SECOND ADDENDUM TO THE

CERTIFIED FINAL PROGRAM ENVIRONMENTAL IMPACT REPORT (PEIR)

FOR THE GENERAL PLAN 2025 PROGRAM

CITY OF RIVERSIDE, RIVERSIDE COUNTY, CALIFORNIA

(State Clearinghouse Number 2004021108)

CERTIFIED NOVEMBER 2007

RESOLUTION NUMBER 21535

SECOND ADDENDUM – NOVEMBER 10, 2009

RESOLUTION NUMBER XXXXX

CASE NUMBER – P09-0196 – MAGNOLIA AVENUE ROADWAY WIDENING, REHABILITATION, AND BEAUTIFICATION PROJECT – GENERAL AMENDMENT AND REVISION TO DRAFT MAGNOLIA AVENUE SPECIFIC PLAN

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SECTION 1
INTRODUCTION

1.1 Purpose and Background

This Second Addendum to the Certified Final Program Environmental Impact Report for the General Plan 2025 Program has been prepared by the City of Riverside ("City") in conformance with the California Environmental Quality Act (Public Resources Code, § 21000 et seq.) ("CEQA"), the State CEQA Guidelines (Cal. Code Regs., Title 14, Chapter 3 § 15000 et seq.) and the City of Riverside CEQA Resolution No. 21106, to address minor changes to the General Plan 2025 Program ("Program") (as defined below) as a result of the Magnolia Avenue widening, rehabilitation and beatification project ("Magnolia Avenue Project"). Those changes are a minor General Plan amendment to the Circulation Element and minor modifications to the Draft Magnolia Avenue Specific Plan.

The City is proposing to improve and beautify Magnolia Avenue from Buchanan Avenue to Tyler Street to meet transportation demands, improve safety and enhance aesthetics of the area. The *Conceptual Plans for Magnolia Avenue Improvements from Buchanan Street to Tyler Street* prepared by VA Consulting in June 2008 (see **Appendix A**), illustrates the project elements, described as follows:

1. Street Improvements

   a. Acquire right-of-way (ROW) and temporary construction easement (TCE) from portions of a number of parcels, as described in **Table 1** (Parcels for ROW Acquisitions and TCE).

   b. Widen the following five locations to provide dedicated right turn lanes:

      i. Eastbound approach of Magnolia Avenue at the intersection with La Sierra Avenue to provide dedicated right turn lanes for vehicles turning southbound;
      ii. Eastbound approach of Magnolia Avenue at the intersection with Tyler Street to provide dedicated right turn lanes for vehicles turning southbound;
      iii. Westbound approach of Magnolia Avenue at the intersection with Buchanan Avenue to provide dedicated right turn lanes for vehicles turning northbound;
      iv. Westbound approach of Magnolia Avenue at the intersection with Banbury Drive to provide dedicated right turn lanes for vehicles turning northbound;
      v. Northbound approach of Buchanan Avenue at the intersection with Magnolia Avenue to provide a dedicated right turn lane for vehicles turning eastbound onto Magnolia Avenue.

   c. Improve Magnolia Avenue at the SR-91 interchange

      i. Widen both sides of Magnolia Avenue to provide auxiliary lanes for the SR-91 interchange, as follows:
         1. The northern side of Magnolia Avenue would be widened from Halladay Avenue to a point approximately 500 feet east of Fillmore Street; and
         2. The southern side would be widened from Pierce Street to a point approximately 700 feet east of Fillmore Street.
      ii. Construct sidewalks on both sides of Magnolia Avenue to connect the sidewalks on the east side of SR-91 to the sidewalks on the west side of SR-91. Construction of the sidewalks under SR-91 would require retaining walls.

d. Improve Magnolia Avenue between Skylark Drive and Banbury Drive, as follows:

i. Reduce width of the median between Skylark Drive and Banbury Drive.
ii. Increase the number of lanes in each direction from two to three.
iii. Improve left turn lanes to increase safety and pocket lengths.
iv. Relocate the power pole at Polk Street.

e. Construct additional median improvements along Magnolia Avenue, as follows:

i. Increase the left turn pocket length at the median east of Golden Avenue.
ii. Increase safety in the median west of Golden Avenue.
iii. Add dual left turn lanes and increase the left turn pocket lengths at both medians at Pierce Street.

f. Construct four bus bays and nine bus pads along Magnolia Avenue throughout the project area.

g. Additional improvements include constructing curb ramps, driveways, cross gutters, and chain link fences. Also the project would relocate or adjust to grade the following utilities: street lights, water meters, water valves, backflow preventer. Finally, the project would rehabilitate entire roadway by cold milling and overlaying with asphalt pavement.

Table 1
Parcels for Right-of-Way (ROW) Acquisitions and Temporary Construction Easements (TCE)

APN	Address	General Plan Designation	Zoning Designation	Existing Land Use	TCE (sf)	ROW Acquisition (sf)
132-020-022	11880 Magnolia Ave.	Commercial (C)	Business and Manufacturing Park (BMP)	vacant	1,563	---
132-020-023	11812, 11820, 11840, 11850 & 11860 Magnolia Ave.	Commercial (C)	Business and Manufacturing Park (BMP)	commercial	1,571	---
132-020-019	11728, 11740, & 11748 Magnolia Ave.; 3773, 3751, & 3741 Merced Dr.; 11731 & 11741 Sterling Ave.	Business/Office Park (B/OP)	Business and Manufacturing Park (BMP)	business and manufacturing park	540	873
142-201-006	11789 Magnolia Ave.	Commercial (C)	Business and Manufacturing Park (BMP)	vacant w/ patchy vegetation	956	710
142-201-005	11781 Magnolia Ave.	Commercial (C)	Business and Manufacturing Park (BMP)	vacant w/ patchy vegetation	1,230	574
142-201-004	11765 Magnolia Ave.	Commercial (C)	Business and Manufacturing Park (BMP)	vacant w/ patchy vegetation	900	420
142-201-003	11755 & 11759 Magnolia Ave.	Commercial (C)	Business and Manufacturing Park (BMP)	commercial	3,204	1649

Table 1
Parcels for Right-of-Way (ROW) Acquisitions and Temporary Construction Easements (TCE)

APN	Address	General Plan Designation	Zoning Designation	Existing Land Use	TCE (sf)	ROW Acquisition (sf)
142-210-062	11547 Magnolia Ave.	High Density Residential (HDR)	Multiple-Family Residential (R-3-1500)	new condominiums	2,254	704
132-020-035	11590 Magnolia Ave.	Mixed Use-Village (MU-V)	Multiple-family Residential (R-3-1500)	vacant	1,881	471
132-020-036	11470, 11480, 11490, 11500, 11510, 11540 & 11550 Magnolia Ave.	Mixed Use-Village (MU-V)	Multiple-family Residential (R-3-1500)	vacant	4,940	42
132-020-033	3608 & 3668 Fillmore Ave.	Mixed Use-Village (MU-V)	Single-family Residential (R-1-7000)	vacant	2,556	---
132-053-007	11150, 11160, 11170 & 11194 Magnolia Ave.	Mixed Use-Urban (MU-U)	Commercial Retail (CR)	commercial	800	---
132-053-038	11140 Magnolia Ave.	Mixed Use-Urban (MU-U)	Commercial Retail (CR)	commercial	2,239	---
132-053-008	11120 Magnolia Ave.	Mixed Use-Urban (MU-U)	Commercial Retail (CR)	commercial	918	---
132-053-040	11110 Magnolia Ave.	Mixed Use-Urban (MU-U)	Commercial Retail (CR)	commercial	1,055	---
142-240-039	3800, 3802, 3804, 3812, 3814, 3816, 3818, 3820, 3822, 3824, 3826, 3828, 3830, 3832, 3834, 3836, 3838, 3840, 3844, 3848, 3850, 3856, 3860, 3862, 3864, 3868 & 3870 La Sierra Ave.	Mixed Use-Village (MU-V)	Commercial Retail (CR)	commercial	5,033	---
138-020-094	11050, 11060, 11064, 11066, 11070 & 11080 Magnolia Ave.	Mixed Use-Urban (MU-U)	Commercial General (CG)	commercial	1,232	---
142-261-007	10909, 10911, 10913, 10915, 10917, 10919, 10921, 10925, 10929, 10933, 10935, 10937, 10941, 10943, 10945, 10947, 10949, 10957, 10959, 10961, 10963, 10969, 10971, 10973 & 10975 Magnolia Ave.	Mixed Use-Village (MU-V)	Commercial Retail (CR)	commercial	2,278	---
143-180-020	10471 Magnolia Ave.	Mixed Use-Village (MU-V)	Commercial Retail (CR)	commercial	780	---
143-180-021	10445 & 10461 Magnolia Ave.	Mixed Use-Village (MU-V)	Commercial Retail (CR)	commercial	382	---
143-180-022	10411 Magnolia Ave.	Mixed Use-Village (MU-V)	Commercial Retail (CR)	commercial	424	---

Table 1 Parcels for Right-of-Way (ROW) Acquisitions and Temporary Construction Easements (TCE)						
APN	**Address**	**General Plan Designation**	**Zoning Designation**	**Existing Land Use**	**TCE (sf)**	**ROW Acquisition (sf)**
138-100-016	10350 & 10380 Magnolia; 3760, 3764, 3766, 3768, 3780, 3782, 3784 & 3790 Tyler Street.	Commercial (C)	Commercial Retail (CR)	commercial	1,065	---
138-100-020	10300 Magnolia Ave.	Commercial (C)	Commercial Retail (CR)	commercial	1,677	---

2. Beautification Improvements

The beautification portion of the Magnolia Avenue Project would provide new median landscaping for the Magnolia Avenue medians from Buchanan Avenue to Banbury Drive in conjunction with the roadway improvements as shown in the *Magnolia Avenue Median Conceptual Plan* prepared by RHA, Inc., in June 2008 (see **Appendix B**). The existing medians can be divided by width into a wide section and a narrow section. The proposed beautification improvements consist of two similar designs, each reflecting the different median widths and incorporating a water-wise design using appropriate plant materials, hardscape, and irrigation elements.

The wider section between Buchanan Avenue to Golden Avenue follows the intent of the guidelines of the Draft Magnolia Avenue Specific Plan's La Sierra District, which strives to restore the historic grandeur of Magnolia Avenue and create a western gateway into the City. In accordance with the guidelines, the median's citrus planting would be expanded at each end of the median in the stretch between Buchanan Avenue to Fillmore Street. To further enhance the citrus heritage of the La Sierra area, a replica of the Gage Canal would be constructed at each median nose in addition to the citrus planting. Historic elements such as smudge pots, concrete irrigation stand pipes and propeller-type wind machines would be installed as public artwork.

The La Sierra District recommends that the median planting be simplified by utilizing one type of tree. Southern Magnolia is proposed based on its flowering character, historic value, and use within the median in other areas. The ground under the Magnolia trees would be planted with drought tolerant turf and shrubs.

The narrower section between Golden Avenue and Banbury drive is designed to reflect the guidelines of the Draft Magnolia Avenue Specific Plan's Galleria District. The design would maintain a single row of Magnolia trees down the center of the median with an accent tree planting of Pink Tabebuia and under-planting of Day Lily at each intersection.

Both designs represent a vision of the Draft Magnolia Avenue Specific Plan while being sensitive to current water conservation needs. The designs propose utilizing colorful low to medium usage shrubs in addition to turf to reduce overall water use. The irrigation system is designed with high efficiency rotary nozzles for turf and landscape drip lines for shrub areas. A 4-foot wide oversized maintenance band of masonry block keeps the irrigation system a significant distance away from the curb edge further reducing water overspray into the street; saving water and preventing water related pavement failure.

All existing median palm trees are proposed to be relocated off-site per the recommendations of the La Sierra and Galleria Districts' guidelines. In the event that the palm tree relocation is cost-prohibitive, a long-term phasing plan may be necessary to address strategies for removal and possible relocation of these trees. Existing Magnolia trees would be preserved if possible, but the new median geometrics would require removal of many existing trees. This would be mitigated with the installation of new box-size Magnolia grandiflora and Tabebuia trees.

3. General Plan Amendment

Currently the Circulation Element of the General Plan 2025 Master Plan of Roadways (General Plan Figure CCM-4) designates Magnolia Avenue as a 120-foot wide Arterial Roadway. However, "Note No. 1" of the Figure CCM-4 and the Circulation Element text proposes that Magnolia Avenue be built to only four lanes, except where six lanes exist (near Tyler Street). Also more specifically, Circulation Element Policy CCM-3.1 limits Magnolia Avenue to four travel lanes south and west of Arlington Avenue while maintaining the six-lane right-of-way (i.e. maintaining additional right-of-way to accommodate future transit, such as Bus Rapid Transit (BRT)).

This proposed General Plan Amendment involves a text change to the Circulation Element (including a change to Note 1 of the CCM-4 – Master Plan of Roadways) to reflect that Magnolia Avenue would be planned and built as a six lane arterial for the portion of Magnolia Avenue westerly of Harrison Street and built to four-lanes easterly of Harrison Street. The proposed amendment would not result in any changes to the ultimate street right-of-way under the existing Master Plan of Roadways, but instead would involve reducing the width of existing medians to add additional travel lanes. As such, the proposed amendment does not preclude future transit, such as BRT.

1.2 Lead Agency and Discretionary Approvals

This Addendum documents the City's consideration of the potential environmental impacts resulting from the minor changes to the Program as a result of the Magnolia Avenue widening, rehabilitation and beatification project resulting in a General Plan amendment and minor modification to the Draft Magnolia Avenue Specific Plan and explains the City's decision that a subsequent EIR is not required. The City of Riverside is the lead agency and has approval authority over the Program and changes that are included as part of this project.

1.3 Documents Incorporated by Reference

Section 15150 of the State CEQA Guidelines encourage environmental documents to incorporate by reference other documents that provide relevant data and analysis.

The following documents are hereby incorporated by reference within this Addendum, and all of these documents are considered part of the Final PEIR.

- *Certified Final Program Environmental Impact Report – City of Riverside General Plan 2025 Program,* ***Certified Final Environmental Impact Report****, State Clearinghouse #2004021108, Volumes I, II & III,* Certified November 20, 2007.

- *Addendum To The Certified Final Program Environmental Impact Report (PEIR) For The General Plan 2025 Program*, adopted February 24, 2009.

- *General Plan 2025,* adopted November 20, 2007.
- *General Plan 2025 Implementation Plan,* adopted November 20, 2007.
- *Zoning Code,* adopted November 27, 2007.
- *Subdivision Code,* adopted November 27, 2007.
- *Amendment to the Noise Code,* adopted November 27, 2007.
- *Citywide Design and Sign Guidelines* adopted November 20, 2007.

These documents incorporated by reference are available for review at the City of Riverside Community Development Department – Planning Division.

1.4 CEQA Requirements for Use of an Addendum

When a lead agency has already prepared an EIR, CEQA mandates that "no subsequent or supplemental environmental impact report shall be required by the lead agency or any responsible agency, unless one or more of the following events occurs: (a) substantial changes are proposed in the project which will require major revisions of the environmental impact report; (b) substantial changes occur with respect to the circumstances under which the project is being undertaken which will require major revisions in the environmental impact report; (c) new information, which was not known and could not have been known at the time the environmental impact report was certified as complete, becomes available" (Cal. Pub. Res. Code, § 21166). State CEQA Guidelines Section 15162 clarifies that a subsequent EIR or supplemental EIR is only required when "substantial changes" occur to a project or the circumstances surrounding a project, or "new information" about a project implicates "new significant environmental effects" or a "substantial increase in the severity of previously significant effects."

When only some changes or additions to a previously certified EIR are necessary and none of the conditions described in Public Resources Code Section 21166 or Section 15162 of the State CEQA Guidelines calling for the preparation of a subsequent or supplemental EIR are met, CEQA allows the lead agency to prepare and adopt an addendum. (State CEQA Guidelines, § 15164(a).)

Previous analysis of environmental impacts has been conducted for the Program, including an Initial Study, a draft PEIR, and a Certified Final PEIR ("Final PEIR").

1.5 Summary of Analysis and Findings

Based upon the environmental checklist prepared for the Magnolia Avenue Project (Section 3) and supporting checklist responses (Section 4), other than the minor changes to the Program in reference to the project, no further clarification or additional explanation is warranted, beyond the analysis contained in the Final PEIR. The environmental effects associated with the changes in the Magnolia Avenue Project do not require additional analysis beyond the analysis previously prepared and distributed in the Final PEIR.

Pursuant to Section 15164 of the State CEQA Guidelines, the City of Riverside finds that only minor modifications are required to the Circulated Final PEIR and that none of the conditions described in Public Resources Code Section 21166 or Section 15162 of the CEQA Guidelines

requiring preparation of a subsequent or supplemental EIR have occurred. More specifically, the City of Riverside has determined that:

- The primary basis for the changes to the Program is to improve traffic conditions and aesthetically enhance Magnolia Avenue; thereby reducing environmental traffic impacts and improving roadway level of service (LOS).

- There are no substantial changes to the project that would require major revisions of the Final PEIR for the Program, due to new significant environmental effects or a substantial increase in the severity of impacts identified in the Final PEIR.

- No substantial changes have occurred in the circumstances under which the project is being undertaken that will require major revisions of the Final PEIR to disclose new significant environmental effects or that would result in a substantial increase in the severity of the impacts identified in the Final PEIR. However, the traffic model for the Program was a program level model based upon data collected in 2003. A more recent corridor specific model taken in 2008, looking at the area between Tyler Street and the westerly City limit, indicates a revised projection of 39,400 vehicles per day where the General Plan 2025 model only predicted 37,500 vehicles per day. The difference is a level of service (LOS) at 4 lanes in 2025 of F or a LOS at 6 lanes in 2025 of C. This newer data does not substantially change the circumstances of the Final PEIR but rather provides information that supports the Magnolia Avenue Project which will improve the LOS on Magnolia Avenue between Tyler Street and the westerly City limit.

- There is no new information of substantial importance, which was not known at the time that the previous Final PEIR for the Magnolia Avenue Project was circulated, indicating that:

  - The Magnolia Avenue Project will not have one or more significant effects not previously discussed in the Final PEIR;

  - There are no impacts that were determined to be significant in the previous Final PEIR that would be substantially more severe.

  - There are no additional mitigation measures or alternatives to the project that would substantially reduce one or more of the significant effects identified in the previous Final PEIR; and

  - There are no additional mitigation measures or alternatives which were rejected by the project proponent that are considerably different from those analyzed in the previous Final PEIR that would substantially reduce any significant impact identified in the Final PEIR.

SECTION 2
DESCRIPTION OF THE PROPOSED ACTION

2.1 Project Description

Changes to the Program description as noted in the Final PEIR are not necessary due to the minor non-substantive changes proposed by the Magnolia Avenue Project.

The Program still remains as the adoption and implementation of the following programmatic land use planning documents:

1. Comprehensive update of the City of Riverside General Plan.

2. Comprehensive update of the City of Riverside Zoning Code (Title 19 of the Municipal Code of the City of Riverside) and the rezoning of properties to reflect new zone names and to respond to General Plan land use designation changes in focus areas Citywide.

3. Comprehensive update of the City of Riverside Subdivision Code (Title 18 of the Riverside Municipal Code of the City of Riverside).

4. Amendment to the Noise Code (Title 7 of the Municipal Code of the City of Riverside).

5. Adoption of the Magnolia Avenue Specific Plan.

6. Adoption of Citywide Design and Sign Guidelines.

See Chapter 3 of Volume II of the Final PEIR for a complete project description.

2.2 Environmental Setting

The City's Planning Area for the Program encompasses approximately 143 square miles and includes a broad array of land uses, ranging from high-density residential, and commercial to semi-rural to agricultural.

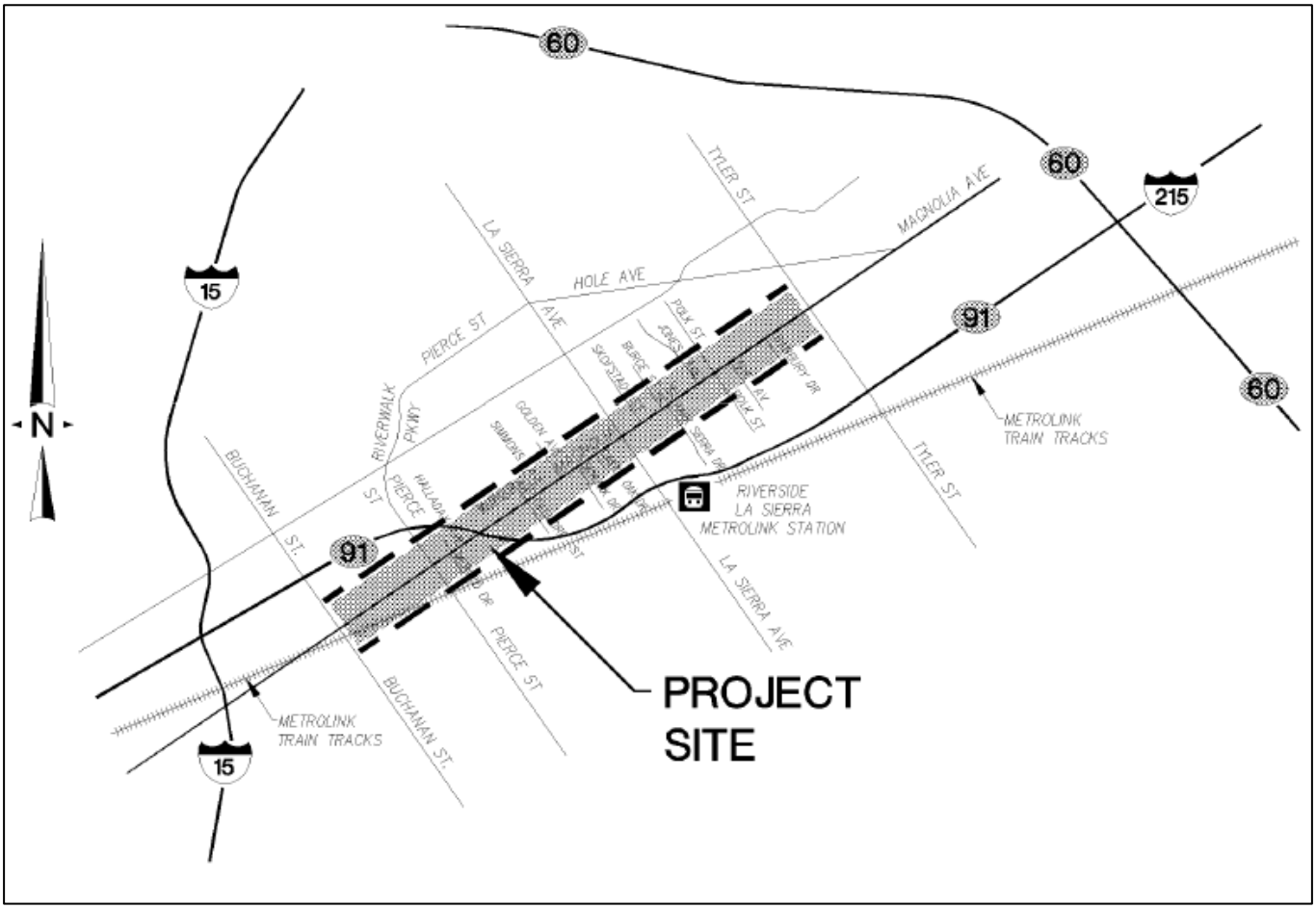
The City of Riverside is located in western Riverside County and is bounded on the north by the unincorporated Riverside County communities of Rubidoux and Jurupa and the cities of Colton and Rialto (San Bernardino County), on the east by Riverside County and the City of Moreno Valley, to the south by unincorporated Riverside County, and to the west by the Riverside County and the cities of Norco and Corona.

See Chapter 4 of Volume II of the Final PEIR for a complete description of the environmental setting.

Magnolia Avenue Project Setting

The General Plan land use designations and zoning designations for the properties on the north and south side of Magnolia Avenue in the project area are described in **Table 2** (Land Uses and Zoning on Adjacent Properties).

Table 2 Land Uses and Zoning on Adjacent Properties		
Street Segments	**General Plan Land Use Designations**	**Zoning**
North side of Magnolia Avenue, from west to east		
Buchanan Street to Pierce Street	Business/Office Park (B/OP) Commercial (C)	Business and Manufacturing Park (BMP) Commercial Retail (CR)
Pierce Street to Golden Avenue	High Density Residential (HDR) Commercial (C)	Single-family Residential (R-1-7000) Multiple-Family Residential (R-3-1500) Office (O) Commercial Retail (CR) Business and Manufacturing Park (BMP)
Golden Avenue to La Sierra Avenue	High Density Residential (HDR) Mixed Use-Village (MU-V)	Multiple-Family Residential (R-3-1500) Commercial Retail (CR)
La Sierra Avenue to Polk Street	Mixed Use-Village (MU-V)	Commercial Retail (CR)
Polk Street to Tyler Street	Mixed Use-Village (MU-V) Commercial (C)	Commercial Retail (CR)
East of intersection of Magnolia Avenue and Tyler Street		
Northeast of intersection	Commercial (C)	Commercial Retail (CR)
Southeast of intersection	Commercial Regional Center (CRC)	Commercial Retail (CR)
South side of Magnolia Avenue, from west to east		
Buchanan Street to Pierce Street	Business/Office Park (B/OP)	Business and Manufacturing Park (BMP)
Pierce Street to Golden Avenue	High Density Residential (HDR) Commercial (C) Business/Office Park (B/OP) Mixed Use-Village (MU-V)	Single-family Residential (R-1-7000) Multiple-Family Residential (R-3-1500) Multiple-Family Residential (R-3-2000) Business and Manufacturing Park (BMP)
Golden Avenue to La Sierra Avenue	Medium Density Residential (MDR) High Density Residential (HDR) Mixed Use-Urban (MU-U)	Single-family Residential (R-1-7000) Multiple-Family Residential (R-3-1500) Commercial Retail (CR)
La Sierra Avenue to Polk Street	Mixed Use-Urban (MU-U)	Single-family Residential (R-1-7000) Commercial Retail (CR) Commercial General (CG)
Polk Street to Tyler Street	Mixed Use-Urban (MU-U) Commercial (C)	Commercial Retail (CR)
West of intersection of Magnolia Avenue and Buchanan Street		
Northwest of intersection	Business/Office Park (B/OP)	Business and Manufacturing Park (BMP)
Southwest of intersection	Medium Density Residential (MDR)	Business and Manufacturing Park (BMP)



Source: VA Consulting, June 2008

SECTION 3
ENVIRONMENTAL CHECKLIST

	Environmental Issues	New Significant Impact	More Severe Impacts	No Substantial Change From Previous Analysis
I.	**Aesthetics** Would the project**:**			
a)	Have a substantial adverse effect on a scenic vista?	☐	☐	☒
b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic building within a state scenic highway?	☐	☐	☒
c)	Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒
d)	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒
II.	**Agriculture Resources** In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:			
a)	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☒
b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☒
c)	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☒
III.	**Air Quality** The following responses are based on the air quality data provided in Appendix c of this document. The air quality data includes an air quality assessment methodology, existing regional and local air quality data, and air emissions calculations. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:			
a)	Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒
b)	Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒

Environmental Issues	New Significant Impact	More Severe Impacts	No Substantial Change From Previous Analysis
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒
IV. Biological Resources Would the project:			
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☒
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☒
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of wildlife nursery sites?	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☒
V. Cultural Resources Would the project:			
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☒

Environmental Issues	New Significant Impact	More Severe Impacts	No Substantial Change From Previous Analysis
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒
VI. Geology and Soils Would the project:			
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving:			
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☒
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒
iv) Landslides?	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☒
VII. Hazards And Hazardous Materials Would the project:			
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment?	☐	☐	☒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒

Environmental Issues	New Significant Impact	More Severe Impacts	No Substantial Change From Previous Analysis
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☒
VIII. Hydrology and Water Quality Would the project:			
a) During project construction, will it create or contribute runoff water that would violate any water quality standards or waste discharge requirements, including the terms of the City's municipal separate stormwater sewer system permit?	☐	☐	☒
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted?	☐	☐	☒
c) Substantially alter the existing drainage pattern of area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site?	☐	☐	☒

Environmental Issues	New Significant Impact	More Severe Impacts	No Substantial Change From Previous Analysis
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒
f) Otherwise substantially degrade water quality?	☐	☐	☒
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☒
h) Place within a 100-year flood hazard area structures, which would impede or redirect flood flows?	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☒
IX. Land Use and Planning Would the project:			
a) Physically divide an established community?	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural communities conservation plan?	☐	☐	☒
X. Mineral Resources Would the project:			
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☒
XI. Noise Would the project:			
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒
b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?	☐	☐	☒
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒

Environmental Issues	New Significant Impact	More Severe Impacts	No Substantial Change From Previous Analysis
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒
XII. Population and Housing Would the project:			
a) Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☒
c) Displace substantial numbers of people necessitating the construction of replacement housing elsewhere?	☐	☐	☒
XIII. Public Services Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:			
a) Fire Protection?	☐	☐	☒
b) Police Protection?	☐	☐	☒
c) Schools?	☐	☐	☒
d) Parks?	☐	☐	☒
e) Other public facilities?	☐	☐	☒
XIV. Recreation			
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	☐	☐	☒

Environmental Issues	New Significant Impact	More Severe Impacts	No Substantial Change From Previous Analysis
XV. Transportation/Traffic Would the project:			
a) Cause an increase in traffic, which 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)?	☐	☐	☒
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☒
c) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☒
f) Result in inadequate parking capacity?	☐	☐	☒
XVI. Utilities and Service Systems Would the project:			
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☒
e) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☒

Environmental Issues	New Significant Impact	More Severe Impacts	No Substantial Change From Previous Analysis
XVII. Mandatory Findings of Significance			
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☒
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☐	☒
c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒

ENVIRONMENTAL DETERMINATION

Based upon the evidence in light of the whole record documented in the attached environmental checklist explanation and cited incorporations:

☐ I find that the amended project has previously been analyzed as part of an earlier CEQA document. The amended project is a component of the whole action analyzed in the previous CEQA document.

☒ I find that the amended project has previously been analyzed as part of an earlier CEQA document. Minor additions and/or clarifications are needed to make the previous documentation adequate to cover the project which are documented in this addendum to the earlier CEQA document (CEQA § 15164).

☐ I find that the amended project has previously been analyzed as part of an earlier CEQA document. However, there is important new information and/or substantial changes have occurred requiring the preparation of an additional CEQA document (ND or EIR) pursuant to CEQA Guidelines Sections 15162 through 15163.

Signed _____ Date 8/20/09
Ken Gutierrez, Planning Director

SECTION 4
DISCUSSION OF ENVIRONMENTAL EVALUATION

I. Aesthetics

a) Have a substantial adverse effect on a scenic vista?

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

c) Substantially degrade the existing visual character or quality of the site and its surroundings?

d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

No Substantial Change from Previous Analysis (a-d). As indicated in the Final PEIR, with adherence to and implementation of the General Plan Policies, **MM Aes 1**, and City standards related to streetlights, it was found that the Program potential aesthetic impacts would be reduced to below a level of significance. One of the primary purposes of the Magnolia Avenue Project is to improve the aesthetics of Magnolia Avenue, restore its historic grandeur, reflect the City's citrus heritage, and create a western gateway into the City. The Magnolia Avenue Project would include specific design elements that illustrate the City's roots in the citrus industry, which was flourishing in the City as early as the 1880s. For example, between Buchanan Avenue and Fillmore Street, the median's citrus planting would be expanded at each end of the median, and a replica of the Gage Canal would be constructed at each median nose in addition to the citrus planting. Historic elements such as smudge pots, concrete irrigation stand pipes and propeller-type wind machines would be installed as public artwork.

Note that as part of the aesthetic improvements to Magnolia Avenue, all existing median palms are proposed to be relocated off-site. In the event the palm tree relocation is cost-prohibitive, a long-term phasing plan may be necessary to address strategies for removal and possible relocation of these trees. Existing Magnolia trees would be preserved if possible, but the new median geometrics would require removal of many existing trees. This would be mitigated with the installation of new box-size Magnolia grandiflora and Tabebuia trees. As such the Magnolia Avenue Project would have a **less than significant impact** directly, indirectly and cumulatively aesthetically. These changes do not change the analysis previously performed in the Final PEIR or increase the impacts on aesthetics.

II. Agricultural Resources

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?

No Substantial Change from Previous Analysis (a-c). As indicated in the Final PEIR for the Program, the Program required a Statement of Overriding Considerations for the impacts associated with the conversion of land under Williamson Act Contract indirectly; the conversion of agricultural uses to non-agricultural use through redesignations which do not allow for agricultural uses; the designation for other than agricultural uses on Prime Farmland, Farmland of Statewide Importance, and Unique Farmland and the overall decline of agriculture in the region. The Magnolia Avenue Project does not increase or significantly change the impacts on agricultural resources as no agricultural resources exist within or near the Project area.

III. Air Quality

a) Conflict with or obstruct implementation of the applicable air quality plan?

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

d) Expose sensitive receptors to substantial pollutant concentrations?

e) Create objectionable odors affecting a substantial number of people?

No Substantial Change from Previous Analysis (a-e). URBEMIS Air Quality Model Runs were prepared by Ultra Systems Environmental on February 25, 2009 (**Appendix C**) for the Magnolia Avenue Project. The model runs determined that the Magnolia Avenue Project would not adversely change the estimated emissions associated with the overall Program.

Air quality impacts from the Magnolia Avenue Project can be divided into two types: short-term impacts and long-term impacts. Short-term impacts are associated with construction activities, and long-term impacts are those resulting from the continued operation of the proposed uses and the associated increase in vehicular trips from the proposed use. The SCAQMD developed CEQA Regional Significance Thresholds when evaluating potential significant air quality impacts. It is appropriate for the City to use SCAQMD thresholds since the City is located within the South Coast Air Basin (SCAB), which is under the jurisdiction of the SCAQMD.

Short-term (Construction) Impacts

Construction of the proposed project would generate temporary, short-term emissions of various air pollutants. Construction emissions can be distinguished as either on-site or off-site. On-site air pollutant emissions during construction would principally consist of exhaust emissions from heavy-duty construction equipment, and fugitive particulate matter from earthwork and material handling operations. Off-site emissions would result from truck delivery of construction materials and hauling of construction debris, and workers commuting to and from the project site. Pollutant emissions would vary from day to day depending on the intensity and type of construction activity.

The Magnolia Avenue Project construction activities would involve removal of existing infrastructure, grading, trenching, installation of new infrastructure, and paving and finishing. Since detailed construction design information was not available at the time this document was prepared, the construction emissions were estimated using construction schedule and equipment usage for a typical roadway widening construction project. For purpose of this analysis, the project anticipates:

- A maximum of six pieces of construction equipment, operating simultaneously in a given day; and
- A maximum of five truck trips per day, occurring for soil hauling, and/or for materials delivery.

On-site and off-site emissions of criteria pollutants from construction activities were estimated using the construction module of URBEMIS2007 (see **Appendix C**). Equipment exhaust emissions were determined using the URBEMIS2007 default values for horsepower and load factors. Estimated emissions from the proposed project construction are shown in **Table 3** (Maximum Daily Construction Emissions) and are compared with the SCAQMD thresholds of significance. Note that the emission estimates do not take into account emission reductions per implementation of typical fugitive dust control measures that would be required to comply with SCAQMD Rule 403.

Table 3
Maximum Daily Construction Emissions

	Pollutant Emission (lbs/day)				
	VOC	***NO_X***	***CO***	***PM_{10}***	***$PM_{2.5}$***
Maximum Daily Construction Emissions	**4.65**	**33.43**	**18.21**	**5.63**	**2.75**
SCAQMD Significance Thresholds	*75*	*100*	*550*	*150*	*55*

As shown in **Table 3**, maximum daily construction emissions would be below the SCAQMD significance thresholds for all criteria pollutants. Air quality impacts associated with the proposed project construction would be temporary and **less than significant**.

Long-term (Operational) Impacts

The proposed street improvement project is designed to meet transportation demands, improve safety and enhance aesthetics of the area. Operation of the proposed project would not generate new stationary or mobile sources of emissions, and therefore would not contribute to an increase in criteria pollutants. In fact, because the project would improve traffic circulation, it would have a beneficial impact on air emissions. No long-term air quality impacts would occur.

GHG Emissions

During construction, the main source of GHG emissions would be the combustion of fossil fuels by construction equipment diesel engines. The only GHG the URBEMIS2007 model considers is carbon dioxide (CO2), and CO2 emissions from construction activities were estimated at 3,260.80 lbs/day (1.63 tons/day) for the duration of project construction (**see Appendix C**). Construction equipment also emits small

amounts of other GHGs, such as methane (CH4) and nitrous oxide (N2O); however, these are relatively minor compared to the CO2 emissions, and the CO2 emissions are assumed to representative of all construction-related GHG emissions. The SCAQMD has not established significance thresholds for GHGs. Given the short-term nature of project construction, GHG impacts associated with project construction would be **less than significant**.

The project is a roadway widening project designed to improve existing and forecasted future traffic circulation. Thus, operation of the proposed project would not generate new stationary or mobile sources of emissions; rather, it would have a beneficial impact on the emission of GHG. No long-term GHG impacts would occur.

For the overall Program, as indicated in the Final PEIR (§7.5.3), even with the implementation of mitigation measures **MM Air 1 – MM Air 12**, previously included in the Final PEIR air quality impacts resulting from the proposed project will be reduced, but potential impacts are still significant. A Statement of Overriding Consideration was approved for the long- and short-term air emissions, including criteria pollutants and global warming gases. Analysis of the proposed Magnolia Avenue Project indicate that this change to the Program does not increase or significantly change the impacts on air quality as previously analyzed.

IV. Biological Resources

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service?

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

e) Conflict with any local applicable policies protecting biological resources?

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other applicable habitat conservation plan?

No Substantial Change from Previous Analysis (a-f). As indicated in the Final PEIR, with adherence to and implementation of **MM Bio 1**, General Plan policies, and compliance with existing regulations, the Project's potential biological impacts were reduced to below a level of significance.

The change to the Program by the Magnolia Avenue Project will affect APNs 132-020-035 and -036 which are located in a Burrowing Owl Survey Area. The Magnolia Avenue Project would temporarily occupy a 6,821 square feet (0.16 acre) narrow strip of land along the northern edge of APNs 132-020-035 and -036 for temporary construction easements and would use a 513 square foot (0.01 acre) very narrow strip of land (0 to 4 feet wide) for permanent acquisition for the Magnolia Avenue Project. This would result in potential impacts to burrowing owls. To reduce potential impacts, mitigation measure MM Biological 1 would require pre-construction burrowing owl surveys in accordance with current California Department of Fish and Game (CDFG) and current Burrowing Owl Consortium guidelines. With incorporation of this mitigation, impacts to burrowing owls would be **less than significant**.

In addition, the Magnolia Avenue Project would affect a number of existing trees, the removal and/or relocation of trees would be consistent with all applicable federal, state, and local policies and regulations related to the protection of biological resources and tree preservation. Specifically:

- The Magnolia Avenue Project is required to comply with Riverside Municipal Code Section 16.72.040 establishing the MSHCP mitigation fee and Section 16.40.040 establishing the Threatened and Endangered Species Fees.
- The Magnolia Avenue Project would be required must to follow the City of Riverside Urban Forest Tree Policy Manual, which documents guidelines for the planting, pruning, preservation, and removal of all trees in City rights-of-way. The specifications in the Manual are based on national standards for tree care established by the International Society of Arboriculture, the National Arborists Association, and the American National Standards Institute.
- The Magnolia Avenue Project would follow the landscape guidelines of the Draft Magnolia Avenue Specific Plan for the La Sierra and Galleria Districts.

Although the project would relocate and/or remove existing trees, it will comply with existing applicable federal, state, and local policies and regulations, including the Urban Forest Tree Policy Manual. Therefore, impacts will be **less than significant**.

None of these proposed changes to the Program will increase impacts on biological resources beyond that which has already been analyzed under the PEIR.

V. Cultural Resources

a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

d) Disturb any human remains, including those interred outside of formal cemeteries?

No Substantial Change from Previous Analysis (a-d). The Final PEIR evaluated impacts to cultural resources from the Project. With adherence to and implementation of MM Cultural 1 – MM Cultural 6, General Plan policies, as well as adherence to standard Federal, State and City regulations, the impact to cultural resources was found to be less than significant.

Cultural Resources

For the Magnolia Avenue Project a Cultural Resources Survey of Historic Resources (**Appendix E**) was prepared by the City of Riverside on May 5, 2009 to determine if the project area qualifies for historic designation at a local, state or national level. Magnolia Avenue and affected properties with structures 50 years or older were evaluated. The survey concluded that the proposed project area of Magnolia Avenue does not qualify for historic designation at the federal, state or local level as the project area of Magnolia Avenue between Tyler Street and Buchanan Avenue was never included in the original section landscaped by the Riverside Land and Irrigating Company in 1877. Today the designated Landmark section of Magnolia Avenue extends from Arlington Avenue to San Rafael Way. The project area is not contiguous to the Landmark portion of Magnolia Avenue, nor does it resemble the original design and landscaping laid out by the Riverside Land and Irrigating Company. The proposed traffic and landscape improvements do not eliminate any historically significant aspect of the roadway or adversely affect the designated Landmark section of Magnolia Avenue.

Right-of-way acquisitions and temporary construction easements will affect several properties identified in Table 1 of this document. Among the properties listed in Table 1, a property located at 11759 Magnolia Avenue (APN 142-201-003) is occupied by a house believed to be 50 years or older (City building permit records do not indicate when the house was built). Given its estimated age, the property and house was evaluated for historical significance as part of the City's Cultural Resource Survey. The survey concluded that the house is currently being used as a business and because its setting has been significantly altered it does not qualify for historic designation at the federal, state or local level.

Therefore, the Magnolia Avenue Project does not cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5.

Archaeological Resources

Based on what is known of the histories of local Native American groups and previously recorded archaeological sites, significant archeological resources are known to exist within the City. Construction of the Magnolia Avenue Project could cause disturbance and/or the destruction of known significant archaeological resources, as defined in the CEQA Guidelines, Section 15064.5 as noted in the Cultural Resources Report. A records search at the Eastern Information Center (EIC), University of California, Riverside, for archeological resources was prepared by Bai "Tom" Tang, Principal Investigator at CRM Tech and is attached as **Appendix D**. The records search found that no archaeological sites have been previously recorded within 1,000 feet of the segment of Magnolia Avenue between Buchanan Street and Tyler Street. While no known archeological resources were identified in the records search, mitigation measure MM Cultural 1 and 2 would

reduce project related adverse impacts to archeological resources and sites containing Native American human remains that may be inadvertently discovered during construction. Through implementation of appropriate mitigation measures (MM Cultural 1 and 2) per the GP 2025 FPEIR, impacts to archeological resources directly, indirectly and cumulatively as a result of the Magnolia Avenue Project can be reduced to a less than significant level.

Human Remains

Where construction is proposed in undeveloped areas, disturbance on vacant lands could have the potential to disturb or destroy buried Native American human remains as well as other human remains, including those interred outside of formal cemeteries. Consistent with State laws protecting these remains, sites containing human remains must be identified and treated in a sensitive manner. In the event that Native American human remains are inadvertently discovered during project-related construction activities, there would be unavoidable significant adverse impacts to Native American resources, but implementation of the Cultural Resources Mitigation Measures 1 and 2 would reduce impacts to human remains, including those interred outside of formal cemeteries, to a less than significant level.

With the implementation of General Plan Program Mitigation Measures the proposed changes of the Magnolia Avenue Project do not change the analysis of the Final PEIR in anyway and do not increase or change the impacts on cultural resources.

VI. Geology and Soils

Would the project:

a) *Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:*

i) *Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.*

ii) *Strong seismic ground shaking?*

iii) *Seismic-related ground failure, including liquefaction?*

iv) *Landslides?*

b) *Result in substantial soil erosion or the loss of topsoil?*

c) *Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?*

d) *Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?*

e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

No Substantial Change from Previous Analysis (a-e). The Final PEIR prepared for the Project evaluated impacts related to geology and soils. With adherence to and implementation of the General Plan policies, existing regulations and Codes, the Project's potential geologic impacts will be reduced below a level of significance at the programmatic level. The proposed changes of the Magnolia Avenue Project do not affect this analysis and do not increase or change the impacts on geology and soils.

VII. Hazards and Hazardous Materials

Would the project:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

No Substantial Change from Previous Analysis (a - h). The Final PEIR analyzed the potential for in impacts related to hazardous materials, airport hazards, wildland fire hazards, and emergency responses. With adherence to and implementation of General Plan policies and **MM Haz 1 – MM Haz 3**, the Project's impacts related to hazardous materials, airport hazards, wildland fire hazards, and emergency responses were found to be less than significant at a programmatic level**.**

The Magnolia Avenue Project involves roadway improvements. The construction of the roadway improvements have the potential to create a hazard to the public or environment

through the routine transportation, use, and disposal of construction related hazardous materials as the project would include the delivery and disposal of hazardous materials such as fuels, oils, solvents, and other materials. These materials are typical of materials delivered to construction sites.

Existing federal and state laws adequately address risks associated with the transport of hazardous materials. The California Department of Transportation is mandated to implement the regulations published as the Code of Federal Regulations, Title 49, commonly referred to as 49 CFR. With regard to the transportation of hazardous materials and wastes, these regulations govern the manufacture of packaging and transport containers; packing and repacking; labeling; and the marking of hazardous material transport. Any transport of hazardous materials to the project site would be subject to the federal and state regulations described above. As well, the City of Riverside Fire Department has the authority to inspect on-site uses and to enforce State and federal laws governing the storage, use, transport, and disposal of hazardous materials and wastes.

Oversight by the appropriate federal, state, and local agencies, and compliance with applicable regulations related to the handling, storage and disposal of hazardous materials ensures a **less than significant** impact directly, indirectly and cumulatively through the implementation of standard State and federal requirements and City ordinances protecting the public or the environment from the routine transport, use, or disposal of hazardous materials.

The proposed changes of the Magnolia Avenue Project would not increase or significantly change impacts related to hazards and hazardous materials and would not result in the potential for any additional hazards to the public or the environment that have not already been evaluated and mitigated to a level of less than significant in the Final PEIR.

