinity of the study area. Roadway construction activity was observed on Arch Road east of SR 99, at Frontage Road-Kingsley Road and Arch Road. The project sites are surrounded by agricultural land uses, with little pedestrian or bicycle activity. Pedestrian traffic flow is relatively light in the vicinity of the project study area; more activity is noticeable in the vicinity of the commercial area near SR 99. The City's 2007 Bicycle Master Plan (City of Stockton 2007) identifies Arch Road and Austin Road as future Class III bike routes by the year 2035. Class III Bicycle Routes provide a shared-lane use with motor vehicle traffic. As defined in the Caltrans Highway Design Manual, Class III bicycle routes are shared facilities which serve either to: (a) Provide continuity to other bicycle facilities (usually Class II bikeways (such as SR 4 in the City of Stockton, which has been identified as a future Class II bicycle lane); or (b) Designate preferred routes through high demand corridors.~~As defined by Caltrans, Class III bicycle routes are signed and should direct cyclist to the superior through route 4.~~
Pedestrian facilities include sidewalks, crosswalks, ADA ramps, and pedestrian signals. Sidewalks are provided along the north side of Arch Road from the SR 99 interchange to Logistics Drive. Crosswalks and pedestrian signals at all of the signalized study intersections accommodate pedestrian movements within the immediate vicinity of the study area.

4.11.2 REGULATORY BACKGROUND

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

No federal plans, policies, regulations, or laws related to transportation are relevant to the proposed projects.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

No state policies, regulations, or laws relating to transportation are relevant to the proposed projects. However, this EIR uses LOS standards developed by the California Department of Transportation (Caltrans) for determining impacts on SR 99.

LOCAL PLANS, POLICIES, REGULATIONS, AND ORDINANCES

No goals or policies from the *San Joaquin County General Plan 2010* or the *City of Stockton General Plan 2035* policies or other local plans, policies, regulations, and ordinances are relevant to the proposed projects because the projects are under the state's jurisdiction. However, this EIR uses the City of Stockton's, San Joaquin County's, and Caltrans' standards for determining impacts on local intersections and roadways. These standards are described below under "Significance Criteria"

4.11.3 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

In accordance with Appendix G of the State CEQA Guidelines, an impact related to traffic and circulation would be considered significant if project implementation would:

- cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections);
- exceed, either individually or cumulatively, a level of service standard established for designated roads or highways;

- result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- substantially increase hazards from a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- result in inadequate emergency access;
- result in inadequate parking capacity; or
- conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

For Caltrans study locations (Caltrans 2010c), a significant impact would occur if a project would result in the following:

- Cause the operation of an intersection to deteriorate from LOS D or better under the Background Conditions to LOS E or F under Project Conditions; or
- For intersections operating at unacceptable levels (LOS E or F) under background conditions, that LOS must be maintained. For the purpose of this analysis, any location with a LOS E or F and an increase in the average delay by five (5) seconds or more (per City of Stockton thresholds) was considered a significant impact.

For City of Stockton study locations, the projects would result in a significant impact:

- If the addition of project traffic would cause the operation of an intersection or roadway segment to deteriorate from LOS D or better under the Background Conditions to LOS E or F under Project Conditions;
- For intersections operating at unacceptable levels (LOS E or LOS F) under background conditions, the addition of project traffic would cause the intersection to further degrade the LOS by increasing the average delay by five (5) seconds or more;
- If project generated transit ridership when added to existing or future ridership, exceeds available or planned system capacity;
- If project design hindered or eliminated an existing designated bikeway, or if the project interfered with implementation of a proposed bikeway or resulted in unsafe conditions for bicyclist, including unsafe bicycle/pedestrian or bicycle/motor conflicts;
- If project automobile and truck access to the project site would adversely affect adjacent streets and sidewalks; or
- If project design would result in inadequate sight distance from a project driveway to view approaching vehicles.

For San Joaquin County study locations, a significant impact would occur when:

- The addition of project traffic causes the LOS to exceed the County's acceptable LOS standards (i.e. A, B, C, or D) established for the study intersection or roadway segment. If project-generated traffic exceeds the County's LOS standards, then mitigation measures that would improve the LOS to an acceptable level must be identified. The LOS must be expressed in terms of delay in seconds for intersections, and vehicles per hour for roadway segments.

- If the LOS for conditions at a given location is at an unacceptable LOS under background conditions, the impact must be assessed in terms of volume-to-capacity (v/c) ratio for roadway segments or "delay" for intersection approaches. If project generated conditions, exceed the v/c ratio for the same roadway segment under "existing" conditions, then mitigation measures that would return the "v/c" ratio to the "existing" level must be identified. Similarly, if the "delay" at a given intersection approach exceeds the "delay" for the same intersection approach under "existing" condition, then mitigation measures that would return the "delay" to the "existing" level must be identified. For this project, project impacts, if any, are measured against background condition. Thus, the "background" condition is representative of the existing condition.

ANALYSIS METHODOLOGY

To evaluate traffic conditions, as well as provide a basis for comparison of conditions before and after - traffic generated from the projects is added to the street system, intersection level of service (LOS) was evaluated at nine (9) study intersections. Based on consultation with City of Stockton and San Joaquin County staff, the intersections listed in Table 4.11-1 were analyzed as part of the traffic impact analysis.

Table 4.11-1
Study Intersections

#	Study Intersection Name	Traffic Control	Jurisdiction
1	SR 99 Southbound & Arch Road[a]	Signal	Caltrans
2	SR 99 Northbound off-ramp & Arch Road[a]	Signal	Caltrans
3	Kingsley Road –SR 99 Frontage Road & Arch Road	Signal	Caltrans
4	Newcastle Road & Arch Road	Signal	City of Stockton
5	Logistics Drive & Arch Road[b]	Signal	City of Stockton
6	NCRF West Driveway & Arch Road	Unsignalized	County
7	NCRF East Driveway & Arch Road	Unsignalized	County
8	Austin Road & Arch Road[b]	Unsignalized	County
9	Austin Road & Project Access Driveway (CHCF & DeWitt Nelson)	Unsignalized	County

Notes:
[a] Intersection operates as part of the Single Point Urban Interchange (SPUI) which includes the SR 99 northbound and southbound ramps.
[b] At the time traffic counts were conducted for this intersection, the intersections was unsignalized. This intersection has since been signalized
Source: DKS Associates, 2010.

In addition, the following roadway segment was evaluated per San Joaquin County requirements:

1. Arch Road just east of Newcastle Road and west of NCWF West Driveway.

The list of study intersections and the study roadway segment was based on the size of the projects and the number of trips it would potentially generate, the surrounding study area, and with consideration of those intersections that are most likely to be affected by the proposed projects. The operation of these intersections was evaluated during the weekday A.M. (7:00-9:00 A.M.), Midday (2:00-4:00 P.M.) and P.M. (4:00-6:00 P.M.) peak periods for the following scenarios:

- **Scenario 1: Existing Condition.** Level of service based on existing peak-hour volumes, lane geometry, and traffic control (e.g., signal timing, signal phasing, STOP control, etc.).

- **Scenario 2: Background Condition.** Existing peak-hour volumes plus forecasted growth from approved, but not yet constructed, developments in the vicinity of the proposed projects that would occur prior to the completed construction of the proposed projects.

- **Scenario 3: NCRF Only.** This scenario evaluates the background condition peak-hour volumes plus project-generated traffic from the NCRF Project. This project condition is hereafter referred to as NCRF Project Condition.

- **Scenario 4: DeWitt Nelson Only.** This scenario evaluates the background condition peak-hour volumes plus project-generated traffic from the DeWitt Nelson Project. This project condition is hereafter referred to as DeWitt Nelson Project Condition.

- **Scenario 5: Combined NCRF and DeWitt Nelson Facilities.** This scenario evaluates the background condition peak-hour volumes plus project-generated traffic from the NCRF and DeWitt Nelson Projects. This project condition is hereafter referred to as NCRF/DeWitt Nelson Project Condition.

- **Scenario 6: Year 2035 General Plan Baseline No Project Condition**. Level of service based on City of Stockton Year 2035 General Plan. Forecasted growth was derived from the City of Stockton Transportation Demand Model for year 2035.

- **Scenario 7: Year 2035 General Plan Baseline with NCRF Project Condition**. This scenario evaluates the Year 2035 General Plan Baseline No Project Condition peak-hour volumes plus traffic generated by the proposed NCRF project.

- **Scenario 8: Year 2035 General Plan Baseline with DeWitt Nelson Project Condition**. This scenario evaluates the Year 2035 General Plan Baseline No Project Condition peak-hour volumes plus traffic generated by the proposed DeWitt Nelson project.

- **Scenario 9: Year 2035 General Plan Baseline with NCRF/DeWitt Nelson Project Condition**. This scenario evaluates the Year 2035 baseline condition peak-hour volumes plus traffic generated by the proposed Dewitt Nelson and NCRF projects.

The impacts of the proposed projects were estimated using the current level of service methodologies set forth by the City of Stockton, San Joaquin County and Caltrans. Particular attention is given to impacts on vehicular, parking, transit, bicycle, and pedestrian facilities. This study also evaluates potential construction impacts from project development.

The transportation analysis represented in this study follows review and incorporation, where appropriate, of data from the following transportation studies:

1. *Mariposa Lakes Specific Plan* – Final Environmental Impact Report (SCH #2006022035). Prepared by EDAW│AECOM for the City of Stockton. June 2008.

2. *Forward Inc. Landfill Expansion* – Draft Environmental Impact Report (SCH 2008052024). Prepared by Grassetti Environmental Consulting for San Joaquin County. January 2010.

3. *Airpark 599 with FAA Restriction Limit* – Supplemental Traffic Impact Analysis. Prepared by KD Anderson & Associates Inc for Carlson, Barbee & Gibson, Inc. December 2, 2009.

4. *Arch-Sperry Extension Road Specific Plan* – Arch-Airport/Sperry Road Geometric Plan Line. Prepared by TJKM Transportation Consultants for the City of Stockton. August 23, 2002.

5. *California Health Care Facility* – Final Environmental Impact Report and Technical Memorandum (Environmental Review of Minor changes to Proposed Project). Prepared by EDAW │AECOM for the City of Stockton. October 2008 and 2009.

6. *Tidewater Crossing* – Final Environmental Impact Report (SCH #2005122101). Prepared by LSA for the City of Stockton. September 2008.

7. *Arch Road Industrial Park* – Project information provided by City of Stockton planning staff. October 19, 2009.

8. *Opus Logistics Center* – Project information provided by City of Stockton planning staff. October 19, 2009.

In addition, data provided in this report are based on recent correspondence and conversations with staff of the City of Stockton, San Joaquin County, and a site visit conducted on August 13, 2010.

EXISTING TRAFFIC VOLUMES AND LEVELS OF SERVICE

Vehicle turning movement counts were conducted by National Data & Surveying Services (NDS) during a typical weekday A.M. (7:00 – 9:00 a.m.) and P.M. (4:00 – 6:00 p.m.) peak period in September 2009 and in June 2010 for the weekday Midday (2:00 – 4:00 p.m.) peak period. The midday peak period coincides with the midday work shift and captures different levels of congestion and travel behavior within the vicinity of the study area.

Intersection turning movement counts consisted of counting each vehicle at each study intersection location by turning movement, and included documenting intersection geometry diagrams and signal phasing. Existing roadway segment volumes were also conducted by NDS during a weekday and over a 24-hour period. Roadway segment volumes were collected in September 2009.

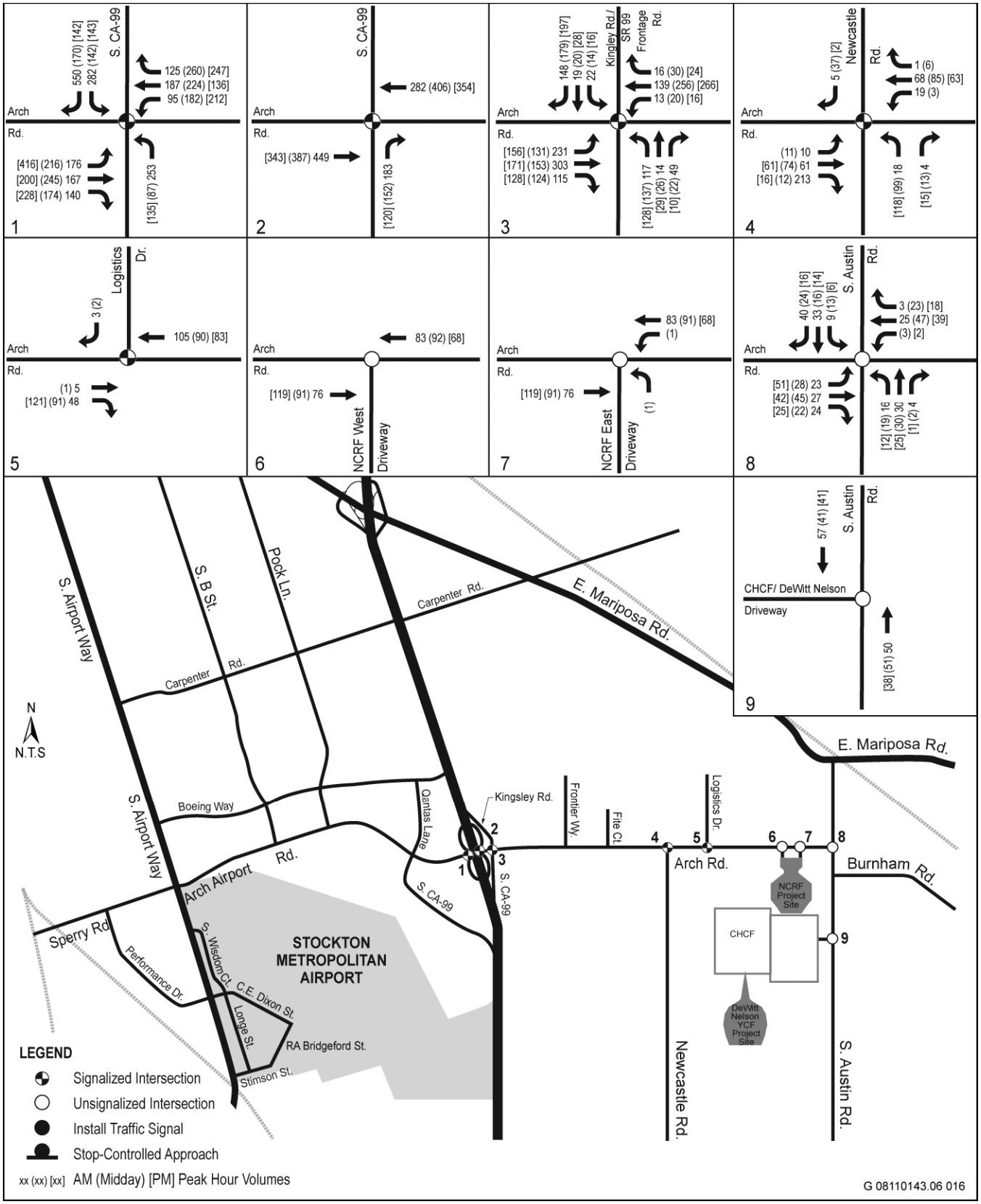
The City of Stockton provided DKS Associates with truck percentages along Arch Road, from the 2009 Arch Industrial II traffic study prepared by Fehr & Peers. These truck percentages were applied to all study intersections east of Kingsley Road for the Existing conditions scenario. Truck percentages at the Caltrans intersections at SR-99 SPUI and Kingsley Road were obtained from Caltrans Traffic Data Branch.

To supplement data collected in the field, the City of Stockton, San Joaquin County, and Caltrans staff provided existing traffic signal timing data for signalized intersections. Exhibit 4.11-3 illustrates the existing peak-hour traffic volumes. Appendix E includes the detail intersection traffic volume count sheets.

Note that since the time the A.M. and P.M. peak period intersection turning movement counts were collected in September 2009, a new traffic signal has been installed at the intersection of Arch Road and Logistics Drive (Intersection #5). The signal installation for this intersection was under construction and not operating when the intersection count volumes were collected for the A.M. and P.M. peak period; thus, the existing condition does not reflect improvements to traffic flow from the signalized operation.

LEVEL OF SERVICE METHODOLOGY

Per City of Stockton and San Joaquin County requirements, traffic conditions for the study intersections were evaluated using the methodologies and capacity analysis procedures from the 2000 Highway Capacity Manual (HCM). For reference purposes, level of service (LOS), as defined in the HCM, is a quality measure describing operating conditions within a traffic stream. It is generally described in terms such as service measures, speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. LOS at study intersections was calculated using SYNCHRO (version 7.0) software for signalized and unsignalized intersections, except for the intersection of Austin Road and Arch Road (Intersection #8), where TRAFFIX software was used since SYNCHRO does not evaluate four-way stop controlled intersections.



Source: DKS 2010

Existing Condition Peak-Hour Intersection Traffic Volumes **Exhibit 4.11-3**

Level of Service Definition

The level of service (LOS) evaluation indicates the degree of congestion that occurs during peak travel periods and is the principal measure of roadway and intersection performance. LOS can range from "A" representing free-flow conditions, to "F" representing extremely long delays. LOS B and C signify stable conditions with acceptable delays. LOS D is typically considered acceptable for a peak hour in urban areas. LOS E is approaching capacity and LOS F represents conditions at or above capacity. The threshold criteria and standards of significance for acceptable levels of service are noted below.

Signalized Intersections

At signalized intersections, LOS is evaluated on the basis of average stopped delay for all vehicles at the intersection. Table 4.11-2 defines the levels of service for signalized intersections based on HCM methodology.

Table 4.11-2
Level of Service Definition for Signalized Intersections

Level of Service	Average Stopped Delay (seconds/vehicle)	Description
A	Delay ≤ 10.0	Free flow; minimal to no delay
B	10.0 < Delay ≤ 20.0	Stable flow, but speeds are beginning to be restricted by traffic condition; slight delays.
C	20.0 < Delay ≤ 35.0	Stable flow, but most drivers cannot select their own speeds and feel somewhat restricted; acceptable delays.
D	35.0 < Delay ≤ 55.0	Approaching unstable flow, and drivers have difficulty maneuvering; tolerable delays.
E	55.0 < Delay ≤ 80.0	Unstable flow with stop and go; delays
F	Delay > 80.0	Total breakdown; congested conditions with excessive delays.

Source: Transportation Research Board, Special Report 209, Highway Capacity Manual, Chapter 16-Signalized Intersections 2000.

Unsignalized Intersections

At unsignalized intersections each approach to the intersection is evaluated separately and assigned a LOS. The level of service is based on the delay at the worst approach for two-way stop controlled intersections. For all-way stop controlled intersections, LOS is based on the average delay. Total delay is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line. This time includes the time required for the vehicle to travel from the last-in-queue position to the first-in queue position. Table 4.11-3 provides definitions of LOS for unsignalized intersections.

Roadway Segments

The traffic operation analysis for the study roadway segment was conducted using the urban street LOS methodology contained in the HCM (Caltrans 2000). Urban street LOS is based on the traveling speeds compared to the desired free flow speed. An indicator of delay is the capacity utilization, or the ratio of traffic volume to a roadway segment's functional capacity. The functional capacity of a roadway segment is influenced by many factors including lane width, shoulder width, grade line, and percentage of trucks, peaking characteristics, and terrain.

Table 4.11-3

Level of Service Definition for Unsignalized Intersections		
Level of Service	**Control Delay[1] (seconds/vehicle)**	**Description**
A	≤ 10	Little or no delay
B	> 10 and ≤ 15	Short traffic delay
C	> 15 and ≤ 25	Average traffic delays
D	> 25 and ≤ 35	Long traffic delays
E	> 35 and ≤ 50	Very long traffic delays
F	> 50	Extreme delays potentially affecting other traffic movements in the intersection

Notes: [1] For two-way stop controlled intersections; LOS is based on the worst approach delay (in seconds per vehicle). For all-way stop controlled intersections, LOS is based on the average delay.
Source: Transportation Research Board, Special Report 209, Highway Capacity Manual, Chapter 17-Unsignalized Intersections, 2000. Exhibit 17-2 Level of Service Criteria for Two-Way Stop-Controlled (TWSC) Intersections and Exhibit 17-22 for All-Way Stop-Controlled (AWSC) Intersections.

Table 4.11-4 summarizes the LOS criteria for various classes of roadway segments including arterial and collector streets. For the purpose of this analysis, Arch Road is classified as a Class II roadway with a free flow speed (ffs) of 40 mph (per San Joaquin County guidelines). In addition, the following assumptions were made in determining the LOS: a traffic signal cycle length of 110 seconds, a lane capacity of 1,900 vehicles per lane, arrival type 4[2] (from City of Stockton guidelines), and a unit extension of 3.[3] Other factors, such as the signal control adjustment factor and the upstream filtering/metering adjustment factor were calculated using tables in Chapter 15 of the HCM. The Synchro intersection level of service outputs for the intersection of Logistics and Arch Road, located west of the NCRF project site,) were used to determine the effective green-to-cycle (g/c) length ratios[4]. The final output of the urban street worksheet is a segment travel speed, which correlates to a roadway segment LOS.

Local Agency Significance Criteria

Intersections

The following LOS thresholds have been adopted by Caltrans, San Joaquin County and City of Stockton.

Based on Caltrans (2002) LOS standards, all state facilities shall operate at:

1. LOS C in rural areas and LOS D in urban areas.

Based on San Joaquin County (2008) LOS standards:

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[2] Arrival type 4: arrival type determines the quality of progression at a signalized intersection. Arrival Type 4 consists of a moderately dense platoon of vehicles that arrives in the middle of a green phase or of a dispersed platoon of 40 to 80 percent of the lane group volume arriving throughout the green phase. It is applied to coordinated movements only during the peak and off-peak direction. Arrival type 4 was used based on the roadway classification (Class II) and per the requirements of San Joaquin County standards and City of Stockton Transportation Impact Analysis (TIA) Guidelines (Appendix D-1).

[3] Unit extension 3: the timing gap, in seconds, between successive vehicles moving on a traffic-actuated approach to a signalized intersection that will cause the signal controller to terminate the green display.

[4] g/c length: the ratio of the effective green time of a phase to the cycle length. Adjustments to the g/c length allow for higher capacity to be accommodated along the road (if higher) and similarly, if the green time length is reduced then capacity of the roadway is reduced.

Table 4.11-4 Level of Service Criteria for Two-Lane Arterial and Local Streets				
Urban Street Class	**I**	**II**	**III**	**IV**
Range of free-flow speeds (FFS)	55 to 45 mi/h	45 to 35 mi/h	35 to 30 mi/h	35 to 25 mi/h
Typical FFS	50 mi/h	40 mi/h	35 mi/h	30 mi/h
LOS	Average Travel Speed (mi/h)			
A	> 42	> 35	> 30	> 25
B	> 34-42	> 28-35	> 24-30	> 19-25
C	> 27-34	> 22-28	> 18-24	> 13-19
D	> 21-27	> 17-22	> 14-18	> 9-13
E	> 16-21	> 13-17	> 10-14	> 7-9
F	≤ 16	≤ 13	≤ 16	≤ 7
Notes: FFS: free-flow speed, mi/h: miles per hour, LOS: level of service Source: Highway Capacity Manual, Transportation Research Board, 2000. Chapter 15 – Urban Street Methodology. Exhibit 15-2.				

1. All county roadways shall operate at LOS C or better (except in a City sphere of influence where the City has adopted LOS D).

2. Intersections shall operate at LOS D or better on minor arterials and roadways of higher classification; and LOS C on all other roads.

3. All freeway and State highways shall operate at LOS D.

Based on the City of Stockton (2003) LOS standards, an acceptable operating level of service (LOS) is defined as:

1. LOS D or better on its roadway system.

Roadway Segments

Based on San Joaquin County LOS standards, an acceptable level is defined as LOS C or better, except in a City Sphere of Influence where a LOS D is acceptable (City's standard is LOS D).

EXISTING INTERSECTION LEVEL OF SERVICE

The intersections and their corresponding existing levels of service are presented in Table 4.11-5. Appendix E includes the detailed calculation level of service analysis sheets including the weekday A.M., Midday, and P.M. peak hours. According to the intersection LOS thresholds, all study intersections currently operate at an acceptable level of service during the A.M., Midday, and P.M. study periods.

EXISTING ROADWAY SEGMENT LEVEL OF SERVICE

The project area roadway segment and its corresponding existing levels of service are presented in Table 4.11-6**.** Based on the roadway segment analysis results, the study roadway segment operates at an acceptable level of service during the A.M., Midday, and P.M. peak hours, respectively.

Table 4.11-5
Existing Intersection Peak Hour LOS

#	Intersection	A.M.		Midday		P.M.	
		Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]
1.	SR 99 & Arch Road[c]	13.4	B	12.7	B	13.2	B
2.	SR 99 Northbound off-ramp & Arch Road[c]	10.8	B	10.6	B	10.4	B
3.	Kingsley Road – SR 99 Frontage Road & Arch Road[c]	19.1	B	20.7	C	20.6	C
4.	Newcastle Road & Arch Road[c]	~~15.3~~16.2	B	~~19.5~~19.7	B	~~15.6~~16.3	B
5.	Logistics Drive & Arch Road[c,e]	~~8.8~~9.1	A	2.0	A	0.0	A
6.	NCRF West Driveway & Arch Road[d]	0.0	A	0.0	A	0.0	A
7.	NCRF East Driveway & Arch Road[d]	0.0	A	0.0	A	0.0	A
8.	Austin Road & Arch Road[d]	7.9	A	7.9	A	7.8	A
9.	Austin Road & Project Access Driveway (CHCF & DeWitt Nelson)[d]	na	na	na	na	na	na

Notes: na: not applicable. Intersection was not evaluated for existing condition since access to/from the CHCF/DeWitt Nelson site is not yet provided.

[a] Delay: in seconds per vehicle

[b] LOS: Level of Service

[c] Signalized Intersection

[d] Unsignalized Intersection: For two-way stop controlled intersections, the LOS rating is based on the worst approach. For all-way stop controlled intersections, the LOS rating is based on the average delay.

[e] The LOS for this intersection, during the A.M. and P.M. peak hour, represents unsignalized operations. The signal was not operating when the A.M. and P.M. peak hour counts were collected. For the Midday peak hour, the LOS is based on signalized operation at the intersection.

Source: DKS Associates 2010.

Table 4.11-6
Existing Roadway Segment Peak Hour LOS

#	Roadway Segment		A.M.		Midday		P.M.	
			EB	WB	EB	WB	EB	WB
1.	Arch Road (East of Newcastle Road and west of NCRF West Driveway)	Peak Hour Volume[a]	76	83	91	92	119	68
		Avg. Travel Speed (mph)[b]	36	36	19	19	36	36
		LOS[c]	A	A	D	D	A	A

Notes: EB: Eastbound, WB: Westbound

[a] Assumed for both directions (eastbound and westbound)

[b] Based on miles per hour (mph)

[c] LOS: Level of Service. Based on average through-vehicle travel speed.

The study roadway segment is within the City of Stockton Sphere of Influence where a LOS D or better is an acceptable level of service.

Source: DKS Associates, 2010.

ISSUES NOT DISCUSSED FURTHER

The proposed projects would consist generally of one to two-story buildings and would not include high-mast lighting or any radio, television, or cell phone towers that could require a change in air traffic patterns (See Section 4.10 "Hazards and Hazardous Materials" for additional discussion related to building height versus air traffic). In addition, the proposed projects would not substantially increase demand for flights. Therefore, impacts associated with alteration of air traffic patterns are not addressed further.

The proposed facilities would be designed to effectively accommodate emergency vehicles (including ambulances), as allowed within the required security parameters. Furthermore, the proposed projects would maintain their own security and utilize the existing local agency fire services. Therefore, impacts associated with emergency vehicle access are also not addressed further.

The proposed projects would provide adequate parking areas on-site to accommodate all staff and visitor vehicles. No off-site parking would occur. Therefore, this issue will not be addressed further.

Because CDCR is a state agency, the proposed projects are not subject to local plans and policies related to alternative modes of transportation. The proposed projects are not located in the vicinity of a residential area (i.e., the nearest residential community is 2.3 miles to the northwest), and it is anticipated that very few employees would commute to work on bicycle. Because bicycle facilities are not located in the vicinity of the project sites; the proposed projects would not increase the demand for such facilities. In addition, transit service is currently not available to the project sites. San Joaquin Regional Transit District "hopper" bus Route 91 is the closest bus route, located more than 2 miles from the site, and no bus service is planned in the area. Further, the project would not be expected to increase demand for transit service. After completion of an inmate's sentence, any released inmate requiring bus service is transported to a bus station by a parole officer. This is done to ensure released inmates are transported to their proper destination. Further, releases are sporadic and would amount to an average of only 1-2 per day, not enough to warrant extension of bus service to the site. When transporting a released inmate to a bus station, the officer is required to wait for visual confirmation that the individual has boarded the bus. Inmates would not be released from custody until it is verified that they will be transported by their family or a parole officer will transport them to a bus terminal. Furthermore, state correctional facilities are not conducive to public transit for several reasons including: the broad geographical dispersion of employees would require multiple transfers for some riders; bus service is not available to serve employees with shift changes occurring at very late or early hours; correctional officers must arrive at the facility in uniform and must transport a substantial amount of equipment (such as guns, batons, other equipment). For these reasons, ~~Because the proposed projects would not be served by bus,~~ the proposed projects would not substantially increase the demand for transit service. CDCR will coordinate with the San Joaquin Regional Transit District regarding the potential for future bus or shuttle service to the site; however, bus service cannot be verified at this time. Impacts associated with alternative modes of transportation are not significant and are not discussed further.

PROJECT IMPACTS AND MITIGATION MEASURES

Note to the reader: This section has been formatted to present the traffic impact analysis in a clear manner and includes a discussion of both project and cumulative impacts so that all technical traffic information remains together in one section (as opposed to re-presenting the same technical information in the cumulative chapter of this document). Further, this section presents the individual impact analysis for each project in the following order NCRF Only, DeWitt Nelson Only, and Combined NCRF/DeWitt Nelson Facilities.

Impact 4.11-1: Construction-Related Traffic Impacts

Construction of the proposed NCRF facility would begin in summer 2011, with an estimated completion date of summer 2013. Construction work shifts would generally be between 6:00 a.m. and 6:00 p.m. Monday to Friday. Parking for construction workers would be provided in the existing visitor parking lot. The construction staging area would be located west of the existing perimeter fence line (Exhibit 3-6).

Construction of the proposed DeWitt Nelson facility is anticipated to begin in spring 2011. Construction work shifts would generally be between 6:00 a.m. and 6:00 p.m. Monday to Friday and could potentially include evening or nighttime construction. The construction staging area would be in the existing visitor parking lot.

Construction trip generation estimates were based on information provided by CDCR staff and consultants. During the peak construction period, construction activities would require up to 100 construction workers for the NCRF project and 480 construction workers for the DeWitt Nelson project that would commute to the site on a daily basis. Average vehicle occupancy of one (1) person per vehicle was assumed for construction workers trips. In addition, construction vehicles would access the project site daily, some construction activities may occur on weekends. It is estimated that at least one heavy vehicle would travel to the NCRF site and approximately 8 heavy vehicles would travel to the DeWitt Nelson site on a daily basis and during the peak periods of construction. For the purpose of this analysis, a passenger-car-equivalent (PCE) ratio of 3.0 was applied to the truck trips (1 heavy vehicle = 3 vehicles) to determine the total passenger vehicle trips equivalent (Caltrans 2000). Table 4.11-7 provides the trip generation estimates during the peak construction period.

Table 4.11-7
Estimated Peak Construction Trip Generation

Trip Type	Number of Workers/ Trucks	Daily Trips	A.M. Peak (7:00-9:00 A.M.)			P.M. Peak (4:00-6:00 P.M.)		
			In	Out	Total	In	Out	Total
NCRF Project								
Construction Workers[1]	100	200	50	-	50	-	50	50
Heavy Vehicles[2]	1	3	3	-	3	-	3	3
Total		**203**	**53**	**-**	**53**	**-**	**53**	**53**
DeWitt Nelson Project								
Construction Workers[1]	480	960	240	-	240	-	240	240
Heavy Vehicles [2]	8	48	12	-	12	-	12	12
Total		**1,008**	**252**	**-**	**252**	**-**	**252**	**252**
Combined NCRF and DeWitt Nelson Projects		**1,211**	**305**	**-**	**305**	**-**	**305**	**305**

Notes:
[1] Email correspondence to DKS Associates from Mike Parker – Ascent Environmental Inc. July 30, 2010.
[2] Per conversations with Mike Parker – Ascent Environmental Inc.

Note that the analysis assumes an estimated 50% of the daily construction trips (workers and construction vehicles) would access the project sites during the AM and PM peak hours, while the remaining 50-percent would access the site at other times during the day, before or after, the peak commute hours. These assumptions are based on known construction activities, worker shifts, and delivery patterns for CDCR projects and reflect the anticipated arrival and departure patterns of construction related vehicles.

Also, the analysis assumes construction of the approved CHCF project concurrently with the construction of the NCRF project, DeWitt Nelson project, and/or combined NCRF/DeWitt Nelson projects, respectively. For reference purposes, Table 4.11-8 list the construction period trip generation estimates for the CHCF site.

Table 4.11-8 CHCF Estimated Peak Construction Trip Generation								
Trip Type	Number of Workers/ Trucks	Daily Trips	A.M. Peak (7:00-9:00 A.M.)			P.M. Peak (4:00-6:00 P.M.)		
			In	Out	Total	In	Out	Total
CHCF (NCYCC)								
Construction Workers[1]	1,220	2,440	610	-	610	-	610	610
Heavy Vehicles[2] (PCE)	165	330	83	-	83	-	83	83
Project Totals		**2,770**	**693**	**-**	**693**	**-**	**693**	**693**

Notes:
Based on projection for the CHCF project. Information provided to DKS via email from Mike Parker, Ascent Environmental, dated July 30, 2010.
PCE: Passenger-Car-Equivalent (1 heavy vehicle = 3 passenger cars)

The intersections and their corresponding construction period levels of service are presented in Table 4.11-9. Appendix E includes the detailed calculation level of service analysis sheets including the weekday A.M., Midday, and P.M. peak hours. To provide a conservative analysis, the construction activities were assumed to occur prior to implementation of any background roadway improvements; therefore, construction-related traffic was compared to traffic conditions under Existing Conditions (as opposed to Background Conditions).

Table 4.11-9 Construction Peak Period Intersection Peak Hour LOS Summary										
#	Intersection	Peak	Existing		Existing + CHCF + NCRF Construction		Existing + CHCF + DeWitt Nelson Construction		Existing + CHCF + NCRF + DeWitt Nelson Construction	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]
1.	SR 99 & Arch Road[c]	A.M.	13.4	B	15.5	B	16.4	B	16.6	B
		Midday	12.7	B	12.7	B	12.7	B	12.7	B
		P.M.	13.2	B	14.3	B	14.6	B	14.7	B
2.	SR 99 Northbound off-ramp & Arch Road[c]	A.M.	10.8	B	14.9	C	18.5	C	20.0	C
		Midday	10.6	B	10.6	B	10.6	B	10.6	B
		P.M.	10.4	B	10.2	B	10.2	B	10.2	B
3.	Kingsley Road – SR 99 Frontage Road & Arch Road[c]	A.M.	19.1	B	23.8	C	40.9	D	49.1	D
		Midday	20.7	C	20.7	C	20.7	C	20.7	C
		P.M.	20.6	C	29.1	C	42.8	D	50.1	D
4.	Newcastle Road & Arch Road[c]	A.M.	16.2 ~~15.3~~	B	**62.7**	**E**	**133.3**	**F**	**153.9**	**F**
		Midday	19.7~~19.5~~	B	19.5	B	19.5	B	19.5	B
		P.M.	16.3~~15.6~~	B	17.6	B	27.4	C	33.9	C
5.	Logistics Drive & Arch Road[c]	A.M.	9.1~~8.8~~	A	8.8	A	8.8	A	8.8	A
		Midday	2.0	A	2.0	A	2.0	A	2.0	A
		P.M.	0.0	A	0.0	A	0.0	A	0.0	A

Table 4.11-9 Construction Peak Period Intersection Peak Hour LOS Summary										
#	Intersection	Peak	Existing		Existing + CHCF + NCRF Construction		Existing + CHCF + DeWitt Nelson Construction		Existing + CHCF + NCRF + DeWitt Nelson Construction	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]
6.	NCRF West Driveway & Arch Road[d]	A.M.	0.0	A	0.0	A	0.0	A	0.0	A
		Midday	0.0	A	0.0	A	0.0	A	0.0	A
		P.M.	0.0	A	0.0	A	0.0	A	0.0	A
7.	NCRF East Driveway & Arch Road[d]	A.M.	0.0	A	0.0	A	0.0	A	0.0	A
		Midday	0.0	A	9.3	A	0.0	A	0.0	A
		P.M.	0.0	A	0.0	A	0.0	A	0.0	A
8.	Austin Road & Arch Road[c]	A.M.	7.9	A	11.1	B	21.2	C	21.5	C
		Midday	7.9	A	7.9	A	7.9	A	7.9	A
		P.M.	7.8	A	18.3	C	**76.1**	**F**	**76.7**	**F**
9.	Austin Road & Project Access Driveway[d] (CHCF & DeWitt Nelson)	A.M.	na	na	0.0	A	0.0	A	0.0	A
		Midday	na	na	0.0	A	0.0	A	0.0	A
		P.M.	na	na	0.0	A	0.0	A	0.0	A

Notes: Intersections operating below acceptable LOS are in **bold**.
na: not applicable
[a] Delay: in seconds per vehicle
[b] LOS: Level of Service
[c] Signalized Intersection
[d] Unsignalized Intersection: For two-way stop controlled intersections, the LOS rating is based on the worst approach. For all-way stop controlled intersections, the LOS rating is based on the average delay.
Source: DKS Associates 2010.

DeWitt Nelson Only

Construction related traffic for the DeWitt Nelson project would result in significant impacts at the intersections of Newcastle Road & Arch Road during the A.M. peak hour and at Austin Road & Arch Road during the P.M. peak hour. During the peak construction period, the addition of construction vehicle traffic would cause the intersection of Newcastle Road & Arch Road to deteriorate from LOS B to LOS F during the A.M. peak hour. Similarly, the intersection of Austin Road & Arch Road would deteriorate from LOS A to LOS F during the P.M. peak hour.

Implementation of the DeWitt Nelson project would result in the deterioration of two intersections to unacceptable levels of service during construction. Therefore, this would be a ***significant*** *impact. (Impact 4.11-1a)*

Mitigation Measure for Impact 4.11-1a

Newcastle Road & Arch Road

The following mitigation measures have been identified to improve intersection operations. The project would contribute approximately 18% of the traffic (construction traffic / total traffic = %) to this intersection during the A.M. peak hour.

- Coordinate with the ~~County~~ City of Stockton to adjust the traffic signal timing to optimize the splits (balance of green and red signal time for each approach) during the A.M. peak hour.

Table 4.11-10 lists the mitigated LOS. With this mitigation in place, the intersection would operate at LOS B during the A.M. peak hour. Thus, the impact would be reduced to a less-than-significant level based on adopted significance criteria. Appendix E includes a comparison summary of the analysis results including the project's relative contribution to the study intersections.

Table 4.11-10
DeWitt Nelson Project – Mitigated Condition LOS C Summary

#	Intersection	Peak	Existing Condition		Existing + CHCF + DeWitt Construction		.Mitigated CHCF[d] + DeWitt Construction		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
4.	Newcastle Road & Arch Road	A.M.	15.3	B	133.3	F	18.1	B	-115.2	No
		Midday	19.5	B	19.5	B	na	na	na	No
		P.M.	15.6	B	27.4	C	na	na	na	No

Notes: Intersections operating below acceptable LOS are in **bold**.
[a] Delay: in seconds per vehicle
[b] LOS: Level of Service
[c] Signalized Intersection
[d] This scenario assumes implementation of the CHCF project plus approved mitigation described in the certified EIR.
Source: DKS Associates 2010

Austin Road & Arch Road

The following mitigation measures have been identified to improve intersection operations. It is assumed that the installation of the traffic signal, as part of the CHCF project would be in place. The project would contribute approximately 26% of the traffic to this intersection during the A.M. peak hour, and approximately 25% of the P.M. peak hour traffic.

- Coordinate with the County to adjust intersection cycle length to 60 sec during peak hours.

Table 4.11-11 lists the mitigated LOS. With this mitigation in place, the intersection would operate at LOS A during the A.M. peak hour and LOS B during the P.M. peak hour. Thus, the impact would be reduced to a less-than-significant level based on adopted significance criteria. Appendix E includes a comparison summary of the analysis results including the project's relative contribution to the study intersections.

Table 4.11-11 DeWitt Nelson Project – Mitigated Condition LOS Summary										
#	Intersection	Peak	Existing Condition		Existing + CHCF + DeWitt Construction		Mitigated CHCF[d] + DeWitt Construction		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
8.	Austin Road & Arch Road	A.M.	7.9	A	21.2	C	6.2	A	-15.0	No
		Midday	7.9	A	7.9	A	11.4	B	3.5	No
		P.M.	7.8	A	76.1	F	12.5	B	-63.6	No

Notes: Intersections operating below acceptable LOS are in bold.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
[d] This scenario assumes implementation of the CHCF project plus approved mitigation described in the certified EIR.
Source: DKS Associates, 2010.

Significance after Mitigation

Implementation of Mitigation Measure for Impact 4.11-1a would return the LOS of the intersections of Newcastle & Arch Road and Austin Road & Arch Road to acceptable levels. While feasible mitigation is available, the City and the County are the agencies that can and should implement this mitigation and it is unknown whether this mitigation would be implemented prior to operation of the project. While this mitigation would reduce the project's impact, for purposes of CEQA, this impact is concluded to be ***potentially significant and unavoidable*** in the event the mitigation is not implemented prior to operation of the project.

NCRF Only

Construction related traffic for the NCRF project would result in significant impacts at the intersection of Newcastle Road & Arch Road during the A.M. peak hour. During the peak construction period, the addition of construction vehicle traffic would cause the intersection of Newcastle Road & Arch Road to deteriorate from LOS B to LOS E during the A.M. peak hour.

Implementation of the NCRF project would result in the deterioration of one intersection to an unacceptable level of service during construction. Therefore, this would be a ***significant*** *impact. (Impact 4.11-1b)*

Mitigation Measure for Impact 4.11-1b

The following mitigation measures have been identified to improve intersection operations. The project would contribute approximately 4% of the traffic to this intersection during the A.M. peak hour.

- Implement Mitigation Measure(s) for Impact 4.11-1a for the intersection of Newcastle Road and Arch Road.

Table 4.11-12 lists the mitigated LOS. With this mitigation in place, the intersection would operate at LOS B during the A.M. peak hour. Thus, the impact would be reduced to a less-than-significant level based on adopted significance criteria. Appendix E includes a comparison summary of the analysis results including the project's relative contribution to the study intersections.

Table 4.11-12 NCRF Project – Mitigated Condition LOS Summary										
#	Intersection	Peak	Existing Condition		Existing + CHCF + NCRF Construction		Mitigated CHCF[d] + NCRF Construction		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
4.	Newcastle Road & Arch Road	A.M.	15.3	B	62.7	E	14.5	B	-48.2	No
		Midday	19.5	B	19.5	B	na	na	na	No
		P.M.	15.6	B	17.6	B	na	na	na	No

Notes: Intersections operating below acceptable LOS are in bold.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
[d] This scenario assumes implementation of the CHCF project plus approved mitigation described in the certified EIR.
Source: DKS Associates, 2010.

Significance after Mitigation

Implementation of Mitigation Measure for Impact 4.11-1a would return the LOS of the intersection of Newcastle & Arch Road to acceptable levels. While feasible mitigation is available, the City is the agency that can and should implement this mitigation and it is unknown whether this mitigation would be implemented prior to operation of the project. While this mitigation would reduce the project's impact, for purposes of CEQA, this impact is concluded to be ***potentially significant and unavoidable*** in the event the mitigation is not implemented prior to operation of the project.

Combined NCRF and DeWitt Nelson Facilities

Construction related traffic for the DeWitt Nelson and NCRF projects would result in impacts at the intersections of Newcastle Road & Arch Road during the A.M. peak hour and at Austin Road & Arch Road during the P.M. peak hour. During the peak construction period, the addition of construction vehicle traffic would cause the intersection of Newcastle Road & Arch Road to deteriorate from LOS B to LOS F during the A.M. peak hour. Similarly, the intersection of Austin Road & Arch Road would deteriorate from LOS A to LOS F during the P.M. peak hour.

Implementation of the DeWitt Nelson and NCRF projects would result in the deterioration of two intersections to unacceptable levels of service during construction. Therefore, this would be a ***significant*** *impact. (Impact 4.11-1b)*

Mitigation Measure for Impact 4.11-1c

<u>Newcastle Road & Arch Road</u>

The following mitigation measures have been identified to improve intersection operations. The project would contribute approximately 23% of the traffic (to this intersection during the A.M. peak hour.

- Implement Mitigation Measure(s) for Impact 4.11-1a for the intersection of Newcastle Road and Arch Road.

Table 4.11-13 lists the mitigated LOS. With this mitigation in place, the intersection would operate at LOS B during the A.M. peak hour. Thus, the impact would be reduced to a less-than-significant level based on adopted significance criteria. Appendix E includes a comparison summary of the analysis results including the project's relative contribution to the study intersections.

Table 4.11-13
NCRF & DeWitt Nelson project – Mitigated Condition LOS Summary

#	Intersection	Peak	Existing Condition		Existing + CHCF + NCRF/DeWitt Construction		Mitigated CHCF[d] + NCRF/DeWitt Construction		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
4.	Newcastle Road & Arch Road	A.M.	15.3	B	153.9	F	18.8	B	-135.1	No
		Midday	19.5	B	19.5	B	na	na	na	No
		P.M.	15.6	B	33.9	C	na	na	na	No

Notes: Intersections operating below acceptable LOS are in bold.
[a] Delay: in seconds per vehicle
[b] LOS: Level of Service
[c] Signalized Intersection
[d] This scenario assumes implementation of the CHCF project plus approved mitigation described in the certified EIR.
Source: DKS Associates, 2010.

Austin Road & Arch Road

The following mitigation measures have been identified to improve intersection operations. The project would contribute approximately 27 % of the traffic to this intersection during the A.M. peak hour, and approximately 26% of the P.M. peak hour traffic.

- Implement Mitigation Measure(s) for Impact 4.11-1a for the intersection of Austin Road and Arch Road.

Table 4.11-14 lists the mitigated LOS. With this mitigation in place, the intersection would operate at LOS C during the A.M. peak hour, LOS B during the Midday and P.M. peak hour. Thus, the impact would be reduced to a less-than-significant level based on adopted significance criteria. Appendix E includes a comparison summary of the analysis results including the project's relative contribution to the study intersections.

Significance after Mitigation

Implementation of Mitigation Measure for Impact 4.11-1a would return the LOS of the intersections of Newcastle & Arch Road and Austin Road & Arch Road to acceptable levels. While feasible mitigation is available, the City and the County are the agencies that can and should implement this mitigation and it is unknown whether this mitigation would be implemented prior to operation of the project. While this mitigation would reduce the project's impact, for purposes of CEQA, this impact is concluded to be ***potentially significant and unavoidable*** in the event the mitigation is not implemented prior to operation of the project.

Table 4.11-14 NCRF & DeWitt Nelson Projects – Mitigated Condition LOS Summary										
#	Intersection	Peak	Existing Condition		Existing + CHCF + NCRF/DeWitt Construction		Mitigated CHCF[d] + NCRF/DeWitt Construction		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
8.	Austin Road & Arch Road	A.M.	7.9	A	21.5	C	6.3	A	-15.2	No
		Midday	7.9	A	7.9	A	11.4	B	3.5	No
		P.M.	7.8	A	76.7	F	12.7	B	-64.0	No

Notes: Intersections operating below acceptable LOS are in **bold**.
[a] Delay: in seconds per vehicle
[b] LOS: Level of Service
[c] Signalized Intersection
[d] This scenario assumes implementation of the CHCF project plus approved mitigation described in the certified EIR.
Source: DKS Associates, 2010.

Background Condition

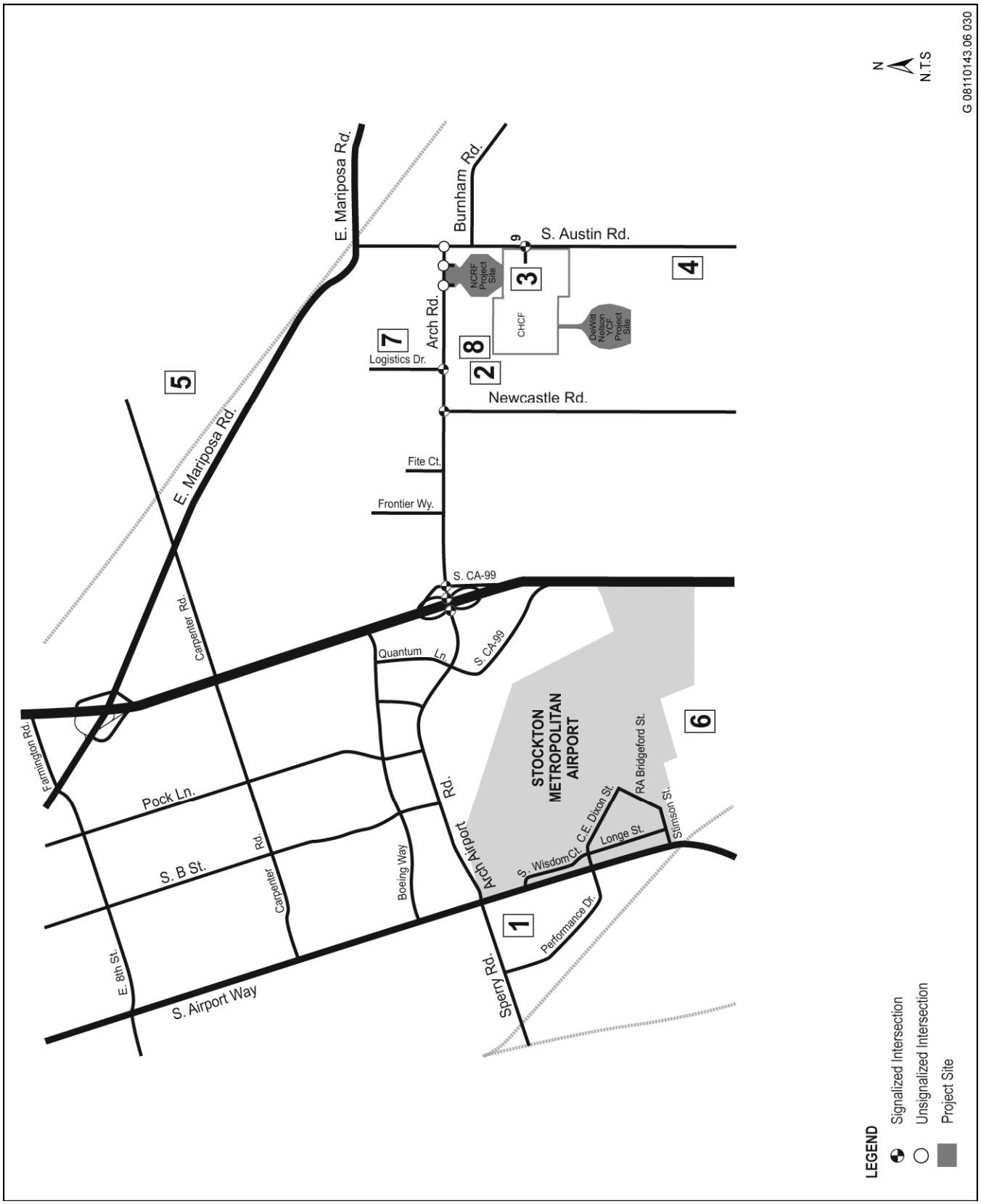
The background condition includes the traffic expected to be generated by approved and planned projects prior to completion of the proposed projects, (see section 4.11.3, "Impacts and Mitigation," for detailed project list). For the purpose of this analysis, trips generated from the following projects were added to the study area:

- Airpark 599
- Arch Road Industrial Park (Phase 1)
- California Health Care Facility (CHCF)
- Forward Inc. Landfill Expansion
- Mariposa Lakes Specific Plan Project (Phase I)
- Tidewater Crossing

The portion of these trips that would travel through the study area were added to the local street network and used for the intersection LOS analysis under the background condition. Exhibit 4.11-4 illustrates the location of approved projects. A list of 8 projects shown on Exhibit 4.11-4 are located within the vicinity of the NCRF and DeWitt Nelson project sites is provided in Table 4.11-15.

Roadway improvements that are associated with approved developments were also assumed to be completed in the near-term. Per conversations with City staff (McDowell, pers. comm., 2009), the following roadway improvements were assumed to be implemented prior to the completion date of the proposed projects, and thus were included in the background analysis:

- Arch Road – Sperry Road Extension Specific Plan
  - Widening of Arch Road to four-lanes (2-lanes in each direction) including a 22 foot median.
- Kingsley Road – SR 99 Frontage Road & Arch Road Intersection Improvements
  - Additional eastbound though-lane
- Newcastle Road and Arch Road Intersection Improvements



Source: DKS 2010

Location of Approved/Planned Projects **Exhibit 4.11-4**

Table 4.11-15 List of Projects in the Vicinity		
1.	Airpark 599~~Arch Road Industrial Park~~	550 acres -over 5 million square feet of primarily office/light industrial/warehouse uses ~~-19 buildable lots.~~ ~~-3.5 million s.f. of Industrial (maximum floor area permitted)~~
2.	Arch Road Industrial Park~~CHCF Stockton~~	-133 acres -19 buildable lots. -3.5 million s.f. of Industrial (maximum floor area permitted)~~-144 acres;~~ ~~-1,734-bed approved prison medical and mental health care facility~~ ~~-over 1.1 million s.f.~~ ~~-up to 3,000 employees.~~
3.	CHCF Stockton~~Airpark 599~~	--144 acres; -1,734-bed approved prison medical and mental health care facility -over 1.1 million s.f. -up to 3,000 employees.~~550 acres~~ ~~-over 5 million square feet of primarily office/light industrial/warehouse uses~~
4.	Forward Landfill Expansion (currently on hold)	-184-acre expansion of landfill (from 567 to 751 acres) -increase in the permitted number of daily vehicles (620 to 960 vehicles).
5.	Mariposa Lakes Project	-1,510 acres -10,514 residential units -12 million s.f. of Industrial -1 million s.f. of commercial -one high school -six elementary schools
6.	Tidewater Crossing	-909 acres -2,663 residential units -5.29 million s.f. of industrial -186,200 s.f. of commercial -up to two elementary schools
7.*	Opus Logistics Center	-439 acres -9.56 million s.f. of industrial
8.*	CCC Delta Service Center	-20 acres -52,000 s.f.
Note: * The Opus Logistics Center and the CCC Delta Service Center are not listed among the approved projects in Section 4.11 "Transportation" because the Opus Logistics project is already built into the traffic model in the 2035 Cumulative No Project Condition, and the CCC Delta Service Center is built-in the model, as well, encompassed within the TAZ where it is located.		

- Additional eastbound through-lane and
- Additional westbound through-lane

► Logistics Drive and Arch Road Intersection Improvements

- Widening of the westbound approach to include one left shared through-lane.
- Widening of the eastbound approach to include one through shared right-turn lane.

- Addition of a south leg (northbound approach) to facilitate access to the Arch Industrial Project. The northbound geometry will be a shared left-thru-right turn lane. This improvement is planned as part of the Arch Road Industrial Park (Phase I) Project.

- Austin Road and Arch Road Intersection Improvements (per the Mariposa Lakes Specific Plan – Phase 1)

  - Widening of the southbound approach to include one left shared through-lane and one right-turn lane.
  - Widening of the eastbound approach to include dual left-turn lanes, one through lane shared right-turn lane.
  - Converting the westbound approach to include one left-turn lane and one through shared right-turn lane.

In addition, roadway improvements associated with the approved CDCR CHCF project were also assumed and included in the analysis, as follows:

- Arch Road and Austin Road Intersection Improvements

  - Traffic signal installation with protected phasing for the eastbound approach.

- Austin Road Access Road

  - Widening of Austin Road at project driveway to provide for a dedicated left-turn lane in the northbound direction.

  - Traffic signal installation at the CHCF/DeWitt Nelson entrance.

- SR 99 NB off-ramp & Arch Road

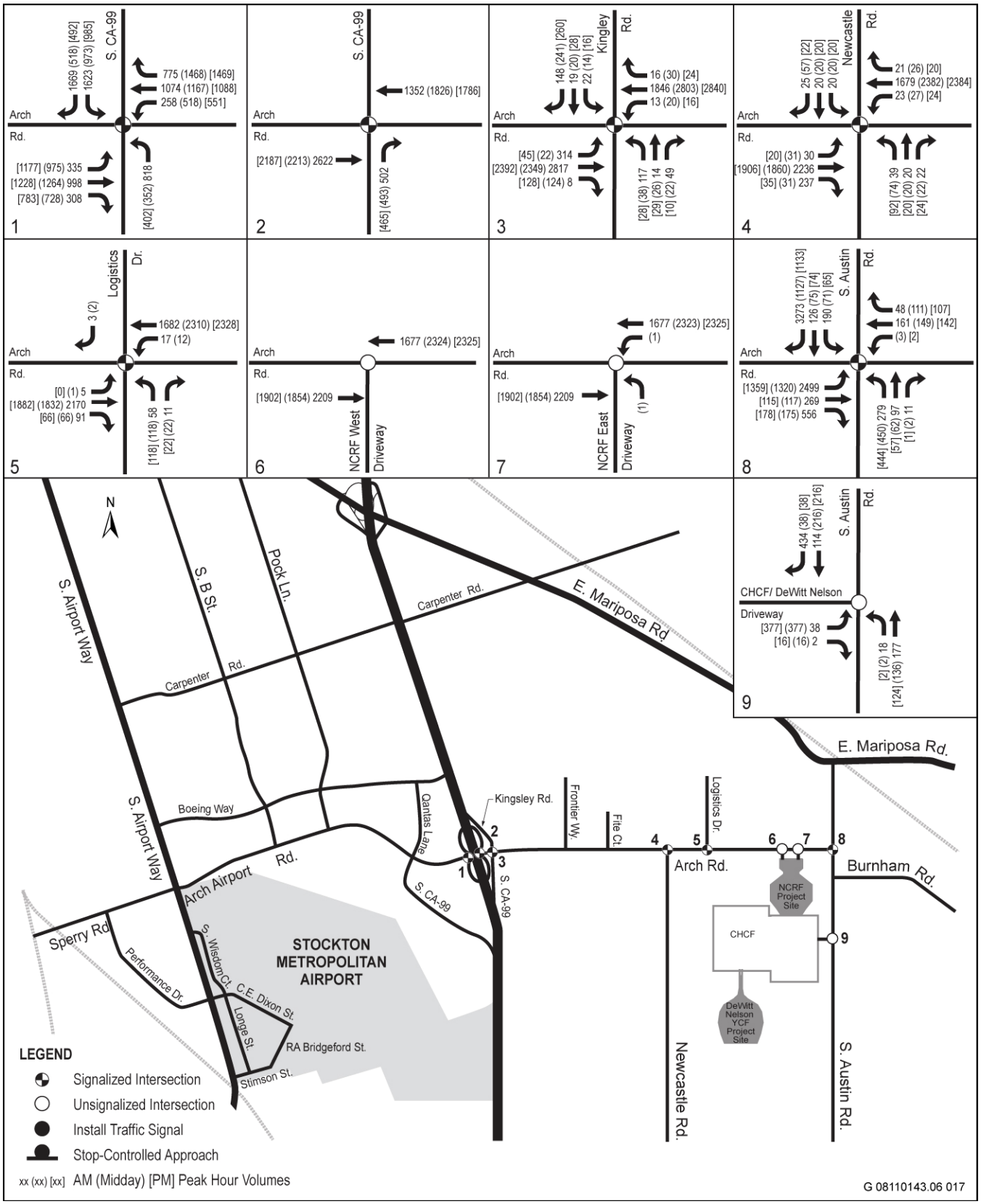
  - Traffic signal installation for the NB off-ramp including an additional 300 feet of storage capacity for the northbound off-ramp, overlap phasing with existing SR 99/Arch Road traffic signal, and optimized green times.

Note that signalization of the SR 99 Northbound off-ramp at Arch Road (Study Intersection #2) would result in the northbound right-turn lane operating as an overlap phase of the existing SR 99 Northbound off-ramp and Arch Road traffic signal. This lane would provide a right-turn arrow only when traffic is present on the northbound off-ram. Thus, the operation of this intersection was evaluated in conjunction with the SR-99 Southbound off-ramp & Arch Road (#1) intersection. That is, there is one single point urban interchange (SPUI) traffic signal that controls the operation of both the southbound and northbound off-ramps as well as through traffic on Arch road under SR 99).

Exhibit 4.11-5 illustrates the background condition traffic volumes at each study intersection.

Background Intersection Level of Service

The study intersections and their corresponding background levels of service are presented in Table 4.11-16. Appendix E includes the detailed calculation level of service analysis sheets including the weekday A.M., Midday and P.M. peak hours.



Source: DKS 2010

Background Condition Peak-Hour Intersection Traffic Volumes **Exhibit 4.11-5**

Table 4.11-16 Background Intersection Peak Hour LOS							
#	Intersection	A.M.		Midday		P.M.	
		Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]
1/2.	SR 99 SPUI & Arch Road[c]	147.9	**F**	113.0	**F**	116.9	**F**
3.	Kingsley Road – SR 99 Frontage Road & Arch Road[c]	78.1	**E**	107.5	**F**	116.8	**F**
4.	Newcastle Road & Arch Road[c]	~~20.9~~40.7	~~C~~D	~~24.5~~38.5	~~C~~D	~~28.5~~42.4	~~C~~D
5.	Logistics Drive & Arch Road[c]	~~11.4~~13.4	~~B~~B	~~30.7~~43.9	~~C~~D	~~19.9~~29.1	~~B~~C
6.	NCRF West Driveway & Arch Road[d]	0.0	A	0.0	A	0.0	A
7.	NCRF East Driveway & Arch Road[d]	0.0	A	0.0	A	0.0	A
8.	Austin Road & Arch Road[c]	~~869.1~~1,061.9	**F**	~~111.3~~133.1	**F**	~~111.3~~131.6	**F**
9.	Austin Road & Project Access Driveway (CHCF & DeWitt Nelson) [d]	~~3.7~~3.6	A	~~8.4~~8.6	A	~~8.3~~8.5	A

Notes: Intersections operating below acceptable LOS are in **bold**.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
d Unsignalized Intersection: For two-way stop controlled intersections, the LOS rating is based on the worst approach. For all-way stop controlled intersections, the LOS rating is based on the average delay.
Source: DKS Associates, 2010.

Under background conditions, the following intersections would operate at unacceptable LOS.

1/2. SR 99 SPUI & Arch Road – The SPUI would operate at LOS F during the A.M., Midday and P.M. peak hours.

4. Kingsley Road – SR 99 Frontage Road & Arch Road – This intersection would deteriorate from LOS B to LOS E during the A.M. peak and from LOS C to LOS F during the Midday peak and P.M. peak hours.

8. Austin Road & Arch Road – This intersection would deteriorate from LOS A to LOS F during the A.M., Midday and P.M. Peak hours.

Background Roadway Segment Level of Service

The project area roadway segment and its corresponding background levels of service are presented in Table 4.11-17. Similar to the existing (Table 4.11-6) condition, the roadway would operate at an acceptable level of service during the A.M., Midday, and P.M. peak hours.

Table 4.11-17 Background Roadway Segment Peak Hour LOS								
#	Roadway Segment		A.M.		Midday		P.M.	
			EB	WB	EB	WB	EB	WB
1.	Arch Road (East of Newcastle Road and west of NCRF West Driveway)	Peak Hour Volume[a]	2,209	1,677	1,854	2,324	1,902	2,325
		Avg. Travel Speed (mph)[b]	18	19	18	19	18	19
		LOS[c]	D	D	D	D	D	D

Notes: EB: Eastbound, WB: Westbound
[a] Peak Hour Volume: Assumed for both directions (eastbound and westbound)
[b] Average Travel Speed: Based on miles per hour
[c] LOS: Level of Service. Based on average through-vehicle travel speed.
Source: DKS Associates, 2010.

Project Condition

The amount of traffic associated with a project is estimated using a three-step process: (1) trip generation, (2) trip distribution, and (3) trip assignment. Trip generation is the process of predicting the number of peak hour trips a proposed development would contribute to the roadways, and whether these trips would be entering or exiting the site. The trip generation estimates for the projects were conservatively derived based on the overlapping shifts for custody and administrative staff and observations of operational characteristics of other correctional institutions. As shown in Table 4.11-17, 25, and 33 below, the projects would generate two trips per employee (one arriving, one departing) plus estimated delivery and visitor trips. To be conservative, no carpooling by employees was assumed; although some may occur, which would reduce overall trip generation. The NCRF and DeWitt Nelson projects are *prison* facilities, not a typical office, commercial, or medical facility where customers and employees frequently come and go. Entering and exiting any CDCR facility requires security checks, which are time consuming. So, once a person arrives for work, they rarely leave before their shift is over; there simply is not enough time to go through security screening and leave/return to the site during shift breaks. Each correctional facility provides onsite food service and other necessary staff conveniences. This is easily observed in locations where CDCR has constructed prisons outside of towns and cities; there is virtually no traffic on the roads that serve the prisons except during shift changes and visiting hours. CDCR operates over 30 prisons, and the trip rate used to prepare EIRs is based on data and observations of how CDCR prisons operate–real-world examples.

After the number of trips is determined, the distribution process projects the direction these trips use to approach and depart the site, from a regional perspective. Trip assignment involves determining which specific roadways a vehicle would use to travel between its origin and destination.

The following roadway improvements were assumed to be implemented prior to the completion date of the proposed projects, and thus were included in the analysis:

- NCRF West Driveway and Arch Road Intersection Improvement.
  - Traffic signal installation with full access to/from the project.

- NCRF East Driveway and Arch Road Intersection Improvement.
  - Right-in and Right-out access only.

Impact 4.11-2: Impacts to Study Area Intersections and Roadway Segment

NCRF Only

The trip generation for the NCRF project was based on the following assumptions:

- Total daily staff added by the proposed NCRF project (by shift);
- Daily service vehicle and delivery vehicle trips;
- Daily visitor vehicle trips.

Visitation hours would be permitted 7-days a week between 8:00 a.m. and 9:00 p.m. Visitation on weekdays would be by appointment only with an estimated 50 visitors per day.

Table 4.11-18 summarizes the breakdown of staff by shift and the estimated trip generation based on staff in and out of the project during the studied peak hour periods. The estimated trips listed in Table 4.11-18 account for additional trips that would occur due to visitors, employees, deliveries etc. during the peak periods.

Table 4.11-18 Estimated NCRF Project Trip Generation											
Trip Type	Number of Staff/Visitors/ Deliveries	Daily Trips	A.M. Peak (7:00-9:00 A.M.)			Midday Peak (2:00-4:00 P.M.)			P.M. Peak (4:00-6:00 P.M.)		
			In	Out	Total	In	Out	Total	In	Out	Total
Employee Trips											
1st Watch[1] (10:00 P.M. – 6:00 A.M.)	38	76		19	19						
2nd Watch[1] (6:00 A.M. – 2:00 P.M.)	106	212					106	106			
3rd Watch[1] (2:00 P.M. – 10:00 P.M.)	68	136				68		68			
Administrative (8:00 A.M. – 5:00 P.M.)	171	342	171		90					171	171
Employee Trip Total	**383**	**766**	**171**	**19**	**190**	**68**	**106**	**174**		**171**	**171**
Visitor Trips[3] (peak weekday)	50	100	13		13	6	7	13		13	13
Delivery and Service Vehicles[4]	5	10	1	1	2	1	1	2	1	1	2
Project Totals	**438**	**876**	**185**	**20**	**205**	**75**	**114**	**189**	**1**	**185**	**186**

Notes:

1. Daily staff trips are based on a total of 381 staff distributed over three shifts (watch) times. A portion of the 1st watch staff (10 p.m. to 6:00 a.m.) would be outbound trips during the A.M. peak hour.
2. Administrative staff trips are based on email correspondence sent from Mike Parker, Ascent Environmental, July 1, 2010.
3. Per the NOP, the average number of daily visitors is estimated to be approximately 50. Visiting times are 8:00 a.m. to 9:00 p.m. It is assumed ¼ of the visitor trips occur during each peak hour.
4. Delivery and Service vehicle trips (5 deliveries per day) with at least one delivery during each peak hour. All other deliveries would occur throughout the day.

Source: California Department of Corrections (CDCR).

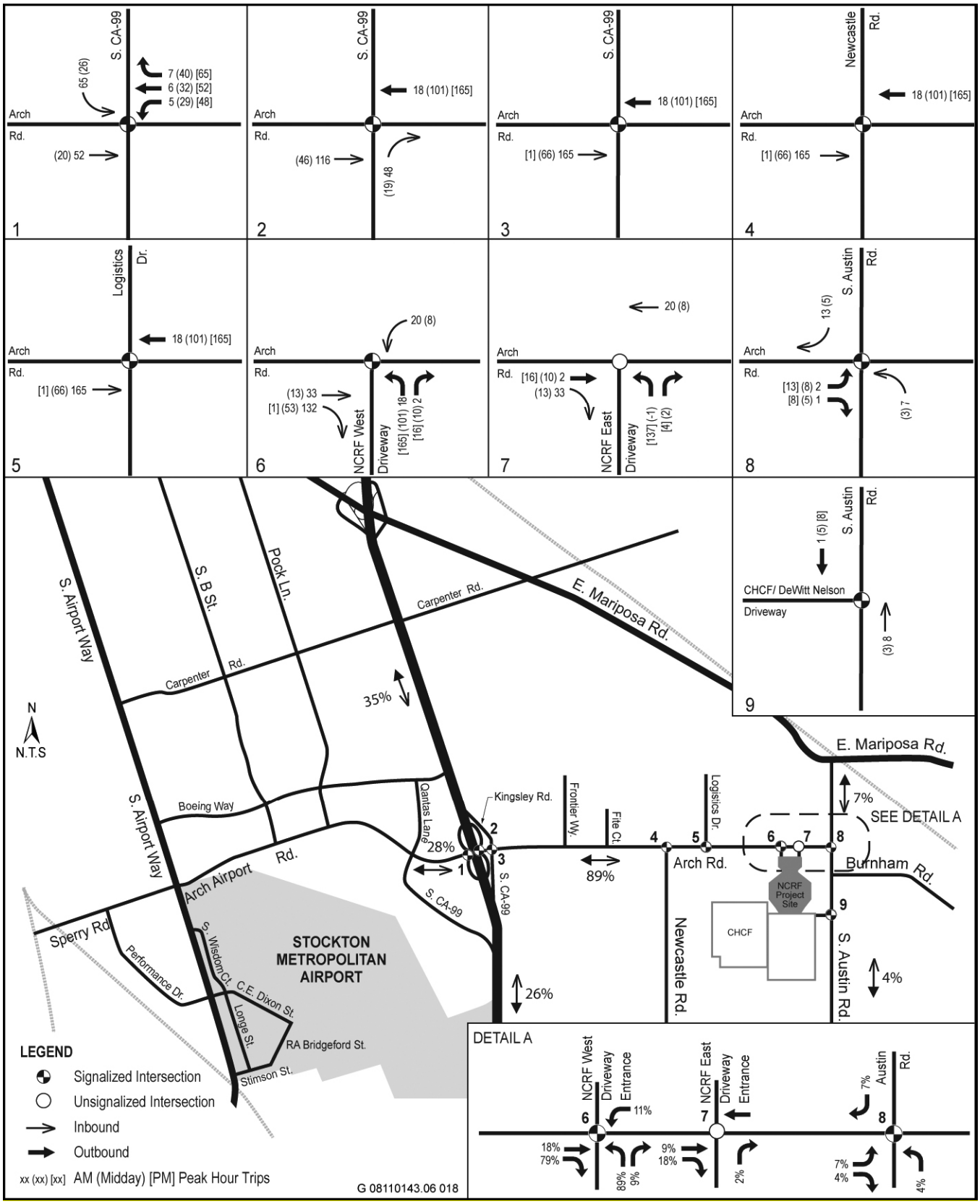
Trip Distribution

The direction of approach and departure for project trips of the proposed project were estimated based on travel patterns from the certified CHCF (2009) EIR analysis, which is located south of the NCRF site via Austin Road. DKS reviewed traffic volumes, turning movements at the intersections and locations of various land uses as part of this analysis. Trip distribution patterns were reviewed and approved by City of Stockton and San Joaquin County staff.

Trip Assignment

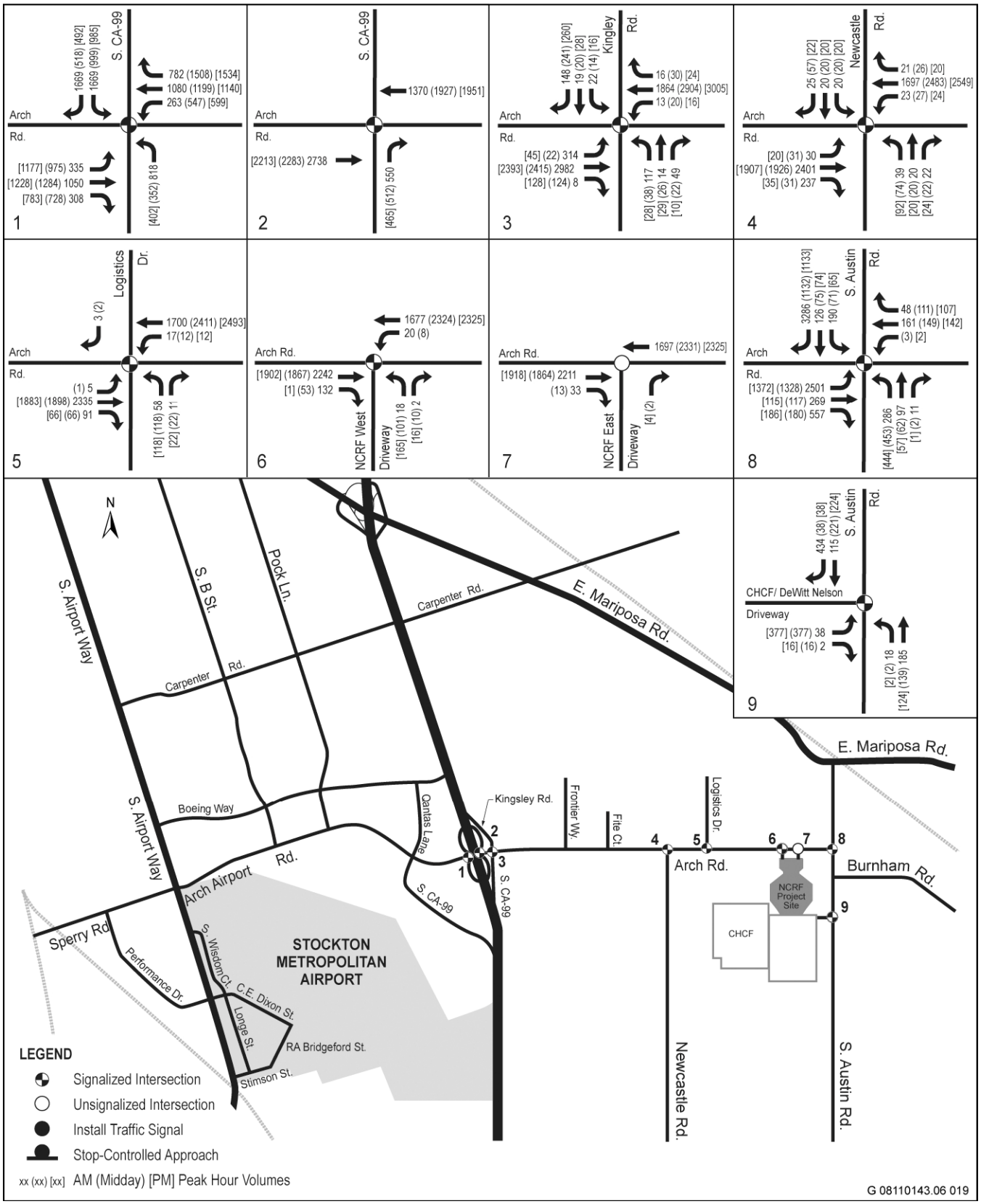
Project-generated trips were assigned to the roadway network based on access points, trip distribution assumptions and likely travel patterns.

Exhibits 4.11-6 and 4.11-7 illustrates the project trip distribution and trip assignment.



Source: DKS 2010

NCRF Project Trip Distribution and Trip Assignment **Exhibit 4.11-6**



Source: DKS 2010

NCRF Project Peak Hour Intersection Traffic Volumes **Exhibit 4.11-7**

NCRF Study Intersection Level of Service

The intersections and their corresponding levels of service are presented in Table 4.7-19. Appendix E includes the detailed calculation level of service analysis sheets including the weekday A.M., Midday, and P.M. peak hours.

Table 4.11-19
NCRF Project Intersection Peak Hour LOS Summary

#	Intersection	A.M.		Midday		P.M.	
		Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]
1/2.	SR 99 SPUI & Arch Road[c]	163.7	**F**	121.1	**F**	121.9	**F**
3.	Kingsley Road – SR 99 Frontage Road & Arch Road[c]	92.4	**F**	120.9	**F**	137.8	**F**
4.	Newcastle Road & Arch Road[c]	~~31.3~~55.0	~~C~~E	~~28.7~~45.3	~~C~~D	~~36.0~~56.1	~~D~~E
5.	Logistics Drive & Arch Road[c]	~~15.4~~19.0	B	~~40.1~~52.3	D	~~31.3~~42.1	~~C~~D
6.	NCRF West Driveway & Arch Road[c]	~~7.2~~14.2	~~A~~B	~~8.8~~13.4	~~A~~B	~~12.3~~16.3	B
7.	NCRF East Driveway & Arch Road[d]	0.0	A	~~16.9~~16.8	C	~~17.7~~18.3	C
8.	Austin Road & Arch Road[c]	~~873.4~~1,067.4	**F**	~~115.0~~135.3	**F**	~~112.9~~133.3	**F**
9.	Austin Road & Project Access Driveway (CHCF & DeWitt Nelson) [C]	~~3.7~~3.6	A	~~8.5~~9.0	A	~~8.5~~8.8	A

Notes: Intersections operating below acceptable LOS are in **bold**.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
d Unsignalized Intersection: For two-way stop controlled intersections, the LOS rating is based on the worst approach. For all-way stop controlled intersections, the LOS rating is based on the average delay.
Source: DKS Associates 2010.

Table 4.11-20 provides a level of service comparison to determine NCRF project impacts, if any.

Table 4.11-20
NCRF Project Intersection Peak Hour LOS Impact Comparison

#	Intersection	Peak	Existing		Background Condition		Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
1/2	SR 99 SPUI & Arch Road[c]	A.M.	na	na	147.9	**F**	163.7	**F**	15.8	**Yes**
		Midday	na	na	113.0	**F**	121.1	**F**	8.1	**Yes**
		P.M.	na	na	116.9	**F**	121.9	**F**	5.0	**Yes**
3.	Kingsley Road – SR 99 Frontage Road & Arch Road[c]	A.M.	19.1	B	78.1	**E**	92.4	**F**	14.3	**Yes**
		Midday	20.7	C	107.5	**F**	120.9	**F**	13.4	**Yes**
		P.M.	20.6	C	116.8	**F**	137.8	**F**	21.0	**Yes**

Table 4.11-20
NCRF Project Intersection Peak Hour LOS Impact Comparison

#	Intersection	Peak	Existing		Background Condition		Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
4.	Newcastle Road & Arch Road[c]	A.M.	16.2~~15.3~~	B	40.7~~20.9~~	DC	55.0~~31.3~~	**E**~~C~~	14.3~~10.4~~	~~No~~**Yes**
		Midday	19.7~~19.5~~	B	38.5~~24.5~~	D	45.3~~28.7~~	D~~C~~	6.8~~4.2~~	No
		P.M.	16.3~~15.6~~	B	42.4~~28.5~~	D	56.1~~36.0~~	**E**~~D~~	13.7~~7.5~~	~~No~~**Yes**
5.	Logistics Drive & Arch Road[c]	A.M.	9.1~~8.8~~	A	13.4~~11.4~~	B	19.0~~15.4~~	B	5.6~~4.0~~	No
		Midday	2.0	A	43.9~~30.7~~	D	52.3~~40.1~~	D	8.4~~9.4~~	No
		P.M.	0.0	A	29.1~~19.9~~	C	42.1~~31.3~~	D	13.0~~11.4~~	No
6.	NCRF West Driveway & Arch Road[c]	A.M.	0.0	A	0.0	A	14.2~~7.2~~	B	14.2~~7.2~~	No
		Midday	0.0	A	0.0	A	13.4~~8.8~~	B	13.4~~8.8~~	No
		P.M.	0.0	A	0.0	A	16.3~~12.3~~	B	16.3~~12.3~~	No
7.	NCRF East Driveway & Arch Road[d]	A.M.	0.0	A	0.0	A	0.0	A	0.0	No
		Midday	0.0	A	0.0	A	16.8~~16.9~~	C	16.8~~16.9~~	No
		P.M.	0.0	A	0.0	A	18.3~~17.7~~	C	18.3~~17.7~~	No
8.	Austin Road & Arch Road[c]	A.M.	7.9	A	1,061.9 ~~869.1~~	**F**	1,067.4 ~~873.4~~	**F**	5.5~~4.3~~	**Yes**
		Midday	7.9	A	133.1 ~~111.3~~	**F**	135.3 ~~115.0~~	**F**	2.2~~3.7~~	~~Yes~~No
		P.M.	7.8	A	131.6 ~~111.3~~	**F**	133.3 ~~112.9~~	**F**	1.7~~1.6~~	~~Yes~~No
9.	Austin Road & Project Access[c] (CHCF & DeWitt Nelson)	A.M.	na	na	3.6~~3.7~~	A	3.6~~3.7~~	A	0.0	No
		Midday	na	na	8.6~~8.4~~	A	9.0~~8.5~~	A	0.4~~0.1~~	No
		P.M.	na	na	8.5~~8.3~~	A	8.8~~8.5~~	A	0.3~~0.2~~	No

Notes: Intersections operating below acceptable LOS are in bold. na: not applicable.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
d Unsignalized Intersection For two-way stop controlled intersections; the LOS rating is based on the worst approach. For all-way stop controlled intersections, the LOS rating is based on the average delay.
Source: DKS Associates 2010

The addition of project-related trips would contribute to an already deficient level of service at the SR 99 SPUI and Arch Road (#1/2). This intersection would continue to operate at LOS F, during the A.M., Midday, and P.M. peak hour. This intersection is under Caltrans jurisdiction and even though the facility is deficient under the background condition (LOS F), the project would result in a significant impact at this location because it would result in an increase in delay by five or more seconds based on City of Stockton criteria.

The addition of project-related trips would contribute to an already deficient level of service at the intersection of Kingsley Road – SR 99 Frontage Road & Arch Road (#3). This intersection would deteriorate from LOS E to LOS F during the A.M. peak hour and it would continue to operate at LOS F during the Midday, and P.M. peak

hours and would increase delay by more than five seconds. Thus, the project would result in a significant impact at this location.

The intersection of Newcastle Road and Arch Road would experience a deficient level of service during the A.M. and P.M. peak hours. The intersection would deteriorate from LOS D to LOS E during both peak hours with an increase of delay by more than five seconds. Thus, the project would result in a significant impact at this location.

The intersection of Austin Road and Arch Road would continue to operate at LOS F during the A.M., Midday, and P.M. peak hour. The addition of project-related trips would contribute to an already deficient LOS at this intersection. Operations would exceed San Joaquin County significance criteria, which require that delay not increase above background conditions, and the project would result in a significant impact during the A.M. peak hour at this location.

All other study intersections would operate acceptably or would not exceed adopted significance thresholds of applicable agencies; therefore, no significant impacts would occur at these intersections.

NCRF Roadway Level of Service

The roadway segment and its corresponding level of service are presented in Table 4.11-21. Table 4.11-22 provides a level of service comparison to determine NCRF project impacts, if any. Based on the roadway segment analysis results, the roadway would operate at an acceptable level of service. Note, based on input from the City, the widening of Arch Road from two-to-four lanes is assumed under this analysis.

Table 4.11-21
NCRF Project Roadway Segment Peak Hour LOS Summary

#	Roadway Segment		A.M.		Midday		P.M.	
			EB	WB	EB	WB	EB	WB
1.	Arch Road (East of Newcastle Road and west of NCRF West Drive)	Peak Hour Volume[a]	2,374	1,695	1,920	2,424	1,903	2,490
		Avg. Travel Speed (mph)[b]	18	19	18	19	18	19
		LOS[c]	D	D	D	D	D	D

Notes:
a Assumed for both directions (eastbound and westbound)
b Based on miles per hour
c LOS: Level of Service. Based on average through-vehicle travel speed.
Source: DKS Associates 2010.

Implementation of the NCRF project would result in the acceptable operation of the study area roadway segment; however, it would result in the deterioration of three study intersections to unacceptable operating conditions based on adopted thresholds of local agencies. Therefore, this would be a ***significant*** *impact. (Impact 4.11-2a)*

Mitigation Measure for Impact 4.11-2a

1. SR 99 SPUI & Arch Road

The following mitigation measures have been identified to improve intersection operations and achieve a difference in average delay of less than 5 seconds or LOS D or better during the A.M., Midday, and P.M. peak hours. The project would contribute 2.14% of the traffic to this intersection during the A.M. peak hour, 1.93% during the Midday peak hour, and 1.87 % during the P.M. peak hour. CDCR will contribute

Table 4.11-22 NCRF Project Roadway Segment Peak Hour LOS Impact Comparison												
#	Roadway Segment		Existing			Background Condition			Project Condition			Significant Impact
			A.M.	MD	P.M.	A.M.	MD	P.M.	A.M.	MD	P.M.	Yes/No?
1.	Arch Road (East of Newcastle Road and west of NCRF West Driveway	Peak Hour Volume[a] EB	76	91	119	2,209	1,854	1,902	2,374	1,920	1,903	No
		Peak Hour Volume[a] WB	83	92	68	1,677	2,324	2,325	1,695	2,424	2,490	No
		Avg. Travel Speed[b] EB	36	19	36	18	18	18	18	18	18	No
		Avg. Travel Speed[b] WB	36	19	36	19	19	19	19	19	19	No
		LOS[c] EB	A	D	A	D	D	D	D	D	D	No
		LOS[c] WB	A	D	A	D	D	D	D	D	D	No

Notes:
a Assumed for both directions (eastbound and westbound)
b Based on miles per hour
c LOS: Level of Service. Based on average through-vehicle travel speed.
Source: DKS Associates 2010.

appropriate fees based on trip ends generated by the project to the City of Stockton to help fund implementation of this improvement. This improvement is not currently in the City's traffic impact fee program.

