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Traffic Impact Analysis

Valley Corridor Specific Plan

Prepared for

San Bernardino County

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EXECUTIVE SUMMARY

Purpose of Report and Study Objectives

The purpose of this study is to evaluate the effects on traffic circulation produced from the proposed development of Valley Corridor Specific Plan in the County of San Bernardino.

The objectives of this study include the following:

- Document existing traffic conditions in the vicinity of the proposed development;
- Determine the traffic generated from the proposed development;
- Evaluate existing plus project traffic conditions;
- Evaluate year 2035 without project traffic conditions;
- Evaluate year 2035 with project traffic conditions;
- Determine if the level of service (LOS) required by the San Bernardino County Traffic Impact Study Guidelines, the City of Fontana General Plan, and the Caltrans Guide for the Preparation of Traffic Impact Studies will be maintained at all study intersections, and if not, determine the mitigation measures that will be necessary in order to maintain the required LOS;
- Determine if peak hour traffic signal warrants are met for any of the unsignalized study intersections;

Site Location and Study Area

The proposed project is located in the Valley Region of the County of San Bernardino. Valley Corridor Specific Plan is located between Marygold Avenue on the north, Interstate 10 Freeway on the south, Spruce Avenue on the east, and Alder Avenue on the west. The proposed project is located within the Bloomington Community Plan.

Development Description

Project Size

The project site encompasses approximately 308 acres. The project currently includes 114.2 acres Valley Corridor/Bloomington Enterprise, 51.6 acres Valley Corridor/Commercial, 84.7 acres Valley Corridor/Low & Medium Density Residential, 17.4 acres Valley Corridor/Medium & High Density Residential, 26.1 acres Valley Corridor/Mixed-Use, 6.3 acres easement, and 7.4 acres flood control channel.

Project Trip Generation

The proposed specific plan is anticipated to generate approximately 23,633 net new daily trip-ends, including 1,174 trip-ends during the AM peak hour and 1,356 trip-ends during the PM peak hour.

Project Zoning and Land Use

The existing and proposed zoning and land use designations are as follows:

- Existing Zoning:
  - BL/CG-SCp (Bloomington/General Commercial-Sign Control Primary)
  - BL/CS (Bloomington/Service Commercial)
  - BL/IN (Bloomington/Institutional)

    - BL/RS (Bloomington/Single Residential)
    - BL/RS-20M (Bloomington/Single Residential – 20,000 square feet minimum)
- Proposed Zoning:
    - Valley Corridor/Mixed-Use
    - Valley Corridor/Bloomington Enterprise
    - Valley Corridor/Commercial
    - Valley Corridor/Low & Medium Density Residential
    - Valley Corridor/Medium & High Density Residential
- Existing Land Use:
    - Auto Repair/Services
    - Auto Sales
    - Church
    - Commercial Storage
    - Community Facility
    - General Office
    - Industrial
    - Mobile Home
    - Multi-Family
    - Nursery
    - Open Storage
    - Parking
    - Parks
    - Restaurant/Bar
    - Retail Store/Service
    - Service Station
    - Single Family Detached
    - Vacant
- Proposed Land Use:
    - Industrial Park
    - Commercial Storage
    - Gas Station & Convenience
    - Hotel
    - Restaurant
    - Retail Sales/Service
    - Single Family Detached
    - Residential Condo/Townhouse
    - Multi-Family/Retail Sales/Service.

Principal Findings

Acceptable Level of Service

The acceptable Level of Service (LOS) for the Bloomington area in unincorporated San Bernardino County is based on the Bloomington Community Plan, Policy BL/CI 1.1:

> *Ensure that all new development proposals do not degrade Levels of Service (LOS) on Major Arterials below LOS "C" during non-peak hours or below LOS "D" during peak hours.*

The acceptable LOS for the City of Fontana is based on the City of Fontana General Plan Circulation Element Goal #1, Policy 12:

> *All streets and intersections designed after the adoption of the General Plan will be planned to function at level of service (LOS) C or better, wherever possible. Improvements to existing streets will be designed to LOS C standards whenever feasible.*

The acceptable LOS for Caltrans facilities is based on the Caltrans' *Guide for the Preparation of Traffic Impact Studies* Section II:

> *Caltrans endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" on State highway facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than the appropriate target LOS, the existing measures of effectiveness (MOE) should be maintained.*

Per discussion with Mark Roberts, Caltrans District 8 Office Chief, Intergovernmental Review, Community and Regional Planning, the region-wide goal for acceptable LOS on all freeways, roadway segments, and intersections is LOS D.

Determination of Significant Impact

The determination of significant impacts used in this study is based on the County of San Bernardino Traffic Impact Analysis Guidelines, Sections 10.8.1 and 10.8.2, with modifications to accommodate the varying acceptable LOS standards in different jurisdictions:

> ***SIGNALIZED INTERSECTIONS***
> *Any study intersection that is operating at an acceptable LOS for any study scenario without project traffic in which the addition of project traffic causes the intersection to degrade to an unacceptable LOS shall mitigate the impact to bring the intersection back to an acceptable LOS.*
> *Any study intersection that is operating at an unacceptable LOS for any study scenario without project traffic shall mitigate any impacts so as to bring the intersection back to the overall level of delay established prior to project traffic being added. For scenarios which include the addition of Cumulative Project Traffic (i.e. shared impacts), study intersections shall be mitigated to an acceptable LOS.*
>
> ***UNSIGNALIZED INTERSECTIONS***
> *An impact is considered significant if the study determines that either section a) or both sections b) and c) occur.*
> *a) The addition of project related traffic causes the intersection to move from an acceptable LOS to an unacceptable LOS*
> *OR*
> *b) The project contributes additional traffic to an intersection that is already projected to operate at an unacceptable LOS with background traffic*
> *AND*
> *c) One or both of the following conditions are met:*
> *1) The project adds ten (10) or more trips to any approach*
> *2) The intersection meets the peak hour traffic signal warrant after the addition of project traffic.*

Once a significant impact has been identified, mitigation shall be provided as follows:
1. For scenarios involving project traffic but not Cumulative Project Traffic, the LOS shall be mitigated to either an acceptable LOS for case a) above or to pre-project LOS and delay for case b) above.
2. For scenarios that include Cumulative Project Traffic study intersections shall be mitigated to an acceptable LOS.

Levels of Service – Existing Conditions

The existing levels of service for the study intersections vary from LOS A to E. The following study intersections operate at an unacceptable LOS:

1. Sierra Avenue (NS) / San Bernardino Avenue (EW)
2. Sierra Avenue (NS) / Valley Boulevard (EW)
14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)

Levels of Service – Existing Plus Project Conditions

For existing plus project traffic conditions without off-site improvements, the study intersections are expected to operate at levels of service that vary from LOS A to E. The following study intersection would operate at an unacceptable LOS and meet the criteria for significant impact:

1. Sierra Avenue (NS) / San Bernardino Avenue (EW)
2. Sierra Avenue (NS) / Valley Boulevard (EW)
7. Alder Avenue (NS) / Marygold Avenue (EW)
14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)
15. Cedar Avenue (NS) / I-10 Eastbound Ramps (EW)

With the improvements presented in Table 6-1 and Figure 6-A, the significantly impacted study intersections could be improved to meet the required level of service or bring the overall level of delay back to the level established prior to project traffic being added.

Levels of Service – Year 2035 without Project Conditions

For year 2035 without project traffic conditions, the study intersections are expected to operate at levels of service that vary from LOS B to F. The following study intersections would operate at an unacceptable LOS:

1. Sierra Avenue (NS) / San Bernardino Avenue (EW)
4. Sierra Avenue (NS) / Slover Avenue (EW)
7. Alder Avenue (NS) / Marygold Avenue (EW)
8. Alder Avenue (NS) / Valley Boulevard (EW)
14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)
15. Cedar Avenue (NS) / I-10 Eastbound Ramps (EW)
16. Cedar Avenue (NS) / Slover Avenue (EW)

Levels of Service – Year 2035 with Project Conditions

For year 2035 with project traffic conditions, the study intersections are expected to operate at levels of service that vary from LOS B to F. The following study intersections would operate at an unacceptable LOS:

1. Sierra Avenue (NS) / San Bernardino Avenue (EW)
2. Sierra Avenue (NS) / Valley Boulevard (EW)
4. Sierra Avenue (NS) / Slover Avenue (EW)

7. Alder Avenue (NS) / Marygold Avenue (EW)
8. Alder Avenue (NS) / Valley Boulevard (EW)
9. Locust Avenue (NS) / Marygold Avenue (EW)
13. Cedar Avenue (NS) / Valley Boulevard (EW)
14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)
15. Cedar Avenue (NS) / I-10 Eastbound Ramps (EW)
16. Cedar Avenue (NS) / Slover Avenue (EW)

With the improvements presented in Table 6-2 and Figure 6-B, levels of service at the impacted study intersections could be improved to meet the required level of service.

▪ Traffic Signal Warrants

The California MUTCD states that the satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal. Peak hour traffic signal warrant analysis should only be considered as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal. Intersections that exceed the peak hour warrant are more likely to meet one or more of the other volume based signal warrants. The Manual on Uniform Traffic Control Devices (MUTCD) also advises that a traffic control signal should not be installed unless:

- One or more of the traffic signal warrants is satisfied;
- An engineering study indicates that installing a traffic control signal will improve the overall safety and/or operation of the intersection; and
- It will not seriously disrupt progressive traffic flow.

For existing traffic conditions, the peak hour traffic control signal warrant is satisfied for the following study area unsignalized intersection (see Appendix D for technical calculations):

7. Alder Avenue (NS) / Marygold Avenue (EW)

For existing plus project traffic conditions, year 2035 without project conditions, and year 2035 with project conditions, no additional study area unsignalized intersections are expected to meet the peak hour traffic control signal warrant (see Appendix D for technical calculations).

The following study area unsignalized intersection does not satisfy the peak hour traffic control signal warrant in any study scenario (see Appendix D for technical calculations):

9. Locust Avenue (NS) / Marygold Avenue (EW)

▪ Circulation Recommendations

Project Specific Improvements

This traffic impact analysis demonstrates that the direct traffic impacts generated by Valley Corridor Specific Plan can be mitigated to less than significant levels if the following recommended intersection improvements are adopted.

- Modify the intersection of Sierra Avenue and San Bernardino Avenue to include the following geometrics:
  Northbound: One left-turn lane. Two through lanes. One right-turn lane.
  Southbound: One left-turn lane. One through lane. One shared through and right-turn lane.

Eastbound: One left-turn lane. Two through lanes. ***Add one right-turn lane with overlap phase.***
Westbound: One left-turn lane. One through lane. One shared through and right-turn lane.
This improvement is in the City of Fontana and the County of San Bernardino would have no jurisdiction to implement the mitigation. It may also require additional right-of-way and may not be feasible to implement. A significant impact will remain if this mitigation measure cannot be implemented.

- Modify the intersection of Sierra Avenue and Valley Boulevard to include the following geometrics:
  Northbound: Two left-turn lanes. Two through lanes. One right-turn lane with overlap phase.
  Southbound: Two left-turn lanes. Three through lanes. ***Add one right-turn lane with overlap phase.***
  Eastbound: Two left-turn lanes. Two through lanes. One right-turn lane with overlap phase.
  Westbound: Two left-turn lanes. Two through lanes. One right-turn lane with overlap phase.
  This improvement is in the City of Fontana and the County of San Bernardino would have no jurisdiction to implement the mitigation. It may also require additional right-of-way and may not be feasible to implement. A significant impact will remain if this mitigation measure cannot be implemented.

- Install a traffic signal at the intersection of Alder Avenue and Marygold Avenue with the following existing geometrics:
  Northbound: One shared left-turn and through lane. One right-turn lane.
  Southbound: One shared left-turn and through lane. One right-turn lane.
  Eastbound: One shared left-turn, through, and right-turn lane.
  Westbound: One shared left-turn, through, and right-turn lane.

- Modify the intersection of Cedar Avenue and I-10 Westbound Ramps to include the following geometrics:
  Northbound: One left-turn lane. ***Add second left-turn lane.*** Two through lanes. ***Add third through lane.***
  Southbound: Three through lanes. One right-turn lane.
  Eastbound: Not applicable.
  Westbound: One shared left-turn, through, and right-turn lane. One right-turn lane.
  This improvement is within Caltrans right-of-way and the County of San Bernardino would have no jurisdiction to implement the mitigation. These improvements are consistent with the Cedar Avenue Overcrossing Widening project. The payment of County of San Bernardino Regional Transportation Development Mitigation Fees would contribute the project's fair share of these interchange improvements based on the Development Mitigation Nexus Study (Appendix K of the SANBAG CMP).

- Modify the intersection of Cedar Avenue and I-10 Eastbound Ramps to include the following geometrics:
  Northbound: Three through lanes. One right-turn lane.
  Southbound: One left-turn lane. ***Add second left-turn lane.*** Two through lanes. ***Add third through lane.***
  Eastbound: One left-turn lane. One shared left-turn, through, and right-turn lane.
  Westbound: Not applicable.
  This improvement is within Caltrans right-of-way and the County of San Bernardino would have no

jurisdiction to implement the mitigation. These improvements are consistent with the Cedar Avenue Overcrossing Widening project. The payment of County of San Bernardino Regional Transportation Development Mitigation Fees would contribute the project's fair share of these interchange improvements based on the Development Mitigation Nexus Study (Appendix K of the SANBAG CMP).

Cumulative Improvements

The cumulative traffic impacts generated by Valley Corridor Specific Plan and other projects included in the SBTAM model can be mitigated to meet the required level of service if the following improvements are adopted. Because these are cumulative impacts, the project should not be solely responsible to implement these measures, but should be required to pay a fair share contribution.

- Modify the intersection of Sierra Avenue and San Bernardino Avenue to include the following geometrics:
  Northbound: One left-turn lane. Two through lanes. One right-turn lane ***with overlap phase***.
  Southbound: One left-turn lane. Two through lanes. ***Add one right-turn lane.***
  Eastbound: One left-turn lane. Two through lanes. ***Add one right-turn lane.***
  Westbound: One left-turn lane. One through lane. One shared through and right-turn lane.