VIII. Hydrology and Water Quality

a) *During project construction, will it create or contribute runoff water that would violate any water quality standards or waste discharge requirements, including the terms of the City's municipal separate stormwater sewer system permit or waste discharge requirements?*

b) *Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?*

c) *Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?*

d) *Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?*

e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

f) Otherwise substantially degrade water quality?

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

h) Place within a 100-year flood hazard area structures, which would impede or redirect flood flows?

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

j) Inundation by seiche, tsunami, or mudflow?

No Substantial Change from Previous Analysis (a – j). The Magnolia Avenue Project would construct roadway and landscaped median improvements that would add 110,000 square feet of impervious surfaces (e.g. pavement) and 6,000 square feet of pervious surfaces (e.g. landscaping), resulting in a net increase of 104,000 square feet (2.4 acres) of impervious surface and a net increase in total surface runoff.

It is noted that a review of the National Flood Insurance Rate Map (Community Panel Number 06065C0715G dated August 28, 2008) and Figure 5.8-2 -- Flood Hazard Areas of the Final PEIR, shows that the Magnolia Avenue Project site is not located within or near a 100-year flood hazard area. However, it is located within a 500-year flood hazard area and subject to dam inundation from the Lake Mathews Dam, Harrison Dam, and Mockingbird Canyon Dam. In the event of a dam failure, first flow waters are expected to reach the site in 20 to 110 minutes, depending on the dam. However, the project is a roadway improvement project and would not involve the construction of super structures such as bridges or buildings. Furthermore, the Magnolia Avenue Project would improve existing roadways that are already subject to the same level of risk from flooding and dam inundation. Therefore, relative to the existing setting, the Magnolia Avenue Project would not increase risk from flooding, or dam inundation; therefore, impacts from the 500-year flood would be **less than significant**.

As indicated in the Final PEIR, adherence to and implementation of the General Plan policies, as well as adherence to standard Federal, State and local regulations, mitigated potential hydrology and water quality impacts at the General Plan level to the degree feasible. The precise reduction in pollutant reduction could not be quantified, however. Further, at General Plan level of review, no other feasible mitigation existed to completely avoid such impacts because, despite the implementation of BMPs and other measures, small amounts of pollutants may have impacted impaired water bodies. For this reason, both direct and cumulative impacts to water quality were found to be significant.

In addition, the Final PEIR found that potential significant environmental impacts could result if one of the nine dams located within the Planning Area failed. Although compliance with State Civil Code Section 1103 – 1103.4 would notify those potentially affected when real estate changes owners, it would not reduce the impact. Also, new and existing developments may add small amounts of pollutants to runoff into the Santa Ana

River and San Jacinto River, which are impaired receiving waters and as such the impacts related to exceeding water quality standards or waste discharge requirements related to implementation of the General Plan as a whole are considered significant. Therefore, potential impacts due to the General Plan 2025 remained significant and unavoidable with respect to catastrophic dam failure.

A Statement of Overriding Considerations was adopted for these impacts, and the Magnolia Avenue Project does not change the analysis previously prepared in the Final PEIR. The changes proposed by the Magnolia Avenue Project do not increase the impacts on hydrology and water quality.

IX. Land Use and Planning

a) Physically divide an established community?

b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

No Substantial Change from Previous Analysis (a-c). Currently the Circulation Element of the General Plan 2025 Master Plan of Roadways (Figure CCM-4) designates Magnolia Avenue as a 120-foot wide Arterial Roadway. However, "Note No. 1" of the Figure CCM-4 – Master Plan of Roadways and the Circulation Element text proposes Magnolia Avenue to be built to four lanes, except where six lanes exist (near Tyler Street). Also, more specifically, Circulation Element Policy CCM-3.1 limits Magnolia Avenue to four travel lanes south and west of Arlington Avenue while maintaining the six-lane right-of-way (i.e. maintaining additional right-of-way to accommodate future transit, such as Bus Rapid Transit (BRT)).

The project proposes to establish Magnolia Avenue as a 6-lane arterial roadway, from Harrison Street to the westerly City limit, so as to meet transportation demands, improve safety, and enhance aesthetics of the area. The changes to Magnolia Avenue are necessary to accommodate increases in traffic on Magnolia Avenue (see Transportation/Traffic).

In addition to amending the General Plan 2025, the Draft Magnolia Avenue Specific Plan will also be amended to reflect the Magnolia Avenue Project. Changes to the Specific Plan include: 1) minor text revisions; 2) change to Policy 2.1; 3) change to Figure 5.8B – Roadway Cross-Sections with Potential Buildout – Magnolia Avenue between Jones Avenue and Burge Avenue; 4) change to Figure 6.1 – La Sierra District Streetscape; and 5) add Figure 6.1 b – La Sierra District Streetscape.

The General Plan Amendment and Specific Plan changes would be consistent with the overall goals and policies of the General Plan. Objectives CCM-2 and CCM-6 as well as Policy CCM-2.2 state the City's intent to build a transportation system that meets the City's needs while minimizing environmental impacts, including air quality impacts. Policy CCM-2.3 describes the minimum levels of service on arterial streets, such as Magnolia Avenue. If the Magnolia Avenue Project were not implemented, then it is

forecasted that Magnolia Avenue would not meet the City's needs, would not achieve the minimum level of service identified for arterial roadways, and would generate increased air quality impacts resulting from idling vehicles. Policies CCM-2.2 and 2.8 emphasize the importance of aesthetic considerations along roadways. The project would support these policies in that it would include significant enhancements to the medians to create a western gateway to the City and to reflect the City's citrus heritage. In sum, the General Plan Amendment would support the overall goals and policies of the General Plan better than maintaining Magnolia Avenue in its current state of a mixed 4-lane and 6-lane arterial roadway, as is currently stated in the General Plan.

As indicated in the Final PEIR, with adherence to and implementation of General Plan policies, impacts related to land use and planning that were found to be less than significant. The changes proposed by the Magnolia Avenue Project will not change this analysis or increase or significantly change the impacts on land use and planning.

X. Mineral Resources

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

No Substantial Change from Previous Analysis (a, b). As indicated in the Final PEIR, implementation of the General Plan would not physically disrupt or prohibit the mining of state-designated areas, and impacts were found to be less than significant. The changes proposed by the Magnolia Avenue Project will not change this analysis or increase or significantly change the impacts on mineral resources.

XI. Noise

Would the project result in:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

No Substantial Change from Previous Analysis (a-f). At the project level, the proposed Magnolia Avenue Project would improve Magnolia Avenue to meet transportation demands, improve safety and enhance aesthetics of the area. It would not introduce new stationary and/or mobile noise sources upon its operation, and therefore would not change ambient noise environment in the vicinity. The Magnolia Avenue Project involves the widening of Magnolia Avenue by 4 feet to provide an auxiliary lane for the SR-91 interchange near 11547 Magnolia Avenue (APN 142-210-062), which is zoned for multifamily residential uses and developed with condominiums. Although traffic noise would potentially move 4 feet closer to the onsite sensitive receptors in the residences, the noise level increase would be minimal and not perceptible. Therefore, impacts from the Magnolia Avenue Project would be **less than significant**.

Although short-term, construction related activities are the most common source of groundborne noise that could affect occupants of neighboring uses throughout the City. The Federal Transit Administration (FTA) uses a peak particle velocity (PPV) of 0.2 inch per second as the vibration damage threshold for fragile buildings and a PPV of 0.12 inch per second for extremely fragile historic buildings. The FTA criterion for infrequent ground-borne vibration events (less than 30 events per day) that may cause annoyance is 83 vibration decibels (VdB) for institutional land uses with primarily daytime use.

The FTA has published standard vibration levels for construction equipment operations. The calculated root mean square (RMS) velocity level expressed in VdB and PPV for construction equipment at distances of 50, 75, and 100 feet are listed in **Table 4** (Vibration Levels of Construction Equipment).

Table 4
Vibration Levels of Construction Equipment

Equipment	PPV at 50 ft (in/sec)	RMS at 50 ft (VdB)	PPV at 75 ft (in/sec)	RMS at 75 ft (VdB)	PPV at 100 ft (in/sec)	RMS at 100 ft (VdB)
Large Bulldozer	0.0315	81	0.0171	73	0.0111	69
Loaded Truck	0.0269	80	0.0146	72	0.0095	68
Jackhammer	0.0124	73	0.0067	65	0.0044	61
Small Bulldozer	0.0011	52	0.0006	44	0.0004	40

Source: FTA. 2006. *Noise and Vibration Impact Assessment.* May. Chapter 12.

As shown in **Table 4**, the vibration levels of construction equipment would be below the FTA damage threshold of 0.12 inch per second PPV for fragile historic buildings at a distance of 50 feet. In addition, since it is not expected that heavy equipment, such as large bulldozers or loaded trucks, would operate close enough to any residences, the project's construction would not generate groundborne vibrations that would cause human annoyance (considering the FTA threshold of 83 VdB). Therefore, the construction impact would be **less than significant**.

For the Program a thorough noise analysis was presented in the Final PEIR. The changes proposed by the Magnolia Avenue Project would not involve any activities that would increase noise associated with the Program or change this analysis.

As analyzed in the Final PEIR, the General Plan would create noise that would affect new and existing sensitive receptors. Most of the noise is anticipated to come from increased traffic as a result of increased population. Policies incorporated into the General Plan

reduce this impact, but most would only benefit new receptors rather than existing receptors. Existing receptors will be exposed to increased noise levels that exceed General Plan noise standards and represent a permanent and substantial increase. The mitigation measures **MM Noise 1 – MM Noise 6**, adopted as part of the General Plan, substantially lessen these impacts; however, the exact degree of noise reduction was not feasibly quantifiable at the time of approval of the General Plan. Therefore, these impacts remained significant and unavoidable, and a Statement of Overriding Consideration was adopted.

XII. Population and Housing

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

No Substantial Change from Previous Analysis (a-c). The Magnolia Avenue Project level, the project would not displace existing housing, necessitating the construction of replacement housing elsewhere. As described in **Table 1**, the Magnolia Avenue Project would involve the permanent acquisition of small portions of a number of parcels and would also use portions of parcels for temporary construction easements (TCEs). Several of these parcels are zoned and designated by the General Plan Land Use map for residential or mixed uses.

The Magnolia Avenue Project would acquire small portions of three parcels zoned for residential or mixed uses: APNs 132-020-035, 132-020-036, and 142-210-062. APNs 132-020-035 and -036 are currently vacant. Because the Magnolia Avenue Project would acquire only narrow slivers of land on the edges of the properties where they adjoin Magnolia Avenue, development of the Magnolia Avenue Project would not preclude the future development of residential units on these two parcels. The third parcel (APN 142-210-062) was recently developed with condominiums. The Magnolia Avenue Project would acquire a 704 square foot strip of land that is approximately four feet wide into the property; however, it would not necessitate the removal of any residential units.

Regarding TCE, the project would use portions of 14 parcels identified by the General Plan Land Use map for residential or mixed uses for TCEs. Of the 14 parcels, all but one is currently developed with commercial uses or is vacant. Only APN 142-210-062 is developed with a residential use. On APN 142-210-062, the TCE would extend approximately 10 feet into the property along the property's edge with Magnolia Avenue and the SR-91 west bound onramp, for a total of 2,254 square feet (0.05 acre) of TCE. As with the permanent acquisition, the TCE would be located in the setback of existing residences, but it would not necessitate the removal of any residential units.

Thus, the Magnolia Avenue Project would not displace existing housing, necessitating the construction of replacement housing elsewhere and impacts would be **less than significant**.

At the Program indicated in the Final PEIR, impacts remain significant and unavoidable related to population growth due to the General Plan. A Statement of Overriding Considerations was adopted. The changes proposed by the Magnolia Avenue Project do not change this analysis or increase or significantly change impacts to population and housing.

XIII. Public Services

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

a) Fire Protection?

b) Police Protection?

c) Schools?

d) Parks?

e) Other public facilities?

No Substantial Change from Previous Analysis (a-e). As indicated in the Final PEIR, the impacts related to increased services for fire, police, schools, parks and libraries were found to be less than significant because of the General Plan policies, existing regulations which require funds from new development to pay their fair share toward impacts and implementation of **MM PS 1 – MM PS 2**. The Magnolia Avenue Project does not change this analysis or increase or significantly change impacts to public services.

XIV. Recreation

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

No Substantial Change from Previous Analysis (a, b). As indicated in the Final PEIR, with adherence to and implementation of **MM Rec 1 and 2**, General Plan Policies, the Park and Recreation Master Plan, the Renaissance SIP, and the collection of appropriate Park Development Impact Fees, the General Plan's impacts related to recreational facilities were decreased. However, the actual construction of park and recreational facilities to meet City requirements could not be determined with certainty. Thus, it was considered possible that the required improvements to park and recreational facilities would not be constructed in time to mitigate the project's cumulative impacts to below the level of significance. Therefore, after mitigation, it was found that the General Plan's cumulative impacts could remain significant, and a Statement of Overriding

Consideration was adopted. The Magnolia Avenue Project has no impact on recreation and therefore does not change the analysis of Final PEIR in regard to recreation.

XV. Transportation/Traffic

a) Cause an increase in traffic which 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)?

b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?

c) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

e) Result in inadequate emergency access?

f) Result in inadequate parking capacity?

No Substantial Change from Previous Analysis (a-f). The Magnolia Avenue corridor is an important four-lane east-west roadway that parallels SR 91 through the City of Riverside. It is classified as a 120-arterial, Special Boulevard on the Master Plan of Roadway in the General Plan 2025. The traffic model for the Program was a program level model based upon data collected in 2003. Based on the Magnolia Avenue Improvements Traffic Analysis (**Appendix F**) prepared by the Public Works Department, the Magnolia Avenue corridor is nearing or currently exceeding capacity and will continue to exceed capacity in the future General Plan year 2025, if no improvements are made. Looking at the area between Tyler Street and the westerly City limit, a revised projection results in 39,400 vehicles per day where the General Plan 2025 model only predicted 37,500 vehicles per day. The difference is a level of service (LOS) at 4 lanes in 2025 of F or a LOS at 6 lanes in 2025 of C.

The existing arterial level of service according to travel times and speeds (performance analysis) is currently LOS D, but there are some sections of the Magnolia Avenue corridor that perform at LOS E and LOS F under existing four-lane conditions. Additionally, in the General Plan year 2025, the entire corridor is expected to perform at LOS E with substantial operational deterioration within some segments.

In order to alleviate congestion and accommodate projected traffic volumes, the Public Works Department recommends widening the Magnolia Avenue corridor to 6 lanes (3 lanes in each direction) with a dedicated bike lane in each direction from Tyler Street to approximately Castle Oak Drive (west of La Sierra Avenue). The Magnolia Avenue Project would also construct an auxiliary lane in each direction on Magnolia Avenue from Pierce Street through the SR 91 interchange. After these improvements are implemented, the Magnolia Avenue corridor would decrease rather than increase the volume to capacity ratio and will perform at a volume to capacity and arterial LOS C. Because the Magnolia Avenue Project would improve the level of service, impacts would be **less than significant.**

Traffic impacts were evaluated in the Final PEIR for the Program. Potential impacts associated with traffic, design features, emergency access, inadequate parking, and alternative modes of transportation were found to be less than significant without mitigation.

Even with the implementation of the mitigation measures **MM Trans 1 – MM Trans 2,** impacts to LOS at studied intersections citywide and impacts to the overall traffic within the City and Sphere of Influence, were such that not all projected roadway links will be able to accommodate the increases at LOS D or better. Where a LOS of D could not be achieved these impacts were considered significant and unavoidable and a Statement of Overriding Consideration was adopted. The proposed changes of the Magnolia Avenue Project do not change this analysis or increase or significantly change impacts to transportation/traffic. In fact, the Magnolia Avenue Project will improve the LOS on Magnolia Avenue from Tyler Street to the westerly City limit.

XVI. Utilities and Service Systems

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

g) Comply with applicable federal, state, and local statutes and regulations related to solid waste?

No Substantial Change from Previous Analysis (a-g). As indicated in the Final PEIR, impacts on utilities and service systems were found to be less than significant at the programmatic level for the General Plan at the expected typical build-out levels. With adherence to and implementation of General Plan policies, implementation tools, and EIR mitigation measures **MM UTL 1 – MM UTL 4**, impacts related to water, sewer, storm drain, energy, and telecommunications utilities and service systems caused by demand in excess of typical project levels were found to be less than significant. Solid waste generated by the Program at typical levels was also found to be less than significant. It was found that solid waste generated by the Program in excess of typical levels cumulatively could be significant if landfill capacity in the region is not increased, and, as

such, a Statement of Overriding Consideration was adopted. The proposed changes of the Magnolia Avenue Project do not change this analysis or increase or significantly change impacts to utilities and service systems.

XVII. Mandatory Findings of Significance

a) *Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?*

No Substantial Change from Previous Analysis. As indicated in the Final PEIR, potential impacts related to habitat of fish or wildlife species as discussed in the Biological Resources Section 7.5.4, were all found to be less than significant with mitigation. Additionally, potential impacts to cultural, archaeological and paleontological resources related to major periods of California and the City of Riverside's history or prehistory as discussed in the Cultural Resources Section 7.5.5 were also found to be less than significant with mitigation. The Magnolia Avenue Project changes do not adversely affect this analysis or increase or significantly change impacts to habitat of fish or wildlife species.

b) *Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?*

No Substantial Change from Previous Analysis. The cumulative effects of the Magnolia Avenue Project were included in Section 7.6.0 and as proposed Magnolia Avenue Project does not change this analysis or increase or significantly change the Program's cumulative impacts.

c) *Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?*

No Substantial Change from Previous Analysis. The Final PEIR, based on the analysis and conclusions therein, found that implementation of the Program may have potential impacts, directly or indirectly to human beings, with respect to agricultural lands, air quality, noise, population and housing, and traffic. Potential direct and indirect impacts that result from the proposed project were discussed in detail in the Environmental Impact Analysis, Section 7.5, within each issue area, and are summarized throughout the entire Final PEIR document. The proposed changes of the Magnolia Avenue Project do not change this analysis or increase or significantly change the Program's direct or indirect effects on human beings.

SECTION 5
REFERENCES

Certified Final Program Environmental Impact Report – City of Riverside General Plan 2025 Program, ***Certified Final Environmental Impact Report****, State Clearinghouse #2004021108, Volumes I, II & III,* Certified November 20, 2007.

Addendum To The Certified Final Program Environmental Impact Report (PEIR) For The General Plan 2025 Program dated February 24, 2009.

General Plan 2025, adopted November 20, 2007.

General Plan 2025 Implementation Plan, adopted November 20, 2007.

Zoning Code, adopted November 27, 2007.

Subdivision Code, adopted November 27, 2007.

Amendment to the Noise Code, adopted November 27, 2007.

Citywide Design and Sign Guidelines p adopted November 20, 2007.

SECTION 6
APPENDICES

Appendix A - Conceptual Plan for Magnolia Avenue Improvements prepared by VA Consulting on June 20, 2008.

Appendix B – Conceptual Landscape Plan for Magnolia Avenue Median Improvements prepared by RHA Landscape Architects on June 2, 2008

Appendix C – Urbemis Emissions Report Prepared by VA Consulting on February 25, 2009

Appendix D – Cultural Resource Investigation Prepared by CRM Tech on February 6, 2009

Appendix E – Historic Survey Report Prepared by the City of Riverside Planning Division – Historic Preservation on May 5, 2009

Appendix F – Magnolia Avenue Improvements Tyler Street to Buchanan Street Analysis of Capacity, Level of Service and Performance prepared the City of Riverside Public Works Department on October 30, 2008.

Appendix A

Conceptual Plan for Magnolia Avenue Improvements

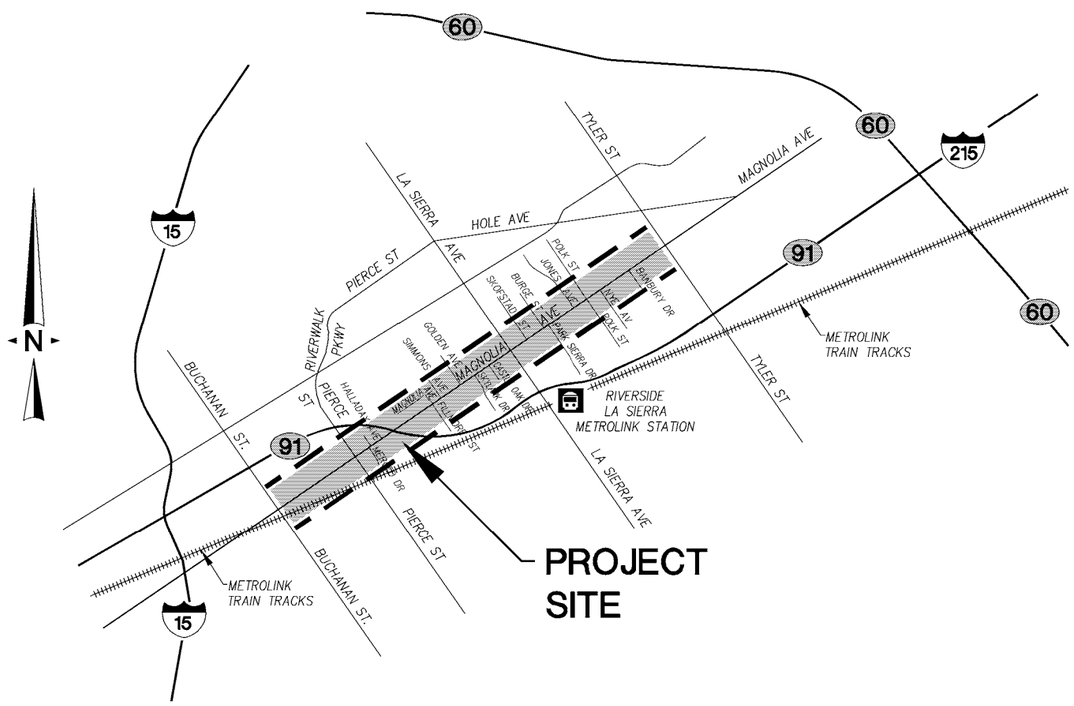
CITY OF RIVERSIDE, CALIFORNIA

PUBLIC WORKS DEPARTMENT

CONCEPTUAL PLANS FOR

MAGNOLIA AVENUE IMPROVEMENTS

FROM BUCHANAN STREET TO TYLER STREET



LOCATION MAP

PREPARED BY:			
VA CONSULTING	**VA Consulting, Inc.** ENGINEERS · PLANNERS · SURVEYORS	*MAGNOLIA AVE. IMPROVEMENTS CONCEPT PLAN* *MAGNOLIA AVE. FROM BUCHANNAN ST. TO TYLER ST.*	
	17801 CARTWRIGHT ROAD IRVINE, CA 92614 (949) 474-1400 TEL (949) 261-8482 FAX	HORIZ. SCALE: N/A VERT. SCALE: N/A	SHEET 1 OF 10 DATE: 6/20/08

MAGNOLIA AVE. IMPROVEMENTS - CONCEPT PLAN
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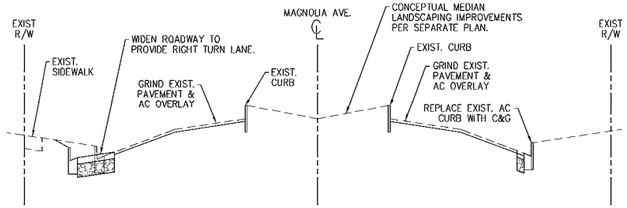
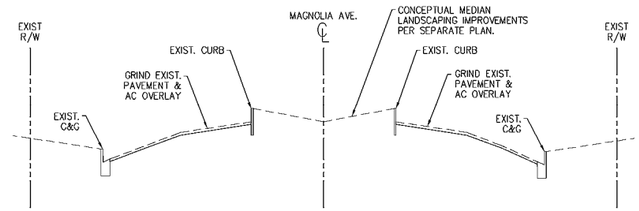
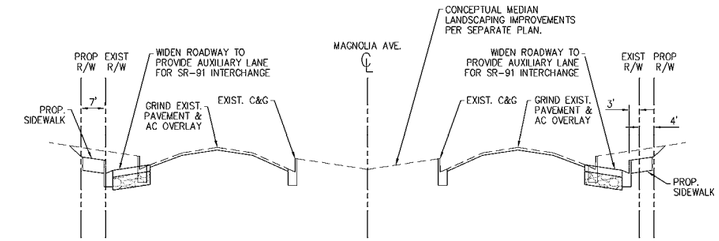


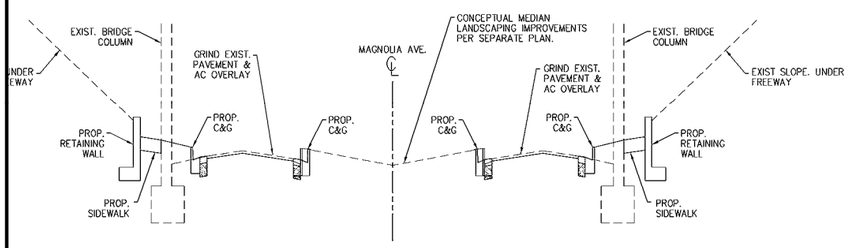
BUCHANAN AVE. TO 13+20



13+20 TO MERCED DR.



MERCED DR. TO SR-91



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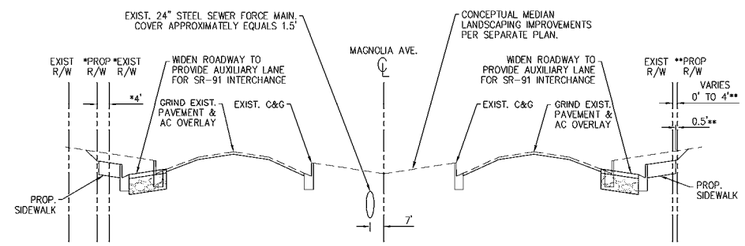
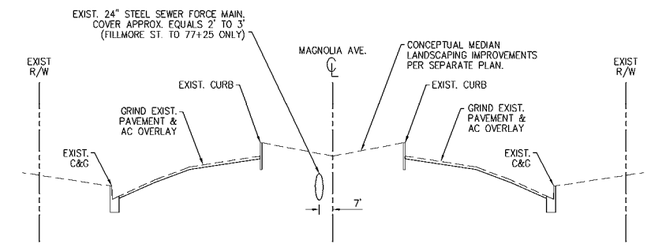


* DENOTES STA. 57+50 TO 58+43.65

** DENOTES STA. 55+00 TO 57+25

SR-91 TO FILLMORE ST.



FILLMORE TO 77+25

ADDITIONAL NOTES

1. ALL PROPOSED ROADWAY WIDENING SECTIONS SHALL HAVE A SLOPE OF 2% MINIMUM.
2. AC OVERLAY THICKNESSES AND PROPOSED WIDENING PAVEMENT SECTIONS TO BE PROVIDED BY GEOTECH AFTER GEOTECHNICAL INVESTIGATION HAS BEEN COMPLETED.
3. THE HEIGHT OF ALL EXISTING MEDIANS ADJACENT TO PROPOSED AC OVERLAY WILL BE REDUCED BY A VALUE EQUAL TO THE THICKNESS OF THE PROPOSED AC OVERLAY.
4. ALL EXISTING MEDIAN CURBS, CURB AND GUTTERS, AND SIDEWALKS INDICATED ON TYPICAL SECTIONS ARE PROTECTED IN PLACE UNLESS OTHERWISE NOTED.
5. LANE WIDTHS AND TYPICAL MEDIAN AND PARKWAY WIDTHS SHOWN ON PLAN VIEW.

PREPARED BY:

VA CONSULTING

VA Consulting, Inc.

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MAGNOLIA AVE. IMPROVEMENTS CONCEPT PLAN

MAGNOLIA AVE. FROM BUCHANAN ST. TO TYLER ST.

HORIZ. SCALE: 1"=40' VERT. SCALE: N/A

SHEET 2A OF 10

DATE: 6/20/08

MAGNOLIA AVE. IMPROVEMENTS - CONCEPT PLAN
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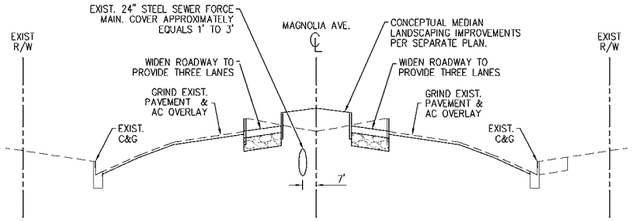
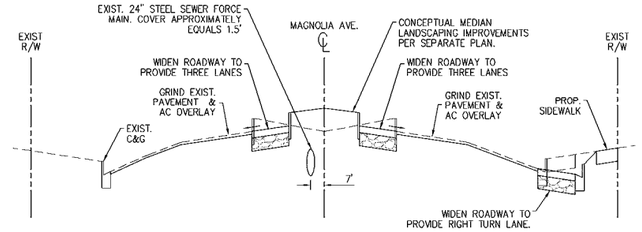
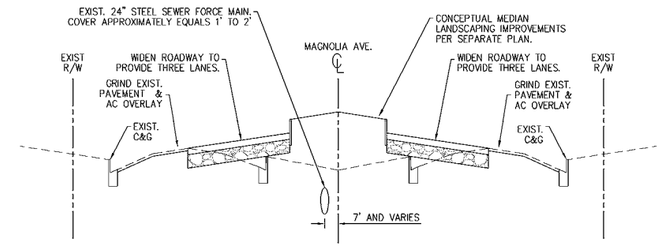


77+25 TO 88+50

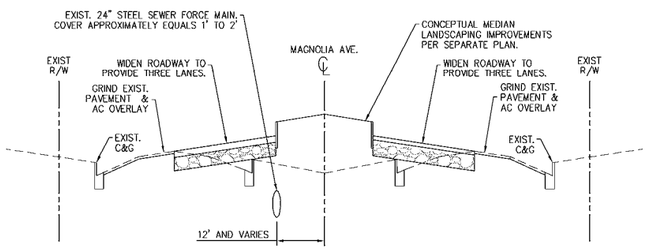
LA SIERRA AVE. TO PARK SIERRA DR.



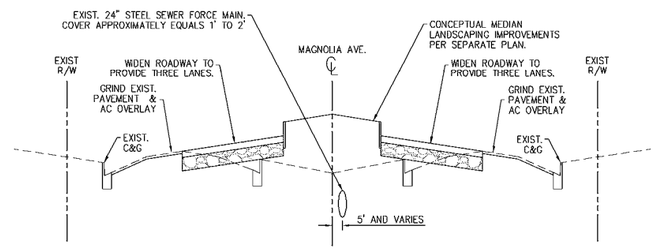
88+50 TO LA SIERRA AVE.



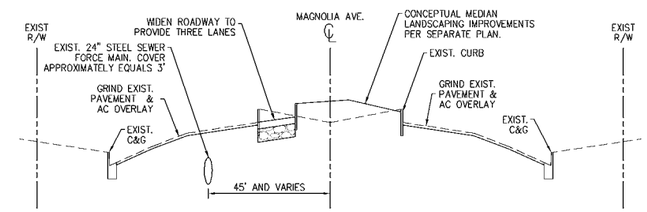
PARK SIERRA DR. TO 118+50



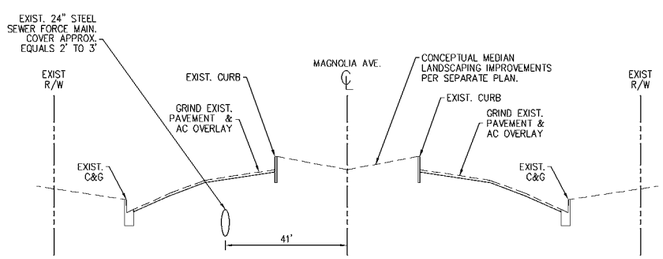
118+50 TO 121+50



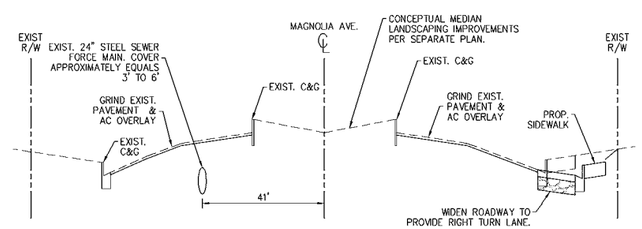
121+50 TO BANBURY DR.



BANBURY DR. TO 137+50



137+50 TO 143+50



143+50 TO TYLER ST.

ADDITIONAL NOTES

1. ALL PROPOSED ROADWAY WIDENING SECTIONS SHALL HAVE A SLOPE OF 2% MINIMUM.
2. AC OVERLAY THICKNESSES AND PROPOSED WIDENING PAVEMENT SECTIONS TO BE PROVIDED BY GEOTECH AFTER GEOTECHNICAL INVESTIGATION HAS BEEN COMPLETED.
3. THE HEIGHT OF ALL EXISTING MEDIANS ADJACENT TO PROPOSED AC OVERLAY WILL BE REDUCED BY A VALUE EQUAL TO THE THICKNESS OF THE PROPOSED AC OVERLAY.
4. ALL EXISTING MEDIAN CURBS, CURB AND GUTTERS, AND SIDEWALKS INDICATED ON TYPICAL SECTIONS ARE PROTECTED IN PLACE UNLESS OTHERWISE NOTED.
5. LANE WIDTHS AND TYPICAL MEDIAN AND PARKWAY WIDTHS SHOWN ON PLAN VIEW.

PREPARED BY:

VA CONSULTING

VA Consulting, Inc.

ENGINEERS · PLANNERS · SURVEYORS

17801 CARTWRIGHT ROAD
IRVINE, CA 92614

(949) 474-1400 TEL
(949) 261-8482 FAX

MAGNOLIA AVE. IMPROVEMENTS
CONCEPT PLAN

MAGNOLIA AVE. FROM BUCHANNAN ST. TO TYLER ST.

HORIZ. SCALE: 1"=40' VERT. SCALE: N/A

SHEET 2B OF 10

DATE: 6/20/08

MAGNOLIA AVE. IMPROVEMENTS - CONCEPT PLAN
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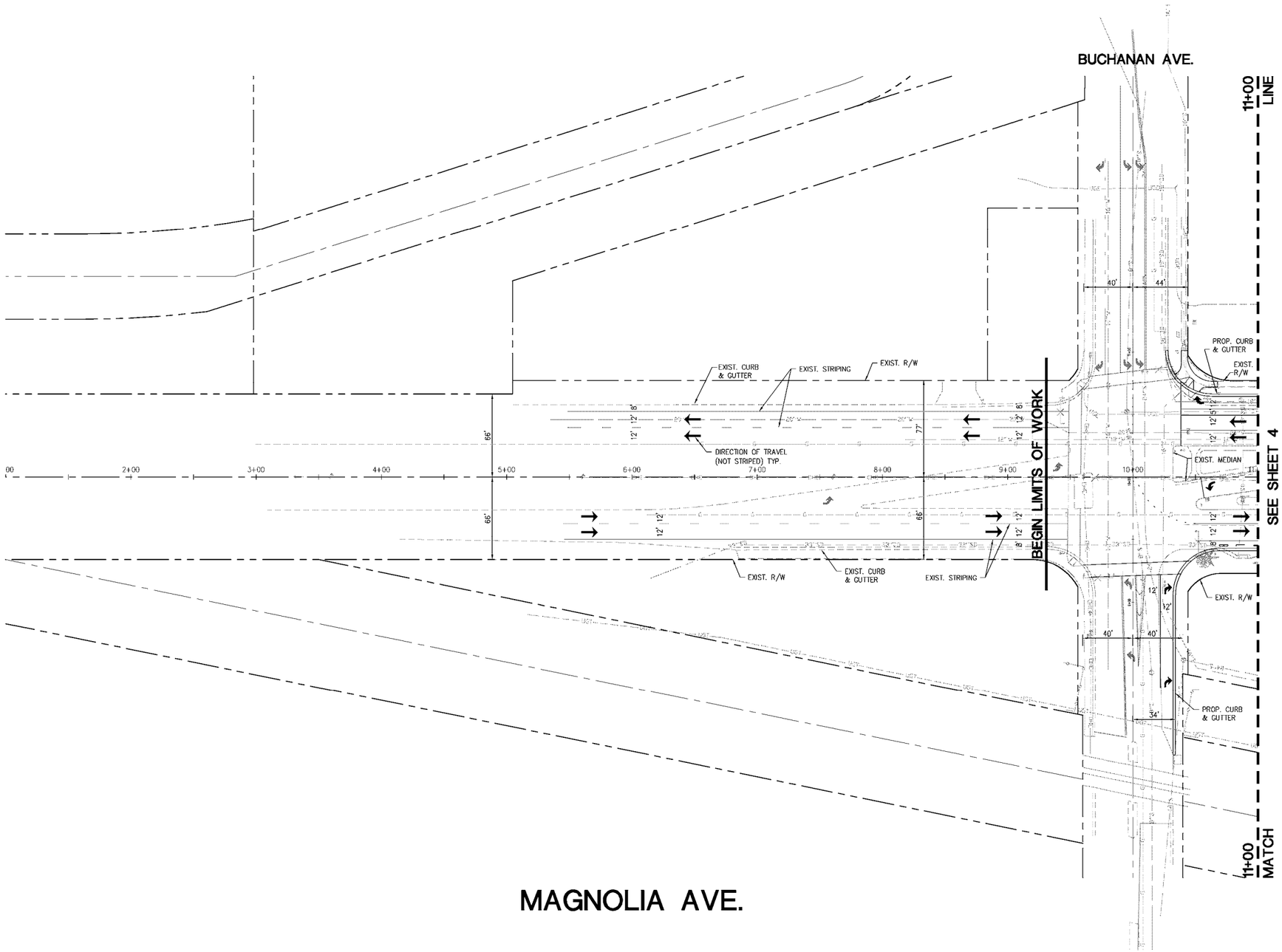

TEMPORARY CONSTRUCTION EASEMENT (TCE)

RIGHT OF WAY ACQUISITION (RW)

N

SCALE: 1"=40'

GRAPHIC SCALE

40 0 40 120

SCALE: 1" = 40

PREPARED BY:			
VA CONSULTING	**VA Consulting, Inc.** ENGINEERS · PLANNERS · SURVEYORS	*MAGNOLIA AVE. IMPROVEMENTS CONCEPT PLAN* *MAGNOLIA AVE. FROM BUCHANAN ST. TO TYLER ST.*	
	17801 CARTWRIGHT ROAD IRVINE, CA 92614	(949) 474-1400 TEL (949) 261-8482 FAX	SHEET 3 OF 10
		HORIZ. SCALE: 1"=40' VERT. SCALE: N/A	DATE: 6/20/08

MAGNOLIA AVE. IMPROVEMENTS - CONCEPT PLAN
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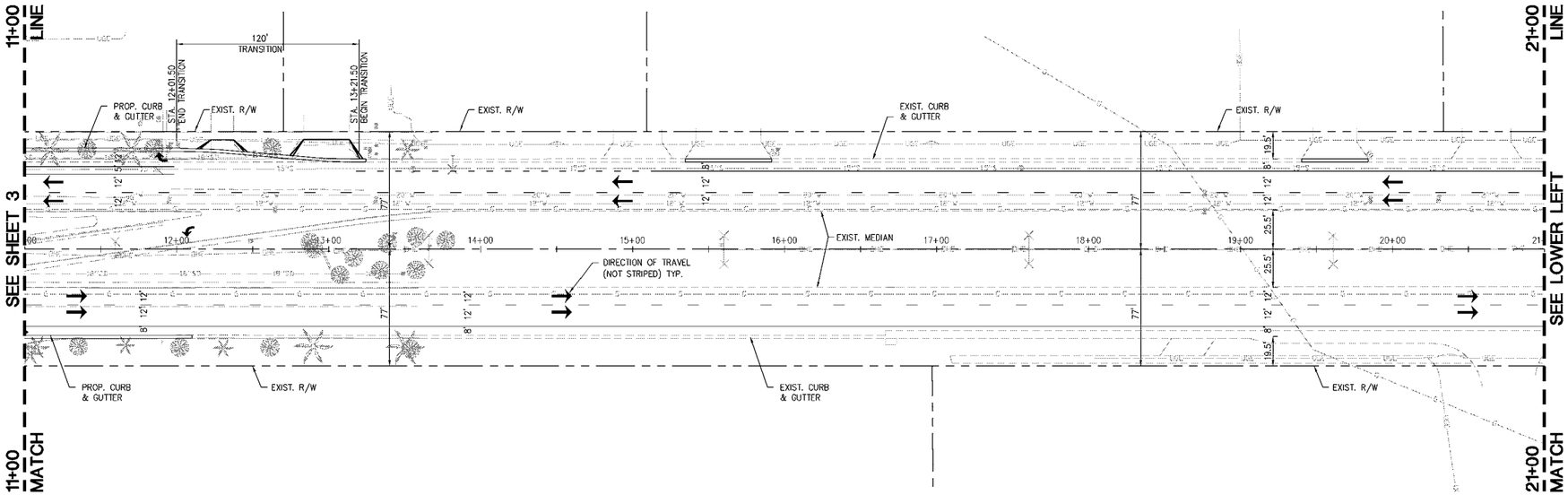
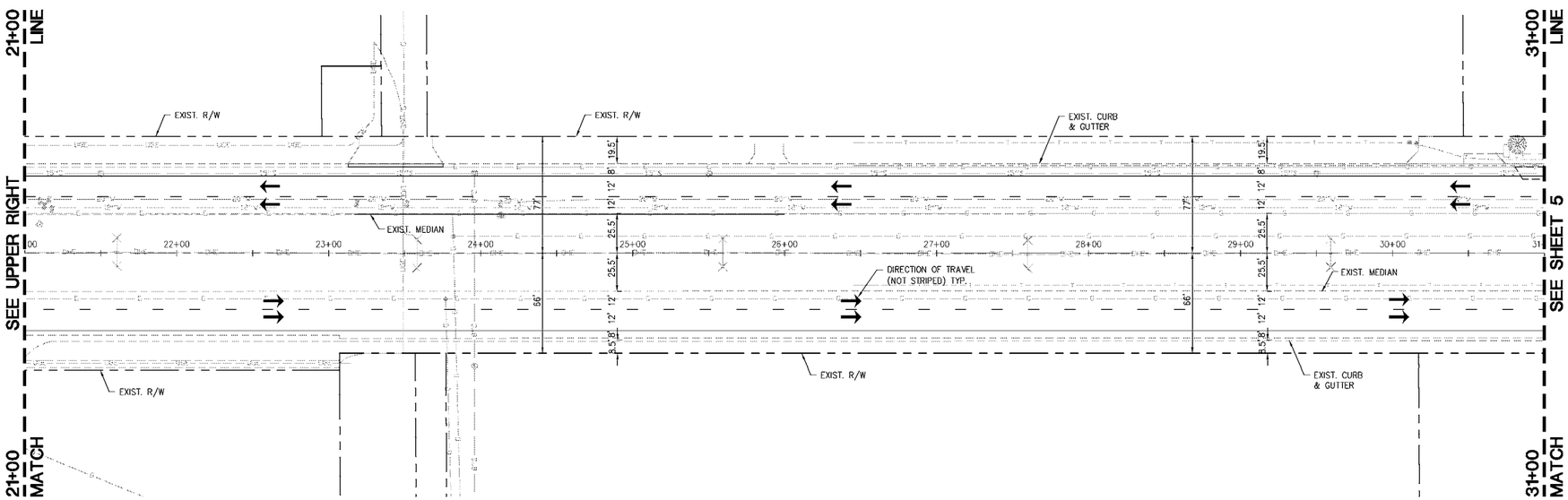


MAGNOLIA AVE.



MAGNOLIA AVE.