- Adjust traffic signal timing to optimize the splits and cycle length to 150 seconds during the A.M. peak hour.
- Adjust traffic signal timing to optimize the splits and cycle length to 100 seconds and coordinate the traffic signal with the intersection of Kingsley Road - SR 99 Frontage Road and Arch Road during the Midday peak hour.
- Adjust traffic signal timing to optimize the splits and cycle length to 135 seconds and coordinate the traffic signal with the intersection of Kingsley Road - SR 99 Frontage Road and Arch Road during the P.M. peak hour.

Table 4.11-23 lists the mitigated LOS. With this mitigation in place, the intersection would continue to operate at LOS F during the A.M., Midday and P.M. peak hours but delay would not increase by more than five seconds and, therefore, would not exceed adopted significance criteria. Thus, the impact would be reduced to a less-than-significant level based on adopted significance criteria. Appendix E includes a comparison summary of the analysis results including the project's relative contribution to the study intersections.

2. Kingsley Road – SR 99 Frontage Road & Arch Road

The following mitigation measures have been identified to improve intersection operations and achieve a difference in average delay of less than five seconds or LOS D or better during the A.M., Midday, and P.M. peak hours. The project would contribute 3.29% of the traffic to this intersection during the A.M. peak hour, 2.84% during the Midday peak hour, and 2.77% during the P.M. peak hour. CDCR will contribute appropriate fees based on trip ends generated by the project to the City of Stockton to help fund implementation of this improvement. This improvement is not in the City's traffic impact fee program.

Table 4.11-23 NCRF project – Mitigated Condition LOS Summary										
#	Intersection	Peak	Background Condition		Project Condition		Mitigated Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
1/2.	SR 99 SPUI & Arch Road	A.M.	147.9	**F**	163.7	**F**	152.6	**F**	4.7	No
		Midday	113.0	**F**	121.1	**F**	113.1	**F**	0.1	No
		P.M.	116.9	**F**	121.9	**F**	117.5	**F**	0.6	No

Notes: Intersections operating below acceptable LOS are in **bold**.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
Source: DKS Associates, 2010.

- Adjust traffic signal timing to optimize the splits and cycle length to 150 seconds during the A.M. peak hour.
- Adjust traffic signal timing to optimize the splits and cycle length to 100 seconds and coordinate the traffic signal with the SR 99 SPUI & Arch Road intersection, during the Midday peak hour.
- Adjust traffic signal timing to optimize the splits and cycle length to 135 seconds and coordinate the traffic signal with the SR 99 SPUI & Arch Road intersection, during the P.M. peak hour.

Table 4.11-24 lists the mitigated LOS. With this mitigation in place, the intersection would operate at LOS D during the A.M. peak hour and it would continue to operate at LOS F during the Midday and P.M. peak hours but would not increase delay by more than five seconds. Thus, the impact would be reduced to a less-than-significant level based on adopted significance criteria. Appendix E includes a comparison summary of the analysis results including the project's relative contribution to the study intersections.

Table 4.11-24 NCRF Project – Mitigated Condition LOS Summary										
#	Intersection	Peak	Background Condition		Project Condition		Mitigated Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
3.	Kingsley Road – SR 99 Frontage Road & Arch Road	A.M.	78.1	**E**	92.4	**F**	54.9	D	-23.2	No
		Midday	107.5	**F**	120.9	**F**	104.1	**F**	-3.4	No
		P.M.	116.8	**F**	137.8	**F**	115.7	**F**	-1.1	No

Notes: Intersections operating below acceptable LOS are in **bold**.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
Source: DKS Associates 2010

3. Newcastle Road & Arch Road

The following mitigation measures have been identified to improve intersection operations and achieve a difference in average delay of less than the background conditions or LOS D or better during the A.M., Midday, and P.M. peak hours. The project would contribute 4.02% of the traffic to this intersection during the A.M. peak hour and 3.49% during the P.M. peak hourThis improvement is not in the City's traffic impact fee program. CDCR will monitor traffic at the above intersection for two years after the date on which the NCRF Project begins operations. If, based on those traffic data, the level of service at any of the above intersections exceeds the threshold of significance, CDCR will fund/undertake the following mitigation:

- Adjust the traffic signal timing to optimize splits during the impacted A.M. and P.M. hours (balance of green and red time for each approach).

Table 4.11-25 lists the mitigated LOS. With this mitigation in place, the intersection would continue to operate at LOS F during the A.M. and P.M. peak hours but would not increase delay above background conditions. Thus, this impact would be reduced to a less-than-significant level. In calculating CDCR's "fair share" obligation towards traffic improvements, CDCR will credit its total "fair share" obligation by the amount it spends towards the above mitigation in excess of its percentage contributions to traffic congestion at those intersections. Appendix E includes a comparison summary of the significance thresholds criteria including the project's relative contribution to the study intersections.

Table 4.11-25
NCRF Project – Mitigated Condition LOS Impact Comparison

#	Intersection	Peak	Background Condition		Project Condition		Mitigated Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
8.	Newcastle Road & Arch Road	A.M.	40.7	D	55.0	**E**	54.8	D	14.1	No
		Midday	No Impact or Mitigation							
		P.M.	42.4	D	56.1	**E**	54.0	D	11.6	No

Notes: Intersections operating below acceptable LOS are in bold.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
Source: DKS Associates 2010

~~3~~4. Austin Road & Arch Road

The following mitigation measures have been identified to improve intersection operations and achieve a difference in average delay of less than the background conditions or LOS D or better during the A.M., Midday, and P.M. peak hours. The project would contribute 0.31% of the traffic to this intersection during the A.M. peak hour, 0.57% during the Midday peak hour, and 0.57% during the P.M. peak hour. CDCR will contribute appropriate fees based on trip ends generated by the project to the County of San Joaquin to help fund implementation of this improvement. This improvement is not in the County's traffic impact fee program.

- Adjust the traffic signal timing to provide the southbound right-turn lane with overlap phasing (allow right-turns to turn when opposing left turns turn).

- Adjust the traffic signal timing to optimize splits (balance of green and red time for each approach).

Table 4.11-~~25~~26 lists the mitigated LOS. With this mitigation in place, the intersection would continue to operate at LOS F during the A.M., Midday, and P.M. peak hours but would not increase delay above background conditions. Thus, this impact would be reduced to a less-than-significant level. Appendix E includes a comparison summary of the significance thresholds criteria including the project's relative contribution to the study intersections.

Table 4.11-26~~5~~
NCRF Project – Mitigated Condition LOS Impact Comparison

#	Intersection	Peak	Background Condition		Project Condition		Mitigated Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
8.	Austin Road & Arch Road	A.M.	1,061.9 ~~869.1~~	**F**	1,067.4 ~~873.4~~	**F**	631.5 ~~481.2~~	**F**	430.4 ~~387.9~~	No
		Midday	133.1 ~~111.3~~	**F**	135.3 ~~115.0~~	**F**	108.6 ~~92.5~~	**F**	24.5~~18.8~~	No
		P.M.	131.6 ~~111.3~~	**F**	133.3 ~~112.9~~	**F**	108.3 ~~89.9~~	**F**	23.3~~21.4~~	No

Notes: Intersections operating below acceptable LOS are in bold.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
Source: DKS Associates 2010

Significance after Mitigation

Implementation of Mitigation Measure for Impact 4.11-2a (1) would reduce the project's impacts to the intersection of SR 99 SPUI & Arch Road to a less-than-significant level. While feasible mitigation is available, Caltrans is the agency that can and should implement this mitigation and it is unknown whether this mitigation would be implemented prior to operation of the project. While this mitigation would reduce the project's impact, for purposes of CEQA, this impact is concluded to be ***potentially significant and unavoidable*** in the event the mitigation is not implemented prior to operation of the project.

Implementation of mitigation measure for Impact 4.11-2a (2) would reduce the project's impact to the intersection of Kingsley Road (Frontage Road) and Arch Road to a less-than-significant level. While feasible mitigation is available, Caltrans is the agency that can and should implement this mitigation and it is unknown whether this mitigation would be implemented prior to operation of the project. While this mitigation would reduce the project's impact, for purposes of CEQA, this impact is concluded to be ***potentially significant and unavoidable*** in the event the mitigation is not implemented prior to operation of the project.

Implementation of mitigation measure for Impact 4.11-2a (3) would reduce the project's impact to a ***less-than-significant*** level.

Implementation of mitigation measure for Impact 4.11-2a (4) would reduce the project's impact to a less-than-significant level. While feasible mitigation is available, the County is the agency that can and should implement this mitigation and it is unknown whether this mitigation would be implemented prior to operation of the project. While this mitigation would reduce the project's impact, for purposes of CEQA, this impact is concluded to be

potentially significant and unavoidable in the event the mitigation is not implemented prior to operation of the project.

DeWitt Nelson Only

Trip Generation

The trip generation for the DeWitt Nelson project was based on the total daily staff added by the proposed DeWitt Nelson project (by shift). Deliveries for this facility would be coordinated with the NCRF facility. Visitation hours would only be allowed on weekends, Saturday and Sundays from 8:00 a.m. to 5:00 p.m. with an estimated 150 visitors per day.

Table 4.11-27 summarizes estimated trip generation during the A.M., Midday, and P.M. peak periods.

Table 4.11-~~26~~27
Estimated DeWitt Nelson Project Trip Generation

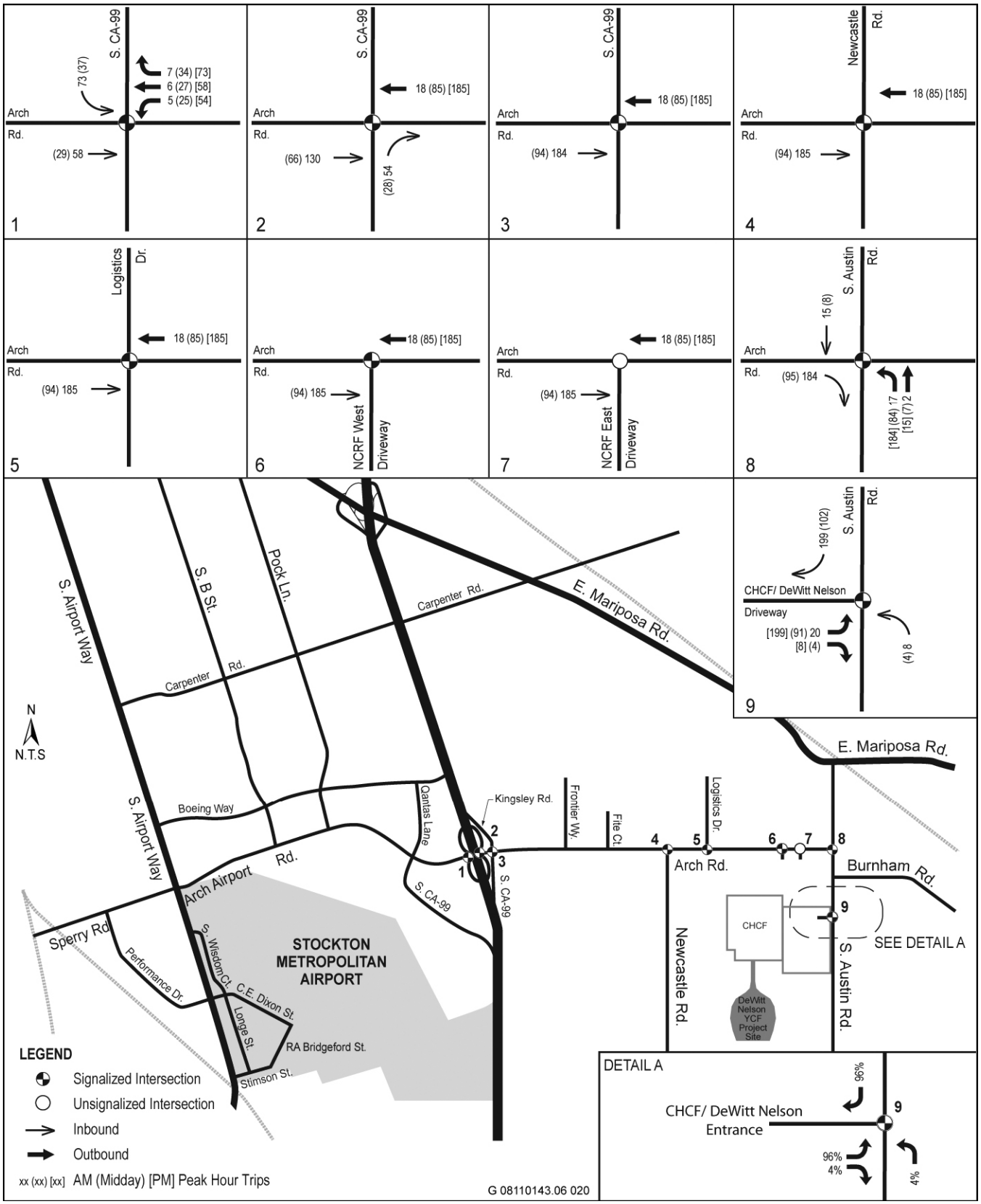
Trip Type	Number of Staff/Visitors/ Deliveries	Daily Trips	A.M. Peak (7:00-9:00 A.M.)			Midday Peak (2:00-4:00 P.M.)			P.M. Peak (4:00-6:00 P.M.)		
			In	Out	Total	In	Out	Total	In	Out	Total
Employee Trips											
1st Watch[1] (10:00 P.M. – 6:00 A.M.)	40	80		20	227						
2nd Watch[1] (6:00 A.M. – 2:00 P.M.)	95	190					95	95			
3rd Watch[1] (2:00 P.M. – 10:00 P.M.)	106	212				106		106			
Administrative[2] (8:00 A.M. – 5:00 P.M.)	207	414	207		207					207	207
Employee Trip Total[3]	**448**	**896**	**207**	**20**	**227**	**106**	**95**	**201**	**-**	**207**	**207**

Notes:
1. Daily staff trips are based on a total of 453 staff distributed over three shifts (watch) times. A portion of the 1st watch staff (10 p.m. to 6:00 a.m.) would be outbound trips during the A.M. peak hour.
2. Administrative staff trips are based on email correspondence sent from Mike Parker, Ascent Environmental, July 1, 2010.
3. Visiting hours will be allowed on Saturdays and Sundays from 8:00 a.m. to 5:00 p.m. with an estimated 150 visitors per day; thus, no weekday visitor trips are assumed. Delivery truck trips are assumed to be shared with the CHCF facility.

Source: California Department of Corrections (CDCR)

Trip Distribution

The direction of approach and departure for project trips were estimated based on travel patterns from the approved CHCF (2009) EIR analysis, which is located north of the DeWitt Nelson site via Austin Road. DKS reviewed traffic volumes, turning movements at the intersections, and locations of various land uses as part of this analysis. Trip distribution patterns were reviewed and approved by City of Stockton and San Joaquin County staff. Exhibit 4.11-8 illustrates the project trip distribution and trip assignment.



Source: DKS 2010

DeWitt Nelson Project Trip Distribution and Trip Assignment **Exhibit 4.11-8**

Trip Assignment

Project-generated trips were assigned to the roadway network based on access points, trip distribution assumptions, and likely travel patterns.

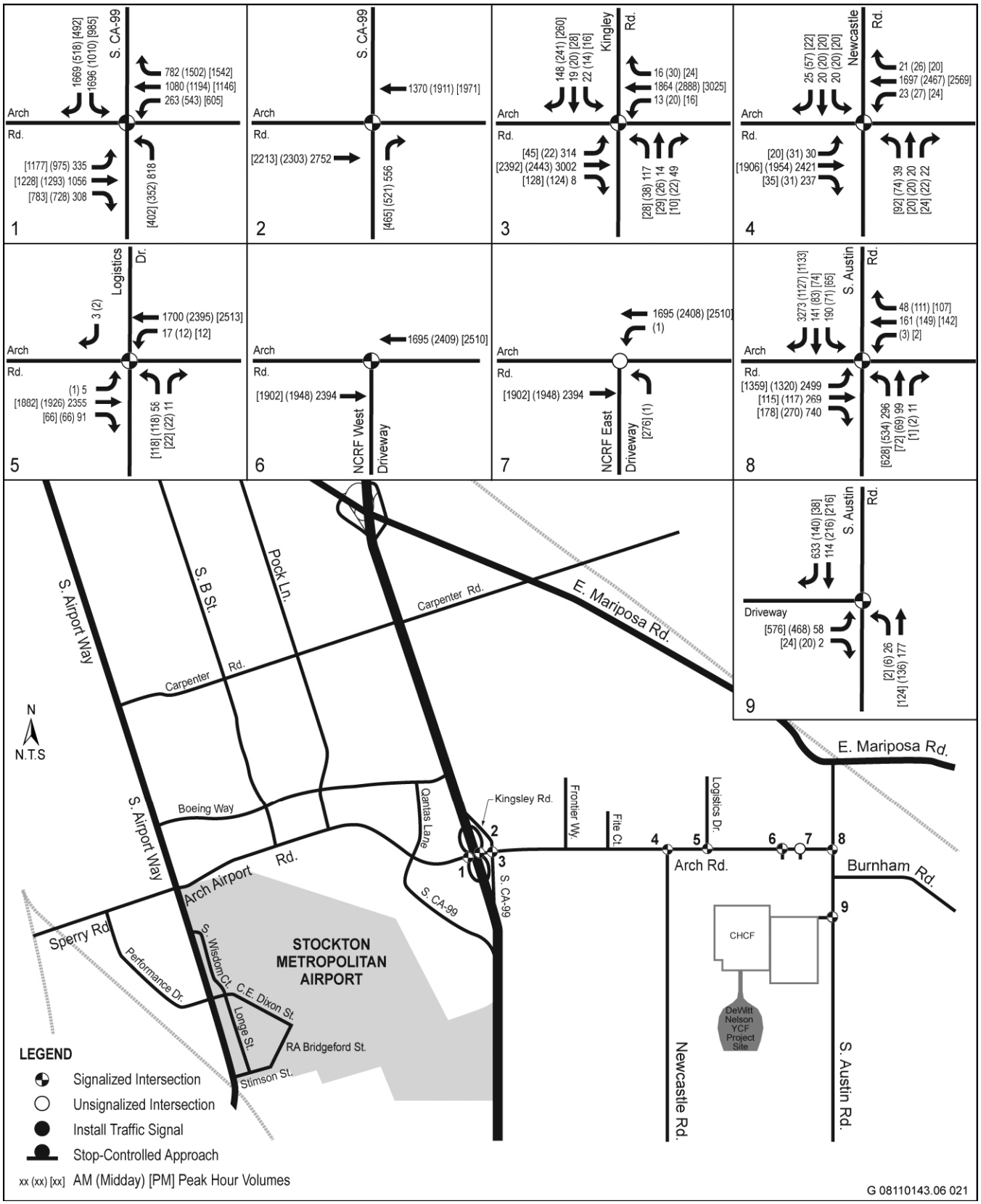
DeWitt Nelson Intersection Level of Service

The intersections and their corresponding project levels of service are presented in Table 4.11-28. Exhibit 4.11-9 presents the DeWitt Nelson Peak Hour intersection volumes. Appendix E includes the detailed calculation level of service analysis sheets including the weekday A.M., Midday, and P.M. peak hours.

Table 4.11-~~27~~28
Dewitt Nelson Project Intersection Peak Hour LOS Summary

#	Intersection	A.M.		Midday		P.M.	
		Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]
1/2.	SR 99 SPUI & Arch Road[c]	166.1	**F**	123.2	**F**	122.6	**F**
3.	Kingsley Road – SR 99 Frontage Road & Arch Road[c]	94.1	**F**	119.5	**F**	140.5	**F**
4.	Newcastle Road & Arch Road[c]	~~32.9~~57.3	~~C~~**E**	~~27.9~~43.9	~~C~~D	~~37.2~~58.1	~~D~~**E**
5.	Logistics Drive & Arch Road[c]	~~16.2~~20.3	~~B~~C	~~38.7~~50.6	~~D~~D	~~33.0~~44.2	~~C~~D
6.	NCRF West Driveway & Arch Road[c]	~~7.3~~15.4	~~A~~C	~~7.7~~13.5	~~A~~B	~~10.3~~20.0	~~B~~B
7.	NCRF East Driveway & Arch Road[d]	0.0	A	0.0	A	0.0	A
8.	Austin Road & Arch Road[c]	~~862.1~~ 1,052.9	**F**	~~131.0~~145.9	**F**	~~157.8~~167.6	**F**
9.	Austin Road & Project Access Driveway[c] (CHCF & DeWitt Nelson)	~~4.3~~4.4	A	~~10.7~~11.0	B	~~11.0~~11.4	B

Notes: Intersections operating below acceptable LOS are in **bold**.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
d Unsignalized Intersection: For two-way stop controlled intersections, the LOS rating is based on the worst approach. For all-way stop controlled intersections, the LOS rating is based on the average delay.
Source: DKS Associates 2010



Source: DKS 2010

DeWitt Nelson Project Peak Hour Intersection Traffic Volumes **Exhibit 4.11-9**

Table 4.11-29 provides a level of service comparison to determine significance criteria and project impacts, if any.

Table 4.11-2829
Dewitt Nelson Project Intersection Peak Hour LOS Impact Comparison

#	Intersection	Peak	Existing		Background Condition		Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
1/2	SR 99 SPUI & Arch Road[c]	A.M.	na	na	147.9	**F**	166.1	**F**	18.2	**Yes**
		Midday	na	na	113.0	**F**	123.2	**F**	10.2	**Yes**
		P.M.	na	na	116.9	**F**	122.6	**F**	5.7	**Yes**
3.	Kingsley Road – SR 99 Frontage Road & Arch Road[c]	A.M.	19.1	B	78.1	**E**	94.1	**F**	16.0	**Yes**
		Midday	20.7	C	107.5	**F**	119.5	**F**	12.0	**Yes**
		P.M.	20.6	C	116.8	**F**	140.5	**F**	23.7	**Yes**
4.	Newcastle Road & Arch Road[c]	A.M.	16.2~~15.3~~	B	40.7~~20.9~~	D~~C~~	57.3~~32.9~~	**E**~~C~~	16.6~~12.0~~	~~No~~**Yes**
		Midday	19.7~~19.5~~	B	38.5~~24.5~~	D~~C~~	43.9~~27.9~~	D~~C~~	5.4~~3.4~~	No
		P.M.	16.3~~15.6~~	B	42.4~~28.5~~	D~~C~~	58.1~~37.2~~	**E**~~D~~	15.7~~8.7~~	~~No~~**Yes**
5.	Logistics Drive & Arch Road[c]	A.M.	9.1~~8.8~~	A	13.4~~11.4~~	B	20.3~~16.2~~	C~~B~~	6.9~~4.8~~	No
		Midday	2.0	A	43.9~~30.7~~	D~~C~~	50.6~~38.7~~	D~~D~~	6.7~~8.0~~	No
		P.M.	0.0	A	29.1~~19.9~~	C~~B~~	44.2~~33.0~~	D~~C~~	15.1~~13.1~~	No
6.	NCRF West Driveway & Arch Road[d]	A.M.	0.0	A	0.0	A	15.4~~7.3~~	C~~A~~	15.4~~7.3~~	No
		Midday	0.0	A	0.0	A	13.5~~7.7~~	B~~A~~	13.5~~7.7~~	No
		P.M.	0.0	A	0.0	A	20.0~~10.3~~	B	20.0~~10.3~~	No
7.	NCRF East Driveway & Arch Road[c]	A.M.	0.0	A	0.0	A	0.0	A	0.0	No
		Midday	0.0	A	0.0	A	0.0	A	0.0	No
		P.M.	0.0	A	0.0	A	0.0	A	0.0	No
8.	Austin Road & Arch Road[c]	A.M.	7.9	A	1061.9 ~~869.1~~	**F**	1,052.9 ~~862.1~~	**F**	-9.0~~-7.0~~	No
		Midday	7.9	A	133.1 ~~111.3~~	**F**	145.9~~131.0~~	**F**	12.8~~19.7~~	**Yes**
		P.M.	7.8	A	131.6 ~~111.3~~	**F**	167.6~~157.8~~	**F**	36.0~~46.5~~	**Yes**
9.	Austin Road &	A.M.	na	na	3.6~~3.7~~	A	4.4~~4.3~~	A	0.8~~0.6~~	No

Table 4.11-2829 Dewitt Nelson Project Intersection Peak Hour LOS Impact Comparison										
#	Intersection	Peak	Existing		Background Condition		Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
	Project Access Driveway[c] (CHCF & DeWitt Nelson)	Midday	na	na	8.6~~8.4~~	A	11.0~~10.7~~	B	2.4~~2.3~~	No
		P.M.	na	na	8.5~~8.3~~	A	11.4~~11.0~~	B	2.9~~2.7~~	No

Notes: na: not applicable.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
d Unsignalized Intersection For two-way stop controlled intersections, the LOS rating is based on the worst approach. For all-way stop controlled intersections, the LOS rating is based on the average delay.
Source: DKS Associates, 2010.

The addition of project-related trips would contribute to an already deficient level of service at the SR 99 SPUI and Arch Road (#1/2). This intersection would continue to operate at LOS F, during the A.M., Midday, and P.M. peak hour and would increase delay by more than five seconds. Thus, this would be a significant impact based on City of Stockton significance criteria for a state facility.

The addition of project-related trips would contribute to an already deficient level of service at the intersection of Kingsley Road – SR 99 Frontage Road & Arch Road (#3). This intersection would deteriorate from LOS E in the background condition to LOS F during the A.M. peak hour. The intersection would also continue to operate at LOS F during the Midday and P.M. peak hours and would increase delay by more than five seconds. Thus, this would be a significant impact based on City of Stockton significance criteria for a state facility (Note: Caltrans does not have a significance threshold).

The intersection of Newcastle Road and Arch Road would experience a deficient level of service during the A.M. and P.M. peak hours. The intersection would deteriorate from LOS D to LOS E during both peak hours with an increase of delay by more than five seconds. Thus, the project would result in a significant impact at this location.

The intersection of Austin Road & Arch Road would continue to operate at LOS F during the A.M., Midday, and P.M. peak hour. The addition of project-related trips would contribute to an already deficient level of service at this intersection and would increase delay above background conditions. Thus, this would be a significant impact based on San Joaquin County significance criteria.

All other intersections would operate acceptably or would not exceed adopted significance thresholds of applicable agencies; therefore, no significant impacts would occur at these intersections.

DeWitt Nelson Roadway Level of Service

The roadway segment and its corresponding project levels of service are presented in Table 4.11-30.

Table 4.11-31 provides a level of service comparison to determine significance criteria and project impacts, if any. Based on the roadway segment analysis results, the roadway currently operates at an acceptable level of service. Note that the widening of Arch Road from 2-to-4 lanes is assumed under this analysis.

Table 4.11-~~29~~30 Dewitt Nelson Project Roadway Segment Peak Hour LOS Summary								
#	Roadway Segment		A.M.		Midday		P.M.	
			EB	WB	EB	WB	EB	WB
1.	Arch Road (East of Newcastle Road and west of NCRF West Drive)	Peak Hour Volume[a]	2,394	695	1,948	2,409	1,902	2,510
		Avg. Travel Speed (mph)[b]	18	19	18	19	18	19
		LOS[c]	D	D	D	D	D	D

Notes:
a Assumed for both directions (eastbound and westbound)
b Based on miles per hour (mph)
c LOS: Level of Service. Based on average through-vehicle travel speed.
Source: DKS Associates 2010

Table 4.11-~~30~~31 Dewitt Nelson Project Roadway Segment Peak Hour LOS Impact Comparison													
#	Roadway Segment			Existing			Background Condition			Project Condition			Significant Impact
				A.M.	MD	P.M.	A.M.	MD	P.M.	A.M.	MD	P.M.	Yes/No?
1.	Arch Road (East of Newcastle Road and west of NCRF West Drive)	Peak Hour Volume[a]	EB	76	91	119	2,209	1,854	1,902	2,394	1,948	1,902	No
			WB	83	92	68	1,677	2,324	2,325	695	2,409	2,510	No
		Avg. Travel Speed[b]	EB	36	19	36	18	18	18	18	18	18	No
			WB	36	19	36	19	19	19	19	19	19	No
		LOS[c]	EB	A	D	A	D	D	D	D	D	D	No
			WB	A	D	A	D	D	D	D	D	D	No

Notes:
a Assumed for both directions (eastbound and westbound)
b Based on miles per hour (mph)
c LOS: Level of Service. Based on average through-vehicle travel speed.
Source: DKS Associates 2010

Implementation of the DeWitt Nelson project would result in the acceptable operation of the study area roadway segment; however, it would result in the deterioration of three study intersections to unacceptable operating conditions based on adopted thresholds of local agencies. Therefore, this would be a ***significant*** *impact. (Impact 4.11-2b)*

Mitigation Measure for Impact 4.11-2b

1. SR 99 SPUI & Arch Road

The following mitigation measures have been identified to improve intersection operations and achieve a difference in average delay of less than five seconds or LOS D or better during the A.M., Midday, and P.M. peak hours. The project would contribute 2.37% of the traffic to this intersection during the A.M. peak hour, 2.08% during the Midday peak hour and 2.10% during the P.M. peak hour. CDCR will

contribute appropriate fees based on trip ends generated by the project to the City of Stockton to help fund implementation of this improvement. This improvement is not in the City's traffic impact fee program.

- Implement Mitigation Measure for Impact 4.11-2a (1).

Table 4.11-32 lists the mitigated LOS. With this mitigation in place, the intersection would continue to operate at LOS F during the A.M., Midday, and P.M. peak hours but would not increase delay by more than five seconds. Thus, the impact would be reduced to a less-than-significant level based on adopted significance criteria. Appendix E includes a comparison summary of the analysis results including the project's relative contribution to the study intersections.

Table 4.11-~~31~~32
Dewitt Nelson Project – Mitigated Condition LOS Summary

#	Intersection	Peak	Background Condition		Project Condition		Mitigated Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
1/2.	SR 99 SPUI & Arch Road	A.M.	147.9	**F**	166.1	**F**	150.9	**F**	3.0	No
		Midday	113.0	**F**	123.2	**F**	115.1	**F**	2.1	No
		P.M.	116.9	**F**	122.6	**F**	118.3	**F**	1.4	No

Notes: Intersections operating below acceptable LOS are in **bold**.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
Source: DKS Associates, 2010.

2. Kingsley Road – SR 99 Frontage Road & Arch Road

The following mitigation measures have been identified to improve intersection operations and achieve a difference in average delay of less than 5.0 seconds or LOS D or better during the A.M., Midday, and P.M. peak hours. The project would contribute 3.63% of the traffic to this intersection during the A.M. peak hour, 3.04% during the Midday peak hour and 3.08 % during the P.M. peak hour. CDCR will contribute appropriate fees based on trip ends generated by the project to the City of Stockton to help fund implementation of this improvement. This improvement is not in the City's traffic impact fee program.

- Implement Mitigation Measure for Impact 4.11-2a(2)

Table 4.11-33 lists the mitigated LOS. With this mitigation in place, the intersection would operate at LOS D during the A.M. peak hour and it would continue to operate at LOS F during the Midday and P.M. peak hours but would not increase delay by more than five seconds. Thus, the impact would be reduced to a less-than-significant level based on adopted significance criteria. Appendix E includes a comparison summary of the analysis results including the project's relative contribution to the study intersections.

3. Newcastle Road & Arch Road

The following mitigation measures have been identified to improve intersection operations and achieve a difference in average delay of less than the background conditions or LOS D or better during the A.M., Midday, and P.M. peak hours. The project would contribute 4.44% of the traffic to this intersection during the A.M. peak hour and 3.88% during the P.M. peak hour. This improvement is not in the City's traffic impact fee program. CDCR will monitor traffic at the above intersection for two years after the

Table 4.11-~~32~~33 Dewitt Nelson Project – Mitigated Condition LOS Summary										
#	Intersection	Peak	Background Condition		Project Condition		Mitigated Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
3.	Kingsley Road – SR 99 Frontage Road & Arch Road	A.M.	78.1	**E**	94.1	**F**	44.3	D	-33.8	No
		Midday	107.5	**F**	119.5	**F**	103.4	**F**	-4.1	No
		P.M.	116.8	**F**	140.5	**F**	118.1	**F**	1.3	No

Notes: Intersections operating below acceptable LOS are in **bold**.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
Source: DKS Associates 2010

date on which the DeWitt Nelson Project begins operations. If, based on those traffic data, the level of service at any of the above intersections exceeds the threshold of significance; CDCR will fund/undertake the following mitigation:

- Adjust the traffic signal timing to a130 second cycle and optimize splits during the impacted A.M. and P.M. hours (balance of green and red time for each approach).

Table 4.11-34 lists the mitigated LOS. With this mitigation in place, the intersection would continue to operate at LOS F during the A.M. and P.M. peak hours but would not increase delay above background conditions. Thus, this impact would be reduced to a less-than-significant level. In calculating CDCR's "fair share" obligation towards traffic improvements, CDCR will credit its total "fair share" obligation by the amount it spends towards the above mitigation in excess of its percentage contributions to traffic congestion at those intersections. Appendix E includes a comparison summary of the significance thresholds criteria including the project's relative contribution to the study intersections.

Table 4.11-34 NCRF Project – Mitigated Condition LOS Impact Comparison										
#	Intersection	Peak	Background Condition		Project Condition		Mitigated Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
8.	Newcastle Road & Arch Road	A.M.	40.7	D	57.3	**E**	53.4	D	12.7	No
		Midday	No Impact or Mitigation							
		P.M.	42.4	D	58.1	**E**	52.9	D	10.5	No

Notes: Intersections operating below acceptable LOS are in bold.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
Source: DKS Associates 2010

4. Austin Road & Arch Road

The following mitigation measures have been identified to improve intersection operations and achieve a difference in average delay of less than the background condition or LOS D or better during the A.M., Midday, and P.M. peak hours. The project would contribute 2.82% of the traffic to this intersection during the A.M. peak hour, 5.03% during the Midday peak hour and 5.13% during the P.M. peak hour. CDCR will contribute appropriate fees based on trip ends generated by the project to the County of San Joaquin to help fund implementation of this improvement. This improvement is not in the County's traffic impact fee program.

- Reconfigure the northbound approach on Austin Road to provide a dedicated left-turn lane.
- Provide the southbound right-turn lane with overlap phasing (to allow right turns to turn when opposing left turns go).
- Reconfigure the westbound approach on Arch Road to provide a shared thru-left and a dedicated right-turn lane.
- Adjust traffic signal timing to 130 seconds and optimize splits (the balance of red and green time for each approach).

Table 4.11-~~33~~ 35 lists the mitigated LOS. With this mitigation in place, the intersection would continue to operate at LOS F during the A.M., Midday, and P.M. peak hours but would not increase delay above background conditions.

However, this mitigation may not be feasible given right-of-way constraints and utility relocation requirements. Appendix E includes a comparison summary of the significance thresholds criteria including the project's relative contribution to the study intersections.

Table 4.11-~~33~~35
Dewitt Nelson Project – Mitigated Condition LOS Summary

#	Intersection	Peak	Background Condition		Project Condition		Mitigated Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
8.	Austin Road & Arch Road	A.M.	1,061.9 ~~869.1~~	**F**	1,052.9 ~~862.1~~	**F**	599.7 ~~452.8~~	F	462.2 ~~416.3~~	No
		Midday	133.1 ~~111.3~~	**F**	145.9 ~~131.0~~	**F**	92.7~~72.8~~	**F**~~F~~	40.4~~38.5~~	No
		P.M.	131.6 ~~111.3~~	**F**	167.6 ~~157.8~~	**F**	122.6 ~~98.8~~	F	9.0~~12.5~~	No

Notes: Intersections operating below acceptable LOS are in **bold**.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
Source: DKS Associates 2010

Significance after Mitigation

Implementation of Mitigation Measure for Impact 4.11-2b (1) would reduce the project's impacts to the intersection of SR 99 SPUI & Arch Road to a less-than-significant level. While feasible mitigation is available, Caltrans is the agency that can and should implement this mitigation and it is unknown whether this mitigation would be implemented prior to operation of the project. While this mitigation would reduce the project's impact, for purposes of CEQA, this impact is concluded to be ***potentially significant and unavoidable*** in the event the mitigation is not implemented prior to operation of the project.

Implementation of mitigation measure for Impact 4.11-2b (2) would reduce the project's impact to the intersection of Kingsley Road (Frontage Road) and Arch Road to a less-than-significant level. While feasible mitigation is available, Caltrans is the agency that can and should implement this mitigation and it is unknown whether this mitigation would be implemented prior to operation of the project. While this mitigation would reduce the project's impact, for purposes of CEQA, this impact is concluded to be ***potentially significant and unavoidable*** in the event the mitigation is not implemented prior to operation of the project.

Implementation of mitigation measure for Impact 4.11-2b (3) would reduce the project's impact to a ***less-than-significant*** level.

Implementation of mitigation measure for Impact 4.11-2b (~~3~~4) would reduce the impact to a less-than-significant level at the intersection of Austin Road & Arch Road. While the payment of traffic fees would help fund the ultimate improvement of this intersection to its maximum extent, it is unknown whether the County would implement this mitigation as proposed and whether the County would be able to secure the appropriate right-of-way for the improvements. Therefore, while this mitigation, if implemented, would reduce the project's impact to a less-than-significant level, for purposes of CEQA, this impact is concluded to be ***potentially significant and unavoidable*** in the event the mitigation is not implemented prior to operation of the project.

Combined NCRF and DeWitt Nelson Facilities

Trip Generation

The trip generation for the combined NCRF and DeWitt Nelson projects was based on the total daily staff added by the proposed NCRF facility and DeWitt Nelson facility. Deliveries and visitation hours would be the same as described above for each facility separately.

Table 4-11-~~33~~36 summarizes estimated trip generation during the A.M., Midday, and P.M. peak periods.

Table 4.11-~~33~~36
Estimated NCRF and Dewitt Nelson Projects Trip Generation

Trip Type	Facility	Number of Staff/Visitors / Deliveries	Daily Trips	A.M. Peak (7:00-9:00 A.M.)			Midday Peak (2:00-4:00 P.M.)			P.M. Peak (4:00-6:00 P.M.)		
				In	Out	Total	In	Out	Total	In	Out	Total
Employee Trips												
1st Watch[1] (10:00 P.M. – 6:00 A.M.)	NCRF	38	76	-	19	19	-	-	-	-	-	-
	DeWitt Nelson	40	80	-	20	20	-	-	-	-	-	-
2nd Watch[1] (6:00 A.M. – 2:00 P.M.)	NCRF	106	212	-	-	-	-	106	106	-	-	-
	DeWitt Nelson	95	190	-	-	-	-	95	95	-	-	-

3rd Watch[1] (2:00 P.M. – 10:00 P.M.)	NCRF	68	136	-	-	-	68	-	68	-	-	-
	DeWitt Nelson	106	212	-	-	-	106	-	106	-	-	-
Administrative[2] (8:00 A.M. – 5:00 P.M.)	NCRF	171	342	171	-	171	-	-	-	-	171	171
	DeWitt Nelson	207	414	207	-	207	-	-	-	-	207	207
Employee Trip Total			*1,662*	*378*	*39*	*714*	*174*	*201*	*375*	-	*378*	*378*
Visitor Trips[3] (peak weekday)	NCRF	50	100	13	-	13	6	7	13		13	13
Delivery and Service Vehicles[4]	NCRF	5	10	1	1	2	1	1	2	1	1	2
Project Totals			*1,772*	*392*	*40*	*729*	*181*	*209*	*390*	*1*	*392*	*393*

Notes:

1. Daily staff trips are based on a total of 381 staff for NCRF and 453 for DeWitt Nelson distributed over three shifts (watch) times. A portion of the 1st watch staff (10 p.m. to 6:00 a.m.) would be outbound tips during the A.M. peak hour.
2. Administrative staff trips are based on email correspondence sent from Mike Parker, Ascent Environmental, July 1, 2010
3. Per the NOP, the average number of daily NCRF visitors is estimated to be approximately 50. Visiting times are 8:00 a.m. to 9:00 p.m. It is assumed ¼ of the visitor trips occur during each peak hour. For DeWitt Nelson, visiting hours will be allowed on Saturdays and Sundays from 8:00 a.m. to 5:00 p.m. with an estimated 150 visitors per day; thus, no weekday visitor trips are assumed.
4. NCRF Delivery and Service vehicle trips (5 deliveries per day) with at least one delivery during each peak hour. All other deliveries would occur throughout the day. Delivery truck trips for DeWitt Nelson are assumed to be shared with the CHCF facility.

Source: California Department of Corrections (CDCR).

Trip Distribution

The direction of approach and departure for project trips of the proposed projects were estimated based on travel patterns from the approved CHCF EIR analysis (CHCF 2009), which is located south of the NCRF site (or north of the DeWitt Nelson site) via Austin Road. DKS reviewed traffic volumes, turning movements at the intersections, and locations of various land uses as part of this analysis. Trip distribution patterns were reviewed and approved by City of Stockton and San Joaquin County staff.

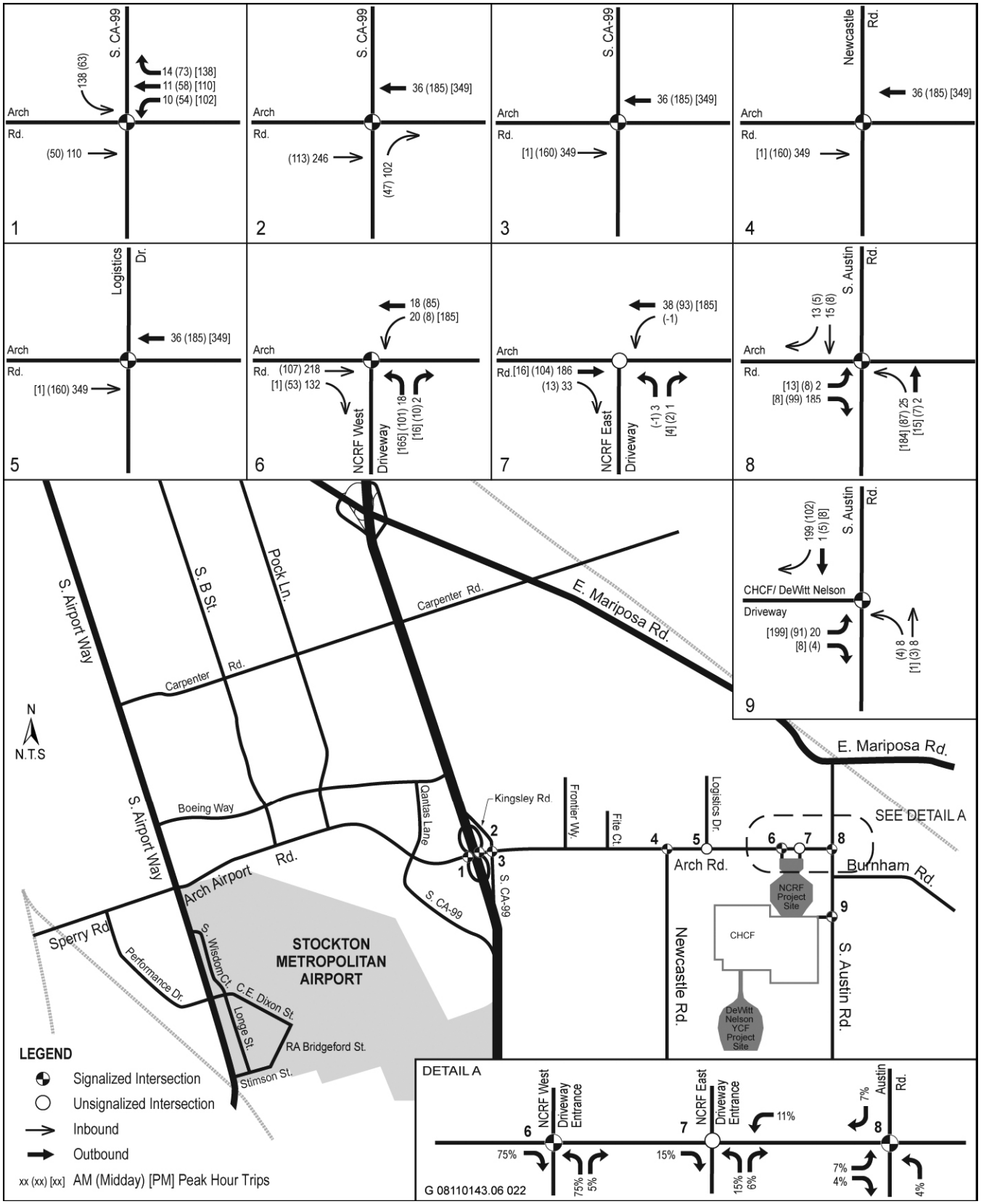
Trip Assignment

Project-generated trips were assigned to the roadway network based on access points, trip distribution assumptions, and likely travel patterns. Exhibit 4.11-10 illustrates the project trip distribution and trip assignment.

Combined NCRF and DeWitt Nelson Intersection Level of Service

The intersections and their corresponding project levels of service are presented in Table 4.11-37. Appendix E includes the detailed calculation level of service analysis sheets including the weekday A.M., Midday, and P.M. peak hours.

Exhibit 4.11-11 presents the traffic volumes for the combined NCRF and DeWitt Nelson facilities.

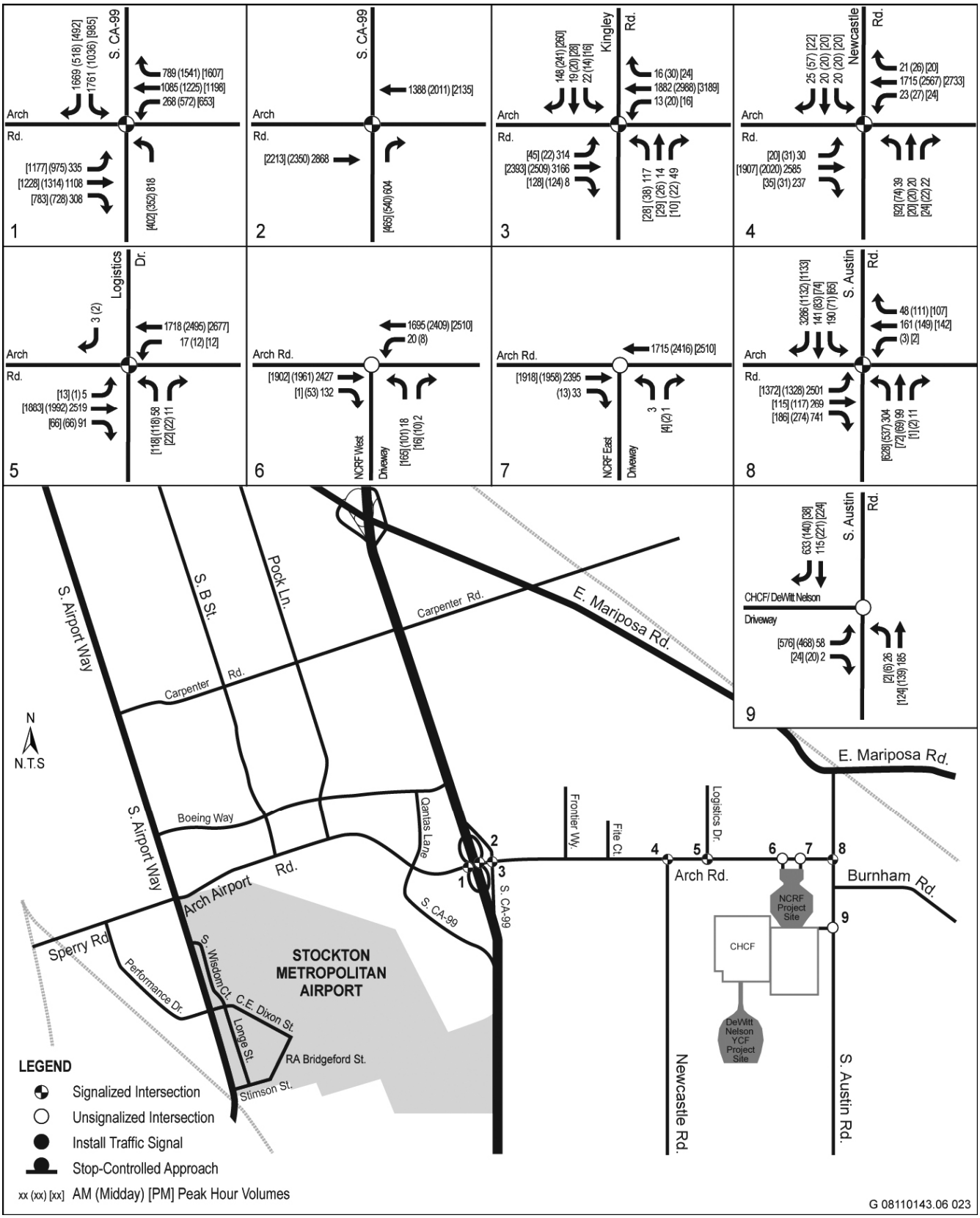


Source: DKS 2010

NCRF and DeWitt Nelson Projects Trip Distribution and Trip Assignment **Exhibit 4.11-10**

Table 4.11-~~34~~37 NCRF and DeWitt Nelson Projects Intersection Peak Hour LOS							
#	Intersection	A.M.		Midday		P.M.	
		Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]
1/2.	SR 99 SPUI & Arch Road[c]	187.4	**F**	134.4	**F**	128.9	**F**
3.	Kingsley Road – SR 99 Frontage Road & Arch Road[c]	110.0	**F**	133.6	**F**	162.3	**F**
4.	Newcastle Road & Arch Road[c]	~~48.0~~75.6	~~D~~E	~~33.5~~53.5	~~C~~D	~~50.4~~76.4	~~D~~**E**
5.	Logistics Drive & Arch Road[c]	~~30.2~~35.1	~~C~~D	~~48.9~~61.9	~~D~~**E**	~~48.9~~61.8	~~D~~**E**
6.	NCRF West Driveway & Arch Road[c]	~~13.1~~28.9	~~B~~C	~~26.5~~44.2	~~C~~D	~~20.8~~31.9	C
7.	NCRF East Driveway & Arch Road[d]	0.0	A	13.9013.8	B	11.117.1	BC
8.	Austin Road & Arch Road[c]	~~866.3~~1058.3	**F**	~~133.3~~148.3	**F**	~~159.9~~169.0	**F**
9.	Austin Road & Project Access Driveway[c] (CHCF & DeWitt Nelson)	~~4.3~~4.3	A	~~10.8~~11.1	B	~~11.3~~11.7	B

Notes: Intersections operating below acceptable LOS are in **bold**. na: not applicable.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
d Unsignalized Intersection For two-way stop controlled intersections, the LOS rating is based on the worst approach. For all-way stop controlled intersections, the LOS rating is based on the average delay.
Source: DKS Associates 2010



Source: DKS 2010

NCRF and DeWitt Nelson Projects Projected Traffic Volumes **Exhibit 4.11-11**

Table 4.11-~~35~~ 38 provides a level of service comparison to determine significance criteria and project impacts, if any.

Table 4.11-~~35~~38
NCRF and Dewitt Nelson Projects Intersection Peak Hour LOS Impact Comparison

#	Intersection	Peak	Existing		Background Condition		Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
1/2	SR 99 SPUI & Arch Road	A.M.	na	na	147.9	**F**	187.4	**F**	39.5	**Yes**
		Midday	na	na	113.0	**F**	134.4	**F**	21.4	**Yes**
		P.M.	na	na	116.9	**F**	128.9	**F**	12.0	**Yes**
3.	Kingsley Road – SR 99 Frontage Road & Arch Road[c]	A.M.	19.1	B	78.1	**E**	110.0	**F**	31.9	**Yes**
		Midday	20.7	C	107.5	**F**	133.6	**F**	26.1	**Yes**
		P.M.	20.6	C	116.8	**F**	162.3	**F**	45.5	**Yes**
4.	Newcastle Road & Arch Road[c]	A.M.	16.2~~15.3~~	B	40.7~~20.9~~	D~~C~~	75.6~~48.0~~	**E**~~D~~	34.9~~27.1~~	~~No~~**Yes**
		Midday	19.7~~19.5~~	B	38.5~~24.5~~	D~~C~~	53.5~~33.5~~	D~~C~~	15.0~~9.0~~	No
		P.M.	16.3~~15.6~~	B	42.4~~28.5~~	D~~C~~	76.4~~50.4~~	**E**~~D~~	34.0~~21.9~~	**Yes**~~No~~
5.	Logistics Drive & Arch Road[c]	A.M.	9.1~~8.8~~	A	13.4~~11.4~~	B~~B~~	35.1~~30.2~~	D~~C~~	21.7~~18.8~~	No
		Midday	2.0	A	43.9~~30.7~~	D~~C~~	61.9~~48.9~~	**E**~~D~~	18.0~~18.2~~	**Yes**~~No~~
		P.M.	0.0	A	29.1~~19.9~~	C~~B~~	61.8~~48.9~~	**E**~~D~~	32.7~~29.0~~	**Yes**~~No~~
6.	NCRF West Driveway & Arch Road[c]	A.M.	0.0	A	0.0	A	28.9~~13.1~~	C~~B~~	28.9~~13.1~~	No
		Midday	0.0	A	0.0	A	44.2~~26.5~~	D~~C~~	44.2~~26.5~~	No
		P.M.	0.0	A	0.0	A	31.9~~20.8~~	C	31.9~~20.8~~	No
7.	NCRF East Driveway & Arch Road[d]	A.M.	0.0	A	0.0	A	0.0	A	0.0	No
		Midday	0.0	A	0.0	A	13.8~~13.9~~	B	13.8~~13.9~~	No
		P.M.	0.0	A	0.0	A	17.1~~11.1~~	C	17.1~~11.1~~	No
8.	Austin Road & Arch Road[c]	A.M.	7.9	A	1,061.9 ~~869.1~~	**F**	1,058.3 ~~866.3~~	**F**	3.6~~2.8~~	No
		Midday	7.9	A	133.1 ~~111.3~~	**F**	148.3~~133.3~~	**F**	15.2~~22.0~~	**Yes**
		P.M.	7.8	A	131.6 ~~111.3~~	**F**	169.0~~159.9~~	**F**	37.4~~48.6~~	**Yes**
9.	Austin Road & Project Access Driveway[c,d] (CHCF & DeWitt Nelson)	A.M.	0.0~~na~~	A~~na~~	3.6~~3.7~~	A	4.3~~4.3~~	A	0.7~~0.6~~	No
		Midday	0.0~~na~~	A~~na~~	8.6~~8.4~~	A	11.1~~10.8~~	B	2.5~~2.4~~	No
		P.M.	0.0~~na~~	A~~na~~	8.5~~8.3~~	A	11.7~~11.3~~	B	3.2~~3.0~~	No

Notes: Intersections operating below acceptable LOS are in **bold**. na: not applicable.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
d Unsignalized Intersection For two-way stop controlled intersections; the LOS rating is based on the worst approach. For all-way stop controlled intersections, the LOS rating is based on the average delay.
Source: DKS Associates, 2010.

The addition of trips from the DeWitt Nelson and NCRF projects would contribute to an already deficient level of service at the SR 99 SPUI & Arch Road (#1/2) intersection. This intersection would continue to operate at LOS F, during the A.M., Midday and P.M. peak hours and would increase delay by more than five seconds. Thus, this would be a significant impact based on City of Stockton significance criteria for a state facility.

The addition of project-related trips would contribute to an already deficient level of service at the intersection of Kingsley Road – SR 99 Frontage Road & Arch Road (#3). This intersection would deteriorate from LOS E in the background condition to LOS F during the A.M. peak hour, it would continue to operate at LOS F during the Midday and P.M. peak hours, and would increase delay by more than five seconds. Thus, this would be a significant impact based on City of Stockton significance criteria for a state facility.

The intersection of Newcastle Road and Arch Road would experience a deficient level of service during the A.M. and P.M. peak hours. The intersection would deteriorate from LOS D to LOS E during both peak hours with an increase of delay by more than five seconds. Thus, the project would result in a significant impact at this location.

The intersection of Logistics Drive and Arch Road would experience a deficient level of service during the Midday and P.M. peak hours. The intersection would deteriorate from LOS C and D to LOS E during both peak hours with an increase of delay by more than five seconds. Thus, the project would result in a significant impact at this location.

The intersection of Austin Road & Arch Road would continue to operate at LOS F during the A.M., Midday, and P.M. peak hours. The addition of project-related trips would contribute to an already deficient level of service at this intersection and would increase delay above background conditions. Thus, this would be a significant impact based on San Joaquin County significance criteria.

All other intersections would operate acceptably or would not exceed adopted significance thresholds of applicable agencies; therefore, no significant impacts would occur at these intersections.

NCRF and DeWitt Nelson Roadway Level of Service

The roadway segment and its corresponding project levels of service are presented in Table 4.11-~~36~~39. Based on the roadway segment analysis results, the roadway operates at an acceptable level of service. Table 4.11-~~37~~ 40 provides a level of service comparison to determine significance criteria and impacts, if any. Based on the roadway segment analysis results, the road would operate at acceptable levels during the A.M., Midday, and P.M. peak hours.

Table 4.11-~~36~~39
NCRF and DeWitt Nelson Roadway Segment Peak Hour LOS

#	Roadway Segment		A.M.		Midday		P.M.	
			EB	WB	EB	WB	EB	WB
1.	Arch Road (East of Newcastle Road and west of NCRF West Drive)	Peak Hour Volume[a]	2,559	1,713	2,014	2,509	1,903	2,675
		Avg. Travel Speed (mph)[b]	18	19	18	19	18	18
		LOS[c]	D	D	D	D	D	D

Notes:
a Assumed for both directions (eastbound and westbound)
b Based on miles per hour
c LOS: Level of Service. Based on average through-vehicle travel speed.
Source: DKS Associates, 2010

Table 4.11-~~37~~40 NCRF and DeWitt Nelson Projects Roadway Segment Peak Hour LOS Impact Comparison													
#	Roadway Segment			Existing			Background Condition			Project Condition			Significant Impact
				A.M.	MD	P.M.	A.M.	MD	P.M.	A.M.	MD	P.M.	Yes/No?
1.	Arch Road (East of Newcastle Road and west of NCRF West Drive)	Peak Hour Volume[a]	EB	76	91	119	2,209	1,854	1,902	2,559	2,014	1,903	No
			WB	83	92	68	1,677	2,324	2,325	1,713	2,509	2,675	No
		Avg. Travel Speed[b]	EB	36	19	36	18	18	18	18	18	18	No
			WB	36	19	36	19	19	19	19	19	18	No
		LOS[c]	EB	A	D	A	D	D	D	D	D	D	No
			WB	A	D	A	D	D	D	D	D	D	No

Notes:
a Assumed for both directions (eastbound and westbound)
b Based on miles per hour
c LOS: Level of Service. Based on average through-vehicle travel speed.
Source: DKS Associates, 2010

Implementation of the combined NCRF and DeWitt Nelson projects would result in the acceptable operation of the study area roadway segment; however, the projects would result in the deterioration of three study intersections to unacceptable operating conditions based on adopted thresholds of local agencies. Therefore, this would be a ***significant*** *impact. (Impact 4.11-2c)*

Mitigation Measure for Impact 4.11-2c

1. SR 99 SPUI & Arch Road

The following mitigation measures have been identified to improve intersection operations and achieve a difference in average delay of less than five seconds or LOS D or better during the A.M., Midday, and P.M. peak hours. The projects would contribute 4.40% of the traffic to this intersection during the A.M. peak hour, 3.92% during the Midday peak hour and 3.89 % during the P.M. peak hour. CDCR will contribute appropriate fees based on trip ends generated by the project to the City of Stockton to help fund implementation of this improvement. This improvement is not in the City's traffic impact fee program.

- Adjust traffic signal to optimize the splits and cycle length to 150 seconds and coordinate traffic signal with the intersection of Kingsley Road – SR 99 Frontage Road and Arch Road, during the A.M. peak hour.
- Adjust traffic signal to optimize the splits and cycle length to 125 seconds and coordinate the traffic signal with the intersection of Kingsley Road - SR 99 Frontage Road and Arch Road during the Midday peak hour.
- Adjust traffic signal to optimize the splits and cycle length to 130 seconds and coordinate the traffic signal with the intersection of Kingsley Road - SR 99 Frontage Road and Arch Road during the P.M. peak hour.

Table 4.11-~~38~~ 41 lists the mitigated LOS. With this mitigation in place, the intersection would continue to operate at LOS F during the A.M., Midday, and P.M. peak hours but with less delay increase than the unmitigated condition. However, delay would still be increased by more than five seconds, therefore, the impact would be significant and unavoidable based on adopted significance criteria. No other feasible mitigation is available to reduce this impact because of the physical constraints of the interchange. Appendix E includes a comparison summary of the analysis results including the project's relative contribution to the study intersections.

Table 4.11-~~38~~41
NCRF and DeWitt Nelson Projects – Mitigated Condition LOS summary

#	Intersection	Peak	Background Condition		Project Condition		Mitigated Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
1/2.	SR 99 SPUI & Arch Road	A.M.	147.9	**F**	187.4	**F**	177.7	**F**	29.8	**Yes**
		Midday	113.0	**F**	134.4	**F**	126.1	**F**	13.1	**Yes**
		P.M.	116.9	**F**	128.9	**F**	122.2	**F**	5.3	**Yes**

Notes: Intersections operating below acceptable LOS are in **bold**.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
Source: DKS Associates, 2010

2. Kingsley Road – SR 99 Frontage Road & Arch Road

The following mitigation measures have been identified to improve intersection operations and achieve a difference in average delay of less than 5.0 seconds or LOS D or better during the A.M., Midday, and P.M. peak hours. The projects would contribute 6.67% of the traffic to this intersection during the A.M. peak hour, 5.70% during the Midday peak hour, and 5.68 % during the P.M. peak hour. CDCR will contribute appropriate fees based on trip ends generated by the project to the City of Stockton to help fund implementation of this improvement. This improvement is not in the City's traffic impact fee program.

- Adjust traffic signal timing to optimize the splits and cycle length to 150 seconds and coordinate the traffic signal with the SR 99 SPUI & Arch Road intersection, during the A.M. peak hour.
- Adjust traffic signal timing to optimize the splits and cycle length to 125 seconds and coordinate the traffic signal with the SR 99 SPUI & Arch Road intersection, during the Midday peak hour.
- Adjust traffic signal timing to optimize the splits and cycle length to 130 seconds and coordinate the traffic signal with the SR 99 SPUI & Arch Road intersection, during the P.M. peak hour.
- Adjust traffic signal timing to provide the north and south approaches on Kingsley Road with permitted and protected traffic signal phasing.
- Convert the southbound approach to a shared thru-left turn-lane and a dedicated right-turn lane.

Table 4.11-42 lists the mitigated LOS. With this mitigation in place, the intersection would operate at LOS C during the A.M. peak hour, LOS E during the Midday peak hour, and it would continue to operate at LOS F during the Midday and P.M. peak hours but would not increase delay by more than five seconds. Thus, the impact would be reduced to a less-than-significant level based on adopted significance criteria. Appendix E includes a comparison summary of the analysis results including the project's relative contribution to the study intersections.

Table 4.11-~~39~~42 NCRF and DeWitt Nelson Projects – Mitigated Condition LOS Summary										
#	Intersection	Peak	Background Condition		Project Condition		Mitigated Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
3.	Kingsley Road – SR 99 Frontage Road & Arch Road	A.M.	78.1	**E**	110.0	**F**	31.9	C	-46.2	No
		Midday	107.5	**F**	133.6	**F**	94.1	F	-13.4	No
		P.M.	116.8	**F**	162.3	**F**	117.7	F	-0.9	No

Notes: Intersections operating below acceptable LOS are in **bold**.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
Source: DKS Associates 2010

3. Newcastle Road & Arch Road

The following mitigation measures have been identified to improve intersection operations and achieve a difference in average delay of less than the background condition or LOS D or better during the A.M., Midday, and P.M. peak hours. The projects would contribute 8.09% of the traffic to this intersection during the A.M. peak hour, 7.02% during the Midday peak hour, and 7.09% during the P.M. peak hour. This improvement is not in the City's traffic impact fee program. CDCR will monitor traffic at the above intersection for two years after the date on which the second of the two projects (DeWitt Nelson and NCRF) begins operations. If, based on those traffic data, the level of service at any of the above intersections exceeds the threshold of significance, CDCR will fund/undertake the following mitigation:

- Provide a dedicated eastbound right turn lane.
- Provide a dedicated northbound left turn lane.
- Adjust traffic signal timing to 130 seconds and optimize splits (the balance of red and green time for each approach).

Table 4.11-43 lists the mitigated LOS. With this mitigation in place, the intersection would operate at LOS D during the A.M., Midday peak hour and would continue to operate at LOS F during the A.M. and P.M. peak hours but would not increase delay above background conditions. Thus, this impact would be reduced to a less-than-significant level. In calculating CDCR's "fair share" obligation towards traffic improvements, CDCR will credit its total "fair share" obligation by the amount it spends towards the above mitigation in excess of its percentage contributions to traffic congestion at those intersections. Appendix E includes a comparison summary of the significance thresholds criteria including the project's relative contribution to the study intersections.

Table 4.11-43 NCRF and DeWitt Nelson Projects – Mitigated Condition LOS Summary										
#	Intersection	Peak	Background Condition		Project Condition		Mitigated Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
4.	Newcastle Road & Arch Road	A.M.	40.7	D	75.6	**E**	35.2	D	-5.5	No
		Midday	38.5	D	53.5	D	47.4	D	8.9	No
		P.M.	42.4	D	76.4	**E**	54.0	D	11.6	No

Notes: Intersections operating below acceptable LOS are in **bold**. Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
Source: DKS Associates, 2010.

4. Logistics Road & Arch Road

The following mitigation measures have been identified to improve intersection operations and achieve a difference in average delay of less than the background condition or LOS D or better during the A.M., Midday, and P.M. peak hours. The projects would contribute 8.71% of the traffic to this intersection during the A.M. peak hour, 7.33% during the Midday peak hour, and 7.33% during the P.M. peak hour. This improvement is not in the City's traffic impact fee program. CDCR will monitor traffic at the above intersection for two years after the date on which the second of the two projects (DeWitt Nelson and NCRF) begins operations. If, based on those traffic data, the level of service at any of the above intersections exceeds the threshold of significance, CDCR will fund/undertake the following mitigation:

- Provide a dedicated northbound left turn lane.
- Adjust traffic signal timing to 130 seconds for the Midday and PM peak hours and optimize splits (the balance of red and green time for each approach).

Table 4.11-44 lists the mitigated LOS. With this mitigation in place, the intersection would operate at LOS D during the A.M., Midday peak hour and would continue to operate at LOS F during the A.M. and P.M. peak hours but would not increase delay above background conditions. Thus, this impact would be reduced to a less-than-significant level. In calculating CDCR's "fair share" obligation towards traffic improvements, CDCR will credit its total "fair share" obligation by the amount it spends towards the above mitigation in excess of its percentage contributions to traffic congestion at those intersections. Appendix E includes a comparison summary of the significance thresholds criteria including the project's relative contribution to the study intersections.

Table 4.11-44
NCRF and DeWitt Nelson Projects – Mitigated Condition LOS Summary

#	Intersection	Peak	Background Condition		Project Condition		Mitigated Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
5.	Logistics Road & Arch Road	A.M.	13.4	B	35.1	D	23.4	C	10.0	No
		Midday	43.9	D	61.9	**E**	49.5	D	5.6	No
		P.M.	29.1	C	61.8	**E**	51.5	D	22.4	No

Notes: Intersections operating below acceptable LOS are in **bold**. Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
Source: DKS Associates, 2010.

5. Austin Road & Arch Road

The following mitigation measures have been identified to improve intersection operations and achieve a difference in average delay of less than the background condition or LOS D or better during the A.M., Midday, and P.M. peak hours. The projects would contribute 3.12% of the traffic to this intersection during the A.M. peak hour, 5.52% during the Midday peak hour, and 5.65% during the P.M. peak hour.

CDCR will contribute appropriate fees based on trip ends generated by the project to the County of San Joaquin to help fund implementation of this improvement. This improvement is not in the County's traffic impact fee program.

- Implement Mitigation Measure for Impact 4.11-2b (4).

Table 4.11-45 lists the mitigated LOS. With this mitigation in place, the intersection would operate at LOS E during the Midday peak hour and would continue to operate at LOS F during the A.M. and P.M. peak hours but would not increase delay above background conditions. Appendix E includes a comparison summary of the significance thresholds criteria including the project's relative contribution to the study intersections.

Table 4.11-~~40~~45
NCRF and DeWitt Nelson Projects – Mitigated Condition LOS Summary

#	Intersection	Peak	Background Condition		Project Condition		Mitigated Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
8.	Austin Road & Arch Road	A.M.	1,061.9 ~~869.1~~	**F**	1,058.3 ~~866.3~~	**F**	603.4 ~~456.2~~	F	458.5 ~~412.9~~	No
		Midday	133.1 ~~111.3~~	**F**	148.3 ~~133.3~~	**F**	94.4~~74.3~~	**F**~~E~~	38.7~~37.0~~	No
		P.M.	131.6 ~~111.3~~	**F**	169.0 ~~159.9~~	**F**	123.8 ~~100.7~~	F	-7.8~~10.6~~	No

Notes: Intersections operating below acceptable LOS are in **bold**. Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
Source: DKS Associates, 2010.

Significance after Mitigation

Implementation of Mitigation Measure for Impact 4.11-2c (1) would reduce the project's impacts to the intersection of SR 99 SPUI & Arch Road but not to a less-than-significant level. No other feasible mitigation is available to further reduce this impact. While some feasible mitigation is available, as described in this EIR, Caltrans is the agency that can and should implement this mitigation and it is unknown whether this mitigation would be implemented prior to operation of the project. This impact is concluded to be ***potentially significant and unavoidable.***

Implementation of mitigation measure for Impact 4.11-2b (2) would reduce the project's impact to the intersection of Kingsley Road (Frontage Road) and Arch Road to a less-than-significant level. While feasible mitigation is available, Caltrans is the agency that can and should implement this mitigation and it is unknown whether this mitigation would be implemented prior to operation of the project. While this mitigation would reduce the project's impact, for purposes of CEQA, this impact is concluded to be ***potentially significant and unavoidable*** in the event the mitigation is not implemented prior to operation of the project.

Implementation of mitigation measure for Impact 4.11-2b (3) would reduce the impact to a ***less-than-significant*** level at the intersection of Newcastle Road & Arch Road.

Implementation of mitigation measure for Impact 4.11-2b (4) would reduce the impact to a ***less-than-significant*** level at the intersection of Logistics Drive & Arch Road.

Implementation of mitigation measure for Impact 4.11-2b (~~3~~5) would reduce the impact to a less-than-significant level at the intersection of Austin Road & Arch Road. While the payment of traffic fees would help fund the ultimate improvement of this intersection to its maximum extent, it is unknown whether the County would implement this mitigation as proposed and whether they would be able to secure the appropriate right-of-way for the improvements. Therefore, while this mitigation, if implemented, would reduce the project's impact to a less-than-significant level, for purposes of CEQA, this impact is concluded to be ***potentially significant and unavoidable*** in the event the mitigation is not implemented prior to operation of the project.

CUMULATIVE PROJECT IMPACTS AND MITIGATION MEASURES

Year 2035 General Plan Baseline No Project Condition

DKS reviewed recent travel forecast model run projections for all study intersections. The growth projections were derived from the travel demand model provided by the City of Stockton. The City's 2035 General Plan condition assumes the following roadway and intersection improvements will be in place Arch Road

- Widening of Arch Road from four-lanes to six-lanes from Frontage Road to just east of Newcastle Road.

- Austin Road
  - Widening of Austin Road from two-lanes to four-lanes and from four-lanes to six-lanes north of Arch Road.
- Arch Road and SR 99 Frontage Road – Kingsley Road Intersection Improvement
  - One additional left-turn lane in the northbound direction.
  - Two additional right-turn lanes in the southbound direction.
  - One additional left-turn lane and a dedicated right-turn lane in the eastbound direction.
  - One additional through-lane in the westbound direction.
- Arch Road and Austin Road Intersection Improvement
  - One additional left-turn lane and one through lane in the northbound direction.
  - Conversion of the southbound approach to one left-turn lane, two through lanes, and two right-turn lanes.
  - Conversion of the westbound approach to a shared left-thru lane and a dedicated right-turn lane.

In addition, the analysis also assumed the following roadway improvements:

- Newcastle Road and Arch Road Intersection Improvements
  - Additional northbound left-turn lane.
  - Converting the southbound approach to one-left turn lane and one shared left-thru lane.
  - Additional eastbound through-lane.
  - Additional westbound through-lane.
- Logistics Drive and Arch Road Intersection Improvements

- Widening of the westbound approach to include one left-turn lane, one thru-lane and one shared-right turn lane

- Widening of the eastbound approach to include one through shared right-turn lane.

- Austin Road & Project Access Driveway (CHCF & DeWitt Nelson) Improvements.

- One additional through lane in the northbound and southbound direction.

Exhibit 4.11-12 illustrates the weekday A.M., Midday and P.M. peak hour volumes for the 2035 Cumulative No Project Condition.

Cumulative No Project Intersection Level of Service

The intersections and their corresponding cumulative no project levels of service are presented in Table 4.11-~~41~~46**.** Appendix E includes the detailed calculation level of service analysis sheets including the weekday A.M., Midday, and P.M. peak hours. Based on the level of service results, the addition of cumulative growth expected for year 2035 would cause the following intersections to operate below acceptable levels of service:

- SR 99 SPUI & Arch Road
- Kingsley Road – SR 99 Frontage Road & Arch Road
- Logistics Drive & Arch Road
- Austin Road & Arch Road

Cumulative No Project Roadway Level of Service

The roadway segment and its corresponding 2035 No Project levels of service are presented in Table 4.11-~~42~~47. Based on the roadway segment analysis results, the roadway segment would operate at an acceptable level of service during the A.M. peak hour in the eastbound direction. The addition of cumulative growth expected for Year 2035 would cause the roadway to operate at LOS F in the westbound direction during the A.M. peak hour and at LOS E during the Midday peak hour (eastbound and westbound) and LOS E in the eastbound direction during the P.M. peak hour.

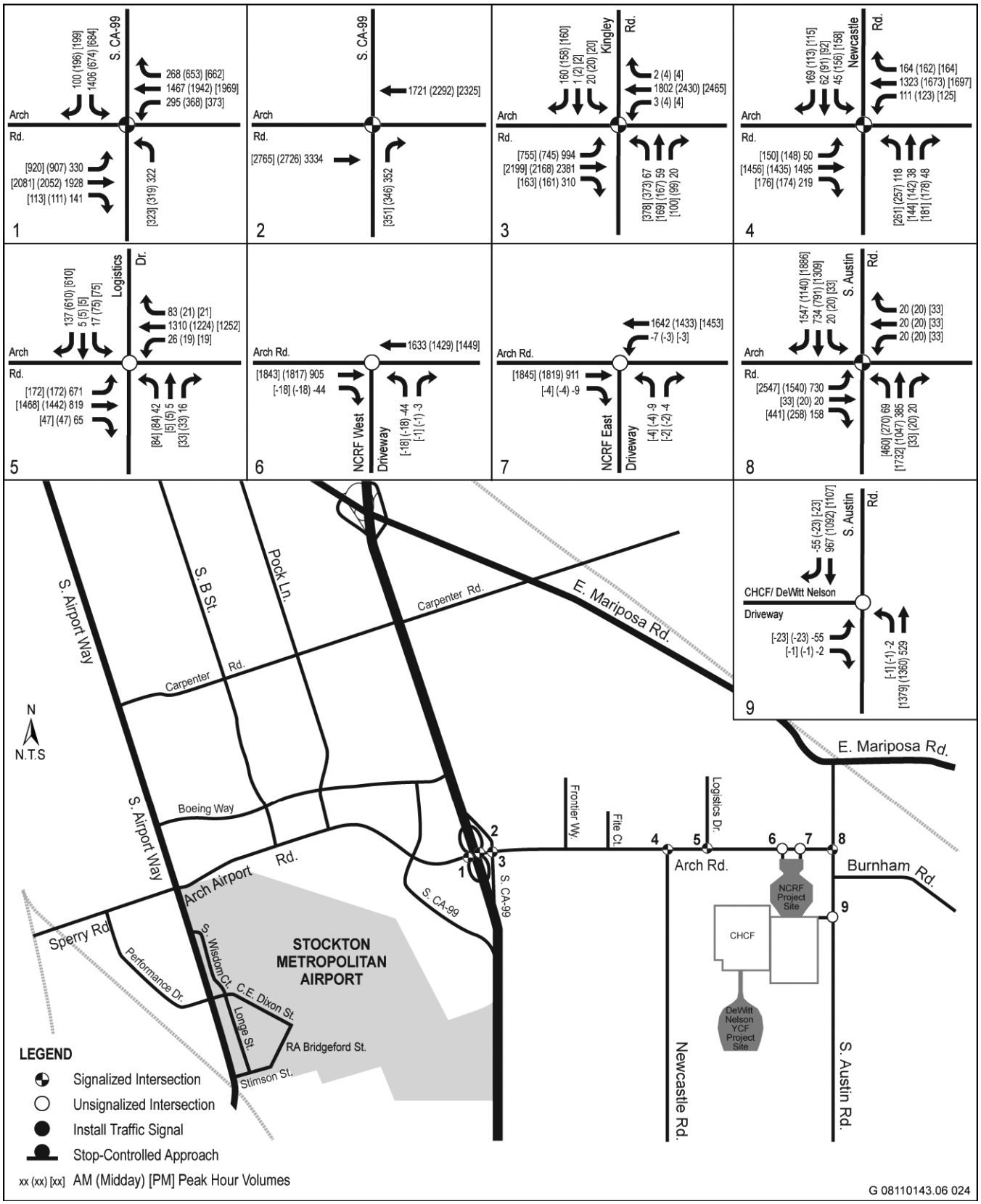
Impact 4.11-3: Cumulative Intersection and Roadway Segment Impacts

Cumulative Plus NCRF Only

DKS evaluated whether the NCRF project would result in significant cumulative impacts at the study intersections. Trips associated with the project were added to the cumulative no project scenario and the resulting intersection turning movement volumes for the cumulative with NCRF project scenario are shown in Exhibit 4.11-13.

Intersection Level of Service

The intersections and their corresponding project levels of service are presented in Table 4.11-48. Appendix E includes the detailed calculation level of service analysis sheets including the weekday A.M., Midday, and P.M. peak hours.



Source: DKS 2010

Year 2035 General Plan Baseline No Project Peak-Hour Intersection Traffic Volumes Exhibit 4.11-2

Table 4.11-~~41~~46 2035 Cumulative No Project Intersection Peak Hour LOS							
#	Intersection	A.M.		Midday		P.M.	
		Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]
1/2.	SR 99 SPUI & Arch Road[c]	245.5	**F**	197.0	**F**	204.2	**F**
3.	Kingsley Road – SR 99 Frontage Road & Arch Road[c]	51.3	D	134.9	**F**	139.7	**F**
4.	Newcastle Road & Arch Road[c]	~~27.0~~29.4	C	~~44.9~~51.3	D	~~46.9~~53.7	D
5.	Logistics Drive & Arch Road[c]	~~72.2~~96.2	~~E~~**F**	~~215.0~~ 230.9	**F**	~~215.0~~ 230.9	**F**
6.	NCRF West Driveway & Arch Road[d]	0.0	A	0.0	A	0.0	A
7.	NCRF East Driveway & Arch Road[d]	0.0	A	0.0	A	0.0	A
8.	Austin Road & Arch Road[c]	~~26.4~~27.8	C	~~126.8~~ 135.4	**F**	~~368.8~~ 425.1	**F**
9.	Austin Road & Project Access Driveway (CHCF & DeWitt Nelson)[c]	0.0	A	~~9.6~~10.1	A	~~10.3~~10.7	B

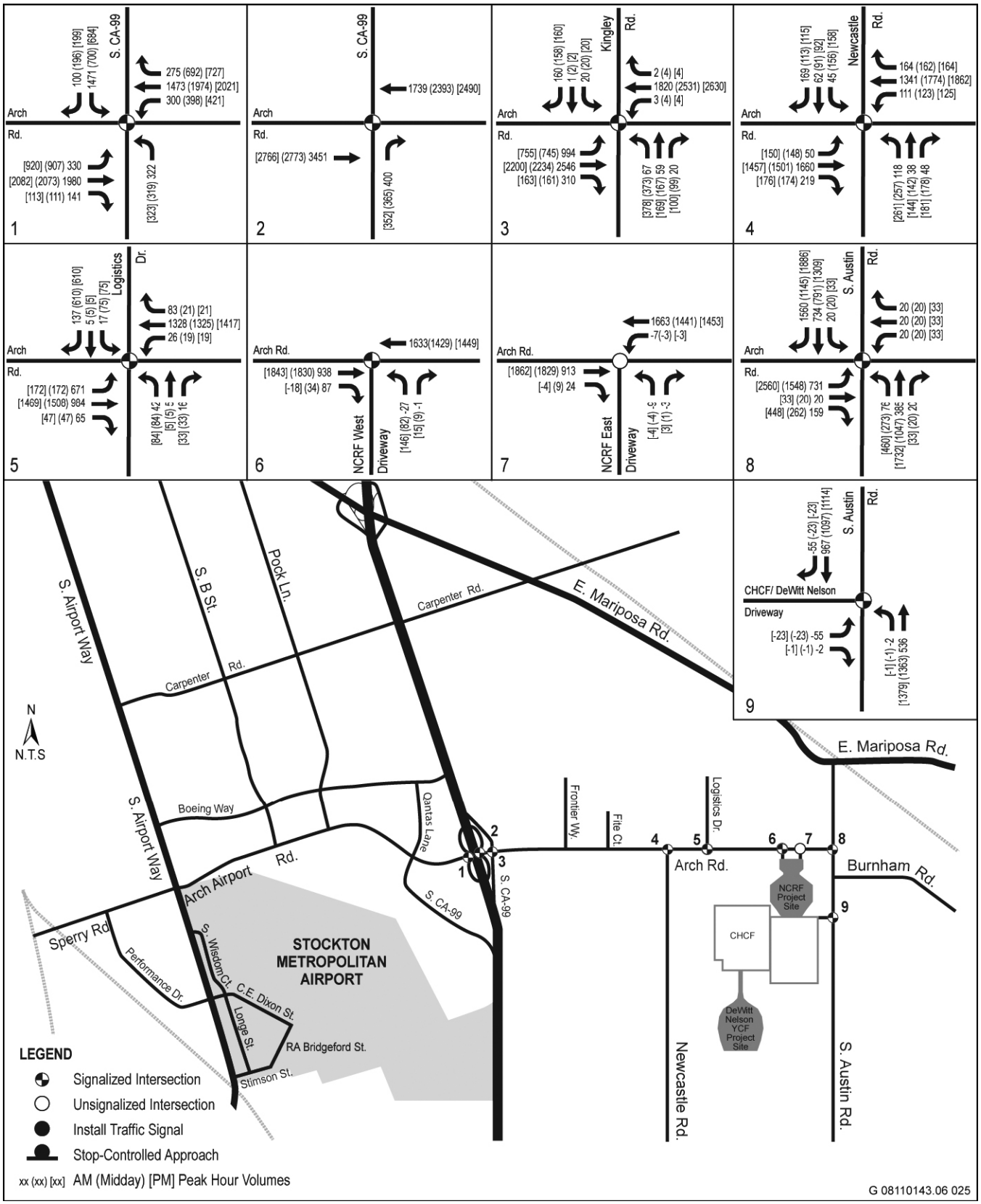
Notes: Intersections operating below acceptable LOS are in **bold.**
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
d Unsignalized Intersection: For two-way stop controlled intersections, the LOS rating is based on the worst approach. For all-way stop controlled intersections, the LOS rating is based on the average delay
Source: DKS Associates, 2010.

Table 4.11-~~42~~47 Cumulative No Project Roadway Segment Peak Hour LOS								
#	Roadway Segment		A.M.		Midday		P.M.	
			EB	WB	EB	WB	EB	WB
1.	Arch Road (west of NCRF West Driveway and East of Newcastle Road)	Peak Hour Volume[a]	861	1,589	1,799	1,411	1,825	1,431
		Avg. Travel Speed (mph)[b]	19	6	16	14	16	13
		LOS[c]	D	**F**	**E**	**E**	**E**	**E**

Notes: Intersections operating below acceptable LOS are in bold.
EB: Eastbound, WB: Westbound
a Assumed for both directions (eastbound and westbound)
b Based on miles per hour
c LOS: Level of Service. Based on average through-vehicle travel speed.
Source: DKS Associates 2010

Table 4.11-~~43~~48 2035 Cumulative with NCRF Project Intersection Peak Hour LOS							
#	Intersection	A.M.		Midday		P.M.	
		Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]
1/2.	SR 99 & Arch Road[c]	267.1	**F**	203.0	**F**	207.0	**F**
3.	Kingsley Road – SR 99 Frontage Road & Arch Road[c]	53.4	D	148.2	**F**	163.1	**F**
4.	Newcastle Road & Arch Road[c]	~~28.3~~31.6	C	~~45.1~~51.9	D	~~47.3~~54.8	D
5.	Logistics Drive & Arch Road[c]	~~71.5~~91.7	~~**E**~~**F**	~~206.8~~ 222.0	**F**	~~204.8~~ 220.1	~~**E**~~**F**
6.	NCRF West Driveway & Arch Road[c]	~~4.4~~4.7	A	~~7.3~~7.8	A	~~8.3~~8.5	A
7.	NCRF East Driveway & Arch Road[d]	0.0	A	~~13.7~~13.8	B	~~13.7~~14.0	B
8.	Austin Road & Arch Road[c]	~~27.0~~28.2	C	~~128.8~~ 137.5	**F**	~~371.3~~ 427.8	**F**
9.	Austin Road & Project Access Driveway[c] (CHCF & DeWitt Nelson)	0.0	A	~~10.2~~10.6	B	~~10.3~~10.7	B

Notes: Intersections operating below acceptable LOS are in **bold**.
na: not applicable.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
d Unsignalized Intersection For two-way stop controlled intersections, the LOS rating is based on the worst approach. For all-way stop controlled intersections, the LOS rating is based on the average delay.
Source: DKS Associates 2010



Source: DKS 2010

Year 2035 General Plan Baseline with NCRF Project
Peak-Hour Intersection Traffic Volumes **Exhibit 4.11-13**

Table 4.11-~~44~~ 49 provides a level of service comparison that shows project impacts, if any.