- Modify the intersection of Sierra Avenue and Valley Boulevard to include the following geometrics:
  Northbound: Two left-turn lanes. Two through lanes. ***Add third through lane.*** One right-turn lane with overlap phase.
  Southbound: Two left-turn lanes. Two through lanes. One shared through and right-turn lane.
  Eastbound: Two left-turn lanes. Two through lanes. ***Add third through lane.*** One right-turn lane with overlap phase.
  Westbound: One left-turn lane. One through lane. One shared through and right-turn lane.

- Modify the intersection of Sierra Avenue and Slover Avenue to include the following geometrics:
  Northbound: Two left-turn lanes. Three through lanes. ***Add fourth through lane.*** One right-turn lane ***with overlap phase.***
  Southbound: Two left-turn lanes. Three through lanes. ***Add one right-turn lane with overlap phase.***
  Eastbound: Two left-turn lanes. Two through lanes. ***Add third through lane.*** One right-turn lane ***with overlap phase.***
  Westbound: Two left-turn lanes. Two through lanes. Two right-turn lanes with overlap phase.

- Install a traffic signal at the intersection of Alder Avenue and Marygold Avenue to include the following geometrics:
  Northbound: One left-turn lane. One shared through and right-turn lane.
  Southbound: One left-turn lane. One shared through and right-turn lane.
  Eastbound: One shared left-turn, through, and right-turn lane.
  Westbound: One shared left-turn, through, and right-turn lane.

- Modify the intersection of Alder Avenue and Valley Boulevard to include the following geometrics:
  Northbound: ***Add two left-turn lanes.*** One through lane. ***Add second through lane.*** One right-turn lane ***with overlap phase.***
  Southbound: ***Add one left-turn lane.*** One through lane. ***Add second through lane. Add right-***

turn lane with overlap phase.
Eastbound: One left-turn lane. ***Add second left-turn lane.*** Two through lanes. Add right-turn lane ***with overlap phase.***
Westbound: One left-turn lane. ***Add second left-turn lane.*** One through lane. One shared through and right-turn lane.

- Modify the intersection of Locust Avenue and Marygold Avenue to include the following geometrics:
  Northbound: One shared left-turn and through lane. ***Modify right-turn lane to shared through and right-turn lane.***
  Southbound: One shared left-turn and through lane. One right-turn lane.
  Eastbound: One shared left-turn, through, and right-turn lane.
  Westbound: One shared left-turn, through, and right-turn lane.

- Modify the intersection of Cedar Avenue and Valley Boulevard to include the following geometrics:
  Northbound: Two left-turn lanes. Two through lanes. ***Add third through lane.*** One right-turn lane with overlap phase.
  Southbound: Two left-turn lanes. Two through lanes. One shared through and right-turn lane.
  Eastbound: Two left-turn lanes. One through lane. Two right-turn lanes with overlap phase.
  Westbound: Two left-turn lanes. One through lane. One shared through and right-turn lane.

- Modify the intersection of Cedar Avenue and I-10 Westbound Ramps to include the following geometrics:
  Northbound: One left-turn lane. ***Add second left-turn lane.*** Two through lanes. ***Add third through lane.***
  Southbound: Three through lanes. One right-turn lane ***with overlap phase***.
  Eastbound: Not applicable.
  Westbound: ***Modify shared left-turn, through, and right-turn lane to shared left-turn and right-turn lane (restrict through movement).*** One right-turn lane.

- Modify the intersection of Cedar Avenue and I-10 Eastbound Ramps to include the following geometrics:
  Northbound: Three through lanes. One right-turn lane.
  Southbound: One left-turn lane. ***Add second left-turn lane.*** Two through lanes. ***Add third through lane.***
  Eastbound: One left-turn lane. One shared left-turn, through, and right-turn lane.
  Westbound: Not applicable.

- Modify the intersection of Cedar Avenue and Slover Avenue to include the following geometrics:
  Northbound: One left-turn lane. One through lane. One shared through and right-turn lane.
  Southbound: One left-turn lane. One through lane. One shared through and right-turn lane.
  Eastbound: One left-turn lane. ***Add second left-turn lane.*** One shared through and right-turn lane.
  Westbound: One left-turn lane. One through lane. One right-turn lane with overlap phase.

INTRODUCTION

Purpose of Report and Study Objectives

The purpose of this study is to evaluate the effects on traffic circulation produced from the proposed development of Valley Corridor Specific Plan in the County of San Bernardino.

The objectives of this study include the following:

- Document existing traffic conditions in the vicinity of the proposed development;
- Determine the traffic generated from the proposed development;
- Evaluate existing plus project traffic conditions;
- Evaluate year 2035 without project traffic conditions;
- Evaluate year 2035 with project traffic conditions;
- Determine if the level of service (LOS) required by the San Bernardino County Traffic Impact Study Guidelines, the City of Fontana General Plan, and the Caltrans Guide for the Preparation of Traffic Impact Studies will be maintained at all study intersections, and if not, determine the mitigation measures that will be necessary in order to maintain the required LOS;
- Determine if peak hour traffic signal warrants are met for any of the unsignalized study intersections;

Site Location and Study Area

The proposed project is located in the Valley Region of the County of San Bernardino. Valley Corridor Specific Plan is located between Marygold Avenue on the north, Interstate 10 Freeway on the south, Spruce Avenue on the east, and Alder Avenue on the west. The proposed project is located within the Bloomington Community Plan.

The project site location is presented on Figure 2-A.

Development Description

Project Size and Description

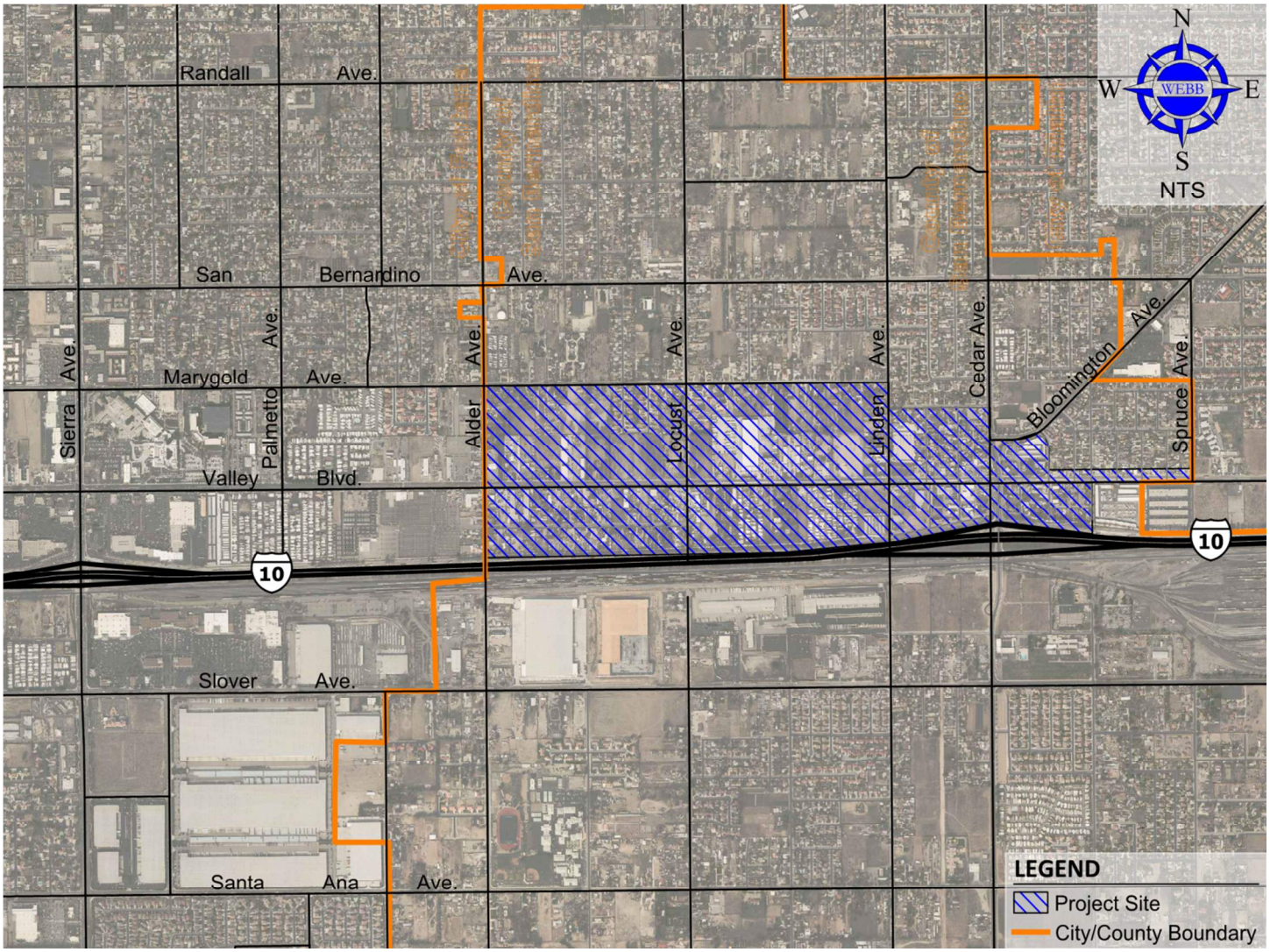
The project site encompasses approximately 308 acres. The project currently includes 114.2 acres Valley Corridor/Bloomington Enterprise, 51.6 acres Valley Corridor/Commercial, 84.7 acres Valley Corridor/Low & Medium Density Residential, 17.4 acres Valley Corridor/Medium & High Density Residential, 26.1 acres Valley Corridor/Mixed-Use, 6.3 acres easement, and 7.4 acres flood control channel.

Existing Land Use and Zoning

Existing land use and zoning designations are as follows:

- Existing Zoning:
    - BL/CG-SCp (Bloomington/General Commercial-Sign Control Primary)
    - BL/CS (Bloomington/Service Commercial)
    - BL/IN (Bloomington/Institutional)
    - BL/RS (Bloomington/Single Residential)
    - BL/RS-20M (Bloomington/Single Residential – 20,000 square feet minimum)

Figure 2-A – Project Site Location Map



- Existing Land Use:
    - Auto Repair/Services
    - Auto Sales
    - Church
    - Commercial Storage
    - Community Facility
    - General Office
    - Industrial
    - Mobile Home
    - Multi-Family
    - Nursery
    - Open Storage
    - Parking
    - Parks
    - Restaurant/Bar
    - Retail Store/Service
    - Service Station
    - Single Family Detached
    - Vacant

Proposed Land Use and Zoning

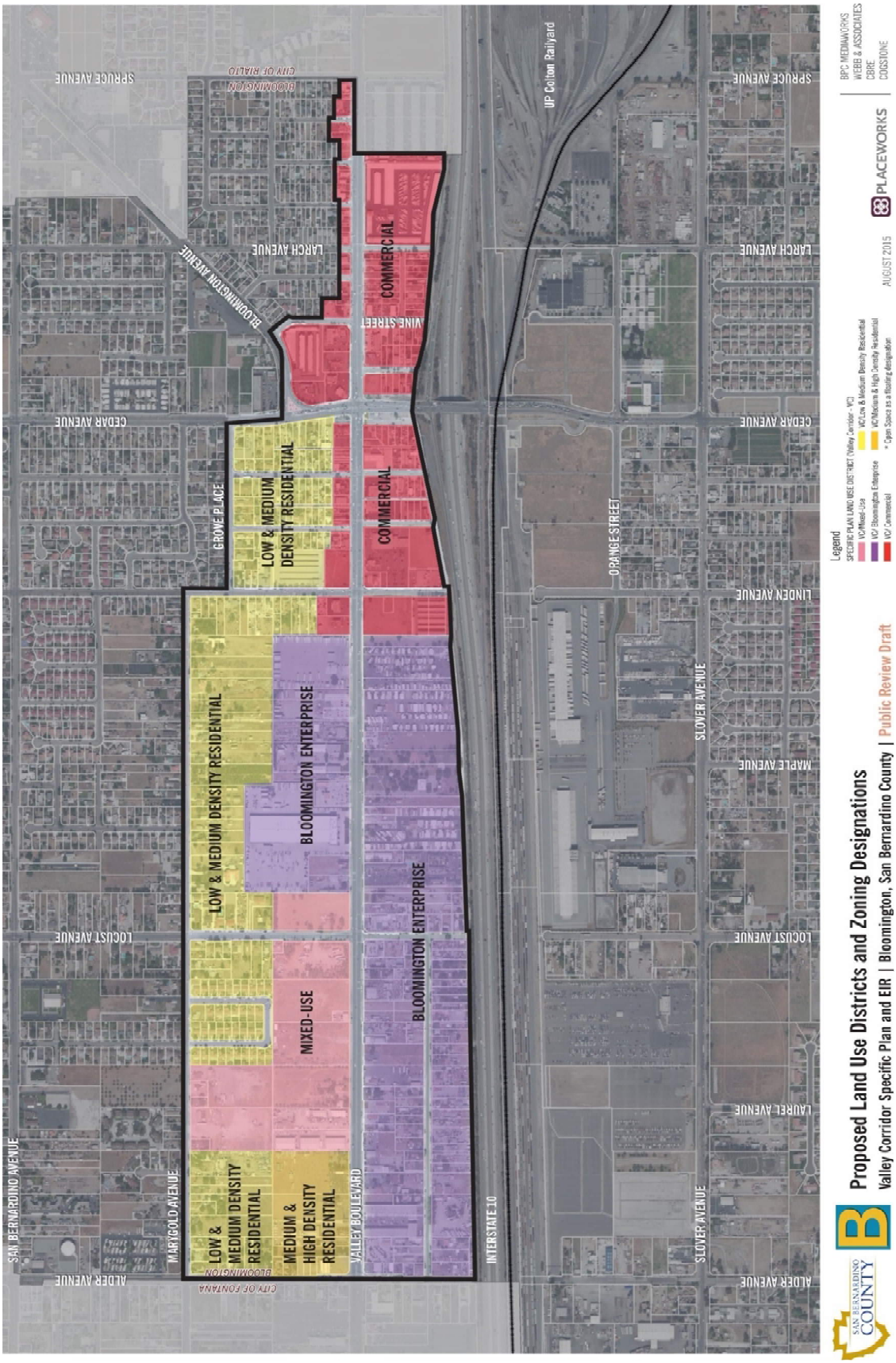
Proposed land use and zoning designations are as follows:

- Proposed Zoning:
    - Valley Corridor/Mixed-Use
    - Valley Corridor/Bloomington Enterprise
    - Valley Corridor/Commercial
    - Valley Corridor/Low & Medium Density Residential
    - Valley Corridor/Medium & High Density Residential
- Proposed Land Use:
    - Industrial Park
    - Commercial Storage
    - Gas Station & Convenience
    - Hotel
    - Restaurant
    - Retail Sales/Service
    - Single Family Detached
    - Residential Condo/Townhouse
    - Multi-Family/Retail Sales/Service.

