North Academy Corridor Master Plan

City of Sanger

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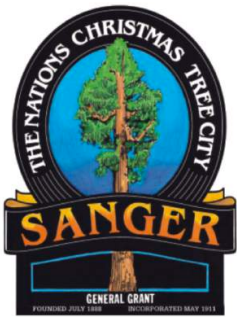
PLANNING CONSULTANTS

North Academy Corridor Master Plan



Prepared for

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URBAN PLANNING • PLANNING POLICY • DESIGN REVIEW

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1: Introduction

What is the Purpose of the Master Plan?

The North Academy Corridor Master Plan is intended to guide urban development within a planning area centered on Academy Avenue, north of the existing Sanger city boundary, extending to the intersection of Academy Avenue and State Route 180 (Kings Canyon Road).

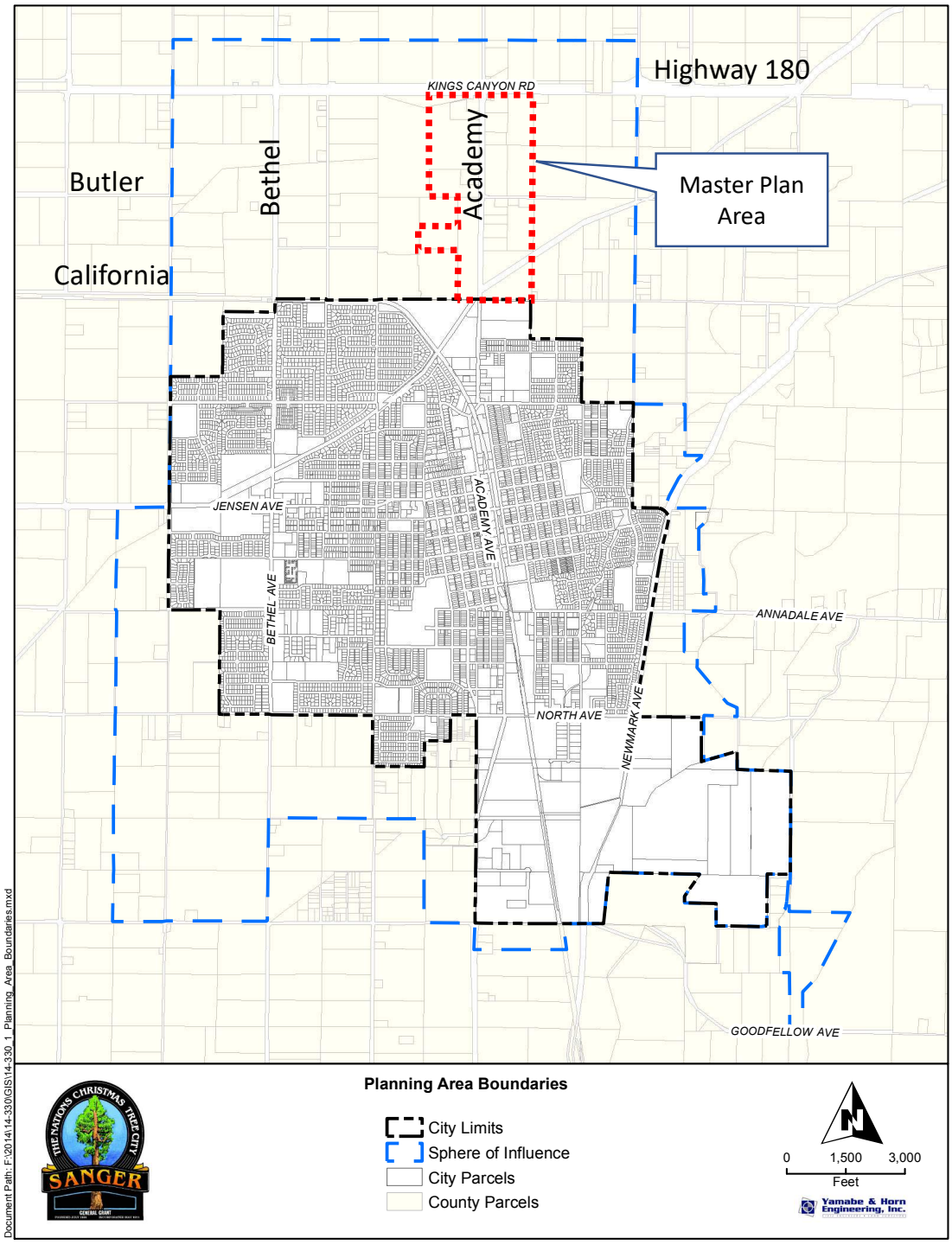
The annexation and development of this corridor was selected by the Sanger City Council as one of its top land use goals for action. It is important to note that the annexation of these lands is guided by a Memorandum of Understanding between the City of Sanger and Fresno County.

The MOU provides that cities may seek the annexation of lands within its Sphere of Influence (SOI), provided they prepare a Master Plan for the imminent development of commercial and industrial lands. In the case of the planning area, Sanger has designated these lands for commercial development. A copy of the MOU is found in Appendix "A".

What Lands Are Affected?

The Master Plan area contains approximately 36 existing parcels containing approximately 367 acres, as shown in Map 1-1. This area is situated within Sanger's existing Sphere of Influence boundary, (which was last amended in 2006 to include this and other areas on the north side of the City, in an effort to capitalize on the strategic location at the intersection of State Highway 180 and major north/south roadways of the community).

Map 1-1: Master Plan Project Area



How is the Master Plan organized?

The Master Plan is organized into the following chapters:

1. **Introduction**: This chapter establishes the basis for the Master Plan and explains why it is being prepared and how it will be used.
2. **Existing Conditions**: This chapter explores existing conditions in the planning area, including land uses, circulation features, utilities, and opportunities and constraints
3. **Goals, Objectives and Action Plans**: This chapter establishes goals, policies and action plans for development that is envisioned for the corridor. Items to be addressed include:
   - Proposed Land Uses
   - Circulation Features
   - Design Guidelines
   - Utilities
   - Financing

What About public participation in the planning process?

The City Council directed that the public be involved in the creation of the Master Plan. Toward this objective, the City held a number of workshops, specifically inviting property owners from within the planning area, the general public, and the Planning Commission. The purpose of these workshops was to educate the public and planning commission on planning issues within the project area, and receive feedback on these issues and give direction moving forward.

What is the Master Plan's relationship to the Sanger General Plan?

The North Academy Corridor Master Plan is considered to be an implementation tool of the Sanger General Plan. While the General Plan lays out generalized development policies, this master plan sets forth more specific detailed development rules that will shape future development in the planning area.

What About Environmental Review?

The City has prepared an Environmental Impact Report (EIR) for the Master Plan, as well as for the Sanger General Plan update. The purpose was to conserve funds and time, since these plans were prepared simultaneously.

The purpose of the EIR is to provide City decision-makers (the City Council, Planning Commission, staff, etc.) the general public and affected agencies with the environmental consequences of implementing the Master Plan. The EIR also identifies mitigation measures that could reduce the impact of the project on the environment.

2: Planning Area Profile

Overview

This chapter profiles existing conditions in the Master Plan area, including:

- Land uses and zoning
- Agricultural Preserve contracts
- Circulation features
- Utilities
- Environmental Setting
- Opportunities and Constraints

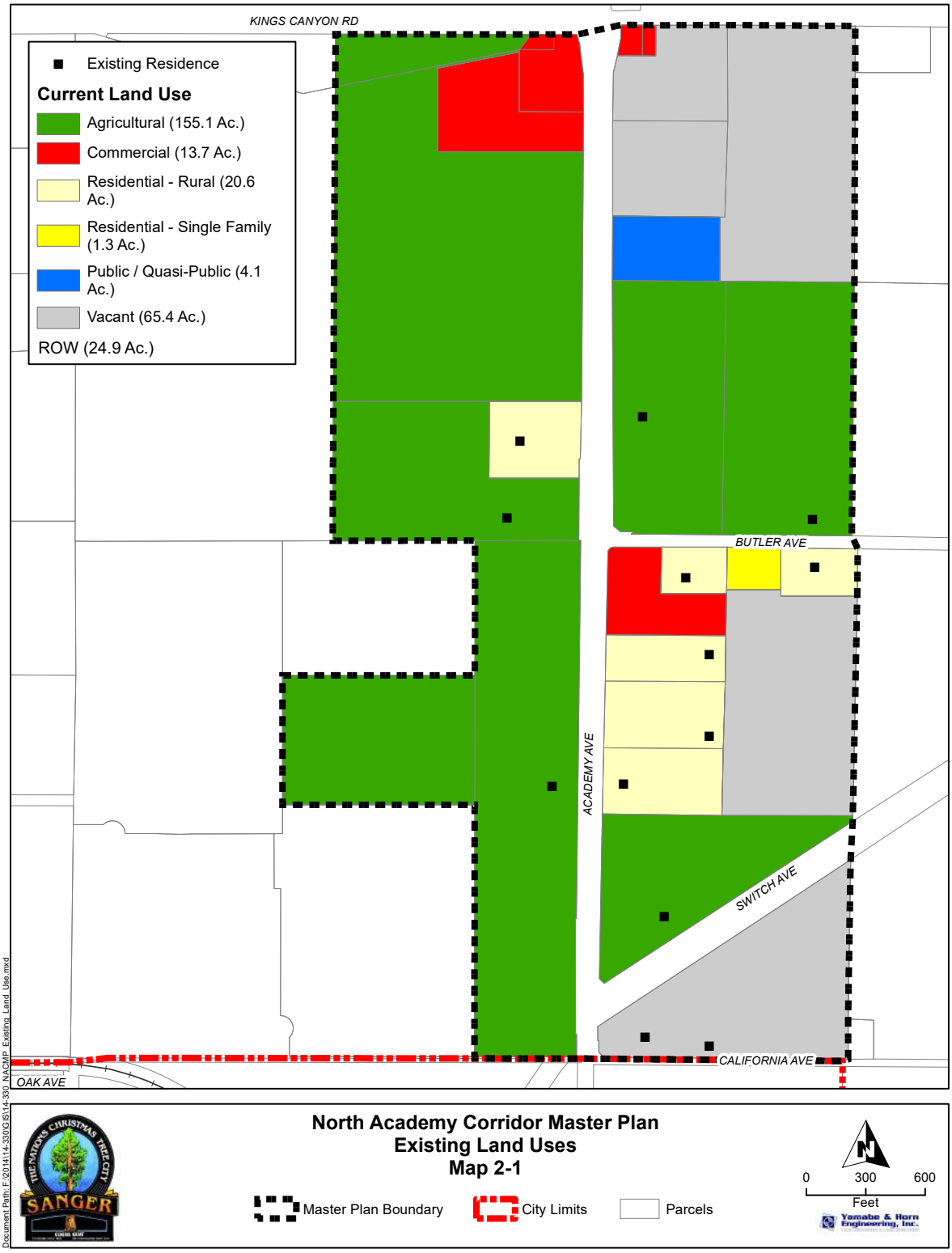
Land Use

Map 3-1 shows existing land uses in the 285-acre Master Plan boundaries. The planning area is characterized by a number of uses, however the use that occupies the most land is agriculture, at 54%. Vacant land occupies the next largest area at 23 percent. There are 23 residential dwellings known to existing in the area and these occupy about 8% of the planning area.

Acreages for specific uses in the planning area are shown below:

Land Use	Acres	Percent of Total
Agriculture	155.1 acres	54%
Single Family Residential	21.9	8%
Commercial	13.7	5%
Public	4.1	1%
Vacant	65.4	23%
Rights-of-way	24.9	9%
Total	285.1 acres	

Map 2-1: Existing Land Uses



Existing Zoning

The planning area is currently under the jurisdiction of Fresno County, however it is within the Sphere of Influence of the City of Sanger. The Sphere of Influence defines those areas the City may annex for future urban development.

The County has zoned most of the land for agriculture (the AE-20 zone), with commercial designations for lands at the southwest and southeast corner of the intersection of Highway 180 and Academy Avenue. These parcels are zoned C-6 (General Commercial).

Circulation features

There are several existing circulation features in the master plan boundary, including:

Academy Avenue runs north/south and is designated as an Arterial roadway by the Sanger General Plan, Circulation Element. Within the planning boundary, Academy is improved with two travel lanes in each direction, along with gravel shoulders and a median divider.

South of the planning area, Academy travels through the core of Sanger and functions as a major travel corridor. South of Sanger, Academy offers access to the cities of Parlier and Kingsburg, as well as State Highway 99. Academy is designated an Arterial roadway by the Circulation Element of the Sanger General Plan.

State Highway 180 (Kings Canyon Road) is an east-west State highway that forms the northern boundary of the planning area. This roadway was recently improved to a limited-access expressway with four lanes. The intersection of Highway 180 and Academy Avenue is controlled with a traffic signal for traffic in all four directions.

Other existing roadways in the planning area include:

Butler Avenue is an east-west roadway that intersects Academy Avenue about midway between the northern city limit and Highway 33. This is currently a rural roadway with one lane in each direction along with gravel shoulders. Butler Avenue is designated a Collector roadway by the Circulation Element of the Sanger General Plan.

California Avenue is an east-west roadway at the south end of the planning area. This roadway extends east from Academy Avenue and features one lane in each direction along with gravel shoulders. California Avenue is designated a Minor Arterial roadway by the Circulation Element of the Sanger General Plan.

Switch Avenue runs east from Academy Avenue along the north side of Fowler Switch Canal. This roadway features one travel lane in each direction along with gravel shoulders. This street is designated as a Local roadway by the Circulation Element.

Other transportation Facilities

The only other circulation facility that exists in the planning area is a Class II bike lane that runs along both sides of Academy Avenue from the northern city limits boundary at California Avenue, to Highway 180 and beyond. The existing Sanger Circulation Element designates other future bike lanes in the planning area, along Butler Avenue and California Avenue. There are currently no improved sidewalks, trails or transit stops in the planning area.

Appendix "B" contains a traffic impact analysis report for the Master Plan.

Utilities

The planning area currently has a water main that extends north from the city limits boundary to about 1,100 feet south of Highway 180. This line currently serves the Cal Fire headquarters located on the east side of Academy.

There is currently no city sewer or storm drain service in the planning area. All existing homes and businesses are served by on-site water and sewer systems. However, the planning area is within the boundaries of Sanger's master plans for Water, Sewer and Storm Drainage systems. These plans identify utilities that will be required to serve this area as well as other areas within Sanger's Sphere of Influence both east and west of the Master Plan boundaries.

Additional information on utilities can be found in Appendix "C"

Environmental Setting

The planning area is currently mostly rural/agricultural in character. However there are a number of buildings and improvements devoted to various uses in the area, including residential, commercial, agricultural and public.

Soils/Geology/Topography

Similar to much of the Sanger region, the Master Plan area is characterized by level terrain, with a slight decrease in elevation from east to west. Geologically, the Sanger area is part of the Great Central Valley, with sedimentary deposits originating in the Sierra Nevada mountains. There are six soil groups with ten distinct soil types in the planning area, including:

- Atwater loam
- Delhi loamy sand
- Greenfield sandy loam
- Ramona loam
- Exeter loam
- San Joaquin loam

Limitations for urban development range from moderate to severe, generally due to the ability of soils to shrink and swell and/or have corrosive characteristics, These limitations can be overcome by a variety of strategies, including soil stabilization, use of special coatings or importation of more suitable soil types for foundations or road beds.

Agricultural Preserve Contracts

There are currently no Agriculture Preserve Contracts applied to land within the master plan boundary. However, there is a contract on land immediately adjacent to the east side of the master plan. Agriculture preserve contracts are a legal mechanism by which property owners may obtain a reduced property tax rate in exchange for maintaining the property in agricultural use.

Flooding/Waterways

According to flood zone maps prepared by the Federal Emergency Management Agency (FEMA) all areas of the master plan are outside the 100-year and 500-year flood boundaries. The nearest areas subject to flooding are located to the south, south of Church Avenue along the east side of the railroad track. The raised bed of the railroad track tends to form a barrier to the movement of flood waters flowing from east to west.

A major hydrological feature of the planning area is the Fowler Switch Canal. This channel delivers irrigation water from the Kings River and distributes it to farms across central Fresno County. This canal traverses the southern portion of the planning area in a northeast to southwest direction. Switch Avenue runs parallel along the north side of the canal. The canal presents a potential open space opportunity, as the City could develop an open space corridor along the sides of the channel. This opportunity is explored further in Chapter 3.

Wildlife and Vegetation

The distribution of native wildlife and vegetation has been significantly modified in the master plan area with the establishment of agricultural and urban uses over the past century. No rare or endangered species of plant or animals are known to inhabit the planning area, though some animals may occasionally travel through the area. It is possible that the Fowler Switch Canal acts as a transportation corridor for some animals. The nearest area with significant natural vegation is the bottoms of the Kings River, about 1-1/4 mile southeast of the Master Plan area. The river bottom features stands of oak trees, willows and other riparian vegetation supported by the river.

Archaeological Features

Similar to native plants and wildlife it is unlikely that any significant archaeological sites are located in the Master Plan area due to past and present use for intensive agriculture and urban activities. While the likelihood of archaeological features is low, there is always the possibility that buried artifacts exist. State law requires that such artifacts be preserved in the event they are discovered.

Noise

The major source of noise in the master plan area is from traffic moving along area roadways, in particular State Highway 180 and Academy Avenue. Other noise sources result from agricultural operations (such as tractors plowing and harvesting) as well as occasional trains along the San Joaquin Valley Railroad, southwest of the planning boundaries. In general, there are no noise sources that are uncharacteristic of the Sanger area as a whole.

Opportunities and Constraints

It is important to identify opportunities and constraints to urban development in the planning area, as these can help to ground planning efforts in reality, and shape policies that the City will apply.

Opportunities and constraints for urban development in the planning area include the following:

Opportunities:

- Open, level areas mostly free of development
- Absence of agricultural preserve contracts
- Good street and highway access
- Utilities can easily be extended
- Existing water main under Academy Avenue

Constraints:

- Existing residences
- Existing commercial uses
- Lack of existing infrastructure (primarily sewer service)
- Expense of extending utilities and making street improvements

3. Goals, Objectives and Implementation

This chapter of the Master Plan establishes goals, objectives and action plans that the City will follow in developing the Master Plan area.

Goals are overall direction-setting expressions of the Master Plan's intent. They represent an ideal end condition expected in the planning area, such as *"Establish an attractive entrance to Sanger along North Academy Avenue".*

An **objective** is a specific end condition or state that is an intermediate step toward attaining a goal. For the preceding goal, an objective might be *"Establish a landscape theme for the Academy corridor".*

An **action plan** is a program that will be utilized to achieve goals and objectives. For the preceding objective, an action plan might be *"Contract with a consultant to prepare a landscaping plan for the Academy corridor"*

Goals and Objectives are established pertaining to several key issues, including:

- Land Use
- Circulation/Transportation
- Utilities
- Design Guidelines and Site Planning
- Streetscape/Public Facilities
- Financing/Implementation

Overall Planning Goals

The following overarching goals are established to provide guidance in the implementation of the North Academy Corridor Master Plan:

- *Recognize the planning area's unique position in Sanger as a gateway to the community.*
- *Identify opportunities and constraints that will affect implementation of the Master Plan.*
- *Facilitate a land use pattern that is as free as possible from conflicts and which establishes uses that are complementary to one another.*

- *Work with property owners, businesses and residents to implement the Master Plan.*
- *Promote the development of uses that will create an engaging entrance to Sanger, while at the same time, not threatening the existing commercial uses and buildings in the downtown and other commercial areas.*
- *Encourage public and private investment in the Master Plan area.*
- *Enhance the community's entryways in the Master Plan area.*
- *Protect viable uses that exist in the planning area.*
- *Provide for safe and effective circulation for all travel modes in the planning area, including automobile, truck, bicycle, transit and pedestrians.*

The following sections identify goals, objectives and action plans pertaining to specific issues of the Master Plan.

ISSUE ONE: Land Use

While the planning area is predominately rural in nature today, it lies within Sanger's Sphere of Influence and both the Master Plan and the Sanger General Plan designate the area for urban development. In fact, the Sanger General Plan has designated this area for urban uses since 2006.

Under the terms of the Memorandum of Understanding between the City of Sanger and Fresno County governing annexations, this Master Plan is limited to designating the area for commercial and/or industrial development.

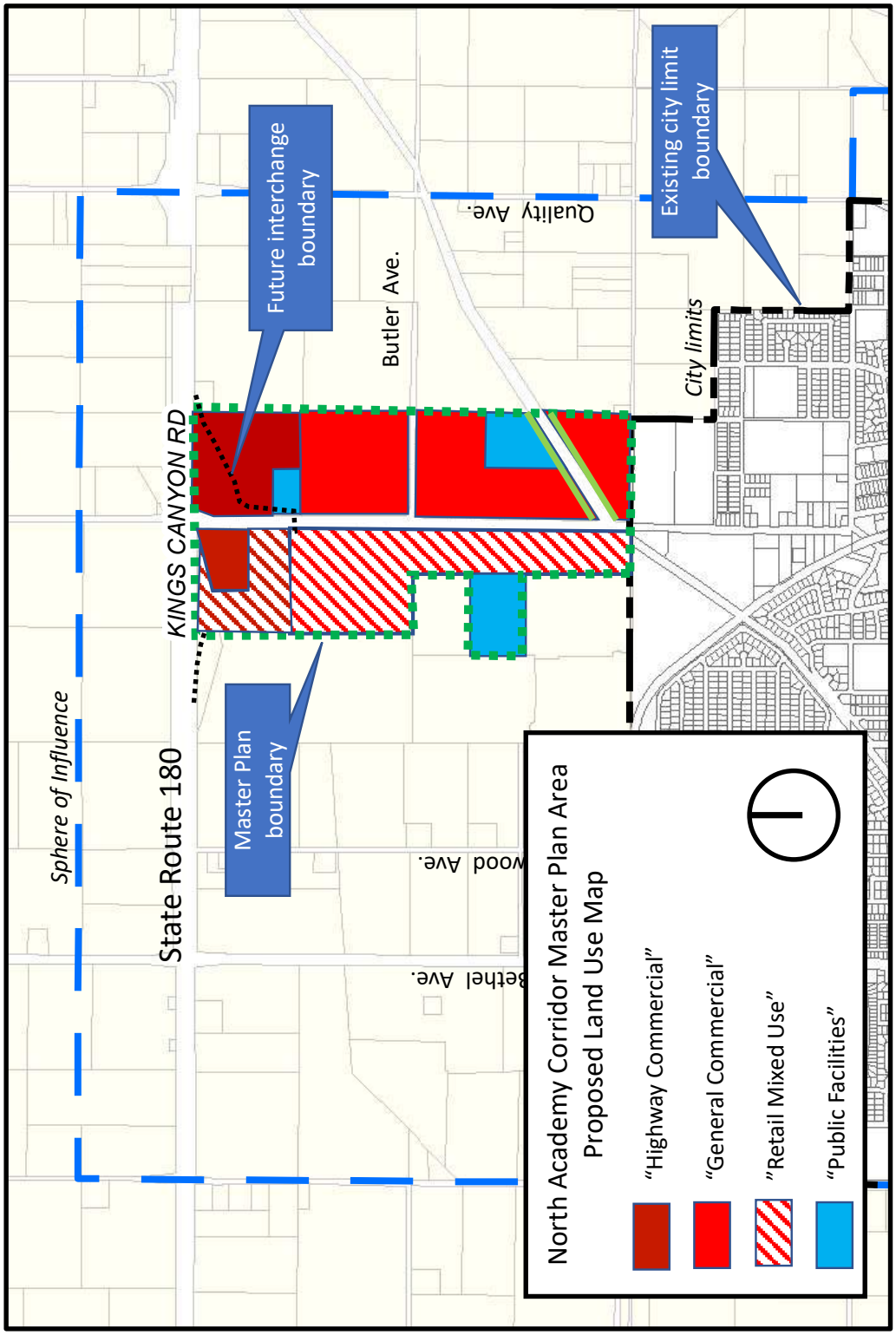
Goals and Objectives

1. Establish land use designations for the master Plan area that provide for a full range of appropriate uses.

    a. The Master Plan designates several land use categories below. The sites will be pre-zoned with City zoning designations that are consistent with the land use categories.

The master Plan designates the area with several land use categories: Highway Commercial", "General Commercial" "Retail Mixed Use" and "Public Facilities" (see Map 3-1). Descriptions of these designations are as follows:

Map 3-1: Proposed Land Uses



General Commercial

The "General Commercial" designation typically allows for shopping centers, retail uses, offices and related uses, at appropriate locations. The Plan designates approximately 169± acres with the General Commercial category.

Zoning Designations:

- C-4 (General Commercial)
- C-M (Commercial and Light Manufacturing)

Off-Site Requirements

Development shall be required to connect to City water, sewer and storm drain facilities. Development shall be required to install paved streets, curbs, gutters, sidewalks, street lamps and other facilities as required by the City Engineer.

On-Site Requirements

New development will comply with requirements of the Sanger Zoning Ordinance and Sanger Design Guidelines, as appropriate, and include attractive buildings and landscaping, parking areas, lighting, and screened storage areas. In order to facilitate walking, pedestrian circulation shall be considered as an important design element of this type of development.

Highway Commercial

This designation is intended to provide for well-designed commercial development that provides services to travelers around the interchange of Highway 180 and Academy Avenue. Uses such as lodging, restaurants, service stations, and specific retail uses are emphasized. Approximately 70± acres are designated with the Highway Commercial designation.

Zoning Designations:

- C-5 (Highway Commercial). This will be a new zone district for Sanger (that needs to be drafted and adopted).

Off-Site Requirements

Development shall be required to connect to City water, sewer and storm drain facilities, however, in some cases on-site water and sewer systems will be considered if the distance to the municipal system is significant. Development would then be required to connect to the City system at such time in the future when the system is reasonably close. Development shall also be required to install paved streets, curbs, gutters, sidewalks, street lamps and other facilities as required by the City Engineer.

On-Site Requirements

New development will comply with requirements of the Sanger Zoning Ordinance and Sanger Design Guidelines, as appropriate, and include attractive buildings and significant landscaping, parking areas, lighting, and screened storage areas. The City will also require the use of monument-style signs that combine businesses (to prevent a "forest" of pole signs).

Retail Mixed Use

The retail mixed-use designation is intended to build in flexibility for future projects to meet the changing needs of the City and the marketplace. It is proposed to be applied to land along the north Academy Avenue corridor and other selected locations in the northern part of the community. It could also be applied to other locations in the City depending on requests from property owners.

This land use will allow for a mix of uses, both vertical and horizontal, that accompany larger regional retail centers and lifestyle centers. Included in this are entertainment uses, hotel and other community facilities. The primary land use shall be any of the proposed six commercial categories. Secondary uses could be residential or light industrial, but not to exceed 45 percent of a given parcel (or contiguous parcels).

Zoning

RMU. This zone is to be adopted.

Off-Site Requirements

Development shall be required to connect to City water, sewer and storm drain facilities. Development shall be required to install paved streets, curbs, gutters, sidewalks, street lamps and other facilities as required by the City Engineer.

On-Site Requirements

New development will comply with requirements of the Sanger Zoning Ordinance and Sanger Design Guidelines, as appropriate, and include attractive buildings and landscaping, parking areas, lighting, and screened storage areas. In order to facilitate walking, pedestrian circulation shall be considered as an important design element of this type of development. Residential development would be permitted to standards of the RM-1.5 or RM-2.5 zone.

Public Facilities

This designation is reserved for facilities that are operated by public agencies. Within the Master Plan boundaries this includes the Cal Fire station and two planned stormwater ponding basins. Approximately 14 acres of land are designated "Public Facilities".

Zoning Designations:

RSC (Resource, Schools and Conservation)

Off-Site Requirements

As appropriate, development shall be required to connect to City water, sewer and storm drain facilities. Development shall be required to install paved streets, curbs, gutters, sidewalks, street lamps and other facilities as required by the City Engineer.

On-Site Requirements

Depending on the use, new development will be landscaped, parking lots (where required) will be constructed off-street and will be landscaped, and new uses shall undergo site plan review.

What About Existing Uses?

While agricultural uses dominate the planning area at the present time, there are a number of existing residential dwellings as well as several commercial uses and one public use (the Cal Fire station). As the plan proposes to designate most of the area with commercial land use designations (which will result in commercial zoning to be applied) all existing dwellings would potentially become legally non-conforming uses. Under planning law, this means that such uses could continue to exist but could not be expanded. For example, an existing house could not have a room added, or a swimming pool installed – because the site is now zoned for commercial use. This could have negative impacts on those homeowners residing in the master plan area.

Goals and Objectives

1. Ensure that existing residential uses are not negatively impacted by adoption of the Master Plan.

    a. Amend the zoning ordinance to specify that existing, legally-conforming residential dwellings within the Master Plan area shall not be considered to be non-conforming uses. Any expansion or modification of a dwelling that existed upon its annexation into the City of Sanger may occur as a permitted use under the appropriate residential zone (e.g. the R-1 zone). However, new dwellings will not be permitted in the planning area.

What About Land Within the Future Highway 180/Academy interchange?

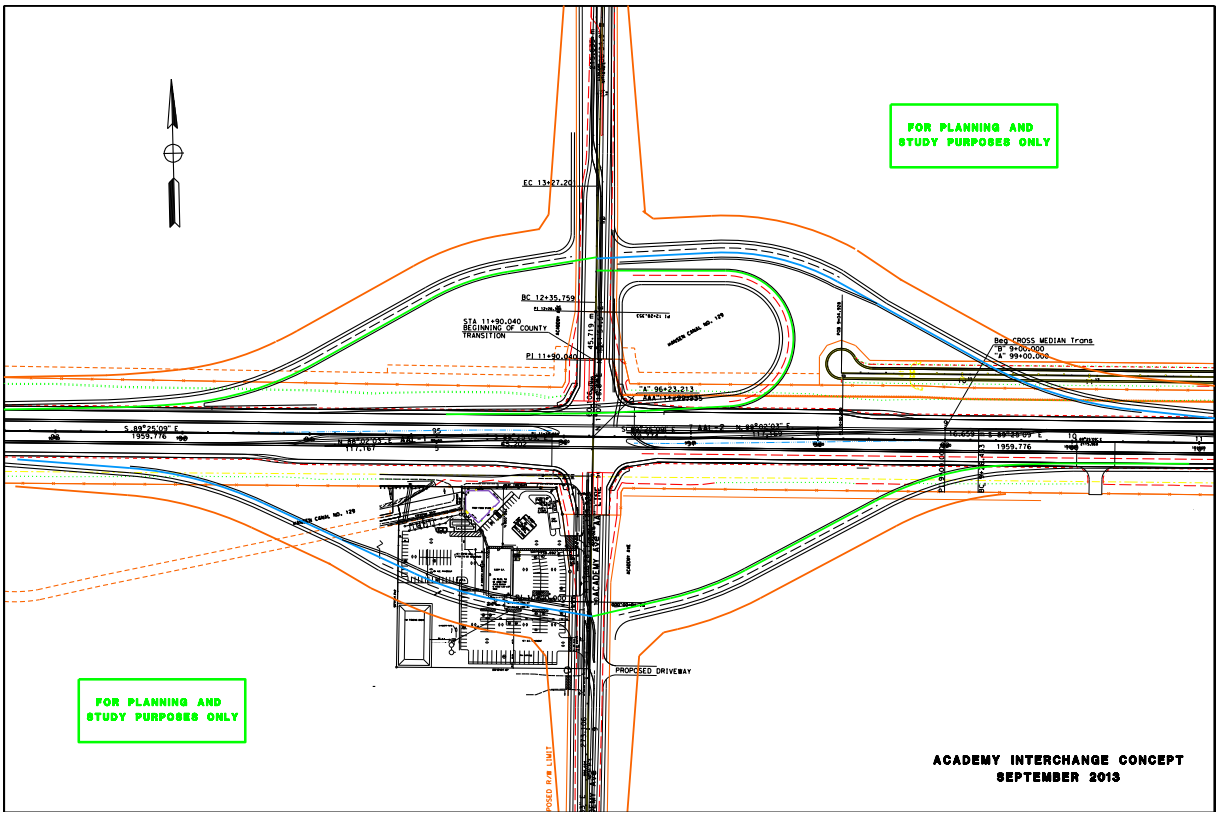
Caltrans has adopted a preliminary layout for a future freeway interchange at the intersection of Highway 180 and Academy Avenue (see Figure 3-2). While this layout is preliminary, the City does not want to authorize development to occur within the boundaries of the interchange – as such development would need to be removed for construction of the interchange.

Goals and Objectives

1. Coordinate with Caltrans on the extent of a future interchange at the intersection of State Highway 180 and Academy Avenue.

a. Prohibit new land uses within the footprint of any planned interchange.

Figure 3-1: Preliminary Interchange Layout



Source: California Department of Transportation, 2017

ISSUE TWO: Circulation

Transportation will be an critical part of development of the Master Plan area. With the volume of development that is envisioned, it will be important to establish a safe and effective transportation network. While circulation for motor vehicles (cars and trucks) will be most prominent, it is important to also plan for alternative transportation needs, including bicyclists, pedestrians and transit. The following establishes goals and objectives for the planning area:

Goals and Objectives

1. Maintain a circulation network of arterial, collector, local streets, as well as bike lanes, sidewalks and transit stops that will meet projected circulation needs of the planning area.

    a. The Master Plan includes a map that designates existing and future circulation improvements (see Map 3-2).

2. The City will adopt plan lines as needed for future roadways in the master plan area.

    a. The City Engineer will determine whether plan lines are required and work to implement them.

3. Designate funding for circulation improvements in Sanger's Capital Improvement Program, as appropriate.

    a. The City shall ensure that funding for circulation improvements is included in the Capital Improvements program, as appropriate.

4. Minimize the number of driveways along Academy Avenue

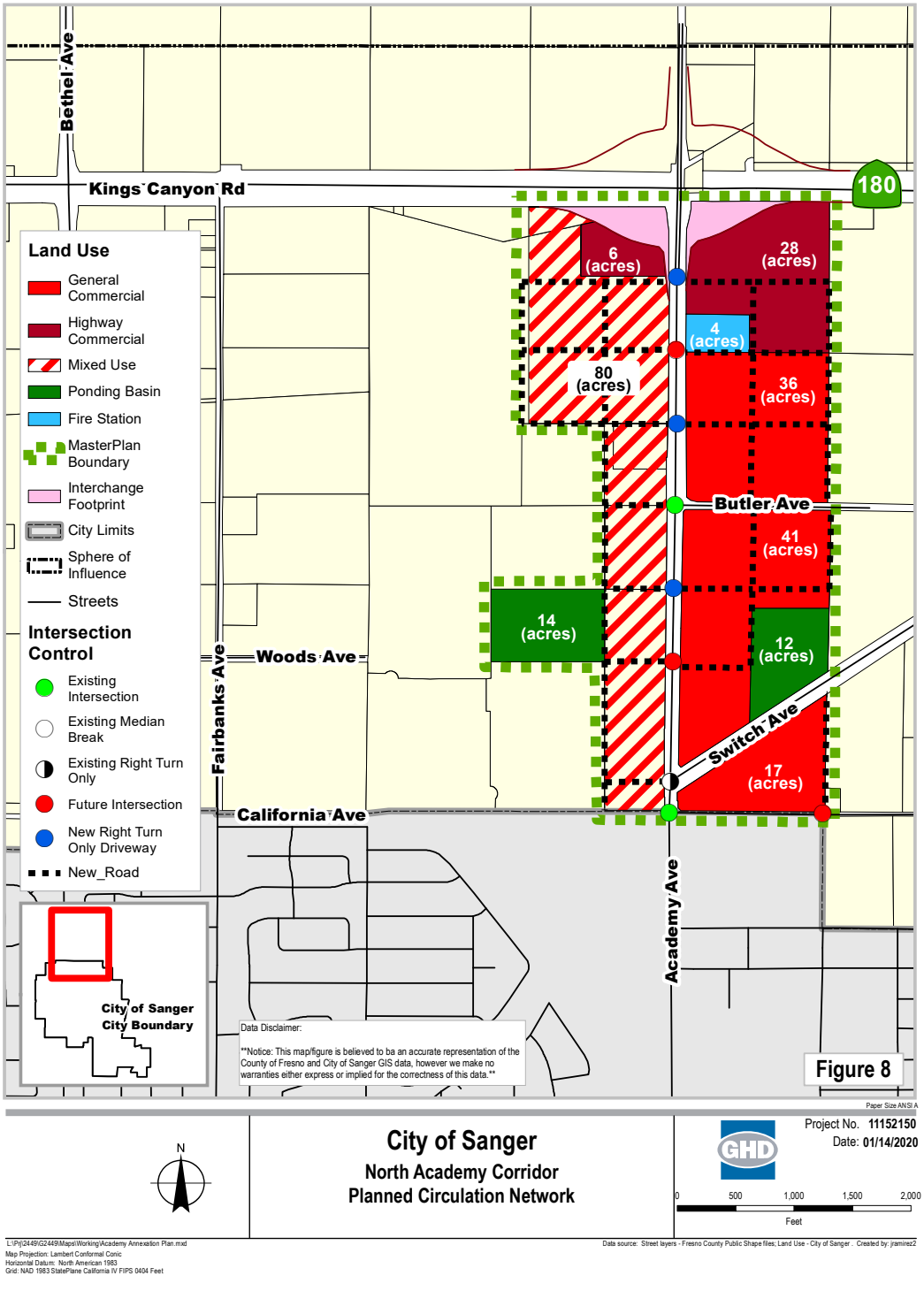
    a. Through the Site Plan Review process, the City will ensure the number of driveways along Academy Avenue is minimized.

5. Consider traffic calming mechanisms on roadways, including roundabouts instead of traffic signals.

    a. Through the Site Plan Review process, and capital improvements plan process, the City will work to establish traffic calming mechanisms in appropriate portions of the planning area.

6. Coordinate with Caltrans on future development of a freeway interchange at the intersection of State Route 180 and Academy Avenue.

Map 3-2: Proposed Circulation Features



a. The City will maintain communication with Caltrans on an ongoing basis regarding a future interchange.

7. Developments should feature vehicular (and pedestrian/bicycle) connections to adjacent properties so that persons are not forced onto Academy Avenue to make simple connecting trips.

   a. All site plans shall be designed to promote mulit-modal connectivity to adjacent properties to reduce use of Academy Avenue when feasible.

ISSUE THREE: Utilities

Future commercial development that is proposed in the planning area will require services, including water, sewer and storm drain systems. Other services are provided by private utilities and will include electricity, natural gas, telephone and internet. This plan focuses on those utilities that are provided by the City of Sanger.

The City Engineer has prepared a list and maps of improvements that will be needed to serve development in the planning area, along with cost estimates for each (see Appendix C). Key improvements that are identified for each system include:

Water

- A new municipal well is required to serve the project area. This is Well #28 – identified in the existing Sanger Water Service Master Plan
- 12 inch water mains on east-west alignments, generally at ½ mile increments
- Extension of the existing Academy Avenue water line north with a 12-inch main to Highway 180
- New 8-inch water mains, generally along ¼ mile increments throughout the plan area (south to north and east to west).

Sewer

- Connection to the existing Eastside Interceptor line along the Quality Avenue alignment, and extension of an 18-inch sewer main in Quality north to Church Avenue
- An 18-inch sewer main in California Avenue between Quality and the Harrison Avenue alignment
- A fifteen inch line in California Avenue between the Harrison Avenue alignment and Academy Avenue.
- An 8-inch line in California Avenue between Academy and the westerly Plan Area boundary.
- A 15-inch line in Academy Avenue between California Avenue and the Woods Avenue alignment.
- A 12-inch line in Academy Avenue between the Woods Avenue alignment and State Route 180.
- A 10-inch line along the Woods Avenue alignment within the Plan Area boundary.
- A 10-inch line in Butler Avenue within the Plan Area boundary.
- A 10-inch line along the Sierra Avenue alignment within the Plan Area boundary. An extension of a 24-inch line in Newmark Avenue from North Avenue south to Muscat Avenue (the “Newmark Extension”) is assumed at this point to be necessary at initial development due to the existing North Avenue trunk main being at full capacity, but

flow metering on the North Avenue trunk main may provide data to determine that the Newmark Extension may be deferred to a later phase of development of the Plan Area. This flow metering is expected to be completed prior to development of any properties within the Plan Area.
- Expansion of capacity of the existing sewer lift station near Annadale and Newmark Avenues.

Storm Drainage

- Retension basins on the east and west sides of the Master Plan area, as well as partial expansion of a master-planned stormwater basin south of California Avenue west of the Harrison Avenue alignment.
- Mains and other lines identified on Exhibit SD-2 and SD-3 of the Utilities analysis in Appendix C.

Estimated costs for water, sewer and storm drain systems needed to serve the Master Plan area are:

Water system: $8,320,000
Wastewater: $6,950,000
Storm Drainage: $8,220,000

Total: $22,910,000

Issue #6 of this Master Plan identifies potential funding mechanisms that could be used to pay for needed infrastructure improvements in the planning area.

Goals and Objectives

1. New development in the planning area shall be connected to city utilities, including water, sewer and storm drain systems.

    a. Through the Site Plan Review process, the City will ensure that new developments install utilities.

2. For development occurring at the interchange of Highway 180 and Academy Avenue, consider allowing the installation of temporary on-site septic systems and on-site storm drainage facilities. When City sewer is extended to this area such systems would be abandoned and the project would connect to City utilities.

a. When use of temporary on-site septic systems or on-site storm drainage facilities are warranted for development at the interchange of Highway 180 and Academy Avenue, such development shall enter into an agreement requiring the use to connect to City utilities once they are reasonably available.

ISSUE FOUR: Design Guidelines and Site Planning

The master plan corridor is the major gateway to Sanger. The City has determined that it is desirous to adopt design guidelines to shape development that reflects positively on the City and that creates a sense of place. In considering the idea of "sense of place", the Planning Commission determined that architectural styles that are native and historic to the San Joaquin Valley and California should be emphasized. In addition, styles that reflect Sanger's historic ties to the mountains, logging, the railroad and agriculture should be considered. At the same time, the City should exercise some degree of flexibility with respect to design guidelines.

Goals and Objectives

1. Develop a suite of architectural design and site planning guidelines that will be applied to development that occurs in the master plan area.

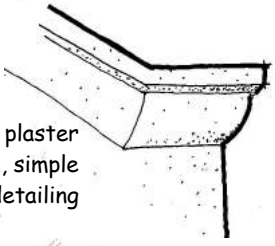
    a. Encourage and emphasize architectural styles that create a "sense of place" and reflect the history of Sanger, the San Joaquin Valley and California, including:

        - Mediterranean
        - Mission/Spanish
        - Western false-front
        - Mountain

        These styles and components of design are shown in Figure 3-2. Other styles may be considered as long as they meet the intent of the Master Plan, which is to create a unique and memorable environment. The following exhibits are essentially a "menu" of design strategies for each particular style and contain elements (as appropriate) related to common building components, including:

        - Form and mass
        - Roof
        - Eaves/Overhangs
        - Doors
        - Windows
        - Wall Materials
        - Other

Figure 3-2: Architectural Design Guidelines: Mediterranean

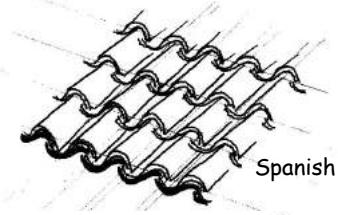


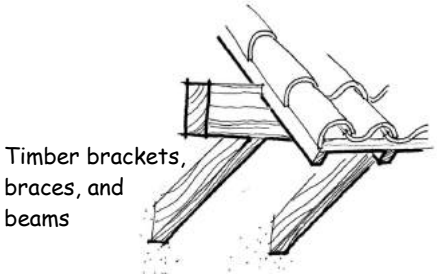
Façade:
Simple geometry and shapes, with primary façade flanked by secondary or "junior" facades; terminate end of facades with "tower" elements to add perceived depth to façade volumes

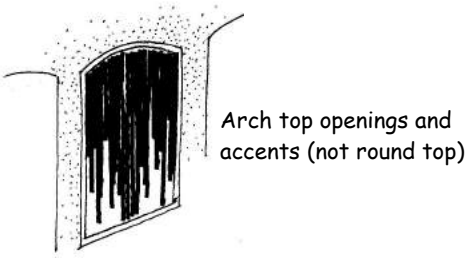
Roof features:
Spanish S tile on 6:12 or steeper plane, exposed rafters supported on exposed timber and knee braces.

Finishes:
Smooth finish cement plaster (stucco, no sand finish), white or light color, with feature colors at targeted portions for sharp overall composition and consistency. Exposed lumber and framing: opaque dark walnut stain.

Ornament:
Simple geometry accents and shapes consistent with style; either applied or inset into plaster. Light fixtures: black iron style commercial duty fixtures in either lantern or wall sconce, complimenting building geometry or historical reference.







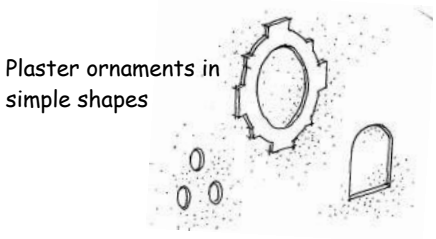


Figure 3-3: Architectural Design Guidelines: Mission/Spanish

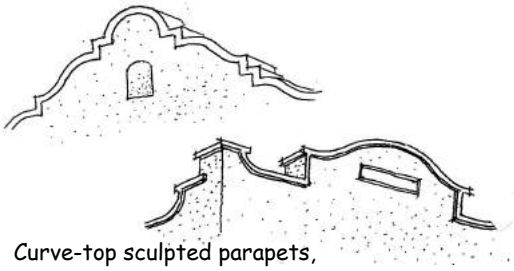
Mission

Façade:
Signature of style is curve-top and sculpted parapets; primary façade flanked by secondary or "junior" facades, return parapet walls to add perceived depth to façade volumes

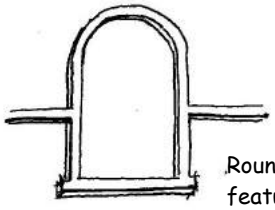
Roof features:
Horizontal roof projected over walkways, of exposed wood rafters supported by timber beams

Finishes:
Adobe-look cement plaster (stucco; no sand finish), white or light color, with feature colors at targeted portions for sharp overall composition and consistency. Exposed lumber and framing: opaque dark walnut stain.

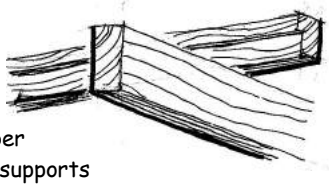
Ornament:
Simple geometry accents and shapes consistent with style; either applied or inset into plaster.
Glazed tile accents and "broaches."
Light fixtures: black iron style commercial duty fixtures in either lantern or wall sconce, complimenting building geometry or historical reference.



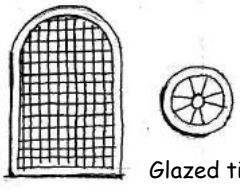
Curve-top sculpted parapets, adobe-look plaster



Round top plaster features and banding



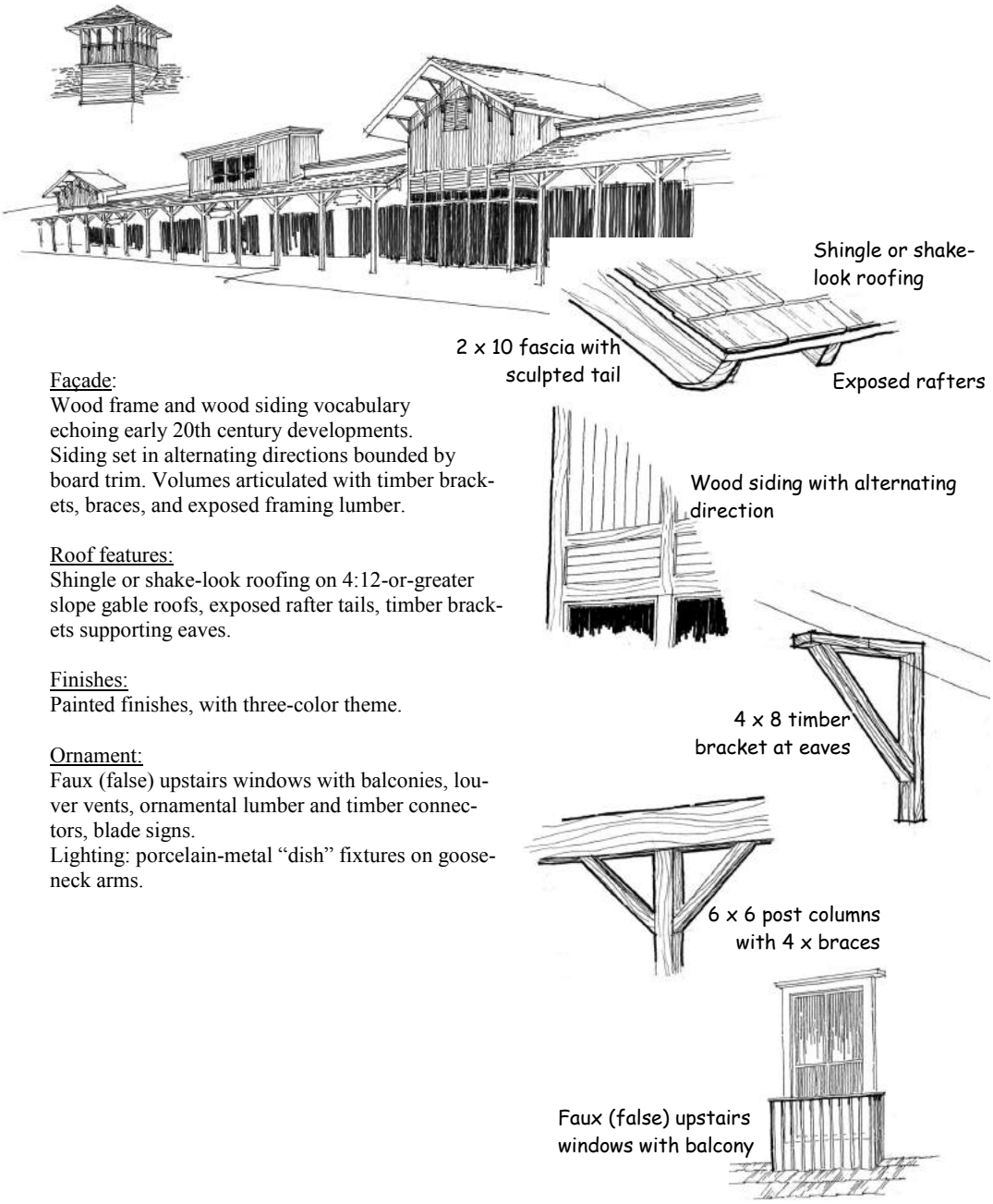
Heavy timber beams and supports



Glazed tile features, mosaic tile "broaches"

Figure 3-4: Architectural Design Guidelines: Western False Front/Plank and Beam

Plank and Beam



Façade:
Wood frame and wood siding vocabulary echoing early 20th century developments. Siding set in alternating directions bounded by board trim. Volumes articulated with timber brackets, braces, and exposed framing lumber.

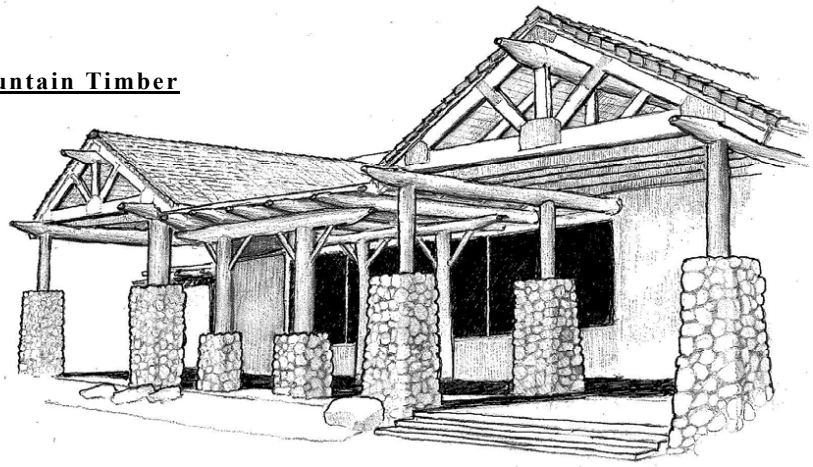
Roof features:
Shingle or shake-look roofing on 4:12-or-greater slope gable roofs, exposed rafter tails, timber brackets supporting eaves.

Finishes:
Painted finishes, with three-color theme.

Ornament:
Faux (false) upstairs windows with balconies, louver vents, ornamental lumber and timber connectors, blade signs.
Lighting: porcelain-metal "dish" fixtures on gooseneck arms.

Figure 3-5: Architectural Design Guidelines: Mountain Style

Mountain Timber

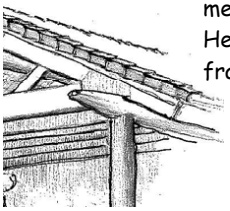


Façade:
Simple gable shapes framed with large timber and log members are the signature of this theme. Emphasizes wood finishes. The character is enhanced with the use of river rock features.

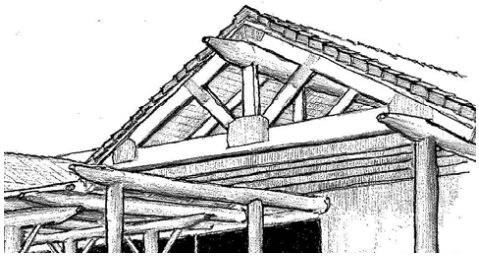
Roof features:
Open-web timber trusses, peeled log "rafters" framing, underside of sloping roof decks exposed to view, 6:12 slopes. Shingle roofing or standing seam metal roofs.

Finishes:
Exposed lumber finished with clear stains to show wood grains. Plank or horizontal siding and board trims. Painted or coated finishes used sparingly to contrast natural wood look. Roofing colors can be used to create a distinct look apart from other neighboring structures.

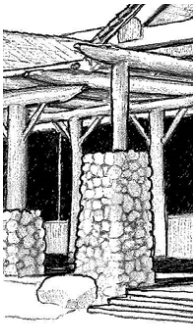
Ornament:
Decorative features to be used with discretion to maintain honest look. Primary ornament consists of black iron or oil-rubbed steel brackets connecting structural members.
Oversize black-iron or oil-rubbed steel patch hinges at doors and window shutters, with simple geometries.
Light fixtures: simple geometry black iron style commercial duty fixtures in either lantern or wall sconce, complimenting building geometry or historical reference. Utilize carefully placed spots and floods for night illumination
Other enhancements: faux black stove-pipe chimney on roof. Wood decking.



Peeled log carrying members,
Heavy wood timber framing



Unenclosed open-gable roof structures, exposed metal connectors



River rock features: column bases, wall accents

Site Planning

Good site planning is just as important as good architectural design, to ensure that new development functions well and is attractive in this, the main gateway to Sanger. The presence of large, undeveloped parcels in the planning area presents the opportunity for comprehesively-designed developments.

Goals and Objectives

1. Ensure that future commercial development is designed in a well-though-out fashion that implements the following design elements:

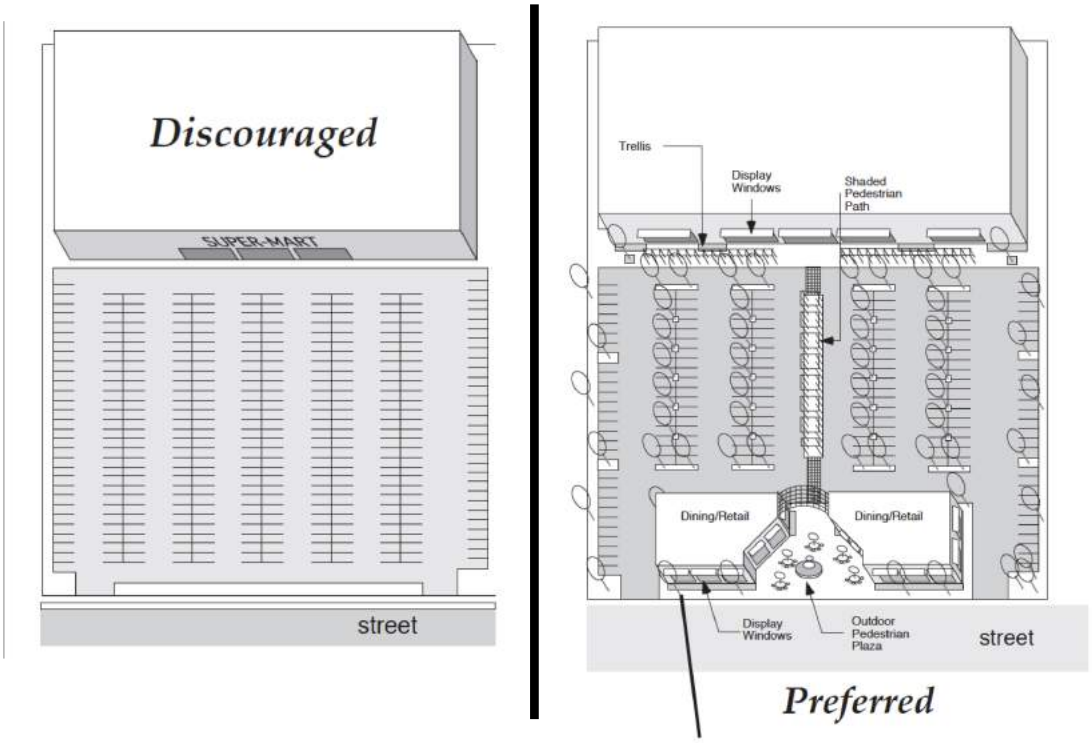
    - An attractive interplay of buildings, landscaping and parking areas.
    - Site frontages should not be dominated by large expanses of parking lots. Parking areas should be broken up by landscaping and buildings, to the extent practical.
    - Developments should feature pedestrian elements, such as wide walkways, plazas with outdoor furniture, fountains and statuary, and walkways that connect separate buildings.
    - Parking areas shall be heavily landscaped, including tree coverage that achieves 40% shading within fifteen years.
    - Main drive aisles should feature islands that divide opposing traffic and break up otherwise large expanses of pavement.
    - Developments should feature vehicular and pedestrian connections to adjacent properties, including future residential development to the east and west of Academy Avenue.

    Examples of the foregoing design strategies are demonstrated in the following illustrations.

    a. The City Planner will ensure the foregoing design elements are implemented through the Site Plan Review process.

Figure 3-6: Large Lot Commercial Site Planning

Avoid large expanses of parking lot. Parking areas should be screened with smaller buildings set forward toward the street



Additional buildings are placed at the street edge to visually screen an otherwise expansive parking lot. An outdoor plaza leads to a pedestrian arbor through the parking lot to the main building.

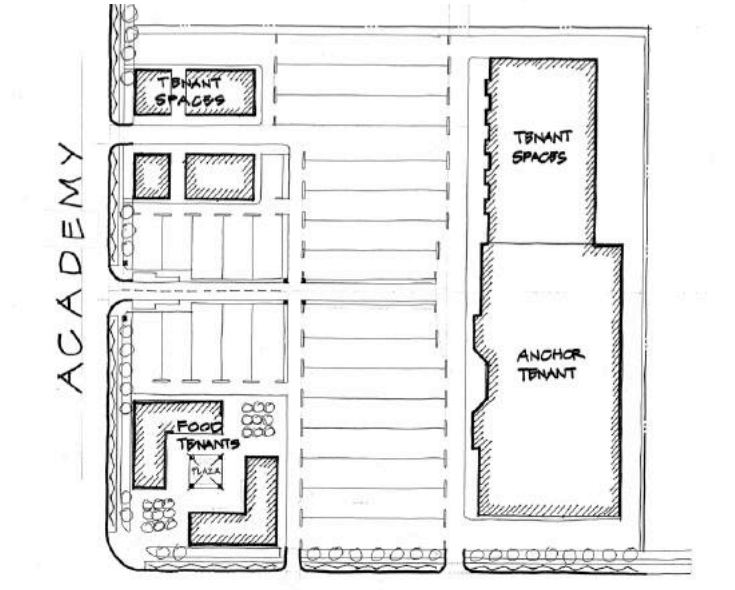


Figure 3-7: Parking Lot Design Strategies

Where screening of the parking lot as previously illustrated is not possible, as many pedestrian amenities should be included in the parking lot and building exterior as possible. The graphic below illustrates various elements that should be considered, including

1. Shade trees and landscaping.
2. Parking lot pathways, shaded with trellises
3. Store front pedestrian areas with seating
4. Fountains and statuary
5. Effective pedestrian connections with adjoining properties.

Parking Lot Trellis over pedestrian walkway. This feature visually "breaks up" the expanse of parking lot and provides an attractive pedestrian feature

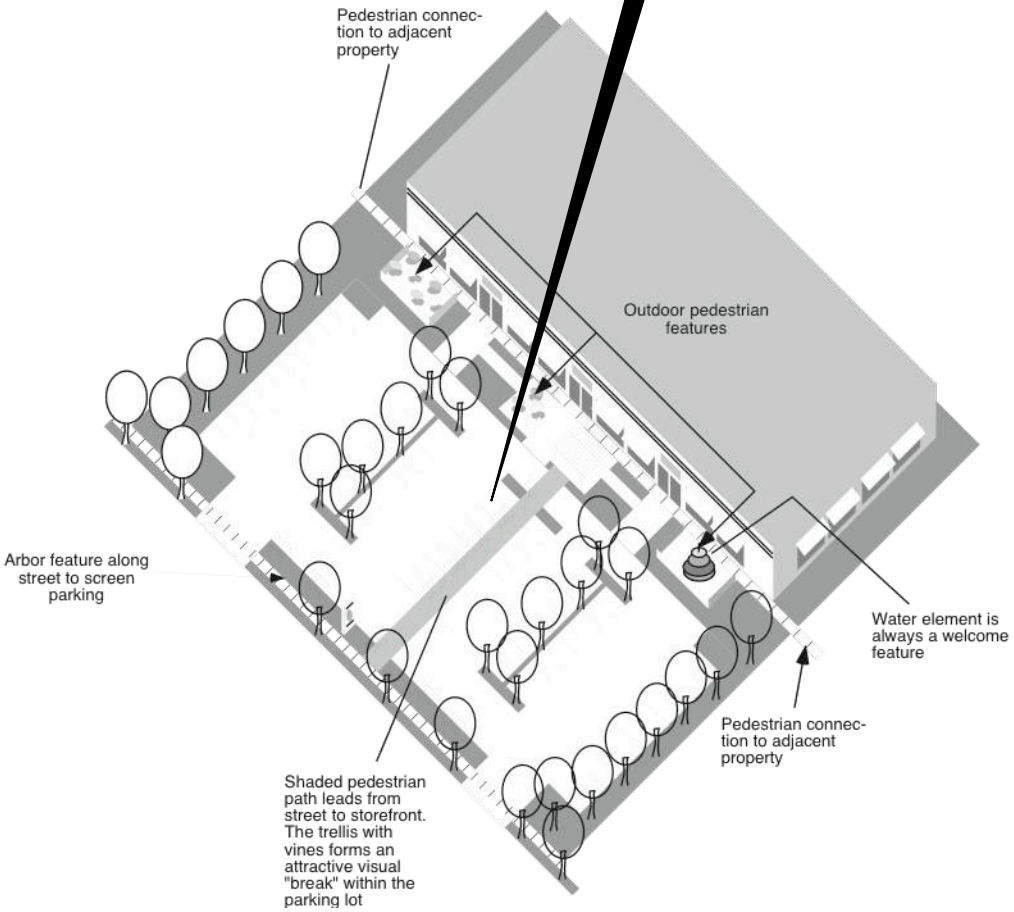
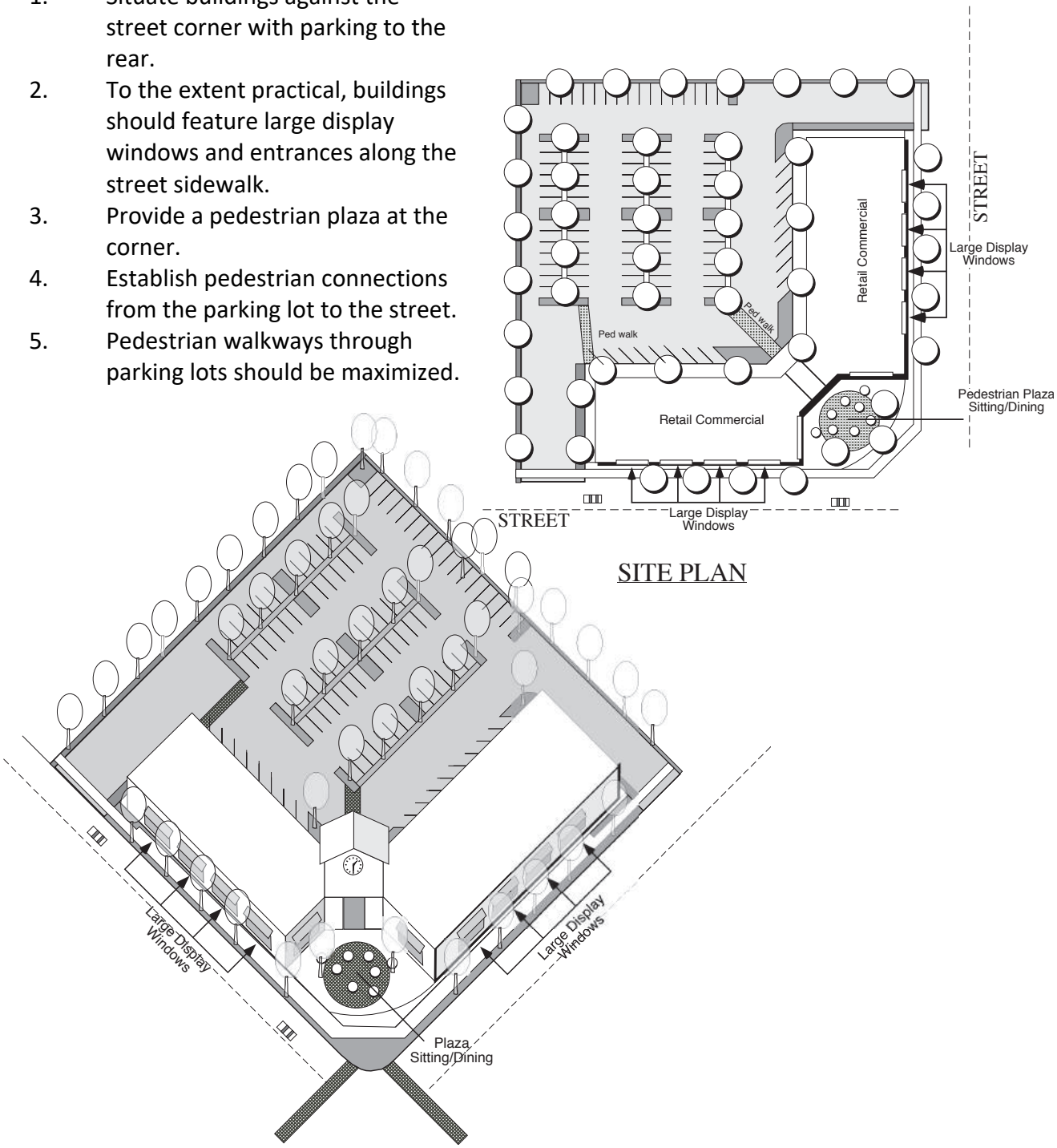


Figure 3-8: Corner Site Design

The following diagrams illustrate a preferred design strategy for a corner-lot location. Desirable design strategies include:

1. Situate buildings against the street corner with parking to the rear.
2. To the extent practical, buildings should feature large display windows and entrances along the street sidewalk.
3. Provide a pedestrian plaza at the corner.
4. Establish pedestrian connections from the parking lot to the street.
5. Pedestrian walkways through parking lots should be maximized.



ISSUE FIVE: Streetscape/Public Facilities

The Master Plan contains the main entrance to Sanger – Academy Avenue, a four lane arterial that proceeds south from State Highway 180 into the City limits.

The desired image of the streetscape is one that makes a statement and connotes a sense of place. Sanger is along State Highway 180 – the main entrance to Kings Canyon National Park, as well as Sequoia National Park and the Sequoia National Forest – important mountain recreational areas of the central Sierra Nevada. Motorists traveling to the mountains could be attracted to visit and shop in the City by a strong attractive design theme that relates to the mountains, agriculture and Sanger's history as a railroad town.

Goals and Objectives:

1. Establish a memorable streetscape along the Academy Avenue corridor that includes attractive landscaping and streetscape elements, including street trees, theme street lamps, bike paths, ranch-style fencing and theme street signs, among others.

    a. Development design within the Academy Avenue corridor in the Master Plan area shall include attractive landscaping and streetscape elements consistent with the design elements of the Master Plan.These elements are illustrated below.

    b. Traffic signal posts and support arms shall be painted gloss black. All other traffic sign posts shall be painted gloss black. The Public Works Director shall ensure implementation of this goal.

Figure 3-9: Welcome arch over Academy Avenue.