Table 4.11-44~~49~~
2035 Cumulative with NCRF Project Intersection Peak Hour LOS Impact Comparison

#	Intersection	Peak	Existing		2035 Cumulative No Project Condition		2035 Cumulative with NCRF Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
1/2.	SR 99 SPUI & Arch Road[c]	A.M.	na	na	245.5	**F**	267.1	**F**	21.6	**Yes**
		Midday	na	na	197.0	**F**	203.0	**F**	6.0	**Yes**
		P.M.	na	na	204.2	**F**	207.0	**F**	2.8	No
3.	Kingsley Road – SR 99 Frontage Road & Arch Road[c]	A.M.	19.1	B	51.3	D	53.4	D	2.1	No
		Midday	20.7	C	134.9	**F**	148.2	**F**	13.3	**Yes**
		P.M.	20.6	C	139.7	**F**	163.1	**F**	23.4	**Yes**
4.	Newcastle Road & Arch Road[c]	A.M.	16.2~~15.3~~	B	29.4~~27.0~~	C	31.6~~28.3~~	C	2.2~~1.3~~	No
		Midday	19.7~~19.5~~	B	51.3~~44.9~~	D	51.9~~45.1~~	D	0.6~~0.2~~	No
		P.M.	16.3~~15.6~~	B	53.7~~46.9~~	D	54.8~~47.3~~	D	1.1~~0.4~~	No
5.	Logistics Drive & Arch Road[c]	A.M.	9.1~~8.8~~	A	96.2~~72.2~~	**F~~E~~**	91.7~~71.5~~	**F~~E~~**	4.5-~~0.7~~	No
		Midday	2.0~~2.0~~	A	230.9 ~~215.0~~	**F**	222.0 ~~206.8~~	**F~~E~~**	8.9-~~8.2~~	No
		P.M.	0.0	A	230.9 ~~215.0~~	**F**	220.1 ~~204.8~~	**F~~E~~**	10.8~~10.2~~	No
6.	NCRF West Driveway & Arch Road[c]	A.M.	0.0	A	0.0	A	4.7~~4.4~~	A	4.7~~4.4~~	No
		Midday	0.0	A	0.0	A	7.8~~7.3~~	A	7.8~~7.3~~	No
		P.M.	0.0	A	0.0	A	8.5~~8.3~~	A	8.5~~8.3~~	No
7.	NCRF East Driveway & Arch Road[d]	A.M.	0.0	A	0.0	A	0.0	A	0.0	No
		Midday	0.0	A	0.0	A	13.8~~13.7~~	B	13.8~~13.7~~	No
		P.M.	0.0	A	0.0	A	14.0~~13.7~~	B	14.0~~0.0~~	No
8.	Austin Road & Arch Road[c]	A.M.	7.9	A	27.8~~26.4~~	C	28.2~~27.0~~	C	0.4~~0.6~~	No
		Midday	7.9	A	135.4 ~~126.8~~	**F**	137.5 ~~128.8~~	**F**	2.1~~2.0~~	**Yes**
		P.M.	7.8	A	425.1 ~~368.8~~	**F**	427.8 ~~371.3~~	**F**	2.7~~2.5~~	**Yes**
9.	Austin Road & Project Access Driveway [c](CHCF & DeWitt Nelson)	A.M.	na	na	0.0	A	0.0	A	0.0	No
		Midday	na	na	10.1~~9.6~~	A	10.6~~10.2~~	B	0.5~~0.6~~	No
		P.M.	na	na	10.7~~10.3~~	B	10.7~~10.3~~	B	0.0	No

Notes: Intersections operating below acceptable LOS are in bold.
na: not applicable.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection

d Unsignalized Intersection For two-way stop controlled intersections; the LOS rating is based on the worst approach. For all-way stop controlled intersections, the LOS rating is based on the average delay.
Source: DKS Associates, 2010.

The addition of project-related trips would contribute to an already deficient level of service at the SR 99 SPUI & Arch Road (#1/2). This intersection would continue to operate at LOS F, during the A.M., Midday, and P.M. peak hours; however, delay would only increase by more than five seconds for the A.M. and Midday peak hours, which would be significant based on City of Stockton criteria for a state facility. Therefore, this would be a significant cumulative impact and the project's contribution would be considerable.

The addition of project-related trips would contribute to an already deficient level of service at the intersection of Kingsley Road – SR 99 Frontage Road & Arch Road (#3). This intersection would continue to operate at LOS F during the Midday and P.M. peak hours and would increase delay by more than five seconds based on the City of Stockton criteria significance criteria. Therefore, this would be a significant cumulative impact and the project's contribution would be considerable.

While the intersection of Logistics Drive & Arch Road would continue to operate at LOS ~~E~~ F during the A.M., Midday, and P.M. peak hours. This intersection would not increase delay by more than five seconds, per the City of Stockton significance criteria. Thus, the addition of project-related traffic would not result in a considerable contribution significant cumulative impact at this location.

The intersection of Austin Road & Arch Road would continue to operate at LOS F during the Midday and P.M. peak hour. The addition of project-related trips would contribute to an already deficient level of service F at this intersection during the Midday peak hour and P.M. peak hour and would increase delay above background conditions, which is unacceptable based on San Joaquin County significance criteria. Therefore, this would be a significant cumulative impact and the project's contribution would be considerable.

All other study intersections would operate acceptably or would not exceed adopted significance thresholds of applicable agencies; therefore, no significant impacts would occur at these intersections.

Cumulative Plus NCRF Project Roadway Level of Service

The roadway segment and its corresponding 2035 Cumulative plus NCRF project levels of service are presented in Table 4.11-~~45~~50. Based on the roadway segment analysis results, the roadway operates at an acceptable level of service, except in the westbound direction during the A.M. peak hour. Table 4.11-~~46~~ 51 provides a level of service comparison to determine significance criteria and project impacts, if any.

Table 4.11-~~45~~50
2035 Cumulative with NCRF Project Roadway Segment Peak Hour LOS

#	Roadway Segment		A.M.		Midday		P.M.	
			EB	WB	EB	WB	EB	WB
1.	Arch Road (East of Newcastle Road and west of NCRF West Driveway)	Peak Hour Volume[a]	1,025	1,606	1,864	1,511	1,825	1,595
		Avg. Travel Speed (mph)[b]	19	7	16	11	16	9
		LOS[c]	D	**F**	**E**	**F**	**E**	**F**

Notes: EB: Eastbound, WB: Westbound
a Assumed for both directions (eastbound and westbound)
b Based on miles per hour
c LOS: Level of Service. Based on average through-vehicle travel speed.
Source: DKS Associates, 2010

Table 4.11-~~46~~51 2035 Cumulative with NCRF Project Roadway Segment Peak Hour LOS Impact Comparison								
#	Roadway Segment		2035 Cumulative No Project Condition			2035 Cumulative with NCRF Project Condition		
			A.M.	MD	P.M.	A.M.	MD	P.M.
1.	Arch Road (East of Newcastle Road and west of NCRF West Driveway)	Peak Hour Volume[a] EB	861	1,799	1,825	1,025	1,864	1,825
		Peak Hour Volume[a] WB	1,589	1,411	1,431	1,606	1,511	1,595
		Avg. Travel Speed[b] EB	19	16	16	19	16	16
		Avg. Travel Speed[b] WB	6	14	13	7	11	9
		LOS[c] EB	D	**E**	**E**	D	**E**	**E**
		LOS[c] WB	**F**	**E**	**E**	**F**	**F**	**F**

Notes: EB: Eastbound, WB: Westbound
a Assumed for both directions (eastbound and westbound)
b Based on miles per hour
c LOS: Level of Service. Based on average through-vehicle travel speed.
Source: DKS Associates 2010

The addition of NCRF project trips under cumulative conditions would cause the LOS in the eastbound direction to continue to operate at LOS E during the Midday and P.M. peak hours. In the westbound direction, the roadway would continue to operate at LOS F during A.M. peak hour. The addition of project traffic would cause the LOS to deteriorate from LOS E to LOS F during the Midday and P.M. peak hours. Per San Joaquin County's significance criteria, impacts on roadway segments are assessed in terms of volume-to-capacity (v/c) ratios. If the v/c ratio for a roadway segment, under cumulative plus project conditions, exceeds the v/c ratio for the same roadway segment under cumulative no project conditions then mitigation measures that would return the v/c ratio to the cumulative no project level must be identified. Table 4.11-~~47~~ 52 provides a v/c comparison to determine significance criteria and project impacts, if any.

Table 4.11-~~47~~52 2035 Cumulative Plus NCRF Project Peak Hour Volume-to-Capacity Analysis												
#	Roadway Segment		Volume-to-Capacity Ratio (V/C)									
			Existing			2035 Cumulative No Project Condition			2035 Cumulative with NCRF Project Condition			Significant Impact
			A.M.	MD	P.M.	A.M.	MD	P.M.	A.M.	MD	P.M.	Yes/No?
1.	Arch Road (East of Newcastle Road and west of NCRF West Driveway)	EB	0.04	0.03	0.05	0.28	0.88	0.89	0.33	**0.89**	0.87	**Yes**
		WB	0.08	0.06	0.05	1.10	0.98	0.99	1.08	**1.02**	**1.05**	**Yes**

Notes: Increases in V/C ratio are in **bold** for the designated peak hour.
Source: DKS Associates, 2010.

Based on the v/c analysis results, the addition of project-related traffic would result increase the v/c ratio for this study roadway segment in the Midday for the eastbound and in the Midday and P.M. peak hour in the westbound

direction. Therefore, this would be a significant cumulative impact and the project contribution would be considerable.

Implementation of the NCRF project would result in the deterioration of three study intersections to unacceptable operating conditions based on adopted thresholds of local agencies. It would also result in deterioration of the study area roadway segment under cumulative conditions. Therefore, this would be a ***significant*** *cumulative impact and the project's contribution would be considerable. (Impact 4.11-3a)*

Mitigation Measure for Impact 4.11-3a

1. SR 99 SPUI & Arch Road

The following mitigation measures have been identified to improve intersection operations and achieve a difference in average delay of less than five seconds or LOS D or better during the A.M., Midday, and P.M. peak hours. The project would contribute 2.69% of the traffic to this intersection during the A.M. peak hour, 2.16% during the Midday peak hour and 2.13% during the P.M. peak hour. CDCR will contribute appropriate fees based on trip ends generated by the project to the City of Stockton to help fund implementation of this improvement. This improvement is not in the City's traffic impact fee program.

- Adjust traffic signal to optimize the splits and cycle length to 150 seconds during the A.M., Midday, and P.M. peak hour.

Table 4.11-53 lists the mitigated LOS. With this mitigation in place, the intersection would continue to operate at LOS F during the A.M., Midday, and P.M. peak hours but would not increase delay by more than five seconds. Thus, the impact would be reduced to a less-than-significant level based on adopted significance criteria. Appendix E includes a comparison summary of the analysis results including the project's relative contribution to the study intersections.

Table 4.11-~~48~~53
2035 Cumulative with NCRF Project – Mitigated Condition LOS Summary

#	Intersection	Peak	2035 Cumulative No Project Condition		2035 Cumulative with NCRF Project		Mitigated 2035 Cumulative with NCRF Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
1/2.	SR 99 SPUI & Arch Road	A.M.	245.5	**F**	267.1	**F**	221.0	**F**	-24.5	No
		Midday	197.0	**F**	203.0	**F**	156.6	**F**	-40.4	No
		P.M.	204.2	**F**	207.0	**F**	159.0	**F**	-45.2	No

Notes: Intersections operating below acceptable LOS are in **bold**.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
Source: DKS Associates 2010

2. Kingsley Road – SR 99 Frontage Road & Arch Road

- The following mitigation measures have been identified to improve intersection operations and achieve a difference in average delay of less than five seconds or LOS D or better during the A.M., Midday, and P.M. peak hours. The project would contribute 3.05% of the traffic to this intersection

during the A.M. peak hour, 2.57% during the Midday peak hour, and 2.2% during the P.M. peak hour. CDCR will contribute appropriate fees based on trip ends generated by the project to the City of Stockton to help fund implementation of this improvement. This improvement is not in the City's traffic impact fee program. Adjust traffic signal to optimize the splits and cycle length to 150 seconds during the Midday and P.M. peak hour.

Table 4.11-~~49~~ 54 lists the mitigated LOS. With this mitigation in place, the intersection would operate at LOS D during the A.M. peak hour and it would continue to operate at LOS F during the Midday and P.M. peak hours but would not increase delay above five seconds. Thus, the impact would be reduced to a less-than-significant level based on adopted significance criteria. Appendix E includes a comparison summary of the analysis results including the project's relative contribution to the study intersections.

Table 4.11-~~49~~54
Cumulative with NCRF Project – Mitigated Condition LOS Summary

#	Intersection	Peak	2035 Cumulative No Project		2035 Cumulative with NCRF Project		Mitigated 2035 Cumulative with NCRF Project		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
3.	Kingsley Road – SR 99 Frontage Road & Arch Road	A.M.	51.3	D	53.4	D	na	na	na	No
		Midday	134.9	**F**	148.2	**F**	97.1	**F**	-37.8	No
		P.M.	139.7	**F**	163.1	**F**	108.3	**F**	-31.4	No

Notes: Intersections operating below acceptable LOS are in **bold**. na: not applicable, intersection at acceptable LOS.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
Source: DKS Associates 2010

3. Austin Road & Arch Road

The following mitigation measures have been identified to improve intersection operations and achieve a difference in average delay of less than the background condition or LOS D or better during the A.M., Midday, and P.M. peak hours. The project would contribute 0.58% of the traffic to this intersection during the A.M. peak hour, 0.39% during the Midday peak hour, and 0.23% during the P.M. peak hour. CDCR will contribute appropriate fees based on trip ends generated by the project to the County of San Joaquin traffic fee to help fund implementation of this improvement. This improvement is not in the County's traffic impact fee program.

- Increase the traffic signal cycle length to 120 seconds and optimize splits during the Midday and P.M. peak hours.

Table 4.11-~~50~~ 55 lists the mitigated LOS. With this mitigation in place, the intersection would continue to operate at LOS F during the Midday and P.M. peak hour but would not increase delay above cumulative no project conditions. Appendix E includes a comparison summary of the significance thresholds criteria including the project's relative contribution to the study intersections.

Table 4.11-~~50~~55 Cumulative with NCRF project – mitigated condition LOS summary										
#	Intersection	Peak	2035 Cumulative No Project Condition		2035 Cumulative with NCRF Project		Mitigated 2035 Cumulative with NCRF Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
8.	Austin Road & Arch Road	A.M.	No Impact or Mitigation							
		Midday	135.4 ~~126.8~~	**F**	137.5 ~~128.8~~	**F**	86.6~~80.8~~	**F**	48.8~~46.0~~	No
		P.M.	425.1 ~~368.8~~	**F**	427.8 ~~371.3~~	**F**	420.5 ~~360.9~~	**F**	4.6~~7.9~~	No

Notes: Intersections operating below acceptable LOS are in bold.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
Source: DKS Associates, 2010.

4. Arch Road – East of Newcastle Road and west of NCRF West Driveway (Roadway Segment)

The following mitigation measures at the intersection of Logistics Drive and Arch Road have been identified to improve the roadway segment operations and achieve a difference in volume-to-capacity ratio equal to or less than the 2035 Cumulative No Project condition during the A.M., Midday, and P.M. peak hours. The project would contribute 1.06% during the A.M. peak hour, 6.62% during the Midday peak hour, and 10.28% during the P.M. peak hour. CDCR will contribute appropriate fees based on trip ends generated by the project to the County of San Joaquin to help fund implementation of this improvement.

- Adjust the traffic signal to optimize the cycle length to 100 seconds and optimize east and west splits during the Midday peak hour at the intersection of Logistics Drive and Arch Road.
- Adjust the traffic signal to optimize the cycle length to 130 seconds and optimize east and west splits during the P.M. peak hour at the intersection of Logistics Drive and Arch Road.

Table 4.11-~~51~~ 56 lists the mitigated LOS and volume-to-capacity ratio. With this mitigation in place, the roadway segment would continue to operate at LOS E during the P.M. peak hour in the eastbound direction. In the westbound direction, the roadway would continue to operate at LOS F during the A.M. peak hour and would improve to LOS E during the Midday and P.M. peak hour but would not exceed any thresholds of significance. Appendix E includes a comparison summary of the significance thresholds criteria including the project's relative contribution to the study intersections.

Significance after Mitigation

Implementation of mitigation measure, for Impact 4.11-3a (1) would reduce the project's impacts to the intersection of SR 99 SPUI & Arch Road to a less-than-significant level. While feasible mitigation is available, Caltrans is the agency that can and should implement this mitigation and it is unknown whether this mitigation would be implemented prior to operation of the project. While this mitigation would reduce the project's cumulative impact, for purposes of CEQA, this impact is concluded to be ***cumulatively significant and unavoidable*** and the project's contribution would be considerable in the event the mitigation is not implemented prior to operation of the project.

Table 4.11-~~51~~56 2035 Cumulative Plus NCRF Project Peak Hour Volume-to-Capacity Analysis												
#	Roadway Segment		Volume-to-Capacity Ratio (V/C)									
			2035 Cumulative No Project Condition			2035 Cumulative with NCRF Project Condition			2035 Cumulative with NCRF Project Condition Mitigated			Significant Impact
			A.M.	MD	P.M.	A.M.	MD	P.M.	A.M.	MD	P.M.	Yes or No?
1.	Arch Road (East of Newcastle Road and west of NCRF West Driveway)	EB	0.28	0.88	0.89	0.33	**0.89**	0.87	0.33	0.83	0.83	No
		LOS	D	**E**	**E**	D	**E**	**E**	D	D	**E**	No
		WB	1.10	0.98	0.99	1.08	**1.02**	**1.05**	1.08	0.97	0.98	No
		LOS	**F**	**E**	**E**	**F**	**F**	**F**	**F**	**E**	**E**	No

Notes: Increases in V/C ratio are in **bold** for the designated peak hour.
Source: DKS Associates 2010

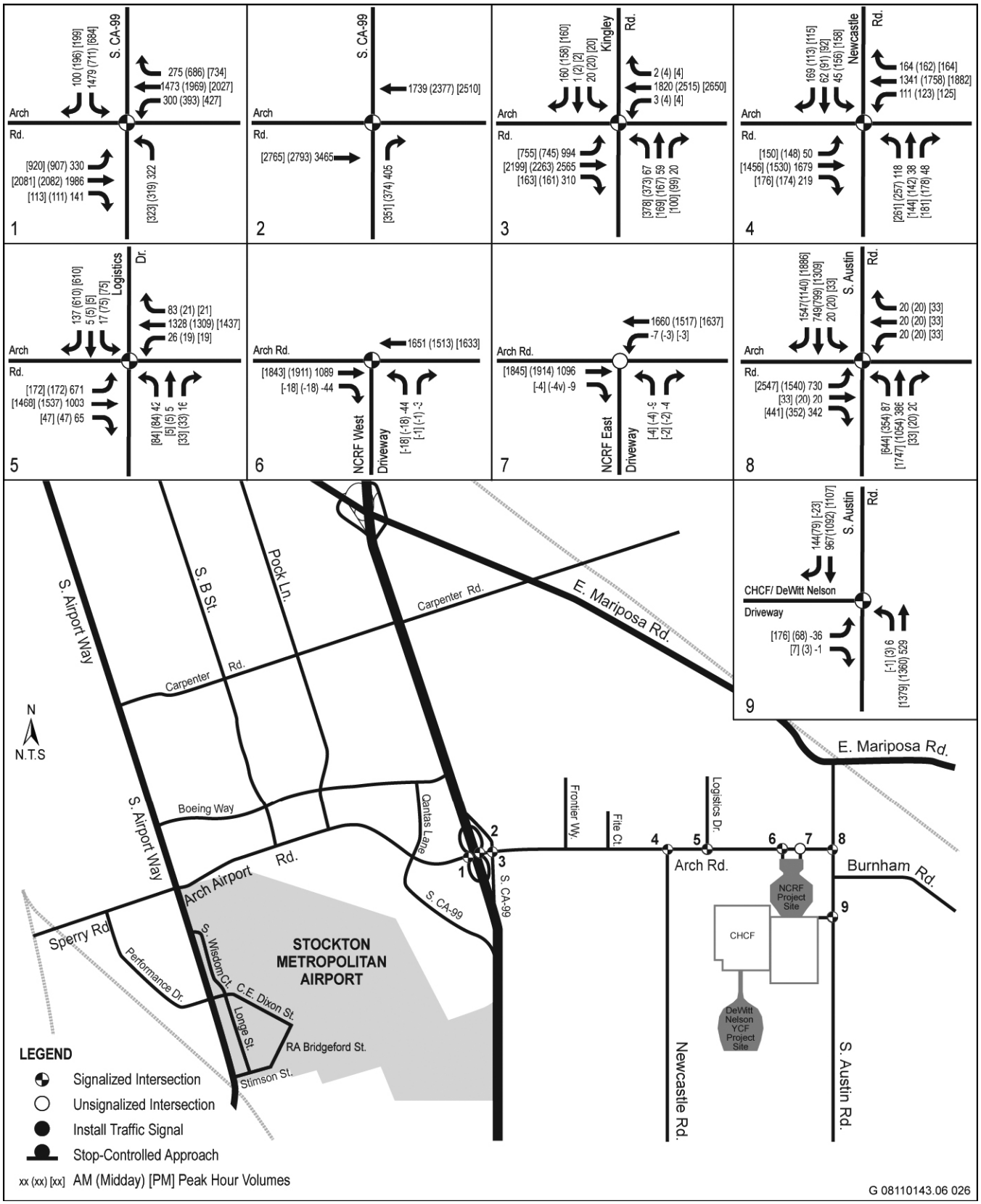
Implementation of mitigation measure for Impact 4.11-3a (2) would reduce the project's impact to the intersection of Kingsley Road (Frontage Road) and Arch Road to a less-than-significant level. While feasible mitigation is available, Caltrans is the agency that can and should implement this mitigation and it is unknown whether this mitigation would be implemented prior to operation of the project. While this mitigation would reduce the project's cumulative impact, for purposes of CEQA, this impact is concluded to be ***cumulatively significant and unavoidable*** and the project's contribution would be considerable in the event the mitigation is not implemented prior to operation of the project.

Implementation of mitigation measure for Impact 4.11-3a (3) would reduce the impact to a less-than-significant level at the intersection of Austin Road & Arch Road. While feasible mitigation is available, San Joaquin County is the agency that can and should implement this mitigation and it is unknown whether this mitigation would be implemented prior to operation of the project. Therefore, while this mitigation, if implemented, would reduce the project's cumulative impact to a less-than-significant level, for purposes of CEQA, this impact is concluded to be ***potentially significant and unavoidable*** and the project's contribution would be considerable in the event the mitigation is not implemented prior to operation of the project.

Implementation of mitigation measure for Impact 4.11-3a (4) would reduce the impact to a less-than-significant level along the Arch Road – East of Newcastle Road and west of NCRF West Driveway roadway segment. While feasible mitigation is available, San Joaquin County is the agency that can and should implement this mitigation and it is unknown whether this mitigation would be implemented prior to operation of the project. Therefore, while this mitigation, if implemented, would reduce the project's impact to a less-than-significant level, for purposes of CEQA, this impact is concluded to be ***potentially significant and unavoidable*** and the project's contribution would be considerable in the event the mitigation is not implemented prior to operation of the project.

Cumulative Plus DeWitt Nelson Only

DKS evaluated whether the DeWitt Nelson Project would result in significant cumulative impacts at the study intersections. Trips associated with the project were added to the cumulative no project scenario and the resulting intersection turning movement volumes for the cumulative with project scenario are shown in Exhibit 4.11-14.



Source: DKS 2010

2035 Cumulative with DeWitt Nelson Project
Peak Hour Intersection Traffic Volumes **Exhibit 4.11-14**

Cumulative Plus DeWitt Intersection Level of Service

The intersections and their corresponding project levels of service are presented in Table 4.11-57. Appendix E includes the detailed calculation level of service analysis sheets including the weekday A.M., Midday, and P.M. peak hours.

Table 4.11-57~~52~~
2035 Cumulative with DeWitt Nelson Project Intersection Peak Hour LOS

#	Intersection	A.M.		Midday		P.M.	
		Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]
1/2.	SR 99 & Arch Road[c]	269.6	F	204.8	F	207.2	F
3.	Kingsley Road – SR 99 Frontage Road & Arch Road[c]	53.7	D	145.7	F	166.0	F
4.	Newcastle Road & Arch Road[c]	~~28.5~~32.0	C	~~45.1~~51.8	D	~~47.4~~55.0	~~D~~E
5.	Logistics Drive & Arch Road[c]	**~~71.1~~91.2**	**~~E~~F**	**~~206.1~~221.4**	**F**	**~~204.0~~219.3**	**F**
6.	NCRF West Driveway & Arch Road[c]	~~3.8~~4.0	A	~~4.1~~4.4	A	~~4.2~~4.5	A
7.	NCRF East Driveway & Arch Road[d]	0.0	A	0.0	A	0.0	A
8.	Austin Road & Arch Road[c]	~~28.42~~9.5	C	~~149.3~~159.0	F	~~436.1~~497.9	F
9.	Austin Road & Project Access Driveway[c] (CHCF & DeWitt Nelson)	~~0.7~~0.1	A	~~13.0~~3.2	~~B~~A	~~16.0~~6.8	~~B~~A

Notes: Intersections operating below acceptable LOS are in bold. na: not applicable.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
d Unsignalized Intersection For two-way stop controlled intersections; the LOS rating is based on the worst approach. For all-way stop controlled intersections, the LOS rating is based on the average delay.
Source: DKS Associates 2010

Table 4.11-~~53~~58 provides a level of service comparison that shows project impacts, if any.

Table 4.11-~~53~~58
2035 Cumulative with DeWitt Nelson Project Intersection Peak Hour LOS

#	Intersection	Peak	Existing		2035 Cumulative No Project		2035 Cumulative with DeWitt Nelson Project		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
1/2.	SR 99 SPUI & Arch Road[c]	A.M.	na	na	245.5	F	269.6	F	24.1	**Yes**
		Midday	na	na	197.0	F	204.8	F	7.8	**Yes**
		P.M.	na	na	204.2	F	207.2	F	3.0	No
3.	Kingsley Road – SR 99 Frontage Road & Arch Road[c]	A.M.	19.1	B	51.3	D	53.7	D	2.4	No
		Midday	20.7	C	134.9	F	145.7	F	10.8	**Yes**
		P.M.	20.6	C	139.7	F	166.0	F	26.3	**Yes**
4.	Newcastle Road & Arch Road[c]	A.M.	16.2~~15.3~~	B	29.4~~27.0~~	C	32.0~~28.5~~	C	2.6~~1.5~~	No
		Midday	19.7~~19.5~~	B	51.3~~44.9~~	D	51.8~~45.1~~	D	0.5~~0.2~~	No
		P.M.	16.3~~15.6~~	B	53.7~~46.9~~	D	55.0~~47.4~~	**E**~~D~~	1.3~~0.5~~	~~No~~**Yes**
5.	Logistics Drive & Arch Road[c]	A.M.	9.1~~8.8~~	A	96.2~~72.2~~	**F**~~E~~	91.2~~71.1~~	**F**~~E~~	-5.0~~-1.1~~	No
		Midday	2.0	A	230.9~~215.0~~	F	221.4 ~~206.1~~	F	-9.5~~-9.9~~	No
		P.M.	0.0	A	230.9~~215.0~~	F	219.3 ~~204.0~~	F	11.6~~11.0~~	No
6.	NCRF West Driveway & Arch Road[d]	A.M.	0.0	A	0.0	A	4.0~~3.8~~	A	4.0~~3.8~~	No
		Midday	0.0	A	0.0	A	4.4~~4.1~~	A	4.4~~4.1~~	No
		P.M.	0.0	A	0.0	A	4.5~~4.2~~	A	4.5~~4.2~~	No
7.	NCRF East Driveway & Arch Road[c]	A.M.	0.0	A	0.0	A	0.0	A	0.0	No
		Midday	0.0~~9.4~~	A	0.0	A	0.0	A	0.0	No
		P.M.	0.0	A	0.0	A	0.0	A	0.0	No
8.	Austin Road & Arch Road[c]	A.M.	7.9	A	27.8~~26.4~~	C	29.5~~28.4~~	C	1.7~~2.0~~	No
		Midday	7.9	A	135.4~~126.8~~	F	159.0 ~~149.3~~	F	23.6~~22.5~~	**Yes**
		P.M.	7.8	A	425.1~~368.8~~	F	497.9 ~~436.1~~	F	72.8~~67.3~~	**Yes**

9.	Austin Road & Project Access Driveway (CHCF & DeWitt Nelson)	A.M.	na	na	0.0	A	0.1~~0.7~~	A	0.1~~0.7~~	No
		Midday	na	na	10.1~~9.6~~	A	3.2~~13.0~~	A~~B~~	-6.9~~3.4~~	No
		P.M.	na	na	10.7~~10.3~~	B	6.8~~16.0~~	A~~B~~	-3.9~~5.7~~	No

Notes: Intersections operating below acceptable LOS are in bold.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
d Unsignalized Intersection: For two-way stop controlled intersections, the LOS rating is based on the worst approach.
Source: DKS Associates, 2010.

The addition of project-related trips would contribute to an already deficient level of service at the SR 99 SPUI & Arch Road (#1/2). This intersection would continue to operate at LOS F, during the A.M., Midday, and P.M. peak hours, however delay would only increase by more than five seconds for the A.M. and Midday peak hours, which would be significant based on City of Stockton criteria for a state facility. Therefore, this would be a significant cumulative impact and the project's contribution would be considerable.

The addition of project-related trips would contribute to an already deficient level of service at the intersection of Kingsley Road – SR 99 Frontage Road & Arch Road (#3). This intersection would continue to operate at LOS F during the Midday and P.M. peak hours and would increase delay by more than five seconds. Therefore, this would be a significant cumulative impact and the project's contribution would be considerable.

The intersection of Newcastle Road and Arch Road would experience a deficient level of service during the P.M. peak hour. The intersection would deteriorate from LOS D to LOS E with an increase of delay by more than five seconds. Thus, the project would result in a significant impact at this location. The intersection of Logistics Drive & Arch Road (#5) would continue to operate at LOS ~~E~~ F during the A.M.,~~peak hour and LOS F during the~~ Midday, and P.M. peak hours, but would not increase delay by more than five seconds. Thus, the addition of project-related traffic would not result in a significant cumulative impact at this location.

The intersection of Austin Road & Arch Road would continue to operate at LOS F during the Midday and P.M. peak hour. The addition of project-related trips would contribute to an already deficient level of service at this intersection and would increase delay above cumulative no project conditions. Therefore, this would be a significant cumulative impact and the project's contribution would be considerable.

All other study intersections would operate acceptably or would not exceed adopted significance thresholds of applicable agencies; therefore, no significant impacts would occur at these intersections.

Cumulative Plus DeWitt Nelson Roadway Level of Service

The study roadway segment and its corresponding 2035 Cumulative plus Dewitt Nelson project levels of service are presented in Table 4.11-~~54~~59. Based on the roadway segment analysis results, the roadway operates at an acceptable level of service in the eastbound direction during the A.M. peak hour. The roadway operates below acceptable LOS D in the westbound direction during the A.M. peak hour and in both directions (eastbound and westbound) during the Midday and P.M. peak hours, respectively.

Table 4.11-~~55~~ 60 provides a level of service comparison to determine significance criteria and project impacts, if any.

Table 4.11-~~54~~59 2035 Cumulative with DeWitt Nelson Project Roadway Segment Peak Hour LOS								
#	Roadway Segment		A.M.		Midday		P.M.	
			EB	WB	EB	WB	EB	WB
1.	Arch Road (East of Newcastle Road and west of NCRF West Driveway)	Peak Hour Volume[a]	1,045	1,607	1,893	1,495	1,825	1,615
		Avg. Travel Speed (mph)[b]	19	7	12	16	16	8
		LOS[c]	D	**F**	**F**	**E**	**E**	**F**

Notes: EB: Eastbound, WB: Westbound
a Peak Hour Volume: Assumed for both directions (eastbound and westbound)
b Average Travel Speed: Based on miles per hour
c LOS: Level of Service. Based on average through-vehicle travel speed.
Source: DKS Associates 2010

Table 4.11-~~55~~60 2035 Cumulative with DeWitt Nelson Project Roadway Segment Peak Hour LOS Impact Comparison								
#	Roadway Segment			2035 No Project			2035 Cumulative with DeWitt Nelson Project	
			A.M.	MD	P.M.	A.M.	MD	P.M.
1.	Arch Road (East of Newcastle Road and west of NCRF West Driveway)	Peak Hour Volume[a] EB	861	1,799	1,825	1,045	1,893	1,825
		Peak Hour Volume[a] WB	1,589	1,411	1,431	1,607	1,495	1,615
		Avg. Travel Speed[b] EB	19	16	16	19	12	16
		Avg. Travel Speed[b] WB	6	14	13	7	16	8
		LOS[c] EB	D	**E**	**E**	D	**F**	**E**
		LOS[c] WB	**F**	**E**	**E**	**F**	**E**	**F**

Notes:
a Peak Hour Volume: Assumed for both directions (eastbound and westbound)
b Average Travel Speed: Based on miles per hour
c LOS: Level of Service. Based on average through-vehicle travel speed.
Source: DKS Associates 2010

Under cumulative conditions, the addition of DeWitt Nelson project trips would cause the LOS in the eastbound direction to deteriorate from LOS E to F during the Midday peak hours. The roadway would continue to operate at LOS E in the eastbound direction during the P.M. peak hours. In the westbound direction the roadway would continue to operate at LOS F during the A.M. peak hour and LOS E during the Midday peak hour. However, the LOS would deteriorate from LOS E to LOS F in the P.M. peak hour. Per San Joaquin County's significance criteria, for roadway segments operating at a deficient LOS, impacts on roadway segments are assessed in terms of volume-to-capacity (v/c) ratios. If the v/c ratio for a roadway segment, under cumulative plus project conditions, exceeds the v/c ratio for the same roadway segment under cumulative no project conditions then mitigation measures that would return the v/c ratio to the cumulative no project level must be identified. Table 4.11-61~~56~~ provides a v/c comparison to determine significance criteria and project impacts, if any.

Table 4.11-~~56~~61 2035 Cumulative with DeWitt Nelson Project Peak Hour Volume-to-Capacity Analysis												
			Volume-to-Capacity Ratio									
#	Roadway Segment		Existing			2035 No Project Condition			2035 Cumulative with DeWitt Nelson Project Condition			Significant Impact
			A.M.	MD	P.M.	A.M.	MD	P.M.	A.M.	MD	P.M.	Yes/No?
1.	Arch Road (East of Newcastle Road and west of NCRF West Driveway)	EB	0.04	0.03	0.05	0.28	0.88	0.89	0.34	**1.02**	0.87	**Yes**
		WB	0.08	0.06	0.05	1.10	0.98	0.99	1.08	0.76	**1.06**	**Yes**
Notes: Increases in V/C ratio are in **bold** for the designated peak hour. Source: DKS Associates, 2010.												

Based on the v/c analysis results, the addition of project-related traffic under cumulative conditions with DeWitt Nelson would result in an increase in the v/c ratio along this roadway segment in the eastbound direction during the A.M. and Midday peak hour and in the westbound direction during the P.M. peak hour. This would be a significant cumulative impact and the project's contribution would be considerable.

Implementation of the DeWitt Nelson project under cumulative conditions would result in the deterioration of three study intersections to unacceptable operating conditions based on adopted thresholds of local agencies. In addition, it would cause the v/c ratio for one roadway segment to increase above cumulative no project conditions Therefore, this would be a ***significant*** *cumulative impact and the project's contribution would be considerable. (Impact 4.11-3b)*

Mitigation Measure for Impact 4.11-3b

1. SR 99 SPUI & Arch Road

The following mitigation measures have been identified to improve intersection operations and achieve a difference in average delay of less than five seconds or LOS D or better during the A.M., Midday, and P.M. peak hours. The project would contribute 2.97% of the traffic to this intersection during the A.M. peak hour, 2.32% during the Midday peak hour and 2.34% during the P.M. peak hour. CDCR will contribute appropriate fees based on trip ends generated by the project to the City of Stockton traffic to help fund implementation of this improvement.

- Implement Mitigation Measure for Impact for 4.11-3a (1).

Table 4.11-~~57~~ 62 lists the mitigated LOS. With this mitigation in place, the intersection would continue to operate at LOS F during the A.M., Midday, and P.M. peak hours but would not increase delay by more than five seconds. Thus, the impact would be reduced to a less-than-significant level based on adopted significance criteria. Appendix E includes a comparison summary of the analysis results including the project's relative contribution to the study intersections.

Table 4.11-~~57~~62 Cumulative with DeWitt Nelson Project – Mitigated Condition LOS Summary										
#	Intersection	Peak	2035 Cumulative No Project Condition		2035 Cumulative with Dewitt Nelson Project		Mitigated 2035 Cumulative with Dewitt Nelson Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
3.	SR 99 SPUI & Arch Road	A.M.	245.5	**F**	269.6	**F**	225.7	**F**	-19.8	No
		Midday	197.0	**F**	204.8	**F**	163.0	**F**	-34.0	No
		P.M.	204.2	**F**	207.2	**F**	159.1	**F**	-45.1	No

Notes: Intersections operating below acceptable LOS are in **bold**.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
Source: DKS Associates 2010

2. Kingsley Road – SR 99 Frontage Road & Arch Road

The following mitigation measures have been identified to improve intersection operations and achieve a difference in average delay of less than five seconds or LOS D or better during the A.M., Midday, and P.M. peak hours. The project would contribute 3.35% of the traffic to this intersection during the A.M. peak hour, 2.76% during the Midday peak hour, and 2.80% during the P.M. peak hour. CDCR will contribute appropriate fees based on trip ends generated by the project to the City of Stockton to help fund implementation of this improvement.

- Implement Mitigation Measure for Impact 4.11-3a (2).

Table 4.11-~~58~~ 63 lists the mitigated LOS. With this mitigation in place, the intersection would operate at LOS D during the A.M. peak hour and it would continue to operate at LOS F during the Midday and P.M. peak hours but would not increase delay by more than five seconds. Thus, the impact would be reduced to a less-than-significant level based on adopted significance criteria. Appendix E includes a comparison summary of the analysis results including the project's relative contribution to the study intersections.

Table 4.11-~~58~~63 Cumulative with DeWitt Nelson Project – Mitigated Condition LOS Summary										
#	Intersection	Peak	2035 Cumulative No Project		2035 Cumulative with DeWitt Nelson Project		Mitigated 2035 Cumulative with DeWitt Nelson Project		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
3.	Kingsley Road – SR 99 Frontage Road & Arch Road	A.M.	51.3	D	53.7	D	Na	na	na	No
		Midday	134.9	**F**	145.7	**F**	97.0	F	-37.9	No
		P.M.	139.7	**F**	166.0	**F**	110.2	F	-29.5	No

Notes: Na: not applicable, acceptable LOS.
Intersections operating below acceptable LOS are in **bold**.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
Source: DKS Associates 2010

3. Newcastle Road & Arch Road

The following mitigation measures have been identified to improve intersection operations and achieve a difference in average delay of less than the cumulative no project condition or LOS D or better during the A.M., Midday, and P.M. peak hours. The project would contribute 3.77% during the P.M. peak hour. CDCR will monitor traffic at the above intersection for two years after the date on which the DeWitt Nelson Project begins operations. If, based on those traffic data, the level of service at any of the above intersections exceeds the threshold of significance, CDCR will fund/undertake the following mitigation:

- Adjust the traffic signal timing to a130 second cycle and optimize splits during the impacted A.M. and P.M. hours (balance of green and red time for each approach).

Adjust signal timing to optimize splits during the P.M. peak hour.

Table 4.11-64 lists the mitigated LOS. With this mitigation in place, the intersection would continue to operate at LOS F during the Midday and P.M. peak hour but would not increase delay above cumulative no project conditions. Thus, this impact would be reduced to a less-than-significant level. In calculating CDCR's "fair share" obligation towards traffic improvements, CDCR will credit its total "fair share" obligation by the amount it spends towards the above mitigation in excess of its percentage contributions to traffic congestion at those intersections.

Appendix E includes a comparison summary of the significance thresholds criteria including the project's relative contribution to the study intersections.

Table 4.11-64
Cumulative with DeWitt Nelson Project – Mitigated Condition LOS Summary

#	Intersection	Peak	2035 Cumulative No Project Condition		2035 Cumulative with Dewitt Nelson Project		Mitigated 2035 Cumulative with Dewitt Nelson Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
8.	Austin Road & Arch Road	A.M.	No Impact or Mitigation							
		Midday	No Impact or Mitigation							
		P.M.	53.7	D	55.0	**E**	53.0	D	-0.7	No

Notes: Na: not applicable, acceptable LOS. Intersections operating below acceptable LOS are in **bold**.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
Source: DKS Associates 2010.

4. Austin Road & Arch Road

The following mitigation measures have been identified to improve intersection operations and achieve a difference in average delay of less than the cumulative no project condition or LOS D or better during the A.M., Midday, and P.M. peak hours. The project would contribute 5.50% of the traffic to this intersection during the A.M. peak hour, 3.60% during the Midday peak hour and 2.27% during the P.M. peak hour. CDCR will contribute appropriate fees based on trip ends generated by the project to the San Joaquin County to help fund implementation of this improvement.

- Increase the intersection traffic signal timing cycle length to 120 seconds and optimize splits during the Midday and P.M. peak hours.

- ~~Increase the intersection traffic signal timing cycle length to 120 seconds and optimize splits during the P.M. peak hour and p~~Provide overlap phasing for the southbound right-turn lane.

Table 4.11-~~59~~ 65 lists the mitigated LOS. With this mitigation in place, the intersection would continue to operate at LOS F during the Midday and P.M. peak hour but would not increase delay above cumulative no project conditions. Appendix E includes a comparison summary of the significance thresholds criteria including the project's relative contribution to the study intersections.

Table 4.11-~~59~~65
Cumulative with DeWitt Nelson Project – Mitigated Condition LOS Summary

#	Intersection	Peak	2035 Cumulative No Project Condition		2035 Cumulative with Dewitt Nelson Project		Mitigated 2035 Cumulative with Dewitt Nelson Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
8.	Austin Road & Arch Road	A.M.	27.8~~26.4~~	C	29.5~~28.4~~	C	21.8~~Na~~	C~~na~~	-6.0~~na~~	No
		Midday	135.4 ~~126.8~~	**F**	159.0~~149.3~~	**F**	96.4~~91.9~~	F	-39.0~~37.9~~	No
		P.M.	425.1 ~~368.8~~	**F**	497.9~~436.1~~	**F**	389.5~~333.6~~	F	-35.6~~35.2~~	No

Notes: Na: not applicable, acceptable LOS. Intersections operating below acceptable LOS are in **bold**.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
Source: DKS Associates 2010.

5. Arch Road – East of Newcastle Road and west of NCRF West Driveway (Roadway Segment)

The following mitigation measures have been identified to improve the roadway operations and achieve a difference in volume-to-capacity ratio equal to or less than the 2035 Cumulative No Project condition during the A.M., Midday, and P.M. peak hours. CDCR will contribute appropriate fees based on trip ends generated by the project to the ~~County of San Joaquin~~ City of Stockton to help fund implementation of this improvement.

- Adjust traffic signal timing to optimize the cycle length to 100 seconds and optimize east and west splits during the Midday peak hour at the intersection of Logistics Drive and Arch Road.
- Adjust traffic signal timing to optimize the cycle length to 140 seconds and optimize east and west splits during the P.M. peak hour at the intersection of Logistics Drive and Arch Road.

Table 4.11-66 lists the mitigated LOS and volume-to-capacity ratio. With this mitigation in place, the roadway would continue to operate at LOS F during the Midday peak hour and LOS E during the P.M. peak hour in the eastbound direction. In the westbound direction, the roadway would continue to operate at LOS F during the A.M. peak hour and at LOS E during the Midday and P.M. peak hour but would not increase the volume-to-capacity level above cumulative no project conditions. Appendix E includes a comparison summary of the significance thresholds criteria including the project's relative contribution to the study intersections.

Table 4.11-~~60~~66 2035 Cumulative plus DeWitt Nelson Project Peak Hour Volume-to-Capacity Analysis												
#	Roadway Segment		Volume-to-Capacity Ratio (V/C)									
			2035 Cumulative No Project Condition			2035 Cumulative with DeWitt Project Condition			2035 Cumulative with DeWitt Project Condition Mitigated			Significant Impact
			A.M.	MD	P.M.	A.M.	MD	P.M.	A.M.	MD	P.M.	Yes or No?
1.	Arch Road (west of NCRF West Driveway and East of Newcastle Road)	EB	0.28	0.88	0.89	0.34	**1.02**	0.87	0.34	0.86	0.83	No
		LOS	D	**E**	**E**	D	**F**	**E**	D	**F**	**E**	No
		WB	1.10	0.98	0.99	1.08	0.76	**1.06**	1.08	0.96	0.97	No
		LOS	**F**	**E**	**E**	**F**	**E**	**F**	**F**	**E**	**E**	No

Notes: Increases in V/C ratio are in **bold** for the designated peak hour.
Source: DKS Associates 2010.

Significance after Mitigation

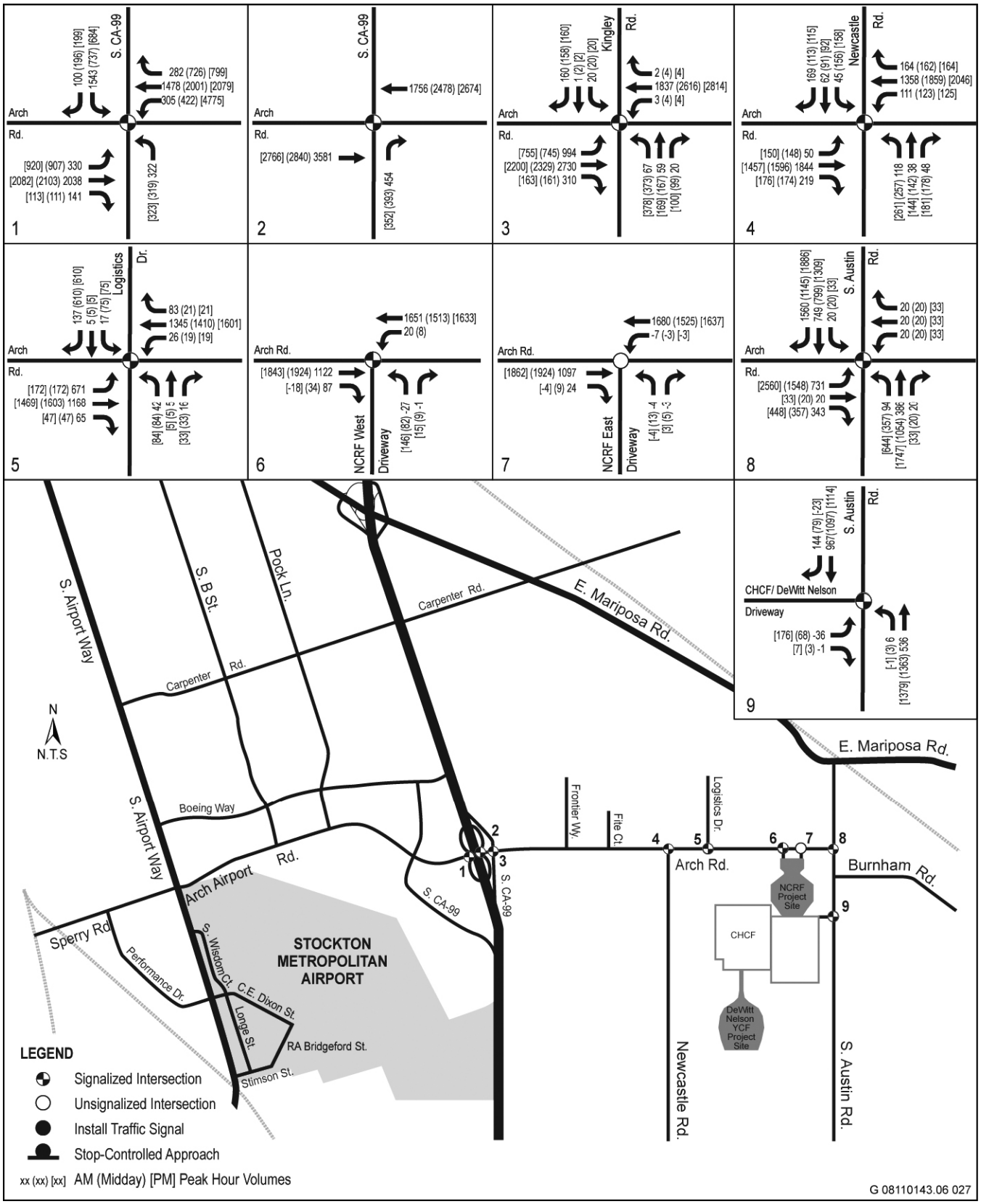
Implementation of mitigation measure for Impact 4.11-3a (1) would reduce the project's impacts to the intersection of SR 99 SPUI & Arch Road to a less-than-significant level. While feasible mitigation is available, Caltrans is the agency that can and should implement this mitigation and it is unknown whether this mitigation would be implemented prior to operation of the project. While this mitigation would reduce the project's impact, for purposes of CEQA, this impact is concluded to be ***cumulatively significant and unavoidable*** and the project's contribution would be considerable in the event the mitigation is not implemented prior to operation of the project.

Implementation of mitigation measure for Impact 4.11-3a (2) would reduce the project's impact to the intersection of Kingsley Road (Frontage Road) and Arch Road to a less-than-significant level. While feasible mitigation is available, Caltrans is the agency that can and should implement this mitigation and it is unknown whether this mitigation would be implemented prior to operation of the project. While this mitigation would reduce the project's impact, for purposes of CEQA, this impact is concluded to be ***cumulatively significant and unavoidable*** and the project's contribution would be considerable in the event the mitigation is not implemented prior to operation of the project.

Implementation of mitigation measure for Impact 4.11-3b (3) would reduce the impact to a ***less-than-significant*** level at the intersection of Newcastle Road & Arch Road.

Implementation of mitigation measure for Impact 4.11-3b (4) would reduce the impact to a less-than-significant level at the intersection of Austin Road & Arch Road. While feasible mitigation is available, San Joaquin County is the agency that can and should implement this mitigation and it is unknown whether this mitigation would be implemented prior to operation of the project. Therefore, while this mitigation, if implemented would reduce the project's impact to a less-than-significant level, for purposes of CEQA, this impact is concluded to be ***potentially significant and unavoidable*** and the project's contribution would be considerable in the event the mitigation is not implemented prior to operation of the project.

Implementation of mitigation measure for Impact 4.11-3b (5) would reduce the impact to a less-than-significant level along the Arch Road – East of Newcastle Road and west of NCRF West Driveway roadway segment. While feasible mitigation is available, San Joaquin County is the agency that can and should implement this mitigation and it is unknown whether this mitigation would be implemented prior to operation of the project. Therefore, while this mitigation, if implemented would reduce the project's impact to a less-than-significant level, for purposes of CEQA, this impact is concluded to be ***potentially significant and unavoidable*** and the project's



Source: DKS 2010

2035 Cumulative General Plan Baseline with NCRF/DeWitt Nelson Project Peak Hour Traffic Volumes **Exhibit 4.11-3**

contribution would be considerable in the event the mitigation is not implemented prior to operation of the project.

Cumulative Plus Combined NCRF and DeWitt Nelson Facilities

DKS evaluated whether the combined NCRF and DeWitt Nelson projects would result in significant cumulative impacts at the study intersections. Trips associated with the project were added to the cumulative no project scenario and the resulting intersection turning movement volumes for the cumulative with project scenario are shown in Exhibit 4.11-15.

Cumulative Plus Combined NCRF and DeWitt Nelson Facilities Intersection Level of Service

The intersections and their corresponding project levels of service are presented in Table 4.11-~~61~~67. Appendix E includes the detailed calculation level of service analysis sheets including the weekday A.M., Midday, and P.M. peak hours.

Table 4.11-~~61~~67
2035 Cumulative with NCRF and DeWitt Nelson Intersection Peak Hour LOS

#	Intersection	A.M.		Midday		P.M.	
		Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]
1/2.	SR 99 SPUI & Arch Road[c]	290.6	**F**	219.3	**F**	210.3	**F**
3.	Kingsley Road – SR 99 Frontage Road & Arch Road[c]	58.8	**E**	159.4	**F**	190.7	**F**
4.	Newcastle Road & Arch Road[c]	~~30.8~~38.7	~~C~~D	~~45.5~~5139	D	~~48.8~~57.8	~~D~~**E**
5.	Logistics Drive & Arch Road[c]	~~70.6~~90.2	~~**E**~~**F**	~~198.7~~ 213.6	**F**	~~197.9~~ 213.2	**F**
6.	NCRF West Driveway & Arch Road[d]	~~3.8~~3.9	A	~~6.4~~6.8	A	~~8.7~~9.3	A
7.	NCRF East Driveway & Arch Road[c]	0.0	A	~~15.0~~15.1	C	~~13.7~~13.8	B
8.	Austin Road & Arch Road[c]	~~28.7~~29.9	C	~~151.2~~161.0	**F**	~~438.4~~500.3	**F**
9.	Austin Road & Project Access Driveway[c] (CHCF & DeWitt Nelson)	~~0.7~~0.1	A	~~13.1~~3.5	~~B~~A	~~16.1~~6.8	~~B~~A

Notes: Intersections operating below acceptable LOS are in **bold**.
na: not applicable.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
d Unsignalized Intersection For two-way stop controlled intersections; the LOS rating is based on the worst approach. For all-way stop controlled intersections, the LOS rating is based on the average delay
Source: DKS Associates, 2010.

Table 4.11-~~62~~ 68 provides a level of service comparison to determine significance criteria and project impacts, if any.

Table 4.11-68~~62~~
2035 Cumulative with NCRF and DeWitt Nelson Project Intersection Peak Hour LOS Impact Comparison

#	Intersection	Peak	Existing		2035 Cumulative No Project		2035 Cumulative with NCRF and DeWitt Nelson Facilities		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
1/2.	SR 99 SPUI & Arch Road[c]	A.M.	na	na	245.5	**F**	290.6	**F**	45.1	**Yes**
		Midday	na	na	197.0	**F**	219.3	**F**	22.3	**Yes**
		P.M.	na	na	204.2	**F**	210.3	**F**	6.1	**Yes**
3.	Kingsley Road – SR 99 Frontage Road & Arch Road[c]	A.M.	19.1	B	51.3	D	58.8	**E**	7.5	**Yes**
		Midday	20.7	C	134.9	**F**	159.4	**F**	24.5	**Yes**
		P.M.	20.6	C	139.7	**F**	190.7	**F**	51.0	**Yes**
4.	Newcastle Road & Arch Road[c]	A.M.	16.2~~15.3~~	B	29.4~~27.0~~	C	38.7~~30.8~~	D~~C~~	9.3~~3.8~~	No
		Midday	19.7~~19.5~~	B	51.3~~44.9~~	D	51.9~~45.5~~	D	0.6	No
		P.M.	16.3~~15.6~~	B	53.7~~46.9~~	D	57.8~~48.8~~	**E**~~D~~	4.1~~1.9~~	~~No~~**Yes**
5.	Logistics Drive & Arch Road[c]	A.M.	9.18.8	A	96.2~~72.2~~	**F**~~F~~	90.2~~70.6~~	**F**~~F~~	-6.0-~~1.6~~	No
		Midday	2.0	A	230.9 ~~215.0~~	**F**	213.6 ~~198.7~~	**F**	-17.3-~~16.3~~	No
		P.M.	0.0	A	230.9 ~~215.0~~	**F**	213.2 ~~197.9~~	**F**	-17.7-~~17.1~~	No
6.	NCRF West Driveway & Arch Road[d]	A.M.	0.0	A	0.0	A	3.8	A	3.8	No
		Midday	0.0	A	0.0	A	6.4	A	6.4	No
		P.M.	0.0	A	0.0	A	9.3~~8.7~~	A	9.3~~8.7~~	No
7.	NCRF East Driveway & Arch Road[c]	A.M.	0.0	A	0.0	A	0.0	A	0.0	No
		Midday	0.0	A	0.0	A	15.1~~15.0~~	C	15.1~~15.0~~	No
		P.M.	0.0	A	0.0	A	13.8~~13.7~~	B	13.8~~13.7~~	No
8.	Austin Road & Arch Road[c]	A.M.	7.9	A	27.8~~26.4~~	C	29.9~~28.7~~	C	2.1~~2.3~~	No
		Midday	7.9	A	135.4~~126.8~~	**F**	161.0~~151.2~~	**F**	25.6~~24.4~~	**Yes**
		P.M.	7.8	A	425.1~~368.8~~	**F**	500.3~~438.4~~	**F**	75.2~~69.6~~	**Yes**
9.	Austin Road & Project Access Driveway[c] (CHCF & DeWitt Nelson)	A.M.	na	na	0.0	A	0.1~~0.7~~	A	0.1~~0.7~~	No
		Midday	na	na	10.1~~9.6~~	A	3.5~~13.1~~	A~~B~~	-6.6~~3.5~~	No
		P.M.	na	na	10.7~~10.3~~	B	6.8~~16.1~~	A~~B~~	-3.9~~5.8~~	No

Notes: Intersections operating below acceptable LOS are in bold. na: not applicable.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection

Table 4.11-68~~62~~ 2035 Cumulative with NCRF and DeWitt Nelson Project Intersection Peak Hour LOS Impact Comparison										
#	Intersection	Peak	Existing		2035 Cumulative No Project		2035 Cumulative with NCRF and DeWitt Nelson Facilities		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
d Unsignalized Intersection For two-way stop controlled intersections; the LOS rating is based on the worst approach. For all-way stop controlled intersections, the LOS rating is based on the average delay. Source: DKS Associates 2010										

The addition of project-related trips would contribute to an already deficient level of service at the SR 99 SPUI & Arch Road (#1/2) intersection. This intersection would continue to operate at LOS F, during the A.M., Midday and P.M. peak hours and would increase delay by more than five seconds, which would be significant based on City of Stockton criteria for a state facility. Therefore, this would be a significant cumulative impact and the project's contribution would be considerable.

The addition of project-related trips would contribute to an already deficient level of service at the intersection of Kingsley Road – SR 99 Frontage Road & Arch Road (#3). This intersection would deteriorate from LOS D to LOS E during the A.M. peak hour. During the Midday and P.M. peak hours, the intersection would continue to operate at LOS F and would increase delay by more than five seconds. Therefore, this would be a significant cumulative impact and the project's contribution would be considerable.

The intersection of Newcastle Road and Arch Road would experience a deficient level of service during the P.M. peak hour. The intersection would deteriorate from LOS D to LOS E with an increase of delay by more than five seconds. Thus, the project would result in a significant impact at this location.

The intersection of Logistics Drive & Arch Road would continue to operate at LOS ~~E~~ F during the A.M. peak hour and LOS F during the Midday and P.M. peak hours but would not increase delay by more than five seconds. Thus, the addition of project-related traffic would not result in a significant cumulative impact at this location.

The intersection of Austin Road & Arch Road would continue to operate at LOS F during the Midday and P.M. peak hour. The addition of project-related trips would contribute to an already deficient level of service F at this intersection during the Midday peak hour and P.M. peak hour and would increase delay above cumulative no project conditions. Therefore, this would be a significant cumulative impact and the project's contribution would be considerable.

All other study intersections would operate acceptably or would not exceed adopted significance thresholds of applicable agencies; therefore, no significant impacts would occur at these intersections.

Cumulative Plus Combined NCRF and DeWitt Nelson Facilities Roadway Level of Service

The roadway segment and its corresponding 2035 cumulative with combined NCRF and DeWitt Nelson projects levels of service are presented in Table 4.11-~~63~~69. Based on the roadway segment analysis results, the roadway would operate at an acceptable level of service D in the eastbound direction during the A.M. peak hour. The roadway would operate at LOS F in the westbound direction during the A.M. peak hour. During the Midday and P.M. peak hours, the roadway operates at LOS E in the eastbound direction and at LOS F in the westbound direction, respectively.

Table 4.11-~~64~~ 70 provides a level of service comparison to determine significance criteria and project impacts, if any.

Table 4.11-69~~63~~ 2035 Cumulative with NCRF and DeWitt Nelson Projects Roadway Segment Peak Hour LOS								
#	Roadway Segment		A.M.		Midday		P.M.	
			EB	WB	EB	WB	EB	WB
1.	Arch Road (west of NCRF West Driveway and East of Newcastle Road)	Peak Hour Volume[a]	1,209	1,624	1,958	1,596	1,825	1,779
		Avg. Travel Speed (mph)[b]	19	6	16	9	16	6
		LOS[c]	D	**F**	**E**	**F**	**E**	**F**

Notes: EB: Eastbound, WB: Westbound
a Peak Hour Volume: Assumed for both directions (eastbound and westbound)
b Average Travel Speed: Based on miles per hour
c LOS: Level of Service. Based on average through-vehicle travel speed.
Source: DKS Associates 2010

Table 4.11-70~~64~~ 2035 Cumulative with NCRF and Dewitt Nelson Projects Roadway Segment Peak-Hour LOS Impact Comparison								
#	Roadway Segment			2035 Cumulative No Project			2035 Cumulative with NCRF and DeWitt Nelson Project	
				A.M.	MD	P.M.	A.M.	MD	P.M.
1.	Arch Road (west of NCRF West Driveway and East of Newcastle Road)	Peak Hour Volume[a]	EB	861	1,799	1,825	1,209	1,958	1,825
			WB	1,589	1,411	1,431	1,624	1,596	1,779
		Avg. Travel Speed[b]	EB	19	16	16	19	16	16
			WB	6	14	13	6	9	6
		LOS[c]	EB	D	**E**	**E**	D	**E**	**E**
			WB	**F**	**E**	**E**	**F**	**F**	**F**

b Average Travel Speed: Based on miles per hour
c LOS: Level of Service. Based on average through-vehicle travel speed.

Under cumulative conditions, the addition of NCRF and DeWitt Nelson project trips would cause the LOS in the eastbound direction to continue to operate at LOS E during the Midday and P.M. peak hours. In the westbound direction the roadway would continue to operate at LOS F direction during the A.M. peak hour and would deteriorate from LOS E to LOS F during the Midday and P.M. peak hour. Per San Joaquin County's significance criteria, for roadway segments operating at a deficient LOS, impacts on roadway segments are assessed in terms of volume-to-capacity (v/c) ratios. If the v/c ratio for a roadway segment, under cumulative plus project conditions, exceeds the v/c ratio for the same roadway segment under cumulative no project conditions then mitigation measures that would return the v/c ratio to the cumulative no project level must be identified. Table 4.11-~~65~~ 71 provides a v/c comparison to determine significance criteria and project impacts, if any.

Based on the v/c ratio analysis results, the addition of project-related traffic under cumulative conditions with NCRF and DeWitt Nelson projects would result in an increase in the v/c ratio along this roadway segment in the eastbound direction during the A.M. and Midday peak hours and in the westbound direction during the Midday and P.M. peak hours. This would be a significant cumulative impact and the project's contribution would be considerable.

Table 4.11-71~~65~~ 2035 Cumulative Plus NCRF and DeWitt Nelson Projects Peak Hour Volume-to-Capacity Analysis												
			Volume-to-Capacity Ratio									
#	Roadway Segment		Existing			2035 No Project			2035 with NCRF/DeWitt Nelson Project			Significant Impact
			A.M.	MD	P.M.	A.M.	MD	P.M.	A.M.	MD	P.M.	Yes/No?
1.	Arch Road (west of NCRF West Driveway and East of Newcastle Road)	EB	0.04	0.03	0.05	0.28	0.88	0.89	**0.39**	**0.94**	0.87	**Yes**
		WB	0.08	0.06	0.05	1.10	0.98	0.99	1.10	**1.05**	**1.11**	**Yes**

Notes: Increases in V/C ratio are in **bold** for the designated peak hour.
Source: DKS Associates 2010

Implementation of the NCRF and DeWitt Nelson projects would result in the deterioration of three study intersections to unacceptable operating conditions based on adopted thresholds of local agencies. In addition, it would cause the v/c ratio for one roadway segment to increase above cumulative no project conditions. Therefore, this would be a ***significant*** *cumulative impact and the project's contribution would be considerable (Impact 4.11-3c).*

Mitigation Measure for Impact 4.11-3c

1. SR 99 SPUI & Arch Road

The following mitigation measures have been identified to improve intersection operations and achieve a difference in average delay of less than five seconds or LOS D or better during the A.M., Midday, and P.M. peak hours. The project would contribute 5.49% of the traffic to this intersection during the A.M. peak hour, 4.38% during the Midday peak hour, and 4.37% during the P.M. peak hour. CDCR will contribute appropriate fees based on trip ends generated by the project to the City of Stockton to help fund implementation of this improvement.

- Implement Mitigation Measure for Impact 4.11-3a(1)

Table 4.11-72 lists the mitigated LOS. With this mitigation in place, the intersection would continue to operate at LOS F during the A.M., Midday, and P.M. peak hours but would not increase delay by more than five seconds. Thus, the impact would be reduced to a less-than-significant level based on adopted significance criteria. Appendix E includes a comparison summary of the analysis results including the project's relative contribution to the study intersections.

2. Kingsley Road – SR 99 Frontage Road & Arch Road

The following mitigation measures have been identified to improve intersection operations and achieve a difference in average delay of less than five seconds or LOS D or better during the A.M., Midday, and P.M. peak hours. The project would contribute 6.19% of the traffic during the A.M. peak hour, 5.20% during the Midday peak hour and 6.17% during the P.M. peak hour. CDCR will contribute appropriate fees based on trip ends generated by the project to the City of Stockton t to help fund implementation of this improvement.

- Implement Mitigation Measure for Impact 4.11-1a (2).

Table 4.11-72~~66~~ Cumulative with NCRF and DeWitt Nelson Projects – Mitigated Condition LOS Summary										
#	Intersection	Peak	2035 Cumulative No Project Condition		2035 Cumulative with NCRF/DeWitt Nelson Project		Mitigated 2035 Cumulative with NCRF/DeWitt Nelson Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
3.	SR 99 SPUI & Arch Road	A.M.	245.5	**F**	290.6	**F**	248.8	F	3.3	No
		Midday	197.0	**F**	219.3	**F**	170.7	F	-26.3	No
		P.M.	204.2	**F**	210.3	**F**	161.9	F	-42.3	No

Notes: Intersections operating below acceptable LOS are in **bold**.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
Source: DKS Associates 2010

Table 4.11-~~67~~ 73 lists the mitigated LOS. With this mitigation in place, the intersection would improve to LOS D during the A.M. peak hour and it would continue to operate at LOS F during the Midday and P.M. peak hours, but would not increase delay by more than five seconds. Thus, the impact would be reduced to a less-than-significant level based on adopted significance criteria. Appendix E includes a comparison summary of the analysis results including the project's relative contribution to the study intersections.

Table 4.11-73~~67~~ Cumulative with NCRF and DeWitt Nelson Projects – Mitigated Condition LOS Summary										
#	Intersection	Peak	2035 Cumulative No Project		2035 Cumulative with NCRF/Dewitt Nelson Project		Mitigated 2035 Cumulative with NCRF/ Dewitt Nelson Project		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
3.	Kingsley Road – SR 99 Frontage Road & Arch Road	A.M.	51.3	D	58.8	**E**	39.8	D	-11.5	No
		Midday	134.9	**F**	159.4	**F**	98.8	**F**	-36.1	No
		P.M.	139.7	**F**	190.7	**F**	118.8	**F**	-20.9	No

Notes: Intersections operating below acceptable LOS are in **bold**.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
Source: DKS Associates 2010

3. Newcastle Road & Arch Road

The following mitigation measures have been identified to improve intersection operations and achieve a difference in average delay of less than the cumulative no project condition or LOS D or better during the A.M., Midday, and P.M. peak hours. The project would contribute 6.90% during the P.M. peak hour. CDCR will monitor traffic at the above intersection for two years after the date on which the second of the two projects (DeWitt Nelson and NCRF) begins operations. If, based on those traffic data, the level of service at any of the above intersections exceeds the threshold of significance, CDCR will fund/undertake the following mitigation:

- Provide a dedicated westbound right turn lane.

- Adjust signal timing to optimize splits during the P.M. peak hour.

Table 4.11-74 lists the mitigated LOS. With this mitigation in place, the intersection would continue to operate at LOS F during the Midday and P.M. peak hour but would not increase delay above cumulative no project conditions. Thus, this impact would be reduced to a less-than-significant level. In calculating CDCR's "fair share" obligation towards traffic improvements, CDCR will credit its total "fair share" obligation by the amount it spends towards the above mitigation in excess of its percentage contributions to traffic congestion at those intersections. Appendix E includes a comparison summary of the significance thresholds criteria including the project's relative contribution to the study intersections.

Table 4.11-74
Cumulative with DeWitt Nelson Project – Mitigated Condition LOS Summary

#	Intersection	Peak	2035 Cumulative No Project Condition		2035 Cumulative with Dewitt Nelson Project		Mitigated 2035 Cumulative with Dewitt Nelson Project Condition		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
4.	Newcastle Road & Arch Road	A.M.	No Impact or Mitigation							
		Midday	No Impact or Mitigation							
		P.M.	53.7	D	55.0	**E**	53.0	D	-0.7	No

Notes: Na: not applicable, acceptable LOS. Intersections operating below acceptable LOS are in **bold**.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
Source: DKS Associates 2010.

4. Austin Road & Arch Road

The following mitigation measures have been identified to improve intersection operations and achieve a difference in average delay of less than the cumulative no project conditions or LOS D or better during the A.M., Midday, and P.M. peak hours. The project would contribute 6.03% of the traffic to this intersection during the A.M. peak hour, 3.98% during the Midday peak hour and 2.49% during the P.M. peak hour. CDCR will contribute appropriate fees based on trip ends generated by the project to the County of San Joaquin to help fund implementation of this improvement.

- Implement Mitigation Measure for Impact 4.11-3b (3).

Table 4.11-75~~68~~ lists the mitigated LOS. With this mitigation in place, the intersection would continue to operate at LOS F during the Midday and P.M. peak hour, but would not increase delay above cumulative no project conditions. Appendix E includes a comparison summary of the significance thresholds criteria including the project's relative contribution to the study intersections.

5. Arch Road – East of Newcastle Road and west of NCRF West Driveway (Roadway Segment)

The following mitigation measures have been identified to improve the roadway operations and achieve a difference in volume-to-capacity ratio equal to or less than the 2035 Cumulative No Project condition during the A.M., Midday, and P.M. peak hours. CDCR will contribute appropriate fees based on trip ends generated by the project to the County of San Joaquin to help fund implementation of this improvement.

- Adjust traffic signal timing to optimize the cycle length to 130 seconds and optimize east and west splits on Arch Road during the Midday peak hour at the intersection of Logistics Drive and Arch Road.

- Adjust traffic signal timing to the cycle length to 140 seconds and optimize east and west splits on Arch Road during the P.M. peak hour at the intersection of Logistics Drive and Arch Road.

Table 4.11-75~~68~~
Cumulative with NCRF and DeWitt Nelson Projects – Mitigated Condition LOS Summary

#	Intersection	Peak	2035 Cumulative No Project		2035 Cumulative with NCRF/DeWitt Nelson Project		Mitigated 2035 Cumulative with NCRF/DeWitt Nelson Project		Significant Impact	
			Delay[a]	LOS[b]	Delay[a]	LOS[b]	Delay[a]	LOS[b]	Δ in delay	Yes/No?
8.	Austin Road & Arch Road	A.M.	27.8~~26.4~~	C	29.9~~28.7~~	C	22.8~~na~~	C~~na~~	-5.0~~na~~	No
		Midday	135.4~~126.8~~	**F**	161.0~~151.2~~	**F**	97.7~~93.1~~	**F**	-37.7~~33.7~~	No
		P.M.	425.1~~368.8~~	**F**	500.3~~438.4~~	**F**	391.6~~335.6~~	**F**	-33.5~~33.2~~	No

Notes: na: not applicable, the intersection operates at acceptable LOS. Intersections operating below acceptable LOS are in **bold**.
a Delay: in seconds per vehicle
b LOS: Level of Service
c Signalized Intersection
Source: DKS Associates 2010

Table 4.11-~~69~~76 lists the mitigated LOS and volume-to-capacity ratio. With this mitigation in place, the roadway would continue to operate at LOS F during the Midday peak hour and LOS E during the P.M. peak hour in the eastbound direction. In the westbound direction, the roadway would continue to operate at LOS F during the A.M. peak hour and at LOS E during the Midday and P.M. peak hour. Delay at this intersection would not increase above background conditions. Therefore, this impact would be reduced to a less-than-significant level. Appendix E includes a comparison summary of the significance thresholds criteria including the project's relative contribution to the study intersections.

Table 4.11-76~~69~~
2035 Cumulative plus NCRF and DeWitt Nelson Projects Peak Hour Volume-to-Capacity Analysis

#	Roadway Segment		Volume-to-Capacity Ratio (V/C)									
			2035 Cumulative No Project			2035 Cumulative with NCRF and DeWitt Nelson Project			2035 Cumulative with NCRF and DeWitt Nelson Project Mitigated			Significant Impact
			A.M.	MD	P.M.	A.M.	MD	P.M.	A.M.	MD	P.M.	Yes or No?
1.	Arch Road (East of Newcastle Road and west of NCRF West Driveway and)	EB	0.28	0.88	0.89	**0.39**	**0.94**	0.87	0.39	0.87	0.77	No
		LOS	D	**E**	**E**	D	**E**	**E**	D	**E**	**D**	No
		WB	1.10	0.98	0.99	1.10	**1.05**	**1.11**	1.10	0.95	0.96	No
		LOS	**F**	**E**	**E**	**F**	**F**	**F**	**F**	**E**	**E**	No

Significance after Mitigation

Implementation of mitigation measure for Impact 4.11-3a (1) would reduce the project's impacts to the intersection of SR 99 SPUI & Arch Road to a less-than-significant level. While feasible mitigation is available,

Caltrans is the agency that can and should implement this mitigation and it is unknown whether this mitigation would be implemented prior to operation of the project. While this mitigation would reduce the project's impact, for purposes of CEQA, this impact is concluded to be ***cumulatively significant and unavoidable*** and the DeWitt Nelson and NCRF project's contribution would be considerable in the event the mitigation is not implemented prior to operation of the project.

Implementation of mitigation measure for Impact 4.11-3a (2) would reduce the project's impact to the intersection of Kingsley Road (Frontage Road) and Arch Road to a less-than-significant level. While feasible mitigation is available, Caltrans is the agency that can and should implement this mitigation and it is unknown whether this mitigation would be implemented prior to operation of the project. While this mitigation would reduce the project's impact, for purposes of CEQA, this impact is concluded to be ***cumulatively significant and unavoidable*** and the DeWitt Nelson and the NCRF project's contribution would be considerable in the event the mitigation is not implemented prior to operation of the project.

Implementation of mitigation measure for Impact 4.11-3b (3) would reduce the impact to a ***less-than-significant*** level at the intersection of Newcastle Road & Arch Road.

Implementation of mitigation measure for Impact 4.11-3b (~~3~~4) would reduce the impact to a less-than-significant level at the intersection of Austin Road & Arch Road. While feasible mitigation is available, San Joaquin County is the agency that can and should implement this mitigation and it is unknown whether this mitigation would be implemented prior to operation of the project. Therefore, while this mitigation, if implemented would reduce the DeWitt Nelson and NCRF project's impact to a less-than-significant level, for purposes of CEQA, this impact is concluded to be ***potentially significant and unavoidable*** and the project's contribution would be considerable in the event the mitigation is not implemented prior to operation of the project.

Implementation of mitigation measure for Impact 4.11-3c (~~5~~4) would reduce the impact to a less-than-significant level along the Arch Road – East of Newcastle Road and west of NCRF West Driveway roadway segment. While feasible mitigation is available, San Joaquin County is the agency that can and should implement this mitigation and it is unknown whether this mitigation would be implemented prior to operation of the project. Therefore, while this mitigation, if implemented would reduce the project's impact to a less-than-significant level, for purposes of CEQA, this impact is concluded to be ***potentially significant and unavoidable*** and the DeWitt Nelson and NCRF project's contribution would be considerable in the event the mitigation is not implemented prior to operation of the project.

Impact 4.11-4: Project and Cumulative Impacts to Freeway Segments and Merge/Diverge

This section provides an evaluation of State Route 99, between the French Camp Road interchange to the south and Arch Road, and between Arch Road and the Mariposa Road interchange to the north. The operational analysis was conducted for the freeway mainline using the Basic Freeway Segment methodologies set forth in the HCM (Caltrans 2000). A LOS rating is measured in terms of volume-to-capacity (v/c) ratio and vehicle density. For the purpose of this analysis, a lane capacity of 1,850 vehicles per lane per hour (vplph) was assumed, which is consistent with that used in the analysis presented in the CHCF and Mariposa Lakes Project EIR's. A weaving analysis was not required as the distance between the interchanges of Mariposa Road, Arch Road, and French Camp Road, is greater than 2,500 feet, which is enough distance to allow vehicles to merge/exist without potential weaving impacts. Per Caltrans standard, an acceptable operational LOS for freeway mainline segments is LOS D or better.

Table 4.11-~~70~~ 78 defines the level of service for freeway segments.

Existing (2009) Annual Average Daily Traffic (AADT) volumes were obtained from the *Caltrans Traffic and Vehicle Data Systems Unit* (Caltrans 2010d) database. Peak hour directional volumes were determined using the "K" and "D" factors provided in the *Peak Hour Volume Data Report* on the Caltrans Traffic Data Branch website.

Future forecast ramp volumes were added onto the existing mainline volumes accordingly. The analysis assumed the current lane capacity for the existing scenario. Under the background and project scenarios, the planned widening of SR 99 from four-lanes to six-lanes was assumed. The 2035 scenario assumes an additional widening from six lanes to ten-lanes on SR 99, which is consistent with Caltrans' plans for this facility. Table 4.11-78 provides a summary of the freeway analysis for all study scenarios.

Table 4.11-~~70~~77
Level of Service Definition for Freeway Segments

Level of Service	Maximum V/C ratio	Maximum Density (pcpmpl)
A	0.32	0-11
B	0.53	>11-18
C	0.74	>18-26
D	0.90	>26-35
E	1.0	>35-45
F	varies	>45

Notes: v/c: volume to capacity.
pcpmpl: passenger car-per mile-per lane.
Source: Transportation Research Board, Special Report 209, Highway Capacity Manual, Chapter 23

Table 4.11-~~71~~78
Freeway Segment LOS Summary

Scenario	Peak	French Camp to Arch Road						Arch Road to Mariposa Road					
		Northbound			Southbound			Northbound			Southbound		
		Volume	V/C	LOS	Volume	V/C	LOS	Volume	V/C	LOS	Volume	V/C	LOS
Existing	AM	2,916	0.79	D	2,389	0.65	C	3,130	0.85	D	2,225	0.60	C
	PM	3,299	0.89	D	2,984	0.81	D	**3,542**	**0.96**	**E**	2,780	0.75	D
Background	AM	3,800	0.68	C	4,849	0.87	D	3,939	0.71	C	2,556	0.46	B
	PM	3,9141	0.70	C	4,162	0.75	D	**5,388**	**1.00**	**E**	3,572	0.66	C
NCRF Project	AM	3,848	0.69	C	4,914	0.89	D	3,946	0.71	C	2,561	0.46	B
	PM	3,911	0.70	C	4,176	0.75	D	**5,590**	**1.01**	**F**	3,722	0.67	C
DeWitt Nelson Project	AM	3,854	0.69	C	4,922	0.89	D	3,946	0.71	C	2,561	0.46	B
	PM	3,911	0.70	C	4,176	0.75	D	**5,598**	**1.01**	**F**	3,728	0.67	C
NCRF/DeWitt Nelson	AM	3,902	0.70	C	4,987	0.90	D	3,953	0.71	C	2,566	0.46	B
	PM	3,911	0.70	C	4,176	0.75	D	**5,663**	**1.02**	**F**	3,776	0.68	C
2035 No Project	AM	3,154	0.34	B	3,063	0.33	B	3,427	0.37	B	2426	0.26	A
	PM	3,718	0.40	B	3,582	0.39	B	4,461	0.48	B	2,826	0.31	A
2035 with NCRF	AM	3,202	0.35	B	3,128	0.34	B	3,434	0.37	B	2,431	0.26	A
	PM	3,719	0.40	B	3,582	0.39	B	4,526	0.49	B	2,874	0.31	A
2035 with DeWitt Nelson	AM	3,207	0.35	B	3,136	0.34	B	3,434	0.37	B	2,431	0.26	A
	PM	3,718	0.40	B	3,582	0.39	B	4,533	0.49	B	2,880	0.31	A

Table 4.11-~~71~~78 Freeway Segment LOS Summary													
Scenario	Peak	French Camp to Arch Road						Arch Road to Mariposa Road					
		Northbound			Southbound			Northbound			Southbound		
		Volume	V/C	LOS	Volume	V/C	LOS	Volume	V/C	LOS	Volume	V/C	LOS
2035 with NCRF/DeWitt Nelson	AM	3,256	0.35	B	3,200	0.35	B	3,441	0.37	B	2,436	0.26	A
	PM	3,719	0.40	B	3,582	0.39	B	4,598	0.50	B	2,928	0.32	A

Notes: Volume: peak hour volume, v/c: volume-to-capacity ratio, LOS: level of service
Source: DKS Associates 2010

Under the existing condition, SR 99 operates at LOS E during the P.M. peak hour, north of the Arch Road interchange. Per Caltrans criteria, this segment of the freeway operates below acceptable LOS D. All other segments operate at LOS D or better under existing conditions. Under the background condition, the segment of SR 99 north of Arch Road interchange would continue to operate at LOS E. All freeway segments would operate acceptably under cumulative 2035 conditions.

NCRF Only

The addition of the NCRF project traffic to this segment of SR 99 would deteriorate the LOS E in the background condition to LOS F during the P.M. peak hour. The project would contribute 1.16 % of the traffic and it would result in an increase of 0.01 in the volume-to-capacity ratio. In addition, the project would potentially result in merging and diverging impacts on the freeway because of the capacity constraints. This increase in volume-to-capacity ratio exceeds the threshold for San Joaquin County. Therefore, this would be considered a significant project impact.

Implementation of the NCRF project would result in the deterioration of the Arch Road to Mariposa Road freeway segment in the northbound direction to an unacceptable LOS. In addition, the project would potentially result in merging and diverging impacts on the freeway. This would be a ***significant*** *impact. (Impact 4.11-4a)*

Mitigation Measure for Impact 4.11-4a

The following mitigation measures have been identified to improve the freeway operations.

- Widen SR 99 from six-lanes to eight lanes.

With implementation of this improvement, the LOS of this freeway segment would improve from F to D.

Significance after Mitigation

Implementation of mitigation measure for Impact 4.11-4a would reduce the project's impacts to the northbound segment of SR 99 from Arch Road to Mariposa Road, including merge/diverge impacts, to a less-than-significant level. While feasible mitigation is available, Caltrans is the agency that can and should implement this mitigation. While Caltrans has identified and is planning for this improvement~~ and construction is projected to begin in 2011, it is unlikely that~~, this improvement could not feasibly be implemented prior to operation of the project. ~~Acceleration of the schedule would not be feasible.~~ While this mitigation would reduce the project's impact to this freeway segment once implemented, for purposes of CEQA, this impact is concluded to be ***cumulatively***

significant and unavoidable and the project's contribution would be considerable in the interim period when the project is operational and the improvement is not complete.

DeWitt Nelson Only

The addition of the DeWitt Nelson project traffic to this segment of SR 99 would deteriorate the LOS E in the background condition to LOS F during the P.M. peak hour. The project would contribute 1.30 % of the traffic during P.M. peak hour and it would result in an increase of 0.01 in the volume-to-capacity ratio. This increase in volume-to-capacity ratio exceeds the threshold for San Joaquin County. In addition, the project would potentially result in merging and diverging impacts on the freeway because of capacity constraints. Therefore, this would be considered a significant project impact.

Implementation of the DeWitt Nelson project would result in the deterioration of the Arch Road to Mariposa Road freeway segment in the northbound direction to an unacceptable LOS. In addition, the project would potentially result in merging and diverging impacts on the freeway. This would be a ***significant*** *impact. (Impact 4.11-4b)*

Mitigation Measure for Impact 4.11-5b

The following mitigation measures have been identified to improve the freeway operations

- Implement Mitigation Measure for Impact 4.11-4a.
- With implementation of this improvement, the LOS of this freeway segment would improve from F to D.

Significance after Mitigation

Implementation of mitigation measure for Impact 4.11-4a would reduce the project's impacts to the northbound segment of SR 99 from Arch Road to Mariposa Road, including merge/diverge impacts, to a less-than-significant level. While feasible mitigation is available, Caltrans is the agency that can and should implement this mitigation. While Caltrans has identified and is planning for this improvement and construction is projected to begin in 2011, it is unlikely that this improvement could feasibly be implemented prior to operation of the project. Acceleration of the schedule would not be feasible. While this mitigation would reduce the project's impact to this freeway segment once implemented, for purposes of CEQA, this impact is concluded to be ***cumulatively significant and unavoidable*** and the project's contribution would be considerable in the interim period when the project is operational and the improvement is not complete.

Combined NCRF and DeWitt Nelson Facilities

The addition of the combined NCRF/DeWitt Nelson project traffic to this segment of SR 99 would deteriorate the LOS E in the background condition to LOS F during the P.M. peak hour. The project would contribute 2.44 % of the traffic during P.M. peak hour result in an increase of 0.02 in the volume-to-capacity ratio. This increase in volume-to-capacity ratio exceeds the threshold for San Joaquin County. In addition, the project would potentially result in merging and diverging impacts on the freeway because of capacity constraints. Therefore, this would be considered a significant project impact.

Implementation of the NCRF and DeWitt Nelson projects would result in the deterioration of the Arch Road to Mariposa Road freeway segment in the northbound direction to an unacceptable LOS. In addition, the project would potentially result in merging and diverging impacts on the freeway. This would be a ***significant*** *impact, (Impact 4.11-4c)*

Mitigation Measure for Impact 4.11-5c

The following mitigation measures have been identified to improve the freeway operations

- Implement Mitigation Measure for Impact 4.11-4a.

With implementation of this improvement, the LOS of this freeway segment would improve from F to D.

Significance after Mitigation

Implementation of mitigation measure for Impact 4.11-4a would reduce the projects' impacts to the northbound segment of SR 99 from Arch Road to Mariposa Road, including merge/diverge impacts, to a less-than-significant level. While feasible mitigation is available, Caltrans is the agency that can and should implement this mitigation. While Caltrans has identified and is planning for this improvement and construction is projected to begin in 2011, it is unlikely that this improvement could feasibly be implemented prior to operation of the projects. Acceleration of the schedule would not be feasible. While this mitigation would reduce the project's impact to this freeway segment once implemented, for purposes of CEQA, this impact is concluded to be ***cumulatively significant and unavoidable*** and the project's contribution would be considerable in the interim period when the project is operational and the improvement is not complete.