Site Plan of Proposed Project

The current proposed project layout is shown on Figure 2-B.

Figure 2-B – Project Site Plan



Existing and Proposed Circulation Plan

Within the Valley Corridor Specific Plan area the following streets are classified in the Bloomington Community Plan Circulation Element:

- Major Highways
    - Valley Boulevard
    - Cedar Avenue
- Secondary Highways
    - Alder Avenue
    - Locust Avenue

The remaining streets are not classified in the Bloomington Community Plan Circulation Element.

The Valley Corridor Specific Plan does not propose to change the classification of any roadways.

Proposed Project Opening Year and Proposed Project Phasing

For analysis purposes, it is assumed that Valley Corridor Specific Plan will be developed in a single phase and full development is anticipated by 2035.

Sphere of Influence

Valley Corridor Specific Plan is adjacent to the borders of the City of Fontana and the City of Rialto.

AREA CONDITIONS

Existing Roadway Descriptions

Sierra Avenue is a divided 4 to 8-lane north/south arterial in the study area. In the City of Fontana Circulation Master Plan, it is classified as a Major Highway south of Slover Avenue, an Eight Lane Major highway between Slover Avenue and Valley Boulevard, and a Modified Major Highway north of Valley Boulevard. Street parking is not allowed. There are existing sidewalks on both sides of the street, but designated bike lanes do not exist within the study area.

Palmetto Avenue is an undivided 2-lane north/south highway in the study area. In the City of Fontana Circulation Master Plan, it is classified as a Collector Street. Street parking is allowed. There are existing sidewalks, but designated bike lanes do not exist within the study area.

Alder Avenue is an undivided 2 to 4-lane north/south highway in the study area. In the City of Fontana Circulation Master Plan, it is classified as a Modified Secondary Highway. In the Bloomington Community Plan Circulation Element, it is classified as a Secondary Highway. Street parking is allowed along some portions of the street. Sidewalks are intermittently provided, but designed bike lanes do not exist within the study area.

Locust Avenue is an undivided 2-lane north/south highway in the study area. In the Bloomington Community Plan Circulation Element, it is classified as a Secondary Highway. Street parking is allowed. Sidewalks are intermittently provided, but designated bike lanes do not exist within the study area.

Cedar Avenue is a divided 4-lane north/south highway in the study area. In the Bloomington Community Plan Circulation Element, it is classified as a Major Highway. Street parking is allowed along some portions of the street. There are existing sidewalks on both sides of the street, but designated bike lanes do not exist within the study area.

San Bernardino Avenue in an undivided 2 to 4-lane east/west highway in the study area. In the City of Fontana Circulation Master Plan, it is classified as a Modified Secondary Highway. In the Bloomington Community Plan Circulation Element, it is classified as a Secondary Highway. Street parking is allowed. There are existing sidewalks on both sides of the street within the City of Fontana, but are only intermittently provided in unincorporated San Bernardino County. Designated bike lanes do not exist on this street within the study area.

Marygold Avenue is an undivided 2-lane east/west highway in the study area. In the City of Fontana Circulation Master Plan, it is classified as a Collector Street. In is not a designated roadway in the Bloomington Community Plan Circulation Element. Street parking is allowed. Sidewalks are intermittently provided, but designated bike lanes do not exist within the study area.

Valley Boulevard is a divided 4 to 6-lane east/west highway in the study area. In the City of Fontana Circulation Master Plan, it is classified as a Modified Major Highway. In the Bloomington Community Plan Circulation Element, it is classified as a Major Highway. Street parking is allowed on some portions of the street. There are existing sidewalks on both sides of the street within the City of Fontana, but are only intermittently provided in unincorporated San Bernardino County. Designated bike lanes do not exist on this street within the study area.

Slover Avenue is a 2 to 6-lane east/west highway in the study area. It is generally divided in the City of Fontana and undivided in unincorporated San Bernardino County. In the City of Fontana Circulation Master Plan, it is classified as a Primary Highway. In the Bloomington Community Plan Circulation Element, it is classified as a Major Highway. Street parking is generally not allowed in the City of Fontana, but generally allowed in unincorporated San Bernardino County. There are existing sidewalks on both sides of the street within the City of Fontana, but are only intermittently provided in unincorporated San Bernardino County. Designated bike lanes do not exist on this street within the study area.

▪ Study Intersections

The study area includes the following intersections:

1. Sierra Avenue (NS) / San Bernardino Avenue (EW)
2. Sierra Avenue (NS) / Valley Boulevard (EW)
3. Sierra Avenue (NS) / I-10 Ramps (EW)
4. Sierra Avenue (NS) / Slover Avenue (EW)
5. Palmetto Avenue (NS) / Valley Boulevard (EW)
6. Alder Avenue (NS) / San Bernardino Avenue (EW)
7. Alder Avenue (NS) / Marygold Avenue (EW)
8. Alder Avenue (NS) / Valley Boulevard (EW)
9. Locust Avenue (NS) / Marygold Avenue (EW)
10. Locust Avenue (NS) / Valley Boulevard (EW)
11. Cedar Avenue (NS) / San Bernardino Avenue (EW)
12. Cedar Avenue (NS) / Bloomington Avenue (EW)
13. Cedar Avenue (NS) / Valley Boulevard (EW)
14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)
15. Cedar Avenue (NS) / I-10 Eastbound Ramps (EW)
16. Cedar Avenue (NS) / Slover Avenue (EW)

▪ Existing Traffic Controls and Intersection Geometrics

The existing roadway system is shown on Figure 3-A. It identifies the existing intersection traffic controls (i.e. signals and signage) and intersection geometrics within the study area.

▪ Future Infrastructure Improvements

Cedar Avenue Overcrossing Widening

The I-10/Cedar Avenue interchange is being expanded to improve operation and capacity. This involves widening the existing Cedar Avenue overcrossing, the Union Pacific Railroad (UPRR) overhead, and Cedar Avenue from four to six lanes; and realigning and widening the I-10 on- and off-ramps to improve turning and storage capacity. The improvements also include side-by-side dual left-turn lanes between the eastbound and westbound ramp intersections and the addition of an auxiliary lane on the eastbound on- and off-ramps.

Alder Avenue Interchange

Alder Avenue currently dead-ends at I-10/UPRR. There are currently no plans on constructing an overcrossing or interchange in the Bloomington Community Plan, but the City of Fontana General Plan shows a future interchange at this location. No known design or funding is available for this project, so construction of this project was not assumed in this study.

▪ Existing Traffic Volumes

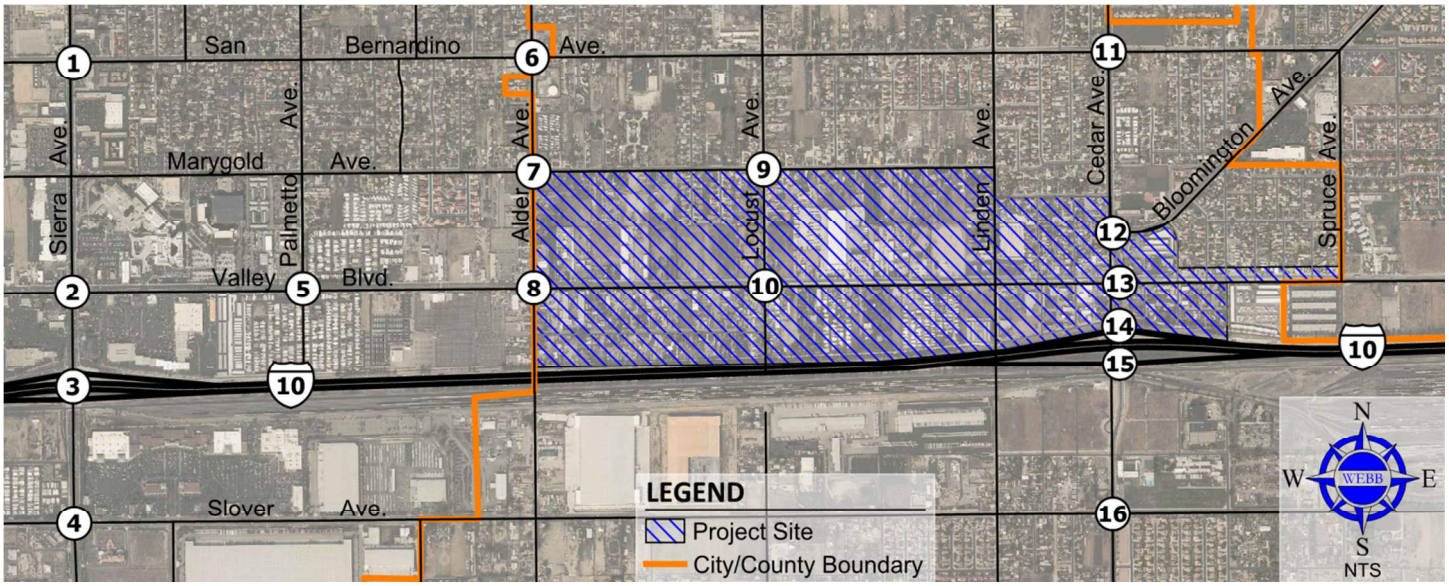
The existing AM peak period and PM peak period intersection turning movement counts were conducted by Counts Unlimited, Inc. The traffic count worksheets are provided in Appendix C. The AM and PM peak hour intersection turning movement volumes are presented on Figure 3-B and Figure 3-C, respectively.

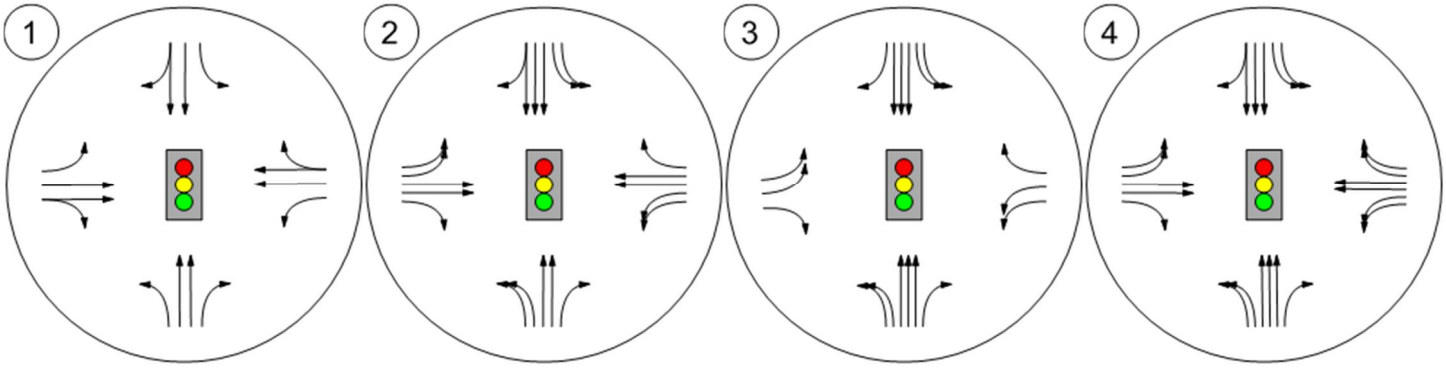
The existing daily traffic counts along Valley Boulevard were conducted by Counts Unlimited, Inc. Based on these counts, the peak hour volume is approximately 8% of the daily volume. The estimated existing average daily traffic (ADT) for roadways within the study area is presented in Table 3-1.

Table 3-1 – Existing Average Daily Traffic (ADT) Volumes

Roadway Segment	ADT
Valley Boulevard between Sierra Avenue and Palmetto Avenue	29970
Valley Boulevard between Palmetto Avenue and Alder Avenue	20590
Valley Boulevard between Alder Avenue and Locust Avenue	18540
Valley Boulevard between Locust Avenue and Cedar Avenue	23030
Valley Boulevard between Cedar Avenue and Cactus Avenue	12470
Sierra Avenue between Slover Avenue and I-10 Ramps	49980
Sierra Avenue between I-10 Ramps and Valley Boulevard	60410
Sierra Avenue between Valley Boulevard and San Bernardino Avenue	37910
Alder Avenue between Valley Boulevard and Marygold Avenue	8780
Alder Avenue between Marygold Avenue and San Bernardino Avenue	10390
Locust Avenue between Valley Boulevard and Marygold Avenue	5540
Cedar Avenue between Slover Avenue and I-10 Ramps	25800
Cedar Avenue between I-10 Ramps and Valley Boulevard	41530
Cedar Avenue between Valley Boulevard and Bloomington Avenue	30210
Cedar Avenue between Bloomington Avenue and San Bernardino Avenue	22860