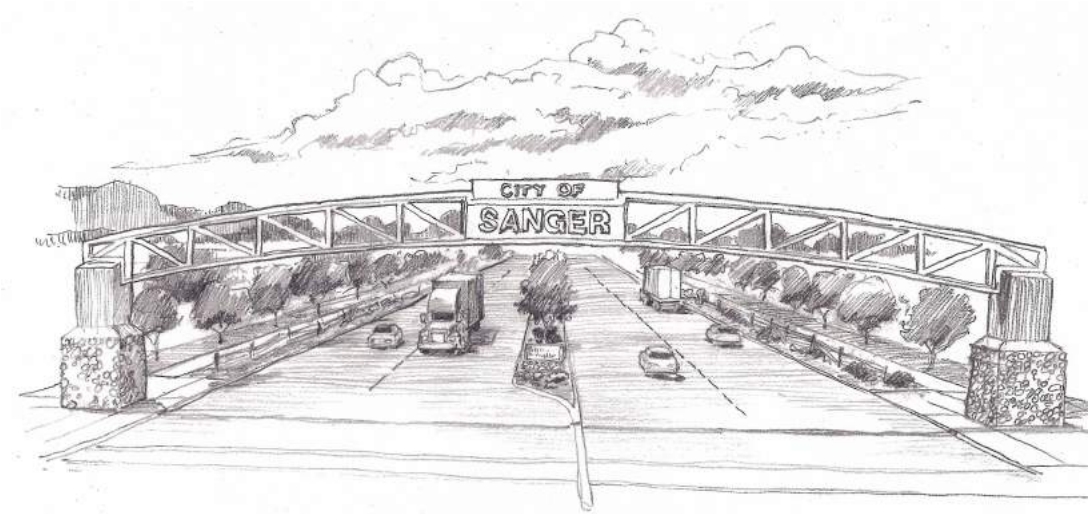


Figure 3-10: Academy Avenue Streetscape Elements Cross-Section Drawings

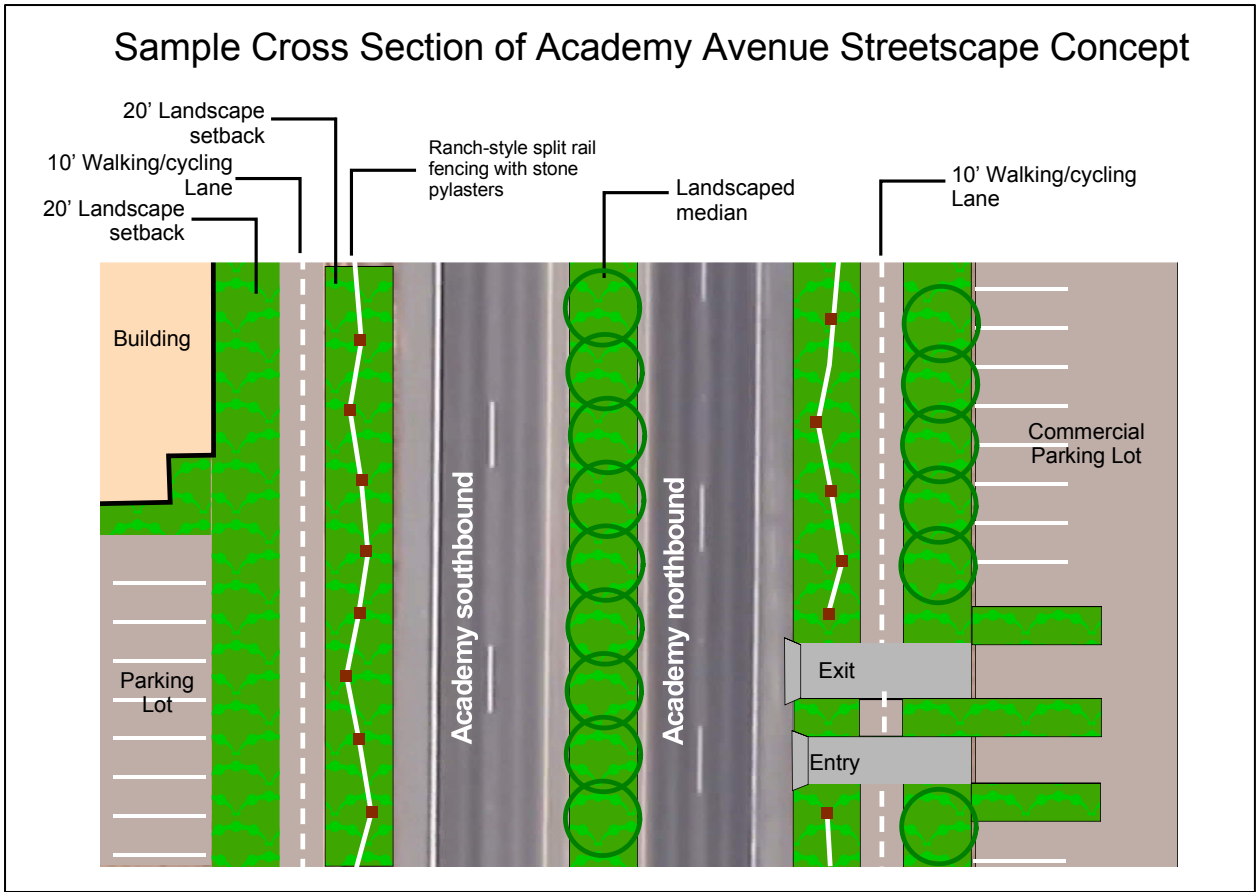


Figure 3-11: Cross Section View

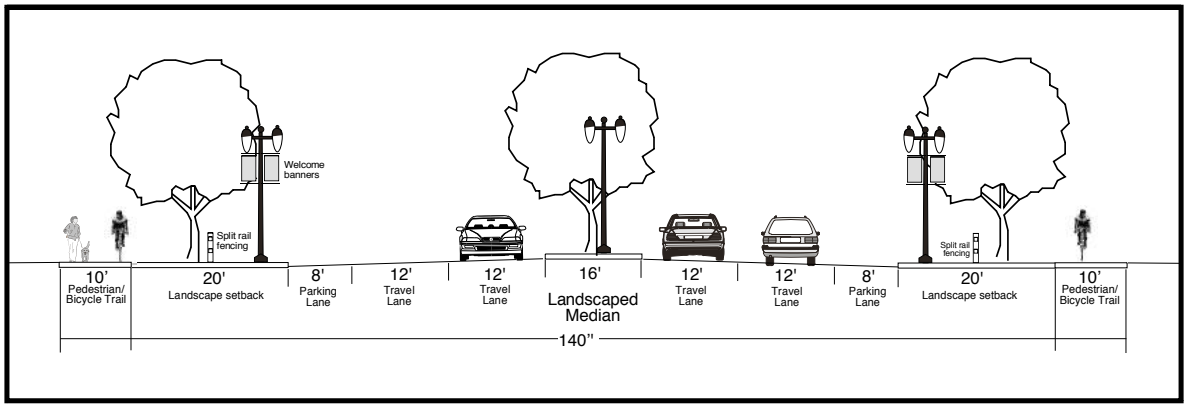
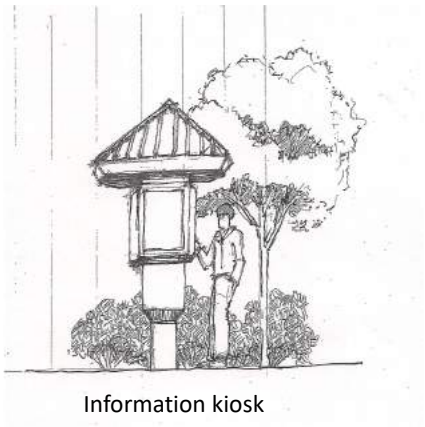


Figure 3-12: Streetscape Elements

Median street sign



Information kiosk

Decorative monument

Antique-style street lamps

Split rail fencing with stone pilasters

ISSUE SIX: FINANCING/IMPLEMENTATION

The cost to develop urban uses in the Master Plan area will be borne primarily by private developers, with support by the City. Key expenses will be related to the installation of infrastructure – water, sewer and storm drain lines and appurtenances, as well as support infrastructure like street lamps, signage and landscaping, among others.

There are a number of options for how improvements can be financed, including a "pay as you go" option (wherein developers install those items required to serve their projects) to establishment of some type of financing district, where property owners throughout the Master Plan area are assessed to pay for improvements that are required to serve development occurring in the planning area. The costs to serve development, along with an overview of financing mechanisms are discussed below, along with goals and objectives.

Goals and Objectives:

1. **Provide clear implementation strategies and actions to ensure development in the Master Plan Area occurs in an efficient and orderly manner.**

    a. Identify the infrastructure that must be constructed to match development as it progresses.
    b. Provide a Phasing Plan to direct development in logical increments.
    c. Identify policies and/or timing, if required, to ensure that backbone infrastructure and public facility improvements will support the associated development in compliance with City policies and standards.
    d. Identify funding for the installation of needed backbone infrastructure.
    e. Identify funding for the delivery of ongoing public services for the Master Plan Area.

Development in the Master Plan Area will likely require the construction of public facility improvements; these improvements will be funded by a variety of mechanisms. Financing methods may include, but are not limited to, the mechanisms outlined in this section.

Estimated Utility Improvement Costs

The City prepared cost estimates to connect the Master Plan Area to existing sewer, water, and drainage infrastructure systems. By buildout, the Master Plan Area will require approximately $28.2 million in backbone improvements. Phase 1 improvements have not been identified yet, as they will depend on the location of new development. Backbone improvements include sewer distribution lines, lift station upgrades, water distribution lines, a new well, retention basins, storm drains, curbs, median and frontage landscaping, striping, and signage. Table 3-1,

below, summarizes these costs by category. Appendix C contains cost estimates for utility and street improvements.

Depending on the location of initial development within the Master Plan Area, some or all of these improvements will be required; additional analysis would be needed to determine the ability for temporary and/or on-site sewer, water, and/or drainage improvements that could serve a certain level of new development.

Table 3-1: Utility Improvement Costs

Utility Improvement Costs	
Category	**Amount**
Wastewater Collection [1]	$6,950,000
Water Service [2]	$8,440,000
Storm Drainage Improvements [3]	$7,520,000
Street Improvements [4]	$5,460,000
Total	**$28,370,000**
[1] Includes pipelines, pump replacement at Newmark Lift Station, and associated appurtenances.	
[2] Includes pipelines, Well #28 construction, bore and jack, and associated appurtenances.	
[3] Includes pipelines, basin construction, land value of proposed basins, and associated appurtenances.	
[4] Includes curbs, median and frontage landscaping, striping, and signage. Excludes concrete curb & gutter, decorative streetlights, and pedestrian trail.	

Estimated Annual Maintenance Costs and Revenues

A fiscal analysis prepared under separate cover projected the annual impact of the Plan Area's development on the City's General Fund budget at the completion of Phase 1 and Project Buildout. The analysis concludes that new development, entirely non-residential in character, generates far more revenues than cost for the City's General Fund. Net revenues are produced largely because non-residential development generates more property tax, sales tax, and hotel tax revenues relative to the cost of providing public services to daytime workers.

Existing Revenue Sources

City Impact Fee Credits

The City of Sanger has established a series of development impact fees that can help fund major capital improvements for the Master Plan Area. New development in the Master Plan

Area will participate in these fee programs to help fund a proportionate share of facilities. To the extent that the developer is responsible for constructing or financing improvements that are within the City's existing fee program, he/she may be eligible for credits and/or reimbursements. For sewer and water fees, most, though not all, improvements would be eligible for credits and/or reimbursements; 8-inch lines or smaller are excluded from the capital improvement program of these existing fee programs. For traffic fees, median improvements would be creditable.

Table 3-2, provides a preliminary estimate of development impact fee revenues based on existing (2018) fee rates for Phase 1 and Project Buildout; a portion of these revenues may be available as credits against the cost of Master Plan Area improvements. As this figure illustrates, Phase 1 development is expected to generate only a small fraction of revenues needed to construct required backbone infrastructure.

Other Agency Fees

In addition to City fee programs, a number of other public agencies serving the Master Plan Area have established fees that may have capital improvement projects designed to serve the Master Plan Area. For example, new development will pay Sanger Joint Unified School District fees; while no school improvements are included within the Master Plan Area, new development will still generate fees for needed facilities in the larger community. To the extent that new development in the Master Plan area is served by these agencies, new development will pay the appropriate zonal fee(s). Project revenues from school fees are shown in Table 3-2.

Table 3-2: Development Impact Fee Estimates

Phase 1 & Buildout Development Impact Fee Rev. Estimate		
	Fee Revenue (2018$)	
Item	Phase 1 (through 2040) [1], [3]	Buildout [2], [3]
Development Acres	26.5	241.6
Fee Category		
Sanitary Sewer #2 (Collection) New Growth Area	$62,249	$567,518
Sanitary Sewer #2 (Treatment) New Growth Area	$187,143	$1,706,179
Water	$149,460	$1,362,624
Storm Drainage #DR-2	$210,039	$1,914,922
Traffic	$594,263	$5,417,880
Subtotal City	**$1,203,153**	**$10,969,123**
Recreation	$80,468	$664,731
School	$204,826	$1,692,042

Public Safety Facilities: Police	$75,711	$690,251
Public Safety Facilities: Fire	$125,001	$1,139,627
Solid Waste Major Facilities	$65,190	$594,336
Total	**$1,754,348**	**$15,750,110**

[1] Includes Hwy Retail (5.5 acres), General Retail (16.6) acres, Office (2.0 acres), and Hotel (est. 2.4 acres).

[2] Includes Hwy Retail (70.0 acres), General Retail (167.2 acres), Office (2.0 acres), and Hotel (est. 2.4 acres).

[3] Revenues estimated presumes that Hwy Retail, General Retail, Office and Hotel will be treated as commercial.

Source: City of Sanger Impact and Improvement Fees, Effective August 21, 2007 and still in effect during 2018; Sanger Unified School District Staff, May 2018; New Economics & Advisory Staff.

General Fund

Another potential funding source for necessary improvements is the City's General Fund, in which the City collects several revenues from sources such as property taxes, sales tax, etc. The General Fund can be used for a variety of purposes, and the City would need to consider whether using General Fund monies on capital improvements needed for the Project is appropriate.

A fiscal analysis prepared for the Master Plan area shows that property and sales tax revenue generated by new development into the City's General Fund will exceed the cost to provide existing levels of service for public safety, road maintenance, and other needed services. Such surpluses, when they occur, could be utilized to help repay any monies previously expended to advance fund capital improvements.

New Funding Sources

Special Financing District

The Master Plan Area may also develop a Special Financing District to fund improvements that are not included in existing fee programs. The district might fund, for example, arterial and collector roads, transit, trunk sewer and water lines, drainage facilities, and other public facilities. The Special Financing District (SFD) could be developed as a publicly-administered fee program or a community facilities district.

Community Facilities District(s)

Another funding and/or financing mechanism that may be utilized to help fund the construction and/or acquisition of backbone infrastructure and facilities within the Plan Area are Community Facilities Districts (CFDs). The 1982 Mello-Roos Community Facilities Act enables cities and other entities to establish a CFD to fund various facilities and services. The proceeds of the

Mello-Roos special tax can be used for direct funding of facility construction, acquisition and/or to pay off bonds. A market analysis prepared under separate cover indicates that new development will likely occur at a modest absorption rate in the Master Plan Area. As such, a CFD would generate funds on a "pay as you go" basis instead of leveraging special tax rates to issue an infrastructure bond.

One or more CFD's for Services can also be established for maintenance of certain facilities that provide special benefit to the Master Plan Area. Such facilities may include landscape corridors, medians, open space, bike paths/trails, detention/retention facilities, etc. The CFD for Services may be used to fund governmental services that benefit users within the Master Plan Area, including law enforcement and fire services, to the extent that service levels exceed current levels.

Landscape and Lighting Assessment District

A Landscape and Lighting Assessment District (LLD) is a similar financing mechanism to a CFD for services. This mechanism may be established, and through annual assessments to property owners, would create a fund to maintain public facilities within the Plan Area. These facilities could include landscape corridors, medians, open space areas, parks and linear parkways, pedestrian and bike trails, storm water facilities and street lights.

Developer Financing

Direct developer/merchant builder funding may be used to provide upfront financing of backbone improvements. To the extent that a gap exists between the cost of facilities and other revenue sources, developer funding would also be the ultimate funding source.

As new development occurs, a subset of the Backbone infrastructure improvements identified by the City will be required. Initially, some new development may be able to proceed with temporary, onsite, and/or a small portion of sewer, water, and/or drainage infrastructure. Temporary and/or onsite improvements are not part of the City's existing fee programs and would not be eligible for fee credits/reimbursements; these improvements may be permitted by the City (depending on the location of new development). Nonetheless, this new development would still be expected to pay the full level of development impact fees in order to help generate funding for future backbone infrastructure.

At some point (to be determined by the City) and/or for new development in certain locations, Backbone infrastructure improvements will be needed to connect new development to existing utility systems. In these cases, developers may be required to provide up-front funding for and/or install needed infrastructure. Developers will be eligible for credits against their fee obligation for eligible facilities. Should a developer construct more than the project's proportionate share of infrastructure improvements, future reimbursements would be owed; development impact fees collected from subsequent development in the Master Plan Area

would be used to reimburse initial developers. The timing for reimbursement is not known at this time and could affect the development feasibility for initial developers. The implementation of fee credits and reimbursements would be subject to the City's policies and ordinances.

Table 3-3 summarizes the possible options for funding and/or financing mechanisms for Master Plan Area improvements and facilities.

Table 3-3: Funding/Financing Mechanisms

Funding/Financing Mechanisms		
Improvement	**Facility Funding Options**	**Maintenance Funding Options**
Roads	Fees, Special Financing District	Property & Sales Tax (General Fund)
Fire	Fees	Property Tax (General Fund)
Water	Fees, Special Financing District	Customer Rates
Sewer	Fees, Special Financing District	Customer Rates
Drainage Facilities	Fees, Special Financing District	Property & Sales Tax (General Fund)
Electric Facilities	User Rates	User Rates
Public Protection	General Fund	Property Tax (General Fund)

Technical Appendices

Appendix A

Memorandum of Understanding Governing Annexations

AMENDED AND RESTATED MEMORANDUM OF UNDERSTANDING BETWEEN THE COUNTY OF FRESNO, THE CITY OF SANGER, AND THE SANGER REDEVELOPMENT AGENCY

THIS AMENDED AND RESTATED MEMORANDUM OF UNDERSTANDING (hereinafter "Restated MOU") is made and executed this 13th day of December, 2005, by and between the COUNTY OF FRESNO, a political subdivision of the State of California (hereinafter referred to as "CITY"), and the City of SANGER, a municipal corporation of the State of California (hereinafter referred to as "CITY"), and the SANGER REDEVELOPMENT AGENCY, a redevelopment agency organized and existing under and by virtue of the laws of the State of California (hereinafter referred to as "AGENCY").

W I T N E S S E T H

WHEREAS, COUNTY, CITY and AGENCY wish to work together to develop a fair and equitable approach to tax sharing and the encouragement of sound economic growth; and

WHEREAS, in order to encourage economic development and environmentally sound land use planning, it is important that any tax sharing among COUNTY, CITY and AGENCY be determined in advance and that such arrangements not be fiscally detrimental to either COUNTY, CITY, or AGENCY; and

WHEREAS, COUNTY, CITY and AGENCY recognize the importance of COUNTY and CITY services and are prepared to cooperate in an effort to address COUNTY's and CITY's fiscal problems; and

WHEREAS, through annexation and appropriate redevelopment, CITY and AGENCY provide the opportunity for economic growth and development to support public services for CITY and COUNTY; and

WHEREAS, close cooperation between COUNTY, CITY and AGENCY is necessary to maintain the quality of life throughout Fresno County and deliver needed services in the most cost-efficient manner to all CITY and COUNTY residents; and

WHEREAS, COUNTY recognizes the need for orderly growth within and adjacent to CITY and for supporting appropriate annexations and promoting the concentration of development within CITY; and

WHEREAS, CITY and AGENCY recognize that development within CITY limits may also have the effect of concentrating revenue-generating activities within CITY rather than in unincorporated areas and that, as a result of Proposition 13 and its implementing legislation, annexation by CITY of unincorporated territory can result in a loss of revenue sources for COUNTY unless there is significant new development activity as a result of annexation; and

WHEREAS, annexation which results in the development of urban uses in response to a clearly demonstrated community demand is appropriate; and well planned and fiscally sound redevelopment can be a valuable tool in the physical and economic development of CITY and COUNTY;

WHEREAS, the parties recognize that COUNTY General Plan Goal LU-G provides that COUNTY will direct urban growth and development within the cities spheres of influence to existing incorporated cities and will ensure that all development in city fringe areas is well planned and adequately served by necessary public facilities and infrastructure and furthers countywide economic development goals; and

WHEREAS, the parties recognize that when urban growth and development is directed to cities there is a lost opportunity of development by COUNTY in the unincorporated area and that sharing of local sales and use taxes generated by such development would serve as a tool for the COUNTY to participate in receiving a share of that new revenue; and

WHEREAS, it is the interest of the parties to require all new urban development to pay a roughly proportionate share of the cost of urban services and infrastructure created by the development, whether it occurs in the CITY or in the adjacent unincorporated area of the CITY's sphere of influence.

NOW, THEREFORE, COUNTY, CITY and AGENCY hereby agree as follows:

ARTICLE I

DEFINITIONS

Unless the particular provision or context otherwise requires, the definitions contained in this article and in the Revenue and Taxation Code shall govern the construction, meaning, and application of words used in this RESTATED MOU.

1.1 "Base property tax revenues" means property tax revenues allocated by tax rate equivalents to all taxing jurisdictions as to the geographic area comprising a given tax rate area annexed in the fiscal year immediately preceding the tax year in which property tax revenues are apportioned pursuant to this RESTATED MOU, including the amount of State reimbursement of the homeowners' and business inventory exemptions.

1.2 Except as provided in Section 6.1, "property tax increment" means revenue from the annual tax increment, as "annual tax increment" is defined in Section 98 of the Revenue and Taxation Code, attributable to the tax rate area for the respective tax year.

1.3 "Substantial development" or "substantially developed" means real property which, prior to annexation, has an improvement value to land value ratio equal to or greater than 1.25:1, as of the lien date in the fiscal year in which the annexation becomes effective under the Cortese-Knox Local Government Reorganization Act, and on and after January 1, 2000, the Corteses-Knox-Hertzberg Local Government Reorganization Act of 2000.

1.4 "Property tax revenue" means base property tax revenue, plus the property tax increment for a given tax rate area.

1.5 "Tax apportionment ratio" means the tax apportionment ratio of the parties for a given fiscal year and shall be ascertained by dividing the amount determined for each party pursuant to Revenue and Taxation Code Sections 96(a) or 97(a), whichever is applicable, by that party's gross assessed value, and by then dividing the sum of the

resulting tax rate equivalents of both parties into each party's tax rate equivalent to produce the tax apportionment ratio.

1.6 "Tax rate equivalent" means the factor derived for an agency by dividing the property tax levy for the prior fiscal year computed pursuant to Section 97 of the Revenue and Taxation Code by the gross assessed value of the agency for the prior fiscal year.

1.7 "Redevelopment project" means any new redevelopment plan or project area and any amendment to an existing development plan or project area to which Health and Safety Code Section 33354.6, as amended by Chapter 147 of the 19845 Statues, applies. For example, the addition of the power of eminent domain to an existing redevelopment plan is not a "redevelopment project" because it does not affect any of the criteria listed in Health and Safety Code Section 33354.6.

1.8 "Effective Date" shall mean the date that all the parties hereto shall execute this Amended and Restated Memorandum of Understanding between the County of Fresno and the City of Sanger and the City of Sanger Redevelopment Agency.

1.9 "Urban development" or "urban type development" shall mean development not allowed in areas designated Agriculture, Rural Residential or River Influence in COUNTY's General Plan or its applicable community plans as of the Effective Date of this RESTATED MOU.

ARTICLE II

ANNEXATIONS BY CITY

2.1 Any annexations undertaken by CITY following the date of the execution of this RESTATED MOU shall be consistent with both the terms of this MOU and the standards (hereinafter "The Standards" or "Standards") as set forth in Exhibit "1", attached hereto and incorporated by reference herein as if set fourth fully at this point. This RESTATED MOU shall not apply to annexations proposed by CITY which are not in compliance with its terms or which fail to meet The Standards. If a proposed

annexation is not in compliance with the terms of this RESTATED MOU, including but not limited to, The Standards, then no property tax exchange agreement, as required by Revenue and Taxation Code Section 99, shall exist in regards to that proposed annexation. Any such non-complying annexation shall be handled individually through separate negotiations between CITY and COUNTY.

2.2 In order to encourage the orderly processing of proposed annexations, CITY shall, at least thirty (30) days prior to filing any annexation proposal with the Fresno County Local Agency Formation Commission (hereinafter "LAFCO"), notify COUNTY of its intention to file such proposal to be filed. Upon COUNTY's request, CITY agrees to meet with COUNTY to review whether its proposed annexation complies with The Standards. Within fifteen (15) days after the date COUNTY receives notice by the CITY of its annexation proposal, COUNTY shall notify CITY in writing if it has determined that the proposed annexation is inconsistent with The Standards. Upon receipt of such notification, CITY may either modify the proposal to COUNTY's specifications or adopt a resolution finding that the proposed annexation is, in CITY's determination, consistent with The Standards.

2.3 If CITY adopts a resolution making the findings described in Section 2.2, then COUNTY may challenge such finding through arbitration proceedings conducted in accordance with the rules established by the American Arbitration Association. County shall have thirty (30) days following receipt of written notice from CITY of such resolution to request arbitration. The request shall be directed to CITY and shall be in writing. The parties agree to proceed with arbitration in a timely manner. In the event of such challenge, the arbitrator hearing the matter shall independently review the evidence and determine whether the proposed annexation is consistent with the Standards. The costs incurred by the prevailing party in the arbitration proceedings, shall be paid by the non-prevailing party. The parties agree that CITY shall not proceed with the proposed annexation until COUNTY's action challenging CITY's findings on such matter is finally resolved. The parties intend to finally resolve the challenge by the

process set forth in this section. If CITY attempts to proceed with such proposed annexation prior to the expiration of the period in which COUNTY may request arbitration expires or prior to the conclusion of a challenge upholding the finding, then this RESTATED MOU shall immediately terminate as to such annexation and, in particular, no property tax exchange agreement, as required by Section 99 of the Revenue and Taxation Code, shall exist between CITY and COUNTY as to that proposed annexation.

2.4 For the purpose of promoting economic development and job creation, an Alternate Standard for Annexation for industrial or regional commercial uses is hereby created. In the place of the Standards for Annexation set forth in Exhibit 1, the Alternate Standard for Annexation shall apply to and govern the review of annexation proposals for industrial or regional commercial uses. Annexation proposals for industrial/regional commercial uses shall include a conceptual development plan, as described herein. The conceptual development plan shall consist of the economic objectives to be achieved, the service and financing strategy and its schedule, and shall include a map of the proposed prezoning. The conceptual development plan's schedule shall include milestones for major project components, to measure the progress of the project. Due to the complexity of such projects the development schedule for planning and implementation may reasonably require a period of from five to ten years. The annexation proposal shall be submitted to and reviewed by the COUNTY pursuant to Section 2.2. Annexation proposals that comply with the criteria of this Section 2.4 shall be deemed to comply with Section 2.1. The annexation application to be submitted to LAFCO shall be considered complete upon adoption of the prezoning by the CITY. COUNTY and CITY agree to meet annually to review the progress toward the achievement of the economic development objectives and to identify ways to promote mutual economic development objectives.

2.5. Section 2.4 shall be deemed suspended if CITY rezones an area that was annexed using the Alternate Standard for Annexation to a zone other than Industrial/Regional Commercial without COUNTY's consent.

ARTICLE III

EXHANGE OF PROPERTY TAX REVENUES TO BE MADE UNDER SECTION 99 OF THE REVENUE AND TAXATION CODE

3.1 The property tax revenues collected in relation to annexations covered by the terms of this RESTATED MOU shall be apportioned between CITY and COUNTY as set forth in Sections 3.2 and 3.3 below. The parties acknowledge that, pursuant to Sections 54902, 54902.1 and 54903 of Government Code and Sections 97 and 99 of the Revenue and Taxation Code, the distribution of such property tax revenues will not be effective until the revenues are collected in the tax year following the calendar year in which the statement of boundary changes and the map or plat is filed with the County Assessor and the State Board of Equalization.

3.2 In regards to the annexation of real properties which are not considered substantially developed at the time of annexation, COUNTY will retain all of its base property tax revenue upon annexation. The amount of the property tax increment for special districts whose services are assumed by CITY shall be combined with the property tax increment of the COUNTY, the sum of which shall be allocated between CITY and COUNTY pursuant to the following ratio:

COUNTY: 53%

CITY: 47%

Effective July 1, 2006 these property tax-sharing ratios shall be as shown in Exhibit "2".

3.3 In regards to the annexation of real properties which are considered substantially developed at the time of annexation, property tax revenue (base plus increment) will be reallocated as follows: a detaching or dissolving district's property tax revenue (base plus increment) shall be combined with COUNTY's and the sum of which

shall be allocated between CITY and COUNTY pursuant to the ratio set forth in Section 3.2.

ARTICLE IV

DEVELOPMENT WITHIN AND ADJACENT TO CITY'S SPHERE OF INFLUENCE

4.1 Within one half mile of CITY's boundary, COUNTY shall not approve any discretionary development permits for new urban development within CITY's sphere of influence unless the development shall have first been referred to CITY for consideration of possible annexation. If CITY does not, within sixty (60) days of receipt of notice from COUNTY, adopt a resolution of application to initiate annexation proceedings before LAFCO, COUNTY may approve development permits for that new urban development. County's approval shall take into consideration CITY's general plan and be consistent with COUNTY's general plan policies, provided, that the development is orderly and does not result in the premature conversion of agricultural lands.

4.2 Within the CITY's sphere of influence, COUNTY shall require compliance with development standards that are comparable to CITY's and charge fees reflecting the increased administrative and implementing cost where such CITY standards are more stringent than COUNTY's. These requirements shall apply to discretionary development applications approved by COUNTY. For purposes of this Agreement, "discretionary development applications" shall mean General Plan Amendments, Rezoning, Tentative Tract Maps, Tentative Parcel Maps, Conditional Use Permits, Director Review and Approvals, and Variances.

4.3 CITY development fees shall be charged for any discretionary development applications to be approved by the COUNTY within CITY's sphere of influence. To establish or amend CITY development fees, CITY shall conduct a public hearing and notify property owners in accordance with State Law. At the conclusion of

that hearing, CITY shall adopt a resolution describing the type, amount, and purpose of CITY fees to be requested for COUNTY adoption.

4.4 CITY shall transmit the adopted resolution to the COUNTY for its adoption of the fees. CITY shall include a draft ordinance for COUNTY's adoption with appropriate supporting documentation or findings by the CITY demonstrating that the fees comply with Section 66000 of the Government Code and other applicable State Law requirements. CITY fees may also include CITY's and COUNTY's increased administrative costs and inspection charges.

4.5 COUNTY shall collect the applicable CITY development fees for infrastructure and facilities at the time of final map approval or issuance of building permits as established by the fee schedule. Or, COUNTY shall require the applicant to present a voucher issued by CITY evidencing the payment of the fees directly to CITY, or written confirmation by CITY that fees are inapplicable. If COUNTY imposes and collects fees on behalf of CITY, COUNTY shall transfer the fees to CITY at the earliest time legally permitted.

4.6 CITY shall give COUNTY at least thirty (30) days notice before implementing any new fees or an amendment to existing fees. Notwithstanding this Section 4.6, or any other provision of this MOU, CITY shall be solely responsible for determining the amount of the fees and setting them in accordance with law. This Section 4.6 shall not be construed as a representation by COUNTY as to the propriety of the fees or the procedures used in setting them.

4.7 CITY shall hold harmless, defend and indemnify the COUNTY from all claims, demands, litigation of any kind whatsoever arising from disputes relating to the fees, the enactment of or the collection of CITY development fees.

4.8 If COUNTY adopts capital facilities fees, CITY shall require that an applicant for any land use entitlement or permit within CITY shall pay all COUNTY public facilities fees applicable to the entitlement or permit on behalf of the COUNTY. At the COUNTY's request, CITY shall either timely impose and collect all such fees or

shall require the applicant to present a voucher issue by COUNTY evidencing the payment of fees directly to COUNTY. If adopted by COUNTY, the fees are to mitigate the impact of development on required COUNTY facilities and services including, but not limited to, the criminal justice system, health, social services, parks, transportation and library. If CITY imposes and collects fees on behalf of COUNTY, CITY shall transfer the fees to COUNTY at the earliest time legally permissible to do so. COUNTY may impose new fees and amend existing fees from time to time in its sole discretion. COUNTY shall give CITY at least thirty (30) days notice before implementing any new fees or an amendment to existing fees. Notwithstanding this Section 4.8, or any other provision of this Restated MOU, COUNTY shall be solely responsible for determining the amount of the fees and setting them in accordance with law. This Section 4.8 shall not be construed as a representation by CITY as to the propriety of the fees or the procedures used in setting them.

4.9 COUNTY shall hold harmless, defend and indemnify the CITY from all claims, demands, litigations of any kind whatsoever arising from disputes relating to the enactment or collection of capital facilities fees.

4.10 COUNTY shall support urban unification. To this end, COUNTY shall oppose the creation of new governmental entities within CITY's sphere of influence, except for such entities that may be necessary to address service requirements that cannot be addressed by annexation to CITY. CITY and COUNTY will support transition agreements with current service providers which recognize the primary role of cities as providers of urban services and where current services have participated in service master planning.

4.11 Within the CITY's sphere of influence and for the two mile area beyond the CITY's sphere of influence boundary, COUNTY and CITY agree that, in the early stages of preparation of land use and circulation proposals and general plan amendments, they shall consult at the staff level in such fashion as to provide meaningful participation in the policy formulation process, and shall likewise consult on other policy changes which

may have an impact on growth or the provision of urban services. CITY shall also be given the opportunity to respond to COUNTY before the final document is prepared for presentation to COUNTY's Planning Commission. COUNTY agrees that it will solicit comments from CITY in the preparation of any Initial Study required by the California Environmental Quality Act undertaken within the area.

4.12 Any change in the CITY's sphere of influence proposed by either COUNTY or CITY which would modify the area depicted in Exhibit "3" requires the mutual consultation of both parties prior to submission to LAFCO.

ARTICLE V

IMPLEMENTATION OF SALES TAX REVENUE COLLECTION

5.1 Pursuant to the Bradley Burns Uniform Local Sales and Use Tax Law, Part 1.5, Division 2, of the Revenue and Taxation Code (commencing with Section 7200), CITY is, concurrent with the execution of this RESTATED MOU, amending its local sales and use tax ordinance. This amendment shall be timely forwarded to the State Board of Equalization so that it will become operative as of the first July 1 following the CITY reaching the threshold forth in subsections 5.2.1 and 5.2.2. This amendment shall enable COUNTY, pursuant to its sales and use tax ordinance, to collect a portion of the sales and use tax revenues generated within the incorporated areas of CITY in accordance with the applicable rate set forth on Exhibit 4", attached hereto and incorporated by reference as if set forth fully at this point. The format of this amendment by CITY to its local sales and use tax ordinance shall likewise provide as a credit against the payment of taxes due under such ordinance, an amount equal to any sales and use tax due to COUNTY.

5.2 Except as otherwise provided herein, CITY further agrees that the amendment adopted pursuant to Section 5.1 above shall likewise provide for the periodic reallocation of additional sales tax revenues generated within the incorporated areas of CITY in accordance with the schedule set forth on Exhibit "4". Each

subsequent incremental adjustment shall go into effect at the commencement of the fiscal year indicated. These periodic adjustments shall enable COUNTY, pursuant to its sales and use tax ordinance, to collect that portion of the sales and use tax revenues generated within the incorporated areas of CITY equal to the applicable percentage as specified in Exhibit "4". These periodic adjustments shall automatically go into effect provided that:

5.2.1 CITY receives sales tax revenues per capita in an amount greater than fifty percent (50%) of the sales tax revenue per capita collected by all Fresno County cities when taken as a group during the most recent fiscal year for which State Board of Equalization information is available, then it hereby agrees to reallocated sales tax revenues with COUNTY beginning in fiscal year 1991-92 in accordance with the provisions of this article; and

5.2.2 CITY's annual sales tax revenue information is available for the State Board of Equalization allows City to reallocate sales tax revenue at the percentage designated in Exhibit "4" and still have a net increase in its remaining sales tax revenue when compared with the fiscal year immediately preceding the fiscal year described above. The periodic phase in of sales tax reallocation described herein shall be delayed from year-to-year if CITY falls below the sales tax reallocation threshold as identified in Section 5.2. In those years in which CITY does not meet the sales tax reallocation threshold, CITY's sharing proportion shall continue at the same rate as in the last year in which CITY met or exceeded the threshold. When, in a subsequent year, CITY again meets or exceeds the threshold, the sharing proportion of CITY shall be at the next higher sharing proportion shown on Exhibit "4", and the annual phase-in shall continue therefrom.

5.3 The sales tax ordinance amendments adopted by CITY pursuant to this article are intended to reduce CITY's sales tax rate from its then-existing level to a level

which thereby enables COUNTY, pursuant to its sales tax ordinance, to continue collecting those amounts set forth in the previous provisions of this article as well as the applicable percentages set forth on Exhibit "4". In addition, each periodic adjustment is intended by the parties to enable COUNTY to collect an amount equivalent to the applicable percentage specified in Exhibit "4".

5.4 Whenever CITY proposes an annexation of unincorporated territory which generates substantial sales tax revenue for COUNTY, CITY, agrees to further amend its local sales and use tax ordinance as set for in this section. Notwithstanding the language of subsections 5.2.1 and 5.2.2, this additional amendment shall become operative no later than the commencement of the next calendar quarter following the date upon which such annexation is certified as complete by the Executive Officer of LAFCO. This additional amendment shall decrease CITY 's sales tax rate to yield an amount of substantial sales tax revenue being collected by COUNTY in the area to be annexed, thus enabling COUNTY to increase its sales tax rate by a corresponding percentage which shall continue to accrue to COUNTY throughout the term of this RESTATED MOU. Any such additional amendment made by CITY pursuant to this section shall be cumulative and likewise preserve intact any periodic adjustments previously implemented pursuant to this RESTATED MOU. Further, CITY agrees that it shall not split or separate areas into smaller annexations for the purpose of, or having the effect of, creating an annexation or annexations which, individually, do not generate substantial sales tax revenue, but which would generate such revenue if combined. For purposes of this article, the term "substantial sales tax revenue" shall be defined as sales tax revenue derived from taxable sales in the area annexed equal to at least:

5.4.1 If only information for less than one fiscal year exists, then $100,000 in taxable sales in the most recent quarter for which such information from the State Board of Equalization is available in writing or electronic or magnetic media, and projected to a full four quarters, at least $400,000 in taxable sales.

5.4.2 If information for one or more years exist, then $400,000 in taxable sales in the most recent year for which such information from the State Board of Equalization is available in writing or electronic or magnetic media.

5.5 If CITY fails to amend its sales tax ordinance as provided in section 5.1, or if the amendment to the sales tax ordinance fails to provide for the periodic reallocation of additional sales tax revenues as provided in section 5.2, the subsections therein, and Exhibit "4", or if CITY fails to further amend its sales tax ordinance upon the annexation of unincorporated territory which generates substantial sales tax revenue for COUNTY as provided in section 5.4, or if CITY splits or separates areas into smaller areas as prohibited by section 5.4, then this RESTATED MOU shall immediately terminate and, in particular, no property tax exchange agreement, as required by Section 99 of the Revenue and Taxation Code, shall exist between CITY and COUNTY.

5.6 CITY and COUNTY further agree that the annual report of the State Board of Equalization and the Department of Finance Annual Population Estimates shall be used as the data source for the purpose of calculating the per capita sales tax revenue pursuant to this RESTATED MOU.

5.7 Application of the formula to be used in the allocation of revenues pursuant to section 5.2 is illustrated in Exhibit "5", attached hereto and incorporated by reference herein as if set forth fully at this point.

ARTICLE VI

REDEVELOPMENT

6.1 The parties acknowledge that circumstances may develop making it desirable to negotiate the amount of property tax increment, as described in Section 33670 of the Health and Safety Code, that AGENCY will pass through to County and the Fresno County Library District (hereinafter "Library District") in individual redevelopment projects. In those instances where CITY or AGENCY wish to negotiate, the parties agree to conduct and complete such negotiations within a 60-day period

following CITY or AGENCY's written notice to COUNTY of the desire to negotiate as to the particular redevelopment project. These negotiations will take place prior to AGENCY approval of the preliminary report. In the absence of such negotiations or if negotiations do not result in an agreement within the negotiating period, CITY and AGENCY will pass through to COUNTY and the Library District one hundred percent (100%) of their respective shares of the property tax increment for the project. The parties shall take all actions necessary under Section 33401 of the Health and Safety Code and other provisions of law to accomplish the purposes of this article. This obligation includes a finding by AGENCY that any pass through of the property tax increment to COUNTY and the Library District is necessary and appropriate to alleviate any financial burden or detriment to COUNTY and the Library District caused by a redevelopment project.

6.2 Understanding that the following remedies are available without statement herein, but desiring that the parties be aware, if a redevelopment project is approved without CITY and AGENCY fully complying with this article, then COUNTY's cumulative remedies shall include, but not be limited to, the following:

6.2.1 COUNTY may, to the full extent provided by law, challenge the validity of the redevelopment plan approved or adopted for a redevelopment project and may exercise any and all other such remedies it may have related to such redevelopment project. This subsection shall not be construed to allow COUNTY to challenge a redevelopment plan approved prior to the date of this RESTATED MOU, except as allowed by law in the absence of this RESTATED MOU.

6.2.2 If CITY and AGENCY fail or refuse to negotiate with COUNTY or if negotiations do not conclude in an agreement, and CITY and AGENCY pass through to COUNTY and the Library District less than one hundred percent (100%) of their respective shares of the property tax increment, then this RESTATED MOU shall automatically terminate and, in particular,

no property tax exchange agreement, as required by Section 99 of the Revenue and Taxation Code, shall exist between City and County.

6.2.3 COUNTY may maintain a court action for specific performance of the provisions of this article, and for declaratory relief to settle disputes as to CITY's or AGENCY's compliance with this article.

6.3 The provisions of this article shall apply only to Redevelopment Plans adopted prior to January 1, 1994. For each redevelopment plan adopted prior to January 1, 1994, but amended after January 1, 1994, to include new territory, Article VI of the RESTATED MOU shall be inapplicable to the new added territory.

ARTICLE VII

COUNTY AND CITY ASSURANCES ON USE OF REVENUE

7.1 COUNTY recognizes that certain revenue reallocated to it by this RESTATED MOU would otherwise have been appropriated by CITY to meet demands for services. In light therefore, COUNTY agrees to use such new revenue in order to maintain levels of COUNTY services that are supportive of CITY and AGENCY services, unless the federal or state governments materially reduce the level of funding for such services. Examples of such COUNTY services include: criminal justice system, public health, and other similar services.

7.2 CITY agrees to continue enforcement of laws which result in the collection of fines and forfeitures.

ARTICLE VIII

COOPERATIVE EFFORTS AT LEGISLATIVE REFORM

8.1 CITY and COUNTY agree to work jointly for state legislation and appropriations that would improve the fiscal condition of both CITY and COUNTY.

ARTICLE IX

GENERAL PROVISIONS

9.1 Term of MOU

This RESTATED MOU shall commence as of the date of execution by COUNTY, CITY and AGENCY and shall remain in effect for a period of fifteen (15) years, unless terminated prior to that time by mutual agreement of the parties.

In addition, should all or any portion of this RESTATED MOU be declared invalid or inoperative by a court of competent jurisdiction, or should any party to this RESTATED MOU fail to perform any of its obligations hereunder, or should any party to this RESTATED MOU take any action to frustrate the intentions of the parties as expressed in this RESTATED MOU, then in such event, this entire RESTATED MOU, as well as any ancillary documents entered into by the parties in order to fulfill the intent of this RESTATED MOU, shall immediately be of no force and effect and, in particular, no property tax exchange agreement, as required by Section 99 of the Revenue and Taxation Code, shall exist between the CITY and COUNTY as to unincorporated property.

9.2 Geographic Application of RESTATED MOU

This RESTATED MOU shall apply only to the area identified as the City of Sanger's Sphere of Influence as depicted in Exhibit 3. This RESTATED MOU shall not apply to any sphere of influence beyond the area depicted in Exhibit 3 unless and until the parties mutually agree to amend this RESTATED MOU,

9.3 Termination Due to Changes in Law

The purpose of this MOU is to alleviate in part the revenue shortfall experienced by COUNTY which may result from CITY's annexation of revenue-producing or potentially revenue-producing properties located within the unincorporated area of COUNTY, and from CITY's and AGENCY's redevelopment projects. The purpose of this RESTATED MOU is also to enable CITY to proceed with territorial expansion and economic growth consistent with the terms of existing law as mutually understood by the parties as well as to maximize each party's ability to deliver essential governmental services. In entering into this RESTATED MOU, the parties mutually assume the continuation of the existing statutory scheme for the distribution of available tax

revenues to local government and that assumption is a basic tenet of this RESTATED MOU. Accordingly, it is mutually understood and agreed that this RESTATED MOU may, by mutual agreement be terminated should changes occur in statutory law, court decisions or state administrative interpretations which negate the basic tenets of this RESTATED MOU.

9.4 Modification

This RESTATED MOU and all of the covenants and conditions set forth herein may be modified or amended only by a writing duly authorized and executed by COUNTY, CITY and AGENCY.

9.5 Enforcement

COUNTY, CITY and AGENCY each acknowledge that this instrument cannot bind or limit themselves or each other or their future governing bodies in the exercise of their discretionary legislative power. However, each binds itself that it will insofar as is legally possible fully carry out the intent and purposes hereof, if necessary by administrative action independent of ordinances, and that this RESTATED MOU may be enforced by injunction to the extent allowed by law.

9.6 Entire MOU; Suppression

With respect to the subject matter hereof, this RESTATED MOU supersedes any and all previous negotiations, proposals, commitments, writings, and understandings of any nature whatsoever between COUNTY, CITY and AGENCY except as otherwise provided herein. This RESTATED MOU does not supersede existing written agreements among COUNTY, CITY and AGENCY pertaining to redevelopment projects, as defined in this RESTATED MOU, trigger the application of article VI of this RESTATED MOU.

9.7 Notice

All notices, requests, certifications or other correspondence required to be provided by the parties to this RESTATED MOU shall be in writing and shall be

delivered by first class mail or an equal or better form of delivery to the respective parties at the following addresses:

COUNTY	CITY AND AGENCY
County Administrative Officer	City Manager
County of Fresno	City of Sanger
Hall of Records, Room 300	City Hall
2281 Tulare Street	1700 Seventh Street
Fresno, CA 93721	Sanger, CA 93657

9.8 Renegotiation

If County enters into an MOU with another City that has terms and conditions more favorable in the aggregate to that city than those terms and conditions contained herein, COUNTY agrees that it will negotiate such terms and conditions upon written request from CITY or AGENCY, with the intent of offering a more favorable agreement. Negotiations shall conclude thirty (30) days from the date of receipt of notice by COUNTY and, if agreement is tentatively reached during that period, the legislative bodies of the parties shall approve any such amendment within thirty (30) days from the date of receipt of notice by COUNTY and, if agreement is tentatively reached during that period, the legislative bodies of the parties shall approve any such amendment within thirty (30) days following the date of the tentative agreement. COUNTY, CITY and AGENCY are not required to reach agreement.

9.9 Notice of Breach

Prior to this RESTATED MOU being terminated as expressly provided in Sections 5.5,6.2.2 and 9.1, COUNTY shall provide notice to CITY and AGENCY of such breach, and CITY and AGENCY shall comply with the terms and conditions of this RESTATED MOU within thirty (30) days of receipt of notice. If CITY or AGENCY fail to timely comply, this RESTATED MOU shall terminate as provided herein. During the thirty (30) day notice period and until CITY and AGENCY certify in writing that they are in compliance and COUNTY agrees in writing, no property tax exchange agreement, as required by Section 99 of the Revenue and Taxation Code, shall exist between COUNTY and CITY with respect to any pending annexation.

Except as otherwise provided in the RESTATED MOU for a breach of its terms and conditions, the parties may enforce this RESTATED MOU in a manner authorized by law.

IN WITNESS WHEREOF, the parties hereto have executed this RESTATED MOU in the County of Fresno, State of California, on the dates set forth above.

COUNTY OF FRESNO, a Political Subdivision of the State of California ("COUNTY")

By: _____
Judith G. Case, Chairman
Board of Supervisors

DEC 13 2005

ATTEST:
Bernice E. Seidel,
Clerk to the Board of Supervisors

By: _____

REVIEWED AND RECOMMENDED FOR APPROVAL
Bart Bohn, County Administrative Officer

By: _____

APPROVED AS TO LEGAL FORM:
Dennis Marshall, County Counsel

By: _____

APPROVED AS TO ACCOUNTING FORM:
Auditor-Controller/Treasure-Tax Collector

By: _____

CITY OF SANGER, a Municipal Corporation of the State of California ("CITY")

By: _____
Michael A. Montelongo, Mayor
City of SANGER

REDEVELOPMENT AGENCY OF THE CITY OF SANGER ("Agency")

By: _____
Jim Drinkhouse, Interim Executive Director

APPROVED AS TO LEGAL FORM:
David J. Weiland, City Attorney
City of SANGER

By: _____

ATTEST:

Barbara Mergan,
Clerk to the City of SANGER

By: _____

EXHIBIT 1
STANDARDS FOR ANNEXATION

- The proposal must be consistent with the adopted sphere of influence of the city and not conflict with the goals and policies of the Cortese-Knox-Hertzberg Act.

- The proposal must be consistent with city general and specific plans, including adopted goals and policies.

- Pursuant to CEQA, the proposal must mitigate any significant adverse effect on continuing agricultural operations on adjacent properties, to the extent reasonable and consistent with the applicable general and specific plan.

- A proposal for annexation is acceptable if one of the following conditions exist:

  1. There is existing substantial development provided the City confines its area requested to that area needed to include the substantial development and create logical boundaries.

  2. Development exists that requires urban services which can be provided by the City.

  3. If no development requiring urban services exists, at least 50% of the area proposed for annexation has:

     (a) Approved tentative subdivision map (single-family residential)
     (b) Approved site plan (for uses besides single-family residential)

- The proposal would not create islands. Boundaries must ultimately minimize creation of peninsulas and corridors, or other distortion of boundaries.

For any of the following circumstances a proposal for annexation is presumed to comply with all standards for annexation:

- The request for annexation is by a city for annexation of its own publicly-owned property for public use.

- The request for annexation is by a city in order to facilitate construction of public improvements or public facilities which otherwise could not be constructed.

- The request for annexation is to remove an unincorporated island or substantially surrounded area.

- The request for annexation is for an industrial or regional commercial project for which a development application has been made and no significant adverse environmental impact will result that cannot be mitigated or overridden by a necessary public purpose. Condition(s) assuring the financing or completion of necessary development infrastructure before completion of annexation shall be made a part of the proposal.

- The annexation is intended to mitigate or otherwise comply with standards/conditions required by another agency with respect to another development annexation.

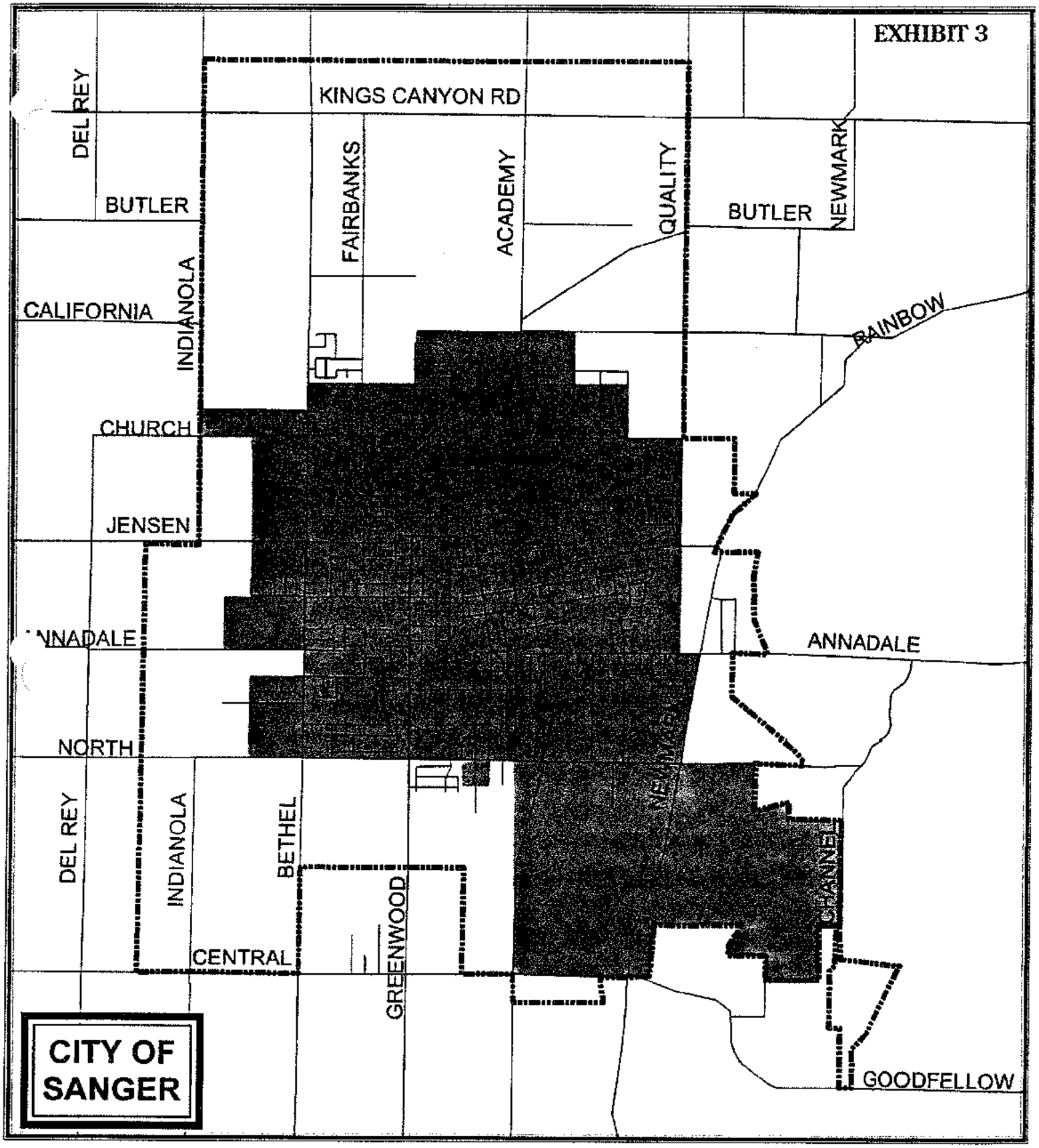
EXHIBIT 2

SANGER

Effective July 1, 2006, the property tax-sharing ratios shall be as follows:

County	City	Effective Date:
53.0%	47.0%	July 1, 2006
53.0%	47.0%	July 1, 2007
53.0%	47.0%	July 1, 2008
53.5%	46.5%	July 1, 2009
54.0%	46.0%	July 1, 2010
54.5%	45.5%	July 1, 2011
55.0%	45.0%	July 1, 2012
56.0%	44.0%	July 1, 2013
57.0%	43.0%	July 1, 2014
58.0%	42.0%	July 1, 2015
59.0%	41.0%	July 1, 2016
60.0%	40.0%	July 1, 2017
61.0%	39.0%	July 1, 2018
62.0%	38.0%	July 1, 2019
63.0%	37.0%	July 1, 2020

CITY OF SANGER



Fresno Local Agency Formation Commission

City of Sanger Sphere of Influence

Legend

Sanger SOI (as of 8/18/04)

City of Sanger

1 0.5 0 1 Miles

N W E S

EXHIBIT 4

SALES TAX REVENUE
SHARING PROPORTION

YEAR	CITY
1	5
2	5
3	5
4	5
5	5
6	5
7	5
8	5
9	5
10	5
11	5
12	5
13	5
14	5
15	5

EXHIBIT 5

TABLE 1: SALES TAX REVENUE ALLOCATION APPLICATION FY 2003-04 DATA

CITY	SALES TAX REVENUE 2002-2003	POPULATION JANUARY 1 2003	PER CAPITA SALES TAX REVENUE 2002-2003	SALES TAX REVENUE 2003-2004	POPULATION JANUARY 1 2004	PER CAPITA SALES TAX REVENUE 2003-2004	MEETS 50% CRITERIA 2002-2003	MEETS 50% CRITERIA 2003-2004	GROWTH OVER 1/2%	SALES TAX REVENUE GROWTH
	A	B	C	D	E	F	G	H	I	J
CLOVIS	$11,068,774	75,977	$145.69	$11,880,894	80,884	$146.89	A	A	YES	7.34%
COALINGA (1)	$657,568	11,505	$57.15	$757,100	11,780	$64.27	B	A	YES	15.14%
FIREBAUGH	$648,375	6,172	$105.05	$560,376	6,585	$85.10	A	A	NO	-13.57%
FOWLER	$586,855	4,273	$137.34	$839,660	4,600	$182.53	A	A	YES	43.08%
FRESNO	$56,899,314	448,453	$126.88	$61,848,563	456,143	$135.59	A	A	YES	8.70%
HURON	$133,441	6,894	$19.36	$147,496	6,969	$21.16	B	B	YES	10.53%
KERMAN	$597,099	9,993	$59.75	$624,057	10,666	$58.51	A	B	YES	4.51%
KINGSBURG	$594,097	10,489	$56.64	$654,516	11,157	$58.66	B	B	YES	10.17%
MENDOTA	$325,350	8,163	$39.86	$342,470	8,656	$39.56	B	B	YES	5.26%
ORANGE COVE	$122,038	8,739	$13.96	$136,415	9,255	$14.74	B	B	YES	11.78%
PARLIER	$194,649	12,167	$16.00	$293,951	12,262	$23.97	B	B	YES	51.02%
REEDLEY	$1,357,474	21,335	$63.63	$1,308,719	21,753	$60.16	A	B	NO	-3.59%
SANGER	$1,464,559	19,894	$73.62	$1,513,208	20,520	$73.74	A	A	YES	3.32%
SAN JOAQUIN	$116,983	3,492	$33.50	$126,836	3,569	$35.54	B	B	YES	8.42%
SELMA	$3,926,954	20,902	$187.87	$4,096,095	21,781	$188.06	A	A	YES	4.31%
SALES TAX REVENUE TOTAL ALL CITIES	$78,693,530	668,448		$85,130,356	686,580					
PER CAPITA ALL CITIES			$117.73			$123.99				
50% MINIMUM			$58.86			$62.00				
UNINCORPORATED POPULATION (1)		172,975			176,062					
TOTAL COUNTY POPULATION		841,423			862,642					

SALES TAX REVENUES: COLUMNS A & D, SOURCE: STATE BOARD OF EQUALIZATION ANNUAL REPORT STATISTICAL APPENDIX; FISCAL YEAR DATA AVAILABLE IN JANUARY OF NEXT CALENDAR YEAR.

POPULATION DATA: COLUMNS B & E, SOURCE: SOURCE STATE DEPARTMENT OF FINANCE JANUARY 1, POPULATION ESTIMATES; AVAILABLE IN MAY OF THAT CALENDAR YEAR.

PER CAPITA SALES TAX ALL CITIES (FY 1996) SUM COLUMNS A & B. THEN DIVIDE THE COLUMN A SUMMED TOTAL BY THE COLUMN B SUMMED TOTAL. THE RESULT IS LISTED IN COLUMN C AS " PER CAPITA CITIES".

PER CAPITA SALES TAX ALL CITIES (FY 1997) SUM COLUMNS D & E. THEN DIVIDE THE COLUMN D SUMMED TOTAL BY THE COLUMN E SUMMED TOTAL. THE RESULT IS LISTED IN COLUMN F AS " PER CAPITA CITIES".

50% MINIMUM CRITERIA: THE PREVIOUS CALCULATIONS ARE DIVIDED BY 2. THEN A COMPARISON OF THIS NUMBER WITH THE NUMBERS IN COLUMNS C & F IS MADE. THE RESULTS ARE REFLECTED IN COLUMNS G & H. "A" MEANS ABOVE, "B" BELOW THE CRITIERIA.

SALES TAX REVENUE GROWTH: COLUMN J; COMPUTE PERCENTAGE GROWTH OF SALES TAX REVENUE; CHANGE IN SALES TAX REVENUE IN COLUMN D COMPARED TO COLUMN A.

GROWTH CRITERIA: IF THE SALES TAX REVENUES OF THE CITY GREW BY AT LEAST 1/2%. THE RESULTS ARE REFLECTED IN COLUMN "I" WITH A "YES".

(1) COALINGA & UNINCORPORATEC YEAR 2003 and 2004 POPULATION ADJUSTED PER AGREEMENT DATED MARCH 23, 1999, SECTION 6. Population data for the adjustment provided by Council of Fresno County Governments.

Appendix B

Traffic Analysis

North Academy Corridor Master Plan

Transportation Impact Analysis Report

Prepared for:

Collins & Schoettler Planning Consultants

Prepared by:

GHD

North Academy Corridor Master Plan

Transportation Impact Analysis Report

Prepared for:

Collins & Schoettler

1002 W. Main Street

Visalia, CA 93291

Prepared by:

GHD

30 River Place West, Suite 220

Fresno, CA 93720

(559) 326-5900

January 2020

BST No. 11152150

2449RPT003.DOCX

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- CITY OF SANGER: PLANNED CIRCULATION NETWORK
- METRO TRAFFIC COUNTS
- SYNCHRO ANALYSIS
- WARRANTS
- MITIGATION

Introduction

This report has been prepared by GHD to provide a Transportation Impact Analysis Report (TIAR) for the proposed annexation of approximately 238 acres on both sides of North Academy between the current City of Sanger City limits boundary (along California Avenue alignment) north to State Route 180 (Kings Canyon Road) in Fresno County, California. Figure 1 identifies the North Academy Corridor Master Plan Area. The term "project" as used in this report refers to buildout of the proposed North Academy Corridor Master Plan.

The City of Sanger is currently undergoing a General Plan Update (GPU), which is scheduled for adoption in 2020. In an effort to increase its retail and mixed land use opportunities, the City of Sanger wishes to extend its boundary northward to include the addition of approximately 94 acres of General Commercial, 80 acres of Mixed-Use, 34 acres of Highway Commercial, and 30 acres of Public Facilities, including two ponding basin sites (26 acres) and one fire station (4 acres).

Consistent with CEQA guidelines, the following traffic scenarios are evaluated as part of this TIAR:

- *Existing* conditions
- *Existing plus Project* conditions
- *Cumulative No Project* conditions
- *Cumulative plus Project* conditions

Existing conditions quantify the current traffic operations at the study locations. Traffic counts were taken on Thursday, January 11, 2018, and on Tuesday, March 5, 2019, by Metro Traffic Data, Inc., to establish typical weekday traffic conditions during the AM and PM peak hours. These peak hour turning movement counts (intersections) and 24-hour volume reports (roadway segments) were conducted during “clear” weather conditions, while schools were in session and during a non-holiday week.

Existing plus Project conditions is an analysis scenario in which traffic impacts associated with buildout of the proposed project are investigated in comparison to the *Existing* conditions scenario. The project-generated peak hour volumes were added to the *Existing* conditions volumes to obtain the *Existing plus Project* traffic volumes.

Cumulative No Project conditions refers to a future analysis scenario that would consider planned growth of the City of Sanger’s General Plan and regional growth. The volumes were developed using Fresno Council of Governments (Fresno COG) Regional Travel Demand Forecast Model and supplemental information regarding proposed land uses of the Bethel Avenue corridor located 1 mile west of Academy Avenue. No growth of the Academy Avenue corridor is assumed under this scenario.

Cumulative *plus Project* conditions is an analysis scenario in which traffic impacts associated with buildout of the proposed project are investigated in comparison to the Cumulative *No Project* conditions scenario. The project-generated peak hour volumes were added to the Cumulative *No Project* condition volumes to obtain the Cumulative *plus Project* traffic volumes.

Study Area

The study area is shown on Figure 1, and includes primary local arterials, collectors and city streets. In addition, State Route 180 (Kings Canyon Road) is included in this analysis.

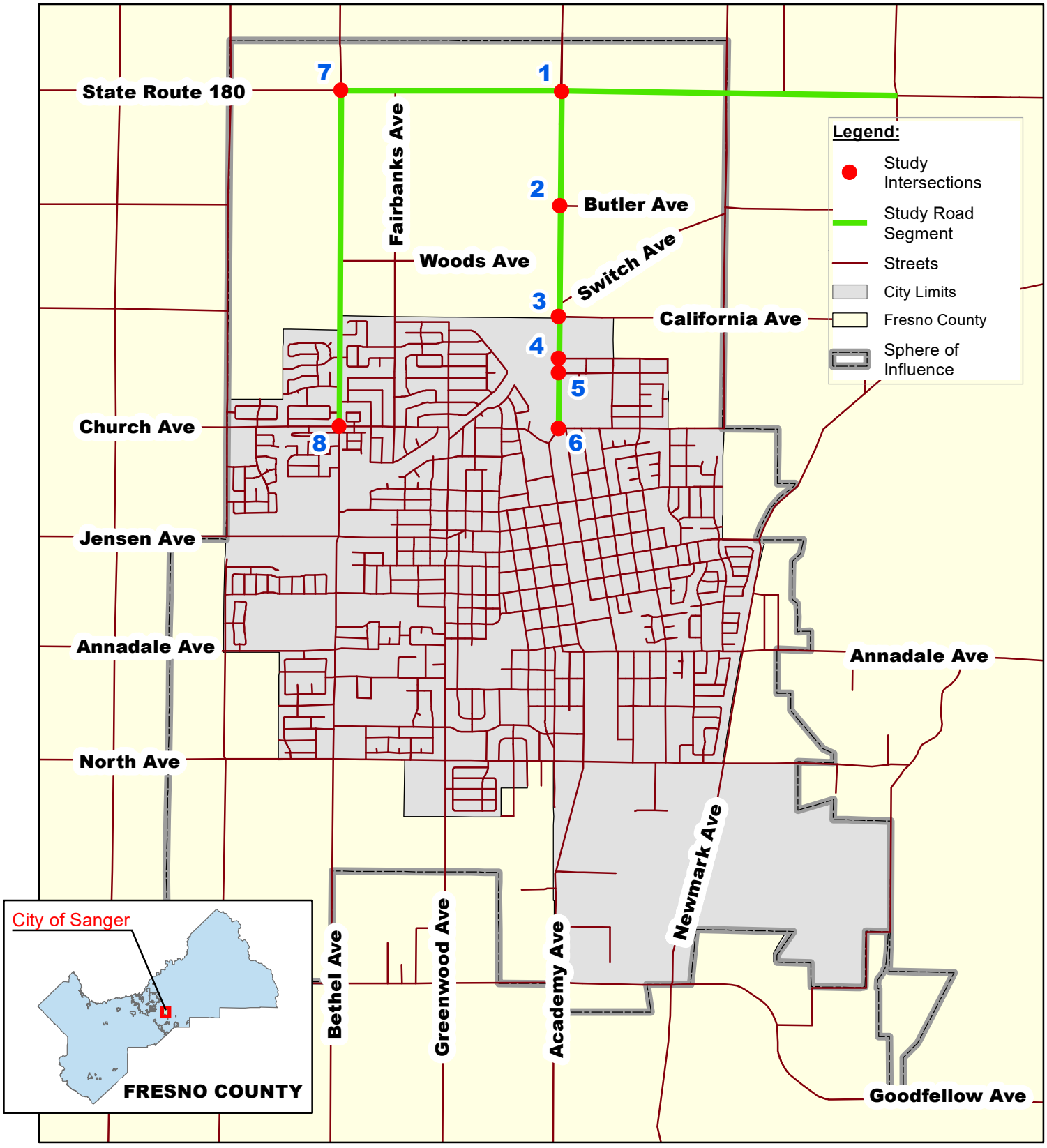

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FIGURE 1

N

City of Sanger
North Academy Corridor Master Plan

Project No. **11152150**
Date: **01/14/2020**

0 0.25 0.5 1
Miles

L:\Prj\2449\G2449\Maps\Working\North Academy Corridor Master Plan.mxd
Print date: 21 Jan 2020 - 16:23

Data source: . Created by: jramirez2

Study Intersections

The following intersections were selected for analysis on the basis of providing primary local and regional access to and from the project site:

1. State Route 180 (Kings Canyon Road)/Academy Avenue
2. Butler Avenue/Academy Avenue
3. California Avenue/Academy Avenue
4. Geary Avenue/Academy Avenue
5. Florence Avenue/Academy Avenue
6. Church Avenue/Academy Avenue
7. State Route 180 (Kings Canyon Road)/Bethel Avenue
8. Church Avenue/Bethel Avenue

Study Roadway Segments

In addition, the following roadway segments were selected for analysis:

1. State Route 180 (Kings Canyon Road) between Bethel Avenue and Academy Avenue
2. State Route 180 (Kings Canyon Road) between Academy Avenue and Newmark Avenue
3. Academy Avenue between Church Avenue and Butler Avenue
4. Academy Avenue between Butler Avenue and State Route 180 (Kings Canyon Road)
5. Bethel Avenue between Church Avenue and Florence Avenue
6. Bethel Avenue between Florence Avenue and State Route 180 (Kings Canyon Road)

Existing Conditions

Existing conditions analysis establishes the baseline traffic conditions. *Existing* conditions is the analysis scenario in which current operations are quantified at the study intersections.

Transportation System

State Route 180 (Kings Canyon Road) is a regional highway facility that is located north of Sanger. This route begins in Fresno and heads east to Sequoia/Kings Canyon National Parks. Near Sanger, State Route 180 is a four-lane divided expressway that carries an annual average daily traffic (AADT) count of approximately 16,200.[1] Currently, limited highway commercial services are provided at the State Route 180/Academy Avenue intersection for regional travelers and local residents. The future concept for State Route 180/Academy Avenue includes a modern interchange.

Academy Avenue is a north/south arterial located in central Sanger and bisects the community. Academy Avenue is a regional route in Fresno County that extends from the State Route 99 in the south to State Route 168 in the north. Through the City of Sanger, Academy Avenue is a four-lane divided and undivided arterial between Central Avenue and California Avenue and is a

[1] 2017, State of California, Department of Transportation, Traffic Operations Division. Average calculated between Back AADT and Ahead AADT at Post Mile 71.61.

designated truck route. North of the City limits, Academy Avenue extends approximately one (1) mile to State Route 180, which includes the primary study area of this project. Class II bike lanes exist or are proposed along this corridor within the City limits and rural sections of Fresno County. Academy Avenue serves many land uses in the Sanger area, including residential, commercial, retail, industrial, medical and agricultural.

Bethel Avenue is a north/south aligned arterial generally consisting of a four-lane divided roadway between North and Florence Avenues in western Sanger. North of Florence Avenue, Bethel Avenue is a two-lane roadway and continues northward and extends through State Route 180. In the General Plan, Bethel Avenue is designated as a future Principal Arterial and truck route in Sanger. Also a regional route in Fresno County, in its entirety, Bethel Avenue extends from State Route 99 (near Kamm Avenue) in the south to Ashlan Avenue in the north. In Sanger, Bethel Avenue serves a variety of residential, institutional (educational, religious), commercial, retail and industrial land uses.

Butler Avenue is currently a rural, two-lane road that extends from Academy Avenue east where it dead ends at Quality Avenue. Existing land uses on this street include single-family residences, light industrial and agricultural uses. However, in the future it is designated as a two-lane collector in the City of Sanger's Draft 2019 General Plan between Indianola Avenue and Quality Avenue. According to the City Standards, collector right-of-way widths range from 60 to 92 feet. This width would typically accommodate a minimum of two travel lanes and may include bike lanes, parking and sidewalks. A typical collector street cross section is shown below.