Cumulative Plus NCRF Only

All study freeway segments would operate acceptably under the Cumulative plus NCRF Only project condition assuming that proposed freeway expansion projects would be implemented based on the timelines proposed by Caltrans. Therefore, the project would have less-than-significant freeway segment and merge/diverge impacts. However, it is possible that the proposed freeway expansion may not occur as proposed or may be delayed. If this occurs, potentially significant cumulative freeway segment and merge/diverge impacts would occur until such time that the freeway expansion is complete and the project would have a considerable contribution to this significant cumulative impact during that interim period.

While implementation of the NCRF project under 2035 cumulative conditions would result in the acceptable operation of all study freeway segments assuming that proposed freeway expansions would be implemented as proposed, it is possible that expansion may be delayed such that interim cumulatively significant freeway segment and merge/diverge impacts would occur until such time that the expansion improvements are implemented. The project would have a considerable contribution to this ***significant*** *cumulative impact during the interim period. (Impact 4.11-4d)*

Mitigation Measure for Impact 4.11-4d

No feasible mitigation is available beyond Caltrans' proposed expansion of SR 99 from 6 to 10 lanes.

Significance after Mitigation

Caltrans is the agency that is responsible for implementing the freeway expansion. While Caltrans has identified and is planning for this improvement and construction is projected to begin in 2011, this improvement may not be implemented prior to cumulative development and acceleration of the schedule may not be feasible. Therefore, this impact is concluded to be ***cumulatively significant and unavoidable*** and the project's contribution would be considerable in the interim period when the project is operational and the improvement is not complete.

Cumulative Plus DeWitt Nelson Only

All study freeway segments would operate acceptably under the Cumulative plus DeWitt Nelson Only project condition assuming that proposed freeway expansion projects would be implemented based on the timelines proposed by Caltrans. Therefore, the project would have less-than-significant freeway segment and merge/diverge impacts. However, it is possible that the proposed freeway expansion may not occur as proposed or may be delayed. If this occurs, potentially significant cumulative freeway segment and merge/diverge impacts would occur until such time that the freeway expansion is complete and the project would have a considerable contribution to this significant cumulative impact during that interim period.

While implementation of the DeWitt Nelson project under 2035 cumulative conditions would result in the acceptable operation of all study freeway segments assuming that proposed freeway expansions would be implemented as proposed, it is possible that expansion may be delayed such that interim cumulatively significant freeway segment and merge/diverge impacts would occur until such time that the expansion improvements are implemented. The project would have a considerable contribution to this ***significant*** *cumulative impact during the interim period. (Impact 4.11-4e)*

Mitigation Measure for Impact 4.11-4e

No feasible mitigation is available beyond Caltrans' proposed expansion of SR 99 from 6 to 10 lanes. Significance after Mitigation

Caltrans is the agency that is responsible for implementing the freeway expansion. While Caltrans has identified and is planning for this improvement and construction is projected to begin in 2011, this improvement may not be implemented prior to cumulative development and acceleration of the schedule may not be feasible. Therefore, this impact is concluded to be ***cumulatively significant and unavoidable*** and the project's contribution would be considerable in the interim period when the project is operational and the improvement is not complete.

Cumulative Plus Combined DeWitt Nelson and NCRF Facilities

All study freeway segments would operate acceptably under the Cumulative plus NCRF and DeWitt Nelson project condition assuming that proposed freeway expansion projects would be implemented based on the timelines proposed by Caltrans. Therefore, the project would have less-than-significant freeway segment and merge/diverge impacts. However, it is possible that the proposed freeway expansion may not occur as proposed or may be delayed. If this occurs, potentially significant cumulative freeway segment and merge/diverge impacts would occur until such time that the freeway expansion is complete and the project would have a considerable contribution to this significant cumulative impact during that interim period.

While implementation of the NCRF and DeWitt Nelson projects under 2035 cumulative conditions would result in the acceptable operation of all study freeway segments assuming that proposed freeway expansions would be implemented as proposed, it is possible that expansion may be delayed such that interim cumulatively significant freeway segment and merge/diverge impacts would occur until such time that the expansion improvements are implemented. The project would have a considerable contribution to this ***significant*** *cumulative impact during the interim period. (Impact 4.11-4f)*

Mitigation Measure for Impact 4.11-4f

No feasible mitigation is available beyond Caltrans' proposed expansion of SR 99 from 6 to 10 lanes.

Significance after Mitigation

Caltrans is the agency that is responsible for implementing the freeway expansion. While Caltrans has identified and is planning for this improvement and construction is projected to begin in 2011, this improvement may not be

implemented prior to cumulative development and acceleration of the schedule may not be feasible. Therefore, this impact is concluded to be cumulatively significant and unavoidable and the project's contribution would be considerable in the interim period when the project is operational and the improvement is not complete.

Impact 4.11-5: Freeway Queuing Impacts

A 95th percentile queuing analysis was performed for the SR 99 single-point urban interchange (SPUI) to determine the potential vehicle queue due to the projects (if any) and the ability of the existing roadway storage bays to provide adequate storage space for those queues. The 95th percentile queues were determined using SimTraffic, a simulation software, and by applying HCM Methodology. Three SimTraffic 60-minute simulation runs were conducted per Caltrans' request, with the low and high range reported. Specific vehicle parameters were also accounted for in the simulation runs per Caltrans' request. The analysis assumes an average car length of 25 feet.

Table 4.11-~~72~~ 80 summarizes the queuing analysis for the eastbound and westbound approach of the SR 99 SPUI & Arch Road, with the storage capacity indicated on top of the table and the 95% queue estimate shown for each scenario. The table shows the range of queues calculated for each movement. Table 4.11-~~73~~ 79 summarizes the queuing analysis for SR 99 northbound and southbound ramps.

Existing Condition

Table 4.11-74 shows the existing storage capacities of the Arch Road eastbound and westbound approaches at the SR 99 SPUI. The eastbound approach provides a total storage capacity of 8,435 feet (337 vehicles) and consists of the following: dual left-turn lanes with a storage capacity of 350 feet (14 vehicles) for the inside lane and 1,975 feet (79 vehicles) for the outside lane. Note that the outside lane extends to the Qantas Lane and Arch Road intersection. The two (2) eastbound through lanes have a total storage capacity of 3,950 feet (1,975 feet, 79 vehicles per lane) and the right-turn lane provides 2,160 feet (86 vehicles) of storage capacity. Note that the storage capacity for the right-turn lanes includes the distance along the on-ramp to the SR 99 southbound mainline merging point. Queues reported for the dual eastbound left-turn movement account for the maximum queue for a single lane.

The two (2) westbound left-turn lanes have a storage capacity of 225 feet each (9 vehicles per lane). The two (2) westbound through lanes have a storage capacity of 650 feet each (26 vehicles per lane) and the right-turn lane provides 740 feet (30 vehicles).

Table 4.11-~~73~~79 shows the existing storage capacities for the SR 99 northbound and southbound ramps at the SR 99 SPUI and Arch Road interchange. The total storage length of the northbound ramp is 1,500 feet (60 vehicles) and 1,250 feet (48 vehicles) for the southbound ramp. Under the background condition, the northbound ramp would include an additional right turn storage length of 300 feet. Queues reported for the northbound and southbound ramps represent the maximum queue for a single-left turn lane, right-turn, and through-lane segment of the ramp. The through-lane segment is assumed to be the distance from the stop line at the intersection to the gore of the freeway mainline.

Background Condition

SR 99 SPUI & Arch Road

Based on the queuing analysis results, during the A.M., Midday, and P.M. peak hours, the eastbound through-lane queues between the SR 99 SPUI and Qantas Lane are estimated to be 85 vehicles, 90 vehicles, and 92 vehicles, respectively. The eastbound left-turn queues for the A.M., Midday, and P.M. peak hours are estimated to be 84 vehicles, 92 vehicles, and 90 vehicles, respectively. The eastbound through-lane and left-turn queues exceed the storage capacity for all peak hours and would likely have an effect on the operation of the Qantas Lane and Arch Road intersection.

Table 4.11-~~73~~79 SR 99 SPUI & Arch Road Northbound and Southbound Ramps Queuing Analysis						
Storage Lengths	AM Peak Hour		Midday Peak Hour		PM Peak Hour	
	NB	SB	NB	SB	NB	SB
	1,500 ft	1,250 ft	1,500 ft	1,250 ft	1,500 ft	1,250 ft
Existing	151-174	**2085-2331**	136-146	90-119	114-125	110-152
Background	**2141-2211**	**1269-1763**	**2065-2261**	**2036-2252**	**1934-2331**	**2008-2246**
NCRF Project	**2029-2154**	**1775-1914**	**2165-2297**	**2017-2229**	**2210-2307**	**2120-2286**
DeWitt Project	**1932-2123**	**1915-2034**	**1843-2243**	**2091-2180**	**2227-2310**	**2124-2196**
NCRF/DeWitt Project	**1912-2051**	**1875-2042**	**1863-2030**	**2015-2177**	**1992-2246**	**2067-2288**
2035 Cumulative No Project	**1033-2277**	**1842-1929**	**1028-2310**	**2090-2186**	**1435-1710**	**2205-2293**
2035 with NCRF Project	**2047-2196**	**1889-2079**	**2081-2240**	**2179-2254**	**1967-2099**	**2092-2156**
2035 with DeWitt Project	**2079-2220**	**1857-1932**	**2227-2334**	**2089-2186**	**1951-3048**	**2038-2165**
2035 with NCRF/DeWitt Project	**1864-2270**	**1879-1932**	**2044-2330**	**2059-2215**	**2050-2198**	**2081-2197**

Notes: ft: feet, # - #: Minimum – Maximum 95th queue range in feet, NB: Northbound, SB: Southbound
Source: DKS Associates 2010.

The westbound through-lane queues on Arch Road between the SR 99 SPUI and Kingsley Road are estimated to be 26 vehicles for the A.M. peak hour, 24 vehicles for the Midday peak hour, and 27 vehicles for the P.M. peak

hour. The westbound right-turn lane queues are estimated to be 23 vehicles for the A.M. peak hour, 28 vehicles for the Midday peak hour, and 30 vehicles for the P.M. peak hour. Based on the queuing analysis results, the westbound through-lane queues would exceed the storage capacity during the P.M. peak hour and would likely have an effect on the intersection operation of Arch Road at Kingsley Road.

SR 99 Northbound and Southbound Ramps

During the Background A.M., Midday, and P.M. peak hours, the northbound off-ramp queues are estimated to be 89 vehicles, 91 vehicles, and 93 vehicles, respectively. The southbound off-ramp queues for the A.M., Midday, and P.M. peak hours are estimated to be 71 vehicles, 91 vehicles, and 90 vehicles, respectively. Both northbound and southbound off-ramp queues would exceed the storage capacity of the ramps during all peak hours and would likely back up onto the mainline segment of SR 99.

Cumulative 2035 Roadway Improvements

The following roadway improvements were assumed in the cumulative 2035 analysis. Under the Year 2035 study scenarios, the intersection of Arch Road and Kingsley Road would be improved to include a fourth westbound through-lane, per the assumptions published in the Mariposa Lakes EIR. For the purpose of this analysis, it was assumed that the intersection at the SR 99 SPUI & Arch Road would not be widened to accommodate an additional westbound through-lane. The additional through-lane would be accommodated by extending the second westbound left turn pocket. The storage capacity of the westbound left-turn lane would, therefore, increase from 225 to 650 feet or 26 vehicles.

Table 4.11-~~72~~80
SR 99 SPUI & Arch Road Queuing Analysis

	AM Peak Hour						Midday Peak Hour						PM Peak Hour					
	EBL	EBT	EBR	WBL	WBT	WBR	EBL	EBT	EBR	WBL	WBT	WBR	EBL	EBT	EBR	WBL	WBT	WBR
Storage Lengths	**1,975 ft**	**1,975 ft**	**2,160 ft**	**225 ft**	**650 ft**	**740 ft**	**1,975 ft**	**1,975 ft**	**2,160 ft**	**225 ft**	**650 ft**	**740 ft**	**1,975 ft**	**1,975 ft**	**2,160 ft**	**225 ft**	**650 ft**	**740 ft**
Existing	91-99	94-113	0	75-172	147-250	0	87-99	108-129	0	159-196	147-589	0-28	143-172	126-142	0	202-230	143-193	0-28
Background	**2015-2090**	**2045-2120**	1685-1744	**254-255**	367-632	244-575	**2191-2295**	**2283-2231**	1056-1370	**250**	474-584	255-690	**2068-2235**	**2160-2301**	1017-1238	**249-250**	**538-657**	570-738
NCRF Project	**2009-2130**	**2105-2180**	1756-1782	**249-250**	449-591	247-438	**2173-2289**	**2189-2353**	720-989	**250**	472-515	447-486	**2200-2237**	**2204-2242**	1060-1354	**249-250**	556-636	622-654
DeWitt Project	**1997-2012**	**2110-2126**	1693-1741	**250**	**572-658**	501-616	**2196-2258**	**2194-2365**	551-917	**249-250**	496-640	446-512	**2218-2281**	**2107-2237**	967-1235	**250**	577-638	533-626
NCRF/DeWitt Project	**1991-2076**	**2089-2175**	1690-1748	**250**	**527-610**	275-471	**2071-2230**	**2201-2290**	794-1146	**250**	570-617	604-663	**2199-2238**	**2191-2322**	562-1725	**250**	**548-731**	**517-794**
2035 Cumulative No Project	**2160-2249**	**2046-2132**	1434-1715	627-650	**698-759**	**787-818**	**2123-2332**	**2015-2178**	1424-1649	**621-655**	**628-660**	**707-791**	**1957-2039**	**1966-2052**	1410-1500	**678-711**	**648-697**	**771-807**
2035 with NCRF Project	**2044-2210**	**2049-2074**	1493-1513	622-650	**680-752**	**747-795**	**2173-2239**	**2063-2154**	1515-1733	**629-661**	**623-654**	**716-771**	**2202-2296**	**2077-2219**	1604-1692	**657-673**	**655-708**	**747-794**
2035 with DeWitt Project	**2109-2141**	**2038-2092**	1537-1661	**628-660**	**691-722**	**683-787**	**2214-2281**	**2087-2174**	1447-1645	**606-712**	**666-720**	**730-745**	**2193-2289**	**2094-2152**	1535-1694	**673-685**	**639-682**	**728-782**
2035 with NCRF/DeWitt Project	**2029-2226**	**2026-2124**	1603-1662	**641-685**	**690-736**	**780-816**	**2209-2315**	**2162-2245**	1635-1760	**639-690**	**657-678**	**739-774**	**2156-2287**	**2104-2179**	1517-1648	**632-663**	**654-700**	**715-813**

Notes: ft: feet
- #: Minimum – Maximum 95th queue range in feet
* Capacity for the WBL storage is increased to 650 feet.
EBL: Eastbound left
EBT: Eastbound thru
EBR: Eastbound right
WBL: Westbound left
WBT: Westbound thru
WBR: Westbound right

Cumulative 2035 No Project Condition

Based on the queuing analysis results, during the A.M., Midday, and P.M. peak hours, the eastbound through-lane queues between the SR 99 SPUI and Qantas Lane are estimated to be 86 vehicles, 88 vehicles, and 83 vehicles, respectively. The eastbound left turn queues for the A.M., Midday, and P.M. peak hours are estimated to be 90 vehicles, 94 vehicles, and 82 vehicles, respectively. The eastbound through-lane and left queues exceed the storage capacity of the segment for all peak hours and would likely effect the operation of the Qantas Lane and Arch Road intersection.

The westbound through-lane queues on Arch Road between the SR 99 SPUI and Kingsley Road are estimated to be 26 vehicles for the A.M. peak hour, 27 vehicles for the Midday peak hour, and 29 vehicles for the P.M. peak hour. The westbound right-turn queues are estimated to be 33 vehicles for the A.M. peak hour, 32 vehicles for the Midday peak hour, and 33 vehicles for the P.M. peak hour. The westbound left-turn queues exceed the storage capacity of the segment during the Midday and P.M. peak hours. The westbound through-lane and right-turn queues exceed the storage capacity of the segment during the all peak hours and would likely effect the operation at Kingsley Road.

SR 99 Northbound and Southbound Ramps

During the A.M., Midday, and P.M. peak hours, the northbound off-ramp queues are estimated to be 92 vehicles, 93 vehicles, and 69 vehicles, respectively. The southbound off-ramp queues for the A.M., Midday, and P.M. peak hours are estimated to be 78 vehicles, 88 vehicles, and 92 vehicles, respectively. Both northbound and southbound queues would exceed the storage capacity of the off-ramps for all peak hours and would potentially back up onto the mainline segments of SR 99.

NCRF Only

SR 99 SPUI & Arch Road

Based on the queuing analysis results, during the A.M., Midday, and P.M. peak hours, the eastbound through-lane queues between the SR 99 SPUI and Qantas Lane are estimated to be 88 vehicles, 95 vehicles, and 90 vehicles, respectively. The eastbound left turn queues for the A.M., Midday, and P.M. peak hours are estimated to be 86 vehicles, 92 vehicles, and 90 vehicles, respectively. With the addition of NCRF project traffic, the eastbound through-lane queues increase by 3 vehicles during the A.M. peak hour and 5 vehicles during the Midday peak hour. During the P.M. peak hour, the queue decreases by 2 vehicles. The eastbound left turn queues increase by 2 vehicles during the A.M. peak hour and remain the same for the Midday and P.M. peak hours. The eastbound through-lane and left queues continue to exceed the storage capacity for all peak hours and would likely have an effect on the operation of the Qantas Lane and Arch Road intersection.

The westbound through-lane queues on Arch Road between the SR 99 SPUI and Kingsley Road are estimated to be 24 vehicles for the A.M. peak hour, 24 vehicles for the Midday peak hour, and 26 vehicles for the P.M. peak hour. The westbound right-turn queues are estimated to be 18 vehicles for the A.M. peak hour, 20 vehicles for the Midday peak hour, and 27 vehicles for the P.M. peak hour. Based on the analysis, which balances signal timing along this segment of Arch Road between the various intersections, the westbound through-lane P.M. peak hour queue would be reduced by 1 car, because of changed operating conditions and traffic patterns. The westbound right-turn queues would be reduced and would be accommodated within the storage length.

SR 99 Northbound and Southbound Ramps

During the A.M., Midday, and P.M. peak hours, the northbound off-ramp queues are estimated to be 87 vehicles, 92 vehicles, and 93 vehicles, respectively. The southbound off-ramp queues for the A.M., Midday, and P.M. peak hours are estimated to be 77 vehicles, 90 vehicles, and 92 vehicles, respectively. With the addition of project

traffic the northbound queue would increase by 1 car during the midday peak hour. The queue would be reduced for the A.M. peak hour and remain the same for the P.M. peak hour. With the addition of project traffic the southbound queue would increase by 6 vehicles during the A.M. peak hour and 2 vehicles during the P.M. peak hour. The queue would be reduced for the Midday peak hour. Both northbound and southbound off-ramp queues would continue to exceed the storage capacity of the off-ramps and would potentially back up onto the mainline segments of SR 99.

*Implementation of the NCRF project would result in eastbound through-lane and left queues at the intersection that continue to exceed the storage capacity for all peak hours. Further, both northbound and southbound off-ramp queues would continue to exceed the storage capacity of the off-ramps and would potentially back up onto the mainline segments of SR 99. This would be a **significant** impact. (Impact 4.11-5a)*

Mitigation Measure for Impact 4.11-5a

The following mitigation measures at the intersection of SR 99 SPUI & Arch Road have been identified to improve the operation of the intersection and balance the queue lengths.

- Adjust traffic signal timing to balance queue lengths and delays at the control intersection on Kingsley Road – SR 99 Frontage Road and Arch Road and Qantas Lane and Arch Road so that vehicles do not queue back on to the mainline SR 99 freeway.
- Implement Mitigation Measure for Impact 4.11-4a.

Implementation of this mitigation measure would return vehicle queues to background or better conditions. This impact would be reduced to a less-than-significant level.

Significance after Mitigation

Implementation of mitigation measure for Impact 4.11-5a would reduce the project's impacts to vehicle queues. While feasible mitigation is available, Caltrans is the agency that can and should implement this mitigation. With regard to signal timing, it is unknown whether this improvement would be implemented prior to operation of the project. Further, while Caltrans has identified and is planning for the widening of SR 99 to 10 lanes and construction is projected to begin in 2012, it is unlikely that this improvement could feasibly be implemented prior to operation of the project. Acceleration of the schedule would not be feasible. While this mitigation would reduce the project's impact to this freeway segment once implemented, for purposes of CEQA, this impact is concluded to be ***significant and unavoidable*** in the interim period when the project is operational and the improvement is not complete.

DeWitt Nelson Only

SR 99 SPUI & Arch Road

Based on the queuing analysis results, during the A.M., Midday, and P.M. peak hours the eastbound through-lane queues between the SR 99 SPUI and Qantas Lane are estimated to be 85 vehicles, 95 vehicles, and 90 vehicles, respectively. The eastbound left turn queues for the A.M., Midday, and P.M. peak hours are estimated to be 81 vehicles, 91 vehicles, and 92 vehicles, respectively. With the addition of DeWitt Nelson project traffic, the eastbound through-lane queues would increase by 5 vehicles during the Midday peak hour and remain the same for the A.M. peak hour. The queue would decrease by 2 vehicles during the P.M. peak hour. The eastbound left turn queues would increase by 2 vehicles during the P.M. peak hour and decrease for the Midday and P.M. peak hours. The eastbound through-lane and left queues would continue to exceed the storage capacity for all peak hours and would likely have an effect on the operation of the Qantas Lane and Arch Road intersection.

The westbound through-lane queues on Arch Road between the SR 99 SPUI and Kingsley Road are estimated to be 27 vehicles for the A.M. peak hour, 26 vehicles for the Midday peak hour, and 26 vehicles for the P.M. peak hour. The westbound right-turn queues are estimated to be 25 vehicles for the A.M. peak hour, 21 vehicles for the Midday peak hour, and 25 vehicles for the P.M. peak hour. One vehicle would be added to the westbound though queue which would exceed the storage capacity and would likely effect the operation of Arch Road at Kingsley Road. Westbound right-turn queues would increase by 2 vehicles during the A.M. peak hour and would be reduced during the Midday and P.M. peak hours. The westbound right turn queues would be accommodated within the storage length.

SR 99 Northbound and Southbound Ramps

During the A.M., Midday, and P.M. peak hours, the northbound off-ramp queues are estimated to be 85 vehicles, 90 vehicles, and 93 vehicles, respectively. The southbound off-ramp queues for the A.M., Midday, and P.M. peak hours are estimated to be 82 vehicles, 88 vehicles, and 88 vehicles, respectively. With the addition of project traffic, the northbound queue would decrease because of changed traffic patterns during the A.M. and Midday peak hour and would remain the same for the P.M. peak hour. With the addition of project traffic, the southbound queue would increase by 11 vehicles during the A.M. peak hour. The queue would be reduced for the Midday and P.M. peak hours. Both northbound and southbound off-ramp queues continue to exceed the storage capacity of the off-ramps and would potentially back up onto the mainline segments of SR 99.

Implementation of the DeWitt Nelson project would result in eastbound through-lane and left queues that would continue to exceed the storage capacity for all peak hours and would likely have an effect on the operation of the Qantas Lane and Arch Road intersection. Further, both northbound and southbound off-ramp queues would continue to exceed the storage capacity of the off-ramps and would potentially back up onto the mainline segments of SR 99. This would be a ***significant*** *impact. (Impact 4.11-5b)*

Mitigation Measure for Impact 4.11-5b

The following mitigation measures at the intersection of SR 99 SPUI & Arch Road have been identified to improve the operation of the intersection and balance the queue lengths

- Implement Mitigation Measure for Impact 4.11-5a.

Implementation of this mitigation measure would return vehicle queues to background or better conditions. This Impact would be reduced to a ***less-than-significant*** level.

Significance after Mitigation

Implementation of mitigation measure for Impact 4.11-5a would reduce the project's impacts to vehicle queues. While feasible mitigation is available, Caltrans is the agency that can and should implement this mitigation. With regard to signal timing, it is unknown whether this improvement would be implemented prior to operation of the project. Further, while Caltrans has identified and is planning for the widening of SR 99 to 10 lanes and construction is projected to begin in 2012, it is unlikely that this improvement could feasibly be implemented prior to operation of the project. Acceleration of the schedule would not be feasible. While this mitigation would reduce the project's impact to this freeway segment once implemented, for purposes of CEQA, this impact is concluded to be ***significant and unavoidable*** in the interim period when the project is operational and the improvement is not complete.

Combined NCRF and DeWitt Nelson Facilities

Based on the queuing analysis results, during the A.M., Midday, and P.M. peak hours, the eastbound through-lane queues between the SR 99 SPUI and Qantas Lane are estimated to be 87 vehicles, 92 vehicles, and 93 vehicles, respectively. The eastbound left turn queues for the A.M., Midday, and P.M. peak hours are estimated to be 84 vehicles, 90 vehicles, and 90 vehicles, respectively. With the addition of project traffic, the eastbound through-lane queues would increase by 2 vehicles during the A.M. and Midday peak hours and by 1 car during the P.M. peak hour. The eastbound left turn queues would remain the same for the A.M. and P.M. peak hours and would decreases for the Midday peak hour. The eastbound through-lane and left queues would exceed the storage capacity of the segment for all peak hours and would likely effect the operation of the Qantas Lane and Arch Road operation.

The westbound through-lane queues on Arch Road between the SR 99 SPUI and Kingsley Road are estimated to be 25 vehicles for the A.M. peak hour, 25 vehicles for the Midday peak hour, and 30 vehicles for the P.M. peak hour. The westbound right-turn queues are estimated to be 19 vehicles for the A.M. peak hour, 27 vehicles for the Midday peak hour, and 32 vehicles for the P.M. peak hour. Three vehicles would be added to the westbound through-lane movement during the P.M. peak hour. Based on the queuing analysis results, the westbound through-lane queues would exceed the storage capacity during the P.M. peak hour and would likely have an effect on the operation of Arch Road at Kingsley Road. The westbound right-turn queues would increase by 2 vehicles during the P.M. peak hour and would be reduced during the A.M. and Midday peak hours. The westbound right turn queues would be accommodated within the storage length for the A.M. and Midday peak hours but would exceed the storage capacity during the P.M. peak hour and would likely have an effect on the operation of Arch Road at Kingsley Road.

SR 99 Northbound and Southbound Ramps

During the A.M., Midday, and P.M. peak hours, the northbound off-ramp queues are estimated to be 83 vehicles, 82 vehicles, and 90 vehicles, respectively. The southbound off-ramp queues for the A.M., Midday, and P.M. peak hours are estimated to be 82 vehicles, 88 vehicles, and 92 vehicles, respectively. With the addition of project traffic, the northbound queue would decrease for all peak hours. With the addition of project traffic, the southbound queue would increase by 11 vehicles during the A.M. peak hour and 2 vehicles for the P.M. peak hour. The queue would be reduced for the Midday peak hour. Both northbound and southbound queues would continue to exceed the storage capacity of the off-ramps and would potentially back up onto the mainline segments of SR 99.

Implementation of the NCRF and DeWitt Nelson projects would result in eastbound through-lane and left queues that would continue to exceed the storage capacity for all peak hours and would likely have an effect on the operation of the Qantas Lane and Arch Road intersection. The westbound right turn queues would be accommodated within the storage length for the A.M. and Midday peak hours but would exceed the storage capacity during the P.M. peak hour and would likely have an effect on the operation of Arch Road at Kingsley Road. Further, both northbound and southbound off-ramp queues would continue to exceed the storage capacity of the off-ramps and would potentially back up onto the mainline segments of SR 99. This would be a ***significant*** *impact. (Impact 4.11-5c)*

Mitigation Measure for Impact 4.11-5c

The following mitigation measures at the intersection of SR 99 SPUI & Arch Road have been identified to improve the operation of the intersection and balance the queue lengths.

- Implement Mitigation Measure for Impact ~~4.11-6a~~4.11-5f.

Implementation of this mitigation measure would return vehicle queues to background or better conditions. This Impact would be reduced to a ***less-than-significant*** level.

Significance after Mitigation

Implementation of mitigation measure for Impact 4.11-5a would reduce the project's impacts to vehicle queues. While feasible mitigation is available, Caltrans is the agency that can and should implement this mitigation. With regard to signal timing, it is unknown whether this improvement would be implemented prior to operation of the project. Further, while Caltrans has identified and is planning for the widening of SR 99 to 10 lanes and construction is projected to begin in 2012, it is unlikely that this improvement could feasibly be implemented prior to operation of the project. Acceleration of the schedule would not be feasible. While this mitigation would reduce the project's impact to this freeway segment once implemented, for purposes of CEQA, this impact is concluded to be ***significant and unavoidable*** in the interim period when the project is operational and the improvement is not complete.

Cumulative with NCRF Project

Based on the queuing analysis results, during the A.M., Midday, and P.M. peak hours, the eastbound through-lane queues between the SR 99 SPUI and Qantas Lane are estimated to be 83 vehicles, 87 vehicles, and 89 vehicles, respectively. The eastbound left turn queues for the A.M., Midday, and P.M. peak hours are estimated to be 89 vehicles, 90 vehicles, and 92 vehicles, respectively. With the addition of project traffic, the eastbound through-lane queue would decrease for the A.M. and Midday peak hours and increase by 6 vehicles for the P.M. Peak hour. The eastbound left turn A.M. and Midday peak hour queues would be reduced and 10 vehicles would be added during the P.M. peak hour. The eastbound through-lane and left queues would exceed the storage capacity of the segment for all peak hours and would likely effect the operation of the Qantas Lane and Arch Road intersection.

The westbound through lane queues on Arch Road between the SR 99 SPUI and Kingsley Road are estimated to be 31 vehicles for the A.M. peak hour, 27 vehicles for the Midday peak hour, and 29 vehicles for the P.M. peak hour. The westbound left-turn lane queues on Arch Road between the SR 99 SPUI and Kingsley Road are estimated to be 26 vehicles for the A.M. peak hour, 27 vehicles for the Midday peak hour, and 27 vehicles for the P.M. peak hour. The westbound right-turn queues are estimated to be 32 vehicles for the A.M. peak hour, 31 vehicles for the Midday peak hour, and 32 vehicles for the P.M. peak hour. The westbound through-lane queues would remain the same for the A.M. and Midday peak hours and would increase by 1 vehicle during the P.M. peak hour. Westbound left turn queues would remain the same for the A.M. and Midday peak hours. P.M. peak hour queues would be reduced by 2 vehicles. Westbound right turn queues would be reduced by 1 vehicle for all peak hours. The westbound queues would continue to exceed the storage capacity of the segment and would likely effect operation of Arch Road at Kingsley Road.

SR 99 Northbound and Southbound Ramps

During the A.M., Midday, and P.M. peak hours, the northbound off-ramp queues are estimated to be 88 vehicles, 90 vehicles, and 84 vehicles for the A.M., Midday, and P.M. peak hours, respectively. The southbound off-ramp queues for the A.M., Midday, and P.M. peak hours are estimated to be 84 vehicles, 90 vehicles, and 87 vehicles, respectively. With the addition of project traffic, the northbound queues would be reduced during the A.M. and Midday peak hour but would increase by 15 vehicles during the P.M. peak hour. The southbound queue would increase by 6 vehicles during the A.M. peak hour and 2 vehicles during the Midday peak hour. The P.M. queue would be reduced by 5 vehicles. Both northbound and southbound queues would continue exceed the storage capacity of the off-ramps for all peak hours and would potentially back up onto the mainline segments of SR 99.

Implementation of the NCRF project under cumulative conditions would result in eastbound through-lane and left queues that would continue to exceed the storage capacity for all peak hours and would likely have an effect on the operation of the Qantas Lane and Arch Road intersection. The westbound queues would exceed the storage capacity and would likely have an effect on the operation of Arch Road at Kingsley Road. Further, both northbound and southbound off-ramp queues would continue to exceed the storage capacity of the off-ramps and would potentially back up onto the mainline segments of SR 99.

*This would be a **significant** cumulative impact and the project's contribution would be cumulatively considerable. (Impact 4.11-5d)*

Mitigation Measure for Impact 4.11-5d

No feasible mitigation that is not already planned is available to reduce this impact.

Significance after Mitigation

No feasible mitigation is available to reduce this impact. Therefore, this impact would be ***significant and unavoidable*** and the NCRF project's contribution would be cumulatively considerable.

Cumulative Plus DeWitt Nelson Project

Based on the queuing analysis results, during the A.M., Midday, and P.M. peak hours, the eastbound through-lane queues between the SR 99 SPUI and Qantas Lane are estimated to be 84 vehicles, 87 vehicles, and 87 vehicles, respectively. The eastbound left turn queues for the A.M., Midday, and P.M. peak hours are estimated to be 86 vehicles, 92 vehicles, and 92 vehicles, respectively. With the addition of project traffic, the eastbound through-lane and left turn queues would decrease for the A.M. and Midday peak hours. During the P.M. peak hour, the eastbound through-lane and left turn queues would increase by 4 and 10 vehicles, respectively. The eastbound through-lane and left queues would exceed the storage capacity of the segment for all peak hours and would likely effect the operation of Arch Road at Qantas Lane.

The westbound through lane queues on Arch Road between the SR 99 SPUI and Kingsley Road are estimated to be 29 vehicles for the A.M. peak hour, 29 vehicles for the Midday peak hour, and 28 vehicles for the P.M. peak hour. The westbound left-turn lane queues on Arch Road between the SR 99 SPUI and Kingsley Road are estimated to be 27 vehicles for the A.M. peak hour, 29 vehicles for the Midday peak hour, and 28 vehicles for the P.M. peak hour. The westbound right-turn queues are estimated to be 32 vehicles for the A.M. peak hour, 30 vehicles for the Midday peak hour, and 32 vehicles for the P.M. peak hour. The westbound through-lane queues increases by 2 vehicles for the A.M. and Midday peak hours and remains the same for the P.M. peak hour. Westbound left turn would queues increase by 1 vehicle for the A.M. and P.M. peak hours and by 2 vehicles during the Midday peak hour. Westbound right turn queues are reduced by for all peak hours. The westbound queues would continue to exceed the storage capacity of the segment and would likely effect operation of Arch Road at Kingsley Road.

SR 99 Northbound and Southbound Ramps

During the A.M., Midday, and P.M. peak hours, the northbound off-ramp queues are estimated to be 89 vehicles, 94 vehicles, and 122 vehicles, respectively. The southbound off-ramp queues for the A.M., Midday, and P.M. peak hours are estimated to be 78 vehicles, 88 vehicles, and 87 vehicles, respectively. With the addition of project traffic, the northbound queues would be reduced during the A.M. and Midday peak hour but the P.M. peak hour queue would increase by 53 vehicles. The southbound queue would remain the same for the A.M. and Midday peak hours and would be reduce for the P.M. peak hour. Both northbound and southbound queues would continue to exceed the storage capacity of the off-ramps for all peak hours and would potentially back up onto the mainline segments of SR 99.

Implementation of the DeWitt Nelson project under cumulative conditions would result in eastbound through-lane and left queues that would continue to exceed the storage capacity for all peak hours and would likely have an effect on the operation of the Qantas Lane and Arch Road intersection. The westbound queues would be accommodated would exceed the storage capacity and would likely have an effect on the operation of Arch Road at Kingsley Road. Further, both northbound and southbound off-ramp queues would continue to exceed the storage capacity of the off-ramps and would potentially back up

onto the mainline segments of SR 99. This would be a ***significant*** *cumulative impact and the project's contribution would be cumulatively considerable. (Impact 4.11-5e)*

Mitigation Measure for Impact 4.11-5e

No feasible mitigation that is not already planned is available to reduce this impact.

Significance after Mitigation

No feasible mitigation is available to reduce this impact. Therefore, this impact would be ***significant and unavoidable*** and the NCRF project's contribution would be cumulatively considerable.

Cumulative Plus Combined NCRF and DeWitt Nelson Facilities

Based on the queuing analysis results, during the 2035 with Project 1+2 Condition A.M., Midday, and P.M. peak hours the eastbound through-lane queues between the SR 99 SPUI and Qantas Lane are estimated to be 85 vehicles, 90 vehicles, and 88 vehicles, respectively. The eastbound left turn queues for the A.M., Midday, and P.M. peak hours are estimated to be 89 vehicles, 83 vehicles, and 92 vehicles, respectively. With the addition of project traffic, the eastbound through-lane would increase by 2 and 5 vehicles for the Midday and P.M. peak hours, respectively. The queues would decrease for the A.M. peak hour. The eastbound left turn would queues decrease for the A.M. and Midday peak hours and increases by 10 vehicles for the P.M. peak hour. The eastbound through-lane and left queues would exceed the storage capacity of the segment for all peak hours and would likely effect the operation at Qantas Lane.

The westbound through lane queues on Arch Road between the SR 99 SPUI and Kingsley Road are estimated to be 30 vehicles for the A.M. peak hour, 28 vehicles for the Midday peak hour, and 28 vehicles for the P.M. peak hour. The westbound left-turn lane queues on Arch Road between the SR 99 SPUI and Kingsley Road are estimated to be 28 vehicles for the A.M. peak hour, 28 vehicles for the Midday peak hour, and 27 vehicles for the P.M. peak hour. The westbound right-turn queues are estimated to be 33 vehicles for the A.M. peak hour, 31 vehicles for the Midday peak hour, and 33 vehicles for the P.M. peak hour. The westbound through-lane movement queues would decrease by for the A.M. peak hour and would remain the same for the P.M. peak hour. The Midday queue would increase by 1 car. The westbound left turn queues would increase by 2 vehicles for the A.M. and by 2 vehicles during the Midday peak hour while the P.M. queue would be reduced. The westbound right turn queues would remain the same for the A.M. and P.M. peak hours. The Midday peak hour queue would be reduced. The westbound queues would continue to exceed the storage capacity of the segment and would likely effect the operation of Arch Road at Kingsley Road.

SR 99 Northbound and Southbound Ramps

During the A.M., Midday, and P.M. peak hours, the northbound off-ramp queues are estimated to be 91 vehicles, 94 vehicles, and 88 vehicles, respectively. The southbound off-ramp queues for the A.M., Midday, and P.M. peak hours are estimated to be 78 vehicles, 89 vehicles, and 88 vehicles, respectively. With the addition of project traffic, the northbound queues would be reduced during the A.M. peak hour but would increase by 1 vehicle during the Midday peak hour and 19 vehicles during peak hour. The southbound queue would be remain the same for the A.M. peak hour and would be reduce for the P.M. peak hour. One vehicle would be added to the queue for the Midday peak hour. Both northbound and southbound queues would continue to exceed the storage capacity of the off-ramps for all peak hours and would potentially back up onto the mainline segments of SR 99.

Implementation of the NCRF and DeWitt Nelson projects under cumulative conditions would result in eastbound through-lane and left queues that would continue to exceed the storage capacity for all peak hours and would likely have an effect on the operation of the Qantas Lane and Arch Road intersection. The westbound queues would be accommodated would exceed the

storage capacity and would likely have an effect on the operation of Arch Road at Kingsley Road. Further, both northbound and southbound off-ramp queues would continue to exceed the storage capacity of the off-ramps and would potentially back up onto the mainline segments of SR 99. This would be a ***significant*** *cumulative impact and the project's contribution would be cumulatively considerable. (Impact 4.11-5f)*

Mitigation Measure for Impact 4.11-5f

No feasible mitigation that is not already planned is available to reduce this impact.

Significance after Mitigation

No feasible mitigation is available to reduce this impact. Therefore, this impact would be ***significant and unavoidable*** and the NCRF and DeWitt Nelson project's contribution would be cumulatively considerable.

ATTACHMENT A

CITY OF STOCKTON

INTERSECTION ANALYSIS – SYNCHRO MODEL OUTPUT

Existing LOS Worksheets

Movement	EBL	EBT	WBL	WBT	SEL	NWL
Lane Configurations						
Volume (vph)	176	167	95	187	282	253
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	2.6	2.6
Lane Util. Factor	0.97	0.95	0.97	0.95	0.97	0.97
Frt	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	0.95	1.00	0.95	0.95
Satd. Flow (prot)	3367	3167	3045	3343	3019	3099
Flt Permitted	0.95	1.00	0.95	1.00	0.95	0.95
Satd. Flow (perm)	3367	3167	3045	3343	3019	3099
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	191	182	103	203	307	275
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	191	182	103	203	307	275
Heavy Vehicles (%)	4%	14%	15%	8%	16%	13%
Turn Type	Prot		Prot		custom	custom
Protected Phases	5	2	1	6		3
Permitted Phases					7	3
Actuated Green, G (s)	8.2	12.2	5.8	9.8	9.6	9.6
Effective Green, g (s)	11.2	15.2	8.8	12.8	12.6	12.6
Actuated g/C Ratio	0.24	0.33	0.19	0.28	0.27	0.27
Clearance Time (s)	5.6	7.3	5.6	7.3	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5	2.5	2.5
Lane Grp Cap (vph)	818	1044	581	928	825	847
v/s Ratio Prot	c0.06	0.06	0.03	c0.06		0.09
v/s Ratio Perm					c0.10	
v/c Ratio	0.23	0.17	0.18	0.22	0.37	0.32
Uniform Delay, d1	14.0	11.0	15.6	12.8	13.6	13.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.1	0.1	0.1	0.2	0.2
Delay (s)	14.2	11.0	15.8	12.9	13.8	13.5
Level of Service	B	B	B	B	B	B
Approach Delay (s)		12.6		13.9		
Approach LOS		B		B		

Intersection Summary			
HCM Average Control Delay	13.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	46.1	Sum of lost time (s)	9.5
Intersection Capacity Utilization	30.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	449	0	0	282	0	183
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	488	0	0	307	0	199
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	196			488		
pX, platoon unblocked			0.95		0.95	0.95
vC, conflicting volume			488		565	244
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			360		441	104
tC, single (s)			4.1		6.8	7.4
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.5
p0 queue free %			100		100	76
cM capacity (veh/h)			1137		519	820

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	WB 4	NB 1
Volume Total	244	244	77	77	77	77	199
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	199
cSH	1700	1700	1700	1700	1700	1700	820
Volume to Capacity	0.14	0.14	0.05	0.05	0.05	0.05	0.24
Queue Length 95th (ft)	0	0	0	0	0	0	24
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.8
Lane LOS							B
Approach Delay (s)	0.0		0.0				10.8
Approach LOS							B

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	30.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	231	303	115	13	139	16	117	14	49	22	19	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.98		1.00	0.88		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	3046		1641	3847		1703	1645		1289	1586	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	3046		1641	3847		1703	1645		1289	1586	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	251	329	125	14	151	17	127	15	53	24	21	161
RTOR Reduction (vph)	0	27	0	0	13	0	0	41	0	0	143	0
Lane Group Flow (vph)	251	427	0	14	155	0	127	27	0	24	39	0
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	17.3	23.4		1.8	7.9		9.9	14.2		2.5	6.8	
Effective Green, g (s)	17.3	23.4		1.8	7.9		9.9	14.2		2.5	6.8	
Actuated g/C Ratio	0.29	0.39		0.03	0.13		0.16	0.23		0.04	0.11	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	478	1178		49	502		279	386		53	178	
v/s Ratio Prot	c0.15	c0.14		0.01	0.04		c0.07	0.02		0.02	c0.02	
v/s Ratio Perm												
v/c Ratio	0.53	0.36		0.29	0.31		0.46	0.07		0.45	0.22	
Uniform Delay, d1	18.1	13.2		28.7	23.8		22.9	18.0		28.3	24.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.1		1.2	0.3		0.4	0.0		2.2	0.2	
Delay (s)	18.6	13.4		29.9	24.1		23.3	18.0		30.6	24.7	
Level of Service	B	B		C	C		C	B		C	C	
Approach Delay (s)		15.2			24.5			21.5			25.3	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM Average Control Delay	19.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	60.5	Sum of lost time (s)	18.6
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	61	213	19	68	1	18	0	4	0	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0	6.0		5.0				5.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00				1.00
Frt	1.00	0.88		1.00	1.00	0.85		0.98				0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96				1.00
Satd. Flow (prot)	1492	1387		1492	1570	1335		1474				1335
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.85				1.00
Satd. Flow (perm)	1492	1387		1492	1570	1335		1301				1335
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	66	232	21	74	1	20	0	4	0	0	5
RTOR Reduction (vph)	0	82	0	0	0	0	0	3	0	0	0	4
Lane Group Flow (vph)	11	216	0	21	74	1	0	21	0	0	0	1
Heavy Vehicles (%)	21%	21%	21%	21%	21%	21%	21%	21%	21%	21%	21%	21%
Turn Type	Prot			Prot		Perm	Perm			Perm		Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases						2	4			8		8
Actuated Green, G (s)	1.2	49.1		2.7	50.6	50.6		24.1				24.1
Effective Green, g (s)	1.2	49.1		2.7	50.6	50.6		24.1				24.1
Actuated g/C Ratio	0.01	0.53		0.03	0.55	0.55		0.26				0.26
Clearance Time (s)	5.0	6.0		5.0	6.0	6.0		5.0				5.0
Vehicle Extension (s)	2.0	6.0		2.0	6.0	6.0		2.0				2.0
Lane Grp Cap (vph)	19	741		44	864	735		341				350
v/s Ratio Prot	0.01	c0.16		c0.01	0.05							
v/s Ratio Perm						0.00		c0.02				0.00
v/c Ratio	0.58	0.29		0.48	0.09	0.00		0.06				0.00
Uniform Delay, d1	45.1	11.8		43.9	9.7	9.3		25.4				25.0
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00				1.00
Incremental Delay, d2	23.8	1.0		3.0	0.2	0.0		0.3				0.0
Delay (s)	68.9	12.8		46.9	9.9	9.3		25.8				25.0
Level of Service	E	B		D	A	A		C				C
Approach Delay (s)		14.8			18.0			25.8			25.0	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	16.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	91.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	28.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	5	48	105	0	0	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	52	114	0	0	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	114				177	114
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	114				177	114
tC, single (s)	4.3				6.6	6.4
tC, 2 stage (s)						
tF (s)	2.4				3.7	3.5
p0 queue free %	100				100	100
cM capacity (veh/h)	1365				768	889

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	5	52	114	3
Volume Left	5	0	0	0
Volume Right	0	0	0	3
cSH	1365	1700	1700	889
Volume to Capacity	0.00	0.03	0.07	0.00
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	7.6	0.0	0.0	9.1
Lane LOS	A			A
Approach Delay (s)	0.7		0.0	9.1
Approach LOS				A

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	15.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	76	0	0	83	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	83	0	0	90	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			83		128	41
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			83		128	41
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1513		854	1021

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	55	28	30	60	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1513	1700	1700
Volume to Capacity	0.03	0.02	0.00	0.04	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	76	0	0	83	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	83	0	0	90	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			83		128	41
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			83		128	41
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1513		854	1021

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	55	28	0	45	45	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.03	0.02	0.00	0.03	0.03	0.00
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A
Approach Delay (s)	0.0		0.0			0.0
Approach LOS						A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #8 Austin/Arch

Cycle (sec):	100	Critical Vol./Cap.(X):	0.105
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	7.9
Optimal Cycle:	0	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L - T - R			L - T - R			L - T - R			L - T - R		
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 1 0 0 1			0 0 1! 0 0			1 0 1 0 1			0 1 0 0 1		
Volume Module:												
Base Vol:	16	30	4	9	33	40	23	27	24	0	25	3
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	16	30	4	9	33	40	23	27	24	0	25	3
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	16	30	4	9	33	40	23	27	24	0	25	3
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	16	30	4	9	33	40	23	27	24	0	25	3
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	16	30	4	9	33	40	23	27	24	0	25	3
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.35	0.65	1.00	0.11	0.40	0.49	1.00	1.00	1.00	0.00	1.00	1.00
Final Sat.:	247	462	855	85	313	380	650	715	831	0	718	835
Capacity Analysis Module:												
Vol/Sat:	0.06	0.06	0.00	0.11	0.11	0.11	0.04	0.04	0.03	xxxx	0.03	0.00
Crit Moves:	****					****		****			****	
Delay/Veh:	8.0	8.0	6.8	8.0	8.0	8.0	8.3	7.8	7.0	0.0	7.7	6.9
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	8.0	8.0	6.8	8.0	8.0	8.0	8.3	7.8	7.0	0.0	7.7	6.9
LOS by Move:	A	A	A	A	A	A	A	A	A	*	A	A
ApproachDel:	7.9			8.0			7.7			7.6		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	7.9			8.0			7.7			7.6		
LOS by Appr:	A			A			A			A		
AllWayAvgQ:	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0

Note: Queue reported is the number of cars per lane.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	50	57	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	54	62	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	116	62	62			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	116	62	62			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	880	1003	1541			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	0	0	54	62
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.03	0.04
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.0	0.0		0.0
Approach LOS	A			

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBL	WBT	SEL	NWL
Lane Configurations						
Volume (vph)	216	245	182	224	142	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	2.6	2.6
Lane Util. Factor	0.97	0.95	0.97	0.95	0.97	0.97
Frt	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	0.95	1.00	0.95	0.95
Satd. Flow (prot)	3367	3167	3045	3343	3019	3099
Flt Permitted	0.95	1.00	0.95	1.00	0.95	0.95
Satd. Flow (perm)	3367	3167	3045	3343	3019	3099
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	235	266	198	243	154	95
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	235	266	198	243	154	95
Heavy Vehicles (%)	4%	14%	15%	8%	16%	13%
Turn Type	Prot		Prot		custom	custom
Protected Phases	5	2	1	6		3
Permitted Phases					7	3
Actuated Green, G (s)	8.6	9.2	8.4	9.0	7.3	7.3
Effective Green, g (s)	11.6	12.2	11.4	12.0	10.3	10.3
Actuated g/C Ratio	0.27	0.28	0.26	0.28	0.24	0.24
Clearance Time (s)	5.6	7.3	5.6	7.3	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5	2.5	2.5
Lane Grp Cap (vph)	900	890	800	924	716	735
v/s Ratio Prot	c0.07	c0.08	0.07	0.07		0.03
v/s Ratio Perm					c0.05	
v/c Ratio	0.26	0.30	0.25	0.26	0.22	0.13
Uniform Delay, d1	12.5	12.2	12.6	12.2	13.3	13.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1	0.2	0.1	0.1	0.1
Delay (s)	12.7	12.4	12.8	12.4	13.4	13.1
Level of Service	B	B	B	B	B	B
Approach Delay (s)		12.5		12.5		
Approach LOS		B		B		

Intersection Summary			
HCM Average Control Delay	12.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	43.4	Sum of lost time (s)	5.2
Intersection Capacity Utilization	27.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	387	0	0	406	0	152
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	421	0	0	441	0	165
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	196			488		
pX, platoon unblocked			0.97		0.97	0.97
vC, conflicting volume			421		531	210
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			338		452	121
tC, single (s)			4.1		6.8	7.4
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.5
p0 queue free %			100		100	80
cM capacity (veh/h)			1180		519	813

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	WB 4	NB 1
Volume Total	210	210	110	110	110	110	165
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	165
cSH	1700	1700	1700	1700	1700	1700	813
Volume to Capacity	0.12	0.12	0.06	0.06	0.06	0.06	0.20
Queue Length 95th (ft)	0	0	0	0	0	0	19
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.6
Lane LOS							B
Approach Delay (s)	0.0		0.0				10.6
Approach LOS							B

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	26.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	131	153	124	20	256	30	137	26	22	14	20	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.98		1.00	0.93		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	2986		1641	3848		1703	1734		1289	1584	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	2986		1641	3848		1703	1734		1289	1584	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	142	166	135	22	278	33	149	28	24	15	22	195
RTOR Reduction (vph)	0	94	0	0	13	0	0	17	0	0	172	0
Lane Group Flow (vph)	142	207	0	22	298	0	149	35	0	15	45	0
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	10.2	17.9		2.2	9.9		13.9	18.1		2.7	6.9	
Effective Green, g (s)	10.2	17.9		2.2	9.9		13.9	18.1		2.7	6.9	
Actuated g/C Ratio	0.17	0.30		0.04	0.17		0.23	0.30		0.05	0.12	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	286	898		61	640		398	527		58	184	
v/s Ratio Prot	c0.08	0.07		0.01	c0.08		c0.09	0.02		0.01	c0.03	
v/s Ratio Perm												
v/c Ratio	0.50	0.23		0.36	0.47		0.37	0.07		0.26	0.24	
Uniform Delay, d1	22.3	15.6		28.0	22.4		19.1	14.7		27.4	23.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.1		1.3	0.4		0.2	0.0		0.9	0.3	
Delay (s)	22.8	15.7		29.3	22.8		19.4	14.7		28.3	24.2	
Level of Service	C	B		C	C		B	B		C	C	
Approach Delay (s)		18.0			23.2			18.2			24.4	
Approach LOS		B			C			B			C	

Intersection Summary			
HCM Average Control Delay	20.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	59.5	Sum of lost time (s)	18.6
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	74	12	3	85	6	99	0	13	0	0	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0	6.0		5.0				5.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00				1.00
Frt	1.00	0.98		1.00	1.00	0.85		0.98				0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96				1.00
Satd. Flow (prot)	1649	1700		1649	1736	1476		1637				1476
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.75				1.00
Satd. Flow (perm)	1649	1700		1649	1736	1476		1282				1476
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	80	13	3	92	7	108	0	14	0	0	40
RTOR Reduction (vph)	0	4	0	0	0	3	0	4	0	0	0	29
Lane Group Flow (vph)	12	89	0	3	92	4	0	118	0	0	0	11
Bus Blockages (#/hr)	17	17	17	17	17	17	17	17	17	17	17	17
Turn Type	Prot			Prot		Perm	Perm			Perm		Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases						2	4			8		8
Actuated Green, G (s)	1.2	48.3		1.0	48.1	48.1		24.1				24.1
Effective Green, g (s)	1.2	48.3		1.0	48.1	48.1		24.1				24.1
Actuated g/C Ratio	0.01	0.54		0.01	0.54	0.54		0.27				0.27
Clearance Time (s)	5.0	6.0		5.0	6.0	6.0		5.0				5.0
Vehicle Extension (s)	2.0	6.0		2.0	6.0	6.0		2.0				2.0
Lane Grp Cap (vph)	22	918		18	934	794		346				398
v/s Ratio Prot	c0.01	0.05		0.00	c0.05							
v/s Ratio Perm						0.00		c0.09				0.01
v/c Ratio	0.55	0.10		0.17	0.10	0.00		0.34				0.03
Uniform Delay, d1	43.8	10.0		43.8	10.1	9.6		26.3				24.0
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00				1.00
Incremental Delay, d2	14.0	0.2		1.6	0.2	0.0		2.7				0.0
Delay (s)	57.8	10.2		45.4	10.3	9.6		29.0				24.0
Level of Service	E	B		D	B	A		C				C
Approach Delay (s)		15.6			11.3			29.0			24.0	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	19.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	89.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	27.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	1	91	90	0	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0		5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	
Frt	1.00	1.00	1.00		0.86	
Flt Protected	0.95	1.00	1.00		1.00	
Satd. Flow (prot)	1543	1624	1624		1405	
Flt Permitted	0.95	1.00	1.00		1.00	
Satd. Flow (perm)	1543	1624	1624		1405	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	99	98	0	0	2
RTOR Reduction (vph)	0	0	0	0	2	0
Lane Group Flow (vph)	1	99	98	0	0	0
Heavy Vehicles (%)	17%	17%	17%	17%	17%	17%
Turn Type	Prot					
Protected Phases	7	4	8		6	
Permitted Phases						
Actuated Green, G (s)	1.2	115.9	109.7		1.1	
Effective Green, g (s)	1.2	115.9	109.7		1.1	
Actuated g/C Ratio	0.01	0.91	0.86		0.01	
Clearance Time (s)	5.0	6.0	6.0		5.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	14	1470	1392		12	
v/s Ratio Prot	0.00	c0.06	c0.06		c0.00	
v/s Ratio Perm						
v/c Ratio	0.07	0.07	0.07		0.00	
Uniform Delay, d1	62.8	0.6	1.4		62.9	
Progression Factor	1.00	1.00	1.00		1.00	
Incremental Delay, d2	2.2	0.1	0.1		0.0	
Delay (s)	65.0	0.7	1.5		63.0	
Level of Service	E	A	A		E	
Approach Delay (s)		1.3	1.5		63.0	
Approach LOS		A	A		E	

Intersection Summary			
HCM Average Control Delay	2.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.07		
Actuated Cycle Length (s)	128.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	17.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	91	0	0	92	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	99	0	0	100	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			99		149	49
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			99		149	49
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1492		828	1008

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	66	33	33	67	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1492	1700	1700
Volume to Capacity	0.04	0.02	0.00	0.04	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	91	0	0	91	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	99	0	0	99	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			99		148	49
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			99		148	49
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1492		829	1008

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	66	33	0	49	49	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.04	0.02	0.00	0.03	0.03	0.00
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A
Approach Delay (s)	0.0		0.0			0.0
Approach LOS						A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #8 Austin/Arch

Cycle (sec):	100	Critical Vol./Cap.(X):	0.072
Loss Time (sec):	0 (Y+R=4.0 sec)	Average Delay (sec/veh):	7.9
Optimal Cycle:	0	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L -	T -	R	L -	T -	R	L -	T -	R	L -	T -	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 1	0 0	1	0 0	1! 0	0	1 0	1 0	1	0 1	0 0	1
Volume Module:												
Base Vol:	19	30	2	13	16	24	28	45	22	3	47	23
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	19	30	2	13	16	24	28	45	22	3	47	23
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	19	30	2	13	16	24	28	45	22	3	47	23
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	19	30	2	13	16	24	28	45	22	3	47	23
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	19	30	2	13	16	24	28	45	22	3	47	23
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.39	0.61	1.00	0.25	0.30	0.45	1.00	1.00	1.00	0.06	0.94	1.00
Final Sat.:	264	417	818	181	223	334	650	715	830	43	679	847
Capacity Analysis Module:												
Vol/Sat:	0.07	0.07	0.00	0.07	0.07	0.07	0.04	0.06	0.03	0.07	0.07	0.03
Crit Moves:		****			****			****			****	
Delay/Veh:	8.2	8.2	6.9	8.1	8.1	8.1	8.4	7.9	7.0	7.9	7.9	6.9
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	8.2	8.2	6.9	8.1	8.1	8.1	8.4	7.9	7.0	7.9	7.9	6.9
LOS by Move:	A	A	A	A	A	A	A	A	A	A	A	A
ApproachDel:		8.2			8.1			7.9			7.6	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		8.2			8.1			7.9			7.6	
LOS by Appr:		A			A			A			A	
AllWayAvgQ:	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.0

Note: Queue reported is the number of cars per lane.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	51	41	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	55	45	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	100	45	45			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	100	45	45			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	899	1025	1564			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	0	0	55	45
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.03	0.03
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.0	0.0		0.0
Approach LOS	A			

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBL	WBT	SEL	NWL
Lane Configurations						
Volume (vph)	416	200	212	136	143	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	2.6	2.6
Lane Util. Factor	0.97	0.95	0.97	0.95	0.97	0.97
Frt	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	0.95	1.00	0.95	0.95
Satd. Flow (prot)	3367	3167	3045	3343	3019	3099
Flt Permitted	0.95	1.00	0.95	1.00	0.95	0.95
Satd. Flow (perm)	3367	3167	3045	3343	3019	3099
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	452	217	230	148	155	147
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	452	217	230	148	155	147
Heavy Vehicles (%)	4%	14%	15%	8%	16%	13%
Turn Type	Prot		Prot		custom	custom
Protected Phases	5	2	1	6		3
Permitted Phases					7	3
Actuated Green, G (s)	11.5	10.8	9.0	8.3	7.5	7.5
Effective Green, g (s)	14.5	13.8	12.0	11.3	10.5	10.5
Actuated g/C Ratio	0.32	0.30	0.26	0.25	0.23	0.23
Clearance Time (s)	5.6	7.3	5.6	7.3	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5	2.5	2.5
Lane Grp Cap (vph)	1066	954	798	825	692	710
v/s Ratio Prot	c0.13	c0.07	0.08	0.04		0.05
v/s Ratio Perm					c0.05	
v/c Ratio	0.42	0.23	0.29	0.18	0.22	0.21
Uniform Delay, d1	12.4	12.0	13.5	13.6	14.3	14.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.1	0.2	0.1	0.1	0.1
Delay (s)	12.6	12.1	13.7	13.7	14.5	14.4
Level of Service	B	B	B	B	B	B
Approach Delay (s)		12.5		13.7		
Approach LOS		B		B		

Intersection Summary			
HCM Average Control Delay	13.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	45.8	Sum of lost time (s)	5.2
Intersection Capacity Utilization	33.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	343	0	0	354	0	120
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	373	0	0	385	0	130
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	196			488		
pX, platoon unblocked			0.99		0.99	0.99
vC, conflicting volume			373		469	186
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			337		434	148
tC, single (s)			4.1		6.8	7.4
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.5
p0 queue free %			100		100	84
cM capacity (veh/h)			1203		543	794

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	WB 4	NB 1
Volume Total	186	186	96	96	96	96	130
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	130
cSH	1700	1700	1700	1700	1700	1700	794
Volume to Capacity	0.11	0.11	0.06	0.06	0.06	0.06	0.16
Queue Length 95th (ft)	0	0	0	0	0	0	15
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	10.4
Lane LOS							B
Approach Delay (s)	0.0		0.0				10.4
Approach LOS							B

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	23.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	156	171	128	16	266	24	128	29	10	16	28	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Lane Util. Factor	1.00	0.95		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.99		1.00	0.96		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	2993		1641	3846		1703	1791		1289	1587	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	2993		1641	3846		1703	1791		1289	1587	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	170	186	139	17	289	26	139	32	11	17	30	214
RTOR Reduction (vph)	0	88	0	0	10	0	0	8	0	0	188	0
Lane Group Flow (vph)	170	237	0	17	305	0	139	35	0	17	56	0
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	14.7	22.6		2.4	10.3		10.3	14.8		2.8	7.3	
Effective Green, g (s)	14.7	22.6		2.4	10.3		10.3	14.8		2.8	7.3	
Actuated g/C Ratio	0.24	0.37		0.04	0.17		0.17	0.24		0.05	0.12	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	401	1105		64	647		287	433		59	189	
v/s Ratio Prot	c0.10	0.08		0.01	c0.08		c0.08	0.02		0.01	c0.03	
v/s Ratio Perm												
v/c Ratio	0.42	0.21		0.27	0.47		0.48	0.08		0.29	0.29	
Uniform Delay, d1	19.7	13.2		28.5	23.0		23.0	17.9		28.2	24.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.1		0.8	0.4		0.5	0.0		1.0	0.3	
Delay (s)	19.9	13.3		29.4	23.4		23.5	18.0		29.2	24.9	
Level of Service	B	B		C	C		C	B		C	C	
Approach Delay (s)		15.6			23.7			22.2			25.2	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM Average Control Delay	20.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	61.2	Sum of lost time (s)	18.6
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	101	16	0	63	0	118	0	15	0	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			5.0				5.0
Lane Util. Factor		1.00			1.00			1.00				1.00
Frt		0.98			1.00			0.98				0.85
Flt Protected		1.00			1.00			0.96				1.00
Satd. Flow (prot)		1591			1624			1532				1380
Flt Permitted		1.00			1.00			0.75				1.00
Satd. Flow (perm)		1591			1624			1198				1380
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	110	17	0	68	0	128	0	16	0	0	2
RTOR Reduction (vph)	0	3	0	0	0	0	0	4	0	0	0	1
Lane Group Flow (vph)	0	124	0	0	68	0	0	140	0	0	0	1
Heavy Vehicles (%)	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%	17%
Turn Type	Prot			Prot		Perm	Perm			Perm		Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases						2	4			8		8
Actuated Green, G (s)		48.0			48.0			24.0				24.0
Effective Green, g (s)		48.0			48.0			24.0				24.0
Actuated g/C Ratio		0.58			0.58			0.29				0.29
Clearance Time (s)		6.0			6.0			5.0				5.0
Vehicle Extension (s)		6.0			6.0			2.0				2.0
Lane Grp Cap (vph)		920			939			346				399
v/s Ratio Prot		c0.08			0.04							
v/s Ratio Perm								c0.12				0.00
v/c Ratio		0.13			0.07			0.41				0.00
Uniform Delay, d1		8.0			7.7			23.8				21.0
Progression Factor		1.00			1.00			1.00				1.00
Incremental Delay, d2		0.3			0.1			3.5				0.0
Delay (s)		8.3			7.9			27.3				21.0
Level of Service		A			A			C				C
Approach Delay (s)		8.3			7.9			27.3			21.0	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM Average Control Delay	16.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	83.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	27.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	121	83	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	132	90	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	90				222	90
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	90				222	90
tC, single (s)	4.3				6.6	6.4
tC, 2 stage (s)						
tF (s)	2.4				3.7	3.5
p0 queue free %	100				100	100
cM capacity (veh/h)	1416				734	928

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	0	132	90	0
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.00	0.08	0.05	0.00
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				A
Approach Delay (s)	0.0		0.0	0.0
Approach LOS				A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	9.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	119	0	0	68	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	129	0	0	74	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			129		166	65
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			129		166	65
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1454		808	986

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	86	43	25	49	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1454	1700	1700
Volume to Capacity	0.05	0.03	0.00	0.03	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	119	0	0	68	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	129	0	0	74	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			129		166	65
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			129		166	65
tC, single (s)			4.1		7.1	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1454		767	986

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	86	43	0	37	37	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.05	0.03	0.00	0.02	0.02	0.00
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A
Approach Delay (s)	0.0		0.0			0.0
Approach LOS						A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

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------------------------------------------------------------------------------
------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM 4-Way Stop Method (Base Volume Alternative)
******************************************************************************
Intersection #8 Austin/Arch
******************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.076
Loss Time (sec):       0 (Y+R=4.0 sec)  Average Delay (sec/veh):         7.8
Optimal Cycle:         0                Level Of Service:                  A
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        0  1  0  0  1    0  0  1! 0  0    1  0  1  0  1    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      12   25     1     6   14    16    51   42    25     2   39    18
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   12   25     1     6   14    16    51   42    25     2   39    18
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    12   25     1     6   14    16    51   42    25     2   39    18
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   12   25     1     6   14    16    51   42    25     2   39    18
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   12   25     1     6   14    16    51   42    25     2   39    18
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.32 0.68  1.00  0.17 0.39  0.44  1.00 1.00  1.00  0.05 0.95  1.00
Final Sat.:   222  462   816   123  287   327   668  735   858    36  699   863
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.05 0.05  0.00  0.05 0.05  0.05  0.08 0.06  0.03  0.06 0.06  0.02
Crit Moves:        ****        ****              ****                  ****
Delay/Veh:    8.1  8.1   6.9   8.0  8.0   8.0   8.4  7.8   6.9   7.8  7.8   6.9
Delay Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   8.1  8.1   6.9   8.0  8.0   8.0   8.4  7.8   6.9   7.8  7.8   6.9
LOS by Move:   A    A     A     A    A     A     A    A     A     A    A     A
ApproachDel:       8.1              8.0              7.9              7.5
Delay Adj:        1.00             1.00             1.00             1.00
ApprAdjDel:        8.1              8.0              7.9              7.5
LOS by Appr:        A                A                A                A
AllWayAvgQ:   0.1  0.1   0.0   0.0  0.0   0.0   0.1  0.1   0.0   0.1  0.1   0.0
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	38	41	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	41	45	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	86	45	45			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	86	45	45			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	915	1025	1564			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	0	0	41	45
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.02	0.03
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS	A			
Approach Delay (s)	0.0	0.0		0.0
Approach LOS	A			

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	6.7%	ICU Level of Service	A
Analysis Period (min)	15		

Background LOS Worksheets

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	335	998	258	1074	775	1623	818	502
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	364	1085	280	1167	842	1764	889	546
RTOR Reduction (vph)	0	0	0	0	0	0	0	2
Lane Group Flow (vph)	364	1085	280	1167	842	1764	889	544
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	14.7	22.7	21.4	29.4	90.0	27.4	27.4	21.4
Effective Green, g (s)	17.7	25.7	24.4	32.4	90.0	30.4	30.4	21.4
Actuated g/C Ratio	0.20	0.29	0.27	0.36	1.00	0.34	0.34	0.24
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	662	904	826	1203	1583	1020	1047	376
v/s Ratio Prot	0.11	c0.34	0.09	0.35			0.29	c0.34
v/s Ratio Perm					0.53	c0.58		
v/c Ratio	0.55	1.20	0.34	0.97	0.53	1.73	0.85	1.45
Uniform Delay, d1	32.6	32.1	26.3	28.3	0.0	29.8	27.7	34.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	100.8	0.2	19.1	1.3	332.4	6.5	215.2
Delay (s)	33.5	132.9	26.6	47.4	1.3	362.2	34.1	249.5
Level of Service	C	F	C	D	A	F	C	F
Approach Delay (s)		107.9		27.9				
Approach LOS		F		C				

Intersection Summary			
HCM Average Control Delay	147.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.48		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	116.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	314	2817	8	13	1846	16	117	14	49	22	19	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.88		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	4509		1641	3843		1703	1645		1289	1586	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	4509		1641	3843		1703	1645		1289	1586	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	341	3062	9	14	2007	17	127	15	53	24	21	161
RTOR Reduction (vph)	0	0	0	0	1	0	0	46	0	0	145	0
Lane Group Flow (vph)	341	3071	0	14	2023	0	127	22	0	24	37	0
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	19.3	62.8		0.9	44.4		6.0	13.0		2.7	9.7	
Effective Green, g (s)	19.3	62.8		0.9	44.4		6.0	13.0		2.7	9.7	
Actuated g/C Ratio	0.20	0.64		0.01	0.45		0.06	0.13		0.03	0.10	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	329	2889		15	1741		104	218		36	157	
v/s Ratio Prot	c0.20	c0.68		0.01	c0.53		c0.07	c0.01		0.02	c0.02	
v/s Ratio Perm												
v/c Ratio	1.04	1.06		0.93	1.16		1.22	0.10		0.67	0.24	
Uniform Delay, d1	39.4	17.6		48.5	26.8		46.0	37.4		47.2	40.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	59.4	36.5		195.4	79.8		159.2	0.1		30.6	0.3	
Delay (s)	98.7	54.1		243.9	106.6		205.2	37.4		77.8	41.0	
Level of Service	F	D		F	F		F	D		E	D	
Approach Delay (s)		58.6			107.5			146.7			45.3	
Approach LOS		E			F			F			D	

Intersection Summary			
HCM Average Control Delay	78.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	98.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	90.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	2236	237	23	1679	21	39	20	22	20	20	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	0.99		1.00	1.00			0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	1.00
Satd. Flow (prot)	1583	3121		1583	3161			1568			1626	1417
Flt Permitted	0.95	1.00		0.95	1.00			0.83			0.75	1.00
Satd. Flow (perm)	1583	3121		1583	3161			1326			1243	1417
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	2430	258	25	1825	23	42	22	24	22	22	27
RTOR Reduction (vph)	0	6	0	0	1	0	0	11	0	0	0	26
Lane Group Flow (vph)	33	2682	0	25	1847	0	0	77	0	0	44	1
Heavy Vehicles (%)	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%	14%
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		8
Actuated Green, G (s)	4.1	95.2		2.3	93.4			5.0			5.0	5.0
Effective Green, g (s)	4.1	95.2		2.3	93.4			5.0			5.0	5.0
Actuated g/C Ratio	0.03	0.80		0.02	0.79			0.04			0.04	0.04
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Vehicle Extension (s)	2.0	6.0		2.0	6.0			2.0			2.0	2.0
Lane Grp Cap (vph)	55	2507		31	2491			56			52	60
v/s Ratio Prot	c0.02	c0.86		0.02	0.58							
v/s Ratio Perm								c0.06			0.04	0.00
v/c Ratio	0.60	1.07		0.81	0.74			1.37			0.85	0.02
Uniform Delay, d1	56.4	11.6		57.9	6.4			56.8			56.4	54.4
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	11.2	40.0		80.5	2.0			245.3			68.3	0.0
Delay (s)	67.6	51.6		138.4	8.4			302.1			124.6	54.4
Level of Service	E	D		F	A			F			F	D
Approach Delay (s)		51.8			10.2			302.1			97.9	
Approach LOS		D			B			F			F	

Intersection Summary			
HCM Average Control Delay	40.7	HCM Level of Service	D
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	118.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	2170	91	17	1682	0	58	0	11	0	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0			6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95			0.95			1.00			1.00	
Frt	1.00	0.99			1.00			0.98			0.86	
Flt Protected	0.95	1.00			1.00			0.96			1.00	
Satd. Flow (prot)	1612	3204			3222			1593			1467	
Flt Permitted	0.95	1.00			0.88			0.76			1.00	
Satd. Flow (perm)	1612	3204			2830			1259			1467	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	2359	99	18	1828	0	63	0	12	0	0	3
RTOR Reduction (vph)	0	3	0	0	0	0	0	7	0	0	3	0
Lane Group Flow (vph)	5	2455	0	0	1846	0	0	68	0	0	0	0
Heavy Vehicles (%)	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	0.8	96.0			90.2			7.0			7.0	
Effective Green, g (s)	0.8	96.0			90.2			7.0			7.0	
Actuated g/C Ratio	0.01	0.84			0.79			0.06			0.06	
Clearance Time (s)	5.0	6.0			6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	11	2698			2239			77			90	
v/s Ratio Prot	0.00	c0.77									0.00	
v/s Ratio Perm					0.65			c0.05				
v/c Ratio	0.45	0.91			0.82			0.89			0.00	
Uniform Delay, d1	56.4	6.1			7.1			53.1			50.2	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	27.0	5.9			3.6			65.4			0.0	
Delay (s)	83.4	12.0			10.8			118.5			50.2	
Level of Service	F	B			B			F			D	
Approach Delay (s)		12.1			10.8			118.5			50.2	
Approach LOS		B			B			F			D	

Intersection Summary			
HCM Average Control Delay	13.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	114.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	2209	0	0	1677	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2401	0	0	1823	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				1072		
pX, platoon unblocked						
vC, conflicting volume			2401		3312	1201
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2401		3312	1201
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			196		6	177

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1601	800	608	1215	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	196	1700	1700
Volume to Capacity	0.94	0.47	0.00	0.71	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	2209	0	0	1677	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2401	0	0	1823	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				578		
pX, platoon unblocked						
vC, conflicting volume			2401		3312	1201
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2401		3312	1201
tC, single (s)			4.1		7.0	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			196		5	177

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	1601	800	0	911	911	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.94	0.47	0.00	0.54	0.54	0.00
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A
Approach Delay (s)	0.0		0.0			0.0
Approach LOS						A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2499	269	556	0	161	48	279	97	11	190	126	3273
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	4.0
Lane Util. Factor	0.97	1.00			1.00			1.00			1.00	1.00
Frt	1.00	0.90			0.97			1.00			1.00	0.85
Flt Protected	0.95	1.00			1.00			0.97			0.97	1.00
Satd. Flow (prot)	3019	1472			1582			1575			1590	1392
Flt Permitted	0.95	1.00			1.00			0.46			0.66	1.00
Satd. Flow (perm)	3019	1472			1582			744			1076	1392
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2716	292	604	0	175	52	303	105	12	207	137	3558
RTOR Reduction (vph)	0	50	0	0	7	0	0	1	0	0	0	471
Lane Group Flow (vph)	2716	846	0	0	220	0	0	419	0	0	344	3087
Heavy Vehicles (%)	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%
Turn Type	Prot			Perm			Perm			Perm		Perm
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		6
Actuated Green, G (s)	53.0	74.0			17.0			68.0			68.0	68.0
Effective Green, g (s)	53.0	74.0			17.0			68.0			68.0	68.0
Actuated g/C Ratio	0.35	0.49			0.11			0.45			0.45	0.45
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	1067	726			179			337			488	631
v/s Ratio Prot	c0.90	c0.57			0.14							
v/s Ratio Perm								0.56			0.32	c2.22
v/c Ratio	2.55	1.17			1.23			1.24			0.70	4.89
Uniform Delay, d1	48.5	38.0			66.5			41.0			32.9	41.0
Progression Factor	1.00	1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2	698.2	89.2			142.0			132.7			4.6	1755.3
Delay (s)	746.7	127.2			208.5			173.7			37.5	1796.3
Level of Service	F	F			F			F			D	F
Approach Delay (s)		593.0			208.5			173.7			1641.3	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	1061.9	HCM Level of Service	F
HCM Volume to Capacity ratio	3.45		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	245.3%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	38	2	18	177	114	434
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.89	
Flt Protected	0.95		0.95	1.00	1.00	
Satd. Flow (prot)	1767		1770	1597	1608	
Flt Permitted	0.95		0.42	1.00	1.00	
Satd. Flow (perm)	1767		781	1597	1608	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	2	20	192	124	472
RTOR Reduction (vph)	2	0	0	0	83	0
Lane Group Flow (vph)	41	0	20	192	513	0
Heavy Vehicles (%)	2%	2%	2%	19%	19%	2%
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	6.3		66.6	66.6	66.6	
Effective Green, g (s)	6.3		66.6	66.6	66.6	
Actuated g/C Ratio	0.08		0.82	0.82	0.82	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	138		643	1315	1324	
v/s Ratio Prot	c0.02			0.12	c0.32	
v/s Ratio Perm			0.03			
v/c Ratio	0.30		0.03	0.15	0.39	
Uniform Delay, d1	35.2		1.3	1.4	1.9	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	1.2		0.0	0.1	0.2	
Delay (s)	36.4		1.3	1.5	2.0	
Level of Service	D		A	A	A	
Approach Delay (s)	36.4			1.5	2.0	
Approach LOS	D			A	A	

Intersection Summary			
HCM Average Control Delay	3.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	80.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	975	1264	518	1167	1468	973	352	493
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1060	1374	563	1268	1596	1058	383	536
RTOR Reduction (vph)	0	0	0	0	0	0	0	3
Lane Group Flow (vph)	1060	1374	563	1268	1596	1058	383	533
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	20.4	27.7	22.4	29.7	90.0	21.4	21.4	22.4
Effective Green, g (s)	23.4	30.7	25.4	32.7	90.0	24.4	24.4	22.4
Actuated g/C Ratio	0.26	0.34	0.28	0.36	1.00	0.27	0.27	0.25
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	875	1080	859	1215	1583	818	840	394
v/s Ratio Prot	0.31	c0.43	0.18	0.38			0.12	c0.34
v/s Ratio Perm					c1.01	c0.35		
v/c Ratio	1.21	1.27	0.66	1.04	1.01	1.29	0.46	1.35
Uniform Delay, d1	33.3	29.6	28.4	28.6	45.0	32.8	27.3	33.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	105.7	129.8	1.8	38.0	24.6	141.1	0.3	174.7
Delay (s)	139.0	159.5	30.3	66.6	69.6	173.9	27.6	208.5
Level of Service	F	F	C	E	E	F	C	F
Approach Delay (s)		150.6		62.0				
Approach LOS		F		E				

Intersection Summary			
HCM Average Control Delay	113.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	104.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	2349	124	20	2803	30	38	26	22	14	20	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.93		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	4486		1641	3843		1703	1734		1289	1580	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	4486		1641	3843		1703	1734		1289	1580	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	2553	135	22	3047	33	41	28	24	15	22	262
RTOR Reduction (vph)	0	4	0	0	1	0	0	21	0	0	204	0
Lane Group Flow (vph)	24	2684	0	22	3079	0	41	31	0	15	80	0
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	5.5	57.2		1.7	53.4		3.3	12.6		1.2	10.5	
Effective Green, g (s)	5.5	57.2		1.7	53.4		3.3	12.6		1.2	10.5	
Actuated g/C Ratio	0.06	0.63		0.02	0.58		0.04	0.14		0.01	0.12	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	101	2811		31	2248		62	239		17	182	
v/s Ratio Prot	c0.01	0.60		c0.01	c0.80		c0.02	0.02		0.01	c0.05	
v/s Ratio Perm												
v/c Ratio	0.24	0.95		0.71	1.37		0.66	0.13		0.88	0.44	
Uniform Delay, d1	40.9	15.9		44.6	18.9		43.4	34.5		45.0	37.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	8.7		46.1	169.3		18.6	0.1		157.0	0.6	
Delay (s)	41.3	24.6		90.7	188.2		62.0	34.6		202.0	38.3	
Level of Service	D	C		F	F		E	C		F	D	
Approach Delay (s)		24.7			187.6			46.7			46.5	
Approach LOS		C			F			D			D	

Intersection Summary			
HCM Average Control Delay	107.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	91.3	Sum of lost time (s)	22.6
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	1860	31	27	2382	26	74	20	22	20	20	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00			0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.98	1.00
Satd. Flow (prot)	1626	3244		1626	3247			1616			1670	1455
Flt Permitted	0.95	1.00		0.95	1.00			0.78			0.78	1.00
Satd. Flow (perm)	1626	3244		1626	3247			1303			1340	1455
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	2022	34	29	2589	28	80	22	24	22	22	62
RTOR Reduction (vph)	0	1	0	0	1	0	0	7	0	0	0	52
Lane Group Flow (vph)	34	2055	0	29	2616	0	0	119	0	0	44	10
Heavy Vehicles (%)	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		8
Actuated Green, G (s)	3.2	92.9		2.4	92.1			9.0			9.0	9.0
Effective Green, g (s)	3.2	92.9		2.4	92.1			9.0			9.0	9.0
Actuated g/C Ratio	0.03	0.77		0.02	0.77			0.07			0.07	0.07
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Vehicle Extension (s)	2.0	6.0		2.0	6.0			2.0			2.0	2.0
Lane Grp Cap (vph)	43	2505		32	2486			97			100	109
v/s Ratio Prot	c0.02	0.63		0.02	c0.81							
v/s Ratio Perm								c0.09			0.03	0.01
v/c Ratio	0.79	0.82		0.91	1.05			1.22			0.44	0.09
Uniform Delay, d1	58.2	8.5		58.8	14.1			55.6			53.2	51.8
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	59.9	3.2		117.7	33.7			162.9			1.1	0.1
Delay (s)	118.1	11.7		176.5	47.8			218.5			54.4	52.0
Level of Service	F	B		F	D			F			D	D
Approach Delay (s)		13.4			49.3			218.5			53.0	
Approach LOS		B			D			F			D	

Intersection Summary			
HCM Average Control Delay	38.5	HCM Level of Service	D
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	120.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	1832	66	12	2310	0	118	0	22	0	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0			6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95			0.95			1.00			1.00	
Frt	1.00	0.99			1.00			0.98			0.86	
Flt Protected	0.95	1.00			1.00			0.96			1.00	
Satd. Flow (prot)	1641	3265			3281			1622			1494	
Flt Permitted	0.95	1.00			0.93			0.76			1.00	
Satd. Flow (perm)	1641	3265			3047			1282			1494	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1991	72	13	2511	0	128	0	24	0	0	2
RTOR Reduction (vph)	0	2	0	0	0	0	0	6	0	0	2	0
Lane Group Flow (vph)	1	2061	0	0	2524	0	0	146	0	0	0	0
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	0.8	92.0			86.2			11.0			11.0	
Effective Green, g (s)	0.8	92.0			86.2			11.0			11.0	
Actuated g/C Ratio	0.01	0.81			0.76			0.10			0.10	
Clearance Time (s)	5.0	6.0			6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	12	2635			2304			124			144	
v/s Ratio Prot	0.00	c0.63									0.00	
v/s Ratio Perm					c0.83			c0.11				
v/c Ratio	0.08	0.78			1.10			1.17			0.00	
Uniform Delay, d1	56.2	5.8			13.9			51.5			46.5	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	3.0	2.4			50.6			135.4			0.0	
Delay (s)	59.2	8.1			64.5			186.9			46.5	
Level of Service	E	A			E			F			D	
Approach Delay (s)		8.2			64.5			186.9			46.5	
Approach LOS		A			E			F			D	

Intersection Summary			
HCM Average Control Delay	43.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	114.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	95.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1854	0	0	2324	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2015	0	0	2526	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				1072		
pX, platoon unblocked						
vC, conflicting volume			2015		3278	1008
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2015		3278	1008
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			279		7	239

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1343	672	842	1684	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	279	1700	1700
Volume to Capacity	0.79	0.40	0.00	0.99	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1854	0	0	2323	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2015	0	0	2525	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				578		
pX, platoon unblocked						
vC, conflicting volume			2015		3278	1008
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2015		3278	1008
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			279		7	239

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	1343	672	0	1262	1262	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.79	0.40	0.00	0.74	0.74	0.00
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A
Approach Delay (s)	0.0		0.0			0.0
Approach LOS						A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1320	117	175	3	149	111	450	62	2	71	75	1127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	0.97	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.91		1.00	0.94			1.00			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.98	1.00
Satd. Flow (prot)	3273	1616		1687	1662			1700			1734	1509
Flt Permitted	0.95	1.00		0.57	1.00			0.60			0.73	1.00
Satd. Flow (perm)	3273	1616		1009	1662			1073			1296	1509
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1435	127	190	3	162	121	489	67	2	77	82	1225
RTOR Reduction (vph)	0	36	0	0	18	0	0	0	0	0	0	480
Lane Group Flow (vph)	1435	281	0	3	265	0	0	558	0	0	159	745
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot			Perm			Perm			Perm		Perm
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		6
Actuated Green, G (s)	53.0	76.0		19.0	19.0			66.0			66.0	66.0
Effective Green, g (s)	53.0	76.0		19.0	19.0			66.0			66.0	66.0
Actuated g/C Ratio	0.35	0.51		0.13	0.13			0.44			0.44	0.44
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	1156	819		128	211			472			570	664
v/s Ratio Prot	c0.44	0.17			c0.16							
v/s Ratio Perm				0.00				c0.52			0.12	0.49
v/c Ratio	1.24	0.34		0.02	1.25			1.18			0.28	1.12
Uniform Delay, d1	48.5	22.1		57.4	65.5			42.0			26.8	42.0
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	116.1	0.3		0.1	147.2			101.9			0.3	73.6
Delay (s)	164.6	22.3		57.4	212.7			143.9			27.1	115.6
Level of Service	F	C		E	F			F			C	F
Approach Delay (s)		138.9			211.0			143.9			105.4	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	133.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	122.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	377	16	2	136	216	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.98	
Flt Protected	0.95		0.95	1.00	1.00	
Satd. Flow (prot)	1768		1770	1652	1647	
Flt Permitted	0.95		0.59	1.00	1.00	
Satd. Flow (perm)	1768		1097	1652	1647	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	410	17	2	148	235	41
RTOR Reduction (vph)	2	0	0	0	17	0
Lane Group Flow (vph)	425	0	2	148	259	0
Heavy Vehicles (%)	2%	2%	2%	15%	15%	2%
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	14.2		10.8	10.8	10.8	
Effective Green, g (s)	14.2		10.8	10.8	10.8	
Actuated g/C Ratio	0.43		0.33	0.33	0.33	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	761		359	541	539	
v/s Ratio Prot	c0.24			0.09	c0.16	
v/s Ratio Perm			0.00			
v/c Ratio	0.56		0.01	0.27	0.48	
Uniform Delay, d1	7.1		7.5	8.2	8.9	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.9		0.0	0.3	0.7	
Delay (s)	7.9		7.5	8.5	9.5	
Level of Service	A		A	A	A	
Approach Delay (s)	7.9			8.5	9.5	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	8.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	33.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	1177	1228	551	1088	1469	985	402	465
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1279	1335	599	1183	1597	1071	437	505
RTOR Reduction (vph)	0	0	0	0	0	0	0	4
Lane Group Flow (vph)	1279	1335	599	1183	1597	1071	437	501
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	23.4	27.7	21.4	25.7	90.0	22.4	22.4	21.4
Effective Green, g (s)	26.4	30.7	24.4	28.7	90.0	25.4	25.4	21.4
Actuated g/C Ratio	0.29	0.34	0.27	0.32	1.00	0.28	0.28	0.24
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	988	1080	826	1066	1583	852	875	376
v/s Ratio Prot	c0.38	c0.42	0.20	0.35			0.14	0.32
v/s Ratio Perm					c1.01	c0.35		
v/c Ratio	1.29	1.24	0.73	1.11	1.01	1.26	0.50	1.33
Uniform Delay, d1	31.8	29.6	29.8	30.6	45.0	32.3	27.0	34.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	140.1	114.4	3.2	62.8	24.8	125.2	0.3	167.0
Delay (s)	171.9	144.0	32.9	93.5	69.8	157.5	27.3	201.3
Level of Service	F	F	C	F	E	F	C	F
Approach Delay (s)		157.7		71.5				
Approach LOS		F		E				