Figure 3-A – Existing Roadway System



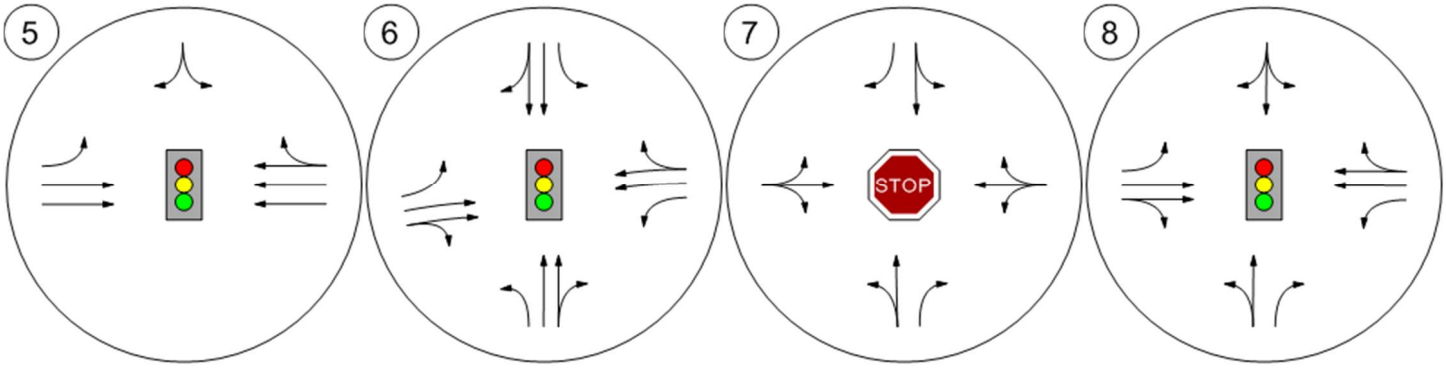


1. Sierra Avenue (NS) / San Bernardino Avenue (EW)

2. Sierra Avenue (NS) / Valley Boulevard (EW)

3. Sierra Avenue (NS) / I-10 Ramps (EW)

4. Sierra Avenue (NS) / Slover Avenue (EW)



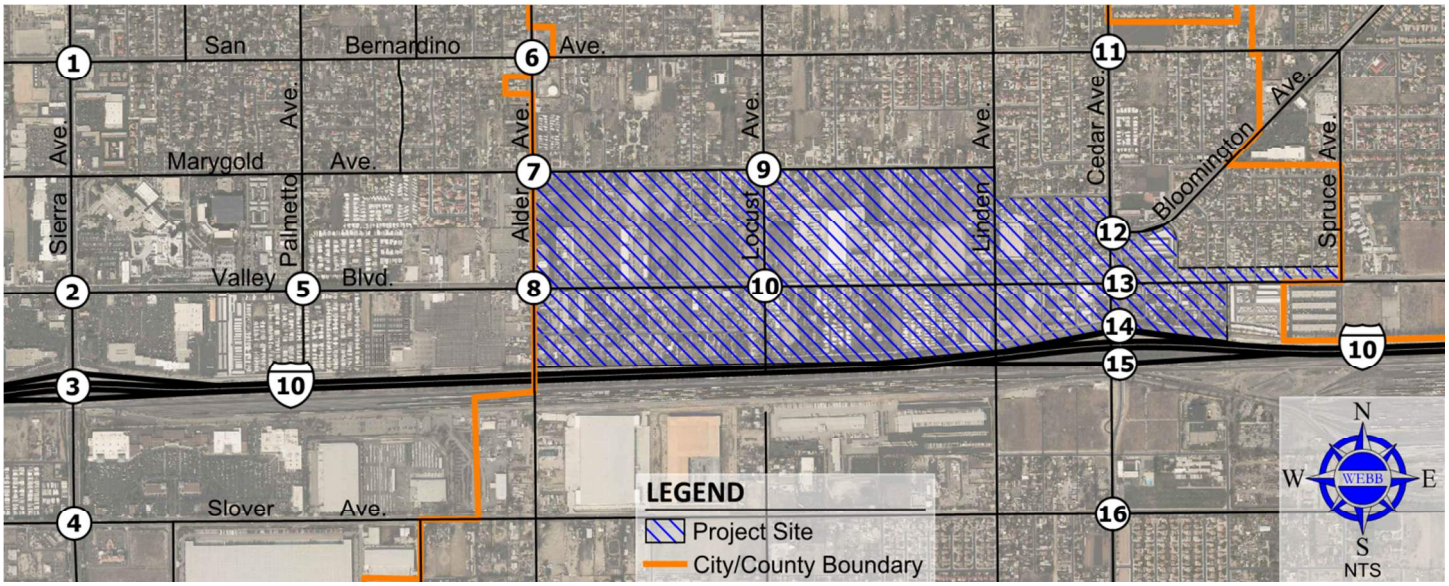
5. Palmetto Avenue (NS) / Valley Boulevard (EW)

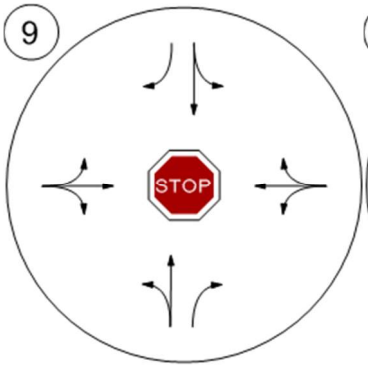
6. Alder Avenue (NS) / San Bernardino Avenue (EW)

7. Alder Avenue (NS) / Marygold Avenue (EW)

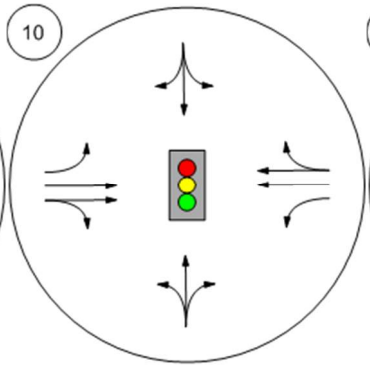
8. Alder Avenue (NS) / Valley Boulevard (EW)

Figure 3-A – Existing Roadway System (Continued)

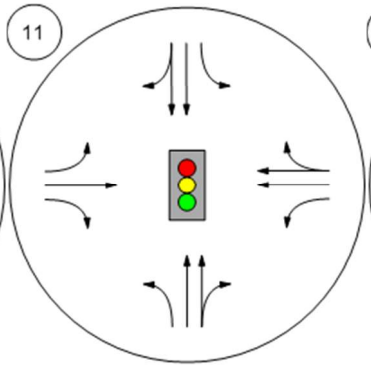




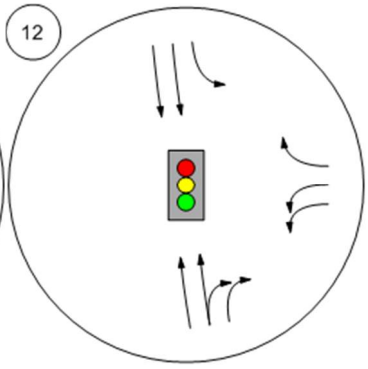
9. Locust Avenue (NS) / Marygold Avenue (EW)



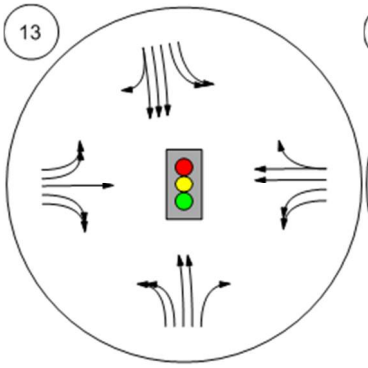
10. Locust Avenue (NS) / Valley Boulevard (EW)



11. Cedar Avenue (NS) / San Bernardino Avenue (EW)



12. Cedar Avenue (NS) / Bloomington Avenue (EW)



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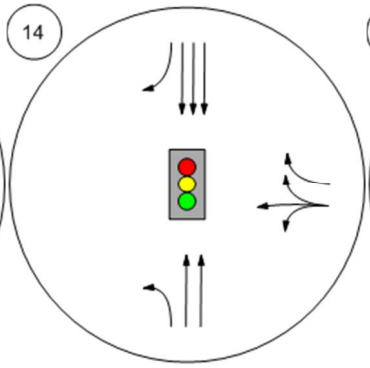

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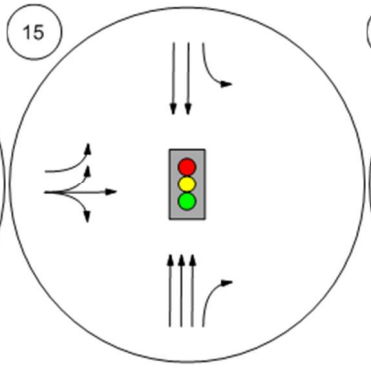

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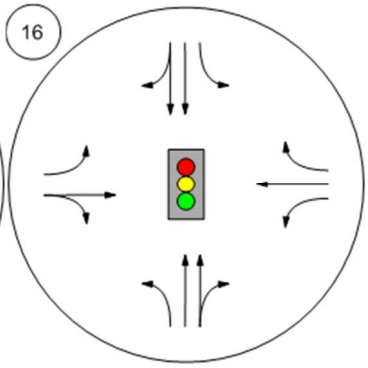
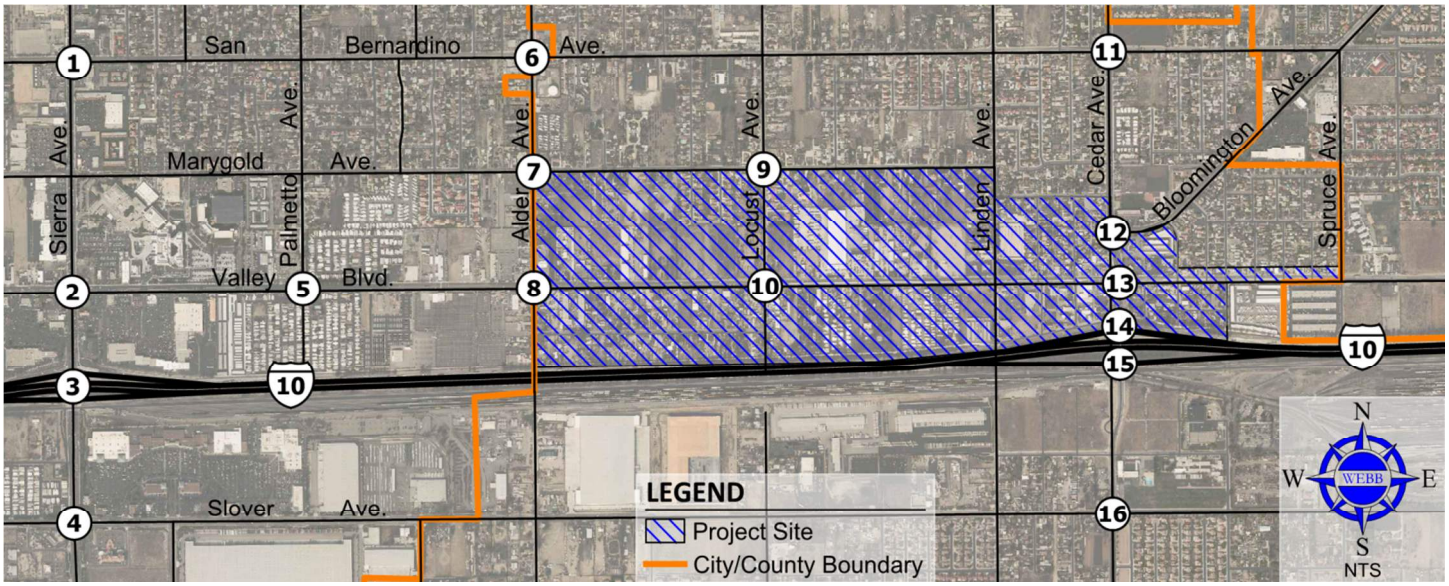
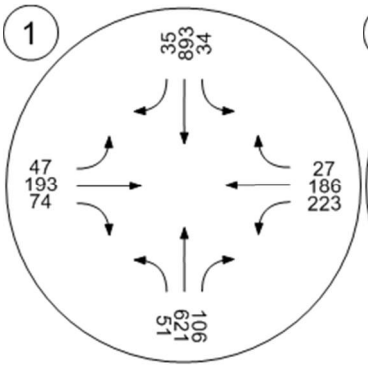


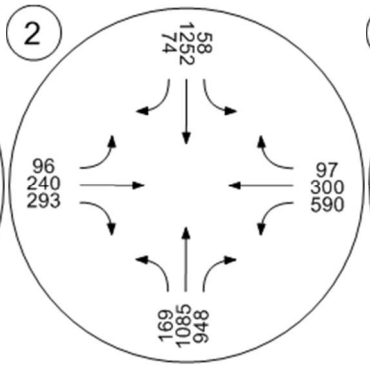
16. Cedar Avenue (NS) / Slover Avenue (EW)

Figure 3-B – Existing AM Peak Hour Intersection Volumes

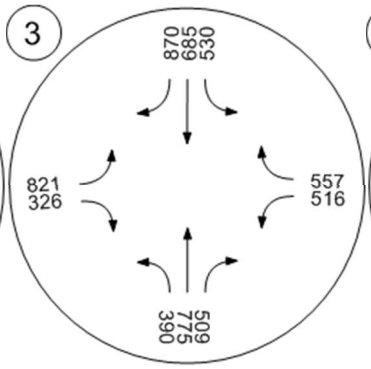




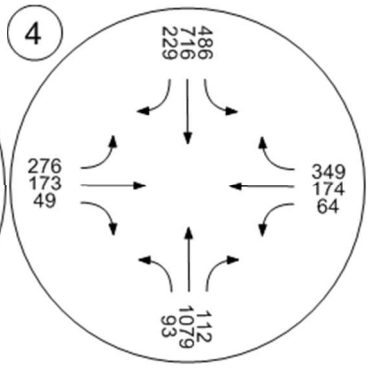
1. Sierra Avenue (NS) / San Bernardino Avenue (EW)



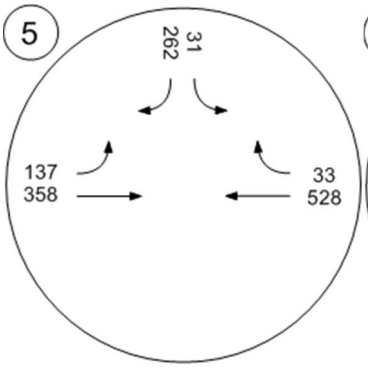
2. Sierra Avenue (NS) / Valley Boulevard (EW)



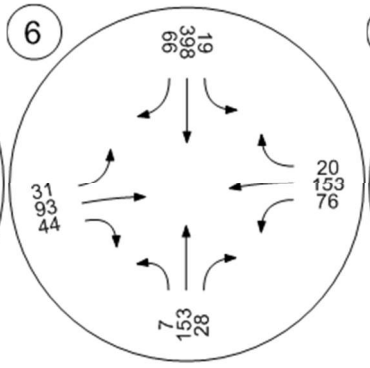
3. Sierra Avenue (NS) / I-10 Ramps (EW)