TEMPORARY CONSTRUCTION EASEMENT (TCE)

RIGHT OF WAY ACQUISITION (RW)

N

SCALE: 1"=40'

GRAPHIC SCALE

40 0 40 120

SCALE: 1" = 40

PREPARED BY:			
VA CONSULTING	**VA Consulting, Inc.** ENGINEERS · PLANNERS · SURVEYORS	*MAGNOLIA AVE. IMPROVEMENTS CONCEPT PLAN* *MAGNOLIA AVE. FROM BUCHANNAN ST. TO TYLER ST.*	
	17801 CARTWRIGHT ROAD IRVINE, CA 92614	(949) 474-1400 TEL (949) 261-8482 FAX	SHEET 4 OF 10
		HORIZ. SCALE: 1"=40' VERT. SCALE: N/A	DATE: 6/20/08

MAGNOLIA AVE. IMPROVEMENTS - CONCEPT PLAN
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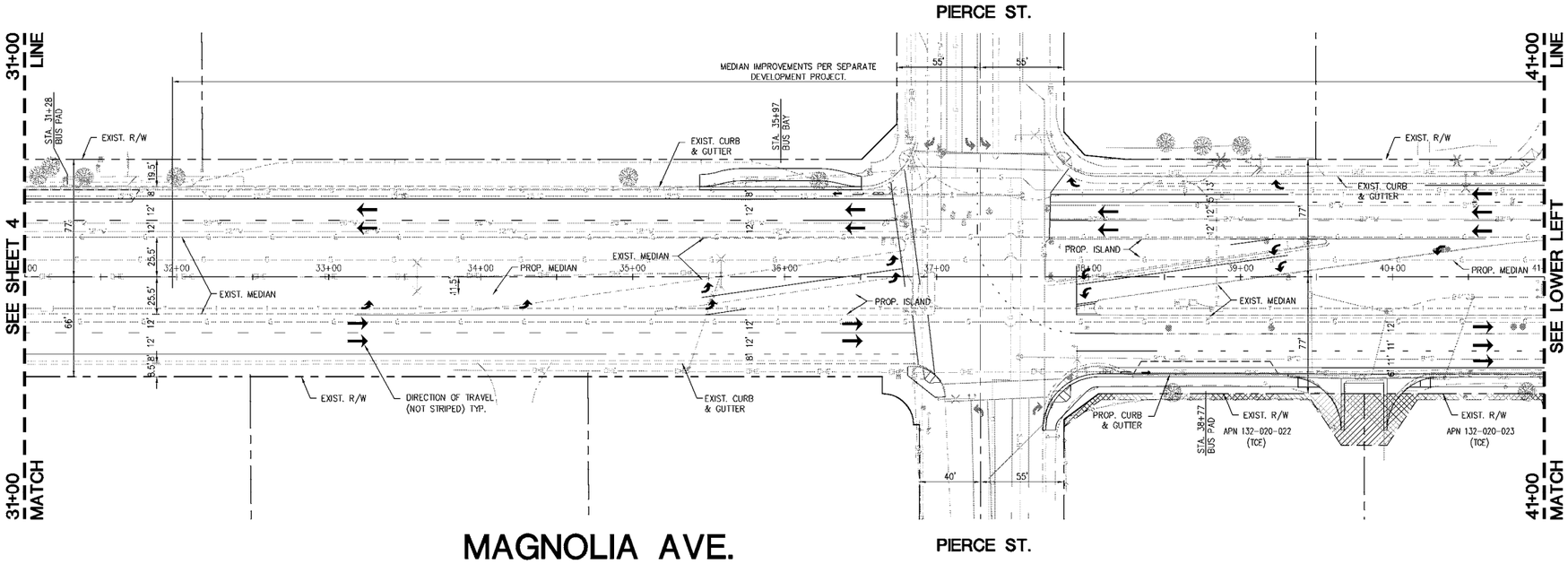

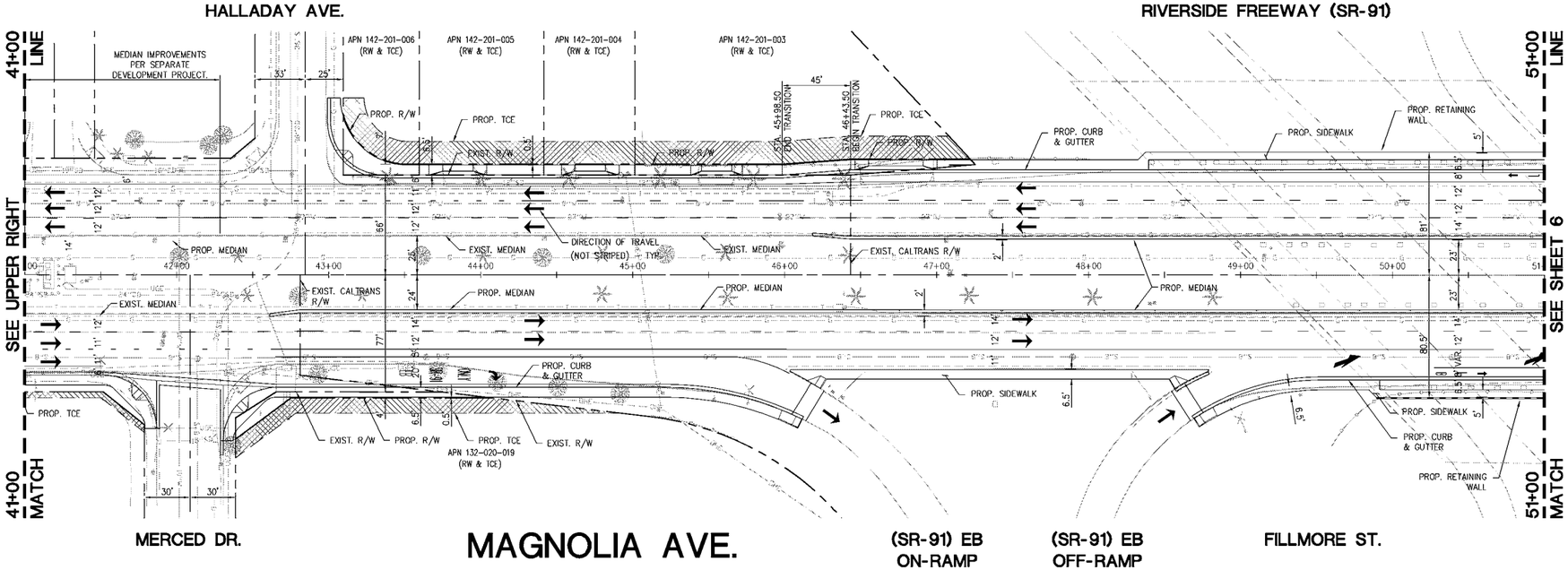

TEMPORARY CONSTRUCTION EASEMENT (TCE)

RIGHT OF WAY ACQUISITION (RW)

SCALE: 1"=40'

GRAPHIC SCALE

40 0 40 120

SCALE: 1" = 40

PREPARED BY:

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IRVINE, CA 92614

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MAGNOLIA AVE. IMPROVEMENTS CONCEPT PLAN

MAGNOLIA AVE. FROM BUCHANNAN ST. TO TYLER ST.

HORIZ. SCALE: 1"=40' VERT. SCALE: N/A

SHEET 5 OF 10

DATE: 6/20/08

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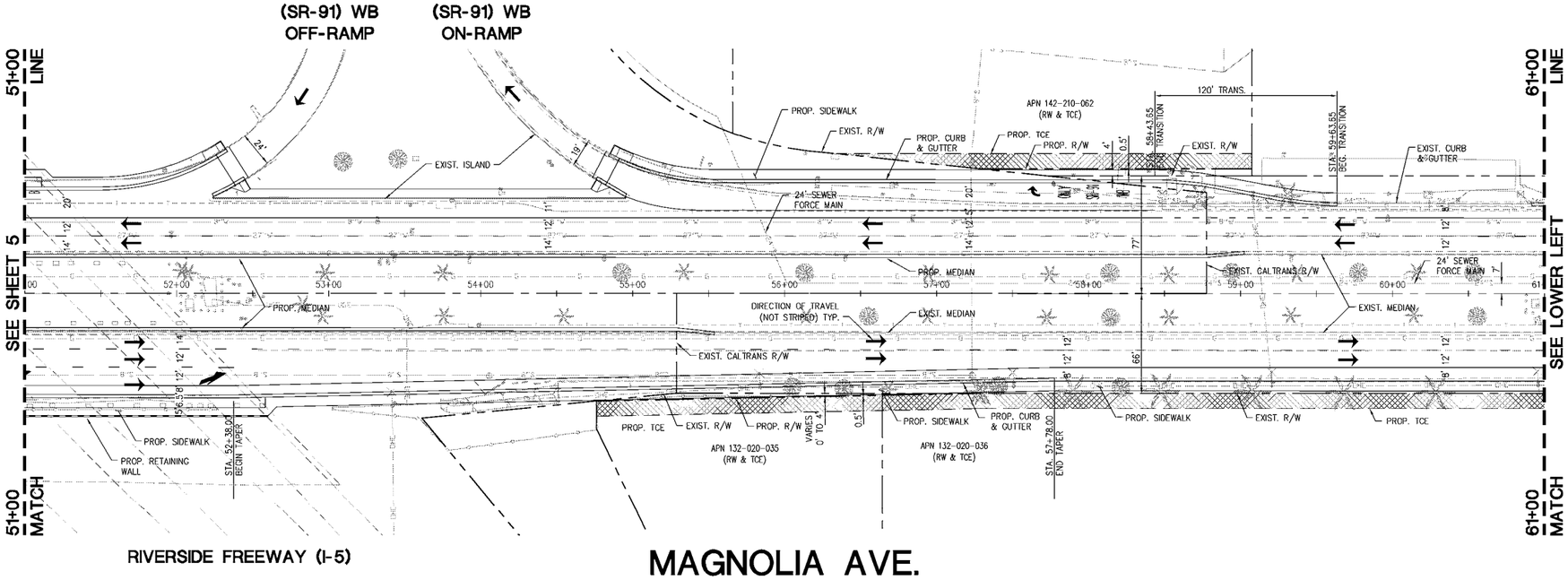

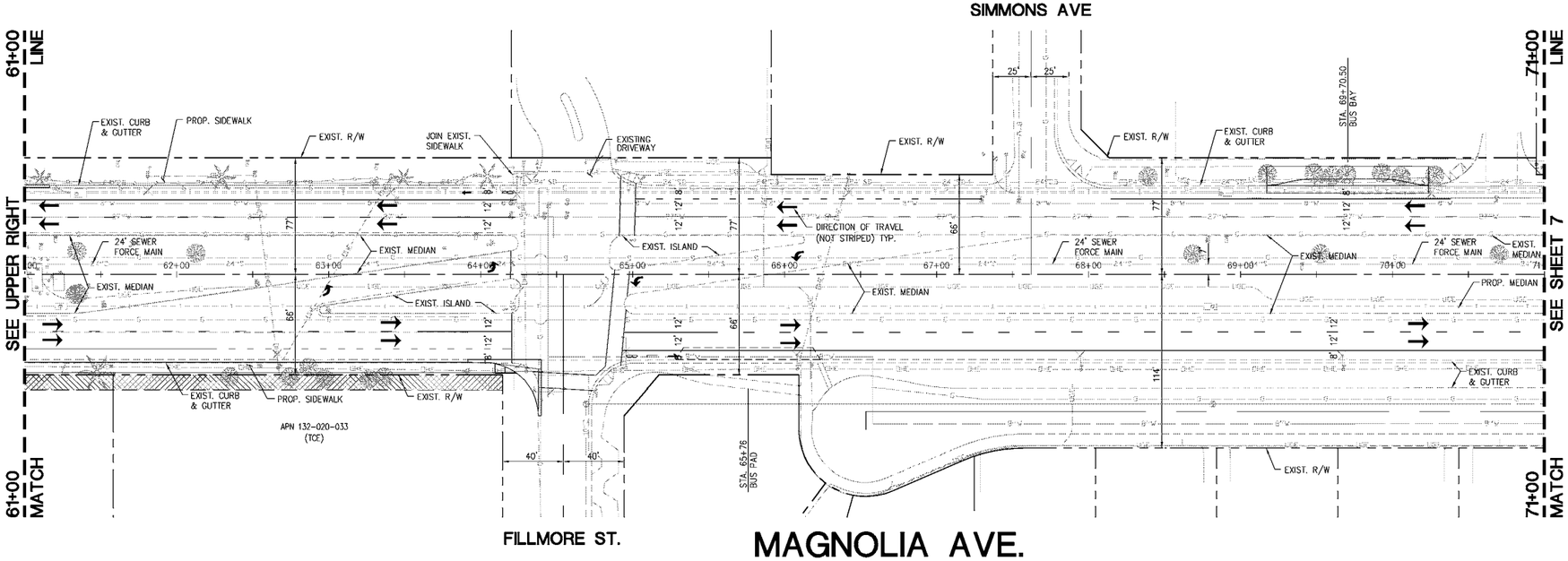

TEMPORARY CONSTRUCTION EASEMENT (TCE)

RIGHT OF WAY ACQUISITION (RW)

N SCALE: 1"=40'

GRAPHIC SCALE

40 0 40 120

SCALE: 1" = 40

PREPARED BY:

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MAGNOLIA AVE. IMPROVEMENTS CONCEPT PLAN

MAGNOLIA AVE. FROM BUCHANNAN ST. TO TYLER ST.

HORIZ. SCALE: 1"=40' VERT. SCALE: N/A

SHEET 6 OF 10

DATE: 6/20/08

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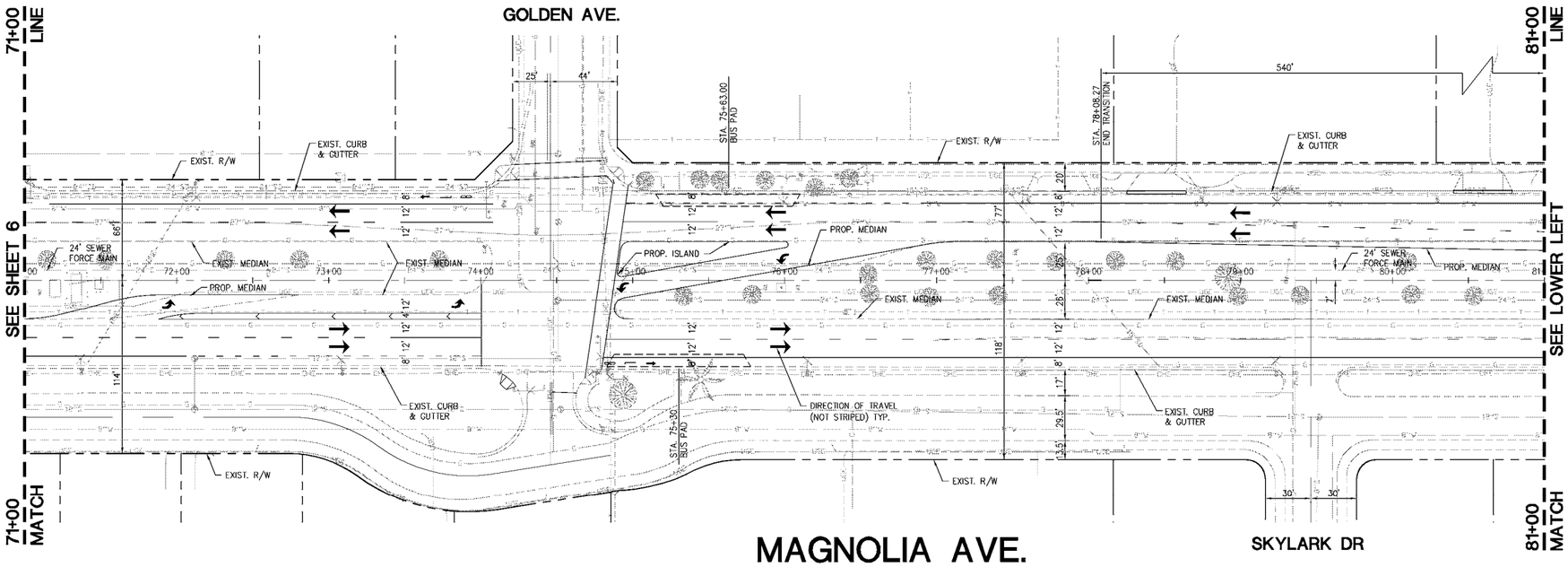

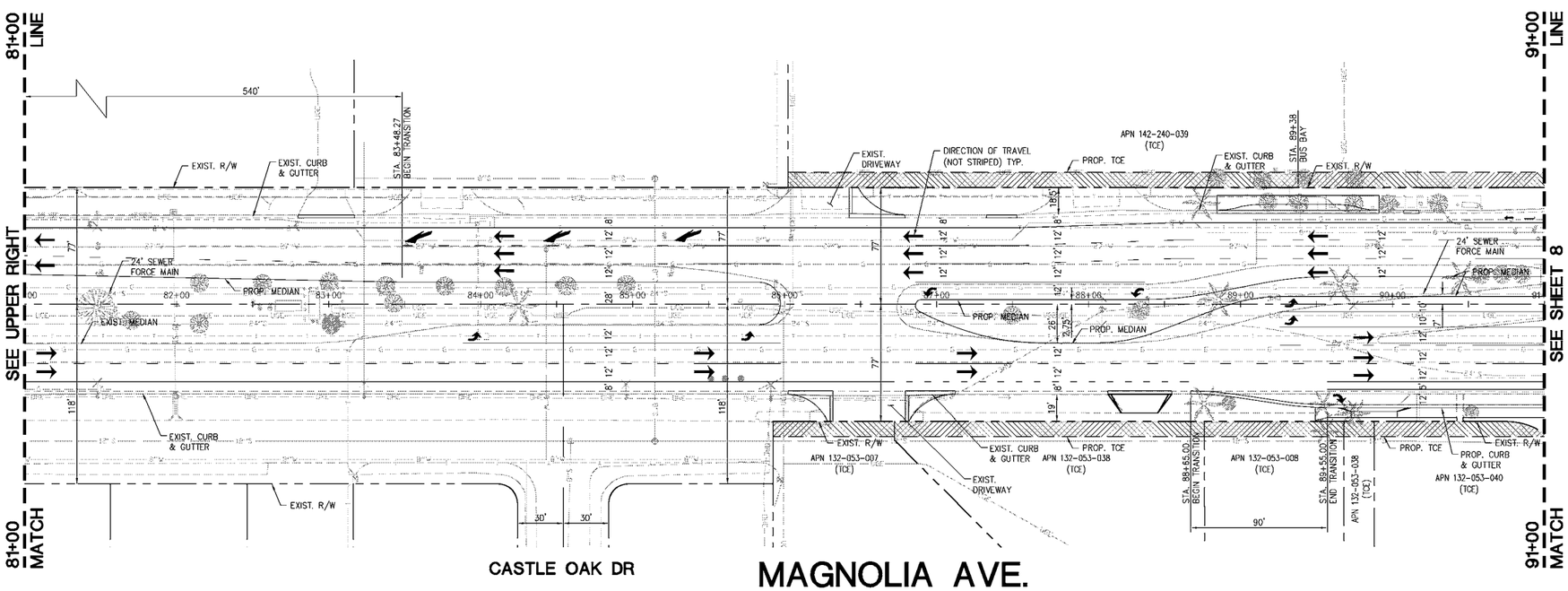

TEMPORARY CONSTRUCTION EASEMENT (TCE)

RIGHT OF WAY ACQUISITION (RW)

SCALE: 1"=40'

GRAPHIC SCALE

40 0 40 120

SCALE: 1" = 40

PREPARED BY:

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IRVINE, CA 92614

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(949) 261-8482 FAX

MAGNOLIA AVE. IMPROVEMENTS CONCEPT PLAN

MAGNOLIA AVE. FROM BUCHANNAN ST. TO TYLER ST.

HORIZ. SCALE: 1"=40' VERT. SCALE: N/A

SHEET 7 OF 10

DATE: 6/20/08

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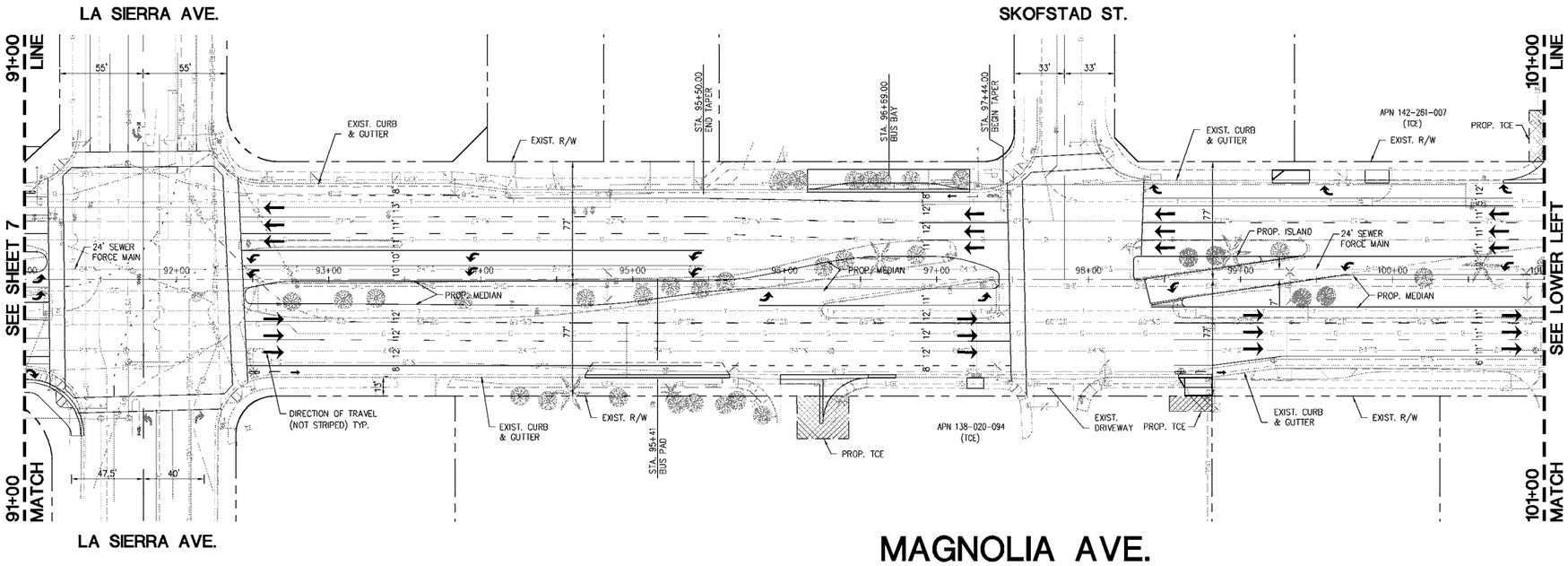

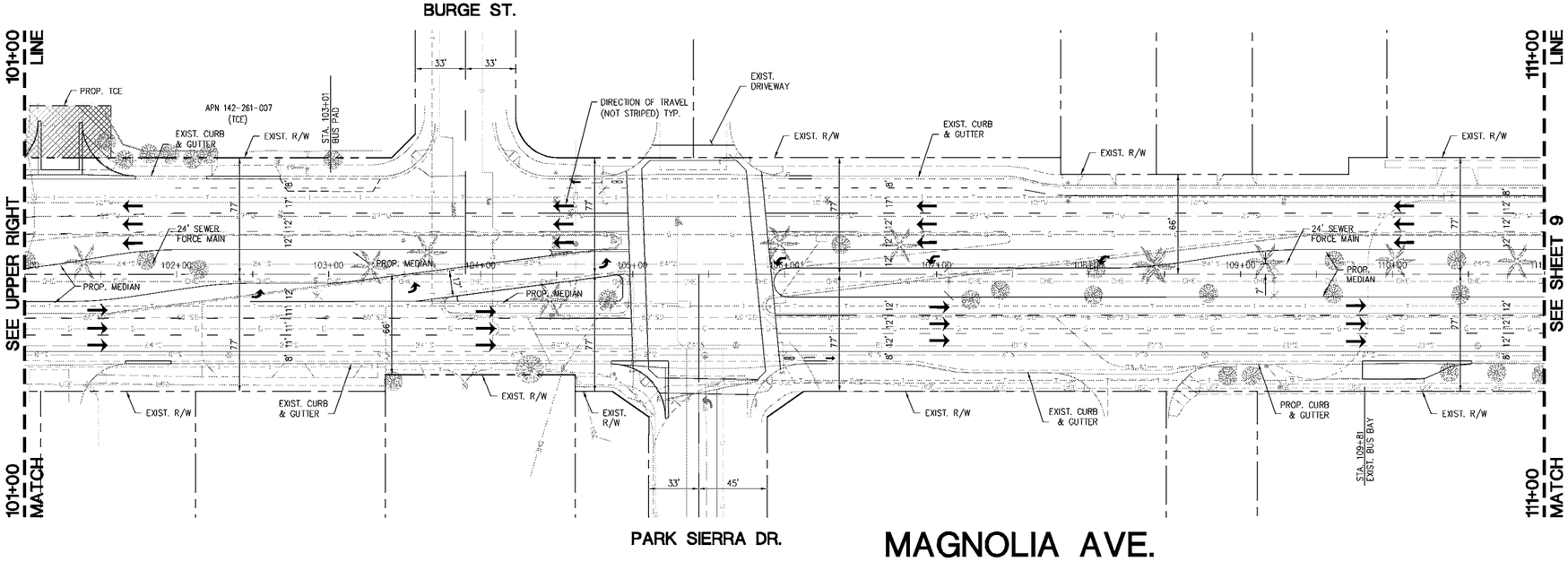

TEMPORARY CONSTRUCTION EASEMENT (TCE)

RIGHT OF WAY ACQUISITION (RW)

N SCALE: 1"=40'

GRAPHIC SCALE

40 0 40 120

SCALE: 1" = 40

PREPARED BY:

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MAGNOLIA AVE. IMPROVEMENTS CONCEPT PLAN

MAGNOLIA AVE. FROM BUCHANAN ST. TO TYLER ST.

HORIZ. SCALE: 1"=40' VERT. SCALE: N/A

SHEET 8 OF 10

DATE: 6/20/08

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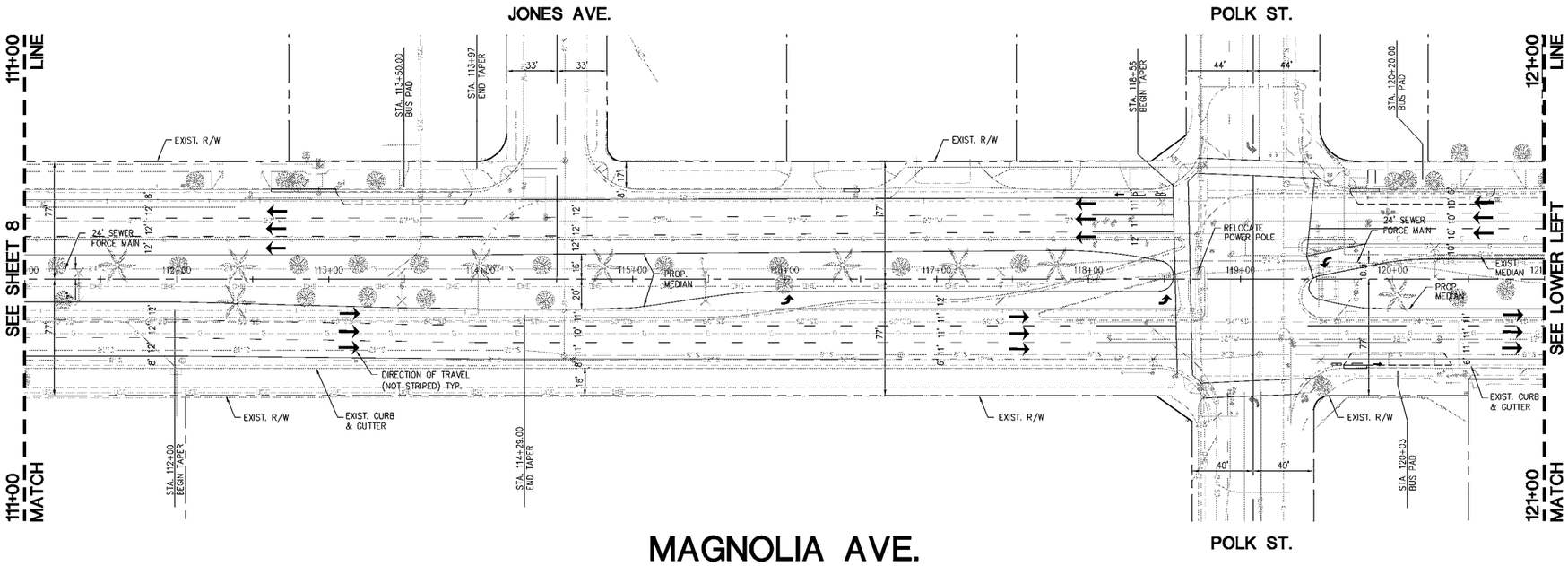

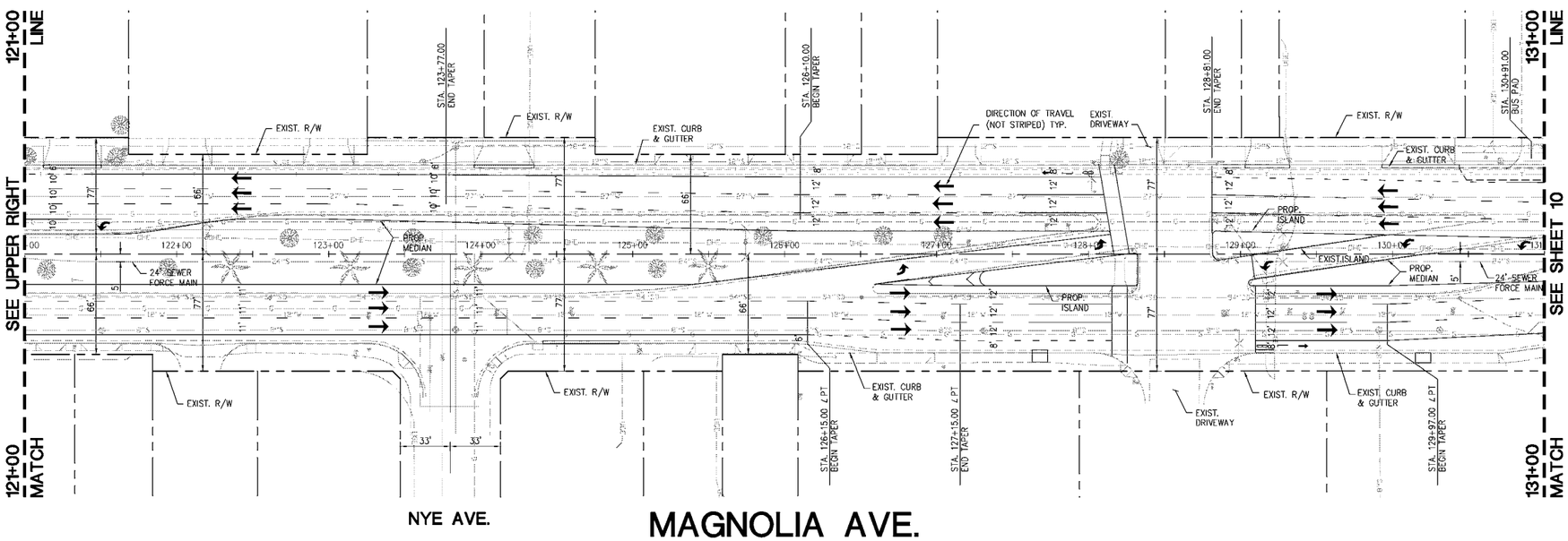

TEMPORARY CONSTRUCTION EASEMENT (TCE)

RIGHT OF WAY ACQUISITION (RW)

GRAPHIC SCALE

40 0 40 120

SCALE: 1" = 40

PREPARED BY:

VA Consulting, Inc.

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IRVINE, CA 92614

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(949) 261-8482 FAX

MAGNOLIA AVE. IMPROVEMENTS CONCEPT PLAN

MAGNOLIA AVE. FROM BUCHANAN ST. TO TYLER ST.

HORIZ. SCALE: 1"=40' VERT. SCALE: N/A

SHEET 9 OF 10

DATE: 6/20/08

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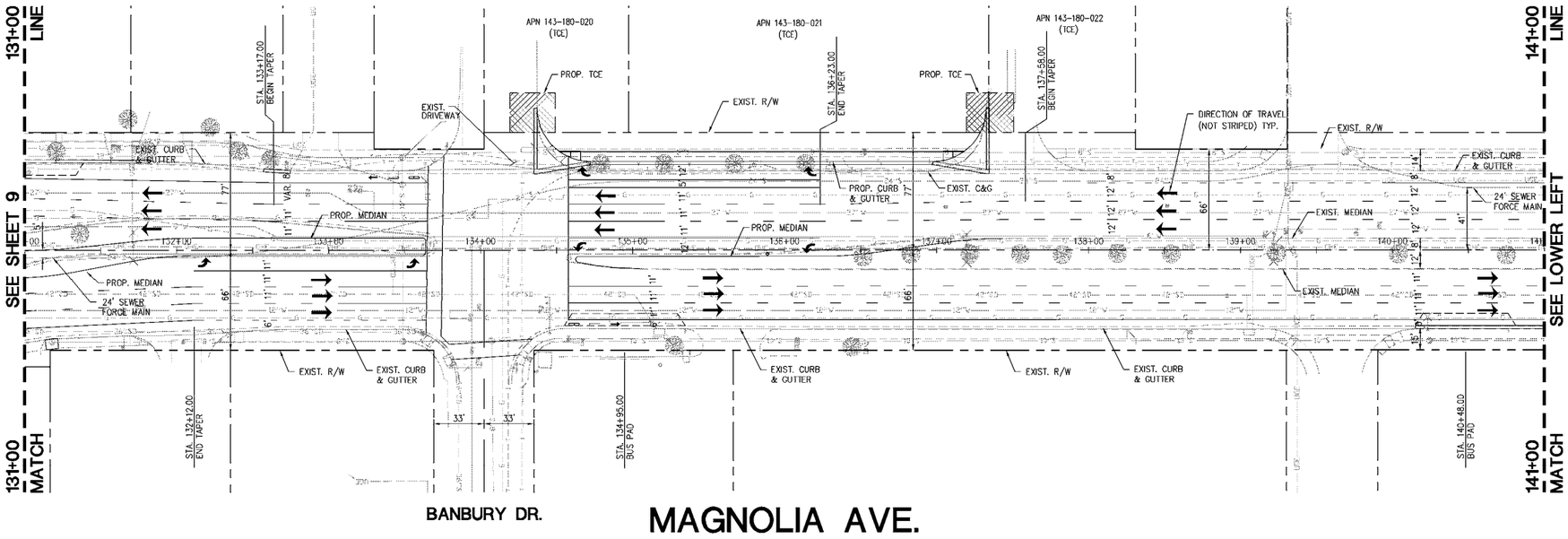

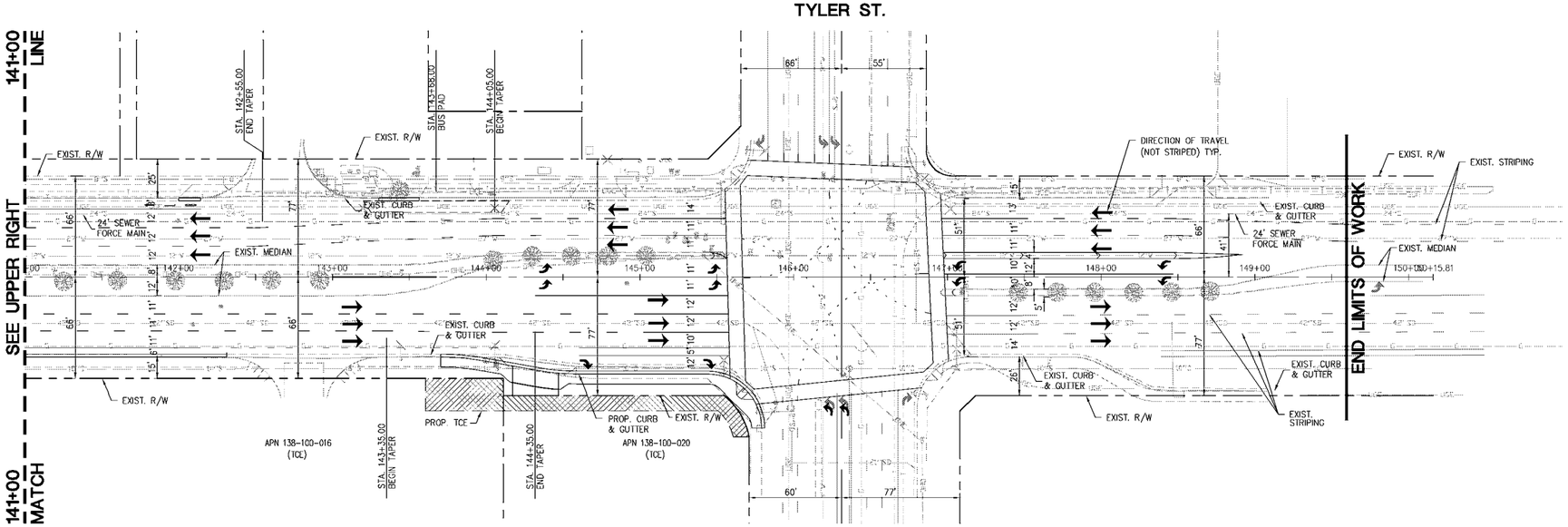

TEMPORARY CONSTRUCTION EASEMENT (TCE)

RIGHT OF WAY ACQUISITION (RW)

N SCALE: 1"=40'

GRAPHIC SCALE

40 0 40 120

SCALE: 1" = 40

PREPARED BY:

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IRVINE, CA 92614

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MAGNOLIA AVE. IMPROVEMENTS CONCEPT PLAN

MAGNOLIA AVE. FROM BUCHANAN ST. TO TYLER ST.

HORIZ. SCALE: 1"=40' VERT. SCALE: N/A

SHEET 10 OF 10

DATE: 6/20/08

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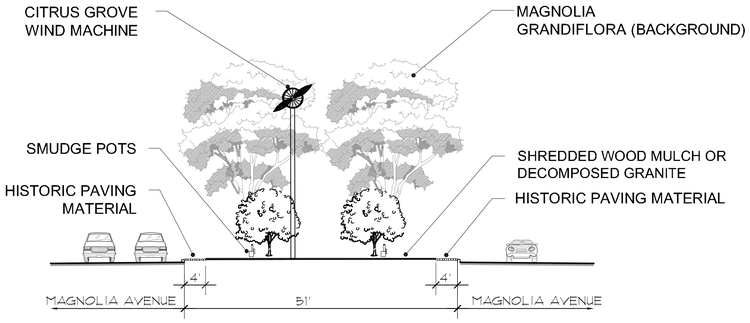
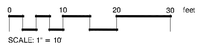
Appendix B

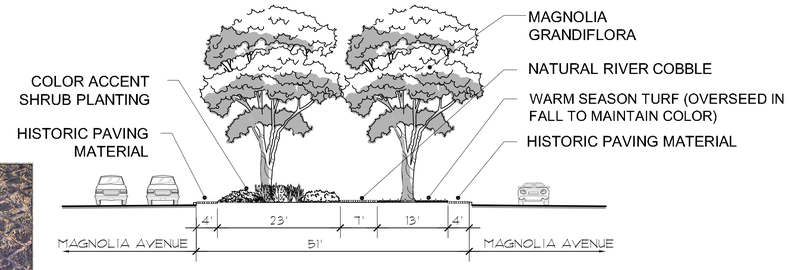
Conceptual Landscape Plan for
Magnolia Avenue Median Improvements

CITY OF RIVERSIDE

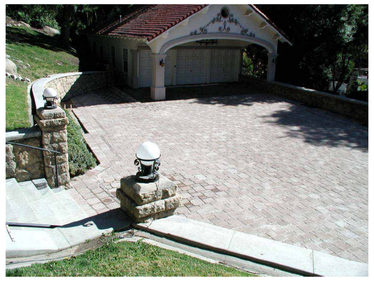


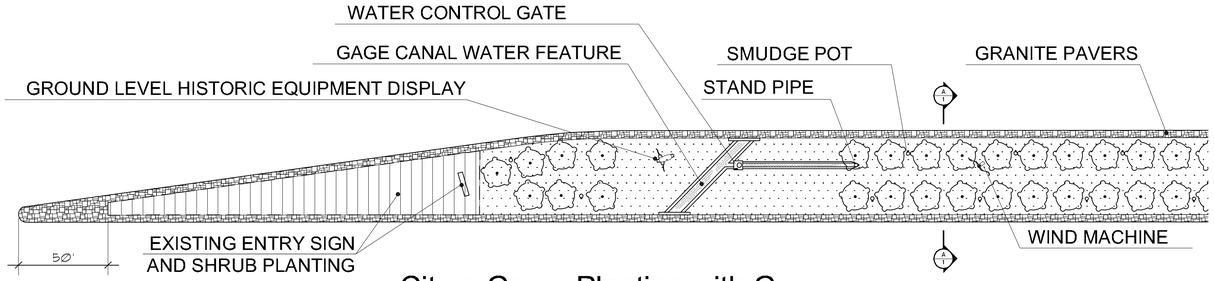
SECTION A-1



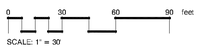


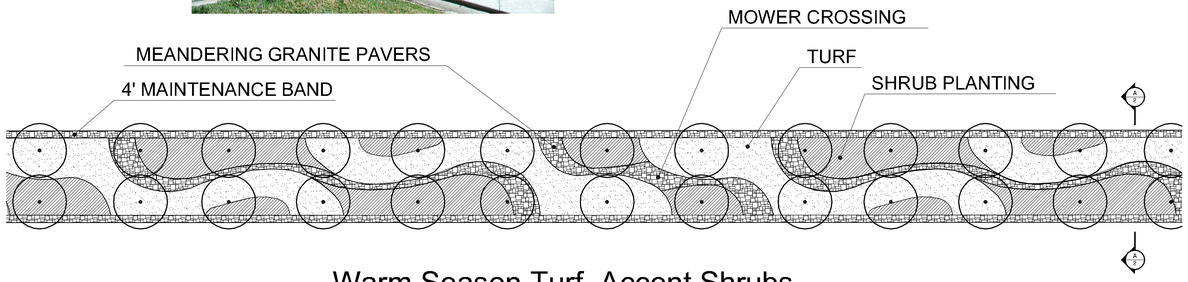
SECTION A-2



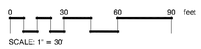


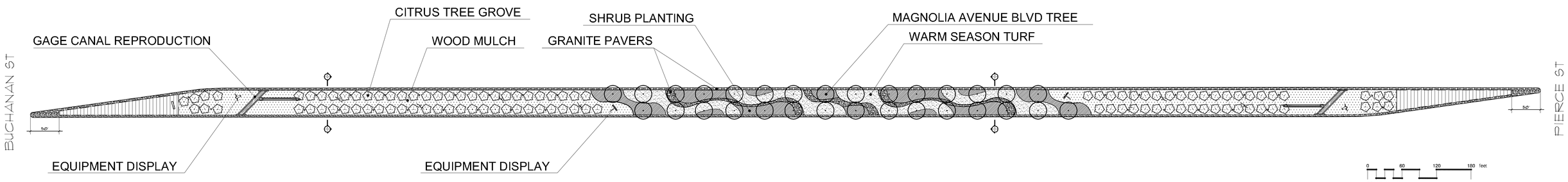
Citrus Grove Planting with Gage Canal Water Feature and Historic Equipment Display





Warm Season Turf, Accent Shrubs, and Granite Pavers Maintenance Edge and Decorative Bands





Magnolia Avenue

RHA
LANDSCAPE ARCHITECTS PLANNERS INC.
6216 BROCKTON AVENUE
SUITE 212
RIVERSIDE, CA 92506
LIC. #1512
PH. (951) 781-1930
FAX (951) 686-8091

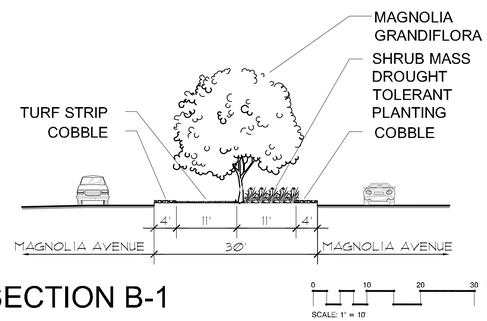
Gage Canal and Citrus Theme

Magnolia Avenue Median Conceptual Plan

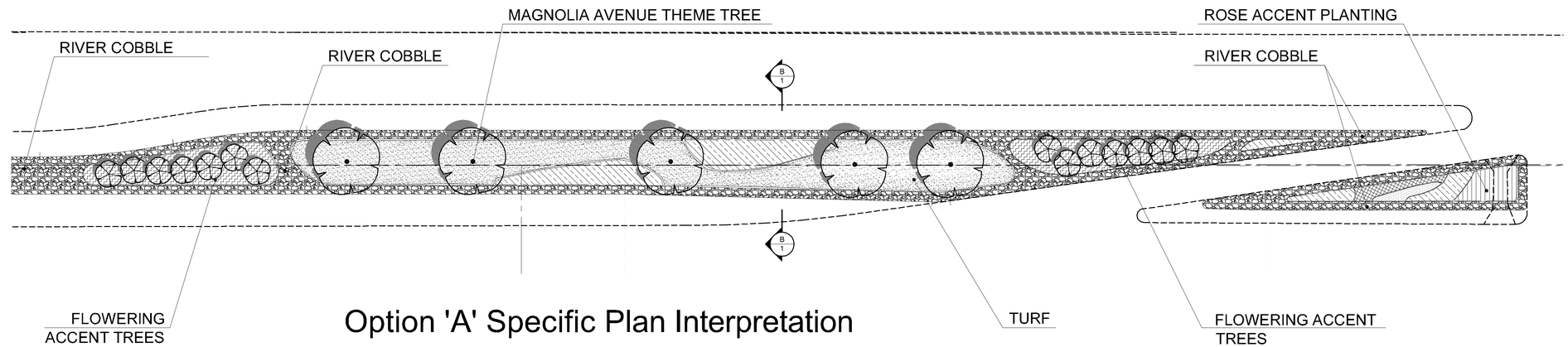
June 2, 2008

CITY OF RIVERSIDE

MAGNOLIA AVENUE



SECTION B-1



Option 'A' Specific Plan Interpretation

CONCEPT PLANT SCHEDULE

BOULEVARD TREES
Magnolia grandiflora / Southern Magnolia

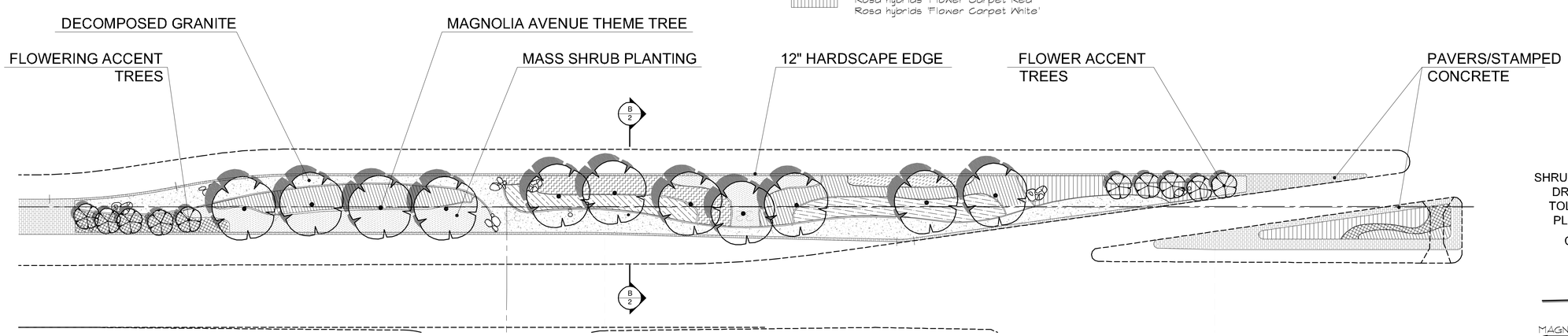
FLOWERING ACCENT TREES
Tabebuia heterophylla / Pink Tabebuia

MASS SHRUB PLANTINGS
Abelia grandiflora 'Edward Goucher' / Glossy Abelia
Bougainvillea alexandria / Bougainvillea
Hemerocallis hybrid 'Red' / Red Daylily
Lantana camara 'Spreading Sunset' / Lantana
Lantana montevidensis / Purple Trailing Lantana
Lantana montevidensis 'Yellow' / Trailing Lantana
Rhaphiolepis indica 'Ballerina' / Indian Hawthorne
Salvia greggii 'Furmen's Red' / Sage

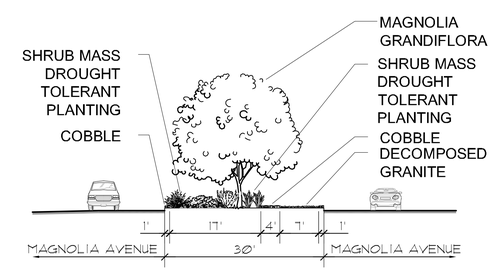
FLOWERING ACCENT SHRUBS
Rosa hybrids 'Flower Carpet Red'
Rosa hybrids 'Flower Carpet White'

GROUND COVERS
Trachelospermum jasminoides / Star Jasmine

TURF
Turf Sod / Drought tolerant fescue blend



MAGNOLIA AVENUE



SECTION B-2

0 10 20 30 feet
SCALE: 1" = 10'

Option 'B' Reduced Turf

La Sierra to Tyler

Magnolia Avenue Median Conceptual Plan

RHA LANDSCAPE ARCHITECTS PLANNERS INC.
6216 BROCKTON AVENUE
SUITE 212
RIVERSIDE, CA 92506
LIC. #1512
PH. (951) 781-1930
FAX (951) 686-8091

0 20 40 60 feet
SCALE: 1" = 20'

NORTH

Appendix C

Urbemis Emissions Report

2/25/2009 7:03:58 PM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: Q:\00 Open Projects\5623 VA Consulting - Magnolia Ave Project Riverside\Air and Noise\5623 - Magnolia Ave Improvement.urb924

Project Name: 5623- Magnolia Avenue Improvement

Project Location: Riverside County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2009 TOTALS (lbs/day unmitigated)	4.50	33.43	18.21	0.01	3.42	2.21	5.63	0.72	2.03	2.75	3,260.80
2010 TOTALS (lbs/day unmitigated)	4.65	27.18	13.60	0.01	0.03	1.83	1.86	0.01	1.68	1.69	2,583.99

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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Time Slice 8/3/2009-10/30/2009 Active Days: 65	4.50	**33.43**	**18.21**	0.01	**3.42**	**2.21**	**5.63**	**0.72**	**2.03**	**2.75**	**3,260.80**
Fine Grading 08/01/2009-10/30/2009	4.50	33.43	18.21	0.01	3.42	2.21	5.63	0.72	2.03	2.75	3,260.80
Fine Grading Dust	0.00	0.00	0.00	0.00	3.40	0.00	3.40	0.71	0.00	0.71	0.00
Fine Grading Off Road Diesel	4.22	30.00	15.31	0.00	0.00	2.07	2.07	0.00	1.91	1.91	2,650.36
Fine Grading On Road Diesel	0.23	3.33	1.19	0.00	0.01	0.13	0.15	0.00	0.12	0.13	423.84
Fine Grading Worker Trips	0.05	0.10	1.71	0.00	0.01	0.01	0.01	0.00	0.00	0.01	186.60
Time Slice 11/2/2009-12/31/2009 Active Days: 44	4.17	25.01	15.38	0.00	0.01	2.17	2.18	0.00	2.00	2.00	2,087.60
Trenching 11/02/2009-12/31/2009	4.17	25.01	15.38	0.00	0.01	2.17	2.18	0.00	2.00	2.00	2,087.60
Trenching Off Road Diesel	4.12	24.91	13.67	0.00	0.00	2.16	2.16	0.00	1.99	1.99	1,901.00
Trenching Worker Trips	0.05	0.10	1.71	0.00	0.01	0.01	0.01	0.00	0.00	0.01	186.60
Time Slice 1/4/2010-3/31/2010 Active Days: 63	**4.65**	27.18	13.60	**0.01**	0.03	1.83	1.86	0.01	1.68	1.69	2,583.99
Asphalt 01/04/2010-03/31/2010	4.65	27.18	13.60	0.01	0.03	1.83	1.86	0.01	1.68	1.69	2,583.99
Paving Off-Gas	0.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	3.37	23.13	10.63	0.00	0.00	1.67	1.67	0.00	1.54	1.54	1,841.95
Paving On Road Diesel	0.28	3.96	1.41	0.01	0.02	0.15	0.17	0.01	0.14	0.15	555.45
Paving Worker Trips	0.05	0.09	1.57	0.00	0.01	0.01	0.01	0.00	0.00	0.01	186.59

Phase Assumptions

Phase: Fine Grading 8/1/2009 - 10/30/2009 - Removal of Structure and Site Grading

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0.34

Fugitive Dust Level of Detail: Default

10 lbs per acre-day

On Road Truck Travel (VMT): 100

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Off-Road Equipment:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Sweepers/Scrubbers (91 hp) operating at a 0.68 load factor for 8 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 11/2/2009 - 12/31/2009 - Trenching

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

1 Pumps (53 hp) operating at a 0.74 load factor for 8 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

2 Trenchers (63 hp) operating at a 0.75 load factor for 8 hours per day

Phase: Paving 1/4/2010 - 3/31/2010 - Construction of Infrastructure and Paving

Acres to be Paved: 23

Off-Road Equipment:

1 Air Compressors (106 hp) operating at a 0.48 load factor for 8 hours per day

1 Other General Industrial Equipment (238 hp) operating at a 0.51 load factor for 8 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day

1 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 0 hours per day

Appendix D

Cultural Resource Investigation

Excluding Confidential Archeological Site Record
Appendix 1 of the Report

CRM TECH
1016 E. Cooley Drive, Suite A/B
Colton, CA 92324

February 6, 2009

Jeff Wilkerson
VA Consulting, Inc.
17801 Cartwright Road
Irvine, CA 92614

RE: Cultural Resource Investigation
Magnolia Avenue Improvements Project (Buchanan Street to Tyler Street)
City of Riverside, Riverside County, California
CRM TECH Contract #2316

Dear Mr. Wilkerson:

At the request of VA Consulting, Inc. ("Client"), CRM TECH has completed a records search at the Eastern Information Center (EIC), University of California, Riverside, to gather information on historical/archaeological resources that may be affected by the project referenced above. The project entails roadway widening, rehabilitation, tree planting, and beautification along a 2.5-mile segment of Magnolia Avenue between Buchanan Street and Tyler Street. The project location lies in a portion of the El Sobrante de San Jacinto land grant in T3S R6W, SBBM, as shown on the USGS Riverside West, Calif. 7.5' quadrangle (Fig. 1).