Intersection Summary			
HCM Average Control Delay	116.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	5.2
Intersection Capacity Utilization	102.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	2392	128	16	2840	24	28	29	10	16	28	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.96		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	4486		1641	3843		1703	1791		1289	1583	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	4486		1641	3843		1703	1791		1289	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	2600	139	17	3087	26	30	32	11	17	30	283
RTOR Reduction (vph)	0	4	0	0	0	0	0	10	0	0	215	0
Lane Group Flow (vph)	49	2735	0	17	3113	0	30	33	0	17	98	0
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	7.8	57.1		1.7	51.0		2.0	9.6		2.3	9.9	
Effective Green, g (s)	7.8	57.1		1.7	51.0		2.0	9.6		2.3	9.9	
Actuated g/C Ratio	0.09	0.64		0.02	0.57		0.02	0.11		0.03	0.11	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	146	2868		31	2195		38	193		33	175	
v/s Ratio Prot	c0.03	c0.61		0.01	c0.81		c0.02	0.02		0.01	c0.06	
v/s Ratio Perm												
v/c Ratio	0.34	0.95		0.55	1.42		0.79	0.17		0.52	0.56	
Uniform Delay, d1	38.3	14.9		43.4	19.1		43.4	36.2		42.9	37.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	8.5		10.2	190.9		63.7	0.2		5.5	2.2	
Delay (s)	38.8	23.3		53.6	210.0		107.2	36.4		48.5	39.8	
Level of Service	D	C		D	F		F	D		D	D	
Approach Delay (s)		23.6			209.2			65.5			40.3	
Approach LOS		C			F			E			D	

Intersection Summary			
HCM Average Control Delay	116.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	89.3	Sum of lost time (s)	9.3
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	1906	35	24	2384	20	92	20	24	20	20	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00			0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.98	1.00
Satd. Flow (prot)	1626	3243		1626	3248			1617			1670	1455
Flt Permitted	0.95	1.00		0.95	1.00			0.77			0.81	1.00
Satd. Flow (perm)	1626	3243		1626	3248			1287			1391	1455
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	2072	38	26	2591	22	100	22	26	22	22	24
RTOR Reduction (vph)	0	1	0	0	0	0	0	6	0	0	0	22
Lane Group Flow (vph)	22	2109	0	26	2613	0	0	142	0	0	44	2
Heavy Vehicles (%)	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		8
Actuated Green, G (s)	2.3	89.1		2.3	89.1			11.0			11.0	11.0
Effective Green, g (s)	2.3	89.1		2.3	89.1			11.0			11.0	11.0
Actuated g/C Ratio	0.02	0.75		0.02	0.75			0.09			0.09	0.09
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Vehicle Extension (s)	2.0	6.0		2.0	6.0			2.0			2.0	2.0
Lane Grp Cap (vph)	32	2440		32	2444			120			129	135
v/s Ratio Prot	0.01	0.65		c0.02	c0.80							
v/s Ratio Perm								c0.11			0.03	0.00
v/c Ratio	0.69	0.86		0.81	1.07			1.18			0.34	0.02
Uniform Delay, d1	57.7	10.4		57.8	14.7			53.7			50.3	48.8
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	39.1	4.4		81.6	39.9			138.7			0.6	0.0
Delay (s)	96.8	14.8		139.4	54.6			192.4			50.9	48.8
Level of Service	F	B		F	D			F			D	D
Approach Delay (s)		15.6			55.4			192.4			50.1	
Approach LOS		B			E			F			D	

Intersection Summary			
HCM Average Control Delay	42.4	HCM Level of Service	D
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	118.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1882	66	12	2328	0	118	0	22	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			5.0				
Lane Util. Factor		0.95			0.95			1.00				
Frt		0.99			1.00			0.98				
Flt Protected		1.00			1.00			0.96				
Satd. Flow (prot)		3265			3281			1622				
Flt Permitted		1.00			0.93			0.95				
Satd. Flow (perm)		3265			3045			1606				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2046	72	13	2530	0	128	0	24	0	0	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	2116	0	0	2543	0	0	146	0	0	0	0
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)		88.0			88.0			11.0				
Effective Green, g (s)		88.0			88.0			11.0				
Actuated g/C Ratio		0.80			0.80			0.10				
Clearance Time (s)		6.0			6.0			5.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		2612			2436			161				
v/s Ratio Prot		0.65										
v/s Ratio Perm					c0.84			c0.09				
v/c Ratio		0.81			1.04			0.90				
Uniform Delay, d1		6.3			11.0			49.0				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		2.8			31.0			44.1				
Delay (s)		9.1			42.0			93.0				
Level of Service		A			D			F				
Approach Delay (s)		9.1			42.0			93.0			0.0	
Approach LOS		A			D			F			A	

Intersection Summary			
HCM Average Control Delay	29.1	HCM Level of Service	C
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1902	0	0	2325	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2067	0	0	2527	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				1072		
pX, platoon unblocked						
vC, conflicting volume			2067		3331	1034
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2067		3331	1034
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			266		6	229

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1378	689	842	1685	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	266	1700	1700
Volume to Capacity	0.81	0.41	0.00	0.99	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1902	0	0	2325	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2067	0	0	2527	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				578		
pX, platoon unblocked						
vC, conflicting volume			2067		3331	1034
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2067		3331	1034
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			266		6	229

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	1378	689	0	1264	1264	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.81	0.41	0.00	0.74	0.74	0.00
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A
Approach Delay (s)	0.0		0.0			0.0
Approach LOS						A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1359	115	178	2	142	107	444	57	1	65	74	1133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	0.97	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.91		1.00	0.94			1.00			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.98	1.00
Satd. Flow (prot)	3273	1614		1687	1661			1700			1735	1509
Flt Permitted	0.95	1.00		0.57	1.00			0.61			0.74	1.00
Satd. Flow (perm)	3273	1614		1008	1661			1083			1316	1509
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1477	125	193	2	154	116	483	62	1	71	80	1232
RTOR Reduction (vph)	0	37	0	0	18	0	0	0	0	0	0	494
Lane Group Flow (vph)	1477	281	0	2	252	0	0	546	0	0	151	738
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot			Perm			Perm			Perm		Perm
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		6
Actuated Green, G (s)	55.0	77.0		18.0	18.0			65.0			65.0	65.0
Effective Green, g (s)	55.0	77.0		18.0	18.0			65.0			65.0	65.0
Actuated g/C Ratio	0.37	0.51		0.12	0.12			0.43			0.43	0.43
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	1200	829		121	199			469			570	654
v/s Ratio Prot	c0.45	0.17			c0.15							
v/s Ratio Perm				0.00				c0.50			0.11	0.49
v/c Ratio	1.23	0.34		0.02	1.26			1.16			0.26	1.13
Uniform Delay, d1	47.5	21.5		58.2	66.0			42.5			27.2	42.5
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	111.3	0.2		0.1	152.5			95.0			0.3	76.1
Delay (s)	158.8	21.8		58.3	218.5			137.5			27.5	118.6
Level of Service	F	C		E	F			F			C	F
Approach Delay (s)		134.6			217.3			137.5			108.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	131.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	121.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	377	16	2	124	216	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.98	
Flt Protected	0.95		0.95	1.00	1.00	
Satd. Flow (prot)	1768		1770	1652	1647	
Flt Permitted	0.95		0.59	1.00	1.00	
Satd. Flow (perm)	1768		1097	1652	1647	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	410	17	2	135	235	41
RTOR Reduction (vph)	2	0	0	0	17	0
Lane Group Flow (vph)	425	0	2	135	259	0
Heavy Vehicles (%)	2%	2%	2%	15%	15%	2%
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	14.2		10.8	10.8	10.8	
Effective Green, g (s)	14.2		10.8	10.8	10.8	
Actuated g/C Ratio	0.43		0.33	0.33	0.33	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	761		359	541	539	
v/s Ratio Prot	c0.24			0.08	c0.16	
v/s Ratio Perm			0.00			
v/c Ratio	0.56		0.01	0.25	0.48	
Uniform Delay, d1	7.1		7.5	8.1	8.9	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.9		0.0	0.2	0.7	
Delay (s)	7.9		7.5	8.4	9.5	
Level of Service	A		A	A	A	
Approach Delay (s)	7.9			8.4	9.5	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	8.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	33.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

NCRF Project Condition LOS Worksheets

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	335	1050	263	1080	782	1688	818	550
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	364	1141	286	1174	850	1835	889	598
RTOR Reduction (vph)	0	0	0	0	0	0	0	2
Lane Group Flow (vph)	364	1141	286	1174	850	1835	889	596
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	14.7	21.7	20.4	27.4	90.0	29.4	29.4	20.4
Effective Green, g (s)	17.7	24.7	23.4	30.4	90.0	32.4	32.4	20.4
Actuated g/C Ratio	0.20	0.27	0.26	0.34	1.00	0.36	0.36	0.23
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	662	869	792	1129	1583	1087	1116	359
v/s Ratio Prot	0.11	c0.36	0.09	0.35			0.29	c0.38
v/s Ratio Perm					0.54	c0.61		
v/c Ratio	0.55	1.31	0.36	1.04	0.54	1.69	0.80	1.66
Uniform Delay, d1	32.6	32.6	27.2	29.8	0.0	28.8	25.8	34.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	149.1	0.3	37.7	1.3	313.7	3.9	309.7
Delay (s)	33.5	181.7	27.5	67.5	1.3	342.5	29.7	344.5
Level of Service	C	F	C	E	A	F	C	F
Approach Delay (s)		145.9		38.2				
Approach LOS		F		D				

Intersection Summary			
HCM Average Control Delay	163.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	122.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	314	2982	8	13	1864	16	117	14	49	22	19	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.88		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	4509		1641	3843		1703	1645		1289	1586	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	4509		1641	3843		1703	1645		1289	1586	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	341	3241	9	14	2026	17	127	15	53	24	21	161
RTOR Reduction (vph)	0	0	0	0	1	0	0	46	0	0	145	0
Lane Group Flow (vph)	341	3250	0	14	2042	0	127	22	0	24	37	0
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	19.3	62.8		0.9	44.4		6.0	13.0		2.7	9.7	
Effective Green, g (s)	19.3	62.8		0.9	44.4		6.0	13.0		2.7	9.7	
Actuated g/C Ratio	0.20	0.64		0.01	0.45		0.06	0.13		0.03	0.10	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	329	2889		15	1741		104	218		36	157	
v/s Ratio Prot	c0.20	c0.72		0.01	0.53		c0.07	c0.01		0.02	c0.02	
v/s Ratio Perm												
v/c Ratio	1.04	1.12		0.93	1.17		1.22	0.10		0.67	0.24	
Uniform Delay, d1	39.4	17.6		48.5	26.8		46.0	37.4		47.2	40.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	59.4	61.4		195.4	84.4		159.2	0.1		30.6	0.3	
Delay (s)	98.7	79.0		243.9	111.2		205.2	37.4		77.8	41.0	
Level of Service	F	E		F	F		F	D		E	D	
Approach Delay (s)		80.8			112.1			146.7			45.3	
Approach LOS		F			F			F			D	

Intersection Summary			
HCM Average Control Delay	92.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	98.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	94.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	2401	237	23	1697	21	39	20	22	20	20	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	0.99		1.00	1.00			0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	1.00
Satd. Flow (prot)	1597	3152		1597	3189			1582			1640	1429
Flt Permitted	0.95	1.00		0.95	1.00			0.83			0.75	1.00
Satd. Flow (perm)	1597	3152		1597	3189			1338			1254	1429
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	2610	258	25	1845	23	42	22	24	22	22	27
RTOR Reduction (vph)	0	6	0	0	1	0	0	11	0	0	0	26
Lane Group Flow (vph)	33	2862	0	25	1867	0	0	77	0	0	44	1
Heavy Vehicles (%)	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		8
Actuated Green, G (s)	4.1	95.2		2.3	93.4			5.0			5.0	5.0
Effective Green, g (s)	4.1	95.2		2.3	93.4			5.0			5.0	5.0
Actuated g/C Ratio	0.03	0.80		0.02	0.79			0.04			0.04	0.04
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Vehicle Extension (s)	2.0	6.0		2.0	6.0			2.0			2.0	2.0
Lane Grp Cap (vph)	55	2532		31	2514			56			53	60
v/s Ratio Prot	c0.02	c0.91		0.02	0.59							
v/s Ratio Perm								c0.06			0.04	0.00
v/c Ratio	0.60	1.13		0.81	0.74			1.37			0.83	0.02
Uniform Delay, d1	56.4	11.6		57.9	6.4			56.8			56.3	54.4
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	11.2	64.3		80.5	2.0			245.3			63.1	0.0
Delay (s)	67.6	75.9		138.4	8.4			302.1			119.4	54.4
Level of Service	E	E		F	A			F			F	D
Approach Delay (s)		75.8			10.2			302.1			94.7	
Approach LOS		E			B			F			F	

Intersection Summary			
HCM Average Control Delay	55.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	118.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	94.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	2335	91	17	1700	0	58	0	11	0	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0			6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95			0.95			1.00			1.00	
Frt	1.00	0.99			1.00			0.98			0.86	
Flt Protected	0.95	1.00			1.00			0.96			1.00	
Satd. Flow (prot)	1612	3205			3222			1593			1467	
Flt Permitted	0.95	1.00			0.85			0.76			1.00	
Satd. Flow (perm)	1612	3205			2740			1259			1467	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	2538	99	18	1848	0	63	0	12	0	0	3
RTOR Reduction (vph)	0	2	0	0	0	0	0	7	0	0	3	0
Lane Group Flow (vph)	5	2635	0	0	1866	0	0	68	0	0	0	0
Heavy Vehicles (%)	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	0.8	96.0			90.2			7.0			7.0	
Effective Green, g (s)	0.8	96.0			90.2			7.0			7.0	
Actuated g/C Ratio	0.01	0.84			0.79			0.06			0.06	
Clearance Time (s)	5.0	6.0			6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	11	2699			2168			77			90	
v/s Ratio Prot	0.00	c0.82									0.00	
v/s Ratio Perm					0.68			c0.05				
v/c Ratio	0.45	0.98			0.86			0.89			0.00	
Uniform Delay, d1	56.4	8.0			7.8			53.1			50.2	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	27.0	12.6			4.8			65.4			0.0	
Delay (s)	83.4	20.6			12.6			118.5			50.2	
Level of Service	F	C			B			F			D	
Approach Delay (s)		20.7			12.6			118.5			50.2	
Approach LOS		C			B			F			D	

Intersection Summary			
HCM Average Control Delay	19.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	114.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2242	132	20	1677	18	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	0.99		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	3240		1770	3252	1760	
Flt Permitted	1.00		0.08	1.00	0.96	
Satd. Flow (perm)	3240		155	3252	1760	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2437	143	22	1823	20	2
RTOR Reduction (vph)	7	0	0	0	2	0
Lane Group Flow (vph)	2573	0	22	1823	20	0
Heavy Vehicles (%)	11%	2%	2%	11%	2%	2%
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	48.0		48.0	48.0	4.0	
Effective Green, g (s)	48.0		48.0	48.0	4.0	
Actuated g/C Ratio	0.80		0.80	0.80	0.07	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	2592		124	2602	117	
v/s Ratio Prot	c0.79			0.56	c0.01	
v/s Ratio Perm			0.14			
v/c Ratio	0.99		0.18	0.70	0.17	
Uniform Delay, d1	5.8		1.4	2.7	26.4	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	15.9		0.7	0.9	0.7	
Delay (s)	21.7		2.1	3.6	27.1	
Level of Service	C		A	A	C	
Approach Delay (s)	21.7			3.6	27.1	
Approach LOS	C			A	C	

Intersection Summary			
HCM Average Control Delay	14.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	2211	33	0	1697	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2403	36	0	1845	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	494			578		
pX, platoon unblocked			0.25		0.25	0.25
vC, conflicting volume			2439		3343	1220
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			739		4385	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			214		0	269

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1602	837	922	922	0
Volume Left	0	0	0	0	0
Volume Right	0	36	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.94	0.49	0.54	0.54	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2501	269	557	0	161	48	286	97	11	190	126	3286
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	4.0
Lane Util. Factor	0.97	1.00			1.00			1.00			1.00	1.00
Frt	1.00	0.90			0.97			1.00			1.00	0.85
Flt Protected	0.95	1.00			1.00			0.96			0.97	1.00
Satd. Flow (prot)	3019	1472			1582			1575			1590	1392
Flt Permitted	0.95	1.00			1.00			0.45			0.66	1.00
Satd. Flow (perm)	3019	1472			1582			742			1075	1392
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2718	292	605	0	175	52	311	105	12	207	137	3572
RTOR Reduction (vph)	0	50	0	0	7	0	0	1	0	0	0	471
Lane Group Flow (vph)	2718	847	0	0	220	0	0	427	0	0	344	3101
Heavy Vehicles (%)	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%
Turn Type	Prot			Perm			Perm			Perm		Perm
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		6
Actuated Green, G (s)	53.0	74.0			17.0			68.0			68.0	68.0
Effective Green, g (s)	53.0	74.0			17.0			68.0			68.0	68.0
Actuated g/C Ratio	0.35	0.49			0.11			0.45			0.45	0.45
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	1067	726			179			336			487	631
v/s Ratio Prot	c0.90	c0.58			0.14							
v/s Ratio Perm								0.58			0.32	c2.23
v/c Ratio	2.55	1.17			1.23			1.27			0.71	4.91
Uniform Delay, d1	48.5	38.0			66.5			41.0			33.0	41.0
Progression Factor	1.00	1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2	699.1	89.7			142.0			143.8			4.6	1765.3
Delay (s)	747.6	127.7			208.5			184.8			37.6	1806.3
Level of Service	F	F			F			F			D	F
Approach Delay (s)		593.8			208.5			184.8			1650.9	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	1067.4	HCM Level of Service	F
HCM Volume to Capacity ratio	3.46		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	246.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	38	2	18	185	115	434
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.89	
Flt Protected	0.95		0.95	1.00	1.00	
Satd. Flow (prot)	1767		1770	1597	1608	
Flt Permitted	0.95		0.42	1.00	1.00	
Satd. Flow (perm)	1767		780	1597	1608	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	2	20	201	125	472
RTOR Reduction (vph)	2	0	0	0	83	0
Lane Group Flow (vph)	41	0	20	201	514	0
Heavy Vehicles (%)	2%	2%	2%	19%	19%	2%
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	6.3		66.7	66.7	66.7	
Effective Green, g (s)	6.3		66.7	66.7	66.7	
Actuated g/C Ratio	0.08		0.82	0.82	0.82	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	137		642	1315	1324	
v/s Ratio Prot	c0.02			0.13	c0.32	
v/s Ratio Perm			0.03			
v/c Ratio	0.30		0.03	0.15	0.39	
Uniform Delay, d1	35.3		1.3	1.4	1.9	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	1.2		0.0	0.1	0.2	
Delay (s)	36.5		1.3	1.5	2.0	
Level of Service	D		A	A	A	
Approach Delay (s)	36.5			1.5	2.0	
Approach LOS	D			A	A	

Intersection Summary			
HCM Average Control Delay	3.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	81.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	975	1284	547	1199	1508	999	352	512
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1060	1396	595	1303	1639	1086	383	557
RTOR Reduction (vph)	0	0	0	0	0	0	0	3
Lane Group Flow (vph)	1060	1396	595	1303	1639	1086	383	554
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	20.4	27.7	22.4	29.7	90.0	21.4	21.4	22.4
Effective Green, g (s)	23.4	30.7	25.4	32.7	90.0	24.4	24.4	22.4
Actuated g/C Ratio	0.26	0.34	0.28	0.36	1.00	0.27	0.27	0.25
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	875	1080	859	1215	1583	818	840	394
v/s Ratio Prot	0.31	c0.44	0.20	0.39			0.12	c0.35
v/s Ratio Perm					c1.04	c0.36		
v/c Ratio	1.21	1.29	0.69	1.07	1.04	1.33	0.46	1.41
Uniform Delay, d1	33.3	29.6	28.8	28.6	45.0	32.8	27.3	33.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	105.7	138.7	2.4	47.6	32.3	155.9	0.3	197.4
Delay (s)	139.0	168.3	31.2	76.3	77.3	188.7	27.6	231.2
Level of Service	F	F	C	E	E	F	C	F
Approach Delay (s)		155.7		69.2				
Approach LOS		F		E				

Intersection Summary			
HCM Average Control Delay	121.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.36		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	107.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	2415	124	20	2904	30	38	26	22	14	20	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.93		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	4487		1641	3843		1703	1734		1289	1580	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	4487		1641	3843		1703	1734		1289	1580	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	2625	135	22	3157	33	41	28	24	15	22	262
RTOR Reduction (vph)	0	3	0	0	0	0	0	21	0	0	204	0
Lane Group Flow (vph)	24	2757	0	22	3190	0	41	31	0	15	80	0
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	5.5	57.2		1.7	53.4		3.3	12.6		1.2	10.5	
Effective Green, g (s)	5.5	57.2		1.7	53.4		3.3	12.6		1.2	10.5	
Actuated g/C Ratio	0.06	0.63		0.02	0.58		0.04	0.14		0.01	0.12	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	101	2811		31	2248		62	239		17	182	
v/s Ratio Prot	c0.01	0.61		c0.01	c0.83		c0.02	0.02		0.01	c0.05	
v/s Ratio Perm												
v/c Ratio	0.24	0.98		0.71	1.42		0.66	0.13		0.88	0.44	
Uniform Delay, d1	40.9	16.5		44.6	18.9		43.4	34.5		45.0	37.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	12.8		46.1	191.2		18.6	0.1		157.0	0.6	
Delay (s)	41.3	29.3		90.7	210.1		62.0	34.6		202.0	38.3	
Level of Service	D	C		F	F		E	C		F	D	
Approach Delay (s)		29.4			209.3			46.7			46.5	
Approach LOS		C			F			D			D	

Intersection Summary			
HCM Average Control Delay	120.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	91.3	Sum of lost time (s)	22.6
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	1926	31	27	2483	26	74	20	22	20	20	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00			0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.98	1.00
Satd. Flow (prot)	1641	3274		1641	3277			1631			1685	1468
Flt Permitted	0.95	1.00		0.95	1.00			0.78			0.78	1.00
Satd. Flow (perm)	1641	3274		1641	3277			1314			1352	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	2093	34	29	2699	28	80	22	24	22	22	62
RTOR Reduction (vph)	0	1	0	0	0	0	0	7	0	0	0	50
Lane Group Flow (vph)	34	2126	0	29	2727	0	0	119	0	0	44	12
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		8
Actuated Green, G (s)	3.2	92.9		2.4	92.1			9.0			9.0	9.0
Effective Green, g (s)	3.2	92.9		2.4	92.1			9.0			9.0	9.0
Actuated g/C Ratio	0.03	0.77		0.02	0.77			0.07			0.07	0.07
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Vehicle Extension (s)	2.0	6.0		2.0	6.0			2.0			2.0	2.0
Lane Grp Cap (vph)	44	2528		33	2509			98			101	110
v/s Ratio Prot	c0.02	0.65		0.02	c0.83							
v/s Ratio Perm								c0.09			0.03	0.01
v/c Ratio	0.77	0.84		0.88	1.09			1.21			0.44	0.11
Uniform Delay, d1	58.2	8.9		58.8	14.1			55.6			53.2	51.9
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	53.1	3.6		104.1	46.6			157.9			1.1	0.2
Delay (s)	111.3	12.5		162.9	60.7			213.6			54.3	52.1
Level of Service	F	B		F	E			F			D	D
Approach Delay (s)		14.0			61.7			213.6			53.0	
Approach LOS		B			E			F			D	

Intersection Summary			
HCM Average Control Delay	45.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	120.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	92.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	1898	66	12	2411	0	118	0	22	0	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0			6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95			0.95			1.00			1.00	
Frt	1.00	0.99			1.00			0.98			0.86	
Flt Protected	0.95	1.00			1.00			0.96			1.00	
Satd. Flow (prot)	1656	3295			3311			1637			1508	
Flt Permitted	0.95	1.00			0.93			0.76			1.00	
Satd. Flow (perm)	1656	3295			3072			1294			1508	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	2063	72	13	2621	0	128	0	24	0	0	2
RTOR Reduction (vph)	0	2	0	0	0	0	0	6	0	0	2	0
Lane Group Flow (vph)	1	2133	0	0	2634	0	0	146	0	0	0	0
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	0.8	92.0			86.2			11.0			11.0	
Effective Green, g (s)	0.8	92.0			86.2			11.0			11.0	
Actuated g/C Ratio	0.01	0.81			0.76			0.10			0.10	
Clearance Time (s)	5.0	6.0			6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	12	2659			2323			125			146	
v/s Ratio Prot	0.00	c0.65									0.00	
v/s Ratio Perm					c0.86			c0.11				
v/c Ratio	0.08	0.80			1.13			1.17			0.00	
Uniform Delay, d1	56.2	6.0			13.9			51.5			46.5	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	3.0	2.7			66.2			131.8			0.0	
Delay (s)	59.2	8.7			80.1			183.3			46.5	
Level of Service	E	A			F			F			D	
Approach Delay (s)		8.7			80.1			183.3			46.5	
Approach LOS		A			F			F			D	

Intersection Summary			
HCM Average Control Delay	52.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	114.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	98.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1867	53	8	2324	101	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	1.00		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	3304		1770	3312	1760	
Flt Permitted	1.00		0.09	1.00	0.96	
Satd. Flow (perm)	3304		159	3312	1760	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2029	58	9	2526	110	11
RTOR Reduction (vph)	3	0	0	0	6	0
Lane Group Flow (vph)	2084	0	9	2526	115	0
Heavy Vehicles (%)	9%	2%	2%	9%	2%	2%
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	47.0		47.0	47.0	5.0	
Effective Green, g (s)	47.0		47.0	47.0	5.0	
Actuated g/C Ratio	0.78		0.78	0.78	0.08	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	2588		125	2594	147	
v/s Ratio Prot	0.63			c0.76	c0.07	
v/s Ratio Perm			0.06			
v/c Ratio	0.81		0.07	0.97	0.78	
Uniform Delay, d1	3.8		1.5	5.9	27.0	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	1.9		0.2	12.1	22.5	
Delay (s)	5.7		1.7	18.0	49.5	
Level of Service	A		A	B	D	
Approach Delay (s)	5.7			18.0	49.5	
Approach LOS	A			B	D	

Intersection Summary			
HCM Average Control Delay	13.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1864	13	0	2331	0	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2026	14	0	2534	0	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	494			578		
pX, platoon unblocked			0.28		0.28	0.28
vC, conflicting volume			2040		3300	1020
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		4057	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			460		1	308

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1351	689	1267	1267	2
Volume Left	0	0	0	0	0
Volume Right	0	14	0	0	2
cSH	1700	1700	1700	1700	308
Volume to Capacity	0.79	0.41	0.75	0.75	0.01
Queue Length 95th (ft)	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	16.8
Lane LOS					C
Approach Delay (s)	0.0		0.0		16.8
Approach LOS					C

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1328	117	180	3	149	111	453	62	2	71	75	1132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	0.97	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.91		1.00	0.94			1.00			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.98	1.00
Satd. Flow (prot)	3273	1614		1687	1662			1700			1734	1509
Flt Permitted	0.95	1.00		0.57	1.00			0.60			0.73	1.00
Satd. Flow (perm)	3273	1614		1003	1662			1073			1296	1509
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1443	127	196	3	162	121	492	67	2	77	82	1230
RTOR Reduction (vph)	0	37	0	0	18	0	0	0	0	0	0	480
Lane Group Flow (vph)	1443	286	0	3	265	0	0	561	0	0	159	750
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot			Perm			Perm			Perm		Perm
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		6
Actuated Green, G (s)	53.0	76.0		19.0	19.0			66.0			66.0	66.0
Effective Green, g (s)	53.0	76.0		19.0	19.0			66.0			66.0	66.0
Actuated g/C Ratio	0.35	0.51		0.13	0.13			0.44			0.44	0.44
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	1156	818		127	211			472			570	664
v/s Ratio Prot	c0.44	0.18			c0.16							
v/s Ratio Perm				0.00				c0.52			0.12	0.50
v/c Ratio	1.25	0.35		0.02	1.25			1.19			0.28	1.13
Uniform Delay, d1	48.5	22.2		57.4	65.5			42.0			26.8	42.0
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	119.1	0.3		0.1	147.2			104.4			0.3	76.4
Delay (s)	167.6	22.4		57.5	212.7			146.4			27.1	118.4
Level of Service	F	C		E	F			F			C	F
Approach Delay (s)		141.0			211.0			146.4			107.9	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	135.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	123.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	377	16	2	139	221	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.98	
Flt Protected	0.95		0.95	1.00	1.00	
Satd. Flow (prot)	1768		1770	1546	1541	
Flt Permitted	0.95		0.58	1.00	1.00	
Satd. Flow (perm)	1768		1089	1546	1541	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	410	17	2	151	240	41
RTOR Reduction (vph)	3	0	0	0	11	0
Lane Group Flow (vph)	424	0	2	151	270	0
Heavy Vehicles (%)	2%	2%	2%	15%	15%	2%
Bus Blockages (#/hr)	0	0	0	16	16	0
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	13.9		12.4	12.4	12.4	
Effective Green, g (s)	13.9		12.4	12.4	12.4	
Actuated g/C Ratio	0.41		0.36	0.36	0.36	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	716		394	559	557	
v/s Ratio Prot	c0.24			0.10	c0.17	
v/s Ratio Perm			0.00			
v/c Ratio	0.59		0.01	0.27	0.48	
Uniform Delay, d1	8.0		7.0	7.7	8.5	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	1.3		0.0	0.3	0.7	
Delay (s)	9.3		7.0	8.0	9.1	
Level of Service	A		A	A	A	
Approach Delay (s)	9.3			8.0	9.1	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	9.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	34.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	1177	1228	599	1140	1534	985	402	465
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1279	1335	651	1239	1667	1071	437	505
RTOR Reduction (vph)	0	0	0	0	0	0	0	4
Lane Group Flow (vph)	1279	1335	651	1239	1667	1071	437	501
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	23.4	27.7	21.4	25.7	90.0	22.4	22.4	21.4
Effective Green, g (s)	26.4	30.7	24.4	28.7	90.0	25.4	25.4	21.4
Actuated g/C Ratio	0.29	0.34	0.27	0.32	1.00	0.28	0.28	0.24
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	988	1080	826	1066	1583	852	875	376
v/s Ratio Prot	c0.38	c0.42	0.21	0.37			0.14	0.32
v/s Ratio Perm					c1.05	c0.35		
v/c Ratio	1.29	1.24	0.79	1.16	1.05	1.26	0.50	1.33
Uniform Delay, d1	31.8	29.6	30.4	30.6	45.0	32.3	27.0	34.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	140.1	114.4	5.0	83.6	38.0	125.2	0.3	167.0
Delay (s)	171.9	144.0	35.4	114.2	83.0	157.5	27.3	201.3
Level of Service	F	F	D	F	F	F	C	F
Approach Delay (s)		157.7		85.2				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	121.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	5.2
Intersection Capacity Utilization	103.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	2393	128	16	3005	24	28	29	10	16	28	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.96		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	4486		1641	3843		1703	1791		1289	1583	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	4486		1641	3843		1703	1791		1289	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	2601	139	17	3266	26	30	32	11	17	30	283
RTOR Reduction (vph)	0	4	0	0	0	0	0	10	0	0	215	0
Lane Group Flow (vph)	49	2736	0	17	3292	0	30	33	0	17	98	0
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	7.8	57.1		1.7	51.0		2.0	9.6		2.3	9.9	
Effective Green, g (s)	7.8	57.1		1.7	51.0		2.0	9.6		2.3	9.9	
Actuated g/C Ratio	0.09	0.64		0.02	0.57		0.02	0.11		0.03	0.11	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	146	2868		31	2195		38	193		33	175	
v/s Ratio Prot	c0.03	c0.61		0.01	c0.86		c0.02	0.02		0.01	c0.06	
v/s Ratio Perm												
v/c Ratio	0.34	0.95		0.55	1.50		0.79	0.17		0.52	0.56	
Uniform Delay, d1	38.3	14.9		43.4	19.1		43.4	36.2		42.9	37.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	8.5		10.2	227.2		63.7	0.2		5.5	2.2	
Delay (s)	38.8	23.4		53.6	246.4		107.2	36.4		48.5	39.8	
Level of Service	D	C		D	F		F	D		D	D	
Approach Delay (s)		23.7			245.4			65.5			40.3	
Approach LOS		C			F			E			D	

Intersection Summary			
HCM Average Control Delay	137.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	89.3	Sum of lost time (s)	9.3
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	1907	35	24	2549	20	92	20	24	20	20	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00			0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.98	1.00
Satd. Flow (prot)	1641	3273		1641	3278			1631			1685	1468
Flt Permitted	0.95	1.00		0.95	1.00			0.77			0.81	1.00
Satd. Flow (perm)	1641	3273		1641	3278			1299			1403	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	2073	38	26	2771	22	100	22	26	22	22	24
RTOR Reduction (vph)	0	1	0	0	0	0	0	6	0	0	0	22
Lane Group Flow (vph)	22	2110	0	26	2793	0	0	142	0	0	44	2
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		8
Actuated Green, G (s)	2.3	89.1		2.3	89.1			11.0			11.0	11.0
Effective Green, g (s)	2.3	89.1		2.3	89.1			11.0			11.0	11.0
Actuated g/C Ratio	0.02	0.75		0.02	0.75			0.09			0.09	0.09
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Vehicle Extension (s)	2.0	6.0		2.0	6.0			2.0			2.0	2.0
Lane Grp Cap (vph)	32	2463		32	2467			121			130	136
v/s Ratio Prot	0.01	0.64		c0.02	c0.85							
v/s Ratio Perm								c0.11			0.03	0.00
v/c Ratio	0.69	0.86		0.81	1.13			1.17			0.34	0.02
Uniform Delay, d1	57.7	10.2		57.8	14.7			53.7			50.3	48.8
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	39.1	4.1		81.6	65.1			134.9			0.6	0.0
Delay (s)	96.8	14.3		139.4	79.7			188.6			50.9	48.8
Level of Service	F	B		F	E			F			D	D
Approach Delay (s)		15.2			80.3			188.6			50.1	
Approach LOS		B			F			F			D	

Intersection Summary			
HCM Average Control Delay	56.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	118.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1883	66	12	2493	0	118	0	22	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			5.0				
Lane Util. Factor		0.95			0.95			1.00				
Frt		0.99			1.00			0.98				
Flt Protected		1.00			1.00			0.96				
Satd. Flow (prot)		3295			3311			1637				
Flt Permitted		1.00			0.93			0.95				
Satd. Flow (perm)		3295			3079			1621				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2047	72	13	2710	0	128	0	24	0	0	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	2117	0	0	2723	0	0	146	0	0	0	0
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)		88.0			88.0			11.0				
Effective Green, g (s)		88.0			88.0			11.0				
Actuated g/C Ratio		0.80			0.80			0.10				
Clearance Time (s)		6.0			6.0			5.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		2636			2463			162				
v/s Ratio Prot		0.64										
v/s Ratio Perm					c0.88			c0.09				
v/c Ratio		0.80			1.11			0.90				
Uniform Delay, d1		6.2			11.0			49.0				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		2.7			54.2			42.3				
Delay (s)		8.9			65.2			91.3				
Level of Service		A			E			F				
Approach Delay (s)		8.9			65.2			91.3			0.0	
Approach LOS		A			E			F			A	

Intersection Summary			
HCM Average Control Delay	42.1	HCM Level of Service	D
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	94.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1902	1	0	2325	165	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	0.95			0.95	1.00	
Frt	1.00			1.00	0.99	
Flt Protected	1.00			1.00	0.96	
Satd. Flow (prot)	3312			3312	1761	
Flt Permitted	1.00			1.00	0.96	
Satd. Flow (perm)	3312			3312	1761	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2067	1	0	2527	179	17
RTOR Reduction (vph)	0	0	0	0	4	0
Lane Group Flow (vph)	2068	0	0	2527	192	0
Heavy Vehicles (%)	9%	2%	2%	9%	2%	2%
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	70.7			70.7	11.0	
Effective Green, g (s)	70.7			70.7	11.0	
Actuated g/C Ratio	0.79			0.79	0.12	
Clearance Time (s)	4.0			4.0	4.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	2610			2610	216	
v/s Ratio Prot	0.62			c0.76	c0.11	
v/s Ratio Perm						
v/c Ratio	0.79			0.97	0.89	
Uniform Delay, d1	5.4			8.5	38.8	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	1.7			11.1	33.4	
Delay (s)	7.1			19.6	72.2	
Level of Service	A			B	E	
Approach Delay (s)	7.1			19.6	72.2	
Approach LOS	A			B	E	

Intersection Summary			
HCM Average Control Delay	16.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	89.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1918	0	0	2325	0	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2085	0	0	2527	0	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	494			578		
pX, platoon unblocked			0.25		0.25	0.25
vC, conflicting volume			2085		3348	1042
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		4373	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			412		0	275

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1390	695	1264	1264	4
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	4
cSH	1700	1700	1700	1700	275
Volume to Capacity	0.82	0.41	0.74	0.74	0.02
Queue Length 95th (ft)	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	18.3
Lane LOS					C
Approach Delay (s)	0.0		0.0		18.3
Approach LOS					C

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1372	115	186	2	142	107	444	57	1	65	74	1133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	0.97	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.91		1.00	0.94			1.00			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.98	1.00
Satd. Flow (prot)	3273	1611		1687	1661			1700			1735	1509
Flt Permitted	0.95	1.00		0.56	1.00			0.61			0.74	1.00
Satd. Flow (perm)	3273	1611		1000	1661			1083			1316	1509
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1491	125	202	2	154	116	483	62	1	71	80	1232
RTOR Reduction (vph)	0	39	0	0	18	0	0	0	0	0	0	494
Lane Group Flow (vph)	1491	288	0	2	252	0	0	546	0	0	151	738
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot			Perm			Perm			Perm		Perm
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		6
Actuated Green, G (s)	55.0	77.0		18.0	18.0			65.0			65.0	65.0
Effective Green, g (s)	55.0	77.0		18.0	18.0			65.0			65.0	65.0
Actuated g/C Ratio	0.37	0.51		0.12	0.12			0.43			0.43	0.43
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	1200	827		120	199			469			570	654
v/s Ratio Prot	c0.46	0.18			c0.15							
v/s Ratio Perm				0.00				c0.50			0.11	0.49
v/c Ratio	1.24	0.35		0.02	1.26			1.16			0.26	1.13
Uniform Delay, d1	47.5	21.6		58.2	66.0			42.5			27.2	42.5
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	116.3	0.3		0.1	152.5			95.0			0.3	76.1
Delay (s)	163.8	21.9		58.3	218.5			137.5			27.5	118.6
Level of Service	F	C		E	F			F			C	F
Approach Delay (s)		138.3			217.3			137.5			108.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	133.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	121.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	377	16	2	124	224	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.98	
Flt Protected	0.95		0.95	1.00	1.00	
Satd. Flow (prot)	1768		1770	1652	1647	
Flt Permitted	0.95		0.58	1.00	1.00	
Satd. Flow (perm)	1768		1085	1652	1647	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	410	17	2	135	243	41
RTOR Reduction (vph)	3	0	0	0	11	0
Lane Group Flow (vph)	424	0	2	135	273	0
Heavy Vehicles (%)	2%	2%	2%	15%	15%	2%
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	13.7		11.9	11.9	11.9	
Effective Green, g (s)	13.7		11.9	11.9	11.9	
Actuated g/C Ratio	0.41		0.35	0.35	0.35	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	721		384	585	583	
v/s Ratio Prot	c0.24			0.08	c0.17	
v/s Ratio Perm			0.00			
v/c Ratio	0.59		0.01	0.23	0.47	
Uniform Delay, d1	7.8		7.0	7.6	8.4	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	1.2		0.0	0.2	0.6	
Delay (s)	9.0		7.0	7.8	9.0	
Level of Service	A		A	A	A	
Approach Delay (s)	9.0			7.8	9.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	8.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	33.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

DeWitt Nelson Project Condition LOS Worksheets

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	335	1056	263	1080	782	1696	818	556
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	364	1148	286	1174	850	1843	889	604
RTOR Reduction (vph)	0	0	0	0	0	0	0	2
Lane Group Flow (vph)	364	1148	286	1174	850	1843	889	602
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	14.7	21.7	20.4	27.4	90.0	29.4	29.4	20.4
Effective Green, g (s)	17.7	24.7	23.4	30.4	90.0	32.4	32.4	20.4
Actuated g/C Ratio	0.20	0.27	0.26	0.34	1.00	0.36	0.36	0.23
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	662	869	792	1129	1583	1087	1116	359
v/s Ratio Prot	0.11	c0.36	0.09	0.35			0.29	c0.38
v/s Ratio Perm					0.54	c0.61		
v/c Ratio	0.55	1.32	0.36	1.04	0.54	1.70	0.80	1.68
Uniform Delay, d1	32.6	32.6	27.2	29.8	0.0	28.8	25.8	34.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	152.5	0.3	37.7	1.3	317.0	3.9	317.1
Delay (s)	33.5	185.2	27.5	67.5	1.3	345.8	29.7	351.9
Level of Service	C	F	C	E	A	F	C	F
Approach Delay (s)		148.7		38.2				
Approach LOS		F		D				

Intersection Summary			
HCM Average Control Delay	166.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.57		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	123.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	314	3002	8	13	1864	16	117	14	49	22	19	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.88		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	4509		1641	3843		1703	1645		1289	1586	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	4509		1641	3843		1703	1645		1289	1586	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	341	3263	9	14	2026	17	127	15	53	24	21	161
RTOR Reduction (vph)	0	0	0	0	1	0	0	46	0	0	145	0
Lane Group Flow (vph)	341	3272	0	14	2042	0	127	22	0	24	37	0
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	19.3	62.8		0.9	44.4		6.0	13.0		2.7	9.7	
Effective Green, g (s)	19.3	62.8		0.9	44.4		6.0	13.0		2.7	9.7	
Actuated g/C Ratio	0.20	0.64		0.01	0.45		0.06	0.13		0.03	0.10	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	329	2889		15	1741		104	218		36	157	
v/s Ratio Prot	c0.20	c0.73		0.01	0.53		c0.07	c0.01		0.02	c0.02	
v/s Ratio Perm												
v/c Ratio	1.04	1.13		0.93	1.17		1.22	0.10		0.67	0.24	
Uniform Delay, d1	39.4	17.6		48.5	26.8		46.0	37.4		47.2	40.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	59.4	64.6		195.4	84.4		159.2	0.1		30.6	0.3	
Delay (s)	98.7	82.2		243.9	111.2		205.2	37.4		77.8	41.0	
Level of Service	F	F		F	F		F	D		E	D	
Approach Delay (s)		83.7			112.1			146.7			45.3	
Approach LOS		F			F			F			D	

Intersection Summary			
HCM Average Control Delay	94.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	98.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	94.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	2421	237	23	1697	21	39	20	22	20	20	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	0.99		1.00	1.00			0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	1.00
Satd. Flow (prot)	1597	3152		1597	3189			1582			1640	1429
Flt Permitted	0.95	1.00		0.95	1.00			0.83			0.75	1.00
Satd. Flow (perm)	1597	3152		1597	3189			1338			1254	1429
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	2632	258	25	1845	23	42	22	24	22	22	27
RTOR Reduction (vph)	0	6	0	0	1	0	0	11	0	0	0	26
Lane Group Flow (vph)	33	2884	0	25	1867	0	0	77	0	0	44	1
Heavy Vehicles (%)	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		8
Actuated Green, G (s)	4.1	95.2		2.3	93.4			5.0			5.0	5.0
Effective Green, g (s)	4.1	95.2		2.3	93.4			5.0			5.0	5.0
Actuated g/C Ratio	0.03	0.80		0.02	0.79			0.04			0.04	0.04
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Vehicle Extension (s)	2.0	6.0		2.0	6.0			2.0			2.0	2.0
Lane Grp Cap (vph)	55	2532		31	2514			56			53	60
v/s Ratio Prot	c0.02	c0.92		0.02	0.59							
v/s Ratio Perm								c0.06			0.04	0.00
v/c Ratio	0.60	1.14		0.81	0.74			1.37			0.83	0.02
Uniform Delay, d1	56.4	11.6		57.9	6.4			56.8			56.3	54.4
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	11.2	68.0		80.5	2.0			245.3			63.1	0.0
Delay (s)	67.6	79.6		138.4	8.4			302.1			119.4	54.4
Level of Service	E	E		F	A			F			F	D
Approach Delay (s)		79.5			10.2			302.1			94.7	
Approach LOS		E			B			F			F	

Intersection Summary			
HCM Average Control Delay	57.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	118.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	94.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	2355	91	17	1700	0	58	0	11	0	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0			6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95			0.95			1.00			1.00	
Frt	1.00	0.99			1.00			0.98			0.86	
Flt Protected	0.95	1.00			1.00			0.96			1.00	
Satd. Flow (prot)	1612	3205			3222			1593			1467	
Flt Permitted	0.95	1.00			0.84			0.76			1.00	
Satd. Flow (perm)	1612	3205			2709			1259			1467	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	2560	99	18	1848	0	63	0	12	0	0	3
RTOR Reduction (vph)	0	2	0	0	0	0	0	7	0	0	3	0
Lane Group Flow (vph)	5	2657	0	0	1866	0	0	68	0	0	0	0
Heavy Vehicles (%)	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	0.8	96.0			90.2			7.0			7.0	
Effective Green, g (s)	0.8	96.0			90.2			7.0			7.0	
Actuated g/C Ratio	0.01	0.84			0.79			0.06			0.06	
Clearance Time (s)	5.0	6.0			6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	11	2699			2143			77			90	
v/s Ratio Prot	0.00	c0.83									0.00	
v/s Ratio Perm					0.69			c0.05				
v/c Ratio	0.45	0.98			0.87			0.89			0.00	
Uniform Delay, d1	56.4	8.3			8.0			53.1			50.2	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	27.0	14.0			5.2			65.4			0.0	
Delay (s)	83.4	22.3			13.2			118.5			50.2	
Level of Service	F	C			B			F			D	
Approach Delay (s)		22.4			13.2			118.5			50.2	
Approach LOS		C			B			F			D	

Intersection Summary			
HCM Average Control Delay	20.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	114.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2394	0	0	1695	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0		
Lane Util. Factor	0.95			0.95		
Frt	1.00			1.00		
Flt Protected	1.00			1.00		
Satd. Flow (prot)	3252			3252		
Flt Permitted	1.00			1.00		
Satd. Flow (perm)	3252			3252		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2602	0	0	1842	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	2602	0	0	1842	0	0
Heavy Vehicles (%)	11%	2%	2%	11%	2%	2%
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	48.0			48.0		
Effective Green, g (s)	48.0			48.0		
Actuated g/C Ratio	0.80			0.80		
Clearance Time (s)	4.0			4.0		
Vehicle Extension (s)	3.0			3.0		
Lane Grp Cap (vph)	2602			2602		
v/s Ratio Prot	c0.80			0.57		
v/s Ratio Perm						
v/c Ratio	1.00			0.71		
Uniform Delay, d1	6.0			2.8		
Progression Factor	1.00			1.00		
Incremental Delay, d2	17.6			0.9		
Delay (s)	23.6			3.7		
Level of Service	C			A		
Approach Delay (s)	23.6			3.7	0.0	
Approach LOS	C			A	A	

Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	2394	0	0	1695	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2602	0	0	1842	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	494			578		
pX, platoon unblocked			0.23		0.23	0.23
vC, conflicting volume			2602		3523	1301
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1292		5247	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			124		0	253

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1735	867	921	921	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	1.02	0.51	0.54	0.54	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2499	269	740	0	161	48	296	99	11	190	141	3273
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	4.0
Lane Util. Factor	0.97	1.00			1.00			1.00			1.00	1.00
Frt	1.00	0.89			0.97			1.00			1.00	0.85
Flt Protected	0.95	1.00			1.00			0.96			0.97	1.00
Satd. Flow (prot)	3019	1458			1582			1575			1592	1392
Flt Permitted	0.95	1.00			1.00			0.44			0.66	1.00
Satd. Flow (perm)	3019	1458			1582			715			1088	1392
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2716	292	804	0	175	52	322	108	12	207	153	3558
RTOR Reduction (vph)	0	66	0	0	7	0	0	1	0	0	0	471
Lane Group Flow (vph)	2716	1030	0	0	220	0	0	441	0	0	360	3087
Heavy Vehicles (%)	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%
Turn Type	Prot			Perm			Perm			Perm		Perm
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		6
Actuated Green, G (s)	53.0	74.0			17.0			68.0			68.0	68.0
Effective Green, g (s)	53.0	74.0			17.0			68.0			68.0	68.0
Actuated g/C Ratio	0.35	0.49			0.11			0.45			0.45	0.45
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	1067	719			179			324			493	631
v/s Ratio Prot	c0.90	c0.71			0.14							
v/s Ratio Perm								0.62			0.33	c2.22
v/c Ratio	2.55	1.43			1.23			1.36			0.73	4.89
Uniform Delay, d1	48.5	38.0			66.5			41.0			33.5	41.0
Progression Factor	1.00	1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2	698.2	202.7			142.0			181.9			5.5	1755.3
Delay (s)	746.7	240.7			208.5			222.9			39.0	1796.3
Level of Service	F	F			F			F			D	F
Approach Delay (s)		601.2			208.5			222.9			1634.8	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	1052.9	HCM Level of Service	F
HCM Volume to Capacity ratio	3.49		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	246.3%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	58	2	26	177	114	633
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.89	
Flt Protected	0.95		0.95	1.00	1.00	
Satd. Flow (prot)	1769		1770	1652	1618	
Flt Permitted	0.95		0.31	1.00	1.00	
Satd. Flow (perm)	1769		573	1652	1618	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	63	2	28	192	124	688
RTOR Reduction (vph)	2	0	0	0	144	0
Lane Group Flow (vph)	63	0	28	192	668	0
Heavy Vehicles (%)	2%	2%	2%	15%	15%	2%
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	6.4		54.2	54.2	54.2	
Effective Green, g (s)	6.4		54.2	54.2	54.2	
Actuated g/C Ratio	0.09		0.79	0.79	0.79	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	165		453	1305	1278	
v/s Ratio Prot	c0.04			0.12	c0.41	
v/s Ratio Perm			0.05			
v/c Ratio	0.38		0.06	0.15	0.52	
Uniform Delay, d1	29.2		1.6	1.7	2.6	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	1.5		0.1	0.1	0.4	
Delay (s)	30.7		1.6	1.8	3.0	
Level of Service	C		A	A	A	
Approach Delay (s)	30.7			1.7	3.0	
Approach LOS	C			A	A	

Intersection Summary			
HCM Average Control Delay	4.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	68.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	975	1293	543	1194	1502	1010	352	521
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1060	1405	590	1298	1633	1098	383	566
RTOR Reduction (vph)	0	0	0	0	0	0	0	3
Lane Group Flow (vph)	1060	1405	590	1298	1633	1098	383	563
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	20.4	27.7	22.4	29.7	90.0	21.4	21.4	22.4
Effective Green, g (s)	23.4	30.7	25.4	32.7	90.0	24.4	24.4	22.4
Actuated g/C Ratio	0.26	0.34	0.28	0.36	1.00	0.27	0.27	0.25
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	875	1080	859	1215	1583	818	840	394
v/s Ratio Prot	0.31	c0.44	0.19	0.39			0.12	c0.36
v/s Ratio Perm					c1.03	c0.36		
v/c Ratio	1.21	1.30	0.69	1.07	1.03	1.34	0.46	1.43
Uniform Delay, d1	33.3	29.6	28.8	28.6	45.0	32.8	27.3	33.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	105.7	142.3	2.3	46.2	31.2	162.2	0.3	207.2
Delay (s)	139.0	171.9	31.1	74.8	76.2	195.0	27.6	241.0
Level of Service	F	F	C	E	E	F	C	F
Approach Delay (s)		157.8		68.1				
Approach LOS		F		E				

Intersection Summary			
HCM Average Control Delay	123.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.38		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	108.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	2443	124	20	2888	30	38	26	22	14	20	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.93		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	4487		1641	3843		1703	1734		1289	1580	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	4487		1641	3843		1703	1734		1289	1580	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	2655	135	22	3139	33	41	28	24	15	22	262
RTOR Reduction (vph)	0	3	0	0	0	0	0	21	0	0	204	0
Lane Group Flow (vph)	24	2787	0	22	3172	0	41	31	0	15	80	0
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	5.5	57.2		1.7	53.4		3.3	12.6		1.2	10.5	
Effective Green, g (s)	5.5	57.2		1.7	53.4		3.3	12.6		1.2	10.5	
Actuated g/C Ratio	0.06	0.63		0.02	0.58		0.04	0.14		0.01	0.12	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	101	2811		31	2248		62	239		17	182	
v/s Ratio Prot	c0.01	0.62		c0.01	c0.83		c0.02	0.02		0.01	c0.05	
v/s Ratio Perm												
v/c Ratio	0.24	0.99		0.71	1.41		0.66	0.13		0.88	0.44	
Uniform Delay, d1	40.9	16.8		44.6	18.9		43.4	34.5		45.0	37.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	14.9		46.1	187.6		18.6	0.1		157.0	0.6	
Delay (s)	41.3	31.7		90.7	206.5		62.0	34.6		202.0	38.3	
Level of Service	D	C		F	F		E	C		F	D	
Approach Delay (s)		31.8			205.7			46.7			46.5	
Approach LOS		C			F			D			D	

Intersection Summary			
HCM Average Control Delay	119.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	91.3	Sum of lost time (s)	22.6
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	1954	31	27	2467	26	74	20	22	20	20	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00			0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.98	1.00
Satd. Flow (prot)	1641	3274		1641	3277			1631			1685	1468
Flt Permitted	0.95	1.00		0.95	1.00			0.78			0.78	1.00
Satd. Flow (perm)	1641	3274		1641	3277			1314			1352	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	2124	34	29	2682	28	80	22	24	22	22	62
RTOR Reduction (vph)	0	1	0	0	0	0	0	7	0	0	0	50
Lane Group Flow (vph)	34	2157	0	29	2710	0	0	119	0	0	44	12
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		8
Actuated Green, G (s)	3.2	92.9		2.4	92.1			9.0			9.0	9.0
Effective Green, g (s)	3.2	92.9		2.4	92.1			9.0			9.0	9.0
Actuated g/C Ratio	0.03	0.77		0.02	0.77			0.07			0.07	0.07
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Vehicle Extension (s)	2.0	6.0		2.0	6.0			2.0			2.0	2.0
Lane Grp Cap (vph)	44	2528		33	2509			98			101	110
v/s Ratio Prot	c0.02	0.66		0.02	c0.83							
v/s Ratio Perm								c0.09			0.03	0.01
v/c Ratio	0.77	0.85		0.88	1.08			1.21			0.44	0.11
Uniform Delay, d1	58.2	9.1		58.8	14.1			55.6			53.2	51.9
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	53.1	3.9		104.1	43.9			157.9			1.1	0.2
Delay (s)	111.3	13.1		162.9	58.0			213.6			54.3	52.1
Level of Service	F	B		F	E			F			D	D
Approach Delay (s)		14.6			59.1			213.6			53.0	
Approach LOS		B			E			F			D	

Intersection Summary			
HCM Average Control Delay	43.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	120.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	92.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	1926	66	12	2395	0	118	0	22	0	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0			6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95			0.95			1.00			1.00	
Frt	1.00	1.00			1.00			0.98			0.86	
Flt Protected	0.95	1.00			1.00			0.96			1.00	
Satd. Flow (prot)	1656	3295			3311			1637			1508	
Flt Permitted	0.95	1.00			0.93			0.76			1.00	
Satd. Flow (perm)	1656	3295			3069			1294			1508	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	2093	72	13	2603	0	128	0	24	0	0	2
RTOR Reduction (vph)	0	2	0	0	0	0	0	6	0	0	2	0
Lane Group Flow (vph)	1	2163	0	0	2616	0	0	146	0	0	0	0
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	0.8	92.0			86.2			11.0			11.0	
Effective Green, g (s)	0.8	92.0			86.2			11.0			11.0	
Actuated g/C Ratio	0.01	0.81			0.76			0.10			0.10	
Clearance Time (s)	5.0	6.0			6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	12	2659			2321			125			146	
v/s Ratio Prot	0.00	c0.66									0.00	
v/s Ratio Perm					c0.85			c0.11				
v/c Ratio	0.08	0.81			1.13			1.17			0.00	
Uniform Delay, d1	56.2	6.2			13.9			51.5			46.5	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	3.0	2.9			63.4			131.8			0.0	
Delay (s)	59.2	9.0			77.3			183.3			46.5	
Level of Service	E	A			E			F			D	
Approach Delay (s)		9.1			77.3			183.3			46.5	
Approach LOS		A			E			F			D	

Intersection Summary			
HCM Average Control Delay	50.6	HCM Level of Service	D
HCM Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	114.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	98.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1948	0	0	2409	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0		
Lane Util. Factor	0.95			0.95		
Frt	1.00			1.00		
Flt Protected	1.00			1.00		
Satd. Flow (prot)	3312			3312		
Flt Permitted	1.00			1.00		
Satd. Flow (perm)	3312			3312		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2117	0	0	2618	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	2117	0	0	2618	0	0
Heavy Vehicles (%)	9%	2%	2%	9%	2%	2%
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	48.0			48.0		
Effective Green, g (s)	48.0			48.0		
Actuated g/C Ratio	0.80			0.80		
Clearance Time (s)	4.0			4.0		
Vehicle Extension (s)	3.0			3.0		
Lane Grp Cap (vph)	2650			2650		
v/s Ratio Prot	0.64			c0.79		
v/s Ratio Perm						
v/c Ratio	0.80			0.99		
Uniform Delay, d1	3.3			5.7		
Progression Factor	1.00			1.00		
Incremental Delay, d2	1.8			14.6		
Delay (s)	5.1			20.3		
Level of Service	A			C		
Approach Delay (s)	5.1			20.3	0.0	
Approach LOS	A			C	A	

Intersection Summary			
HCM Average Control Delay	13.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1948	0	0	2408	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2117	0	0	2617	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	494			578		
pX, platoon unblocked			0.26		0.26	0.26
vC, conflicting volume			2117		3426	1059
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		4633	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			423		0	283

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1412	706	1309	1309	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.83	0.42	0.77	0.77	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1320	117	270	3	149	111	534	69	2	71	83	1127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	0.97	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.90		1.00	0.94			1.00			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.98	1.00
Satd. Flow (prot)	3273	1590		1687	1662			1700			1736	1509
Flt Permitted	0.95	1.00		0.52	1.00			0.59			0.74	1.00
Satd. Flow (perm)	3273	1590		918	1662			1055			1309	1509
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1435	127	293	3	162	121	580	75	2	77	90	1225
RTOR Reduction (vph)	0	55	0	0	18	0	0	0	0	0	0	480
Lane Group Flow (vph)	1435	365	0	3	265	0	0	657	0	0	167	745
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot			Perm			Perm			Perm		Perm
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		6
Actuated Green, G (s)	53.0	76.0		19.0	19.0			66.0			66.0	66.0
Effective Green, g (s)	53.0	76.0		19.0	19.0			66.0			66.0	66.0
Actuated g/C Ratio	0.35	0.51		0.13	0.13			0.44			0.44	0.44
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	1156	806		116	211			464			576	664
v/s Ratio Prot	c0.44	0.23			c0.16							
v/s Ratio Perm				0.00				c0.62			0.13	0.49
v/c Ratio	1.24	0.45		0.03	1.25			1.42			0.29	1.12
Uniform Delay, d1	48.5	23.7		57.4	65.5			42.0			27.0	42.0
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	116.1	0.4		0.1	147.2			199.6			0.3	73.6
Delay (s)	164.6	24.1		57.5	212.7			241.6			27.2	115.6
Level of Service	F	C		E	F			F			C	F
Approach Delay (s)		132.8			211.0			241.6			105.0	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	145.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	127.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	468	20	6	136	216	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.95	
Flt Protected	0.95		0.95	1.00	1.00	
Satd. Flow (prot)	1768		1770	1696	1665	
Flt Permitted	0.95		0.42	1.00	1.00	
Satd. Flow (perm)	1768		787	1696	1665	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	509	22	7	148	235	152
RTOR Reduction (vph)	3	0	0	0	43	0
Lane Group Flow (vph)	528	0	7	148	344	0
Heavy Vehicles (%)	2%	2%	2%	12%	12%	2%
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	17.1		13.9	13.9	13.9	
Effective Green, g (s)	17.1		13.9	13.9	13.9	
Actuated g/C Ratio	0.44		0.36	0.36	0.36	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	775		280	604	593	
v/s Ratio Prot	c0.30			0.09	c0.21	
v/s Ratio Perm			0.01			
v/c Ratio	0.68		0.03	0.25	0.58	
Uniform Delay, d1	8.8		8.1	8.8	10.2	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	2.5		0.0	0.2	1.4	
Delay (s)	11.3		8.2	9.1	11.6	
Level of Service	B		A	A	B	
Approach Delay (s)	11.3			9.0	11.6	
Approach LOS	B			A	B	

Intersection Summary			
HCM Average Control Delay	11.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	39.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	1177	1228	605	1146	1542	985	402	465
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1279	1335	658	1246	1676	1071	437	505
RTOR Reduction (vph)	0	0	0	0	0	0	0	4
Lane Group Flow (vph)	1279	1335	658	1246	1676	1071	437	501
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	23.4	27.7	21.4	25.7	90.0	22.4	22.4	21.4
Effective Green, g (s)	26.4	30.7	24.4	28.7	90.0	25.4	25.4	21.4
Actuated g/C Ratio	0.29	0.34	0.27	0.32	1.00	0.28	0.28	0.24
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	988	1080	826	1066	1583	852	875	376
v/s Ratio Prot	c0.38	c0.42	0.22	0.37			0.14	0.32
v/s Ratio Perm					c1.06	c0.35		
v/c Ratio	1.29	1.24	0.80	1.17	1.06	1.26	0.50	1.33
Uniform Delay, d1	31.8	29.6	30.5	30.6	45.0	32.3	27.0	34.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	140.1	114.4	5.4	86.3	40.0	125.2	0.3	167.0
Delay (s)	171.9	144.0	35.9	116.9	85.0	157.5	27.3	201.3
Level of Service	F	F	D	F	F	F	C	F
Approach Delay (s)		157.7		87.1				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	122.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	5.2
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	2392	128	16	3025	24	28	29	10	16	28	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.96		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	4486		1641	3843		1703	1791		1289	1583	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	4486		1641	3843		1703	1791		1289	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	2600	139	17	3288	26	30	32	11	17	30	283
RTOR Reduction (vph)	0	4	0	0	0	0	0	10	0	0	215	0
Lane Group Flow (vph)	49	2735	0	17	3314	0	30	33	0	17	98	0
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	7.8	57.1		1.7	51.0		2.0	9.6		2.3	9.9	
Effective Green, g (s)	7.8	57.1		1.7	51.0		2.0	9.6		2.3	9.9	
Actuated g/C Ratio	0.09	0.64		0.02	0.57		0.02	0.11		0.03	0.11	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	146	2868		31	2195		38	193		33	175	
v/s Ratio Prot	c0.03	c0.61		0.01	c0.86		c0.02	0.02		0.01	c0.06	
v/s Ratio Perm												
v/c Ratio	0.34	0.95		0.55	1.51		0.79	0.17		0.52	0.56	
Uniform Delay, d1	38.3	14.9		43.4	19.1		43.4	36.2		42.9	37.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	8.5		10.2	231.7		63.7	0.2		5.5	2.2	
Delay (s)	38.8	23.3		53.6	250.9		107.2	36.4		48.5	39.8	
Level of Service	D	C		D	F		F	D		D	D	
Approach Delay (s)		23.6			249.9			65.5			40.3	
Approach LOS		C			F			E			D	

Intersection Summary			
HCM Average Control Delay	140.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	89.3	Sum of lost time (s)	9.3
Intersection Capacity Utilization	91.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	1906	35	24	2569	20	92	20	24	20	20	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00			0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.98	1.00
Satd. Flow (prot)	1641	3273		1641	3278			1631			1685	1468
Flt Permitted	0.95	1.00		0.95	1.00			0.77			0.81	1.00
Satd. Flow (perm)	1641	3273		1641	3278			1299			1403	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	2072	38	26	2792	22	100	22	26	22	22	24
RTOR Reduction (vph)	0	1	0	0	0	0	0	6	0	0	0	22
Lane Group Flow (vph)	22	2109	0	26	2814	0	0	142	0	0	44	2
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		8
Actuated Green, G (s)	2.3	89.1		2.3	89.1			11.0			11.0	11.0
Effective Green, g (s)	2.3	89.1		2.3	89.1			11.0			11.0	11.0
Actuated g/C Ratio	0.02	0.75		0.02	0.75			0.09			0.09	0.09
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Vehicle Extension (s)	2.0	6.0		2.0	6.0			2.0			2.0	2.0
Lane Grp Cap (vph)	32	2463		32	2467			121			130	136
v/s Ratio Prot	0.01	0.64		c0.02	c0.86							
v/s Ratio Perm								c0.11			0.03	0.00
v/c Ratio	0.69	0.86		0.81	1.14			1.17			0.34	0.02
Uniform Delay, d1	57.7	10.2		57.8	14.7			53.7			50.3	48.8
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	39.1	4.1		81.6	68.7			134.9			0.6	0.0
Delay (s)	96.8	14.3		139.4	83.3			188.6			50.9	48.8
Level of Service	F	B		F	F			F			D	D
Approach Delay (s)		15.1			83.8			188.6			50.1	
Approach LOS		B			F			F			D	

Intersection Summary			
HCM Average Control Delay	58.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	118.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1882	66	12	2513	0	118	0	22	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			5.0				
Lane Util. Factor		0.95			0.95			1.00				
Frt		0.99			1.00			0.98				
Flt Protected		1.00			1.00			0.96				
Satd. Flow (prot)		3295			3311			1637				
Flt Permitted		1.00			0.93			0.95				
Satd. Flow (perm)		3295			3079			1621				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2046	72	13	2732	0	128	0	24	0	0	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	2116	0	0	2745	0	0	146	0	0	0	0
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)		88.0			88.0			11.0				
Effective Green, g (s)		88.0			88.0			11.0				
Actuated g/C Ratio		0.80			0.80			0.10				
Clearance Time (s)		6.0			6.0			5.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		2636			2463			162				
v/s Ratio Prot		0.64										
v/s Ratio Perm					c0.89			c0.09				
v/c Ratio		0.80			1.11			0.90				
Uniform Delay, d1		6.1			11.0			49.0				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		2.7			57.9			42.3				
Delay (s)		8.8			68.9			91.3				
Level of Service		A			E			F				
Approach Delay (s)		8.8			68.9			91.3			0.0	
Approach LOS		A			E			F			A	

Intersection Summary			
HCM Average Control Delay	44.2	HCM Level of Service	D
HCM Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	94.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1902	0	0	2510	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0		
Lane Util. Factor	0.95			0.95		
Frt	1.00			1.00		
Flt Protected	1.00			1.00		
Satd. Flow (prot)	3312			3312		
Flt Permitted	1.00			1.00		
Satd. Flow (perm)	3312			3312		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2067	0	0	2728	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	2067	0	0	2728	0	0
Heavy Vehicles (%)	9%	2%	2%	9%	2%	2%
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	48.0			48.0		
Effective Green, g (s)	48.0			48.0		
Actuated g/C Ratio	0.80			0.80		
Clearance Time (s)	4.0			4.0		
Vehicle Extension (s)	3.0			3.0		
Lane Grp Cap (vph)	2650			2650		
v/s Ratio Prot	0.62			c0.82		
v/s Ratio Perm						
v/c Ratio	0.78			1.03		
Uniform Delay, d1	3.2			6.0		
Progression Factor	1.00			1.00		
Incremental Delay, d2	1.5			25.6		
Delay (s)	4.7			31.6		
Level of Service	A			C		
Approach Delay (s)	4.7			31.6	0.0	
Approach LOS	A			C	A	

Intersection Summary			
HCM Average Control Delay	20.0	HCM Level of Service	B
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1902	0	0	2510	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2067	0	0	2728	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	494			578		
pX, platoon unblocked			0.26		0.26	0.26
vC, conflicting volume			2067		3432	1034
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		4643	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			426		0	285

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1378	689	1364	1364	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.81	0.41	0.80	0.80	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1359	115	178	2	142	107	628	72	1	65	74	1133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	0.97	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.91		1.00	0.94			1.00			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.98	1.00
Satd. Flow (prot)	3273	1614		1687	1661			1699			1735	1509
Flt Permitted	0.95	1.00		0.57	1.00			0.61			0.75	1.00
Satd. Flow (perm)	3273	1614		1008	1661			1079			1328	1509
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1477	125	193	2	154	116	683	78	1	71	80	1232
RTOR Reduction (vph)	0	37	0	0	18	0	0	0	0	0	0	494
Lane Group Flow (vph)	1477	281	0	2	252	0	0	762	0	0	151	738
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot			Perm			Perm			Perm		Perm
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		6
Actuated Green, G (s)	55.0	77.0		18.0	18.0			65.0			65.0	65.0
Effective Green, g (s)	55.0	77.0		18.0	18.0			65.0			65.0	65.0
Actuated g/C Ratio	0.37	0.51		0.12	0.12			0.43			0.43	0.43
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	1200	829		121	199			468			575	654
v/s Ratio Prot	c0.45	0.17			c0.15							
v/s Ratio Perm				0.00				c0.71			0.11	0.49
v/c Ratio	1.23	0.34		0.02	1.26			1.63			0.26	1.13
Uniform Delay, d1	47.5	21.5		58.2	66.0			42.5			27.2	42.5
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	111.3	0.2		0.1	152.5			292.3			0.2	76.1
Delay (s)	158.8	21.8		58.3	218.5			334.8			27.4	118.6
Level of Service	F	C		E	F			F			C	F
Approach Delay (s)		134.6			217.3			334.8			108.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	167.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.42		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	132.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	576	24	2	124	216	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.98	
Flt Protected	0.95		0.95	1.00	1.00	
Satd. Flow (prot)	1768		1770	1696	1685	
Flt Permitted	0.95		0.53	1.00	1.00	
Satd. Flow (perm)	1768		994	1696	1685	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	626	26	2	135	235	41
RTOR Reduction (vph)	3	0	0	0	11	0
Lane Group Flow (vph)	649	0	2	135	265	0
Heavy Vehicles (%)	2%	2%	2%	12%	12%	2%
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	20.5		12.2	12.2	12.2	
Effective Green, g (s)	20.5		12.2	12.2	12.2	
Actuated g/C Ratio	0.50		0.30	0.30	0.30	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	891		298	508	505	
v/s Ratio Prot	c0.37			0.08	c0.16	
v/s Ratio Perm			0.00			
v/c Ratio	0.73		0.01	0.27	0.53	
Uniform Delay, d1	7.9		10.0	10.8	11.8	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	3.0		0.0	0.3	1.0	
Delay (s)	10.9		10.0	11.1	12.8	
Level of Service	B		B	B	B	
Approach Delay (s)	10.9			11.1	12.8	
Approach LOS	B			B	B	

Intersection Summary			
HCM Average Control Delay	11.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	40.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

NCRF & DeWitt Nelson Projects Condition LOS Worksheets

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	335	1108	268	1085	789	1761	818	604
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	364	1204	291	1179	858	1914	889	657
RTOR Reduction (vph)	0	0	0	0	0	0	0	1
Lane Group Flow (vph)	364	1204	291	1179	858	1914	889	656
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	14.7	21.7	20.4	27.4	90.0	29.4	29.4	20.4
Effective Green, g (s)	17.7	24.7	23.4	30.4	90.0	32.4	32.4	20.4
Actuated g/C Ratio	0.20	0.27	0.26	0.34	1.00	0.36	0.36	0.23
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	662	869	792	1129	1583	1087	1116	359
v/s Ratio Prot	0.11	c0.38	0.10	0.35			0.29	c0.41
v/s Ratio Perm					0.54	c0.63		
v/c Ratio	0.55	1.39	0.37	1.04	0.54	1.76	0.80	1.83
Uniform Delay, d1	32.6	32.6	27.2	29.8	0.0	28.8	25.8	34.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	180.6	0.3	39.1	1.3	346.2	3.9	383.3
Delay (s)	33.5	213.3	27.5	68.9	1.3	375.0	29.7	418.1
Level of Service	C	F	C	E	A	F	C	F
Approach Delay (s)		171.5		38.8				
Approach LOS		F		D				

Intersection Summary			
HCM Average Control Delay	187.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	129.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	314	3166	8	13	1882	16	117	14	49	22	19	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.88		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	4509		1641	3843		1703	1645		1289	1586	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	4509		1641	3843		1703	1645		1289	1586	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	341	3441	9	14	2046	17	127	15	53	24	21	161
RTOR Reduction (vph)	0	0	0	0	1	0	0	46	0	0	145	0
Lane Group Flow (vph)	341	3450	0	14	2062	0	127	22	0	24	37	0
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	19.3	62.8		0.9	44.4		6.0	13.0		2.7	9.7	
Effective Green, g (s)	19.3	62.8		0.9	44.4		6.0	13.0		2.7	9.7	
Actuated g/C Ratio	0.20	0.64		0.01	0.45		0.06	0.13		0.03	0.10	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	329	2889		15	1741		104	218		36	157	
v/s Ratio Prot	c0.20	c0.77		0.01	0.54		c0.07	c0.01		0.02	c0.02	
v/s Ratio Perm												
v/c Ratio	1.04	1.19		0.93	1.18		1.22	0.10		0.67	0.24	
Uniform Delay, d1	39.4	17.6		48.5	26.8		46.0	37.4		47.2	40.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	59.4	91.1		195.4	89.3		159.2	0.1		30.6	0.3	
Delay (s)	98.7	108.7		243.9	116.1		205.2	37.4		77.8	41.0	
Level of Service	F	F		F	F		F	D		E	D	
Approach Delay (s)		107.8			116.9			146.7			45.3	
Approach LOS		F			F			F			D	

Intersection Summary			
HCM Average Control Delay	110.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	98.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	97.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	2585	237	23	1715	21	39	20	22	20	20	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	0.99		1.00	1.00			0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	1.00
Satd. Flow (prot)	1597	3154		1597	3189			1582			1640	1429
Flt Permitted	0.95	1.00		0.95	1.00			0.83			0.75	1.00
Satd. Flow (perm)	1597	3154		1597	3189			1338			1254	1429
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	2810	258	25	1864	23	42	22	24	22	22	27
RTOR Reduction (vph)	0	5	0	0	1	0	0	11	0	0	0	26
Lane Group Flow (vph)	33	3063	0	25	1886	0	0	77	0	0	44	1
Heavy Vehicles (%)	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		8
Actuated Green, G (s)	4.1	95.2		2.3	93.4			5.0			5.0	5.0
Effective Green, g (s)	4.1	95.2		2.3	93.4			5.0			5.0	5.0
Actuated g/C Ratio	0.03	0.80		0.02	0.79			0.04			0.04	0.04
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Vehicle Extension (s)	2.0	6.0		2.0	6.0			2.0			2.0	2.0
Lane Grp Cap (vph)	55	2534		31	2514			56			53	60
v/s Ratio Prot	c0.02	c0.97		0.02	0.59							
v/s Ratio Perm								c0.06			0.04	0.00
v/c Ratio	0.60	1.21		0.81	0.75			1.37			0.83	0.02
Uniform Delay, d1	56.4	11.6		57.9	6.5			56.8			56.3	54.4
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	11.2	97.8		80.5	2.1			245.3			63.1	0.0
Delay (s)	67.6	109.5		138.4	8.6			302.1			119.4	54.4
Level of Service	E	F		F	A			F			F	D
Approach Delay (s)		109.0			10.3			302.1			94.7	
Approach LOS		F			B			F			F	

Intersection Summary			
HCM Average Control Delay	75.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	118.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	99.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	2519	91	17	1718	0	58	0	11	0	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0			6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95			0.95			1.00			1.00	
Frt	1.00	0.99			1.00			0.98			0.86	
Flt Protected	0.95	1.00			1.00			0.96			1.00	
Satd. Flow (prot)	1626	3235			3251			1607			1481	
Flt Permitted	0.95	1.00			0.75			0.76			1.00	
Satd. Flow (perm)	1626	3235			2431			1270			1481	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	2738	99	18	1867	0	63	0	12	0	0	3
RTOR Reduction (vph)	0	2	0	0	0	0	0	7	0	0	3	0
Lane Group Flow (vph)	5	2835	0	0	1885	0	0	68	0	0	0	0
Heavy Vehicles (%)	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	0.8	96.0			90.2			7.0			7.0	
Effective Green, g (s)	0.8	96.0			90.2			7.0			7.0	
Actuated g/C Ratio	0.01	0.84			0.79			0.06			0.06	
Clearance Time (s)	5.0	6.0			6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	11	2724			1923			78			91	
v/s Ratio Prot	0.00	c0.88									0.00	
v/s Ratio Perm					0.78			c0.05				
v/c Ratio	0.45	1.04			0.98			0.88			0.00	
Uniform Delay, d1	56.4	9.0			11.1			53.1			50.2	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	27.0	29.0			16.4			61.7			0.0	
Delay (s)	83.4	38.0			27.4			114.8			50.2	
Level of Service	F	D			C			F			D	
Approach Delay (s)		38.1			27.4			114.8			50.2	
Approach LOS		D			C			F			D	

Intersection Summary			
HCM Average Control Delay	35.1	HCM Level of Service	D
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	114.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2427	132	20	1695	18	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	0.99		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	3241		1770	3252	1760	
Flt Permitted	1.00		0.08	1.00	0.96	
Satd. Flow (perm)	3241		155	3252	1760	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2638	143	22	1842	20	2
RTOR Reduction (vph)	6	0	0	0	2	0
Lane Group Flow (vph)	2775	0	22	1842	20	0
Heavy Vehicles (%)	11%	2%	2%	11%	2%	2%
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	48.0		48.0	48.0	4.0	
Effective Green, g (s)	48.0		48.0	48.0	4.0	
Actuated g/C Ratio	0.80		0.80	0.80	0.07	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	2593		124	2602	117	
v/s Ratio Prot	c0.86			0.57	c0.01	
v/s Ratio Perm			0.14			
v/c Ratio	1.07		0.18	0.71	0.17	
Uniform Delay, d1	6.0		1.4	2.8	26.4	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	39.9		0.7	0.9	0.7	
Delay (s)	45.9		2.1	3.7	27.1	
Level of Service	D		A	A	C	
Approach Delay (s)	45.9			3.6	27.1	
Approach LOS	D			A	C	

Intersection Summary			
HCM Average Control Delay	28.9	HCM Level of Service	C
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	2395	33	0	1715	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2603	36	0	1864	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	494			578		
pX, platoon unblocked			0.23		0.23	0.23
vC, conflicting volume			2639		3553	1320
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1455		5369	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			108		0	253

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1736	904	932	932	0
Volume Left	0	0	0	0	0
Volume Right	0	36	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	1.02	0.53	0.55	0.55	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2501	269	741	0	161	48	304	99	11	190	141	3286
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0			4.0			4.0	4.0
Lane Util. Factor	0.97	1.00			1.00			1.00			1.00	1.00
Frt	1.00	0.89			0.97			1.00			1.00	0.85
Flt Protected	0.95	1.00			1.00			0.96			0.97	1.00
Satd. Flow (prot)	3019	1458			1582			1574			1592	1392
Flt Permitted	0.95	1.00			1.00			0.44			0.66	1.00
Satd. Flow (perm)	3019	1458			1582			713			1087	1392
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2718	292	805	0	175	52	330	108	12	207	153	3572
RTOR Reduction (vph)	0	66	0	0	7	0	0	1	0	0	0	471
Lane Group Flow (vph)	2718	1031	0	0	220	0	0	449	0	0	360	3101
Heavy Vehicles (%)	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%
Turn Type	Prot			Perm			Perm			Perm		Perm
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		6
Actuated Green, G (s)	53.0	74.0			17.0			68.0			68.0	68.0
Effective Green, g (s)	53.0	74.0			17.0			68.0			68.0	68.0
Actuated g/C Ratio	0.35	0.49			0.11			0.45			0.45	0.45
Clearance Time (s)	4.0	4.0			4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	1067	719			179			323			493	631
v/s Ratio Prot	c0.90	c0.71			0.14							
v/s Ratio Perm								0.63			0.33	c2.23
v/c Ratio	2.55	1.43			1.23			1.39			0.73	4.91
Uniform Delay, d1	48.5	38.0			66.5			41.0			33.5	41.0
Progression Factor	1.00	1.00			1.00			1.00			1.00	1.00
Incremental Delay, d2	699.1	203.0			142.0			194.1			5.5	1765.3
Delay (s)	747.6	241.0			208.5			235.1			39.0	1806.3
Level of Service	F	F			F			F			D	F
Approach Delay (s)		601.9			208.5			235.1			1644.5	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	1058.3	HCM Level of Service	F
HCM Volume to Capacity ratio	3.50		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	247.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	58	2	26	185	115	633
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	1.00		1.00	1.00	0.89	
Flt Protected	0.95		0.95	1.00	1.00	
Satd. Flow (prot)	1769		1770	1652	1618	
Flt Permitted	0.95		0.31	1.00	1.00	
Satd. Flow (perm)	1769		572	1652	1618	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	63	2	28	201	125	688
RTOR Reduction (vph)	2	0	0	0	144	0
Lane Group Flow (vph)	63	0	28	201	669	0
Heavy Vehicles (%)	2%	2%	2%	15%	15%	2%
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	6.4		54.2	54.2	54.2	
Effective Green, g (s)	6.4		54.2	54.2	54.2	
Actuated g/C Ratio	0.09		0.79	0.79	0.79	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	165		452	1305	1278	
v/s Ratio Prot	c0.04			0.12	c0.41	
v/s Ratio Perm			0.05			
v/c Ratio	0.38		0.06	0.15	0.52	
Uniform Delay, d1	29.2		1.6	1.7	2.6	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	1.5		0.1	0.1	0.4	
Delay (s)	30.7		1.6	1.8	3.0	
Level of Service	C		A	A	A	
Approach Delay (s)	30.7			1.8	3.0	
Approach LOS	C			A	A	

Intersection Summary			
HCM Average Control Delay	4.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	68.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	975	1314	572	1225	1541	1036	352	540
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1060	1428	622	1332	1675	1126	383	587
RTOR Reduction (vph)	0	0	0	0	0	0	0	2
Lane Group Flow (vph)	1060	1428	622	1332	1675	1126	383	585
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	20.4	26.7	22.4	28.7	90.0	22.4	22.4	22.4
Effective Green, g (s)	23.4	29.7	25.4	31.7	90.0	25.4	25.4	22.4
Actuated g/C Ratio	0.26	0.33	0.28	0.35	1.00	0.28	0.28	0.25
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	875	1045	859	1177	1583	852	875	394
v/s Ratio Prot	0.31	c0.45	0.20	0.40			0.12	c0.37
v/s Ratio Perm					c1.06	c0.37		
v/c Ratio	1.21	1.37	0.72	1.13	1.06	1.32	0.44	1.48
Uniform Delay, d1	33.3	30.1	29.1	29.1	45.0	32.3	26.5	33.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	105.7	171.1	3.0	70.3	39.8	152.9	0.3	231.1
Delay (s)	139.0	201.3	32.2	99.5	84.8	185.2	26.7	264.9
Level of Service	F	F	C	F	F	F	C	F
Approach Delay (s)		174.8		81.2				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	134.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.41		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	110.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	2509	124	20	2988	30	38	26	22	14	20	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.93		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	4488		1641	3843		1703	1734		1289	1580	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	4488		1641	3843		1703	1734		1289	1580	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	2727	135	22	3248	33	41	28	24	15	22	262
RTOR Reduction (vph)	0	3	0	0	0	0	0	21	0	0	204	0
Lane Group Flow (vph)	24	2859	0	22	3281	0	41	31	0	15	80	0
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	5.5	57.2		1.7	53.4		3.3	12.6		1.2	10.5	
Effective Green, g (s)	5.5	57.2		1.7	53.4		3.3	12.6		1.2	10.5	
Actuated g/C Ratio	0.06	0.63		0.02	0.58		0.04	0.14		0.01	0.12	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	101	2812		31	2248		62	239		17	182	
v/s Ratio Prot	c0.01	0.64		c0.01	c0.85		c0.02	0.02		0.01	c0.05	
v/s Ratio Perm												
v/c Ratio	0.24	1.02		0.71	1.46		0.66	0.13		0.88	0.44	
Uniform Delay, d1	40.9	17.0		44.6	18.9		43.4	34.5		45.0	37.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	21.2		46.1	209.2		18.6	0.1		157.0	0.6	
Delay (s)	41.3	38.3		90.7	228.2		62.0	34.6		202.0	38.3	
Level of Service	D	D		F	F		E	C		F	D	
Approach Delay (s)		38.3			227.2			46.7			46.5	
Approach LOS		D			F			D			D	