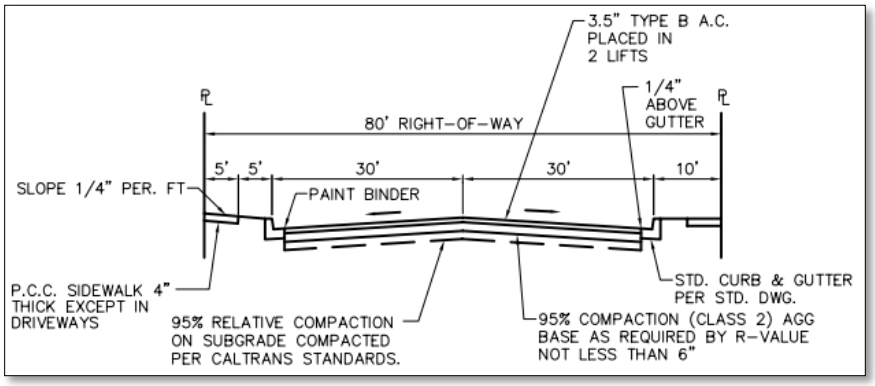


FIGURE 2: COLLECTOR STREET TYPICAL CROSS-SECTION

For this study, Butler Avenue is proposed to be extended to the west of Academy Avenue and improved to provide access to proposed future commercial development along the North Academy Avenue corridor.

California Avenue is an east/west aligned future arterial in the northern portion of Sanger. California Avenue is currently a two-lane, undivided roadway from McCall Avenue to Indianola Avenue in northwest Sanger and between Academy Avenue in central Sanger and Rainbow Avenue in eastern Sanger. California Avenue is planned to provide east/west travel in northern Sanger and will be constructed to arterial standards in the City limits (north of the railroad tracks) and fill in the existing gap between Indianola and Academy Avenues. However, the ultimate future alignment has not be determined. This roadway currently serves residential and agricultural land uses.

Geary Avenue and ***Florence Avenue*** are two-lane local streets that runs east-west from Academy Avenue east to Harrison Avenue. Both of these streets primarily serve single-family residences and are adjacent to agricultural lands. In addition, a community park is located south of Florence Avenue near Faller Avenue.

Church Avenue is an important east/west undivided two-lane collector that serves Sanger between Bethel Avenue and Greenwood Avenue and from Hill Avenue to Quality Avenue. With a pavement width of 56 feet, this route serves a school, residences, businesses and a church. As a result of the mixed land uses and wide road, sections along Church Avenue will provide Class II Bike Lanes. In addition, a two-way left-turn lane (TWLTL) and on-street parking are planned for this corridor.

Bicycle & Pedestrian Facilities

Currently, Academy Avenue is designated as a Class II Bike Lane between California Avenue and State Route 180. It is the only existing bike route within the study area, as shown in Figure 3 from the *City of Sanger General Plan*. However, when Butler and California Avenues are extended to include through trips across Academy Avenue, adequate right-of-way will be allow for future east-west bike lanes. Bethel Avenue is classified as a Class II Buffered Bike Lane north of California Avenue. Additionally, the *Fresno County Regional Active Transportation Plan* identifies a planned Class I Trail/Bikeway along the current irrigation ditch and within the current transmission line crossing diagonally through the study area.

FIGURE 3: EXISTING BIKE MAP (PARTIAL)

Figure 4 identifies existing sidewalks and trails south of the study area. An existing trail is found adjacent to Oak Avenue/Acacia Avenue and several sidewalks are found within the City limits. An additional trail and sidewalks are proposed and shown in Figure 4.

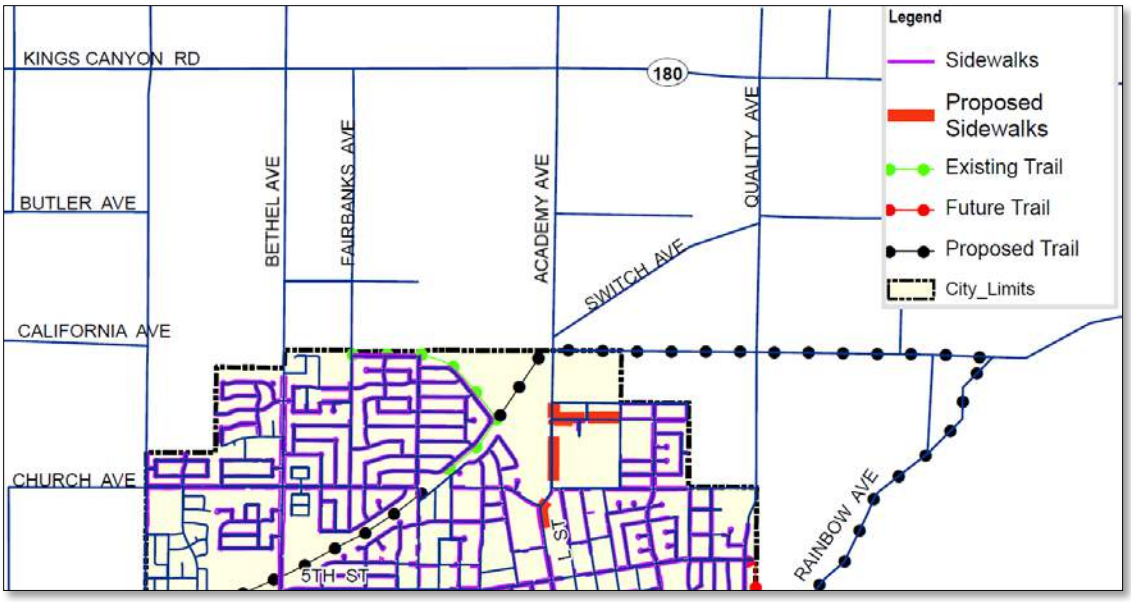


FIGURE 4: EXISTING SIDEWALK & TRAIL MAP (PARTIAL)

Transit

Limited transit routes/bus stops are found along the North Academy Avenue study area. In fact, Figure 5 shows that the nearest existing transit stop is located at City Hall (7th Street). However, as the study area is developed, there will be an opportunity to connect North Academy Avenue to other parts of the City and/or County as new destinations are developed.

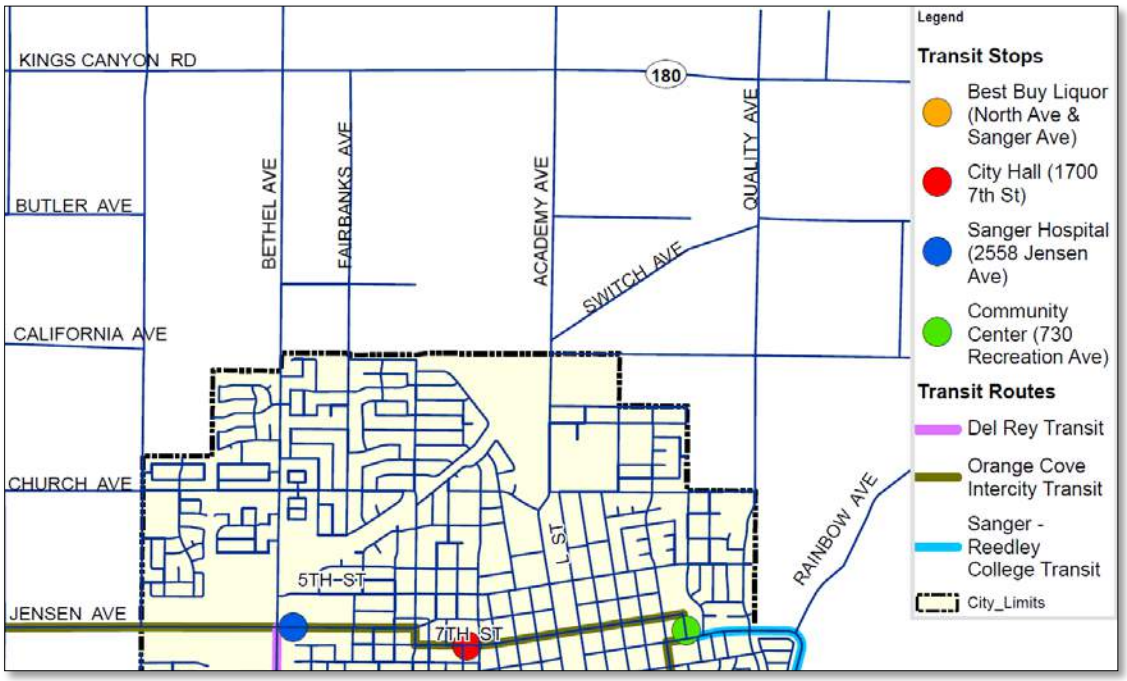


FIGURE 5: TRANSIT MAP (PARTIAL)

Existing Traffic Volumes

Intersection turning movement counts were collected on Thursday, January 11, 2018, and on Tuesday, March 5, 2019, at the study intersections during weekday AM (7:00 - 9:00 AM) and PM (4:00 - 6:00 PM) peak periods. Daily traffic counts along the Academy Avenue corridor were also collected on this day. The study area highway facilities along the State Route 180 mainline segments were evaluated using 2017 annual average daily traffic (AADT) counts collected from Caltrans.

Technical Analysis Parameters

This TIAR provides a "planning level" evaluation of traffic conditions, which is considered sufficient for CEQA/NEPA clearance purposes. The "planning level" evaluation incorporates appropriate heavy vehicle adjustment factors, peak-hour factors, and signal lost-time factors (as needed). LOS operations have been determined using the *Highway Capacity Manual (HCM), Sixth Edition* methodologies for determining intersection delay, incorporating the aforementioned factors. The following subsections outline the methodology and analysis parameters used to quantify traffic operations at study intersections.

Intersection LOS Methodologies

Levels of Service (LOS) have been calculated for all intersection control types using the methods documented in the Transportation Research Board Publication *HCM Sixth Edition.* Traffic operations have been quantified through the determination of "Level of Service" (LOS). LOS is a qualitative measure of traffic operating conditions, whereby a letter grade A through F is assigned to an intersection or roadway segment representing progressively worsening traffic conditions.

For signalized intersections and All-Way-Stop-Controlled (AWSC) intersection, the intersection delays and LOS are average values for all intersection movements. For Two-Way-Stop-Controlled (TWSC) intersections, the intersection delays and LOS is representative of those for the worst-case movement. LOS definitions for different types of intersection controls are outlined in Table 1. Average daily traffic (ADT) thresholds shown in Table 2 are based upon the HCM and are Fresno COG's currently adopted LOS methodology for roadway segments and utilized by the member agencies of Fresno COG, including the City of Sanger.

Synchro Modeling

The *Synchro 6th Edition* software suite by *Trafficware* has been used to implement the *HCM Sixth Edition* analysis methodologies. The peak hour capacity tables contained in this report present the intersection delay and LOS estimates as calculated using the *Synchro* software.

TABLE 1
LEVEL OF SERVICE (LOS) CRITERIA FOR INTERSECTIONS

Level of Service	Type of Flow	Delay	Maneuverability	Stopped Delay/Vehicle		
				Signalized	Un signalized	All-Way Stop
A	Stable Flow	Very slight delay. Progression is very favorable, with most vehicles arriving during the green phase not stopping at all.	Turning movements are easily made, and nearly all drivers find freedom of operation.	<10.0	<10.0	<10.0
B	Stable Flow	Good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles.	>10.0 and <20.0	>10.0 and <15.0	>10.0 and <15.0
C	Stable Flow	Higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted	>20.0 and <35.0	>15.0 and <25.0	>15.0 and <25.0
D	Approaching Unstable Flow	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	Maneuverability is severely limited during short periods due to temporary back-ups.	>35.0 and <55.0	>25.0 and <35.0	>25.0 and <35.0
E	Unstable Flow	Generally considered to be the limit of acceptable delay. Indicative of poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.	There are typically long queues of vehicles waiting upstream of the intersection.	>55.0 and <80.0	>35.0 and <50.0	>35.0 and <50.0
F	Forced Flow	Generally considered to be unacceptable to most drivers. Often occurs with over saturation. May also occur at high volume-to-capacity ratios. There are many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.	Jammed conditions. Back-ups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream back-up conditions.	>80.0	>50.0	>50.0

References: Highway Capacity Manual, Sixth Edition

TABLE 2
LEVEL OF SERVICE (LOS) CRITERIA FOR ROADWAY SEGMENTS

Roadway Segment Type	Total Two-Way Average Daily Traffic (ADT)				
	LOS A	LOS B	LOS C	LOS D	LOS E
4-Lane Divided Expressway	23,670	28,130	30,800	37,200	40,000
6-Lane Divided Arterial (with left-turn lane)	32,000	38,000	43,000	49,000	54,000
4-Lane Divided Arterial (with left-turn lane)	22,000	25,000	29,000	32,500	36,000
4-Lane Undivided Arterial (no left-turn lane)	18,000	21,000	24,000	27,000	30,000
2-Lane Arterial (with left-turn lane)	11,000	12,500	14,500	16,000	18,000
2-Lane Arterial (no left-turn lane)	9,000	10,500	12,000	13,500	15,000
2-Lane Collector/Local Street	6,000	7,500	9,000	10,500	12,000

Notes:

All volumes are approximate and assume ideal roadway characteristics. Actual threshold volumes for each LOS listed above may vary depending on a variety of factors including curvature and grade, intersection or interchange spacing, driveway spacing, percentage of trucks and other heavy vehicles, travel lane widths, signal timing characteristics, on-street parking, volume of cross traffic and pedestrians, etc. Traffic exceeding LOS E thresholds is LOS F.

Reference: Highway Capacity Manual

Level of Service Standard

The *City of Sanger General Plan Circulation Element* has designated LOS "C" as the minimum acceptable LOS standard on city facilities. In this report, a peak-hour of LOS "C" is taken as the threshold for acceptable traffic operations at all study intersections. All intersection turning movement volumes and LOS worksheets will be provided in a separate Technical Appendix.

Although Caltrans has not designated a LOS standard, Caltrans' Guide for the Preparation of Traffic Impact Studies (December 2002) indicates that when the LOS of a State highway facility falls below the LOS "C/D" cusp in rural areas and the LOS "D/E" cusp in the Urban Areas, any additional traffic may have a significant impact. When existing State highway facilities are operating at higher levels of service than noted above, 20-year forecasts or general plan build-out analysis for the facility should be considered to establish equitable project contributions to local development impact fee programs that address cumulative traffic impacts.

Standards of Significance

To determine whether "significance" should be associated with unsignalized intersection LOS, a supplemental traffic signal warrant analysis was also performed. The signal warrant criteria employed for this study are presented in the *California Manual on Uniform Traffic Control Devices* (CAMUTCD). Specifically, this study utilized the Peak-Hour Warrant 3. Though utilization of this warrant may indicate that signalization would be required, the final decision to provide this improvement should be based on further studies utilizing the additional warrants presented in CAMUTCD.

Existing Conditions

Existing Intersection Operations

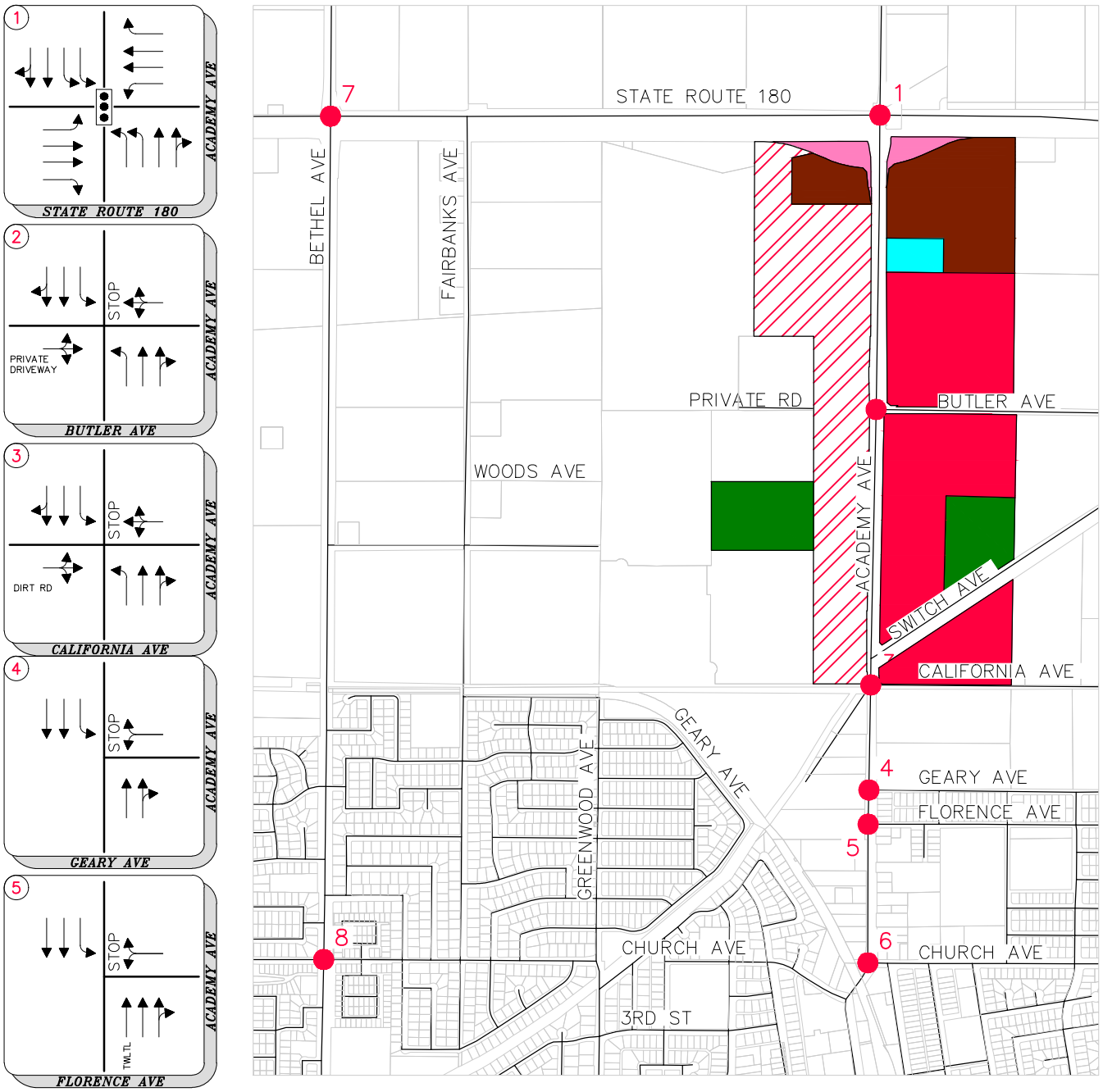
Existing AM and PM peak hour intersection traffic operations were quantified using the intersection lane geometrics and control (Figure 6) and existing peak hour volumes (Figure 7) and the existing. Table 7 contains a summary of the *Existing* conditions study intersections LOS results.

TABLE 3
EXISTING: INTERSECTION LEVEL OF SERVICE

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour			PM Peak Hour		
				Delay	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]
1	Academy Ave/Kings Canyon Rd (SR 180)	Signal	C	10.4	B	--	10.8	B	--
2	Academy Ave/Butler Ave	TWSC	C	14.4	B	No	14.1	B	No
3	Academy Ave/California Ave	TWSC	C	13.7	B	No	15.7	C	No
4	Academy Ave/Geary Ave	TWSC	C	10.3	B	No	10.0	B	No
5	Academy Ave/Florence Ave	TWSC	C	11.7	B	No	13.9	B	No
6	Academy Ave/Church Ave	TWSC	C	12.8	B	No	19.3	C	No
7	Bethel Ave/Kings Canyon Rd (SR 180)	Signal	C	13.9	B	--	14.4	B	--
8	Bethel Ave/Church Ave	Signal	C	10.6	B	--	6.0	B	--

Notes:
1. TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal
3. Warrant = Based on California MUTCD Warrant 3

As shown in Table 3, all of the study intersections operate at acceptable LOS "C" or better. In addition, none of the non-signalized intersections currently meet the California MUTCD Peak Hour Warrant 3 under *Existing* conditions.



NORTH

1,500 0 1,500

1 inch =1,500 ft.

CITY OF SANGER
NORTH ACADEMY CORRIDOR

EXISTING LANE GEOMETRICS & CONTROL

Project No. 11152150
Report No. -
Date: 01/14/2020

FIGURE NO. 6

Filename: L:\Prj\2449\T2449\T2449TG001.dwg

GHD_SOURCE

NORTH

1,500 0 1,500

1 inch =1,500 ft.

CITY OF SANGER
NORTH ACADEMY CORRIDOR

EXISTING PEAK HOUR VOLUMES

Project No. 11152150
Report No. -
Date: 01/14/2020

FIGURE NO. 7

Filename: L:\Prj\2449\T2449\T2449TG001.dwg

GHD_SOURCE

Existing Roadway Segment Operations

Existing highway and roadway segments were quantified using existing ADT values posted from the Caltrans website and the daily traffic counts collected in January 2018. Table 4 contains a summary of the roadway segments LOS results under *Existing* conditions.

TABLE 4
EXISTING: ROADWAY SEGMENTS LEVEL OF SERVICE

Roadway Segment	Limits	No. of Lanes	Facility Type	AADT	LOS
State Route 180	Bethel Avenue – Academy Avenue	4	Divided Expressway	18,600	A
State Route 180	Academy Avenue – Newmark Avenue	4	Divided Expressway	15,300	A
Academy Avenue	Church Avenue – Butler Avenue	4	Principal Arterial	12,520	A
Academy Avenue	Butler Avenue – State Route 180	4	Principal Arterial	13,000	A
Bethel Avenue	Church Avenue – Florence Avenue	4	Arterial	7,290	A
Bethel Avenue	Florence Avenue – State Route 180	2	Collector	8,260	C

As shown in Table 4, all of the study roadway segments are currently operating at acceptable conditions under *Existing* conditions.

Existing plus Project

Project Description

As identified in the introduction, the City of Sanger is currently undergoing a General Plan Update (GPU), which is scheduled for adoption in 2020. In an effort to increase its retail and mixed land use opportunities, the City of Sanger wishes to extend its boundary northward to include the addition of approximately 94 acres of General Commercial, 80 acres of Mixed-Use (residential *and* commercial), 34 acres of Highway Commercial, and 30 acres of Public Facilities, including two ponding basin sites (26 acres) and one fire station (4 acres). Figure 8 presents the proposed land use for this project, which also included the proposed roadway network.

Trip Generation

The analysis assumes that the North Academy Avenue corridor will provide an additional 238 acres of mixed-use development (commercial and residential), as shown in Figure 8. Following determination of proposed development in raw acres, several assumptions were made to convert values into square feet in order to calculate trip generation. These assumptions include using a floor area ratio (FAR) of 0.2, which includes a 5.8% reduction for roads. Table 5 identifies proposed project trip generation for the North Academy Avenue Corridor project.

TABLE 5
PROJECT TRIP GENERATION

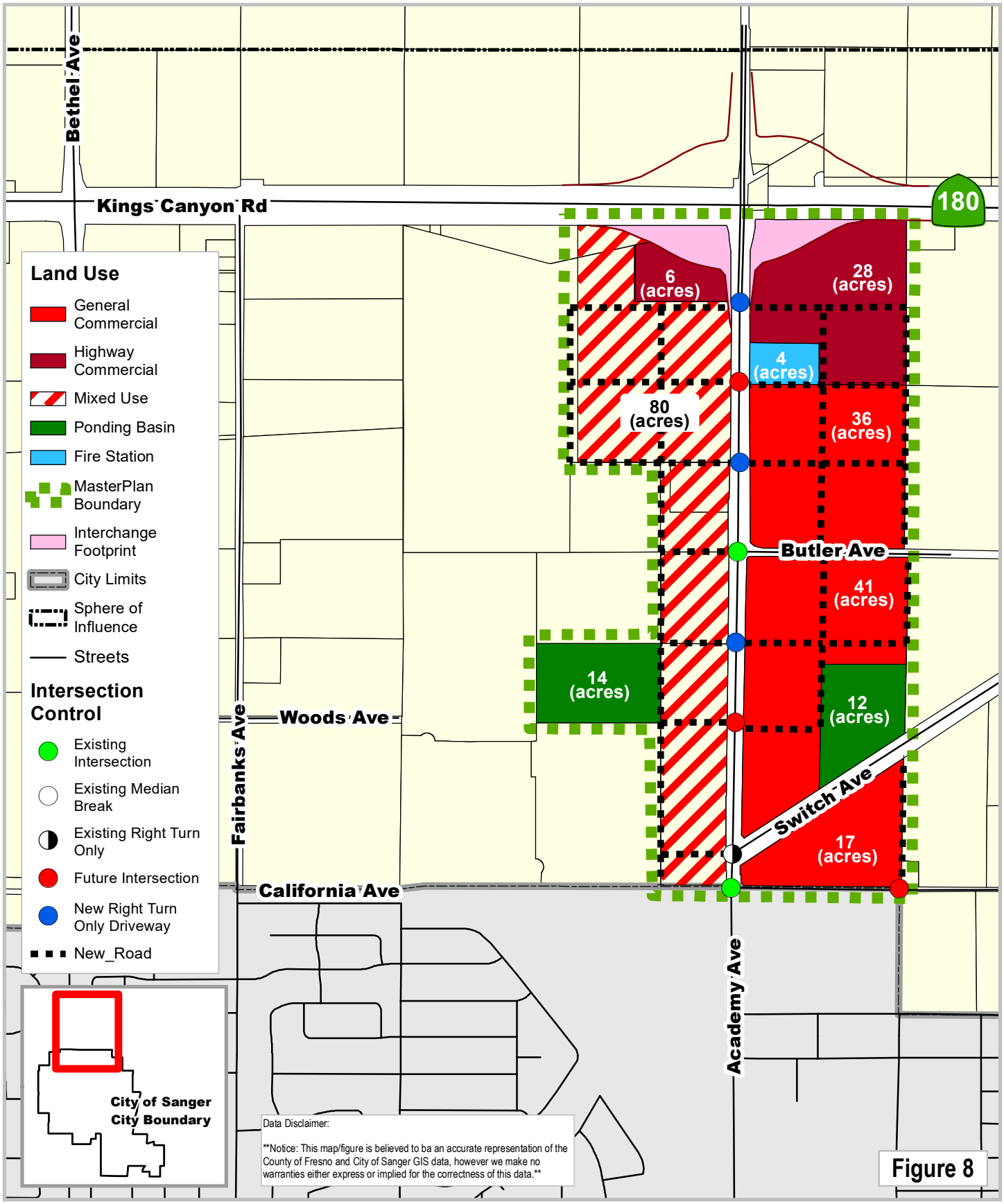
			AM Peak Hour Trip			PM Peak Hour Trip		
			Rate/Unit			Rate/Unit		
Land Use Category (ITE Code)	Unit	Rate/Unit	Total	In %	Out %	Total	In %	Out %
Multifamily Housing (Low Rise) (220)	D.U.	6.31	0.45	0.20	0.80	0.58	0.64	0.36
Shopping Center (820)	KSF	37.75	0.94	0.62	0.38	3.81	0.48	0.52
Fire and Rescue Station (575)*	Site	1	--	0.51	0.49	--	0.46	0.54
			AM Peak Hour Trip			PM Peak Hour Trip		
Project Name	D.U./KSF	Daily Trips	Total	In	Out	Total	In	Out
West of Academy Ave								
Mixed Use								
Residential	80	505	36	7	29	46	30	17
Commercial	86	3,256	81	50	31	329	158	171
Highway Commercial	11	407	10	6	4	41	20	21
Sub Total		4,168	127	64	63	416	207	209
East of Academy Ave								
Fire / Rescue Station	1		37	19	18	13	6	7
General Commercial	169	6,376	159	98	60	644	309	335
Highway Commercial	50	1,899	47	29	18	192	92	100
Sub Total		8,275	243	147	96	848	407	441
Total		**12,443**	**370**	**211**	**160**	**1,264**	**614**	**650**

** Limited ITE data; information from a fire station in San Diego by LLG (2009)*

As shown in Table 5, the project is expected to generate approximately 12,443 daily trips, including 370 AM peak hour trips, and 1,264 PM peak hour trips.

Trip Distribution

The project trip distribution was developed using the Fresno COG Regional Travel Demand Forecast Model, supplemented by the daily and peak hour traffic counts collected, adjacent and planned land uses and geographical location of the site. A majority of the trips gravitate toward State Route 180 (Kings Canyon Road) via Academy Avenue.



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City of Sanger

North Academy Corridor Planned Circulation Network

Project No. **11152150**
Date: **01/14/2020**

0 500 1,000 1,500 2,000
Feet

L:\Prj\2449\G2449\Maps\Working\Academy Annexation Plan.mxd
Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California IV FIPS 0404 Feet

Data source: Street layers - Fresno County Public Shape files; Land Use - City of Sanger . Created by: jramirez2

Project Access & Trip Assignment

Beyond trip distribution, trip assignment determines which driveways, and in turn which surface streets (Academy Avenue, Butler Avenue, etc.) users will utilize to get to and from their destinations. Logical travel paths are based upon location of land use, geometrics of intersections/driveways and trip distribution.

Existing plus Project Intersection Operations

Existing plus Project conditions analyze the proposed growth of the planned circulation network of the City of Sanger. Existing road geometric characteristics were used to analyze the *Existing plus Project* scenario. *Existing plus Project* lane geometrics are presented in Figure 9. Intersection traffic volumes were developed by superimposing proposed project volumes to *Existing* conditions. The resulting *Existing plus Project* traffic volumes are presented in Figure 10. Table 6 presents the projected LOS for the *Existing plus Project* conditions.

TABLE 6
EXISTING PLUS PROJECT: INTERSECTION LEVEL OF SERVICE

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour			PM Peak Hour		
				Delay[4]	LOS	Warrant Met?[3]	Delay	LOS	Warrant Met?[3]
1	Academy Ave/Kings Canyon Rd (SR 180)	Signal	C	10.4	B	--	11.8	B	--
2	Academy Ave/Butler Ave	TWSC	C	16.0	C	No	21.0	C	No
3	Academy Ave/California Ave	TWSC	C	16.3	C	No	21.7	C	No
4	Academy Ave/Geary Ave	TWSC	C	10.7	B	No	10.5	B	No
5	Academy Ave/Florence Ave	TWSC	C	12.4	B	No	15.1	C	No
6	**Academy Ave/Church Ave**	**TWSC**	**C**	14.1	B	No	**26.8**	**D**	**No**
7	Bethel Ave/Kings Canyon Rd (SR 180)	Signal	C	12.5	B	--	13.3	B	--
8	Bethel Ave/Church Ave	Signal	C	10.2	B	--	5.8	B	--

Notes:

1. TWSC = Two Way Stop Control

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal

3. Warrant = Based on California MUTCD Warrant 3

As shown in bold type in Table 6, two (2) PM peak hour intersection deficiencies are projected to operate at unacceptable LOS D or worse conditions under *Existing plus Project* conditions. Further, the intersection at Academy Avenue/Butler Avenue meets the CA MUTCD Warrant 3 under peak hour conditions. The remaining deficient projected intersection does not meet the CA MUTCD Warrant 3. All Mitigation measures are discussed in a subsequent section of this report.

NORTH

1,500 0 1,500

1 inch =1,500 ft.

CITY OF SANGER
NORTH ACADEMY CORRIDOR

EXISTING plus PROJECT LANE GEOMETRICS & CONTROL

Project No. 11152150
Report No. -
Date: 01/14/2020

FIGURE NO. 9

Filename: L:\Prj\2449\T2449\T2449TG001.dwg

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NORTH

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1 inch =1,500 ft.

CITY OF SANGER
NORTH ACADEMY CORRIDOR

EXISTING plus PROJECT CONDITIONS PEAK HOUR VOLUMES

Project No. 11152150
Report No. -
Date: 01/14/2020

FIGURE NO. 10

Filename: L:\Prj\2449\T2449\T2449TG001.dwg

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Existing plus Project Roadway Segment Operations

Existing plus Project roadway segments for daily trips were quantified by superimposing proposed project volumes to the *Existing Conditions* ADT values. Table 7 contains a summary of the *Existing plus Project* conditions roadway segments LOS results.

TABLE 7
EXISTING PLUS PROJECT: ROADWAY SEGMENTS LEVEL OF SERVICE

Roadway Segment	Limits	No. of Lanes	Facility Type	AADT	LOS
State Route 180	Bethel Avenue – Academy Avenue	4	Divided Expressway	21,600	A
State Route 180	Academy Avenue – Newmark Avenue	4	Divided Expressway	15,760	A
Academy Avenue	Church Avenue – Butler Avenue	4	Principal Arterial	14,950	A
Academy Avenue	Butler Avenue – State Route 180	4	Principal Arterial	17,640	A
Bethel Avenue	Church Avenue – Florence Avenue	4	Arterial	7,290	A
Bethel Avenue	Florence Avenue – State Route 180	2	Collector	8,260	C

As presented in Table 7, all of the study roadway segments are expected to operate at acceptable LOS under *Existing plus Project* conditions.

Cumulative Conditions

Cumulative conditions refer to 2035 general plan development of the City of Sanger General Plan. During analysis of this project, additional proposed land uses have been identified along the Bethel Avenue corridor, one mile west of the project. This proposed development, however, is not in the current General Plan and therefore has been included as part of *Cumulative* base conditions.

Development along the east side of Bethel Avenue between California Avenue and State Route 180 proposes mixed uses (both residential and commercial), neighborhood commercial and medium and high density residential uses. Development on this corridor is anticipated to provide approximately 645 dwelling units and 66,000 square feet of commercial uses.

The Fresno Council of Governments (Fresno COG) Regional Travel Demand Forecast Model for 2015 and 2035 conditions were utilized to develop a growth rate for a 20 year period (2015 to 2035). The annual growth rate per study intersection and road was then applied over a 20 year period and added to the existing turning movement counts to develop Cumulative conditions.

In addition, the future roadway network includes new roads, i.e., extension of Butler and California Avenues between Indianola Avenue and Academy Avenue and other connections. These roads are shown in the General Plan and will provide improved east-west circulation in northern Sanger.

Cumulative No Project Traffic Operations

For *Cumulative No Project* conditions, lane geometrics and control are presented in Figure 11 and peak hour turning movement volumes are shown in Figure 12. Table 8 contains summaries of the resulting *Cumulative No Project* intersection LOS conditions.

TABLE 8
CUMULATIVE NO PROJECT CONDITIONS: INTERSECTION LEVEL OF SERVICE

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour			PM Peak Hour		
				Delay[4]	LOS	Warrant Met?[3]	Delay[4]	LOS	Warrant Met?[3]
1	Academy Ave/Kings Canyon Rd (SR 180)	Signal	C	13.3	B	--	14.3	B	--
2	**Academy Ave/Butler Ave**	**TWSC**	**C**	**42.0**	**E**	**No**	**205.7**	**F**	**No**
3	**Academy Ave/California Ave**	**TWSC**	**C**	**OVR**	**F**	**Yes**	**OVR**	**F**	**Yes**
4	Academy Ave/Geary Ave	TWSC	C	11.4	B	No	15.7	C	No
5	Academy Ave/Florence Ave	TWSC	C	13.7	B	No	22.7	C	No
6	**Academy Ave/Church Ave**	**TWSC**	**C**	**43.1**	**E**	**Yes**	**OVR**	**F**	**Yes**
7	**Bethel Ave/Kings Canyon Rd (SR 180)**	**Signal**	**C**	**48.4**	**D**	**--**	**38.7**	**D**	**--**
8	Bethel Ave/Church Ave	Signal	C	9.7	A	--	5.1	A	--

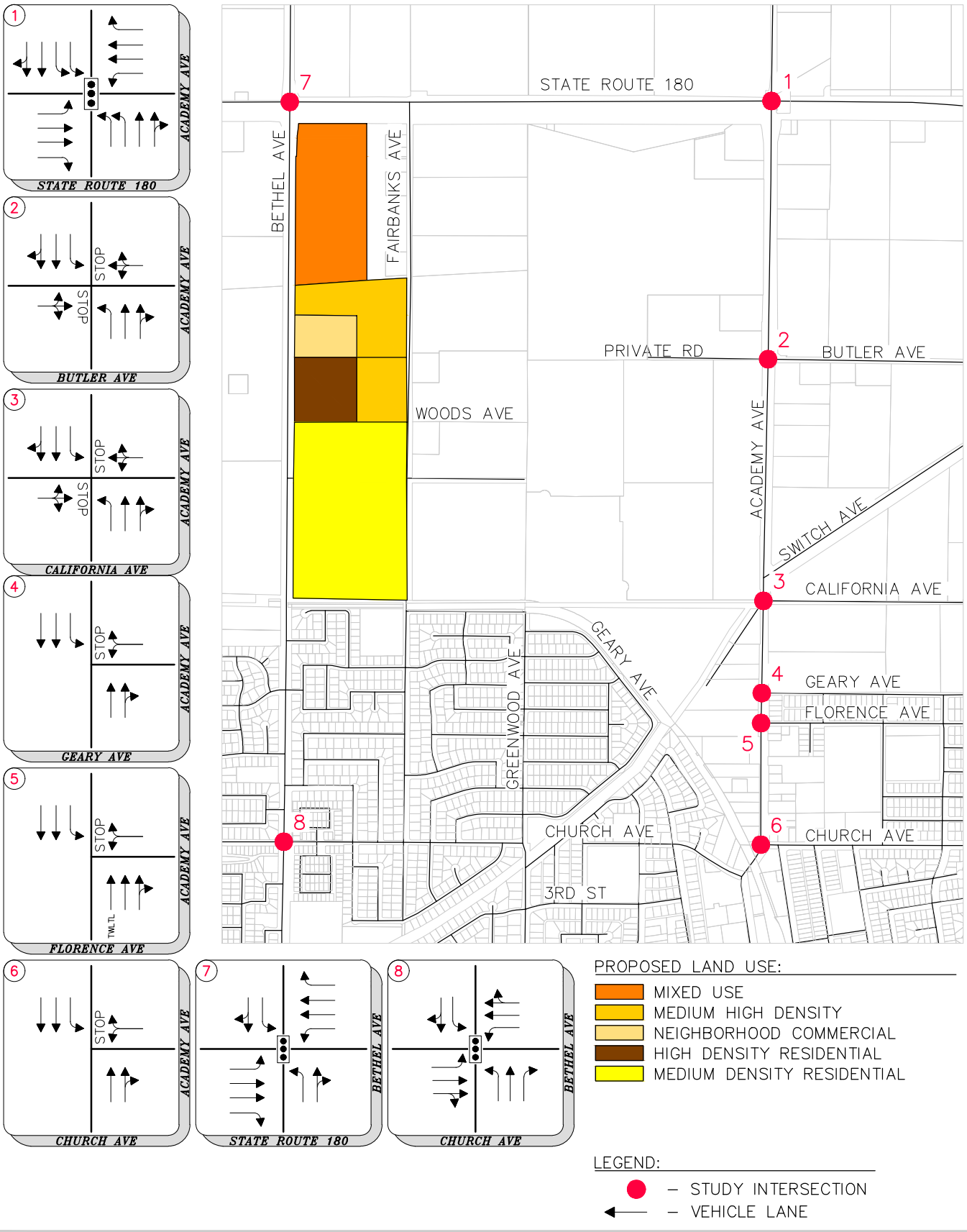
Notes:

1. TWSC = Two Way Stop Control

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal

3. Warrant = Based on California MUTCD Warrant 3

4. OVR = Delay exceeds 300 seconds



CITY OF SANGER
NORTH ACADEMY CORRIDOR

CUMULATIVE LANE GEOMETRICS & CONTROL

Project No. 11152150
Report No. -
Date: 01/14/2020

FIGURE NO. 11

Filename: L:\Prj\2449\T2449\T2449TG001.dwg

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CITY OF SANGER
NORTH ACADEMY CORRIDOR

CUMULATIVE NO-PROJECT PEAK HOUR VOLUMES

Project No. 11152150
Report No. -
Date: 01/14/2020

FIGURE NO. 12

Filename: L:\Prj\2449\T2449\T2449TG001.dwg

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As presented in bold type on Table 8, 4 intersection deficiencies are projected to operate at unacceptable LOS E or worse conditions under *Cumulative No Project* conditions during both the AM/PM peak hour periods. Additionally, the intersections of Academy Avenue/California Avenue and Academy Avenue/Church Avenue – both AM/PM peak hours – are anticipated to meet the CA MUTCD Warrant 3. All Mitigation measures are discussed in a subsequent section of this report.

Cumulative No Project Roadway Segment Operations

Cumulative No Project roadway segment operations daily were quantified using the Fresno COG Regional Travel Demand Forecast Model and growth rates. Table 9 contains a summary of the *Cumulative No Project* conditions roadway segments LOS results.

TABLE 9
CUMULATIVE NO PROJECT: ROADWAY SEGMENTS LEVEL OF SERVICE

Roadway Segment	Limits	No. of Lanes	Facility Type	AADT	LOS
State Route 180	**Bethel Avenue – Academy Avenue**	**4**	**Divided Expressway**	**39,770**	**E**
State Route 180	Academy Avenue – Newmark Avenue	4	Divided Expressway	28,160	C
Academy Avenue	Church Avenue – Butler Avenue	4	Principal Arterial	22,200	B
Academy Avenue	Butler Avenue – State Route 180	4	Principal Arterial	21,890	A
Bethel Avenue	Church Avenue – Florence Avenue	4	Principal Arterial	10,790	A
Bethel Avenue	Florence Avenue – State Route 180	4	Principal Arterial	19,160	B

As presented in bold type in Table 9, all of the study roadway segments currently or are expected to operate at acceptable LOS in the *Cumulative No Project* conditions with the exception of a roadway segment along State Route 180 between Bethel and Academy Avenues. This segment is forecasted to operate at LOS E conditions. Mitigation measures are discussed in a subsequent section on this report.

Cumulative plus Project

Cumulative plus Project Intersection Operations

Cumulative plus Project conditions were developed by adding proposed project volumes to *Cumulative No Project* intersection traffic volumes. Intersection geometrics assumed are the same as *Cumulative "No Project".* Figure 13 identifies *Cumulative plus Project* lane geometrics and control and Figure 14 shows the resulting *Cumulative plus Project* AM and PM peak hour intersection traffic volumes. Table 10 presents the results of the *Cumulative plus Project* condition analysis.

TABLE 10
CUMULATIVE PLUS PROJECT CONDITIONS: INTERSECTION LEVEL OF SERVICE

#	Intersection	Control Type[1,2]	Target LOS	AM Peak Hour			PM Peak Hour		
				Delay[4]	LOS	Warrant Met?[3]	Delay[4]	LOS	Warrant Met?[3]
1	Academy Ave/Kings Canyon Rd (SR 180)	Signal	C	13.7	B	--	17.0	B	--
2	**Academy Ave/Butler Ave**	**TWSC**	**C**	**47.6**	**E**	**No**	**OVR**	**F**	**Yes**
3	**Academy Ave/California Ave**	**TWSC**	**C**	**OVR**	**F**	**Yes**	**OVR**	**F**	**Yes**
4	Academy Ave/Geary Ave	TWSC	C	11.6	B	No	16.4	C	No
5	**Academy Ave/Florence Ave**	**TWSC**	**C**	14.1	B	No	**124.7**	**F**	**No**
6	**Academy Ave/Church Ave**	**TWSC**	**C**	**54.4**	**F**	**Yes**	**215.9**	**F**	**Yes**
7	**Bethel Ave/Kings Canyon Rd (SR 180)**	**Signal**	**C**	**48.4**	**D**	--	**38.7**	**D**	--
8	Bethel Ave/Church Ave	Signal	C	9.7	A	--	5.1	A	--

Notes:

1. TWSC = Two Way Stop Control

2. LOS = Delay based on worst minor street approach for TWSC intersections, average of all approaches for Signal

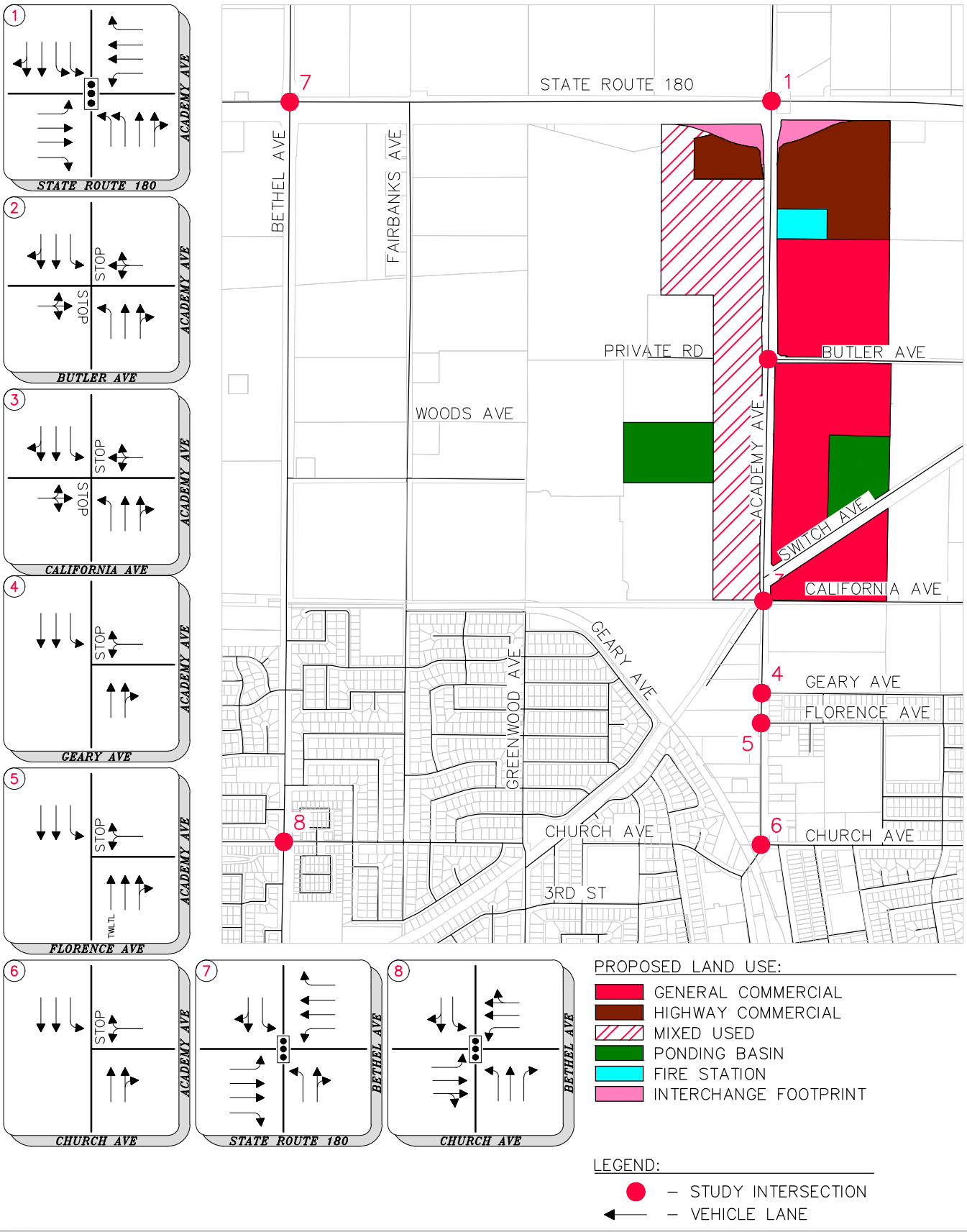
3. Warrant = Based on California MUTCD Warrant 3

4. OVR = Delay exceeds 300 seconds

As presented in bold type in Table 10, five (5) intersection deficiencies are projected to operate at unacceptable LOS E or worse conditions under *Cumulative plus Project* conditions. Further, four (4) intersections along Academy Avenue (California, Florence, Butler and Church Avenues) are anticipated to meet the CA MUTCD Warrant 3 (Peak Hour) under AM and/or PM peak periods. All Mitigation measures are discussed in a subsequent section of this report.

Cumulative plus Project Roadway Segment Operations

Cumulative plus Project freeway segments and ramp segments for AM and PM peak hours were quantified by superimposing proposed project traffic over the *Cumulative No Project* traffic volumes. Table 11 shows *Cumulative plus Project* conditions roadway segments LOS results.



NORTH

1,500 0 1,500

1 inch =1,500 ft.

CITY OF SANGER
NORTH ACADEMY CORRIDOR

CUMULATIVE plus PROJECT LANE GEOMETRICS & CONTROL

Project No. 11152150
Report No. -
Date: 01/14/2020

FIGURE NO. 13

Filename: L:\Prj\2449\T2449\T2449TG001.dwg

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NORTH

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1 inch =1,500 ft.

CITY OF SANGER
NORTH ACADEMY CORRIDOR

CUMULATIVE plus PROJECT PEAK HOUR VOLUMES

Project No. 11152150
Report No. -
Date: 01/14/2020

FIGURE NO. 14

Filename: L:\Prj\2449\T2449\T2449TG001.dwg

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TABLE 11
CUMULATIVE PLUS PROJECT: ROADWAY SEGMENTS LEVEL OF SERVICE

Roadway Segment	Limits	No. of Lanes	Facility Type	AADT	LOS
State Route 180	**Bethel Avenue – Academy Avenue**	**4**	**Divided Expressway**	**43,800**	**F**
State Route 180	Academy Avenue – Newmark Avenue	4	Divided Expressway	28,550	C
Academy Avenue	Church Avenue – Butler Avenue	4	Principal Arterial	25,540	C
Academy Avenue	Butler Avenue – State Route 180	4	Principal Arterial	28,290	C
Bethel Avenue	Church Avenue – Florence Avenue	4	Principal Arterial	11,190	A
Bethel Avenue	Florence Avenue – State Route 180	4	Principal Arterial	19,560	A

As presented in bold type in Table 11, one (1) roadway segment is projected to operate at unacceptable LOS D or worse conditions in the *Cumulative plus Project* conditions scenario. Mitigation measures are discussed in the following section of this report.

Recommended Mitigation Measures

This section presents project impacts at the study intersections based upon the results of the analysis presented in this report. Mitigation measures have been developed for worst case scenarios to achieve acceptable LOS conditions. Although traffic signals have been recommended, other intersection improvements, such as roundabouts, should be considered.

However, mitigation measures identified in this section did not include operational analysis of roundabouts due to additional analysis that would be required. Should roundabouts be considered on any state facilities, it is recommended that an Intersection Control Evaluation (ICE), per Caltrans standards, be assessed to determine if it is a feasible mitigation measure for this corridor. Figure 15, at the end of this sections, identifies Mitigated Lane Geometrics and Control under *Cumulative plus Project* conditions.

Existing Deficiencies & Mitigations

Under *Existing* conditions, all of the study intersections and roadways operate at acceptable LOS "C" or better conditions. Therefore, mitigation measures are not recommended under this scenario.

Existing plus Project Deficiencies & Mitigations

Under *Existing plus Project* conditions, one (1) intersection is projected to operate at unacceptable LOS D or worse conditions. As such the following mitigation measures are recommended.

Academy Avenue/Church Avenue (#6): Install a traffic signal. This intersection is anticipated to operate at LOS D conditions during the PM peak hour; however, it is not anticipated to meet the CA MUTCD Warrant 3 (Peak Hour). With installation of a traffic, this intersection is forecasted to operate at LOS A with 5.0 seconds of delay.

#	Intersection	Control Type	Delay	LOS
6	Academy Ave/Church Ave	Signal	5.0	A

It should be noted that the draft General Plan identifies a traffic signal or roundabout along the Academy Avenue corridor under future conditions. The City may want to monitor this intersection in the future to determine when this intersection meets the CA MUTCD Warrant 3.

Cumulative No Project Deficiencies & Mitigations

Under *Cumulative No Project* conditions three (3) AM and three (3) PM intersection deficiencies are projected to operate at unacceptable LOS E or worse conditions under *Cumulative No Project* conditions. Further, the intersections of Academy Avenue/California Avenue and Academy Avenue/Church Avenue – both AM/PM peak hours – are anticipated to meet the CA MUTCD Warrant 3.

Academy Avenue/Butler Avenue (#2): Install traffic signal. This intersection is projected to operate at LOS F conditions during the PM peak hour and is not anticipated to meet the CA MUTCD Warrant 3 (Peak Hour). With installation of a traffic signal and extension of Butler Avenue

as a two-lane roadway, this intersection is forecasted to operate at LOS A with 5.0 seconds of delay.

#	Intersection	Control Type	Delay	LOS
2	Academy Ave/Butler Ave	Signal	5.0	A

Academy Avenue/California Avenue (#3): Install traffic signal. This intersection is forecasted to operate at LOS F conditions during the PM peak hour and is anticipated to meet the CA MUTCD Warrant 3 (Peak Hour). With installation of a traffic signal and extension of California Avenue as a two-lane roadway, this intersection is projected to operate at LOS A with 13.5 seconds of delay.

#	Intersection	Control Type	Delay	LOS
3	Academy Ave/California Ave	Signal	13.5	B

Academy Avenue/Church Avenue (#6): Install traffic signal. This intersection is expected to operate at LOS F conditions during the PM peak hour and is anticipated to meet the CA MUTCD Warrant 3 (Peak Hour). With installation of a traffic signal, this intersection is anticipated to operate at LOS A with 9.2 seconds of delay.

#	Intersection	Control Type	Delay	LOS
6	Academy Ave/Church Ave	Signal	9.2	A

Roadway Segments

State Route 180 between Bethel Avenue and Academy Avenue: At this location, State Route 180 will continue to be planned as an expressway, as indicated in Caltrans' State Route 180 Transportation Concept Report. Potential concepts have identified at-grade and grade-separated access at these intersections (Bethel and Academy Avenues). It is important that Caltrans and the City of Sanger preserve right-of-way at these intersections to accommodate for future growth along the State Route 180 Corridor. Auxiliary lanes should also be considered in the future.

Cumulative plus Project Deficiencies & Mitigations

Under *Cumulative plus Project* conditions, three (3) AM and four (4) PM peak hour intersection deficiencies are projected to operate at unacceptable LOS D conditions under *Cumulative plus Project* conditions. Further, three intersections along Academy Avenue (California, Butler and Church Avenues) are anticipated to meet the CA MUTCD Warrant 3 (Peak Hour) under AM and/or PM peak periods.

Academy Avenue/Butler Avenue (#2): Install traffic signal. This intersection is forecasted to operate at LOS F conditions during the PM peak hour and is anticipated to meet the CA MUTCD Warrant 3 (Peak Hour). With installation of a traffic signal and extension of Butler Avenue as a two-lane roadway, this intersection is projected to operate at LOS A with 5.3 seconds of delay.

#	Intersection	Control Type	Delay	LOS
2	Academy Ave/Butler Ave	Signal	5.3	A

Academy Avenue/California Avenue (#3): Install traffic signal. This intersection is projected to operate at LOS F conditions during the PM peak hour and is anticipated to meet the CA MUTCD Warrant 3 (Peak Hour). With installation of a traffic signal and extension of California Avenue as a two-lane roadway, this intersection is forecasted to operate at LOS B with 15.9 seconds of delay.

#	Intersection	Control Type	Delay	LOS
3	Academy Ave/California Ave	Signal	15.9	B

Academy Avenue/Florence Avenue (#5): Install traffic signal. This intersection is projected to operate at LOS F conditions during the PM peak hour. With installation of a traffic signal, this intersection is forecasted to operate at LOS B with 5.0 seconds of delay.

#	Intersection	Control Type	Delay	LOS
3	Academy Ave/Florence Ave	Signal	5.0	A

Academy Avenue/Church Avenue (#6): Install traffic signal and widen the southbound approach to accommodate dual left turn lanes and two receiving lanes within the current right-of-way. This intersection is forecasted to operate at LOS F conditions during the PM peak hour and is anticipated to meet the CA MUTCD Warrant 3 (Peak Hour). With installation of a traffic signal and lane widening, this intersection is projected to operate at LOS A with 15.7 seconds of delay.

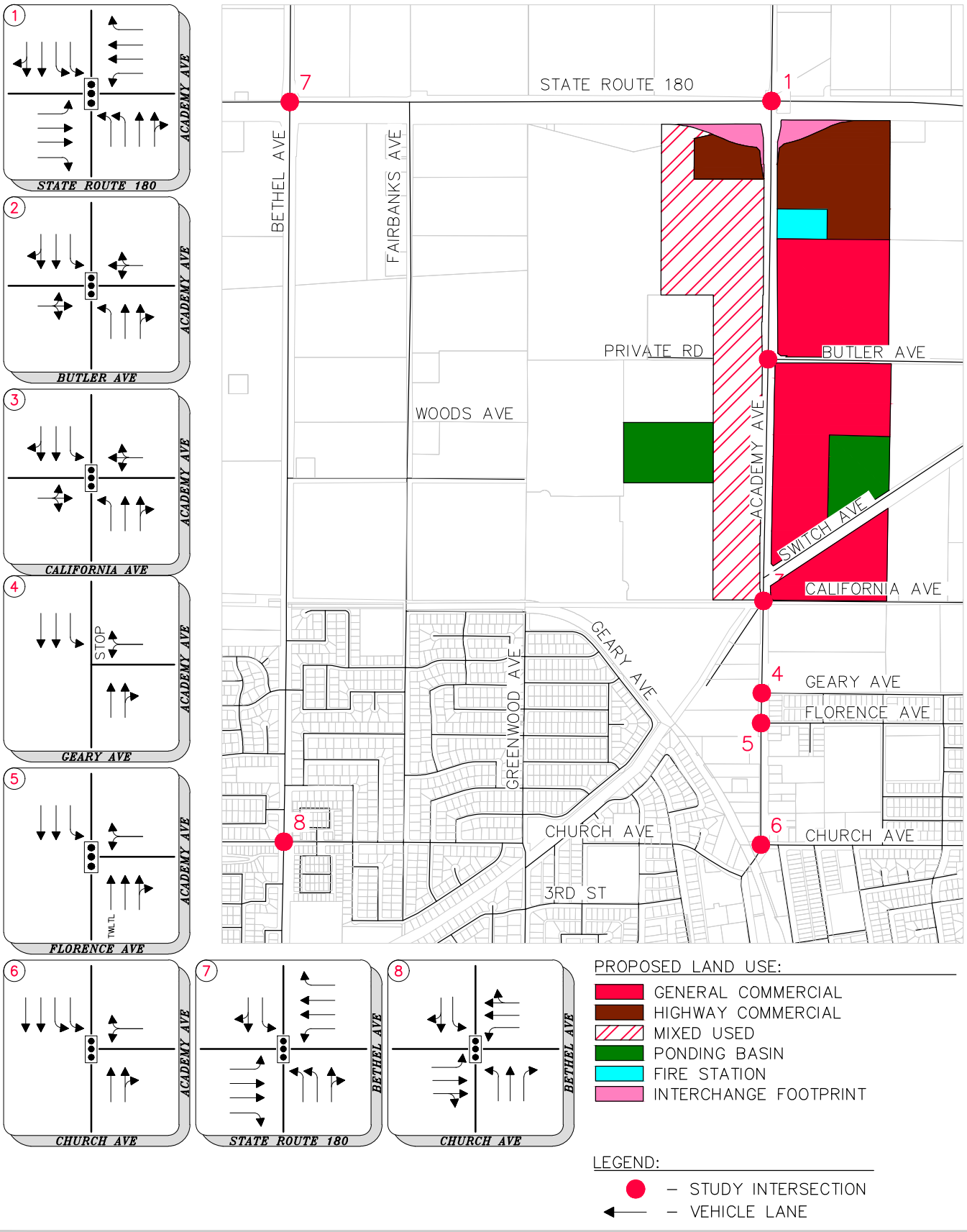
#	Intersection	Control Type	Delay	LOS
6	Academy Ave/Church Ave	Signal	15.7	B

State Route 180/Bethel Avenue (#7): Widen the northbound approach to accommodate dual left turn lanes. This intersection is forecasted to operate at LOS D conditions during the PM peak hour. With installation of a traffic signal, this intersection is projected to operate at LOS C with 33.8 seconds of delay.

#	Intersection	Control Type	Delay	LOS
6	Academy Ave/Church Ave	Signal	33.8	B

Roadway Segments

State Route 180 between Bethel Avenue and Academy Avenue: At this location, State Route 180 will continue to be planned as an expressway, as indicated in Caltrans' State Route 180 Transportation Concept Report. Potential concepts have identified at-grade and grade-separated access at these intersections (Bethel and Academy Avenues). It is important that Caltrans and the City of Sanger preserve right-of-way at these intersections to accommodate for future growth along the State Route 180 Corridor. Auxiliary lanes should also be considered in the future.



NORTH

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1 inch =1,500 ft.

CITY OF SANGER
NORTH ACADEMY CORRIDOR

CUMULATIVE plus PROJECT LANE GEOMETRICS & CONTROL (MITIGATION)

Project No. 11152150
Report No. -
Date: 01/14/2020

FIGURE NO. 15

Filename: L:\Prj\2449\T2449\T2449TG001.dwg

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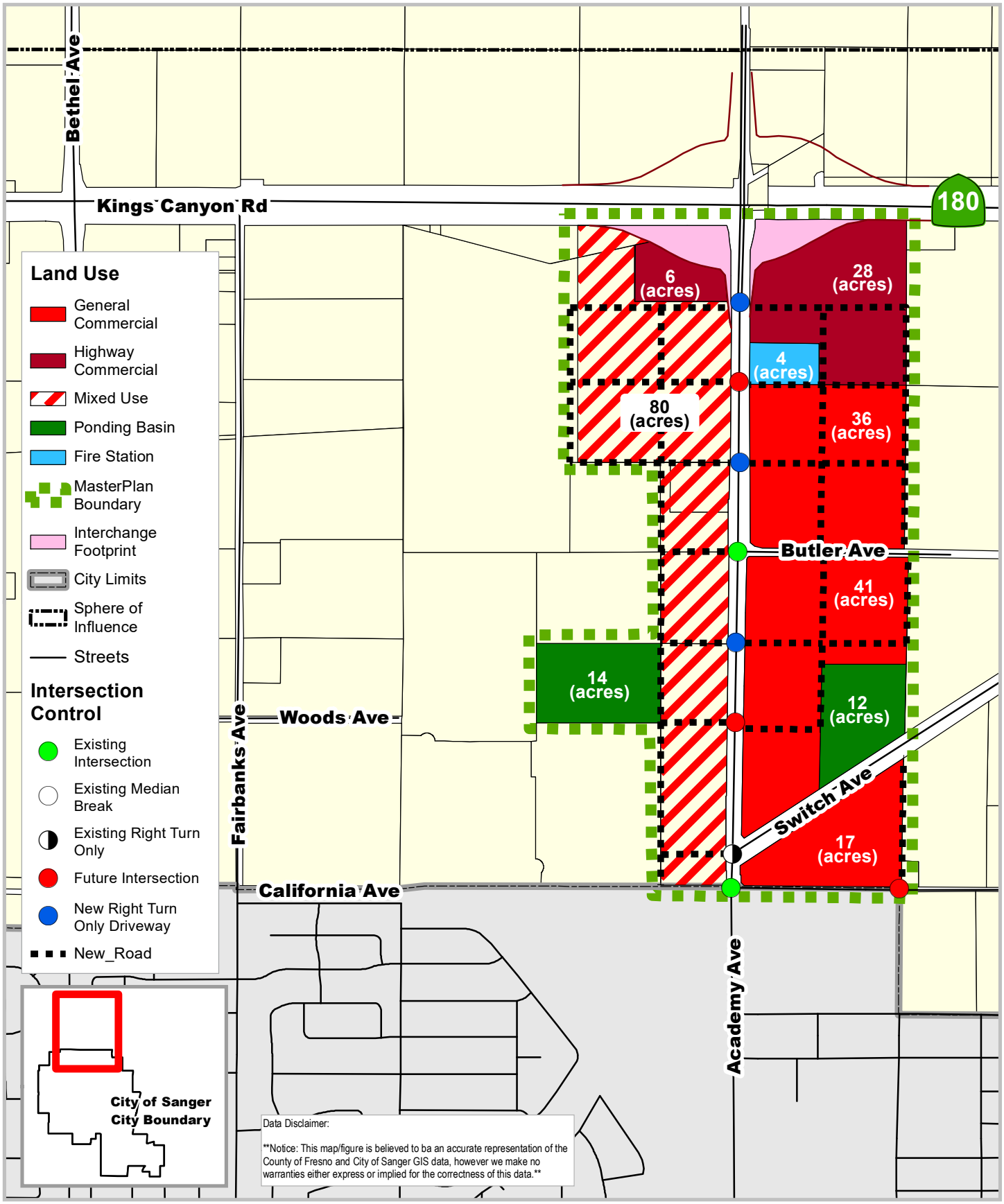
Appendices

- CITY OF SANGER: PLANNED CIRCULATION NETWORK
- METRO TRAFFIC COUNTS
- SYNCHRO ANALYSIS
- WARRANTS
- MITIGATION

Appendices:

City of Sanger: Planned Circulation Network



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City of Sanger

North Academy Corridor Planned Circulation Network

N

Project No. **11152150**
Date: **01/14/2020**

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Feet

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Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California IV FIPS 0404 Feet

Data source: Street layers - Fresno County Public Shape files; Land Use - City of Sanger . Created by: jramirez2

Appendices:
Metro Traffic Counts

Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:

OMNI-Means
943 Reserve Drive
Roseville, CA 95678

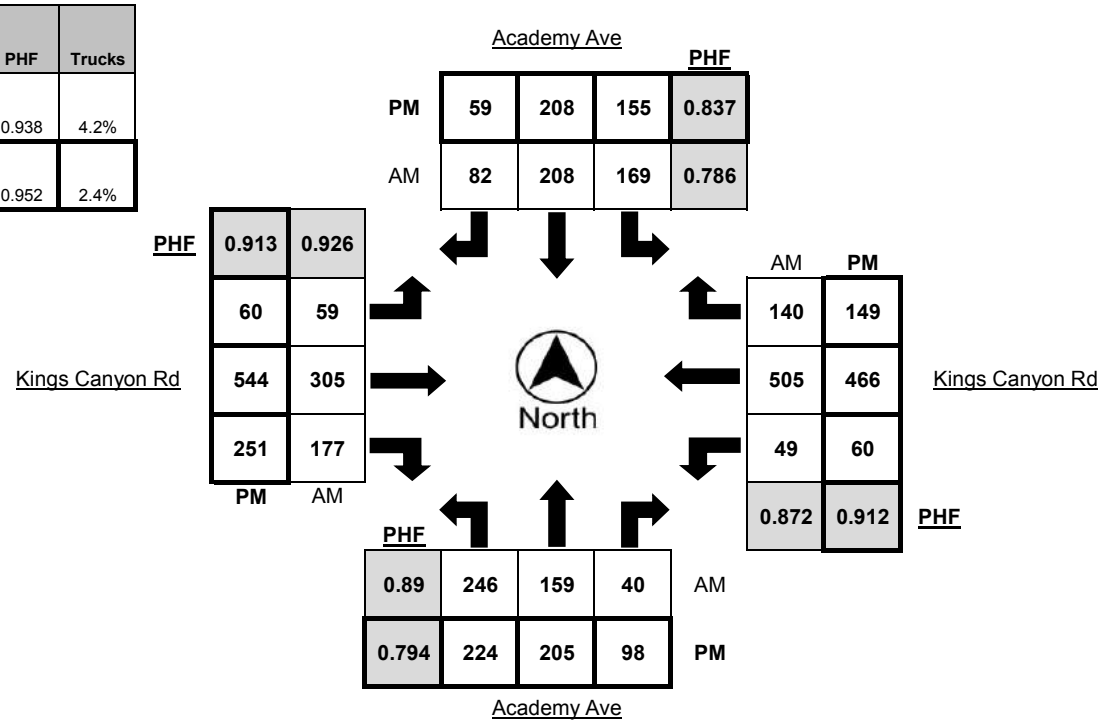
LOCATION Kings Canyon Rd @ Academy Ave
LATITUDE 36.7360
COUNTY Fresno
LONGITUDE -119.5563
COLLECTION DATE Thursday, January 11, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	78	19	15	0	35	37	18	1	8	80	42	9	6	124	28	8
7:15 AM - 7:30 AM	63	30	10	4	41	57	24	3	11	88	47	8	9	157	33	10
7:30 AM - 7:45 AM	62	51	7	4	71	55	20	1	14	76	32	12	12	118	45	10
7:45 AM - 8:00 AM	57	32	8	5	29	47	15	5	18	68	56	11	16	121	36	9
8:00 AM - 8:15 AM	64	46	15	2	28	49	23	0	16	73	42	3	12	109	26	3
8:15 AM - 8:30 AM	57	24	7	3	44	58	12	7	10	79	37	13	9	110	28	6
8:30 AM - 8:45 AM	46	29	14	6	39	53	20	4	11	92	40	11	9	111	23	11
8:45 AM - 9:00 AM	49	26	13	4	26	31	16	3	7	76	51	5	7	108	19	10
TOTAL	**476**	**257**	**89**	**28**	**313**	**387**	**148**	**24**	**95**	**632**	**347**	**72**	**80**	**958**	**238**	**67**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	69	54	29	1	49	42	17	1	18	111	72	2	12	119	36	5
4:15 PM - 4:30 PM	73	58	29	1	37	44	11	2	18	105	68	5	14	128	41	10
4:30 PM - 4:45 PM	49	40	29	3	50	61	15	3	13	141	55	4	8	102	37	8
4:45 PM - 5:00 PM	35	31	17	2	27	58	15	2	17	153	64	6	17	124	44	5
5:00 PM - 5:15 PM	67	76	23	2	41	45	18	1	12	145	64	4	21	112	27	2
5:15 PM - 5:30 PM	44	40	26	1	27	42	21	2	18	165	74	4	13	113	40	4
5:30 PM - 5:45 PM	35	45	19	0	38	55	13	2	15	120	70	5	14	102	29	5
5:45 PM - 6:00 PM	37	45	25	0	29	40	16	2	16	101	66	5	6	91	27	7
TOTAL	**409**	**389**	**197**	**10**	**298**	**387**	**126**	**15**	**127**	**1041**	**533**	**35**	**105**	**891**	**281**	**46**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:15 AM - 8:15 AM	246	159	40	15	169	208	82	9	59	305	177	34	49	505	140	32
4:15 PM - 5:15 PM	224	205	98	8	155	208	59	8	60	544	251	19	60	466	149	25

	PHF	Trucks
AM	0.938	4.2%
PM	0.952	2.4%



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
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Turning Movement Report

Prepared For:

OMNI-Means
943 Reserve Drive
Roseville, CA 95678

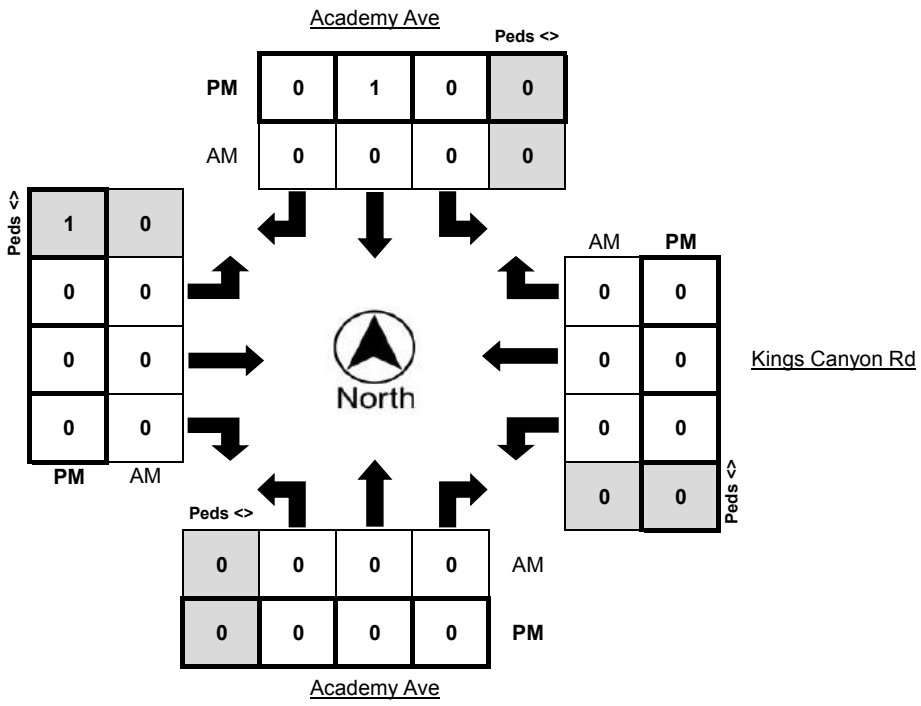
LOCATION Kings Canyon Rd @ Academy Ave
LATITUDE 36.7360
COUNTY Fresno
LONGITUDE -119.5563
COLLECTION DATE Thursday, January 11, 2018
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:15 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 5:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	1	1



Metro Traffic Data Inc.
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Hanford, CA 93230

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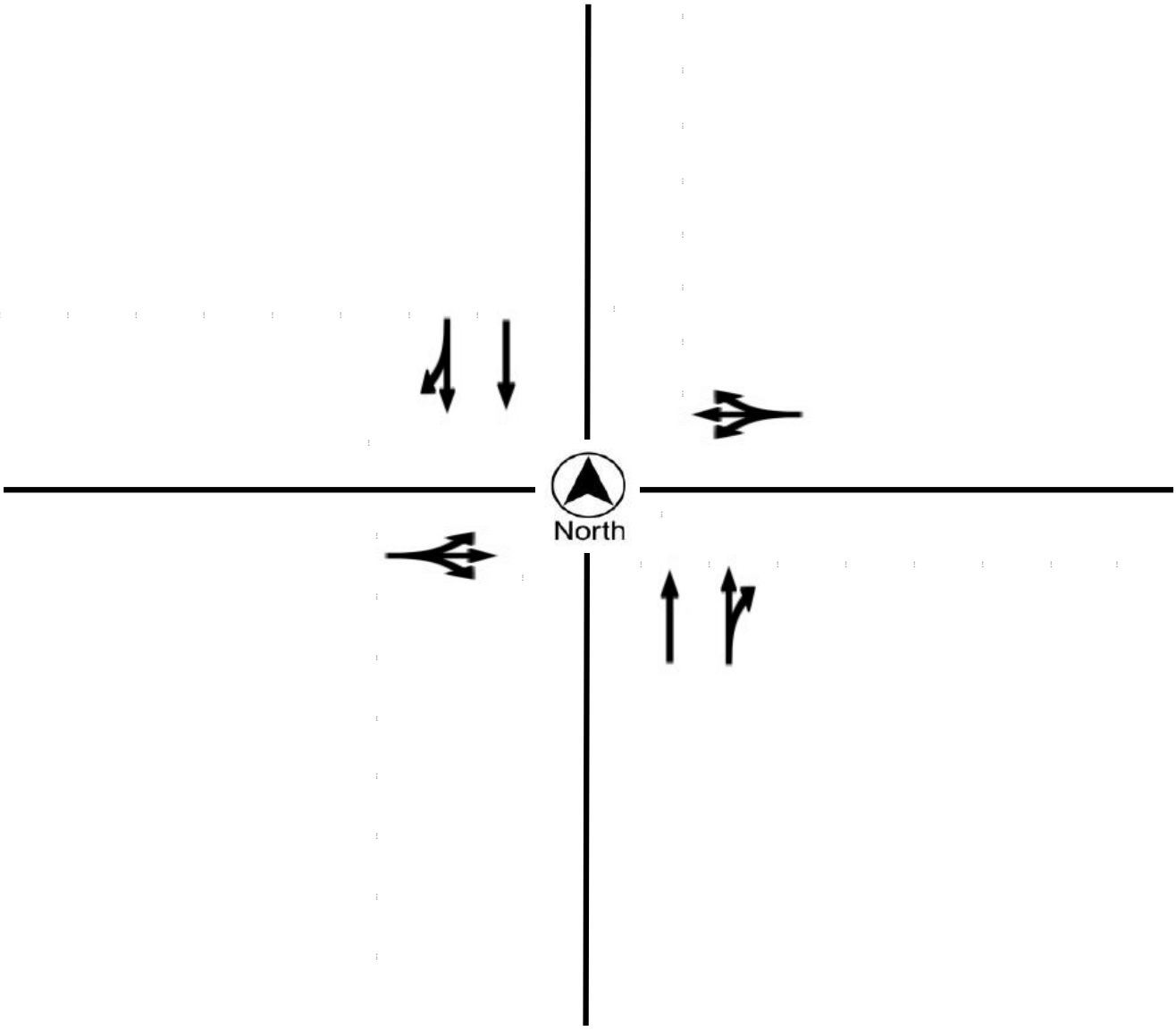
Turning Movement Report

Prepared For:

OMNI-Means
943 Reserve Drive
Roseville, CA 95678

LOCATION	Kings Canyon Rd @ Academy Ave	**N/S STREET**	Academy Ave
COUNTY	Fresno	**E/W STREET**	Kings Canyon Rd
COLLECTION DATE	Thursday, January 11, 2018	**WEATHER**	Clear
CYCLE TIME	125 Seconds	**CONTROL TYPE**	Signal

COMMENTS All approaches have protected left turns.