The primary objective of this study is to clarify the nature and significance of one particular archaeological site that appears on maps on file at the City of Riverside Planning Department. Correspondence with Erin Gettis, the City's Historic Preservation Officer, suggested that the site, identified on the City's maps as "5409," was located within 1,000 feet of the Magnolia Avenue right-of-way. However, the City had insufficient information to assess the significance of the site or the proposed project's potential effect on it.

The records search at the EIC indicates the following:

- Site CA-RIV-5409 (Primary No. 33-005409) is a group of three bedrock milling features located several miles away at the March Air Reserve Base.
- What is identified on the City's maps as "5409" appears to coincide with an EIC file number designating an area previously surveyed by CRM TECH in 2001 for the Arlington Desalter and Pipeline Project (Love et al. 2001), part of which overlaps a portion of the project area.
- The nearest site to Magnolia Avenue encountered during the 2001 survey was Site CA-RIV-6723 (Primary No. 33-011195), a single bedrock milling feature located approximately 3,900 feet to the northwest of Magnolia Avenue, on the north side of a small hill (Hogan 2001; see App. 1).
- No archaeological sites have been previously recorded within 1,000 feet of the segment of Magnolia Avenue between Buchanan Street and Tyler Street.

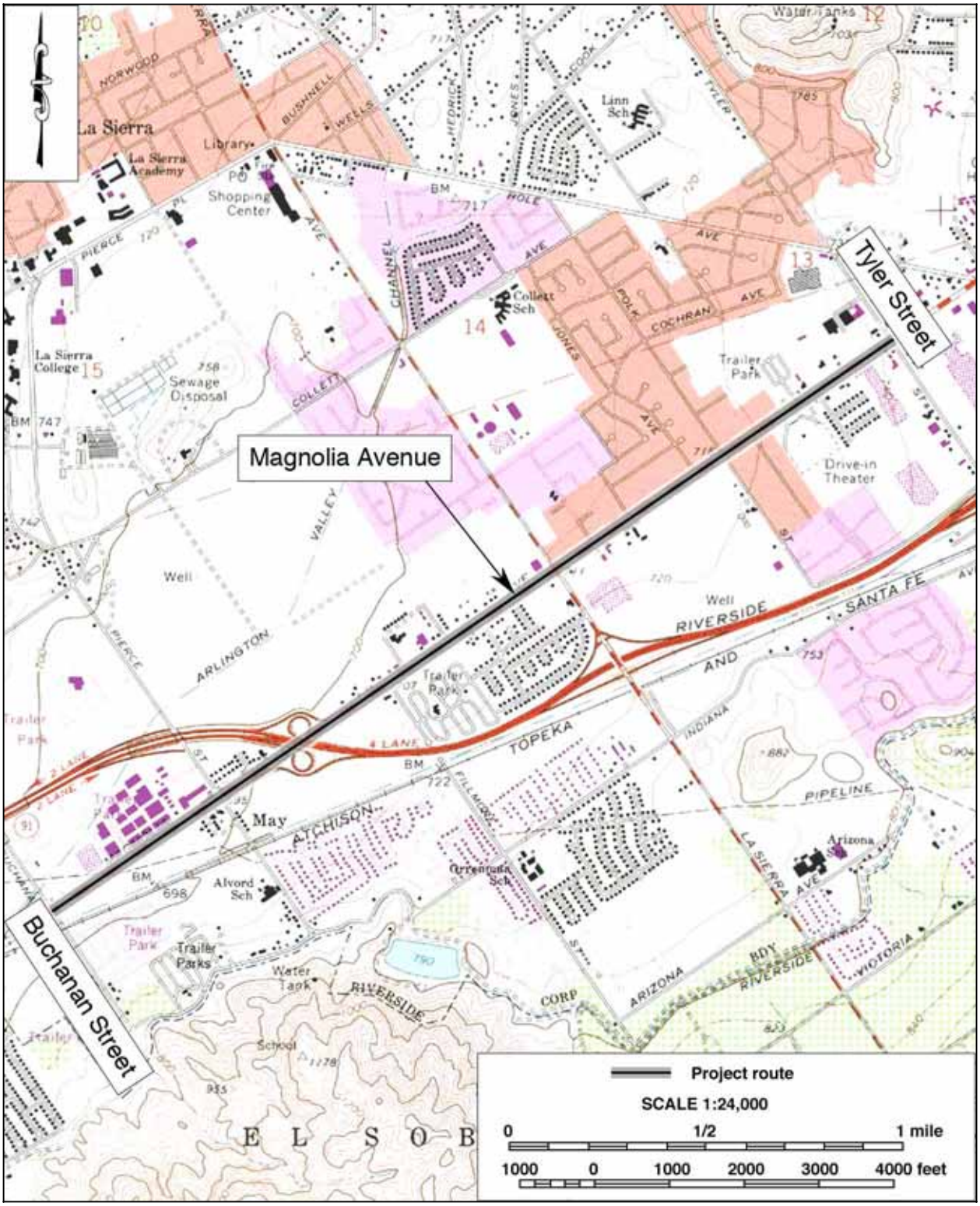

Figure 1. Project location. (Based on USGS Riverside West, Calif., 1:24,000 quadrangle)

The 2001 study concluded that Site CA-RIV-6723 did not meet the statutory definition of a "historical resource," as provided in the California Environmental Quality Act (CEQA; Love et al. 2001:16). Furthermore, the site is located so far from Magnolia Avenue that the proposed project has no potential to impact it, either directly or indirectly. As such, Site CA-RIV-6723 requires no further consideration in the CEQA-compliance process.

It should be noted that another segment of Magnolia Avenue, between Arlington Avenue and San Rafael Way, has been designated by the City of Riverside as Historic Landmark #62 (City of Riverside n.d.). Therefore, CRM TECH recommends that the City take into consideration the potential of the project route itself, as an extension of the designated landmark, to constitute a cultural resource that may require proper treatment in local planning.

Sincerely,

Bai "Tom" Tang, Principal Investigator
CRM TECH

References:

City of Riverside
n.d. Landmarks of the City of Riverside. Http://www.riversideca.gov/historic/pdf/landmarks-web.pdf

Hogan, Michael
2001 California Historical Resources Inventory site record, Site CA-RIV-6723 (33-011195). On file, Eastern Information Center, University of California, Riverside.

Love, Bruce, Bai "Tom" Tang, Michael Hogan, and Mariam Dahdul
2001 Historical/Archaeological Resources Survey Report: Arlington Desalter and Pipeline, Cities of Riverside, Corona, and Norco, Riverside County, California. On file, Eastern Information Center, University of California, Riverside (File No. 5409).

Appendix E

Historic Survey Report

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EXECUTIVE SUMMARY

This cultural resources survey and evaluation was completed by Kim Jarrell Johnson, Historic Preservation Planner, Community Development Department, City of Riverside and Dean R. Ayer, Administrative Analyst, Public Utilities Department, City of Riverside on May 5, 2009. The City of Riverside is considering Magnolia Avenue improvements from the city limits at Buchanan Street to Tyler Street. The purpose of this survey and evaluation is to determine if the project area in question qualifies for historic designation at a local, state or national level. The following summary is designed as a quick overview of the longer, more detailed report.

The project area in question stretches along Magnolia Avenue between Tyler Street and Buchanan Avenue in the southwest portion of the City of Riverside, Riverside County, California. Magnolia Avenue is one of the primary east/west thoroughfares in the City. It extends from Ontario Avenue in Corona to Fourteenth Street in downtown Riverside. In the project area, Magnolia Avenue is a 4-lane to 6-lane arterial roadway with partially landscaped medians.

In1875 private investors S.C. Evans and W.T. Sayward joined with the San Jacinto Tin Company to form the Riverside Land and Irrigating Company (RL&I). Their combined water and real estate interests in the Riverside area came to around 12,000 acres just south of the original Riverside tract owned by the Southern California Colony Association.

The RL&I planned general improvements to make their holdings more appealing to real estate speculators and investors. W.T. Sayward is credited with first conceiving the idea of a grand roadway beginning at the base of the Temescal Mountains, running through the RL&I property, and continuing through Riverside all the way to the base of the San Bernardino Mountains.

Beginning in 1877 Magnolia Avenue was laid out 132 feet in width, including 20 foot wide pedestrian parkways on each side of the roadway. A central median measuring 10 feet wide was incorporated down the center of the avenue. This design made the eastbound and westbound lanes 41 feet each.

The initial work on Magnolia Avenue included the 3 mile section beginning at Arlington Avenue and heading west to Van Buren Boulevard. The median and pedestrian parkways were landscaped with a selection of Pepper, Blue Gum, Magnolia, Palm, and Grevilla trees.

The Riverside Land and Irrigating Company only owned and managed Magnolia Avenue for nine years. After the City of Riverside formally incorporated in 1883 the RL&I transferred their land holdings to the newly created Riverside Water Company in 1884, as part of a legal compromise over water rights.

Initially, the City of Riverside incorporated all of the RL&I lands including Magnolia Avenue all the way out to Temescal Street. The RL&I tracts of land extending from Tyler Street west to Temescal Street were oddly shaped, underdeveloped and mostly unimproved. In 1907 RL&I lands west of Tyler Street were voted out of the city limits.

This portion of Magnolia remained unincorporated land of Riverside County until it was reacquired by the City of Riverside through annexation in 1964. Throughout the years sporadic improvements were made to this western section of Magnolia Avenue. Most were in response to increased traffic flow from commercial and retail development in the area. Additional alterations were made to Magnolia Avenue to accommodate State Route 91 which was first opened to automobile traffic in the area in 1963. Median and curb construction done in 1968, 1976, and 1997 further modified the roadway and left it much the way it stands today.

It is the conclusion of this report that the proposed project area of Magnolia Avenue does not qualify for historic designation at the federal, state, or local levels. The proposed street and beautification improvements to the project area will enhance traffic flow along Magnolia Avenue and provide new median landscaping that creates a western gateway into the City.

PROJECT DESCRIPTION

The applicant is proposing to improve and beautify Magnolia Avenue from Buchanan Avenue to Tyler Street to meet transportation demands, improve safety and enhance aesthetics of the area.

A. Street Improvements

1. Acquire right-of-way (ROW) and temporary construction easement (TCE) from portions of a number of parcels.
2. Widen the following five locations to provide dedicated right turn lanes:
    a. Eastbound approach of Magnolia Avenue at the intersection with La Sierra Avenue to provide dedicated right turn lanes for vehicles turning southbound;
    b. Eastbound approach of Magnolia Avenue at the intersection with Tyler Street to provide dedicated right turn lanes for vehicles turning southbound;
    c. Westbound approach of Magnolia Avenue at the intersection with Buchanan Avenue to provide dedicated right turn lanes for vehicles turning northbound;
    d. Westbound approach of Magnolia Avenue at the intersection with Banbury Drive to provide dedicated right turn lanes for vehicles turning northbound;
    e. Northbound approach of Buchanan Avenue at the intersection with Magnolia Avenue to provide a dedicated right turn lane for vehicles turning eastbound onto Magnolia Avenue.
3. Improve Magnolia Avenue at the SR-91 interchange.
    a. Widen both sides of Magnolia Avenue to provide auxiliary lanes for the SR-91 interchange, as follows:
        i. The northern side of Magnolia Avenue would be widened from Halladay Avenue to a point approximately 500 feet east of Fillmore Street; and
        ii. The southern side would be widened from Pierce Street to a point approximately 700 feet east of Fillmore Street.
    b. Construct sidewalks on both sides of Magnolia Avenue to connect the sidewalks on the east side of SR-91 to the sidewalks on the west side of SR-91. Construction of the sidewalks under SR-91 would require retaining walls.
4. Improve Magnolia Avenue between Skylark Drive and Banbury Drive, as follows:
    a. Reduce width of the median between Skylark Drive and Banbury Drive.
    b. Increase the number of lanes in each direction from two to three.
    c. Improve left turn lanes to increase safety and pocket lengths.
    d. Relocate the power pole at Polk Street.
5. Construct additional median improvements along Magnolia Avenue, as follows:

a. Increase the left turn pocket length at the median east of Golden Avenue.
b. Increase safety in the median west of Golden Avenue.
c. Add dual left turn lanes and increase the left turn pocket lengths at both medians at Pierce Street.

6. Construct four bus bays and nine bus pads along Magnolia Avenue throughout the project area.
7. Additional improvements include constructing curb ramps, driveways, cross gutters, and chain link fences. Also the project would relocate or adjust to grade the following utilities: street lights, water meters, water valves, backflow preventer. Finally, the project would rehabilitate entire roadway by cold milling and overlaying with asphalt pavement.

B. Beautification Improvements

The beautification portion of the project would provide new median landscaping for the Magnolia Avenue medians from Buchanan Avenue to Banbury Drive in conjunction with the roadway improvements. The existing medians can be divided by width into a wide section and a narrow section. The proposed beautification improvements consist of two similar designs, each reflecting the different median widths and incorporating a water-wise design using appropriate plant materials, hardscape, and irrigation elements.

The wider section between Buchanan Avenue to Golden Avenue follows the intent of the guidelines of the Draft Magnolia Avenue Specific Plan's La Sierra District, which strives to restore the historic grandeur of Magnolia Avenue and create a western gateway into the City. In accordance with the guidelines, the median's citrus planting would be expanded at each end of the median in the stretch between Buchanan Avenue to Fillmore Street. To further enhance the citrus heritage of the La Sierra area, a replica of the Gage Canal would be constructed at each median nose in addition to the citrus planting. Historic elements such as smudge pots, concrete irrigation stand pipes and propeller-type wind machines would be installed as public artwork.

The La Sierra District recommends that the median planting be simplified by utilizing one type of tree. Southern Magnolia is proposed based on its flowering character, historic value, and use within the median in other areas. The ground under the Magnolia trees would be planted with drought tolerant turf and shrubs.

The narrower section between Golden Avenue and Banbury drive is designed to reflect the guidelines of the Draft Magnolia Avenue Specific Plan's Galleria District. The design would maintain a single row of Magnolia trees down the center of the median with an accent tree planting of Pink Tabebuia and under-planting of Day Lily at each intersection.

Both designs represent a vision of the Draft Magnolia Avenue Specific Plan while being sensitive to current water conservation needs. The designs propose utilizing colorful low to medium usage shrubs in addition to turf to reduce overall water use. The irrigation system is designed with high efficiency rotary nozzles for turf and landscape drip lines for shrub areas. A 4-foot wide oversized maintenance band of masonry block keeps the irrigation system a significant distance away from the curb edge further reducing water overspray into the street; saving water and preventing water related pavement failure.

All existing median palm trees are proposed to be relocated off-site per the recommendations of the La Sierra and Galleria Districts' guidelines. In the event that the palm tree relocation is cost-prohibitive, a long-term phasing plan may be necessary to address strategies for removal and possible relocation of these trees. Existing Magnolia trees would be preserved if possible, but the new median geometrics would require removal of many existing trees. This would be mitigated with the installation of new box-size Magnolia grandiflora and Tabebuia trees.

SCOPE OF WORK

This report documents the methodology and findings of the cultural resources report for the Magnolia Avenue Roadway Widening, Rehabilitation, and Beautification Project. The scope of work to complete the report and make findings concerning the historical status of the roadway in question included:

- Review of city files to find previous cultural resource studies, historical designations, and other existing information about the roadway and in the vicinity of the roadway.
- Review of available resources for information related to the history of the roadway including but not limited to the local history section of the Riverside Public Library, the Riverside Metropolitan Museum, County of Riverside Assessor, local history researchers and writers, long time residents of the City of Riverside, and online resources.
- A field survey of the roadway, including infield photographic recordation of both the section of roadway in question and the section of roadway previously designated as a City of Riverside Landmark.
- Roadway specific research to determine construction history, access historical integrity and place the roadway within the context of transportation, neighborhood, and citywide history.
- Research and preparation of a cultural description and a historic context statement.
- Evaluation of the roadway for significance under CEQA according to the NRHP and CRHR criteria and Title 20 of the Riverside Municipal Code.
- Evaluation of 11759 Magnolia Avenue for historical significance.

- Recordation of the report results on the appropriate State of California Historic Resources Inventory (DPR) forms.
- Recommendation of mitigation measures, if applicable.
- Preparation of a report, including maps, photos, figures, and applicable DPR forms, to document the findings of the investigation.

PROJECT LOCATION AND SETTING

The project area in question stretches along Magnolia Avenue between Tyler Street and Buchanan Avenue in the southwest portion of the City of Riverside, Riverside County, California. (**See Figure 1**) Magnolia Avenue is one of the primary east/west thoroughfares in the City. It extends from Ontario Avenue in Corona to Fourteenth Street in downtown Riverside. In the project area, Magnolia Avenue is a 4-lane to 6-lane arterial roadway with partially landscaped medians.

The section from Buchanan Avenue to La Sierra Avenue is 50 feet wide with a double-row of alternating Mexican Fan Palms and Magnolia Trees. The section from La Sierra Avenue to Banbury Drive is narrower and runs between 12 feet and 26 feet wide. This section also has the double-row palm/tree planting in the wider portions and reduces to a single-row in the narrower portion with an inconsistent repeating pattern of the palm/tree planting pattern.

The properties that front Magnolia Avenue between Buchanan Avenue and Tyler Street are a mix of land uses including: vacant land, single and multi-family residential, office, commercial (including shopping centers, restaurants, and motels), medical facilities, and religious facilities. Residential uses adjoin both the north and south sides of Magnolia Avenue between Filmore Street and Castle Oak Drive.

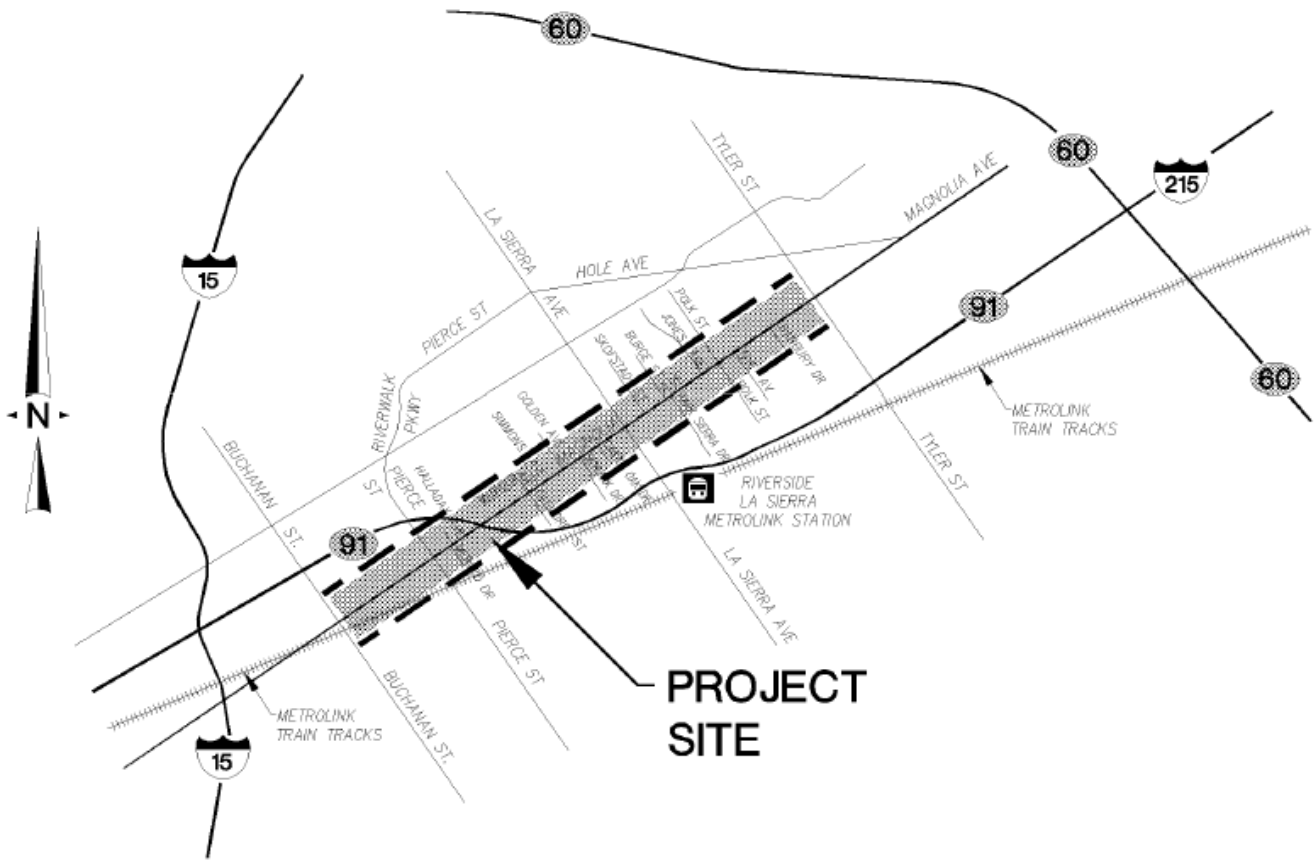

Figure 1- Project Location

PROJECT METHODOLOGY

RESEARCH, FIELDWORK, AND CONSULTATION WITH LOCAL GROUPS
To complete an evaluation of the significance of the roadway Kim Jarrell Johnson, Historic Preservation Planner, & Dean R. Ayer, Administrative Analyst, conducted research at City of Riverside Planning Division, City of Riverside Public Works Department, Riverside Public Library Local History Collection, Riverside Metropolitan Museum, County of Riverside Assessor, and an internet web search. Ms. Johnson and Mr. Ayer also consulted with local members of the historical community:

Kevin Hallaran, Archivist, Riverside Metropolitan Museum
Jessica Herdina, Local History Supervisor, Riverside Public Library
Steve Lech, local historian and President of the Riverside Historical Society
Jennifer Mermilliod, local historian and principal of JM Research and Consulting
Daniel Paul, Architectural Historian
Bill Wilkman, local historian and principal of Wilkman Preservation Services

On April 17, 2009, Kim Jarrell Johnson, Historic Preservation Planner, Erin Gettis, Historic Preservation Officer, and Dean R. Ayer, Administrative Analyst,

visited the project area along Magnolia Avenue. The roadways and medians were examined for width, landscaping, and historic integrity. The project area was compared to other stretches of Magnolia Avenue including the City Landmark section of Magnolia Avenue from Arlington Avenue to San Rafael Way. Photographs of Magnolia Avenue were taken both inside and outside of the projects area.

HISTORIC CONTEXT STATEMENT

Spanish Period (A.D. 1769 to 1824)

Europeans first visited the present-day Riverside area in the early and mid 1770s, soon after the Spanish colonization of Alta California in 1769. In 1772 Pedro Fages led a group of Spanish soldiers into the area to track down deserters from the Spanish garrison in San Diego. In 1774 Juan Bautista De Anza, given the task of finding an overland route from Sonora in present day Mexico to colonies and missions in Alta California, led a group of 34 soldiers, interpreters, and servants to San Gabriel. In 1776 he retraced his route to lead a group of settlers to establish a colony at San Francisco. The route Anza followed led him across what is today the city of Moreno Valley, through Sycamore Canyon, through today's Riverside just south of what is now the downtown area, and across the Santa Ana River at a narrow point now known as Anza Narrows. (Lech 2004:4, 9-10)

After the establishment of the mission system what is now the Riverside area became one of the Mission San Gabriel's rancherias, known as Jurupa. However, the Rancho Jurupa was used primarily to run cattle for the mission and no Europeans are known to have settled the area during this time.

Mexican Period (A.D. 1821 to 1848)

The Mexican period began with the success of the Mexican Revolution and its resulting independence from Spain in 1821. The Secularization Act was passed in 1833 and the mission lands were divided into large land grants called ranchos. The Mexican government granted the ranchos to well-connected Mexican families. Three ranchos included portions of present day Riverside: the Jurupa, the La Sierra and the El Sobrante de San Jacinto. The seven-square-league Rancho Jurupa was granted to Juan Bandini, an administrator for the Mission San Gabriel, in 1838. In 1843 Bandini sold 1.5 leagues of the Rancho to Benjamin "Benito" Wilson. Wilson, in turn, sold the land to Louis Robidoux and Robidoux's land became known as the Robidoux rancho. It was a portion of Robidoux's Rancho that was later incorporated into Riverside, covering what is today primarily downtown. The other two ranchos are located west and south of the Rancho Jurupa, located in today's La Sierra area.

The project area in question closely follows the border shared between the Rancho La Sierra and the Rancho El Sobrante De San Jacinto. As Magnolia Avenue travels northeast towards downtown Riverside it passes through a portion of the Rancho Jurupa property.

American Settlement Period (A.D. 1848 to 1885)

The American period began with Mexico's defeat at the end of the Mexican-American war and the handing over of California to the United States under the treaty of Guadelupe Hildago on February 2, 1848. The almost simultaneous discovery of gold on the American River near Sacramento lead to the Gold Rush of 1848-49. California became the 31st state on September 9, 1850. For the settlers that came to southern California, much of their financial success came from cattle ranching rather than gold. Severe droughts and floods as well as legal disputes over land boundaries adversely affected this prosperity and caused many ranchos to go bankrupt. (Castillo 1978, Cleland 1941) At this time nearly all of present day Riverside County was located within the boundaries of San Diego County. A small portion was located first in Los Angeles County and, after it was formed in 1853, in San Bernardino County. Riverside County was formed, after several previously failed proposals, on March 11, 1893.

After the flood of 1862 came three years of terrible drought. Louis Robidoux, who was also suffering from injury and subsequent ill health at this time, began to sell off parts of his rancho. He sold a portion of his rancho located on the east side of the Santa Ana River to the California Silk Center Association. The Association bought additional land from Abel Stearns, who had received ownership of the rest of the Rancho Jurupa from his father-in-law Juan Bandini, and another portion from the government, for a total of about 8,600 acres. The Association planned to plant mulberry trees and grow silk worms. The silk enterprise was a failure, however. (Patterson, 1971:35-37)

In 1870 John North led a party to purchase the bankrupt silk association land for the founding of a new town. Very shortly, two other colonies were founded nearby by Samuel Cary Evans and William Sayward in Arlington/La Sierra area. (Lech 2007: 7) The three independent ventures merged in 1875 and the city incorporated in 1883.

The young city of Riverside grew rapidly in the 1870's and 80s during southern California's land boom. Riverside's early success received a huge boost when the navel orange was introduced in the mid-1870s. This led to the spread of citrus culture throughout Southern California and boosted Riverside to the forefront of the citrus industry. In 1893, when Riverside County was formed, Riverside became the county seat and largest and most dominant city in the new county.

While Riverside continued to grow through the early part of the 20th century, it was the housing boom and baby boom population growth that caused the greatest change in the city. Starting after World War II, Riverside's once widespread citrus acreage began being replaced by tracts of homes. Urban development of open and agricultural lands continues to this day.

Magnolia Avenue

In1875 private investors S.C. Evans and W.T. Sayward joined with the San Jacinto Tin Company to form the Riverside Land and Irrigating Company (RL&I). Their combined water and real estate interests in the Riverside area came to around 12,000 acres just south of the original Riverside tract owned by the Southern California Colony Association. Over the next few years the newly formed RL&I set about gradually acquiring all the stock of the Southern California Colony Association. By March 10th, 1877 the RL&I had acquired and consolidated nearly all land and water interest in the Riverside area including the original Silk Center Association, the Southern California Colony Association, S.C. Evans' holdings, W.T Sayward's holdings, and the San Jacinto Tin Company.(Hall 1888:226)

In order to profit from the selling of their lands, the RL&I planned general improvements to make their holdings more appealing to real estate speculators and investors. After subdividing their lands into farming lots, residential lots, and city block lots, managers of the RL&I planed for roadways to connect their planned development to downtown Riverside, thus making it accessible to settlers, speculators, and the like. W.T. Sayward is credited with first conceiving the idea of a grand roadway beginning at the base of the Temescal Mountains, running through the RL&I property, and continuing through Riverside all the way to the base of the San Bernardino Mountains.(Brown & Boyd 1922:377) "W.T. Sayward, the land company president, came up with the idea for 'Bloomingdale Avenue' while discussing local affairs with other RL&I members. He gave in when the wife of another company bigwig suggested Magnolia instead."(The Press Enterprise Dec. 5 1999) The RL&I had to scale back their initial plans for the roadway due to difficulties in securing right-of-way from Arlington Avenue to 14th street. Undeterred the RL&I began work on the eastern end of Magnolia Avenue in 1877.

Figure 2- Looking West Down Magnolia Ave. from Washington St. circa 1900

Magnolia Avenue was laid out 132 feet in width, including 20 foot wide parkways on each side of the roadway. A central median measuring 10 feet wide was incorporated down the center of the avenue. This design made the eastbound and westbound lanes 41 feet each. Magnolia was laid out in a straight line running south 43 degrees west through the RL&I lands for a total of 15 miles. Additional streets were surveyed and graded to intersect Magnolia Avenue at right angles every half mile, and were to be named after Presidents of the United States.(Riverside Daily Press Aug. 10 1924) The named President cross streets were 80 feet wide and did not strictly follow historical succession of the presidency. They began at the eastern end of the avenue with Washington Street and progressed towards the west with Madison, Jefferson, Adams, Monroe, Jackson, Van Buren, Tyler, Polk, Taylor (now La Sierra Ave.), Filmore, Pierce, Buchanan, Lincoln, Johnson (now McKinley St.), and finally Grant. After the last Presidential street, Magnolia Avenue continued west across the RL&I lands for an additional ¾ of a mile terminating 4 blocks west of Temescal Street in the area known as Home Gardens.

The initial work on Magnolia Avenue included the 3 mile section beginning at Arlington Avenue and heading west to Van Buren Boulevard. This stretch was

graded and planted with shade trees starting in 1877. Much thought was given to the tree plantings along the pedestrian walk ways and center median. A.S. White, H.J. Rudisill, and James Boyd were given the task to select appropriate trees for the avenue. Consultants in Northern California recommended planting deciduous trees to allow the dirt roadways to evaporate rainwater thus preventing muddy hazards. White, Rudisill, and Boyd concluded that Riverside had such little rainfall that evergreen trees would beautify Magnolia Avenue without causing a public transportation nuisance. (Brown & Boyd 1922:378) Pepper trees were selected for the center median as they are fast growing and practically indigenous to the area.

Figure 3- Pepper Trees along Magnolia Avenue circa 1880

Blue Gum trees were chosen for the sides along the pedestrian walkways. Initially, Magnolias were to be planted in large quantities, but Riverside's climate did not favor their rapid growth, "so they planted it only at the intersections." (Gordon 1994:67) This location gave the Magnolia trees a better supply of water due to a close proximity to irrigation ditches.

Figure 4- Magnolia Tree planting circa 1880

The Blue Gum trees did not meet the expectations of the planners and were subsequently removed and replaced by Palms and Grevillas. James Boyd was awarded the contract to furnish, plant, and care for the avenue trees for one year. Boyd purchased the trees in Los Angeles where the Pepper and Blue Gum trees cost 5 cents each and the Magnolias $2 a piece. (Brown & Boyd 1922:379) With a mild climate and adequate water supply the initial tree plantings on Magnolia Avenue all survived the first year. The RL&I planted the trees 16 feet apart and intended to remove every other tree as soon as the branches interlocked to prevent damage to the roadway from overgrowth and damage to the trees themselves. As of 1922 this task had yet to be done and was being stalled by the opinion that it would permanently injure some of the trees and adversely affect the beauty of the avenue.

The RL&I shrewdly tied the costs of improving the initial 3 mile section of Magnolia Avenue to the private parties who had purchased frontage lots along the roadway. In offering to cover one third the expense of grading the road, to purchase and plant rows of trees along the side walks and median, to care for the trees for a period of one year, and to furnish irrigation water for free, the RL&I insured that the entrance to Magnolia Avenue would be a uniformly beautiful route to their available land holdings. Property owners along this three mile section of frontage quickly accepted the offer and praised the RL&I for creating such a beautiful road.

The Riverside Land and Irrigating Company only owned and managed Magnolia Avenue for nine years. After the City of Riverside formally incorporated in 1883

the RL&I transferred their land holdings to the newly created Riverside Water Company in 1884, as part of a legal compromise over water rights. "The boundaries of the proposed City of Riverside were in themselves a revelation of the purpose of incorporation. They were drawn around all the land owned and controlled by the Riverside Land & Irrigating Company or irrigated by its canals, and little else." (Patterson, 1996:94) Initially, the City of Riverside incorporated all of the RL&I lands including Magnolia Avenue all the way out to Temescal Street. The RL&I tracts of land extending from Tyler Street west to Temescal Street were oddly shaped, underdeveloped and mostly unimproved. In 1907 RL&I lands west of Tyler Street were voted out of the city limits.

In an attempt to unify their new jurisdiction the City of Riverside allowed a mule car rail line to operate along Magnolia Avenue from Arlington Avenue west to the line's terminus in the Arlington business district at Van Buren Boulevard. This service started in 1887 and linked the downtown Mile Square portion of Riverside with the recently acquired RL&I lands. This line was later electrified in 1899 and shuttled passengers from the Arlington area to the City center and back again. (The Press Enterprise June 17, 1990)

Figure 5- Electrified street car on Magnolia Avenue circa 1900

Passenger cars continued to travel down the Magnolia Avenue rail line until it began to compete with and impede automobile traffic. The Pacific Electric Company eliminated this passenger route in 1913 but continued to use the line for freight service for another 28 years. "However, by the 1950's these electric car lines were eliminated because of nightly freight trains that became a nuisance to the neighborhoods along the boulevard." (The Arroyo Group 2007:2-

3) With increasing vehicle traffic on Magnolia Avenue, the City took steps to maintain public safety in 1891. After a second City Council session an amendment to the traffic code was passed making both sides of Magnolia Avenue one way thoroughfares. The designation extended from Arlington Ave. all the way to Corona. (Riverside Daily Press, June 8, 1891)

Magnolia Avenue received national attention for its beauty and design and was featured in numerous magazines, brochures and travel journals. It was possibly one of the first scenic tree planted roadways in Southern California. Community planners took note and began emulating the roadway's layout. "Magnolia Avenue became an important showplace for Riverside in the ensuing years, and was copied in many other places." (Lech 2004:180) Ontario, Redlands, and Rialto all modeled grand roadways after Magnolia Avenue. Even Riverside's celebrated Victoria Avenue is based on the Magnolia Avenue example. As the roadway's notoriety grew Riverside residents began to take pride in its appearance.

In 1901 members of the Riverside Women's Club and Socorro Club funded improvements to the original section of Magnolia Avenue. It was this group of philanthropic ladies that proposed the systematic curbing of the roadway and median. Additionally, their plan called for the planting of turf grass down the central median. "Probably the most important work which the ladies hope to achieve will be locating the original navel orange tree at the head of Magnolia avenue." (Riverside Daily Press May 1, 1901)

Figure 6- Parent Navel Orange Tree at entrance to Magnolia Avenue circa 1920

By 1910 the City of Riverside recognized the need to extend Magnolia Avenue and link it with the downtown core. The city secured right-of-way through the Government Tract connecting Magnolia Avenue with Cypress Street of the original Riverside Colony. This new portion of roadway extended from Arlington Avenue to the Tequesquite Arroyo. Cypress Street was later renamed as part of Magnolia Avenue to avoid confusion between the monikers “Old Magnolia” and “New Magnolia”. In 1913 the City completed the fill of the Tequesquite Arroyo and joined Magnolia Avenue with Market Street that continued into the downtown area. (Riverside Daily Press August 10, 1924) This section of “New Magnolia” did not enjoy the wide pedestrian walk ways and tree planted median that was originally laid out by the planners for the Riverside Land and Irrigating Company. Still, the improvements lengthened Magnolia Avenue considerably and provided a direct route from the Arlington area and downtown Riverside.

West of Tyler Street along Magnolia Avenue had originally been RL&I lands, but was voted out of the city in 1907. This portion of Magnolia remained unincorporated land of Riverside County until it was reacquired by the City of Riverside through annexation in 1964. No data could be located addressing the landscaping of this western portion of Magnolia Avenue. Still, historic aerials show that it was not planted like the original landscaped section between Arlington and Van Buren. It is probable that the RL&I was unable to finance improvements along the entire length of Magnolia before it turned over its lands to the City in a Water Rights settlement in 1884. As the project area in question was, at the time, a considerable distance from the City center, these lands were less desirable to settlers and real estate speculators. This same line of thinking was likely to have partially influenced the City of Riverside’s decision to vote this area outside of the city limits in 1907.

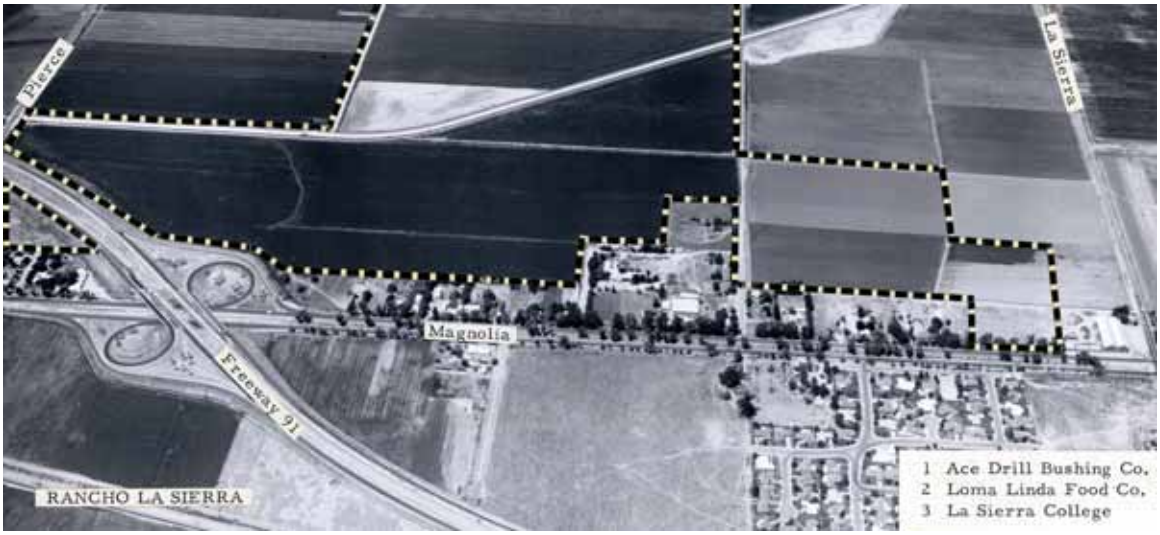

Figure 7- 1963 Aerial of Magnolia Avenue between La Sierra and Pierce

Throughout the years sporadic improvements were made to this western section of Magnolia Avenue. Most were in response to increased traffic flow from

commercial and retail development in the area. Additional alterations were made to Magnolia Avenue to accommodate State Route 91 which was first opened to automobile traffic in the area in 1963. Median and curb construction done in 1968, 1976, and 1997 further modified the roadway and left it much the way it is today.

When compared to similar aerial photographs of sections of Magnolia Avenue that remained inside the city limits, the RL&I tract that was left unincorporated until 1964 exhibits some distinguishing characteristics. The large 20 foot wide pedestrian parkways are non existent with only sidewalks with minimum setbacks in their place. The median no longer conforms to the original 10 foot wide plan and varies in width from 12 to 50 feet. Landscaping is along this stretch is also not representative of the original RL&I plan with Mexican Fan Palm and Magnolia trees randomly alternating through the median. Discussions with local historians and preservation researchers has led to the speculation that once the rail line along Magnolia Was abandoned, the tracks were removed and the rail line right-of-way may have been incorporated into the median.(Hallaran, Lech, Mermilliod, & Wilkman 4/09) This could explain the unusually large median from La Sierra Avenue to Buchanan. This portion of Magnolia Avenue was not within the City limits when the rail line was abandoned in the late 1950's and was likely left unimproved until it was annexed by the City in 1964. Moreover, it is probable that the extra-wide median does not exist east of Tyler Street due to the City incorporating the rail line right-of-way directly into the traffic lanes of Magnolia Avenue to improve traffic flow within the City limits.