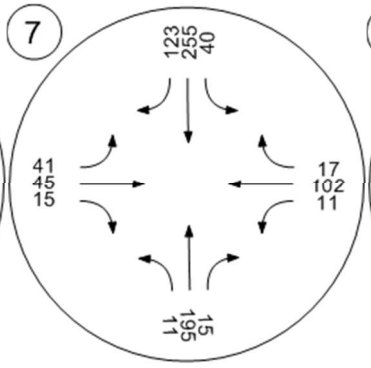
4. Sierra Avenue (NS) / Slover Avenue (EW)



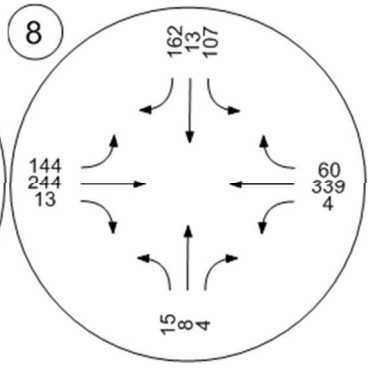
5. Palmetto Avenue (NS) / Valley Boulevard (EW)



6. Alder Avenue (NS) / San Bernardino Avenue (EW)

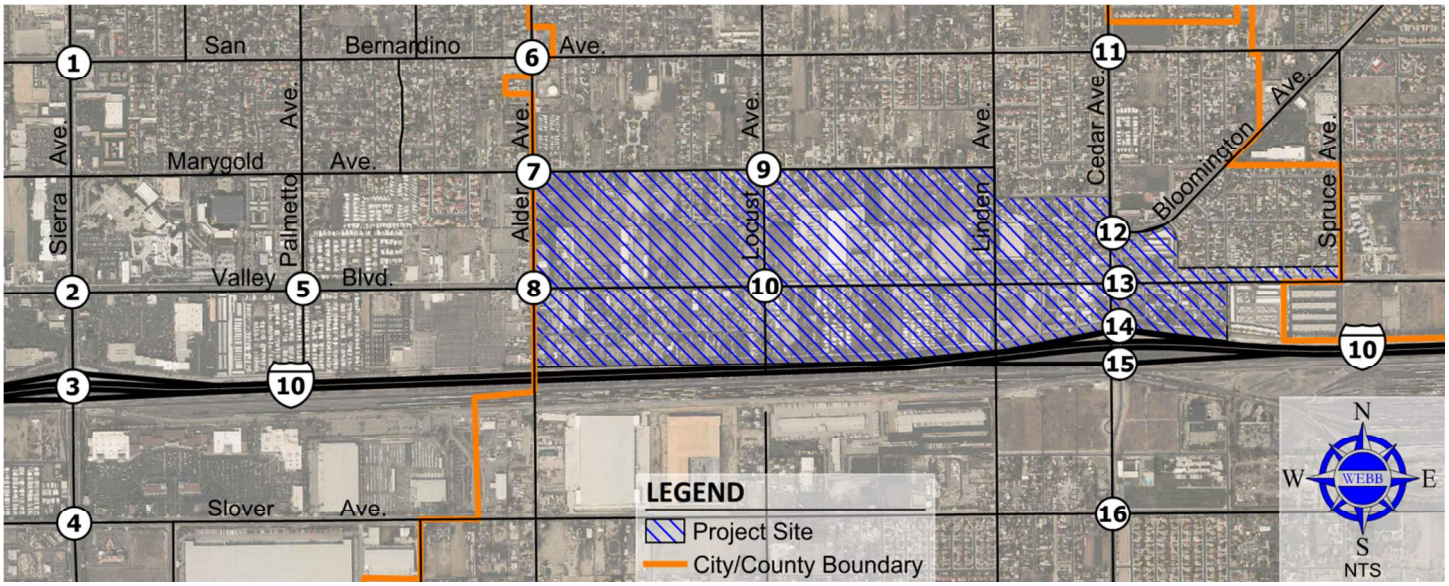


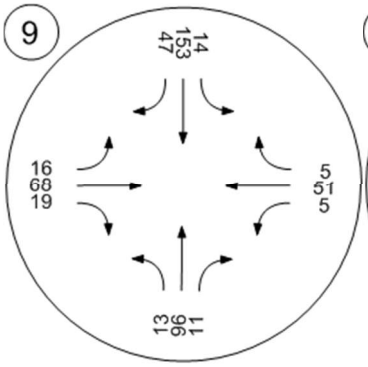
7. Alder Avenue (NS) / Marygold Avenue (EW)



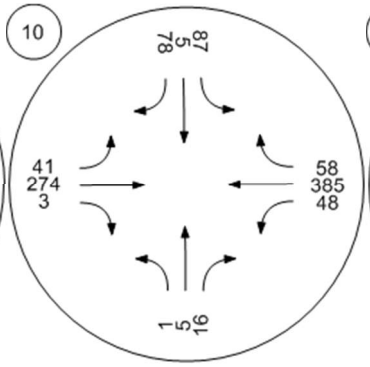
8. Alder Avenue (NS) / Valley Boulevard (EW)

Figure 3-B – Existing AM Peak Hour Intersection Volumes (Continued)

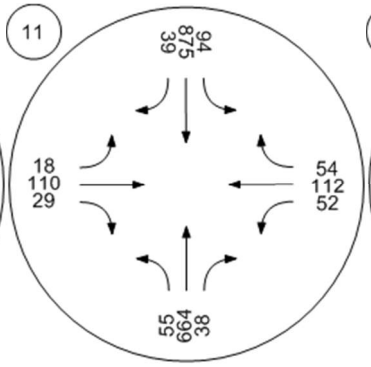




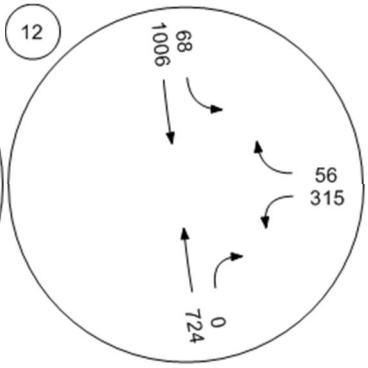
9. Locust Avenue (NS) / Marygold Avenue (EW)



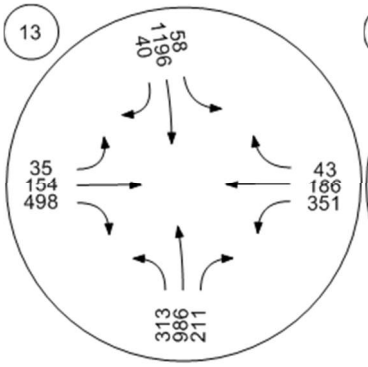
10. Locust Avenue (NS) / Valley Boulevard (EW)



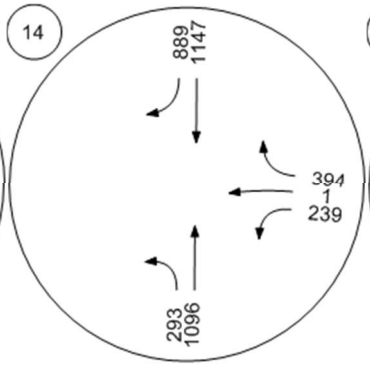
11. Cedar Avenue (NS) / San Bernardino Avenue (EW)



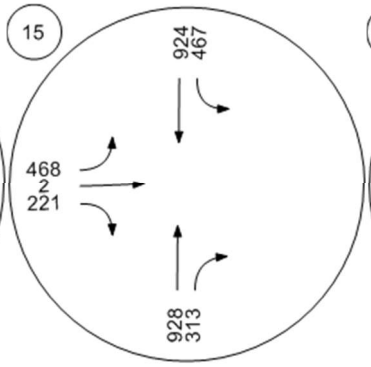
12. Cedar Avenue (NS) / Bloomington Avenue (EW)



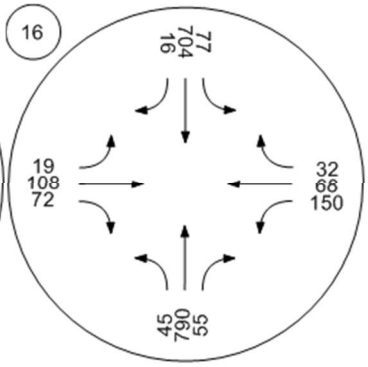
13. Cedar Avenue (NS) / Valley Boulevard (EW)



14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)

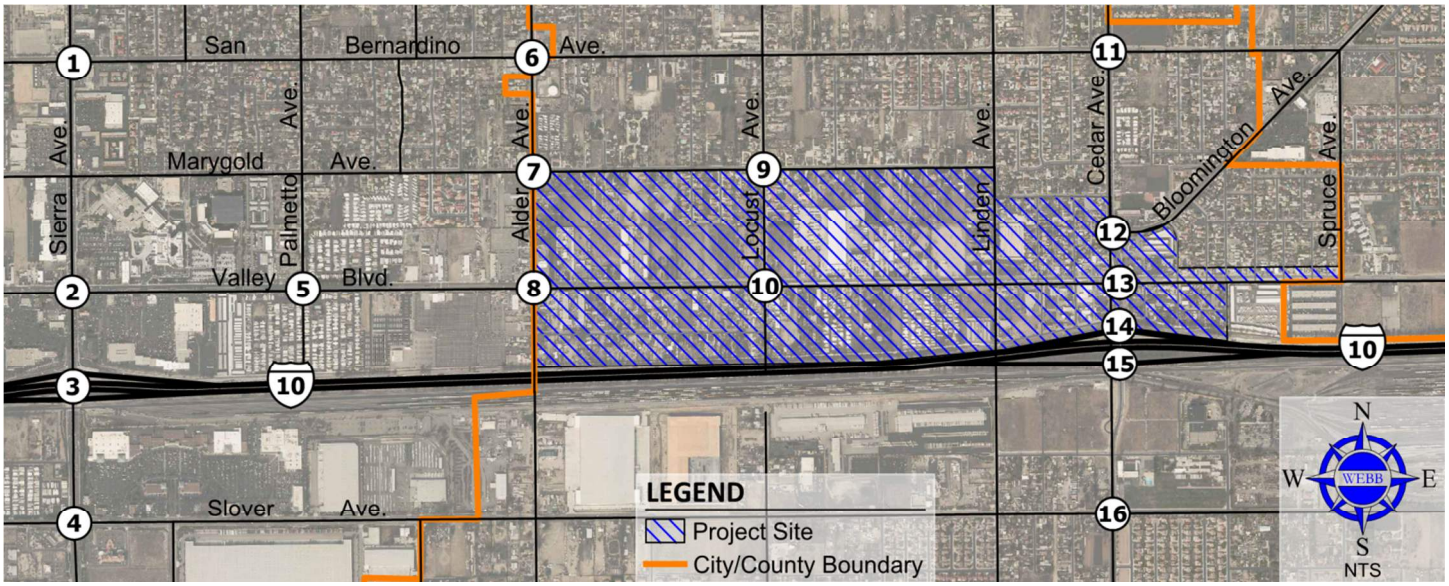


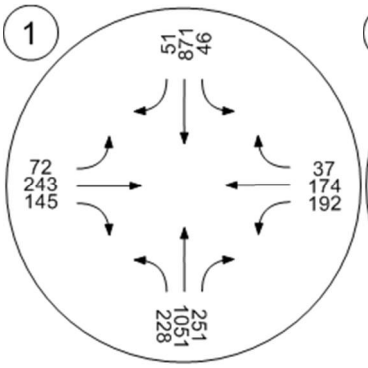
15. Cedar Avenue (NS) / I-10 Eastbound Ramps(EW)



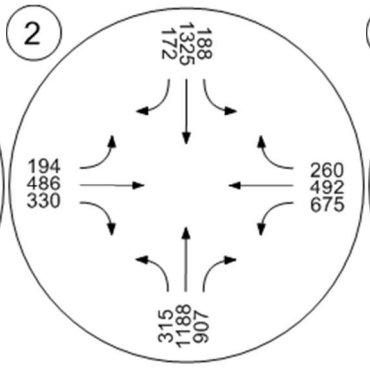
16. Cedar Avenue (NS) / Slover Avenue (EW)

Figure 3-C – Existing PM Peak Hour Intersection Volumes

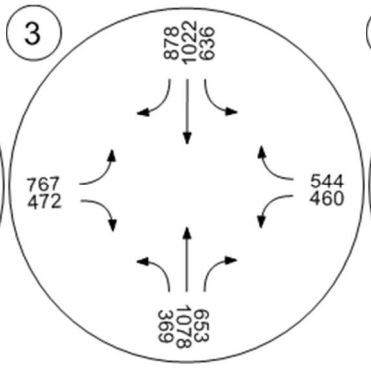




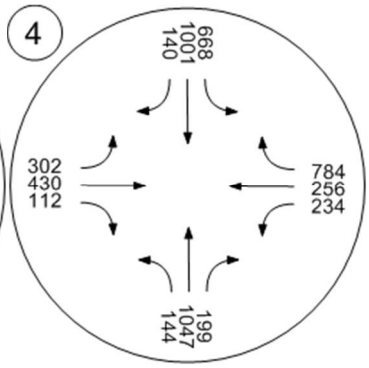
1. Sierra Avenue (NS) / San Bernardino Avenue (EW)



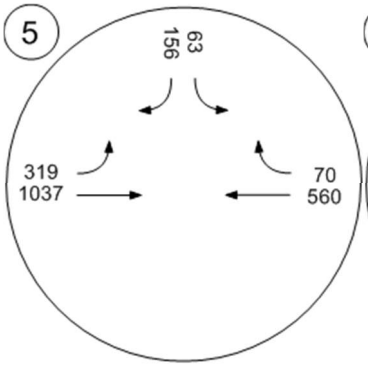
2. Sierra Avenue (NS) / Valley Boulevard (EW)



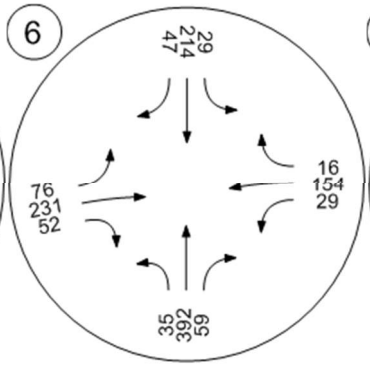
3. Sierra Avenue (NS) / I-10 Ramps (EW)