Intersection Summary			
HCM Average Control Delay	133.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	91.3	Sum of lost time (s)	22.6
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	2020	31	27	2567	26	74	20	22	20	20	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00			0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.98	1.00
Satd. Flow (prot)	1641	3274		1641	3277			1631			1685	1468
Flt Permitted	0.95	1.00		0.95	1.00			0.78			0.78	1.00
Satd. Flow (perm)	1641	3274		1641	3277			1314			1352	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	2196	34	29	2790	28	80	22	24	22	22	62
RTOR Reduction (vph)	0	1	0	0	0	0	0	7	0	0	0	48
Lane Group Flow (vph)	34	2229	0	29	2818	0	0	119	0	0	44	14
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		8
Actuated Green, G (s)	3.2	92.9		2.4	92.1			9.0			9.0	9.0
Effective Green, g (s)	3.2	92.9		2.4	92.1			9.0			9.0	9.0
Actuated g/C Ratio	0.03	0.77		0.02	0.77			0.07			0.07	0.07
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Vehicle Extension (s)	2.0	6.0		2.0	6.0			2.0			2.0	2.0
Lane Grp Cap (vph)	44	2528		33	2509			98			101	110
v/s Ratio Prot	c0.02	0.68		0.02	c0.86							
v/s Ratio Perm								c0.09			0.03	0.01
v/c Ratio	0.77	0.88		0.88	1.12			1.21			0.44	0.13
Uniform Delay, d1	58.2	9.8		58.8	14.1			55.6			53.2	52.0
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	53.1	4.9		104.1	61.3			157.9			1.1	0.2
Delay (s)	111.3	14.6		162.9	75.4			213.6			54.3	52.2
Level of Service	F	B		F	E			F			D	D
Approach Delay (s)		16.1			76.2			213.6			53.1	
Approach LOS		B			E			F			D	

Intersection Summary			
HCM Average Control Delay	53.5	HCM Level of Service	D
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	120.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	1992	66	12	2495	0	118	0	22	0	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0			6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95			0.95			1.00			1.00	
Frt	1.00	1.00			1.00			0.98			0.86	
Flt Protected	0.95	1.00			1.00			0.96			1.00	
Satd. Flow (prot)	1656	3296			3311			1637			1508	
Flt Permitted	0.95	1.00			0.93			0.76			1.00	
Satd. Flow (perm)	1656	3296			3066			1294			1508	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	2165	72	13	2712	0	128	0	24	0	0	2
RTOR Reduction (vph)	0	2	0	0	0	0	0	6	0	0	2	0
Lane Group Flow (vph)	1	2235	0	0	2725	0	0	146	0	0	0	0
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	0.8	92.0			86.2			11.0			11.0	
Effective Green, g (s)	0.8	92.0			86.2			11.0			11.0	
Actuated g/C Ratio	0.01	0.81			0.76			0.10			0.10	
Clearance Time (s)	5.0	6.0			6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)	12	2660			2318			125			146	
v/s Ratio Prot	0.00	c0.68									0.00	
v/s Ratio Perm					c0.89			c0.11				
v/c Ratio	0.08	0.84			1.18			1.17			0.00	
Uniform Delay, d1	56.2	6.6			13.9			51.5			46.5	
Progression Factor	1.00	1.00			1.00			1.00			1.00	
Incremental Delay, d2	3.0	3.4			83.9			131.8			0.0	
Delay (s)	59.2	10.0			97.8			183.3			46.5	
Level of Service	E	A			F			F			D	
Approach Delay (s)		10.0			97.8			183.3			46.5	
Approach LOS		B			F			F			D	

Intersection Summary			
HCM Average Control Delay	61.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	114.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	101.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1961	53	8	2409	101	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	1.00		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	3304		1770	3312	1760	
Flt Permitted	1.00		0.14	1.00	0.96	
Satd. Flow (perm)	3304		266	3312	1760	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2132	58	9	2618	110	11
RTOR Reduction (vph)	5	0	0	0	9	0
Lane Group Flow (vph)	2185	0	9	2618	112	0
Heavy Vehicles (%)	9%	2%	2%	9%	2%	2%
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	28.0		28.0	28.0	4.0	
Effective Green, g (s)	28.0		28.0	28.0	4.0	
Actuated g/C Ratio	0.70		0.70	0.70	0.10	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	2313		186	2318	176	
v/s Ratio Prot	0.66			c0.79	c0.06	
v/s Ratio Perm			0.03			
v/c Ratio	0.94		0.05	1.13	0.64	
Uniform Delay, d1	5.3		1.9	6.0	17.3	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	8.9		0.1	64.4	7.3	
Delay (s)	14.2		2.0	70.4	24.6	
Level of Service	B		A	E	C	
Approach Delay (s)	14.2			70.1	24.6	
Approach LOS	B			E	C	

Intersection Summary			
HCM Average Control Delay	44.2	HCM Level of Service	D
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1958	13	0	2416	0	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2128	14	0	2626	0	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	494			578		
pX, platoon unblocked			0.38		0.38	0.38
vC, conflicting volume			2142		3448	1071
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			735		4184	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			328		1	411

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1419	724	1313	1313	2
Volume Left	0	0	0	0	0
Volume Right	0	14	0	0	2
cSH	1700	1700	1700	1700	411
Volume to Capacity	0.83	0.43	0.77	0.77	0.01
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	13.8
Lane LOS					B
Approach Delay (s)	0.0		0.0		13.8
Approach LOS					B

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1328	117	274	3	149	111	537	69	2	71	83	1132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	0.97	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.89		1.00	0.94			1.00			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.98	1.00
Satd. Flow (prot)	3273	1589		1687	1662			1700			1736	1509
Flt Permitted	0.95	1.00		0.51	1.00			0.59			0.74	1.00
Satd. Flow (perm)	3273	1589		914	1662			1054			1310	1509
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1443	127	298	3	162	121	584	75	2	77	90	1230
RTOR Reduction (vph)	0	56	0	0	18	0	0	0	0	0	0	480
Lane Group Flow (vph)	1443	369	0	3	265	0	0	661	0	0	167	750
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot			Perm			Perm			Perm		Perm
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		6
Actuated Green, G (s)	53.0	76.0		19.0	19.0			66.0			66.0	66.0
Effective Green, g (s)	53.0	76.0		19.0	19.0			66.0			66.0	66.0
Actuated g/C Ratio	0.35	0.51		0.13	0.13			0.44			0.44	0.44
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	1156	805		116	211			464			576	664
v/s Ratio Prot	c0.44	0.23			c0.16							
v/s Ratio Perm				0.00				c0.63			0.13	0.50
v/c Ratio	1.25	0.46		0.03	1.25			1.42			0.29	1.13
Uniform Delay, d1	48.5	23.8		57.4	65.5			42.0			27.0	42.0
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	119.1	0.4		0.1	147.2			203.3			0.3	76.4
Delay (s)	167.6	24.2		57.5	212.7			245.3			27.2	118.4
Level of Service	F	C		E	F			F			C	F
Approach Delay (s)		134.9			211.0			245.3			107.5	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	148.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	128.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	468	20	6	139	221	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.95	
Flt Protected	0.95		0.95	1.00	1.00	
Satd. Flow (prot)	1768		1770	1696	1665	
Flt Permitted	0.95		0.42	1.00	1.00	
Satd. Flow (perm)	1768		774	1696	1665	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	509	22	7	151	240	152
RTOR Reduction (vph)	3	0	0	0	40	0
Lane Group Flow (vph)	528	0	7	151	352	0
Heavy Vehicles (%)	2%	2%	2%	12%	12%	2%
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	17.4		14.2	14.2	14.2	
Effective Green, g (s)	17.4		14.2	14.2	14.2	
Actuated g/C Ratio	0.44		0.36	0.36	0.36	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	777		278	608	597	
v/s Ratio Prot	c0.30			0.09	c0.21	
v/s Ratio Perm			0.01			
v/c Ratio	0.68		0.03	0.25	0.59	
Uniform Delay, d1	8.9		8.2	8.9	10.3	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	2.4		0.0	0.2	1.5	
Delay (s)	11.3		8.3	9.2	11.8	
Level of Service	B		A	A	B	
Approach Delay (s)	11.3			9.1	11.8	
Approach LOS	B			A	B	

Intersection Summary			
HCM Average Control Delay	11.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	39.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	1177	1228	653	1198	1607	985	402	465
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1279	1335	710	1302	1747	1071	437	505
RTOR Reduction (vph)	0	0	0	0	0	0	0	4
Lane Group Flow (vph)	1279	1335	710	1302	1747	1071	437	501
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	23.4	27.7	21.4	25.7	90.0	22.4	22.4	21.4
Effective Green, g (s)	26.4	30.7	24.4	28.7	90.0	25.4	25.4	21.4
Actuated g/C Ratio	0.29	0.34	0.27	0.32	1.00	0.28	0.28	0.24
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	988	1080	826	1066	1583	852	875	376
v/s Ratio Prot	c0.38	c0.42	0.23	0.39			0.14	0.32
v/s Ratio Perm					c1.10	c0.35		
v/c Ratio	1.29	1.24	0.86	1.22	1.10	1.26	0.50	1.33
Uniform Delay, d1	31.8	29.6	31.2	30.6	45.0	32.3	27.0	34.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	140.1	114.4	8.9	108.2	56.6	125.2	0.3	167.0
Delay (s)	171.9	144.0	40.1	138.9	101.6	157.5	27.3	201.3
Level of Service	F	F	D	F	F	F	C	F
Approach Delay (s)		157.7		102.9				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	128.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	5.2
Intersection Capacity Utilization	105.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	2393	128	16	3189	24	28	29	10	16	28	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.96		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	4486		1641	3843		1703	1791		1289	1583	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	4486		1641	3843		1703	1791		1289	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	2601	139	17	3466	26	30	32	11	17	30	283
RTOR Reduction (vph)	0	4	0	0	0	0	0	10	0	0	215	0
Lane Group Flow (vph)	49	2736	0	17	3492	0	30	33	0	17	98	0
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	7.8	57.1		1.7	51.0		2.0	9.6		2.3	9.9	
Effective Green, g (s)	7.8	57.1		1.7	51.0		2.0	9.6		2.3	9.9	
Actuated g/C Ratio	0.09	0.64		0.02	0.57		0.02	0.11		0.03	0.11	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	146	2868		31	2195		38	193		33	175	
v/s Ratio Prot	c0.03	c0.61		0.01	c0.91		c0.02	0.02		0.01	c0.06	
v/s Ratio Perm												
v/c Ratio	0.34	0.95		0.55	1.59		0.79	0.17		0.52	0.56	
Uniform Delay, d1	38.3	14.9		43.4	19.1		43.4	36.2		42.9	37.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	8.5		10.2	268.0		63.7	0.2		5.5	2.2	
Delay (s)	38.8	23.4		53.6	287.2		107.2	36.4		48.5	39.8	
Level of Service	D	C		D	F		F	D		D	D	
Approach Delay (s)		23.7			286.0			65.5			40.3	
Approach LOS		C			F			E			D	

Intersection Summary			
HCM Average Control Delay	162.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	89.3	Sum of lost time (s)	9.3
Intersection Capacity Utilization	94.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	1907	35	24	2733	20	92	20	24	20	20	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00			0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.98	1.00
Satd. Flow (prot)	1641	3273		1641	3278			1631			1685	1468
Flt Permitted	0.95	1.00		0.95	1.00			0.77			0.81	1.00
Satd. Flow (perm)	1641	3273		1641	3278			1299			1403	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	2073	38	26	2971	22	100	22	26	22	22	24
RTOR Reduction (vph)	0	1	0	0	0	0	0	6	0	0	0	22
Lane Group Flow (vph)	22	2110	0	26	2993	0	0	142	0	0	44	2
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		8
Actuated Green, G (s)	2.3	89.1		2.3	89.1			11.0			11.0	11.0
Effective Green, g (s)	2.3	89.1		2.3	89.1			11.0			11.0	11.0
Actuated g/C Ratio	0.02	0.75		0.02	0.75			0.09			0.09	0.09
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Vehicle Extension (s)	2.0	6.0		2.0	6.0			2.0			2.0	2.0
Lane Grp Cap (vph)	32	2463		32	2467			121			130	136
v/s Ratio Prot	0.01	0.64		c0.02	c0.91							
v/s Ratio Perm								c0.11			0.03	0.00
v/c Ratio	0.69	0.86		0.81	1.21			1.17			0.34	0.02
Uniform Delay, d1	57.7	10.2		57.8	14.7			53.7			50.3	48.8
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	39.1	4.1		81.6	99.8			134.9			0.6	0.0
Delay (s)	96.8	14.3		139.4	114.5			188.6			50.9	48.8
Level of Service	F	B		F	F			F			D	D
Approach Delay (s)		15.2			114.7			188.6			50.1	
Approach LOS		B			F			F			D	

Intersection Summary			
HCM Average Control Delay	76.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	118.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	100.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1883	66	12	2677	0	118	0	22	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			5.0				
Lane Util. Factor		0.95			0.95			1.00				
Frt		0.99			1.00			0.98				
Flt Protected		1.00			1.00			0.96				
Satd. Flow (prot)		3295			3311			1637				
Flt Permitted		1.00			0.93			0.95				
Satd. Flow (perm)		3295			3084			1621				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2047	72	13	2910	0	128	0	24	0	0	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	2117	0	0	2923	0	0	146	0	0	0	0
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)		88.0			88.0			11.0				
Effective Green, g (s)		88.0			88.0			11.0				
Actuated g/C Ratio		0.80			0.80			0.10				
Clearance Time (s)		6.0			6.0			5.0				
Vehicle Extension (s)		3.0			3.0			3.0				
Lane Grp Cap (vph)		2636			2467			162				
v/s Ratio Prot		0.64										
v/s Ratio Perm					c0.95			c0.09				
v/c Ratio		0.80			1.18			0.90				
Uniform Delay, d1		6.2			11.0			49.0				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		2.7			87.6			42.3				
Delay (s)		8.9			98.6			91.3				
Level of Service		A			F			F				
Approach Delay (s)		8.9			98.6			91.3			0.0	
Approach LOS		A			F			F			A	

Intersection Summary			
HCM Average Control Delay	61.8	HCM Level of Service	E
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	99.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1902	1	0	2510	165	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	0.95			0.95	1.00	
Frt	1.00			1.00	0.99	
Flt Protected	1.00			1.00	0.96	
Satd. Flow (prot)	3312			3312	1761	
Flt Permitted	1.00			1.00	0.96	
Satd. Flow (perm)	3312			3312	1761	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2067	1	0	2728	179	17
RTOR Reduction (vph)	0	0	0	0	6	0
Lane Group Flow (vph)	2068	0	0	2728	191	0
Heavy Vehicles (%)	9%	2%	2%	9%	2%	2%
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	47.0			47.0	5.0	
Effective Green, g (s)	47.0			47.0	5.0	
Actuated g/C Ratio	0.78			0.78	0.08	
Clearance Time (s)	4.0			4.0	4.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	2594			2594	147	
v/s Ratio Prot	0.62			c0.82	c0.11	
v/s Ratio Perm						
v/c Ratio	0.80			1.05	1.30	
Uniform Delay, d1	3.8			6.5	27.5	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	1.8			33.2	174.2	
Delay (s)	5.5			39.7	201.7	
Level of Service	A			D	F	
Approach Delay (s)	5.5			39.7	201.7	
Approach LOS	A			D	F	

Intersection Summary			
HCM Average Control Delay	31.9	HCM Level of Service	C
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1918	0	0	2510	0	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2085	0	0	2728	0	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	494			578		
pX, platoon unblocked			0.28		0.28	0.28
vC, conflicting volume			2085		3449	1042
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		4607	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			453		0	303

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1390	695	1364	1364	4
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	4
cSH	1700	1700	1700	1700	303
Volume to Capacity	0.82	0.41	0.80	0.80	0.01
Queue Length 95th (ft)	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	17.1
Lane LOS					C
Approach Delay (s)	0.0		0.0		17.1
Approach LOS					C

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1372	115	186	2	142	107	628	72	1	65	74	1133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	0.97	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.91		1.00	0.94			1.00			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.98	1.00
Satd. Flow (prot)	3273	1611		1687	1661			1699			1735	1509
Flt Permitted	0.95	1.00		0.56	1.00			0.61			0.75	1.00
Satd. Flow (perm)	3273	1611		1000	1661			1079			1328	1509
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1491	125	202	2	154	116	683	78	1	71	80	1232
RTOR Reduction (vph)	0	39	0	0	18	0	0	0	0	0	0	494
Lane Group Flow (vph)	1491	288	0	2	252	0	0	762	0	0	151	738
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot			Perm			Perm			Perm		Perm
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		6
Actuated Green, G (s)	55.0	77.0		18.0	18.0			65.0			65.0	65.0
Effective Green, g (s)	55.0	77.0		18.0	18.0			65.0			65.0	65.0
Actuated g/C Ratio	0.37	0.51		0.12	0.12			0.43			0.43	0.43
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	1200	827		120	199			468			575	654
v/s Ratio Prot	c0.46	0.18			c0.15							
v/s Ratio Perm				0.00				c0.71			0.11	0.49
v/c Ratio	1.24	0.35		0.02	1.26			1.63			0.26	1.13
Uniform Delay, d1	47.5	21.6		58.2	66.0			42.5			27.2	42.5
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	116.3	0.3		0.1	152.5			292.3			0.2	76.1
Delay (s)	163.8	21.9		58.3	218.5			334.8			27.4	118.6
Level of Service	F	C		E	F			F			C	F
Approach Delay (s)		138.3			217.3			334.8			108.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	169.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.43		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	132.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	576	24	2	124	224	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.98	
Flt Protected	0.95		0.95	1.00	1.00	
Satd. Flow (prot)	1768		1770	1696	1685	
Flt Permitted	0.95		0.52	1.00	1.00	
Satd. Flow (perm)	1768		976	1696	1685	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	626	26	2	135	243	41
RTOR Reduction (vph)	3	0	0	0	10	0
Lane Group Flow (vph)	649	0	2	135	274	0
Heavy Vehicles (%)	2%	2%	2%	12%	12%	2%
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	20.4		12.6	12.6	12.6	
Effective Green, g (s)	20.4		12.6	12.6	12.6	
Actuated g/C Ratio	0.50		0.31	0.31	0.31	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	880		300	521	518	
v/s Ratio Prot	c0.37			0.08	c0.16	
v/s Ratio Perm			0.00			
v/c Ratio	0.74		0.01	0.26	0.53	
Uniform Delay, d1	8.2		9.9	10.7	11.7	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	3.3		0.0	0.3	1.0	
Delay (s)	11.4		9.9	11.0	12.7	
Level of Service	B		A	B	B	
Approach Delay (s)	11.4			10.9	12.7	
Approach LOS	B			B	B	

Intersection Summary			
HCM Average Control Delay	11.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	41.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

2035 without Project LOS Worksheets

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	330	1928	295	1467	268	1406	322	352
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	359	2096	321	1595	291	1528	350	383
RTOR Reduction (vph)	0	0	0	0	0	0	0	1
Lane Group Flow (vph)	359	2096	321	1595	291	1528	350	382
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	14.6	28.7	18.4	32.5	90.0	24.4	24.4	18.4
Effective Green, g (s)	17.6	31.7	21.4	35.5	90.0	27.4	27.4	18.4
Actuated g/C Ratio	0.20	0.35	0.24	0.39	1.00	0.30	0.30	0.20
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	658	1115	724	1319	1583	919	943	324
v/s Ratio Prot	0.11	c0.66	c0.11	0.48			0.11	c0.24
v/s Ratio Perm					0.18	c0.51		
v/c Ratio	0.55	1.88	0.44	1.21	0.18	1.66	0.37	1.18
Uniform Delay, d1	32.6	29.1	29.2	27.2	0.0	31.3	24.5	35.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	399.3	0.4	101.5	0.3	303.0	0.2	108.1
Delay (s)	33.5	428.5	29.7	128.7	0.3	334.3	24.7	143.9
Level of Service	C	F	C	F	A	F	C	F
Approach Delay (s)		370.7		97.4				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	245.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	126.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	994	2381	310	3	1802	2	67	59	20	20	1	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86		0.97	1.00		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.96		1.00	0.85	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3242	4510	1468	1641	4842		3303	1791		1289	1429	2854
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3242	4510	1468	1641	4842		3303	1791		1289	1429	2854
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1080	2588	337	3	1959	2	73	64	22	22	1	174
RTOR Reduction (vph)	0	0	67	0	0	0	0	12	0	0	54	110
Lane Group Flow (vph)	1080	2588	270	3	1961	0	73	74	0	22	4	7
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6									8
Actuated Green, G (s)	28.4	64.1	64.1	0.9	36.6		7.7	10.9		2.6	5.8	5.8
Effective Green, g (s)	28.4	64.1	64.1	0.9	36.6		7.7	10.9		2.6	5.8	5.8
Actuated g/C Ratio	0.29	0.66	0.66	0.01	0.38		0.08	0.11		0.03	0.06	0.06
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	2.0	2.5	2.5	2.0	2.5		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	948	2977	969	15	1825		262	201		35	85	170
v/s Ratio Prot	c0.33	0.57		0.00	c0.41		c0.02	c0.04		c0.02	0.00	
v/s Ratio Perm			0.18									0.00
v/c Ratio	1.14	0.87	0.28	0.20	1.07		0.28	0.37		0.63	0.05	0.04
Uniform Delay, d1	34.4	13.2	6.9	47.7	30.2		42.1	39.9		46.8	43.1	43.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	75.5	2.9	0.1	2.4	44.3		0.2	0.4		22.7	0.1	0.0
Delay (s)	109.9	16.1	7.0	50.1	74.5		42.3	40.3		69.5	43.1	43.1
Level of Service	F	B	A	D	E		D	D		E	D	D
Approach Delay (s)		40.6			74.5			41.2			46.0	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM Average Control Delay	51.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	97.1	Sum of lost time (s)	22.6
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	1495	219	111	1323	164	118	38	48	45	62	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.92		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1612	4543		1612	4555		1612	1554		1612	1510	
Flt Permitted	0.95	1.00		0.95	1.00		0.44	1.00		0.70	1.00	
Satd. Flow (perm)	1612	4543		1612	4555		747	1554		1182	1510	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1625	238	121	1438	178	128	41	52	49	67	184
RTOR Reduction (vph)	0	15	0	0	13	0	0	38	0	0	82	0
Lane Group Flow (vph)	54	1848	0	121	1603	0	128	55	0	49	169	0
Heavy Vehicles (%)	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%	12%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	6.6	57.7		12.3	63.4		33.0	33.0		33.0	33.0	
Effective Green, g (s)	6.6	57.7		12.3	63.4		33.0	33.0		33.0	33.0	
Actuated g/C Ratio	0.06	0.48		0.10	0.53		0.28	0.28		0.28	0.28	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	89	2203		167	2427		207	431		328	419	
v/s Ratio Prot	0.03	c0.41		c0.08	0.35			0.04			0.11	
v/s Ratio Perm							c0.17			0.04		
v/c Ratio	0.61	0.84		0.72	0.66		0.62	0.13		0.15	0.40	
Uniform Delay, d1	54.9	26.6		51.7	20.0		37.5	32.2		32.4	35.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.8	4.0		12.4	1.4		13.1	0.6		0.1	0.2	
Delay (s)	62.7	30.6		64.1	21.5		50.6	32.8		32.5	35.2	
Level of Service	E	C		E	C		D	C		C	D	
Approach Delay (s)		31.5			24.4			43.1			34.8	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM Average Control Delay	29.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	119.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	671	819	65	26	1310	83	42	5	16	17	5	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		6.0	6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.97			0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (prot)	1641	3245		1641	3253			1614			1517	
Flt Permitted	0.95	1.00		0.30	1.00			0.32			0.97	
Satd. Flow (perm)	1641	3245		515	3253			542			1473	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	729	890	71	28	1424	90	46	5	17	18	5	149
RTOR Reduction (vph)	0	5	0	0	4	0	0	11	0	0	134	0
Lane Group Flow (vph)	729	956	0	28	1510	0	0	57	0	0	38	0
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	41.0	88.0		42.0	42.0			11.0			11.0	
Effective Green, g (s)	41.0	88.0		42.0	42.0			11.0			11.0	
Actuated g/C Ratio	0.37	0.80		0.38	0.38			0.10			0.10	
Clearance Time (s)	5.0	6.0		6.0	6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	612	2596		197	1242			54			147	
v/s Ratio Prot	c0.44	0.29			c0.46							
v/s Ratio Perm				0.05				c0.11			0.03	
v/c Ratio	1.19	0.37		0.14	1.22			1.06			0.26	
Uniform Delay, d1	34.5	3.1		22.2	34.0			49.5			45.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	101.6	0.4		1.5	104.6			140.1			0.9	
Delay (s)	136.1	3.5		23.7	138.6			189.6			46.7	
Level of Service	F	A		C	F			F			D	
Approach Delay (s)		60.7			136.5			189.6			46.7	
Approach LOS		E			F			F			D	

Intersection Summary			
HCM Average Control Delay	96.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	103.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	905	0	0	1633	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	984	0	0	1775	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				1072		
pX, platoon unblocked						
vC, conflicting volume			984		1871	492
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			984		1871	492
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			698		64	523

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	656	328	592	1183	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	698	1700	1700
Volume to Capacity	0.39	0.19	0.00	0.70	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	911	0	0	1642	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	990	0	0	1785	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				578		
pX, platoon unblocked						
vC, conflicting volume			990		1883	495
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			990		1883	495
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			694		63	520

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	660	330	0	892	892	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.39	0.19	0.00	0.52	0.52	0.00
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A
Approach Delay (s)	0.0		0.0			0.0
Approach LOS						A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	730	20	158	20	20	20	69	385	20	20	734	1547
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	0.95	0.88
Frt	1.00	0.87			1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3273	1540			1732	1509	1687	3349		1687	3374	2656
Flt Permitted	0.95	1.00			0.74	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3273	1540			1321	1509	1687	3349		1687	3374	2656
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	793	22	172	22	22	22	75	418	22	22	798	1682
RTOR Reduction (vph)	0	100	0	0	0	21	0	3	0	0	0	973
Lane Group Flow (vph)	793	94	0	0	44	1	75	437	0	22	798	709
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot			Perm		Perm	Prot			Prot		Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8		8						6
Actuated Green, G (s)	29.6	40.5			6.9	6.9	6.4	47.6		1.7	42.9	42.9
Effective Green, g (s)	29.6	40.5			6.9	6.9	6.4	47.6		1.7	42.9	42.9
Actuated g/C Ratio	0.29	0.40			0.07	0.07	0.06	0.47		0.02	0.42	0.42
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	952	613			90	102	106	1566		28	1422	1119
v/s Ratio Prot	c0.24	0.06					c0.04	0.13		0.01	0.24	
v/s Ratio Perm					c0.03	0.00						c0.27
v/c Ratio	0.83	0.15			0.49	0.01	0.71	0.28		0.79	0.56	0.63
Uniform Delay, d1	33.8	19.7			45.7	44.3	46.8	16.6		49.9	22.3	23.2
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.3	0.1			4.1	0.1	19.3	0.1		82.7	0.5	1.2
Delay (s)	40.1	19.8			49.9	44.3	66.1	16.7		132.6	22.8	24.4
Level of Service	D	B			D	D	E	B		F	C	C
Approach Delay (s)		36.1			48.0			23.9			24.9	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	27.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	101.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	0	16	473	531	379
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0	4.0	
Lane Util. Factor			1.00	0.95	0.95	
Frt			1.00	1.00	0.94	
Flt Protected			0.95	1.00	1.00	
Satd. Flow (prot)			1770	3343	3208	
Flt Permitted			0.29	1.00	1.00	
Satd. Flow (perm)			540	3343	3208	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	17	514	577	412
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	17	514	989	0
Heavy Vehicles (%)	2%	2%	2%	8%	8%	2%
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)			120.0	120.0	120.0	
Effective Green, g (s)			120.0	120.0	120.0	
Actuated g/C Ratio			1.00	1.00	1.00	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			3.0	3.0	3.0	
Lane Grp Cap (vph)			540	3343	3208	
v/s Ratio Prot				0.15	c0.31	
v/s Ratio Perm			0.03			
v/c Ratio			0.03	0.15	0.31	
Uniform Delay, d1			0.0	0.0	0.0	
Progression Factor			1.00	1.00	1.00	
Incremental Delay, d2			0.0	0.0	0.1	
Delay (s)			0.0	0.0	0.1	
Level of Service			A	A	A	
Approach Delay (s)	0.0			0.0	0.1	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	0.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	30.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	907	2052	368	1942	653	674	319	346
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	986	2230	400	2111	710	733	347	376
RTOR Reduction (vph)	0	0	0	0	0	0	0	5
Lane Group Flow (vph)	986	2230	400	2111	710	733	347	371
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	19.4	35.1	18.4	34.1	90.0	18.0	18.0	18.4
Effective Green, g (s)	22.4	38.1	21.4	37.1	90.0	21.0	21.0	18.4
Actuated g/C Ratio	0.25	0.42	0.24	0.41	1.00	0.23	0.23	0.20
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	838	1341	724	1378	1583	704	723	324
v/s Ratio Prot	c0.29	c0.70	0.13	0.63			0.11	0.23
v/s Ratio Perm					c0.45	c0.24		
v/c Ratio	1.18	1.66	0.55	1.53	0.45	1.04	0.48	1.15
Uniform Delay, d1	33.8	25.9	30.1	26.4	0.0	34.5	29.8	35.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	91.9	301.7	0.9	243.1	0.9	45.1	0.4	95.6
Delay (s)	125.7	327.6	31.0	269.5	0.9	79.6	30.2	131.4
Level of Service	F	F	C	F	A	E	C	F
Approach Delay (s)		265.7		180.7				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	197.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	5.2
Intersection Capacity Utilization	109.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	745	2168	161	4	2430	4	373	167	99	20	2	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86		0.97	1.00		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.94		1.00	0.86	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	810	2357	175	4	2641	4	405	182	108	22	2	172
RTOR Reduction (vph)	0	0	44	0	0	0	0	20	0	0	54	109
Lane Group Flow (vph)	810	2357	131	4	2645	0	405	270	0	22	5	6
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6									8
Actuated Green, G (s)	28.6	64.5	64.5	0.9	36.8		16.3	19.8		2.5	6.0	6.0
Effective Green, g (s)	28.6	64.5	64.5	0.9	36.8		16.3	19.8		2.5	6.0	6.0
Actuated g/C Ratio	0.27	0.61	0.61	0.01	0.35		0.15	0.19		0.02	0.06	0.06
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	2.0	2.5	2.5	2.0	2.5		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	872	2737	891	14	1676		506	328		30	81	161
v/s Ratio Prot	c0.25	0.52		0.00	c0.55		c0.12	c0.15		0.02	0.00	
v/s Ratio Perm			0.09									0.00
v/c Ratio	0.93	0.86	0.15	0.29	1.58		0.80	0.82		0.73	0.06	0.04
Uniform Delay, d1	37.9	17.2	9.0	52.4	34.8		43.4	41.6		51.6	47.5	47.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	15.5	3.0	0.1	4.1	263.1		8.4	14.5		56.2	0.1	0.0
Delay (s)	53.4	20.2	9.1	56.4	297.8		51.8	56.1		107.8	47.6	47.5
Level of Service	D	C	A	E	F		D	E		F	D	D
Approach Delay (s)		27.7			297.5			53.6			54.3	
Approach LOS		C			F			D			D	

Intersection Summary			
HCM Average Control Delay	134.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	106.3	Sum of lost time (s)	14.6
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	148	1435	174	123	1673	162	257	142	178	156	91	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.92		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	4639		1641	4653		1641	1583		1641	1584	
Flt Permitted	0.95	1.00		0.95	1.00		0.48	1.00		0.29	1.00	
Satd. Flow (perm)	1641	4639		1641	4653		835	1583		498	1584	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	161	1560	189	134	1818	176	279	154	193	170	99	123
RTOR Reduction (vph)	0	12	0	0	10	0	0	38	0	0	37	0
Lane Group Flow (vph)	161	1737	0	134	1984	0	279	309	0	170	185	0
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	9.0	58.1		12.9	62.0		33.0	33.0		33.0	33.0	
Effective Green, g (s)	9.0	58.1		12.9	62.0		33.0	33.0		33.0	33.0	
Actuated g/C Ratio	0.08	0.48		0.11	0.52		0.28	0.28		0.28	0.28	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	123	2246		176	2404		230	435		137	436	
v/s Ratio Prot	c0.10	0.37		0.08	c0.43			0.20			0.12	
v/s Ratio Perm							0.33			c0.34		
v/c Ratio	1.31	0.77		0.76	0.83		1.21	0.71		1.24	0.42	
Uniform Delay, d1	55.5	25.5		52.1	24.4		43.5	39.2		43.5	35.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	185.5	2.7		15.9	3.4		129.0	9.5		155.6	0.2	
Delay (s)	241.0	28.2		68.0	27.8		172.5	48.7		199.1	35.9	
Level of Service	F	C		E	C		F	D		F	D	
Approach Delay (s)		46.1			30.4			103.9			106.7	
Approach LOS		D			C			F			F	

Intersection Summary			
HCM Average Control Delay	51.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	88.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	172	1459	47	19	1224	21	84	5	16	75	5	610
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		6.0	6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.98			0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1687	3358		1687	3365			1672			1555	
Flt Permitted	0.95	1.00		0.15	1.00			0.33			0.96	
Satd. Flow (perm)	1687	3358		268	3365			571			1504	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	187	1586	51	21	1330	23	91	5	17	82	5	663
RTOR Reduction (vph)	0	2	0	0	1	0	0	5	0	0	249	0
Lane Group Flow (vph)	187	1635	0	21	1352	0	0	108	0	0	501	0
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	17.7	88.0		65.3	65.3			11.0			11.0	
Effective Green, g (s)	17.7	88.0		65.3	65.3			11.0			11.0	
Actuated g/C Ratio	0.16	0.80		0.59	0.59			0.10			0.10	
Clearance Time (s)	5.0	6.0		6.0	6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	271	2686		159	1998			57			150	
v/s Ratio Prot	0.11	c0.49			c0.40							
v/s Ratio Perm				0.08				0.19			c0.33	
v/c Ratio	0.69	0.61		0.13	0.68			1.89			3.34	
Uniform Delay, d1	43.6	4.3		9.9	15.2			49.5			49.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	7.4	1.0		1.7	1.9			458.0			1069.0	
Delay (s)	50.9	5.3		11.6	17.0			507.5			1118.5	
Level of Service	D	A		B	B			F			F	
Approach Delay (s)		10.0			17.0			507.5			1118.5	
Approach LOS		A			B			F			F	

Intersection Summary			
HCM Average Control Delay	230.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	100.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1817	0	0	1429	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1975	0	0	1553	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				1072		
pX, platoon unblocked						
vC, conflicting volume			1975		2752	988
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1975		2752	988
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			289		16	246

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1317	658	518	1036	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	289	1700	1700
Volume to Capacity	0.77	0.39	0.00	0.61	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1819	0	0	1433	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1977	0	0	1558	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				578		
pX, platoon unblocked						
vC, conflicting volume			1977		2756	989
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1977		2756	989
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			289		16	246

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	1318	659	0	779	779	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.78	0.39	0.00	0.46	0.46	0.00
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A
Approach Delay (s)	0.0		0.0			0.0
Approach LOS						A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1540	20	258	20	20	20	270	1047	20	20	791	1140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	0.95	0.88
Frt	1.00	0.86			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3335	1558			1765	1538	1719	3428		1719	3438	2707
Flt Permitted	0.95	1.00			0.69	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3335	1558			1254	1538	1719	3428		1719	3438	2707
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1674	22	280	22	22	22	293	1138	22	22	860	1239
RTOR Reduction (vph)	0	89	0	0	0	21	0	1	0	0	0	766
Lane Group Flow (vph)	1674	213	0	0	44	1	293	1159	0	22	860	473
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot			Perm		Perm	Prot			Prot		Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8		8						6
Actuated Green, G (s)	34.6	46.0			7.4	7.4	9.2	48.9		1.8	41.5	41.5
Effective Green, g (s)	34.6	46.0			7.4	7.4	9.2	48.9		1.8	41.5	41.5
Actuated g/C Ratio	0.32	0.42			0.07	0.07	0.08	0.45		0.02	0.38	0.38
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	1062	659			85	105	145	1542		28	1313	1033
v/s Ratio Prot	c0.50	0.14					c0.17	c0.34		0.01	0.25	
v/s Ratio Perm					c0.04	0.00						0.17
v/c Ratio	1.58	0.32			0.52	0.01	2.02	0.75		0.79	0.65	0.46
Uniform Delay, d1	37.0	21.0			48.9	47.2	49.8	24.9		53.3	27.7	25.2
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	263.9	0.3			5.2	0.1	482.7	2.1		82.7	1.2	0.3
Delay (s)	300.9	21.2			54.2	47.3	532.4	27.0		136.0	28.9	25.5
Level of Service	F	C			D	D	F	C		F	C	C
Approach Delay (s)		258.2			51.9			128.9			28.0	
Approach LOS		F			D			F			C	

Intersection Summary			
HCM Average Control Delay	135.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	108.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	97.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	354	0	1	981	368	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	1.00		1.00	1.00	1.00	
Flt Protected	0.95		0.95	1.00	1.00	
Satd. Flow (prot)	1770		1770	3374	3374	
Flt Permitted	0.95		0.52	1.00	1.00	
Satd. Flow (perm)	1770		962	3374	3374	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	385	0	1	1066	400	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	385	0	1	1066	400	0
Heavy Vehicles (%)	2%	2%	2%	7%	7%	2%
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	14.8		22.2	22.2	22.2	
Effective Green, g (s)	14.8		22.2	22.2	22.2	
Actuated g/C Ratio	0.33		0.49	0.49	0.49	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	582		475	1665	1665	
v/s Ratio Prot	c0.22			c0.32	0.12	
v/s Ratio Perm			0.00			
v/c Ratio	0.66		0.00	0.64	0.24	
Uniform Delay, d1	13.0		5.8	8.4	6.6	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	2.8		0.0	0.8	0.1	
Delay (s)	15.8		5.8	9.3	6.6	
Level of Service	B		A	A	A	
Approach Delay (s)	15.8			9.3	6.6	
Approach LOS	B			A	A	

Intersection Summary			
HCM Average Control Delay	10.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	920	2081	373	1969	662	684	323	351
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1000	2262	405	2140	720	743	351	382
RTOR Reduction (vph)	0	0	0	0	0	0	0	4
Lane Group Flow (vph)	1000	2262	405	2140	720	743	351	378
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	19.4	35.1	18.4	34.1	90.0	18.0	18.0	18.4
Effective Green, g (s)	22.4	38.1	21.4	37.1	90.0	21.0	21.0	18.4
Actuated g/C Ratio	0.25	0.42	0.24	0.41	1.00	0.23	0.23	0.20
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	838	1341	724	1378	1583	704	723	324
v/s Ratio Prot	c0.30	c0.71	0.13	0.64			0.11	0.24
v/s Ratio Perm					c0.45	c0.25		
v/c Ratio	1.19	1.69	0.56	1.55	0.45	1.06	0.49	1.17
Uniform Delay, d1	33.8	25.9	30.2	26.4	0.0	34.5	29.8	35.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	98.7	312.3	0.9	252.5	0.9	49.5	0.4	103.3
Delay (s)	132.5	338.3	31.1	278.9	0.9	84.0	30.2	139.1
Level of Service	F	F	C	F	A	F	C	F
Approach Delay (s)		275.2		186.9				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	204.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	5.2
Intersection Capacity Utilization	110.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	755	2199	163	4	2465	4	378	169	100	20	2	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86		0.97	1.00		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.94		1.00	0.86	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	821	2390	177	4	2679	4	411	184	109	22	2	174
RTOR Reduction (vph)	0	0	44	0	0	0	0	20	0	0	54	110
Lane Group Flow (vph)	821	2390	133	4	2683	0	411	273	0	22	5	7
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6									8
Actuated Green, G (s)	28.6	64.5	64.5	0.9	36.8		16.3	19.9		2.5	6.1	6.1
Effective Green, g (s)	28.6	64.5	64.5	0.9	36.8		16.3	19.9		2.5	6.1	6.1
Actuated g/C Ratio	0.27	0.61	0.61	0.01	0.35		0.15	0.19		0.02	0.06	0.06
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	2.0	2.5	2.5	2.0	2.5		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	871	2734	890	14	1675		506	329		30	82	164
v/s Ratio Prot	c0.25	0.53		0.00	c0.55		c0.12	c0.16		0.02	0.00	
v/s Ratio Perm			0.09									0.00
v/c Ratio	0.94	0.87	0.15	0.29	1.60		0.81	0.83		0.73	0.06	0.04
Uniform Delay, d1	38.1	17.6	9.1	52.4	34.8		43.6	41.6		51.6	47.4	47.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	17.9	3.4	0.1	4.1	273.6		9.1	15.0		56.2	0.1	0.0
Delay (s)	56.0	20.9	9.1	56.5	308.4		52.7	56.6		107.8	47.6	47.4
Level of Service	E	C	A	E	F		D	E		F	D	D
Approach Delay (s)		28.8			308.1			54.3			54.2	
Approach LOS		C			F			D			D	

Intersection Summary			
HCM Average Control Delay	139.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	106.4	Sum of lost time (s)	18.6
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	1456	176	125	1697	164	261	144	181	158	92	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.92		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	4639		1641	4653		1641	1583		1641	1583	
Flt Permitted	0.95	1.00		0.95	1.00		0.48	1.00		0.28	1.00	
Satd. Flow (perm)	1641	4639		1641	4653		827	1583		480	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	1583	191	136	1845	178	284	157	197	172	100	125
RTOR Reduction (vph)	0	12	0	0	10	0	0	38	0	0	38	0
Lane Group Flow (vph)	163	1762	0	136	2013	0	284	316	0	172	187	0
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	9.0	58.0		13.0	62.0		33.0	33.0		33.0	33.0	
Effective Green, g (s)	9.0	58.0		13.0	62.0		33.0	33.0		33.0	33.0	
Actuated g/C Ratio	0.08	0.48		0.11	0.52		0.28	0.28		0.28	0.28	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	123	2242		178	2404		227	435		132	435	
v/s Ratio Prot	c0.10	0.38		0.08	c0.43			0.20			0.12	
v/s Ratio Perm							0.34			c0.36		
v/c Ratio	1.33	0.79		0.76	0.84		1.25	0.73		1.30	0.43	
Uniform Delay, d1	55.5	25.8		52.0	24.7		43.5	39.4		43.5	35.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	191.8	2.9		15.9	3.7		144.0	10.2		180.6	0.3	
Delay (s)	247.3	28.7		68.0	28.4		187.5	49.6		224.1	36.0	
Level of Service	F	C		E	C		F	D		F	D	
Approach Delay (s)		47.1			30.9			111.0			117.5	
Approach LOS		D			C			F			F	

Intersection Summary			
HCM Average Control Delay	53.7	HCM Level of Service	D
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	172	1459	47	19	1224	21	84	5	16	75	5	610
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		6.0	6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.98			0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1687	3358		1687	3365			1672			1555	
Flt Permitted	0.95	1.00		0.15	1.00			0.33			0.96	
Satd. Flow (perm)	1687	3358		268	3365			571			1504	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	187	1586	51	21	1330	23	91	5	17	82	5	663
RTOR Reduction (vph)	0	2	0	0	1	0	0	5	0	0	249	0
Lane Group Flow (vph)	187	1635	0	21	1352	0	0	108	0	0	501	0
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	17.7	88.0		65.3	65.3			11.0			11.0	
Effective Green, g (s)	17.7	88.0		65.3	65.3			11.0			11.0	
Actuated g/C Ratio	0.16	0.80		0.59	0.59			0.10			0.10	
Clearance Time (s)	5.0	6.0		6.0	6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	271	2686		159	1998			57			150	
v/s Ratio Prot	0.11	c0.49			c0.40							
v/s Ratio Perm				0.08				0.19			c0.33	
v/c Ratio	0.69	0.61		0.13	0.68			1.89			3.34	
Uniform Delay, d1	43.6	4.3		9.9	15.2			49.5			49.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	7.4	1.0		1.7	1.9			458.0			1069.0	
Delay (s)	50.9	5.3		11.6	17.0			507.5			1118.5	
Level of Service	D	A		B	B			F			F	
Approach Delay (s)		10.0			17.0			507.5			1118.5	
Approach LOS		A			B			F			F	

Intersection Summary			
HCM Average Control Delay	230.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	100.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1843	0	0	1449	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2003	0	0	1575	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				1072		
pX, platoon unblocked						
vC, conflicting volume			2003		2791	1002
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2003		2791	1002
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			282		15	241

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1336	668	525	1050	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	282	1700	1700
Volume to Capacity	0.79	0.39	0.00	0.62	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1845	0	0	1453	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2005	0	0	1579	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				578		
pX, platoon unblocked						
vC, conflicting volume			2005		2795	1003
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2005		2795	1003
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			282		15	240

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	1337	668	0	790	790	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.79	0.39	0.00	0.46	0.46	0.00
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A
Approach Delay (s)	0.0		0.0			0.0
Approach LOS						A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2547	33	441	33	33	33	460	1732	33	33	1309	1886
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	0.95	0.88
Frt	1.00	0.86			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3183	1486			1685	1468	1641	3273		1641	3282	2584
Flt Permitted	0.95	1.00			0.60	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	1486			1041	1468	1641	3273		1641	3282	2584
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2768	36	479	36	36	36	500	1883	36	36	1423	2050
RTOR Reduction (vph)	0	66	0	0	0	33	0	1	0	0	0	863
Lane Group Flow (vph)	2768	449	0	0	72	3	500	1918	0	36	1423	1187
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Perm		Perm	Prot			Prot		Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8		8						6
Actuated Green, G (s)	34.2	48.7			10.5	10.5	9.0	53.1		2.9	47.0	47.0
Effective Green, g (s)	34.2	48.7			10.5	10.5	9.0	53.1		2.9	47.0	47.0
Actuated g/C Ratio	0.29	0.42			0.09	0.09	0.08	0.46		0.02	0.40	0.40
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	933	620			94	132	127	1489		41	1322	1041
v/s Ratio Prot	c0.87	c0.30					c0.30	c0.59		0.02	0.43	
v/s Ratio Perm					0.07	0.00						0.46
v/c Ratio	2.97	0.72			0.77	0.02	3.94	1.29		0.88	1.08	1.14
Uniform Delay, d1	41.2	28.4			51.9	48.4	53.9	31.8		56.7	34.9	34.9
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	887.9	4.2			30.4	0.1	1340.4	134.8		92.9	48.1	74.9
Delay (s)	929.2	32.6			82.3	48.5	1394.2	166.6		149.7	82.9	109.8
Level of Service	F	C			F	D	F	F		F	F	F
Approach Delay (s)		788.5			71.0			420.4			99.3	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM Average Control Delay	425.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.93		
Actuated Cycle Length (s)	116.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	151.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	354	0	1	1000	1069	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	1.00		1.00	1.00	1.00	
Flt Protected	0.95		0.95	1.00	1.00	
Satd. Flow (prot)	1770		1770	3374	3369	
Flt Permitted	0.95		0.17	1.00	1.00	
Satd. Flow (perm)	1770		309	3374	3369	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	385	0	1	1087	1162	16
RTOR Reduction (vph)	0	0	0	0	1	0
Lane Group Flow (vph)	385	0	1	1087	1177	0
Heavy Vehicles (%)	2%	2%	2%	7%	7%	2%
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	15.3		24.1	24.1	24.1	
Effective Green, g (s)	15.3		24.1	24.1	24.1	
Actuated g/C Ratio	0.32		0.51	0.51	0.51	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	571		157	1715	1713	
v/s Ratio Prot	c0.22			0.32	c0.35	
v/s Ratio Perm			0.00			
v/c Ratio	0.67		0.01	0.63	0.69	
Uniform Delay, d1	13.9		5.7	8.4	8.8	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	3.1		0.0	0.8	1.2	
Delay (s)	17.0		5.8	9.2	10.0	
Level of Service	B		A	A	A	
Approach Delay (s)	17.0			9.2	10.0	
Approach LOS	B			A	A	

Intersection Summary			
HCM Average Control Delay	10.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	47.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

2035 with NCRF Project LOS Worksheets

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	330	1980	300	1473	275	1471	322	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	359	2152	326	1601	299	1599	350	435
RTOR Reduction (vph)	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	359	2152	326	1601	299	1599	350	435
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	14.6	28.7	19.4	33.5	90.0	23.4	23.4	19.4
Effective Green, g (s)	17.6	31.7	22.4	36.5	90.0	26.4	26.4	19.4
Actuated g/C Ratio	0.20	0.35	0.25	0.41	1.00	0.29	0.29	0.22
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	658	1115	758	1356	1583	886	909	341
v/s Ratio Prot	0.11	c0.68	0.11	c0.48			0.11	c0.27
v/s Ratio Perm					0.19	c0.53		
v/c Ratio	0.55	1.93	0.43	1.18	0.19	1.80	0.39	1.28
Uniform Delay, d1	32.6	29.1	28.4	26.8	0.0	31.8	25.3	35.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	421.8	0.4	89.2	0.3	366.6	0.2	145.0
Delay (s)	33.5	451.0	28.8	116.0	0.3	398.4	25.5	180.3
Level of Service	C	F	C	F	A	F	C	F
Approach Delay (s)		391.3		87.7				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	267.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.83		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	133.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	994	2546	310	3	1820	2	67	59	20	20	1	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86		0.97	1.00		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.96		1.00	0.85	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3242	4510	1468	1641	4842		3303	1791		1289	1429	2854
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3242	4510	1468	1641	4842		3303	1791		1289	1429	2854
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1080	2767	337	3	1978	2	73	64	22	22	1	174
RTOR Reduction (vph)	0	0	63	0	0	0	0	12	0	0	54	110
Lane Group Flow (vph)	1080	2767	274	3	1980	0	73	74	0	22	4	7
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6									8
Actuated Green, G (s)	28.4	64.1	64.1	0.9	36.6		7.7	10.9		2.6	5.8	5.8
Effective Green, g (s)	28.4	64.1	64.1	0.9	36.6		7.7	10.9		2.6	5.8	5.8
Actuated g/C Ratio	0.29	0.66	0.66	0.01	0.38		0.08	0.11		0.03	0.06	0.06
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	2.0	2.5	2.5	2.0	2.5		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	948	2977	969	15	1825		262	201		35	85	170
v/s Ratio Prot	c0.33	0.61		0.00	c0.41		c0.02	c0.04		c0.02	0.00	
v/s Ratio Perm			0.19									0.00
v/c Ratio	1.14	0.93	0.28	0.20	1.08		0.28	0.37		0.63	0.05	0.04
Uniform Delay, d1	34.4	14.5	6.9	47.7	30.2		42.1	39.9		46.8	43.1	43.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	75.5	5.9	0.1	2.4	48.2		0.2	0.4		22.7	0.1	0.0
Delay (s)	109.9	20.4	7.0	50.1	78.5		42.3	40.3		69.5	43.1	43.1
Level of Service	F	C	A	D	E		D	D		E	D	D
Approach Delay (s)		42.4			78.4			41.2			46.0	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM Average Control Delay	53.4	HCM Level of Service	D
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	97.1	Sum of lost time (s)	22.6
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	1660	219	111	1341	164	118	38	48	45	62	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.92		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1626	4591		1626	4597		1626	1568		1626	1523	
Flt Permitted	0.95	1.00		0.95	1.00		0.44	1.00		0.70	1.00	
Satd. Flow (perm)	1626	4591		1626	4597		754	1568		1193	1523	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1804	238	121	1458	178	128	41	52	49	67	184
RTOR Reduction (vph)	0	13	0	0	12	0	0	38	0	0	82	0
Lane Group Flow (vph)	54	2029	0	121	1624	0	128	55	0	49	169	0
Heavy Vehicles (%)	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	6.5	57.7		12.2	63.4		33.0	33.0		33.0	33.0	
Effective Green, g (s)	6.5	57.7		12.2	63.4		33.0	33.0		33.0	33.0	
Actuated g/C Ratio	0.05	0.49		0.10	0.53		0.28	0.28		0.28	0.28	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	89	2228		167	2451		209	435		331	423	
v/s Ratio Prot	0.03	c0.44		c0.07	0.35			0.04			0.11	
v/s Ratio Perm							c0.17			0.04		
v/c Ratio	0.61	0.91		0.72	0.66		0.61	0.13		0.15	0.40	
Uniform Delay, d1	55.0	28.2		51.7	20.0		37.4	32.2		32.4	34.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.8	7.0		12.4	1.4		12.7	0.6		0.1	0.2	
Delay (s)	62.7	35.2		64.1	21.5		50.1	32.8		32.4	35.1	
Level of Service	E	D		E	C		D	C		C	D	
Approach Delay (s)		35.9			24.4			42.8			34.7	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM Average Control Delay	31.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	118.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	671	984	65	26	1328	83	42	5	16	17	5	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		6.0	6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.97			0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (prot)	1656	3281		1656	3283			1629			1531	
Flt Permitted	0.95	1.00		0.25	1.00			0.32			0.97	
Satd. Flow (perm)	1656	3281		434	3283			547			1487	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	729	1070	71	28	1443	90	46	5	17	18	5	149
RTOR Reduction (vph)	0	4	0	0	4	0	0	11	0	0	134	0
Lane Group Flow (vph)	729	1137	0	28	1529	0	0	57	0	0	38	0
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	41.0	88.0		42.0	42.0			11.0			11.0	
Effective Green, g (s)	41.0	88.0		42.0	42.0			11.0			11.0	
Actuated g/C Ratio	0.37	0.80		0.38	0.38			0.10			0.10	
Clearance Time (s)	5.0	6.0		6.0	6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	617	2625		166	1254			55			149	
v/s Ratio Prot	c0.44	0.35			c0.47							
v/s Ratio Perm				0.06				c0.10			0.03	
v/c Ratio	1.18	0.43		0.17	1.22			1.04			0.25	
Uniform Delay, d1	34.5	3.4		22.5	34.0			49.5			45.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	97.6	0.5		2.2	106.0			133.1			0.9	
Delay (s)	132.1	3.9		24.7	140.0			182.6			46.6	
Level of Service	F	A		C	F			F			D	
Approach Delay (s)		53.9			137.9			182.6			46.6	
Approach LOS		D			F			F			D	

Intersection Summary			
HCM Average Control Delay	91.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	104.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	938	87	20	1633	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		
Lane Util. Factor	0.95		1.00	0.95		
Frt	0.99		1.00	1.00		
Flt Protected	1.00		0.95	1.00		
Satd. Flow (prot)	3373		1770	3406		
Flt Permitted	1.00		0.24	1.00		
Satd. Flow (perm)	3373		441	3406		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1020	95	22	1775	0	0
RTOR Reduction (vph)	19	0	0	0	0	0
Lane Group Flow (vph)	1096	0	22	1775	0	0
Heavy Vehicles (%)	6%	2%	2%	6%	2%	2%
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	25.2		25.2	25.2		
Effective Green, g (s)	25.2		25.2	25.2		
Actuated g/C Ratio	0.68		0.68	0.68		
Clearance Time (s)	4.0		4.0	4.0		
Vehicle Extension (s)	3.0		3.0	3.0		
Lane Grp Cap (vph)	2279		298	2301		
v/s Ratio Prot	0.32			c0.52		
v/s Ratio Perm			0.05			
v/c Ratio	0.48		0.07	0.77		
Uniform Delay, d1	2.9		2.1	4.1		
Progression Factor	1.00		1.00	1.00		
Incremental Delay, d2	0.2		0.1	1.7		
Delay (s)	3.1		2.2	5.8		
Level of Service	A		A	A		
Approach Delay (s)	3.1			5.7	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	4.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	37.3	Sum of lost time (s)	12.1
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	913	24	0	1663	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	992	26	0	1808	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	494			578		
pX, platoon unblocked			0.93		0.93	0.93
vC, conflicting volume			1018		1909	509
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			858		1821	308
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			720		64	637

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	662	357	904	904	0
Volume Left	0	0	0	0	0
Volume Right	0	26	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.39	0.21	0.53	0.53	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	731	20	159	20	20	20	76	385	20	20	734	1560
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	0.95	0.88
Frt	1.00	0.87			1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3303	1554			1749	1524	1703	3380		1703	3406	2682
Flt Permitted	0.95	1.00			0.74	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3303	1554			1333	1524	1703	3380		1703	3406	2682
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	795	22	173	22	22	22	83	418	22	22	798	1696
RTOR Reduction (vph)	0	100	0	0	0	21	0	3	0	0	0	973
Lane Group Flow (vph)	795	95	0	0	44	1	83	437	0	22	798	723
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot			Perm		Perm	Prot			Prot		Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8		8						6
Actuated Green, G (s)	30.0	40.9			6.9	6.9	6.5	48.0		1.7	43.2	43.2
Effective Green, g (s)	30.0	40.9			6.9	6.9	6.5	48.0		1.7	43.2	43.2
Actuated g/C Ratio	0.29	0.40			0.07	0.07	0.06	0.47		0.02	0.42	0.42
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	966	619			90	102	108	1581		28	1434	1129
v/s Ratio Prot	c0.24	0.06					c0.05	0.13		0.01	0.23	
v/s Ratio Perm					c0.03	0.00						c0.27
v/c Ratio	0.82	0.15			0.49	0.01	0.77	0.28		0.79	0.56	0.64
Uniform Delay, d1	33.8	19.8			46.1	44.7	47.3	16.7		50.3	22.5	23.5
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.8	0.1			4.1	0.1	27.3	0.1		82.7	0.5	1.2
Delay (s)	39.6	19.9			50.3	44.7	74.7	16.8		133.0	22.9	24.8
Level of Service	D	B			D	D	E	B		F	C	C
Approach Delay (s)		35.7			48.4			26.0			25.1	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	28.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	102.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	0	16	480	531	379
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0	4.0	
Lane Util. Factor			1.00	0.95	0.95	
Frt			1.00	1.00	0.94	
Flt Protected			0.95	1.00	1.00	
Satd. Flow (prot)			1770	3343	3208	
Flt Permitted			0.29	1.00	1.00	
Satd. Flow (perm)			540	3343	3208	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	17	522	577	412
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	17	522	989	0
Heavy Vehicles (%)	2%	2%	2%	8%	8%	2%
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)			120.0	120.0	120.0	
Effective Green, g (s)			120.0	120.0	120.0	
Actuated g/C Ratio			1.00	1.00	1.00	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			3.0	3.0	3.0	
Lane Grp Cap (vph)			540	3343	3208	
v/s Ratio Prot				0.16	c0.31	
v/s Ratio Perm			0.03			
v/c Ratio			0.03	0.16	0.31	
Uniform Delay, d1			0.0	0.0	0.0	
Progression Factor			1.00	1.00	1.00	
Incremental Delay, d2			0.0	0.0	0.1	
Delay (s)			0.0	0.0	0.1	
Level of Service			A	A	A	
Approach Delay (s)	0.0			0.0	0.1	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	0.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	30.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	907	2073	398	1974	692	700	319	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	986	2253	433	2146	752	761	347	397
RTOR Reduction (vph)	0	0	0	0	0	0	0	4
Lane Group Flow (vph)	986	2253	433	2146	752	761	347	393
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	19.4	35.1	18.4	34.1	90.0	18.0	18.0	18.4
Effective Green, g (s)	22.4	38.1	21.4	37.1	90.0	21.0	21.0	18.4
Actuated g/C Ratio	0.25	0.42	0.24	0.41	1.00	0.23	0.23	0.20
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	838	1341	724	1378	1583	704	723	324
v/s Ratio Prot	c0.29	c0.71	0.14	0.64			0.11	0.25
v/s Ratio Perm					c0.47	c0.25		
v/c Ratio	1.18	1.68	0.60	1.56	0.48	1.08	0.48	1.21
Uniform Delay, d1	33.8	25.9	30.5	26.4	0.0	34.5	29.8	35.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	91.9	309.3	1.3	254.4	1.0	57.9	0.4	120.9
Delay (s)	125.7	335.3	31.8	280.8	1.0	92.4	30.2	156.7
Level of Service	F	F	C	F	A	F	C	F
Approach Delay (s)		271.5		185.3				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	203.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	5.2
Intersection Capacity Utilization	111.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	745	2234	161	4	2531	4	373	167	99	20	2	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86		0.97	1.00		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.94		1.00	0.86	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	810	2428	175	4	2751	4	405	182	108	22	2	172
RTOR Reduction (vph)	0	0	43	0	0	0	0	20	0	0	54	109
Lane Group Flow (vph)	810	2428	132	4	2755	0	405	270	0	22	5	6
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6									8
Actuated Green, G (s)	28.6	64.5	64.5	0.9	36.8		16.3	19.8		2.5	6.0	6.0
Effective Green, g (s)	28.6	64.5	64.5	0.9	36.8		16.3	19.8		2.5	6.0	6.0
Actuated g/C Ratio	0.27	0.61	0.61	0.01	0.35		0.15	0.19		0.02	0.06	0.06
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	2.0	2.5	2.5	2.0	2.5		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	872	2737	891	14	1676		506	328		30	81	161
v/s Ratio Prot	c0.25	0.54		0.00	c0.57		c0.12	c0.15		0.02	0.00	
v/s Ratio Perm			0.09									0.00
v/c Ratio	0.93	0.89	0.15	0.29	1.64		0.80	0.82		0.73	0.06	0.04
Uniform Delay, d1	37.9	17.8	9.0	52.4	34.8		43.4	41.6		51.6	47.5	47.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	15.5	3.9	0.1	4.1	292.4		8.4	14.5		56.2	0.1	0.0
Delay (s)	53.4	21.7	9.1	56.4	327.2		51.8	56.1		107.8	47.6	47.5
Level of Service	D	C	A	E	F		D	E		F	D	D
Approach Delay (s)		28.5			326.8			53.6			54.3	
Approach LOS		C			F			D			D	

Intersection Summary			
HCM Average Control Delay	148.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	106.3	Sum of lost time (s)	14.6
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	148	1501	174	123	1774	162	257	142	178	156	91	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.92		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	4642		1641	4656		1641	1583		1641	1584	
Flt Permitted	0.95	1.00		0.95	1.00		0.48	1.00		0.29	1.00	
Satd. Flow (perm)	1641	4642		1641	4656		835	1583		498	1584	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	161	1632	189	134	1928	176	279	154	193	170	99	123
RTOR Reduction (vph)	0	11	0	0	9	0	0	38	0	0	37	0
Lane Group Flow (vph)	161	1810	0	134	2095	0	279	309	0	170	185	0
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	9.0	58.1		12.9	62.0		33.0	33.0		33.0	33.0	
Effective Green, g (s)	9.0	58.1		12.9	62.0		33.0	33.0		33.0	33.0	
Actuated g/C Ratio	0.08	0.48		0.11	0.52		0.28	0.28		0.28	0.28	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	123	2248		176	2406		230	435		137	436	
v/s Ratio Prot	c0.10	0.39		0.08	c0.45			0.20			0.12	
v/s Ratio Perm							0.33			c0.34		
v/c Ratio	1.31	0.81		0.76	0.87		1.21	0.71		1.24	0.42	
Uniform Delay, d1	55.5	26.2		52.1	25.5		43.5	39.2		43.5	35.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	185.5	3.2		15.9	4.7		129.0	9.5		155.6	0.2	
Delay (s)	241.0	29.4		68.0	30.2		172.5	48.7		199.1	35.9	
Level of Service	F	C		E	C		F	D		F	D	
Approach Delay (s)		46.5			32.4			103.9			106.7	
Approach LOS		D			C			F			F	

Intersection Summary			
HCM Average Control Delay	51.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	172	1525	47	19	1325	21	84	5	16	75	5	610
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		6.0	6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.98			0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1687	3359		1687	3366			1672			1555	
Flt Permitted	0.95	1.00		0.14	1.00			0.33			0.96	
Satd. Flow (perm)	1687	3359		249	3366			571			1504	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	187	1658	51	21	1440	23	91	5	17	82	5	663
RTOR Reduction (vph)	0	2	0	0	1	0	0	5	0	0	249	0
Lane Group Flow (vph)	187	1707	0	21	1462	0	0	108	0	0	501	0
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	17.7	88.0		65.3	65.3			11.0			11.0	
Effective Green, g (s)	17.7	88.0		65.3	65.3			11.0			11.0	
Actuated g/C Ratio	0.16	0.80		0.59	0.59			0.10			0.10	
Clearance Time (s)	5.0	6.0		6.0	6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	271	2687		148	1998			57			150	
v/s Ratio Prot	0.11	c0.51			c0.43							
v/s Ratio Perm				0.08				0.19			c0.33	
v/c Ratio	0.69	0.64		0.14	0.73			1.89			3.34	
Uniform Delay, d1	43.6	4.5		9.9	16.1			49.5			49.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	7.4	1.2		2.0	2.4			458.0			1069.0	
Delay (s)	50.9	5.6		11.9	18.5			507.5			1118.5	
Level of Service	D	A		B	B			F			F	
Approach Delay (s)		10.1			18.4			507.5			1118.5	
Approach LOS		B			B			F			F	

Intersection Summary			
HCM Average Control Delay	222.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	101.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1830	34	8	1429	82	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	1.00		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	3430		1770	3438	1758	
Flt Permitted	1.00		0.11	1.00	0.96	
Satd. Flow (perm)	3430		207	3438	1758	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1989	37	9	1553	89	10
RTOR Reduction (vph)	2	0	0	0	8	0
Lane Group Flow (vph)	2024	0	9	1553	91	0
Heavy Vehicles (%)	5%	2%	2%	5%	2%	2%
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	36.0		36.0	36.0	8.1	
Effective Green, g (s)	36.0		36.0	36.0	8.1	
Actuated g/C Ratio	0.69		0.69	0.69	0.16	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	2370		143	2376	273	
v/s Ratio Prot	c0.59			0.45	c0.05	
v/s Ratio Perm			0.04			
v/c Ratio	0.85		0.06	0.65	0.33	
Uniform Delay, d1	6.1		2.6	4.5	19.6	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	3.2		0.2	0.7	0.7	
Delay (s)	9.3		2.8	5.2	20.3	
Level of Service	A		A	A	C	
Approach Delay (s)	9.3			5.2	20.3	
Approach LOS	A			A	C	

Intersection Summary			
HCM Average Control Delay	7.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	52.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1829	9	0	1441	0	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1988	10	0	1566	0	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	494			578		
pX, platoon unblocked			0.38		0.38	0.38
vC, conflicting volume			1998		2776	999
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			361		2410	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			453		10	412

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1325	672	783	783	1
Volume Left	0	0	0	0	0
Volume Right	0	10	0	0	1
cSH	1700	1700	1700	1700	412
Volume to Capacity	0.78	0.40	0.46	0.46	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	13.8
Lane LOS					B
Approach Delay (s)	0.0		0.0		13.8
Approach LOS					B

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1548	20	262	20	20	20	273	1047	20	20	791	1145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	0.95	0.88
Frt	1.00	0.86			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3335	1558			1765	1538	1719	3428		1719	3438	2707
Flt Permitted	0.95	1.00			0.69	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3335	1558			1250	1538	1719	3428		1719	3438	2707
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1683	22	285	22	22	22	297	1138	22	22	860	1245
RTOR Reduction (vph)	0	89	0	0	0	21	0	1	0	0	0	770
Lane Group Flow (vph)	1683	218	0	0	44	1	297	1159	0	22	860	475
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot			Perm		Perm	Prot			Prot		Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8		8						6
Actuated Green, G (s)	34.6	46.0			7.4	7.4	9.2	48.9		1.8	41.5	41.5
Effective Green, g (s)	34.6	46.0			7.4	7.4	9.2	48.9		1.8	41.5	41.5
Actuated g/C Ratio	0.32	0.42			0.07	0.07	0.08	0.45		0.02	0.38	0.38
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	1062	659			85	105	145	1542		28	1313	1033
v/s Ratio Prot	c0.50	0.14					c0.17	c0.34		0.01	0.25	
v/s Ratio Perm					c0.04	0.00						0.18
v/c Ratio	1.58	0.33			0.52	0.01	2.05	0.75		0.79	0.65	0.46
Uniform Delay, d1	37.0	21.0			48.9	47.2	49.8	24.9		53.3	27.7	25.2
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	267.7	0.3			5.2	0.1	494.8	2.1		82.7	1.2	0.3
Delay (s)	304.7	21.3			54.2	47.3	544.6	27.0		136.0	28.9	25.5
Level of Service	F	C			D	D	F	C		F	C	C
Approach Delay (s)		261.0			51.9			132.5			28.0	
Approach LOS		F			D			F			C	

Intersection Summary			
HCM Average Control Delay	137.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	108.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	97.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	354	0	1	984	1059	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	1.00		1.00	1.00	1.00	
Flt Protected	0.95		0.95	1.00	1.00	
Satd. Flow (prot)	1770		1770	3374	3369	
Flt Permitted	0.95		0.17	1.00	1.00	
Satd. Flow (perm)	1770		314	3374	3369	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	385	0	1	1070	1151	16
RTOR Reduction (vph)	0	0	0	0	1	0
Lane Group Flow (vph)	385	0	1	1070	1166	0
Heavy Vehicles (%)	2%	2%	2%	7%	7%	2%
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	15.2		23.7	23.7	23.7	
Effective Green, g (s)	15.2		23.7	23.7	23.7	
Actuated g/C Ratio	0.32		0.51	0.51	0.51	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	574		159	1705	1702	
v/s Ratio Prot	c0.22			0.32	c0.35	
v/s Ratio Perm			0.00			
v/c Ratio	0.67		0.01	0.63	0.68	
Uniform Delay, d1	13.7		5.8	8.4	8.8	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	3.1		0.0	0.7	1.2	
Delay (s)	16.8		5.8	9.1	9.9	
Level of Service	B		A	A	A	
Approach Delay (s)	16.8			9.1	9.9	
Approach LOS	B			A	A	

Intersection Summary			
HCM Average Control Delay	10.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	46.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	920	2082	421	2021	727	684	323	352
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1000	2263	458	2197	790	743	351	383
RTOR Reduction (vph)	0	0	0	0	0	0	0	4
Lane Group Flow (vph)	1000	2263	458	2197	790	743	351	379
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	19.4	35.1	18.4	34.1	90.0	18.0	18.0	18.4
Effective Green, g (s)	22.4	38.1	21.4	37.1	90.0	21.0	21.0	18.4
Actuated g/C Ratio	0.25	0.42	0.24	0.41	1.00	0.23	0.23	0.20
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	838	1341	724	1378	1583	704	723	324
v/s Ratio Prot	c0.30	c0.71	0.15	0.66			0.11	0.24
v/s Ratio Perm					c0.50	c0.25		
v/c Ratio	1.19	1.69	0.63	1.59	0.50	1.06	0.49	1.17
Uniform Delay, d1	33.8	25.9	30.8	26.4	0.0	34.5	29.8	35.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	98.7	312.7	1.8	270.9	1.1	49.5	0.4	104.4
Delay (s)	132.5	338.6	32.6	297.4	1.1	84.0	30.2	140.2
Level of Service	F	F	C	F	A	F	C	F
Approach Delay (s)		275.4		194.2				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	207.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	5.2
Intersection Capacity Utilization	111.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	755	2200	163	4	2630	4	378	169	100	20	2	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86		0.97	1.00		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.94		1.00	0.86	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	821	2391	177	4	2859	4	411	184	109	22	2	174
RTOR Reduction (vph)	0	0	44	0	0	0	0	20	0	0	54	110
Lane Group Flow (vph)	821	2391	133	4	2863	0	411	273	0	22	5	7
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6									8
Actuated Green, G (s)	28.6	64.5	64.5	0.9	36.8		16.3	19.9		2.5	6.1	6.1
Effective Green, g (s)	28.6	64.5	64.5	0.9	36.8		16.3	19.9		2.5	6.1	6.1
Actuated g/C Ratio	0.27	0.61	0.61	0.01	0.35		0.15	0.19		0.02	0.06	0.06
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	2.0	2.5	2.5	2.0	2.5		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	871	2734	890	14	1675		506	329		30	82	164
v/s Ratio Prot	c0.25	0.53		0.00	c0.59		c0.12	c0.16		0.02	0.00	
v/s Ratio Perm			0.09									0.00
v/c Ratio	0.94	0.87	0.15	0.29	1.71		0.81	0.83		0.73	0.06	0.04
Uniform Delay, d1	38.1	17.6	9.1	52.4	34.8		43.6	41.6		51.6	47.4	47.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	17.9	3.4	0.1	4.1	321.7		9.1	15.0		56.2	0.1	0.0
Delay (s)	56.0	21.0	9.1	56.5	356.5		52.7	56.6		107.8	47.6	47.4
Level of Service	E	C	A	E	F		D	E		F	D	D
Approach Delay (s)		28.8			356.1			54.3			54.2	
Approach LOS		C			F			D			D	

Intersection Summary			
HCM Average Control Delay	163.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.26		
Actuated Cycle Length (s)	106.4	Sum of lost time (s)	18.6
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	1457	176	125	1862	164	261	144	181	158	92	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.92		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	4639		1641	4658		1641	1583		1641	1583	
Flt Permitted	0.95	1.00		0.95	1.00		0.48	1.00		0.28	1.00	
Satd. Flow (perm)	1641	4639		1641	4658		827	1583		480	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	1584	191	136	2024	178	284	157	197	172	100	125
RTOR Reduction (vph)	0	12	0	0	9	0	0	38	0	0	38	0
Lane Group Flow (vph)	163	1763	0	136	2193	0	284	316	0	172	187	0
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	9.0	58.0		13.0	62.0		33.0	33.0		33.0	33.0	
Effective Green, g (s)	9.0	58.0		13.0	62.0		33.0	33.0		33.0	33.0	
Actuated g/C Ratio	0.08	0.48		0.11	0.52		0.28	0.28		0.28	0.28	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	123	2242		178	2407		227	435		132	435	
v/s Ratio Prot	c0.10	0.38		0.08	c0.47			0.20			0.12	
v/s Ratio Perm							0.34			c0.36		
v/c Ratio	1.33	0.79		0.76	0.91		1.25	0.73		1.30	0.43	
Uniform Delay, d1	55.5	25.8		52.0	26.5		43.5	39.4		43.5	35.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	191.8	2.9		15.9	6.6		144.0	10.2		180.6	0.3	
Delay (s)	247.3	28.7		68.0	33.1		187.5	49.6		224.1	36.0	
Level of Service	F	C		E	C		F	D		F	D	
Approach Delay (s)		47.1			35.1			111.0			117.5	
Approach LOS		D			D			F			F	

Intersection Summary			
HCM Average Control Delay	54.8	HCM Level of Service	D
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	92.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	172	1486	47	19	1417	21	84	5	16	75	5	610
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		6.0	6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.98			0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1687	3358		1687	3366			1672			1555	
Flt Permitted	0.95	1.00		0.15	1.00			0.33			0.96	
Satd. Flow (perm)	1687	3358		260	3366			571			1504	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	187	1615	51	21	1540	23	91	5	17	82	5	663
RTOR Reduction (vph)	0	2	0	0	1	0	0	5	0	0	249	0
Lane Group Flow (vph)	187	1664	0	21	1562	0	0	108	0	0	501	0
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	17.7	88.0		65.3	65.3			11.0			11.0	
Effective Green, g (s)	17.7	88.0		65.3	65.3			11.0			11.0	
Actuated g/C Ratio	0.16	0.80		0.59	0.59			0.10			0.10	
Clearance Time (s)	5.0	6.0		6.0	6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	271	2686		154	1998			57			150	
v/s Ratio Prot	0.11	c0.50			c0.46							
v/s Ratio Perm				0.08				0.19			c0.33	
v/c Ratio	0.69	0.62		0.14	0.78			1.89			3.34	
Uniform Delay, d1	43.6	4.4		9.9	16.9			49.5			49.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	7.4	1.1		1.8	3.1			458.0			1069.0	
Delay (s)	50.9	5.4		11.7	20.1			507.5			1118.5	
Level of Service	D	A		B	C			F			F	
Approach Delay (s)		10.0			20.0			507.5			1118.5	
Approach LOS		B			B			F			F	

Intersection Summary			
HCM Average Control Delay	220.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	103.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1843	0	0	1449	146	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	0.95			0.95	1.00	
Frt	1.00			1.00	0.99	
Flt Protected	1.00			1.00	0.96	
Satd. Flow (prot)	3406			3406	1760	
Flt Permitted	1.00			1.00	0.96	
Satd. Flow (perm)	3406			3406	1760	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2003	0	0	1575	159	16
RTOR Reduction (vph)	0	0	0	0	6	0
Lane Group Flow (vph)	2003	0	0	1575	169	0
Heavy Vehicles (%)	6%	2%	2%	6%	2%	2%
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	38.3			38.3	9.0	
Effective Green, g (s)	38.3			38.3	9.0	
Actuated g/C Ratio	0.69			0.69	0.16	
Clearance Time (s)	4.0			4.0	4.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	2359			2359	286	
v/s Ratio Prot	c0.59			0.46	c0.10	
v/s Ratio Perm						
v/c Ratio	0.85			0.67	0.59	
Uniform Delay, d1	6.3			4.9	21.4	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	3.1			0.7	3.3	
Delay (s)	9.4			5.6	24.7	
Level of Service	A			A	C	
Approach Delay (s)	9.4			5.6	24.7	
Approach LOS	A			A	C	

Intersection Summary			
HCM Average Control Delay	8.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	55.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1862	0	0	1453	0	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2024	0	0	1579	0	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	494			578		
pX, platoon unblocked			0.37		0.37	0.37
vC, conflicting volume			2024		2814	1012
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			382		2500	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			437		9	404

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1349	675	790	790	3
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	3
cSH	1700	1700	1700	1700	404
Volume to Capacity	0.79	0.40	0.46	0.46	0.01
Queue Length 95th (ft)	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	14.0
Lane LOS					B
Approach Delay (s)	0.0		0.0		14.0
Approach LOS					B

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2560	33	448	33	33	33	460	1732	33	33	1309	1886
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	0.95	0.88
Frt	1.00	0.86			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3183	1486			1685	1468	1641	3273		1641	3282	2584
Flt Permitted	0.95	1.00			0.60	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	1486			1035	1468	1641	3273		1641	3282	2584
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2783	36	487	36	36	36	500	1883	36	36	1423	2050
RTOR Reduction (vph)	0	66	0	0	0	33	0	1	0	0	0	863
Lane Group Flow (vph)	2783	457	0	0	72	3	500	1918	0	36	1423	1187
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Perm		Perm	Prot			Prot		Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8		8						6
Actuated Green, G (s)	34.2	48.7			10.5	10.5	9.0	53.1		2.9	47.0	47.0
Effective Green, g (s)	34.2	48.7			10.5	10.5	9.0	53.1		2.9	47.0	47.0
Actuated g/C Ratio	0.29	0.42			0.09	0.09	0.08	0.46		0.02	0.40	0.40
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	933	620			93	132	127	1489		41	1322	1041
v/s Ratio Prot	c0.87	c0.31					c0.30	c0.59		0.02	0.43	
v/s Ratio Perm					0.07	0.00						0.46
v/c Ratio	2.98	0.74			0.77	0.02	3.94	1.29		0.88	1.08	1.14
Uniform Delay, d1	41.2	28.6			51.9	48.4	53.9	31.8		56.7	34.9	34.9
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	895.2	4.5			32.2	0.1	1340.4	134.8		92.9	48.1	74.9
Delay (s)	936.4	33.1			84.1	48.5	1394.2	166.6		149.7	82.9	109.8
Level of Service	F	C			F	D	F	F		F	F	F
Approach Delay (s)		793.5			72.2			420.4			99.3	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM Average Control Delay	427.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.94		
Actuated Cycle Length (s)	116.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	151.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	354	0	1	1000	1076	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	1.00		1.00	1.00	1.00	
Flt Protected	0.95		0.95	1.00	1.00	
Satd. Flow (prot)	1770		1770	3374	3369	
Flt Permitted	0.95		0.16	1.00	1.00	
Satd. Flow (perm)	1770		303	3374	3369	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	385	0	1	1087	1170	16
RTOR Reduction (vph)	0	0	0	0	1	0
Lane Group Flow (vph)	385	0	1	1087	1185	0
Heavy Vehicles (%)	2%	2%	2%	7%	7%	2%
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	15.4		24.6	24.6	24.6	
Effective Green, g (s)	15.4		24.6	24.6	24.6	
Actuated g/C Ratio	0.32		0.51	0.51	0.51	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	568		155	1729	1727	
v/s Ratio Prot	c0.22			0.32	c0.35	
v/s Ratio Perm			0.00			
v/c Ratio	0.68		0.01	0.63	0.69	
Uniform Delay, d1	14.1		5.7	8.4	8.8	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	3.2		0.0	0.7	1.1	
Delay (s)	17.4		5.7	9.1	9.9	
Level of Service	B		A	A	A	
Approach Delay (s)	17.4			9.1	9.9	
Approach LOS	B			A	A	

Intersection Summary			
HCM Average Control Delay	10.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	48.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

2035 with DeWitt Nelson Project LOS Worksheets

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	330	1986	300	1473	275	1479	322	405
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	359	2159	326	1601	299	1608	350	440
RTOR Reduction (vph)	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	359	2159	326	1601	299	1608	350	440
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	14.6	28.7	19.4	33.5	90.0	23.4	23.4	19.4
Effective Green, g (s)	17.6	31.7	22.4	36.5	90.0	26.4	26.4	19.4
Actuated g/C Ratio	0.20	0.35	0.25	0.41	1.00	0.29	0.29	0.22
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	658	1115	758	1356	1583	886	909	341
v/s Ratio Prot	0.11	c0.68	0.11	c0.48			0.11	c0.28
v/s Ratio Perm					0.19	c0.53		
v/c Ratio	0.55	1.94	0.43	1.18	0.19	1.81	0.39	1.29
Uniform Delay, d1	32.6	29.1	28.4	26.8	0.0	31.8	25.3	35.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	424.7	0.4	89.2	0.3	371.2	0.2	150.9
Delay (s)	33.5	453.8	28.8	116.0	0.3	403.0	25.5	186.2
Level of Service	C	F	C	F	A	F	C	F
Approach Delay (s)		393.9		87.7				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	269.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.84		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	133.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	994	2565	310	3	1820	2	67	59	20	20	1	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86		0.97	1.00		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.96		1.00	0.85	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3242	4510	1468	1641	4842		3303	1791		1289	1429	2854
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3242	4510	1468	1641	4842		3303	1791		1289	1429	2854
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1080	2788	337	3	1978	2	73	64	22	22	1	174
RTOR Reduction (vph)	0	0	62	0	0	0	0	12	0	0	54	110
Lane Group Flow (vph)	1080	2788	275	3	1980	0	73	74	0	22	4	7
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6									8
Actuated Green, G (s)	28.4	64.1	64.1	0.9	36.6		7.7	10.9		2.6	5.8	5.8
Effective Green, g (s)	28.4	64.1	64.1	0.9	36.6		7.7	10.9		2.6	5.8	5.8
Actuated g/C Ratio	0.29	0.66	0.66	0.01	0.38		0.08	0.11		0.03	0.06	0.06
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	2.0	2.5	2.5	2.0	2.5		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	948	2977	969	15	1825		262	201		35	85	170
v/s Ratio Prot	c0.33	0.62		0.00	c0.41		c0.02	c0.04		c0.02	0.00	
v/s Ratio Perm			0.19									0.00
v/c Ratio	1.14	0.94	0.28	0.20	1.08		0.28	0.37		0.63	0.05	0.04
Uniform Delay, d1	34.4	14.7	6.9	47.7	30.2		42.1	39.9		46.8	43.1	43.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	75.5	6.5	0.1	2.4	48.2		0.2	0.4		22.7	0.1	0.0
Delay (s)	109.9	21.1	7.0	50.1	78.5		42.3	40.3		69.5	43.1	43.1
Level of Service	F	C	A	D	E		D	D		E	D	D
Approach Delay (s)		42.8			78.4			41.2			46.0	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM Average Control Delay	53.7	HCM Level of Service	D
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	97.1	Sum of lost time (s)	22.6
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	1679	219	111	1341	164	118	38	48	45	62	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.92		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1626	4592		1626	4597		1626	1568		1626	1523	
Flt Permitted	0.95	1.00		0.95	1.00		0.44	1.00		0.70	1.00	
Satd. Flow (perm)	1626	4592		1626	4597		754	1568		1193	1523	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1825	238	121	1458	178	128	41	52	49	67	184
RTOR Reduction (vph)	0	13	0	0	12	0	0	38	0	0	82	0
Lane Group Flow (vph)	54	2050	0	121	1624	0	128	55	0	49	169	0
Heavy Vehicles (%)	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	6.5	57.7		12.2	63.4		33.0	33.0		33.0	33.0	
Effective Green, g (s)	6.5	57.7		12.2	63.4		33.0	33.0		33.0	33.0	
Actuated g/C Ratio	0.05	0.49		0.10	0.53		0.28	0.28		0.28	0.28	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	89	2228		167	2451		209	435		331	423	
v/s Ratio Prot	0.03	c0.45		c0.07	0.35			0.04			0.11	
v/s Ratio Perm							c0.17			0.04		
v/c Ratio	0.61	0.92		0.72	0.66		0.61	0.13		0.15	0.40	
Uniform Delay, d1	55.0	28.5		51.7	20.0		37.4	32.2		32.4	34.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.8	7.7		12.4	1.4		12.7	0.6		0.1	0.2	
Delay (s)	62.7	36.1		64.1	21.5		50.1	32.8		32.4	35.1	
Level of Service	E	D		E	C		D	C		C	D	
Approach Delay (s)		36.8			24.4			42.8			34.7	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM Average Control Delay	32.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	118.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	671	1003	65	26	1328	83	42	5	16	17	5	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		6.0	6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.97			0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (prot)	1656	3282		1656	3283			1629			1531	
Flt Permitted	0.95	1.00		0.24	1.00			0.32			0.97	
Satd. Flow (perm)	1656	3282		425	3283			547			1487	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	729	1090	71	28	1443	90	46	5	17	18	5	149
RTOR Reduction (vph)	0	4	0	0	4	0	0	11	0	0	134	0
Lane Group Flow (vph)	729	1157	0	28	1529	0	0	57	0	0	38	0
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	41.0	88.0		42.0	42.0			11.0			11.0	
Effective Green, g (s)	41.0	88.0		42.0	42.0			11.0			11.0	
Actuated g/C Ratio	0.37	0.80		0.38	0.38			0.10			0.10	
Clearance Time (s)	5.0	6.0		6.0	6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	617	2626		162	1254			55			149	
v/s Ratio Prot	c0.44	0.35			c0.47							
v/s Ratio Perm				0.07				c0.10			0.03	
v/c Ratio	1.18	0.44		0.17	1.22			1.04			0.25	
Uniform Delay, d1	34.5	3.4		22.5	34.0			49.5			45.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	97.6	0.5		2.3	106.0			133.1			0.9	
Delay (s)	132.1	3.9		24.8	140.0			182.6			46.6	
Level of Service	F	A		C	F			F			D	
Approach Delay (s)		53.4			137.9			182.6			46.6	
Approach LOS		D			F			F			D	