Figure 8- Magnolia Avenue crossing in front of Sherman Indian School circa 1930

These differences are likely due to the section in question being disjointed from the City limits for fifty seven years. This distinct lack of unity with the original portion of Magnolia was likely compounded by its setting in a rural agricultural

area that supported only sporadic commercial development along Magnolia Avenue until the Tyler Mall was built in 1970.

Figure 9- Magnolia Avenue at Harrison St. circa 1920

Today Magnolia Avenue continues to be a vital transportation corridor extending approximately seventeen miles through the City of Riverside. This once nationally recognized scenic drive has fallen victim to piecemeal development and displays haphazard landscaping along its reach. At the entrance to the City at Buchanan Street the median is 50 feet wide and has been landscaped in recent years to include a standard City entry monument and a group of Navel Orange trees reflecting Riverside's citrus heritage. Two rows of Mexican Fan Palm and Magnolia trees extend along the median to La Sierra Avenue.

Figure 10- Looking East down Magnolia Ave. from Buchanan 2009

From La Sierra Avenue to Banbury Drive the median gets narrower and measures between 12 and 26 feet wide. The double row of Palm and Magnolia trees continues in the wider portion and then reduces to a single row in the narrower portion. The trees do not appear to have been planted in a repeating pattern in this section of the median.

Figure 11- Looking West down Magnolia Ave. from Banbury Drive 2009

From Tyler Street west to Banbury Drive the median remains narrow and only has Magnolia trees planted in the center median. Turf grass has been planted in this section except where the median has been landscaped with concrete pavers at the intersection of Tyler and Magnolia. Once the median widens out at Banbury Drive no more turf grass is seen in the median all the way out to the city limit.

Figure 12- Looking West down Magnolia Ave. from Tyler Street 2009

The original three mile section of Magnolia Avenue has also experienced some changes throughout it life. Most of the central median trees haven been replaced with Magnolias whereas they were originally only planted at the intersections with the Presidential streets. Sections of the pedestrian walk ways on both sides of the avenue have been altered from their original design. Paving of the original dirt roadways was begun shortly after the Tequesquite Arroyo fill was completed in 1913 and finally completed in 1924. (Riverside Daily Press August 10, 1924) Today this section still maintains the most historical integrity in regards to landscaping, tree planting, and median treatment.

Figure 13- Looking West down Magnolia Ave. from Washington Street 2009

EXISTING RESOURCES

No properties along the 2.75 mile section of Magnolia Avenue have been designated or identified as historic. There are however, a number of landmark properties along Magnolia Avenue within a few miles of the project area:

Heritage House – 8193 Magnolia Avenue
Parent Navel Orange – 7100 Magnolia Avenue
Magnolia United Presbyterian Church – 7200 Magnolia Avenue
Arlington Branch Library – 9556 Magnolia Avenue
Robert Bettner House – 7900 Magnolia Avenue
Sherman Indian High School - 9010 Magnolia Avenue
Riverside Community College Quadrangle – 4800 Magnolia Avenue
Moulton House – 7335 Magnolia Avenue
Palm Elementary School – 6735 Magnolia Avenue
Robert Bettner House – 7995 Magnolia Avenue
Magnolia Avenue Parkways and Center Median - between Arlington Ave & San Rafael Way
Newman Park – Magnolia Avenue at Fourteenth Street
Holden House – 7355 Magnolia Avenue

CRITERIA FOR HISTORIC DESIGNATION

At the national, state, and local level, systems have been created to evaluate, document, and designate those things that tell the history of an area. Most governmental entities use 45 to 50 years as the basic beginning point for determining eligibility for official historic status. The following is a summary of the criteria used at the national, state, and local levels to determine eligibility for historic status.

National Register of Historic Places

A cultural resource is evaluated for eligibility for listing in the National Register according to four criteria. These criteria generally require that the resource be 50 years of age or older and significant at the local, state, or national level according to one or more of the following:

A. It is associated with events that have made a significant contribution to the broad patterns of local or regional history;
B. It is associated with the lives of persons significant in our past;
C. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values, or that represent a significant and distinguishable entity whose components lack individual distinction; and/or
D. It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, state, or the nation.

Properties that are not 50 years of age or older must have “exceptional significance” in accordance with National Register Criteria Considerations. The National Register also requires that a resource possess integrity, which is defined as “the ability of a property to convey its significance.” The aspects of integrity are location, design, setting, materials, workmanship, feeling, and association. To determine which of these factors is most important will depend on the particular National Register criterion or criteria under which the resource is considered eligible for listing.

California Register of Historical Resources

The California Register criteria are based on National Register criteria. For a property to be eligible for inclusion in the California Register, one or more of the following criteria must be met:

(1) The property is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage.
(2) The property is associated with the lives of persons important in our past.

(3) The property embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
(4) The property has yielded, or may be likely to yield, information important in prehistory or history. (PRC § 5024.1(c))

In addition to meeting one or more of the above criteria, California Register regulations require sufficient time to have passed since a resource's period of significance to "obtain a scholarly perspective on the events or individuals associated with the resource." Fifty years is used as a general estimate of the time needed to develop this perspective and permit a legitimate understanding of the resource's significance. A resource less than 50 years old "may be considered for listing in the California Register if it can be demonstrated that sufficient time has passed to understand its historical importance" (CCR 4852 (d)(2)).

Finally, the California Register requires that a resource possess integrity, which is defined as "the authenticity of an historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance" (California Office of Historic Preservation 1999:2). To retain integrity, a resource should have its original location, design, setting, materials, workmanship, feeling, and association. Which of these factors is most important will depend on the particular criterion or criteria under which the resource is considered eligible for listing (California Office of Historic Preservation 1999).

City of Riverside Cultural Resources Ordinance

The City of Riverside's Cultural Resources Ordinance provides designation criteria for Landmarks, Structures of Merit, Historic Districts, and Neighborhood Conservation Areas, the criteria for which are outlined in Riverside Municipal Code (RMC) § 20.20.010, § 20.21.010, § 20.25.010, and § 20.26.010, respectively. A cultural resource may be determined eligible to be a contributor to a Historic District or Neighborhood Conservation Area and/or also be individually designated as a Landmark or Structure of Merit.

The criteria for Landmark designation are as follows:
(a) Exemplifies or reflects special elements of the city's cultural, social, economic, political, aesthetic, engineering, architectural, or natural history; or
(b) Is identified with persons or events significant in local, state, or national history; or
(c) Embodies distinctive characteristics of a style, type, period, or method of construction, or is a valuable example of the use of indigenous materials or craftsmanship; or
(d) Represents the work of a notable builder, designer, or architect; or

(e) Contributes to the significance of a historic area, being a geographically definable area possessing a concentration of historic or scenic properties or thematically related grouping of properties, which contribute to each other and are unified aesthetically by plan or physical development; or
(f) Has a unique location or singular physical characteristics or is a view or vista representing an established and familiar visual feature of a neighborhood community or of the city; or
(g) Embodies elements of architectural design, detail, materials, or craftsmanship that represent a significant structural or architectural achievement or innovation; or
(h) Is similar to other distinctive properties, sites, areas, or objects based on a historic, cultural, or architectural motif; or
(i) Reflects significant geographical patterns, including those associated with different eras of settlement and growth, particular transportation modes, or distinctive examples of park or community planning; or
(j) Is one of the few remaining examples in the city, region, state, or nation possessing distinguishing characteristics of an architectural or historical type or specimen. (RMC § 20.20.010)
The status of Structure of Merit as currently applied by the City is usually used to distinguish historic buildings and structures of lesser significance than a Landmark. A Structure of Merit is one that:
(a) Represents in its location an established and familiar visual feature of the neighborhood, community, or city; or
(b) Materially benefits the historic, architectural, or aesthetic character of the neighborhood; or
(c) Is an example of a type of building which was once common but is now rare in its neighborhood, community, or area; or
(d) Is connected with a business or use which was once common but is now rare; or
(e) Contributes to an understanding of contextual significance of a neighborhood, community, or area. (RMC § 20.21.010)

STATEMENT OF SIGNIFICANCE

It is the conclusion of this report that the proposed project area of Magnolia Avenue does not qualify for historic designation at the federal, state, or local levels. The proposed project area of Magnolia Avenue between Tyler Street and Buchanan Avenue was never included in the original section landscaped by the Riverside Land and Irrigating Company in 1877. The original grand section of Magnolia Avenue only extended 3 miles from Arlington Avenue east to Van Buren Boulevard. Today, the designated Landmark portion of the roadway only extends from Arlington Avenue to San Rafael Way. The project area in question is not contiguous to the Landmark portion of Magnolia Avenue, nor does it resemble the original design & landscaping plan laid out by the RL&I. The project area was set in a rural area outside of the City limits for much of its existence. The lack of landscaping was not a conscious choice but the result of

its' remote location under Riverside County jurisdiction. The current state of the project area is a result of retail and commercial development in the area that began to impact travel in the late 1960's.

The proposed traffic and landscape improvements do not eliminate any historically significant aspect of the roadway or adversely affect the designated Landmark section of Magnolia Avenue. With alterations to the project area, Magnolia Avenue will still retain its identity as a primary east-west traffic artery through the City that links numerous distinct neighborhoods, a portion of which is historic and designated as such.

The proposed street and beautification improvements to the project area will enhance traffic flow along Magnolia Avenue and provide new median landscaping that creates a western gateway into the City. The project plan incorporates elements that reference the local area's cultural heritage. Citrus plantings, replica smudge pots and propeller type wind machines are to be included to connect to the La Sierra area's citrus legacy.

The irrigation plan for the median landscaping is designed to be water-wise utilizing drought tolerant turf and shrubs where appropriate. Additionally a Gage Canal replica is being designed to illustrate the significance of irrigation in the region. Finally, tree plantings are proposed to mimic the historic plantings along the designated Landmark section of Magnolia Avenue. The project plan also stipulates that if current trees interfere with the traffic improvements they will be relocated and replaced with new box-size Magnolia, Grandiflora, and Tabebuia trees.

11759 MAGNOLIA AVENUE

The house in question is located at 11759 Magnolia Ave. It is located on the northwest side of Magnolia Avenue between Pierce Street and La Sierra Avenue. City building permit records do not indicate when the house was built but because the house appears to be over 50 years old and a potion of the lot that the house sits on is proposed to be used for road improvements the City determined that it should be evaluated for historical significance.

The house was built in a typical mid century ranch style in an L-shaped floor plan with stucco siding. The roof is cross gabled covered in composition shingles. An addition has been added to the west side of the house. This may be the addition that received a building permit in March 1965 according to the City building permit records. All the original widows have been replaced with white vinyl windows. What appears to be the original wood "storybook" style wood trim is still located on the east end and the original south facing front of the house. All the original landscaping has been replaced by asphalt paving. The house is currently being used as a business.

The home and its setting have been significantly altered and therefore do not qualify for historic designation at the federal, state or local level. The use of some of the property for road improvements will have no impact on any historic resources.

Figure 14 - 11759 Magnolia Avenue, April 2009

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Persons and Organizations Consulted

Kevin Hallaran, Archivist, Riverside Metropolitan Museum
Steve Lech, local historian and President of the Riverside Historical Society
Jennifer Mermilliod, local historian and principal of JM Research and Consulting
Daniel Paul, Architectural Historian
Bill Wilkman, local historian and principal of Wilkman Preservation Services

Appendix F

Magnolia Avenue Improvements Tyler Street to Buchanan Street
Analysis of Capacity, Level of Service and Performance

MAGNOLIA AVENUE IMPROVEMENTS

TYLER STREET TO BUCHANAN STREET

ANALYSIS OF

CAPACITY, LEVEL OF SERVICE AND PERFORMANCE

PREPARED BY:

CITY OF RIVERSIDE
PUBLIC WORKS DEPARTMENT

OCTOBER 30, 2008

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- Existing Conditions
- Year 2025 with 4 Lanes
- Year 2025 with 6 Lanes

HCM Signalized Intersection Capacity Analysis
- Existing Conditions
- Year 2025 with 4 Lanes
- Year 2025 with 6 Lanes

Measure of Effectiveness (MOE)
- Year 2025 with 4 Lanes
- Year 2025 with 6 Lanes

Directional Volume Count Data, March 2008

Intersection Turning Movement Data, June 2008

MAGNOLIA AVENUE IMPROVEMENTS
TYLER STREET TO BUCHANAN STREET

ANALYSIS OF
CAPACITY, LEVEL OF SERVICE AND PERFORMANCE

INTRODUCTION

Currently, a conceptual plan is being developed for improvements to Magnolia Avenue from Tyler Street to Buchanan Street. This analysis was conducted to review the Level of Service (LOS), performance and capacity based on 4 and 6 lane configurations, as the current design capacity has been exceeded within some of the segments.

BACKGROUND

The segment of Magnolia Avenue between the Western City Limit to Banbury Drive is classified as a 110 foot arterial by the City's General Plan with 4 travel lanes. It is projected to operate at a LOS of D under this scenario for year 2025. Magnolia Avenue parallels SR 91 and it is common for freeway traffic, when freeway incidents occur, to exit the freeway and utilize Magnolia Avenue to bypass traffic congestion. This substantially increases the traffic volume on Magnolia Avenue.

The General Plan utilized the Regional Model from Southern California Association of Governments (SCAG). As in all models it cannot predict a sudden influx of growth and changes of land use. For example, the segment of Magnolia Avenue west of La Sierra currently, 2008 data, has an ADT of 33,700 which exceeds the existing design capacity of 33,000 vehicles.

EVALUATION CRITERIA

The analysis was conducted using Synchro with the La Sierra/Magnolia Avenue 2006 arterial traffic signal coordination project. By utilizing this base, the arterial was optimized for the existing conditions. The segment was analyzed for:

CAPACITY

Capacity is the maximum number of vehicles the arterial segment can accommodate within a specified unit of time, when the segment has ideal physical and operational characteristics. Therefore, capacity is the measure of the arterial's potential. In cases where the capacity is different at different points on the segment, the point with the least capacity is considered to represent the capacity for the entire segment.

VOLUME TO CAPACITY RATIO

Ratio of flow rate to capacity

FLOW RATE

Hourly rate at which vehicles pass a point in the segment divided by a time interval expressed in vehicles per hour (vph).

LEVEL OF SERVICE

A qualitative measure describing operational conditions within a traffic stream, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience.

TABLE CCM-1
LEVEL OF SERVICE DEFINITIONS

LOS	Interpretation	Signalized Intersection Delay (seconds per vehicle)	Stop-Controlled Intersection Average Stop Delay (seconds)
A	Excellent operation. All approaches to the intersection appear quite open, turning movements are easily made and nearly all drivers find freedom of operation.	<10	<10
B	Very good operation. Many drivers begin to feel somewhat restricted within platoons of vehicles. This represents stable flow. An approach to an intersection may occasionally be fully utilized and traffic queues start to form.	>10 and <20	>10 and <15
C	Good operation. Occasionally backups may develop behind turning vehicles. Most drivers feel somewhat restricted.	>20 and <35	>15 and <25
D	Fair operation. There are no long-standing traffic queues. This level is typically associated with design practice for peak periods.	>35 and <55	>25 and <35
E	Poor operation. Some long-standing vehicular queues develop on critical approaches.	>55 and <80	>35 and <50
F	Forced flow. Represents jammed conditions. Backups from locations downstream or on the cross street may restrict or prevent movements of vehicles out of the intersection approach lanes; therefore, volumes carried are not predictable. Potential for stop-and-go type traffic flow.	>80	>50

Source: Highway Capacity Manual 2000, Exhibit 16-2 and Exhibit 17-2

PERFORMANCE

The performance measures for urban streets can be measured by:

- Travel speeds (an effective service measure)
- Travel time (the portion of the travel time that a vehicle is in motion)
- Intersection control delay (additional travel time that is experienced due to controls and interaction with other users of the roadway)

Capacity is one measure of an arterial's potential. While the measure of volume to capacity ratio (v/c) is more significant when analyzing the performance of an arterial system; the operational performance evaluates the arterial as a whole and can provide performance criteria for the individual segments as well.

ANALYSIS

The baseline volume data was provided from a study conducted in 2006 for signal coordination. Intersection turning volume data was also collected at the intersections of Magnolia Avenue and La Sierra Avenue, Tyler Street, and Pierce Street in June 2008. ADT volumes were also collected on Magnolia Avenue west of Tyler Street, east of La Sierra Avenue, and east of Pierce Street in March 2008.

The existing volume data was projected out to year 2025 and compared to the City's General Plan volumes for the same segment. The General Plan projected an ADT of 37,500 vehicles per day based on data collected in 2003. The revised projection of 39,400 vehicles per day is based on more current data from 2008. Therefore, the revised projection was used in the analysis.

The analysis output was focused on:

- Free Flow Speed (average speed on a multi-lane highway under conditions of low volume)
- Signal Delay (percentile delay for the through lane group)
- Travel Time (running time plus signal delay)
- Arterial Speed (segment distance divided by travel time)
- Arterial Level of Service (arterial speed from HCM table based on arterial class)
- Volume to Capacity Ratio (V/C)

The segment was analyzed for Level of Service and performance based on the following conditions:

- Existing Conditions with current lane configuration (4 lanes)
- Future conditions (Year 2025) with current lane configuration (4 lanes)
- Future conditions (Year 2025) with change in lane configuration (6 lanes)

RESULTS

VOLUME TO CAPACITY ANALYSIS[1]

VOLUME TO CAPACITY (v/c)

	V/C RATIO	LOS
Existing Conditions	1.02	E
2025 with 4 lanes	1.19	F
2025 with 6 lanes	.79	C

PERFORMANCE ANALYSIS[2]

EXISTING CONDITIONS
ARTERIAL LOS

EASTBOUND		WESTBOUND	
AM	PM	AM	PM
C	D	D	C

YEAR 2025 WITH 4 TRAVEL LANES
ARTERIAL LOS

EASTBOUND		WESTBOUND	
AM	PM	AM	PM
D	E	E	E

YEAR 2025 WITH 6 TRAVEL LANES
ARTERIAL LOS

EASTBOUND		WESTBOUND	
AM	PM	AM	PM
C	C	C	C

Figure 1 shows a pictorial of the LOS for a Class II arterial and Table 1 gives a comparison of the travel time, arterial speed, and LOS for the different scenarios.

Performance Analysis -
In the existing conditions the overall arterial LOS may show C or D, but there are segments within the arterial operating at a LOS of E and F. The most significant eastbound segments are Pierce Street to La Sierra Avenue and Nye Avenue to Danbury Drive. The LOS improves east of Danbury Drive because the two eastbound lanes go to 3 lanes, which has increased capacity. The most significant westbound segments are La Sierra Avenue to Skofstad Street and Polk Street to Nye Avenue.

In reviewing the analysis for year 2025 with the existing 4 lanes, there is a substantial deterioration of the LOS within some of the segments. This can be attributed to two major factors. An increase in traffic volumes, which decreases the LOS due to lack of lane capacity; secondly left turning vehicles queuing into the through travel lanes blocking through traffic.

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[1] Volume of vehicles to design capacity ratio
[2] Based on travel times and speeds for the entire arterial

LEVEL OF SERVICE (LOS) FOR CLASS II ARTERIALS

A

Free-flow conditions

Vehicles unaffected by other vehicles

Movement within the traffic stream is good

Minor disruptions to flow are absorbed without change to speed

Speed
Greater than 35 MPH

B

Free-flow conditions

Other vehicles become more noticeable

Less freedom to maneuver

Minor disruptions to flow are absorbed, although local deterioration in LOS is more obvious

Speed
28 MPH to 35 MPH

C

Traffic density on roadways becomes more noticeable

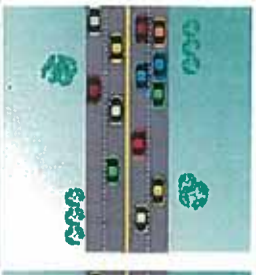
Traffic becomes affected by other vehicles

Travel speeds may become reduced

Queuing occurs with serious traffic disruption

Speed
22 MPH to 28 MPH

D



Movement becomes restricted due to traffic congestion

Speed decline slightly with increasing flows

Minor disruptions can be absorbed without extensive queues forming and the service deteriorating

Speed
17 MPH to 22 MPH

E

Operations at or near capacity

Minimum spacing for maintaining uniform flow

Speeds are highly variable and unpredictable

Speed
13 MPH to 17 MPH

F

Forced or breakdown in vehicular flow

Vehicle speeds are less than 13 mph

Complete congestion

Speed
Less Than 13 MPH

Figure 1

MAGNOLIA AVENUE BETWEEN TYLER STREET AND BUCHANAN STREET
COMPARISON OF LEVEL OF SERVICE

EXISTING CONDITIONS	EASTBOUND		WESTBOUND	
	AM	PM	AM	PM
TRAVEL TIME (sec)	480.6	536.9	429.4	397.7
ARTERIAL SPEED (mph)	24	21.5	21.7	23.4
LOS	C	D	D	C

YEAR 2025 WITH 4 TRAVEL LANES	EASTBOUND		WESTBOUND	
	AM	PM	AM	PM
TRAVEL TIME (sec)	529.4	817.3	667.5	592.3
ARTERIAL SPEED (mph)	21.8	14.1	13.9	15.7
LOS	D	E	E	E

INCREASE/DECREASE (1)	EASTBOUND		WESTBOUND	
	AM	PM	AM	PM
TRAVEL TIME (sec)	10.2%	52.2%	55.4%	48.9%
ARTERIAL SPEED (mph)	-9.2%	-34.4%	-35.9%	-32.9%

YEAR 2025 WITH 6 TRAVEL LANES	EASTBOUND		WESTBOUND	
	AM	PM	AM	PM
TRAVEL TIME (sec)	483.9	524	417.8	391.4
ARTERIAL SPEED (mph)	23.9	22	22.3	23.7
LOS	C	C	C	C

INCREASE/DECREASE (1)	EASTBOUND		WESTBOUND	
	AM	PM	AM	PM
TRAVEL TIME (sec)	0.7%	-2.4%	-2.7%	-1.6%
ARTERIAL SPEED (mph)	-0.4%	2.3%	2.8%	1.3%

(1) COMPARED TO EXISTING CONDITIONS

Table 1

CONCLUSIONS

Magnolia Avenue is currently a 4 lane divided arterial running roughly in a East/West direction. It also parallels the SR 91 Freeway with several easy access points for freeway access. This arterial currently has an ADT of approximately 29,600 to 33,700 vehicles per weekday with a design capacity of 33,000 vehicles per day. With the existing design capacity, the volume to capacity ratio is at LOS E. This results in unstable traffic speeds flowing at capacity with stoppages. It is projected that in the year 2025 there will be approximately 37,440 to 39,400 vehicles per weekday within this same segment. Based on the projected growth (2025) the volume to capacity ration LOS will be F, with the current 4 lane configuration. LOS of F results in a breakdown in the flow of traffic and complete congestion. When the lane configuration changes to 6 lanes, the analysis shows that there is a significant improvement to the Arterial LOS. This improvement provides a reduction in emissions, decreased travel times, and some additional capacity for spillover traffic from SR 91 when incidents occur on the freeway, so that traffic could flow at near capacity volumes with feasibly greater speeds.

This conclusion is supported by volume to capacity analysis (v/c) and operational performance analysis.

RECOMMENDATIONS

Magnolia Avenue from Banbury Street to the Western City Limits should be built out to a 6 lane arterial based on the arterial performance factors and volume to capacity ratios. In addition, the storage capacity needs to be increased for left turn pockets because left turning vehicles are queuing back into the through lanes. Increasing the storage capacity by extending the turn pocket at some point becomes inefficient for signal operation, therefore a dual left turn would be used for efficiency and performance, which will have less impact on landscaped medians. The extension of the left turn pockets with dual left turns and the additional two though lanes can be accommodated within the existing right-of-way by utilizing a portion of the existing median.

It is highly recommended that this arterial segment be built to the standard of a 6 lane arterial. Keeping this segment at its current 4 lane configuration, will result in a significant drop in the arterial level of service with unsatisfactory negative impacts on travel times and speeds.

APPENDIX

Tour Dr
Magnolia Ave
Blackburn Dr
Hyde Ave
Polk St
Polk St
Magnolia Ave
Park Sierra Dr
SR-91 WB Ramps
La Sierra Ave
Hidden Ave
Lugano Dr
La Sierra Ave
Arizona Ave
Stockdale St
SR-91 EB Ramps
Hacienda Dr
La Sierra Ave
Magnolia Ave
Cypress Dr
Cochran Ave
Sierra Dr
La Sierra Ave
Golden Ave
Fillmore St
Magnolia Ave
Pierce St
Magnolia Ave
Buchanan St
Magnolia Ave
Pierce St
Hole Ave
La Sierra Ave
Sequoia Ave
Mesa Ave
Cedar Ave

HCM
ARTERIAL LEVEL OF SERVICE

EXISTING CONDITIONS

Arterial Level of Service: EB Magnolia Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Buchanan St	II	40	77.0	26.8	103.8	0.86	29.7	B
Pierce St	II	40	47.9	25.5	73.4	0.51	25.3	C
Filmore St	II	40	48.1	12.0	60.1	0.52	31.0	B
Golden Ave	II	40	21.5	12.6	34.1	0.19	19.8	D
La Sierra Ave	II	40	32.6	18.6	51.2	0.33	23.2	C
	II	40	13.4	8.2	21.6	0.12	19.3	D
Park Sierra Dr	II	40	16.3	10.3	26.6	0.14	19.1	D
PolkSt	II	40	28.8	20.4	49.2	0.26	19.1	D
Nye Ave	II	40	10.1	8.1	18.2	0.09	17.3	D
Banbury Dr	II	40	22.5	19.9	42.4	0.20	16.6	E
Total	II		318.2	162.4	480.6	3.21	24.0	C

Arterial Level of Service: WB Magnolia Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Banbury Dr	II	40	25.7	21.9	47.6	0.23	17.7	D
Nye Ave	II	40	22.5	8.6	31.1	0.20	22.6	C
PolkSt	II	40	10.1	15.4	25.5	0.09	12.4	F
Park Sierra Dr	II	40	28.8	1.6	30.4	0.26	31.0	B
Skofstad St	II	40	16.3	5.5	21.8	0.14	23.4	C
La Sierra Ave	II	40	13.4	19.4	32.8	0.12	12.7	F
Golden Ave	II	40	32.6	18.1	50.7	0.33	23.4	C
Filmore St	II	40	21.5	7.7	29.2	0.19	23.1	C
Pierce St	II	40	48.1	42.4	90.5	0.52	20.6	D
Buchanan St	II	40	47.9	21.9	69.8	0.51	26.6	C
Total	II		266.9	162.5	429.4	2.58	21.7	D

Arterial Level of Service: EB Magnolia Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Buchanan St	II	40	77.0	37.4	114.4	0.86	26.9	C
Pierce St	II	40	47.9	39.9	87.8	0.51	21.1	D
Filmore St	II	40	48.1	8.7	56.8	0.52	32.8	B
Golden Ave	II	40	21.5	15.0	36.5	0.19	18.5	D
La Sierra Ave	II	40	32.6	40.2	72.8	0.33	16.3	E
	II	40	13.4	15.2	28.6	0.12	14.6	E
Park Sierra Dr	II	40	16.3	5.7	22.0	0.14	23.2	C
PolkSt	II	40	28.8	20.7	49.5	0.26	19.0	D
Nye Ave	II	40	10.1	4.5	14.6	0.09	21.6	D
Banbury Dr	II	40	22.5	31.4	53.9	0.20	13.1	E
Total	II		318.2	218.7	536.9	3.21	21.5	D

Arterial Level of Service: WB Magnolia Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Banbury Dr	II	40	25.7	16.7	42.4	0.23	19.8	D
Nye Ave	II	40	22.5	5.5	28.0	0.20	25.1	C
PolkSt	II	40	10.1	8.6	18.7	0.09	16.9	E
Park Sierra Dr	II	40	28.8	3.3	32.1	0.26	29.3	B
Skofstad St	II	40	16.3	6.5	22.8	0.14	22.3	C
La Sierra Ave	II	40	13.4	31.2	44.6	0.12	9.4	F
Golden Ave	II	40	32.6	5.7	38.3	0.33	31.0	B
Filmore St	II	40	21.5	15.6	37.1	0.19	18.2	D
Pierce St	II	40	48.1	27.9	76.0	0.52	24.5	C
Buchanan St	II	40	47.9	9.8	57.7	0.51	32.1	B
Total	II		266.9	130.8	397.7	2.58	23.4	C

HCM
ARTERIAL LEVEL OF SERVICE

YEAR 2025 WITH 4 LANES

Arterial Level of Service: EB Magnolia Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Buchanan St	II	40	77.0	33.9	110.9	0.86	27.8	C
Pierce St	II	40	47.9	44.3	92.2	0.51	20.1	D
Filmore St	II	40	48.1	14.1	62.2	0.52	29.9	B
Golden Ave	II	40	21.5	15.2	36.7	0.19	18.4	D
La Sierra Ave	II	40	32.6	20.2	52.8	0.33	22.5	C
	II	40	13.4	10.2	23.6	0.12	17.7	D
Park Sierra Dr	II	40	16.3	16.5	32.8	0.14	15.5	E
PolkSt	II	40	28.8	22.6	51.4	0.26	18.3	D
Nye Ave	II	40	10.1	6.6	16.7	0.09	18.9	D
Banbury Dr	II	40	22.5	27.5	50.0	0.20	14.1	E
Total	II		318.2	211.1	529.3	3.21	21.8	D

Arterial Level of Service: WB Magnolia Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Banbury Dr	II	40	25.7	23.8	49.5	0.23	17.0	E
Nye Ave	II	40	22.5	12.8	35.3	0.20	19.9	D
PolkSt	II	40	10.1	20.6	30.7	0.09	10.3	F
Park Sierra Dr	II	40	28.8	2.3	31.1	0.26	30.3	B
Skofstad St	II	40	16.3	6.2	22.5	0.14	22.6	C
La Sierra Ave	II	40	13.4	23.1	36.5	0.12	11.5	F
Golden Ave	II	40	32.6	20.1	52.7	0.33	22.5	C
Filmore St	II	40	21.5	13.7	35.2	0.19	19.1	D
Pierce St	II	40	48.1	194.5	242.6	0.52	7.7	F
Buchanan St	II	40	47.9	83.5	131.4	0.51	14.1	E
Total	II		266.9	400.6	667.5	2.58	13.9	E

Arterial Level of Service: EB Magnolia Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Buchanan St	II	40	77.0	100.5	177.5	0.86	17.4	D
Pierce St	II	40	47.9	165.8	213.7	0.51	8.7	F
Filmore St	II	40	48.1	9.6	57.7	0.52	32.2	B
Golden Ave	II	40	21.5	17.1	38.6	0.19	17.5	D
La Sierra Ave	II	40	32.6	89.1	121.7	0.33	9.8	F
	II	40	13.4	19.1	32.5	0.12	12.9	F
Park Sierra Dr	II	40	16.3	31.8	48.1	0.14	10.6	F
PolkSt	II	40	28.8	22.9	51.7	0.26	18.2	D
Nye Ave	II	40	10.1	10.1	20.2	0.09	15.6	E
Banbury Dr	II	40	22.5	33.1	55.6	0.20	12.7	F
Total	II		318.2	499.1	817.3	3.21	14.1	E

Arterial Level of Service: WB Magnolia Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Banbury Dr	II	40	25.7	39.0	64.7	0.23	13.0	E
Nye Ave	II	40	22.5	20.6	43.1	0.20	16.3	E
PolkSt	II	40	10.1	19.4	29.5	0.09	10.7	F
Park Sierra Dr	II	40	28.8	7.6	36.4	0.26	25.9	C
Skofstad St	II	40	16.3	9.6	25.9	0.14	19.7	D
La Sierra Ave	II	40	13.4	125.1	138.5	0.12	3.0	F
Golden Ave	II	40	32.6	5.8	38.4	0.33	30.9	B
Filmore St	II	40	21.5	19.2	40.7	0.19	16.6	E
Pierce St	II	40	48.1	68.7	116.8	0.52	15.9	E
Buchanan St	II	40	47.9	10.4	58.3	0.51	31.8	B
Total	II		266.9	325.4	592.3	2.58	15.7	E

HCM
ARTERIAL LEVEL OF SERVICE

YEAR 2025 WITH 6 LANES

Arterial Level of Service: EB Magnolia Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Buchanan St	II	40	77.0	25.9	102.9	0.86	29.9	B
Pierce St	II	40	47.9	23.6	71.5	0.51	25.9	C
Filmore St	II	40	48.1	13.4	61.5	0.52	30.3	B
Golden Ave	II	40	21.5	10.9	32.4	0.19	20.8	D
La Sierra Ave	II	40	32.6	21.9	54.5	0.33	21.8	D
	II	40	13.4	9.2	22.6	0.12	18.5	D
Park Sierra Dr	II	40	16.3	14.6	30.9	0.14	16.5	E
PolkSt	II	40	28.8	19.1	47.9	0.26	19.7	D
Nye Ave	II	40	10.1	5.5	15.6	0.09	20.2	D
Banbury Dr	II	40	22.5	21.6	44.1	0.20	16.0	E
Total	II		318.2	165.7	483.9	3.21	23.9	C

Arterial Level of Service: WB Magnolia Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Banbury Dr	II	40	25.7	20.6	46.3	0.23	18.2	D
Nye Ave	II	40	22.5	9.4	31.9	0.20	22.1	C
PolkSt	II	40	10.1	13.4	23.5	0.09	13.4	E
Park Sierra Dr	II	40	28.8	1.9	30.7	0.26	30.7	B
Skofstad St	II	40	16.3	4.7	21.0	0.14	24.3	C
La Sierra Ave	II	40	13.4	22.2	35.6	0.12	11.7	F
Golden Ave	II	40	32.6	17.2	49.8	0.33	23.8	C
Filmore St	II	40	21.5	6.5	28.0	0.19	24.1	C
Pierce St	II	40	48.1	34.1	82.2	0.52	22.6	C
Buchanan St	II	40	47.9	20.9	68.8	0.51	26.9	C
Total	II		266.9	150.9	417.8	2.58	22.3	C

Arterial Level of Service: EB Magnolia Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Buchanan St	II	40	77.0	34.8	111.8	0.86	27.6	C
Pierce St	II	40	47.9	33.0	80.9	0.51	22.9	C
Filmore St	II	40	48.1	9.5	57.6	0.52	32.3	B
Golden Ave	II	40	21.5	13.6	35.1	0.19	19.2	D
La Sierra Ave	II	40	32.6	36.9	69.5	0.33	17.1	D
	II	40	13.4	14.1	27.5	0.12	15.2	E
Park Sierra Dr	II	40	16.3	11.5	27.8	0.14	18.3	D
PolkSt	II	40	28.8	16.5	45.3	0.26	20.8	D
Nye Ave	II	40	10.1	4.3	14.4	0.09	21.9	D
Banbury Dr	II	40	22.5	31.6	54.1	0.20	13.0	E
Total	II		318.2	205.8	524.0	3.21	22.0	C

Arterial Level of Service: WB Magnolia Ave

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Banbury Dr	II	40	25.7	17.6	43.3	0.23	19.4	D
Nye Ave	II	40	22.5	5.3	27.8	0.20	25.3	C
PolkSt	II	40	10.1	7.9	18.0	0.09	17.5	D
Park Sierra Dr	II	40	28.8	5.3	34.1	0.26	27.6	C
Skofstad St	II	40	16.3	5.0	21.3	0.14	23.9	C
La Sierra Ave	II	40	13.4	27.1	40.5	0.12	10.3	F
Golden Ave	II	40	32.6	5.9	38.5	0.33	30.8	B
Filmore St	II	40	21.5	14.5	36.0	0.19	18.7	D
Pierce St	II	40	48.1	26.3	74.4	0.52	25.0	C
Buchanan St	II	40	47.9	9.6	57.5	0.51	32.2	B
Total	II		266.9	124.5	391.4	2.58	23.8	C

HCM SIGNALIZED INTERSECTION CAPACITY ANALYSIS

EXISTING CONDITIONS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1787		3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	1787		3433	1863	1583
Volume (vph)	246	784	118	160	1112	910	50	236	88	340	78	114
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	246	784	118	160	1112	910	50	236	88	340	78	114
RTOR Reduction (vph)	0	0	73	0	0	243	0	14	0	0	0	80
Lane Group Flow (vph)	246	784	45	160	1112	667	50	310	0	340	78	34
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2						4
Actuated Green, G (s)	13.0	35.0	35.0	14.0	36.0	36.0	6.0	21.0		12.0	27.0	27.0
Effective Green, g (s)	15.0	38.0	38.0	16.0	39.0	39.0	8.0	24.0		14.0	30.0	30.0
Actuated g/C Ratio	0.15	0.38	0.38	0.16	0.39	0.39	0.08	0.24		0.14	0.30	0.30
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0
Lane Grp Cap (vph)	266	1345	602	283	1380	617	142	429		481	559	475
v/s Ratio Prot	c0.14	0.22		0.09	0.31		0.03	c0.17		c0.10	0.04	
v/s Ratio Perm			0.03			c0.42						0.02
v/c Ratio	0.92	0.58	0.07	0.57	0.81	1.08	0.35	0.72		0.71	0.14	0.07
Uniform Delay, d1	41.9	24.7	19.8	38.8	27.1	30.5	43.5	34.9		41.0	25.6	25.0
Progression Factor	1.00	1.00	1.00	1.06	0.73	0.78	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	38.8	1.9	0.2	2.8	1.8	46.6	6.7	10.1		8.5	0.5	0.3
Delay (s)	80.7	26.5	20.0	43.9	21.6	70.4	50.3	45.1		49.5	26.1	25.3
Level of Service	F	C	C	D	C	E	D	D		D	C	C
Approach Delay (s)		37.5			43.6			45.8			40.9	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	41.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	97.8%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	4.0	2.0	2.0	4.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3500	3600	1583	3433	3600	1583	1800	3600	1583	1800	3600	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	146	336	194	204	374	58	118	1124	348	282	448	74
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	146	336	194	204	374	58	118	1124	348	282	448	74
RTOR Reduction (vph)	0	0	146	0	0	44	0	0	219	0	0	42
Lane Group Flow (vph)	146	336	49	204	374	15	118	1124	129	282	448	32
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	9.0	21.0	21.0	9.0	21.0	21.0	11.0	33.0	33.0	17.0	39.0	39.0
Effective Green, g (s)	11.0	23.0	25.0	11.0	23.0	25.0	13.0	36.0	37.0	19.0	42.0	43.0
Actuated g/C Ratio	0.11	0.23	0.25	0.11	0.23	0.25	0.13	0.36	0.37	0.19	0.42	0.43
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0
Lane Grp Cap (vph)	385	828	396	378	828	396	234	1296	586	342	1512	681
v/s Ratio Prot	0.04	0.09		c0.06	c0.10		0.07	c0.31		c0.16	0.12	
v/s Ratio Perm			0.03			0.01			0.08			0.02
v/c Ratio	0.38	0.41	0.12	0.54	0.45	0.04	0.50	0.87	0.22	0.82	0.30	0.05
Uniform Delay, d1	41.3	32.7	29.0	42.1	33.1	28.4	40.5	29.8	21.6	38.9	19.2	16.6
Progression Factor	0.84	0.52	1.31	1.58	0.53	0.11	1.22	0.75	0.34	1.15	0.46	0.10
Incremental Delay, d2	2.6	1.4	0.6	5.3	1.7	0.2	7.2	7.7	0.8	19.6	0.5	0.1
Delay (s)	37.5	18.4	38.5	71.7	19.2	3.1	56.4	29.9	8.1	64.3	9.3	1.8
Level of Service	D	B	D	E	B	A	E	C	A	E	A	A
Approach Delay (s)		28.3			34.6			27.1			27.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	28.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	75.1%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	3539	1583	3433	1863	1583
Volume (vph)	242	852	58	366	1452	348	174	538	338	386	254	528
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	242	852	58	366	1452	348	174	538	338	386	254	528
RTOR Reduction (vph)	0	0	38	0	0	180	0	0	274	0	0	223
Lane Group Flow (vph)	242	852	20	366	1452	168	174	538	64	386	254	305
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Actuated Green, G (s)	14.0	31.0	31.0	22.0	39.0	39.0	9.0	16.0	16.0	13.0	20.0	20.0
Effective Green, g (s)	16.0	34.0	34.0	24.0	42.0	42.0	11.0	19.0	19.0	15.0	23.0	23.0
Actuated g/C Ratio	0.16	0.34	0.34	0.24	0.42	0.42	0.11	0.19	0.19	0.15	0.23	0.23
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)	283	1203	538	425	1486	665	195	672	301	515	428	364
v/s Ratio Prot	0.14	0.24		c0.21	c0.41		c0.10	0.15		c0.11	0.14	
v/s Ratio Perm			0.01			0.11			0.04			c0.19
v/c Ratio	0.86	0.71	0.04	0.86	0.98	0.25	0.89	0.80	0.21	0.75	0.59	0.84
Uniform Delay, d1	40.9	28.7	22.1	36.4	28.5	18.8	43.9	38.7	34.2	40.7	34.3	36.7
Progression Factor	1.19	0.78	0.85	1.06	0.79	0.51	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	21.8	2.8	0.1	19.9	18.5	0.9	41.3	9.7	1.6	9.6	5.9	20.0
Delay (s)	70.5	25.2	18.9	58.6	41.1	10.5	85.2	48.4	35.8	50.3	40.3	56.7
Level of Service	E	C	B	E	D	B	F	D	D	D	D	E
Approach Delay (s)		34.4			39.2			50.4			51.0	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	42.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	4.0
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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0			2.0	2.0
Lane Util. Factor	1.00	0.91		1.00	0.95	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	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	1.00
Satd. Flow (prot)	1770	5034		1770	3539	1583	1770	1723			1817	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.65	1.00			0.84	1.00
Satd. Flow (perm)	1770	5034		1770	3539	1583	1218	1723			1573	1583
Volume (vph)	50	700	50	50	600	50	50	50	50	50	50	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	50	700	50	50	600	50	50	50	50	50	50	50
RTOR Reduction (vph)	0	8	0	0	0	28	0	33	0	0	0	33
Lane Group Flow (vph)	50	742	0	50	600	23	50	67	0	0	100	17
Turn Type	Prot			Prot		Perm	Perm			Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases						2	8			4		4
Actuated Green, G (s)	13.0	42.0		13.0	42.0	42.0	31.0	31.0			31.0	31.0
Effective Green, g (s)	15.0	45.0		15.0	45.0	45.0	34.0	34.0			34.0	34.0
Actuated g/C Ratio	0.15	0.45		0.15	0.45	0.45	0.34	0.34			0.34	0.34
Clearance Time (s)	4.0	5.0		4.0	5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)	266	2265		266	1593	712	414	586			535	538
v/s Ratio Prot	0.03	c0.15		0.03	c0.17			0.04				
v/s Ratio Perm						0.01	0.04				c0.06	0.01
v/c Ratio	0.19	0.33		0.19	0.38	0.03	0.12	0.11			0.19	0.03
Uniform Delay, d1	37.2	17.7		37.2	18.2	15.3	22.7	22.7			23.3	22.0
Progression Factor	1.45	1.12		1.12	1.15	1.66	1.00	1.00			1.00	1.00
Incremental Delay, d2	1.4	0.4		1.5	0.7	0.1	0.6	0.4			0.8	0.1
Delay (s)	55.2	20.2		43.3	21.6	25.5	23.3	23.1			24.0	22.1
Level of Service	E	C		D	C	C	C	C			C	C
Approach Delay (s)		22.4			23.5			23.1			23.4	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	23.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	42.0%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0		2.0		2.0	2.0	
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	0.85		0.96		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1750		1770	1723	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.89		0.61	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583		1581		1131	1723	
Volume (vph)	50	700	50	50	600	50	50	50	50	50	50	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	50	700	50	50	600	50	50	50	50	50	50	50
RTOR Reduction (vph)	0	0	28	0	0	28	0	18	0	0	34	0
Lane Group Flow (vph)	50	700	22	50	600	22	0	132	0	50	67	0
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	15.0	41.0	41.0	15.0	41.0	41.0		30.5		30.5	30.5	
Effective Green, g (s)	17.0	44.0	44.0	17.0	44.0	44.0		33.0		33.0	33.0	
Actuated g/C Ratio	0.17	0.44	0.44	0.17	0.44	0.44		0.33		0.33	0.33	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0		4.5		4.5	4.5	
Lane Grp Cap (vph)	301	1557	697	301	1557	697		522		373	569	
v/s Ratio Prot	c0.03	c0.20		0.03	0.17						0.04	
v/s Ratio Perm			0.01			0.01		c0.08		0.04		
v/c Ratio	0.17	0.45	0.03	0.17	0.39	0.03		0.25		0.13	0.12	
Uniform Delay, d1	35.4	19.5	15.9	35.4	18.9	15.9		24.5		23.5	23.3	
Progression Factor	0.89	0.98	1.39	1.26	0.77	1.22		1.00		1.00	1.00	
Incremental Delay, d2	1.2	0.9	0.1	1.1	0.7	0.1		1.2		0.7	0.4	
Delay (s)	32.8	20.1	22.1	45.9	15.3	19.5		25.6		24.2	23.8	
Level of Service	C	C	C	D	B	B		C		C	C	
Approach Delay (s)		21.0			17.8			25.6			23.9	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM Average Control Delay	20.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	47.8%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1681	1692	1583		1786	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1681	1692	1583		1786	1583
Volume (vph)	32	668	126	166	568	4	48	2	28	12	2	12
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	32	668	126	166	568	4	48	2	28	12	2	12
RTOR Reduction (vph)	0	0	50	0	0	1	0	0	26	0	0	11
Lane Group Flow (vph)	32	668	76	166	568	3	24	26	2	0	14	1
Turn Type	Prot		Perm	Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	6.6	57.4	57.4	17.0	67.8	67.8	4.7	4.7	4.7		2.9	2.9
Effective Green, g (s)	8.6	60.4	60.4	19.0	70.8	70.8	7.2	7.2	7.2		5.4	5.4
Actuated g/C Ratio	0.09	0.60	0.60	0.19	0.71	0.71	0.07	0.07	0.07		0.05	0.05
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	152	2138	956	336	2506	1121	121	122	114		96	85
v/s Ratio Prot	0.02	c0.19		c0.09	0.16		0.01	c0.02			c0.01	
v/s Ratio Perm			0.05			0.00			0.00			0.00
v/c Ratio	0.21	0.31	0.08	0.49	0.23	0.00	0.20	0.21	0.02		0.15	0.01
Uniform Delay, d1	42.5	9.7	8.2	36.2	5.1	4.3	43.7	43.7	43.1		45.1	44.8
Progression Factor	0.90	0.90	0.85	1.11	0.24	0.03	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.7	0.4	0.2	1.1	0.2	0.0	0.8	0.9	0.1		0.7	0.0
Delay (s)	39.1	9.0	7.1	41.5	1.4	0.2	44.5	44.6	43.2		45.8	44.8
Level of Service	D	A	A	D	A	A	D	D	D		D	D
Approach Delay (s)		9.9			10.4			44.1			45.3	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM Average Control Delay	12.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	45.7%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0			2.0	
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	0.85	1.00	0.92			0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1723			1750	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.60	1.00			0.89	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1124	1723			1581	
Volume (vph)	50	600	50	50	500	50	50	50	50	50	50	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	50	600	50	50	500	50	50	50	50	50	50	50
RTOR Reduction (vph)	0	0	27	0	0	27	0	34	0	0	18	0
Lane Group Flow (vph)	50	600	23	50	500	23	50	66	0	0	132	0
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	14.0	43.0	43.0	14.0	43.0	43.0	29.5	29.5			29.5	
Effective Green, g (s)	16.0	46.0	46.0	16.0	46.0	46.0	32.0	32.0			32.0	
Actuated g/C Ratio	0.16	0.46	0.46	0.16	0.46	0.46	0.32	0.32			0.32	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.5	4.5			4.5	
Lane Grp Cap (vph)	283	1628	728	283	1628	728	360	551			506	
v/s Ratio Prot	c0.03	c0.17		0.03	0.14			0.04				
v/s Ratio Perm			0.01			0.01	0.04				c0.08	
v/c Ratio	0.18	0.37	0.03	0.18	0.31	0.03	0.14	0.12			0.26	
Uniform Delay, d1	36.3	17.6	14.8	36.3	17.0	14.8	24.2	24.0			25.2	
Progression Factor	1.39	0.65	0.72	1.12	0.42	0.20	1.00	1.00			1.00	
Incremental Delay, d2	1.0	0.5	0.1	1.3	0.5	0.1	0.8	0.4			1.3	
Delay (s)	51.4	11.9	10.8	41.8	7.7	3.0	25.0	24.5			26.5	
Level of Service	D	B	B	D	A	A	C	C			C	
Approach Delay (s)		14.7			10.1			24.7			26.5	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	15.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	45.0%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0		2.0			2.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.96			0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98			0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1750			1750	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.86			0.86	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583		1528			1528	
Volume (vph)	50	800	50	50	600	50	50	50	50	50	50	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	50	800	50	50	600	50	50	50	50	50	50	50
RTOR Reduction (vph)	0	0	21	0	0	21	0	18	0	0	18	0
Lane Group Flow (vph)	50	800	30	50	600	30	0	132	0	0	132	0
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	11.0	56.0	56.0	11.0	56.0	56.0		19.5			19.5	
Effective Green, g (s)	13.0	59.0	59.0	13.0	59.0	59.0		22.0			22.0	
Actuated g/C Ratio	0.13	0.59	0.59	0.13	0.59	0.59		0.22			0.22	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0		4.5			4.5	
Lane Grp Cap (vph)	230	2088	934	230	2088	934		336			336	
v/s Ratio Prot	c0.03	c0.23		0.03	0.17							
v/s Ratio Perm			0.02			0.02		c0.09			0.09	
v/c Ratio	0.22	0.38	0.03	0.22	0.29	0.03		0.39			0.39	
Uniform Delay, d1	38.9	10.9	8.6	38.9	10.1	8.6		33.3			33.3	
Progression Factor	1.08	0.71	0.52	1.32	0.51	0.29		1.00			1.00	
Incremental Delay, d2	1.8	0.5	0.1	2.1	0.3	0.1		3.4			3.4	
Delay (s)	43.9	8.1	4.5	53.7	5.5	2.5		36.7			36.7	
Level of Service	D	A	A	D	A	A		D			D	
Approach Delay (s)		9.9			8.7			36.7			36.7	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	13.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	46.5%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0		2.0			2.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.96			0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98			0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1750			1750	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.88			0.88	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583		1559			1559	
Volume (vph)	50	600	50	50	500	50	50	50	50	50	50	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	50	600	50	50	500	50	50	50	50	50	50	50
RTOR Reduction (vph)	0	0	31	0	0	31	0	18	0	0	18	0
Lane Group Flow (vph)	50	600	20	50	500	20	0	132	0	0	132	0
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	13.0	36.0	36.0	13.0	36.0	36.0		37.0			37.0	
Effective Green, g (s)	15.0	39.0	39.0	15.0	39.0	39.0		40.0			40.0	
Actuated g/C Ratio	0.15	0.39	0.39	0.15	0.39	0.39		0.40			0.40	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0		5.0			5.0	
Lane Grp Cap (vph)	266	1380	617	266	1380	617		624			624	
v/s Ratio Prot	c0.03	c0.17		0.03	0.14							
v/s Ratio Perm			0.01			0.01		c0.08			0.08	
v/c Ratio	0.19	0.43	0.03	0.19	0.36	0.03		0.21			0.21	
Uniform Delay, d1	37.2	22.4	18.8	37.2	21.7	18.8		19.7			19.7	
Progression Factor	1.57	0.52	0.21	0.67	0.79	1.50		1.00			1.00	
Incremental Delay, d2	1.5	1.0	0.1	1.5	0.7	0.1		0.8			0.8	
Delay (s)	59.9	12.5	4.0	26.5	17.9	28.4		20.4			20.4	
Level of Service	E	B	A	C	B	C		C			C	
Approach Delay (s)		15.3			19.5			20.4			20.4	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	17.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	41.0%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0		2.0	2.0			2.0	2.0		2.0	2.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	3504		1770	3498			1788	1583		1788	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.79	1.00		0.79	1.00
Satd. Flow (perm)	1770	3504		1770	3498			1473	1583		1473	1583
Volume (vph)	50	700	50	50	600	50	50	10	50	50	10	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	50	700	50	50	600	50	50	10	50	50	10	50
RTOR Reduction (vph)	0	5	0	0	6	0	0	0	34	0	0	43
Lane Group Flow (vph)	50	745	0	50	644	0	0	60	16	0	60	8
Turn Type	Prot			Prot			Perm		Perm	Perm		Over
Protected Phases	5	2		1	6			4			4	5
Permitted Phases							4		4	4		
Actuated Green, G (s)	13.0	44.0		13.0	44.0			29.0	29.0		29.0	13.0
Effective Green, g (s)	15.0	47.0		15.0	47.0			32.0	32.0		32.0	15.0
Actuated g/C Ratio	0.15	0.47		0.15	0.47			0.32	0.32		0.32	0.15
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0	5.0		5.0	4.0
Lane Grp Cap (vph)	266	1647		266	1644			471	507		471	237
v/s Ratio Prot	c0.03	c0.21		0.03	0.18							0.00
v/s Ratio Perm								c0.04	0.01		0.04	
v/c Ratio	0.19	0.45		0.19	0.39			0.13	0.03		0.13	0.03
Uniform Delay, d1	37.2	17.8		37.2	17.2			24.1	23.4		24.1	36.3
Progression Factor	1.57	0.41		1.15	0.46			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.4	0.8		1.5	0.7			0.6	0.1		0.6	0.2
Delay (s)	59.7	8.2		44.2	8.6			24.7	23.5		24.7	36.5
Level of Service	E	A		D	A			C	C		C	D
Approach Delay (s)		11.4			11.2			24.1			30.1	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	13.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	44.2%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	4.0	2.0	2.0	4.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3500	3539	1583	3500	3539	1583	1800	3539	1583	1800	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	318	596	112	294	668	148	132	864	334	460	1186	162
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	318	596	112	294	668	148	132	864	334	460	1186	162
RTOR Reduction (vph)	0	0	85	0	0	113	0	0	175	0	0	86
Lane Group Flow (vph)	318	596	27	294	668	35	132	864	159	460	1186	76
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	10.0	21.0	21.0	10.0	21.0	21.0	9.0	27.0	27.0	27.0	45.0	45.0
Effective Green, g (s)	12.0	23.0	25.0	12.0	23.0	25.0	11.0	30.0	31.0	29.0	48.0	49.0
Actuated g/C Ratio	0.11	0.22	0.24	0.11	0.22	0.24	0.10	0.29	0.30	0.28	0.46	0.47
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0
Lane Grp Cap (vph)	400	775	377	400	775	377	189	1011	467	497	1618	739
v/s Ratio Prot	c0.09	0.17		0.08	c0.19		0.07	c0.24		c0.26	0.34	
v/s Ratio Perm			0.02			0.02			0.10			0.05
v/c Ratio	0.80	0.77	0.07	0.74	0.86	0.09	0.70	0.85	0.34	0.93	0.73	0.10
Uniform Delay, d1	45.3	38.5	31.0	45.0	39.5	31.2	45.4	35.4	29.0	37.0	23.3	15.7
Progression Factor	0.77	0.85	1.20	0.58	0.49	0.81	1.50	0.61	0.54	0.72	1.59	4.27
Incremental Delay, d2	14.9	7.2	0.4	9.9	10.6	0.4	15.3	7.3	1.5	21.8	2.4	0.2
Delay (s)	49.6	39.8	37.5	35.9	30.2	25.6	83.6	28.8	17.1	48.3	39.4	67.2
Level of Service	D	D	D	D	C	C	F	C	B	D	D	E
Approach Delay (s)		42.6			31.1			31.3			44.1	
Approach LOS		D			C			C			D	