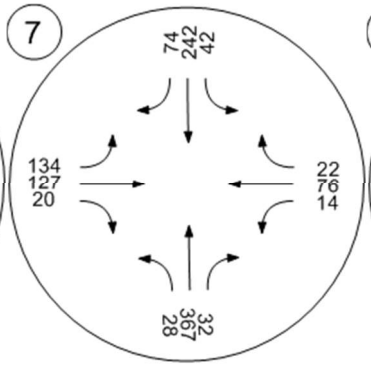
4. Sierra Avenue (NS) / Slover Avenue (EW)



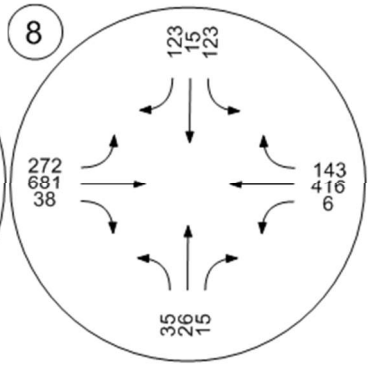
5. Palmetto Avenue (NS) / Valley Boulevard (EW)



6. Alder Avenue (NS) / San Bernardino Avenue (EW)

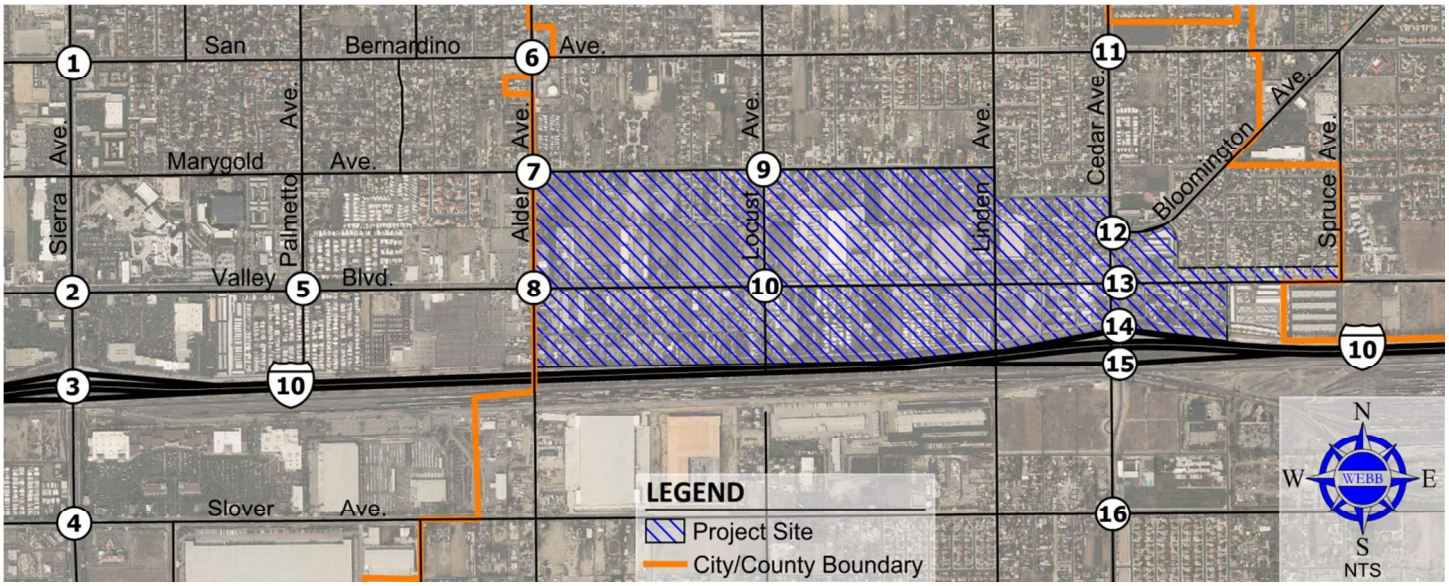


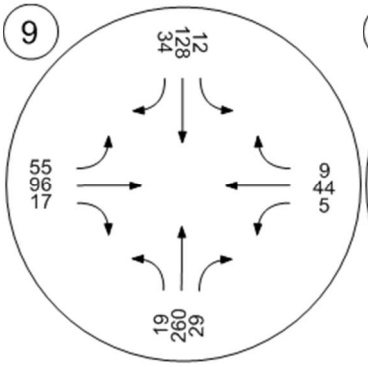
7. Alder Avenue (NS) / Marygold Avenue (EW)



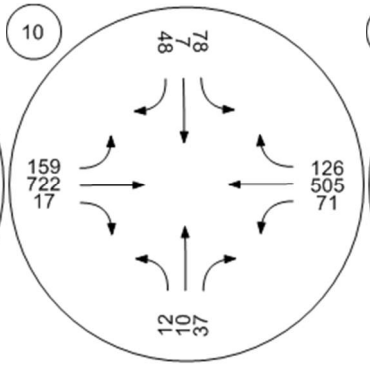
8. Alder Avenue (NS) / Valley Boulevard (EW)

Figure 3-C – Existing PM Peak Hour Intersection Volumes (Continued)

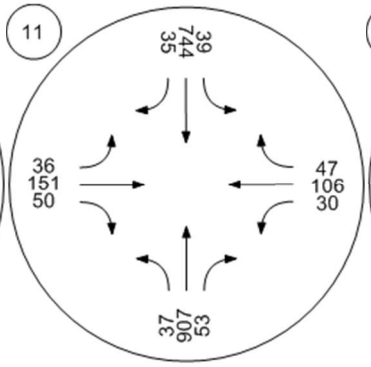




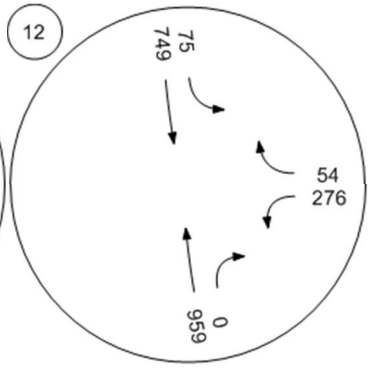
9. Locust Avenue (NS) / Marygold Avenue (EW)



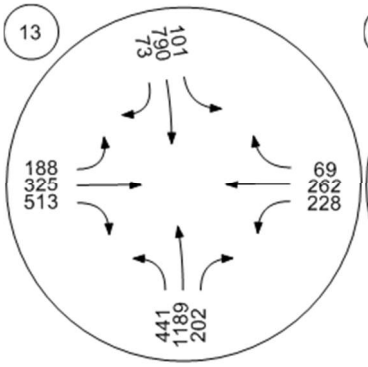
10. Locust Avenue (NS) / Valley Boulevard (EW)



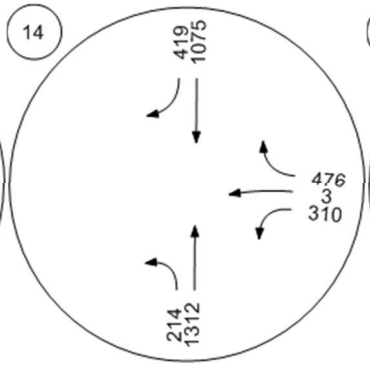
11. Cedar Avenue (NS) / San Bernardino Avenue (EW)



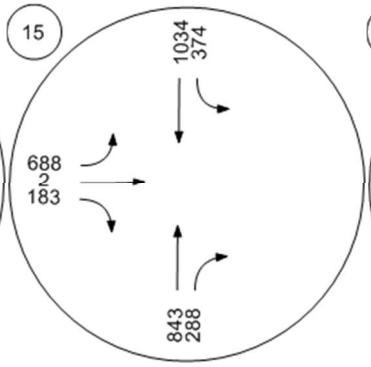
12. Cedar Avenue (NS) / Bloomington Avenue (EW)



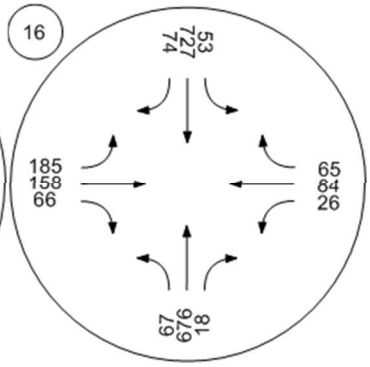
13. Cedar Avenue (NS) / Valley Boulevard (EW)



14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)



15. Cedar Avenue (NS) / I-10 Eastbound Ramps(EW)



16. Cedar Avenue (NS) / Slover Avenue (EW)

Level of Service Methodology

The County of San Bernardino Public Works Department requires that the latest version of the Transportation Research Board Highway Capacity Manual (HCM) be used to analyze Level of Service (LOS). The latest version of the HCM is 2010 (HCM2010).

Quality of service describes how well a transportation facility or service operates from the traveler's perspective. Level of service (LOS) is a quantitative stratification of a performance measure or measures that represent quality of service. LOS is measured on a familiar A to F scale where LOS A represents the best conditions from a traveler's perspective and LOS F the worst. A simple LOS letter system is used to hide much of the complexity of transportation facility performance in order to simplify decision making on whether facility performance is generally acceptable and whether a future change in performance is likely to be perceived as significant by the general public. One reason for the widespread adoption of the LOS concept by agencies is the concept's ability to communicate roadway performance to nontechnical decision makers.

The HCM2010 evaluates the LOS of intersections based upon the control delay per vehicle. Control delay is defined as the delay associated with vehicles slowing in advance of an intersection, the time spent stopped on an intersection approach, the time spent as vehicles move up in the queue, and the time needed for vehicles to accelerate to their desired speed. The methodology used to evaluate the intersection level of service differs on whether the intersection is signalized or unsignalized. Levels of service at signalized and unsignalized intersections have been evaluated using PTV Vistro 4.00, which is based upon HCM2010 methodologies.

Signalized Intersections

Signalized intersections have been evaluated using the Operational Method as described in Chapter 18 of the HCM2010. According to this methodology, the level of service for signalized intersections is based upon the weighted average control delay, in seconds per vehicle, of all vehicles passing through the intersection. Table 3-2 shows the criteria used to determine the level of service for signalized intersections.

Table 3-2 – Level of Service for Signalized Intersections

Level of Service	Control Delay (sec/vehicle)	Description
A	≤ 10	Minimal delay and primarily free-flow operation. Most vehicles do not stop because they arrive during the green indication or only stop for a brief amount of time as the signal changes.
B	> 10 – 20	Short delay and reasonably unimpeded operation. Many vehicles do not stop because they arrive during the green indication or only stop for a short amount of time as the signal changes. More vehicles stop than with LOS A.
C	> 20 – 35	Moderate delay and stable operation. Individual cycle failures (i.e. when queued vehicles do not clear the signal during the next green indication) may begin to appear. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.
D	> 35 – 55	Less stable operation in which small increases in vehicles may cause substantial increases in delay. Many vehicles stop and individual cycle failures are noticeable.
E	> 55 – 80	Significant delay and unstable operation. Most vehicles stop and individual cycle failures are frequent.
F	> 80	Considerable delay and extensive queuing. Almost all vehicles stop and most cycles fail to clear the queue.

Unsignalized Intersections

Unsignalized intersections have been evaluated using Chapter 19 and 20 of the HCM2010. According to this methodology, the level of service for all-way stop intersections is based upon the weighted average control delay, in seconds per vehicle, of all vehicles passing through the intersection. For two-way stop controlled intersections, the level of service is based on the highest control delay of all controlled movements for the intersection. Table 3-3 shows the criteria used to determine the level of service for unsignalized intersections.

Table 3-3 – Level of Service for Unsignalized Intersections

Level of Service	Control Delay (sec/vehicle)	Description
A	≤ 10	Minimal delay. Usually no conflicting traffic.
B	> 10 – 15	Short delay. Occasionally some conflicting traffic.
C	> 15 – 25	Noticeable delay, but not inconveniencing. Usually some conflicting traffic.
D	> 25 – 35	Noticeable delay and irritating. A significant amount of conflicting traffic. Increased likelihood of risk taking.
E	> 35 – 50	Significant delay approaching tolerance level. Lots of conflicting traffic, but with some gaps of suitable size. Risk taking behavior likely.
F	> 50	Considerable delay exceeding tolerance level. Lots of conflicting traffic, with not enough gaps of suitable size. High likelihood of risk taking.

▪ Determination of Impacts & Required Level of Service

Acceptable Level of Service

The acceptable Level of Service (LOS) for the Bloomington area in unincorporated San Bernardino County is based on the Bloomington Community Plan, Policy BL/CI 1.1:

> *Ensure that all new development proposals do not degrade Levels of Service (LOS) on Major Arterials below LOS "C" during non-peak hours or below LOS "D" during peak hours.*

The acceptable LOS for the City of Fontana is based on the City of Fontana General Plan Circulation Element Goal #1, Policy 12:

> *All streets and intersections designed after the adoption of the General Plan will be planned to function at level of service (LOS) C or better, wherever possible. Improvements to existing streets will be designed to LOS C standards whenever feasible.*

The acceptable LOS for Caltrans facilities is based on the Caltrans' *Guide for the Preparation of Traffic Impact Studies* Section II:

> *Caltrans endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" on State highway facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating*

at less than the appropriate target LOS, the existing measures of effectiveness (MOE) should be maintained.

Per discussion with Mark Roberts, Caltrans District 8 Office Chief, Intergovernmental Review, Community and Regional Planning, the region-wide goal for acceptable LOS on all freeways, roadway segments, and intersections is LOS D.

Determination of Significant Impact

The determination of significant impacts at intersections used in this study is based on the County of San Bernardino Traffic Impact Analysis Guidelines, Sections 10.8.1 and 10.8.2, with modifications to accommodate the varying acceptable LOS standards in different jurisdictions:

SIGNALIZED INTERSECTIONS

Any study intersection that is operating at an acceptable LOS for any study scenario without project traffic in which the addition of project traffic causes the intersection to degrade to an unacceptable LOS shall mitigate the impact to bring the intersection back to an acceptable LOS.

Any study intersection that is operating at an unacceptable LOS for any study scenario without project traffic shall mitigate any impacts so as to bring the intersection back to the overall level of delay established prior to project traffic being added. For scenarios which include the addition of Cumulative Project Traffic (i.e. shared impacts), study intersections shall be mitigated to an acceptable LOS.