Intersection Summary			
HCM Average Control Delay	91.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	104.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1089	0	0	1651	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0		
Lane Util. Factor	0.95			0.95		
Frt	1.00			1.00		
Flt Protected	1.00			1.00		
Satd. Flow (prot)	3374			3374		
Flt Permitted	1.00			1.00		
Satd. Flow (perm)	3374			3374		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1184	0	0	1795	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1184	0	0	1795	0	0
Heavy Vehicles (%)	7%	2%	2%	7%	2%	2%
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	32.0			32.0		
Effective Green, g (s)	32.0			32.0		
Actuated g/C Ratio	0.72			0.72		
Clearance Time (s)	4.0			4.0		
Vehicle Extension (s)	3.0			3.0		
Lane Grp Cap (vph)	2443			2443		
v/s Ratio Prot	0.35			c0.53		
v/s Ratio Perm						
v/c Ratio	0.48			0.73		
Uniform Delay, d1	2.6			3.6		
Progression Factor	1.00			1.00		
Incremental Delay, d2	0.2			1.2		
Delay (s)	2.7			4.8		
Level of Service	A			A		
Approach Delay (s)	2.7			4.8	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	4.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	44.2	Sum of lost time (s)	12.2
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1096	0	0	1660	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1191	0	0	1804	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	494			578		
pX, platoon unblocked			0.88		0.88	0.88
vC, conflicting volume			1191		2093	596
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			943		1969	266
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			636		48	644

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	794	397	902	902	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.47	0.23	0.53	0.53	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	730	20	342	20	20	20	87	386	20	20	749	1547
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	0.95	0.88
Frt	1.00	0.86			1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3303	1539			1749	1524	1703	3380		1703	3406	2682
Flt Permitted	0.95	1.00			0.65	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3303	1539			1168	1524	1703	3380		1703	3406	2682
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	793	22	372	22	22	22	95	420	22	22	814	1682
RTOR Reduction (vph)	0	100	0	0	0	20	0	3	0	0	0	978
Lane Group Flow (vph)	793	294	0	0	44	2	95	439	0	22	814	704
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot			Perm		Perm	Prot			Prot		Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8		8						6
Actuated Green, G (s)	29.6	41.0			7.4	7.4	8.9	51.1		1.8	44.0	44.0
Effective Green, g (s)	29.6	41.0			7.4	7.4	8.9	51.1		1.8	44.0	44.0
Actuated g/C Ratio	0.28	0.39			0.07	0.07	0.08	0.48		0.02	0.42	0.42
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	923	596			82	106	143	1631		29	1415	1114
v/s Ratio Prot	c0.24	c0.19					c0.06	0.13		0.01	0.24	
v/s Ratio Perm					0.04	0.00						c0.26
v/c Ratio	0.86	0.49			0.54	0.01	0.66	0.27		0.76	0.58	0.63
Uniform Delay, d1	36.2	24.6			47.6	45.9	47.1	16.3		51.8	23.8	24.5
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.0	0.6			6.6	0.1	11.1	0.1		71.7	0.6	1.2
Delay (s)	44.2	25.2			54.2	45.9	58.1	16.4		123.5	24.3	25.7
Level of Service	D	C			D	D	E	B		F	C	C
Approach Delay (s)		37.9			51.4			23.8			26.1	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	29.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	105.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	0	6	529	967	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0	4.0	
Lane Util. Factor			1.00	0.95	0.95	
Frt			1.00	1.00	0.98	
Flt Protected			0.95	1.00	1.00	
Satd. Flow (prot)			1770	3374	3328	
Flt Permitted			0.23	1.00	1.00	
Satd. Flow (perm)			434	3374	3328	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	7	575	1051	157
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	7	575	1208	0
Heavy Vehicles (%)	2%	2%	2%	7%	7%	2%
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)			120.0	120.0	120.0	
Effective Green, g (s)			120.0	120.0	120.0	
Actuated g/C Ratio			1.00	1.00	1.00	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			3.0	3.0	3.0	
Lane Grp Cap (vph)			434	3374	3328	
v/s Ratio Prot				0.17	c0.36	
v/s Ratio Perm			0.02			
v/c Ratio			0.02	0.17	0.36	
Uniform Delay, d1			0.0	0.0	0.0	
Progression Factor			1.00	1.00	1.00	
Incremental Delay, d2			0.0	0.0	0.1	
Delay (s)			0.0	0.0	0.1	
Level of Service			A	A	A	
Approach Delay (s)	0.0			0.0	0.1	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	0.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	907	2082	393	1969	686	711	319	374
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	986	2263	427	2140	746	773	347	407
RTOR Reduction (vph)	0	0	0	0	0	0	0	3
Lane Group Flow (vph)	986	2263	427	2140	746	773	347	404
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	19.4	35.1	18.4	34.1	90.0	18.0	18.0	18.4
Effective Green, g (s)	22.4	38.1	21.4	37.1	90.0	21.0	21.0	18.4
Actuated g/C Ratio	0.25	0.42	0.24	0.41	1.00	0.23	0.23	0.20
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	838	1341	724	1378	1583	704	723	324
v/s Ratio Prot	c0.29	c0.71	0.14	0.64			0.11	0.26
v/s Ratio Perm					c0.47	c0.26		
v/c Ratio	1.18	1.69	0.59	1.55	0.47	1.10	0.48	1.25
Uniform Delay, d1	33.8	25.9	30.4	26.4	0.0	34.5	29.8	35.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	91.9	312.7	1.2	252.5	1.0	63.9	0.4	134.1
Delay (s)	125.7	338.6	31.6	278.9	1.0	98.4	30.2	169.9
Level of Service	F	F	C	F	A	F	C	F
Approach Delay (s)		274.0		184.5				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	204.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	5.2
Intersection Capacity Utilization	112.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	745	2263	161	4	2515	4	373	167	99	20	2	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86		0.97	1.00		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.94		1.00	0.86	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	810	2460	175	4	2734	4	405	182	108	22	2	172
RTOR Reduction (vph)	0	0	42	0	0	0	0	20	0	0	54	109
Lane Group Flow (vph)	810	2460	133	4	2738	0	405	270	0	22	5	6
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6									8
Actuated Green, G (s)	28.6	64.5	64.5	0.9	36.8		16.3	19.8		2.5	6.0	6.0
Effective Green, g (s)	28.6	64.5	64.5	0.9	36.8		16.3	19.8		2.5	6.0	6.0
Actuated g/C Ratio	0.27	0.61	0.61	0.01	0.35		0.15	0.19		0.02	0.06	0.06
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	2.0	2.5	2.5	2.0	2.5		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	872	2737	891	14	1676		506	328		30	81	161
v/s Ratio Prot	c0.25	0.55		0.00	c0.57		c0.12	c0.15		0.02	0.00	
v/s Ratio Perm			0.09									0.00
v/c Ratio	0.93	0.90	0.15	0.29	1.63		0.80	0.82		0.73	0.06	0.04
Uniform Delay, d1	37.9	18.1	9.0	52.4	34.8		43.4	41.6		51.6	47.5	47.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	15.5	4.4	0.1	4.1	287.9		8.4	14.5		56.2	0.1	0.0
Delay (s)	53.4	22.5	9.1	56.4	322.6		51.8	56.1		107.8	47.6	47.5
Level of Service	D	C	A	E	F		D	E		F	D	D
Approach Delay (s)		29.1			322.2			53.6			54.3	
Approach LOS		C			F			D			D	

Intersection Summary			
HCM Average Control Delay	145.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	106.3	Sum of lost time (s)	14.6
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	148	1530	174	123	1758	162	257	142	178	156	91	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.92		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	4643		1641	4656		1641	1583		1641	1584	
Flt Permitted	0.95	1.00		0.95	1.00		0.48	1.00		0.29	1.00	
Satd. Flow (perm)	1641	4643		1641	4656		835	1583		498	1584	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	161	1663	189	134	1911	176	279	154	193	170	99	123
RTOR Reduction (vph)	0	11	0	0	9	0	0	38	0	0	37	0
Lane Group Flow (vph)	161	1841	0	134	2078	0	279	309	0	170	185	0
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	9.0	58.1		12.9	62.0		33.0	33.0		33.0	33.0	
Effective Green, g (s)	9.0	58.1		12.9	62.0		33.0	33.0		33.0	33.0	
Actuated g/C Ratio	0.08	0.48		0.11	0.52		0.28	0.28		0.28	0.28	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	123	2248		176	2406		230	435		137	436	
v/s Ratio Prot	c0.10	0.40		0.08	c0.45			0.20			0.12	
v/s Ratio Perm							0.33			c0.34		
v/c Ratio	1.31	0.82		0.76	0.86		1.21	0.71		1.24	0.42	
Uniform Delay, d1	55.5	26.5		52.1	25.3		43.5	39.2		43.5	35.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	185.5	3.5		15.9	4.4		129.0	9.5		155.6	0.2	
Delay (s)	241.0	29.9		68.0	29.7		172.5	48.7		199.1	35.9	
Level of Service	F	C		E	C		F	D		F	D	
Approach Delay (s)		46.8			32.0			103.9			106.7	
Approach LOS		D			C			F			F	

Intersection Summary			
HCM Average Control Delay	51.8	HCM Level of Service	D
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	172	1554	47	19	1309	21	84	5	16	75	5	610
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		6.0	6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.98			0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1687	3359		1687	3366			1672			1555	
Flt Permitted	0.95	1.00		0.14	1.00			0.33			0.96	
Satd. Flow (perm)	1687	3359		241	3366			571			1504	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	187	1689	51	21	1423	23	91	5	17	82	5	663
RTOR Reduction (vph)	0	2	0	0	1	0	0	5	0	0	249	0
Lane Group Flow (vph)	187	1738	0	21	1445	0	0	108	0	0	501	0
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	17.7	88.0		65.3	65.3			11.0			11.0	
Effective Green, g (s)	17.7	88.0		65.3	65.3			11.0			11.0	
Actuated g/C Ratio	0.16	0.80		0.59	0.59			0.10			0.10	
Clearance Time (s)	5.0	6.0		6.0	6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	271	2687		143	1998			57			150	
v/s Ratio Prot	0.11	c0.52			c0.43							
v/s Ratio Perm				0.09				0.19			c0.33	
v/c Ratio	0.69	0.65		0.15	0.72			1.89			3.34	
Uniform Delay, d1	43.6	4.6		9.9	15.9			49.5			49.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	7.4	1.2		2.2	2.3			458.0			1069.0	
Delay (s)	50.9	5.8		12.1	18.2			507.5			1118.5	
Level of Service	D	A		B	B			F			F	
Approach Delay (s)		10.2			18.1			507.5			1118.5	
Approach LOS		B			B			F			F	

Intersection Summary			
HCM Average Control Delay	221.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	102.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1911	0	0	1513	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0		
Lane Util. Factor	0.95			0.95		
Frt	1.00			1.00		
Flt Protected	1.00			1.00		
Satd. Flow (prot)	3438			3438		
Flt Permitted	1.00			1.00		
Satd. Flow (perm)	3438			3438		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2077	0	0	1645	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	2077	0	0	1645	0	0
Heavy Vehicles (%)	5%	2%	2%	5%	2%	2%
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	39.0			39.0		
Effective Green, g (s)	39.0			39.0		
Actuated g/C Ratio	0.76			0.76		
Clearance Time (s)	4.0			4.0		
Vehicle Extension (s)	3.0			3.0		
Lane Grp Cap (vph)	2624			2624		
v/s Ratio Prot	c0.60			0.48		
v/s Ratio Perm						
v/c Ratio	0.79			0.63		
Uniform Delay, d1	3.6			2.7		
Progression Factor	1.00			1.00		
Incremental Delay, d2	1.7			0.5		
Delay (s)	5.3			3.2		
Level of Service	A			A		
Approach Delay (s)	5.3			3.2	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	4.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	51.1	Sum of lost time (s)	12.1
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1914	0	0	1517	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2080	0	0	1649	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	494			578		
pX, platoon unblocked			0.31		0.31	0.31
vC, conflicting volume			2080		2905	1040
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		2688	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			495		5	331

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1387	693	824	824	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.82	0.41	0.48	0.48	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1540	20	352	20	20	20	354	1054	20	20	799	1140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	0.95	0.88
Frt	1.00	0.86			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3335	1553			1765	1538	1719	3428		1719	3438	2707
Flt Permitted	0.95	1.00			0.65	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3335	1553			1171	1538	1719	3428		1719	3438	2707
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1674	22	383	22	22	22	385	1146	22	22	868	1239
RTOR Reduction (vph)	0	88	0	0	0	20	0	1	0	0	0	765
Lane Group Flow (vph)	1674	317	0	0	44	2	385	1167	0	22	868	474
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot			Perm		Perm	Prot			Prot		Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8		8						6
Actuated Green, G (s)	34.6	46.2			7.6	7.6	9.2	49.1		1.8	41.7	41.7
Effective Green, g (s)	34.6	46.2			7.6	7.6	9.2	49.1		1.8	41.7	41.7
Actuated g/C Ratio	0.32	0.42			0.07	0.07	0.08	0.45		0.02	0.38	0.38
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	1058	658			82	107	145	1543		28	1314	1035
v/s Ratio Prot	c0.50	c0.20					c0.22	c0.34		0.01	0.25	
v/s Ratio Perm					0.04	0.00						0.17
v/c Ratio	1.58	0.48			0.54	0.01	2.66	0.76		0.79	0.66	0.46
Uniform Delay, d1	37.2	22.8			49.0	47.3	49.9	25.0		53.5	27.9	25.2
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	266.5	0.6			6.6	0.1	764.2	2.2		82.7	1.3	0.3
Delay (s)	303.8	23.3			55.7	47.3	814.2	27.2		136.2	29.1	25.6
Level of Service	F	C			E	D	F	C		F	C	C
Approach Delay (s)		249.2			52.9			222.3			28.1	
Approach LOS		F			D			F			C	

Intersection Summary			
HCM Average Control Delay	159.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	109.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	102.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	68	3	3	1360	1092	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.99		1.00	1.00	0.99	
Flt Protected	0.95		0.95	1.00	1.00	
Satd. Flow (prot)	1768		1770	3406	3380	
Flt Permitted	0.95		0.20	1.00	1.00	
Satd. Flow (perm)	1768		381	3406	3380	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	74	3	3	1478	1187	86
RTOR Reduction (vph)	3	0	0	0	7	0
Lane Group Flow (vph)	74	0	3	1478	1266	0
Heavy Vehicles (%)	2%	2%	2%	6%	6%	2%
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	5.1		59.8	59.8	59.8	
Effective Green, g (s)	5.1		59.8	59.8	59.8	
Actuated g/C Ratio	0.07		0.82	0.82	0.82	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	124		313	2794	2773	
v/s Ratio Prot	c0.04			c0.43	0.37	
v/s Ratio Perm			0.01			
v/c Ratio	0.60		0.01	0.53	0.46	
Uniform Delay, d1	32.9		1.2	2.1	1.9	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	7.6		0.0	0.2	0.1	
Delay (s)	40.5		1.2	2.3	2.0	
Level of Service	D		A	A	A	
Approach Delay (s)	40.5			2.3	2.0	
Approach LOS	D			A	A	

Intersection Summary			
HCM Average Control Delay	3.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	72.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	920	2081	427	2027	734	684	323	351
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1000	2262	464	2203	798	743	351	382
RTOR Reduction (vph)	0	0	0	0	0	0	0	4
Lane Group Flow (vph)	1000	2262	464	2203	798	743	351	378
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	19.4	35.1	18.4	34.1	90.0	18.0	18.0	18.4
Effective Green, g (s)	22.4	38.1	21.4	37.1	90.0	21.0	21.0	18.4
Actuated g/C Ratio	0.25	0.42	0.24	0.41	1.00	0.23	0.23	0.20
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	838	1341	724	1378	1583	704	723	324
v/s Ratio Prot	c0.30	c0.71	0.15	0.66			0.11	0.24
v/s Ratio Perm					c0.50	c0.25		
v/c Ratio	1.19	1.69	0.64	1.60	0.50	1.06	0.49	1.17
Uniform Delay, d1	33.8	25.9	30.8	26.4	0.0	34.5	29.8	35.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	98.7	312.3	1.9	272.9	1.1	49.5	0.4	103.3
Delay (s)	132.5	338.3	32.8	299.3	1.1	84.0	30.2	139.1
Level of Service	F	F	C	F	A	F	C	F
Approach Delay (s)		275.2		195.0				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	207.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	5.2
Intersection Capacity Utilization	112.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	755	2199	163	4	2650	4	378	169	100	20	2	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86		0.97	1.00		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.94		1.00	0.86	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	821	2390	177	4	2880	4	411	184	109	22	2	174
RTOR Reduction (vph)	0	0	44	0	0	0	0	20	0	0	54	110
Lane Group Flow (vph)	821	2390	133	4	2884	0	411	273	0	22	5	7
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6									8
Actuated Green, G (s)	28.6	64.5	64.5	0.9	36.8		16.3	19.9		2.5	6.1	6.1
Effective Green, g (s)	28.6	64.5	64.5	0.9	36.8		16.3	19.9		2.5	6.1	6.1
Actuated g/C Ratio	0.27	0.61	0.61	0.01	0.35		0.15	0.19		0.02	0.06	0.06
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	2.0	2.5	2.5	2.0	2.5		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	871	2734	890	14	1675		506	329		30	82	164
v/s Ratio Prot	c0.25	0.53		0.00	c0.60		c0.12	c0.16		0.02	0.00	
v/s Ratio Perm			0.09									0.00
v/c Ratio	0.94	0.87	0.15	0.29	1.72		0.81	0.83		0.73	0.06	0.04
Uniform Delay, d1	38.1	17.6	9.1	52.4	34.8		43.6	41.6		51.6	47.4	47.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	17.9	3.4	0.1	4.1	327.3		9.1	15.0		56.2	0.1	0.0
Delay (s)	56.0	20.9	9.1	56.5	362.1		52.7	56.6		107.8	47.6	47.4
Level of Service	E	C	A	E	F		D	E		F	D	D
Approach Delay (s)		28.8			361.7			54.3			54.2	
Approach LOS		C			F			D			D	

Intersection Summary			
HCM Average Control Delay	166.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.26		
Actuated Cycle Length (s)	106.4	Sum of lost time (s)	18.6
Intersection Capacity Utilization	89.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	1456	176	125	1882	164	261	144	181	158	92	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.92		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	4639		1641	4659		1641	1583		1641	1583	
Flt Permitted	0.95	1.00		0.95	1.00		0.48	1.00		0.28	1.00	
Satd. Flow (perm)	1641	4639		1641	4659		827	1583		480	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	1583	191	136	2046	178	284	157	197	172	100	125
RTOR Reduction (vph)	0	12	0	0	8	0	0	38	0	0	38	0
Lane Group Flow (vph)	163	1762	0	136	2216	0	284	316	0	172	187	0
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	9.0	58.0		13.0	62.0		33.0	33.0		33.0	33.0	
Effective Green, g (s)	9.0	58.0		13.0	62.0		33.0	33.0		33.0	33.0	
Actuated g/C Ratio	0.08	0.48		0.11	0.52		0.28	0.28		0.28	0.28	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	123	2242		178	2407		227	435		132	435	
v/s Ratio Prot	c0.10	0.38		0.08	c0.48			0.20			0.12	
v/s Ratio Perm							0.34			c0.36		
v/c Ratio	1.33	0.79		0.76	0.92		1.25	0.73		1.30	0.43	
Uniform Delay, d1	55.5	25.8		52.0	26.7		43.5	39.4		43.5	35.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	191.8	2.9		15.9	7.2		144.0	10.2		180.6	0.3	
Delay (s)	247.3	28.7		68.0	33.9		187.5	49.6		224.1	36.0	
Level of Service	F	C		E	C		F	D		F	D	
Approach Delay (s)		47.1			35.9			111.0			117.5	
Approach LOS		D			D			F			F	

Intersection Summary			
HCM Average Control Delay	55.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	172	1485	47	19	1437	21	84	5	16	75	5	610
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		6.0	6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.98			0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1687	3358		1687	3366			1672			1555	
Flt Permitted	0.95	1.00		0.15	1.00			0.33			0.96	
Satd. Flow (perm)	1687	3358		260	3366			571			1504	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	187	1614	51	21	1562	23	91	5	17	82	5	663
RTOR Reduction (vph)	0	2	0	0	1	0	0	5	0	0	249	0
Lane Group Flow (vph)	187	1663	0	21	1584	0	0	108	0	0	501	0
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	17.7	88.0		65.3	65.3			11.0			11.0	
Effective Green, g (s)	17.7	88.0		65.3	65.3			11.0			11.0	
Actuated g/C Ratio	0.16	0.80		0.59	0.59			0.10			0.10	
Clearance Time (s)	5.0	6.0		6.0	6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	271	2686		154	1998			57			150	
v/s Ratio Prot	0.11	c0.50			c0.47							
v/s Ratio Perm				0.08				0.19			c0.33	
v/c Ratio	0.69	0.62		0.14	0.79			1.89			3.34	
Uniform Delay, d1	43.6	4.4		9.9	17.2			49.5			49.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	7.4	1.1		1.8	3.3			458.0			1069.0	
Delay (s)	50.9	5.4		11.7	20.5			507.5			1118.5	
Level of Service	D	A		B	C			F			F	
Approach Delay (s)		10.0			20.4			507.5			1118.5	
Approach LOS		B			C			F			F	

Intersection Summary			
HCM Average Control Delay	219.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	104.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1843	0	0	1633	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0		
Lane Util. Factor	0.95			0.95		
Frt	1.00			1.00		
Flt Protected	1.00			1.00		
Satd. Flow (prot)	3406			3406		
Flt Permitted	1.00			1.00		
Satd. Flow (perm)	3406			3406		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2003	0	0	1775	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	2003	0	0	1775	0	0
Heavy Vehicles (%)	6%	2%	2%	6%	2%	2%
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	37.7			37.7		
Effective Green, g (s)	37.7			37.7		
Actuated g/C Ratio	0.76			0.76		
Clearance Time (s)	4.0			4.0		
Vehicle Extension (s)	3.0			3.0		
Lane Grp Cap (vph)	2578			2578		
v/s Ratio Prot	c0.59			0.52		
v/s Ratio Perm						
v/c Ratio	0.78			0.69		
Uniform Delay, d1	3.6			3.1		
Progression Factor	1.00			1.00		
Incremental Delay, d2	1.5			0.8		
Delay (s)	5.1			3.9		
Level of Service	A			A		
Approach Delay (s)	5.1			3.9	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	4.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	49.8	Sum of lost time (s)	12.1
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1845	0	0	1637	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2005	0	0	1779	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	494			578		
pX, platoon unblocked			0.32		0.32	0.32
vC, conflicting volume			2005		2895	1003
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		2669	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			514		6	344

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1337	668	890	890	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.79	0.39	0.52	0.52	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2547	33	441	33	33	33	644	1747	33	33	1309	1886
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	0.95	0.88
Frt	1.00	0.86			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3183	1486			1685	1468	1641	3273		1641	3282	2584
Flt Permitted	0.95	1.00			0.60	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	1486			1041	1468	1641	3273		1641	3282	2584
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2768	36	479	36	36	36	700	1899	36	36	1423	2050
RTOR Reduction (vph)	0	66	0	0	0	33	0	1	0	0	0	863
Lane Group Flow (vph)	2768	449	0	0	72	3	700	1934	0	36	1423	1187
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Perm		Perm	Prot			Prot		Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8		8						6
Actuated Green, G (s)	34.2	48.7			10.5	10.5	9.0	53.1		2.9	47.0	47.0
Effective Green, g (s)	34.2	48.7			10.5	10.5	9.0	53.1		2.9	47.0	47.0
Actuated g/C Ratio	0.29	0.42			0.09	0.09	0.08	0.46		0.02	0.40	0.40
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	933	620			94	132	127	1489		41	1322	1041
v/s Ratio Prot	c0.87	c0.30					c0.43	c0.59		0.02	0.43	
v/s Ratio Perm					0.07	0.00						0.46
v/c Ratio	2.97	0.72			0.77	0.02	5.51	1.30		0.88	1.08	1.14
Uniform Delay, d1	41.2	28.4			51.9	48.4	53.9	31.8		56.7	34.9	34.9
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	887.9	4.2			30.4	0.1	2047.5	139.5		92.9	48.1	74.9
Delay (s)	929.2	32.6			82.3	48.5	2101.3	171.3		149.7	82.9	109.8
Level of Service	F	C			F	D	F	F		F	F	F
Approach Delay (s)		788.5			71.0			684.0			99.3	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM Average Control Delay	497.9	HCM Level of Service	F
HCM Volume to Capacity ratio	2.07		
Actuated Cycle Length (s)	116.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	161.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	176	7	0	1379	1107	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.99			1.00	1.00	
Flt Protected	0.95			1.00	1.00	
Satd. Flow (prot)	1768			3406	3406	
Flt Permitted	0.95			1.00	1.00	
Satd. Flow (perm)	1768			3406	3406	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	191	8	0	1499	1203	0
RTOR Reduction (vph)	2	0	0	0	0	0
Lane Group Flow (vph)	197	0	0	1499	1203	0
Heavy Vehicles (%)	2%	2%	2%	6%	6%	2%
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	10.5			37.7	37.7	
Effective Green, g (s)	10.5			37.7	37.7	
Actuated g/C Ratio	0.19			0.67	0.67	
Clearance Time (s)	4.0			4.0	4.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	330			2285	2285	
v/s Ratio Prot	c0.11			c0.44	0.35	
v/s Ratio Perm						
v/c Ratio	0.60			0.66	0.53	
Uniform Delay, d1	20.9			5.4	4.7	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	2.9			0.7	0.2	
Delay (s)	23.8			6.1	4.9	
Level of Service	C			A	A	
Approach Delay (s)	23.8			6.1	4.9	
Approach LOS	C			A	A	

Intersection Summary			
HCM Average Control Delay	6.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	56.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

2035 with NCRF & DeWitt Nelson Projects LOS Worksheets

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	330	2038	305	1478	282	1543	322	454
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	359	2215	332	1607	307	1677	350	493
RTOR Reduction (vph)	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	359	2215	332	1607	307	1677	350	493
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	14.6	28.7	19.4	33.5	90.0	23.4	23.4	19.4
Effective Green, g (s)	17.6	31.7	22.4	36.5	90.0	26.4	26.4	19.4
Actuated g/C Ratio	0.20	0.35	0.25	0.41	1.00	0.29	0.29	0.22
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	658	1115	758	1356	1583	886	909	341
v/s Ratio Prot	0.11	c0.70	0.11	c0.48			0.11	c0.31
v/s Ratio Perm					0.19	c0.56		
v/c Ratio	0.55	1.99	0.44	1.19	0.19	1.89	0.39	1.45
Uniform Delay, d1	32.6	29.1	28.5	26.8	0.0	31.8	25.3	35.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	447.2	0.4	91.1	0.3	406.0	0.2	216.5
Delay (s)	33.5	476.3	28.9	117.8	0.3	437.8	25.5	251.8
Level of Service	C	F	C	F	A	F	C	F
Approach Delay (s)		414.6		88.6				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	290.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.93		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	140.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	994	2730	310	3	1837	2	67	59	20	20	1	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86		0.97	1.00		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.96		1.00	0.85	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3242	4510	1468	1641	4842		3303	1791		1289	1429	2854
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3242	4510	1468	1641	4842		3303	1791		1289	1429	2854
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1080	2967	337	3	1997	2	73	64	22	22	1	174
RTOR Reduction (vph)	0	0	58	0	0	0	0	12	0	0	54	110
Lane Group Flow (vph)	1080	2967	279	3	1999	0	73	74	0	22	4	7
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6									8
Actuated Green, G (s)	28.4	64.1	64.1	0.9	36.6		7.7	10.9		2.6	5.8	5.8
Effective Green, g (s)	28.4	64.1	64.1	0.9	36.6		7.7	10.9		2.6	5.8	5.8
Actuated g/C Ratio	0.29	0.66	0.66	0.01	0.38		0.08	0.11		0.03	0.06	0.06
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	2.0	2.5	2.5	2.0	2.5		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	948	2977	969	15	1825		262	201		35	85	170
v/s Ratio Prot	c0.33	0.66		0.00	c0.41		c0.02	c0.04		c0.02	0.00	
v/s Ratio Perm			0.19									0.00
v/c Ratio	1.14	1.00	0.29	0.20	1.10		0.28	0.37		0.63	0.05	0.04
Uniform Delay, d1	34.4	16.4	6.9	47.7	30.2		42.1	39.9		46.8	43.1	43.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	75.5	15.6	0.1	2.4	52.2		0.2	0.4		22.7	0.1	0.0
Delay (s)	109.9	32.0	7.0	50.1	82.5		42.3	40.3		69.5	43.1	43.1
Level of Service	F	C	A	D	F		D	D		E	D	D
Approach Delay (s)		49.3			82.4			41.2			46.0	
Approach LOS		D			F			D			D	

Intersection Summary			
HCM Average Control Delay	58.8	HCM Level of Service	E
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	97.1	Sum of lost time (s)	22.6
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	1844	219	111	1358	164	118	38	48	45	62	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.92		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1626	4599		1626	4598		1626	1568		1626	1523	
Flt Permitted	0.95	1.00		0.95	1.00		0.44	1.00		0.70	1.00	
Satd. Flow (perm)	1626	4599		1626	4598		754	1568		1193	1523	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	2004	238	121	1476	178	128	41	52	49	67	184
RTOR Reduction (vph)	0	12	0	0	12	0	0	38	0	0	82	0
Lane Group Flow (vph)	54	2230	0	121	1642	0	128	55	0	49	169	0
Heavy Vehicles (%)	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	6.5	57.7		12.2	63.4		33.0	33.0		33.0	33.0	
Effective Green, g (s)	6.5	57.7		12.2	63.4		33.0	33.0		33.0	33.0	
Actuated g/C Ratio	0.05	0.49		0.10	0.53		0.28	0.28		0.28	0.28	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	89	2232		167	2452		209	435		331	423	
v/s Ratio Prot	0.03	c0.48		c0.07	0.36			0.04			0.11	
v/s Ratio Perm							c0.17			0.04		
v/c Ratio	0.61	1.00		0.72	0.67		0.61	0.13		0.15	0.40	
Uniform Delay, d1	55.0	30.6		51.7	20.1		37.4	32.2		32.4	34.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.8	18.9		12.4	1.5		12.7	0.6		0.1	0.2	
Delay (s)	62.7	49.4		64.1	21.6		50.1	32.8		32.4	35.1	
Level of Service	E	D		E	C		D	C		C	D	
Approach Delay (s)		49.7			24.5			42.8			34.7	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM Average Control Delay	38.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	118.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	671	1168	65	26	1345	83	42	5	16	17	5	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		6.0	6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.97			0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (prot)	1656	3286		1656	3283			1629			1531	
Flt Permitted	0.95	1.00		0.20	1.00			0.32			0.97	
Satd. Flow (perm)	1656	3286		355	3283			547			1487	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	729	1270	71	28	1462	90	46	5	17	18	5	149
RTOR Reduction (vph)	0	4	0	0	4	0	0	11	0	0	134	0
Lane Group Flow (vph)	729	1337	0	28	1548	0	0	57	0	0	38	0
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	41.0	88.0		42.0	42.0			11.0			11.0	
Effective Green, g (s)	41.0	88.0		42.0	42.0			11.0			11.0	
Actuated g/C Ratio	0.37	0.80		0.38	0.38			0.10			0.10	
Clearance Time (s)	5.0	6.0		6.0	6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	617	2629		136	1254			55			149	
v/s Ratio Prot	c0.44	0.41			c0.47							
v/s Ratio Perm				0.08				c0.10			0.03	
v/c Ratio	1.18	0.51		0.21	1.23			1.04			0.25	
Uniform Delay, d1	34.5	3.7		22.8	34.0			49.5			45.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	97.6	0.7		3.4	112.5			133.1			0.9	
Delay (s)	132.1	4.4		26.2	146.5			182.6			46.6	
Level of Service	F	A		C	F			F			D	
Approach Delay (s)		49.4			144.3			182.6			46.6	
Approach LOS		D			F			F			D	

Intersection Summary			
HCM Average Control Delay	90.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	104.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1122	87	20	1651	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		
Lane Util. Factor	0.95		1.00	0.95		
Frt	0.99		1.00	1.00		
Flt Protected	1.00		0.95	1.00		
Satd. Flow (prot)	3378		1770	3406		
Flt Permitted	1.00		0.19	1.00		
Satd. Flow (perm)	3378		345	3406		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1220	95	22	1795	0	0
RTOR Reduction (vph)	13	0	0	0	0	0
Lane Group Flow (vph)	1302	0	22	1795	0	0
Heavy Vehicles (%)	6%	2%	2%	6%	2%	2%
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	32.0		32.0	32.0		
Effective Green, g (s)	32.0		32.0	32.0		
Actuated g/C Ratio	0.72		0.72	0.72		
Clearance Time (s)	4.0		4.0	4.0		
Vehicle Extension (s)	3.0		3.0	3.0		
Lane Grp Cap (vph)	2446		250	2466		
v/s Ratio Prot	0.39			c0.53		
v/s Ratio Perm			0.06			
v/c Ratio	0.53		0.09	0.73		
Uniform Delay, d1	2.7		1.8	3.6		
Progression Factor	1.00		1.00	1.00		
Incremental Delay, d2	0.2		0.2	1.1		
Delay (s)	3.0		2.0	4.7		
Level of Service	A		A	A		
Approach Delay (s)	3.0			4.6	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	3.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	44.2	Sum of lost time (s)	12.2
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1097	24	0	1680	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1192	26	0	1826	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	494			578		
pX, platoon unblocked			0.86		0.86	0.86
vC, conflicting volume			1218		2118	609
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			939		1980	235
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			627		46	663

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	795	424	913	913	0
Volume Left	0	0	0	0	0
Volume Right	0	26	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.47	0.25	0.54	0.54	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	731	20	343	20	20	20	94	386	20	20	749	1560
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	0.95	0.88
Frt	1.00	0.86			1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3303	1539			1749	1524	1703	3380		1703	3406	2682
Flt Permitted	0.95	1.00			0.65	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3303	1539			1167	1524	1703	3380		1703	3406	2682
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	795	22	373	22	22	22	102	420	22	22	814	1696
RTOR Reduction (vph)	0	100	0	0	0	20	0	3	0	0	0	976
Lane Group Flow (vph)	795	295	0	0	44	2	102	439	0	22	814	720
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot			Perm		Perm	Prot			Prot		Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8		8						6
Actuated Green, G (s)	29.7	41.2			7.5	7.5	9.1	51.5		1.8	44.2	44.2
Effective Green, g (s)	29.7	41.2			7.5	7.5	9.1	51.5		1.8	44.2	44.2
Actuated g/C Ratio	0.28	0.39			0.07	0.07	0.09	0.48		0.02	0.42	0.42
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	921	595			82	107	146	1634		29	1414	1113
v/s Ratio Prot	c0.24	c0.19					c0.06	0.13		0.01	0.24	
v/s Ratio Perm					0.04	0.00						c0.27
v/c Ratio	0.86	0.50			0.54	0.01	0.70	0.27		0.76	0.58	0.65
Uniform Delay, d1	36.5	24.8			47.8	46.1	47.4	16.3		52.1	23.9	24.9
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.4	0.7			6.6	0.1	13.6	0.1		71.7	0.6	1.3
Delay (s)	44.9	25.4			54.4	46.1	61.0	16.4		123.8	24.5	26.2
Level of Service	D	C			D	D	E	B		F	C	C
Approach Delay (s)		38.4			51.7			24.8			26.5	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	29.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	106.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	0	0	6	536	967	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0	4.0	
Lane Util. Factor			1.00	0.95	0.95	
Frt			1.00	1.00	0.98	
Flt Protected			0.95	1.00	1.00	
Satd. Flow (prot)			1770	3374	3328	
Flt Permitted			0.23	1.00	1.00	
Satd. Flow (perm)			434	3374	3328	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	7	583	1051	157
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	7	583	1208	0
Heavy Vehicles (%)	2%	2%	2%	7%	7%	2%
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)			120.0	120.0	120.0	
Effective Green, g (s)			120.0	120.0	120.0	
Actuated g/C Ratio			1.00	1.00	1.00	
Clearance Time (s)			4.0	4.0	4.0	
Vehicle Extension (s)			3.0	3.0	3.0	
Lane Grp Cap (vph)			434	3374	3328	
v/s Ratio Prot				0.17	c0.36	
v/s Ratio Perm			0.02			
v/c Ratio			0.02	0.17	0.36	
Uniform Delay, d1			0.0	0.0	0.0	
Progression Factor			1.00	1.00	1.00	
Incremental Delay, d2			0.0	0.0	0.1	
Delay (s)			0.0	0.0	0.1	
Level of Service			A	A	A	
Approach Delay (s)	0.0			0.0	0.1	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	0.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	907	2103	422	2001	726	737	319	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	986	2286	459	2175	789	801	347	427
RTOR Reduction (vph)	0	0	0	0	0	0	0	3
Lane Group Flow (vph)	986	2286	459	2175	789	801	347	424
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	19.4	33.7	19.4	33.7	90.0	18.4	18.4	19.4
Effective Green, g (s)	22.4	36.7	22.4	36.7	90.0	21.4	21.4	19.4
Actuated g/C Ratio	0.25	0.41	0.25	0.41	1.00	0.24	0.24	0.22
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	838	1291	758	1363	1583	718	737	341
v/s Ratio Prot	c0.29	c0.72	0.15	0.65			0.11	0.27
v/s Ratio Perm					0.50	c0.27		
v/c Ratio	1.18	1.77	0.61	1.60	0.50	1.12	0.47	1.24
Uniform Delay, d1	33.8	26.6	29.9	26.6	0.0	34.3	29.4	35.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	91.9	350.0	1.4	271.6	1.1	70.0	0.3	131.8
Delay (s)	125.7	376.6	31.3	298.2	1.1	104.3	29.8	167.1
Level of Service	F	F	C	F	A	F	C	F
Approach Delay (s)		301.0		193.9				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	219.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.43		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	115.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	745	2329	161	4	2616	4	373	167	99	20	2	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86		0.97	1.00		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.94		1.00	0.86	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	810	2532	175	4	2843	4	405	182	108	22	2	172
RTOR Reduction (vph)	0	0	41	0	0	0	0	20	0	0	54	109
Lane Group Flow (vph)	810	2532	134	4	2847	0	405	270	0	22	5	6
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6									8
Actuated Green, G (s)	28.6	64.5	64.5	0.9	36.8		16.3	19.8		2.5	6.0	6.0
Effective Green, g (s)	28.6	64.5	64.5	0.9	36.8		16.3	19.8		2.5	6.0	6.0
Actuated g/C Ratio	0.27	0.61	0.61	0.01	0.35		0.15	0.19		0.02	0.06	0.06
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	2.0	2.5	2.5	2.0	2.5		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	872	2737	891	14	1676		506	328		30	81	161
v/s Ratio Prot	c0.25	0.56		0.00	c0.59		c0.12	c0.15		0.02	0.00	
v/s Ratio Perm			0.09									0.00
v/c Ratio	0.93	0.93	0.15	0.29	1.70		0.80	0.82		0.73	0.06	0.04
Uniform Delay, d1	37.9	18.7	9.0	52.4	34.8		43.4	41.6		51.6	47.5	47.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	15.5	6.0	0.1	4.1	317.0		8.4	14.5		56.2	0.1	0.0
Delay (s)	53.4	24.7	9.1	56.4	351.7		51.8	56.1		107.8	47.6	47.5
Level of Service	D	C	A	E	F		D	E		F	D	D
Approach Delay (s)		30.6			351.3			53.6			54.3	
Approach LOS		C			F			D			D	

Intersection Summary			
HCM Average Control Delay	159.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	106.3	Sum of lost time (s)	14.6
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	148	1596	174	123	1859	162	257	142	178	156	91	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.92		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1656	4689		1656	4702		1656	1598		1656	1598	
Flt Permitted	0.95	1.00		0.95	1.00		0.48	1.00		0.29	1.00	
Satd. Flow (perm)	1656	4689		1656	4702		843	1598		503	1598	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	161	1735	189	134	2021	176	279	154	193	170	99	123
RTOR Reduction (vph)	0	11	0	0	8	0	0	38	0	0	37	0
Lane Group Flow (vph)	161	1913	0	134	2189	0	279	309	0	170	185	0
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	9.0	58.1		12.9	62.0		33.0	33.0		33.0	33.0	
Effective Green, g (s)	9.0	58.1		12.9	62.0		33.0	33.0		33.0	33.0	
Actuated g/C Ratio	0.08	0.48		0.11	0.52		0.28	0.28		0.28	0.28	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	124	2270		178	2429		232	439		138	439	
v/s Ratio Prot	c0.10	0.41		0.08	c0.47			0.19			0.12	
v/s Ratio Perm							0.33			c0.34		
v/c Ratio	1.30	0.84		0.75	0.90		1.20	0.70		1.23	0.42	
Uniform Delay, d1	55.5	27.0		52.0	26.2		43.5	39.1		43.5	35.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	181.1	4.0		14.7	6.0		124.8	9.1		151.9	0.2	
Delay (s)	236.6	31.0		66.7	32.2		168.3	48.3		195.4	35.9	
Level of Service	F	C		E	C		F	D		F	D	
Approach Delay (s)		46.9			34.2			101.8			105.1	
Approach LOS		D			C			F			F	

Intersection Summary			
HCM Average Control Delay	51.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	172	1620	47	19	1410	21	84	5	16	75	5	610
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		6.0	6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.98			0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1687	3360		1687	3366			1672			1555	
Flt Permitted	0.95	1.00		0.13	1.00			0.33			0.96	
Satd. Flow (perm)	1687	3360		224	3366			571			1504	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	187	1761	51	21	1533	23	91	5	17	82	5	663
RTOR Reduction (vph)	0	2	0	0	1	0	0	5	0	0	249	0
Lane Group Flow (vph)	187	1810	0	21	1555	0	0	108	0	0	501	0
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	17.7	88.0		65.3	65.3			11.0			11.0	
Effective Green, g (s)	17.7	88.0		65.3	65.3			11.0			11.0	
Actuated g/C Ratio	0.16	0.80		0.59	0.59			0.10			0.10	
Clearance Time (s)	5.0	6.0		6.0	6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	271	2688		133	1998			57			150	
v/s Ratio Prot	0.11	c0.54			c0.46							
v/s Ratio Perm				0.09				0.19			c0.33	
v/c Ratio	0.69	0.67		0.16	0.78			1.89			3.34	
Uniform Delay, d1	43.6	4.8		10.0	16.9			49.5			49.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	7.4	1.4		2.5	3.1			458.0			1069.0	
Delay (s)	50.9	6.1		12.5	20.0			507.5			1118.5	
Level of Service	D	A		B	B			F			F	
Approach Delay (s)		10.3			19.9			507.5			1118.5	
Approach LOS		B			B			F			F	

Intersection Summary			
HCM Average Control Delay	213.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	104.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1924	34	8	1513	82	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	1.00		1.00	1.00	0.99	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	3431		1770	3438	1758	
Flt Permitted	1.00		0.10	1.00	0.96	
Satd. Flow (perm)	3431		184	3438	1758	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2091	37	9	1645	89	10
RTOR Reduction (vph)	2	0	0	0	7	0
Lane Group Flow (vph)	2126	0	9	1645	92	0
Heavy Vehicles (%)	5%	2%	2%	5%	2%	2%
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	40.4		40.4	40.4	6.7	
Effective Green, g (s)	40.4		40.4	40.4	6.7	
Actuated g/C Ratio	0.73		0.73	0.73	0.12	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	2516		135	2521	214	
v/s Ratio Prot	c0.62			0.48	c0.05	
v/s Ratio Perm			0.05			
v/c Ratio	0.84		0.07	0.65	0.43	
Uniform Delay, d1	5.2		2.1	3.8	22.4	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	2.8		0.2	0.6	1.4	
Delay (s)	7.9		2.3	4.4	23.8	
Level of Service	A		A	A	C	
Approach Delay (s)	7.9			4.4	23.8	
Approach LOS	A			A	C	

Intersection Summary			
HCM Average Control Delay	6.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	55.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1924	9	0	1525	0	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2091	10	0	1658	0	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	494			578		
pX, platoon unblocked			0.33		0.33	0.33
vC, conflicting volume			2101		2925	1051
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			287		2774	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			422		5	359

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1394	707	829	829	1
Volume Left	0	0	0	0	0
Volume Right	0	10	0	0	1
cSH	1700	1700	1700	1700	359
Volume to Capacity	0.82	0.42	0.49	0.49	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	15.1
Lane LOS					C
Approach Delay (s)	0.0		0.0		15.1
Approach LOS					C

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1548	20	357	20	20	20	357	1054	20	20	799	1145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	0.95	0.88
Frt	1.00	0.86			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3335	1553			1765	1538	1719	3428		1719	3438	2707
Flt Permitted	0.95	1.00			0.64	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3335	1553			1167	1538	1719	3428		1719	3438	2707
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1683	22	388	22	22	22	388	1146	22	22	868	1245
RTOR Reduction (vph)	0	88	0	0	0	20	0	1	0	0	0	769
Lane Group Flow (vph)	1683	322	0	0	44	2	388	1167	0	22	868	476
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot			Perm		Perm	Prot			Prot		Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8		8						6
Actuated Green, G (s)	34.6	46.2			7.6	7.6	9.2	49.1		1.8	41.7	41.7
Effective Green, g (s)	34.6	46.2			7.6	7.6	9.2	49.1		1.8	41.7	41.7
Actuated g/C Ratio	0.32	0.42			0.07	0.07	0.08	0.45		0.02	0.38	0.38
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	1058	658			81	107	145	1543		28	1314	1035
v/s Ratio Prot	c0.50	c0.21					c0.23	c0.34		0.01	0.25	
v/s Ratio Perm					0.04	0.00						0.18
v/c Ratio	1.59	0.49			0.54	0.01	2.68	0.76		0.79	0.66	0.46
Uniform Delay, d1	37.2	22.9			49.1	47.3	49.9	25.0		53.5	27.9	25.3
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	270.3	0.6			7.2	0.1	773.5	2.2		82.7	1.3	0.3
Delay (s)	307.6	23.4			56.3	47.3	823.4	27.2		136.2	29.1	25.6
Level of Service	F	C			E	D	F	C		F	C	C
Approach Delay (s)		251.9			53.3			225.7			28.2	
Approach LOS		F			D			F			C	

Intersection Summary			
HCM Average Control Delay	161.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	109.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	102.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	68	3	3	1363	1097	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.99		1.00	1.00	0.99	
Flt Protected	0.95		0.95	1.00	1.00	
Satd. Flow (prot)	1768		1770	3406	3380	
Flt Permitted	0.95		0.20	1.00	1.00	
Satd. Flow (perm)	1768		373	3406	3380	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	74	3	3	1482	1192	86
RTOR Reduction (vph)	3	0	0	0	7	0
Lane Group Flow (vph)	74	0	3	1482	1271	0
Heavy Vehicles (%)	2%	2%	2%	6%	6%	2%
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	6.7		61.3	61.3	61.3	
Effective Green, g (s)	6.7		61.3	61.3	61.3	
Actuated g/C Ratio	0.09		0.81	0.81	0.81	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	156		301	2747	2726	
v/s Ratio Prot	c0.04			c0.44	0.38	
v/s Ratio Perm			0.01			
v/c Ratio	0.48		0.01	0.54	0.47	
Uniform Delay, d1	33.0		1.4	2.5	2.3	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	2.3		0.0	0.2	0.1	
Delay (s)	35.3		1.4	2.7	2.4	
Level of Service	D		A	A	A	
Approach Delay (s)	35.3			2.7	2.4	
Approach LOS	D			A	A	

Intersection Summary			
HCM Average Control Delay	3.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	76.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	920	2082	475	2079	799	684	323	352
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1000	2263	516	2260	868	743	351	383
RTOR Reduction (vph)	0	0	0	0	0	0	0	4
Lane Group Flow (vph)	1000	2263	516	2260	868	743	351	379
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	19.4	35.1	18.4	34.1	90.0	18.0	18.0	18.4
Effective Green, g (s)	22.4	38.1	21.4	37.1	90.0	21.0	21.0	18.4
Actuated g/C Ratio	0.25	0.42	0.24	0.41	1.00	0.23	0.23	0.20
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	838	1341	724	1378	1583	704	723	324
v/s Ratio Prot	c0.30	c0.71	0.17	0.68			0.11	0.24
v/s Ratio Perm					c0.55	c0.25		
v/c Ratio	1.19	1.69	0.71	1.64	0.55	1.06	0.49	1.17
Uniform Delay, d1	33.8	25.9	31.5	26.4	0.0	34.5	29.8	35.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	98.7	312.7	3.3	291.3	1.4	49.5	0.4	104.4
Delay (s)	132.5	338.6	34.8	317.8	1.4	84.0	30.2	140.2
Level of Service	F	F	C	F	A	F	C	F
Approach Delay (s)		275.4		202.3				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	210.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	5.2
Intersection Capacity Utilization	113.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	755	2200	163	4	2814	4	378	169	100	20	2	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86		0.97	1.00		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.94		1.00	0.86	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	821	2391	177	4	3059	4	411	184	109	22	2	174
RTOR Reduction (vph)	0	0	44	0	0	0	0	20	0	0	54	110
Lane Group Flow (vph)	821	2391	133	4	3063	0	411	273	0	22	5	7
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6									8
Actuated Green, G (s)	28.6	64.5	64.5	0.9	36.8		16.3	19.9		2.5	6.1	6.1
Effective Green, g (s)	28.6	64.5	64.5	0.9	36.8		16.3	19.9		2.5	6.1	6.1
Actuated g/C Ratio	0.27	0.61	0.61	0.01	0.35		0.15	0.19		0.02	0.06	0.06
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	2.0	2.5	2.5	2.0	2.5		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	871	2734	890	14	1675		506	329		30	82	164
v/s Ratio Prot	c0.25	0.53		0.00	c0.63		c0.12	c0.16		0.02	0.00	
v/s Ratio Perm			0.09									0.00
v/c Ratio	0.94	0.87	0.15	0.29	1.83		0.81	0.83		0.73	0.06	0.04
Uniform Delay, d1	38.1	17.6	9.1	52.4	34.8		43.6	41.6		51.6	47.4	47.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	17.9	3.4	0.1	4.1	375.3		9.1	15.0		56.2	0.1	0.0
Delay (s)	56.0	21.0	9.1	56.5	410.1		52.7	56.6		107.8	47.6	47.4
Level of Service	E	C	A	E	F		D	E		F	D	D
Approach Delay (s)		28.8			409.6			54.3			54.2	
Approach LOS		C			F			D			D	

Intersection Summary			
HCM Average Control Delay	190.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	106.4	Sum of lost time (s)	18.6
Intersection Capacity Utilization	92.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	1457	176	125	2046	164	261	144	181	158	92	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.92		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1656	4682		1656	4706		1656	1598		1656	1598	
Flt Permitted	0.95	1.00		0.95	1.00		0.48	1.00		0.28	1.00	
Satd. Flow (perm)	1656	4682		1656	4706		835	1598		484	1598	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	1584	191	136	2224	178	284	157	197	172	100	125
RTOR Reduction (vph)	0	12	0	0	8	0	0	38	0	0	38	0
Lane Group Flow (vph)	163	1763	0	136	2394	0	284	316	0	172	187	0
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	9.0	58.1		12.9	62.0		33.0	33.0		33.0	33.0	
Effective Green, g (s)	9.0	58.1		12.9	62.0		33.0	33.0		33.0	33.0	
Actuated g/C Ratio	0.08	0.48		0.11	0.52		0.28	0.28		0.28	0.28	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	124	2267		178	2431		230	439		133	439	
v/s Ratio Prot	c0.10	0.38		0.08	c0.51			0.20			0.12	
v/s Ratio Perm							0.34			c0.36		
v/c Ratio	1.31	0.78		0.76	0.98		1.23	0.72		1.29	0.43	
Uniform Delay, d1	55.5	25.6		52.1	28.5		43.5	39.3		43.5	35.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	187.4	2.7		15.9	15.0		137.3	9.8		176.6	0.2	
Delay (s)	242.9	28.3		68.0	43.6		180.8	49.1		220.1	36.0	
Level of Service	F	C		E	D		F	D		F	D	
Approach Delay (s)		46.4			44.9			107.8			115.7	
Approach LOS		D			D			F			F	

Intersection Summary			
HCM Average Control Delay	57.8	HCM Level of Service	E
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	96.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	172	1486	47	19	1601	21	84	5	16	75	5	610
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		6.0	6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.98			0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1687	3358		1687	3367			1672			1555	
Flt Permitted	0.95	1.00		0.15	1.00			0.33			0.96	
Satd. Flow (perm)	1687	3358		260	3367			571			1504	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	187	1615	51	21	1740	23	91	5	17	82	5	663
RTOR Reduction (vph)	0	2	0	0	0	0	0	5	0	0	249	0
Lane Group Flow (vph)	187	1664	0	21	1763	0	0	108	0	0	501	0
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	17.7	88.0		65.3	65.3			11.0			11.0	
Effective Green, g (s)	17.7	88.0		65.3	65.3			11.0			11.0	
Actuated g/C Ratio	0.16	0.80		0.59	0.59			0.10			0.10	
Clearance Time (s)	5.0	6.0		6.0	6.0			5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	271	2686		154	1999			57			150	
v/s Ratio Prot	0.11	c0.50			c0.52							
v/s Ratio Perm				0.08				0.19			c0.33	
v/c Ratio	0.69	0.62		0.14	0.88			1.89			3.34	
Uniform Delay, d1	43.6	4.4		9.9	19.1			49.5			49.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	7.4	1.1		1.8	6.0			458.0			1069.0	
Delay (s)	50.9	5.4		11.7	25.1			507.5			1118.5	
Level of Service	D	A		B	C			F			F	
Approach Delay (s)		10.0			24.9			507.5			1118.5	
Approach LOS		B			C			F			F	

Intersection Summary			
HCM Average Control Delay	213.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	108.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1843	0	0	1633	146	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	0.95			0.95	1.00	
Frt	1.00			1.00	0.99	
Flt Protected	1.00			1.00	0.96	
Satd. Flow (prot)	3438			3438	1760	
Flt Permitted	1.00			1.00	0.96	
Satd. Flow (perm)	3438			3438	1760	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2003	0	0	1775	159	16
RTOR Reduction (vph)	0	0	0	0	6	0
Lane Group Flow (vph)	2003	0	0	1775	169	0
Heavy Vehicles (%)	5%	2%	2%	5%	2%	2%
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	37.7			37.7	9.6	
Effective Green, g (s)	37.7			37.7	9.6	
Actuated g/C Ratio	0.68			0.68	0.17	
Clearance Time (s)	4.0			4.0	4.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	2344			2344	306	
v/s Ratio Prot	c0.58			0.52	c0.10	
v/s Ratio Perm						
v/c Ratio	0.85			0.76	0.55	
Uniform Delay, d1	6.7			5.8	20.9	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	3.3			1.4	2.2	
Delay (s)	10.0			7.2	23.0	
Level of Service	A			A	C	
Approach Delay (s)	10.0			7.2	23.0	
Approach LOS	A			A	C	

Intersection Summary			
HCM Average Control Delay	9.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	55.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1862	0	0	1637	0	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2024	0	0	1779	0	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	494			578		
pX, platoon unblocked			0.38		0.38	0.38
vC, conflicting volume			2024		2914	1012
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			446		2774	0
tC, single (s)			4.1		7.0	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			424		5	414

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1349	675	890	890	3
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	3
cSH	1700	1700	1700	1700	414
Volume to Capacity	0.79	0.40	0.52	0.52	0.01
Queue Length 95th (ft)	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	13.8
Lane LOS					B
Approach Delay (s)	0.0		0.0		13.8
Approach LOS					B

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2560	33	448	33	33	33	644	1747	33	33	1309	1886
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	0.95	0.88
Frt	1.00	0.86			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3183	1486			1685	1468	1641	3273		1641	3282	2584
Flt Permitted	0.95	1.00			0.60	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	1486			1035	1468	1641	3273		1641	3282	2584
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2783	36	487	36	36	36	700	1899	36	36	1423	2050
RTOR Reduction (vph)	0	66	0	0	0	33	0	1	0	0	0	863
Lane Group Flow (vph)	2783	457	0	0	72	3	700	1934	0	36	1423	1187
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Perm		Perm	Prot			Prot		Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8		8						6
Actuated Green, G (s)	34.2	48.7			10.5	10.5	9.0	53.1		2.9	47.0	47.0
Effective Green, g (s)	34.2	48.7			10.5	10.5	9.0	53.1		2.9	47.0	47.0
Actuated g/C Ratio	0.29	0.42			0.09	0.09	0.08	0.46		0.02	0.40	0.40
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	933	620			93	132	127	1489		41	1322	1041
v/s Ratio Prot	c0.87	c0.31					c0.43	c0.59		0.02	0.43	
v/s Ratio Perm					0.07	0.00						0.46
v/c Ratio	2.98	0.74			0.77	0.02	5.51	1.30		0.88	1.08	1.14
Uniform Delay, d1	41.2	28.6			51.9	48.4	53.9	31.8		56.7	34.9	34.9
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	895.2	4.5			32.2	0.1	2047.5	139.5		92.9	48.1	74.9
Delay (s)	936.4	33.1			84.1	48.5	2101.3	171.3		149.7	82.9	109.8
Level of Service	F	C			F	D	F	F		F	F	F
Approach Delay (s)		793.5			72.2			684.0			99.3	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM Average Control Delay	500.3	HCM Level of Service	F
HCM Volume to Capacity ratio	2.08		
Actuated Cycle Length (s)	116.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	161.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	176	7	0	1379	1114	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			0.95	0.95	
Frt	0.99			1.00	1.00	
Flt Protected	0.95			1.00	1.00	
Satd. Flow (prot)	1768			3406	3406	
Flt Permitted	0.95			1.00	1.00	
Satd. Flow (perm)	1768			3406	3406	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	191	8	0	1499	1211	0
RTOR Reduction (vph)	2	0	0	0	0	0
Lane Group Flow (vph)	197	0	0	1499	1211	0
Heavy Vehicles (%)	2%	2%	2%	6%	6%	2%
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	10.5			37.7	37.7	
Effective Green, g (s)	10.5			37.7	37.7	
Actuated g/C Ratio	0.19			0.67	0.67	
Clearance Time (s)	4.0			4.0	4.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	330			2285	2285	
v/s Ratio Prot	c0.11			c0.44	0.36	
v/s Ratio Perm						
v/c Ratio	0.60			0.66	0.53	
Uniform Delay, d1	20.9			5.4	4.7	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	2.9			0.7	0.2	
Delay (s)	23.8			6.1	4.9	
Level of Service	C			A	A	
Approach Delay (s)	23.8			6.1	4.9	
Approach LOS	C			A	A	

Intersection Summary			
HCM Average Control Delay	6.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	56.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Mitigated

NCRF Project Condition LOS Worksheets

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	335	1050	263	1080	782	1688	818	550
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	364	1141	286	1174	850	1835	889	598
RTOR Reduction (vph)	0	0	0	0	0	0	0	1
Lane Group Flow (vph)	364	1141	286	1174	850	1835	889	597
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	17.7	36.7	38.4	57.4	150.0	56.4	56.4	38.4
Effective Green, g (s)	20.7	39.7	41.4	60.4	150.0	59.4	59.4	38.4
Actuated g/C Ratio	0.14	0.26	0.28	0.40	1.00	0.40	0.40	0.26
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	465	838	840	1346	1583	1196	1227	405
v/s Ratio Prot	0.11	c0.36	0.09	0.35			0.29	c0.38
v/s Ratio Perm					0.54	c0.61		
v/c Ratio	0.78	1.36	0.34	0.87	0.54	1.53	0.72	1.47
Uniform Delay, d1	62.5	55.1	43.4	41.2	0.0	45.3	38.4	55.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.4	170.4	0.2	6.5	1.3	244.7	2.0	225.8
Delay (s)	70.9	225.6	43.6	47.7	1.3	290.0	40.4	281.6
Level of Service	E	F	D	D	A	F	D	F
Approach Delay (s)		188.2		30.1				
Approach LOS		F		C				

Intersection Summary			
HCM Average Control Delay	152.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.47		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	122.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	314	2982	8	13	1864	16	117	14	49	22	19	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.88		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	4509		1641	3843		1703	1645		1289	1586	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	4509		1641	3843		1703	1645		1289	1586	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	341	3241	9	14	2026	17	127	15	53	24	21	161
RTOR Reduction (vph)	0	0	0	0	0	0	0	47	0	0	149	0
Lane Group Flow (vph)	341	3250	0	14	2043	0	127	21	0	24	33	0
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	26.4	93.0		1.9	68.5		9.0	14.1		4.5	9.6	
Effective Green, g (s)	26.4	93.0		1.9	68.5		9.0	14.1		4.5	9.6	
Actuated g/C Ratio	0.20	0.70		0.01	0.52		0.07	0.11		0.03	0.07	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	334	3174		24	1993		116	176		44	115	
v/s Ratio Prot	c0.20	c0.72		0.01	0.53		c0.07	0.01		0.02	c0.02	
v/s Ratio Perm												
v/c Ratio	1.02	1.02		0.58	1.02		1.09	0.12		0.55	0.28	
Uniform Delay, d1	52.8	19.5		64.7	31.8		61.5	53.4		62.8	58.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	54.7	22.4		21.1	26.8		111.3	0.1		7.2	0.5	
Delay (s)	107.5	42.0		85.8	58.6		172.9	53.5		70.0	58.5	
Level of Service	F	D		F	E		F	D		E	E	
Approach Delay (s)		48.2			58.7			131.2			59.8	
Approach LOS		D			E			F			E	

Intersection Summary			
HCM Average Control Delay	54.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	132.1	Sum of lost time (s)	18.6
Intersection Capacity Utilization	94.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	2401	237	23	1697	21	39	20	22	20	20	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	0.99		1.00	1.00			0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	1.00
Satd. Flow (prot)	1597	3152		1597	3189			1582			1640	1429
Flt Permitted	0.95	1.00		0.95	1.00			0.83			0.79	1.00
Satd. Flow (perm)	1597	3152		1597	3189			1338			1333	1429
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	2610	258	25	1845	23	42	22	24	22	22	27
RTOR Reduction (vph)	0	6	0	0	1	0	0	12	0	0	0	26
Lane Group Flow (vph)	33	2862	0	25	1867	0	0	76	0	0	44	1
Heavy Vehicles (%)	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		8
Actuated Green, G (s)	4.1	96.2		2.3	94.4			4.0			4.0	4.0
Effective Green, g (s)	4.1	96.2		2.3	94.4			4.0			4.0	4.0
Actuated g/C Ratio	0.03	0.81		0.02	0.80			0.03			0.03	0.03
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Vehicle Extension (s)	2.0	6.0		2.0	6.0			2.0			2.0	2.0
Lane Grp Cap (vph)	55	2559		31	2540			45			45	48
v/s Ratio Prot	c0.02	c0.91		0.02	0.59							
v/s Ratio Perm								c0.06			0.03	0.00
v/c Ratio	0.60	1.12		0.81	0.74			1.70			0.98	0.02
Uniform Delay, d1	56.4	11.1		57.9	5.9			57.2			57.2	55.4
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	11.2	59.3		80.5	1.9			392.0			124.1	0.1
Delay (s)	67.6	70.4		138.4	7.9			449.3			181.3	55.4
Level of Service	E	E		F	A			F			F	E
Approach Delay (s)		70.4			9.6			449.3			133.4	
Approach LOS		E			A			F			F	

Intersection Summary			
HCM Average Control Delay	54.8	HCM Level of Service	D
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	118.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	94.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	38	2	18	185	115	434
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.89	
Flt Protected	0.95		0.95	1.00	1.00	
Satd. Flow (prot)	1767		1770	1597	1608	
Flt Permitted	0.95		0.42	1.00	1.00	
Satd. Flow (perm)	1767		780	1597	1608	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	2	20	201	125	472
RTOR Reduction (vph)	2	0	0	0	83	0
Lane Group Flow (vph)	41	0	20	201	514	0
Heavy Vehicles (%)	2%	2%	2%	19%	19%	2%
Turn Type			Perm			
Protected Phases	4			2	6	
Permitted Phases			2			
Actuated Green, G (s)	6.3		66.7	66.7	66.7	
Effective Green, g (s)	6.3		66.7	66.7	66.7	
Actuated g/C Ratio	0.08		0.82	0.82	0.82	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	137		642	1315	1324	
v/s Ratio Prot	c0.02			0.13	c0.32	
v/s Ratio Perm			0.03			
v/c Ratio	0.30		0.03	0.15	0.39	
Uniform Delay, d1	35.3		1.3	1.4	1.9	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	1.2		0.0	0.1	0.2	
Delay (s)	36.5		1.3	1.5	2.0	
Level of Service	D		A	A	A	
Approach Delay (s)	36.5			1.5	2.0	
Approach LOS	D			A	A	

Intersection Summary			
HCM Average Control Delay	3.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	81.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	975	1284	547	1199	1508	999	352	512
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1060	1396	595	1303	1639	1086	383	557
RTOR Reduction (vph)	0	0	0	0	0	0	0	3
Lane Group Flow (vph)	1060	1396	595	1303	1639	1086	383	554
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	22.4	31.7	25.4	34.7	100.0	24.4	24.4	25.4
Effective Green, g (s)	25.4	34.7	28.4	37.7	100.0	27.4	27.4	25.4
Actuated g/C Ratio	0.25	0.35	0.28	0.38	1.00	0.27	0.27	0.25
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	855	1099	865	1260	1583	827	849	402
v/s Ratio Prot	0.31	c0.44	0.20	0.39			0.12	c0.35
v/s Ratio Perm					c1.04	c0.36		
v/c Ratio	1.24	1.27	0.69	1.03	1.04	1.31	0.45	1.38
Uniform Delay, d1	37.3	32.6	31.9	31.1	50.0	36.3	30.1	37.3
Progression Factor	1.00	1.00	0.55	0.80	1.00	1.00	1.00	1.00
Incremental Delay, d2	117.9	128.9	0.2	18.6	18.5	149.5	0.3	185.2
Delay (s)	155.2	161.5	17.7	43.6	68.5	185.8	30.3	222.5
Level of Service	F	F	B	D	E	F	C	F
Approach Delay (s)		158.8		50.8				
Approach LOS		F		D				

Intersection Summary			
HCM Average Control Delay	113.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.26		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.2
Intersection Capacity Utilization	107.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	2415	124	20	2904	30	38	26	22	14	20	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.93		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	4487		1641	3843		1703	1734		1289	1580	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	4487		1641	3843		1703	1734		1289	1580	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	2625	135	22	3157	33	41	28	24	15	22	262
RTOR Reduction (vph)	0	4	0	0	1	0	0	20	0	0	122	0
Lane Group Flow (vph)	24	2756	0	22	3189	0	41	32	0	15	162	0
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	2.0	61.0		2.0	61.0		3.4	16.4		2.0	15.0	
Effective Green, g (s)	2.0	61.0		2.0	61.0		3.4	16.4		2.0	15.0	
Actuated g/C Ratio	0.02	0.61		0.02	0.61		0.03	0.16		0.02	0.15	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	33	2737		33	2344		58	284		26	237	
v/s Ratio Prot	c0.01	0.61		0.01	c0.83		c0.02	0.02		0.01	c0.10	
v/s Ratio Perm												
v/c Ratio	0.73	1.01		0.67	1.36		0.71	0.11		0.58	0.69	
Uniform Delay, d1	48.7	19.5		48.7	19.5		47.8	35.6		48.6	40.3	
Progression Factor	0.95	0.64		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.0	7.0		32.9	165.1		27.3	0.1		17.8	6.4	
Delay (s)	52.2	19.5		81.6	184.6		75.1	35.7		66.4	46.7	
Level of Service	D	B		F	F		E	D		E	D	
Approach Delay (s)		19.8			183.9			53.0			47.7	
Approach LOS		B			F			D			D	

Intersection Summary			
HCM Average Control Delay	104.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1328	117	180	3	149	111	453	62	2	71	75	1132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	0.97	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.91		1.00	0.94			1.00			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.98	1.00
Satd. Flow (prot)	3273	1614		1687	1662			1700			1734	1509
Flt Permitted	0.95	1.00		0.57	1.00			0.61			0.73	1.00
Satd. Flow (perm)	3273	1614		1003	1662			1083			1304	1509
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1443	127	196	3	162	121	492	67	2	77	82	1230
RTOR Reduction (vph)	0	43	0	0	21	0	0	0	0	0	0	42
Lane Group Flow (vph)	1443	281	0	3	262	0	0	561	0	0	159	1188
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot			Perm			Perm			Perm		pm+ov
Protected Phases	7	4			8			2			6	7
Permitted Phases				8			2			6		6
Actuated Green, G (s)	45.0	65.0		16.0	16.0			57.0			57.0	102.0
Effective Green, g (s)	45.0	65.0		16.0	16.0			57.0			57.0	102.0
Actuated g/C Ratio	0.35	0.50		0.12	0.12			0.44			0.44	0.78
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	1133	807		123	205			475			572	1230
v/s Ratio Prot	c0.44	0.17			c0.16							0.33
v/s Ratio Perm				0.00				c0.52			0.12	0.45
v/c Ratio	1.27	0.35		0.02	1.28			1.18			0.28	0.97
Uniform Delay, d1	42.5	19.7		50.1	57.0			36.5			23.3	12.4
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	130.1	0.3		0.1	157.1			101.3			0.3	17.9
Delay (s)	172.6	19.9		50.2	214.1			137.8			23.6	30.3
Level of Service	F	B		D	F			F			C	C
Approach Delay (s)		144.7			212.4			137.8			29.5	
Approach LOS		F			F			F			C	

Intersection Summary			
HCM Average Control Delay	108.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	123.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	1177	1228	599	1140	1534	985	402	465
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1279	1335	651	1239	1667	1071	437	505
RTOR Reduction (vph)	0	0	0	0	0	0	0	5
Lane Group Flow (vph)	1279	1335	651	1239	1667	1071	437	500
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	39.4	45.7	34.4	40.7	135.0	36.4	36.4	34.4
Effective Green, g (s)	42.4	48.7	37.4	43.7	135.0	39.4	39.4	34.4
Actuated g/C Ratio	0.31	0.36	0.28	0.32	1.00	0.29	0.29	0.25
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	1057	1142	844	1082	1583	881	904	403
v/s Ratio Prot	c0.38	0.42	0.21	c0.37			0.14	0.32
v/s Ratio Perm					c1.05	c0.35		
v/c Ratio	1.21	1.17	0.77	1.15	1.05	1.22	0.48	1.24
Uniform Delay, d1	46.3	43.1	44.9	45.6	67.5	47.8	39.4	50.3
Progression Factor	1.00	1.00	0.92	1.05	1.00	1.00	1.00	1.00
Incremental Delay, d2	103.5	85.7	0.4	66.5	25.8	107.5	0.3	127.6
Delay (s)	149.8	128.9	41.5	114.5	93.3	155.3	39.7	177.9
Level of Service	F	F	D	F	F	F	D	F
Approach Delay (s)		139.1		91.2				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	117.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	103.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	2393	128	16	3005	24	28	29	10	16	28	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.96		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	4486		1641	3843		1703	1791		1289	1583	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	4486		1641	3843		1703	1791		1289	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	2601	139	17	3266	26	30	32	11	17	30	283
RTOR Reduction (vph)	0	4	0	0	0	0	0	9	0	0	70	0
Lane Group Flow (vph)	49	2736	0	17	3292	0	30	34	0	17	243	0
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	5.6	86.7		2.0	83.1		3.0	24.9		2.8	24.7	
Effective Green, g (s)	5.6	86.7		2.0	83.1		3.0	24.9		2.8	24.7	
Actuated g/C Ratio	0.04	0.64		0.01	0.62		0.02	0.18		0.02	0.18	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	69	2881		24	2366		38	330		27	290	
v/s Ratio Prot	c0.03	0.61		0.01	c0.86		c0.02	0.02		0.01	c0.15	
v/s Ratio Perm												
v/c Ratio	0.71	0.95		0.71	1.39		0.79	0.10		0.63	0.84	
Uniform Delay, d1	63.9	22.2		66.2	26.0		65.7	45.8		65.6	53.2	
Progression Factor	0.87	0.68		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.6	1.0		56.1	178.7		63.7	0.1		28.6	17.8	
Delay (s)	58.4	16.0		122.3	204.7		129.4	45.8		94.2	71.0	
Level of Service	E	B		F	F		F	D		F	E	
Approach Delay (s)		16.8			204.2			80.2			72.2	
Approach LOS		B			F			F			E	

Intersection Summary			
HCM Average Control Delay	115.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	1907	35	24	2549	20	92	20	24	20	20	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00			0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.98	1.00
Satd. Flow (prot)	1641	3273		1641	3278			1631			1685	1468
Flt Permitted	0.95	1.00		0.95	1.00			0.77			0.81	1.00
Satd. Flow (perm)	1641	3273		1641	3278			1299			1396	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	2073	38	26	2771	22	100	22	26	22	22	24
RTOR Reduction (vph)	0	1	0	0	0	0	0	6	0	0	0	22
Lane Group Flow (vph)	22	2110	0	26	2793	0	0	142	0	0	44	2
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		8
Actuated Green, G (s)	2.3	90.1		2.3	90.1			10.0			10.0	10.0
Effective Green, g (s)	2.3	90.1		2.3	90.1			10.0			10.0	10.0
Actuated g/C Ratio	0.02	0.76		0.02	0.76			0.08			0.08	0.08
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Vehicle Extension (s)	2.0	6.0		2.0	6.0			2.0			2.0	2.0
Lane Grp Cap (vph)	32	2491		32	2494			110			118	124
v/s Ratio Prot	0.01	0.64		c0.02	c0.85							
v/s Ratio Perm								c0.11			0.03	0.00
v/c Ratio	0.69	0.85		0.81	1.12			1.29			0.37	0.02
Uniform Delay, d1	57.7	9.5		57.8	14.2			54.2			51.2	49.7
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	39.1	3.8		81.6	59.9			181.5			0.7	0.0
Delay (s)	96.8	13.3		139.4	74.1			235.7			52.0	49.7
Level of Service	F	B		F	E			F			D	D
Approach Delay (s)		14.2			74.7			235.7			51.2	
Approach LOS		B			E			F			D	

Intersection Summary			
HCM Average Control Delay	54.0	HCM Level of Service	D
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	118.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1372	115	186	2	142	107	444	57	1	65	74	1133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	0.97	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.91		1.00	0.94			1.00			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.98	1.00
Satd. Flow (prot)	3273	1611		1687	1661			1700			1735	1509
Flt Permitted	0.95	1.00		0.56	1.00			0.62			0.75	1.00
Satd. Flow (perm)	3273	1611		1000	1661			1093			1325	1509
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1491	125	202	2	154	116	483	62	1	71	80	1232
RTOR Reduction (vph)	0	45	0	0	21	0	0	0	0	0	0	46
Lane Group Flow (vph)	1491	282	0	2	249	0	0	546	0	0	151	1186
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot			Perm			Perm			Perm		pm+ov
Protected Phases	7	4			8			2			6	7
Permitted Phases				8			2			6		6
Actuated Green, G (s)	46.0	66.0		16.0	16.0			56.0			56.0	102.0
Effective Green, g (s)	46.0	66.0		16.0	16.0			56.0			56.0	102.0
Actuated g/C Ratio	0.35	0.51		0.12	0.12			0.43			0.43	0.78
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	1158	818		123	204			471			571	1230
v/s Ratio Prot	c0.46	0.18			c0.15							0.34
v/s Ratio Perm				0.00				c0.50			0.11	0.44
v/c Ratio	1.29	0.34		0.02	1.22			1.16			0.26	0.96
Uniform Delay, d1	42.0	19.1		50.1	57.0			37.0			23.8	12.4
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	136.0	0.3		0.1	135.0			93.1			0.2	17.6
Delay (s)	178.0	19.4		50.1	192.0			130.1			24.0	30.0
Level of Service	F	B		D	F			F			C	C
Approach Delay (s)		149.5			191.0			130.1			29.4	
Approach LOS		F			F			F			C	

Intersection Summary			
HCM Average Control Delay	108.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	121.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Mitigated

DeWitt Nelson Project Condition LOS Worksheets

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	335	1056	263	1080	782	1696	818	556
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	364	1148	286	1174	850	1843	889	604
RTOR Reduction (vph)	0	0	0	0	0	0	0	1
Lane Group Flow (vph)	364	1148	286	1174	850	1843	889	603
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	18.0	36.7	38.4	57.1	150.0	56.4	56.4	38.4
Effective Green, g (s)	21.0	39.7	41.4	60.1	150.0	59.4	59.4	38.4
Actuated g/C Ratio	0.14	0.26	0.28	0.40	1.00	0.40	0.40	0.26
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	471	838	840	1339	1583	1196	1227	405
v/s Ratio Prot	0.11	c0.36	0.09	0.35			0.29	c0.38
v/s Ratio Perm					0.54	c0.61		
v/c Ratio	0.77	1.37	0.34	0.88	0.54	1.54	0.72	1.49
Uniform Delay, d1	62.2	55.1	43.4	41.5	0.0	45.3	38.4	55.8
Progression Factor	1.00	1.00	0.75	0.55	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.7	174.1	0.1	4.1	0.6	247.7	2.0	232.3
Delay (s)	69.9	229.2	32.5	27.0	0.6	293.0	40.4	288.1
Level of Service	E	F	C	C	A	F	D	F
Approach Delay (s)		190.9		18.0				
Approach LOS		F		B				

Intersection Summary			
HCM Average Control Delay	150.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.48		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	123.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	314	3002	8	13	1864	16	117	14	49	22	19	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.88		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	4509		1641	3843		1703	1645		1289	1586	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	4509		1641	3843		1703	1645		1289	1586	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	341	3263	9	14	2026	17	127	15	53	24	21	161
RTOR Reduction (vph)	0	0	0	0	0	0	0	48	0	0	150	0
Lane Group Flow (vph)	341	3272	0	14	2043	0	127	20	0	24	32	0
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	26.4	110.3		2.0	85.9		9.0	14.5		4.6	10.1	
Effective Green, g (s)	26.4	110.3		2.0	85.9		9.0	14.5		4.6	10.1	
Actuated g/C Ratio	0.18	0.74		0.01	0.57		0.06	0.10		0.03	0.07	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	294	3316		22	2201		102	159		40	107	
v/s Ratio Prot	c0.20	c0.73		0.01	0.53		c0.07	0.01		0.02	c0.02	
v/s Ratio Perm												
v/c Ratio	1.16	0.99		0.64	0.93		1.25	0.13		0.60	0.30	
Uniform Delay, d1	61.8	19.1		73.6	29.2		70.5	62.0		71.8	66.6	
Progression Factor	1.07	1.36		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	75.7	2.5		36.7	8.4		168.9	0.1		15.1	0.6	
Delay (s)	141.7	28.6		110.4	37.6		239.4	62.1		86.9	67.1	
Level of Service	F	C		F	D		F	E		F	E	
Approach Delay (s)		39.3			38.1			177.5			69.4	
Approach LOS		D			D			F			E	

Intersection Summary			
HCM Average Control Delay	44.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	94.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	2421	237	23	1697	21	39	20	22	20	20	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	0.99		1.00	1.00			0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	1.00
Satd. Flow (prot)	1597	3152		1597	3189			1582			1640	1429
Flt Permitted	0.95	1.00		0.95	1.00			0.83			0.75	1.00
Satd. Flow (perm)	1597	3152		1597	3189			1338			1254	1429
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	2632	258	25	1845	23	42	22	24	22	22	27
RTOR Reduction (vph)	0	5	0	0	1	0	0	11	0	0	0	26
Lane Group Flow (vph)	33	2885	0	25	1867	0	0	77	0	0	44	1
Heavy Vehicles (%)	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		8
Actuated Green, G (s)	4.1	105.2		2.3	103.4			5.0			5.0	5.0
Effective Green, g (s)	4.1	105.2		2.3	103.4			5.0			5.0	5.0
Actuated g/C Ratio	0.03	0.82		0.02	0.80			0.04			0.04	0.04
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Vehicle Extension (s)	2.0	6.0		2.0	6.0			2.0			2.0	2.0
Lane Grp Cap (vph)	51	2580		29	2566			52			49	56
v/s Ratio Prot	c0.02	c0.92		0.02	0.59							
v/s Ratio Perm								c0.06			0.04	0.00
v/c Ratio	0.65	1.12		0.86	0.73			1.49			0.90	0.02
Uniform Delay, d1	61.5	11.6		62.9	5.9			61.8			61.5	59.4
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	19.2	59.1		106.7	1.8			297.9			88.5	0.0
Delay (s)	80.7	70.7		169.7	7.8			359.7			150.0	59.4
Level of Service	F	E		F	A			F			F	E
Approach Delay (s)		70.9			9.9			359.7			115.6	
Approach LOS		E			A			F			F	

Intersection Summary			
HCM Average Control Delay	53.4	HCM Level of Service	D
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	128.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	94.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2499	269	740	0	161	48	296	99	11	190	141	3273
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	0.89			1.00	0.85	1.00	0.98			1.00	0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00			0.97	1.00
Satd. Flow (prot)	3019	1458			1638	1392	1556	1613			1592	1392
Flt Permitted	0.95	1.00			1.00	1.00	0.32	1.00			0.72	1.00
Satd. Flow (perm)	3019	1458			1638	1392	525	1613			1174	1392
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2716	292	804	0	175	52	322	108	12	207	153	3558
RTOR Reduction (vph)	0	76	0	0	0	46	0	3	0	0	0	36
Lane Group Flow (vph)	2716	1020	0	0	175	6	322	117	0	0	360	3522
Heavy Vehicles (%)	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%
Turn Type	Prot			Perm		Perm	Perm			Perm		pm+ov
Protected Phases	7	4			8			2			6	7
Permitted Phases				8		8	2			6		6
Actuated Green, G (s)	59.0	79.0			16.0	16.0	43.0	43.0			43.0	102.0
Effective Green, g (s)	59.0	79.0			16.0	16.0	43.0	43.0			43.0	102.0
Actuated g/C Ratio	0.45	0.61			0.12	0.12	0.33	0.33			0.33	0.78
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	1370	886			202	171	174	534			388	1135
v/s Ratio Prot	0.90	c0.70			0.11			0.07				c1.41
v/s Ratio Perm						0.00	0.61				0.31	1.12
v/c Ratio	1.98	1.15			0.87	0.04	1.85	0.22			0.93	3.10
Uniform Delay, d1	35.5	25.5			56.0	50.2	43.5	31.4			42.0	14.0
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	444.8	81.0			29.9	0.1	404.1	0.2			28.0	948.6
Delay (s)	480.3	106.5			85.9	50.3	447.6	31.6			70.0	962.6
Level of Service	F	F			F	D	F	C			E	F
Approach Delay (s)		372.8			77.7			334.6			880.5	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM Average Control Delay	599.7	HCM Level of Service	F
HCM Volume to Capacity ratio	2.78		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	237.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	975	1293	543	1194	1502	1010	352	521
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1060	1405	590	1298	1633	1098	383	566
RTOR Reduction (vph)	0	0	0	0	0	0	0	3
Lane Group Flow (vph)	1060	1405	590	1298	1633	1098	383	563
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	22.4	31.7	25.4	34.7	100.0	24.4	24.4	25.4
Effective Green, g (s)	25.4	34.7	28.4	37.7	100.0	27.4	27.4	25.4
Actuated g/C Ratio	0.25	0.35	0.28	0.38	1.00	0.27	0.27	0.25
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	855	1099	865	1260	1583	827	849	402
v/s Ratio Prot	0.31	c0.44	0.19	0.39			0.12	c0.36
v/s Ratio Perm					c1.03	c0.36		
v/c Ratio	1.24	1.28	0.68	1.03	1.03	1.33	0.45	1.40
Uniform Delay, d1	37.3	32.6	31.8	31.1	50.0	36.3	30.1	37.3
Progression Factor	1.00	1.00	0.55	0.81	1.00	1.00	1.00	1.00
Incremental Delay, d2	117.9	132.4	0.2	17.1	17.0	155.8	0.3	194.7
Delay (s)	155.2	165.1	17.7	42.2	67.0	192.1	30.3	232.0
Level of Service	F	F	B	D	E	F	C	F
Approach Delay (s)		160.8		49.6				
Approach LOS		F		D				

Intersection Summary			
HCM Average Control Delay	115.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.27		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.2
Intersection Capacity Utilization	108.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	2443	124	20	2888	30	38	26	22	14	20	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.93		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	4487		1641	3843		1703	1734		1289	1580	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	4487		1641	3843		1703	1734		1289	1580	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	2655	135	22	3139	33	41	28	24	15	22	262
RTOR Reduction (vph)	0	4	0	0	1	0	0	20	0	0	122	0
Lane Group Flow (vph)	24	2786	0	22	3171	0	41	32	0	15	162	0
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	2.0	61.0		2.0	61.0		3.4	16.4		2.0	15.0	
Effective Green, g (s)	2.0	61.0		2.0	61.0		3.4	16.4		2.0	15.0	
Actuated g/C Ratio	0.02	0.61		0.02	0.61		0.03	0.16		0.02	0.15	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	33	2737		33	2344		58	284		26	237	
v/s Ratio Prot	c0.01	0.62		0.01	c0.83		c0.02	0.02		0.01	c0.10	
v/s Ratio Perm												
v/c Ratio	0.73	1.02		0.67	1.35		0.71	0.11		0.58	0.69	
Uniform Delay, d1	48.7	19.5		48.7	19.5		47.8	35.6		48.6	40.3	
Progression Factor	0.95	0.64		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.0	10.7		32.9	161.7		27.3	0.1		17.8	6.4	
Delay (s)	52.1	23.2		81.6	181.2		75.1	35.7		66.4	46.7	
Level of Service	D	C		F	F		E	D		E	D	
Approach Delay (s)		23.4			180.5			53.0			47.7	
Approach LOS		C			F			D			D	

Intersection Summary			
HCM Average Control Delay	103.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1320	117	270	3	149	111	534	69	2	71	83	1127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	0.90			1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00			0.98	1.00
Satd. Flow (prot)	3273	1590			1774	1509	1687	1769			1736	1509
Flt Permitted	0.95	1.00			0.99	1.00	0.61	1.00			0.84	1.00
Satd. Flow (perm)	3273	1590			1759	1509	1089	1769			1488	1509
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1435	127	293	3	162	121	580	75	2	77	90	1225
RTOR Reduction (vph)	0	64	0	0	0	107	0	1	0	0	0	41
Lane Group Flow (vph)	1435	356	0	0	165	14	580	76	0	0	167	1184
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot			Perm		Perm	Perm			Perm		pm+ov
Protected Phases	7	4			8			2			6	7
Permitted Phases				8		8	2			6		6
Actuated Green, G (s)	45.0	64.0			15.0	15.0	57.0	57.0			57.0	102.0
Effective Green, g (s)	45.0	64.0			15.0	15.0	57.0	57.0			57.0	102.0
Actuated g/C Ratio	0.35	0.50			0.12	0.12	0.44	0.44			0.44	0.79
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	1142	789			205	175	481	782			657	1240
v/s Ratio Prot	c0.44	0.22						0.04				0.33
v/s Ratio Perm					c0.09	0.01	c0.53				0.11	0.45
v/c Ratio	1.26	0.45			0.80	0.08	1.21	0.10			0.25	0.95
Uniform Delay, d1	42.0	21.1			55.6	50.8	36.0	21.0			22.6	11.5
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	122.7	0.4			20.1	0.2	110.9	0.1			0.2	15.9
Delay (s)	164.7	21.5			75.6	51.0	146.9	21.1			22.8	27.4
Level of Service	F	C			E	D	F	C			C	C
Approach Delay (s)		132.3			65.2			132.2			26.9	
Approach LOS		F			E			F			C	