Intersection Summary			
HCM Average Control Delay	37.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	90.2%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	3539	1583	3433	1863	1583
Volume (vph)	430	1222	114	358	808	266	144	522	158	412	372	248
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	430	1222	114	358	808	266	144	522	158	412	372	248
RTOR Reduction (vph)	0	0	67	0	0	185	0	0	129	0	0	191
Lane Group Flow (vph)	430	1222	47	358	808	81	144	522	29	412	372	57
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Actuated Green, G (s)	28.0	36.0	36.0	21.0	29.0	29.0	9.0	16.0	16.0	14.0	21.0	21.0
Effective Green, g (s)	30.0	39.0	39.0	23.0	32.0	32.0	11.0	19.0	19.0	16.0	24.0	24.0
Actuated g/C Ratio	0.29	0.37	0.37	0.22	0.30	0.30	0.10	0.18	0.18	0.15	0.23	0.23
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)	506	1314	588	388	1079	482	185	640	286	523	426	362
v/s Ratio Prot	c0.24	c0.35		c0.20	0.23		0.08	0.15		c0.12	c0.20	
v/s Ratio Perm			0.03			0.05			0.02			0.04
v/c Ratio	0.85	0.93	0.08	0.92	0.75	0.17	0.78	0.82	0.10	0.79	0.87	0.16
Uniform Delay, d1	35.4	31.7	21.4	40.1	32.9	26.7	45.8	41.3	35.9	42.9	39.0	32.4
Progression Factor	1.51	0.99	1.46	1.04	0.70	0.54	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.5	7.8	0.1	29.7	4.7	0.7	26.9	11.0	0.7	11.4	21.2	0.9
Delay (s)	63.1	39.3	31.4	71.3	27.6	15.3	72.7	52.3	36.6	54.3	60.3	33.3
Level of Service	E	D	C	E	C	B	E	D	D	D	E	C
Approach Delay (s)		44.5			36.3			52.9			51.4	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	44.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	4.0
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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1738		3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	1738		3433	1863	1583
Volume (vph)	142	974	116	218	558	414	40	146	118	776	292	74
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	142	974	116	218	558	414	40	146	118	776	292	74
RTOR Reduction (vph)	0	0	76	0	0	268	0	28	0	0	0	48
Lane Group Flow (vph)	142	974	40	218	558	146	40	236	0	776	292	26
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2						4
Actuated Green, G (s)	13.0	33.0	33.0	14.0	34.0	34.0	6.0	14.0		26.0	34.0	34.0
Effective Green, g (s)	15.0	36.0	36.0	16.0	37.0	37.0	8.0	17.0		28.0	37.0	37.0
Actuated g/C Ratio	0.14	0.34	0.34	0.15	0.35	0.35	0.08	0.16		0.27	0.35	0.35
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0
Lane Grp Cap (vph)	253	1213	543	270	1247	558	135	281		915	656	558
v/s Ratio Prot	0.08	c0.28		c0.12	0.16		0.02	c0.14		c0.23	0.16	
v/s Ratio Perm			0.03			0.09						0.02
v/c Ratio	0.56	0.80	0.07	0.81	0.45	0.26	0.30	0.84		0.85	0.45	0.05
Uniform Delay, d1	41.9	31.3	23.3	43.0	26.1	24.3	45.8	42.7		36.5	26.1	22.4
Progression Factor	1.00	1.00	1.00	1.29	0.34	1.03	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.7	5.7	0.3	16.7	0.8	0.8	5.5	25.1		9.6	2.2	0.2
Delay (s)	50.7	37.0	23.5	72.2	9.7	25.8	51.4	67.8		46.1	28.3	22.5
Level of Service	D	D	C	E	A	C	D	E		D	C	C
Approach Delay (s)		37.3			26.8			65.6			40.0	
Approach LOS		D			C			E			D	

Intersection Summary			
HCM Average Control Delay	37.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	89.4%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0			2.0	2.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	1.00			1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.86			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.96	1.00
Satd. Flow (prot)	1770	5009		1770	3539	1583	1770	1609			1788	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.71	1.00			0.76	1.00
Satd. Flow (perm)	1770	5009		1770	3539	1583	1320	1609			1424	1583
Volume (vph)	100	900	100	100	1200	100	50	10	100	50	10	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	100	900	100	100	1200	100	50	10	100	50	10	50
RTOR Reduction (vph)	0	13	0	0	0	51	0	68	0	0	0	34
Lane Group Flow (vph)	100	987	0	100	1200	49	50	42	0	0	60	16
Turn Type	Prot			Prot		Perm	Perm			Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases						2	8			4		4
Actuated Green, G (s)	12.0	42.0		18.0	48.0	48.0	31.0	31.0			31.0	31.0
Effective Green, g (s)	14.0	45.0		20.0	51.0	51.0	34.0	34.0			34.0	34.0
Actuated g/C Ratio	0.13	0.43		0.19	0.49	0.49	0.32	0.32			0.32	0.32
Clearance Time (s)	4.0	5.0		4.0	5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)	236	2147		337	1719	769	427	521			461	513
v/s Ratio Prot	c0.06	0.20		0.06	c0.34			0.03				
v/s Ratio Perm						0.03	0.04				c0.04	0.01
v/c Ratio	0.42	0.46		0.30	0.70	0.06	0.12	0.08			0.13	0.03
Uniform Delay, d1	41.8	21.3		36.5	21.0	14.3	25.0	24.7			25.1	24.3
Progression Factor	0.90	1.47		1.28	0.69	0.18	1.00	1.00			1.00	1.00
Incremental Delay, d2	4.9	0.6		1.9	2.0	0.1	0.6	0.3			0.6	0.1
Delay (s)	42.3	32.0		48.5	16.4	2.8	25.5	25.0			25.6	24.4
Level of Service	D	C		D	B	A	C	C			C	C
Approach Delay (s)		32.9			17.7			25.1			25.1	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM Average Control Delay	24.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0		2.0		2.0	2.0	
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	0.85		0.94		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1710		1770	1630	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.87		0.66	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583		1519		1228	1630	
Volume (vph)	200	1000	100	200	950	100	50	10	50	50	10	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	200	1000	100	200	950	100	50	10	50	50	10	50
RTOR Reduction (vph)	0	0	54	0	0	59	0	29	0	0	34	0
Lane Group Flow (vph)	200	1000	46	200	950	41	0	81	0	50	26	0
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	21.0	45.0	45.0	16.0	40.0	40.0		30.5		30.5	30.5	
Effective Green, g (s)	23.0	48.0	48.0	18.0	43.0	43.0		33.0		33.0	33.0	
Actuated g/C Ratio	0.22	0.46	0.46	0.17	0.41	0.41		0.31		0.31	0.31	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0		4.5		4.5	4.5	
Lane Grp Cap (vph)	388	1618	724	303	1449	648		477		386	512	
v/s Ratio Prot	c0.11	0.28		c0.11	c0.27						0.02	
v/s Ratio Perm			0.03			0.03		c0.05		0.04		
v/c Ratio	0.52	0.62	0.06	0.66	0.66	0.06		0.17		0.13	0.05	
Uniform Delay, d1	36.1	21.6	15.9	40.6	25.0	18.8		26.1		25.7	25.1	
Progression Factor	0.88	0.88	1.28	1.47	0.27	0.09		1.00		1.00	1.00	
Incremental Delay, d2	4.0	1.5	0.1	8.5	1.8	0.1		0.8		0.7	0.2	
Delay (s)	35.8	20.5	20.5	68.0	8.5	1.8		26.9		26.4	25.3	
Level of Service	D	C	C	E	A	A		C		C	C	
Approach Delay (s)		22.8			17.5			26.9			25.8	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM Average Control Delay	20.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00		0.96	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1681	1687	1583		1788	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00		0.96	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1681	1687	1583		1788	1583
Volume (vph)	64	1154	78	144	880	26	246	2	90	42	8	20
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	64	1154	78	144	880	26	246	2	90	42	8	20
RTOR Reduction (vph)	0	0	33	0	0	11	0	0	77	0	0	18
Lane Group Flow (vph)	64	1154	45	144	880	15	123	125	13	0	50	2
Turn Type	Prot		Perm	Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	9.6	53.2	53.2	14.3	57.9	57.9	12.3	12.3	12.3		7.2	7.2
Effective Green, g (s)	11.6	56.2	56.2	16.3	60.9	60.9	14.8	14.8	14.8		9.7	9.7
Actuated g/C Ratio	0.11	0.54	0.54	0.16	0.58	0.58	0.14	0.14	0.14		0.09	0.09
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	196	1894	847	275	2053	918	237	238	223		165	146
v/s Ratio Prot	0.04	c0.33		c0.08	0.25		0.07	c0.07			c0.03	
v/s Ratio Perm			0.03			0.01			0.01			0.00
v/c Ratio	0.33	0.61	0.05	0.52	0.43	0.02	0.52	0.53	0.06		0.30	0.01
Uniform Delay, d1	43.1	16.8	11.7	40.8	12.3	9.4	41.8	41.8	39.1		44.5	43.3
Progression Factor	0.49	0.21	0.06	0.94	0.20	0.12	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.7	1.1	0.1	1.4	0.5	0.0	1.9	2.1	0.1		1.0	0.0
Delay (s)	22.0	4.7	0.8	39.7	3.0	1.2	43.7	43.9	39.2		45.5	43.3
Level of Service	C	A	A	D	A	A	D	D	D		D	D
Approach Delay (s)		5.3			8.0			42.6			44.9	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	11.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	105.0	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	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0			2.0	
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	0.85	1.00	0.88			0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1630			1710	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.66	1.00			0.87	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1225	1630			1518	
Volume (vph)	50	500	50	50	600	50	50	10	50	50	10	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	50	500	50	50	600	50	50	10	50	50	10	50
RTOR Reduction (vph)	0	0	27	0	0	27	0	35	0	0	29	0
Lane Group Flow (vph)	50	500	23	50	600	23	50	25	0	0	81	0
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	16.0	46.0	46.0	16.0	46.0	46.0	29.5	29.5			29.5	
Effective Green, g (s)	18.0	49.0	49.0	18.0	49.0	49.0	32.0	32.0			32.0	
Actuated g/C Ratio	0.17	0.47	0.47	0.17	0.47	0.47	0.30	0.30			0.30	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.5	4.5			4.5	
Lane Grp Cap (vph)	303	1652	739	303	1652	739	373	497			463	
v/s Ratio Prot	c0.03	0.14		0.03	c0.17			0.02				
v/s Ratio Perm			0.01			0.01	0.04				c0.05	
v/c Ratio	0.17	0.30	0.03	0.17	0.36	0.03	0.13	0.05			0.18	
Uniform Delay, d1	37.1	17.4	15.2	37.1	18.0	15.2	26.5	25.8			26.8	
Progression Factor	1.49	0.48	0.35	1.08	0.83	1.18	1.00	1.00			1.00	
Incremental Delay, d2	0.6	0.2	0.0	1.1	0.6	0.1	0.7	0.2			0.8	
Delay (s)	56.0	8.7	5.3	41.0	15.5	18.0	27.2	26.0			27.6	
Level of Service	E	A	A	D	B	B	C	C			C	
Approach Delay (s)		12.3			17.5			26.5			27.6	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	16.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	42.9%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0		2.0			2.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.94			0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98			0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1710			1710	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.85			0.85	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583		1487			1487	
Volume (vph)	50	1200	50	50	1000	50	50	10	50	50	10	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	50	1200	50	50	1000	50	50	10	50	50	10	50
RTOR Reduction (vph)	0	0	25	0	0	25	0	29	0	0	29	0
Lane Group Flow (vph)	50	1200	25	50	1000	25	0	81	0	0	81	0
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	16.0	50.0	50.0	16.0	50.0	50.0		25.5			25.5	
Effective Green, g (s)	18.0	53.0	53.0	18.0	53.0	53.0		28.0			28.0	
Actuated g/C Ratio	0.17	0.50	0.50	0.17	0.50	0.50		0.27			0.27	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0		4.5			4.5	
Lane Grp Cap (vph)	303	1786	799	303	1786	799		397			397	
v/s Ratio Prot	c0.03	c0.34		0.03	0.28							
v/s Ratio Perm			0.02			0.02		c0.05			0.05	
v/c Ratio	0.17	0.67	0.03	0.17	0.56	0.03		0.21			0.21	
Uniform Delay, d1	37.1	19.5	13.1	37.1	17.9	13.1		29.9			29.9	
Progression Factor	0.97	0.70	0.93	1.39	0.29	0.29		1.00			1.00	
Incremental Delay, d2	0.7	1.3	0.0	1.1	1.2	0.1		1.2			1.2	
Delay (s)	36.6	15.0	12.2	52.6	6.4	3.9		31.0			31.0	
Level of Service	D	B	B	D	A	A		C			C	
Approach Delay (s)		15.7			8.4			31.0			31.0	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM Average Control Delay	13.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	54.6%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0		2.0			2.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.94			0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98			0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1710			1710	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.85			0.85	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583		1491			1491	
Volume (vph)	50	500	50	50	600	50	50	10	50	50	10	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	50	500	50	50	600	50	50	10	50	50	10	50
RTOR Reduction (vph)	0	0	30	0	0	30	0	28	0	0	28	0
Lane Group Flow (vph)	50	500	20	50	600	20	0	82	0	0	82	0
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	16.0	38.0	38.0	16.0	38.0	38.0		37.0			37.0	
Effective Green, g (s)	18.0	41.0	41.0	18.0	41.0	41.0		40.0			40.0	
Actuated g/C Ratio	0.17	0.39	0.39	0.17	0.39	0.39		0.38			0.38	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0		5.0			5.0	
Lane Grp Cap (vph)	303	1382	618	303	1382	618		568			568	
v/s Ratio Prot	c0.03	0.14		0.03	c0.17							
v/s Ratio Perm			0.01			0.01		c0.05			0.05	
v/c Ratio	0.17	0.36	0.03	0.17	0.43	0.03		0.14			0.14	
Uniform Delay, d1	37.1	22.7	19.7	37.1	23.5	19.7		21.3			21.3	
Progression Factor	1.49	0.62	0.54	1.73	0.21	0.06		1.00			1.00	
Incremental Delay, d2	1.1	0.7	0.1	0.8	0.7	0.1		0.5			0.5	
Delay (s)	56.6	14.9	10.8	65.1	5.6	1.2		21.8			21.8	
Level of Service	E	B	B	E	A	A		C			C	
Approach Delay (s)		18.0			9.6			21.8			21.8	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM Average Control Delay	14.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	38.0%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0		2.0	2.0			2.0	2.0		2.0	2.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	3486		1770	3495			1788	1583		1788	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.79	1.00		0.79	1.00
Satd. Flow (perm)	1770	3486		1770	3495			1468	1583		1468	1583
Volume (vph)	100	900	100	100	1100	100	50	10	50	50	10	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	100	900	100	100	1100	100	50	10	50	50	10	50
RTOR Reduction (vph)	0	8	0	0	7	0	0	0	35	0	0	42
Lane Group Flow (vph)	100	992	0	100	1193	0	0	60	15	0	60	8
Turn Type	Prot			Prot			Perm		Perm	Perm		Over
Protected Phases	5	2		1	6			4			4	5
Permitted Phases							4		4	4		
Actuated Green, G (s)	14.0	48.0		14.0	48.0			29.0	29.0		29.0	14.0
Effective Green, g (s)	16.0	51.0		16.0	51.0			32.0	32.0		32.0	16.0
Actuated g/C Ratio	0.15	0.49		0.15	0.49			0.30	0.30		0.30	0.15
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0	5.0		5.0	4.0
Lane Grp Cap (vph)	270	1693		270	1698			447	482		447	241
v/s Ratio Prot	c0.06	0.28		0.06	c0.34							0.00
v/s Ratio Perm								c0.04	0.01		0.04	
v/c Ratio	0.37	0.59		0.37	0.70			0.13	0.03		0.13	0.03
Uniform Delay, d1	40.0	19.4		40.0	21.1			26.5	25.6		26.5	37.9
Progression Factor	1.46	0.17		1.51	0.17			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.2	1.2		2.9	1.9			0.6	0.1		0.6	0.2
Delay (s)	61.6	4.5		63.5	5.4			27.1	25.7		27.1	38.1
Level of Service	E	A		E	A			C	C		C	D
Approach Delay (s)		9.7			9.9			26.5			32.1	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM Average Control Delay	11.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM SIGNALIZED INTERSECTION CAPACITY ANALYSIS

YEAR 2025 WITH 4 LANES

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	4.0	2.0	2.0	4.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3500	3600	1583	3433	3600	1583	1800	3600	1583	1800	3600	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	146	336	194	204	374	58	118	1124	348	282	448	74
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	204	470	272	286	524	81	165	1574	487	395	627	104
RTOR Reduction (vph)	0	0	204	0	0	61	0	0	179	0	0	59
Lane Group Flow (vph)	204	470	68	286	524	20	165	1574	308	395	627	45
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	9.0	21.0	21.0	9.0	21.0	21.0	11.0	33.0	33.0	17.0	39.0	39.0
Effective Green, g (s)	11.0	23.0	25.0	11.0	23.0	25.0	13.0	36.0	37.0	19.0	42.0	43.0
Actuated g/C Ratio	0.11	0.23	0.25	0.11	0.23	0.25	0.13	0.36	0.37	0.19	0.42	0.43
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0
Lane Grp Cap (vph)	385	828	396	378	828	396	234	1296	586	342	1512	681
v/s Ratio Prot	0.06	0.13		c0.08	c0.15		0.09	c0.44		c0.22	0.17	
v/s Ratio Perm			0.04			0.01			0.19			0.03
v/c Ratio	0.53	0.57	0.17	0.76	0.63	0.05	0.71	1.21	0.53	1.15	0.41	0.07
Uniform Delay, d1	42.1	34.1	29.4	43.2	34.7	28.5	41.7	32.0	24.6	40.5	20.4	16.7
Progression Factor	0.90	0.52	1.45	1.51	0.56	0.12	1.15	0.83	0.60	1.09	0.64	0.13
Incremental Delay, d2	4.3	2.3	0.8	12.2	3.4	0.2	16.1	103.7	3.3	97.6	0.8	0.2
Delay (s)	42.1	20.0	43.3	77.5	22.9	3.5	64.1	130.4	18.1	141.7	13.9	2.3
Level of Service	D	C	D	E	C	A	E	F	B	F	B	A
Approach Delay (s)		31.5			38.7			100.9			57.7	
Approach LOS		C			D			F			E	

Intersection Summary			
HCM Average Control Delay	68.2	HCM Level of Service	E
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	99.9%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	3539	1583	3433	1863	1583
Volume (vph)	242	852	58	366	1452	348	174	538	338	386	254	528
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	339	1193	81	512	2033	487	244	753	473	540	356	739
RTOR Reduction (vph)	0	0	51	0	0	161	0	0	279	0	0	210
Lane Group Flow (vph)	339	1193	30	512	2033	326	244	753	194	540	356	529
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Actuated Green, G (s)	14.0	31.0	31.0	22.0	39.0	39.0	9.0	16.0	16.0	13.0	20.0	20.0
Effective Green, g (s)	16.0	34.0	34.0	24.0	42.0	42.0	11.0	19.0	19.0	15.0	23.0	23.0
Actuated g/C Ratio	0.16	0.34	0.34	0.24	0.42	0.42	0.11	0.19	0.19	0.15	0.23	0.23
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)	283	1203	538	425	1486	665	195	672	301	515	428	364
v/s Ratio Prot	0.19	0.34		c0.29	c0.57		c0.14	0.21		c0.16	0.19	
v/s Ratio Perm			0.02			0.21			0.12			c0.33
v/c Ratio	1.20	0.99	0.06	1.20	1.37	0.49	1.25	1.12	0.65	1.05	0.83	1.45
Uniform Delay, d1	42.0	32.9	22.2	38.0	29.0	21.2	44.5	40.5	37.4	42.5	36.7	38.5
Progression Factor	1.13	0.84	1.30	1.02	0.82	0.68	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	103.9	15.5	0.1	112.5	170.0	2.6	148.2	72.8	10.2	53.0	17.0	218.5
Delay (s)	151.4	43.0	28.9	151.4	193.8	17.0	192.7	113.3	47.6	95.5	53.6	257.0
Level of Service	F	D	C	F	F	B	F	F	D	F	D	F
Approach Delay (s)		65.1			158.2			105.3			159.4	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM Average Control Delay	129.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	125.5%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1787		3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	1787		3433	1863	1583
Volume (vph)	246	784	118	160	1112	910	50	236	88	340	78	114
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	344	1098	165	224	1557	1274	70	330	123	476	109	160
RTOR Reduction (vph)	0	0	102	0	0	191	0	14	0	0	0	112
Lane Group Flow (vph)	344	1098	63	224	1557	1083	70	439	0	476	109	48
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2						4
Actuated Green, G (s)	13.0	35.0	35.0	14.0	36.0	36.0	6.0	21.0		12.0	27.0	27.0
Effective Green, g (s)	15.0	38.0	38.0	16.0	39.0	39.0	8.0	24.0		14.0	30.0	30.0
Actuated g/C Ratio	0.15	0.38	0.38	0.16	0.39	0.39	0.08	0.24		0.14	0.30	0.30
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0
Lane Grp Cap (vph)	266	1345	602	283	1380	617	142	429		481	559	475
v/s Ratio Prot	c0.19	0.31		0.13	0.44		0.04	c0.25		c0.14	0.06	
v/s Ratio Perm			0.04			c0.68						0.03
v/c Ratio	1.29	0.82	0.10	0.79	1.13	1.76	0.49	1.02		0.99	0.19	0.10
Uniform Delay, d1	42.5	27.9	20.0	40.4	30.5	30.5	44.1	38.0		42.9	26.0	25.3
Progression Factor	1.00	1.00	1.00	1.08	0.77	0.63	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	157.0	5.6	0.3	2.1	58.7	340.5	11.7	49.7		38.6	0.8	0.4
Delay (s)	199.5	33.4	20.4	45.6	82.2	359.7	55.8	87.7		81.5	26.8	25.7
Level of Service	F	C	C	D	F	F	E	F		F	C	C
Approach Delay (s)		67.6			195.2			83.4			61.5	
Approach LOS		E			F			F			E	

Intersection Summary			
HCM Average Control Delay	134.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.32		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	132.9%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0			2.0	2.0
Lane Util. Factor	1.00	0.91		1.00	0.95	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	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.98	1.00
Satd. Flow (prot)	1770	5034		1770	3539	1583	1770	1723			1817	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.60	1.00			0.81	1.00
Satd. Flow (perm)	1770	5034		1770	3539	1583	1113	1723			1516	1583
Volume (vph)	50	700	50	50	600	50	50	50	50	50	50	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	70	980	70	70	840	70	70	70	70	70	70	70
RTOR Reduction (vph)	0	8	0	0	0	39	0	36	0	0	0	46
Lane Group Flow (vph)	70	1042	0	70	840	32	70	104	0	0	140	24
Turn Type	Prot			Prot		Perm	Perm			Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases						2	8			4		4
Actuated Green, G (s)	13.0	42.0		13.0	42.0	42.0	31.0	31.0			31.0	31.0
Effective Green, g (s)	15.0	45.0		15.0	45.0	45.0	34.0	34.0			34.0	34.0
Actuated g/C Ratio	0.15	0.45		0.15	0.45	0.45	0.34	0.34			0.34	0.34
Clearance Time (s)	4.0	5.0		4.0	5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)	266	2265		266	1593	712	378	586			515	538
v/s Ratio Prot	0.04	c0.21		0.04	c0.24			0.06				
v/s Ratio Perm						0.02	0.06				c0.09	0.02
v/c Ratio	0.26	0.46		0.26	0.53	0.04	0.19	0.18			0.27	0.04
Uniform Delay, d1	37.6	19.1		37.6	19.8	15.4	23.2	23.2			24.0	22.1
Progression Factor	1.37	1.42		1.09	1.12	1.49	1.00	1.00			1.00	1.00
Incremental Delay, d2	2.0	0.6		2.4	1.2	0.1	1.1	0.7			1.3	0.2
Delay (s)	53.4	27.7		43.3	23.5	23.1	24.3	23.8			25.3	22.3
Level of Service	D	C		D	C	C	C	C			C	C
Approach Delay (s)		29.3			24.9			24.0			24.3	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	26.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0		2.0		2.0	2.0	
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	0.85		0.96		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1750		1770	1723	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.87		0.55	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583		1540		1022	1723	
Volume (vph)	50	700	50	50	600	50	50	50	50	50	50	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	70	980	70	70	840	70	70	70	70	70	70	70
RTOR Reduction (vph)	0	0	39	0	0	39	0	18	0	0	36	0
Lane Group Flow (vph)	70	980	31	70	840	31	0	192	0	70	104	0
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	15.0	41.0	41.0	15.0	41.0	41.0		30.5		30.5	30.5	
Effective Green, g (s)	17.0	44.0	44.0	17.0	44.0	44.0		33.0		33.0	33.0	
Actuated g/C Ratio	0.17	0.44	0.44	0.17	0.44	0.44		0.33		0.33	0.33	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0		4.5		4.5	4.5	
Lane Grp Cap (vph)	301	1557	697	301	1557	697		508		337	569	
v/s Ratio Prot	c0.04	c0.28		0.04	0.24						0.06	
v/s Ratio Perm			0.02			0.02		c0.12		0.07		
v/c Ratio	0.23	0.63	0.04	0.23	0.54	0.04		0.38		0.21	0.18	
Uniform Delay, d1	35.9	21.7	16.0	35.9	20.6	16.0		25.6		24.1	23.9	
Progression Factor	0.99	0.95	0.98	1.28	0.93	1.44		1.00		1.00	1.00	
Incremental Delay, d2	1.7	1.8	0.1	1.6	1.2	0.1		2.1		1.4	0.7	
Delay (s)	37.2	22.3	15.7	47.6	20.3	23.2		27.8		25.5	24.6	
Level of Service	D	C	B	D	C	C		C		C	C	
Approach Delay (s)		22.8			22.5			27.8			24.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	23.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1681	1692	1583		1787	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1681	1692	1583		1787	1583
Volume (vph)	32	668	126	166	568	4	48	2	28	12	2	12
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	45	935	176	232	795	6	67	3	39	17	3	17
RTOR Reduction (vph)	0	0	89	0	0	2	0	0	36	0	0	16
Lane Group Flow (vph)	45	935	87	232	795	4	34	36	3	0	20	1
Turn Type	Prot		Perm	Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	6.6	46.6	46.6	24.8	64.8	64.8	6.3	6.3	6.3		4.3	4.3
Effective Green, g (s)	8.6	49.6	49.6	26.8	67.8	67.8	8.8	8.8	8.8		6.8	6.8
Actuated g/C Ratio	0.09	0.50	0.50	0.27	0.68	0.68	0.09	0.09	0.09		0.07	0.07
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	152	1755	785	474	2399	1073	148	149	139		122	108
v/s Ratio Prot	0.03	c0.26		c0.13	0.22		0.02	c0.02			c0.01	
v/s Ratio Perm			0.06			0.00			0.00			0.00
v/c Ratio	0.30	0.53	0.11	0.49	0.33	0.00	0.23	0.24	0.02		0.16	0.01
Uniform Delay, d1	42.9	17.3	13.4	30.8	6.7	5.2	42.4	42.5	41.7		43.9	43.5
Progression Factor	0.88	0.84	0.66	0.97	0.24	0.04	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.9	1.0	0.2	0.7	0.3	0.0	0.8	0.8	0.1		0.6	0.0
Delay (s)	38.8	15.5	9.1	30.7	2.0	0.2	43.2	43.3	41.7		44.6	43.5
Level of Service	D	B	A	C	A	A	D	D	D		D	D
Approach Delay (s)		15.4			8.4			42.7			44.1	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM Average Control Delay	14.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0			2.0	
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	0.85	1.00	0.92			0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1723			1750	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.54	1.00			0.87	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1013	1723			1539	
Volume (vph)	50	600	50	50	500	50	50	50	50	50	50	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	70	840	70	70	700	70	70	70	70	70	70	70
RTOR Reduction (vph)	0	0	38	0	0	38	0	36	0	0	18	0
Lane Group Flow (vph)	70	840	32	70	700	32	70	104	0	0	192	0
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	14.0	43.0	43.0	14.0	43.0	43.0	29.5	29.5			29.5	
Effective Green, g (s)	16.0	46.0	46.0	16.0	46.0	46.0	32.0	32.0			32.0	
Actuated g/C Ratio	0.16	0.46	0.46	0.16	0.46	0.46	0.32	0.32			0.32	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.5	4.5			4.5	
Lane Grp Cap (vph)	283	1628	728	283	1628	728	324	551			492	
v/s Ratio Prot	c0.04	c0.24		0.04	0.20			0.06				
v/s Ratio Perm			0.02			0.02	0.07				c0.12	
v/c Ratio	0.25	0.52	0.04	0.25	0.43	0.04	0.22	0.19			0.39	
Uniform Delay, d1	36.7	19.1	14.9	36.7	18.2	14.9	24.8	24.6			26.4	
Progression Factor	1.32	0.71	0.80	1.06	0.71	1.29	1.00	1.00			1.00	
Incremental Delay, d2	0.6	0.3	0.0	1.9	0.7	0.1	1.5	0.8			2.3	
Delay (s)	49.0	13.9	11.9	40.6	13.6	19.3	26.4	25.4			28.8	
Level of Service	D	B	B	D	B	B	C	C			C	
Approach Delay (s)		16.2			16.3			25.7			28.8	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	18.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0		2.0			2.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.96			0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98			0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1750			1750	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.77			0.77	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583		1377			1377	
Volume (vph)	50	800	50	50	600	50	50	50	50	50	50	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	70	1120	70	70	840	70	70	70	70	70	70	70
RTOR Reduction (vph)	0	0	29	0	0	29	0	18	0	0	18	0
Lane Group Flow (vph)	70	1120	41	70	840	41	0	192	0	0	192	0
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	11.0	56.0	56.0	11.0	56.0	56.0		19.5			19.5	
Effective Green, g (s)	13.0	59.0	59.0	13.0	59.0	59.0		22.0			22.0	
Actuated g/C Ratio	0.13	0.59	0.59	0.13	0.59	0.59		0.22			0.22	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0		4.5			4.5	
Lane Grp Cap (vph)	230	2088	934	230	2088	934		303			303	
v/s Ratio Prot	c0.04	c0.32		0.04	0.24							
v/s Ratio Perm			0.03			0.03		c0.14			0.14	
v/c Ratio	0.30	0.54	0.04	0.30	0.40	0.04		0.63			0.63	
Uniform Delay, d1	39.4	12.3	8.6	39.4	11.0	8.6		35.3			35.3	
Progression Factor	1.02	0.77	0.98	1.43	0.50	0.22		1.00			1.00	
Incremental Delay, d2	2.1	0.6	0.1	3.3	0.6	0.1		9.7			9.7	
Delay (s)	42.4	10.1	8.5	59.5	6.1	2.0		45.1			45.1	
Level of Service	D	B	A	E	A	A		D			D	
Approach Delay (s)		11.8			9.6			45.1			45.1	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM Average Control Delay	16.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0		2.0			2.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.96			0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98			0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1750			1750	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.86			0.86	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583		1521			1521	
Volume (vph)	50	600	50	50	500	50	50	50	50	50	50	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	70	840	70	70	700	70	70	70	70	70	70	70
RTOR Reduction (vph)	0	0	43	0	0	43	0	18	0	0	18	0
Lane Group Flow (vph)	70	840	27	70	700	27	0	192	0	0	192	0
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	13.0	36.0	36.0	13.0	36.0	36.0		37.0			37.0	
Effective Green, g (s)	15.0	39.0	39.0	15.0	39.0	39.0		40.0			40.0	
Actuated g/C Ratio	0.15	0.39	0.39	0.15	0.39	0.39		0.40			0.40	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0		5.0			5.0	
Lane Grp Cap (vph)	266	1380	617	266	1380	617		608			608	
v/s Ratio Prot	c0.04	c0.24		0.04	0.20							
v/s Ratio Perm			0.02			0.02		c0.13			0.13	
v/c Ratio	0.26	0.61	0.04	0.26	0.51	0.04		0.32			0.32	
Uniform Delay, d1	37.6	24.4	18.9	37.6	23.2	18.9		20.6			20.6	
Progression Factor	1.54	0.54	0.32	0.67	0.81	1.51		1.00			1.00	
Incremental Delay, d2	2.1	1.8	0.1	2.0	1.1	0.1		1.4			1.4	
Delay (s)	59.9	15.0	6.2	27.2	19.9	28.8		22.0			22.0	
Level of Service	E	B	A	C	B	C		C			C	
Approach Delay (s)		17.6			21.2			22.0			22.0	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM Average Control Delay	19.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	52.6%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0		2.0	2.0			2.0	2.0		2.0	2.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	3504		1770	3498			1788	1583		1788	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.76	1.00		0.76	1.00
Satd. Flow (perm)	1770	3504		1770	3498			1412	1583		1412	1583
Volume (vph)	50	700	50	50	600	50	50	10	50	50	10	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	70	980	70	70	840	70	70	14	70	70	14	70
RTOR Reduction (vph)	0	5	0	0	6	0	0	0	48	0	0	60
Lane Group Flow (vph)	70	1045	0	70	904	0	0	84	22	0	84	11
Turn Type	Prot			Prot			Perm		Perm	Perm		Over
Protected Phases	5	2		1	6			4			4	5
Permitted Phases							4		4	4		
Actuated Green, G (s)	13.0	44.0		13.0	44.0			29.0	29.0		29.0	13.0
Effective Green, g (s)	15.0	47.0		15.0	47.0			32.0	32.0		32.0	15.0
Actuated g/C Ratio	0.15	0.47		0.15	0.47			0.32	0.32		0.32	0.15
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0	5.0		5.0	4.0
Lane Grp Cap (vph)	266	1647		266	1644			452	507		452	237
v/s Ratio Prot	c0.04	c0.30		0.04	0.26							0.01
v/s Ratio Perm								c0.06	0.01		0.06	
v/c Ratio	0.26	0.63		0.26	0.55			0.19	0.04		0.19	0.04
Uniform Delay, d1	37.6	20.0		37.6	18.9			24.6	23.5		24.6	36.4
Progression Factor	1.48	0.25		1.09	0.61			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.0	1.5		2.1	1.2			0.9	0.2		0.9	0.4
Delay (s)	57.7	6.6		43.0	12.7			25.5	23.6		25.5	36.7
Level of Service	E	A		D	B			C	C		C	D
Approach Delay (s)		9.8			14.9			24.6			30.6	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM Average Control Delay	14.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	54.5%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	4.0	2.0	2.0	4.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3500	3539	1583	3500	3539	1583	1800	3539	1583	1800	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	318	596	112	294	668	148	132	864	334	460	1186	162
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	445	834	157	412	935	207	185	1210	468	644	1660	227
RTOR Reduction (vph)	0	0	120	0	0	158	0	0	146	0	0	98
Lane Group Flow (vph)	445	834	37	412	935	49	185	1210	322	644	1660	129
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	10.0	21.0	21.0	10.0	21.0	21.0	9.0	27.0	27.0	27.0	45.0	45.0
Effective Green, g (s)	12.0	23.0	25.0	12.0	23.0	25.0	11.0	30.0	31.0	29.0	48.0	49.0
Actuated g/C Ratio	0.11	0.22	0.24	0.11	0.22	0.24	0.10	0.29	0.30	0.28	0.46	0.47
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0
Lane Grp Cap (vph)	400	775	377	400	775	377	189	1011	467	497	1618	739
v/s Ratio Prot	c0.13	0.24		0.12	c0.26		0.10	c0.34		c0.36	0.47	
v/s Ratio Perm			0.02			0.03			0.20			0.08
v/c Ratio	1.11	1.08	0.10	1.03	1.21	0.13	0.98	1.20	0.69	1.30	1.03	0.17
Uniform Delay, d1	46.5	41.0	31.2	46.5	41.0	31.5	46.9	37.5	32.7	38.0	28.5	16.3
Progression Factor	0.78	0.85	1.35	0.59	0.54	0.68	1.36	0.73	0.49	0.81	1.38	2.58
Incremental Delay, d2	78.6	54.4	0.5	44.3	101.1	0.5	57.0	97.5	7.4	146.4	28.3	0.5
Delay (s)	114.8	89.2	42.6	71.9	123.0	21.9	120.9	124.7	23.5	177.0	67.7	42.3
Level of Service	F	F	D	E	F	C	F	F	C	F	E	D
Approach Delay (s)		92.1			96.0			98.9			93.3	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	95.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	121.0%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	3539	1583	3433	1863	1583
Volume (vph)	430	1222	114	358	808	266	144	522	158	412	372	248
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	602	1711	160	501	1131	372	202	731	221	577	521	347
RTOR Reduction (vph)	0	0	67	0	0	175	0	0	181	0	0	251
Lane Group Flow (vph)	602	1711	93	501	1131	197	202	731	40	577	521	96
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Actuated Green, G (s)	28.0	36.0	36.0	21.0	29.0	29.0	9.0	16.0	16.0	14.0	21.0	21.0
Effective Green, g (s)	30.0	39.0	39.0	23.0	32.0	32.0	11.0	19.0	19.0	16.0	24.0	24.0
Actuated g/C Ratio	0.29	0.37	0.37	0.22	0.30	0.30	0.10	0.18	0.18	0.15	0.23	0.23
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)	506	1314	588	388	1079	482	185	640	286	523	426	362
v/s Ratio Prot	c0.34	c0.48		c0.28	0.32		0.11	0.21		c0.17	c0.28	
v/s Ratio Perm			0.06			0.12			0.03			0.06
v/c Ratio	1.19	1.30	0.16	1.29	1.05	0.41	1.09	1.14	0.14	1.10	1.22	0.26
Uniform Delay, d1	37.5	33.0	22.0	41.0	36.5	29.0	47.0	43.0	36.1	44.5	40.5	33.2
Progression Factor	1.45	0.96	1.20	0.99	0.73	0.45	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	87.3	136.5	0.1	148.9	40.7	2.5	92.8	81.7	1.0	70.6	119.8	1.8
Delay (s)	141.8	168.0	26.5	189.6	67.5	15.6	139.8	124.7	37.2	115.1	160.3	35.0
Level of Service	F	F	C	F	E	B	F	F	D	F	F	D
Approach Delay (s)		152.5			88.4			110.6			112.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	119.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	127.0%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1738		3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1770	1738		3433	1863	1583
Volume (vph)	142	974	116	218	558	414	40	146	118	776	292	74
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	199	1364	162	305	781	580	56	204	165	1086	409	104
RTOR Reduction (vph)	0	0	85	0	0	376	0	28	0	0	0	67
Lane Group Flow (vph)	199	1364	77	305	781	204	56	341	0	1086	409	37
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2						4
Actuated Green, G (s)	13.0	33.0	33.0	14.0	34.0	34.0	6.0	14.0		26.0	34.0	34.0
Effective Green, g (s)	15.0	36.0	36.0	16.0	37.0	37.0	8.0	17.0		28.0	37.0	37.0
Actuated g/C Ratio	0.14	0.34	0.34	0.15	0.35	0.35	0.08	0.16		0.27	0.35	0.35
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0
Lane Grp Cap (vph)	253	1213	543	270	1247	558	135	281		915	656	558
v/s Ratio Prot	0.11	c0.39		c0.17	0.22		0.03	c0.20		c0.32	0.22	
v/s Ratio Perm			0.05			0.13						0.02
v/c Ratio	0.79	1.12	0.14	1.13	0.63	0.37	0.41	1.21		1.19	0.62	0.07
Uniform Delay, d1	43.5	34.5	23.8	44.5	28.3	25.3	46.3	44.0		38.5	28.2	22.5
Progression Factor	1.00	1.00	1.00	1.34	0.34	1.56	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	21.4	67.2	0.5	73.0	0.8	0.6	9.1	124.7		95.1	4.4	0.2
Delay (s)	64.9	101.7	24.4	132.8	10.3	39.9	55.4	168.7		133.6	32.6	22.8
Level of Service	E	F	C	F	B	D	E	F		F	C	C
Approach Delay (s)		90.2			43.0			153.8			100.6	
Approach LOS		F			D			F			F	