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Turning Movement Report

Prepared For:

OMNI-Means
943 Reserve Drive
Roseville, CA 95678

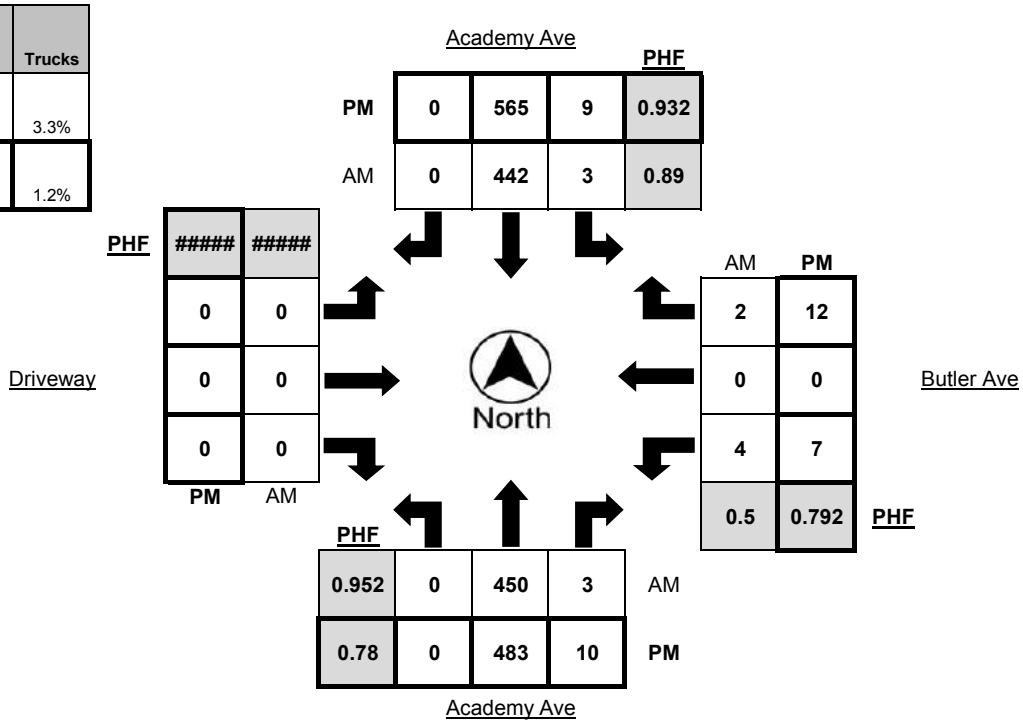
LOCATION Academy Ave @ Butler Ave
LATITUDE 36.7285
COUNTY Fresno
LONGITUDE -119.5564
COLLECTION DATE Thursday, January 11, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	0	110	0	0	0	85	0	1	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	113	0	4	0	125	0	5	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	114	0	2	1	96	0	0	0	0	0	0	2	0	1	0
7:45 AM - 8:00 AM	0	104	3	6	1	114	0	8	0	0	0	0	1	0	1	0
8:00 AM - 8:15 AM	0	119	0	3	1	107	0	2	0	0	0	0	1	0	0	0
8:15 AM - 8:30 AM	0	84	1	2	0	112	0	7	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	73	1	6	2	92	0	5	0	0	0	0	0	0	1	0
8:45 AM - 9:00 AM	0	88	1	4	1	102	0	2	0	0	0	0	0	0	1	1
TOTAL	**0**	**805**	**6**	**27**	**6**	**833**	**0**	**30**	**0**	**0**	**0**	**0**	**4**	**0**	**4**	**1**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	0	144	2	3	3	129	0	5	0	0	0	0	5	0	4	0
4:15 PM - 4:30 PM	0	129	4	1	4	122	0	1	0	0	0	0	2	0	3	0
4:30 PM - 4:45 PM	0	110	2	1	6	124	1	5	0	0	0	0	3	0	2	0
4:45 PM - 5:00 PM	0	91	2	2	1	147	0	4	0	0	0	0	1	0	4	0
5:00 PM - 5:15 PM	0	155	3	2	4	135	0	0	0	0	0	0	2	0	4	0
5:15 PM - 5:30 PM	0	116	2	1	2	131	0	0	0	0	0	0	3	0	1	0
5:30 PM - 5:45 PM	0	121	3	1	2	152	0	3	0	0	0	0	1	0	3	0
5:45 PM - 6:00 PM	0	92	1	0	0	120	0	0	0	0	0	0	2	0	3	0
TOTAL	**0**	**958**	**19**	**11**	**22**	**1060**	**1**	**18**	**0**	**0**	**0**	**0**	**19**	**0**	**24**	**0**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:15 AM - 8:15 AM	0	450	3	15	3	442	0	15	0	0	0	0	4	0	2	0
4:45 PM - 5:45 PM	0	483	10	6	9	565	0	7	0	0	0	0	7	0	12	0

	PHF	Trucks
AM	0.950	3.3%
PM	0.896	1.2%



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Turning Movement Report

Prepared For:

OMNI-Means
943 Reserve Drive
Roseville, CA 95678

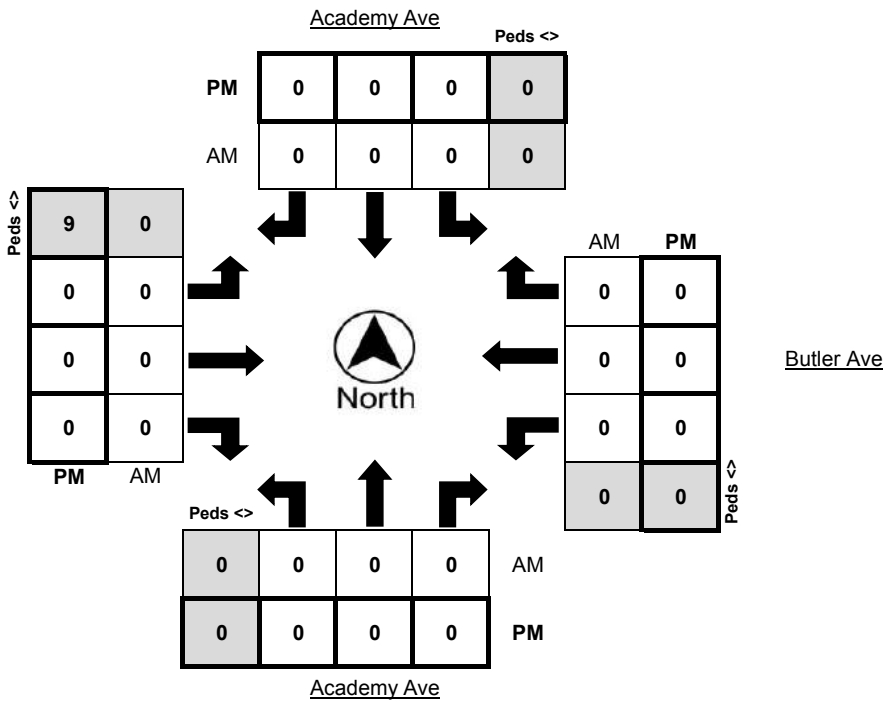
LOCATION Academy Ave @ Butler Ave
LATITUDE 36.7285
COUNTY Fresno
LONGITUDE -119.5564
COLLECTION DATE Thursday, January 11, 2018
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	6
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**15**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:15 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	0	9



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Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

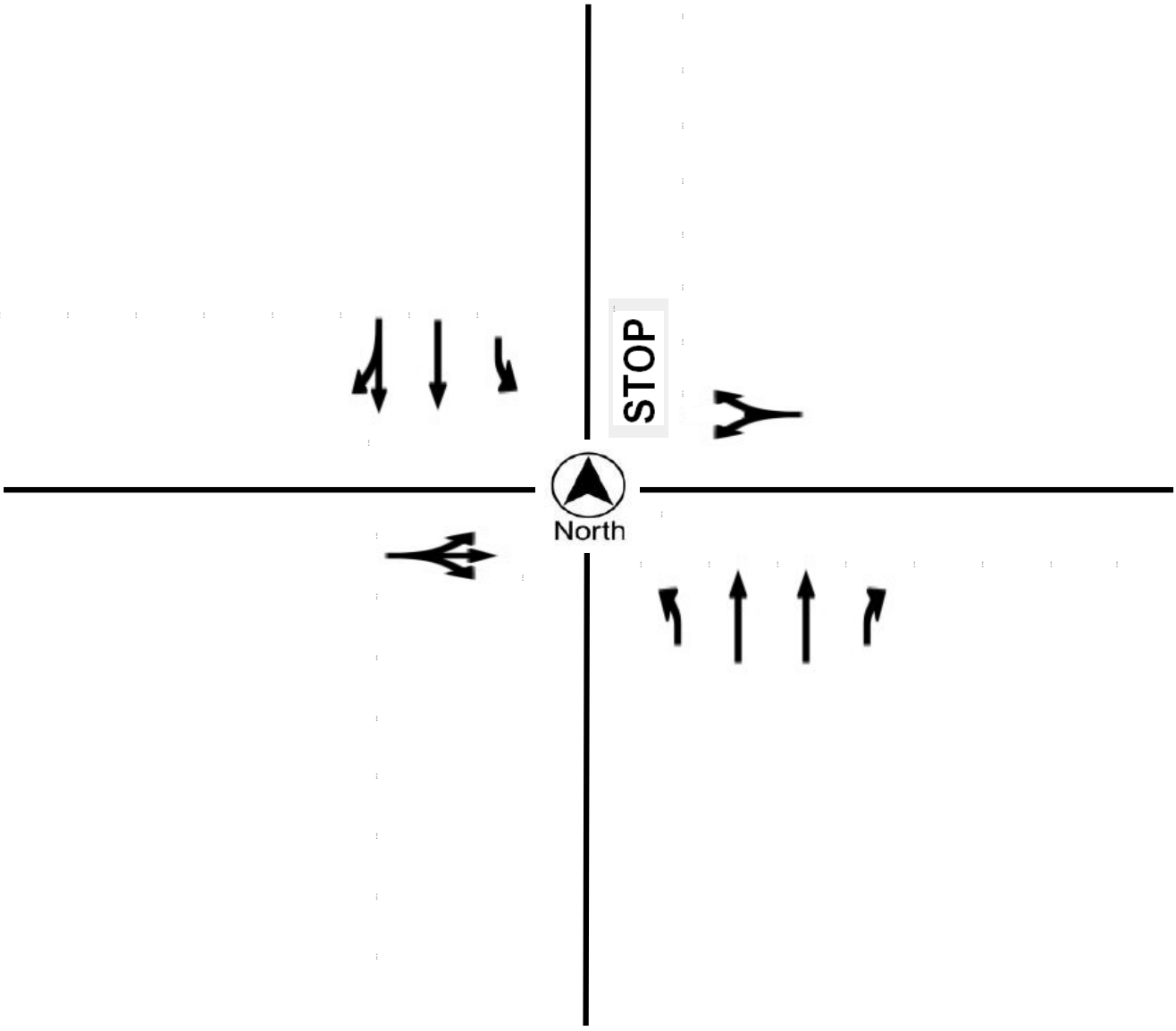
Turning Movement Report

Prepared For:

OMNI-Means
943 Reserve Drive
Roseville, CA 95678

LOCATION	Academy Ave @ Butler Ave	**N/S STREET**	Academy Ave
COUNTY	Fresno	**E/W STREET**	Butler Ave
COLLECTION DATE	Thursday, January 11, 2018	**WEATHER**	Clear
CYCLE TIME	N/A	**CONTROL TYPE**	One-Way Stop

COMMENTS



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Turning Movement Report

Prepared For:

OMNI-Means
943 Reserve Drive
Roseville, CA 95678

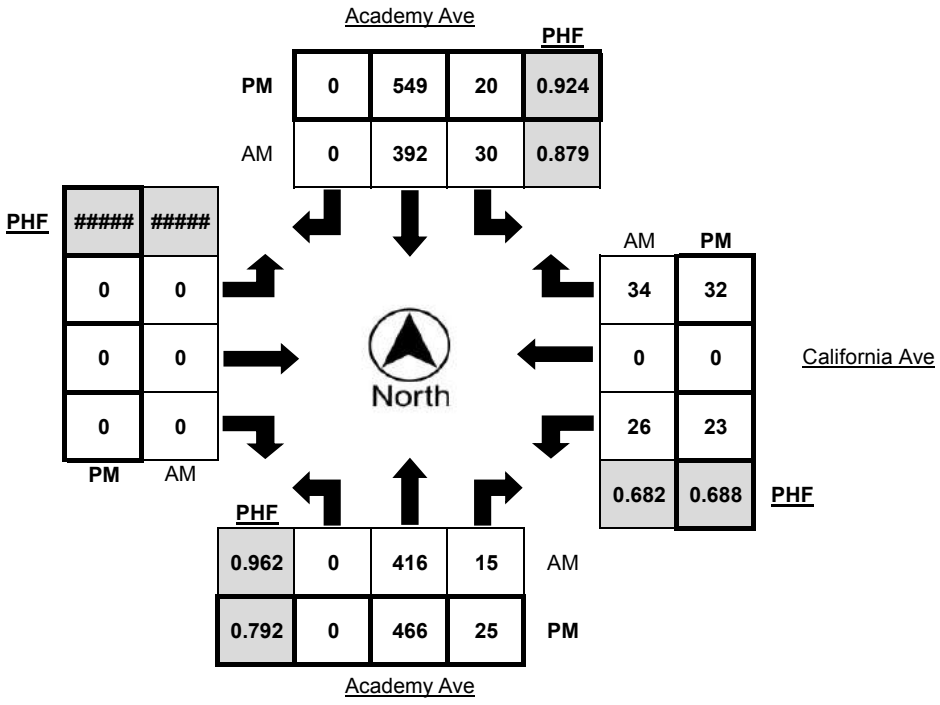
LOCATION Academy Ave @ California Ave
LATITUDE 36.7213
COUNTY Fresno
LONGITUDE -119.5565
COLLECTION DATE Thursday, January 11, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	0	105	2	0	5	81	0	1	0	0	0	0	4	0	7	0
7:15 AM - 7:30 AM	0	107	0	4	6	114	0	4	0	0	0	0	4	0	3	0
7:30 AM - 7:45 AM	0	108	4	3	8	86	0	0	0	0	0	0	5	0	10	0
7:45 AM - 8:00 AM	0	100	3	5	9	98	0	8	0	0	0	0	7	0	9	1
8:00 AM - 8:15 AM	0	101	8	3	7	94	0	1	0	0	0	0	10	0	12	0
8:15 AM - 8:30 AM	0	84	8	4	6	110	0	7	0	0	0	0	4	0	3	1
8:30 AM - 8:45 AM	0	72	8	4	3	94	0	7	0	0	0	0	14	0	4	0
8:45 AM - 9:00 AM	0	88	1	3	1	101	0	2	0	0	0	0	9	0	6	2
TOTAL	**0**	**765**	**34**	**26**	**45**	**778**	**0**	**30**	**0**	**0**	**0**	**0**	**57**	**0**	**54**	**4**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	0	133	5	0	7	126	0	5	0	0	0	0	6	0	8	1
4:15 PM - 4:30 PM	0	118	7	1	6	118	0	1	0	0	0	0	7	0	13	0
4:30 PM - 4:45 PM	0	109	8	2	7	122	0	5	0	0	0	0	9	0	6	0
4:45 PM - 5:00 PM	0	89	5	1	8	141	0	4	0	0	0	0	5	0	10	0
5:00 PM - 5:15 PM	0	148	7	2	4	136	0	0	0	0	0	0	3	0	8	0
5:15 PM - 5:30 PM	0	109	5	1	3	123	0	0	0	0	0	0	4	0	5	0
5:30 PM - 5:45 PM	0	120	8	1	5	149	0	4	0	0	0	0	11	0	9	1
5:45 PM - 6:00 PM	0	90	6	1	5	123	0	1	0	0	0	0	11	0	6	1
TOTAL	**0**	**916**	**51**	**9**	**45**	**1038**	**0**	**20**	**0**	**0**	**0**	**0**	**56**	**0**	**65**	**3**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:15 AM - 8:15 AM	0	416	15	15	30	392	0	13	0	0	0	0	26	0	34	1
4:45 PM - 5:45 PM	0	466	25	5	20	549	0	8	0	0	0	0	23	0	32	1

	PHF	Trucks
AM	0.975	3.2%
PM	0.911	1.3%



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Turning Movement Report

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OMNI-Means
943 Reserve Drive
Roseville, CA 95678

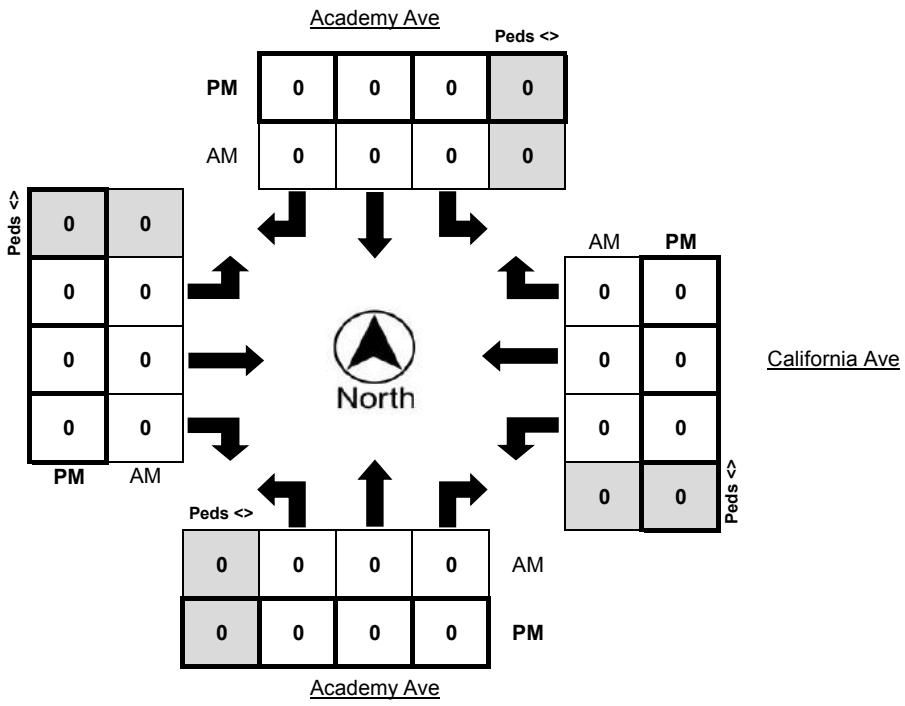
LOCATION Academy Ave @ California Ave
LATITUDE 36.7213
COUNTY Fresno
LONGITUDE -119.5565
COLLECTION DATE Thursday, January 11, 2018
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:15 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	**0**	**0**



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

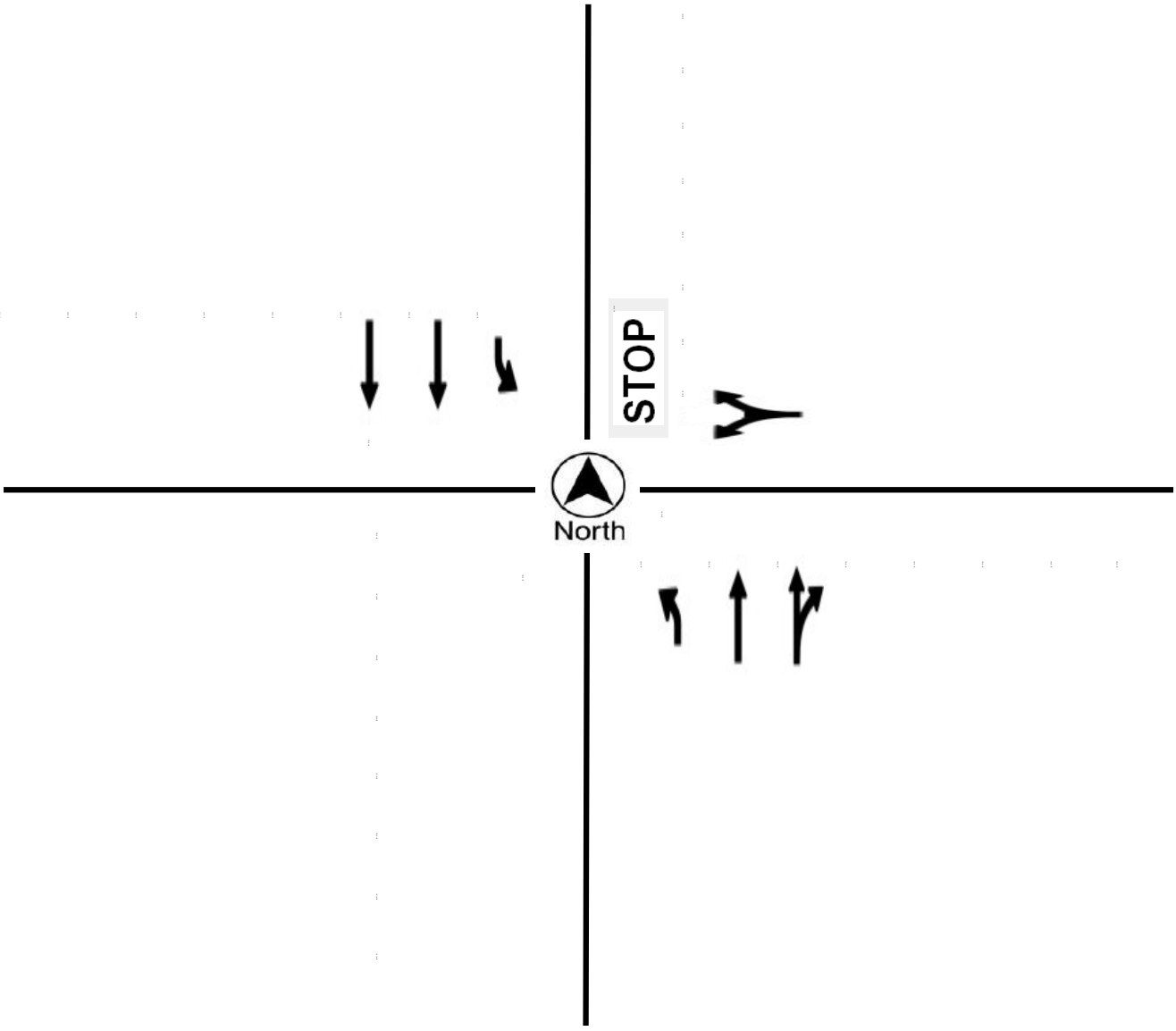
Turning Movement Report

Prepared For:

OMNI-Means
943 Reserve Drive
Roseville, CA 95678

LOCATION	Academy Ave @ California Ave	**N/S STREET**	Academy Ave
COUNTY	Fresno	**E/W STREET**	California Ave
COLLECTION DATE	Thursday, January 11, 2018	**WEATHER**	Clear
CYCLE TIME	N/A	**CONTROL TYPE**	One-Way Stop

COMMENTS



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Turning Movement Report

Prepared For:

OMNI-Means
943 Reserve Drive
Roseville, CA 95678

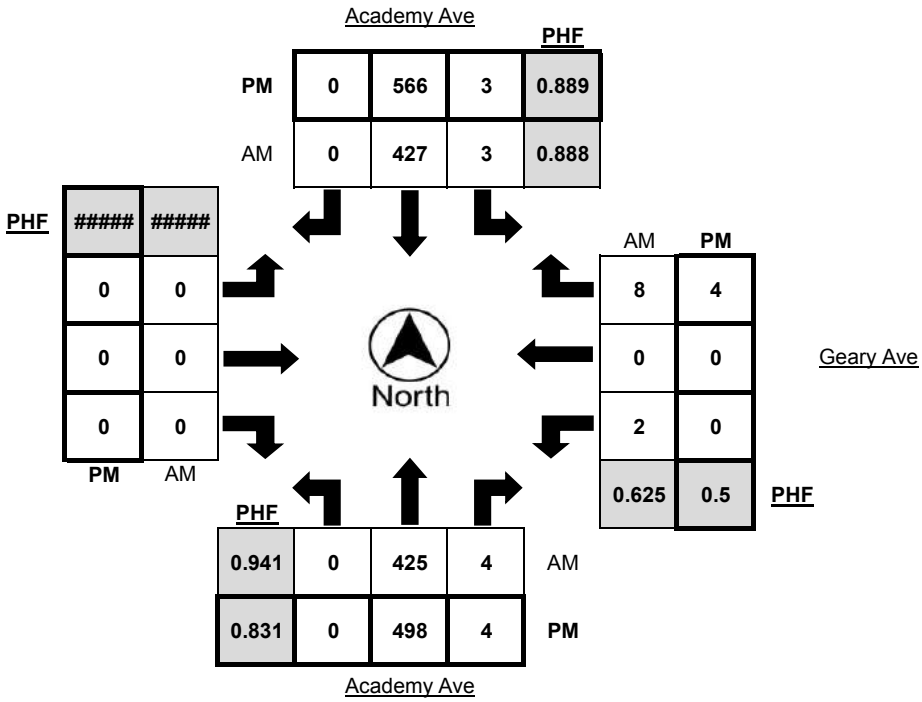
LOCATION Academy Ave @ Geary Ave
LATITUDE 36.7185
COUNTY Fresno
LONGITUDE -119.5565
COLLECTION DATE Thursday, January 11, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	0	104	3	0	1	84	0	1	0	0	0	0	0	0	2	0
7:15 AM - 7:30 AM	0	106	1	4	1	120	0	5	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	113	1	3	1	92	0	1	0	0	0	0	1	0	3	0
7:45 AM - 8:00 AM	0	99	1	5	1	110	0	7	0	0	0	0	1	0	3	0
8:00 AM - 8:15 AM	0	107	1	3	0	105	0	1	0	0	0	0	0	0	2	0
8:15 AM - 8:30 AM	0	89	1	4	1	108	0	7	0	0	0	0	0	0	3	0
8:30 AM - 8:45 AM	0	78	0	5	0	109	0	8	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	100	0	4	0	112	0	3	0	0	0	0	0	0	1	0
TOTAL	**0**	**796**	**8**	**28**	**5**	**840**	**0**	**33**	**0**	**0**	**0**	**0**	**2**	**0**	**14**	**0**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	0	141	1	1	1	133	0	5	0	0	0	0	1	0	0	0
4:15 PM - 4:30 PM	0	120	3	1	1	125	0	2	0	0	0	0	1	0	1	0
4:30 PM - 4:45 PM	0	116	1	2	2	126	0	5	0	0	0	0	1	0	0	0
4:45 PM - 5:00 PM	0	102	1	2	0	145	0	4	0	0	0	0	0	0	1	0
5:00 PM - 5:15 PM	0	148	3	1	1	137	0	0	0	0	0	0	0	0	2	0
5:15 PM - 5:30 PM	0	115	0	1	1	125	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	133	0	1	1	159	0	4	0	0	0	0	0	0	1	0
5:45 PM - 6:00 PM	0	91	1	0	1	134	0	2	0	0	0	0	1	0	2	0
TOTAL	**0**	**966**	**10**	**9**	**8**	**1084**	**0**	**22**	**0**	**0**	**0**	**0**	**4**	**0**	**7**	**0**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:15 AM - 8:15 AM	0	425	4	15	3	427	0	14	0	0	0	0	2	0	8	0
4:45 PM - 5:45 PM	0	498	4	5	3	566	0	8	0	0	0	0	0	0	4	0

	PHF	Trucks
AM	0.953	3.3%
PM	0.914	1.2%



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Turning Movement Report

Prepared For:

OMNI-Means
943 Reserve Drive
Roseville, CA 95678

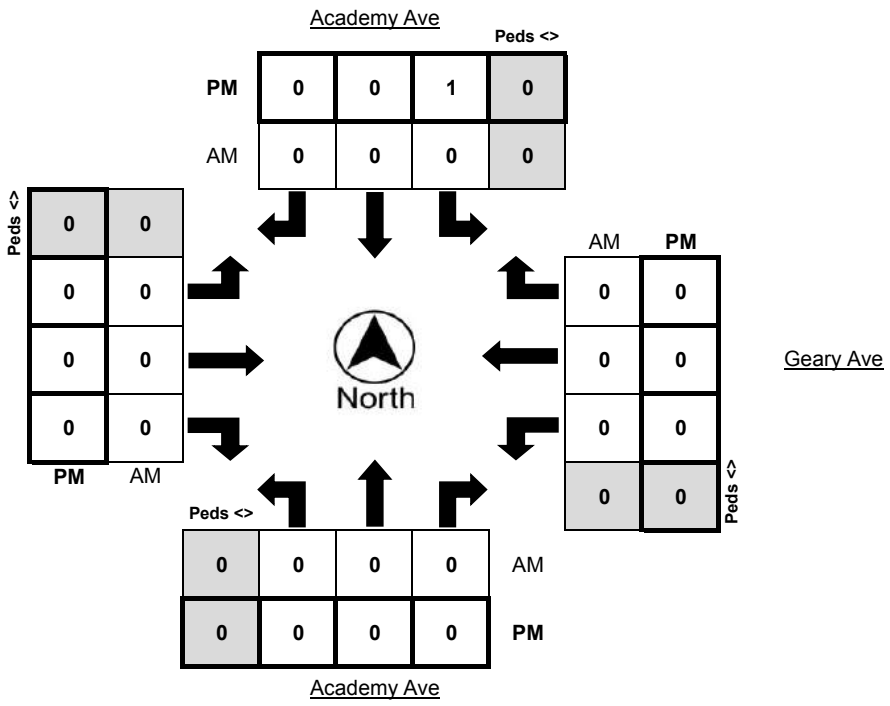
LOCATION Academy Ave @ Geary Ave
LATITUDE 36.7185
COUNTY Fresno
LONGITUDE -119.5565
COLLECTION DATE Thursday, January 11, 2018
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:15 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	1	0



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

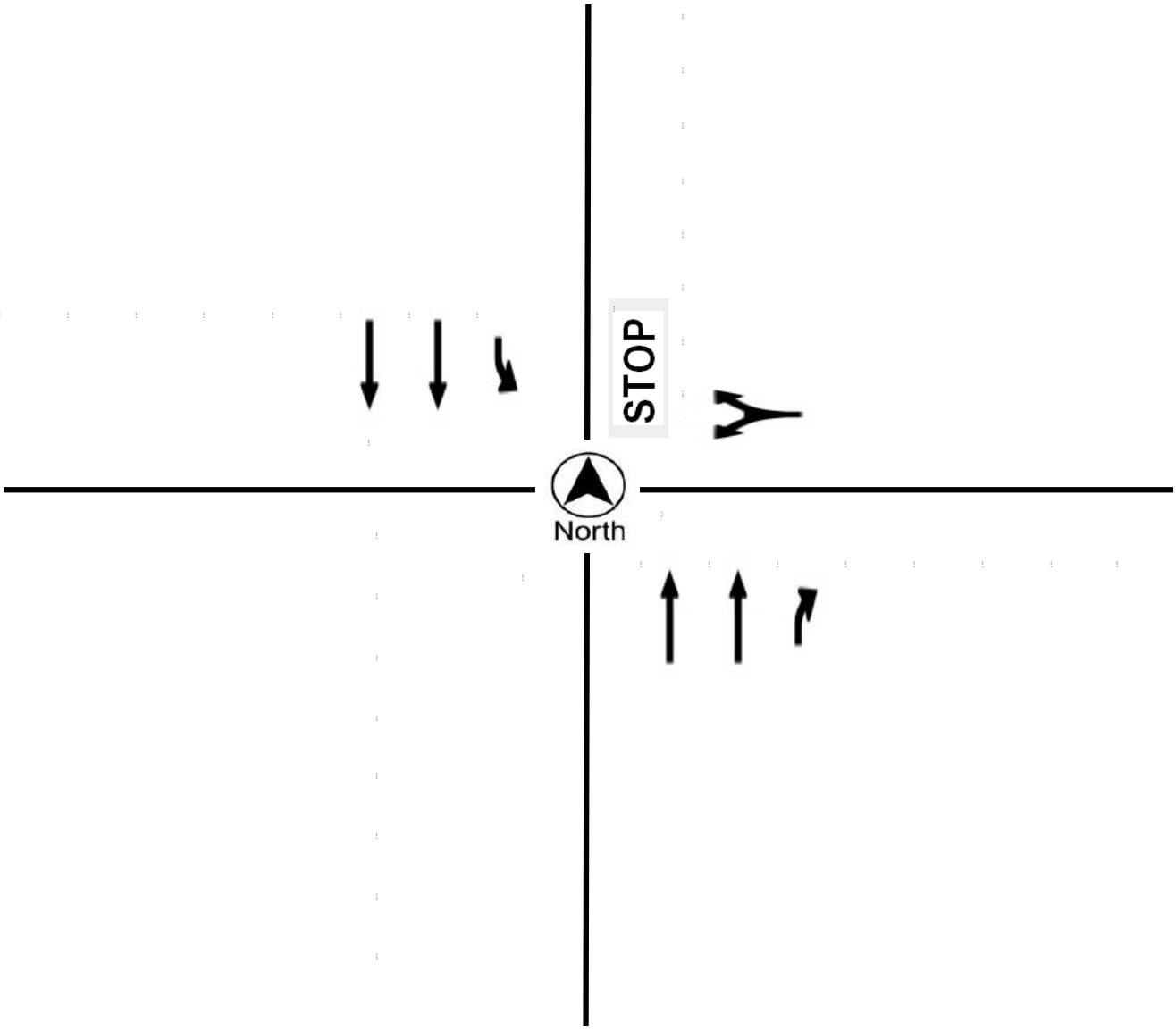
Turning Movement Report

Prepared For:

OMNI-Means
943 Reserve Drive
Roseville, CA 95678

LOCATION	Academy Ave @ Geary Ave	**N/S STREET**	Academy Ave
COUNTY	Fresno	**E/W STREET**	Geary Ave
COLLECTION DATE	Thursday, January 11, 2018	**WEATHER**	Clear
CYCLE TIME	N/A	**CONTROL TYPE**	One-Way Stop

COMMENTS



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Turning Movement Report

Prepared For:

OMNI-Means
943 Reserve Drive
Roseville, CA 95678

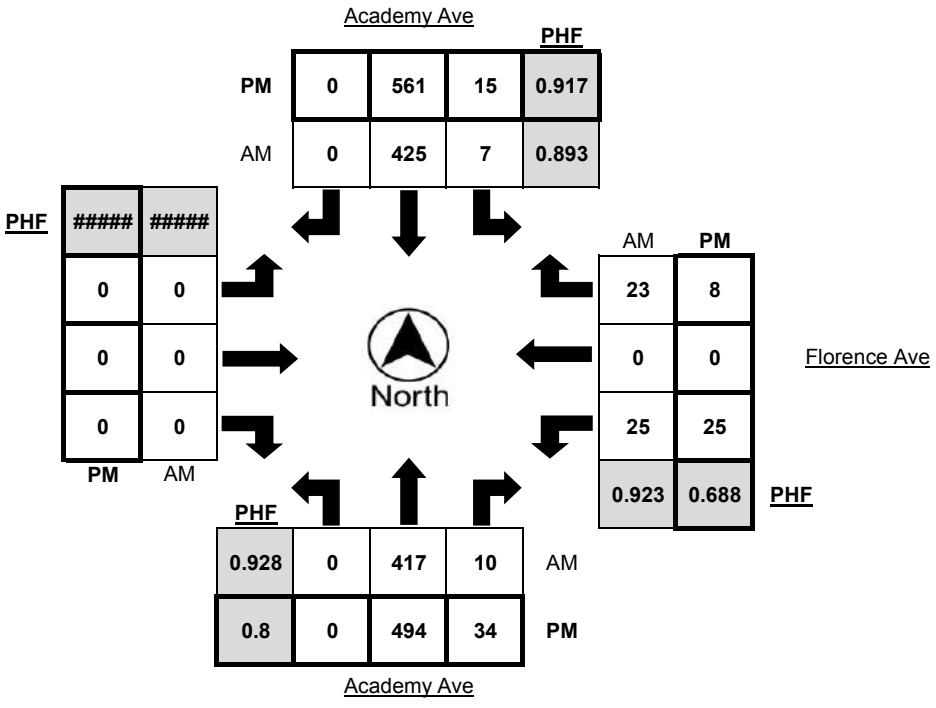
LOCATION Academy Ave @ Florence Ave
LATITUDE 36.7176
COUNTY Fresno
LONGITUDE -119.5566
COLLECTION DATE Thursday, January 11, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	0	104	2	0	2	81	0	1	0	0	0	0	5	0	3	0
7:15 AM - 7:30 AM	0	103	0	4	1	120	0	4	0	0	0	0	6	0	6	0
7:30 AM - 7:45 AM	0	111	4	4	2	95	0	0	0	0	0	0	8	0	5	0
7:45 AM - 8:00 AM	0	98	4	5	2	108	0	7	0	0	0	0	7	0	5	1
8:00 AM - 8:15 AM	0	105	2	3	2	102	0	1	0	0	0	0	4	0	7	0
8:15 AM - 8:30 AM	0	86	2	4	3	108	0	7	0	0	0	0	1	0	7	0
8:30 AM - 8:45 AM	0	81	3	5	1	110	0	7	0	0	0	0	4	0	2	0
8:45 AM - 9:00 AM	0	93	3	3	0	112	0	3	0	0	0	0	5	0	3	0
TOTAL	**0**	**781**	**20**	**28**	**13**	**836**	**0**	**30**	**0**	**0**	**0**	**0**	**40**	**0**	**38**	**1**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	0	129	5	1	7	133	0	3	0	0	0	0	2	0	3	0
4:15 PM - 4:30 PM	0	128	2	1	3	114	0	2	0	0	0	0	3	0	2	0
4:30 PM - 4:45 PM	0	114	9	1	4	133	0	5	0	0	0	0	7	0	4	1
4:45 PM - 5:00 PM	0	102	0	1	4	144	0	4	0	0	0	0	7	0	1	0
5:00 PM - 5:15 PM	0	153	12	2	4	139	0	0	0	0	0	0	4	0	0	0
5:15 PM - 5:30 PM	0	113	8	1	3	125	0	0	0	0	0	0	8	0	4	0
5:30 PM - 5:45 PM	0	126	14	0	4	153	0	1	0	0	0	0	6	0	3	0
5:45 PM - 6:00 PM	0	89	8	0	3	140	0	2	0	0	0	0	4	0	3	0
TOTAL	**0**	**954**	**58**	**7**	**32**	**1081**	**0**	**17**	**0**	**0**	**0**	**0**	**41**	**0**	**20**	**1**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:15 AM - 8:15 AM	0	417	10	16	7	425	0	12	0	0	0	0	25	0	23	1
4:45 PM - 5:45 PM	0	494	34	4	15	561	0	5	0	0	0	0	25	0	8	0

	PHF	Trucks
AM	0.961	3.2%
PM	0.911	0.8%



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Turning Movement Report

Prepared For:

OMNI-Means
943 Reserve Drive
Roseville, CA 95678

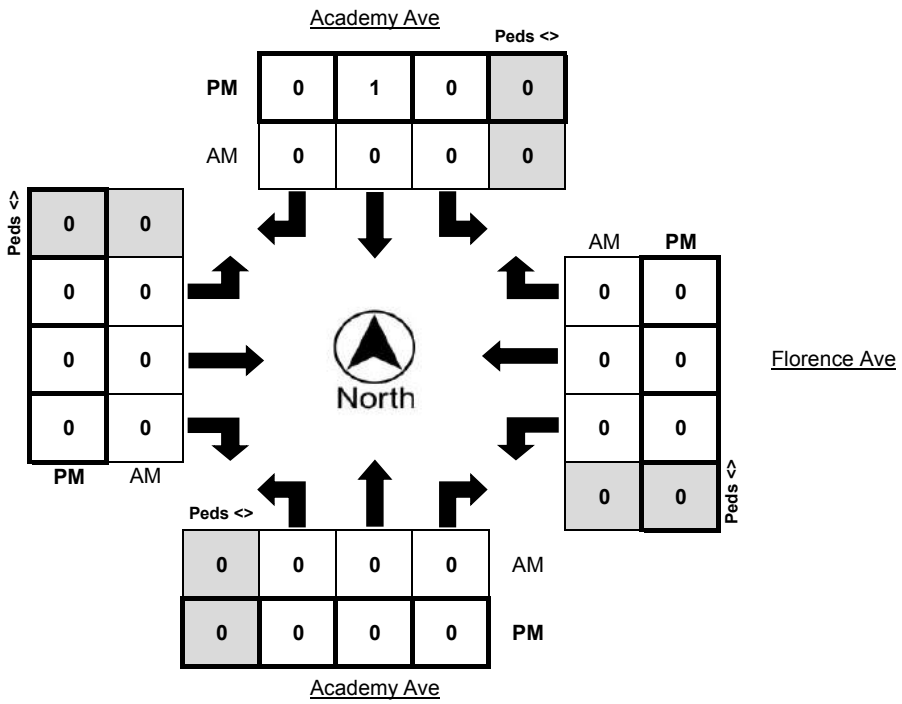
LOCATION Academy Ave @ Florence Ave
LATITUDE 36.7176
COUNTY Fresno
LONGITUDE -119.5566
COLLECTION DATE Thursday, January 11, 2018
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:15 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	1	0



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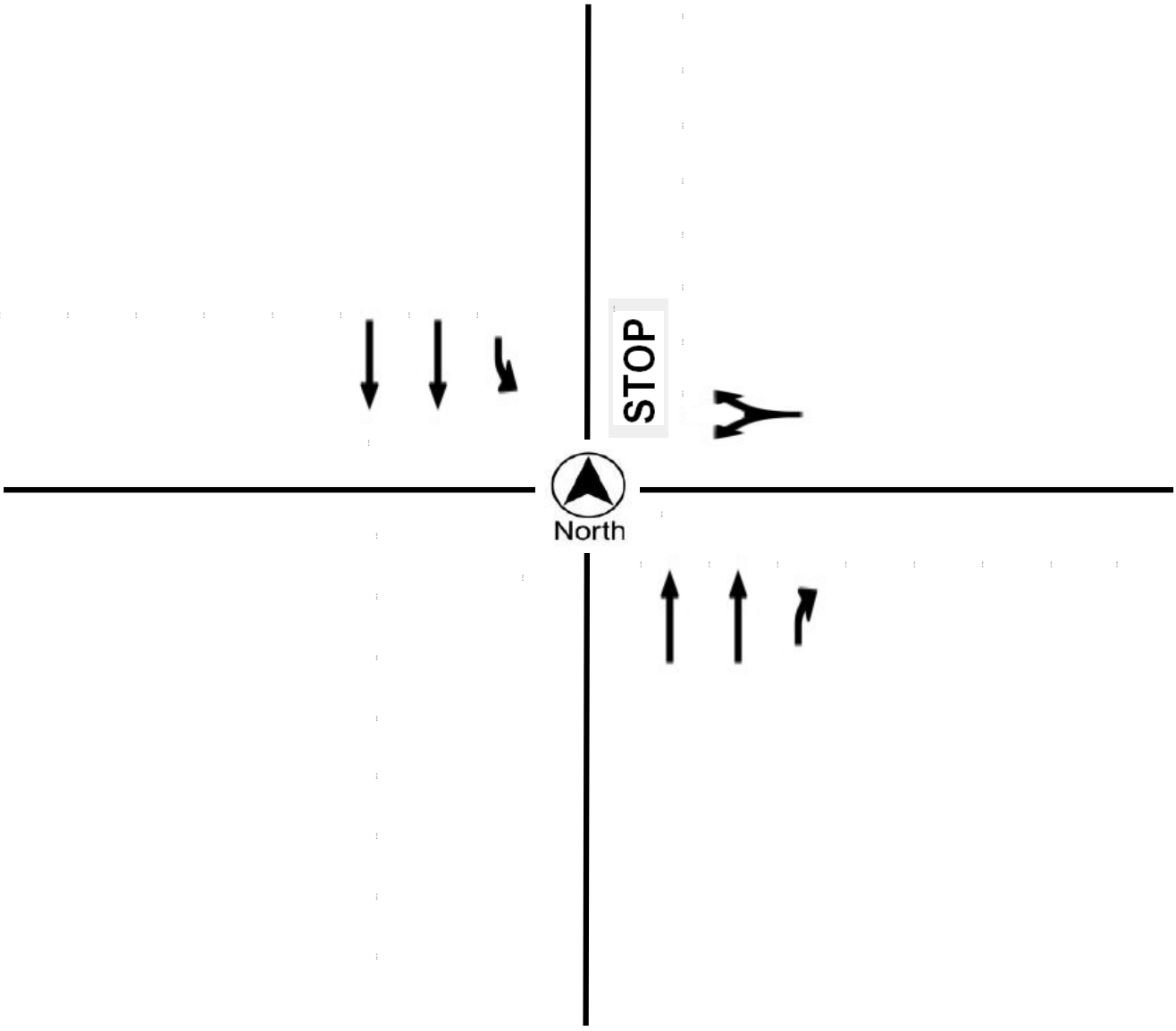
Turning Movement Report

Prepared For:

OMNI-Means
943 Reserve Drive
Roseville, CA 95678

LOCATION	Academy Ave @ Florence Ave	**N/S STREET**	Academy Ave
COUNTY	Fresno	**E/W STREET**	Florence Ave
COLLECTION DATE	Thursday, January 11, 2018	**WEATHER**	Clear
CYCLE TIME	N/A	**CONTROL TYPE**	One-Way Stop

COMMENTS



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Turning Movement Report

Prepared For:

OMNI-Means
943 Reserve Drive
Roseville, CA 95678

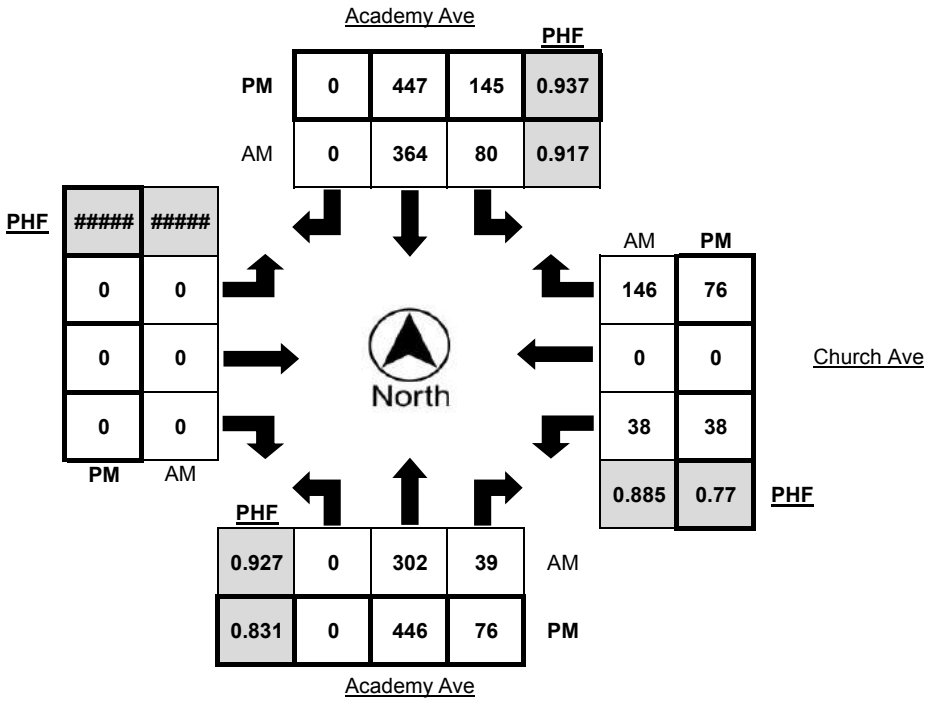
LOCATION Academy Ave @ Church Ave
LATITUDE 36.7140
COUNTY Fresno
LONGITUDE -119.5565
COLLECTION DATE Thursday, January 11, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	0	72	4	1	19	64	0	1	0	0	0	0	7	0	40	0
7:15 AM - 7:30 AM	0	64	4	4	24	97	0	4	0	0	0	0	11	0	34	0
7:30 AM - 7:45 AM	0	83	7	4	21	83	0	0	0	0	0	0	12	0	35	1
7:45 AM - 8:00 AM	0	79	12	3	23	90	0	7	0	0	0	0	12	0	28	0
8:00 AM - 8:15 AM	0	76	16	3	12	94	0	0	0	0	0	0	3	0	49	0
8:15 AM - 8:30 AM	0	75	13	5	9	102	0	8	0	0	0	0	7	0	14	0
8:30 AM - 8:45 AM	0	59	8	4	9	107	0	7	0	0	0	0	9	0	21	0
8:45 AM - 9:00 AM	0	82	12	0	20	99	0	4	0	0	0	0	12	0	19	0
TOTAL	**0**	**590**	**76**	**24**	**137**	**736**	**0**	**31**	**0**	**0**	**0**	**0**	**73**	**0**	**240**	**1**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	0	114	20	0	33	103	0	5	0	0	0	0	11	0	34	0
4:15 PM - 4:30 PM	0	106	17	1	32	90	0	2	0	0	0	0	13	0	15	0
4:30 PM - 4:45 PM	0	107	21	1	32	118	0	4	0	0	0	0	11	0	20	0
4:45 PM - 5:00 PM	0	84	9	0	27	128	0	5	0	0	0	0	9	0	14	0
5:00 PM - 5:15 PM	0	138	19	3	37	107	0	1	0	0	0	0	4	0	21	0
5:15 PM - 5:30 PM	0	100	16	1	32	111	0	0	0	0	0	0	13	0	24	0
5:30 PM - 5:45 PM	0	115	19	1	38	120	0	1	0	0	0	0	10	0	24	0
5:45 PM - 6:00 PM	0	93	22	0	38	109	0	2	0	0	0	0	11	0	7	0
TOTAL	**0**	**857**	**143**	**7**	**269**	**886**	**0**	**20**	**0**	**0**	**0**	**0**	**82**	**0**	**159**	**0**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:15 AM - 8:15 AM	0	302	39	14	80	364	0	11	0	0	0	0	38	0	146	1
5:00 PM - 6:00 PM	0	446	76	5	145	447	0	4	0	0	0	0	38	0	76	0

	PHF	Trucks
AM	0.969	2.7%
PM	0.942	0.7%



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:

OMNI-Means
943 Reserve Drive
Roseville, CA 95678

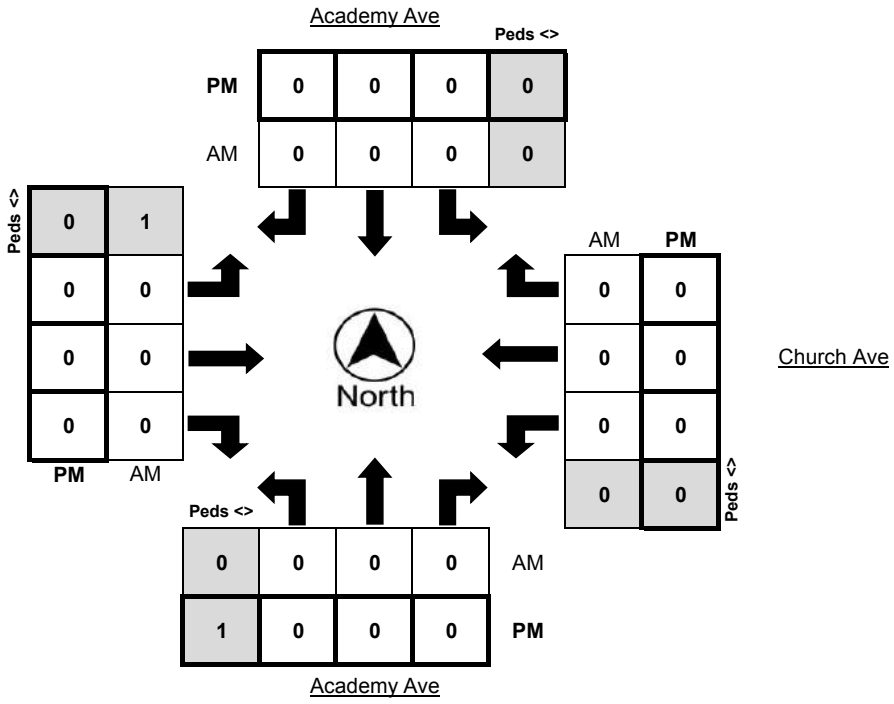
LOCATION Academy Ave @ Church Ave
LATITUDE 36.7140
COUNTY Fresno
LONGITUDE -119.5565
COLLECTION DATE Thursday, January 11, 2018
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:15 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM - 6:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	1
PM Peak Total	0	1



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

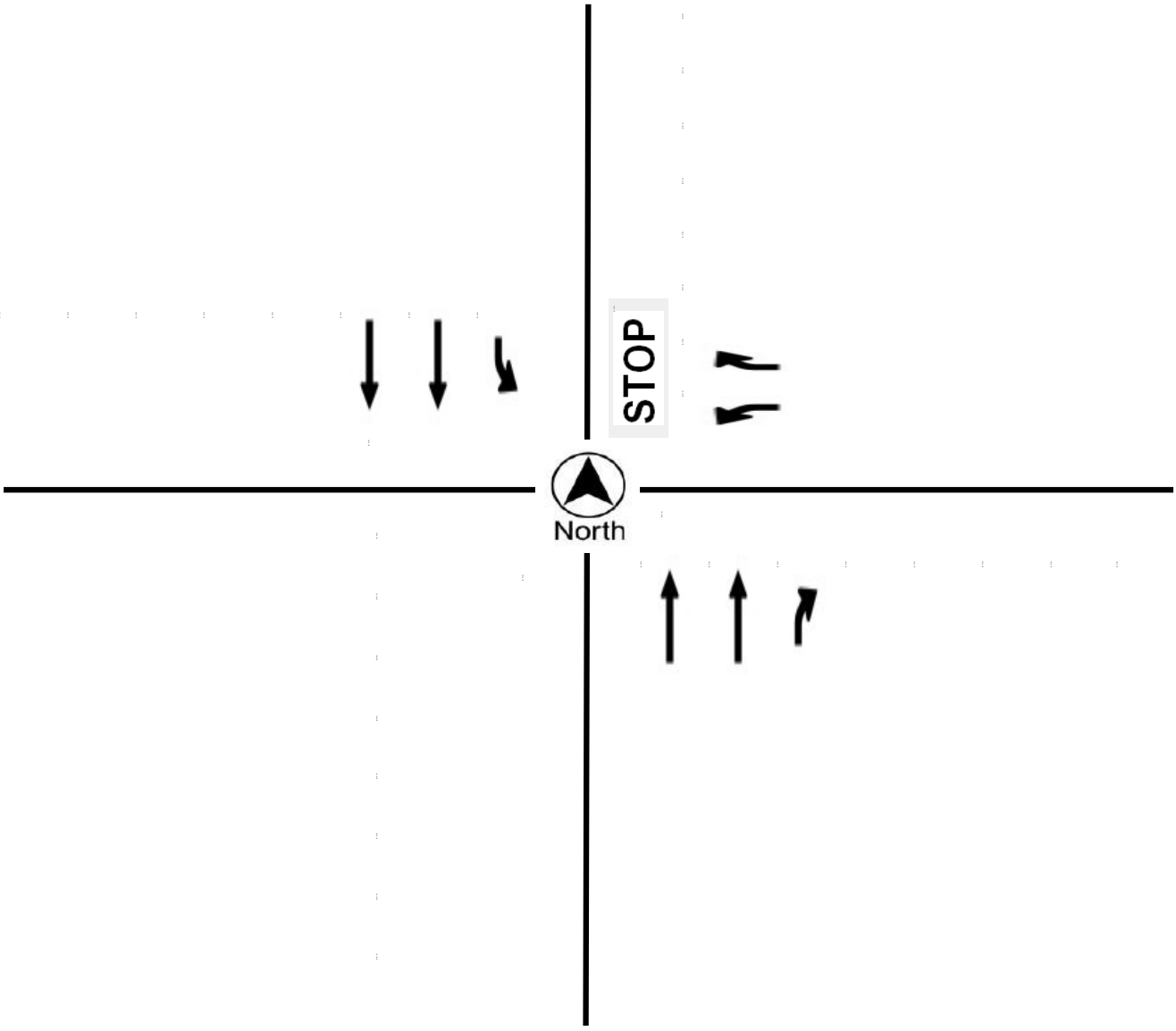
Turning Movement Report

Prepared For:

OMNI-Means
943 Reserve Drive
Roseville, CA 95678

LOCATION	Academy Ave @ Church Ave	**N/S STREET**	Academy Ave
COUNTY	Fresno	**E/W STREET**	Church Ave
COLLECTION DATE	Thursday, January 11, 2018	**WEATHER**	Clear
CYCLE TIME	N/A	**CONTROL TYPE**	One-Way Stop

COMMENTS



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

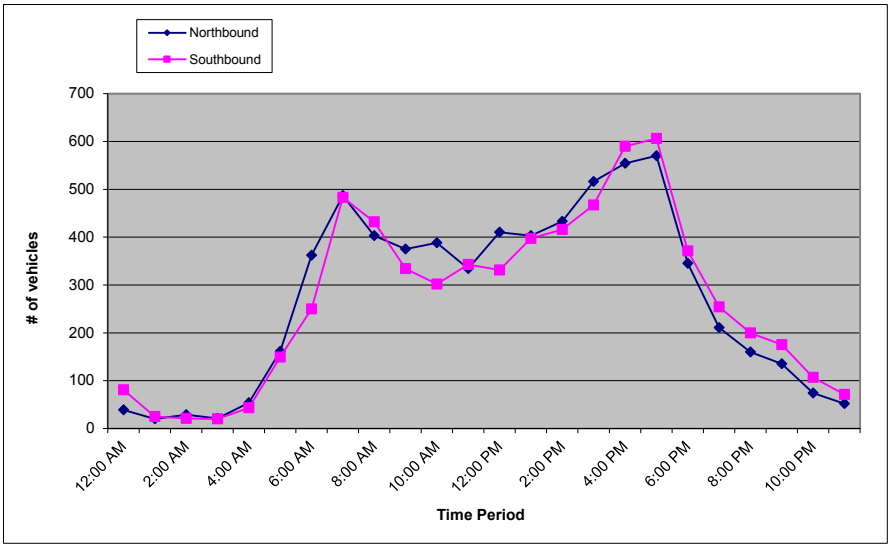
24 Hour Volume Report

Prepared For: **OMNI-MEANS, Ltd.**
943 Reserve Drive, Suite 100
Roseville, CA

LOCATION	Academy Ave s/o Kings Canyon Rd	**LATITUDE**	36.7345464
COUNTY	Fresno	**LONGITUDE**	-119.5562401
COLLECTION DATE	Thursday, January 11, 2018	**WEATHER**	Clear
NUMBER OF LANES	4		

	Northbound					Southbound					Hourly
Hour	:00	:15	:30	:45	**Total**	:00	:15	:30	:45	**Total**	**Totals**
12:00 AM	9	12	5	13	**39**	15	23	23	20	**81**	**120**
1:00 AM	8	5	2	5	**20**	5	6	7	7	**25**	**45**
2:00 AM	4	11	8	6	**29**	4	7	6	4	**21**	**50**
3:00 AM	2	2	11	6	**21**	4	7	6	3	**20**	**41**
4:00 AM	5	9	19	21	**54**	10	7	12	14	**43**	**97**
5:00 AM	16	28	62	55	**161**	17	31	47	54	**149**	**310**
6:00 AM	59	89	125	89	**362**	34	44	66	106	**250**	**612**
7:00 AM	119	124	127	117	**487**	112	119	119	133	**483**	**970**
8:00 AM	132	89	87	95	**403**	105	122	112	93	**432**	**835**
9:00 AM	87	104	100	84	**375**	85	72	89	88	**334**	**709**
10:00 AM	84	92	111	101	**388**	80	70	68	84	**302**	**690**
11:00 AM	99	84	82	69	**334**	68	76	104	95	**343**	**677**
12:00 PM	102	107	96	105	**410**	74	92	83	82	**331**	**741**
1:00 PM	109	105	90	99	**403**	104	94	94	105	**397**	**800**
2:00 PM	110	97	131	95	**433**	91	108	99	118	**416**	**849**
3:00 PM	108	131	160	117	**516**	117	98	121	131	**467**	**983**
4:00 PM	161	151	128	114	**554**	141	141	148	160	**590**	**1144**
5:00 PM	181	134	139	116	**570**	150	143	182	131	**606**	**1176**
6:00 PM	106	99	77	63	**345**	97	106	95	73	**371**	**716**
7:00 PM	56	49	54	52	**211**	71	76	60	47	**254**	**465**
8:00 PM	50	43	34	33	**160**	38	48	63	51	**200**	**360**
9:00 PM	39	40	36	20	**135**	45	55	47	28	**175**	**310**
10:00 PM	26	21	18	9	**74**	34	35	21	17	**107**	**181**
11:00 PM	11	15	12	14	**52**	13	21	18	19	**71**	**123**
Total	**50.3%**				**6536**	**49.7%**				**6468**	
	13004										

AM%	**39.6%**	**AM Peak**	**976**	**7:15 am to 8:15 am**	**AM P.H.F.**	**0.98**
PM%	**60.4%**	**PM Peak**	**1203**	**4:45 pm to 5:45 pm**	**PM P.H.F.**	**0.91**



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

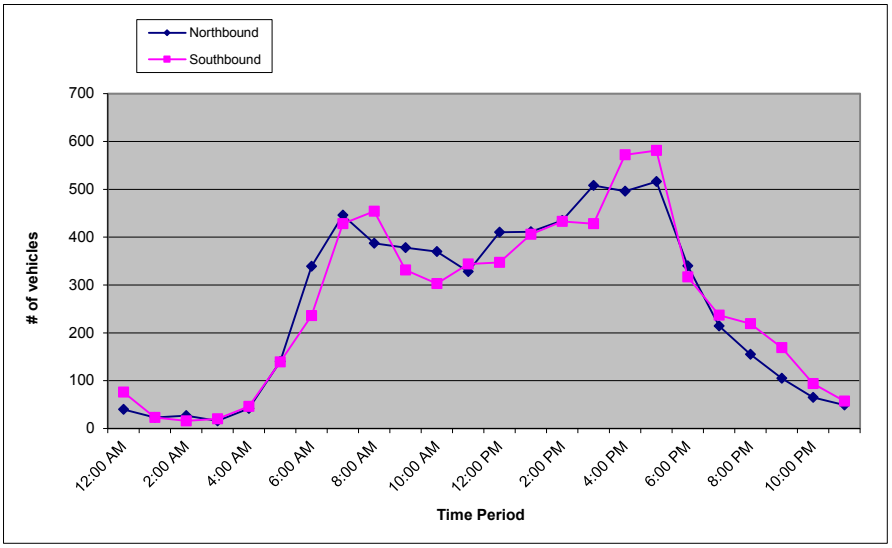
24 Hour Volume Report

Prepared For: **OMNI-MEANS, Ltd.**
943 Reserve Drive, Suite 100
Roseville, CA

LOCATION	Academy Ave n/o Church Ave	**LATITUDE**	36.7148389
COUNTY	Fresno	**LONGITUDE**	-119.5566478
COLLECTION DATE	Thursday, January 11, 2018	**WEATHER**	Clear
NUMBER OF LANES	4		