Intersection Summary			
HCM Average Control Delay	92.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	129.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	117.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	1177	1228	605	1146	1542	985	402	465
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1279	1335	658	1246	1676	1071	437	505
RTOR Reduction (vph)	0	0	0	0	0	0	0	5
Lane Group Flow (vph)	1279	1335	658	1246	1676	1071	437	500
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	39.4	45.7	34.4	40.7	135.0	36.4	36.4	34.4
Effective Green, g (s)	42.4	48.7	37.4	43.7	135.0	39.4	39.4	34.4
Actuated g/C Ratio	0.31	0.36	0.28	0.32	1.00	0.29	0.29	0.25
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	1057	1142	844	1082	1583	881	904	403
v/s Ratio Prot	c0.38	0.42	0.22	c0.37			0.14	0.32
v/s Ratio Perm					c1.06	c0.35		
v/c Ratio	1.21	1.17	0.78	1.15	1.06	1.22	0.48	1.24
Uniform Delay, d1	46.3	43.1	45.0	45.6	67.5	47.8	39.4	50.3
Progression Factor	1.00	1.00	0.92	1.05	1.00	1.00	1.00	1.00
Incremental Delay, d2	103.5	85.7	0.4	69.3	28.2	107.5	0.3	127.6
Delay (s)	149.8	128.9	41.6	117.4	95.7	155.3	39.7	177.9
Level of Service	F	F	D	F	F	F	D	F
Approach Delay (s)		139.1		93.3				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	118.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	2392	128	16	3025	24	28	29	10	16	28	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.96		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	4486		1641	3843		1703	1791		1289	1583	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	4486		1641	3843		1703	1791		1289	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	2600	139	17	3288	26	30	32	11	17	30	283
RTOR Reduction (vph)	0	4	0	0	0	0	0	9	0	0	70	0
Lane Group Flow (vph)	49	2735	0	17	3314	0	30	34	0	17	243	0
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	5.6	86.7		2.0	83.1		3.0	24.9		2.8	24.7	
Effective Green, g (s)	5.6	86.7		2.0	83.1		3.0	24.9		2.8	24.7	
Actuated g/C Ratio	0.04	0.64		0.01	0.62		0.02	0.18		0.02	0.18	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3		4.0	5.3	
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	69	2881		24	2366		38	330		27	290	
v/s Ratio Prot	c0.03	0.61		0.01	c0.86		c0.02	0.02		0.01	c0.15	
v/s Ratio Perm												
v/c Ratio	0.71	0.95		0.71	1.40		0.79	0.10		0.63	0.84	
Uniform Delay, d1	63.9	22.1		66.2	26.0		65.7	45.8		65.6	53.2	
Progression Factor	0.87	0.68		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.6	1.0		56.1	182.9		63.7	0.1		28.6	17.8	
Delay (s)	58.4	16.0		122.3	208.8		129.4	45.8		94.2	71.0	
Level of Service	E	B		F	F		F	D		F	E	
Approach Delay (s)		16.7			208.4			80.2			72.2	
Approach LOS		B			F			F			E	

Intersection Summary			
HCM Average Control Delay	118.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	91.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	1906	35	24	2569	20	92	20	24	20	20	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00			0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.98	1.00
Satd. Flow (prot)	1641	3273		1641	3278			1631			1685	1468
Flt Permitted	0.95	1.00		0.95	1.00			0.77			0.81	1.00
Satd. Flow (perm)	1641	3273		1641	3278			1299			1403	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	2072	38	26	2792	22	100	22	26	22	22	24
RTOR Reduction (vph)	0	1	0	0	0	0	0	5	0	0	0	22
Lane Group Flow (vph)	22	2109	0	26	2814	0	0	143	0	0	44	2
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		8
Actuated Green, G (s)	2.3	99.1		2.3	99.1			11.0			11.0	11.0
Effective Green, g (s)	2.3	99.1		2.3	99.1			11.0			11.0	11.0
Actuated g/C Ratio	0.02	0.77		0.02	0.77			0.09			0.09	0.09
Clearance Time (s)	5.0	6.0		5.0	6.0			5.0			5.0	5.0
Vehicle Extension (s)	2.0	6.0		2.0	6.0			2.0			2.0	2.0
Lane Grp Cap (vph)	29	2526		29	2530			111			120	126
v/s Ratio Prot	0.01	0.64		c0.02	c0.86							
v/s Ratio Perm								c0.11			0.03	0.00
v/c Ratio	0.76	0.83		0.90	1.11			1.28			0.37	0.02
Uniform Delay, d1	62.8	9.4		62.9	14.7			58.7			55.4	53.7
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	65.7	3.4		120.3	56.7			179.9			0.7	0.0
Delay (s)	128.4	12.8		183.3	71.4			238.6			56.1	53.8
Level of Service	F	B		F	E			F			E	D
Approach Delay (s)		14.0			72.4			238.6			55.3	
Approach LOS		B			E			F			E	

Intersection Summary			
HCM Average Control Delay	52.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	128.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1359	115	178	2	142	107	628	72	1	65	74	1133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	0.91			1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00			0.98	1.00
Satd. Flow (prot)	3273	1614			1775	1509	1687	1772			1735	1509
Flt Permitted	0.95	1.00			1.00	1.00	0.64	1.00			0.84	1.00
Satd. Flow (perm)	3273	1614			1767	1509	1132	1772			1489	1509
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1477	125	193	2	154	116	683	78	1	71	80	1232
RTOR Reduction (vph)	0	43	0	0	0	103	0	1	0	0	0	44
Lane Group Flow (vph)	1477	275	0	0	156	13	683	78	0	0	151	1188
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot			Perm		Perm	Perm			Perm		pm+ov
Protected Phases	7	4			8			2			6	7
Permitted Phases				8		8	2			6		6
Actuated Green, G (s)	41.0	59.6			14.6	14.6	61.0	61.0			61.0	102.0
Effective Green, g (s)	41.0	59.6			14.6	14.6	61.0	61.0			61.0	102.0
Actuated g/C Ratio	0.32	0.46			0.11	0.11	0.47	0.47			0.47	0.79
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	1043	748			201	171	537	841			706	1244
v/s Ratio Prot	c0.45	0.17						0.04				0.30
v/s Ratio Perm					c0.09	0.01	c0.60				0.10	0.48
v/c Ratio	1.42	0.37			0.78	0.08	1.27	0.09			0.21	0.96
Uniform Delay, d1	43.8	22.3			55.4	51.0	33.8	18.6			19.8	11.3
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	192.9	0.3			17.0	0.2	136.4	0.0			0.2	15.9
Delay (s)	236.7	22.6			72.4	51.2	170.2	18.6			19.9	27.2
Level of Service	F	C			E	D	F	B			B	C
Approach Delay (s)		198.8			63.3			154.5			26.4	
Approach LOS		F			E			F			C	

Intersection Summary			
HCM Average Control Delay	125.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.26		
Actuated Cycle Length (s)	128.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	122.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Mitigated

NCRF & DeWitt Nelson Projects Condition LOS Worksheets

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	335	1108	268	1085	789	1761	818	604
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	364	1204	291	1179	858	1914	889	657
RTOR Reduction (vph)	0	0	0	0	0	0	0	1
Lane Group Flow (vph)	364	1204	291	1179	858	1914	889	656
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	17.7	36.7	39.4	58.4	150.0	55.4	55.4	39.4
Effective Green, g (s)	20.7	39.7	42.4	61.4	150.0	58.4	58.4	39.4
Actuated g/C Ratio	0.14	0.26	0.28	0.41	1.00	0.39	0.39	0.26
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	465	838	861	1368	1583	1175	1207	416
v/s Ratio Prot	0.11	c0.38	0.10	0.35			0.29	c0.41
v/s Ratio Perm					0.54	c0.63		
v/c Ratio	0.78	1.44	0.34	0.86	0.54	1.63	0.74	1.58
Uniform Delay, d1	62.5	55.1	42.7	40.4	0.0	45.8	39.2	55.3
Progression Factor	1.00	1.00	1.22	1.29	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.4	203.4	0.1	4.0	0.7	286.9	2.2	271.2
Delay (s)	70.9	258.5	52.1	56.3	0.7	332.7	41.5	326.5
Level of Service	E	F	D	E	A	F	D	F
Approach Delay (s)		215.0		35.3				
Approach LOS		F		D				

Intersection Summary			
HCM Average Control Delay	177.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.56		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	129.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	314	3166	8	13	1882	16	117	14	49	22	19	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3			5.3	5.3
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00		1.00	0.88			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.97	1.00
Satd. Flow (prot)	1671	4509		1641	3843		1703	1645			1463	1568
Flt Permitted	0.95	1.00		0.95	1.00		0.52	1.00			0.80	1.00
Satd. Flow (perm)	1671	4509		1641	3843		924	1645			1197	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	341	3441	9	14	2046	17	127	15	53	24	21	161
RTOR Reduction (vph)	0	0	0	0	0	0	0	46	0	0	0	151
Lane Group Flow (vph)	341	3450	0	14	2063	0	127	22	0	0	45	10
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot			Prot			pm+pt			pm+pt		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases							4			8		8
Actuated Green, G (s)	26.4	113.8		2.9	90.3		18.7	18.7			9.7	9.7
Effective Green, g (s)	26.4	113.8		2.9	90.3		18.7	18.7			9.7	9.7
Actuated g/C Ratio	0.18	0.76		0.02	0.60		0.12	0.12			0.06	0.06
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3			5.3	5.3
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	294	3421		32	2313		141	205			77	101
v/s Ratio Prot	c0.20	c0.77		0.01	c0.54		c0.03	0.01				
v/s Ratio Perm							c0.08				0.04	0.01
v/c Ratio	1.16	1.01		0.44	0.89		0.90	0.11			0.58	0.10
Uniform Delay, d1	61.8	18.1		72.7	25.6		64.6	58.2			68.2	66.1
Progression Factor	0.89	0.54		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	75.7	6.9		3.5	5.7		46.5	0.1			7.1	0.2
Delay (s)	130.5	16.7		76.2	31.4		111.2	58.3			75.3	66.2
Level of Service	F	B		E	C		F	E			E	E
Approach Delay (s)		27.0			31.7			92.7			68.2	
Approach LOS		C			C			F			E	

Intersection Summary			
HCM Average Control Delay	31.9	HCM Level of Service	C
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	90.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	2585	237	23	1715	21	39	20	22	20	20	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0	4.0	6.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.92			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.98	1.00
Satd. Flow (prot)	1597	3195	1429	1597	3189		1597	1550			1640	1429
Flt Permitted	0.95	1.00	1.00	0.95	1.00		1.00	1.00			0.82	1.00
Satd. Flow (perm)	1597	3195	1429	1597	3189		1681	1550			1376	1429
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	2810	258	25	1864	23	42	22	24	22	22	27
RTOR Reduction (vph)	0	0	46	0	1	0	0	23	0	0	0	26
Lane Group Flow (vph)	33	2810	212	25	1886	0	42	23	0	0	44	1
Heavy Vehicles (%)	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%
Turn Type	Prot		Perm	Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases			6				4			8		8
Actuated Green, G (s)	4.1	97.6	97.6	2.3	94.8		4.0	4.0			4.0	4.0
Effective Green, g (s)	4.1	97.6	97.6	2.3	94.8		4.0	4.0			4.0	4.0
Actuated g/C Ratio	0.03	0.82	0.82	0.02	0.80		0.03	0.03			0.03	0.03
Clearance Time (s)	5.0	6.0	6.0	4.0	6.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	2.0	6.0	6.0	3.0	6.0		2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	55	2623	1173	31	2543		57	52			46	48
v/s Ratio Prot	c0.02	c0.88		0.02	0.59			0.01				
v/s Ratio Perm			0.15				0.02				c0.03	0.00
v/c Ratio	0.60	1.07	0.18	0.81	0.74		0.74	0.44			0.96	0.02
Uniform Delay, d1	56.6	10.7	2.2	58.1	6.0		56.9	56.3			57.4	55.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	11.2	40.3	0.3	83.8	2.0		59.0	24.6			114.4	0.1
Delay (s)	67.8	50.9	2.6	141.9	8.0		115.9	81.0			171.8	55.6
Level of Service	E	D	A	F	A		F	F			F	E
Approach Delay (s)		47.1			9.7			97.7			127.6	
Approach LOS		D			A			F			F	

Intersection Summary			
HCM Average Control Delay	35.2	HCM Level of Service	D
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	118.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	2519	91	17	1718	0	58	0	11	0	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0			6.0		5.0	5.0			5.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	1.00			1.00	
Frt	1.00	0.99			1.00		1.00	0.85			0.86	
Flt Protected	0.95	1.00			1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1626	3235			3251		1626	1455			1481	
Flt Permitted	0.95	1.00			0.80		1.00	1.00			1.00	
Satd. Flow (perm)	1626	3235			2616		1712	1455			1481	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	2738	99	18	1867	0	63	0	12	0	0	3
RTOR Reduction (vph)	0	2	0	0	0	0	0	12	0	0	3	0
Lane Group Flow (vph)	5	2835	0	0	1885	0	63	0	0	0	0	0
Heavy Vehicles (%)	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	0.8	99.0			93.2		4.0	4.0			4.0	
Effective Green, g (s)	0.8	99.0			93.2		4.0	4.0			4.0	
Actuated g/C Ratio	0.01	0.87			0.82		0.04	0.04			0.04	
Clearance Time (s)	5.0	6.0			6.0		5.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	11	2809			2139		60	51			52	
v/s Ratio Prot	0.00	c0.88						0.00			0.00	
v/s Ratio Perm					0.72		c0.04					
v/c Ratio	0.45	1.01			0.88		1.05	0.01			0.00	
Uniform Delay, d1	56.4	7.5			6.8		55.0	53.1			53.1	
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2	27.0	19.2			5.6		130.8	0.1			0.0	
Delay (s)	83.4	26.7			12.4		185.8	53.2			53.1	
Level of Service	F	C			B		F	D			D	
Approach Delay (s)		26.8			12.4			164.6			53.1	
Approach LOS		C			B			F			D	

Intersection Summary			
HCM Average Control Delay	23.4	HCM Level of Service	C
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	114.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	91.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2501	269	741	0	161	48	304	99	11	190	141	3286
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	0.89			1.00	0.85	1.00	0.98			1.00	0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00			0.97	1.00
Satd. Flow (prot)	3019	1458			1638	1392	1556	1613			1592	1392
Flt Permitted	0.95	1.00			1.00	1.00	0.32	1.00			0.72	1.00
Satd. Flow (perm)	3019	1458			1638	1392	525	1613			1174	1392
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2718	292	805	0	175	52	330	108	12	207	153	3572
RTOR Reduction (vph)	0	77	0	0	0	46	0	3	0	0	0	36
Lane Group Flow (vph)	2718	1021	0	0	175	6	330	117	0	0	360	3536
Heavy Vehicles (%)	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%	16%
Turn Type	Prot			Perm		Perm	Perm			Perm		pm+ov
Protected Phases	7	4			8			2			6	7
Permitted Phases				8		8	2			6		6
Actuated Green, G (s)	59.0	79.0			16.0	16.0	43.0	43.0			43.0	102.0
Effective Green, g (s)	59.0	79.0			16.0	16.0	43.0	43.0			43.0	102.0
Actuated g/C Ratio	0.45	0.61			0.12	0.12	0.33	0.33			0.33	0.78
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	1370	886			202	171	174	534			388	1135
v/s Ratio Prot	0.90	c0.70			0.11			0.07				c1.41
v/s Ratio Perm						0.00	0.63				0.31	1.13
v/c Ratio	1.98	1.15			0.87	0.04	1.90	0.22			0.93	3.12
Uniform Delay, d1	35.5	25.5			56.0	50.2	43.5	31.4			42.0	14.0
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	445.4	81.3			29.9	0.1	424.3	0.2			28.0	954.1
Delay (s)	480.9	106.8			85.9	50.3	467.8	31.6			70.0	968.1
Level of Service	F	F			F	D	F	C			E	F
Approach Delay (s)		373.3			77.7			351.4			885.9	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM Average Control Delay	603.4	HCM Level of Service	F
HCM Volume to Capacity ratio	2.79		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	238.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	975	1314	572	1225	1541	1036	352	540
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1060	1428	622	1332	1675	1126	383	587
RTOR Reduction (vph)	0	0	0	0	0	0	0	3
Lane Group Flow (vph)	1060	1428	622	1332	1675	1126	383	584
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	28.4	40.7	33.4	45.7	125.0	32.4	32.4	33.4
Effective Green, g (s)	31.4	43.7	36.4	48.7	125.0	35.4	35.4	33.4
Actuated g/C Ratio	0.25	0.35	0.29	0.39	1.00	0.28	0.28	0.27
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	846	1107	887	1302	1583	855	878	423
v/s Ratio Prot	0.31	c0.45	0.20	0.40			0.12	c0.37
v/s Ratio Perm					c1.06	c0.37		
v/c Ratio	1.25	1.29	0.70	1.02	1.06	1.32	0.44	1.38
Uniform Delay, d1	46.8	40.6	39.5	38.1	62.5	44.8	36.6	45.8
Progression Factor	1.00	1.00	0.96	0.71	1.00	1.00	1.00	1.00
Incremental Delay, d2	123.5	137.4	0.2	14.4	27.9	150.9	0.3	185.6
Delay (s)	170.3	178.0	38.2	41.3	90.4	195.7	36.9	231.4
Level of Service	F	F	D	D	F	F	D	F
Approach Delay (s)		174.7		63.4				
Approach LOS		F		E				

Intersection Summary			
HCM Average Control Delay	126.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.28		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	6.9
Intersection Capacity Utilization	110.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	2509	124	20	2988	30	38	26	22	14	20	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3			5.3	5.3
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00			1.00	1.00
Frt	1.00	0.99		1.00	1.00		1.00	0.93			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	1.00
Satd. Flow (prot)	1671	4488		1641	3843		1703	1734			1517	1568
Flt Permitted	0.95	1.00		0.95	1.00		0.73	1.00			0.89	1.00
Satd. Flow (perm)	1671	4488		1641	3843		1314	1734			1372	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	2727	135	22	3248	33	41	28	24	15	22	262
RTOR Reduction (vph)	0	3	0	0	1	0	0	19	0	0	0	88
Lane Group Flow (vph)	24	2859	0	22	3280	0	41	33	0	0	37	174
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot			Prot			pm+pt			pm+pt		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases							4			8		8
Actuated Green, G (s)	3.0	80.2		4.1	81.3		27.4	26.1			18.0	18.0
Effective Green, g (s)	3.0	80.2		4.1	81.3		27.4	26.1			18.0	18.0
Actuated g/C Ratio	0.02	0.64		0.03	0.65		0.22	0.21			0.14	0.14
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3			5.3	5.3
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	40	2880		54	2499		301	362			198	226
v/s Ratio Prot	0.01	c0.64		0.01	c0.85		c0.00	0.02				
v/s Ratio Perm							0.03				0.03	c0.11
v/c Ratio	0.60	0.99		0.41	1.31		0.14	0.09			0.19	0.77
Uniform Delay, d1	60.4	22.1		59.3	21.9		39.3	39.9			47.1	51.5
Progression Factor	0.84	0.64		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	1.5	3.6		1.8	143.7		0.1	0.0			0.2	13.2
Delay (s)	52.4	17.8		61.1	165.5		39.4	39.9			47.2	64.7
Level of Service	D	B		E	F		D	D			D	E
Approach Delay (s)		18.1			164.8			39.7			62.5	
Approach LOS		B			F			D			E	

Intersection Summary			
HCM Average Control Delay	94.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	10.6
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	2020	31	27	2567	26	74	20	22	20	20	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0	5.0	6.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.92			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.98	1.00
Satd. Flow (prot)	1641	3282	1468	1641	3277		1641	1592			1685	1468
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.73	1.00			0.82	1.00
Satd. Flow (perm)	1641	3282	1468	1641	3277		1258	1592			1413	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	34	2196	34	29	2790	28	80	22	24	22	22	62
RTOR Reduction (vph)	0	0	7	0	0	0	0	22	0	0	0	49
Lane Group Flow (vph)	34	2196	27	29	2818	0	80	24	0	0	44	13
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot		Perm	Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases			6				4			8		8
Actuated Green, G (s)	3.2	93.9	93.9	2.4	93.1		8.0	8.0			8.0	8.0
Effective Green, g (s)	3.2	93.9	93.9	2.4	93.1		8.0	8.0			8.0	8.0
Actuated g/C Ratio	0.03	0.78	0.78	0.02	0.77		0.07	0.07			0.07	0.07
Clearance Time (s)	5.0	6.0	6.0	5.0	6.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	2.0	6.0	6.0	2.0	6.0		2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	44	2562	1146	33	2536		84	106			94	98
v/s Ratio Prot	c0.02	0.67		0.02	c0.86			0.01				
v/s Ratio Perm			0.02				c0.06				0.03	0.01
v/c Ratio	0.77	0.86	0.02	0.88	1.11		0.95	0.22			0.47	0.14
Uniform Delay, d1	58.2	8.8	3.0	58.8	13.6		56.0	53.2			54.1	52.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	53.1	4.0	0.0	104.1	56.3		85.7	4.8			1.3	0.2
Delay (s)	111.3	12.7	3.0	162.9	69.9		141.7	58.0			55.4	53.1
Level of Service	F	B	A	F	E		F	E			E	D
Approach Delay (s)		14.1			70.8			111.1			54.1	
Approach LOS		B			E			F			D	

Intersection Summary			
HCM Average Control Delay	47.4	HCM Level of Service	D
HCM Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	120.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	92.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	1992	66	12	2495	0	118	0	22	0	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0			6.0		5.0	5.0			5.0	
Lane Util. Factor	1.00	0.95			0.95		1.00	1.00			1.00	
Frt	1.00	1.00			1.00		1.00	0.85			0.86	
Flt Protected	0.95	1.00			1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1656	3296			3311		1656	1482			1508	
Flt Permitted	0.95	1.00			0.92		0.76	1.00			1.00	
Satd. Flow (perm)	1656	3296			3058		1319	1482			1508	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	2165	72	13	2712	0	128	0	24	0	0	2
RTOR Reduction (vph)	0	2	0	0	0	0	0	22	0	0	2	0
Lane Group Flow (vph)	1	2235	0	0	2725	0	128	2	0	0	0	0
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)	0.8	112.0			106.2		11.0	11.0			11.0	
Effective Green, g (s)	0.8	112.0			106.2		11.0	11.0			11.0	
Actuated g/C Ratio	0.01	0.84			0.79		0.08	0.08			0.08	
Clearance Time (s)	5.0	6.0			6.0		5.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	10	2755			2424		108	122			124	
v/s Ratio Prot	0.00	c0.68						0.00			0.00	
v/s Ratio Perm					c0.89		c0.10					
v/c Ratio	0.10	0.81			1.12		1.19	0.02			0.00	
Uniform Delay, d1	66.2	5.6			13.9		61.5	56.5			56.5	
Progression Factor	1.00	1.00			1.00		1.00	1.00			1.00	
Incremental Delay, d2	4.4	2.7			61.9		144.7	0.1			0.0	
Delay (s)	70.6	8.3			75.8		206.2	56.6			56.5	
Level of Service	E	A			E		F	E			E	
Approach Delay (s)		8.4			75.8			182.6			56.5	
Approach LOS		A			E			F			E	

Intersection Summary			
HCM Average Control Delay	49.5	HCM Level of Service	D
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	99.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1328	117	274	3	149	111	537	69	2	71	83	1132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	0.89			1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00			0.98	1.00
Satd. Flow (prot)	3273	1589			1774	1509	1687	1769			1736	1509
Flt Permitted	0.95	1.00			0.99	1.00	0.61	1.00			0.84	1.00
Satd. Flow (perm)	3273	1589			1759	1509	1089	1769			1488	1509
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1443	127	298	3	162	121	584	75	2	77	90	1230
RTOR Reduction (vph)	0	66	0	0	0	107	0	1	0	0	0	41
Lane Group Flow (vph)	1443	359	0	0	165	14	584	76	0	0	167	1189
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot			Perm		Perm	Perm			Perm		pm+ov
Protected Phases	7	4			8			2			6	7
Permitted Phases				8		8	2			6		6
Actuated Green, G (s)	45.0	64.0			15.0	15.0	57.0	57.0			57.0	102.0
Effective Green, g (s)	45.0	64.0			15.0	15.0	57.0	57.0			57.0	102.0
Actuated g/C Ratio	0.35	0.50			0.12	0.12	0.44	0.44			0.44	0.79
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	1142	788			205	175	481	782			657	1240
v/s Ratio Prot	c0.44	0.23						0.04				0.33
v/s Ratio Perm					c0.09	0.01	c0.54				0.11	0.45
v/c Ratio	1.26	0.46			0.80	0.08	1.21	0.10			0.25	0.96
Uniform Delay, d1	42.0	21.2			55.6	50.8	36.0	21.0			22.6	11.7
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	125.7	0.4			20.1	0.2	114.3	0.1			0.2	16.5
Delay (s)	167.7	21.6			75.6	51.0	150.3	21.1			22.8	28.2
Level of Service	F	C			E	D	F	C			C	C
Approach Delay (s)		134.5			65.2			135.2			27.5	
Approach LOS		F			E			F			C	

Intersection Summary			
HCM Average Control Delay	94.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	129.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	117.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	1177	1228	653	1198	1607	985	402	465
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1279	1335	710	1302	1747	1071	437	505
RTOR Reduction (vph)	0	0	0	0	0	0	0	5
Lane Group Flow (vph)	1279	1335	710	1302	1747	1071	437	500
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	37.4	44.7	32.4	39.7	130.0	34.4	34.4	32.4
Effective Green, g (s)	40.4	47.7	35.4	42.7	130.0	37.4	37.4	32.4
Actuated g/C Ratio	0.31	0.37	0.27	0.33	1.00	0.29	0.29	0.25
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	1046	1162	829	1098	1583	869	892	395
v/s Ratio Prot	c0.38	0.42	0.23	0.39			0.14	0.32
v/s Ratio Perm					c1.10	c0.35		
v/c Ratio	1.22	1.15	0.86	1.19	1.10	1.23	0.49	1.27
Uniform Delay, d1	44.8	41.1	44.9	43.6	65.0	46.3	38.4	48.8
Progression Factor	1.00	1.00	0.95	0.85	1.00	1.00	1.00	1.00
Incremental Delay, d2	108.9	77.4	0.9	84.5	47.7	114.6	0.3	138.1
Delay (s)	153.7	118.5	43.4	121.6	112.7	160.9	38.7	186.9
Level of Service	F	F	D	F	F	F	D	F
Approach Delay (s)		135.7		102.7				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	122.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	2.6
Intersection Capacity Utilization	105.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	2393	128	16	3189	24	28	29	10	16	28	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3		4.0	5.3		4.0	5.3			5.3	5.3
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00			1.00	1.00
Frt	1.00	0.99		1.00	1.00		1.00	0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	1.00
Satd. Flow (prot)	1671	4486		1641	3843		1703	1791			1536	1568
Flt Permitted	0.95	1.00		0.95	1.00		0.73	1.00			0.90	1.00
Satd. Flow (perm)	1671	4486		1641	3843		1302	1791			1402	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	2601	139	17	3466	26	30	32	11	17	30	283
RTOR Reduction (vph)	0	3	0	0	0	0	0	9	0	0	0	106
Lane Group Flow (vph)	49	2737	0	17	3492	0	30	34	0	0	47	177
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot			Prot			pm+pt			pm+pt		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases							4			8		8
Actuated Green, G (s)	5.6	87.6		2.0	84.0		27.1	25.8			18.7	18.7
Effective Green, g (s)	5.6	87.6		2.0	84.0		27.1	25.8			18.7	18.7
Actuated g/C Ratio	0.04	0.67		0.02	0.65		0.21	0.20			0.14	0.14
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3			5.3	5.3
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	72	3023		25	2483		281	355			202	226
v/s Ratio Prot	c0.03	0.61		0.01	c0.91		c0.00	0.02				
v/s Ratio Perm							0.02				0.03	c0.11
v/c Ratio	0.68	0.91		0.68	1.41		0.11	0.10			0.23	0.78
Uniform Delay, d1	61.3	17.7		63.7	23.0		41.7	42.6			49.3	53.7
Progression Factor	0.86	0.63		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	1.9	0.5		46.7	185.3		0.1	0.0			0.2	14.9
Delay (s)	54.5	11.8		110.4	208.3		41.7	42.6			49.5	68.6
Level of Service	D	B		F	F		D	D			D	E
Approach Delay (s)		12.5			207.8			42.3			65.9	
Approach LOS		B			F			D			E	

Intersection Summary			
HCM Average Control Delay	117.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.6
Intersection Capacity Utilization	95.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	1907	35	24	2733	20	92	20	24	20	20	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	5.0			5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.98	1.00
Satd. Flow (prot)	1641	3282	1468	1641	3282	1468	1641	1587			1685	1468
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.73	1.00			0.82	1.00
Satd. Flow (perm)	1641	3282	1468	1641	3282	1468	1258	1587			1411	1468
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	2073	38	26	2971	22	100	22	26	22	22	24
RTOR Reduction (vph)	0	0	8	0	0	4	0	25	0	0	0	23
Lane Group Flow (vph)	22	2073	30	26	2971	18	100	23	0	0	44	1
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases			6			2	4			8		8
Actuated Green, G (s)	2.3	102.0	102.0	3.5	103.2	103.2	7.0	7.0			7.0	7.0
Effective Green, g (s)	2.3	102.0	102.0	3.5	103.2	103.2	7.0	7.0			7.0	7.0
Actuated g/C Ratio	0.02	0.79	0.79	0.03	0.80	0.80	0.05	0.05			0.05	0.05
Clearance Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)	2.0	6.0	6.0	2.0	6.0	6.0	2.0	2.0			2.0	2.0
Lane Grp Cap (vph)	29	2605	1165	45	2636	1179	69	86			77	80
v/s Ratio Prot	0.01	0.63		c0.02	c0.91			0.01				
v/s Ratio Perm			0.02			0.01	c0.08				0.03	0.00
v/c Ratio	0.76	0.80	0.03	0.58	1.13	0.01	1.45	0.27			0.57	0.02
Uniform Delay, d1	62.8	7.4	2.8	61.8	12.6	2.5	60.8	58.3			59.3	57.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	65.7	2.6	0.0	10.7	62.7	0.0	266.1	7.7			6.2	0.0
Delay (s)	128.5	10.0	2.8	72.4	75.4	2.5	326.9	66.0			65.5	57.5
Level of Service	F	B	A	E	E	A	F	E			E	E
Approach Delay (s)		11.1			74.8			242.2			62.7	
Approach LOS		B			E			F			E	

Intersection Summary			
HCM Average Control Delay	54.0	HCM Level of Service	D
HCM Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	128.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	97.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1883	66	12	2677	0	118	0	22	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		5.0	5.0				
Lane Util. Factor		0.95			0.95		1.00	1.00				
Frt		0.99			1.00		1.00	0.85				
Flt Protected		1.00			1.00		0.95	1.00				
Satd. Flow (prot)		3295			3311		1656	1482				
Flt Permitted		1.00			0.93		0.95	1.00				
Satd. Flow (perm)		3295			3077		1656	1482				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2047	72	13	2910	0	128	0	24	0	0	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	22	0	0	0	0
Lane Group Flow (vph)	0	2117	0	0	2923	0	128	2	0	0	0	0
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
Turn Type	Prot			Perm			Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Actuated Green, G (s)		108.0			108.0		11.0	11.0				
Effective Green, g (s)		108.0			108.0		11.0	11.0				
Actuated g/C Ratio		0.83			0.83		0.08	0.08				
Clearance Time (s)		6.0			6.0		5.0	5.0				
Vehicle Extension (s)		3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)		2737			2556		140	125				
v/s Ratio Prot		0.64						0.00				
v/s Ratio Perm					c0.95		c0.08					
v/c Ratio		0.77			1.14		0.91	0.02				
Uniform Delay, d1		5.2			11.0		59.0	54.5				
Progression Factor		1.00			1.00		1.00	1.00				
Incremental Delay, d2		2.2			69.8		50.7	0.1				
Delay (s)		7.4			80.8		109.7	54.6				
Level of Service		A			F		F	D				
Approach Delay (s)		7.4			80.8			101.0			0.0	
Approach LOS		A			F			F			A	

Intersection Summary			
HCM Average Control Delay	51.5	HCM Level of Service	D
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1372	115	186	2	142	107	628	72	1	65	74	1133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	0.91			1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00			0.98	1.00
Satd. Flow (prot)	3273	1611			1775	1509	1687	1772			1735	1509
Flt Permitted	0.95	1.00			0.99	1.00	0.64	1.00			0.84	1.00
Satd. Flow (perm)	3273	1611			1767	1509	1129	1772			1489	1509
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1491	125	202	2	154	116	683	78	1	71	80	1232
RTOR Reduction (vph)	0	45	0	0	0	103	0	1	0	0	0	44
Lane Group Flow (vph)	1491	282	0	0	156	13	683	78	0	0	151	1188
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot			Perm		Perm	Perm			Perm		pm+ov
Protected Phases	7	4			8			2			6	7
Permitted Phases				8		8	2			6		6
Actuated Green, G (s)	42.0	60.6			14.6	14.6	60.0	60.0			60.0	102.0
Effective Green, g (s)	42.0	60.6			14.6	14.6	60.0	60.0			60.0	102.0
Actuated g/C Ratio	0.33	0.47			0.11	0.11	0.47	0.47			0.47	0.79
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	1069	759			201	171	527	827			695	1244
v/s Ratio Prot	c0.46	0.17						0.04				0.31
v/s Ratio Perm					c0.09	0.01	c0.60				0.10	0.48
v/c Ratio	1.39	0.37			0.78	0.08	1.30	0.09			0.22	0.96
Uniform Delay, d1	43.3	21.8			55.4	51.0	34.3	19.1			20.4	11.3
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	183.4	0.3			17.0	0.2	146.8	0.1			0.2	15.9
Delay (s)	226.7	22.1			72.4	51.2	181.1	19.2			20.5	27.2
Level of Service	F	C			E	D	F	B			C	C
Approach Delay (s)		189.9			63.3			164.3			26.5	
Approach LOS		F			E			F			C	

Intersection Summary			
HCM Average Control Delay	123.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.27		
Actuated Cycle Length (s)	128.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	122.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Mitigated

2035 with NCRF Project LOS Worksheets

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	330	1980	300	1473	275	1471	322	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	359	2152	326	1601	299	1599	350	435
RTOR Reduction (vph)	0	0	0	0	0	0	0	1
Lane Group Flow (vph)	359	2152	326	1601	299	1599	350	434
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	17.6	58.7	27.4	68.5	150.0	45.4	45.4	27.4
Effective Green, g (s)	20.6	61.7	30.4	71.5	150.0	48.4	48.4	27.4
Actuated g/C Ratio	0.14	0.41	0.20	0.48	1.00	0.32	0.32	0.18
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	462	1303	617	1593	1583	974	1000	289
v/s Ratio Prot	0.11	c0.68	0.11	0.48			0.11	c0.27
v/s Ratio Perm					0.19	c0.53		
v/c Ratio	0.78	1.65	0.53	1.01	0.19	1.64	0.35	1.50
Uniform Delay, d1	62.5	44.1	53.4	39.2	0.0	50.8	38.8	61.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.0	296.7	0.8	23.8	0.3	293.4	0.2	243.4
Delay (s)	70.5	340.8	54.2	63.0	0.3	344.2	38.9	304.7
Level of Service	E	F	D	E	A	F	D	F
Approach Delay (s)		302.2		53.3				
Approach LOS		F		D				

Intersection Summary			
HCM Average Control Delay	221.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.62		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	133.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	994	2546	310	3	1820	2	67	59	20	20	1	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86		0.97	1.00		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.96		1.00	0.85	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3242	4510	1468	1641	4842		3303	1791		1289	1429	2854
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3242	4510	1468	1641	4842		3303	1791		1289	1429	2854
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1080	2767	337	3	1978	2	73	64	22	22	1	174
RTOR Reduction (vph)	0	0	63	0	0	0	0	12	0	0	54	110
Lane Group Flow (vph)	1080	2767	274	3	1980	0	73	74	0	22	4	7
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6									8
Actuated Green, G (s)	28.4	64.1	64.1	0.9	36.6		7.7	10.9		2.6	5.8	5.8
Effective Green, g (s)	28.4	64.1	64.1	0.9	36.6		7.7	10.9		2.6	5.8	5.8
Actuated g/C Ratio	0.29	0.66	0.66	0.01	0.38		0.08	0.11		0.03	0.06	0.06
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	2.0	2.5	2.5	2.0	2.5		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	948	2977	969	15	1825		262	201		35	85	170
v/s Ratio Prot	c0.33	0.61		0.00	c0.41		c0.02	c0.04		c0.02	0.00	
v/s Ratio Perm			0.19									0.00
v/c Ratio	1.14	0.93	0.28	0.20	1.08		0.28	0.37		0.63	0.05	0.04
Uniform Delay, d1	34.4	14.5	6.9	47.7	30.2		42.1	39.9		46.8	43.1	43.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	75.5	5.9	0.1	2.4	48.2		0.2	0.4		22.7	0.1	0.0
Delay (s)	109.9	20.4	7.0	50.1	78.5		42.3	40.3		69.5	43.1	43.1
Level of Service	F	C	A	D	E		D	D		E	D	D
Approach Delay (s)		42.4			78.4			41.2			46.0	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM Average Control Delay	53.4	HCM Level of Service	D
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	97.1	Sum of lost time (s)	22.6
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1548	20	262	20	20	20	273	1047	20	20	791	1145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	0.95	0.88
Frt	1.00	0.86			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3335	1558			1765	1538	1719	3428		1719	3438	2707
Flt Permitted	0.95	1.00			0.69	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3335	1558			1250	1538	1719	3428		1719	3438	2707
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1683	22	285	22	22	22	297	1138	22	22	860	1245
RTOR Reduction (vph)	0	141	0	0	0	21	0	1	0	0	0	867
Lane Group Flow (vph)	1683	166	0	0	44	1	297	1159	0	22	860	378
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot			Perm		Perm	Prot			Prot		Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8		8						6
Actuated Green, G (s)	46.1	57.8			7.7	7.7	15.0	43.1		1.5	29.6	29.6
Effective Green, g (s)	46.1	57.8			7.7	7.7	15.0	43.1		1.5	29.6	29.6
Actuated g/C Ratio	0.40	0.51			0.07	0.07	0.13	0.38		0.01	0.26	0.26
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	1344	787			84	104	225	1291		23	890	700
v/s Ratio Prot	c0.50	0.11					c0.17	c0.34		0.01	0.25	
v/s Ratio Perm					c0.04	0.00						0.14
v/c Ratio	1.25	0.21			0.52	0.01	1.32	0.90		0.96	0.97	0.54
Uniform Delay, d1	34.2	15.7			51.6	49.8	49.7	33.6		56.4	41.9	36.5
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	119.8	0.1			5.8	0.1	171.7	8.5		166.5	22.1	0.8
Delay (s)	154.0	15.8			57.4	49.9	221.4	42.1		222.9	64.0	37.3
Level of Service	F	B			E	D	F	D		F	E	D
Approach Delay (s)		132.6			54.9			78.6			50.0	
Approach LOS		F			D			E			D	

Intersection Summary			
HCM Average Control Delay	86.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	114.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	97.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	907	2073	398	1974	692	700	319	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	986	2253	433	2146	752	761	347	397
RTOR Reduction (vph)	0	0	0	0	0	0	0	3
Lane Group Flow (vph)	986	2253	433	2146	752	761	347	394
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	31.4	75.7	28.4	72.7	150.0	27.4	27.4	28.4
Effective Green, g (s)	34.4	78.7	31.4	75.7	150.0	30.4	30.4	28.4
Actuated g/C Ratio	0.23	0.52	0.21	0.50	1.00	0.20	0.20	0.19
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	772	1662	637	1687	1583	612	628	300
v/s Ratio Prot	c0.29	c0.71	0.14	0.64			0.11	0.25
v/s Ratio Perm					0.47	c0.25		
v/c Ratio	1.28	1.36	0.68	1.27	0.48	1.24	0.55	1.31
Uniform Delay, d1	57.8	35.6	54.7	37.1	0.0	59.8	53.7	60.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	134.7	164.0	2.9	127.2	1.0	122.9	0.8	162.5
Delay (s)	192.5	199.7	57.6	164.4	1.0	182.7	54.5	223.3
Level of Service	F	F	E	F	A	F	D	F
Approach Delay (s)		197.5		113.6				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	156.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.30		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	5.2
Intersection Capacity Utilization	111.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	745	2234	161	4	2531	4	373	167	99	20	2	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86		0.97	1.00		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.94		1.00	0.86	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	810	2428	175	4	2751	4	405	182	108	22	2	172
RTOR Reduction (vph)	0	0	34	0	0	0	0	15	0	0	54	110
Lane Group Flow (vph)	810	2428	141	4	2755	0	405	275	0	22	5	5
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6									8
Actuated Green, G (s)	28.4	91.2	91.2	0.9	63.7		23.6	26.9		2.9	6.2	6.2
Effective Green, g (s)	28.4	91.2	91.2	0.9	63.7		23.6	26.9		2.9	6.2	6.2
Actuated g/C Ratio	0.20	0.65	0.65	0.01	0.45		0.17	0.19		0.02	0.04	0.04
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	2.0	2.5	2.5	2.0	2.5		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	655	2927	953	11	2195		555	337		27	63	126
v/s Ratio Prot	c0.25	0.54		0.00	c0.57		c0.12	c0.16		0.02	0.00	
v/s Ratio Perm			0.10									0.00
v/c Ratio	1.24	0.83	0.15	0.36	1.26		0.73	0.81		0.81	0.07	0.04
Uniform Delay, d1	56.0	18.7	9.6	69.5	38.4		55.4	54.4		68.5	64.4	64.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	119.3	2.0	0.1	7.3	118.7		4.1	13.3		91.8	0.2	0.0
Delay (s)	175.4	20.8	9.6	76.8	157.1		59.5	67.8		160.4	64.6	64.3
Level of Service	F	C	A	E	F		E	E		F	E	E
Approach Delay (s)		56.9			157.0			62.9			75.2	
Approach LOS		E			F			E			E	

Intersection Summary			
HCM Average Control Delay	97.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	140.5	Sum of lost time (s)	14.6
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	920	2082	421	2021	727	684	323	352
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1000	2263	458	2197	790	743	351	383
RTOR Reduction (vph)	0	0	0	0	0	0	0	3
Lane Group Flow (vph)	1000	2263	458	2197	790	743	351	380
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	32.4	75.7	28.4	71.7	150.0	27.4	27.4	28.4
Effective Green, g (s)	35.4	78.7	31.4	74.7	150.0	30.4	30.4	28.4
Actuated g/C Ratio	0.24	0.52	0.21	0.50	1.00	0.20	0.20	0.19
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	795	1662	637	1665	1583	612	628	300
v/s Ratio Prot	c0.30	c0.71	0.15	0.66			0.11	0.24
v/s Ratio Perm					0.50	c0.25		
v/c Ratio	1.26	1.36	0.72	1.32	0.50	1.21	0.56	1.27
Uniform Delay, d1	57.3	35.6	55.2	37.6	0.0	59.8	53.8	60.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	126.2	166.7	3.9	148.1	1.1	110.8	0.9	143.5
Delay (s)	183.5	202.4	59.1	185.8	1.1	170.6	54.6	204.3
Level of Service	F	F	E	F	A	F	D	F
Approach Delay (s)		196.6		126.6				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	159.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	5.2
Intersection Capacity Utilization	111.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	755	2200	163	4	2630	4	378	169	100	20	2	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86		0.97	1.00		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.94		1.00	0.86	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	821	2391	177	4	2859	4	411	184	109	22	2	174
RTOR Reduction (vph)	0	0	34	0	0	0	0	15	0	0	54	112
Lane Group Flow (vph)	821	2391	143	4	2863	0	411	278	0	22	5	5
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6									8
Actuated Green, G (s)	28.4	91.2	91.2	0.9	63.7		23.8	27.1		2.9	6.2	6.2
Effective Green, g (s)	28.4	91.2	91.2	0.9	63.7		23.8	27.1		2.9	6.2	6.2
Actuated g/C Ratio	0.20	0.65	0.65	0.01	0.45		0.17	0.19		0.02	0.04	0.04
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	2.0	2.5	2.5	2.0	2.5		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	654	2923	952	10	2192		559	339		27	63	126
v/s Ratio Prot	c0.25	0.53		0.00	c0.59		c0.12	c0.16		0.02	0.00	
v/s Ratio Perm			0.10									0.00
v/c Ratio	1.26	0.82	0.15	0.40	1.31		0.74	0.82		0.81	0.07	0.04
Uniform Delay, d1	56.1	18.5	9.6	69.6	38.5		55.5	54.4		68.6	64.5	64.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	127.1	1.8	0.1	9.3	141.2		4.3	13.6		91.8	0.2	0.0
Delay (s)	183.3	20.4	9.7	78.9	179.7		59.8	68.0		160.5	64.7	64.5
Level of Service	F	C	A	E	F		E	E		F	E	E
Approach Delay (s)		59.3			179.5			63.2			75.2	
Approach LOS		E			F			E			E	

Intersection Summary			
HCM Average Control Delay	108.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	140.7	Sum of lost time (s)	14.6
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2560	33	448	33	33	33	460	1732	33	33	1309	1886
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	0.95	0.88
Frt	1.00	0.86			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3183	1486			1685	1468	1641	3273		1641	3282	2584
Flt Permitted	0.95	1.00			0.60	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	1486			1036	1468	1641	3273		1641	3282	2584
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2783	36	487	36	36	36	500	1883	36	36	1423	2050
RTOR Reduction (vph)	0	159	0	0	0	33	0	1	0	0	0	882
Lane Group Flow (vph)	2783	364	0	0	72	3	500	1918	0	36	1423	1168
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Perm		Perm	Prot			Prot		Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases				8		8						6
Actuated Green, G (s)	42.2	56.7			10.5	10.5	16.1	44.0		3.1	31.0	31.0
Effective Green, g (s)	42.2	56.7			10.5	10.5	16.1	44.0		3.1	31.0	31.0
Actuated g/C Ratio	0.36	0.49			0.09	0.09	0.14	0.38		0.03	0.27	0.27
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	1160	728			94	133	228	1244		44	879	692
v/s Ratio Prot	c0.87	0.24					c0.30	0.59		0.02	0.43	
v/s Ratio Perm					c0.07	0.00						c0.45
v/c Ratio	2.40	0.50			0.77	0.02	2.19	1.54		0.82	1.62	1.69
Uniform Delay, d1	36.8	20.0			51.4	48.0	49.9	35.9		56.1	42.4	42.4
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	632.3	0.5			30.4	0.1	551.0	247.8		69.3	283.8	316.0
Delay (s)	669.1	20.5			81.8	48.1	600.8	283.7		125.4	326.2	358.4
Level of Service	F	C			F	D	F	F		F	F	F
Approach Delay (s)		566.5			70.6			349.2			342.9	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM Average Control Delay	420.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.97		
Actuated Cycle Length (s)	115.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	151.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Mitigated

2035 with DeWitt Nelson Project LOS Worksheets

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	330	1986	300	1473	275	1479	322	405
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	359	2159	326	1601	299	1608	350	440
RTOR Reduction (vph)	0	0	0	0	0	0	0	1
Lane Group Flow (vph)	359	2159	326	1601	299	1608	350	439
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	17.6	57.7	28.4	68.5	150.0	45.4	45.4	28.4
Effective Green, g (s)	20.6	60.7	31.4	71.5	150.0	48.4	48.4	28.4
Actuated g/C Ratio	0.14	0.40	0.21	0.48	1.00	0.32	0.32	0.19
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	462	1282	637	1593	1583	974	1000	300
v/s Ratio Prot	0.11	c0.68	0.11	0.48			0.11	c0.28
v/s Ratio Perm					0.19	c0.53		
v/c Ratio	0.78	1.68	0.51	1.01	0.19	1.65	0.35	1.46
Uniform Delay, d1	62.5	44.6	52.5	39.2	0.0	50.8	38.8	60.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.0	311.3	0.7	23.8	0.3	297.5	0.2	226.3
Delay (s)	70.5	355.9	53.2	63.0	0.3	348.3	38.9	287.1
Level of Service	E	F	D	E	A	F	D	F
Approach Delay (s)		315.2		53.1				
Approach LOS		F		D				

Intersection Summary			
HCM Average Control Delay	225.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.63		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	133.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	994	2565	310	3	1820	2	67	59	20	20	1	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86		0.97	1.00		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.96		1.00	0.85	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3242	4510	1468	1641	4842		3303	1791		1289	1429	2854
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3242	4510	1468	1641	4842		3303	1791		1289	1429	2854
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1080	2788	337	3	1978	2	73	64	22	22	1	174
RTOR Reduction (vph)	0	0	62	0	0	0	0	12	0	0	54	110
Lane Group Flow (vph)	1080	2788	275	3	1980	0	73	74	0	22	4	7
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6									8
Actuated Green, G (s)	28.4	64.1	64.1	0.9	36.6		7.7	10.9		2.6	5.8	5.8
Effective Green, g (s)	28.4	64.1	64.1	0.9	36.6		7.7	10.9		2.6	5.8	5.8
Actuated g/C Ratio	0.29	0.66	0.66	0.01	0.38		0.08	0.11		0.03	0.06	0.06
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	2.0	2.5	2.5	2.0	2.5		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	948	2977	969	15	1825		262	201		35	85	170
v/s Ratio Prot	c0.33	0.62		0.00	c0.41		c0.02	c0.04		c0.02	0.00	
v/s Ratio Perm			0.19									0.00
v/c Ratio	1.14	0.94	0.28	0.20	1.08		0.28	0.37		0.63	0.05	0.04
Uniform Delay, d1	34.4	14.7	6.9	47.7	30.2		42.1	39.9		46.8	43.1	43.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	75.5	6.5	0.1	2.4	48.2		0.2	0.4		22.7	0.1	0.0
Delay (s)	109.9	21.1	7.0	50.1	78.5		42.3	40.3		69.5	43.1	43.1
Level of Service	F	C	A	D	E		D	D		E	D	D
Approach Delay (s)		42.8			78.4			41.2			46.0	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM Average Control Delay	53.7	HCM Level of Service	D
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	97.1	Sum of lost time (s)	22.6
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	730	20	342	20	20	20	87	386	20	20	749	1547
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	0.95	0.88
Frt	1.00	0.86			1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3303	1539			1749	1524	1703	3380		1703	3406	2682
Flt Permitted	0.95	1.00			0.65	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3303	1539			1168	1524	1703	3380		1703	3406	2682
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	793	22	372	22	22	22	95	420	22	22	814	1682
RTOR Reduction (vph)	0	101	0	0	0	20	0	3	0	0	0	378
Lane Group Flow (vph)	793	293	0	0	44	2	95	439	0	22	814	1304
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot			Perm		Perm	Prot			Prot		pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases				8		8						6
Actuated Green, G (s)	38.1	49.3			7.2	7.2	7.7	37.9		1.7	31.9	70.0
Effective Green, g (s)	38.1	49.3			7.2	7.2	7.7	37.9		1.7	31.9	70.0
Actuated g/C Ratio	0.38	0.49			0.07	0.07	0.08	0.38		0.02	0.32	0.69
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	1247	752			83	109	130	1270		29	1077	1967
v/s Ratio Prot	0.24	0.19					c0.06	0.13		0.01	c0.24	c0.25
v/s Ratio Perm					c0.04	0.00						0.24
v/c Ratio	0.64	0.39			0.53	0.01	0.73	0.35		0.76	0.76	0.66
Uniform Delay, d1	25.7	16.3			45.2	43.6	45.6	22.6		49.4	31.0	8.8
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.1	0.3			6.4	0.1	18.9	0.2		71.7	3.1	0.9
Delay (s)	26.8	16.6			51.6	43.6	64.5	22.8		121.1	34.1	9.6
Level of Service	C	B			D	D	E	C		F	C	A
Approach Delay (s)		23.4			48.9			30.2			18.5	
Approach LOS		C			D			C			B	

Intersection Summary			
HCM Average Control Delay	21.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	100.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	907	2082	393	1969	686	711	319	374
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	986	2263	427	2140	746	773	347	407
RTOR Reduction (vph)	0	0	0	0	0	0	0	2
Lane Group Flow (vph)	986	2263	427	2140	746	773	347	405
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	31.4	73.7	29.4	71.7	150.0	28.4	28.4	29.4
Effective Green, g (s)	34.4	76.7	32.4	74.7	150.0	31.4	31.4	29.4
Actuated g/C Ratio	0.23	0.51	0.22	0.50	1.00	0.21	0.21	0.20
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	772	1619	658	1665	1583	632	649	310
v/s Ratio Prot	c0.29	c0.71	0.14	0.64			0.11	0.26
v/s Ratio Perm					c0.47	c0.26		
v/c Ratio	1.28	1.40	0.65	1.29	0.47	1.22	0.53	1.31
Uniform Delay, d1	57.8	36.6	53.6	37.6	0.0	59.3	52.8	60.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	134.7	182.8	2.2	133.1	1.0	114.1	0.7	158.8
Delay (s)	192.5	219.5	55.8	170.7	1.0	173.4	53.5	219.1
Level of Service	F	F	E	F	A	F	D	F
Approach Delay (s)		211.3		117.7				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	163.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.30		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	5.2
Intersection Capacity Utilization	112.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	745	2263	161	4	2515	4	373	167	99	20	2	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86		0.97	1.00		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.94		1.00	0.86	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	810	2460	175	4	2734	4	405	182	108	22	2	172
RTOR Reduction (vph)	0	0	33	0	0	0	0	15	0	0	54	110
Lane Group Flow (vph)	810	2460	142	4	2738	0	405	275	0	22	5	5
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6									8
Actuated Green, G (s)	29.4	91.2	91.2	0.9	62.7		23.6	26.9		2.9	6.2	6.2
Effective Green, g (s)	29.4	91.2	91.2	0.9	62.7		23.6	26.9		2.9	6.2	6.2
Actuated g/C Ratio	0.21	0.65	0.65	0.01	0.45		0.17	0.19		0.02	0.04	0.04
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	2.0	2.5	2.5	2.0	2.5		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	678	2927	953	11	2161		555	337		27	63	126
v/s Ratio Prot	c0.25	0.55		0.00	c0.57		c0.12	c0.16		0.02	0.00	
v/s Ratio Perm			0.10									0.00
v/c Ratio	1.19	0.84	0.15	0.36	1.27		0.73	0.81		0.81	0.07	0.04
Uniform Delay, d1	55.6	19.0	9.6	69.5	38.9		55.4	54.4		68.5	64.4	64.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	101.7	2.3	0.1	7.3	124.0		4.1	13.3		91.8	0.2	0.0
Delay (s)	157.2	21.3	9.6	76.8	162.9		59.5	67.8		160.4	64.6	64.3
Level of Service	F	C	A	E	F		E	E		F	E	E
Approach Delay (s)		52.7			162.8			62.9			75.2	
Approach LOS		D			F			E			E	

Intersection Summary			
HCM Average Control Delay	97.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	140.5	Sum of lost time (s)	14.6
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1540	20	352	20	20	20	354	1054	20	20	799	1140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	0.95	0.88
Frt	1.00	0.86			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3335	1553			1765	1538	1719	3428		1719	3438	2707
Flt Permitted	0.95	1.00			0.65	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3335	1553			1171	1538	1719	3428		1719	3438	2707
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1674	22	383	22	22	22	385	1146	22	22	868	1239
RTOR Reduction (vph)	0	203	0	0	0	20	0	1	0	0	0	315
Lane Group Flow (vph)	1674	202	0	0	44	2	385	1167	0	22	868	924
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot			Perm		Perm	Prot			Prot		pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases				8		8						6
Actuated Green, G (s)	42.1	54.0			7.9	7.9	19.1	47.1		1.5	29.5	71.6
Effective Green, g (s)	42.1	54.0			7.9	7.9	19.1	47.1		1.5	29.5	71.6
Actuated g/C Ratio	0.37	0.47			0.07	0.07	0.17	0.41		0.01	0.26	0.62
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	1225	732			81	106	287	1409		23	885	1786
v/s Ratio Prot	c0.50	0.13					c0.22	0.34		0.01	c0.25	0.19
v/s Ratio Perm					c0.04	0.00						0.15
v/c Ratio	1.37	0.28			0.54	0.01	1.34	0.83		0.96	0.98	0.52
Uniform Delay, d1	36.2	18.4			51.6	49.7	47.8	30.1		56.5	42.3	11.9
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	170.2	0.2			7.2	0.1	175.3	4.2		166.5	25.5	0.3
Delay (s)	206.5	18.6			58.9	49.8	223.0	34.3		223.0	67.7	12.2
Level of Service	F	B			E	D	F	C		F	E	B
Approach Delay (s)		169.9			55.8			81.1			37.0	
Approach LOS		F			E			F			D	

Intersection Summary			
HCM Average Control Delay	96.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	114.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	102.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	920	2081	427	2027	734	684	323	351
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1000	2262	464	2203	798	743	351	382
RTOR Reduction (vph)	0	0	0	0	0	0	0	3
Lane Group Flow (vph)	1000	2262	464	2203	798	743	351	379
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	32.4	75.7	28.4	71.7	150.0	27.4	27.4	28.4
Effective Green, g (s)	35.4	78.7	31.4	74.7	150.0	30.4	30.4	28.4
Actuated g/C Ratio	0.24	0.52	0.21	0.50	1.00	0.20	0.20	0.19
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	795	1662	637	1665	1583	612	628	300
v/s Ratio Prot	c0.30	c0.71	0.15	0.66			0.11	0.24
v/s Ratio Perm					0.50	c0.25		
v/c Ratio	1.26	1.36	0.73	1.32	0.50	1.21	0.56	1.26
Uniform Delay, d1	57.3	35.6	55.3	37.6	0.0	59.8	53.8	60.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	126.2	166.4	4.2	149.7	1.1	110.8	0.9	142.1
Delay (s)	183.5	202.1	59.5	187.4	1.1	170.6	54.6	202.9
Level of Service	F	F	E	F	A	F	D	F
Approach Delay (s)		196.4		127.3				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	159.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	5.2
Intersection Capacity Utilization	112.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	755	2199	163	4	2650	4	378	169	100	20	2	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86		0.97	1.00		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.94		1.00	0.86	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	821	2390	177	4	2880	4	411	184	109	22	2	174
RTOR Reduction (vph)	0	0	34	0	0	0	0	15	0	0	54	112
Lane Group Flow (vph)	821	2390	143	4	2884	0	411	278	0	22	5	5
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6									8
Actuated Green, G (s)	28.4	91.2	91.2	0.9	63.7		23.8	27.1		2.9	6.2	6.2
Effective Green, g (s)	28.4	91.2	91.2	0.9	63.7		23.8	27.1		2.9	6.2	6.2
Actuated g/C Ratio	0.20	0.65	0.65	0.01	0.45		0.17	0.19		0.02	0.04	0.04
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	2.0	2.5	2.5	2.0	2.5		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	654	2923	952	10	2192		559	339		27	63	126
v/s Ratio Prot	c0.25	0.53		0.00	c0.60		c0.12	c0.16		0.02	0.00	
v/s Ratio Perm			0.10									0.00
v/c Ratio	1.26	0.82	0.15	0.40	1.32		0.74	0.82		0.81	0.07	0.04
Uniform Delay, d1	56.1	18.5	9.6	69.6	38.5		55.5	54.4		68.6	64.5	64.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	127.1	1.8	0.1	9.3	145.4		4.3	13.6		91.8	0.2	0.0
Delay (s)	183.3	20.4	9.7	78.9	183.9		59.8	68.0		160.5	64.7	64.5
Level of Service	F	C	A	E	F		E	E		F	E	E
Approach Delay (s)		59.3			183.8			63.2			75.2	
Approach LOS		E			F			E			E	

Intersection Summary			
HCM Average Control Delay	110.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	140.7	Sum of lost time (s)	14.6
Intersection Capacity Utilization	89.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	1456	176	125	1882	164	261	144	181	158	92	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.92		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1641	4639		1641	4659		1641	1583		1641	1583	
Flt Permitted	0.95	1.00		0.95	1.00		0.49	1.00		0.30	1.00	
Satd. Flow (perm)	1641	4639		1641	4659		850	1583		520	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	1583	191	136	2046	178	284	157	197	172	100	125
RTOR Reduction (vph)	0	12	0	0	9	0	0	38	0	0	38	0
Lane Group Flow (vph)	163	1762	0	136	2216	0	284	316	0	172	187	0
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4			8		
Actuated Green, G (s)	9.0	56.0		13.0	60.0		35.0	35.0		35.0	35.0	
Effective Green, g (s)	9.0	56.0		13.0	60.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio	0.08	0.47		0.11	0.50		0.29	0.29		0.29	0.29	
Clearance Time (s)	5.0	6.0		5.0	6.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	123	2165		178	2330		248	462		152	462	
v/s Ratio Prot	c0.10	0.38		0.08	c0.48			0.20			0.12	
v/s Ratio Perm							c0.33			0.33		
v/c Ratio	1.33	0.81		0.76	0.95		1.15	0.68		1.13	0.41	
Uniform Delay, d1	55.5	27.5		52.0	28.6		42.5	37.6		42.5	34.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	191.8	3.5		15.9	10.2		102.0	8.0		112.7	0.2	
Delay (s)	247.3	31.0		68.0	38.8		144.5	45.6		155.2	34.4	
Level of Service	F	C		E	D		F	D		F	C	
Approach Delay (s)		49.2			40.5			89.6			86.7	
Approach LOS		D			D			F			F	

Intersection Summary			
HCM Average Control Delay	53.0	HCM Level of Service	D
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2547	33	441	33	33	33	644	1747	33	33	1309	1886
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	0.95	0.88
Frt	1.00	0.86			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3183	1486			1685	1468	1641	3273		1641	3282	2584
Flt Permitted	0.95	1.00			0.60	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	1486			1042	1468	1641	3273		1641	3282	2584
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2768	36	479	36	36	36	700	1899	36	36	1423	2050
RTOR Reduction (vph)	0	208	0	0	0	33	0	1	0	0	0	275
Lane Group Flow (vph)	2768	307	0	0	72	3	700	1934	0	36	1423	1775
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Perm		Perm	Prot			Prot		pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases				8		8						6
Actuated Green, G (s)	39.2	53.7			10.5	10.5	20.1	47.0		3.1	30.0	69.2
Effective Green, g (s)	39.2	53.7			10.5	10.5	20.1	47.0		3.1	30.0	69.2
Actuated g/C Ratio	0.34	0.46			0.09	0.09	0.17	0.41		0.03	0.26	0.60
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	1077	689			94	133	285	1328		44	850	1633
v/s Ratio Prot	c0.87	0.21					c0.43	0.59		0.02	c0.43	0.37
v/s Ratio Perm					c0.07	0.00						0.32
v/c Ratio	2.57	0.45			0.77	0.02	2.46	1.46		0.82	1.67	1.09
Uniform Delay, d1	38.3	21.0			51.4	48.0	47.8	34.4		56.1	42.9	23.3
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	709.3	0.5			30.4	0.1	665.7	209.5		69.3	308.5	50.0
Delay (s)	747.6	21.4			81.8	48.1	713.6	243.9		125.4	351.4	73.3
Level of Service	F	C			F	D	F	F		F	F	E
Approach Delay (s)		633.7			70.6			368.7			186.6	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM Average Control Delay	389.5	HCM Level of Service	F
HCM Volume to Capacity ratio	2.09		
Actuated Cycle Length (s)	115.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	161.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Mitigated

2035 with NCRF & DeWitt Nelson Projects LOS Worksheets

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	330	2038	305	1478	282	1543	322	454
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	359	2215	332	1607	307	1677	350	493
RTOR Reduction (vph)	0	0	0	0	0	0	0	1
Lane Group Flow (vph)	359	2215	332	1607	307	1677	350	492
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	17.6	56.7	29.4	68.5	150.0	45.4	45.4	29.4
Effective Green, g (s)	20.6	59.7	32.4	71.5	150.0	48.4	48.4	29.4
Actuated g/C Ratio	0.14	0.40	0.22	0.48	1.00	0.32	0.32	0.20
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	462	1260	658	1593	1583	974	1000	310
v/s Ratio Prot	0.11	c0.70	0.11	0.48			0.11	c0.31
v/s Ratio Perm					0.19	c0.56		
v/c Ratio	0.78	1.76	0.50	1.01	0.19	1.72	0.35	1.59
Uniform Delay, d1	62.5	45.1	51.7	39.2	0.0	50.8	38.8	60.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.0	344.4	0.6	24.7	0.3	329.1	0.2	279.3
Delay (s)	70.5	389.5	52.3	64.0	0.3	379.9	38.9	339.6
Level of Service	E	F	D	E	A	F	D	F
Approach Delay (s)		345.0		53.5				
Approach LOS		F		D				

Intersection Summary			
HCM Average Control Delay	248.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.71		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	140.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	994	2730	310	3	1837	2	67	59	20	20	1	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86		0.97	1.00		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.96		1.00	0.85	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3242	4510	1468	1641	4842		3303	1791		1289	1429	2854
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3242	4510	1468	1641	4842		3303	1791		1289	1429	2854
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1080	2967	337	3	1997	2	73	64	22	22	1	174
RTOR Reduction (vph)	0	0	45	0	0	0	0	9	0	0	55	77
Lane Group Flow (vph)	1080	2967	292	3	1999	0	73	77	0	22	3	40
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot		Perm	Prot			Prot			Prot		Over
Protected Phases	1	6		5	2		7	4		3	8	1
Permitted Phases			6									
Actuated Green, G (s)	45.4	99.1	99.1	0.9	54.6		10.4	11.1		4.3	5.0	45.4
Effective Green, g (s)	45.4	99.1	99.1	0.9	54.6		10.4	11.1		4.3	5.0	45.4
Actuated g/C Ratio	0.34	0.74	0.74	0.01	0.41		0.08	0.08		0.03	0.04	0.34
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	4.0
Vehicle Extension (s)	2.0	2.5	2.5	2.0	2.5		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	1098	3335	1086	11	1973		256	148		41	53	967
v/s Ratio Prot	c0.33	0.66		0.00	c0.41		0.02	c0.04		c0.02	0.00	0.01
v/s Ratio Perm			0.20									
v/c Ratio	0.98	0.89	0.27	0.27	1.01		0.29	0.52		0.54	0.06	0.04
Uniform Delay, d1	43.9	13.3	5.7	66.2	39.7		58.3	58.9		63.9	62.2	29.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	23.0	3.3	0.1	4.8	23.6		0.2	1.3		6.6	0.2	0.0
Delay (s)	66.9	16.6	5.8	71.1	63.3		58.5	60.2		70.5	62.4	29.7
Level of Service	E	B	A	E	E		E	E		E	E	C
Approach Delay (s)		28.1			63.3			59.4			43.9	
Approach LOS		C			E			E			D	

Intersection Summary			
HCM Average Control Delay	39.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	134.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	1844	219	111	1358	164	118	38	48	45	62	169
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0	6.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.92		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1626	4599		1626	4673	1455	1626	1568		1626	1523	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.40	1.00		0.70	1.00	
Satd. Flow (perm)	1626	4599		1626	4673	1455	685	1568		1193	1523	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	2004	238	121	1476	178	128	41	52	49	67	184
RTOR Reduction (vph)	0	12	0	0	0	77	0	38	0	0	83	0
Lane Group Flow (vph)	54	2230	0	121	1476	101	128	55	0	49	168	0
Heavy Vehicles (%)	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
Turn Type	Prot			Prot		Perm	Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases						2	4			8		
Actuated Green, G (s)	7.0	64.1		11.1	68.2	68.2	29.0	29.0		29.0	29.0	
Effective Green, g (s)	7.0	64.1		11.1	68.2	68.2	29.0	29.0		29.0	29.0	
Actuated g/C Ratio	0.06	0.53		0.09	0.57	0.57	0.24	0.24		0.24	0.24	
Clearance Time (s)	5.0	6.0		5.0	6.0	6.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	6.0		2.0	6.0	6.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	95	2453		150	2651	826	165	378		288	367	
v/s Ratio Prot	0.03	c0.48		c0.07	c0.32			0.04			0.11	
v/s Ratio Perm						0.07	c0.19			0.04		
v/c Ratio	0.57	0.91		0.81	0.56	0.12	0.78	0.15		0.17	0.46	
Uniform Delay, d1	55.1	25.4		53.5	16.4	12.1	42.6	35.9		36.1	38.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.6	6.3		24.9	0.8	0.3	29.3	0.8		0.1	0.3	
Delay (s)	59.7	31.8		78.4	17.3	12.4	71.8	36.7		36.2	39.2	
Level of Service	E	C		E	B	B	E	D		D	D	
Approach Delay (s)		32.4			21.0			57.0			38.7	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM Average Control Delay	29.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	120.2	Sum of lost time (s)	22.0
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	731	20	343	20	20	20	94	386	20	20	749	1560
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	0.95	0.88
Frt	1.00	0.86			1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3303	1539			1749	1524	1703	3380		1703	3406	2682
Flt Permitted	0.95	1.00			0.65	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3303	1539			1167	1524	1703	3380		1703	3406	2682
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	795	22	373	22	22	22	102	420	22	22	814	1696
RTOR Reduction (vph)	0	105	0	0	0	20	0	3	0	0	0	391
Lane Group Flow (vph)	795	290	0	0	44	2	102	439	0	22	814	1305
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Turn Type	Prot			Perm		Perm	Prot			Prot		pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases				8		8						6
Actuated Green, G (s)	38.1	49.5			7.4	7.4	10.1	41.2		1.8	32.9	71.0
Effective Green, g (s)	38.1	49.5			7.4	7.4	10.1	41.2		1.8	32.9	71.0
Actuated g/C Ratio	0.36	0.47			0.07	0.07	0.10	0.39		0.02	0.31	0.68
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	1204	729			83	108	165	1333		29	1072	1925
v/s Ratio Prot	0.24	c0.19					c0.06	0.13		0.01	c0.24	c0.25
v/s Ratio Perm					0.04	0.00						0.24
v/c Ratio	0.66	0.40			0.53	0.01	0.62	0.33		0.76	0.76	0.68
Uniform Delay, d1	27.8	17.8			46.9	45.2	45.3	22.0		51.1	32.2	10.0
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.4	0.4			6.4	0.1	6.7	0.1		71.7	3.1	1.0
Delay (s)	29.2	18.2			53.2	45.2	52.1	22.2		122.8	35.4	10.9
Level of Service	C	B			D	D	D	C		F	D	B
Approach Delay (s)		25.5			50.6			27.8			19.8	
Approach LOS		C			D			C			B	

Intersection Summary			
HCM Average Control Delay	22.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	104.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	907	2103	422	2001	726	737	319	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	986	2286	459	2175	789	801	347	427
RTOR Reduction (vph)	0	0	0	0	0	0	0	2
Lane Group Flow (vph)	986	2286	459	2175	789	801	347	425
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	30.4	72.7	30.4	72.7	150.0	28.4	28.4	30.4
Effective Green, g (s)	33.4	75.7	33.4	75.7	150.0	31.4	31.4	30.4
Actuated g/C Ratio	0.22	0.50	0.22	0.50	1.00	0.21	0.21	0.20
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	750	1598	678	1687	1583	632	649	321
v/s Ratio Prot	c0.29	c0.72	0.15	0.65			0.11	0.27
v/s Ratio Perm					0.50	c0.27		
v/c Ratio	1.31	1.43	0.68	1.29	0.50	1.27	0.53	1.32
Uniform Delay, d1	58.3	37.1	53.4	37.1	0.0	59.3	52.8	59.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	151.0	197.4	2.7	134.8	1.1	132.6	0.7	165.4
Delay (s)	209.3	234.6	56.1	171.9	1.1	191.9	53.5	225.2
Level of Service	F	F	E	F	A	F	D	F
Approach Delay (s)		227.0		117.0				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	170.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.37		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	115.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	745	2329	161	4	2616	4	373	167	99	20	2	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86		0.97	1.00		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.94		1.00	0.86	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	810	2532	175	4	2843	4	405	182	108	22	2	172
RTOR Reduction (vph)	0	0	32	0	0	0	0	16	0	0	55	92
Lane Group Flow (vph)	810	2532	143	4	2847	0	405	274	0	22	4	23
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot		Perm	Prot			Prot			Prot		Over
Protected Phases	1	6		5	2		7	4		3	8	1
Permitted Phases			6									
Actuated Green, G (s)	27.5	91.4	91.4	0.9	64.8		23.1	25.4		2.8	5.1	27.5
Effective Green, g (s)	27.5	91.4	91.4	0.9	64.8		23.1	25.4		2.8	5.1	27.5
Actuated g/C Ratio	0.20	0.66	0.66	0.01	0.47		0.17	0.18		0.02	0.04	0.20
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	4.0
Vehicle Extension (s)	2.0	2.5	2.5	2.0	2.5		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	641	2963	965	11	2256		549	321		26	53	564
v/s Ratio Prot	c0.25	0.56		0.00	c0.59		c0.12	c0.16		0.02	0.00	0.01
v/s Ratio Perm			0.10									
v/c Ratio	1.26	0.85	0.15	0.36	1.26		0.74	0.86		0.85	0.08	0.04
Uniform Delay, d1	55.8	18.7	9.1	68.8	37.1		55.1	55.1		67.9	64.7	45.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	130.8	2.6	0.1	7.3	121.6		4.4	18.8		106.7	0.2	0.0
Delay (s)	186.6	21.2	9.1	76.1	158.8		59.6	73.8		174.6	65.0	45.1
Level of Service	F	C	A	E	F		E	E		F	E	D
Approach Delay (s)		58.7			158.6			65.5			65.6	
Approach LOS		E			F			E			E	

Intersection Summary			
HCM Average Control Delay	98.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	139.1	Sum of lost time (s)	14.6
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	148	1596	174	123	1859	162	257	142	178	156	91	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0	6.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.92		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1656	4689		1656	4759	1482	1656	1598		1656	1598	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.51	1.00		0.34	1.00	
Satd. Flow (perm)	1656	4689		1656	4759	1482	894	1598		594	1598	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	161	1735	189	134	2021	176	279	154	193	170	99	123
RTOR Reduction (vph)	0	11	0	0	0	97	0	38	0	0	38	0
Lane Group Flow (vph)	161	1913	0	134	2021	79	279	309	0	170	184	0
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
Turn Type	Prot			Prot		Perm	Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases						2	4			8		
Actuated Green, G (s)	12.0	55.1		10.9	54.0	54.0	38.0	38.0		38.0	38.0	
Effective Green, g (s)	12.0	55.1		10.9	54.0	54.0	38.0	38.0		38.0	38.0	
Actuated g/C Ratio	0.10	0.46		0.09	0.45	0.45	0.32	0.32		0.32	0.32	
Clearance Time (s)	5.0	6.0		5.0	6.0	6.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	6.0		2.0	6.0	6.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	166	2153		150	2142	667	283	506		188	506	
v/s Ratio Prot	c0.10	0.41		0.08	c0.42			0.19			0.12	
v/s Ratio Perm						0.05	c0.31			0.29		
v/c Ratio	0.97	0.89		0.89	0.94	0.12	0.99	0.61		0.90	0.36	
Uniform Delay, d1	53.8	29.6		54.0	31.5	19.2	40.7	34.7		39.3	31.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	59.8	6.0		42.7	10.1	0.4	50.0	5.4		38.9	0.2	
Delay (s)	113.7	35.6		96.6	41.6	19.5	90.8	40.2		78.2	31.8	
Level of Service	F	D		F	D	B	F	D		E	C	
Approach Delay (s)		41.6			43.1			62.7			51.9	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM Average Control Delay	45.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	88.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1548	20	357	20	20	20	357	1054	20	20	799	1145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	0.95	0.88
Frt	1.00	0.86			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3335	1553			1765	1538	1719	3428		1719	3438	2707
Flt Permitted	0.95	1.00			0.64	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3335	1553			1167	1538	1719	3428		1719	3438	2707
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1683	22	388	22	22	22	388	1146	22	22	868	1245
RTOR Reduction (vph)	0	205	0	0	0	20	0	1	0	0	0	314
Lane Group Flow (vph)	1683	205	0	0	44	2	388	1167	0	22	868	931
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot			Perm		Perm	Prot			Prot		pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases				8		8						6
Actuated Green, G (s)	42.1	54.0			7.9	7.9	19.1	47.1		1.5	29.5	71.6
Effective Green, g (s)	42.1	54.0			7.9	7.9	19.1	47.1		1.5	29.5	71.6
Actuated g/C Ratio	0.37	0.47			0.07	0.07	0.17	0.41		0.01	0.26	0.62
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	1225	732			80	106	287	1409		23	885	1786
v/s Ratio Prot	c0.50	0.13					c0.23	0.34		0.01	c0.25	0.19
v/s Ratio Perm					c0.04	0.00						0.15
v/c Ratio	1.37	0.28			0.55	0.01	1.35	0.83		0.96	0.98	0.52
Uniform Delay, d1	36.2	18.5			51.6	49.7	47.8	30.1		56.5	42.3	12.0
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	173.5	0.2			7.9	0.1	179.6	4.2		166.5	25.5	0.3
Delay (s)	209.7	18.7			59.6	49.8	227.4	34.3		223.0	67.7	12.2
Level of Service	F	B			E	D	F	C		F	E	B
Approach Delay (s)		172.3			56.3			82.4			37.0	
Approach LOS		F			E			F			D	

Intersection Summary			
HCM Average Control Delay	97.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	114.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	102.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBL	WBT	WBR2	SEL	NWL	NWR2
Lane Configurations								
Volume (vph)	920	2082	475	2079	799	684	323	352
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.3	2.6	4.3	4.0	2.6	2.6	5.6
Lane Util. Factor	0.97	0.95	0.97	0.95	1.00	0.97	0.97	1.00
Frt	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3367	3167	3045	3343	1583	3019	3099	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3367	3167	3045	3343	1583	3019	3099	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1000	2263	516	2260	868	743	351	383
RTOR Reduction (vph)	0	0	0	0	0	0	0	3
Lane Group Flow (vph)	1000	2263	516	2260	868	743	351	380
Heavy Vehicles (%)	4%	14%	15%	8%	2%	16%	13%	2%
Turn Type	Prot		Prot		Free	custom	custom	custom
Protected Phases	5	2	1	6			3	1
Permitted Phases					Free	7	3	
Actuated Green, G (s)	32.4	75.7	28.4	71.7	150.0	27.4	27.4	28.4
Effective Green, g (s)	35.4	78.7	31.4	74.7	150.0	30.4	30.4	28.4
Actuated g/C Ratio	0.24	0.52	0.21	0.50	1.00	0.20	0.20	0.19
Clearance Time (s)	5.6	7.3	5.6	7.3		5.6	5.6	5.6
Vehicle Extension (s)	3.0	2.5	3.0	2.5		2.5	2.5	3.0
Lane Grp Cap (vph)	795	1662	637	1665	1583	612	628	300
v/s Ratio Prot	c0.30	c0.71	0.17	0.68			0.11	0.24
v/s Ratio Perm					0.55	c0.25		
v/c Ratio	1.26	1.36	0.81	1.36	0.55	1.21	0.56	1.27
Uniform Delay, d1	57.3	35.6	56.5	37.6	0.0	59.8	53.8	60.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	126.2	166.7	7.7	164.8	1.4	110.8	0.9	143.5
Delay (s)	183.5	202.4	64.2	202.5	1.4	170.6	54.6	204.3
Level of Service	F	F	E	F	A	F	D	F
Approach Delay (s)		196.6		135.0				
Approach LOS		F		F				

Intersection Summary			
HCM Average Control Delay	161.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	5.2
Intersection Capacity Utilization	113.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	755	2200	163	4	2814	4	378	169	100	20	2	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86		0.97	1.00		1.00	0.91	0.91
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.94		1.00	0.86	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3242	4510	1468	1641	4842		3303	1759		1289	1432	2854
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	821	2391	177	4	3059	4	411	184	109	22	2	174
RTOR Reduction (vph)	0	0	34	0	0	0	0	16	0	0	55	94
Lane Group Flow (vph)	821	2391	143	4	3063	0	411	277	0	22	4	23
Heavy Vehicles (%)	8%	15%	10%	10%	35%	13%	6%	2%	2%	40%	11%	3%
Turn Type	Prot		Perm	Prot			Prot			Prot		Over
Protected Phases	1	6		5	2		7	4		3	8	1
Permitted Phases			6									
Actuated Green, G (s)	27.4	92.4	92.4	0.9	65.9		23.3	25.6		2.8	5.1	27.4
Effective Green, g (s)	27.4	92.4	92.4	0.9	65.9		23.3	25.6		2.8	5.1	27.4
Actuated g/C Ratio	0.20	0.66	0.66	0.01	0.47		0.17	0.18		0.02	0.04	0.20
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3		4.0	5.3		4.0	5.3	4.0
Vehicle Extension (s)	2.0	2.5	2.5	2.0	2.5		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	633	2970	967	11	2274		549	321		26	52	557
v/s Ratio Prot	c0.25	0.53		0.00	c0.63		c0.12	c0.16		0.02	0.00	0.01
v/s Ratio Perm			0.10									
v/c Ratio	1.30	0.81	0.15	0.36	1.35		0.75	0.86		0.85	0.08	0.04
Uniform Delay, d1	56.5	17.4	9.1	69.4	37.2		55.7	55.7		68.5	65.3	45.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	145.1	1.6	0.1	7.3	159.1		4.9	20.1		106.7	0.2	0.0
Delay (s)	201.5	19.0	9.1	76.7	196.3		60.6	75.8		175.2	65.6	45.8
Level of Service	F	B	A	E	F		E	E		F	E	D
Approach Delay (s)		62.7			196.2			66.9			66.1	
Approach LOS		E			F			E			E	

Intersection Summary			
HCM Average Control Delay	118.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	140.3	Sum of lost time (s)	14.6
Intersection Capacity Utilization	92.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	1457	176	125	2046	164	261	144	181	158	92	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0		5.0	6.0	6.0	5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.92		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1656	4682		1656	4759	1482	1656	1598		1656	1598	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.48	1.00		0.28	1.00	
Satd. Flow (perm)	1656	4682		1656	4759	1482	835	1598		484	1598	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	1584	191	136	2224	178	284	157	197	172	100	125
RTOR Reduction (vph)	0	12	0	0	0	86	0	38	0	0	38	0
Lane Group Flow (vph)	163	1763	0	136	2224	92	284	316	0	172	187	0
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%	9%
Turn Type	Prot			Prot		Perm	Perm			Perm		
Protected Phases	1	6		5	2			4			8	
Permitted Phases						2	4			8		
Actuated Green, G (s)	9.0	58.1		12.9	62.0	62.0	33.0	33.0		33.0	33.0	
Effective Green, g (s)	9.0	58.1		12.9	62.0	62.0	33.0	33.0		33.0	33.0	
Actuated g/C Ratio	0.08	0.48		0.11	0.52	0.52	0.28	0.28		0.28	0.28	
Clearance Time (s)	5.0	6.0		5.0	6.0	6.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)	2.0	6.0		2.0	6.0	6.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	124	2267		178	2459	766	230	439		133	439	
v/s Ratio Prot	c0.10	0.38		0.08	c0.47			0.20			0.12	
v/s Ratio Perm						0.06	0.34			c0.36		
v/c Ratio	1.31	0.78		0.76	0.90	0.12	1.23	0.72		1.29	0.43	
Uniform Delay, d1	55.5	25.6		52.1	26.3	14.9	43.5	39.3		43.5	35.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	187.4	2.7		15.9	6.1	0.3	137.3	9.8		176.6	0.2	
Delay (s)	242.9	28.3		68.0	32.4	15.3	180.8	49.1		220.1	36.0	
Level of Service	F	C		E	C	B	F	D		F	D	
Approach Delay (s)		46.4			33.1			107.8			115.7	
Approach LOS		D			C			F			F	

Intersection Summary			
HCM Average Control Delay	52.4	HCM Level of Service	D
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	92.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2560	33	448	33	33	33	644	1747	33	33	1309	1886
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00			1.00	1.00	1.00	0.95		1.00	0.95	0.88
Frt	1.00	0.86			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3183	1486			1685	1468	1641	3273		1641	3282	2584
Flt Permitted	0.95	1.00			0.60	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3183	1486			1036	1468	1641	3273		1641	3282	2584
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2783	36	487	36	36	36	700	1899	36	36	1423	2050
RTOR Reduction (vph)	0	208	0	0	0	33	0	1	0	0	0	275
Lane Group Flow (vph)	2783	315	0	0	72	3	700	1934	0	36	1423	1775
Heavy Vehicles (%)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Turn Type	Prot			Perm		Perm	Prot			Prot		pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases				8		8						6
Actuated Green, G (s)	39.2	53.7			10.5	10.5	20.1	47.0		3.1	30.0	69.2
Effective Green, g (s)	39.2	53.7			10.5	10.5	20.1	47.0		3.1	30.0	69.2
Actuated g/C Ratio	0.34	0.46			0.09	0.09	0.17	0.41		0.03	0.26	0.60
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	1077	689			94	133	285	1328		44	850	1633
v/s Ratio Prot	c0.87	0.21					c0.43	0.59		0.02	c0.43	0.37
v/s Ratio Perm					c0.07	0.00						0.32
v/c Ratio	2.58	0.46			0.77	0.02	2.46	1.46		0.82	1.67	1.09
Uniform Delay, d1	38.3	21.1			51.4	48.0	47.8	34.4		56.1	42.9	23.3
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	715.5	0.5			30.4	0.1	665.7	209.5		69.3	308.5	50.0
Delay (s)	753.8	21.6			81.8	48.1	713.6	243.9		125.4	351.4	73.3
Level of Service	F	C			F	D	F	F		F	F	E
Approach Delay (s)		638.0			70.6			368.7			186.6	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM Average Control Delay	391.6	HCM Level of Service	F
HCM Volume to Capacity ratio	2.09		
Actuated Cycle Length (s)	115.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	161.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group