Intersection Summary			
HCM Average Control Delay	83.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	119.8%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0			2.0	2.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	1.00			1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.86			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.96	1.00
Satd. Flow (prot)	1770	5009		1770	3539	1583	1770	1609			1788	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.67	1.00			0.72	1.00
Satd. Flow (perm)	1770	5009		1770	3539	1583	1252	1609			1342	1583
Volume (vph)	100	900	100	100	1200	100	50	10	100	50	10	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	140	1260	140	140	1680	140	70	14	140	70	14	70
RTOR Reduction (vph)	0	13	0	0	0	60	0	95	0	0	0	47
Lane Group Flow (vph)	140	1387	0	140	1680	80	70	59	0	0	84	23
Turn Type	Prot			Prot		Perm	Perm			Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases						2	8			4		4
Actuated Green, G (s)	12.0	42.0		18.0	48.0	48.0	31.0	31.0			31.0	31.0
Effective Green, g (s)	14.0	45.0		20.0	51.0	51.0	34.0	34.0			34.0	34.0
Actuated g/C Ratio	0.13	0.43		0.19	0.49	0.49	0.32	0.32			0.32	0.32
Clearance Time (s)	4.0	5.0		4.0	5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)	236	2147		337	1719	769	405	521			435	513
v/s Ratio Prot	c0.08	0.28		0.08	c0.47			0.04				
v/s Ratio Perm						0.05	0.06				c0.06	0.01
v/c Ratio	0.59	0.65		0.42	0.98	0.10	0.17	0.11			0.19	0.04
Uniform Delay, d1	42.8	23.7		37.4	26.4	14.6	25.4	24.9			25.6	24.4
Progression Factor	0.88	1.36		1.19	0.82	0.36	1.00	1.00			1.00	1.00
Incremental Delay, d2	7.6	1.1		3.5	16.2	0.3	0.9	0.4			1.0	0.2
Delay (s)	45.2	33.3		47.9	38.0	5.5	26.4	25.4			26.6	24.5
Level of Service	D	C		D	D	A	C	C			C	C
Approach Delay (s)		34.4			36.4			25.7			25.6	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM Average Control Delay	34.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	81.5%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0		2.0		2.0	2.0	
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	0.85		0.94		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1710		1770	1630	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.85		0.62	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583		1481		1149	1630	
Volume (vph)	200	1000	100	200	950	100	50	10	50	50	10	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	280	1400	140	280	1330	140	70	14	70	70	14	70
RTOR Reduction (vph)	0	0	72	0	0	76	0	29	0	0	48	0
Lane Group Flow (vph)	280	1400	68	280	1330	64	0	125	0	70	36	0
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	21.0	45.0	45.0	16.0	40.0	40.0		30.5		30.5	30.5	
Effective Green, g (s)	23.0	48.0	48.0	18.0	43.0	43.0		33.0		33.0	33.0	
Actuated g/C Ratio	0.22	0.46	0.46	0.17	0.41	0.41		0.31		0.31	0.31	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0		4.5		4.5	4.5	
Lane Grp Cap (vph)	388	1618	724	303	1449	648		465		361	512	
v/s Ratio Prot	c0.16	0.40		c0.16	c0.38						0.02	
v/s Ratio Perm			0.04			0.04		c0.08		0.06		
v/c Ratio	0.72	0.87	0.09	0.92	0.92	0.10		0.27		0.19	0.07	
Uniform Delay, d1	38.0	25.6	16.2	42.8	29.3	19.1		27.0		26.3	25.2	
Progression Factor	1.01	0.77	0.68	1.42	0.44	0.21		1.00		1.00	1.00	
Incremental Delay, d2	4.3	2.6	0.1	20.1	5.4	0.1		1.4		1.2	0.3	
Delay (s)	42.9	22.3	11.2	80.8	18.3	4.2		28.4		27.5	25.5	
Level of Service	D	C	B	F	B	A		C		C	C	
Approach Delay (s)		24.6			27.2			28.4			26.4	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	26.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	79.8%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00		0.96	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1681	1687	1583		1787	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00		0.96	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1681	1687	1583		1787	1583
Volume (vph)	64	1154	78	144	880	26	246	2	90	42	8	20
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	90	1616	109	202	1232	36	344	3	126	59	11	28
RTOR Reduction (vph)	0	0	39	0	0	14	0	0	105	0	0	25
Lane Group Flow (vph)	90	1616	70	202	1232	22	172	175	21	0	70	3
Turn Type	Prot		Perm	Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	9.6	44.1	44.1	19.6	54.1	54.1	15.4	15.4	15.4		7.9	7.9
Effective Green, g (s)	11.6	47.1	47.1	21.6	57.1	57.1	17.9	17.9	17.9		10.4	10.4
Actuated g/C Ratio	0.11	0.45	0.45	0.21	0.54	0.54	0.17	0.17	0.17		0.10	0.10
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	196	1587	710	364	1925	861	287	288	270		177	157
v/s Ratio Prot	0.05	c0.46		0.11	c0.35		0.10	c0.10			c0.04	
v/s Ratio Perm			0.04			0.01			0.01			0.00
v/c Ratio	0.46	1.02	0.10	0.55	0.64	0.03	0.60	0.61	0.08		0.40	0.02
Uniform Delay, d1	43.8	28.9	16.7	37.4	16.8	11.1	40.2	40.3	36.6		44.4	42.7
Progression Factor	0.53	0.32	0.17	0.70	0.35	0.18	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.7	19.4	0.1	0.9	0.8	0.0	3.4	3.6	0.1		1.5	0.0
Delay (s)	24.0	28.8	3.0	27.1	6.7	2.0	43.6	43.9	36.7		45.8	42.7
Level of Service	C	C	A	C	A	A	D	D	D		D	D
Approach Delay (s)		27.0			9.4			41.9			44.9	
Approach LOS		C			A			D			D	

Intersection Summary			
HCM Average Control Delay	22.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	82.1%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0			2.0	
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	0.85	1.00	0.88			0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1630			1710	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.61	1.00			0.85	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1144	1630			1480	
Volume (vph)	50	500	50	50	600	50	50	10	50	50	10	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	70	700	70	70	840	70	70	14	70	70	14	70
RTOR Reduction (vph)	0	0	37	0	0	37	0	49	0	0	29	0
Lane Group Flow (vph)	70	700	33	70	840	33	70	35	0	0	125	0
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	16.0	46.0	46.0	16.0	46.0	46.0	29.5	29.5			29.5	
Effective Green, g (s)	18.0	49.0	49.0	18.0	49.0	49.0	32.0	32.0			32.0	
Actuated g/C Ratio	0.17	0.47	0.47	0.17	0.47	0.47	0.30	0.30			0.30	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.5	4.5			4.5	
Lane Grp Cap (vph)	303	1652	739	303	1652	739	349	497			451	
v/s Ratio Prot	c0.04	0.20		0.04	c0.24			0.02				
v/s Ratio Perm			0.02			0.02	0.06				c0.08	
v/c Ratio	0.23	0.42	0.04	0.23	0.51	0.04	0.20	0.07			0.28	
Uniform Delay, d1	37.5	18.6	15.2	37.5	19.6	15.2	27.0	25.9			27.7	
Progression Factor	1.48	0.51	0.34	1.06	0.92	1.36	1.00	1.00			1.00	
Incremental Delay, d2	0.2	0.1	0.0	1.5	0.9	0.1	1.3	0.3			1.5	
Delay (s)	55.8	9.5	5.2	41.2	19.0	20.8	28.3	26.2			29.3	
Level of Service	E	A	A	D	B	C	C	C			C	
Approach Delay (s)		13.0			20.7			27.2			29.3	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM Average Control Delay	18.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	52.7%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0		2.0			2.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.94			0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98			0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1710			1710	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.82			0.82	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583		1426			1426	
Volume (vph)	50	1200	50	50	1000	50	50	10	50	50	10	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	70	1680	70	70	1400	70	70	14	70	70	14	70
RTOR Reduction (vph)	0	0	30	0	0	35	0	29	0	0	29	0
Lane Group Flow (vph)	70	1680	40	70	1400	35	0	125	0	0	125	0
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	16.0	50.0	50.0	16.0	50.0	50.0		25.5			25.5	
Effective Green, g (s)	18.0	53.0	53.0	18.0	53.0	53.0		28.0			28.0	
Actuated g/C Ratio	0.17	0.50	0.50	0.17	0.50	0.50		0.27			0.27	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0		4.5			4.5	
Lane Grp Cap (vph)	303	1786	799	303	1786	799		380			380	
v/s Ratio Prot	c0.04	c0.47		0.04	0.40							
v/s Ratio Perm			0.03			0.02		c0.09			0.09	
v/c Ratio	0.23	0.94	0.05	0.23	0.78	0.04		0.33			0.33	
Uniform Delay, d1	37.5	24.5	13.2	37.5	21.3	13.2		31.0			31.0	
Progression Factor	0.96	0.68	0.88	1.28	0.31	0.29		1.00			1.00	
Incremental Delay, d2	0.2	1.4	0.0	1.4	2.8	0.1		2.3			2.3	
Delay (s)	36.3	18.1	11.6	49.5	9.4	3.9		33.3			33.3	
Level of Service	D	B	B	D	A	A		C			C	
Approach Delay (s)		18.6			11.0			33.3			33.3	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	16.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0		2.0			2.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.94			0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98			0.98	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1710			1710	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.82			0.82	
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583		1438			1438	
Volume (vph)	50	500	50	50	600	50	50	10	50	50	10	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	70	700	70	70	840	70	70	14	70	70	14	70
RTOR Reduction (vph)	0	0	43	0	0	43	0	28	0	0	28	0
Lane Group Flow (vph)	70	700	27	70	840	27	0	126	0	0	126	0
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	16.0	38.0	38.0	16.0	38.0	38.0		37.0			37.0	
Effective Green, g (s)	18.0	41.0	41.0	18.0	41.0	41.0		40.0			40.0	
Actuated g/C Ratio	0.17	0.39	0.39	0.17	0.39	0.39		0.38			0.38	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0		5.0			5.0	
Lane Grp Cap (vph)	303	1382	618	303	1382	618		548			548	
v/s Ratio Prot	c0.04	0.20		0.04	c0.24							
v/s Ratio Perm			0.02			0.02		c0.09			0.09	
v/c Ratio	0.23	0.51	0.04	0.23	0.61	0.04		0.23			0.23	
Uniform Delay, d1	37.5	24.3	19.8	37.5	25.6	19.8		22.0			22.0	
Progression Factor	1.48	0.65	0.51	1.70	0.22	0.03		1.00			1.00	
Incremental Delay, d2	1.7	1.2	0.1	0.2	0.2	0.0		1.0			1.0	
Delay (s)	57.4	17.0	10.2	63.9	5.8	0.7		23.0			23.0	
Level of Service	E	B	B	E	A	A		C			C	
Approach Delay (s)		19.8			9.6			23.0			23.0	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	48.4%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0		2.0	2.0			2.0	2.0		2.0	2.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	3486		1770	3495			1788	1583		1788	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.76	1.00		0.76	1.00
Satd. Flow (perm)	1770	3486		1770	3495			1407	1583		1407	1583
Volume (vph)	100	900	100	100	1100	100	50	10	50	50	10	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	140	1260	140	140	1540	140	70	14	70	70	14	70
RTOR Reduction (vph)	0	8	0	0	7	0	0	0	49	0	0	59
Lane Group Flow (vph)	140	1392	0	140	1673	0	0	84	21	0	84	11
Turn Type	Prot			Prot			Perm		Perm	Perm		Over
Protected Phases	5	2		1	6			4			4	5
Permitted Phases							4		4	4		
Actuated Green, G (s)	14.0	48.0		14.0	48.0			29.0	29.0		29.0	14.0
Effective Green, g (s)	16.0	51.0		16.0	51.0			32.0	32.0		32.0	16.0
Actuated g/C Ratio	0.15	0.49		0.15	0.49			0.30	0.30		0.30	0.15
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0	5.0		5.0	4.0
Lane Grp Cap (vph)	270	1693		270	1698			429	482		429	241
v/s Ratio Prot	c0.08	0.40		0.08	c0.48							0.01
v/s Ratio Perm								c0.06	0.01		0.06	
v/c Ratio	0.52	0.82		0.52	0.99			0.20	0.04		0.20	0.04
Uniform Delay, d1	41.0	23.1		41.0	26.6			27.0	25.7		27.0	38.0
Progression Factor	1.33	0.32		1.40	0.30			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.9	2.7		2.8	10.7			1.0	0.2		1.0	0.3
Delay (s)	58.3	10.0		60.1	18.6			28.0	25.9		28.0	38.3
Level of Service	E	B		E	B			C	C		C	D
Approach Delay (s)		14.4			21.8			27.0			32.7	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM Average Control Delay	19.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM SIGNALIZED INTERSECTION CAPACITY ANALYSIS

YEAR 2025 WITH 6 LANES

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	4.0	2.0	2.0	4.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3500	3600	1583	3433	3600	1583	1800	3600	1583	1800	3600	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	146	336	194	204	374	58	118	1124	348	282	448	74
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	204	470	272	286	524	81	165	1574	487	395	627	104
RTOR Reduction (vph)	0	0	204	0	0	61	0	0	179	0	0	59
Lane Group Flow (vph)	204	470	68	286	524	20	165	1574	308	395	627	45
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	9.0	21.0	21.0	9.0	21.0	21.0	11.0	33.0	33.0	17.0	39.0	39.0
Effective Green, g (s)	11.0	23.0	25.0	11.0	23.0	25.0	13.0	36.0	37.0	19.0	42.0	43.0
Actuated g/C Ratio	0.11	0.23	0.25	0.11	0.23	0.25	0.13	0.36	0.37	0.19	0.42	0.43
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0
Lane Grp Cap (vph)	385	828	396	378	828	396	234	1296	586	342	1512	681
v/s Ratio Prot	0.06	0.13		c0.08	c0.15		0.09	c0.44		c0.22	0.17	
v/s Ratio Perm			0.04			0.01			0.19			0.03
v/c Ratio	0.53	0.57	0.17	0.76	0.63	0.05	0.71	1.21	0.53	1.15	0.41	0.07
Uniform Delay, d1	42.1	34.1	29.4	43.2	34.7	28.5	41.7	32.0	24.6	40.5	20.4	16.7
Progression Factor	0.84	0.56	1.67	1.55	0.53	0.04	1.15	0.83	0.60	1.09	0.64	0.13
Incremental Delay, d2	4.7	2.6	0.9	12.7	3.5	0.2	16.1	103.7	3.3	97.6	0.8	0.2
Delay (s)	40.0	21.7	50.0	79.8	22.0	1.4	64.1	130.4	18.1	141.7	13.9	2.3
Level of Service	D	C	D	E	C	A	E	F	B	F	B	A
Approach Delay (s)		33.8			38.7			100.9			57.7	
Approach LOS		C			D			F			E	

Intersection Summary			
HCM Average Control Delay	68.6	HCM Level of Service	E
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.0
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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	1770	3539	1583	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	1770	3539	1583	3433	1863	1583
Volume (vph)	242	852	58	366	1452	348	174	538	338	386	254	528
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	339	1193	81	512	2033	487	244	753	473	540	356	739
RTOR Reduction (vph)	0	0	53	0	0	161	0	0	279	0	0	210
Lane Group Flow (vph)	339	1193	28	512	2033	326	244	753	194	540	356	529
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Actuated Green, G (s)	14.0	31.0	31.0	22.0	39.0	39.0	9.0	16.0	16.0	13.0	20.0	20.0
Effective Green, g (s)	16.0	34.0	34.0	24.0	42.0	42.0	11.0	19.0	19.0	15.0	23.0	23.0
Actuated g/C Ratio	0.16	0.34	0.34	0.24	0.42	0.42	0.11	0.19	0.19	0.15	0.23	0.23
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)	549	1729	538	824	2136	665	195	672	301	515	428	364
v/s Ratio Prot	0.10	0.23		c0.15	c0.40		c0.14	0.21		c0.16	0.19	
v/s Ratio Perm			0.02			0.21			0.12			c0.33
v/c Ratio	0.62	0.69	0.05	0.62	0.95	0.49	1.25	1.12	0.65	1.05	0.83	1.45
Uniform Delay, d1	39.1	28.5	22.2	33.9	28.0	21.2	44.5	40.5	37.4	42.5	36.7	38.5
Progression Factor	1.19	0.77	0.81	1.07	0.80	0.65	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.5	1.6	0.1	3.5	11.0	2.6	148.2	72.8	10.2	53.0	17.0	218.5
Delay (s)	50.0	23.4	18.1	39.9	33.3	16.3	192.7	113.3	47.6	95.5	53.6	257.0
Level of Service	D	C	B	D	C	B	F	F	D	F	D	F
Approach Delay (s)		28.8			31.7			105.3			159.4	
Approach LOS		C			C			F			F	

Intersection Summary			
HCM Average Control Delay	72.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	108.5%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	1770	1787		3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	1770	1787		3433	1863	1583
Volume (vph)	246	784	118	160	1112	910	50	236	88	340	78	114
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	344	1098	165	224	1557	1274	70	330	123	476	109	160
RTOR Reduction (vph)	0	0	102	0	0	61	0	14	0	0	0	112
Lane Group Flow (vph)	344	1098	63	224	1557	1213	70	439	0	476	109	48
Turn Type	Prot		Perm	Prot		pm+ov	Prot			Prot		Perm
Protected Phases	1	6		5	2	7	3	8		7	4	
Permitted Phases			6			2						4
Actuated Green, G (s)	13.0	35.0	35.0	14.0	36.0	48.0	6.0	21.0		12.0	27.0	27.0
Effective Green, g (s)	15.0	38.0	38.0	16.0	39.0	53.0	8.0	24.0		14.0	30.0	30.0
Actuated g/C Ratio	0.15	0.38	0.38	0.16	0.39	0.53	0.08	0.24		0.14	0.30	0.30
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	5.0		4.0	5.0	5.0
Lane Grp Cap (vph)	515	1932	602	549	1983	871	142	429		481	559	475
v/s Ratio Prot	c0.10	0.22		0.07	0.31	c0.19	0.04	c0.25		0.14	0.06	
v/s Ratio Perm			0.04			0.57						0.03
v/c Ratio	0.67	0.57	0.10	0.41	0.79	1.39	0.49	1.02		0.99	0.19	0.10
Uniform Delay, d1	40.1	24.5	20.0	37.7	26.8	23.5	44.1	38.0		42.9	26.0	25.3
Progression Factor	1.00	1.00	1.00	1.06	0.76	0.94	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.7	1.2	0.3	0.2	0.3	177.3	11.7	49.7		38.6	0.8	0.4
Delay (s)	46.9	25.7	20.4	40.2	20.7	199.4	55.8	87.7		81.5	26.8	25.7
Level of Service	D	C	C	D	C	F	E	F		F	C	C
Approach Delay (s)		29.7			96.6			83.4			61.5	
Approach LOS		C			F			F			E	

Intersection Summary			
HCM Average Control Delay	72.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	4.0
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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0			2.0	2.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	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)	1770	5085	1583	1770	5085	1583	1770	1723			1817	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.60	1.00			0.81	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	1113	1723			1516	1583
Volume (vph)	50	700	50	50	600	50	50	50	50	50	50	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	70	980	70	70	840	70	70	70	70	70	70	70
RTOR Reduction (vph)	0	0	39	0	0	39	0	36	0	0	0	46
Lane Group Flow (vph)	70	980	32	70	840	32	70	104	0	0	140	24
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases			6			2	8			4		4
Actuated Green, G (s)	13.0	42.0	42.0	13.0	42.0	42.0	31.0	31.0			31.0	31.0
Effective Green, g (s)	15.0	45.0	45.0	15.0	45.0	45.0	34.0	34.0			34.0	34.0
Actuated g/C Ratio	0.15	0.45	0.45	0.15	0.45	0.45	0.34	0.34			0.34	0.34
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)	266	2288	712	266	2288	712	378	586			515	538
v/s Ratio Prot	0.04	c0.19		0.04	c0.17			0.06				
v/s Ratio Perm			0.02			0.02	0.06				c0.09	0.02
v/c Ratio	0.26	0.43	0.04	0.26	0.37	0.04	0.19	0.18			0.27	0.04
Uniform Delay, d1	37.6	18.7	15.4	37.6	18.1	15.4	23.2	23.2			24.0	22.1
Progression Factor	1.45	1.11	2.33	1.09	1.10	1.49	1.00	1.00			1.00	1.00
Incremental Delay, d2	2.2	0.5	0.1	2.4	0.5	0.1	1.1	0.7			1.3	0.2
Delay (s)	56.7	21.4	36.0	43.3	20.5	23.1	24.3	23.8			25.3	22.3
Level of Service	E	C	D	D	C	C	C	C			C	C
Approach Delay (s)		24.5			22.3			24.0			24.3	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	23.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	51.7%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0		2.0		2.0	2.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00		1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.96		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98		0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583		1750		1770	1723	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.87		0.55	1.00	
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583		1540		1022	1723	
Volume (vph)	50	700	50	50	600	50	50	50	50	50	50	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	70	980	70	70	840	70	70	70	70	70	70	70
RTOR Reduction (vph)	0	0	39	0	0	39	0	18	0	0	36	0
Lane Group Flow (vph)	70	980	31	70	840	31	0	192	0	70	104	0
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	15.0	41.0	41.0	15.0	41.0	41.0		30.5		30.5	30.5	
Effective Green, g (s)	17.0	44.0	44.0	17.0	44.0	44.0		33.0		33.0	33.0	
Actuated g/C Ratio	0.17	0.44	0.44	0.17	0.44	0.44		0.33		0.33	0.33	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0		4.5		4.5	4.5	
Lane Grp Cap (vph)	301	2237	697	301	2237	697		508		337	569	
v/s Ratio Prot	c0.04	c0.19		0.04	0.17						0.06	
v/s Ratio Perm			0.02			0.02		c0.12		0.07		
v/c Ratio	0.23	0.44	0.04	0.23	0.38	0.04		0.38		0.21	0.18	
Uniform Delay, d1	35.9	19.4	16.0	35.9	18.8	16.0		25.6		24.1	23.9	
Progression Factor	0.80	0.95	1.38	1.29	0.68	0.94		1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.6	0.1	1.7	0.5	0.1		2.1		1.4	0.7	
Delay (s)	30.4	19.0	22.2	48.0	13.3	15.2		27.8		25.5	24.6	
Level of Service	C	B	C	D	B	B		C		C	C	
Approach Delay (s)		19.9			15.9			27.8			24.9	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	19.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1681	1692	1583		1787	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	1681	1692	1583		1787	1583
Volume (vph)	32	668	126	166	568	4	48	2	28	12	2	12
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	45	935	176	232	795	6	67	3	39	17	3	17
RTOR Reduction (vph)	0	0	89	0	0	2	0	0	36	0	0	16
Lane Group Flow (vph)	45	935	87	232	795	4	34	36	3	0	20	1
Turn Type	Prot		Perm	Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	6.6	46.7	46.7	24.7	64.8	64.8	6.3	6.3	6.3		4.3	4.3
Effective Green, g (s)	8.6	49.7	49.7	26.7	67.8	67.8	8.8	8.8	8.8		6.8	6.8
Actuated g/C Ratio	0.09	0.50	0.50	0.27	0.68	0.68	0.09	0.09	0.09		0.07	0.07
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	152	2527	787	473	3448	1073	148	149	139		122	108
v/s Ratio Prot	0.03	c0.18		c0.13	0.16		0.02	c0.02			c0.01	
v/s Ratio Perm			0.06			0.00			0.00			0.00
v/c Ratio	0.30	0.37	0.11	0.49	0.23	0.00	0.23	0.24	0.02		0.16	0.01
Uniform Delay, d1	42.9	15.5	13.4	30.9	6.1	5.2	42.4	42.5	41.7		43.9	43.5
Progression Factor	0.90	0.87	0.69	1.21	0.25	0.06	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.0	0.4	0.3	0.8	0.1	0.0	0.8	0.8	0.1		0.6	0.0
Delay (s)	39.4	13.8	9.5	38.3	1.7	0.3	43.2	43.3	41.7		44.6	43.5
Level of Service	D	B	A	D	A	A	D	D	D		D	D
Approach Delay (s)		14.2			9.9			42.7			44.1	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM Average Control Delay	14.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	49.5%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0			2.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	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			0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1723			1750	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.54	1.00			0.87	
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	1013	1723			1539	
Volume (vph)	50	600	50	50	500	50	50	50	50	50	50	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	70	840	70	70	700	70	70	70	70	70	70	70
RTOR Reduction (vph)	0	0	38	0	0	38	0	36	0	0	18	0
Lane Group Flow (vph)	70	840	32	70	700	32	70	104	0	0	192	0
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	14.0	43.0	43.0	14.0	43.0	43.0	29.5	29.5			29.5	
Effective Green, g (s)	16.0	46.0	46.0	16.0	46.0	46.0	32.0	32.0			32.0	
Actuated g/C Ratio	0.16	0.46	0.46	0.16	0.46	0.46	0.32	0.32			0.32	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.5	4.5			4.5	
Lane Grp Cap (vph)	283	2339	728	283	2339	728	324	551			492	
v/s Ratio Prot	c0.04	c0.17		0.04	0.14			0.06				
v/s Ratio Perm			0.02			0.02	0.07				c0.12	
v/c Ratio	0.25	0.36	0.04	0.25	0.30	0.04	0.22	0.19			0.39	
Uniform Delay, d1	36.7	17.5	14.9	36.7	16.9	14.9	24.8	24.6			26.4	
Progression Factor	1.37	0.75	0.80	1.12	0.37	0.08	1.00	1.00			1.00	
Incremental Delay, d2	1.2	0.2	0.1	2.0	0.3	0.1	1.5	0.8			2.3	
Delay (s)	51.5	13.3	11.9	43.1	6.5	1.2	26.4	25.4			28.8	
Level of Service	D	B	B	D	A	A	C	C			C	
Approach Delay (s)		16.0			9.1			25.7			28.8	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	53.2%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0		2.0	2.0	2.0		2.0			2.0	
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00		1.00			1.00	
Frt	1.00	0.99		1.00	1.00	0.85		0.96			0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98			0.98	
Satd. Flow (prot)	1770	5040		1770	5085	1583		1750			1750	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.77			0.77	
Satd. Flow (perm)	1770	5040		1770	5085	1583		1377			1377	
Volume (vph)	50	800	50	50	600	50	50	50	50	50	50	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	70	1120	70	70	840	70	70	70	70	70	70	70
RTOR Reduction (vph)	0	7	0	0	0	29	0	18	0	0	18	0
Lane Group Flow (vph)	70	1183	0	70	840	41	0	192	0	0	192	0
Turn Type	Prot			Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		
Actuated Green, G (s)	11.0	56.0		11.0	56.0	56.0		19.5			19.5	
Effective Green, g (s)	13.0	59.0		13.0	59.0	59.0		22.0			22.0	
Actuated g/C Ratio	0.13	0.59		0.13	0.59	0.59		0.22			0.22	
Clearance Time (s)	4.0	5.0		4.0	5.0	5.0		4.5			4.5	
Lane Grp Cap (vph)	230	2974		230	3000	934		303			303	
v/s Ratio Prot	c0.04	c0.23		0.04	0.17							
v/s Ratio Perm						0.03		c0.14			0.14	
v/c Ratio	0.30	0.40		0.30	0.28	0.04		0.63			0.63	
Uniform Delay, d1	39.4	11.0		39.4	10.1	8.6		35.3			35.3	
Progression Factor	1.02	0.82		1.36	0.45	0.26		1.00			1.00	
Incremental Delay, d2	2.1	0.2		3.4	0.2	0.1		9.7			9.7	
Delay (s)	42.4	9.3		56.8	4.7	2.3		45.1			45.1	
Level of Service	D	A		E	A	A		D			D	
Approach Delay (s)		11.1			8.3			45.1			45.1	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	52.6%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0		2.0	2.0	2.0		2.0			2.0	
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00		1.00			1.00	
Frt	1.00	0.99		1.00	1.00	0.85		0.96			0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98			0.98	
Satd. Flow (prot)	1770	5027		1770	5085	1583		1750			1750	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.86			0.86	
Satd. Flow (perm)	1770	5027		1770	5085	1583		1521			1521	
Volume (vph)	50	600	50	50	500	50	50	50	50	50	50	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	70	840	70	70	700	70	70	70	70	70	70	70
RTOR Reduction (vph)	0	10	0	0	0	43	0	18	0	0	18	0
Lane Group Flow (vph)	70	900	0	70	700	27	0	192	0	0	192	0
Turn Type	Prot			Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		
Actuated Green, G (s)	13.0	36.0		13.0	36.0	36.0		37.0			37.0	
Effective Green, g (s)	15.0	39.0		15.0	39.0	39.0		40.0			40.0	
Actuated g/C Ratio	0.15	0.39		0.15	0.39	0.39		0.40			0.40	
Clearance Time (s)	4.0	5.0		4.0	5.0	5.0		5.0			5.0	
Lane Grp Cap (vph)	266	1961		266	1983	617		608			608	
v/s Ratio Prot	c0.04	c0.18		0.04	0.14							
v/s Ratio Perm						0.02		c0.13			0.13	
v/c Ratio	0.26	0.46		0.26	0.35	0.04		0.32			0.32	
Uniform Delay, d1	37.6	22.7		37.6	21.6	18.9		20.6			20.6	
Progression Factor	1.59	0.45		0.64	0.77	1.61		1.00			1.00	
Incremental Delay, d2	2.3	0.7		2.0	0.4	0.1		1.4			1.4	
Delay (s)	62.1	11.0		26.2	17.0	30.5		22.0			22.0	
Level of Service	E	B		C	B	C		C			C	
Approach Delay (s)		14.7			18.9			22.0			22.0	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	17.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	47.2%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0		2.0	2.0			2.0	2.0		2.0	2.0
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	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	5034		1770	5027			1788	1583		1788	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.76	1.00		0.76	1.00
Satd. Flow (perm)	1770	5034		1770	5027			1412	1583		1412	1583
Volume (vph)	50	700	50	50	600	50	50	10	50	50	10	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	70	980	70	70	840	70	70	14	70	70	14	70
RTOR Reduction (vph)	0	8	0	0	10	0	0	0	48	0	0	60
Lane Group Flow (vph)	70	1042	0	70	900	0	0	84	22	0	84	11
Turn Type	Prot			Prot			Perm		Perm	Perm		Over
Protected Phases	5	2		1	6			4			4	5
Permitted Phases							4		4	4		
Actuated Green, G (s)	13.0	44.0		13.0	44.0			29.0	29.0		29.0	13.0
Effective Green, g (s)	15.0	47.0		15.0	47.0			32.0	32.0		32.0	15.0
Actuated g/C Ratio	0.15	0.47		0.15	0.47			0.32	0.32		0.32	0.15
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0	5.0		5.0	4.0
Lane Grp Cap (vph)	266	2366		266	2363			452	507		452	237
v/s Ratio Prot	c0.04	c0.21		0.04	0.18							0.01
v/s Ratio Perm								c0.06	0.01		0.06	
v/c Ratio	0.26	0.44		0.26	0.38			0.19	0.04		0.19	0.04
Uniform Delay, d1	37.6	17.7		37.6	17.1			24.6	23.5		24.6	36.4
Progression Factor	1.58	0.28		1.15	0.53			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.2	0.6		2.3	0.4			0.9	0.2		0.9	0.4
Delay (s)	61.5	5.5		45.4	9.5			25.5	23.6		25.5	36.7
Level of Service	E	A		D	A			C	C		C	D
Approach Delay (s)		9.0			12.1			24.6			30.6	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM Average Control Delay	12.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	45.7%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	4.0	2.0	2.0	4.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3500	5085	1583	3500	5085	1583	1800	3539	1583	1800	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	1770	3539	1583	1770	3539	1583
Volume (vph)	318	596	112	294	668	148	132	864	334	460	1186	162
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	445	834	157	412	935	207	185	1210	468	644	1660	227
RTOR Reduction (vph)	0	0	120	0	0	158	0	0	146	0	0	98
Lane Group Flow (vph)	445	834	37	412	935	49	185	1210	322	644	1660	129
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	10.0	21.0	21.0	10.0	21.0	21.0	9.0	27.0	27.0	27.0	45.0	45.0
Effective Green, g (s)	12.0	23.0	25.0	12.0	23.0	25.0	11.0	30.0	31.0	29.0	48.0	49.0
Actuated g/C Ratio	0.11	0.22	0.24	0.11	0.22	0.24	0.10	0.29	0.30	0.28	0.46	0.47
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0
Lane Grp Cap (vph)	400	1114	377	400	1114	377	189	1011	467	497	1618	739
v/s Ratio Prot	c0.13	0.16		c0.12	c0.18		0.10	c0.34		c0.36	0.47	
v/s Ratio Perm			0.02			0.03			0.20			0.08
v/c Ratio	1.11	0.75	0.10	1.03	0.84	0.13	0.98	1.20	0.69	1.30	1.03	0.17
Uniform Delay, d1	46.5	38.3	31.2	46.5	39.2	31.5	46.9	37.5	32.7	38.0	28.5	16.3
Progression Factor	0.78	0.84	1.36	0.59	0.51	0.91	1.36	0.73	0.49	0.81	1.38	2.58
Incremental Delay, d2	78.9	4.6	0.5	49.7	6.7	0.6	57.0	97.5	7.4	146.4	28.3	0.5
Delay (s)	115.1	36.7	43.1	76.9	26.6	29.3	120.9	124.7	23.5	177.0	67.7	42.3
Level of Service	F	D	D	E	C	C	F	F	C	F	E	D
Approach Delay (s)		61.7			40.3			98.9			93.3	
Approach LOS		E			D			F			F	

Intersection Summary			
HCM Average Control Delay	77.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	113.2%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	0.95	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	1770	3539	1583	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	1770	3539	1583	3433	1863	1583
Volume (vph)	430	1222	114	358	808	266	144	522	158	412	372	248
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	602	1711	160	501	1131	372	202	731	221	577	521	347
RTOR Reduction (vph)	0	0	96	0	0	175	0	0	181	0	0	251
Lane Group Flow (vph)	602	1711	64	501	1131	197	202	731	40	577	521	96
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Actuated Green, G (s)	28.0	36.0	36.0	21.0	29.0	29.0	9.0	16.0	16.0	14.0	21.0	21.0
Effective Green, g (s)	30.0	39.0	39.0	23.0	32.0	32.0	11.0	19.0	19.0	16.0	24.0	24.0
Actuated g/C Ratio	0.29	0.37	0.37	0.22	0.30	0.30	0.10	0.18	0.18	0.15	0.23	0.23
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)	981	1889	588	752	1550	482	185	640	286	523	426	362
v/s Ratio Prot	c0.18	c0.34		c0.15	0.22		0.11	0.21		c0.17	c0.28	
v/s Ratio Perm			0.04			0.12			0.03			0.06
v/c Ratio	0.61	0.91	0.11	0.67	0.73	0.41	1.09	1.14	0.14	1.10	1.22	0.26
Uniform Delay, d1	32.5	31.3	21.6	37.5	32.6	29.0	47.0	43.0	36.1	44.5	40.5	33.2
Progression Factor	1.53	0.97	1.48	1.04	0.71	0.43	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	2.4	0.1	4.6	3.0	2.6	92.8	81.7	1.0	70.6	119.8	1.8
Delay (s)	50.4	32.6	32.1	43.7	26.1	15.1	139.8	124.7	37.2	115.1	160.3	35.0
Level of Service	D	C	C	D	C	B	F	F	D	F	F	D
Approach Delay (s)		36.9			28.5			110.6			112.2	
Approach LOS		D			C			F			F	

Intersection Summary			
HCM Average Control Delay	61.9	HCM Level of Service	E
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	99.3%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	1770	1738		3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	1770	1738		3433	1863	1583
Volume (vph)	142	974	116	218	558	414	40	146	118	776	292	74
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	199	1364	162	305	781	580	56	204	165	1086	409	104
RTOR Reduction (vph)	0	0	51	0	0	74	0	28	0	0	0	67
Lane Group Flow (vph)	199	1364	111	305	781	506	56	341	0	1086	409	37
Turn Type	Prot		Perm	Prot		pm+ov	Prot			Prot		Perm
Protected Phases	1	6		5	2	7	3	8		7	4	
Permitted Phases			6			2						4
Actuated Green, G (s)	13.0	33.0	33.0	14.0	34.0	60.0	6.0	14.0		26.0	34.0	34.0
Effective Green, g (s)	15.0	36.0	36.0	16.0	37.0	65.0	8.0	17.0		28.0	37.0	37.0
Actuated g/C Ratio	0.14	0.34	0.34	0.15	0.35	0.62	0.08	0.16		0.27	0.35	0.35
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	4.0	4.0	5.0		4.0	5.0	5.0
Lane Grp Cap (vph)	490	1743	543	523	1792	1010	135	281		915	656	558
v/s Ratio Prot	0.06	c0.27		c0.09	0.15	0.13	0.03	c0.20		c0.32	0.22	
v/s Ratio Perm			0.07			0.19						0.02
v/c Ratio	0.41	0.78	0.20	0.58	0.44	0.50	0.41	1.21		1.19	0.62	0.07
Uniform Delay, d1	40.9	31.0	24.4	41.4	26.0	11.0	46.3	44.0		38.5	28.2	22.5
Progression Factor	1.00	1.00	1.00	1.30	0.35	1.04	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.5	3.6	0.8	3.1	0.5	1.2	9.1	124.7		95.1	4.4	0.2
Delay (s)	43.4	34.6	25.2	56.8	9.6	12.7	55.4	168.7		133.6	32.6	22.8
Level of Service	D	C	C	E	A	B	E	F		F	C	C
Approach Delay (s)		34.7			19.3			153.8			100.6	
Approach LOS		C			B			F			F	