	Northbound					Southbound					Hourly
Hour	:00	:15	:30	:45	**Total**	:00	:15	:30	:45	**Total**	**Totals**
12:00 AM	12	10	5	13	**40**	14	20	26	16	**76**	**116**
1:00 AM	8	7	2	6	**23**	7	6	7	3	**23**	**46**
2:00 AM	3	8	11	5	**27**	4	6	3	3	**16**	**43**
3:00 AM	1	2	7	6	**16**	4	7	6	3	**20**	**36**
4:00 AM	5	7	16	14	**42**	11	10	10	15	**46**	**88**
5:00 AM	15	24	58	43	**140**	12	27	43	57	**139**	**279**
6:00 AM	53	80	117	89	**339**	31	38	60	107	**236**	**575**
7:00 AM	112	102	120	112	**446**	88	123	98	119	**428**	**874**
8:00 AM	105	94	81	107	**387**	110	107	114	123	**454**	**841**
9:00 AM	101	88	105	84	**378**	88	74	95	74	**331**	**709**
10:00 AM	79	89	100	102	**370**	85	74	64	80	**303**	**673**
11:00 AM	106	76	75	71	**328**	77	84	105	78	**344**	**672**
12:00 PM	105	103	96	106	**410**	75	92	88	92	**347**	**757**
1:00 PM	105	100	94	112	**411**	97	100	100	109	**406**	**817**
2:00 PM	97	107	123	108	**435**	98	114	112	109	**433**	**868**
3:00 PM	96	134	160	118	**508**	113	99	98	118	**428**	**936**
4:00 PM	148	120	126	102	**496**	138	130	148	156	**572**	**1068**
5:00 PM	159	120	138	99	**516**	141	140	162	138	**581**	**1097**
6:00 PM	99	84	79	78	**340**	90	78	81	68	**317**	**657**
7:00 PM	62	50	53	49	**214**	69	71	57	40	**237**	**451**
8:00 PM	52	40	23	40	**155**	42	46	61	70	**219**	**374**
9:00 PM	31	31	25	18	**105**	47	50	44	28	**169**	**274**
10:00 PM	22	18	17	8	**65**	30	27	20	17	**94**	**159**
11:00 PM	12	14	13	10	**49**	8	20	13	16	**57**	**106**
Total	**49.9%**				**6240**	**50.1%**				**6276**	
	12516										

AM%	**39.6%**	**AM Peak**	**889**	**7:15 am to 8:15 am**	**AM P.H.F.**	**0.96**
PM%	**60.4%**	**PM Peak**	**1118**	**4:45 pm to 5:45 pm**	**PM P.H.F.**	**0.93**



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:

GHD
30 River Park Place West Ste 220
Fresno, CA 93720

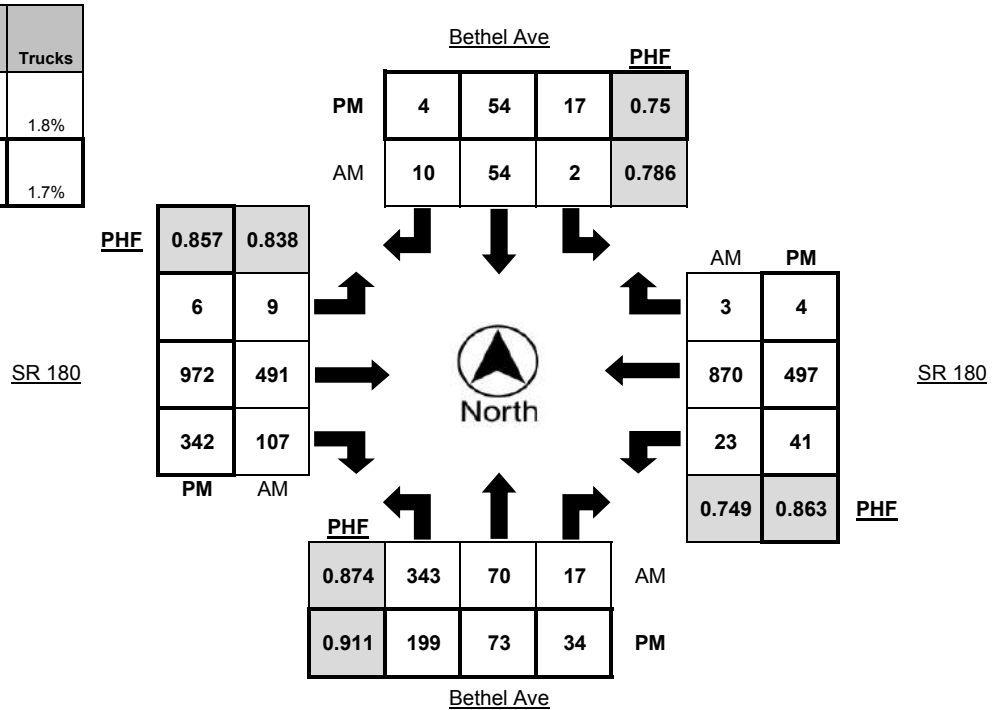
LOCATION SR 180 @ Bethel Ave
LATITUDE 36.736037°
COUNTY Fresno
LONGITUDE -119.574157°
COLLECTION DATE Wednesday, March 06, 2019
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	80	15	2	1	2	13	5	0	2	113	21	4	1	209	0	1
7:15 AM - 7:30 AM	87	16	3	1	0	16	2	0	0	126	33	8	9	289	1	3
7:30 AM - 7:45 AM	95	23	5	1	0	5	2	0	2	142	37	2	7	223	1	11
7:45 AM - 8:00 AM	81	16	7	0	0	20	1	0	5	110	16	3	6	149	1	1
8:00 AM - 8:15 AM	64	14	4	0	4	11	0	0	0	91	38	5	12	131	1	1
8:15 AM - 8:30 AM	67	4	3	0	0	18	0	1	1	144	42	6	12	165	1	2
8:30 AM - 8:45 AM	74	7	5	1	3	12	1	0	1	91	19	6	8	136	2	5
8:45 AM - 9:00 AM	57	9	4	1	0	21	1	0	0	57	38	3	14	115	0	3
TOTAL	**605**	**104**	**33**	**5**	**9**	**116**	**12**	**1**	**11**	**874**	**244**	**37**	**69**	**1417**	**7**	**27**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	39	17	8	1	2	16	0	0	1	164	67	7	9	122	0	3
4:15 PM - 4:30 PM	38	16	2	0	1	15	2	0	1	205	71	4	10	112	1	1
4:30 PM - 4:45 PM	42	13	5	0	1	18	4	0	2	239	72	6	7	127	0	8
4:45 PM - 5:00 PM	41	10	5	1	0	16	0	1	1	235	68	7	6	112	0	2
5:00 PM - 5:15 PM	46	18	4	0	5	5	1	0	2	162	75	7	11	145	1	3
5:15 PM - 5:30 PM	53	13	9	0	3	15	1	0	0	284	101	6	9	131	1	4
5:30 PM - 5:45 PM	53	18	13	0	4	16	0	0	2	279	67	6	8	129	0	2
5:45 PM - 6:00 PM	47	24	8	3	5	18	2	0	2	247	99	6	13	92	2	1
TOTAL	**359**	**129**	**54**	**5**	**21**	**119**	**10**	**1**	**11**	**1815**	**620**	**49**	**73**	**970**	**5**	**24**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 8:00 AM	343	70	17	3	2	54	10	0	9	491	107	17	23	870	3	16
5:00 PM - 6:00 PM	199	73	34	3	17	54	4	0	6	972	342	25	41	497	4	10

	PHF	Trucks
AM	0.859	1.8%
PM	0.904	1.7%



Metro Traffic Data Inc.
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Hanford, CA 93230

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Turning Movement Report

Prepared For:
GHD
30 River Park Place West Ste 220
Fresno, CA 93720

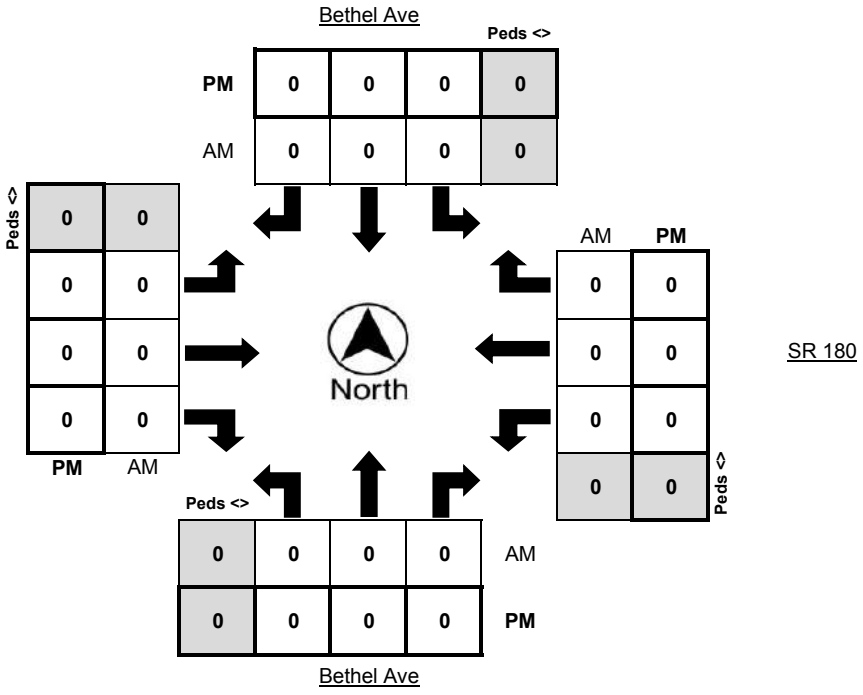
LOCATION SR 180 @ Bethel Ave
LATITUDE 36.736037°
COUNTY Fresno
LONGITUDE -119.574157°
COLLECTION DATE Wednesday, March 06, 2019
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	**0**	**0**



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

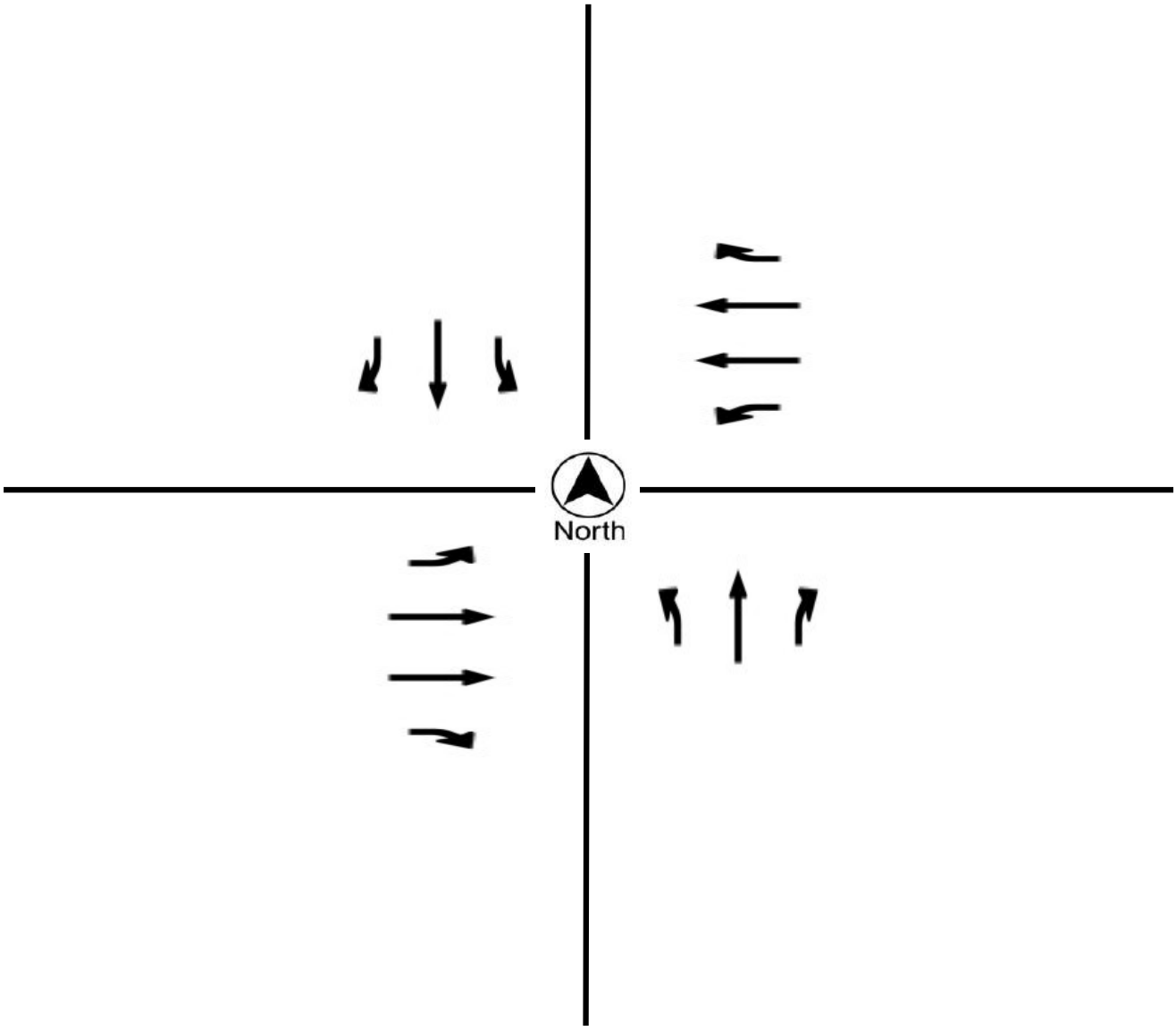
Turning Movement Report

Prepared For:

GHD
30 River Park Place West Ste 220
Fresno, CA 93720

LOCATION	SR 180 @ Bethel Ave	**N/S STREET**	Bethel Ave
COUNTY	Fresno	**E/W STREET**	SR 180
COLLECTION DATE	Wednesday, March 06, 2019	**WEATHER**	Clear
CYCLE TIME	67 Seconds	**CONTROL TYPE**	Signal

COMMENTS All approaches have protected left turns.



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Turning Movement Report

Prepared For:

GHD
30 River Park Place West Ste 220
Fresno, CA 93720

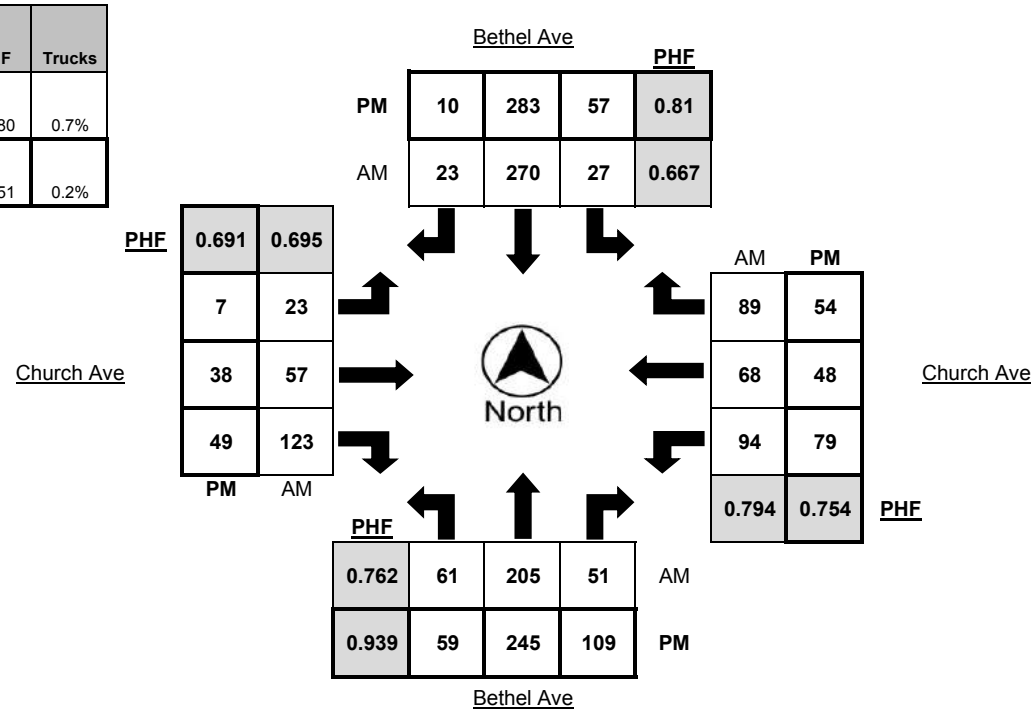
LOCATION Church Ave @ Bethel Ave
LATITUDE 36.713971°
COUNTY Fresno
LONGITUDE -119.574206°
COLLECTION DATE Tuesday, March 05, 2019
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	8	39	7	0	6	53	4	1	2	13	14	1	25	7	22	1
7:15 AM - 7:30 AM	15	50	13	1	8	109	3	0	4	9	20	0	29	23	27	0
7:30 AM - 7:45 AM	17	46	18	1	5	67	9	1	3	20	45	0	24	18	23	1
7:45 AM - 8:00 AM	21	70	13	0	8	41	7	0	14	15	44	0	16	20	17	1
8:00 AM - 8:15 AM	4	47	8	2	3	52	1	0	1	5	17	0	9	3	17	1
8:15 AM - 8:30 AM	5	52	3	2	2	49	0	4	1	4	6	1	8	3	15	0
8:30 AM - 8:45 AM	4	47	7	1	4	35	0	0	1	3	10	0	9	4	9	0
8:45 AM - 9:00 AM	3	36	4	1	3	45	1	0	2	3	15	3	20	6	10	0
TOTAL	**77**	**387**	**73**	**8**	**39**	**451**	**25**	**6**	**28**	**72**	**171**	**5**	**140**	**84**	**140**	**4**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	10	46	17	1	10	66	0	0	3	1	8	0	19	5	8	0
4:15 PM - 4:30 PM	5	51	25	0	15	61	1	1	0	10	9	0	18	2	10	0
4:30 PM - 4:45 PM	9	56	14	0	14	69	0	0	3	7	7	0	14	6	6	0
4:45 PM - 5:00 PM	7	78	34	0	7	78	3	0	3	10	16	0	9	10	3	0
5:00 PM - 5:15 PM	14	73	23	0	12	64	0	0	1	7	6	0	21	7	9	0
5:15 PM - 5:30 PM	11	54	26	0	18	85	5	0	3	14	10	0	19	13	15	0
5:30 PM - 5:45 PM	17	59	31	1	13	76	1	0	3	11	20	0	13	8	16	0
5:45 PM - 6:00 PM	17	59	29	1	14	58	4	0	0	6	13	0	26	20	14	0
TOTAL	**90**	**476**	**199**	**3**	**103**	**557**	**14**	**1**	**16**	**66**	**89**	**0**	**139**	**71**	**81**	**0**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 8:00 AM	61	205	51	2	27	270	23	2	23	57	123	1	94	68	89	3
5:00 PM - 6:00 PM	59	245	109	2	57	283	10	0	7	38	49	0	79	48	54	0

	PHF	Trucks
AM	0.880	0.7%
PM	0.951	0.2%



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Turning Movement Report

Prepared For:

GHD
30 River Park Place West Ste 220
Fresno, CA 93720

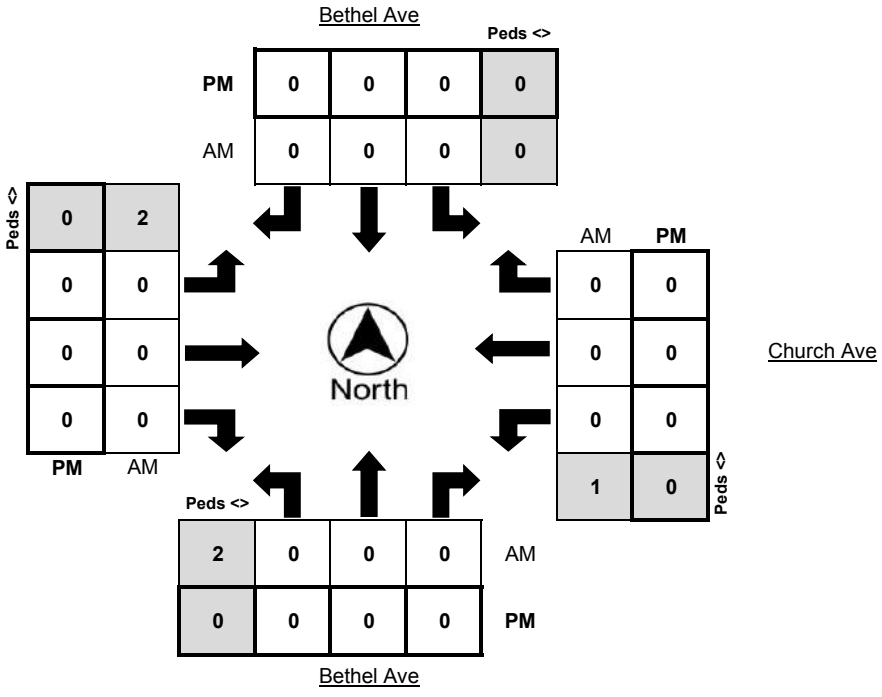
LOCATION Church Ave @ Bethel Ave
LATITUDE 36.713971°
COUNTY Fresno
LONGITUDE -119.574206°
COLLECTION DATE Tuesday, March 05, 2019
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**3**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 8:00 AM	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	2
5:00 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	5
PM Peak Total	0	0



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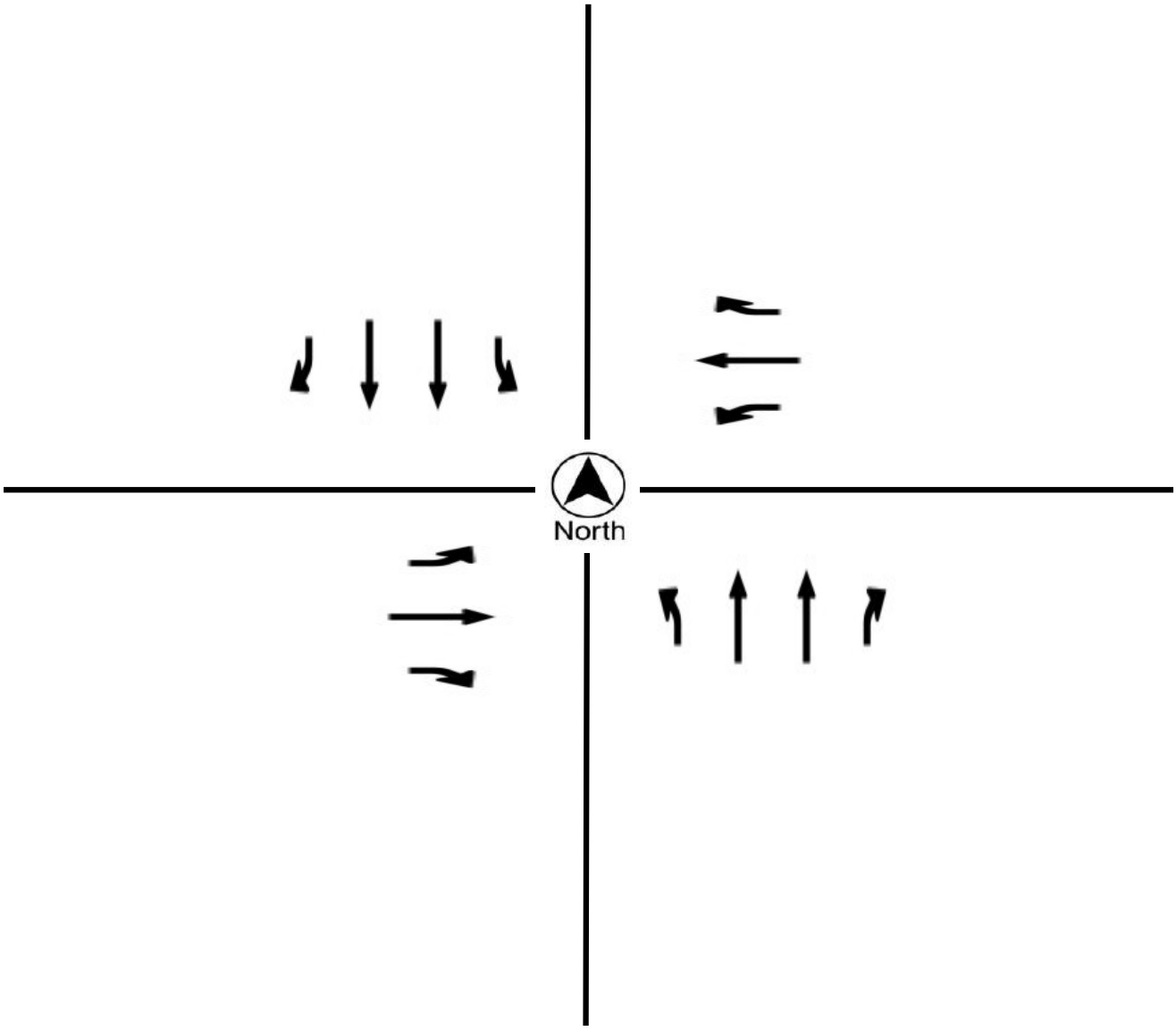
Turning Movement Report

Prepared For:

GHD
30 River Park Place West Ste 220
Fresno, CA 93720

LOCATION	Church Ave @ Bethel Ave	**N/S STREET**	Bethel Ave
COUNTY	Fresno	**E/W STREET**	Church Ave
COLLECTION DATE	Tuesday, March 05, 2019	**WEATHER**	Clear
CYCLE TIME	58 Seconds	**CONTROL TYPE**	Signal

COMMENTS All approaches have protected left turns.



Appendices:
Synchro Analysis

Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	305	177	49	505	140	246	159	40	169	208	82
Future Volume (veh/h)	59	305	177	49	505	140	246	159	40	169	208	82
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744
Adj Flow Rate, veh/h	63	324	188	52	537	149	262	169	43	180	221	87
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	360	1325	591	437	1325	591	970	1052	261	1077	938	358
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Sat Flow, veh/h	705	3313	1478	828	3313	1478	1938	2631	652	2115	2345	895
Grp Volume(v), veh/h	63	324	188	52	537	149	262	105	107	180	154	154
Grp Sat Flow(s),veh/h/ln	705	1657	1478	828	1657	1478	969	1657	1626	1058	1657	1583
Q Serve(g_s), s	3.2	2.9	3.9	2.0	5.2	3.0	4.7	1.8	1.9	2.7	2.8	2.9
Cycle Q Clear(g_c), s	8.4	2.9	3.9	4.9	5.2	3.0	7.6	1.8	1.9	4.6	2.8	2.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.40	1.00		0.57
Lane Grp Cap(c), veh/h	360	1325	591	437	1325	591	970	663	651	1077	663	633
V/C Ratio(X)	0.17	0.24	0.32	0.12	0.41	0.25	0.27	0.16	0.16	0.17	0.23	0.24
Avail Cap(c_a), veh/h	360	1325	591	437	1325	591	970	663	651	1077	663	633
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.7	9.0	9.3	10.6	9.7	9.0	11.5	8.6	8.7	10.1	8.9	9.0
Incr Delay (d2), s/veh	1.1	0.4	1.4	0.6	0.9	1.0	0.7	0.5	0.5	0.3	0.8	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.7	1.0	0.3	1.3	0.7	0.7	0.5	0.5	0.4	0.7	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.7	9.4	10.7	11.2	10.6	10.0	12.2	9.2	9.2	10.5	9.8	9.9
LnGrp LOS	B	A	B	B	B	B	B	A	A	B	A	A
Approach Vol, veh/h		575			738			474			488	
Approach Delay, s/veh		10.3			10.5			10.8			10.1	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		22.5		22.5		22.5		22.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		9.6		10.4		6.6		7.2				
Green Ext Time (p_c), s		1.6		1.8		1.9		2.9				

Intersection Summary												
HCM 6th Ctrl Delay			10.4									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↑↕		↰	↑↕	
Traffic Vol, veh/h	0	0	0	4	0	2	0	450	3	3	442	0
Future Vol, veh/h	0	0	0	4	0	2	0	450	3	3	442	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	140	-	-	145	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	0	0	4	0	2	0	474	3	3	465	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	708	948	233	715	947	239	465	0	0	477	0	0
Stage 1	471	471	-	476	476	-	-	-	-	-	-	-
Stage 2	237	477	-	239	471	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	320	258	766	316	258	759	1086	-	-	1074	-	-
Stage 1	540	555	-	536	552	-	-	-	-	-	-	-
Stage 2	742	552	-	740	555	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	318	257	766	315	257	759	1086	-	-	1074	-	-
Mov Cap-2 Maneuver	318	257	-	315	257	-	-	-	-	-	-	-
Stage 1	540	553	-	536	552	-	-	-	-	-	-	-
Stage 2	740	552	-	738	553	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	14.4	0	0.1
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1086	-	-	-	391	1074	-	-
HCM Lane V/C Ratio	-	-	-	-	0.016	0.003	-	-
HCM Control Delay (s)	0	-	-	0	14.4	8.4	-	-
HCM Lane LOS	A	-	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0	0	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	26	0	34	0	416	15	30	392	0
Future Vol, veh/h	0	0	0	26	0	34	0	416	15	30	392	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	190	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	0	0	27	0	35	0	429	15	31	404	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	681	910	202	701	903	222	404	0	0	444	0	0
Stage 1	466	466	-	437	437	-	-	-	-	-	-	-
Stage 2	215	444	-	264	466	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	335	271	802	324	274	779	1144	-	-	1105	-	0
Stage 1	543	558	-	565	575	-	-	-	-	-	-	0
Stage 2	764	571	-	715	558	-	-	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	313	263	802	317	266	779	1144	-	-	1105	-	-
Mov Cap-2 Maneuver	313	263	-	317	266	-	-	-	-	-	-	-
Stage 1	543	542	-	565	575	-	-	-	-	-	-	-
Stage 2	730	571	-	695	542	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	13.7	0	0.6
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT
Capacity (veh/h)	1144	-	-	-	477	1105	-
HCM Lane V/C Ratio	-	-	-	-	0.13	0.028	-
HCM Control Delay (s)	0	-	-	0	13.7	8.4	-
HCM Lane LOS	A	-	-	A	B	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.4	0.1	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	8	425	4	3	427
Future Vol, veh/h	2	8	425	4	3	427
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	2	8	447	4	3	449

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	680	226	0	0	451	0
Stage 1	449	-	-	-	-	-
Stage 2	231	-	-	-	-	-
Critical Hdwy	6.86	6.96	-	-	4.16	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	-	-	2.23	-
Pot Cap-1 Maneuver	382	774	-	-	1099	-
Stage 1	607	-	-	-	-	-
Stage 2	782	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	381	774	-	-	1099	-
Mov Cap-2 Maneuver	479	-	-	-	-	-
Stage 1	605	-	-	-	-	-
Stage 2	782	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.3	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	689	1099	-
HCM Lane V/C Ratio	-	-	0.015	0.003	-
HCM Control Delay (s)	-	-	10.3	8.3	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	23	417	10	7	425
Future Vol, veh/h	25	23	417	10	7	425
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	90	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	26	24	434	10	7	443

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	675	222	0	0	444	0
Stage 1	439	-	-	-	-	-
Stage 2	236	-	-	-	-	-
Critical Hdwy	6.86	6.96	-	-	4.16	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	-	-	2.23	-
Pot Cap-1 Maneuver	385	779	-	-	1105	-
Stage 1	614	-	-	-	-	-
Stage 2	778	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	383	779	-	-	1105	-
Mov Cap-2 Maneuver	480	-	-	-	-	-
Stage 1	610	-	-	-	-	-
Stage 2	778	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.7	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	588	1105	-
HCM Lane V/C Ratio	-	-	0.085	0.007	-
HCM Control Delay (s)	-	-	11.7	8.3	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	3.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	38	146	302	39	80	364
Future Vol, veh/h	38	146	302	39	80	364
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	39	151	311	40	82	375

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	683	176	0	0	351	0
Stage 1	331	-	-	-	-	-
Stage 2	352	-	-	-	-	-
Critical Hdwy	6.86	6.96	-	-	4.16	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	-	-	2.23	-
Pot Cap-1 Maneuver	381	834	-	-	1197	-
Stage 1	697	-	-	-	-	-
Stage 2	680	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	355	834	-	-	1197	-
Mov Cap-2 Maneuver	355	-	-	-	-	-
Stage 1	649	-	-	-	-	-
Stage 2	680	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.8	0	1.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	652	1197	-
HCM Lane V/C Ratio	-	-	0.291	0.069	-
HCM Control Delay (s)	-	-	12.8	8.2	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	1.2	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	491	107	23	870	3	343	70	17	2	54	10
Future Volume (veh/h)	9	491	107	23	870	3	343	70	17	2	54	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	10	571	124	27	1012	3	399	81	20	2	63	12
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	235	1347	601	357	1347	601	628	549	136	604	579	110
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Sat Flow, veh/h	526	3367	1502	710	3367	1502	1255	1372	339	1226	1447	276
Grp Volume(v), veh/h	10	571	124	27	1012	3	399	0	101	2	0	75
Grp Sat Flow(s),veh/h/ln	526	1683	1502	710	1683	1502	1255	0	1711	1226	0	1722
Q Serve(g_s), s	0.7	5.5	2.4	1.3	11.6	0.1	13.2	0.0	1.7	0.0	0.0	1.2
Cycle Q Clear(g_c), s	12.4	5.5	2.4	6.8	11.6	0.1	14.4	0.0	1.7	1.7	0.0	1.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.20	1.00		0.16
Lane Grp Cap(c), veh/h	235	1347	601	357	1347	601	628	0	684	604	0	689
V/C Ratio(X)	0.04	0.42	0.21	0.08	0.75	0.00	0.64	0.00	0.15	0.00	0.00	0.11
Avail Cap(c_a), veh/h	235	1347	601	357	1347	601	628	0	684	604	0	689
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.9	9.8	8.8	12.2	11.6	8.1	13.0	0.0	8.6	9.2	0.0	8.5
Incr Delay (d2), s/veh	0.3	1.0	0.8	0.4	3.9	0.0	4.9	0.0	0.5	0.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.4	0.6	0.2	3.3	0.0	3.5	0.0	0.5	0.0	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.2	10.7	9.6	12.6	15.5	8.1	17.8	0.0	9.1	9.2	0.0	8.8
LnGrp LOS	B	B	A	B	B	A	B	A	A	A	A	A
Approach Vol, veh/h		705			1042			500			77	
Approach Delay, s/veh		10.6			15.4			16.1			8.8	
Approach LOS		B			B			B			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		22.5		22.5		22.5		22.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		16.4		14.4		3.7		13.6				
Green Ext Time (p_c), s		0.4		1.3		0.2		2.4				

Intersection Summary												
HCM 6th Ctrl Delay			13.9									
HCM 6th LOS			B									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	57	123	94	68	89	61	205	51	27	270	23
Future Volume (veh/h)	23	57	123	94	68	89	61	205	51	27	270	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	26	65	140	107	77	101	69	233	58	31	307	26
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	615	754	639	609	754	639	501	1433	639	553	1433	639
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.13	0.13	0.13
Sat Flow, veh/h	1216	1885	1598	1186	1885	1598	1055	3582	1598	1097	3582	1598
Grp Volume(v), veh/h	26	65	140	107	77	101	69	233	58	31	307	26
Grp Sat Flow(s),veh/h/ln	1216	1885	1598	1186	1885	1598	1055	1791	1598	1097	1791	1598
Q Serve(g_s), s	0.6	1.0	2.6	2.8	1.1	1.8	2.1	1.9	1.0	1.1	3.4	0.6
Cycle Q Clear(g_c), s	1.8	1.0	2.6	3.7	1.1	1.8	5.6	1.9	1.0	3.0	3.4	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	615	754	639	609	754	639	501	1433	639	553	1433	639
V/C Ratio(X)	0.04	0.09	0.22	0.18	0.10	0.16	0.14	0.16	0.09	0.06	0.21	0.04
Avail Cap(c_a), veh/h	615	754	639	609	754	639	501	1433	639	553	1433	639
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.0	8.4	8.9	9.6	8.4	8.6	11.0	8.7	8.4	13.9	13.2	12.0
Incr Delay (d2), s/veh	0.1	0.2	0.8	0.6	0.3	0.5	0.6	0.2	0.3	0.2	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.4	0.9	0.7	0.4	0.6	0.5	0.6	0.3	0.2	1.1	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.1	8.6	9.7	10.2	8.7	9.2	11.6	8.9	8.7	14.1	13.6	12.1
LnGrp LOS	A	A	A	B	A	A	B	A	A	B	B	B
Approach Vol, veh/h		231			285			360			364	
Approach Delay, s/veh		9.3			9.4			9.4			13.5	
Approach LOS		A			A			A			B	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	22.5	22.5	22.5	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	18.0	18.0	18.0
Max Q Clear Time (g_c+I1), s	7.6	4.6	5.4	5.7
Green Ext Time (p_c), s	1.4	0.7	1.6	0.9

Intersection Summary	
HCM 6th Ctrl Delay	10.6
HCM 6th LOS	B

Sanger - North Academy Corridor Master Plan

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	544	251	60	466	149	224	205	98	155	208	59
Future Volume (veh/h)	60	544	251	60	466	149	224	205	98	155	208	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	63	573	264	63	491	157	236	216	103	163	219	62
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	381	1347	601	332	1347	601	1013	896	412	970	1042	288
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Sat Flow, veh/h	742	3367	1502	622	3367	1502	2018	2240	1030	1949	2606	720
Grp Volume(v), veh/h	63	573	264	63	491	157	236	160	159	163	140	141
Grp Sat Flow(s),veh/h/ln	742	1683	1502	622	1683	1502	1009	1683	1587	975	1683	1642
Q Serve(g_s), s	2.9	5.5	5.8	3.7	4.6	3.2	3.9	2.8	3.0	2.7	2.4	2.5
Cycle Q Clear(g_c), s	7.5	5.5	5.8	9.2	4.6	3.2	6.5	2.8	3.0	5.7	2.4	2.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.65	1.00		0.44
Lane Grp Cap(c), veh/h	381	1347	601	332	1347	601	1013	673	635	970	673	657
V/C Ratio(X)	0.17	0.43	0.44	0.19	0.36	0.26	0.23	0.24	0.25	0.17	0.21	0.22
Avail Cap(c_a), veh/h	381	1347	601	332	1347	601	1013	673	635	970	673	657
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.1	9.8	9.8	13.1	9.5	9.0	11.0	9.0	9.0	10.9	8.8	8.9
Incr Delay (d2), s/veh	0.9	1.0	2.3	1.3	0.8	1.1	0.5	0.8	0.9	0.4	0.7	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	1.4	1.5	0.5	1.1	0.8	0.6	0.8	0.8	0.4	0.7	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.1	10.7	12.2	14.4	10.2	10.1	11.5	9.8	9.9	11.3	9.5	9.6
LnGrp LOS	B	B	B	B	B	B	B	A	A	B	A	A
Approach Vol, veh/h		900			711			555			444	
Approach Delay, s/veh		11.3			10.6			10.6			10.2	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	22.5	22.5	22.5	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	18.0	18.0	18.0
Max Q Clear Time (g_c+I1), s	8.5	9.5	7.7	11.2
Green Ext Time (p_c), s	2.0	3.0	1.6	2.2

Intersection Summary	
HCM 6th Ctrl Delay	10.8
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↑↑↱		↰	↑↑↱	
Traffic Vol, veh/h	0	0	0	7	0	12	0	483	10	9	565	0
Future Vol, veh/h	0	0	0	7	0	12	0	483	10	9	565	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	140	-	-	145	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	0	0	0	8	0	13	0	537	11	10	628	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	917	1196	314	877	1191	274	628	0	0	548	0	0
Stage 1	648	648	-	543	543	-	-	-	-	-	-	-
Stage 2	269	548	-	334	648	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.52	6.92	7.52	6.52	6.92	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.01	3.31	3.51	4.01	3.31	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	228	186	685	244	188	727	957	-	-	1025	-	-
Stage 1	428	467	-	494	520	-	-	-	-	-	-	-
Stage 2	716	518	-	656	467	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	222	184	685	242	186	727	957	-	-	1025	-	-
Mov Cap-2 Maneuver	222	184	-	242	186	-	-	-	-	-	-	-
Stage 1	428	462	-	494	520	-	-	-	-	-	-	-
Stage 2	703	518	-	650	462	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	14.1	0	0.1
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	957	-	-	-	418	1025	-	-
HCM Lane V/C Ratio	-	-	-	-	0.051	0.01	-	-
HCM Control Delay (s)	0	-	-	0	14.1	8.5	-	-
HCM Lane LOS	A	-	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↑↑↱		↰	↑↑	
Traffic Vol, veh/h	0	0	0	23	0	32	0	466	25	20	549	0
Future Vol, veh/h	0	0	0	23	0	32	0	466	25	20	549	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	190	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	0	0	0	25	0	35	0	512	27	22	603	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	903	1186	302	872	1173	270	603	0	0	539	0	0
Stage 1	647	647	-	526	526	-	-	-	-	-	-	-
Stage 2	256	539	-	346	647	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.52	6.92	7.52	6.52	6.92	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.01	3.31	3.51	4.01	3.31	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	234	189	697	246	192	731	977	-	-	1032	-	0
Stage 1	428	467	-	506	530	-	-	-	-	-	-	0
Stage 2	729	523	-	646	467	-	-	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	219	185	697	242	188	731	977	-	-	1032	-	-
Mov Cap-2 Maneuver	219	185	-	242	188	-	-	-	-	-	-	-
Stage 1	428	457	-	506	530	-	-	-	-	-	-	-
Stage 2	694	523	-	632	457	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	15.7	0	0.3
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT
Capacity (veh/h)	977	-	-	-	396	1032	-
HCM Lane V/C Ratio	-	-	-	-	0.153	0.021	-
HCM Control Delay (s)	0	-	-	0	15.7	8.6	-
HCM Lane LOS	A	-	-	A	C	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.5	0.1	-

Sanger - North Academy Corridor Master Plan

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	4	498	4	3	566
Future Vol, veh/h	0	4	498	4	3	566
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	0	4	547	4	3	622

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	866	276	0	0	551	0
Stage 1	549	-	-	-	-	-
Stage 2	317	-	-	-	-	-
Critical Hdwy	6.82	6.92	-	-	4.12	-
Critical Hdwy Stg 1	5.82	-	-	-	-	-
Critical Hdwy Stg 2	5.82	-	-	-	-	-
Follow-up Hdwy	3.51	3.31	-	-	2.21	-
Pot Cap-1 Maneuver	294	724	-	-	1022	-
Stage 1	545	-	-	-	-	-
Stage 2	714	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	293	724	-	-	1022	-
Mov Cap-2 Maneuver	410	-	-	-	-	-
Stage 1	543	-	-	-	-	-
Stage 2	714	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	724	1022	-
HCM Lane V/C Ratio	-	-	0.006	0.003	-
HCM Control Delay (s)	-	-	10	8.5	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Sanger - North Academy Corridor Master Plan

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	8	494	34	15	561
Future Vol, veh/h	25	8	494	34	15	561
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	90	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	27	9	543	37	16	616

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	902	290	0	0	580	0
Stage 1	562	-	-	-	-	-
Stage 2	340	-	-	-	-	-
Critical Hdwy	6.82	6.92	-	-	4.12	-
Critical Hdwy Stg 1	5.82	-	-	-	-	-
Critical Hdwy Stg 2	5.82	-	-	-	-	-
Follow-up Hdwy	3.51	3.31	-	-	2.21	-
Pot Cap-1 Maneuver	279	710	-	-	997	-
Stage 1	537	-	-	-	-	-
Stage 2	695	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	275	710	-	-	997	-
Mov Cap-2 Maneuver	393	-	-	-	-	-
Stage 1	528	-	-	-	-	-
Stage 2	695	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.9	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	441	997	-
HCM Lane V/C Ratio	-	-	0.082	0.017	-
HCM Control Delay (s)	-	-	13.9	8.7	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Intersection	
Int Delay, s/veh	2.9

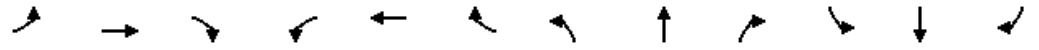
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	38	76	446	76	145	447
Future Vol, veh/h	38	76	446	76	145	447
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	40	81	474	81	154	476

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1061	278	0	0	555	0
Stage 1	515	-	-	-	-	-
Stage 2	546	-	-	-	-	-
Critical Hdwy	6.82	6.92	-	-	4.12	-
Critical Hdwy Stg 1	5.82	-	-	-	-	-
Critical Hdwy Stg 2	5.82	-	-	-	-	-
Follow-up Hdwy	3.51	3.31	-	-	2.21	-
Pot Cap-1 Maneuver	221	722	-	-	1018	-
Stage 1	567	-	-	-	-	-
Stage 2	547	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	188	722	-	-	1018	-
Mov Cap-2 Maneuver	188	-	-	-	-	-
Stage 1	481	-	-	-	-	-
Stage 2	547	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.3	0	2.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	371	1018	-
HCM Lane V/C Ratio	-	-	0.327	0.152	-
HCM Control Delay (s)	-	-	19.3	9.2	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	1.4	0.5	-

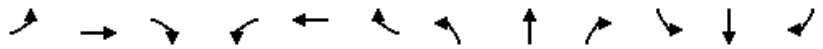
Sanger - North Academy Corridor Master Plan



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	972	342	41	497	4	199	73	34	17	54	4
Future Volume (veh/h)	6	972	342	41	497	4	199	73	34	17	54	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	7	1080	380	46	552	4	221	81	38	19	60	4
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	388	1347	601	200	1347	601	638	456	214	587	657	44
Arrive On Green	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Sat Flow, veh/h	808	3367	1502	344	3367	1502	1267	1141	535	1206	1643	110
Grp Volume(v), veh/h	7	1080	380	46	552	4	221	0	119	19	0	64
Grp Sat Flow(s),veh/h/ln	808	1683	1502	344	1683	1502	1267	0	1676	1206	0	1752
Q Serve(g_s), s	0.3	12.8	9.1	5.2	5.3	0.1	5.9	0.0	2.1	0.5	0.0	1.0
Cycle Q Clear(g_c), s	5.6	12.8	9.1	18.0	5.3	0.1	6.9	0.0	2.1	2.5	0.0	1.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.32	1.00		0.06
Lane Grp Cap(c), veh/h	388	1347	601	200	1347	601	638	0	670	587	0	701
V/C Ratio(X)	0.02	0.80	0.63	0.23	0.41	0.01	0.35	0.00	0.18	0.03	0.00	0.09
Avail Cap(c_a), veh/h	388	1347	601	200	1347	601	638	0	670	587	0	701
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.7	11.9	10.8	20.2	9.7	8.1	10.6	0.0	8.7	9.5	0.0	8.4
Incr Delay (d2), s/veh	0.1	5.1	5.0	2.7	0.9	0.0	1.5	0.0	0.6	0.1	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.7	2.6	0.5	1.3	0.0	1.5	0.0	0.6	0.1	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.8	17.0	15.9	22.9	10.6	8.1	12.1	0.0	9.3	9.6	0.0	8.7
LnGrp LOS	B	B	B	C	B	A	B	A	A	A	A	A
Approach Vol, veh/h		1467			602			340			83	
Approach Delay, s/veh		16.7			11.5			11.1			8.9	
Approach LOS		B			B			B			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		22.5		22.5		22.5		22.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		8.9		14.8		4.5		20.0				
Green Ext Time (p_c), s		0.9		2.2		0.2		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			14.4									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	38	49	79	48	54	59	245	109	57	283	10
Future Volume (veh/h)	7	38	49	79	48	54	59	245	109	57	283	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	7	40	52	83	51	57	62	258	115	60	298	11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	299	248	210	308	248	210	888	2417	1078	820	2417	1078
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.67	0.67	0.67	1.00	1.00	1.00
Sat Flow, veh/h	1306	1900	1610	1325	1900	1610	1087	3610	1610	1025	3610	1610
Grp Volume(v), veh/h	7	40	52	83	51	57	62	258	115	60	298	11
Grp Sat Flow(s),veh/h/ln	1306	1900	1610	1325	1900	1610	1087	1805	1610	1025	1805	1610
Q Serve(g_s), s	0.2	0.8	1.3	2.7	1.1	1.4	0.9	1.1	1.1	0.1	0.0	0.0
Cycle Q Clear(g_c), s	1.3	0.8	1.3	3.5	1.1	1.4	0.9	1.1	1.1	1.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	299	248	210	308	248	210	888	2417	1078	820	2417	1078
V/C Ratio(X)	0.02	0.16	0.25	0.27	0.21	0.27	0.07	0.11	0.11	0.07	0.12	0.01
Avail Cap(c_a), veh/h	651	760	644	665	760	644	888	2417	1078	820	2417	1078
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.1	17.4	17.6	18.9	17.5	17.6	2.6	2.6	2.6	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.6	0.5	0.4	0.7	0.2	0.1	0.2	0.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.4	0.5	0.8	0.5	0.5	0.1	0.2	0.2	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.1	17.7	18.2	19.4	17.9	18.3	2.8	2.7	2.8	0.2	0.1	0.0
LnGrp LOS	B	B	B	B	B	B	A	A	A	A	A	A
Approach Vol, veh/h		99			191			435			369	
Approach Delay, s/veh		18.0			18.7			2.8			0.1	
Approach LOS		B			B			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	34.6	10.4	34.6	10.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	18.0	18.0	18.0
Max Q Clear Time (g_c+I1), s	3.1	3.3	3.3	5.5
Green Ext Time (p_c), s	2.0	0.3	1.8	0.5

Intersection Summary	
HCM 6th Ctrl Delay	6.0
HCM 6th LOS	A

Existing plus Project Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	305	218	56	505	140	298	183	48	169	226	82
Future Volume (veh/h)	59	305	218	56	505	140	298	183	48	169	226	82
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744
Adj Flow Rate, veh/h	64	332	237	61	549	152	324	199	52	184	246	89
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	364	1362	608	431	1362	608	965	1075	274	1057	987	348
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.40	0.41	0.41	0.40
Sat Flow, veh/h	695	3313	1478	786	3313	1478	1891	2614	667	2042	2402	846
Grp Volume(v), veh/h	64	332	237	61	549	152	324	124	127	184	168	167
Grp Sat Flow(s),veh/h/ln	695	1657	1478	786	1657	1478	945	1657	1624	1021	1657	1591
Q Serve(g_s), s	3.2	3.0	5.1	2.5	5.3	3.0	6.1	2.2	2.3	2.8	3.0	3.1
Cycle Q Clear(g_c), s	8.5	3.0	5.1	5.4	5.3	3.0	9.3	2.2	2.3	5.1	3.0	3.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.41	1.00		0.53
Lane Grp Cap(c), veh/h	364	1362	608	431	1362	608	965	681	668	1057	681	654
V/C Ratio(X)	0.18	0.24	0.39	0.14	0.40	0.25	0.34	0.18	0.19	0.17	0.25	0.26
Avail Cap(c_a), veh/h	364	1362	608	431	1362	608	965	681	668	1057	681	654
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.3	8.7	9.3	10.4	9.4	8.7	11.8	8.4	8.5	10.1	8.7	8.8
Incr Delay (d2), s/veh	1.0	0.4	1.9	0.7	0.9	1.0	0.9	0.6	0.6	0.4	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.7	1.3	0.4	1.3	0.7	1.0	0.6	0.6	0.5	0.8	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.4	9.1	11.2	11.1	10.2	9.7	12.7	9.0	9.2	10.5	9.5	9.8
LnGrp LOS	B	A	B	B	B	A	B	A	A	B	A	A
Approach Vol, veh/h		633			762			575			519	
Approach Delay, s/veh		10.3			10.2			11.1			9.9	
Approach LOS		B			B			B			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		22.5		22.5		22.5		22.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		11.3		10.5		7.1		7.4				
Green Ext Time (p_c), s		1.7		1.9		2.0		3.0				

Intersection Summary												
HCM 6th Ctrl Delay			10.4									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	0	6	5	0	3	7	506	5	5	464	5
Future Vol, veh/h	4	0	6	5	0	3	7	506	5	5	464	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	140	-	-	145	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	4	0	7	5	0	3	8	550	5	5	504	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	808	1088	255	831	1088	278	509	0	0	555	0	0
Stage 1	517	517	-	569	569	-	-	-	-	-	-	-
Stage 2	291	571	-	262	519	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	271	213	741	260	213	716	1045	-	-	1005	-	-
Stage 1	507	529	-	472	502	-	-	-	-	-	-	-
Stage 2	690	501	-	717	528	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	267	210	741	255	210	716	1045	-	-	1005	-	-
Mov Cap-2 Maneuver	267	210	-	255	210	-	-	-	-	-	-	-
Stage 1	503	526	-	468	498	-	-	-	-	-	-	-
Stage 2	682	497	-	707	525	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.5	16	0.1	0.1
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1045	-	-	433	336	1005	-	-
HCM Lane V/C Ratio	0.007	-	-	0.025	0.026	0.005	-	-
HCM Control Delay (s)	8.5	-	-	13.5	16	8.6	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	0	6	27	0	34	7	477	17	32	437	1
Future Vol, veh/h	2	0	6	27	0	34	7	477	17	32	437	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	190	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	2	0	7	29	0	37	8	518	18	35	475	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	821	1098	238	851	1089	268	476	0	0	536	0	0
Stage 1	546	546	-	543	543	-	-	-	-	-	-	-
Stage 2	275	552	-	308	546	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	265	210	760	252	212	727	1075	-	-	1021	-	-
Stage 1	487	514	-	489	515	-	-	-	-	-	-	-
Stage 2	705	511	-	674	514	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	244	201	760	242	203	727	1075	-	-	1021	-	-
Mov Cap-2 Maneuver	244	201	-	242	203	-	-	-	-	-	-	-
Stage 1	484	497	-	486	511	-	-	-	-	-	-	-
Stage 2	664	507	-	645	497	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.4	16.3	0.1	0.6
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1075	-	-	497	385	1021	-	-
HCM Lane V/C Ratio	0.007	-	-	0.017	0.172	0.034	-	-
HCM Control Delay (s)	8.4	-	-	12.4	16.3	8.7	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.6	0.1	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	9	492	4	4	466
Future Vol, veh/h	2	9	492	4	4	466
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	2	10	535	4	4	507

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	799	270	0	0	539	0
Stage 1	537	-	-	-	-	-
Stage 2	262	-	-	-	-	-
Critical Hdwy	6.86	6.96	-	-	4.16	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	-	-	2.23	-
Pot Cap-1 Maneuver	321	725	-	-	1019	-
Stage 1	547	-	-	-	-	-
Stage 2	755	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	320	725	-	-	1019	-
Mov Cap-2 Maneuver	427	-	-	-	-	-
Stage 1	545	-	-	-	-	-
Stage 2	755	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	643	1019	-
HCM Lane V/C Ratio	-	-	0.019	0.004	-
HCM Control Delay (s)	-	-	10.7	8.5	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	24	471	10	8	461
Future Vol, veh/h	25	24	471	10	8	461
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	90	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	27	26	512	11	9	501

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	787	262	0	0	523	0
Stage 1	518	-	-	-	-	-
Stage 2	269	-	-	-	-	-
Critical Hdwy	6.86	6.96	-	-	4.16	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	-	-	2.23	-
Pot Cap-1 Maneuver	327	734	-	-	1033	-
Stage 1	560	-	-	-	-	-
Stage 2	749	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	324	734	-	-	1033	-
Mov Cap-2 Maneuver	431	-	-	-	-	-
Stage 1	555	-	-	-	-	-
Stage 2	749	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.4	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	540	1033	-
HCM Lane V/C Ratio	-	-	0.099	0.008	-
HCM Control Delay (s)	-	-	12.4	8.5	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	3.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	38	151	331	39	87	400
Future Vol, veh/h	38	151	331	39	87	400
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	41	164	360	42	95	435

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	789	201	0	0	402	0
Stage 1	381	-	-	-	-	-
Stage 2	408	-	-	-	-	-
Critical Hdwy	6.86	6.96	-	-	4.16	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	-	-	2.23	-
Pot Cap-1 Maneuver	326	803	-	-	1146	-
Stage 1	657	-	-	-	-	-
Stage 2	637	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	299	803	-	-	1146	-
Mov Cap-2 Maneuver	299	-	-	-	-	-
Stage 1	602	-	-	-	-	-
Stage 2	637	-	-	-	-	-

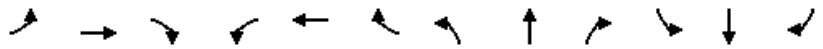
Approach	WB	NB	SB
HCM Control Delay, s	14.1	0	1.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	600	1146	-
HCM Lane V/C Ratio	-	-	0.342	0.083	-
HCM Control Delay (s)	-	-	14.1	8.4	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	1.5	0.3	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	491	107	23	870	3	343	70	17	2	54	10
Future Volume (veh/h)	9	491	107	23	870	3	343	70	17	2	54	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	10	534	116	25	946	3	373	76	18	2	59	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	261	1384	617	382	1384	617	647	569	135	625	597	111
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.40	0.41	0.41	0.40
Sat Flow, veh/h	560	3367	1502	741	3367	1502	1261	1385	328	1233	1452	271
Grp Volume(v), veh/h	10	534	116	25	946	3	373	0	94	2	0	70
Grp Sat Flow(s),veh/h/ln	560	1683	1502	741	1683	1502	1261	0	1713	1233	0	1723
Q Serve(g_s), s	0.7	5.0	2.2	1.1	10.4	0.1	11.6	0.0	1.5	0.0	0.0	1.1
Cycle Q Clear(g_c), s	11.0	5.0	2.2	6.1	10.4	0.1	12.7	0.0	1.5	1.6	0.0	1.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.19	1.00		0.16
Lane Grp Cap(c), veh/h	261	1384	617	382	1384	617	647	0	704	625	0	708
V/C Ratio(X)	0.04	0.39	0.19	0.07	0.68	0.00	0.58	0.00	0.13	0.00	0.00	0.10
Avail Cap(c_a), veh/h	261	1384	617	382	1384	617	647	0	704	625	0	708
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.4	9.3	8.5	11.4	10.9	7.8	12.0	0.0	8.3	8.8	0.0	8.2
Incr Delay (d2), s/veh	0.3	0.8	0.7	0.3	2.8	0.0	3.7	0.0	0.4	0.0	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.2	0.5	0.2	2.7	0.0	3.0	0.0	0.5	0.0	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.6	10.1	9.1	11.7	13.6	7.8	15.8	0.0	8.7	8.8	0.0	8.4
LnGrp LOS	B	B	A	B	B	A	B	A	A	A	A	A
Approach Vol, veh/h		660			974			467			72	
Approach Delay, s/veh		10.0			13.5			14.3			8.4	
Approach LOS		B			B			B			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		22.5		22.5		22.5		22.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		14.7		13.0		3.6		12.4				
Green Ext Time (p_c), s		0.6		1.6		0.2		2.8				

Intersection Summary												
HCM 6th Ctrl Delay			12.5									
HCM 6th LOS			B									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	57	123	94	68	89	61	205	51	27	270	23
Future Volume (veh/h)	23	57	123	94	68	89	61	205	51	27	270	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	25	62	134	102	74	97	66	223	55	29	293	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	634	775	657	628	775	657	522	1473	657	573	1473	657
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.14	0.14	0.14
Sat Flow, veh/h	1224	1885	1598	1196	1885	1598	1070	3582	1598	1110	3582	1598
Grp Volume(v), veh/h	25	62	134	102	74	97	66	223	55	29	293	25
Grp Sat Flow(s),veh/h/ln	1224	1885	1598	1196	1885	1598	1070	1791	1598	1110	1791	1598
Q Serve(g_s), s	0.6	0.9	2.4	2.6	1.1	1.7	2.0	1.8	0.9	1.0	3.3	0.6
Cycle Q Clear(g_c), s	1.7	0.9	2.4	3.5	1.1	1.7	5.2	1.8	0.9	2.8	3.3	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	634	775	657	628	775	657	522	1473	657	573	1473	657
V/C Ratio(X)	0.04	0.08	0.20	0.16	0.10	0.15	0.13	0.15	0.08	0.05	0.20	0.04
Avail Cap(c_a), veh/h	634	775	657	628	775	657	522	1473	657	573	1473	657
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.6	8.1	8.5	9.1	8.1	8.3	10.5	8.3	8.1	13.4	12.9	11.7
Incr Delay (d2), s/veh	0.1	0.2	0.7	0.6	0.2	0.5	0.5	0.2	0.3	0.2	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.3	0.8	0.6	0.4	0.6	0.4	0.6	0.3	0.2	1.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.7	8.3	9.2	9.7	8.4	8.8	11.0	8.5	8.3	13.6	13.2	11.8
LnGrp LOS	A	A	A	A	A	A	B	A	A	B	B	B
Approach Vol, veh/h		221			273			344			347	
Approach Delay, s/veh		8.9			9.0			9.0			13.1	
Approach LOS		A			A			A			B	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	22.5	22.5	22.5	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	18.0	18.0	18.0
Max Q Clear Time (g_c+I1), s	7.2	4.4	5.3	5.5
Green Ext Time (p_c), s	1.3	0.7	1.5	0.9

Intersection Summary	
HCM 6th Ctrl Delay	10.2
HCM 6th LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	544	397	83	466	149	348	248	116	155	272	59
Future Volume (veh/h)	60	544	397	83	466	149	348	248	116	155	272	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	65	591	432	90	507	162	378	270	126	168	296	64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	383	1384	617	309	1384	617	956	925	420	915	1135	242
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.40	0.41	0.41	0.40
Sat Flow, veh/h	728	3367	1502	522	3367	1502	1877	2250	1021	1816	2761	588
Grp Volume(v), veh/h	65	591	432	90	507	162	378	200	196	168	179	181
Grp Sat Flow(s),veh/h/ln	728	1683	1502	522	1683	1502	939	1683	1588	908	1683	1666
Q Serve(g_s), s	3.1	5.6	10.7	6.7	4.7	3.2	7.5	3.6	3.8	3.1	3.1	3.3
Cycle Q Clear(g_c), s	7.8	5.6	10.7	12.3	4.7	3.2	10.8	3.6	3.8	6.8	3.1	3.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.64	1.00		0.35
Lane Grp Cap(c), veh/h	383	1384	617	309	1384	617	956	692	653	915	692	685
V/C Ratio(X)	0.17	0.43	0.70	0.29	0.37	0.26	0.40	0.29	0.30	0.18	0.26	0.26
Avail Cap(c_a), veh/h	383	1384	617	309	1384	617	956	692	653	915	692	685
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.9	9.5	11.0	13.9	9.2	8.7	12.3	8.9	9.0	11.2	8.7	8.8
Incr Delay (d2), s/veh	1.0	1.0	6.5	2.4	0.7	1.0	1.2	1.1	1.2	0.4	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	1.4	3.1	0.7	1.1	0.8	1.2	1.0	1.0	0.5	0.8	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.8	10.4	17.4	16.2	9.9	9.8	13.5	9.9	10.2	11.7	9.6	9.8
LnGrp LOS	B	B	B	B	A	A	B	A	B	B	A	A
Approach Vol, veh/h		1088			759			774			528	
Approach Delay, s/veh		13.4			10.7			11.8			10.3	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		22.5		22.5		22.5		22.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		12.8		12.7		8.8		14.3				
Green Ext Time (p_c), s		2.0		2.5		1.9		1.5				

Intersection Summary												
HCM 6th Ctrl Delay			11.8									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	1	22	16	1	19	22	581	17	15	650	15
Future Vol, veh/h	16	1	22	16	1	19	22	581	17	15	650	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	140	-	-	145	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	17	1	24	17	1	21	24	632	18	16	707	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1112	1445	362	1075	1444	325	723	0	0	650	0	0
Stage 1	747	747	-	689	689	-	-	-	-	-	-	-
Stage 2	365	698	-	386	755	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.52	6.92	7.52	6.52	6.92	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.01	3.31	3.51	4.01	3.31	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	165	132	638	175	132	674	882	-	-	939	-	-
Stage 1	373	421	-	404	447	-	-	-	-	-	-	-
Stage 2	629	443	-	612	417	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	154	126	638	162	126	674	882	-	-	939	-	-
Mov Cap-2 Maneuver	154	126	-	162	126	-	-	-	-	-	-	-
Stage 1	363	414	-	393	435	-	-	-	-	-	-	-
Stage 2	592	431	-	578	410	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21	20.8	0.3	0.2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	882	-	-	267	267	939	-	-
HCM Lane V/C Ratio	0.027	-	-	0.159	0.147	0.017	-	-
HCM Control Delay (s)	9.2	-	-	21	20.8	8.9	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0.5	0.1	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	1	22	27	0	34	22	564	29	22	641	4
Future Vol, veh/h	3	1	22	27	0	34	22	564	29	22	641	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	190	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	3	1	24	29	0	37	24	613	32	24	697	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1102	1440	351	1074	1426	323	701	0	0	645	0	0
Stage 1	747	747	-	677	677	-	-	-	-	-	-	-
Stage 2	355	693	-	397	749	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.52	6.92	7.52	6.52	6.92	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.01	3.31	3.51	4.01	3.31	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	167	133	648	176	135	676	899	-	-	943	-	-
Stage 1	373	421	-	411	453	-	-	-	-	-	-	-
Stage 2	638	445	-	603	420	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	152	126	648	162	128	676	899	-	-	943	-	-
Mov Cap-2 Maneuver	152	126	-	162	128	-	-	-	-	-	-	-
Stage 1	363	410	-	400	441	-	-	-	-	-	-	-
Stage 2	587	433	-	564	410	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.1	21.7	0.3	0.3
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	899	-	-	422	281	943	-	-
HCM Lane V/C Ratio	0.027	-	-	0.067	0.236	0.025	-	-
HCM Control Delay (s)	9.1	-	-	14.1	21.7	8.9	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.9	0.1	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	7	608	4	6	680
Future Vol, veh/h	0	7	608	4	6	680
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	0	8	661	4	7	739

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1047	333	0	0	665	0
Stage 1	663	-	-	-	-	-
Stage 2	384	-	-	-	-	-
Critical Hdwy	6.82	6.92	-	-	4.12	-
Critical Hdwy Stg 1	5.82	-	-	-	-	-
Critical Hdwy Stg 2	5.82	-	-	-	-	-
Follow-up Hdwy	3.51	3.31	-	-	2.21	-
Pot Cap-1 Maneuver	225	666	-	-	927	-
Stage 1	477	-	-	-	-	-
Stage 2	661	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	223	666	-	-	927	-
Mov Cap-2 Maneuver	348	-	-	-	-	-
Stage 1	473	-	-	-	-	-
Stage 2	661	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	666	927	-
HCM Lane V/C Ratio	-	-	0.011	0.007	-
HCM Control Delay (s)	-	-	10.5	8.9	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	11	602	34	18	672
Future Vol, veh/h	25	11	602	34	18	672
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	90	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	27	12	654	37	20	730

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1078	346	0	0	691	0
Stage 1	673	-	-	-	-	-
Stage 2	405	-	-	-	-	-
Critical Hdwy	6.82	6.92	-	-	4.12	-
Critical Hdwy Stg 1	5.82	-	-	-	-	-
Critical Hdwy Stg 2	5.82	-	-	-	-	-
Follow-up Hdwy	3.51	3.31	-	-	2.21	-
Pot Cap-1 Maneuver	215	653	-	-	906	-
Stage 1	471	-	-	-	-	-
Stage 2	645	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	210	653	-	-	906	-
Mov Cap-2 Maneuver	335	-	-	-	-	-
Stage 1	461	-	-	-	-	-
Stage 2	645	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.1	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	394	906	-
HCM Lane V/C Ratio	-	-	0.099	0.022	-
HCM Control Delay (s)	-	-	15.1	9.1	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Intersection	
Int Delay, s/veh	3.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	38	91	539	76	160	543
Future Vol, veh/h	38	91	539	76	160	543
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	41	99	586	83	174	590

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1271	335	0	0	669	0
Stage 1	628	-	-	-	-	-
Stage 2	643	-	-	-	-	-
Critical Hdwy	6.82	6.92	-	-	4.12	-
Critical Hdwy Stg 1	5.82	-	-	-	-	-
Critical Hdwy Stg 2	5.82	-	-	-	-	-
Follow-up Hdwy	3.51	3.31	-	-	2.21	-
Pot Cap-1 Maneuver	161	664	-	-	924	-
Stage 1	497	-	-	-	-	-
Stage 2	488	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	131	664	-	-	924	-
Mov Cap-2 Maneuver	131	-	-	-	-	-
Stage 1	404	-	-	-	-	-
Stage 2	488	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	26.8	0	2.2
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	302	924	-
HCM Lane V/C Ratio	-	-	0.464	0.188	-
HCM Control Delay (s)	-	-	26.8	9.8	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	2.3	0.7	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	972	342	41	497	4	199	73	34	17	54	4
Future Volume (veh/h)	6	972	342	41	497	4	199	73	34	17	54	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	7	1057	372	45	540	4	216	79	37	18	59	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	404	1384	617	210	1384	617	654	469	220	604	674	46
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.40	0.41	0.41	0.40
Sat Flow, veh/h	817	3367	1502	355	3367	1502	1269	1141	534	1209	1641	111
Grp Volume(v), veh/h	7	1057	372	45	540	4	216	0	116	18	0	63
Grp Sat Flow(s),veh/h/ln	817	1683	1502	355	1683	1502	1269	0	1676	1209	0	1752
Q Serve(g_s), s	0.3	12.1	8.7	5.6	5.1	0.1	5.6	0.0	2.0	0.4	0.0	1.0
Cycle Q Clear(g_c), s	5.3	12.1	8.7	17.7	5.1	0.1	6.6	0.0	2.0	2.4	0.0	1.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.32	1.00		0.06
Lane Grp Cap(c), veh/h	404	1384	617	210	1384	617	654	0	689	604	0	720
V/C Ratio(X)	0.02	0.76	0.60	0.21	0.39	0.01	0.33	0.00	0.17	0.03	0.00	0.09
Avail Cap(c_a), veh/h	404	1384	617	210	1384	617	654	0	689	604	0	720
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.2	11.4	10.4	19.0	9.3	7.8	10.1	0.0	8.4	9.1	0.0	8.1
Incr Delay (d2), s/veh	0.1	4.0	4.3	2.3	0.8	0.0	1.4	0.0	0.5	0.1	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.3	2.4	0.5	1.2	0.0	1.4	0.0	0.6	0.1	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.2	15.4	14.7	21.3	10.1	7.8	11.5	0.0	9.0	9.2	0.0	8.3
LnGrp LOS	B	B	B	C	B	A	B	A	A	A	A	A
Approach Vol, veh/h		1436			589			332			81	
Approach Delay, s/veh		15.2			11.0			10.6			8.5	
Approach LOS		B			B			B			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		22.5		22.5		22.5		22.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		8.6		14.1		4.4		19.7				
Green Ext Time (p_c), s		0.9		2.6		0.2		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			13.3									
HCM 6th LOS			B									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	38	49	79	48	54	59	245	109	57	283	10
Future Volume (veh/h)	7	38	49	79	48	54	59	245	109	57	283	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	8	41	53	86	52	59	64	266	118	62	308	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	316	274	232	326	274	232	891	2448	1092	822	2448	1092
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.68	0.68	0.68	1.00	1.00	1.00
Sat Flow, veh/h	1302	1900	1610	1323	1900	1610	1077	3610	1610	1015	3610	1610
Grp Volume(v), veh/h	8	41	53	86	52	59	64	266	118	62	308	11
Grp Sat Flow(s),veh/h/ln	1302	1900	1610	1323	1900	1610	1077	1805	1610	1015	1805	1610
Q Serve(g_s), s	0.2	0.8	1.3	2.7	1.1	1.5	0.9	1.2	1.1	0.1	0.0	0.0
Cycle Q Clear(g_c), s	1.3	0.8	1.3	3.6	1.1	1.5	0.9	1.2	1.1	1.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	316	274	232	326	274	232	891	2448	1092	822	2448	1092
V/C Ratio(X)	0.03	0.15	0.23	0.26	0.19	0.25	0.07	0.11	0.11	0.08	0.13	0.01
Avail Cap(c_a), veh/h	664	781	662	679	781	662	891	2448	1092	822	2448	1092
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.5	16.8	17.0	18.4	16.9	17.1	2.5	2.5	2.5	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.5	0.4	0.3	0.6	0.2	0.1	0.2	0.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.4	0.5	0.8	0.5	0.5	0.1	0.2	0.2	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.6	17.1	17.5	18.8	17.3	17.7	2.6	2.6	2.7	0.2	0.1	0.0
LnGrp LOS	B	B	B	B	B	B	A	A	A	A	A	A
Approach Vol, veh/h		102			197			448			381	
Approach Delay, s/veh		17.4			18.1			2.6			0.1	
Approach LOS		B			B			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	34.5	10.5	34.5	10.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	18.0	18.0	18.0
Max Q Clear Time (g_c+I1), s	3.2	3.3	3.3	5.6
Green Ext Time (p_c), s	2.0	0.3	1.8	0.5