UNSIGNALIZED INTERSECTIONS

An impact is considered significant if the study determines that either section a) or both sections b) and c) occur.

a) The addition of project related traffic causes the intersection to move from an acceptable LOS to an unacceptable LOS

OR

b) The project contributes additional traffic to an intersection that is already projected to operate at an unacceptable LOS with background traffic

AND

c) One or both of the following conditions are met:

1) The project adds ten (10) or more trips to any approach

2) The intersection meets the peak hour traffic signal warrant after the addition of project traffic.

Once a significant impact has been identified, mitigation shall be provided as follows:

1. For scenarios involving project traffic but not Cumulative Project Traffic, the LOS shall be mitigated to either an acceptable LOS for case a) above or to pre-project LOS and delay for case b) above.

2. For scenarios that include Cumulative Project Traffic study intersections shall be mitigated to an acceptable LOS.

▪ Levels of Service – Existing Conditions

The intersection levels of service for existing conditions shown on Table 3-4 are based upon the existing roadway system shown on Figure 3-A and the existing AM and PM peak hour intersection volumes shown on Figure 3-B and Figure 3-C, respectively. The level of service calculation worksheets are provided in Appendix E. The following study intersections currently operate at an unacceptable LOS in existing conditions:

1. Sierra Avenue (NS) / San Bernardino Avenue (EW)

2. Sierra Avenue (NS) / Valley Boulevard (EW)
4. Sierra Avenue (NS) / Slover Avenue (EW)
14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)

Table 3-4 – Intersection Levels of Service – Existing Conditions

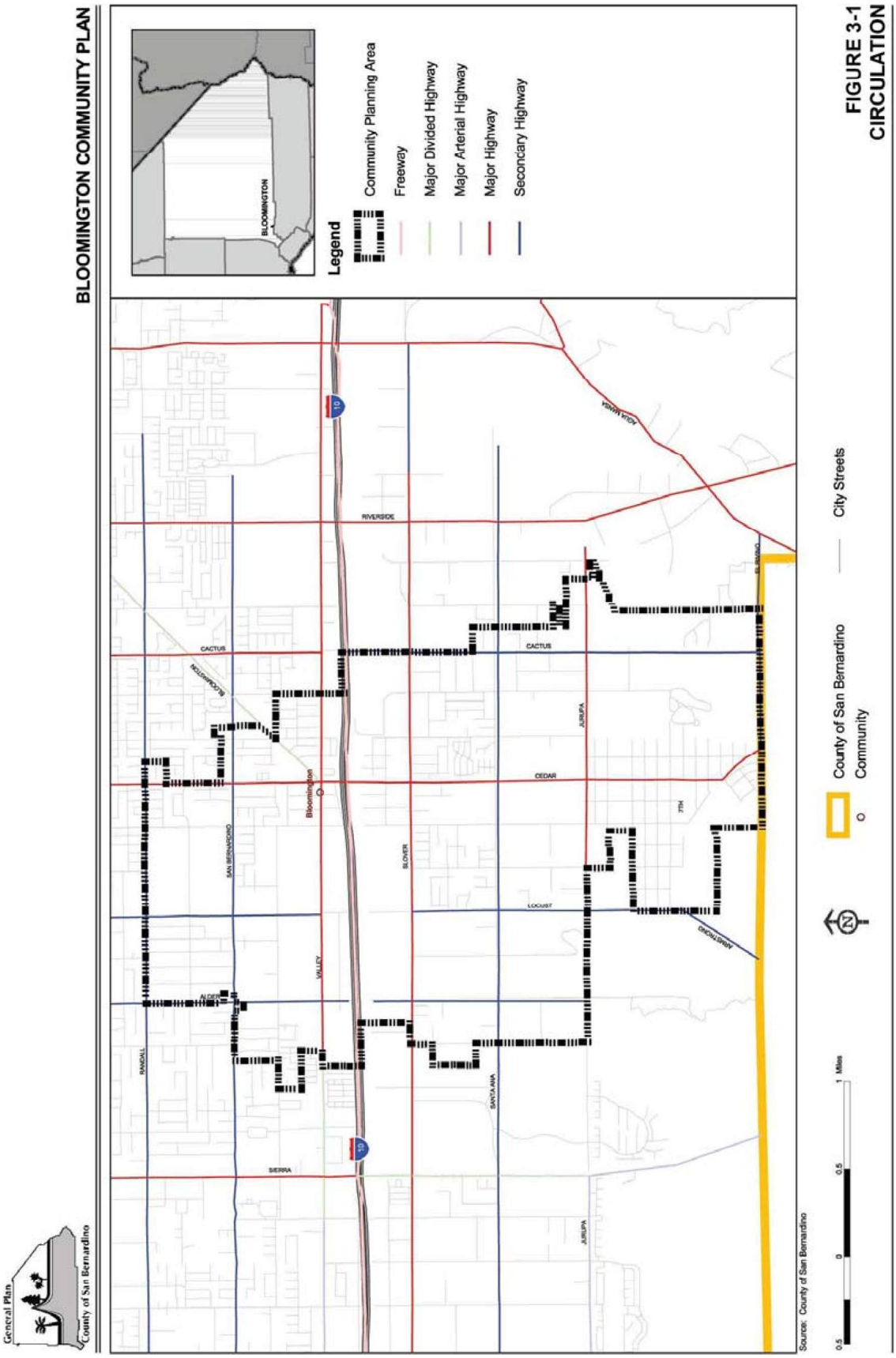
Intersection	Jurisdiction	LOS Standard	Peak Hour	Traffic Control	Delay (sec)	LOS
1. Sierra Avenue (NS) / San Bernardino Avenue (EW)	Fontana	C	AM PM	Signal	28.7 ***37.0***	C ***D***
2. Sierra Avenue (NS) / Valley Boulevard (EW)	Fontana	C	AM PM	Signal	27.9 ***36.6***	C ***D***
3. Sierra Avenue (NS) / I-10 Ramps (EW)	Caltrans	D	AM PM	Signal	25.5 28.1	C C
4. Sierra Avenue (NS) / Slover Avenue (EW)	Fontana	C	AM PM	Signal	28.2 34.7	C C
5. Palmetto Avenue (NS) / Valley Boulevard (EW)	Fontana	C	AM PM	Signal	22.0 17.0	C B
6. Alder Avenue (NS) / San Bernardino Avenue (EW)	Fontana / County	C	AM PM	Signal	15.5 16.7	B B
7. Alder Avenue (NS) / Marygold Avenue (EW)	Fontana / County	C	AM PM	AWSC	11.7 22.9	B C
8. Alder Avenue (NS) / Valley Boulevard (EW)	Fontana / County	C	AM PM	Signal	26.1 25.1	C C
9. Locust Avenue (NS) / Marygold Avenue (EW)	County	D	AM PM	AWSC	8.8 10.7	A B
10. Locust Avenue (NS) / Valley Boulevard (EW)	County	D	AM PM	Signal	18.1 16.8	B B
11. Cedar Avenue (NS) / San Bernardino Avenue (EW)	County	D	AM PM	Signal	18.7 16.8	B B
12. Cedar Avenue (NS) / Bloomington Avenue (EW)	County	D	AM PM	Signal	12.4 12.2	B B
13. Cedar Avenue (NS) / Valley Boulevard (EW)	County	D	AM PM	Signal	43.4 31.4	D C
14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)	Caltrans	D	AM PM	Signal	***67.5*** 33.8	***E*** C
15. Cedar Avenue (NS) / I-10 Eastbound Ramps (EW)	Caltrans	D	AM PM	Signal	39.1 39.6	D D
16. Cedar Avenue (NS) / Slover Avenue (EW)	County	D	AM PM	Signal	21.8 25.5	C C

AWSC = All Way Stop Controlled
XXX = Exceeds LOS Standard

▪ General Plan Circulation

The current Bloomington Community Plan circulation element is shown on Figure 3-D.

Figure 3-D – Bloomington Community Plan Circulation Element



▪ Pedestrian and Bicycle Circulation

Sidewalk improvements are intermittently provided along Valley Boulevard and throughout the specific plan area. Most, but not all improved parcels have installed sidewalks; others have dirt shoulders. The Affordable Bloomington project will install sidewalks along that project's frontage while the Cedar Avenue overcrossing project will remove the southern east–west crosswalk. Crosswalks are provided primarily at signalized intersections, with some also at unsignalized intersections.

Walk Score gives the community of Bloomington an overall score of 26 and labels it a car dependent community. The proposed project area receives a higher Walk Score of 43 due to some available transit and proximity to Ayala Park, a number of schools, and restaurants and stores.

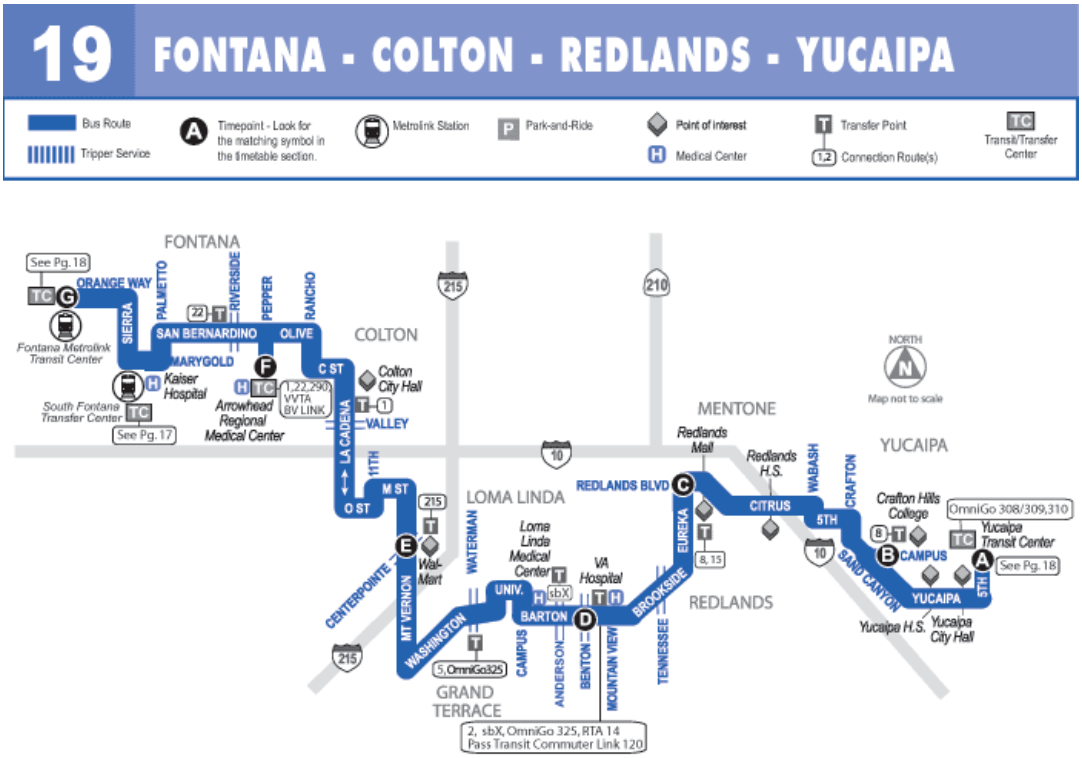
There are no existing bikeways or trails in the study area and only one trail planned for Marygold Avenue. Bicyclists generally ride along the street or on the sidewalk (when available). The Cedar Avenue Overcrossing project would include a shoulder width varying from 6 to 10 feet that is adequate to accommodate a Class II bike lane within the overcrossing.

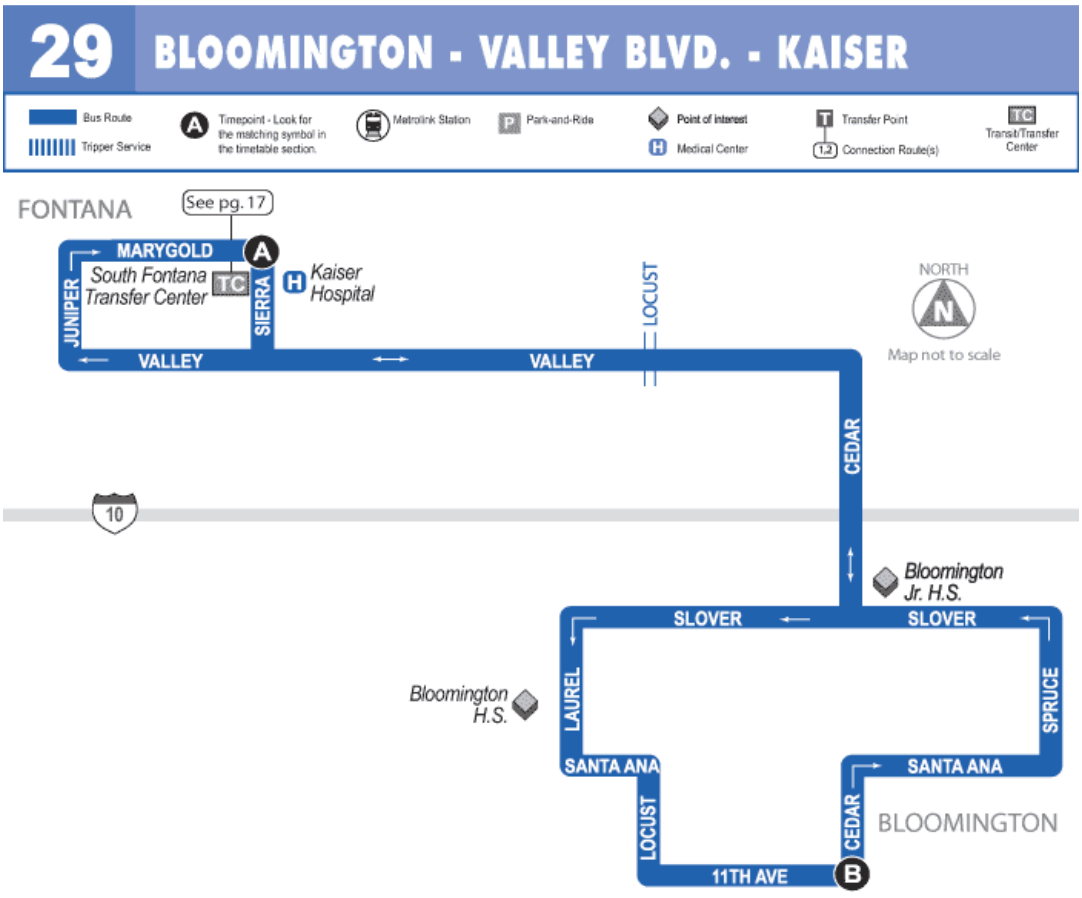
▪ Transit Service

The project area is served by Omnitrans route 19 (Fontana, - Colton – Redlands – Yucaipa) and route 29 (Bloomington – Valley Blvd. – Kaiser). The maps for these routes are shown on Figure 3-E.