Intersection Summary			
HCM Average Control Delay	58.8	HCM Level of Service	E
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	100.2%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0			2.0	2.0
Lane Util. Factor	1.00	0.86		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	0.86			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.96	1.00
Satd. Flow (prot)	1770	6312		1770	5085	1583	1770	1609			1788	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.67	1.00			0.72	1.00
Satd. Flow (perm)	1770	6312		1770	5085	1583	1252	1609			1342	1583
Volume (vph)	100	900	100	100	1200	100	50	10	100	50	10	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	140	1260	140	140	1680	140	70	14	140	70	14	70
RTOR Reduction (vph)	0	18	0	0	0	72	0	95	0	0	0	47
Lane Group Flow (vph)	140	1382	0	140	1680	68	70	59	0	0	84	23
Turn Type	Prot			Prot		Perm	Perm			Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases						2	8			4		4
Actuated Green, G (s)	12.0	42.0		18.0	48.0	48.0	31.0	31.0			31.0	31.0
Effective Green, g (s)	14.0	45.0		20.0	51.0	51.0	34.0	34.0			34.0	34.0
Actuated g/C Ratio	0.13	0.43		0.19	0.49	0.49	0.32	0.32			0.32	0.32
Clearance Time (s)	4.0	5.0		4.0	5.0	5.0	5.0	5.0			5.0	5.0
Lane Grp Cap (vph)	236	2705		337	2470	769	405	521			435	513
v/s Ratio Prot	c0.08	0.22		c0.08	c0.33			0.04				
v/s Ratio Perm						0.04	0.06				c0.06	0.01
v/c Ratio	0.59	0.51		0.42	0.68	0.09	0.17	0.11			0.19	0.04
Uniform Delay, d1	42.8	22.0		37.4	20.7	14.5	25.4	24.9			25.6	24.4
Progression Factor	0.91	1.43		1.19	0.77	0.28	1.00	1.00			1.00	1.00
Incremental Delay, d2	9.4	0.6		3.5	1.4	0.2	0.9	0.4			1.0	0.2
Delay (s)	48.5	32.1		47.9	17.4	4.3	26.4	25.4			26.6	24.5
Level of Service	D	C		D	B	A	C	C			C	C
Approach Delay (s)		33.6			18.7			25.7			25.6	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM Average Control Delay	25.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0		2.0		2.0	2.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00		1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.94		1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98		0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583		1710		1770	1630	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.85		0.62	1.00	
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583		1481		1149	1630	
Volume (vph)	200	1000	100	200	950	100	50	10	50	50	10	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	280	1400	140	280	1330	140	70	14	70	70	14	70
RTOR Reduction (vph)	0	0	76	0	0	83	0	29	0	0	48	0
Lane Group Flow (vph)	280	1400	64	280	1330	57	0	125	0	70	36	0
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	21.0	45.0	45.0	16.0	40.0	40.0		30.5		30.5	30.5	
Effective Green, g (s)	23.0	48.0	48.0	18.0	43.0	43.0		33.0		33.0	33.0	
Actuated g/C Ratio	0.22	0.46	0.46	0.17	0.41	0.41		0.31		0.31	0.31	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0		4.5		4.5	4.5	
Lane Grp Cap (vph)	388	2325	724	303	2082	648		465		361	512	
v/s Ratio Prot	c0.16	0.28		c0.16	c0.26						0.02	
v/s Ratio Perm			0.04			0.04		c0.08		0.06		
v/c Ratio	0.72	0.60	0.09	0.92	0.64	0.09		0.27		0.19	0.07	
Uniform Delay, d1	38.0	21.3	16.1	42.8	24.8	19.0		27.0		26.3	25.2	
Progression Factor	0.96	0.73	1.02	1.47	0.27	0.03		1.00		1.00	1.00	
Incremental Delay, d2	8.5	0.9	0.2	30.1	1.2	0.2		1.4		1.2	0.3	
Delay (s)	45.0	16.4	16.7	93.3	7.8	0.8		28.4		27.5	25.5	
Level of Service	D	B	B	F	A	A		C		C	C	
Approach Delay (s)		20.8			20.9			28.4			26.4	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	21.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00		0.96	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1681	1687	1583		1787	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00		0.96	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	1681	1687	1583		1787	1583
Volume (vph)	64	1154	78	144	880	26	246	2	90	42	8	20
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	90	1616	109	202	1232	36	344	3	126	59	11	28
RTOR Reduction (vph)	0	0	56	0	0	16	0	0	105	0	0	25
Lane Group Flow (vph)	90	1616	53	202	1232	20	172	175	21	0	70	3
Turn Type	Prot		Perm	Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	9.6	44.0	44.0	19.7	54.1	54.1	15.4	15.4	15.4		7.9	7.9
Effective Green, g (s)	11.6	47.0	47.0	21.7	57.1	57.1	17.9	17.9	17.9		10.4	10.4
Actuated g/C Ratio	0.11	0.45	0.45	0.21	0.54	0.54	0.17	0.17	0.17		0.10	0.10
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	196	2276	709	366	2765	861	287	288	270		177	157
v/s Ratio Prot	0.05	c0.32		c0.11	0.24		0.10	c0.10			c0.04	
v/s Ratio Perm			0.03			0.01			0.01			0.00
v/c Ratio	0.46	0.71	0.08	0.55	0.45	0.02	0.60	0.61	0.08		0.40	0.02
Uniform Delay, d1	43.8	23.5	16.6	37.3	14.4	11.1	40.2	40.3	36.6		44.4	42.7
Progression Factor	0.52	0.32	0.25	0.65	0.30	0.31	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.3	1.5	0.2	1.4	0.4	0.0	3.4	3.6	0.1		1.5	0.0
Delay (s)	24.0	9.1	4.2	25.6	4.7	3.4	43.6	43.9	36.7		45.8	42.7
Level of Service	C	A	A	C	A	A	D	D	D		D	D
Approach Delay (s)		9.5			7.6			41.9			44.9	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	13.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0			2.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88			0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.98	
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583	1770	1630			1710	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.61	1.00			0.85	
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583	1144	1630			1480	
Volume (vph)	50	500	50	50	600	50	50	10	50	50	10	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	70	700	70	70	840	70	70	14	70	70	14	70
RTOR Reduction (vph)	0	0	37	0	0	37	0	49	0	0	29	0
Lane Group Flow (vph)	70	700	33	70	840	33	70	35	0	0	125	0
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	16.0	46.0	46.0	16.0	46.0	46.0	29.5	29.5			29.5	
Effective Green, g (s)	18.0	49.0	49.0	18.0	49.0	49.0	32.0	32.0			32.0	
Actuated g/C Ratio	0.17	0.47	0.47	0.17	0.47	0.47	0.30	0.30			0.30	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	4.5	4.5			4.5	
Lane Grp Cap (vph)	303	2373	739	303	2373	739	349	497			451	
v/s Ratio Prot	c0.04	0.14		0.04	c0.17			0.02				
v/s Ratio Perm			0.02			0.02	0.06				c0.08	
v/c Ratio	0.23	0.29	0.04	0.23	0.35	0.04	0.20	0.07			0.28	
Uniform Delay, d1	37.5	17.3	15.2	37.5	17.9	15.2	27.0	25.9			27.7	
Progression Factor	1.50	0.54	0.34	1.08	0.78	1.07	1.00	1.00			1.00	
Incremental Delay, d2	0.7	0.1	0.0	1.7	0.4	0.1	1.3	0.3			1.5	
Delay (s)	57.0	9.4	5.2	42.1	14.4	16.3	28.3	26.2			29.3	
Level of Service	E	A	A	D	B	B	C	C			C	
Approach Delay (s)		13.1			16.5			27.2			29.3	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	16.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	45.7%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0		2.0			2.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.94			0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98			0.98	
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583		1710			1710	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.82			0.82	
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583		1426			1426	
Volume (vph)	50	1200	50	50	1000	50	50	10	50	50	10	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	70	1680	70	70	1400	70	70	14	70	70	14	70
RTOR Reduction (vph)	0	0	35	0	0	35	0	29	0	0	29	0
Lane Group Flow (vph)	70	1680	35	70	1400	35	0	125	0	0	125	0
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	16.0	50.0	50.0	16.0	50.0	50.0		25.5			25.5	
Effective Green, g (s)	18.0	53.0	53.0	18.0	53.0	53.0		28.0			28.0	
Actuated g/C Ratio	0.17	0.50	0.50	0.17	0.50	0.50		0.27			0.27	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0		4.5			4.5	
Lane Grp Cap (vph)	303	2567	799	303	2567	799		380			380	
v/s Ratio Prot	c0.04	c0.33		0.04	0.28							
v/s Ratio Perm			0.02			0.02		c0.09			0.09	
v/c Ratio	0.23	0.65	0.04	0.23	0.55	0.04		0.33			0.33	
Uniform Delay, d1	37.5	19.2	13.2	37.5	17.8	13.2		31.0			31.0	
Progression Factor	0.98	0.70	0.99	1.38	0.23	0.21		1.00			1.00	
Incremental Delay, d2	0.6	0.5	0.0	1.6	0.8	0.1		2.3			2.3	
Delay (s)	37.5	14.0	13.0	53.5	4.9	2.9		33.3			33.3	
Level of Service	D	B	B	D	A	A		C			C	
Approach Delay (s)		14.8			7.0			33.3			33.3	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM Average Control Delay	13.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0	2.0	2.0	2.0	2.0		2.0			2.0	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00		1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.94			0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98			0.98	
Satd. Flow (prot)	1770	5085	1583	1770	5085	1583		1710			1710	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.82			0.82	
Satd. Flow (perm)	1770	5085	1583	1770	5085	1583		1438			1438	
Volume (vph)	50	500	50	50	600	50	50	10	50	50	10	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	70	700	70	70	840	70	70	14	70	70	14	70
RTOR Reduction (vph)	0	0	43	0	0	43	0	28	0	0	28	0
Lane Group Flow (vph)	70	700	27	70	840	27	0	126	0	0	126	0
Turn Type	Prot		Perm	Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	16.0	38.0	38.0	16.0	38.0	38.0		37.0			37.0	
Effective Green, g (s)	18.0	41.0	41.0	18.0	41.0	41.0		40.0			40.0	
Actuated g/C Ratio	0.17	0.39	0.39	0.17	0.39	0.39		0.38			0.38	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0	5.0		5.0			5.0	
Lane Grp Cap (vph)	303	1986	618	303	1986	618		548			548	
v/s Ratio Prot	c0.04	0.14		0.04	c0.17							
v/s Ratio Perm			0.02			0.02		c0.09			0.09	
v/c Ratio	0.23	0.35	0.04	0.23	0.42	0.04		0.23			0.23	
Uniform Delay, d1	37.5	22.6	19.8	37.5	23.4	19.8		22.0			22.0	
Progression Factor	1.50	0.57	0.46	1.72	0.23	0.03		1.00			1.00	
Incremental Delay, d2	1.7	0.5	0.1	1.1	0.4	0.1		1.0			1.0	
Delay (s)	58.2	13.5	9.2	65.5	5.9	0.7		23.0			23.0	
Level of Service	E	B	A	E	A	A		C			C	
Approach Delay (s)		16.8			9.8			23.0			23.0	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM Average Control Delay	14.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	41.4%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0	2.0		2.0	2.0			2.0	2.0		2.0	2.0
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	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	5009		1770	5022			1788	1583		1788	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.76	1.00		0.76	1.00
Satd. Flow (perm)	1770	5009		1770	5022			1407	1583		1407	1583
Volume (vph)	100	900	100	100	1100	100	50	10	50	50	10	50
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (vph)	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%	140%
Adj. Flow (vph)	140	1260	140	140	1540	140	70	14	70	70	14	70
RTOR Reduction (vph)	0	13	0	0	10	0	0	0	49	0	0	59
Lane Group Flow (vph)	140	1387	0	140	1670	0	0	84	21	0	84	11
Turn Type	Prot			Prot			Perm		Perm	Perm		Over
Protected Phases	5	2		1	6			4			4	5
Permitted Phases							4		4	4		
Actuated Green, G (s)	14.0	48.0		14.0	48.0			29.0	29.0		29.0	14.0
Effective Green, g (s)	16.0	51.0		16.0	51.0			32.0	32.0		32.0	16.0
Actuated g/C Ratio	0.15	0.49		0.15	0.49			0.30	0.30		0.30	0.15
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0	5.0		5.0	4.0
Lane Grp Cap (vph)	270	2433		270	2439			429	482		429	241
v/s Ratio Prot	c0.08	0.28		0.08	c0.33							0.01
v/s Ratio Perm								c0.06	0.01		0.06	
v/c Ratio	0.52	0.57		0.52	0.68			0.20	0.04		0.20	0.04
Uniform Delay, d1	41.0	19.2		41.0	20.8			27.0	25.7		27.0	38.0
Progression Factor	1.46	0.18		1.51	0.20			1.00	1.00		1.00	1.00
Incremental Delay, d2	5.8	0.8		5.4	1.2			1.0	0.2		1.0	0.3
Delay (s)	65.7	4.3		67.4	5.3			28.0	25.9		28.0	38.3
Level of Service	E	A		E	A			C	C		C	D
Approach Delay (s)		9.9			10.1			27.0			32.7	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM Average Control Delay	11.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

MEASURES OF EFFECTIVENESS

Zone 3 Totals

Number of Intersections	10
Control Delay / Veh (s/v)	63
Queue Delay / Veh (s/v)	0
Total Delay / Veh (s/v)	63
Total Delay (hr)	623
Stops / Veh	0.62
Stops (#)	22106
Average Speed (mph)	12
Total Travel Time (hr)	878
Distance Traveled (mi)	10214
Fuel Consumed (gal)	1040
Fuel Economy (mpg)	9.8
CO Emissions (kg)	72.67
NOx Emissions (kg)	14.14
VOC Emissions (kg)	16.84
Unserved Vehicles (#)	2073
Vehicles in dilemma zone (#)	1362
Performance Index	684.3

Zone 3 Totals

Number of Intersections	10
Control Delay / Veh (s/v)	56
Queue Delay / Veh (s/v)	1
Total Delay / Veh (s/v)	58
Total Delay (hr)	692
Stops / Veh	0.64
Stops (#)	27406
Average Speed (mph)	11
Total Travel Time (hr)	972
Distance Traveled (mi)	11056
Fuel Consumed (gal)	1162
Fuel Economy (mpg)	9.5
CO Emissions (kg)	81.21
NOx Emissions (kg)	15.80
VOC Emissions (kg)	18.82
Unserved Vehicles (#)	1996
Vehicles in dilemma zone (#)	1325
Performance Index	767.7

Zone 3 Totals

Number of Intersections	10
Control Delay / Veh (s/v)	42
Queue Delay / Veh (s/v)	0
Total Delay / Veh (s/v)	42
Total Delay (hr)	497
Stops / Veh	0.60
Stops (#)	25845
Average Speed (mph)	14
Total Travel Time (hr)	778
Distance Traveled (mi)	11056
Fuel Consumed (gal)	1004
Fuel Economy (mpg)	11.0
CO Emissions (kg)	70.16
NOx Emissions (kg)	13.65
VOC Emissions (kg)	16.26
Unserved Vehicles (#)	1177
Vehicles in dilemma zone (#)	1056
Performance Index	568.7

Zone 3 Totals

Number of Intersections	10
Control Delay / Veh (s/v)	49
Queue Delay / Veh (s/v)	0
Total Delay / Veh (s/v)	49
Total Delay (hr)	487
Stops / Veh	0.59
Stops (#)	21021
Average Speed (mph)	14
Total Travel Time (hr)	742
Distance Traveled (mi)	10214
Fuel Consumed (gal)	929
Fuel Economy (mpg)	11.0
CO Emissions (kg)	64.96
NOx Emissions (kg)	12.64
VOC Emissions (kg)	15.06
Unserved Vehicles (#)	1349
Vehicles in dilemma zone (#)	1237
Performance Index	545.5

Counts Unlimited, inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
(951) 485-7934

City of Riverside
Magnolia Avenue
E/ Pierce Street
24 Hour Directional Volume Count

RIMAEPI
Site Code: 082096D
Date Start: 11-Mar-08
Date End: 11-Mar-08

Start Time	11-Mar-08 Tue	Eastbound Morning	Eastbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Westbound Morning	Westbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		24	223			38	270				
12:15		30	268			33	248				
12:30		26	240			23	316				
12:45		30	226	110	957	22	267	116	1101	226	2058
01:00		28	267			20	268				
01:15		19	244			19	223				
01:30		30	286			14	249				
01:45		13	317	90	1114	18	242	71	982	161	2096
02:00		9	289			12	231				
02:15		4	278			24	257				
02:30		15	365			22	287				
02:45		6	368	34	1300	23	312	81	1087	115	2387
03:00		17	325			20	280				
03:15		21	341			22	290				
03:30		17	415			26	287				
03:45		18	349	73	1430	36	268	104	1125	177	2555
04:00		17	380			41	279				
04:15		32	373			43	253				
04:30		36	371			65	304				
04:45		28	**366**	113	1490	94	**322**	243	1158	356	2648
05:00		57	**388**			92	**262**				
05:15		71	**400**			119	**335**				
05:30		73	**395**			185	**305**				
05:45		88	344	289	1527	202	288	598	1190	887	2717
06:00		104	294			162	284				
06:15		151	261			222	219				
06:30		181	247			230	209				
06:45		222	241	658	1043	269	202	883	914	1541	1957
07:00		**339**	205			237	163				
07:15		**391**	222			**272**	171				
07:30		**275**	181			**363**	179				
07:45		**276**	154	1281	762	**336**	160	1208	673	2489	1435
08:00		280	137			**330**	160				
08:15		279	120			251	130				
08:30		272	122			215	115				
08:45		218	117	1049	496	223	106	1019	511	2068	1007
09:00		192	127			202	141				
09:15		213	98			203	121				
09:30		201	85			176	118				
09:45		194	84	800	394	194	98	775	478	1575	872
10:00		230	105			181	76				
10:15		203	92			171	101				
10:30		197	83			199	60				
10:45		210	50	840	330	204	59	755	296	1595	626
11:00		218	55			187	55				
11:15		219	55			207	55				
11:30		258	36			196	56				
11:45		236	36	931	182	238	51	828	217	1759	399
Total		6268	11025	6268	11025	6681	9732	6681	9732	12949	20757
Combined Total		17293		17293		16413		16413		33706	
AM Peak		07:00				07:15					
Vol.		1281				1301					
P.H.F.		0.819				0.896					
PM Peak			04:45				04:45				
Vol.			1549				1224				
P.H.F.			0.933				0.913				
Percentage		36.2%	63.8%			40.7%	59.3%				
ADT/AADT		ADT 33,706		AADT 33,706							

Counts Unlimited, inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
(951) 485-7934

City of Riverside
Magnolia Avenue
E/ La Sierra Avenue
24 Hour Directional Volume Count

RIMAELS
Site Code: 082096D
Date Start: 11-Mar-08
Date End: 11-Mar-08

Start Time	11-Mar-08 Tue	Eastbound Morning	Eastbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Westbound Morning	Westbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		35	225			47	300				
12:15		30	251			44	268				
12:30		23	230			35	264				
12:45		14	257	102	963	24	219	150	1051	252	2014
01:00		16	259			21	245				
01:15		14	242			30	236				
01:30		22	250			30	249				
01:45		11	237	63	988	31	234	112	964	175	1952
02:00		5	213			36	253				
02:15		3	235			13	247				
02:30		7	226			20	244				
02:45		5	277	20	951	15	245	84	989	104	1940
03:00		9	235			10	241				
03:15		11	255			13	271				
03:30		13	**245**			19	275				
03:45		6	**247**	39	982	16	252	58	1039	97	2021
04:00		16	**287**			22	291				
04:15		10	**259**			31	231				
04:30		12	210			49	262				
04:45		15	256	53	1012	52	**313**	154	1097	207	2109
05:00		29	264			44	**315**				
05:15		21	254			51	**312**				
05:30		31	237			83	**314**				
05:45		40	282	121	1037	67	280	245	1221	366	2258
06:00		59	249			71	253				
06:15		65	252			79	235				
06:30		71	205			88	244				
06:45		129	231	324	937	96	224	334	956	658	1893
07:00		134	188			105	193				
07:15		175	177			148	198				
07:30		205	182			139	198				
07:45		194	153	708	700	136	183	528	772	1236	1472
08:00		**251**	121			126	167				
08:15		**238**	130			124	158				
08:30		**222**	124			129	156				
08:45		**233**	109	944	484	136	165	515	646	1459	1130
09:00		194	102			137	151				
09:15		202	99			168	120				
09:30		196	100			165	107				
09:45		217	80	809	381	180	110	650	488	1459	869
10:00		215	84			204	95				
10:15		203	93			166	85				
10:30		196	80			198	80				
10:45		202	80	816	337	207	69	775	329	1591	666
11:00		197	53			**209**	82				
11:15		193	61			**252**	62				
11:30		217	56			**231**	54				
11:45		227	37	834	207	**255**	54	947	252	1781	459
Total		4833	8979	4833	8979	4552	9804	4552	9804	9385	18783
Combined Total		13812		13812		14356		14356		28168	
AM Peak		08:00				11:00					
Vol.		944				947					
P.H.F.		0.940				0.928					
PM Peak			03:30				04:45				
Vol.			1038				1254				
P.H.F.			0.904				0.995				
Percentage		35.0%	65.0%			31.7%	68.3%				
ADT/AADT		ADT 28,168		AADT 28,168							

Counts Unlimited, inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
(951) 485-7934

City of Riverside
Magnolia Avenue
W/ Tyler Street
24 Hour Directional Volume Count

RIMAWTY
Site Code: 082096C
Date Start: 11-Mar-08
Date End: 11-Mar-08

Start Time	11-Mar-08 Tue	Eastbound Morning	Eastbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Westbound Morning	Westbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		34	294			22	**281**				
12:15		24	299			33	**283**				
12:30		24	279			22	**282**				
12:45		16	287	98	1159	11	**278**	88	1124	186	2283
01:00		16	260			7	243				
01:15		14	269			13	290				
01:30		16	208			8	241				
01:45		10	223	56	960	6	258	34	1032	90	1992
02:00		11	267			15	264				
02:15		9	234			10	237				
02:30		20	260			5	250				
02:45		8	258	48	1019	8	233	38	984	86	2003
03:00		8	283			10	247				
03:15		12	262			8	299				
03:30		6	263			2	231				
03:45		11	244	37	1052	5	244	25	1021	62	2073
04:00		11	304			14	251				
04:15		15	**284**			16	245				
04:30		18	**293**			22	255				
04:45		19	**314**	63	1195	30	259	82	1010	145	2205
05:00		21	**317**			24	282				
05:15		30	264			36	276				
05:30		32	287			55	255				
05:45		24	303	107	1171	54	254	169	1067	276	2238
06:00		34	265			55	205				
06:15		64	252			72	204				
06:30		56	239			89	226				
06:45		71	220	225	976	112	200	328	835	553	1811
07:00		88	185			112	191				
07:15		107	164			156	170				
07:30		148	178			148	174				
07:45		160	154	503	681	164	154	580	689	1083	1370
08:00		138	170			158	151				
08:15		130	114			179	162				
08:30		148	114			194	135				
08:45		126	113	542	511	173	141	704	589	1246	1100
09:00		159	104			184	140				
09:15		183	95			185	111				
09:30		197	102			173	102				
09:45		204	73	743	374	209	98	751	451	1494	825
10:00		208	83			160	71				
10:15		199	77			197	74				
10:30		235	67			215	68				
10:45		212	57	854	284	212	57	784	270	1638	554
11:00		**211**	42			**236**	50				
11:15		**239**	53			**224**	37				
11:30		**258**	53			**238**	39				
11:45		**228**	35	936	183	**228**	34	926	160	1862	343
Total		4212	9565	4212	9565	4509	9232	4509	9232	8721	18797
Combined Total		13777		13777		13741		13741		27518	
AM Peak		11:00				11:00					
Vol.		936				926					
P.H.F.		0.907				0.973					
PM Peak			04:15				12:00				
Vol.			1208				1124				
P.H.F.			0.953				0.940				
Percentage		30.6%	69.4%			32.8%	67.2%				
ADT/AADT		ADT 27,518		AADT 27,518							

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Riverside
N/S: Pierce Street
E/W: Magnolia Avenue
Weather: Sunny

File Name : RIPIMAAM
Site Code : 08223917
Start Date : 6/3/2008
Page No : 1

Groups Printed- Total Volume

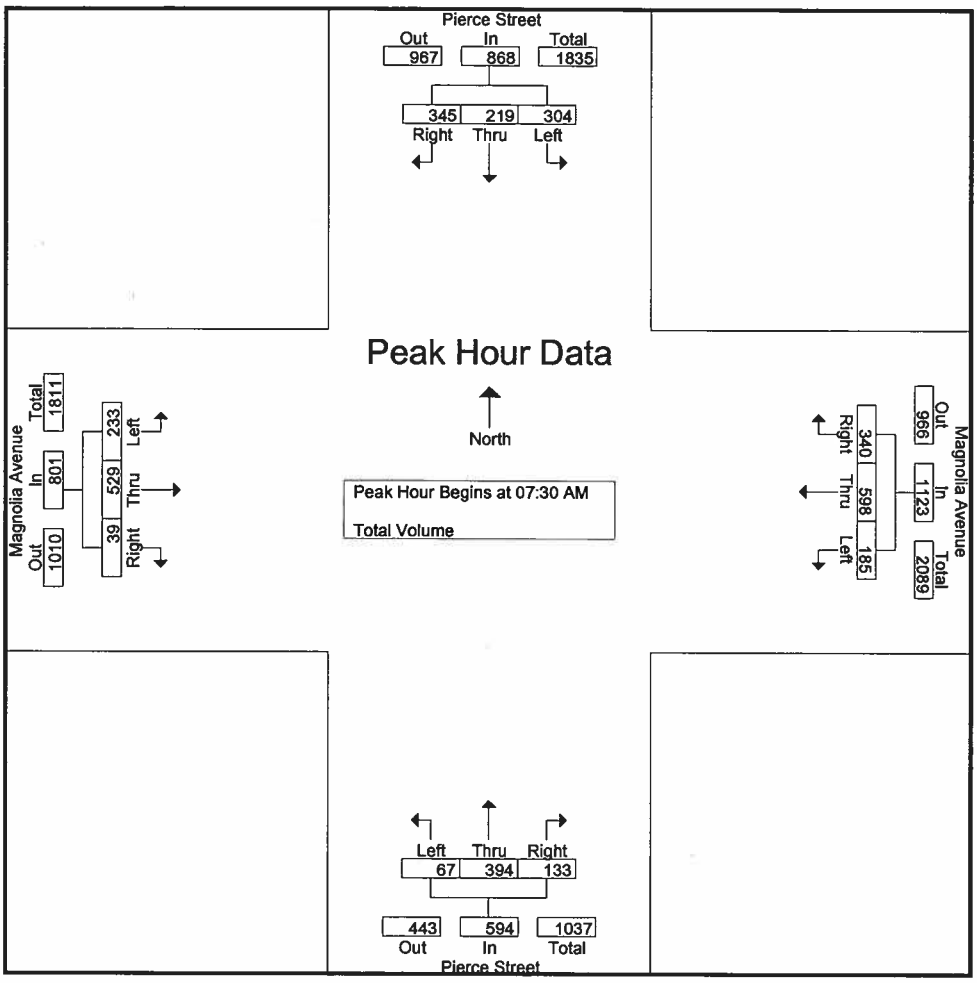
	Pierce Street Southbound				Magnolia Avenue Westbound				Pierce Street Northbound				Magnolia Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	32	14	28	74	20	67	16	103	6	46	38	90	11	77	4	92	359
07:15 AM	83	46	65	194	41	150	44	235	17	97	69	183	34	176	3	213	825
07:30 AM	86	45	84	215	33	166	86	285	17	84	42	143	31	136	6	173	816
07:45 AM	79	55	87	221	45	152	118	315	20	117	35	172	53	99	21	173	881
Total	280	160	264	704	139	535	264	938	60	344	184	588	129	488	34	651	2881
08:00 AM	65	49	87	201	57	158	76	291	19	95	33	147	67	135	7	209	848
08:15 AM	74	70	87	231	50	122	60	232	11	98	23	132	82	159	5	246	841
08:30 AM	97	51	70	218	33	130	67	230	14	72	32	118	42	125	2	169	735
08:45 AM	63	45	48	156	47	110	64	221	11	70	17	98	44	136	11	191	666
Total	299	215	292	806	187	520	267	974	55	335	105	495	235	555	25	815	3090
Grand Total	579	375	556	1510	326	1055	531	1912	115	679	289	1083	364	1043	59	1466	5971
Apprch %	38.3	24.8	36.8		17.1	55.2	27.8		10.6	62.7	26.7		24.8	71.1	4		
Total %	9.7	6.3	9.3	25.3	5.5	17.7	8.9	32	1.9	11.4	4.8	18.1	6.1	17.5	1	24.6	

	Pierce Street Southbound				Magnolia Avenue Westbound				Pierce Street Northbound				Magnolia Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	**86**	45	84	215	33	**166**	86	285	17	84	**42**	143	31	136	6	173	816
07:45 AM	79	55	**87**	221	45	152	**118**	**315**	**20**	**117**	35	**172**	53	99	**21**	173	**881**
08:00 AM	65	49	87	201	**57**	158	76	291	19	95	33	147	67	135	7	209	848
08:15 AM	74	**70**	87	**231**	50	122	60	232	11	98	23	132	**82**	**159**	5	**246**	841
Total Volume	304	219	345	868	185	598	340	1123	67	394	133	594	233	529	39	801	3386
% App. Total	35	25.2	39.7		16.5	53.3	30.3		11.3	66.3	22.4		29.1	66	4.9		
PHF	.884	.782	.991	.939	.811	.901	.720	.891	.838	.842	.792	.863	.710	.832	.464	.814	.961

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Riverside
N/S: Pierce Street
E/W: Magnolia Avenue
Weather: Sunny

File Name : RIPIMAAM
Site Code : 08223917
Start Date : 6/3/2008
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM				07:15 AM				07:15 AM				08:00 AM			
+0 mins.	79	55	**87**	221	41	150	44	235	17	97	**69**	**183**	67	135	7	209
+15 mins.	65	49	87	201	33	**166**	86	285	17	84	42	143	**82**	**159**	5	**246**
+30 mins.	74	**70**	87	**231**	45	152	**118**	**315**	**20**	**117**	35	172	42	125	2	169
+45 mins.	**97**	51	70	218	**57**	158	76	291	19	95	33	147	44	136	**11**	191
Total Volume	315	225	331	871	176	626	324	1126	73	393	179	645	235	555	25	815
% App. Total	36.2	25.8	38		15.6	55.6	28.8		11.3	60.9	27.8		28.8	68.1	3.1	
PHF	.812	.804	.951	.943	.772	.943	.686	.894	.913	.840	.649	.881	.716	.873	.568	.828

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Riverside
N/S: Pierce Street
E/W: Magnolia Avenue
Weather: Sunny

File Name : RIPIMAPM
Site Code : 08223917
Start Date : 6/3/2008
Page No : 1

Groups Printed- Total Volume

	Pierce Street Southbound				Magnolia Avenue Westbound				Pierce Street Northbound				Magnolia Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	78	70	52	200	56	140	54	250	17	91	37	145	68	271	20	359	954
04:15 PM	83	68	39	190	40	131	54	225	9	64	21	94	77	272	23	372	881
04:30 PM	83	81	48	212	56	109	52	217	15	76	31	122	81	223	17	321	872
04:45 PM	94	73	44	211	48	152	56	256	10	72	26	108	80	296	29	405	980
Total	338	292	183	813	200	532	216	948	51	303	115	469	306	1062	89	1457	3687
05:00 PM	125	78	61	264	71	134	53	258	19	83	43	145	87	244	21	352	1019
05:15 PM	95	82	46	223	75	174	74	323	17	91	35	143	98	240	20	358	1047
05:30 PM	94	96	56	246	76	147	77	300	13	82	44	139	85	285	28	398	1083
05:45 PM	89	96	43	228	58	155	82	295	15	68	30	113	90	227	24	341	977
Total	403	352	206	961	280	610	286	1176	64	324	152	540	360	996	93	1449	4126
Grand Total	741	644	389	1774	480	1142	502	2124	115	627	267	1009	666	2058	182	2906	7813
Apprch %	41.8	36.3	21.9		22.6	53.8	23.6		11.4	62.1	26.5		22.9	70.8	6.3		
Total %	9.5	8.2	5	22.7	6.1	14.6	6.4	27.2	1.5	8	3.4	12.9	8.5	26.3	2.3	37.2	

	Pierce Street Southbound				Magnolia Avenue Westbound				Pierce Street Northbound				Magnolia Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	94	73	44	211	48	152	56	256	10	72	26	108	80	**296**	**29**	**405**	980
05:00 PM	**125**	78	**61**	**264**	71	134	53	258	**19**	83	43	**145**	87	244	21	352	1019
05:15 PM	95	82	46	223	75	**174**	74	**323**	17	**91**	35	143	**98**	240	20	358	1047
05:30 PM	94	**96**	56	246	**76**	147	**77**	300	13	82	**44**	139	85	285	28	398	**1083**
Total Volume	408	329	207	944	270	607	260	1137	59	328	148	535	350	1065	98	1513	4129
% App. Total	43.2	34.9	21.9		23.7	53.4	22.9		11	61.3	27.7		23.1	70.4	6.5		
PHF	.816	.857	.848	.894	.888	.872	.844	.880	.776	.901	.841	.922	.893	.899	.845	.934	.953

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Riverside
N/S: Pierce Street
E/W: Magnolia Avenue
Weather: Sunny

File Name : RIPIMAPM
Site Code : 08223917
Start Date : 6/3/2008
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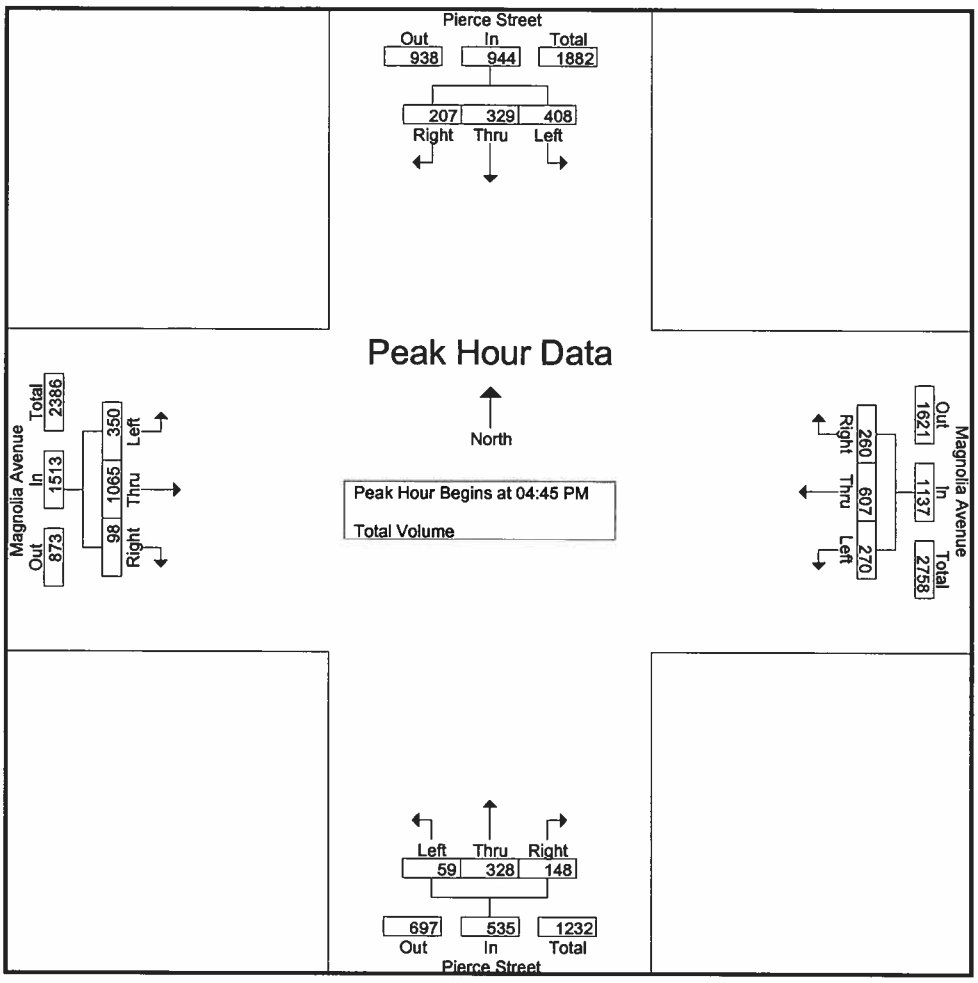

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				04:45 PM			
+0 mins.	**125**	78	**61**	**264**	71	134	53	258	**19**	83	43	**145**	80	**296**	**29**	**405**
+15 mins.	95	82	46	223	75	**174**	74	**323**	17	**91**	35	143	87	244	21	352
+30 mins.	94	**96**	56	246	**76**	147	77	300	13	82	**44**	139	**98**	240	20	358
+45 mins.	89	96	43	228	58	155	**82**	295	15	68	30	113	85	285	28	398
Total Volume	403	352	206	961	280	610	286	1176	64	324	152	540	350	1065	98	1513
% App. Total	41.9	36.6	21.4		23.8	51.9	24.3		11.9	60	28.1		23.1	70.4	6.5	
PHF	.806	.917	.844	.910	.921	.876	.872	.910	.842	.890	.864	.931	.893	.899	.845	.934

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Riverside
N/S: La Sierra Avenue
E/W: Magnolia Avenue
Weather: Sunny

File Name : RILSMAAM
Site Code : 08223949
Start Date : 6/3/2008
Page No : 1

Groups Printed- Total Volume

	La Sierra Avenue Southbound				Magnolia Avenue Westbound				La Sierra Avenue Northbound				Magnolia Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	9	125	29	163	27	51	18	96	13	142	16	171	45	63	22	130	560
07:15 AM	17	211	44	272	42	93	30	165	14	143	41	198	109	87	26	222	857
07:30 AM	37	173	51	261	27	59	17	103	16	111	50	177	33	107	26	166	707
07:45 AM	25	76	25	126	24	104	12	140	19	97	53	169	16	112	26	154	589
Total	88	585	149	822	120	307	77	504	62	493	160	715	203	369	100	672	2713
08:00 AM	25	90	25	140	27	84	15	126	23	83	43	149	16	127	20	163	578
08:15 AM	32	94	18	144	27	79	16	122	13	81	65	159	15	145	31	191	616
08:30 AM	23	95	19	137	27	82	20	129	21	72	63	156	18	130	12	160	582
08:45 AM	28	81	19	128	32	91	19	142	15	70	50	135	16	94	17	127	532
Total	108	360	81	549	113	336	70	519	72	306	221	599	65	496	80	641	2308
Grand Total	196	945	230	1371	233	643	147	1023	134	799	381	1314	268	865	180	1313	5021
Apprch %	14.3	68.9	16.8		22.8	62.9	14.4		10.2	60.8	29		20.4	65.9	13.7		
Total %	3.9	18.8	4.6	27.3	4.6	12.8	2.9	20.4	2.7	15.9	7.6	26.2	5.3	17.2	3.6	26.2	

	La Sierra Avenue Southbound				Magnolia Avenue Westbound				La Sierra Avenue Northbound				Magnolia Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	**37**	**173**	**51**	**261**	**27**	59	**17**	103	16	**111**	50	**177**	**33**	107	26	166	**707**
07:45 AM	25	76	25	126	24	**104**	12	**140**	19	97	53	169	16	112	26	154	589
08:00 AM	25	90	25	140	27	84	15	126	**23**	83	43	149	16	127	20	163	578
08:15 AM	32	94	18	144	27	79	16	122	13	81	**65**	159	15	**145**	**31**	**191**	616
Total Volume	119	433	119	671	105	326	60	491	71	372	211	654	80	491	103	674	2490
% App. Total	17.7	64.5	17.7		21.4	66.4	12.2		10.9	56.9	32.3		11.9	72.8	15.3		
PHF	.804	.626	.583	.643	.972	.784	.882	.877	.772	.838	.812	.924	.606	.847	.831	.882	.880

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Riverside
N/S: La Sierra Avenue
E/W: Magnolia Avenue
Weather: Sunny

File Name : RILSMAAM
Site Code : 08223949
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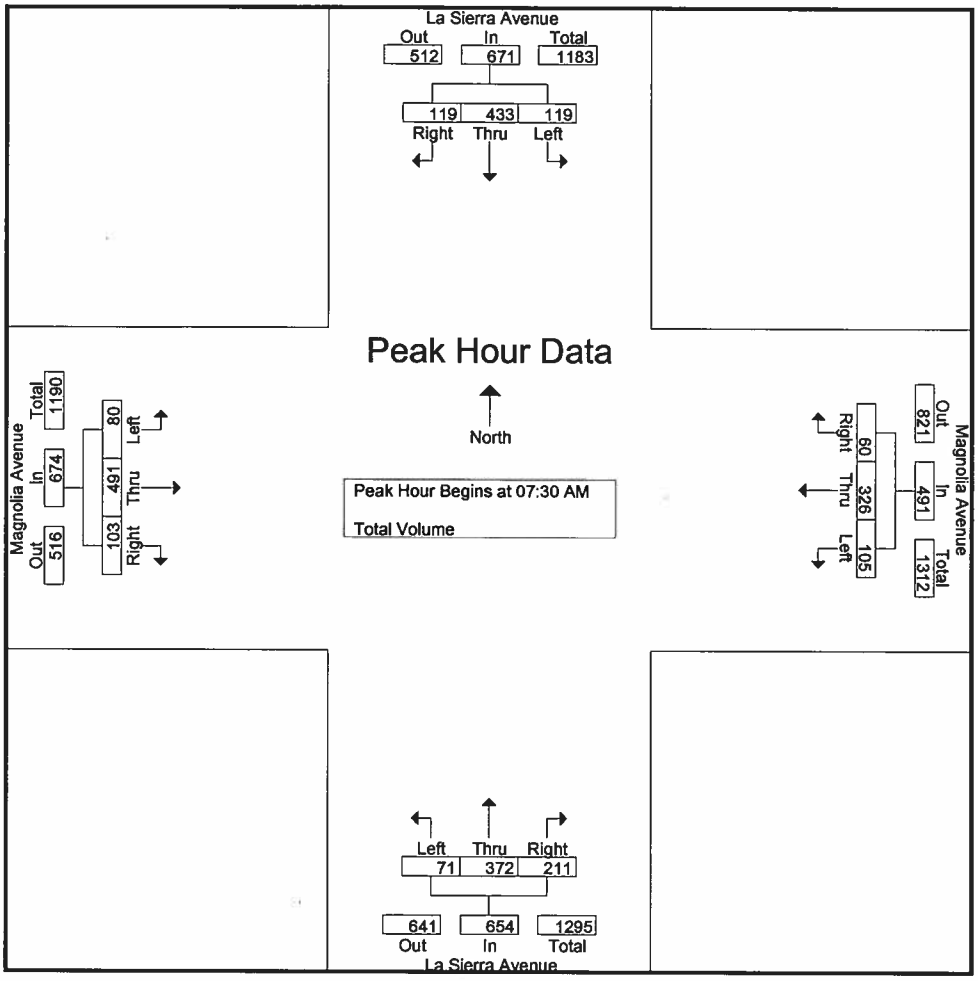

Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	**37**	**173**	**51**	**261**	**27**	59	**17**	103	16	**111**	50	**177**	**33**	107	26	166
+15 mins.	25	76	25	126	24	**104**	12	**140**	19	97	53	169	16	112	26	154
+30 mins.	25	90	25	140	27	84	15	126	**23**	83	43	149	16	127	20	163
+45 mins.	32	94	18	144	27	79	16	122	13	81	**65**	159	15	**145**	**31**	**191**
Total Volume	119	433	119	671	105	326	60	491	71	372	211	654	80	491	103	674
% App. Total	17.7	64.5	17.7		21.4	66.4	12.2		10.9	56.9	32.3		11.9	72.8	15.3	
PHF	.804	.626	.583	.643	.972	.784	.882	.877	.772	.838	.812	.924	.606	.847	.831	.882

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of Riverside
N/S: La Sierra Avenue
E/W: Magnolia Avenue
Weather: Sunny

File Name : RILSMAPM
Site Code : 08223949
Start Date : 6/3/2008
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Groups Printed- Total Volume

	La Sierra Avenue Southbound				Magnolia Avenue Westbound				La Sierra Avenue Northbound				Magnolia Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	43	131	30	204	64	150	40	254	34	95	50	179	53	168	10	231	868
04:15 PM	38	114	29	181	87	164	42	293	38	102	32	172	48	198	12	258	904
04:30 PM	33	166	25	224	66	170	38	274	21	134	48	203	39	173	12	224	925
04:45 PM	43	148	14	205	88	153	35	276	34	101	40	175	56	169	22	247	903
Total	157	559	98	814	305	637	155	1097	127	432	170	729	196	708	56	960	3600
05:00 PM	47	141	27	215	76	231	46	353	51	110	26	187	59	182	27	268	1023
05:15 PM	62	138	18	218	84	207	47	338	44	118	29	191	65	161	15	241	988
05:30 PM	49	160	34	243	81	198	36	315	55	107	35	197	65	228	21	314	1069
05:45 PM	50	146	19	215	64	169	36	269	39	117	47	203	78	165	26	269	956
Total	208	585	98	891	305	805	165	1275	189	452	137	778	267	736	89	1092	4036
Grand Total	365	1144	196	1705	610	1442	320	2372	316	884	307	1507	463	1444	145	2052	7636
Apprch %	21.4	67.1	11.5		25.7	60.8	13.5		21	58.7	20.4		22.6	70.4	7.1		
Total %	4.8	15	2.6	22.3	8	18.9	4.2	31.1	4.1	11.6	4	19.7	6.1	18.9	1.9	26.9	

	La Sierra Avenue Southbound				Magnolia Avenue Westbound				La Sierra Avenue Northbound				Magnolia Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	47	141	27	215	76	**231**	46	**353**	51	110	26	187	59	182	**27**	268	1023
05:15 PM	**62**	138	18	218	**84**	207	**47**	338	44	**118**	29	191	65	161	15	241	988
05:30 PM	49	**160**	**34**	**243**	81	198	36	315	**55**	107	35	197	65	**228**	21	**314**	**1069**
05:45 PM	50	146	19	215	64	169	36	269	39	117	**47**	**203**	**78**	165	26	269	956
Total Volume	208	585	98	891	305	805	165	1275	189	452	137	778	267	736	89	1092	4036
% App. Total	23.3	65.7	11		23.9	63.1	12.9		24.3	58.1	17.6		24.5	67.4	8.2		
PHF	.839	.914	.721	.917	.908	.871	.878	.903	.859	.958	.729	.958	.856	.807	.824	.869	.944

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25286 Jaclyn Avenue
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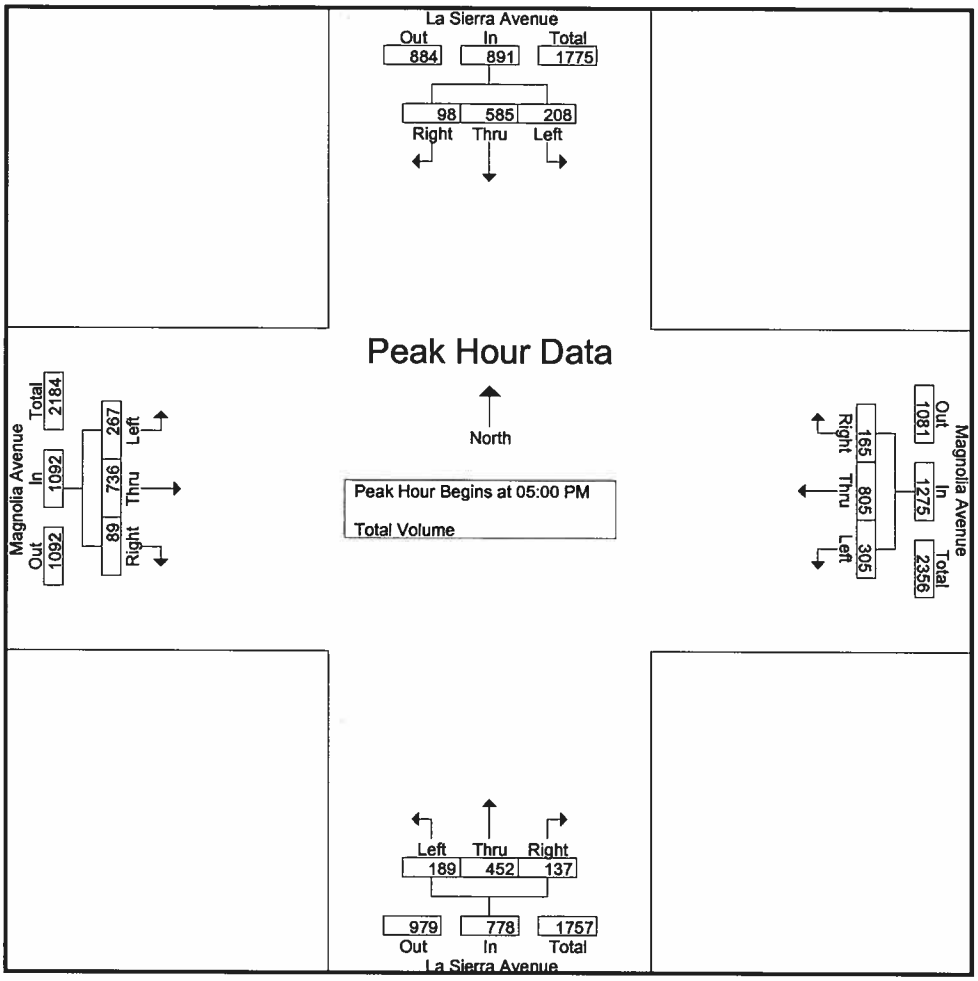

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM				04:45 PM				05:00 PM				05:00 PM			
+0 mins.	47	141	27	215	**88**	153	35	276	51	110	26	187	59	182	**27**	268
+15 mins.	**62**	138	18	218	76	**231**	46	**353**	44	**118**	29	191	65	161	15	241
+30 mins.	49	**160**	**34**	**243**	84	207	**47**	338	**55**	107	35	197	65	**228**	21	**314**
+45 mins.	50	146	19	215	81	198	36	315	39	117	**47**	**203**	**78**	165	26	269
Total Volume	208	585	98	891	329	789	164	1282	189	452	137	778	267	736	89	1092
% App. Total	23.3	65.7	11		25.7	61.5	12.8		24.3	58.1	17.6		24.5	67.4	8.2	
PHF	.839	.914	.721	.917	.935	.854	.872	.908	.859	.958	.729	.958	.856	.807	.824	.869