Intersection Summary	
HCM 6th Ctrl Delay	5.8
HCM 6th LOS	A

Cumulative Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	425	246	81	830	230	375	242	61	358	441	174
Future Volume (veh/h)	82	425	246	81	830	230	375	242	61	358	441	174
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744
Adj Flow Rate, veh/h	89	462	267	88	902	250	408	263	66	389	479	189
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	247	1362	608	374	1362	608	676	1083	267	974	956	375
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.40	0.41	0.41	0.40
Sat Flow, veh/h	455	3313	1478	677	3313	1478	1390	2635	649	1901	2325	911
Grp Volume(v), veh/h	89	462	267	88	902	250	408	164	165	389	340	328
Grp Sat Flow(s),veh/h/ln	455	1657	1478	677	1657	1478	695	1657	1627	950	1657	1580
Q Serve(g_s), s	8.6	4.3	5.8	4.6	9.9	5.4	11.5	2.9	3.0	7.6	6.9	7.0
Cycle Q Clear(g_c), s	18.5	4.3	5.8	8.9	9.9	5.4	18.5	2.9	3.0	10.6	6.9	7.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.40	1.00		0.58
Lane Grp Cap(c), veh/h	247	1362	608	374	1362	608	676	681	669	974	681	649
V/C Ratio(X)	0.36	0.34	0.44	0.24	0.66	0.41	0.60	0.24	0.25	0.40	0.50	0.50
Avail Cap(c_a), veh/h	247	1362	608	374	1362	608	676	681	669	974	681	649
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.3	9.1	9.5	12.1	10.7	9.4	17.5	8.7	8.8	12.2	9.8	10.0
Incr Delay (d2), s/veh	4.1	0.7	2.3	1.5	2.5	2.1	4.0	0.8	0.9	1.2	2.6	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	1.0	1.5	0.6	2.6	1.3	1.9	0.8	0.8	1.2	1.9	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.4	9.7	11.8	13.6	13.3	11.4	21.4	9.5	9.6	13.4	12.4	12.8
LnGrp LOS	C	A	B	B	B	B	C	A	A	B	B	B
Approach Vol, veh/h		818			1240			737			1057	
Approach Delay, s/veh		11.8			12.9			16.1			12.9	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	22.5	22.5	22.5	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	18.0	18.0	18.0
Max Q Clear Time (g_c+I1), s	20.5	20.5	12.6	11.9
Green Ext Time (p_c), s	0.0	0.0	2.7	3.4

Intersection Summary	
HCM 6th Ctrl Delay	13.3
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	6	17	7	13	3	11	655	4	6	782	10
Future Vol, veh/h	10	6	17	7	13	3	11	655	4	6	782	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	140	-	-	145	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	11	7	18	8	14	3	12	712	4	7	850	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1257	1610	431	1181	1613	358	861	0	0	716	0	0
Stage 1	870	870	-	738	738	-	-	-	-	-	-	-
Stage 2	387	740	-	443	875	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	127	103	570	144	102	636	770	-	-	874	-	-
Stage 1	311	365	-	373	420	-	-	-	-	-	-	-
Stage 2	605	419	-	561	363	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	111	101	570	130	100	636	770	-	-	874	-	-
Mov Cap-2 Maneuver	111	101	-	130	100	-	-	-	-	-	-	-
Stage 1	306	362	-	367	413	-	-	-	-	-	-	-
Stage 2	572	412	-	529	360	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29.2	42	0.2	0.1
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	770	-	-	184	122	874	-	-
HCM Lane V/C Ratio	0.016	-	-	0.195	0.205	0.007	-	-
HCM Control Delay (s)	9.7	-	-	29.2	42	9.2	-	-
HCM Lane LOS	A	-	-	D	E	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0.7	0	-	-

Intersection	
Int Delay, s/veh	45.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	49	20	82	43	62	56	61	603	22	65	744	35
Future Vol, veh/h	49	20	82	43	62	56	61	603	22	65	744	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	190	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	53	22	89	47	67	61	66	655	24	71	809	38

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1463	1781	424	1357	1788	340	847	0	0	679	0	0
Stage 1	970	970	-	799	799	-	-	-	-	-	-	-
Stage 2	493	811	-	558	989	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	89	80	576	107	80	653	780	-	-	902	-	-
Stage 1	270	327	-	343	393	-	-	-	-	-	-	-
Stage 2	524	388	-	479	321	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	67	576	60	~ 67	653	780	-	-	902	-	-
Mov Cap-2 Maneuver	-	67	-	60	~ 67	-	-	-	-	-	-	-
Stage 1	247	301	-	314	360	-	-	-	-	-	-	-
Stage 2	354	355	-	346	296	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		$ 510.7	0.9	0.7
HCM LOS	-	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	780	-	-	-	93	902	-	-
HCM Lane V/C Ratio	0.085	-	-	-	1.882	0.078	-	-
HCM Control Delay (s)	10	-	-	-	$ 510.7	9.3	-	-
HCM Lane LOS	B	-	-	-	F	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	-	14.7	0.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	13	616	6	6	801
Future Vol, veh/h	2	13	616	6	6	801
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	2	14	670	7	7	871

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1124	339	0	0	677	0
Stage 1	674	-	-	-	-	-
Stage 2	450	-	-	-	-	-
Critical Hdwy	6.86	6.96	-	-	4.16	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	-	-	2.23	-
Pot Cap-1 Maneuver	198	654	-	-	904	-
Stage 1	465	-	-	-	-	-
Stage 2	606	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	196	654	-	-	904	-
Mov Cap-2 Maneuver	325	-	-	-	-	-
Stage 1	461	-	-	-	-	-
Stage 2	606	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.4	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	576	904	-
HCM Lane V/C Ratio	-	-	0.028	0.007	-
HCM Control Delay (s)	-	-	11.4	9	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	38	564	14	15	808
Future Vol, veh/h	25	38	564	14	15	808
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	90	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	27	41	613	15	16	878

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1092	314	0	0	628	0
Stage 1	621	-	-	-	-	-
Stage 2	471	-	-	-	-	-
Critical Hdwy	6.86	6.96	-	-	4.16	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	-	-	2.23	-
Pot Cap-1 Maneuver	207	679	-	-	943	-
Stage 1	496	-	-	-	-	-
Stage 2	592	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	203	679	-	-	943	-
Mov Cap-2 Maneuver	333	-	-	-	-	-
Stage 1	488	-	-	-	-	-
Stage 2	592	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.7	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	481	943	-
HCM Lane V/C Ratio	-	-	0.142	0.017	-
HCM Control Delay (s)	-	-	13.7	8.9	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-

Intersection	
Int Delay, s/veh	9.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	68	260	336	54	176	697
Future Vol, veh/h	68	260	336	54	176	697
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	74	283	365	59	191	758

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1156	212	0	0	424	0
Stage 1	395	-	-	-	-	-
Stage 2	761	-	-	-	-	-
Critical Hdwy	6.86	6.96	-	-	4.16	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	-	-	2.23	-
Pot Cap-1 Maneuver	188	790	-	-	1125	-
Stage 1	647	-	-	-	-	-
Stage 2	419	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	156	790	-	-	1125	-
Mov Cap-2 Maneuver	156	-	-	-	-	-
Stage 1	537	-	-	-	-	-
Stage 2	419	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	43.1	0	1.8
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	429	1125	-
HCM Lane V/C Ratio	-	-	0.831	0.17	-
HCM Control Delay (s)	-	-	43.1	8.9	-
HCM Lane LOS	-	-	E	A	-
HCM 95th %tile Q(veh)	-	-	7.9	0.6	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	684	201	60	1085	4	712	135	103	3	99	17
Future Volume (veh/h)	13	684	201	60	1085	4	712	135	103	3	99	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	14	743	218	65	1179	4	774	147	112	3	108	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	202	1384	617	295	1384	617	597	384	292	479	609	101
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.40	0.41	0.41	0.40
Sat Flow, veh/h	449	3367	1502	554	3367	1502	1198	933	711	1062	1481	247
Grp Volume(v), veh/h	14	743	218	65	1179	4	774	0	259	3	0	126
Grp Sat Flow(s),veh/h/ln	449	1683	1502	554	1683	1502	1198	0	1644	1062	0	1727
Q Serve(g_s), s	1.3	7.5	4.5	4.5	14.3	0.1	16.4	0.0	5.0	0.1	0.0	2.1
Cycle Q Clear(g_c), s	15.6	7.5	4.5	12.0	14.3	0.1	18.5	0.0	5.0	5.1	0.0	2.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.43	1.00		0.14
Lane Grp Cap(c), veh/h	202	1384	617	295	1384	617	597	0	676	479	0	710
V/C Ratio(X)	0.07	0.54	0.35	0.22	0.85	0.01	1.30	0.00	0.38	0.01	0.00	0.18
Avail Cap(c_a), veh/h	202	1384	617	295	1384	617	597	0	676	479	0	710
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.1	10.0	9.1	14.6	12.0	7.8	16.5	0.0	9.3	11.0	0.0	8.4
Incr Delay (d2), s/veh	0.7	1.5	1.6	1.7	6.8	0.0	145.6	0.0	1.6	0.0	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.9	1.1	0.5	4.4	0.0	29.6	0.0	1.6	0.0	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.7	11.5	10.7	16.3	18.8	7.8	162.1	0.0	11.0	11.1	0.0	9.0
LnGrp LOS	B	B	B	B	B	A	F	A	B	B	A	A
Approach Vol, veh/h		975			1248			1033			129	
Approach Delay, s/veh		11.4			18.6			124.2			9.0	
Approach LOS		B			B			F			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		22.5		22.5		22.5		22.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		20.5		17.6		7.1		16.3				
Green Ext Time (p_c), s		0.0		0.2		0.4		1.2				

Intersection Summary												
HCM 6th Ctrl Delay			48.4									
HCM 6th LOS			D									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	77	166	144	92	143	140	491	119	61	88	46
Future Volume (veh/h)	31	77	166	144	92	143	140	491	119	61	88	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	34	84	180	157	100	155	152	534	129	66	96	50
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	589	775	657	591	775	657	654	1473	657	400	1473	657
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41
Sat Flow, veh/h	1133	1885	1598	1124	1885	1598	1252	3582	1598	778	3582	1598
Grp Volume(v), veh/h	34	84	180	157	100	155	152	534	129	66	96	50
Grp Sat Flow(s),veh/h/ln	1133	1885	1598	1124	1885	1598	1252	1791	1598	778	1791	1598
Q Serve(g_s), s	0.9	1.2	3.4	4.5	1.5	2.8	3.8	4.6	2.3	2.9	0.7	0.9
Cycle Q Clear(g_c), s	2.3	1.2	3.4	5.7	1.5	2.8	4.5	4.6	2.3	7.5	0.7	0.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	589	775	657	591	775	657	654	1473	657	400	1473	657
V/C Ratio(X)	0.06	0.11	0.27	0.27	0.13	0.24	0.23	0.36	0.20	0.17	0.07	0.08
Avail Cap(c_a), veh/h	589	775	657	591	775	657	654	1473	657	400	1473	657
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.0	8.2	8.8	9.9	8.2	8.6	9.4	9.2	8.5	11.8	8.0	8.1
Incr Delay (d2), s/veh	0.2	0.3	1.0	1.1	0.3	0.8	0.8	0.7	0.7	0.9	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.5	1.1	1.1	0.6	1.0	1.0	1.5	0.7	0.5	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.2	8.4	9.8	11.0	8.6	9.5	10.2	9.9	9.2	12.7	8.1	8.3
LnGrp LOS	A	A	A	B	A	A	B	A	A	B	A	A
Approach Vol, veh/h		298			412			815			212	
Approach Delay, s/veh		9.4			9.9			9.8			9.6	
Approach LOS		A			A			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	22.5	22.5	22.5	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	18.0	18.0	18.0
Max Q Clear Time (g_c+I1), s	6.6	5.4	9.5	7.7
Green Ext Time (p_c), s	3.5	1.0	0.6	1.3

Intersection Summary	
HCM 6th Ctrl Delay	9.7
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	704	325	92	715	229	402	487	158	359	482	137
Future Volume (veh/h)	78	704	325	92	715	229	402	487	158	359	482	137
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	85	765	353	100	777	249	437	529	172	390	524	149
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	282	1384	617	274	1384	617	686	1028	333	664	1065	301
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.40	0.41	0.41	0.40
Sat Flow, veh/h	521	3367	1502	477	3367	1502	1406	2500	809	1370	2590	733
Grp Volume(v), veh/h	85	765	353	100	777	249	437	355	346	390	340	333
Grp Sat Flow(s),veh/h/ln	521	1683	1502	477	1683	1502	703	1683	1626	685	1683	1640
Q Serve(g_s), s	6.7	7.8	8.1	9.1	8.0	5.3	11.7	7.1	7.2	11.3	6.7	6.8
Cycle Q Clear(g_c), s	14.7	7.8	8.1	16.9	8.0	5.3	18.5	7.1	7.2	18.5	6.7	6.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.50	1.00		0.45
Lane Grp Cap(c), veh/h	282	1384	617	274	1384	617	686	692	669	664	692	674
V/C Ratio(X)	0.30	0.55	0.57	0.37	0.56	0.40	0.64	0.51	0.52	0.59	0.49	0.49
Avail Cap(c_a), veh/h	282	1384	617	274	1384	617	686	692	669	664	692	674
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.8	10.1	10.2	16.5	10.1	9.4	17.6	9.9	10.0	17.5	9.8	9.9
Incr Delay (d2), s/veh	2.7	1.6	3.8	3.7	1.7	2.0	4.5	2.7	2.8	3.8	2.5	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	2.0	2.2	1.0	2.0	1.3	2.1	2.0	2.0	1.8	1.9	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.5	11.7	14.0	20.3	11.8	11.3	22.1	12.6	12.9	21.3	12.3	12.5
LnGrp LOS	B	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		1203			1126			1138			1063	
Approach Delay, s/veh		12.9			12.4			16.3			15.6	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		22.5		22.5		22.5		22.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		20.5		16.7		20.5		18.9				
Green Ext Time (p_c), s		0.0		0.9		0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	14.3
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	11.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↑↑↱		↰	↑↑↱	
Traffic Vol, veh/h	21	13	35	12	21	20	19	1007	21	17	902	12
Future Vol, veh/h	21	13	35	12	21	20	19	1007	21	17	902	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	140	-	-	145	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	23	14	38	13	23	22	21	1095	23	18	980	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1624	2183	497	1682	2178	559	993	0	0	1118	0	0
Stage 1	1023	1023	-	1149	1149	-	-	-	-	-	-	-
Stage 2	601	1160	-	533	1029	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.52	6.92	7.52	6.52	6.92	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.01	3.31	3.51	4.01	3.31	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	69	46	521	62	46	475	698	-	-	626	-	-
Stage 1	254	313	-	213	273	-	-	-	-	-	-	-
Stage 2	456	270	-	501	311	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	37	43	521	41	43	475	698	-	-	626	-	-
Mov Cap-2 Maneuver	37	43	-	41	43	-	-	-	-	-	-	-
Stage 1	246	304	-	207	265	-	-	-	-	-	-	-
Stage 2	386	262	-	430	302	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	205.7	191.4	0.2	0.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	698	-	-	74	64	626	-	-
HCM Lane V/C Ratio	0.03	-	-	1.014	0.9	0.03	-	-
HCM Control Delay (s)	10.3	-	-	205.7	191.4	10.9	-	-
HCM Lane LOS	B	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	5.4	4.3	0.1	-	-

Intersection	
Int Delay, s/veh	182.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	54	23	93	38	55	53	80	971	52	38	896	49
Future Vol, veh/h	54	23	93	38	55	53	80	971	52	38	896	49
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	190	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	59	25	101	41	60	58	87	1055	57	41	974	53

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1815	2369	514	1840	2367	556	1027	0	0	1112	0	0
Stage 1	1083	1083	-	1258	1258	-	-	-	-	-	-	-
Stage 2	732	1286	-	582	1109	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.52	6.92	7.52	6.52	6.92	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.01	3.31	3.51	4.01	3.31	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	~ 49	35	508	47	~ 35	477	678	-	-	630	-	-
Stage 1	234	294	-	182	243	-	-	-	-	-	-	-
Stage 2	381	235	-	468	286	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	29	508	~ 9	~ 29	477	678	-	-	630	-	-
Mov Cap-2 Maneuver	-	29	-	~ 9	~ 29	-	-	-	-	-	-	-
Stage 1	204	275	-	159	212	-	-	-	-	-	-	-
Stage 2	210	205	-	319	267	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		$ 2988.4	0.8	0.4
HCM LOS	-	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	678	-	-	-	23	630	-	-
HCM Lane V/C Ratio	0.128	-	-	-	6.9	0.066	-	-
HCM Control Delay (s)	11.1	-	-	-	$ 2988.4	11.1	-	-
HCM Lane LOS	B	-	-	-	F	B	-	-
HCM 95th %tile Q(veh)	0.4	-	-	-	19.9	0.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	7	996	8	6	948
Future Vol, veh/h	3	7	996	8	6	948
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	3	8	1083	9	7	1030

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1617	546	0	0	1092	0
Stage 1	1088	-	-	-	-	-
Stage 2	529	-	-	-	-	-
Critical Hdwy	6.82	6.92	-	-	4.12	-
Critical Hdwy Stg 1	5.82	-	-	-	-	-
Critical Hdwy Stg 2	5.82	-	-	-	-	-
Follow-up Hdwy	3.51	3.31	-	-	2.21	-
Pot Cap-1 Maneuver	95	484	-	-	641	-
Stage 1	287	-	-	-	-	-
Stage 2	558	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	94	484	-	-	641	-
Mov Cap-2 Maneuver	208	-	-	-	-	-
Stage 1	284	-	-	-	-	-
Stage 2	558	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.7	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	346	641	-
HCM Lane V/C Ratio	-	-	0.031	0.01	-
HCM Control Delay (s)	-	-	15.7	10.7	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	13	971	71	28	940
Future Vol, veh/h	25	13	971	71	28	940
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	90	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	27	14	1055	77	30	1022

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1665	566	0	0	1132	0
Stage 1	1094	-	-	-	-	-
Stage 2	571	-	-	-	-	-
Critical Hdwy	6.82	6.92	-	-	4.12	-
Critical Hdwy Stg 1	5.82	-	-	-	-	-
Critical Hdwy Stg 2	5.82	-	-	-	-	-
Follow-up Hdwy	3.51	3.31	-	-	2.21	-
Pot Cap-1 Maneuver	89	470	-	-	619	-
Stage 1	285	-	-	-	-	-
Stage 2	531	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	85	470	-	-	619	-
Mov Cap-2 Maneuver	195	-	-	-	-	-
Stage 1	271	-	-	-	-	-
Stage 2	531	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.7	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	244	619	-
HCM Lane V/C Ratio	-	-	0.169	0.049	-
HCM Control Delay (s)	-	-	22.7	11.1	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.6	0.2	-

Intersection	
Int Delay, s/veh	92.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	82	163	839	139	221	784
Future Vol, veh/h	82	163	839	139	221	784
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	89	177	912	151	240	852

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1894	532	0	0	1063	0
Stage 1	988	-	-	-	-	-
Stage 2	906	-	-	-	-	-
Critical Hdwy	6.82	6.92	-	-	4.12	-
Critical Hdwy Stg 1	5.82	-	-	-	-	-
Critical Hdwy Stg 2	5.82	-	-	-	-	-
Follow-up Hdwy	3.51	3.31	-	-	2.21	-
Pot Cap-1 Maneuver	~ 62	495	-	-	657	-
Stage 1	323	-	-	-	-	-
Stage 2	357	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 39	495	-	-	657	-
Mov Cap-2 Maneuver	~ 39	-	-	-	-	-
Stage 1	205	-	-	-	-	-
Stage 2	357	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 830.7	0	3
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	101	657	-
HCM Lane V/C Ratio	-	-	2.637	0.366	-
HCM Control Delay (s)	-	-	$ 830.7	13.6	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	24.7	1.7	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	1259	613	155	655	5	523	161	146	34	126	8
Future Volume (veh/h)	8	1259	613	155	655	5	523	161	146	34	126	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	9	1368	666	168	712	5	568	175	159	37	137	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	336	1384	617	162	1384	617	581	352	319	416	676	44
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.40	0.41	0.41	0.40
Sat Flow, veh/h	696	3367	1502	197	3367	1502	1177	855	777	991	1644	108
Grp Volume(v), veh/h	9	1368	666	168	712	5	568	0	334	37	0	146
Grp Sat Flow(s),veh/h/ln	696	1683	1502	197	1683	1502	1177	0	1632	991	0	1752
Q Serve(g_s), s	0.4	18.1	18.5	0.4	7.1	0.1	16.1	0.0	6.9	1.3	0.0	2.4
Cycle Q Clear(g_c), s	7.5	18.1	18.5	18.5	7.1	0.1	18.5	0.0	6.9	8.2	0.0	2.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.48	1.00		0.06
Lane Grp Cap(c), veh/h	336	1384	617	162	1384	617	581	0	671	416	0	720
V/C Ratio(X)	0.03	0.99	1.08	1.04	0.51	0.01	0.98	0.00	0.50	0.09	0.00	0.20
Avail Cap(c_a), veh/h	336	1384	617	162	1384	617	581	0	671	416	0	720
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.7	13.1	13.3	22.5	9.9	7.8	16.5	0.0	9.9	12.8	0.0	8.5
Incr Delay (d2), s/veh	0.1	21.6	59.3	81.7	1.4	0.0	32.4	0.0	2.6	0.4	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	8.0	13.7	5.0	1.8	0.0	10.4	0.0	2.2	0.3	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.9	34.7	72.6	104.2	11.3	7.9	48.9	0.0	12.5	13.3	0.0	9.2
LnGrp LOS	B	C	F	F	B	A	D	A	B	B	A	A
Approach Vol, veh/h		2043			885			902			183	
Approach Delay, s/veh		47.0			28.9			35.4			10.0	
Approach LOS		D			C			D			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	22.5	22.5	22.5	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	18.0	18.0	18.0
Max Q Clear Time (g_c+I1), s	20.5	20.5	10.2	20.5
Green Ext Time (p_c), s	0.0	0.0	0.5	0.0

Intersection Summary	
HCM 6th Ctrl Delay	38.7
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	51	66	116	65	86	153	701	289	154	700	23
Future Volume (veh/h)	9	51	66	116	65	86	153	701	289	154	700	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	10	55	72	126	71	93	166	762	314	167	761	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	354	357	303	370	357	303	604	2289	1021	446	2289	1021
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.63	0.63	0.63	1.00	1.00	1.00
Sat Flow, veh/h	1241	1900	1610	1284	1900	1610	700	3610	1610	533	3610	1610
Grp Volume(v), veh/h	10	55	72	126	71	93	166	762	314	167	761	25
Grp Sat Flow(s),veh/h/ln	1241	1900	1610	1284	1900	1610	700	1805	1610	533	1805	1610
Q Serve(g_s), s	0.3	1.1	1.7	4.1	1.4	2.2	5.1	4.4	4.0	4.3	0.0	0.0
Cycle Q Clear(g_c), s	1.7	1.1	1.7	5.2	1.4	2.2	5.1	4.4	4.0	8.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	354	357	303	370	357	303	604	2289	1021	446	2289	1021
V/C Ratio(X)	0.03	0.15	0.24	0.34	0.20	0.31	0.28	0.33	0.31	0.37	0.33	0.02
Avail Cap(c_a), veh/h	631	781	662	657	781	662	604	2289	1021	446	2289	1021
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.1	15.3	15.5	17.4	15.4	15.7	3.9	3.8	3.7	0.7	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.4	0.5	0.3	0.6	1.1	0.4	0.8	2.4	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.4	0.6	1.1	0.6	0.8	0.6	0.9	0.9	0.3	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.2	15.5	15.9	18.0	15.7	16.3	5.1	4.2	4.5	3.1	0.4	0.0
LnGrp LOS	B	B	B	B	B	B	A	A	A	A	A	A
Approach Vol, veh/h		137			290			1242			953	
Approach Delay, s/veh		15.8			16.9			4.4			0.9	
Approach LOS		B			B			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	32.5	12.5	32.5	12.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	18.0	18.0	18.0
Max Q Clear Time (g_c+I1), s	7.1	3.7	10.7	7.2
Green Ext Time (p_c), s	5.6	0.4	3.7	0.8

Intersection Summary	
HCM 6th Ctrl Delay	5.1
HCM 6th LOS	A

Cumulative plus Project Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	425	283	87	830	230	407	253	66	358	454	174
Future Volume (veh/h)	82	425	283	87	830	230	407	253	66	358	454	174
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744	1744
Adj Flow Rate, veh/h	89	462	308	95	902	250	442	275	72	389	493	189
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	247	1362	608	366	1362	608	666	1073	276	955	964	368
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.40	0.41	0.41	0.40
Sat Flow, veh/h	455	3313	1478	652	3313	1478	1372	2609	671	1870	2346	894
Grp Volume(v), veh/h	89	462	308	95	902	250	442	173	174	389	347	335
Grp Sat Flow(s),veh/h/ln	455	1657	1478	652	1657	1478	686	1657	1623	935	1657	1583
Q Serve(g_s), s	8.6	4.3	7.0	5.3	9.9	5.4	11.3	3.1	3.2	7.8	7.0	7.2
Cycle Q Clear(g_c), s	18.5	4.3	7.0	9.5	9.9	5.4	18.5	3.1	3.2	11.0	7.0	7.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.41	1.00		0.56
Lane Grp Cap(c), veh/h	247	1362	608	366	1362	608	666	681	667	955	681	651
V/C Ratio(X)	0.36	0.34	0.51	0.26	0.66	0.41	0.66	0.25	0.26	0.41	0.51	0.51
Avail Cap(c_a), veh/h	247	1362	608	366	1362	608	666	681	667	955	681	651
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.3	9.1	9.9	12.3	10.7	9.4	18.1	8.7	8.8	12.4	9.9	10.0
Incr Delay (d2), s/veh	4.1	0.7	3.0	1.7	2.5	2.1	5.2	0.9	1.0	1.3	2.7	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	1.0	1.8	0.7	2.6	1.3	2.2	0.8	0.8	1.2	2.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.4	9.7	12.9	14.1	13.3	11.4	23.2	9.6	9.8	13.7	12.6	12.9
LnGrp LOS	C	A	B	B	B	B	C	A	A	B	B	B
Approach Vol, veh/h		859			1247			789			1071	
Approach Delay, s/veh		12.2			13.0			17.3			13.1	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		22.5		22.5		22.5		22.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		20.5		20.5		13.0		11.9				
Green Ext Time (p_c), s		0.0		0.0		2.6		3.4				

Intersection Summary												
HCM 6th Ctrl Delay			13.7									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	14	6	23	8	13	4	18	681	6	8	804	15
Future Vol, veh/h	14	6	23	8	13	4	18	681	6	8	804	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	140	-	-	145	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	15	7	25	9	14	4	20	740	7	9	874	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1317	1687	445	1243	1692	374	890	0	0	747	0	0
Stage 1	900	900	-	784	784	-	-	-	-	-	-	-
Stage 2	417	787	-	459	908	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	114	92	558	130	91	621	751	-	-	851	-	-
Stage 1	298	353	-	350	400	-	-	-	-	-	-	-
Stage 2	581	399	-	549	350	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	97	89	558	114	88	621	751	-	-	851	-	-
Mov Cap-2 Maneuver	97	89	-	114	88	-	-	-	-	-	-	-
Stage 1	290	349	-	341	389	-	-	-	-	-	-	-
Stage 2	541	388	-	509	346	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	34	47.6	0.3	0.1
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	751	-	-	170	111	851	-	-
HCM Lane V/C Ratio	0.026	-	-	0.275	0.245	0.01	-	-
HCM Control Delay (s)	9.9	-	-	34	47.6	9.3	-	-
HCM Lane LOS	A	-	-	D	E	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.1	0.9	0	-	-

Intersection	
Int Delay, s/veh	56.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	51	20	88	44	62	56	68	631	23	65	767	36
Future Vol, veh/h	51	20	88	44	62	56	68	631	23	65	767	36
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	190	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	55	22	96	48	67	61	74	686	25	71	834	39

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1521	1855	437	1417	1862	356	873	0	0	711	0	0
Stage 1	996	996	-	847	847	-	-	-	-	-	-	-
Stage 2	525	859	-	570	1015	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	80	72	565	96	71	638	762	-	-	878	-	-
Stage 1	260	318	-	321	374	-	-	-	-	-	-	-
Stage 2	501	369	-	471	312	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	60	565	50	~ 59	638	762	-	-	878	-	-
Mov Cap-2 Maneuver	-	60	-	50	~ 59	-	-	-	-	-	-	-
Stage 1	235	292	-	290	338	-	-	-	-	-	-	-
Stage 2	328	333	-	333	287	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		$ 663.2	1	0.7
HCM LOS	-	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	762	-	-	-	80	878	-	-
HCM Lane V/C Ratio	0.097	-	-	-	2.201	0.08	-	-
HCM Control Delay (s)	10.2	-	-	-	$ 663.2	9.5	-	-
HCM Lane LOS	B	-	-	-	F	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	-	16.1	0.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	14	651	6	7	830
Future Vol, veh/h	2	14	651	6	7	830
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	2	15	708	7	8	902

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1179	358	0	0	715	0
Stage 1	712	-	-	-	-	-
Stage 2	467	-	-	-	-	-
Critical Hdwy	6.86	6.96	-	-	4.16	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	-	-	2.23	-
Pot Cap-1 Maneuver	182	636	-	-	875	-
Stage 1	445	-	-	-	-	-
Stage 2	594	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	180	636	-	-	875	-
Mov Cap-2 Maneuver	309	-	-	-	-	-
Stage 1	441	-	-	-	-	-
Stage 2	594	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.6	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	562	875	-
HCM Lane V/C Ratio	-	-	0.031	0.009	-
HCM Control Delay (s)	-	-	11.6	9.2	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	39	597	14	16	837
Future Vol, veh/h	25	39	597	14	16	837
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	90	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	27	42	649	15	17	910

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1146	332	0	0	664	0
Stage 1	657	-	-	-	-	-
Stage 2	489	-	-	-	-	-
Critical Hdwy	6.86	6.96	-	-	4.16	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	-	-	2.23	-
Pot Cap-1 Maneuver	191	661	-	-	914	-
Stage 1	475	-	-	-	-	-
Stage 2	579	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	187	661	-	-	914	-
Mov Cap-2 Maneuver	317	-	-	-	-	-
Stage 1	466	-	-	-	-	-
Stage 2	579	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.1	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	464	914	-
HCM Lane V/C Ratio	-	-	0.15	0.019	-
HCM Control Delay (s)	-	-	14.1	9	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-

Intersection	
Int Delay, s/veh	11.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	68	265	365	54	181	722
Future Vol, veh/h	68	265	365	54	181	722
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	74	288	397	59	197	785

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1214	228	0	0	456	0
Stage 1	427	-	-	-	-	-
Stage 2	787	-	-	-	-	-
Critical Hdwy	6.86	6.96	-	-	4.16	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	-	-	2.23	-
Pot Cap-1 Maneuver	173	772	-	-	1094	-
Stage 1	623	-	-	-	-	-
Stage 2	406	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	142	772	-	-	1094	-
Mov Cap-2 Maneuver	142	-	-	-	-	-
Stage 1	511	-	-	-	-	-
Stage 2	406	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	54.4	0	1.8
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	405	1094	-
HCM Lane V/C Ratio	-	-	0.894	0.18	-
HCM Control Delay (s)	-	-	54.4	9	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	9.3	0.7	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	684	201	60	1085	4	712	135	103	3	99	17
Future Volume (veh/h)	13	684	201	60	1085	4	712	135	103	3	99	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	14	743	218	65	1179	4	774	147	112	3	108	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	202	1384	617	295	1384	617	597	384	292	479	609	101
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.40	0.41	0.41	0.40
Sat Flow, veh/h	449	3367	1502	554	3367	1502	1198	933	711	1062	1481	247
Grp Volume(v), veh/h	14	743	218	65	1179	4	774	0	259	3	0	126
Grp Sat Flow(s),veh/h/ln	449	1683	1502	554	1683	1502	1198	0	1644	1062	0	1727
Q Serve(g_s), s	1.3	7.5	4.5	4.5	14.3	0.1	16.4	0.0	5.0	0.1	0.0	2.1
Cycle Q Clear(g_c), s	15.6	7.5	4.5	12.0	14.3	0.1	18.5	0.0	5.0	5.1	0.0	2.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.43	1.00		0.14
Lane Grp Cap(c), veh/h	202	1384	617	295	1384	617	597	0	676	479	0	710
V/C Ratio(X)	0.07	0.54	0.35	0.22	0.85	0.01	1.30	0.00	0.38	0.01	0.00	0.18
Avail Cap(c_a), veh/h	202	1384	617	295	1384	617	597	0	676	479	0	710
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.1	10.0	9.1	14.6	12.0	7.8	16.5	0.0	9.3	11.0	0.0	8.4
Incr Delay (d2), s/veh	0.7	1.5	1.6	1.7	6.8	0.0	145.6	0.0	1.6	0.0	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.9	1.1	0.5	4.4	0.0	29.6	0.0	1.6	0.0	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.7	11.5	10.7	16.3	18.8	7.8	162.1	0.0	11.0	11.1	0.0	9.0
LnGrp LOS	B	B	B	B	B	A	F	A	B	B	A	A
Approach Vol, veh/h		975			1248			1033			129	
Approach Delay, s/veh		11.4			18.6			124.2			9.0	
Approach LOS		B			B			F			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		22.5		22.5		22.5		22.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		20.5		17.6		7.1		16.3				
Green Ext Time (p_c), s		0.0		0.2		0.4		1.2				

Intersection Summary												
HCM 6th Ctrl Delay			48.4									
HCM 6th LOS			D									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	77	166	144	92	143	140	491	119	61	88	46
Future Volume (veh/h)	31	77	166	144	92	143	140	491	119	61	88	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	34	84	180	157	100	155	152	534	129	66	96	50
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	589	775	657	591	775	657	654	1473	657	400	1473	657
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41
Sat Flow, veh/h	1133	1885	1598	1124	1885	1598	1252	3582	1598	778	3582	1598
Grp Volume(v), veh/h	34	84	180	157	100	155	152	534	129	66	96	50
Grp Sat Flow(s),veh/h/ln	1133	1885	1598	1124	1885	1598	1252	1791	1598	778	1791	1598
Q Serve(g_s), s	0.9	1.2	3.4	4.5	1.5	2.8	3.8	4.6	2.3	2.9	0.7	0.9
Cycle Q Clear(g_c), s	2.3	1.2	3.4	5.7	1.5	2.8	4.5	4.6	2.3	7.5	0.7	0.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	589	775	657	591	775	657	654	1473	657	400	1473	657
V/C Ratio(X)	0.06	0.11	0.27	0.27	0.13	0.24	0.23	0.36	0.20	0.17	0.07	0.08
Avail Cap(c_a), veh/h	589	775	657	591	775	657	654	1473	657	400	1473	657
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.0	8.2	8.8	9.9	8.2	8.6	9.4	9.2	8.5	11.8	8.0	8.1
Incr Delay (d2), s/veh	0.2	0.3	1.0	1.1	0.3	0.8	0.8	0.7	0.7	0.9	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.5	1.1	1.1	0.6	1.0	1.0	1.5	0.7	0.5	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.2	8.4	9.8	11.0	8.6	9.5	10.2	9.9	9.2	12.7	8.1	8.3
LnGrp LOS	A	A	A	B	A	A	B	A	A	B	A	A
Approach Vol, veh/h		298			412			815			212	
Approach Delay, s/veh		9.4			9.9			9.8			9.6	
Approach LOS		A			A			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	22.5	22.5	22.5	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	18.0	18.0	18.0
Max Q Clear Time (g_c+I1), s	6.6	5.4	9.5	7.7
Green Ext Time (p_c), s	3.5	1.0	0.6	1.3

Intersection Summary	
HCM 6th Ctrl Delay	9.7
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	704	444	109	715	229	526	530	176	359	524	137
Future Volume (veh/h)	78	704	444	109	715	229	526	530	176	359	524	137
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	85	765	483	118	777	249	572	576	191	390	570	149
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	282	1384	617	260	1384	617	654	1022	338	619	1086	283
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.40	0.41	0.41	0.40
Sat Flow, veh/h	521	3367	1502	422	3367	1502	1347	2485	822	1288	2643	689
Grp Volume(v), veh/h	85	765	483	118	777	249	572	390	377	390	362	357
Grp Sat Flow(s),veh/h/ln	521	1683	1502	422	1683	1502	674	1683	1624	644	1683	1648
Q Serve(g_s), s	6.7	7.8	12.6	10.7	8.0	5.3	11.1	8.0	8.1	10.4	7.3	7.4
Cycle Q Clear(g_c), s	14.7	7.8	12.6	18.5	8.0	5.3	18.5	8.0	8.1	18.5	7.3	7.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.51	1.00		0.42
Lane Grp Cap(c), veh/h	282	1384	617	260	1384	617	654	692	668	619	692	677
V/C Ratio(X)	0.30	0.55	0.78	0.45	0.56	0.40	0.87	0.56	0.57	0.63	0.52	0.53
Avail Cap(c_a), veh/h	282	1384	617	260	1384	617	654	692	668	619	692	677
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.8	10.1	11.5	17.9	10.1	9.4	19.2	10.2	10.3	18.5	9.9	10.0
Incr Delay (d2), s/veh	2.7	1.6	9.6	5.6	1.7	2.0	15.2	3.3	3.4	4.8	2.8	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	2.0	4.0	1.3	2.0	1.3	3.8	2.3	2.3	2.0	2.1	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.5	11.7	21.1	23.5	11.8	11.3	34.4	13.4	13.7	23.3	12.8	13.0
LnGrp LOS	B	B	C	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		1333			1144			1339			1109	
Approach Delay, s/veh		15.5			12.9			22.5			16.5	
Approach LOS		B			B			C			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		22.5		22.5		22.5		22.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		18.0		18.0		18.0		18.0				
Max Q Clear Time (g_c+I1), s		20.5		16.7		20.5		20.5				
Green Ext Time (p_c), s		0.0		0.9		0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	17.0
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	96.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↑↕		↰	↑↕	
Traffic Vol, veh/h	37	14	57	21	22	27	41	1090	28	23	987	27
Future Vol, veh/h	37	14	57	21	22	27	41	1090	28	23	987	27
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	140	-	-	145	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	40	15	62	23	24	29	45	1185	30	25	1073	29

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1833	2443	551	1884	2442	608	1102	0	0	1215	0	0
Stage 1	1138	1138	-	1290	1290	-	-	-	-	-	-	-
Stage 2	695	1305	-	594	1152	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.52	6.92	7.52	6.52	6.92	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.01	3.31	3.51	4.01	3.31	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	48	31	481	44	31	441	635	-	-	575	-	-
Stage 1	216	277	-	174	234	-	-	-	-	-	-	-
Stage 2	401	230	-	461	272	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 12	28	481	~ 20	28	441	635	-	-	575	-	-
Mov Cap-2 Maneuver	~ 12	28	-	~ 20	28	-	-	-	-	-	-	-
Stage 1	201	265	-	162	217	-	-	-	-	-	-	-
Stage 2	309	214	-	362	260	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, $	1649.5	$ 722.8	0.4	0.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	635	-	-	29	37	575	-	-
HCM Lane V/C Ratio	0.07	-	-	4.048	2.056	0.043	-	-
HCM Control Delay (s)	11.1	-	-	$ 1649.5	$ 722.8	11.5	-	-
HCM Lane LOS	B	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	14.2	8.3	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↑↑↱		↰	↑↑	
Traffic Vol, veh/h	57	24	115	42	55	55	102	1059	55	40	988	53
Future Vol, veh/h	57	24	115	42	55	55	102	1059	55	40	988	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	185	-	-	190	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	62	26	125	46	60	60	111	1151	60	43	1074	58

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2017	2622	566	2039	2621	606	1132	0	0	1211	0	0
Stage 1	1189	1189	-	1403	1403	-	-	-	-	-	-	-
Stage 2	828	1433	-	636	1218	-	-	-	-	-	-	-
Critical Hdwy	7.52	6.52	6.92	7.52	6.52	6.92	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.52	5.52	-	6.52	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.51	4.01	3.31	3.51	4.01	3.31	2.21	-	-	2.21	-	-
Pot Cap-1 Maneuver	~ 35	~ 24	470	~ 33	~ 24	443	619	-	-	577	-	-
Stage 1	201	262	-	148	206	-	-	-	-	-	-	-
Stage 2	334	200	-	435	253	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	~ 18	470	-	~ 18	443	619	-	-	577	-	-
Mov Cap-2 Maneuver	-	~ 18	-	-	~ 18	-	-	-	-	-	-	-
Stage 1	165	242	-	122	169	-	-	-	-	-	-	-
Stage 2	153	164	-	264	234	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			1	0.4
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	619	-	-	-	-	577	-	-
HCM Lane V/C Ratio	0.179	-	-	-	-	0.075	-	-
HCM Control Delay (s)	12.1	-	-	-	-	11.7	-	-
HCM Lane LOS	B	-	-	-	-	B	-	-
HCM 95th %tile Q(veh)	0.6	-	-	-	-	0.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	10	1106	8	9	1062
Future Vol, veh/h	3	10	1106	8	9	1062
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	3	11	1202	9	10	1154

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1804	606	0	0	1211	0
Stage 1	1207	-	-	-	-	-
Stage 2	597	-	-	-	-	-
Critical Hdwy	6.82	6.92	-	-	4.12	-
Critical Hdwy Stg 1	5.82	-	-	-	-	-
Critical Hdwy Stg 2	5.82	-	-	-	-	-
Follow-up Hdwy	3.51	3.31	-	-	2.21	-
Pot Cap-1 Maneuver	71	443	-	-	577	-
Stage 1	248	-	-	-	-	-
Stage 2	515	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	70	443	-	-	577	-
Mov Cap-2 Maneuver	177	-	-	-	-	-
Stage 1	244	-	-	-	-	-
Stage 2	515	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.4	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	329	577	-
HCM Lane V/C Ratio	-	-	0.043	0.017	-
HCM Control Delay (s)	-	-	16.4	11.3	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-

Intersection	
Int Delay, s/veh	2.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	50	24	1573	105	46	1612
Future Vol, veh/h	50	24	1573	105	46	1612
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	90	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	54	26	1710	114	50	1752

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2743	912	0	0	1824	0
Stage 1	1767	-	-	-	-	-
Stage 2	976	-	-	-	-	-
Critical Hdwy	6.82	6.92	-	-	4.12	-
Critical Hdwy Stg 1	5.82	-	-	-	-	-
Critical Hdwy Stg 2	5.82	-	-	-	-	-
Follow-up Hdwy	3.51	3.31	-	-	2.21	-
Pot Cap-1 Maneuver	~ 16	278	-	-	336	-
Stage 1	124	-	-	-	-	-
Stage 2	328	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 14	278	-	-	336	-
Mov Cap-2 Maneuver	75	-	-	-	-	-
Stage 1	106	-	-	-	-	-
Stage 2	328	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	124.7	0	0.5
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	98	336	-
HCM Lane V/C Ratio	-	-	0.821	0.149	-
HCM Control Delay (s)	-	-	124.7	17.6	-
HCM Lane LOS	-	-	F	C	-
HCM 95th %tile Q(veh)	-	-	4.5	0.5	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	34.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	120	254	1378	215	381	1327
Future Vol, veh/h	120	254	1378	215	381	1327
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	130	276	1498	234	414	1442

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	3164	866	0	0	1732	0
Stage 1	1615	-	-	-	-	-
Stage 2	1549	-	-	-	-	-
Critical Hdwy	6.82	6.92	-	-	4.12	-
Critical Hdwy Stg 1	5.82	-	-	-	-	-
Critical Hdwy Stg 2	5.82	-	-	-	-	-
Follow-up Hdwy	3.51	3.31	-	-	2.21	-
Pot Cap-1 Maneuver	~ 8	299	-	-	~ 364	-
Stage 1	150	-	-	-	-	-
Stage 2	163	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	0	299	-	-	~ 364	-
Mov Cap-2 Maneuver	0	-	-	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	163	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	215.9	0	27.5
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	299	~ 364	-
HCM Lane V/C Ratio	-	-	1.36	1.138	-
HCM Control Delay (s)	-	-	215.9	123.5	-
HCM Lane LOS	-	-	F	F	-
HCM 95th %tile Q(veh)	-	-	20.8	16	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	1259	613	155	655	5	523	161	146	34	126	8
Future Volume (veh/h)	8	1259	613	155	655	5	523	161	146	34	126	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	9	1368	666	168	712	5	568	175	159	37	137	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	336	1384	617	162	1384	617	581	352	319	416	676	44
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.40	0.41	0.41	0.40
Sat Flow, veh/h	696	3367	1502	197	3367	1502	1177	855	777	991	1644	108
Grp Volume(v), veh/h	9	1368	666	168	712	5	568	0	334	37	0	146
Grp Sat Flow(s),veh/h/ln	696	1683	1502	197	1683	1502	1177	0	1632	991	0	1752
Q Serve(g_s), s	0.4	18.1	18.5	0.4	7.1	0.1	16.1	0.0	6.9	1.3	0.0	2.4
Cycle Q Clear(g_c), s	7.5	18.1	18.5	18.5	7.1	0.1	18.5	0.0	6.9	8.2	0.0	2.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.48	1.00		0.06
Lane Grp Cap(c), veh/h	336	1384	617	162	1384	617	581	0	671	416	0	720
V/C Ratio(X)	0.03	0.99	1.08	1.04	0.51	0.01	0.98	0.00	0.50	0.09	0.00	0.20
Avail Cap(c_a), veh/h	336	1384	617	162	1384	617	581	0	671	416	0	720
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.7	13.1	13.3	22.5	9.9	7.8	16.5	0.0	9.9	12.8	0.0	8.5
Incr Delay (d2), s/veh	0.1	21.6	59.3	81.7	1.4	0.0	32.4	0.0	2.6	0.4	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	8.0	13.7	5.0	1.8	0.0	10.4	0.0	2.2	0.3	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.9	34.7	72.6	104.2	11.3	7.9	48.9	0.0	12.5	13.3	0.0	9.2
LnGrp LOS	B	C	F	F	B	A	D	A	B	B	A	A
Approach Vol, veh/h		2043			885			902			183	
Approach Delay, s/veh		47.0			28.9			35.4			10.0	
Approach LOS		D			C			D			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	22.5	22.5	22.5	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	18.0	18.0	18.0
Max Q Clear Time (g_c+I1), s	20.5	20.5	10.2	20.5
Green Ext Time (p_c), s	0.0	0.0	0.5	0.0

Intersection Summary	
HCM 6th Ctrl Delay	38.7
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	51	66	116	65	86	153	701	289	154	700	23
Future Volume (veh/h)	9	51	66	116	65	86	153	701	289	154	700	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	10	55	72	126	71	93	166	762	314	167	761	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	354	357	303	370	357	303	604	2289	1021	446	2289	1021
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.63	0.63	0.63	1.00	1.00	1.00
Sat Flow, veh/h	1241	1900	1610	1284	1900	1610	700	3610	1610	533	3610	1610
Grp Volume(v), veh/h	10	55	72	126	71	93	166	762	314	167	761	25
Grp Sat Flow(s),veh/h/ln	1241	1900	1610	1284	1900	1610	700	1805	1610	533	1805	1610
Q Serve(g_s), s	0.3	1.1	1.7	4.1	1.4	2.2	5.1	4.4	4.0	4.3	0.0	0.0
Cycle Q Clear(g_c), s	1.7	1.1	1.7	5.2	1.4	2.2	5.1	4.4	4.0	8.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	354	357	303	370	357	303	604	2289	1021	446	2289	1021
V/C Ratio(X)	0.03	0.15	0.24	0.34	0.20	0.31	0.28	0.33	0.31	0.37	0.33	0.02
Avail Cap(c_a), veh/h	631	781	662	657	781	662	604	2289	1021	446	2289	1021
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.1	15.3	15.5	17.4	15.4	15.7	3.9	3.8	3.7	0.7	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	0.4	0.5	0.3	0.6	1.1	0.4	0.8	2.4	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.4	0.6	1.1	0.6	0.8	0.6	0.9	0.9	0.3	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.2	15.5	15.9	18.0	15.7	16.3	5.1	4.2	4.5	3.1	0.4	0.0
LnGrp LOS	B	B	B	B	B	B	A	A	A	A	A	A
Approach Vol, veh/h		137			290			1242			953	
Approach Delay, s/veh		15.8			16.9			4.4			0.9	
Approach LOS		B			B			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	32.5	12.5	32.5	12.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	18.0	18.0	18.0
Max Q Clear Time (g_c+I1), s	7.1	3.7	10.7	7.2
Green Ext Time (p_c), s	5.6	0.4	3.7	0.8

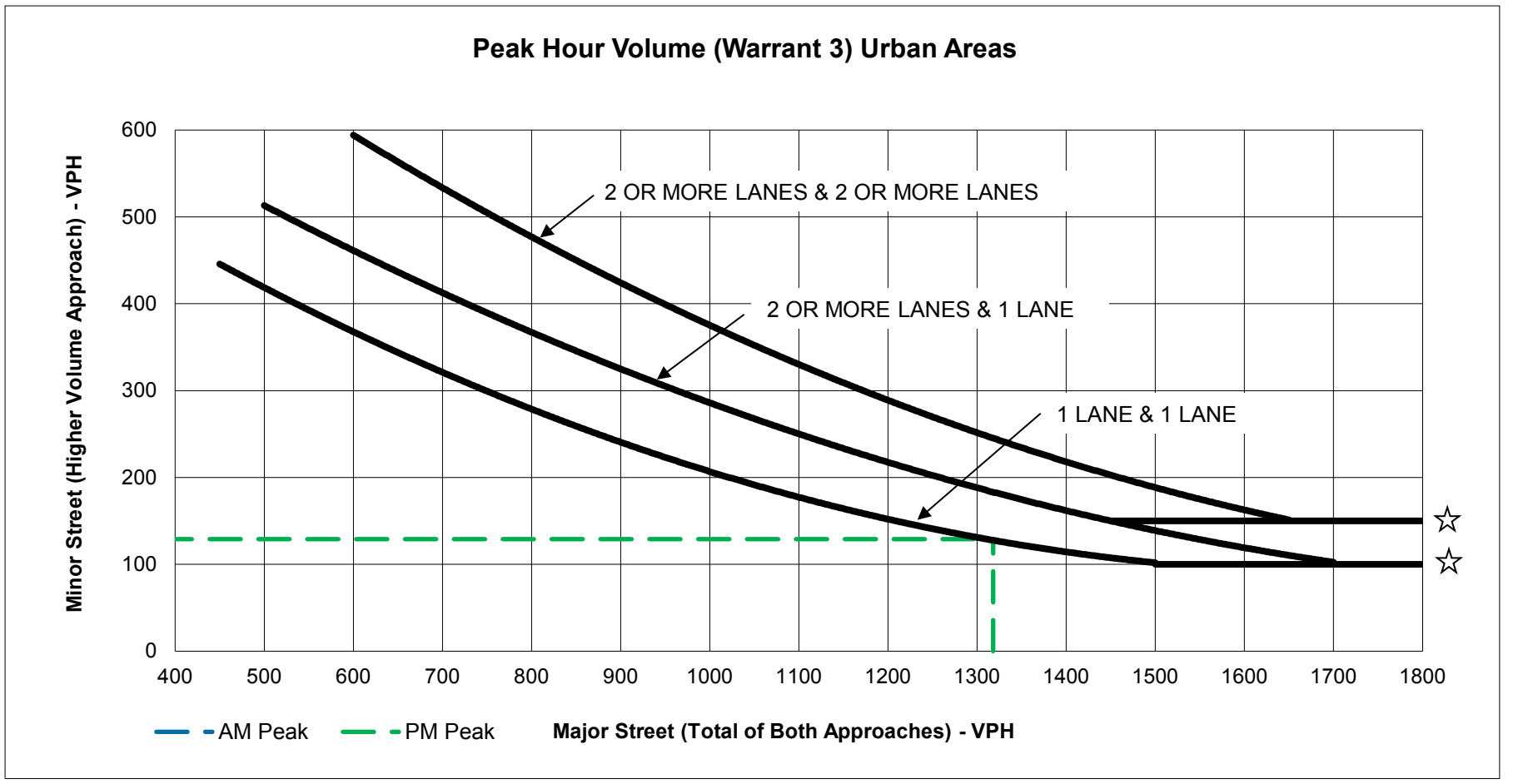
Intersection Summary	
HCM 6th Ctrl Delay	5.1
HCM 6th LOS	A

Appendices:
Warrants

Existing plus Project Conditions

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



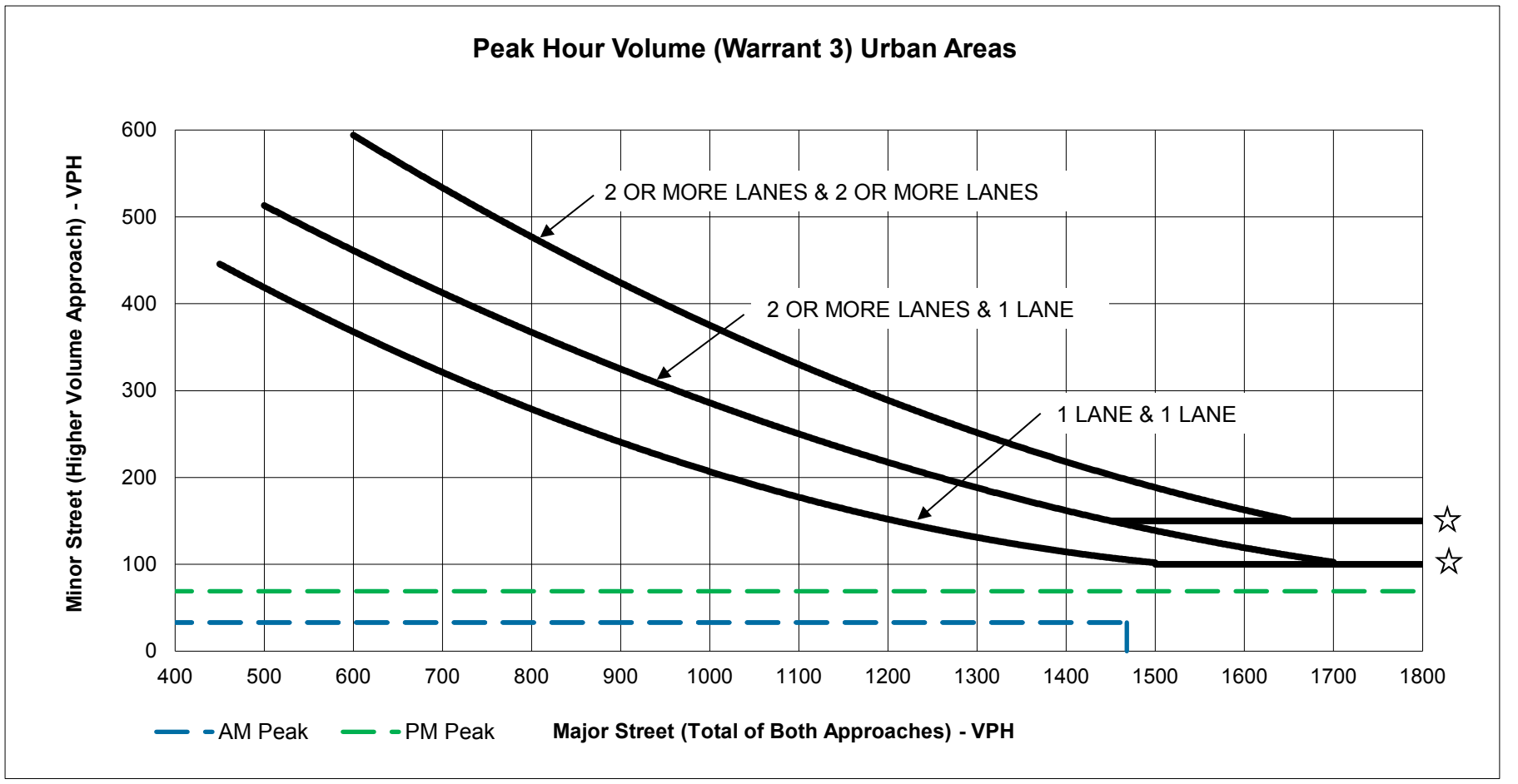
☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)	Existing plus Project (Intersection #6)		
			Number of Lanes
Major Approach	Acadamy Ave		2
Minor Approach	Church Ave		1
	AM Peak	PM Peak	
Major St. Volume:	0	1,318	
Minor St. Volume:	0	129	
Warrant Met?:	-	No	

Cumulative Conditions

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*

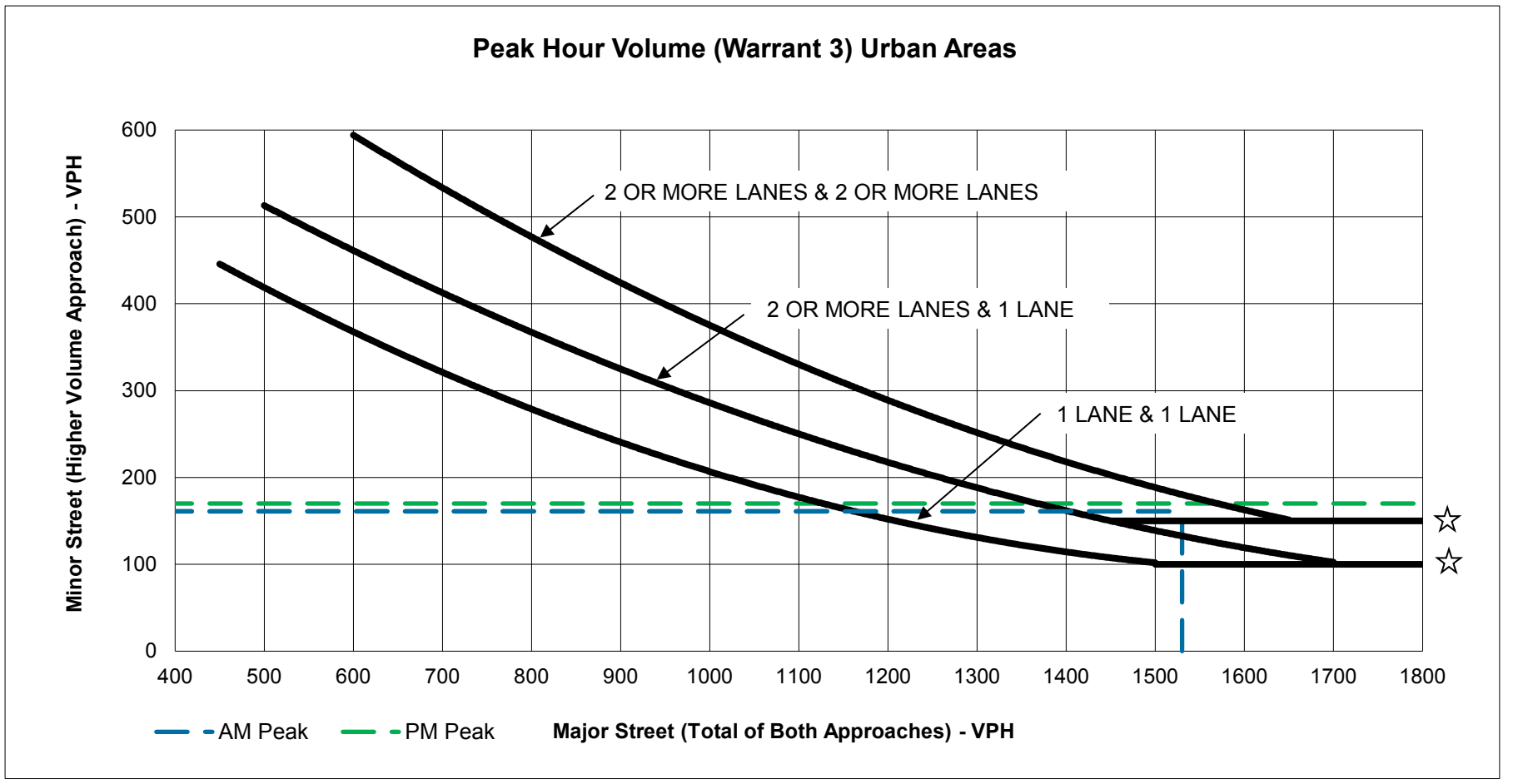


☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)	Cumulative (Intersection #2)		
			Number of Lanes
Major Approach	Acadamy Ave		2
Minor Approach	Butler Ave		1
	AM Peak	PM Peak	
Major St. Volume:	1,468	1,978	
Minor St. Volume:	33	69	
Warrant Met?:	No	No	

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*

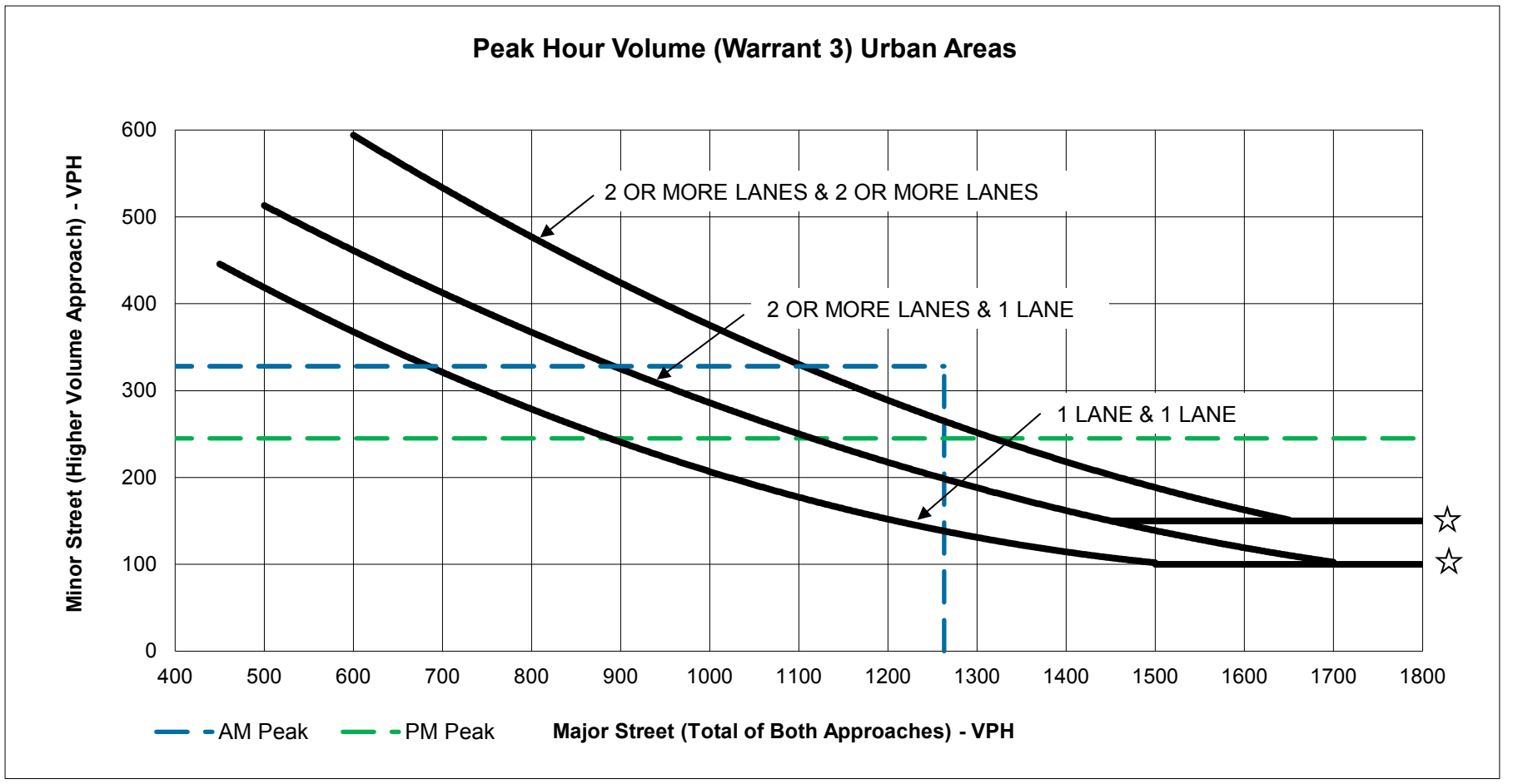


☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)	Cumulative (Intersection #3)		
			Number of Lanes
Major Approach	Acadamy Ave		2
Minor Approach	California Ave		1
	AM Peak	PM Peak	
Major St. Volume:	1,530	2,086	
Minor St. Volume:	161	170	
Warrant Met?:	Yes	Yes	

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



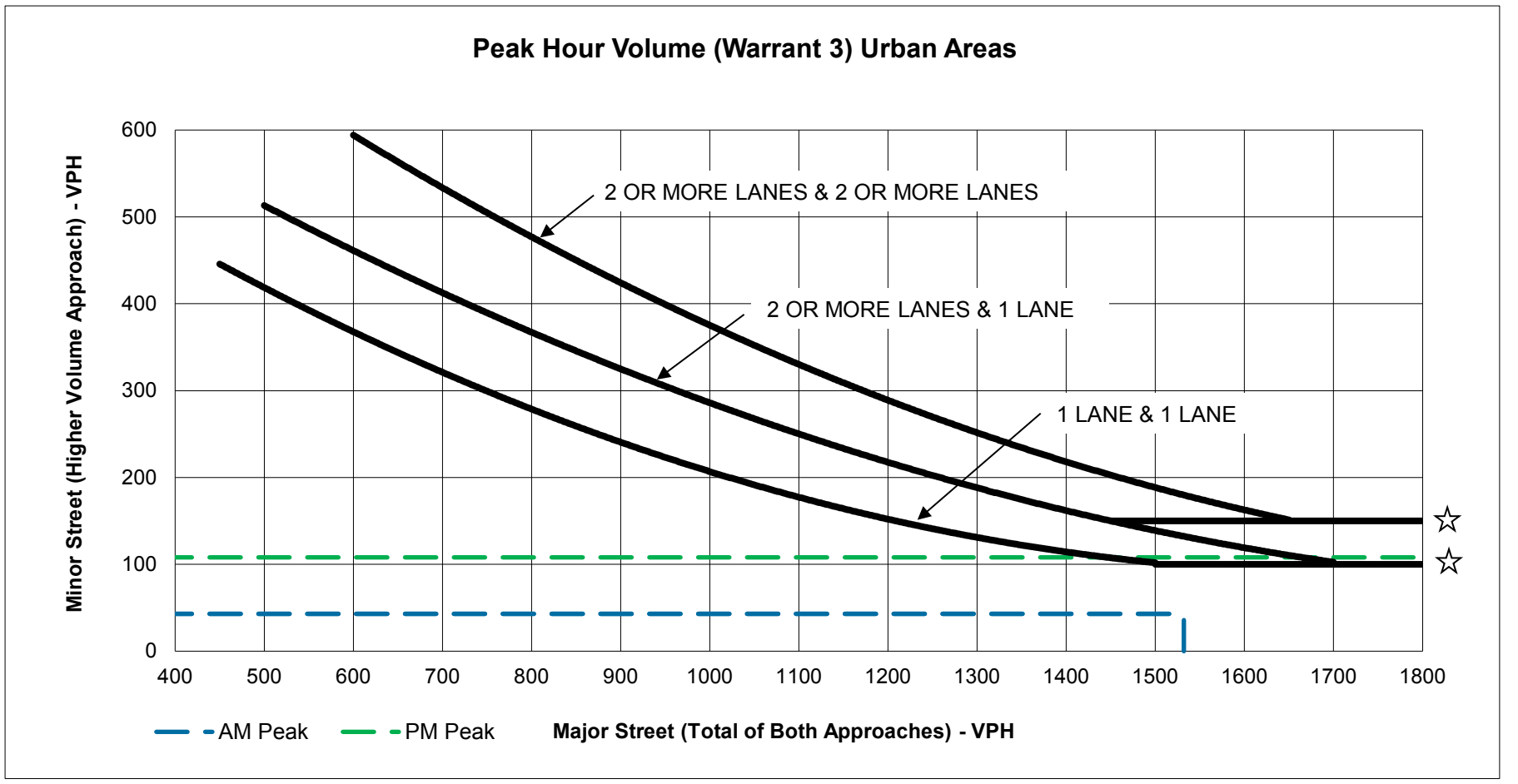
☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)	Cumulative (Intersection #6)		
			Number of Lanes
Major Approach	Acadamy Ave		2
Minor Approach	Church Ave		1
	AM Peak	PM Peak	
Major St. Volume:	1,263	1,983	
Minor St. Volume:	328	245	
Warrant Met?:	Yes	Yes	

Cumulative plus Project Conditions

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*

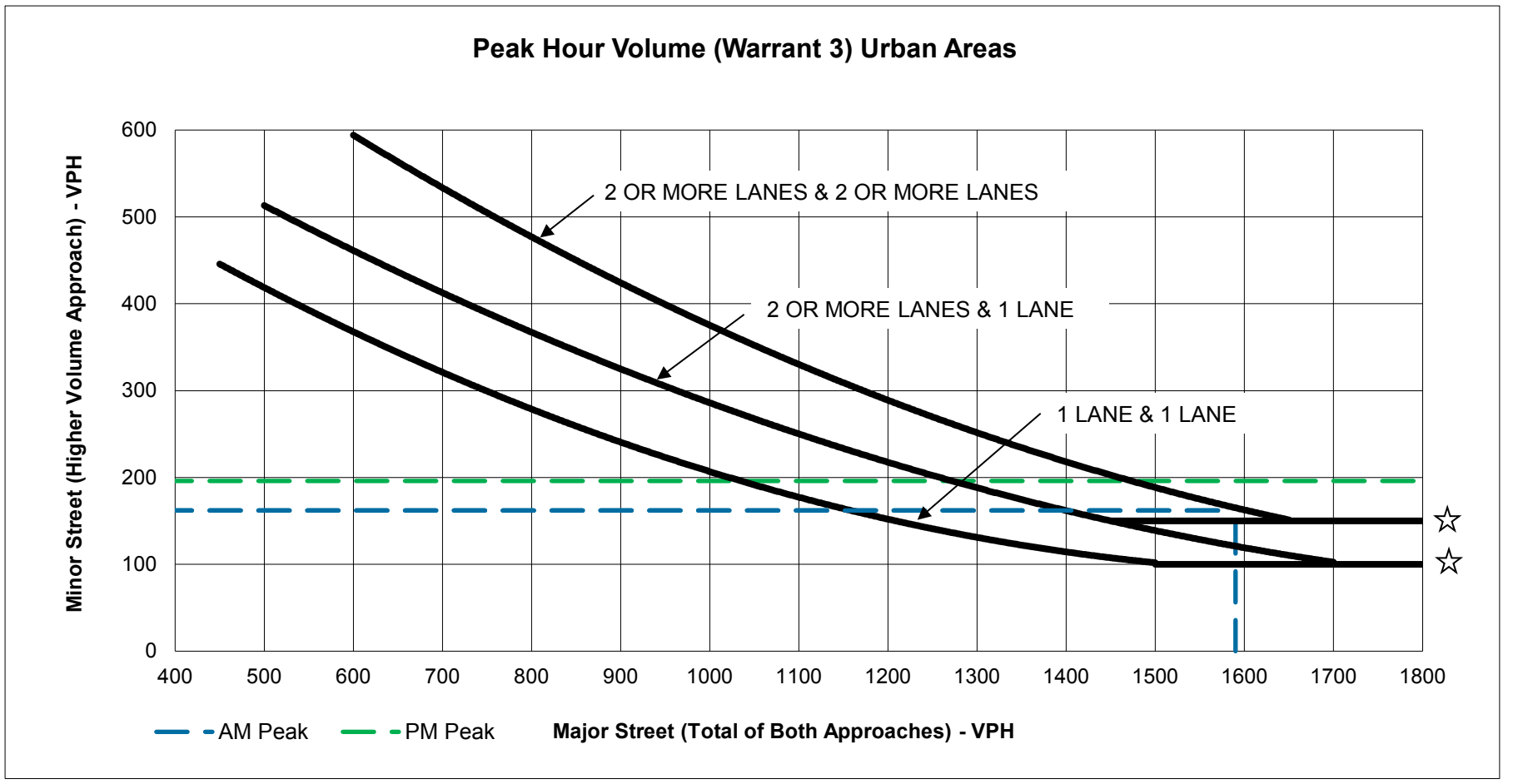


☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)	Cumulative+P (Intersection #2)		
			Number of Lanes
Major Approach	Acadamy Ave		2
Minor Approach	Butler Ave		1
	AM Peak	PM Peak	
Major St. Volume:	1,532	2,196	
Minor St. Volume:	43	108	
Warrant Met?:	No	Yes	

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*

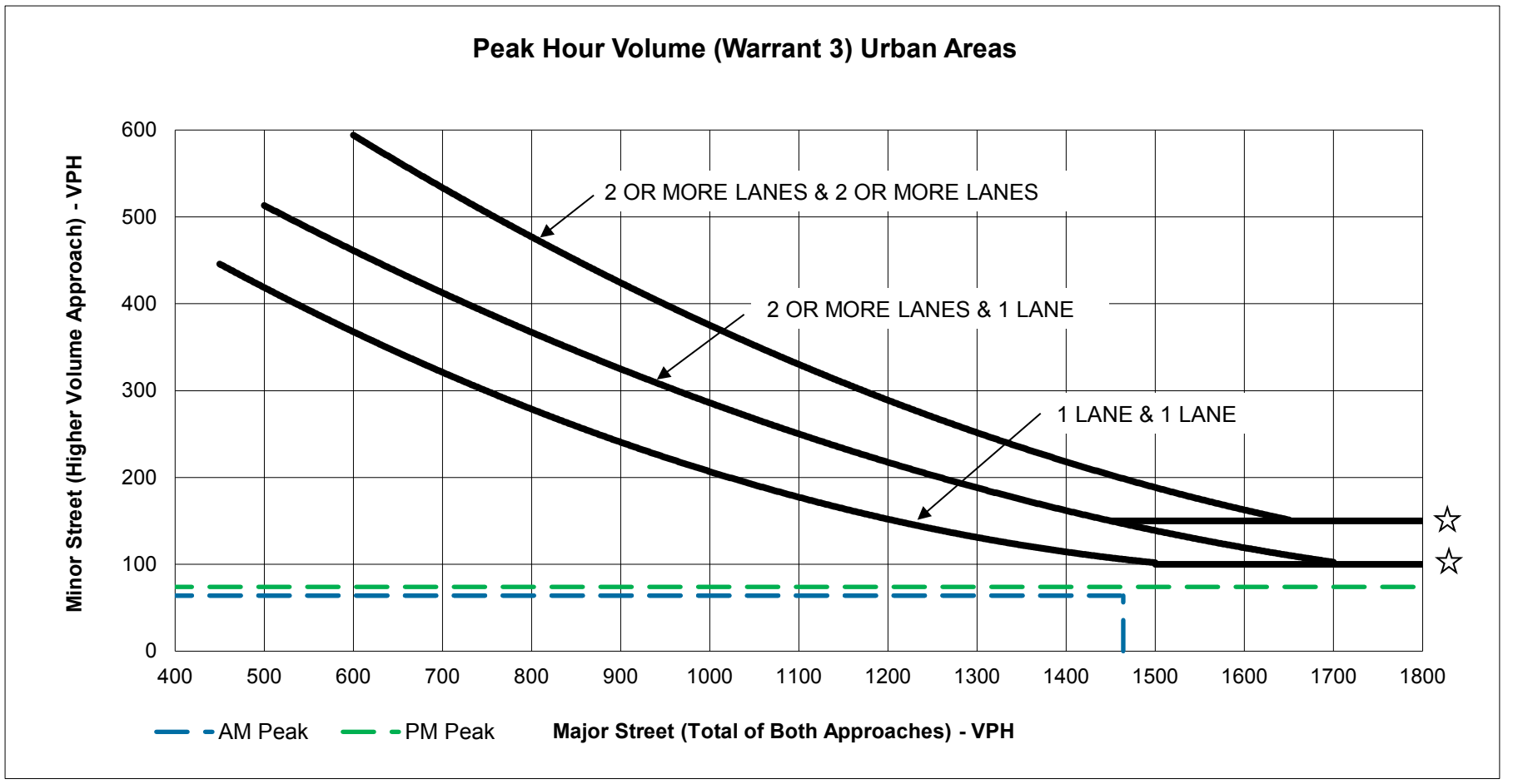


☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)	Cumulative+P (Intersection #3)		
			Number of Lanes
Major Approach	Acadamy Ave		2
Minor Approach	California Ave		1
	AM Peak	PM Peak	
Major St. Volume:	1,590	2,297	
Minor St. Volume:	162	196	
Warrant Met?:	Yes	Yes	

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*

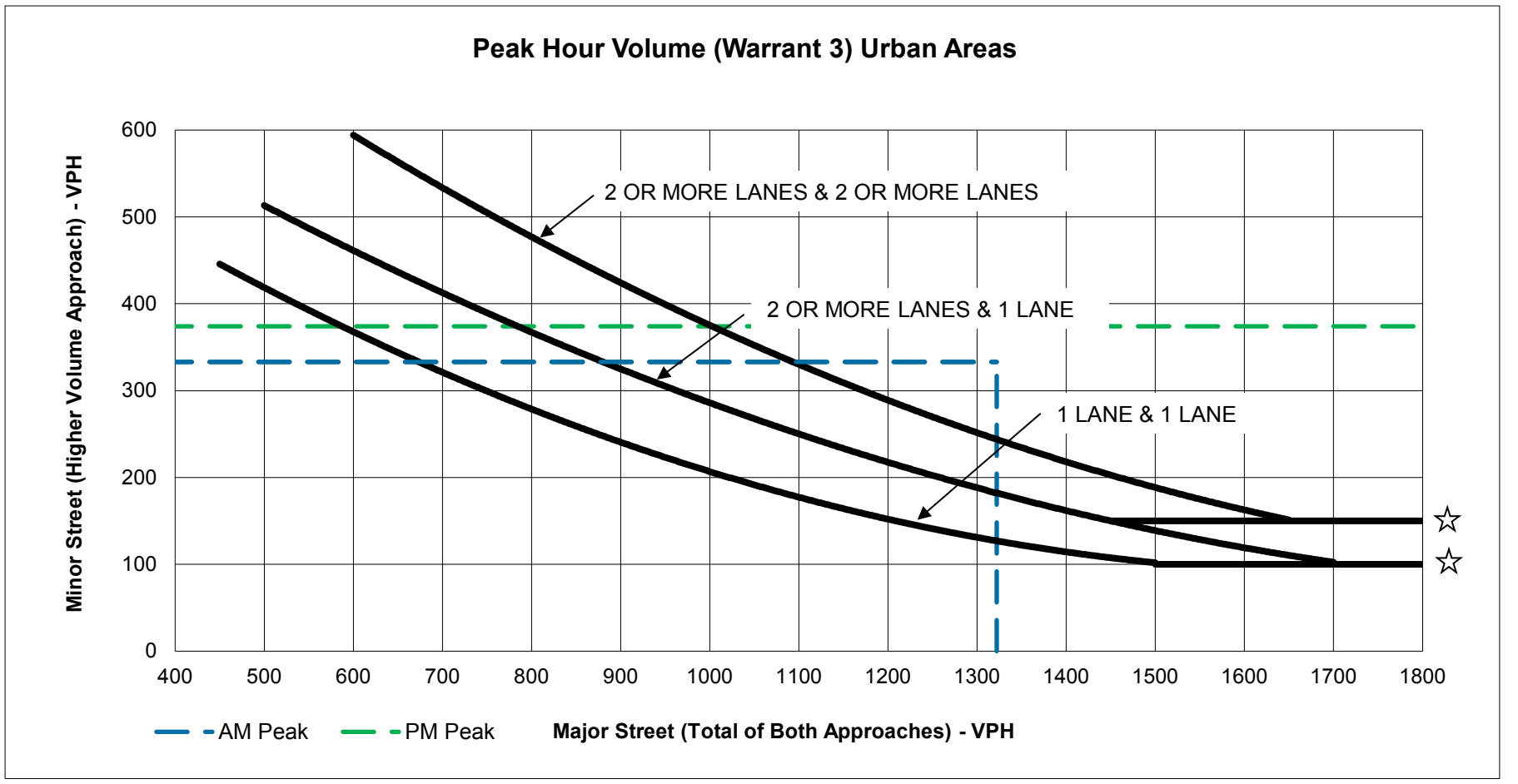


☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)	Cumulative+P (Intersection #5)		
			Number of Lanes
Major Approach	Acadamy Ave		2
Minor Approach	Florence Ave		1
	AM Peak	PM Peak	
Major St. Volume:	1,464	3,336	
Minor St. Volume:	64	74	
Warrant Met?:	No	No	

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



☆ NOTE:
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)	Cumulative+P (Intersection #6)		
			Number of Lanes
Major Approach	Acadamy Ave		2
Minor Approach	Church Ave		1
	AM Peak	PM Peak	
Major St. Volume:	1,322	3,301	
Minor St. Volume:	333	374	
Warrant Met?:	Yes	Yes	

Appendices:
Mitigation

Existing plus Project Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	38	91	539	76	160	543
Future Volume (veh/h)	38	91	539	76	160	543
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1885	1885	1885	1885
Adj Flow Rate, veh/h	41	99	586	83	174	590
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	1	1	1	1
Cap, veh/h	61	146	1591	225	598	1809
Arrive On Green	0.13	0.13	0.51	0.51	0.51	0.51
Sat Flow, veh/h	480	1160	3245	445	774	3676
Grp Volume(v), veh/h	141	0	332	337	174	590
Grp Sat Flow(s),veh/h/ln	1652	0	1791	1805	774	1791
Q Serve(g_s), s	2.0	0.0	2.8	2.8	4.3	2.4
Cycle Q Clear(g_c), s	2.0	0.0	2.8	2.8	7.1	2.4
Prop In Lane	0.29	0.70		0.25	1.00	
Lane Grp Cap(c), veh/h	208	0	905	912	598	1809
V/C Ratio(X)	0.68	0.00	0.37	0.37	0.29	0.33
Avail Cap(c_a), veh/h	1219	0	1321	1332	778	2642
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.2	0.0	3.7	3.7	5.8	3.6
Incr Delay (d2), s/veh	3.8	0.0	0.2	0.2	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.1	0.1	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.0	0.0	3.9	3.9	6.1	3.7
LnGrp LOS	B	A	A	A	A	A
Approach Vol, veh/h	141		669			764
Approach Delay, s/veh	14.0		3.9			4.2
Approach LOS	B		A			A

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		16.8			16.8	7.6
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		18.0			18.0	18.0
Max Q Clear Time (g_c+I1), s		4.8			9.1	4.0
Green Ext Time (p_c), s		3.2			3.3	0.3

Intersection Summary	
HCM 6th Ctrl Delay	5.0
HCM 6th LOS	A

Cumulative Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	13	35	12	21	20	19	1007	21	17	902	12
Future Volume (veh/h)	21	13	35	12	21	20	19	1007	21	17	902	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	23	14	38	13	23	22	21	1095	23	18	980	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	248	43	100	219	89	78	482	1826	38	444	1842	24
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.51	0.51	0.51	0.51	0.51	0.51
Sat Flow, veh/h	449	351	822	318	733	642	572	3587	75	508	3619	48
Grp Volume(v), veh/h	75	0	0	58	0	0	21	547	571	18	485	508
Grp Sat Flow(s),veh/h/ln	1622	0	0	1693	0	0	572	1791	1872	508	1791	1877
Q Serve(g_s), s	0.2	0.0	0.0	0.0	0.0	0.0	0.6	5.3	5.3	0.6	4.4	4.4
Cycle Q Clear(g_c), s	1.0	0.0	0.0	0.7	0.0	0.0	5.1	5.3	5.3	5.9	4.4	4.4
Prop In Lane	0.31		0.51	0.22		0.38	1.00		0.04	1.00		0.03
Lane Grp Cap(c), veh/h	390	0	0	387	0	0	482	912	953	444	912	955
V/C Ratio(X)	0.19	0.00	0.00	0.15	0.00	0.00	0.04	0.60	0.60	0.04	0.53	0.53
Avail Cap(c_a), veh/h	1354	0	0	1394	0	0	613	1322	1382	561	1322	1386
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.8	0.0	0.0	9.7	0.0	0.0	5.7	4.2	4.2	6.3	4.0	4.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.6	0.6	0.0	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	0.2	0.0	0.0	0.0	0.2	0.2	0.0	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.1	0.0	0.0	9.9	0.0	0.0	5.8	4.9	4.8	6.3	4.5	4.5
LnGrp LOS	B	A	A	A	A	A	A	A	A	A	A	A
Approach Vol, veh/h		75			58			1139			1011	
Approach Delay, s/veh		10.1			9.9			4.9			4.5	
Approach LOS		B			A			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	16.9	7.5	16.9	7.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	18.0	18.0	18.0
Max Q Clear Time (g_c+I1), s	7.3	3.0	7.9	2.7
Green Ext Time (p_c), s	5.2	0.3	4.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	5.0
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	23	93	38	55	53	80	971	52	38	896	49
Future Volume (veh/h)	54	23	93	38	55	53	80	971	52	38	896	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	59	25	101	41	60	58	87	1055	57	41	974	53
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	79	33	134	56	81	79	286	1654	89	262	1654	90
Arrive On Green	0.15	0.15	0.15	0.12	0.12	0.12	0.48	0.48	0.48	0.48	0.48	0.48
Sat Flow, veh/h	540	229	924	451	660	638	554	3456	187	511	3454	188
Grp Volume(v), veh/h	185	0	0	159	0	0	87	547	565	41	505	522
Grp Sat Flow(s),veh/h/ln	1692	0	0	1748	0	0	554	1791	1852	511	1791	1851
Q Serve(g_s), s	5.6	0.0	0.0	4.7	0.0	0.0	7.2	12.3	12.3	3.5	10.9	11.0
Cycle Q Clear(g_c), s	5.6	0.0	0.0	4.7	0.0	0.0	18.2	12.3	12.3	15.8	10.9	11.0
Prop In Lane	0.32		0.55	0.26		0.36	1.00		0.10	1.00		0.10
Lane Grp Cap(c), veh/h	246	0	0	216	0	0	286	857	886	262	857	886
V/C Ratio(X)	0.75	0.00	0.00	0.74	0.00	0.00	0.30	0.64	0.64	0.16	0.59	0.59
Avail Cap(c_a), veh/h	569	0	0	588	0	0	337	1021	1056	309	1021	1056
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.9	0.0	0.0	22.6	0.0	0.0	16.7	10.5	10.5	16.4	10.1	10.1
Incr Delay (d2), s/veh	4.6	0.0	0.0	4.9	0.0	0.0	0.6	1.0	1.0	0.3	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	0.0	2.1	0.0	0.0	0.8	3.7	3.8	0.4	3.3	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.5	0.0	0.0	27.5	0.0	0.0	17.3	11.5	11.4	16.7	10.8	10.7
LnGrp LOS	C	A	A	C	A	A	B	B	B	B	B	B
Approach Vol, veh/h		185			159			1199			1068	
Approach Delay, s/veh		26.5			27.5			11.9			11.0	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	30.1	12.3	30.1	11.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	30.5	18.0	30.5	18.0
Max Q Clear Time (g_c+I1), s	20.2	7.6	17.8	6.7
Green Ext Time (p_c), s	5.4	0.7	5.4	0.6

Intersection Summary	
HCM 6th Ctrl Delay	13.5
HCM 6th LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	82	163	839	139	221	784
Future Volume (veh/h)	82	163	839	139	221	784
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1885	1885	1885	1885
Adj Flow Rate, veh/h	89	177	912	151	240	852
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	1	1	1	1
Cap, veh/h	106	210	2063	341	395	2403
Arrive On Green	0.19	0.19	0.67	0.67	0.67	0.67
Sat Flow, veh/h	553	1100	3170	509	535	3676
Grp Volume(v), veh/h	267	0	531	532	240	852
Grp Sat Flow(s),veh/h/ln	1660	0	1791	1794	535	1791
Q Serve(g_s), s	10.1	0.0	9.0	9.0	24.8	6.7
Cycle Q Clear(g_c), s	10.1	0.0	9.0	9.0	33.8	6.7
Prop In Lane	0.33	0.66		0.28	1.00	
Lane Grp Cap(c), veh/h	317	0	1201	1203	395	2403
V/C Ratio(X)	0.84	0.00	0.44	0.44	0.61	0.35
Avail Cap(c_a), veh/h	459	0	1457	1459	472	2914
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.4	0.0	5.0	5.0	12.9	4.6
Incr Delay (d2), s/veh	9.2	0.0	0.3	0.3	1.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	2.1	2.1	2.4	1.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	34.6	0.0	5.3	5.3	14.5	4.7
LnGrp LOS	C	A	A	A	B	A
Approach Vol, veh/h	267		1063			1092
Approach Delay, s/veh	34.6		5.3			6.9
Approach LOS	C		A			A

Timer - Assigned Phs	2			6	8
Phs Duration (G+Y+Rc), s	48.2			48.2	16.9
Change Period (Y+Rc), s	4.5			4.5	4.5
Max Green Setting (Gmax), s	53.0			53.0	18.0
Max Q Clear Time (g_c+I1), s	11.0			35.8	12.1
Green Ext Time (p_c), s	8.1			7.8	0.4

Intersection Summary	
HCM 6th Ctrl Delay	9.2
HCM 6th LOS	A

Cumulative plus Project Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	14	57	21	22	27	41	1090	28	23	987	27
Future Volume (veh/h)	37	14	57	21	22	27	41	1090	28	23	987	27
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	40	15	62	23	24	29	45	1185	30	25	1073	29
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	229	40	116	214	90	88	435	1979	50	402	1976	53
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.55	0.55	0.55	0.55	0.55	0.55
Sat Flow, veh/h	462	294	852	385	659	644	516	3569	90	463	3562	96
Grp Volume(v), veh/h	117	0	0	76	0	0	45	594	621	25	539	563
Grp Sat Flow(s),veh/h/ln	1607	0	0	1689	0	0	516	1791	1869	463	1791	1868
Q Serve(g_s), s	0.8	0.0	0.0	0.0	0.0	0.0	1.8	6.4	6.4	1.1	5.6	5.6
Cycle Q Clear(g_c), s	1.9	0.0	0.0	1.1	0.0	0.0	7.4	6.4	6.4	7.5	5.6	5.6
Prop In Lane	0.34		0.53	0.30		0.38	1.00		0.05	1.00		0.05
Lane Grp Cap(c), veh/h	384	0	0	391	0	0	435	993	1036	402	993	1036
V/C Ratio(X)	0.30	0.00	0.00	0.19	0.00	0.00	0.10	0.60	0.60	0.06	0.54	0.54
Avail Cap(c_a), veh/h	1127	0	0	1154	0	0	557	1417	1479	512	1417	1478
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.6	0.0	0.0	11.3	0.0	0.0	6.5	4.3	4.3	6.8	4.1	4.1
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.2	0.0	0.0	0.1	0.6	0.6	0.1	0.5	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	0.4	0.0	0.0	0.1	0.4	0.4	0.0	0.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.1	0.0	0.0	11.6	0.0	0.0	6.6	4.9	4.9	6.9	4.6	4.6
LnGrp LOS	B	A	A	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		117			76			1260			1127	
Approach Delay, s/veh		12.1			11.6			4.9			4.6	
Approach LOS		B			B			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	20.6	8.4	20.6	8.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	23.0	18.0	23.0	18.0
Max Q Clear Time (g_c+I1), s	9.4	3.9	9.5	3.1
Green Ext Time (p_c), s	6.8	0.5	5.4	0.3

Intersection Summary	
HCM 6th Ctrl Delay	5.3
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	24	115	42	55	55	102	1059	55	40	988	53
Future Volume (veh/h)	57	24	115	42	55	55	102	1059	55	40	988	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	62	26	125	46	60	60	111	1151	60	43	1074	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	77	32	156	60	78	78	259	1816	95	237	1812	98
Arrive On Green	0.16	0.16	0.16	0.12	0.12	0.12	0.52	0.52	0.52	0.52	0.52	0.52
Sat Flow, veh/h	490	205	988	484	632	632	501	3463	180	465	3456	187
Grp Volume(v), veh/h	213	0	0	166	0	0	111	595	616	43	556	576
Grp Sat Flow(s),veh/h/ln	1683	0	0	1747	0	0	501	1791	1853	465	1791	1852
Q Serve(g_s), s	8.5	0.0	0.0	6.4	0.0	0.0	13.7	16.5	16.5	5.1	14.9	14.9
Cycle Q Clear(g_c), s	8.5	0.0	0.0	6.4	0.0	0.0	28.6	16.5	16.5	21.5	14.9	14.9
Prop In Lane	0.29		0.59	0.28		0.36	1.00		0.10	1.00		0.10
Lane Grp Cap(c), veh/h	266	0	0	216	0	0	259	939	971	237	939	971
V/C Ratio(X)	0.80	0.00	0.00	0.77	0.00	0.00	0.43	0.63	0.63	0.18	0.59	0.59
Avail Cap(c_a), veh/h	436	0	0	452	0	0	288	1043	1079	264	1043	1078
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.2	0.0	0.0	29.5	0.0	0.0	21.3	11.8	11.8	19.5	11.4	11.4
Incr Delay (d2), s/veh	5.6	0.0	0.0	5.7	0.0	0.0	1.1	1.1	1.0	0.4	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	0.0	0.0	2.9	0.0	0.0	1.5	5.5	5.7	0.5	4.9	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.8	0.0	0.0	35.2	0.0	0.0	22.4	12.9	12.8	19.8	12.2	12.1
LnGrp LOS	C	A	A	D	A	A	C	B	B	B	B	B
Approach Vol, veh/h		213			166			1322			1175	
Approach Delay, s/veh		33.8			35.2			13.7			12.4	
Approach LOS		C			D			B			B	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	41.0	15.5	41.0	13.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	40.5	18.0	40.5	18.0
Max Q Clear Time (g_c+I1), s	30.6	10.5	23.5	8.4
Green Ext Time (p_c), s	5.9	0.7	7.1	0.6

Intersection Summary	
HCM 6th Ctrl Delay	15.9
HCM 6th LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	50	24	1573	105	46	1612
Future Volume (veh/h)	50	24	1573	105	46	1612
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1885	1885	1885	1885
Adj Flow Rate, veh/h	54	26	1710	114	50	1752
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	1	1	1	1
Cap, veh/h	84	40	2433	161	279	2556
Arrive On Green	0.07	0.07	0.71	0.71	0.71	0.71
Sat Flow, veh/h	1152	555	3504	225	258	3676
Grp Volume(v), veh/h	81	0	891	933	50	1752
Grp Sat Flow(s),veh/h/ln	1728	0	1791	1845	258	1791
Q Serve(g_s), s	1.9	0.0	11.9	12.3	5.9	11.5
Cycle Q Clear(g_c), s	1.9	0.0	11.9	12.3	18.2	11.5
Prop In Lane	0.67	0.32		0.12	1.00	
Lane Grp Cap(c), veh/h	126	0	1278	1316	279	2556
V/C Ratio(X)	0.64	0.00	0.70	0.71	0.18	0.69
Avail Cap(c_a), veh/h	739	0	1404	1446	298	2808
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.0	0.0	3.4	3.5	8.8	3.4
Incr Delay (d2), s/veh	5.4	0.0	1.4	1.5	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.5	0.6	0.2	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.4	0.0	4.8	5.0	9.1	4.0
LnGrp LOS	C	A	A	A	A	A
Approach Vol, veh/h	81		1824			1802
Approach Delay, s/veh	24.4		4.9			4.2
Approach LOS	C		A			A

Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		34.5			34.5	7.6
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		33.0			33.0	18.0
Max Q Clear Time (g_c+I1), s		14.3			20.2	3.9
Green Ext Time (p_c), s		12.6			9.8	0.1

Intersection Summary	
HCM 6th Ctrl Delay	5.0
HCM 6th LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	120	254	1378	215	381	1327
Future Volume (veh/h)	120	254	1378	215	381	1327
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1885	1885	1885	1885
Adj Flow Rate, veh/h	130	0	1498	234	414	1442
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	1	1	1	1
Cap, veh/h	165		1760	270	514	2786
Arrive On Green	0.09	0.00	0.57	0.57	0.15	0.78
Sat Flow, veh/h	1782	0	3206	478	3483	3676
Grp Volume(v), veh/h	131	0	852	880	414	1442
Grp Sat Flow(s),veh/h/ln	1796	0	1791	1799	1742	1791
Q Serve(g_s), s	5.0	0.0	27.3	28.9	8.0	10.4
Cycle Q Clear(g_c), s	5.0	0.0	27.3	28.9	8.0	10.4
Prop In Lane	0.99	0.00		0.27	1.00	
Lane Grp Cap(c), veh/h	166		1013	1017	514	2786
V/C Ratio(X)	0.79		0.84	0.87	0.81	0.52
Avail Cap(c_a), veh/h	194		1097	1102	577	3020
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.8	0.0	12.5	12.8	28.6	2.9
Incr Delay (d2), s/veh	16.9	0.0	5.7	7.0	7.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	9.8	10.7	3.6	1.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	47.7	0.0	18.2	19.8	36.1	3.0
LnGrp LOS	D		B	B	D	A
Approach Vol, veh/h	131	A	1732			1856
Approach Delay, s/veh	47.7		19.0			10.4
Approach LOS	D		B			B

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	14.7	43.7			58.5	10.9
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	11.5	42.5			58.5	7.5
Max Q Clear Time (g_c+I1), s	10.0	30.9			12.4	7.0
Green Ext Time (p_c), s	0.3	8.4			14.9	0.0

Intersection Summary	
HCM 6th Ctrl Delay	15.7
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	1259	613	155	655	5	523	161	146	34	126	8
Future Volume (veh/h)	8	1259	613	155	655	5	523	161	146	34	126	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772	1772
Adj Flow Rate, veh/h	9	1368	666	168	712	5	568	175	159	37	137	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	336	1384	617	162	1384	617	1136	352	319	416	676	44
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.40	0.41	0.41	0.40
Sat Flow, veh/h	696	3367	1502	197	3367	1502	2283	855	777	991	1644	108
Grp Volume(v), veh/h	9	1368	666	168	712	5	568	0	334	37	0	146
Grp Sat Flow(s),veh/h/ln	696	1683	1502	197	1683	1502	1141	0	1632	991	0	1752
Q Serve(g_s), s	0.4	18.1	18.5	0.4	7.1	0.1	9.6	0.0	6.9	1.3	0.0	2.4
Cycle Q Clear(g_c), s	7.5	18.1	18.5	18.5	7.1	0.1	12.0	0.0	6.9	8.2	0.0	2.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.48	1.00		0.06
Lane Grp Cap(c), veh/h	336	1384	617	162	1384	617	1136	0	671	416	0	720
V/C Ratio(X)	0.03	0.99	1.08	1.04	0.51	0.01	0.50	0.00	0.50	0.09	0.00	0.20
Avail Cap(c_a), veh/h	336	1384	617	162	1384	617	1136	0	671	416	0	720
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	12.7	13.1	13.3	22.5	9.9	7.8	12.4	0.0	9.9	12.8	0.0	8.5
Incr Delay (d2), s/veh	0.1	21.6	59.3	81.7	1.4	0.0	1.6	0.0	2.6	0.4	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	8.0	13.7	5.0	1.8	0.0	2.0	0.0	2.2	0.3	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.9	34.7	72.6	104.2	11.3	7.9	13.9	0.0	12.5	13.3	0.0	9.2
LnGrp LOS	B	C	F	F	B	A	B	A	B	B	A	A
Approach Vol, veh/h		2043			885			902			183	
Approach Delay, s/veh		47.0			28.9			13.4			10.0	
Approach LOS		D			C			B			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	22.5	22.5	22.5	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	18.0	18.0	18.0
Max Q Clear Time (g_c+I1), s	14.0	20.5	10.2	20.5
Green Ext Time (p_c), s	1.8	0.0	0.5	0.0

Intersection Summary	
HCM 6th Ctrl Delay	33.8
HCM 6th LOS	C

Appendix C

Utility Maps and Costs

Analysis of Utilities and Infrastructure for North Academy Corridor Master Plan

Yamabe & Horn Engineering, Inc.

Contents Page

1.0 EXISTING PUBLIC FACILITIES

The City of Sanger currently provides public utility service to an area of approximately 3,530 acres through a sanitary sewer collection and treatment system, water distribution system, and storm drain collection and disposal system, including, but not limited to pipelines, manholes, wells, tanks, lift stations, and the City of Sanger Wastewater Treatment Plant (WWTP). Over the years, the City of Sanger has been able to plan for growth in accordance with the current General Plan and the adopted Master Plans for each utility system, which now set the basis for the North Academy Corridor Master Plan (herein after referred to as "Plan"). The Plan Area lies outside and adjacent to the current City Limit but within the Sphere of Influence. The existing facilities adjacent to or within the Plan Area are as described in the following sections.

1.1 EXISTING SANITARY SEWER SERVICE FACILITIES

As early as 1923, the City of Sanger was providing sanitary sewer service to its residents, through the use of a system of several miles of vitrified clay pipe, some of which is still in use today, and which was expanded in 1938 to 15 miles of pipe. The system was further expanded in 1947 with the construction of additional lines and a treatment plant. Additional renovations and expansions to the treatment plant have been made between the early 1960's and the present. One major issue with the functionality of the sewer system was that fact that much of the City's storm drain runoff was directed to the sewer system, overwhelming the treatment facility. This was identified as a problem into the 1990's and beyond. The City has taken measures to separate storm drain and sewer systems, greatly improving the reliability of both services and easing maintenance demands on the sewer treatment facility by eliminating many of the higher flows and solids entering the system by way of the storm runoff.

The Plan Area will ultimately be served by the East Side Interceptor trunk main that currently extends north from its junction with the North Avenue Trunk Main in the southeast portion of the City and terminates at a location just south of the intersection of Church and Quality Avenues, southeast of the Plan Area. No sewer mains currently exist within the Plan Area. All existing developed properties within the Plan Area are currently served by private septic systems. Refer to Exhibit SS-1 in Appendix A for depiction of the existing City of Sanger sewer system.

1.2 EXISTING WATER SERVICE FACILITIES

Groundwater was and is the sole water supply for the City of Sanger. The Kings River recharges the groundwater aquifer, along with runoff from the foothills, which has been sufficient to meet the needs of the area. The City of Sanger Municipal Water System serves the City of Sanger's incorporated limits. The City provides domestic water service from a system of wells citywide, capable of 45 psi (pounds per square inch) of

water pressure. The City has nine wells and two elevated storage tanks, which supply water through a grid distribution system of 4, 6, 8, 10 and 12-inch diameter mains. At this time all wells include disinfection treatment and six also have Granular Activated Carbon (GAC) units to provide further treatment to meet water quality requirements. Well 8 is currently offline due to nitrate levels which exceed the maximum contaminant level (MCL). However, the City has plans to build a third water storage tank with capacity to blend water from Well 8 to a level sufficient to meet State Standards.

There are currently no existing City wells with the Plan area. There is an existing 12" water main in Academy Avenue that extends the full length of the Plan Area, from California Avenue north to Kings Canyon Road (State Route 180). Service from this main is currently provided to the California Department of Forestry & Fire Protection station and a new commercial development, currently under construction on the southwest corner of Academy Avenue and Kings Canyon Road. All other developed properties within the Plan Area are served by private domestic wells. Refer to Exhibit W-1 in Appendix A for depiction of existing City of Sanger water service facilities.

1.3 EXISTING STORM WATER DRAINAGE FACILITIES

The City of Sanger provides for collection, retention, and disposal of storm water drainage from City streets and adjacent properties through the use of storm drain pipes and ponding basins dispersed throughout the City limits. Through an agreement with the Consolidated Irrigation District (CID), the City discharges some peak storm water flows into CID canals to provide additional flood control conveyance and disposal.

The Plan Area has not previously reached the level of development sufficient to require the construction of these facilities. At this time, no storm drain facilities exist within the Plan Area. All drainage and runoff is managed on a parcel-by-parcel basis. Please refer to Exhibit SD-1 in Appendix A for depiction of existing City of Sanger storm drain facilities.

2.0 PROPOSED SANITARY SEWER COLLECTION FACILITIES

Sewer services to be provided by the City of Sanger for the Plan Area are planned to include waste water collection, treatment, and disposal for both the commercial and mixed-use retail-zoned Plan Area and the adjacent residential and industrial uses. A sewer system model was constructed utilizing Innovyze, a wet utility infrastructure analytics software program created for designing and analyzing wastewater and storm drain collection systems, for the Plan Area based on the previously adopted 2005 City of Sanger Sewer Collection System Master Plan (SCSMP). The North Academy Corridor Master Plan (NACMP), the mixed-use retail and commercial component of the draft City of Sanger General Plan Update for 2035 (GPU), includes changes to land use relative to the current 2025 General Plan. The sewer system demands for the Plan Area, based on these updated land uses, were incorporated into the sewer system model. The model output was analyzed to confirm that both the proposed and

existing sewer system pipe sizes per the SCSMP are sufficient to provide adequate service to the updated land uses in the Plan Area.

The Plan Area lies within the Eastside Sewer Interceptor Service Area. Portions of the sewer collection system proposed to serve the North Academy Corridor will also ultimately serve other parcels and development within the Eastside Sewer Interceptor Service Area in accordance with the SCSMP. Additional sewer mains within the Eastside Interceptor Service Area but outside the Plan Area that connect to the primary trunk lines were included in the sewer model to ensure that the trunk lines built with development of the Plan Area will be adequate for the remainder of the Interceptor Service Area at its buildout. See Exhibit SS-2 in Appendix A for a depiction of the various sewer service areas and trunk mains required for development of the Plan Area and the future adjacent development within the City Sphere of Influence.

2.1 LAND USE AND DEMAND

In developing the sewer system model, land-use-based demands for both the Plan Area and for parcels outside the Plan Area but within the Eastside Sewer Interceptor Service Area, were analyzed. The Mixed-Use Retail land use proposed as part of the Plan is intended primarily for General Commercial use with allowable secondary uses of High Density Residential and/or Industrial, up to a maximum ratio of 45% of developed area. For the purposes of sanitary sewer demand, it was assumed that 45% of the Mixed-Use Retail areas would be developed to High Density Residential use, which would result in the highest system demand. The Plan Area was divided into sub-service areas to be served by future sanitary sewer facilities. The base load for each area was determined based upon the land use of the service area and the load was applied to nodes within the service area. Table 2.1 shows the loading rates for the various types of land use.

TABLE 2.1
AVERAGE DAILY LOADING RATES BY LAND USE (FROM 2005 SCSMP)

LAND USE	LOADING RATE	UNITS
Low Density Residential (LDR)	800	GAL/AC PER DAY
Medium Low Density Residential (MLDR)	1,000	GAL/AC PER DAY
Medium Density Residential (MDR)	1,300	GAL/AC PER DAY
Medium High Density Residential (MHDR)	2,600	GAL/AC PER DAY
High Density Residential (HDR)	2,600	GAL/AC PER DAY
Commercial (COMM)	1,000	GAL/AC PER DAY
Industrial (IND)	1,300	GAL/AC PER DAY
Park (PARK)	200	GAL/AC PER DAY

Elementary School (ES)	6,000	GAL/DAY
High School (HS)	40,000	GAL/DAY

2.2 SANITARY SEWER COLLECTION SYSTEM

The sewer collection system within the Plan Area per the SCSMP consists of a network of sewer mains ranging from 10-inch to 24-inch in diameter. The local 8-inch diameter sewer mains are not shown within the SCSMP and were not designed for master plan purposes. The master planned sewer mains were designed based on the estimated flows and the existing ground topography. Table 2.2 shows the minimum and preferred longitudinal slopes used in the design of the sewer mains. The master plan sewer mains are to be PVC pipe, with a Manning's n-value of 0.010 being used for the design. The mains are designed to flow half-full for the average day scenario, allowing additional capacity for peak wastewater flows. Peak flows are typically estimated to be roughly two times the maximum flow under the average day scenario. For the purposes of preparing this model, recent hydrographs of effluent inflow into the WWTP were analyzed. These hydrographs represent system-wide average flows and from the hydrographs, a peaking factor was confirmed to be no more than a factor of 2. With the pipes designed to run half-full during average day flows, capacity is sufficient for full flow during peak flow periods.

TABLE 2.2
LONGITUDINAL SLOPES (FROM 2005 SCSMP)

PIPE DIAMETER (INCHES)	MINIMUM SLOPE (%)	PREFERRED SLOPE (%)
10	0.18	0.30
12	0.15	0.18
15	0.10	0.15
18	0.10	0.12
21	0.04	0.10
24	0.04	0.10

The proposed wastewater collection system to serve the Plan Area is described below and depicted on Exhibit SS-3 in Appendix A. Onsite service mains, 8-inches minimum in diameter, will be required as necessitated by development but are not shown in the exhibit, and not described here, or included in the cost estimate.

- Connection to the existing system is to be made at the north end of the existing Eastside Sewer Interceptor. The terminus of the interceptor is in Quality Avenue, north of the Fourth Street alignment. A proposed 18-inch main will extend north from there in Quality Avenue to its intersection with Church Avenue.

- An 18-inch line in Quality Avenue between Church and California Avenues
- An 18-inch line in California Avenue between Quality Avenue and the Harrison Avenue alignment.
- A 15-inch line in California Avenue between the Harrison Avenue alignment and Academy Avenue.
- An 8-inch line in California Avenue between Academy and the westerly Plan Area boundary (This main intended as a trunk main to serve several parcels within small service area not requiring a larger main, but still located in public right-of-way, and is NOT considered a "local" and is thus included in the model).
- A 15-inch line in Academy Avenue between California Avenue and the Woods Avenue alignment.
- A 12-inch line in Academy Avenue between the Woods Avenue alignment and Kings Canyon Road (State Route 180).
- A 10-inch line along the Woods Avenue alignment within the Plan Area boundary.
- A 10-inch line in Butler Avenue within the Plan Area boundary.
- A 10-inch line along the Sierra Avenue alignment within the Plan Area boundary.
- An extension of a 24-inch line in Newmark Avenue from North Avenue south to Muscat Avenue (the "Newmark Extension") is assumed at this point to be necessary at initial development due to the existing North Avenue trunk main being at full capacity, but flow metering on the North Avenue trunk main may provide data to determine that the Newmark Extension may be deferred to a later phase of development of the Plan Area. This flow metering is expected to be completed prior to development of any properties within the Plan Area.

2.3 LIFT STATION

The Eastside Sewer Interceptor trunk line includes a permanent sewer lift station near Annadale and Newmark Avenues. This lift station is designed and built to ultimately serve as a triplex pump station with three 15-horsepower pumps. It is currently operating as a duplex with two 5-horsepower pumps. In order to achieve sufficient service capacity to handle not only the current demand, but the addition of that of the proposed Plan Area fully developed in its entirety, it will be required to replace the two 5-horsepower pumps with two 15-horsepower pumps within the existing wet well. It is recommended that currently available surplus capacity in this lift station be assessed prior to commencement of any development within the Plan Area as it pertains to the timing of the pump replacements.

2.4 WASTEWATER TREATMENT FACILITY

The existing City of Sanger Waste Water Treatment Facility has sufficient capacity to serve the additional demand placed on it by the development of the Plan Area and does not need to be expanded at this point.

2.5 ESTIMATED COST OF PROPOSED IMPROVEMENTS

The estimated costs provided for construction of the proposed utility services required to serve the Plan Area consist of Baseline Construction Costs, Contingency Costs, and Escalation Costs of the project over time. Since knowledge about site-specific conditions of each proposed project is limited at the master planning stage, a 20-percent contingency was applied to the Baseline Construction Cost to account for unforeseen events and unknown construction conditions. In order to account for inflation, increasing material costs, or unknown changes in market conditions, an Escalation Cost of 3 percent per year is estimated out to the midpoint of construction of the Plan Area, assumed to be 10 years for purposes of these estimates. These assumptions were applied to each of the estimates for utility infrastructure costs addressed herein.

The estimated cost of construction of the proposed wastewater collection facility improvements was prepared for the buildout of 100% of the improvements, and is inclusive of all projected costs related to materials, equipment, labor, engineering, surveying, inspection, testing, etc. See table 2.3 for estimated cost information.

TABLE 2.3
ESTIMATE OF PROBABLE COST FOR CONSTRUCTION OF
PROPOSED WASTEWATER IMPROVEMENTS

DESCRIPTION	EST. COST
Pipelines (includes all pipe, manholes, trenching and resurfacing, etc.)	$3,220,000
Duplex Pump Replacement at Newmark Lift Station	$80,000
Bore and Jack (two locations under Fowler Switch Canal)	$240,000
Contractor costs (mobilization, traffic and dust control, worker protection, etc.)	$280,000
Design and Construction Engineering	$1,030,000
Construction Testing (Trench Compaction, etc.)	$80,000
Contingency (20%)	$760,000
Escalation to Midpoint of Project Construction (3%/year)	$1,260,000
TOTAL WASTEWATER COLLECTION ESTIMATED COST	**$6,950,000**

3.0 PROPOSED WATER SERVICE FACILITIES

Domestic water service facilities proposed to serve the Plan Area will consist of both distribution facilities and supply facilities.

3.1 LAND USE AND DEMAND

The land use of the Plan Area is made up of Highway and General Commercial, and Mixed-Use Retail, as described earlier in this report. Also included are two master-planned storm drain basins. The total acreage of the Plan Area, less the basins, is roughly 260 acres. As with the sanitary sewer demand calculations, it was assumed that the Mixed-Use Retail component would be developed to its maximum allowed (45%) ratio of High Density Residential use. The projected water use coefficients used for analysis of the Average Day demand for the Plan Area are 1.5 gallons per minute (gpm) per acre for Commercial and 3.0 gpm per acre for high density residential. A blended water use coefficient of 2.18 gpm per acre was used in the average-day-demand analysis of the Mixed-Use Retail portion of the Plan Area (66 acres of commercial and the maximum allowed 54 acres of High Density residential). To address Maximum Day and Peak Hour demands, factors of 2.0 and 3.0, respectively, were used, resulting in an overall water service demand for the Plan Area ranging from 472 (average day) to 1,416 (peak hour) gpm.

3.2 WATER WELL

The adopted 2004 Water System Master Plan (WSMP) includes the construction of future City Wells, including Well No. 28. The proposed site for Well No. 28 lies within the Plan Area and will be located near the Cal Fire station on Academy Avenue north of Butler Avenue. Development within the plan area should be required to construct Well No. 28 together with a looped system including a connection point back to the existing main in Academy, in order to provide and maintain two points of connection to water supply. Historically, most wells in the City of Sanger have been equipped with Granular Activated Carbon (GAC) filtration systems to remove 1,2-Dibromo-3-Chloropropane (D.B.C.P.) contamination from the ground water. It is assumed that a GAC filtration system will also be required as a component of the construction of Well No. 28 to remove D.B.C.P. in addition to the contaminant 1,2,3-Trichloropropane (1,2,3-TCP), as mandated by recent requirements of the California State Water Resources Board for public water systems.

3.3 DISTRIBUTION SYSTEM

The proposed backbone distribution system to serve the Plan Area is described below and depicted on Exhibit W-2 in Appendix B. Onsite looped service mains, 8-inches in diameter, will be required as necessitated by development and are not shown in the exhibit, and not described here, or included in the cost estimate.

- New 12-inch mains are to be constructed in the east/west ½-mile streets within the limits of the Plan Area; California Avenue, Butler Avenue, and parallel to and south of Kings Canyon Road (State Route 180). Water mains along Kings Canyon are to be built outside the limits of the State right-of-way. It is assumed that easements for these lines will be dedicated by the development.
- New 8-inch mains are to be constructed in the east/west ¼-mile streets within the limits of the Plan Area; Woods Avenue alignment and Sierra Avenue alignment.
- New 8-inch mains are to be built at the north/south ¼-mile street alignments within the limits of the Plan Area.
- A new 8-inch main is to be built in a north/south alignment west of Academy, in order to provide looped systems for parcels within the Plan Area lying southwest of Butler and Academy Avenues.

3.4 ESTIMATED COST OF PROPOSED IMPROVEMENTS

The estimated cost of construction of the proposed water service facility improvements were prepared for the buildout of 100% of the improvements, and is inclusive of all projected costs related to materials, equipment, labor, engineering, surveying, testing, etc. See table 3.1 for estimated cost information.

TABLE 3.1
ESTIMATE OF PROBABLE COST FOR CONSTRUCTION OF
PROPOSED WATER SERVICE IMPROVEMENTS

DESCRIPTION	EST. COST
Pipelines (includes all pipe, valves, fittings, hydrants, trenching and resurfacing, etc.)	$1,700,000
Well #28 Construction (including test well, production well, pump, motor, treatment equipment, electrical, and site work)	$2,340,000
Bore and Jack (two locations under Fowler Switch Canal)	$200,000
Land Value (Public Utility Easements)	$180,000
Contractor costs (mobilization, traffic & dust control, etc.)	$230,000
Design and Construction Engineering	$1,210,000
Construction Testing (Trench Compaction, etc.)	$90,000
Contingency (20%)	$890,000
Escalation to Project Midpoint of Construction (3%/year)	$1,480,000
TOTAL WATER SERVICE IMPROVEMENTS ESTIMATED COST	**$8,320,000**

4.0 PROPOSED STORM DRAIN FACILITIES

Storm drain services to be provided by the City of Sanger for the Plan Area include collection, retention, and disposal. A storm drain system was modeled for the Plan Area based on the adopted City of Sanger 2005 Storm Drain Master Plan (SDMP).

4.1 LAND USE AND DEMAND

The Plan and GPU include changes to land use relative to the City of Sanger 2025 General Plan, which was the basis for the SDMP. The storm drain system demands for the Plan Area based on these updated land uses were incorporated into the storm drain system model, using the software program Innovyze previously described, and the model output was analyzed to determine any changes necessary to proposed storm pipe sizes from the SDMP based on those land use changes.

Many of the land use changes included in the GPU relative to the 2025 GP involve converting parcels with a lower overall percentage of impermeable area (i.e. rooftops, pavement, concrete, etc.) to a land use with a greater impermeable area, such as converting Medium Density Residential with a planning runoff coefficient ("c-factor") of 0.35 to General Commercial with a c-factor of 0.80. This results in a higher projection of storm water runoff generated in the post-development state that will need to be addressed, compared to that which was originally planned with the 2025 GP and SDMP.

As described previously, the Plan Area, with the exception of two proposed basins, is made up of a combination of Mixed-Use Retail, and General and Highway Commercial. For purposes of the storm drain modeling, the highest possible demand scenario was assumed, which is that the Mixed-Use Retail portion of the Plan Area would be developed entirely as Commercial land use.

In addition to the land use changes from the 2005 SDMP, some of the runoff coefficients used in the SDMP need to be updated. Current industry standards recommend increased runoff coefficients for some of the land uses proposed in the GPU. These revised runoff coefficients were incorporated into the storm drain system model and the storm drain systems for the northern growth areas were re-analyzed.

The Plan Area overlies the North, Northeast, and California-Quality (CQ) Service Areas of the SDMP. Portions of the storm drain collection system proposed to serve the Plan Area will also ultimately serve other parcels and developments within those Service Areas in accordance with the SDMP. Additional storm drain mains within the Service Areas but outside the Plan Area that connect to the trunk lines were included in the storm drain model to ensure that the trunk lines built with development of the Plan Area will be adequate for the remainder of the North, Northeast, and CQ Service Areas upon full build-out of those areas. See Exhibit SD-2 in Appendix A for a depiction of the various storm drain service areas and trunk networks.

The land uses utilized in the storm drain system model were determined based on the Plan and the GPU for parcels outside the Plan Area but within the North, Northeast, and CQ Service Areas. The study area was divided into sub-service areas to be served by both proposed and future storm drain facilities. The base load for each area was determined based upon the proposed land use of the service area and the load was applied to nodes within the service area. Table 4.1 shows the "c" factors used for the various types of land use.

TABLE 4.1
RUNOFF COEFFICIENT, "C" FACTOR (UPDATED FROM 2005 SDMP)

LAND USE	"C" FACTOR
Low Density Residential (LDR)	0.30
Medium Low Density Residential (MLDR)	0.30
Medium Density Residential (MDR)	0.35
Medium High Density Residential (MHDR)	0.45
High Density Residential (HDR)	0.55
Commercial (COMM) – All Types	0.80
Industrial (IND)	0.80
Park (PARK)	0.25
Elementary School (ES)	0.30
High School (HS)	0.30

4.2 STORM DRAINAGE COLLECTION SYSTEM

The Service Areas overlying the Plan Area consist of five separate networks of storm drain manholes, inlets, and mains all ranging from 15" to 54" in diameter. See Exhibit SD-3 for the required pipeline sizing as well as the depiction of facilities required to serve both the Plan Area and future adjacent development. Onsite drainage systems are not shown within the SDMP and were not designed for master plan purposes. The master plan storm drain mains were designed based on the estimated flows and the existing ground topography. The master plan storm drain mains may be PVC pipe for diameters 18-inch and smaller, and concrete pipe (RGRCP) for diameters larger than 18-inch, with a Manning's n-value of 0.010 (PVC) and 0.0013 (concrete) being used for the design. The mains were designed to flow under a surcharged (low-head pressure) condition while maintaining a minimum of two feet of freeboard at the lowest manhole junction and/or drain inlet within each separate system. Lines C, D, and E (per SDMP) are within the North Service Area and serve the westerly majority of the Plan Area.

Lines H and CQ are within the Northeast and CQ Service Areas, respectively, and serve the easterly portion of the Plan Area.

4.3 RETENTION BASINS

The Plan area includes two areas designated for development of retention basins; one in the North Service Area and one in the Northeast Service Area. Each basin is necessary to serve development within the Plan Area. The basin in the North Service Area is situated roughly north of the Woods Avenue alignment and west of Academy Avenue. This is referred to as the North Area Basin with a footprint area of 15 acres and proposed total volume at buildout of the North Service Area of roughly 236 acre-feet. It is assumed that the entire basin property will be purchased and dedicated to the City with buildout of the Plan Area, with excavation occurring over time as development occurs. The cost estimate for the Plan includes the property purchase and fencing of the property, along with excavation sufficient to serve the Plan Area within the North Service Area, estimated at 74 Acre-Feet (AF) or 120,000 cubic yards (CY). Future landscaping is assumed to be completed separately and is not included in the cost estimate.

The 10-acre Northeast Area Basin is located north of the Switch Avenue alignment, east of Academy Avenue and is planned for an ultimate storage volume of approximately 127 acre-feet. This basin may also be proposed for an interconnection to the Fowler Switch Canal for the purposes of groundwater recharge, if an agreement can be reached with Consolidated Irrigation District (CID), the agency maintaining jurisdiction over the canal. As with the North Area Basin, the cost estimate for the Northeast Area Basin includes the cost to purchase and fence the entire property, with excavation sufficient to serve the Plan Area, estimated at 21 AF or 34,000 CY. See Exhibits SD-2 and SD-3 for depiction of basin locations within the Service Areas and Plan Area.

A portion of the Plan Area south of the Fowler Switch Canal lies within the CQ Service Area and is to be served by the CQ basin, per the SDMP. Proposed Basin CQ is outside the boundary of the Plan Area and is not a part of the proposed improvements of the Plan. Development occurring in this area may incorporate temporary onsite retention rather than constructing the additional offsite storm drain facilities and basin excavation required for permanent service. Construction of proposed storm drain facilities lying within the Plan Area will be required. Another portion of the Plan Area south of the Fowler Switch Canal and west of the CQ Service Area is within the existing drainage boundary of the Cesar Chavez Drainage Basin. This area can be designed to surface drain to Academy Avenue and the existing drainage facilities therein.

An area north of Butler Avenue in the westerly portion of the Plan Area within the North Service Area is to be served by storm drain facilities proposed to be built outside the limits of the Plan Area. As with the portion of Plan Area within the CQ

Service Area, this portion of the North Service Area may also develop with temporary onsite retention until such time that permanent facilities are constructed. See Exhibit SD-3 in Appendix A for depiction of the areas recommended for temporary onsite retention or which can be served by existing drainage facilities.

4.4 ESTIMATED COST OF PROPOSED IMPROVEMENTS

The estimated cost of construction of the proposed storm drain improvements were prepared for the buildout of 100% of the improvements, and is inclusive of all projected costs related to materials, equipment, labor, land, engineering, surveying, testing, etc. See table 4.2 for estimated cost information.

TABLE 4.2
ESTIMATE OF PROBABLE COST FOR CONSTRUCTION OF
PROPOSED STORM DRAIN IMPROVEMENTS

DESCRIPTION	EST. COST
Pipelines (includes all pipe, manholes, inlets, outfalls, trenching and resurfacing, etc.)	$2,410,000
Basin Construction (North and Northeast Basins, includes excavation and fencing)	$510,000
Contractor costs (mobilization, traffic & dust control, worker protection, etc.)	$220,000
Design and Construction Engineering	$850,000
Construction Testing (Trench Compaction, etc.)	$60,000
Land Value for Proposed Basins (+/- 25 total acres)	$2,500,000
Contingency, (20%)	$630,000
Escalation to Project Midpoint of Construction (3%/year)	$1,040,000
TOTAL STORM DRAIN IMPROVEMENTS ESTIMATED COST	**$8,220,000**

Appendix A

Exhibits – Existing and Proposed Improvements

North Academy Corridor Master Plan Area

TERMINUS OF EASTSIDE SEWER INTERCEPTOR

Exhibit SS-1
Master Plan Sewer System
North Academy Corridor Master Plan
Existing Conditions

Existing Sewer Mains
City Limits
Sphere of Influence
North Academy Corridor Master Plan Area

0 1,000 2,000
Feet

Yamabe & Horn Engineering, Inc.

Exhibit W-1
Master Plan Water System
North Academy Corridor Master Plan
Existing Conditions

- Wells
- Tanks
- Existing Water Mains
- City Limits
- Sphere of Influence
- North Academy Corridor Master Plan Area

0 1,000 2,000
Feet

Yamabe & Horn Engineering, Inc.

Exhibit SD-1
Master Plan Storm Drain System
North Academy Corridor Master Plan
Existing Conditions

Existing Storm Drain Mains

Existing Storm Drain Basin

City Limits

Sphere of Influence

North Academy Corridor Master Plan Area

0 1,000 2,000
Feet

Yamabe & Horn Engineering, Inc.

KINGS CANYON RD
BUTLER AVE
CALIFORNIA AVE
OAK AVE
WOODS AVE
CHURCH AVE
ANNADALE AVE
GEARY AVE
FLORENCE AVE
TAMRACK AVE
HOLT AVE
VINE AVE
FIFTH ST
SIXTH ST
SEVENTH ST
WEBSTER AVE
NINTH ST
TENTH ST
ELEVENTH ST
TWELFTH ST
THIRTEENTH ST
FOURTEENTH ST
MARY AVE
PALM AVE
MAGNOLIA AVE
MYRTLE AVE
ALMOND AVE
EDGAR AVE
GLORIA AVE
CHERRY AVE
MOIR AVE
NORTH AVE
WALTON AVE
HEIDI AVE
CATHERINE AVE
LIME AVE
JENSEN AVE
SEQUOIA AVE
MEIRWOOD AVE
STERLING AVE
JENNI AVE
FOURTH ST
THIRD ST
SECOND ST
REBECA AVE
FIR AVE
BUCK WAY
GRIFFIN AVE
COMMERCE AVE
CENTRAL AVE
GOODFELLOW AVE
DEL REY AVE
INDIANOLA AVE
MADSEN AVE
NEWMARK AVE
ROSS AVE
TURNEY AVE
QUALITY AVE
RAINBOW AVE
CHANNEL AVE
FAIRBANKS AVE
COTTLE AVE
KEISER AVE
GREENWOOD AVE
ACADEMY AVE
SANGER AVE
BRELHER AVE
POST AVE
LILY AVE
REAGAN AVE
PINEWOOD AVE
LYON AVE
HAWLEY AVE
TAIT AVE
WEST AVE
HILL AVE
DEWITT AVE
HOAG AVE
RAWSON AVE
BETHEL AVE
DALTON AVE
CIRCLE DR
RICHLAND AVE
KISTER AVE
NILE AVE
PARK AVE
SWAN AVE
CANAL DR
ACACIA DR
HOLT AVE
PEARL AVE
FALLER AVE
BENNETT AVE
HUME DR
TUCKER AVE
SKYLAR AVE
MORTON AVE
HARRISON AVE
SEGURA AVE
LEWIS LN
INDUSTRIAL AVE
O ST
N ST
P ST
Q ST
K ST
L ST
J ST
I ST
FOURTH ST
SIXTH ST
EIGHTH ST

Trunk Lines to Serve North Development Area

Trunk Line to Serve Northeast Development Area

Trunk Lines to Serve North Development Area

Trunk Lines to Serve Development South of California

Eastside Sewer Interceptor

Newmark Bypass

WWTP

KINGS CANYON RD
MADSEN AVE
BUTLER AVE
CANAL
SWITCH AVE
SWITCH
ACADEMY AVE
WOODS AVE
FAIRBANKS AVE
ROSS AVE
OAK AVE
CALIFORNIA AVE
ACACIA AVE
ATCHISON AVE
LILY AVE
WATHEN AVE
COTTLE AVE
LYON AVE
LORENA AVE
GEARY AVE
FOWLER
ACACIA AVE
FLORENCE AVE
SEQUOIA AVE
K ST
PEARL AVE
REDWOOD AVE
QUALITY AVE
TAMRACK AVE
MEIRWOOD AVE
TAMARACK AVE
STERLING AVE
HOLT AVE
ACACIA DR
CANAL DR
CHURCH AVE
SARAH AVE
KELLI AVE
EILEEN AVE
BREHLER AVE
POST AVE
JENNI AVE
FINK AVE
HILL AVE
SECOND ST
THIRD ST
FOURTH ST
VINE AVE
BETHEL AVE
OATMAN AVE
WEST AVE
O ST
J ST
SEGURA AVE
WALNUT AVE
MORTON AVE
TUCKER AVE
HARRISON AVE
RAINBOW AVE
HAWLEY AVE
TAIT AVE
FIFTH ST
L ST
JENSEN AVE
I ST
SIXTH ST
SEVENTH ST
JENSEN AVE
K ST
EIGHTH ST
HARRIETT AVE
HUME DR
LILY AVE
WEBSTER AVE
MARY AVE
NINTH ST
HOAG AVE
DEWITT AVE
N ST
RECREATION AVE
PALM AVE
REBECA AVE
CAROL AVE
BUCK WAY
ELEVENTH ST
PALM AVE
TENTH ST
P ST
ROSA AVE
ELEVENTH ST
MADROS AVE
MILLWOOD DR
BIRCH AVE
LEWIS LN
MADSEN AVE
FIR AVE
MAGNOLIA AVE
ANNADALE AVE
MYRTLE AVE
TWELFTH ST
ANNADALE AVE
JEFFERSON WAY
HUME RD
ALMOND AVE
FALLER AVE
I ST
J ST
FOREST LN
EASTWOOD AVE
EDGAR AVE
GLORIA AVE
TUCKER AVE
HUME DR
WALTON AVE
BENNETT AVE
INDUSTRIAL AVE
NEWMARK AVE

Exhibit SS-2
Master Plan Sewer System
North Academy Corridor Master Plan
Service Planning Areas

- Master Plan Sewer Manholes

Master Plan Sewer Pipes

- Pipelines Needed to Serve North Development Area
- Pipelines Needed to Serve Northeast Development Area
- Pipelines Needed to Serve South of California Development Area
- Existing Eastside Sewer Interceptor
- Wastewater Treatment Plant
- North Service Area
- Northeast Service Area
- South of California Service Area
- Eastside Sewer Interceptor Service Area
- North Academy Corridor Master Plan Area

THE NATION'S CHRISTMAS TREE CITY
SANGER
GENERAL GRANT

N

0 600 1,200
Feet

Yamabe & Horn Engineering, Inc.

Exhibit SS-3
Master Plan Sewer System
North Academy Corridor Master Plan
Proposed Improvements

Master Plan Sewer Pipes

- Proposed (To Be Built) - 8"
- Proposed (To Be Built) - 10"
- Proposed (To Be Built) - 12"
- Proposed (To Be Built) - 15"
- Proposed (To Be Built) - 18"
- Proposed (To Be Built) - 24"
- Future (By Others) - 8"
- Future (By Others) - 10"
- Future (By Others) - 12"

- Existing Sewer Pipe
- Wastewater Treatment Plant
- Eastside Sewer Interceptor Service Area
- North Academy Corridor Master Plan Area

0 500 1,000 Feet

Yamabe & Horn Engineering, Inc.

Newmark Extension

Exhibit W-2
Master Plan Water System
North Academy Corridor Master Plan
Proposed Improvements

KINGS CANYON RD
BUTLER AVE
CALIFORNIA AVE
OAK AVE
ACADEMY AVE
SWITCH AVE
FOWLER SWITCH CANAL
GEARY AVE
FLORENCE AVE
K ST
DAISY LANE AVE
SEQUOIA AVE
TAMARACK AVE
REDWOOD AVE
PEARL AVE
STERLING AVE
FALLER AVE
HOLT AVE
CHURCH AVE
L ST
J ST

WELL 28
WELL 30 (FUTURE)

12" 8"

- W Planned Water Well

Master Plan Water Mains

- Proposed (To be Built) - 8"
- Proposed (To be Built) - 12"
- Future (By Others) - 8"
- Future (By Others) - 12"
- Existing Water Main
- Railroad
- North Academy Corridor Master Plan Area

0 250 500
Feet

Yamabe & Horn Engineering, Inc.

Exhibit SD-2
Master Plan Storm Drain System
North Academy Corridor Master Plan
Service Planning Areas

North Service Area

Northeast Service Area

CQ Service Area

North Area Basin

Northeast Area Basin

CQ Basin

KINGS CANYON RD

BUTLER AVE

WOODS AVE

ACADEMY AVE

SWITCH AVE

SWITCH CANAL

FOWLER

QUALITY AVE

OAK AVE

CALIFORNIA AVE

COTTLE AVE

HAWLEY AVE

ACACIA AVE

LORENA AVE

GEARY AVE

FLORENCE AVE

SEQUOIA AVE

WEST AVE

K ST

PEARL AVE

STERLING AVE

REDWOOD AVE

HOLT AVE

CHURCH AVE

SECOND ST

THIRD ST

FOURTH ST

HARRISON AVE

MORTON AVE

FALLER AVE

RECREATION AVE

SEGURA AVE

J ST

K ST

WALNUT AVE

TUCKER AVE

JENSEN AVE

I ST

SIXTH ST

SEVENTH ST

RAINBOW AVE

ELIZABETH AVE

EIGHTH ST

- Master Plan Storm Drain Junction
- Master Plan Storm Drain Outfall
- North Academy Corridor Master Plan Area
- Master Plan Storm Drain Basin

Master Plan Storm Drain Lines

- Line C
- Line CQ
- Line D
- Line E
- Line H

- Service Area C
- Service Area D
- Service Area E
- Service Area H
- Service Area CQ

0 400 800
Feet

Yamabe & Horn Engineering, Inc.

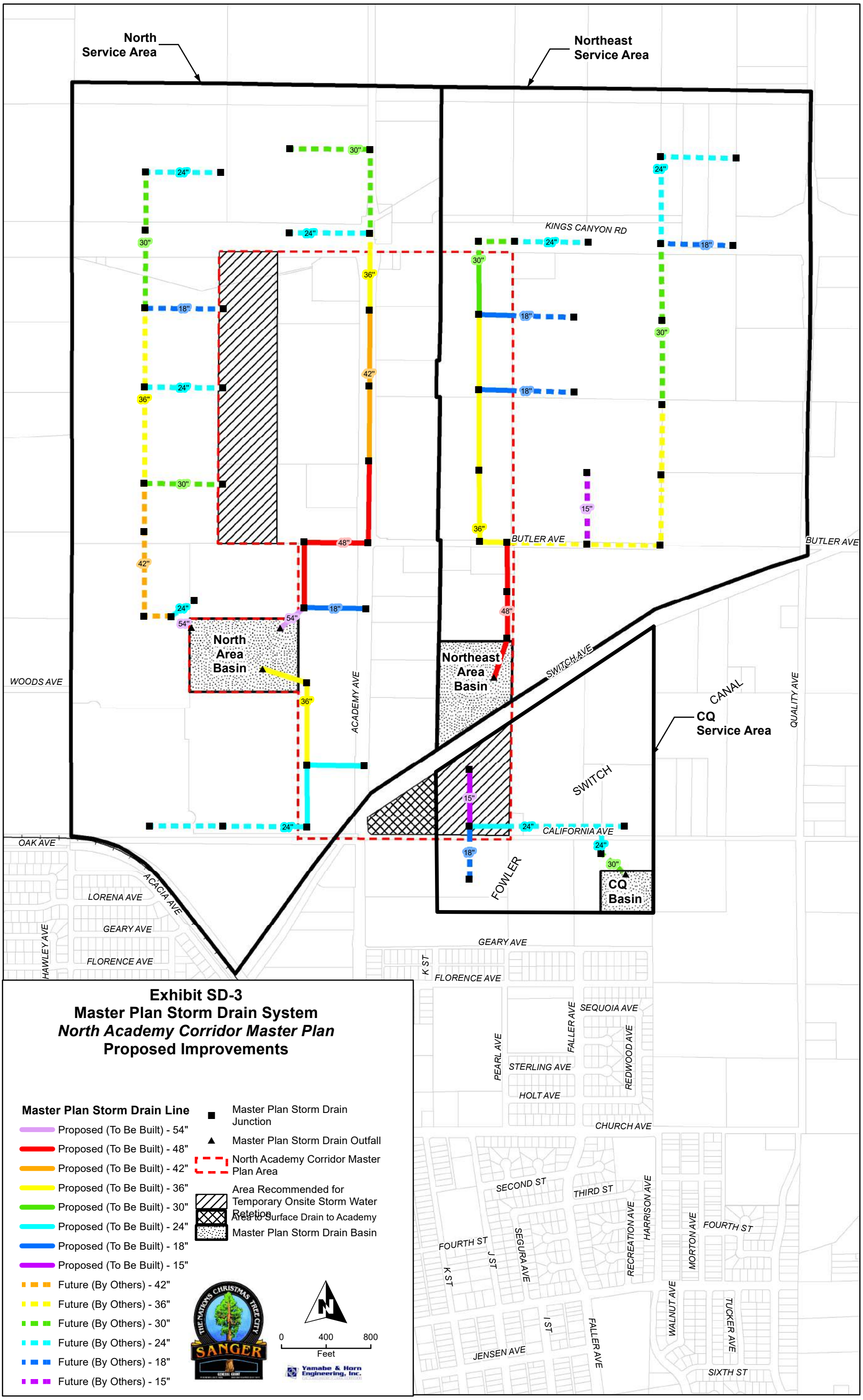


Exhibit SD-3
Master Plan Storm Drain System
North Academy Corridor Master Plan
Proposed Improvements

Master Plan Storm Drain Line

- Proposed (To Be Built) - 54"
- Proposed (To Be Built) - 48"
- Proposed (To Be Built) - 42"
- Proposed (To Be Built) - 36"
- Proposed (To Be Built) - 30"
- Proposed (To Be Built) - 24"
- Proposed (To Be Built) - 18"
- Proposed (To Be Built) - 15"
- Future (By Others) - 42"
- Future (By Others) - 36"
- Future (By Others) - 30"
- Future (By Others) - 24"
- Future (By Others) - 18"
- Future (By Others) - 15"

- Master Plan Storm Drain Junction
- Master Plan Storm Drain Outfall
- North Academy Corridor Master Plan Area
- Area Recommended for Temporary Onsite Storm Water Retetion
- Area to Surface Drain to Academy
- Master Plan Storm Drain Basin

0 400 800
Feet

Yamabe & Horn Engineering, Inc.

Appendix B

Engineer's Opinion of Probable Cost of Proposed Improvements

North Academy Corridor Master Plan Area

YAMABE & HORN ENGINEERING, INC.
2985 North Burl Ave., Suite 101
Fresno, CA 93727
(559) 244-3123, Fax (559) 244-3120

Engineer's Opinion of Probable Cost April 1, 2019
North Academy Corridor - Wastewater Improvements Prepared By: ck
City of Sanger

Item No	Description	Est. Quantity		Unit Price	Extension
	SEWER CONSTRUCTION				
1)	Mobilization	1	L.S.	150,000.00	150,000
2)	Traffic Control	1	L.S.	40,000.00	40,000
3)	Dust Control	1	L.S.	20,000.00	20,000
4)	Worker Protection from Caving Ground in Excav	1	L.S.	70,000.00	70,000
5)	24" Sewer Main	2,300	L.F.	$110.00	250,000
6)	18" Sewer Main	4,500	L.F.	90.00	410,000
7)	15" Sewer Main	3,900	L.F.	75.00	290,000
8)	12" Sewer Main	6,700	L.F.	60.00	400,000
9)	10" Sewer Main	7,800	L.F.	50.00	390,000
10)	8" Sewer Main	1,300	L.F.	40.00	50,000
11)	48" Sewer Manhole	65	EA.	$5,000.00	$330,000
12)	Nemark Sewer LS Pump Replacement	1	L.S.	75,000.00	80,000
13)	Bore and Jack at Fowler Switch Canal	2	EA.	120,000.00	240,000
14)	Pavement Replacement (20' wide)	13,200	L.F.	75.00	990,000
15)	Adjust Existing Manhole	65	EA.	850.00	60,000
16)	Miscellaneous Facilities & Operations	1	L.S.	48,000.00	50,000
				Sub-total Sewer Construction =	$3,820,000
				Contingency (20%) =	$760,000
				Escalation to Mid-Point of Construction (3% per year) =	$1,260,000
	MISCELLANEOUS				
	Design Engineering	15.0%			$570,000
	Construction Engineering	12.0%			460,000
	Testing	2.0%			80,000
				Sub-total Miscellaneous=	$1,110,000
				Total Estimated Project Cost=	**$6,950,000**

YAMABE & HORN ENGINEERING, INC.
2985 North Burl Ave., Suite 101
Fresno, CA 93727
(559) 244-3123, Fax (559) 244-3120

Engineer's Opinion of Probable Cost April 1, 2019
North Academy Corridor - Water System Improvements Prepared By: ck
City of Sanger

Item No	Description	Est. Quantity		Unit Price	Extension
	WATER CONSTRUCTION				
1)	Mobilization	1	L.S.	200,000.00	200,000
2)	Traffic Control	1	L.S.	20,000.00	20,000
3)	Dust Control	1	L.S.	10,000.00	10,000
4)	12" Water Main	6,950	L.F.	65.00	$450,000
5)	12" Gate Valve	18	EA.	2,500.00	50,000
6)	8" Water Main	14,800	L.F.	55.00	810,000
7)	8" Gate Valve	35	EA.	2,000.00	70,000
8)	Fire Hydrant Assembly	40	EA.	4,500.00	180,000
9)	Well No. 28 - Test Well Construction	1	EA.	120,000.00	120,000
10)	Well No. 28 - Production Well Drilling & Developme	1	EA.	270,000.00	270,000
11)	Well No. 28 - Pump, Moptor, Treatment, Electrical,	1	L.S.	1,950,000.00	1,950,000
12)	Bore and Jack at Fowler Switch Canal	2	EA.	100,000.00	200,000
13)	Pavement Replacement (4' wide)	250	L.F.	30.00	10,000
14)	Adjust Valve Boxes	55	EA.	850.00	50,000
15)	Miscellaneous Facilities & Operations	1	L.S.	80,000.00	80,000
				Sub-total Base Bid =	$4,470,000
				Contingency (20%) =	$890,000
				Escalation to Mid-Point of Construction (3% per year) =	$1,480,000
	MISCELLANEOUS				
	Land Value (Public Utility Easement)	1.8	AC	100,000	$180,000
	Design Engineering	15.0%			670,000
	Construction Engineering	12.0%			540,000
	Testing	2.0%			90,000
				Sub-total Miscellaneous=	$1,480,000
				Total Estimated Project Cost=	**$8,320,000**

YAMABE & HORN ENGINEERING, INC.
2985 North Burl Ave., Suite 101
Fresno, CA 93727
(559) 244-3123, Fax (559) 244-3120

Engineer's Opinion of Probable Cost April 1, 2019
North Academy Corridor - Storm Drain Improvements Prepared By: ck
City of Sanger

Item No	Description	Est. Quantity		Unit Price	Extension
	STORM DRAIN CONSTRUCTION				
1)	Mobilization	1	L.S.	110,000.00	110,000
2)	Traffic Control	1	L.S.	40,000.00	40,000
3)	Dust Control	1	L.S.	20,000.00	20,000
4)	Worker Protection from Caving Ground in Excav	1	L.S.	50,000.00	50,000
5)	60" Storm Drain Manhole	5	EA.	$7,000.00	$40,000
6)	48" Storm Drain Manhole	35	EA.	5,000.00	180,000
7)	Storm Drain Inlet	25	EA.	5,000.00	130,000
8)	Outfall Structure	3	EA.	7,500.00	20,000
8)	54" Storm Drain Main	520	L.F.	300.00	160,000
9)	48" Storm Drain Main	3,010	L.F.	170.00	510,000
10)	42" Storm Drain Main	2,515	L.F.	150.00	380,000
11)	36" Storm Drain Main	3,205	L.F.	125.00	400,000
12)	30" Storm Drain Main	540	L.F.	115.00	60,000
13)	24" Storm Drain Main	1,615	L.F.	95.00	150,000
14)	18" Storm Drain Main	520	L.F.	80.00	40,000
15)	15" Storm Drain Main	430	L.F.	65.00	30,000
16)	North Basin Excavation	120,000	CY	2.50	300,000
17)	North Basin Chainlink Fencing	3,250	L.F.	20.00	70,000
18)	Northeast Basin Excavation	34,000	CY	2.50	90,000
19)	Northeast Basin Chainlink Fencing	2,740	L.F.	20.00	50,000
20)	Pavement Replacement (20' wide)	2,600	L.F.	75.00	200,000
21)	Adjust Existing Manhole	40	EA.	850.00	30,000
22)	Miscellaneous Street Facilities & Operations	1	L.S.	80,000.00	80,000
				Sub-total Base Bid =	$3,140,000
				Contingency (20%) =	$630,000
				Escalation to Mid-Point of Construction (3% per year) =	$1,040,000
	MISCELLANEOUS				
	Land Value (Storm Drain Basins)	25	AC	100,000	$2,500,000
	Design Engineering	15.0%			$470,000
	Construction Engineering	12.0%			380,000
	Testing	2.0%			60,000
				Sub-total Miscellaneous=	$3,410,000
				Total Estimated Project Cost=	**$8,220,000**

Appendix D

Fiscal Analysis

NEW ECONOMICS & ADVISORY®

LAND USE ANALYSIS & STRATEGIES

MEMORANDUM

To: Karl Schoettler, Collins & Schoettler

From: Isabel Domeyko and Jesse W. Walker

Date: April 25, 2018

Re: Fiscal Impact Analysis for the City of Sanger's Academy Avenue Annexation Area

This memorandum describes the results of a Fiscal Impact Analysis (FIA) that New Economics has prepared for the Academy Avenue Annexation Area (AAAA), a 260-acre area that is proposed for annexation to the City of Sanger (City). This analysis builds upon previous fiscal impact work that New Economics has prepared and refined over the past several months; the fiscal work first evaluated Sanger's overall fiscal position from developed land uses, and then analyzed the potential fiscal impact from "hypothetical" development that could occur through annexation to the City. The analysis described in this memorandum utilizes the FIA model created in previous tasks to assess the fiscal impacts of the land use plan prepared by Collins & Schoettler for the AAAA.

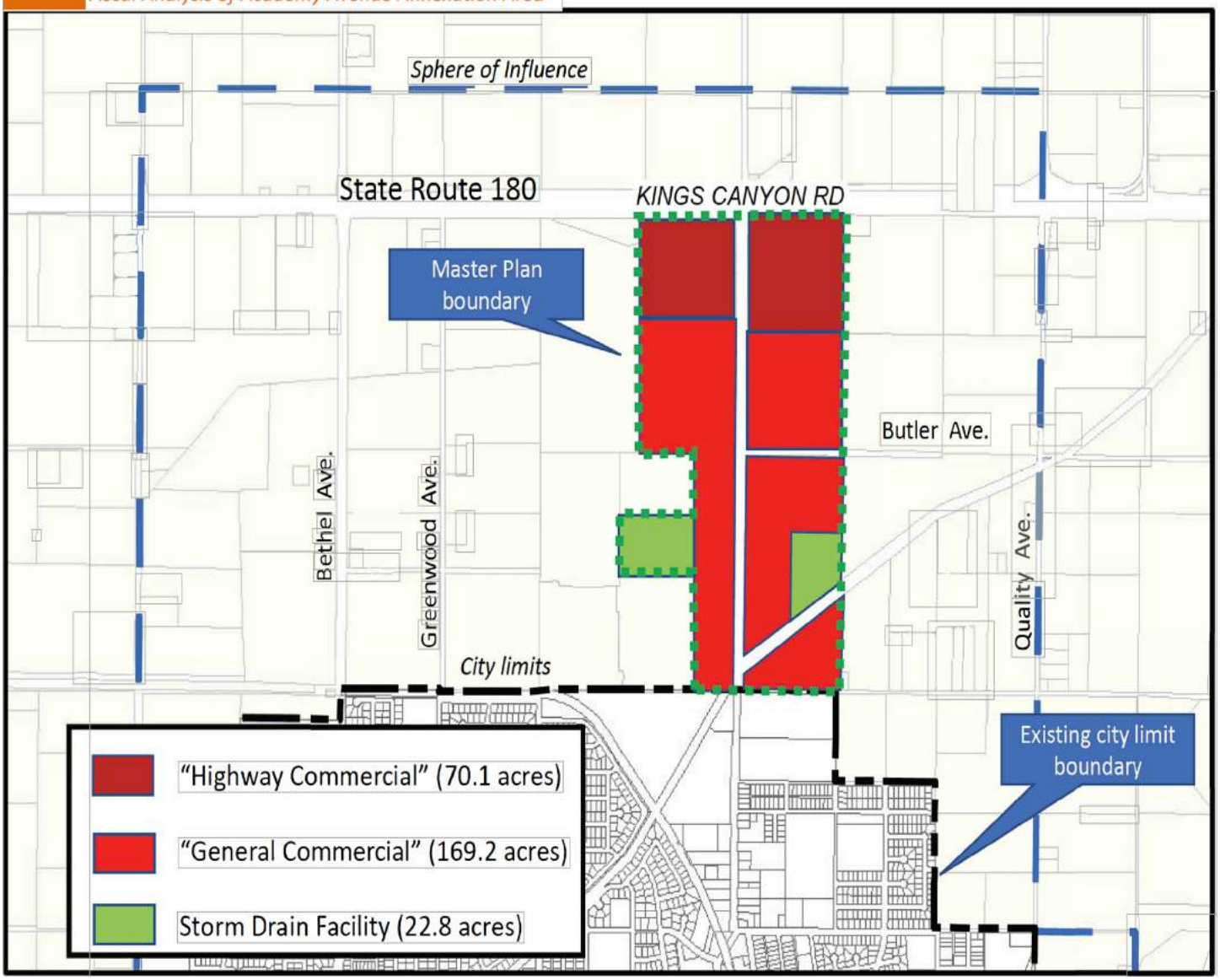
This memorandum includes a summary of the overall findings of the AAAA FIA modeling, followed by a brief discussion of certain key assumptions, data sources, and methodologies that were employed in this FIA model. Detailed appendices are attached to this memorandum which illustrate the calculations used to drive these results, and show all data, assumptions, and methodologies used.

Summary of Results

- **Finding 1: The AAAA includes 70 acres of Highway Commercial land and 169 acres of General Commercial land, for a total of 239 acres of total potential commercial development. These amounts are significantly greater than the amounts that are likely to be supported by the market in the near-term, as analyzed in a recent Market Assessment, prepared by New Economics, which estimates that approximately 17 to 23 acres of new commercial development may be supportable by 2035**. To account for this issue, the results of this FIA are shown in two primary development increments: an initial "Phase 1" which comprises the amount that is deemed to be supportable in the Annexation Area by 2035 (up to 23 acres), and the remaining development up until buildout of the 240-acre commercial portion of the AAAA. **Map 1** shows the location of the AAAA and the breakdown of land uses.

- **Finding 2: The new non-residential development planned for in the Annexation Area is expected to generate a positive fiscal impact for the City. Expressed in 2017 dollars, Phase 1 is estimated to generate a net fiscal surplus to the City of $1.8 million per year, and the entire Annexation Area at buildout is estimated to generate a net fiscal surplus of $18.3 million per year.** **Figure 1** displays the overall results of the Annexation Area FIA modeling, and **Figure 2** shows the key revenue and expenditure items that generate these results.
- **Finding 3: The Annexation Area Fiscal Modeling results are positive even with fairly conservative assumptions regarding the Tax Sharing Agreement between the County and City. If any changes to the Tax Sharing Agreement occur, the results of the FIA will need to be updated.** The *Memorandum of Understanding Between the County of Fresno and the City of Sanger (MOU)* is a key driver for the Annexation Area model. Executed in 2005, the MOU remains in effect for 15 years thereafter, with an anticipated sunset year of 2020. New Economics has used the stipulations of the MOU as stated, with the understanding that a new agreement will be negotiated in the near future. While we presume that new development in the Annexation Area will occur after 2020, the analysis applies the parameters of the MOU and assumes that the City will retain 37% of property tax revenues and 95% of sales tax revenues. The property tax sharing assumption in particular is conservative, and the actual amount of property tax retained by the City could improve if development occurs more quickly, or if an updated tax sharing agreement allows for additional property tax retention while the Annexation Area development occurs. Key parameters of the MOU that are relevant to the sharing of property tax and sales tax are described in the following section, titled **Key Methodologies, Assumptions, and Data Sources**.

Map 1 *North Academy Corridor Master Plan Area*
Fiscal Analysis of Academy Avenue Annexation Area



1 *Overall Summary of Annual Fiscal Impacts of AAAA ($2017)*

Fiscal Analysis of Academy Avenue Annexation Area

Item	Highway Commercial: Highway Retail	Highway Commercial: Hotel	General Commercial: General Retail	General Commercial: Office	Total
Phase 1 (Approx. 23 Acres)					
Total Annual General Fund Revenues	$503,958	$158,233	$1,300,841	$31,171	**$1,994,202**
Total Annual General Fund Expenditures	$28,041	$7,361	$101,413	$15,189	**$152,003**
Net Impact (Revenues Less Expenditures)	**$475,917**	**$150,872**	**$1,199,428**	**$15,982**	**$1,842,199**
Buildout (Approx. 260 Acres)					
Total Annual General Fund Revenues	$6,299,467	$158,233	$13,188,249	$31,171	**$19,677,119**
Total Annual General Fund Expenditures	$350,507	$7,361	$1,028,154	$15,189	**$1,401,211**
Net Impact (Revenues Less Expenditures)	**$5,948,960**	**$150,872**	**$12,160,095**	**$15,982**	**$18,275,908**

Prepared by New Economics & Advisory, April 2018.

2 *Itemized Summary of Annual Fiscal Impacts ($2017)*

Fiscal Analysis of Academy Avenue Annexation Area

	Phase 1 Impacts					Total Annexation Area Impacts				
	Highway Commercial		General Commercial			Highway Commercial		General Commercial		
Item	Highway Retail	Hotel	General Retail	Office	Total	Highway Retail	Hotel	General Retail	Office	Total
General Fund Annual Revenue Projections										
Property Taxes	$6,936	$5,671	$25,084	$3,178	**$40,868**	$86,695	$5,671	$254,304	$3,178	**$349,848**
Property Tax in Lieu of VLF	$13,385	$10,944	$48,408	$6,133	**$78,869**	$167,308	$10,944	$490,772	$6,133	**$675,156**
Sales Taxes	$475,662	$1,443	$1,198,505	$17,557	**$1,693,167**	$5,945,771	$1,443	$12,150,741	$17,557	**$18,115,512**
Transient Occupancy Tax	$0	$137,970	$0	$0	**$137,970**	$0	$137,970	$0	$0	**$137,970**
Property Transfer Tax	$201	$165	$728	$92	**$1,186**	$2,516	$165	$7,381	$92	**$10,154**
Utility Users Tax	$2,746	$721	$9,932	$1,487	**$14,886**	$34,326	$721	$100,690	$1,487	**$137,224**
Franchise Taxes	$1,119	$294	$4,047	$606	**$6,066**	$13,988	$294	$41,033	$606	**$55,921**
Other Taxes	$261	$68	$943	$141	**$1,414**	$3,261	$68	$9,564	$141	**$13,035**
Licenses & Permits	$669	$176	$2,418	$362	**$3,624**	$8,358	$176	$24,516	$362	**$33,411**
Intergovernmental	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	**$0**
Services & Fees	$2,839	$745	$10,267	$1,538	**$15,388**	$35,483	$745	$104,084	$1,538	**$141,850**
Fines & Cost Recovery	$105	$28	$381	$57	**$570**	$1,315	$28	$3,858	$57	**$5,258**
Other Revenue	$36	$9	$129	$19	**$193**	$445	$9	$1,306	$19	**$1,780**
Total Annual General Fund Revenues	**$503,958**	**$158,233**	**$1,300,841**	**$31,171**	$1,994,202	**$6,299,467**	**$158,233**	**$13,188,249**	**$31,171**	$19,677,119
General Fund Annual Expenditure Projections										
General Government	$1,818	$477	$6,576	$985	**$9,857**	$22,729	$477	$66,671	$985	**$90,862**
Public Safety	$19,705	$5,172	$71,265	$10,673	**$106,816**	$246,309	$5,172	$722,505	$10,673	**$984,660**
Public Works - Recreation, Parks, Pool Facilities	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	**$0**
Public Works - Streets	$1,524	$400	$5,513	$826	**$8,263**	$19,055	$400	$55,894	$826	**$76,174**
Community & Economic Development	$2,680	$704	$9,693	$1,452	**$14,529**	$33,502	$704	$98,272	$1,452	**$133,930**
Internal Service Funds	$2,313	$607	$8,366	$1,253	**$12,539**	$28,913	$607	$84,812	$1,253	**$115,586**
Total General Fund Expenditures	**$28,041**	**$7,361**	**$101,413**	**$15,189**	$152,003	**$350,507**	**$7,361**	**$1,028,154**	**$15,189**	$1,401,211
Net Impact (Revenues Less Expenditures)	**$475,917**	**$150,872**	**$1,199,428**	**$15,982**	$1,842,199	**$5,948,960**	**$150,872**	**$12,160,095**	**$15,982**	$18,275,908
Net Impact per Residential Unit or Non-Res. Sq. Ft.	**$7.93**	**$2.39**	**$5.53**	**$0.61**		**$7.93**	**$2.39**	**$5.53**	**$0.61**	

Prepared by New Economics & Advisory, April 2018.

Key Methodologies, Assumptions, and Data Sources

This section briefly describes several key assumptions, methodologies, and data sources which are important to the overall results of the FIA modeling effort.

- **Project Land Use Definitions.** The AAAA Land Use Plan provided by Collins & Schoettler (dated February 7, 2018) contains two primary land use designations: Highway Commercial and General Commercial, as shown in **Map 1**. However, the FIA model is constructed to analyze four distinct land uses, as described below:
    - **Highway Retail** is assumed to consist primarily of relatively small, food-related, convenience-oriented retail. The primary users of this type of space will likely be limited service restaurants. We have assumed an FAR of 0.25 for this type of development. It is assumed in this FIA that all of the Highway Retail will occur in the Highway Commercial land use designation.
    - **General Retail** consists of all other types of retail, which could include grocery, hardware, home furnishings, auto parts, full-service restaurants, etc. We have assumed an FAR of 0.30 for this type of development. It is assumed in this FIA that all of the General Retail will occur in the General Commercial land use designation.
    - **Office** consists of relatively small, local-serving offices which could serve a variety of professions and industries. We have assumed an FAR of 0.30 for this type of development. It is assumed in this FIA that all of the Office development will occur in the General Commercial land use designation.
    - **Hotel** development would consist of a single highway-oriented hotel with 130 rooms. It is assumed in this FIA that all of the Hotel development will occur in the Highway Commercial land use designation.
- **Phase 1 and Buildout Land Use Quantities.** The Phase 1 land use quantities used in this analysis are based on the amounts estimated in the 2018 Market Assessment to be supportable by 2035.[1] The supportable commercial space estimated in the Market Assessment comes from a variety of sources, including household spending, commuter spending, and visitor spending. These various components of demand were placed into the two primary land use classifications that are designed for the AAAA (Highway Commercial and General Commercial), as shown in **Figure A-2**.
- **Employee Density Assumptions.** The analysis includes an estimate of the number of employees that will exist within the Project, since this number will drive municipal expenditure calculations (which are based on per-persons-served and/ or per-employee multipliers), as well as certain revenue calculations such as employee

[1] See the Sanger Academy Avenue Annexation Area Market Assessment, prepared by New Economics dated March, 2018.

spending subject to sales tax. New Economics has utilized the following employee density assumptions, which are shown in **Figure A-4**, and are based on New Economics' experience and industry standards:

- Retail (Highway and General): 500 building square feet per employee;
- Office: 400 building square feet per employee;
- Hotel: 2,000 building square feet per employee.

- **Sales Tax and Taxable Sales Estimates.** This analysis considers the magnitude of taxable sales that are independently generated by each land use category. Retail development (Highway and General) are each attributed taxable sales based on the likely level of sales that will occur at new retail centers in the Annexation Area. The taxable sales calculations are based on taxable sales data provided by industry sources, as well as New Economics' independent analysis of taxable sales at various shopping centers in California. These taxable sales figures assume that there is sufficient market demand to support these sales, which will rely on resident, employee, and visitor spending. Sales tax calculations for each land use also include business-to-business taxable sales and the spending from the employees at each land use type. The total taxable sales for each land use category are applied sales tax rates, including the standard 1% Bradley-Burns sales tax, Measure C, Measure S, and Public Safety Sales Tax (Proposition 172). The sales tax calculations are shown in **Figures B-5**, **B-6**, and **B-7**.

- **Transient Occupancy Tax.** Hotel development in the Annexation Area will generate Transient Occupancy Tax (TOT) to the City. The model calculates TOT allocated to the City based on an average $100 nightly rate, 70 percent occupancy, and the City's 4% TOT rate on hotel room revenues. The calculations used to derive TOT revenues are shown in **Figure B-8**.

- **County Tax Sharing Agreement.** New Economics reviewed the *Memorandum of Understanding Between the County of Fresno and the City of Sanger (MOU)*, and spoke with Fresno County Public Works staff to clarify the parameters of its implementation. It should be noted that the MOU, dated December 13, 2005, will remain in effect for 15 years, which means it is due to expire in 2020. New Economics has used the stipulations of the MOU as stated, with the understanding that a new agreement may be negotiated in the near future. Key parameters of the MOU that are relevant to the sharing of property tax and sales tax are described below.

    - **Property Tax Sharing.** For property tax, the Annexation Area FIA model assumes that the City will retain 37% of property tax generated by development, with the remaining 63% going to the County. The Agreement includes a sliding scale of tax-sharing, ranging from a 47% allocation for the City in the first three years of the agreement, which diminishes to 37% at the end of the agreement period (in 2020). Since the timing of development in the Annexation Area is uncertain, New Economics applied the 37% rate to be conservative, although the share could be slightly higher in earlier years if

development occurs more quickly, or if a new tax-sharing agreement is executed which includes a higher rate to the City.

- **Sales Tax Sharing.** According to Fresno County Public Works Department staff, the County will retain 5% of sales tax generated on properties in annexation areas. The sales tax sharing mechanism is "triggered" based on two key criteria: 1) the City's sales tax per capita being greater than the median of all cities in the County, and 2) the City experiencing year-over-year sales tax growth for the most recent fiscal year. We assume for the purposes of the Annexation Area FIA modeling effort that these criteria are satisfied and thus sales tax sharing will occur in the future.

If you have any questions about the results of the AAAA FIA modeling effort, please feel free to contact us at (916) 538-9857.

Appendix A: Key Assumptions and Supporting Data

A-1 *Key Fiscal Modeling Assumptions*
Fiscal Analysis of Academy Avenue Annexation Area

Item	Assumption
Fiscal Budget Year	Approved 2016/17
Persons per Household [1]	3.69
Citywide	
Population, 2017 [2]	26,412
Employees, 2016 [3]	6,475
Employee Factor (50%)	3,238
Total Service Population	**29,650**

[1] Citywide Persons per Household figure from California Department of Finance, Jan. 1, 2017.

[2] Citywide population figures from California Department of Finance, Jan. 1, 2017.

[3] Citywide employment figures from ESRI (2016).

Sources: ESRI, California DOF, and New Economics.

Prepared by New Economics & Advisory, April 2018.

A-2 *Distribution of Commercial Development by Land Use Category*

Fiscal Analysis of Academy Avenue Annexation Area

Category	Sq. Ft.	Allocated to in Fiscal Impact Study	Highway Commercial	General Commercial
Household-Based Retail Demand [1]				
Motor Vehicle & Parts Dealers	15,475	General Commercial		15,475
Furniture & Home Furnishings	3,856	General Commercial		3,856
Electronics & Appliance	13,170	General Commercial		13,170
Bldg Materials, Garden Equip. & Supply	36,272	General Commercial		36,272
Food & Beverage	30,777	50% Highway; 50% General	15,389	15,389
Health & Personal Care	3,768	General Commercial		3,768
Gasoline Stations	NA	N/A		
Clothing & Clothing Accessories	70,895	General Commercial		70,895
Sporting Goods, Hobby, Book & Music	24,132	General Commercial		24,132
General Merchandise	15,899	General Commercial		15,899
Miscellaneous Store Retailers	7,827	General Commercial		7,827
Nonstore Retailers	NA	N/A		
Food Services & Drinking Places	15,286	50% Highway; 50% General	7,643	7,643
Restaurants/Other Eating Places	5,502	50% Highway; 50% General	2,751	2,751
Subtotal Retail Demand [2]	**242,861**		**25,783**	**217,078**
Commuter Demand	13,000	Highway Commercial	13,000	
Visitor Spending Demand	21,060	Highway Commercial	21,060	
Subtotal All Sources of Retail Demand	**276,921**		**59,843**	**217,078**
Hotel Demand	63,000	Highway Commercial	63,000	
Office Demand	26,162	General Commercial		26,162

[1] High-end of Square feh estimated range of supportable square footage is used.

Prepared by New Economics & Advisory, April 2018.

A-3 *Summary of Prototypes Analyzed*
Fiscal Analysis of Academy Avenue Annexation Area

	Phase 1 Impacts				Total Annexation Area Impacts			
Land Use	Acres	FAR	Residential Units	Residential Sq. Ft. (Round)	Acres	FAR	Residential Units	Residential Sq. Ft. (Round)
Residential	NA	NA	0	NA	0.0	NA	0	NA
Highway Retail	5.5	0.25	n/a	60,000	70.0	0.25	n/a	750,000
General Retail	16.6	0.30	n/a	217,000	167.2	0.30	n/a	2,200,000
Office (Placed in General Retail)	2.0	0.30	n/a	26,000	2.0	0.30	n/a	26,000
	Rooms	Sqft/ Room	Efficiency Factor		Rooms	Sqft/ Room	Efficiency Factor	
Hotel (Placed in Highway Retail)	135	325	70%	63,000	135	325	70%	63,000

Source: California Department of Finance and CoStar.
Prepared by New Economics & Advisory, April 2018.

A-4 *Key Land Use Assumptions*

Fiscal Analysis of Academy Avenue Annexation Area

Item	Phase 1 Impacts				Total Annexation Area Impacts			
	Highway Retail	General Retail	Office	Hotel	Highway Retail	General Retail	Office	Hotel
Market Value								
Average Market Value per Sq. Ft. [1]	$122	$122	$129	$95	$122	$122	$129	$95
Employee Density								
Square Feet per Employee	500	500	400	2,000	500	500	400	2,000
Square Feet	60,000	217,000	26,000	63,000	750,000	2,200,000	26,000	63,000
Total Employees	120	434	65	32	1,500	4,400	65	32

[1] Data from CoStar.

Sources: CoStar and New Economics.

Prepared by New Economics & Advisory, April 2018.

A-5 *Detailed Breakdown of Land Uses and Service Population by Phase*

Fiscal Analysis of Academy Avenue Annexation Area

Item	Phase 1 Impacts					Total Annexation Area Impacts				
	Highway Retail	General Retail	Office	Hotel	**Total**	Highway Retail	General Retail	Office	Hotel	**Total**
Land Use										
Non-Residential Bldg. Sq. Ft.										0
Highway Retail	60,000		-	-	**60,000**	750,000		-	-	**750,000**
General Retail		217,000					2,200,000			**2,200,000**
Office	-		26,000	-	**26,000**	-		26,000	-	**26,000**
Hotel	-		-	63,000	**63,000**	-		-	63,000	**63,000**
Service Population										
Population										
Single Family Units (3.693 PPH)	-	-	-	-	**0**	-	-	-	-	**0**
Multi-Family Units (3.693 PPH)	-	-	-	-	**0**	-	-	-	-	**0**
Subtotal Population	**-**	**-**	**-**	**-**	**0**	**-**	**-**	**-**	**-**	**0**
Employees										
Highway Retail (500 sqft per)	120	-	-	-	**120**	1,500	-	-	-	**1,500**
General Retail (500 sqft per)	-	434	-	-	**434**	-	4,400	-	-	**4,400**
Office (400 sqft per)	-	-	65	-	**65**	-	-	65	-	**65**
Hotel (2000 sqft per)	-	-	-	32	**32**	-	-	-	32	**32**
Subtotal Employees	**120**	**434**	**65**	**32**	**651**	**1,500**	**4,400**	**65**	**32**	**5,997**
Persons-Served	**60**	**217**	**33**	**15.75**	**325**	**750**	**2,200**	**32.50**	**16**	**2,998**

Source: California Department of Finance and CoStar.

Prepared by New Economics & Advisory, April 2018.

Appendix B: Revenue Estimates

B-1 *Summary of Estimated Major Revenues ($2017)*

Fiscal Analysis of Academy Avenue Annexation Area

Item	Estimating Methodology	Supporting Information	Phase 1 Impacts: Highway Retail	Phase 1 Impacts: General Retail	Phase 1 Impacts: Office	Phase 1 Impacts: Hotel	Phase 1 Impacts: Total	Total Annexation Area Impacts: Highway Retail	Total Annexation Area Impacts: General Retail	Total Annexation Area Impacts: Office	Total Annexation Area Impacts: Hotel
General Fund											
Property Taxes	Case Study	B-4	$6,936	$25,084	$3,178	$5,671	**$40,868**	$86,695	$254,304	$3,178	$5,671
Property Tax in Lieu of VLF	Case Study	B-9	$13,385	$48,408	$6,133	$10,944	**$78,869**	$167,308	$490,772	$6,133	$10,944
Sales Taxes	Case Study	B-5	$475,662	$1,198,505	$17,557	$1,443	**$1,693,167**	$5,945,771	$12,150,741	$17,557	$1,443
Transient Occupancy Tax	Case Study	B-8	$0	$0	$0	$137,970	**$137,970**	$0	$0	$0	$137,970
Property Transfer Tax	Case Study	B-10	$201	$728	$92	$165	**$1,186**	$2,516	$7,381	$92	$165
Utility Users Tax	Multiplier	B-3	$2,746	$9,932	$1,487	$721	**$14,886**	$34,326	$100,690	$1,487	$721
Franchise Taxes	Multiplier	B-3	$1,119	$4,047	$606	$294	**$6,066**	$13,988	$41,033	$606	$294
Other Taxes	Multiplier	B-3	$261	$943	$141	$68	**$1,414**	$3,261	$9,564	$141	$68
Licenses & Permits	Multiplier	B-3	$669	$2,418	$362	$176	**$3,624**	$8,358	$24,516	$362	$176
Intergovernmental	Multiplier	B-3	$0	$0	$0	$0	**$0**	$0	$0	$0	$0
Services & Fees	Multiplier	B-3	$2,839	$10,267	$1,538	$745	**$15,388**	$35,483	$104,084	$1,538	$745
Fines & Cost Recovery	Multiplier	B-3	$105	$381	$57	$28	**$570**	$1,315	$3,858	$57	$28
Other Revenue	Multiplier	B-3	$36	$129	$19	$9	**$193**	$445	$1,306	$19	$9
Subtotal General Fund Revenues (Rounded)			**$503,958**	**$1,300,841**	**$31,171**	**$158,233**	**$1,994,202**	**$6,299,467**	**$13,188,249**	**$31,171**	**$158,233**
General Fund Revenues per Sq. Ft.			**$8.40**	**$5.99**	**$1.20**	**$2.51**		**$8.40**	**$5.99**	**$1.20**	**$2.51**

Prepared by New Economics & Advisory, April 2018.

B-2 *FY 2016-17 City Budget Analysis and Revenue Estimation Methodology*

Fiscal Analysis of Academy Avenue Annexation Area

Revenues	FY 2016/17 Budget Amount	Adjusted Amount	Adjustment Description	Calculation Methodology	Table Reference
General Fund Revenues					
Property Taxes					
Property Tax - Secured	$1,388,000			Case Study	B-4
Property Tax - Unsecured	$75,000			Case Study	B-4
Property Tax - Unsecured Delinquent	$2,000			Case Study	B-4
Property Tax - Supplemental Secured	$30,000			Case Study	B-4
Property Tax - Supplemental Unsecured	$800			Case Study	B-4
Property Tax - In Lieu	$150,000			Case Study	B-4
Property Transfer Tax	$40,000			Case Study	B-10
Homeowner Property Tax Relief	$20,000			Case Study	B-4
Subtotal Property Taxes	**$1,705,800**	**$0**			
Sales Taxes					
Sales Taxes	$2,126,777			Case Study	B-5
In Lieu Sales Tax	$0			Not Estimated	
Subtotal Sales Taxes	**$2,126,777**	**$0**			
Utility Users Tax					
Utility Users Tax	$1,242,000	$1,242,000		Multiplier	B-3
Utility Users Tax - Water	$115,000	$115,000		Multiplier	B-3
Subtotal Utility Users Tax	**$1,357,000**	**$1,357,000**			
Franchise Taxes					
Franchise Tax - Natural Gas	$52,000	$52,000		Multiplier	B-3
Franchise Tax - Electricity	$98,000	$98,000		Multiplier	B-3
Franchise Tax - Cable TV	$113,000	$113,000		Multiplier	B-3
Franchise Tax - In Lieu	$100,000	$100,000		Multiplier	B-3
Franchise Tax - Fee Disposal	$190,000	$190,000		Multiplier	B-3
Subtotal Franchise Taxes	**$553,000**	**$553,000**			
Other Taxes					
Transient Occupancy Tax	$9,300	$0		Case Study	B-8
Business License Tax	$106,500	$106,500		Multiplier	B-3
Business License Admin Fee	$22,400	$22,400		Multiplier	B-3
Subtotal Other Taxes	**$138,200**	**$128,900**			
Licenses & Permits					
Dance Permits	$400	$400		Multiplier	B-3
Building Permits	$330,000	$330,000		Multiplier	B-3
Subtotal Licenses & Permits	**$330,400**	**$330,400**			
Intergovernmental					
Post Reimbursements - Police	$5,500	$0		Not Estimated	
SB-90 Police - State Reimbursement	$21,000	$0		Not Estimated	
SUSD SRO Reimbursement	$34,704	$0		Not Estimated	
GEMT Reimbursement	$60,000	$0		Not Estimated	
County EMS Reimbursement	$45,000	$0		Not Estimated	
IGT Reimbursement	$607,323	$0		Not Estimated	
Motor Vehicle In Lieu of Tax	$1,870,000	$0		Case Study	B-9
Indirect Cost Plan Charges	$476,200	$0		Not Estimated	
Subtotal Intergovernmental	**$3,119,727**	**$0**			
Services & Fees					
Senior Deposits	$500	$500		Multiplier	B-3
Youth Sports Fees	$25,000	$25,000		Multiplier	B-3
Adult Sports Fees	$22,000	$22,000		Multiplier	B-3
Aquatic Fees	$38,000	$38,000		Multiplier	B-3
Rental of Community Center	$22,000	$22,000		Multiplier	B-3
Rental of Park Facilities	$8,000	$8,000		Multiplier	B-3
Police - Special Services	$12,000	$12,000		Multiplier	B-3
Police - Reports	$6,000	$6,000		Multiplier	B-3
State Fingerprint Fees	$8,000	$8,000		Multiplier	B-3
Animal Control Services	$2,500	$2,500		Multiplier	B-3
Animal License Fees	$1,500	$1,500		Multiplier	B-3
Photocopy Charge	$100	$100		Multiplier	B-3
NSF Charge	$500	$500		Multiplier	B-3
Sale of Maps/Plans/Documents	$300	$300		Multiplier	B-3
Emergency Services - Ambulance	$1,200,000	$1,200,000		Multiplier	B-3
Bad Debt Recovery	$3,000	$3,000		Multiplier	B-3
Fire Prevention Fees	$15,000	$15,000		Multiplier	B-3

B-2 *FY 2016-17 City Budget Analysis and Revenue Estimation Methodology*

Fiscal Analysis of Academy Avenue Annexation Area

Revenues	FY 2016/17 Budget Amount	Adjusted Amount	Adjustment Description	Calculation Methodology	Table Reference
CPR Fees	$1,000	$1,000		Multiplier	B-3
Zoning and Subdivision Fees	$3,600	$3,600		Multiplier	B-3
Plan Check Fee - Building and Safety	$11,000	$11,000		Multiplier	B-3
Subdivision Inspection Fees	$22,750	$22,750		Multiplier	B-3
Subtotal Services & Fees	**$1,402,750**	**$1,402,750**			
Fines & Cost Recovery					
Court Fines - Non-Traffic	$45,000	$45,000		Multiplier	B-3
DUI Cost Recovery	$4,000	$4,000		Multiplier	B-3
Parking Ticket Fines	$1,000	$1,000		Multiplier	B-3
Water Service/Penalties	$2,000	$2,000		Multiplier	B-3
Subtotal Fines & Cost Recovery	**$52,000**	**$52,000**			
Other Revenue					
SB1473 Building Permit Fees	$2,000	$0		Not Estimated	
Contributions and Sponsorship	$5,100	$5,100		Multiplier	B-3
Miscellaneous Revenue	$6,500	$6,500		Multiplier	B-3
SMIP - Strong Motion Fees	$1,800	$0		Not Estimated	
Rental Sanger Youth Center	$6,000	$6,000		Multiplier	B-3
SYC Utility Reimbursement	$5,600	$0		Not Estimated	
W/C Reimbursements	$20,000	$0		Not Estimated	
Interest Income	$2,000	$0		Not Estimated	
Rental Land/Building/Improvemnts	$45,000	$0		Not Estimated	
Subtotal Other Revenue	**$94,000**	**$17,600**			
Transfers to General Fund					
Transfer from Gas Tax	$621,282	$0		Not Estimated	
Transfer from SLESF Fund	$100,000	$0		Not Estimated	
Transfer from Landscape and Lighting	$144,000	$0		Not Estimated	
Transfer from Public Safety Sales	$90,000	$0		Case Study	B-5
Transfer from ABC Grant	$14,000	$0		Not Estimated	
Transfer from JAG	$15,000	$0		Not Estimated	
Transfer from AAA Grant	$12,000	$0		Not Estimated	
Transfer from CFD - Police	$249,700	$0		Not Estimated	
Transfer from Local Public Safety	$23,365	$0		Case Study	B-5
Transfer from Vehicle Impound Program	$76,635	$0		Not Estimated	
Transfer from SJVAPCD Electric Car Grant	$80,000	$0		Not Estimated	
Transfer from CFD - Fire	$122,900	$0		Not Estimated	
Transfer from CFD - Parks	$77,400	$0		Not Estimated	
Subtotal Transfers to General Fund	**$1,626,282**	**$0**			
Total General Fund Revenues	**$12,505,936**	**$3,841,650**			
Select Special Revenue Funds [1]					
Measure S	$2,160,371	$0		Case Study	B-5
State Gas Tax Funds	$549,728	$549,728		Multiplier	B-3
Measure C	$2,842,041	$0		Case Study	B-5
Local Public Safety Augmentation	$90,000	$0		Case Study	B-5
Administration Fund	$1,700,597	$425,149	25% allocated to the General Fund; 75% to other funds.	Multiplier	B-3
Equipment Fund	$210,000	$52,500	25% allocated to the General Fund; 75% to other funds.	Multiplier	B-3
Risk Management Fund	$2,589,239	$647,310	25% allocated to the General Fund; 75% to other funds.	Multiplier	B-3
Subtotal Select Special Revenue Funds	**$10,876,976**	**$1,674,687**			

[1] Most Special Revenues Funds are assumed to not be impacted by development. However, certain special revenue funds will be impacted by development, based on discussions with City Finance Dept. staf

Prepared by New Economics & Advisory, April 2018.

B-3 ***Revenue Multiplier Calculations ($2017)***
Fiscal Analysis of Academy Avenue Annexation Area

	Citywide				Phase 1 Impacts					Total Annexation Area Impacts				
Item	Adjusted Revenue [1]	Service Population	Per Service Pop.		Highway Retail	General Retail	Office	Hotel	Total	Highway Retail	General Retail	Office	Hotel	Total
Assumptions														
Residential Population			26,412		0	0	0	0	**0**	0	0	0	0	**0**
Employment Population			6,475		120	434	65	32	**651**	1,500	4,400	65	32	**5,997**
Persons-Served [2]			29,650		60	217	33	16	**325**	750	2,200	33	16	**2,998**
Revenues to City														
Utility Users Tax	$1,357,000	Combined	$45.77	per person served	$2,746	$9,932	$1,487	$721	**$14,886**	$34,326	$100,690	$1,487	$721	**$137,224**
Franchise Taxes	$553,000	Combined	$18.65	per person served	$1,119	$4,047	$606	$294	**$6,066**	$13,988	$41,033	$606	$294	**$55,921**
Other Taxes	$128,900	Combined	$4.35	per person served	$261	$943	$141	$68	**$1,414**	$3,261	$9,564	$141	$68	**$13,035**
Licenses & Permits	$330,400	Combined	$11.14	per person served	$669	$2,418	$362	$176	**$3,624**	$8,358	$24,516	$362	$176	**$33,411**
Intergovernmental	$0	Combined	$0.00	per person served	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	**$0**
Services & Fees	$1,402,750	Combined	$47.31	per person served	$2,839	$10,267	$1,538	$745	**$15,388**	$35,483	$104,084	$1,538	$745	**$141,850**
Fines & Cost Recovery	$52,000	Combined	$1.75	per person served	$105	$381	$57	$28	**$570**	$1,315	$3,858	$57	$28	**$5,258**
Other Revenue	$17,600	Combined	$0.59	per person served	$36	$129	$19	$9	**$193**	$445	$1,306	$19	$9	**$1,780**
Gas Tax Funds	$549,728	Combined	$18.54	per person served	$1,112	$4,023	$603	$292	**$6,030**	$13,906	$40,790	$603	$292	**$55,590**
Administration Fund	$425,149	Combined	$14.34	per person served	$860	$3,112	$466	$226	**$4,664**	$10,754	$31,546	$466	$226	**$42,992**
Equipment Fund	$52,500	Combined	$1.77	per person served	$106	$384	$58	$28	**$576**	$1,328	$3,896	$58	$28	**$5,309**
Risk Management Fund	$647,310	Combined	$21.83	per person served	$1,310	$4,738	$710	$344	**$7,101**	$16,374	$48,031	$710	$344	**$65,458**
Total Revenues	**$3,841,700**				**$11,200**	**$40,400**	**$6,000**	**$2,900**	**$60,500**	**$139,500**	**$409,300**	**$6,000**	**$2,900**	**$557,800**

[1] See Figure B-2 for adjustments to budgeted amounts used in multipliers.
[2] Persons-served refers to the full residential population plus 50% of the employment population.
Prepared by New Economics & Advisory, April 2018.

B-4 *Projected Property Tax Revenues ($2017)*

Fiscal Analysis of Academy Avenue Annexation Area

		Phase 1 Impacts					Total Annexation Area Impacts				
Land Use	**Assumption**	Highway Retail	General Retail	Office	Hotel	Total	Highway Retail	General Retail	Office	Hotel	Total
Projected Assessed Value (AV)											
Highway Retail		$7,320,000	$0	$0	$0	**$7,320,000**	$91,500,000	$0	$0	$0	**$91,500,000**
General Retail		$0	$26,474,000	$0	$0	**$26,474,000**	$0	$268,400,000	$0	$0	**$268,400,000**
Office		$0	$0	$3,354,000	$0	**$3,354,000**	$0	$0	$3,354,000	$0	**$3,354,000**
Hotel		$0	$0	$0	$5,985,000	**$5,985,000**	$0	$0	$0	$5,985,000	**$5,985,000**
Total AV		**$7,320,000**	**$26,474,000**	**$3,354,000**	**$5,985,000**	$43,133,000	**$91,500,000**	**$268,400,000**	**$3,354,000**	**$5,985,000**	$369,239,000
1% Gross General Tax Levy	1.00%	$73,200	$264,740	$33,540	$59,850	**$431,330**	$915,000	$2,684,000	$33,540	$59,850	**$3,692,390**
Sanger Property Tax Revenue											
City's General Fund Allocation [1]	0.00%	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	**$0**
Fresno County General Fund Allocation	17.42571% [1]	$12,756	$46,133	$5,845	$10,429	**$75,162**	$159,445	$467,706	$5,845	$10,429	**$643,425**
Fresno County Fire Allocation	8.18193% [1]	$5,989	$21,661	$2,744	$4,897	**$35,291**	$74,865	$219,603	$2,744	$4,897	**$302,109**
Subtotal Fresno County General Fund and Fire	**25.60764%**	**$18,745**	**$67,794**	**$8,589**	**$15,326**	$110,453	**$234,310**	**$687,309**	**$8,589**	**$15,326**	$945,534
City's Share of Property Tax	37.00000% [2]	**$6,936**	**$25,084**	**$3,178**	**$5,671**	$40,868	**$86,695**	**$254,304**	**$3,178**	**$5,671**	$349,848
TOTAL Property Tax Revenue to City of Sanger		**$6,936**	**$25,084**	**$3,178**	**$5,671**	$40,868	**$86,695**	**$254,304**	**$3,178**	**$5,671**	$349,848
Per Building Sq. Ft.		**$0.12**	**$0.12**	**$0.12**	**$0.09**		**$0.12**	**$0.12**	**$0.12**	**$0.09**	

Sources: Fresno County, City of Sanger, and New Economics.

[1] From the Fresno County Auditor-Controller, for TRA 071-000.

[2] Based on the property tax sharing agreement between the County of Fresno, the City of Sanger, and the Sanger Redevelopment Agency, adopted December 5, 2005. Property tax allocation shown in for FY 2020/ 21.

Prepared by New Economics & Advisory, April 2018.

B-5 *Estimated Sales Tax Revenue to City ($2017)*
Fiscal Analysis of Academy Avenue Annexation Area

Item	Assumption	Phase 1 Impacts					Total Annexation Area Impacts				
		Highway Retail	General Retail	Office	Hotel	Total	Highway Retail	General Retail	Office	Hotel	Total
Taxable Sales Summary											
On-Site Taxable Sales	Figure B-6	$18,000,000	$45,126,606	$0	$0	**$63,126,606**	$225,000,000	$457,504,763	$0	$0	**$682,504,763**
Household Spending	Figure NU	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	**$0**
Employee Taxable Spending	Figure B-7	$207,146	$749,179	$330,696	$55,239	**$1,342,260**	$2,589,328	$7,595,361	$330,696	$55,239	**$10,570,623**
Business-to-Business (Non-Retail) Taxable Spending	Figure B-7	$0	$0	$341,343	$0	**$341,343**	$0	$0	$341,343	$0	**$341,343**
Taxable Sales		**$18,207,146**	**$45,875,785**	**$672,039**	**$55,239**	$64,810,209	**$227,589,328**	**$465,100,124**	**$672,039**	**$55,239**	$693,416,729
Sales Tax											
Bradley Burns Sales Tax	1.00%	$182,071	$458,758	$6,720	$552	**$648,102**	$2,275,893	$4,651,001	$6,720	$552	**$6,934,167**
Measure C Sales Tax	0.50%	$91,036	$229,379	$3,360	$276	**$324,051**	$1,137,947	$2,325,501	$3,360	$276	**$3,467,084**
Measure S Sales Tax	0.75%	$136,554	$344,068	$5,040	$414	**$486,077**	$1,706,920	$3,488,251	$5,040	$414	**$5,200,625**
Public Safety Sales Tax (Prop 172)	0.50%	$91,036	$229,379	$3,360	$276	**$324,051**	$1,137,947	$2,325,501	$3,360	$276	**$3,467,084**
Total Sales Tax (All Sources)		**$500,697**	**$1,261,584**	**$18,481**	**$1,519**	$1,782,281	**$6,258,707**	**$12,790,253**	**$18,481**	**$1,519**	$19,068,960
City's Portion of Sales Tax Revenue	**95.00% [1]**	**$475,662**	**$1,198,505**	**$17,557**	**$1,443**	$1,693,167	**$5,945,771**	**$12,150,741**	**$17,557**	**$1,443**	$18,115,512

[1] Based on the property tax sharing agreement between the County of Fresno, the City of Sanger, and the Sanger Redevelopment Agency, adopted December 5, 2005.
Prepared by New Economics & Advisory, April 2018.

B-6 *Estimated On-Site Sales Tax Revenue ($2017)*

Fiscal Analysis of Academy Avenue Annexation Area

Item	Phase 1 Impacts		Total Annexation Area Impacts	
	Highway Retail	General Retail	Highway Retail	General Retail
On-Site Retail (Square Feet)	60,000	217,000	750,000	2,200,000
Taxable Sales per Sq. Ft. [1]	$300	$208	$300	$208
Taxable On-Site Retail Sales	$18,000,000	$45,126,606	$225,000,000	$457,504,763
Taxable On-Site Retail Sales	**$18,000,000**	**$45,126,606**	**$225,000,000**	**$457,504,763**

[1] Highway Retail taxable sales figure from Baker Tilly Circhow Krause LLP, assuming primarily limited-service restaurants, and represents a planning-level estimate subject to refinement. General Retail taxable sales derived by escalating the average taxable sales per square foot Citywide by a factor that reflects the difference between new shopping centers and old shopping centers.

Prepared by New Economics & Advisory, April 2018.

B-7 *Estimated Business-Related Sales Tax Revenue ($2017)*
Fiscal Analysis of Academy Avenue Annexation Area

Item	Assumption	Phase 1 Area Impacts					Total Annexation Area Impacts				
		Highway Retail	General Retail	Office	Hotel	Total	Highway Retail	General Retail	Office	Hotel	Total
ESTIMATED TAXABLE SALES FROM EMPLOYEE SPENDING											
Estimated Employees		120	434	65	32		1,500	4,400	65	32	
Estimated Taxable Worker Spending/Week [1]	See Figure D-2	$36	$36	$106	$36		$36	$36	$106	$36	
Subtotal Estimated Worker Spending	Assumes 48 weeks worked per year	**$207,146.21**	**$749,179**	**$330,695.57**	**$55,239**	**$1,342,260**	**$2,589,327.59**	**$7,595,361**	**$330,695.57**	**$55,239**	**$10,570,623**
Portion Captured by City	***100% of taxable sales [2]***	***$207,146***	***$749,179***	***$330,696***	***$55,239***	***$1,342,260***	***$2,589,328***	***$7,595,361***	***$330,696***	***$55,239***	***$10,570,623***
ESTIMATED TAXABLE SALES FROM PROJECT BUSINESSES (NON-RETAIL)											
Non-Retail Taxable Sales (Board of Equalization, 2014$)	$30,770,000										
Non-Retail Taxable Sales (Board of Equalization, 2017$)	$31,930,897										
Total Sq. Ft. (Office and Industrial Only) [2]	2,432,166										
Taxable Sales Per Sq. Ft.	$13										
Sq. Ft	See Figure A-5	0	0	26,000	0		0	0	26,000	0	
Taxable Sales at Project		***$0***	***$0***	***$341,343***	***$0***	***$341,343***	***$0***	***$0***	***$341,343***	***$0***	***$341,343***

[1] Based on ICSC Office Worker Spending Survey, 2012, inflated to 2017 using CPI. Taxable portion estimated by New Economics.
[2] From CoStar.
Prepared by New Economics & Advisory, April 2018.

B-8 *Estimated Transient Occupancy Tax Revenue to City ($2017)*

Fiscal Analysis of Academy Avenue Annexation Area

Item	Assumption	Phase 1 Impacts	Total Annexation Area Impacts
		Hotel	Hotel
Hotel Rooms		135	135
Annual Rooms Available	365 days/ year		
Occupancy Rate [1]	70%		
Average Daily Room Rate [2]	$100		
City of Sanger TOT Rate	4%		
Total Transient Occupancy Tax		$137,970	$137,970

[1] Planning-level occupancy rate, subject to refinement.

[2] Assumed average daily room rate based on a review of recently-constructed, premium-branded hotels in the Fresno area.

Prepared by New Economics & Advisory, April 2018.

B-9 *Property Tax in Lieu of VLF ($2017)*

Fiscal Analysis of Academy Avenue Annexation Area

Item	Citywide AV	Phase 1 Impacts: Highway Retail	Phase 1 Impacts: General Retail	Phase 1 Impacts: Office	Phase 1 Impacts: Hotel	Phase 1 Impacts: Total	Total Annexation Area Impacts: Highway Retail	Total Annexation Area Impacts: General Retail	Total Annexation Area Impacts: Office	Total Annexation Area Impacts: Hotel	Total Annexation Area Impacts: Total
Estimated FY 2016/17 Citywide AV [1]	$1,022,691,714										
New AV of Development		$7,320,000	$26,474,000	$3,354,000	$5,985,000	**$43,133,000**	$91,500,000	$268,400,000	$3,354,000	$5,985,000	**$369,239,000**
Net New AV		$7,320,000	$26,474,000	$3,354,000	$5,985,000	**$43,133,000**	$91,500,000	$268,400,000	$3,354,000	$5,985,000	**$369,239,000**
% Allocation		0.7%	2.6%	0.3%	0.6%	**4.2%**	8.9%	26.2%	0.3%	0.6%	**36.1%**
FY 2016/17 Property Tax in Lieu of VLF [2]	$1,870,000										
Property Tax in Lieu of VLF		$13,385	$48,408	$6,133	$10,944	**$78,869**	$167,308	$490,772	$6,133	$10,944	**$675,156**
Property Tax in Lieu of VLF (Rounded)		**$13,385**	**$48,408**	**$6,133**	**$10,944**	$78,869	**$167,308**	**$490,772**	**$6,133**	**$10,944**	$675,156

[1] Citywide AV from the 2016/ 17 City Operating Budget, Page 227.
[2] From 2016/ 17 Adopted Budget.
Sources: Fresno County Assessor; City of Sanger 2016/ 17 Adopted Budget; California City Finance.com
Prepared by New Economics & Advisory, April 2018.

B-10 *Property Transfer Tax to City*

Fiscal Analysis of Academy Avenue Annexation Area

Item	Assumption	Phase 1 Impacts					Total Annexation Area Impacts				
		Highway Retail	General Retail	Office	Hotel	Total	Highway Retail	General Retail	Office	Hotel	Total
Market Value											
Highway Retail	$122 per sq. ft.	$7,320,000	$0	$0	$0	**$7,320,000**	$91,500,000	$0	$0	$0	**$91,500,000**
General Retail	$122 per sq. ft.	$0	$26,474,000	$0	$0	**$26,474,000**	$0	$268,400,000	$0	$0	**$268,400,000**
Office	$129 per sq. ft.	$0	$0	$3,354,000	$0	**$3,354,000**	$0	$0	$3,354,000	$0	**$3,354,000**
Hotel	$95 per sq. ft.	$0	$0	$0	$5,985,000	**$5,985,000**	$0	$0	$0	$5,985,000	**$5,985,000**
Subtotal		**$7,320,000**	**$26,474,000**	**$3,354,000**	**$5,985,000**	**$43,133,000**	**$91,500,000**	**$268,400,000**	**$3,354,000**	**$5,985,000**	**$369,239,000**
Value of Turned-Over Property											
Highway Retail	5.0% Turnover Rate [1]	$366,000	$0	$0	$0	**$366,000**	$4,575,000	$0	$0	$0	**$4,575,000**
General Retail	5.0% Turnover Rate [1]	$0	$1,323,700	$0	$0	**$1,323,700**	$0	$13,420,000	$0	$0	**$13,420,000**
Office	5.0% Turnover Rate [1]	$0	$0	$167,700	$0	**$167,700**	$0	$0	$167,700	$0	**$167,700**
Hotel	5.0% Turnover Rate [1]	$0	$0	$0	$299,250	**$299,250**	$0	$0	$0	$299,250	**$299,250**
Subtotal		**$366,000**	**$1,323,700**	**$167,700**	**$299,250**	**$2,156,650**	**$4,575,000**	**$13,420,000**	**$167,700**	**$299,250**	**$18,461,950**
Transfer Tax per $1,000 [2]	**$0.55**										
Est. Annual Property Transfer Tax (Rounded)		**$201**	**$728**	**$92**	**$165**	**$1,186**	**$2,516**	**$7,381**	**$92**	**$165**	**$10,154**

[1] Turnover rates used are planning-level standard industry assumptions, and are subject to refinement.

[2] Total property transfer tax rate is $1.10. The City receives $0.55 and the County receives $0.55.

Source: California City Finance, Property Transfer Tax Rates, November 2013.

Prepared by New Economics & Advisory, April 2018.

Appendix C: Expenditure Estimates

C-1 ***Summary of Estimated Project Expenditures ($2017)***
Fiscal Analysis of Academy Avenue Annexation Area

Item	Expenditure Multiplier		Phase 1 Highway Retail	Phase 1 General Retail	Phase 1 Office	Phase 1 Hotel	Phase 1 Total	Total Annexation Area Impacts Highway Retail	Total Annexation Area Impacts General Retail	Total Annexation Area Impacts Office	Total Annexation Area Impacts Hotel	Total Annexation Area Impacts Total
Assumptions												
Residential Units			0	0	0	0	**0**	0	0	0	0	**0**
Residential Population			0	0	0	0	**0**	0	0	0	0	**0**
Employment Population			120	434	65	32	**651**	1,500	4,400	65	32	**5,997**
Combined Service Population			60	217	33	16	**325**	750	2,200	33	16	**2,998**
General Fund Expenditures												
General Government	$30.30	Per Person Served	$1,818	$6,576	$985	$477	**$9,857**	$22,729	$66,671	$985	$477	**$90,862**
Public Safety	$328.41	Per Person Served	$19,705	$71,265	$10,673	$5,172	**$106,816**	$246,309	$722,505	$10,673	$5,172	**$984,660**
Public Works - Recreation, Parks, Pool Facilities	$67.73	Per Resident	$0	$0	$0	$0	**$0**	$0	$0	$0	$0	**$0**
Public Works - Streets	$25.41	Per Person Served	$1,524	$5,513	$826	$400	**$8,263**	$19,055	$55,894	$826	$400	**$76,174**
Community & Economic Development	$44.67	Per Person Served	$2,680	$9,693	$1,452	$704	**$14,529**	$33,502	$98,272	$1,452	$704	**$133,930**
Internal Service Funds	$38.55	Per Person Served	$2,313	$8,366	$1,253	$607	**$12,539**	$28,913	$84,812	$1,253	$607	**$115,586**
Total General Fund			**$28,041**	**$101,413**	**$15,189**	**$7,361**	**$152,003**	**$350,507**	**$1,028,154**	**$15,189**	**$7,361**	**$1,401,211**
Total Per Sq. Ft.			**$0.47**	**$0.47**	**$0.58**	**$0.12**		**$0.47**	**$0.47**	**$0.58**	**$0.12**	

Prepared by New Economics & Advisory, April 2018.

C-2 *FY 2016-17 City Budget Analysis and Expenditure Estimation Methodology*

Fiscal Analysis of Academy Avenue Annexation Area

Item	2016-17 Adopted Expenditures	Adjustments Amount	Adjustments Description	Adjusted Expenditures
General Government				
City Council	$351,004			$351,004
Non-Deparmental	$547,520			$547,520
Subtotal General Government	**$898,524**	**$0**		**$898,524**
Public Safety				
Police Department	$4,649,953	($479,935)	Nets out offsetting revenues (Except Measure S)	$4,170,018
Measure S Police	$863,856			$863,856
Fire Department	$2,191,229	($111,000)	Nets out offsetting revenues (Except Measure S)	$2,080,229
Ambulance Division	$1,447,550			$1,447,550
Measure S Fire	$1,175,583			$1,175,583
Subtotal Public Safety	**$10,328,171**	**($590,935)**		**$9,737,236**
Public Works				
Recreation Division	$533,241			$533,241
Street Division	$753,282			$753,282
Parks Division	$1,001,541	($221,400)	Nets out offsetting revenues from CFD and LLD	$780,141
Facility and Pool Division	$475,521			$475,521
Water Division	$3,487,547	($3,487,547)	Funded by Enterprise Funds; Assume No Impact	$0
Sewer Division	$5,255,094	($5,255,094)	Funded by Enterprise Funds; Assume No Impact	$0
Disposal Division	$3,510,786	($3,510,786)	Funded by Enterprise Funds; Assume No Impact	$0
Subtotal Public Works	**$15,017,012**	**($12,474,827)**		**$2,542,185**
Community & Economic Development				
Planning Division	$672,882			$672,882
Building Division	$505,515			$505,515
Economic Development Division	$146,024			$146,024
Subtotal Community & Economic Development	**$1,324,421**	**$0**		**$1,324,421**
Internal Service Funds				
City Manager	$438,080	($328,560)	25% allocated to the General Fund; 75% to other funds.	$109,520
City Clerk/Human Resources	$443,638	($332,729)	25% allocated to the General Fund; 75% to other funds.	$110,910
Finance	$840,131	($630,098)	25% allocated to the General Fund; 75% to other funds.	$210,033
Management Information Systems	$51,995	($38,996)	25% allocated to the General Fund; 75% to other funds.	$12,999
Equipment Fuel Fund	$210,000	($157,500)	25% allocated to the General Fund; 75% to other funds.	$52,500
Risk Management Insurance	$1,062,239	($796,679)	25% allocated to the General Fund; 75% to other funds.	$265,560
Risk Management - Health/Benefits	$1,526,000	($1,144,500)	25% allocated to the General Fund; 75% to other funds.	$381,500
Subtotal Internal Service Funds	**$4,572,083**	**($3,429,062)**		**$1,143,021**
Total Expenditures	**$32,140,211**	**($16,494,824)**		**$15,645,387**

Prepared by New Economics & Advisory, April 2018.

C-3 *Calculation of Expenditure Multipliers ($2017)*
Fiscal Analysis of Academy Avenue Annexation Area

Item	Net Expenditures	Service Population		Expenditure Multiplier	
General Fund					
General Government	$898,524	29,650	Persons Served	$30.30	Per Person Served
Public Safety	$9,737,236	29,650	Persons Served	$328.41	Per Person Served
Public Works - Recreation, Parks, Pool Facilities	$1,788,903	26,412	Per Resident	$67.73	Per Resident
Public Works - Streets	$753,282	29,650	Persons Served	$25.41	Per Person Served
Community & Economic Development	$1,324,421	29,650	Persons Served	$44.67	Per Person Served
Internal Service Funds	$1,143,021	29,650	Persons Served	$38.55	Per Person Served
Total City General Fund	**$15,645,387**			**$535.07**	

Prepared by New Economics & Advisory, April 2018.

Appendix D: Additional Supporting Information

D-1 *Estimated AB8 Factors for Annexation Area Tax Rate Area*

Fiscal Analysis of Academy Avenue Annexation Area: Fiscal Analysis

	Tax Rate Area 071-000				
Funds	Pre-ERAF Incremental Allocation Factors	2016-2017 Gross Levy (before negative districts removed & before ERAF)	Regular ERAF Shift 2016-2017	% ERAF Adjustment	Post-ERAF Incremental Allocation Factors
GENERAL	0.39183	$219,808,059.99	($122,053,614.00)	0.55527	0.17426
FRESNO COUNTY LIBRARY	0.02059	$11,964,882.98	($1,647,592.00)	0.13770	0.01775
SANGER-DEL REY CEMETERY	0.01892	$485,277.35	($151,852.00)	0.31292	0.01300
FRESNO COUNTY FIRE	0.09286	$14,077,339.90	($1,673,746.00)	0.11890	0.08182
KINGS RIVER CONSERVATION	0.00526	$599,436.00	$0.00	0.00000	0.00526
CONSOLIDATED MOSQUITO	0.00961	$3,207,605.62	$0.00	0.00000	0.00961
SANGER UNIFIED	0.36497	$12,597,044.26	$0.00	0.00000	0.36497
STATE CENTER COMMUNITY COLLEGE	0.06083	$33,147,118.04	$0.00	0.00000	0.06083
COUNTY SCHOOLS SERVICE	0.03513	$22,741,745.28	$0.00	0.00000	0.03513
ERAF/RPTTF					0.23737
Total General Tax Levy (1% total)	1.000000				1.00000

Source: Fresno County Auditor/ Controller's office.

Prepared by New Economics & Advisory, April 2018.

D-2 *Worker Spending Summary*

Fiscal Analysis of Academy Avenue Annexation Area: Fiscal Analysis

Types of Spending	Mean Weekly Expenditures	Included in Project Office Worker Spending: Yes/No	Included in Project Office Worker Spending: Included Expenditure	Estimated Taxable Portion: % Taxable [1]	Estimated Taxable Portion: Taxable Expenditure
Total Office Worker Spending	**$195.22**				
Transportation and Online Purchases	**$66.03**				
Transportation and Online Purchases	$35.92	No	$0.00	0%	$0.00
Online Purchases Made at the Office (Personal)	$30.11	No	$0.00	0%	$0.00
					$0.00
Full-Service Restaurants and Fast Food	**$26.71**				$0.00
Full-Service Restaurants	$12.97	Yes	$12.97	100%	$12.97
Fast Food/Deli/Lunch Eateries	$13.75	Yes	$13.75	100%	$13.75
					$0.00
Goods and Services	**$102.47**				$0.00
Department Stores	$7.56	Yes	$7.56	95%	$7.18
Discount Stores	$10.63	Yes	$10.63	80%	$8.50
Drug Stores	$6.87	Yes	$6.87	60%	$4.12
Grocery Stores	$19.79	Yes	$19.79	22%	$4.35
Clothing Stores	$3.80	Yes	$3.80	95%	$3.61
Shoe Stores	$2.82	Yes	$2.82	95%	$2.68
Sporting Goods Stores	$2.73	Yes	$2.73	95%	$2.59
Electronics/Phone/Computer Stores	$6.88	Yes	$6.88	95%	$6.54
Jewelry Stores	$3.36	Yes	$3.36	95%	$3.19
Office Supplies/Stationary/Novelty Gifts and Card	$6.90	Yes	$6.90	95%	$6.56
Warehouse Clubs	$9.71	Yes	$9.71	95%	$9.22
Other Goods (florist, non-food vendors, etc.)	$3.61	Yes	$3.61	95%	$3.43
Personal Care Shops	$6.03	Yes	$6.03	95%	$5.73
Personal Services	$3.92	Yes	$3.92	95%	$3.72
Other Services (not elsewhere classified)	$3.48	Yes	$3.48	95%	$3.31
Entertainment (sporting events, live theater, concerts, movies)	$4.35	No	$0.00	95%	$0.00
Adjusted Total Office Worker Spending (2012$)			**$124.81**		**$101.46**
Adjusted Total Office Worker Spending (2017$)			**$130.39**		**$105.99**
Estimated Retail and Industrial Worker Spending					
Fresno MSA Mean Annual Wage (May, 2016)					$45,270
Assumed Weeks Worked Per Year					48
Assumed Hours Worked Per Week					32
Assumed Hourly Wage					$10
Estimated Annual Income Per Worker					$15,360
Annual Wage as a % of Office Annual Wage (2012$)					34%
Estimated Worker Spending Per Week (2017$)					$35.96

[1] Subject to refinement.

Source: International Council of Shopping Centers (ICSC) Research, 2012; Consumer Price Index.

Prepared by New Economics & Advisory, April 2018.

D-3 *Consumer Price Index Changes*

Year	Annual Average	Annual Change (Starting 2005) Amount	%	Cumulative	Annual Change (Starting 2015) Starting 2015	Cumulative
2005	195.300	N/A	N/A	N/A	-3.23%	-17.60%
2006	201.600	6.300	3.23%	3.23%	-2.85%	-14.94%
2007	207.342	5.742	2.85%	6.17%	-3.84%	-12.52%
2008	215.303	7.961	3.84%	10.24%	0.36%	-9.16%
2009	214.537	-0.766	-0.36%	9.85%	-1.64%	-9.48%
2010	218.056	3.519	1.64%	11.65%	-3.16%	-8.00%
2011	224.939	6.883	3.16%	15.18%	-2.07%	-5.10%
2012	229.594	4.655	2.07%	17.56%	-1.46%	-3.13%
2013	232.957	3.363	1.46%	19.28%	-1.62%	-1.71%
2014	236.736	3.779	1.62%	21.22%	-0.12%	-0.12%
2015	237.017	0.281	0.12%	21.36%	-1.26%	-1.26%
2016	240.007	2.990	1.26%	22.89%	NA	NA
2017 [1]	244.524	4.517	1.88%	25.20%		
Average Annual Growth Rate			**1.89%**			
2012-2017				**4.47%**		

[1] Year to date, as of April, 2017.

Source: Consumer Price Index

Prepared by New Economics & Advisory, April 2018.