The Affordable Bloomington project plans to install a bus turnout lane along the project frontage. The direct access to bus service expands access to and from the corridor and enables the County to better compete for future funding.

Figure 3-E –Transit Route Maps





PROJECTED FUTURE TRAFFIC

Method of Projection

For existing (year 2015) scenarios, a build-up method of traffic projection was utilized based on existing traffic conditions and project generated traffic.

For year 2035 scenarios, the San Bernardino Transportation Analysis Model (SBTAM) was used to forecast future volumes.

Project Generated Traffic

Project Trip Generation

Trip Generation Rates

Trip generation represents the amount of traffic traveling to and from the proposed project. The traffic generation figures used in this study are based upon the existing and proposed land uses within the project. The existing land uses include 48.9 TSF (1,000 Square Feet Gross Floor Area) Automobile Care Center, 22.1 TSF Automobile Sales, 11.2 TSF Church, 270.2 TSF Mini-Warehouse, 29.8 TSF Recreational Community Center, 12.5 TSF General Office Building, 401.5 TSF General Light Industrial, 15.5 Acres Mobile Home Park, 80 DU (Dwelling Unit) Apartments, 30 Rooms Hotel, 2.2 TSF Nursery (Garden Center), 6 Acres City Park, 19.9 TSF High-Turnover (Sit-Down) Restaurant, 91.4 TSF Shopping Center, 18 VFP (Vehicle Fueling Positions) Gasoline/Service Station with Convenience Market, and 267 DU Single-Family Detached Housing. The proposed land uses include 1552.1 TSF General Light Industrial, 78.9 TSF High-Turnover (Sit-Down) Restaurant, 460.2 Shopping Center, 18 VFP Gasoline/Service Station with Convenience Market, 100 Rooms Hotel 435 DU Single-Family Detached Housing, 340 DU Residential Condominium/Townhouse, 404 DU Mixed Use: Residential, and 79.8 TSF Mixed Use: Commercial. Table 4-1 shows the peak hour and daily trip generation rates for the existing and proposed land uses.

The trip generation rates are based on the weighted average trip generation rates provided in the *Trip Generation Manual (9th Edition)* by the Institute of Transportation Engineers (ITE), 2012, except for the mixed use land use. The inbound and outbound peak hour trip generation rates are calculated by multiplying the total peak hour generation rate by the directional distribution provided in the *Trip Generation Manual*. The mixed use land use trip generation rates are based on the *(Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region* by San Diego Association of Governments (SANDAG), 2002.

Table 4-1 – Trip Generation Rates

Land Use	Unit	AM Peak Hour			PM Peak Hour			Daily
		Total	In	Out	Total	In	Out	
General Light Industrial Land Use Category: 110	TSF	0.92	0.81	0.11	0.97	0.12	0.85	6.97
Industrial Park Land Use Category: 130	TSF	0.82	0.67	0.15	0.85	0.18	0.67	6.83
Mini-Warehouse Land Use Category: 151	TSF	0.14	0.08	0.06	0.26	0.13	0.13	2.50
Single-Family Detached Housing Land Use Category: 210	DU	0.75	0.19	0.56	1.00	0.63	0.37	9.52
Apartments Land Use Category: 220	DU	0.51	0.10	0.41	0.62	0.40	0.22	6.65
Residential Condominium/Townhouse Land Use Category: 230	DU	0.44	0.07	0.37	0.52	0.35	0.17	5.81
Mobile Home Park Land Use Category: 240	DU	0.44	0.09	0.35	0.59	0.37	0.22	4.99
Hotel Land Use Category: 310	Rooms	0.53	0.31	0.22	0.60	0.31	0.29	8.17
City Park Land Use Category: 411	Acres	4.50	2.52	1.98	3.50	2.00	1.51	9.00
Recreational Community Center Land Use Category: 495	TSF	2.05	1.35	0.70	2.74	1.34	1.40	33.82
Church Land Use Category: 560	TSF	0.56	0.35	0.21	0.55	0.26	0.29	9.11
General Office Building Land Use Category: 710	TSF	1.56	1.37	0.19	1.49	0.25	1.24	11.03
Nursery (Garden Center) Land Use Category: 817	TSF	2.43	1.26	1.17	6.94	3.40	3.54	68.10
Shopping Center Land Use Category: 820	TSF	0.96	0.60	0.36	3.71	1.78	1.93	42.70
Automobile Sales Land Use Category: 841	TSF	1.92	1.44	0.48	2.62	1.05	1.57	32.30
High-Turnover (Sit-Down) Restaurant Land Use Category: 932	TSF	10.81	5.95	4.86	9.85	5.91	3.94	127.15
Automobile Care Center Land Use Category: 942	TSF	3.11	1.49	1.62	3.22	1.93	1.29	2.25
Gasoline/Service Station with Convenience Market Land Use Category: 945	VFP	10.16	5.08	5.08	13.51	6.76	6.76	162.78
Mixed Use: Commercial Only[1]	TSF	3.30	1.98	1.32	9.90	4.95	4.95	110.00
Mixed Use: Residential Only[1]	DU	0.45	0.14	0.32	0.65	0.39	0.26	5.00

TSF = 1,000 Square Feet Gross Floor Area, DU = Dwelling Units, VFP = Vehicle Fueling Positions.
Average trip generation rates from *Trip Generation Manual, ITE, 9th Edition* (2012) except as noted.
[1] Trip generation rates from SANDAG "Brief Guide of Vehicular Traffic Generation Rates."

Internal Trips

A key characteristic of a multi-use development is that trips among the various land uses can be made on-site. These internal trips can be made either by walking or by vehicle entirely on internal pathways or internal roadways without using street external to the site. Internal trips for existing and proposed land uses were calculated based on *National Cooperative Highway Research Program (NCHRP) Report 684 – Enhancing Internal Trip Capture Estimation for Mixed-Use Developments* by Transportation Research Board, 2011. The Internal Trip Capture Estimation worksheets are included in Appendix A.

Pass-by Trips

Pass-by trips are trips made as intermediate stops on the way from an origin to a primary trip destination without a route diversion. Pass-by trips are attracted from traffic passing the site on an adjacent street or roadway that offers direct access to the site. Pass-by trips do not add new traffic to the adjacent street system. Pass-by trips are only applicable to trips that enter or exit the site. Pass-by trips for existing and proposed land uses were calculated based on methodology and data provided in the *Trip Generation Handbook (3rd Edition)* by ITE, 2014.

Project Trip Generation

Table 4-2 presents the daily and peak hour trip generation for the existing land uses. Table 4-3 presents the daily and peak hour trip generation for the proposed land uses. Table 4-4 presents the net new external primary trip-ends for the entire specific plan. As shown, the proposed specific plan is anticipated to generate approximately 23,633 daily trip-end, including 1,174 trip-ends during the AM peak hour and 1,356 trip-ends during the PM peak hour.

Table 4-2 – Existing Land Use Trip Generation

Land Use	Qty	Unit	AM Peak Hour			PM Peak Hour			Daily
			Total	In	Out	Total	In	Out	
General Light Industrial	401.5	TSF	**369**	**325**	**44**	**389**	**47**	**342**	**2,798**
Mini-Warehouse	270.2	TSF	**38**	**21**	**17**	**70**	**35**	**35**	**676**
Single-Family Detached Housing	267	DU	*200*	*50*	*150*	*267*	*168*	*99*	*2,542*
Internal Trip-ends			*(21)*	*(4)*	*(17)*	*(42)*	*(32)*	*(10)*	*(63)*
Land Use Total			**179**	**46**	**133**	**225**	**136**	**89**	**2,479**
Apartments	80	DU	*41*	*8*	*33*	*50*	*32*	*18*	*532*
Internal Trip-ends			*(5)*	*(1)*	*(4)*	*(8)*	*(6)*	*(2)*	*(13)*
Land Use Total			**36**	**7**	**29**	**42**	**26**	**16**	**519**
Mobile Home Park	178	DU	*78*	*16*	*62*	*105*	*65*	*40*	*888*
Internal Trip-ends			*(8)*	*(1)*	*(7)*	*(16)*	*(12)*	*(4)*	*(24)*
Land Use Total			**70**	**15**	**55**	**89**	**53**	**36**	**864**
Hotel	30	Rooms	*16*	*9*	*7*	*18*	*9*	*9*	*245*
Internal Trip-ends			*(3)*		*(3)*	*(15)*	*(8)*	*(7)*	*(18)*
Land Use Total			**13**	**9**	**4**	**3**	**1**	**2**	**227**
City Park	6	Acres	**27**	**15**	**12**	**21**	**12**	**9**	**54**
Recreational Community Center	29.8	TSF	**61**	**40**	**21**	**82**	**40**	**42**	**1,008**
Church	11.3	TSF	**6**	**4**	**2**	**6**	**3**	**3**	**103**
General Office Building	12.5	TSF	*20*	*18*	*2*	*19*	*3*	*16*	*138*
Internal Trip-ends			*(7)*	*(6)*	*(1)*	*(5)*	*(3)*	*(2)*	*(12)*
Land Use Total			**13**	**12**	**1**	**14**	**0**	**14**	**126**
Nursery (Garden Center)	2.2	TSF	5	3	2	15	7	8	150
Internal Trip-ends						*(5)*	*(2)*	*(3)*	*(5)*
Land Use Total			**5**	**3**	**2**	**10**	**5**	**5**	**145**
Shopping Center	91.4	TSF	*88*	*55*	*33*	*339*	*163*	*176*	*3,903*
Internal Trip-ends			*(12)*	*(6)*	*(6)*	*(104)*	*(39)*	*(65)*	*(116)*
Pass-By Trip-ends (PM Peak = 34%)						*(80)*	*(42)*	*(38)*	*(80)*
Land Use Total			**76**	**49**	**27**	**155**	**82**	**73**	**3,707**
Automobile Sales	22.1	TSF	42	31	11	58	23	35	714
Internal Trip-ends			*(5)*	*(3)*	*(2)*	*(19)*	*(6)*	*(13)*	*(24)*
Land Use Total			**37**	**28**	**9**	**39**	**17**	**22**	**690**
High-Turnover (Sit-Down) Restaurant	19.9	TSF	*215*	*118*	*97*	*196*	*118*	*78*	*2,530*
Internal Trip-ends			*(46)*	*(32)*	*(14)*	*(87)*	*(42)*	*(45)*	*(133)*
Pass-By Trip-ends (PM Peak = 43%)						*(47)*	*(33)*	*(14)*	*(47)*
Land Use Total			**169**	**86**	**83**	**62**	**43**	**19**	**2,350**
Automobile Care Center	48.9	TSF	**110**	**73**	**37**	**152**	**73**	**79**	**776**
Gasoline/Service Station with Convenience Market	18	VFP	*183*	*91*	*92*	*243*	*121*	*122*	*2,930*
Pass-By Trip-ends (AM Peak = 58%, PM Peak = 42%)			*(106)*	*(53)*	*(53)*	*(102)*	*(51)*	*(51)*	*(208)*
Land Use Total			**77**	**38**	**39**	**141**	**70**	**71**	**2,722**
Specific Plan Gross Trip-ends Total			1,499	877	622	2,030	919	1,111	19,987
Specific Plan Internal Trip-ends Total			(107)	(53)	(54)	(301)	(150)	(151)	(408)
Specific Plan Pass-By Trip-ends Total			(106)	(53)	(53)	(229)	(126)	(103)	(335)
SPECIFIC PLAN TOTAL EXTERNAL PRIMARY TRIP-ENDS			**1,286**	**771**	**515**	**1,500**	**643**	**857**	**19,244**

TSF = 1,000 Square Feet Gross Floor Area, DU = Dwelling Units, VFP = Vehicle Fueling Positions.

Table 4-3 – Proposed Land Use Trip Generation

Land Use	Qty	Unit	AM Peak Hour			PM Peak Hour			Daily
			Total	In	Out	Total	In	Out	
Industrial Park	1244.1	TSF	**1,020**	**836**	**184**	**1,057**	**222**	**835**	**8,497**
Mini-Warehouse	270.2	TSF	**38**	**21**	**17**	**70**	**35**	**35**	**676**
Single-Family Detached Housing	435	DU	*326*	*82*	*244*	*435*	*274*	*161*	*4,141*
Internal Trip-ends			*(30)*	*(6)*	*(24)*	*(181)*	*(134)*	*(47)*	*(211)*
Land Use Total			**296**	**76**	**220**	**254**	**140**	**114**	**3,930**
Residential Condominium/Townhouse	254	DU	*112*	*19*	*93*	*132*	*88*	*44*	*1,476*
Internal Trip-ends			*(10)*	*(1)*	*(9)*	*(56)*	*(43)*	*(13)*	*(66)*
Land Use Total			**102**	**18**	**84**	**76**	**45**	**31**	**1,410**
Hotel	250	Rooms	*133*	*78*	*55*	*150*	*76*	*74*	*2,043*
Internal Trip-ends			*(16)*	*(3)*	*(13)*	*(46)*	*(26)*	*(20)*	*(62)*
Land Use Total			**117**	**75**	**42**	**104**	**50**	**54**	**1,981**
Shopping Center	252.6	TSF	*242*	*150*	*92*	*937*	*450*	*487*	*10,786*
Internal Trip-ends			*(27)*	*(14)*	*(13)*	*(186)*	*(59)*	*(127)*	*(213)*
Pass-By Trip-ends (PM Peak = 34%)						*(255)*	*(133)*	*(122)*	*(255)*
Land Use Total			**215**	**136**	**79**	**496**	**258**	**238**	**10,318**
High-Turnover (Sit-Down) Restaurant	26.2	TSF	*283*	*156*	*127*	*258*	*155*	*103*	*3,331*
Internal Trip-ends			*(87)*	*(62)*	*(25)*	*(112)*	*(54)*	*(58)*	*(199)*
Pass-By Trip-ends (PM Peak = 43%)						*(63)*	*(43)*	*(19)*	*(63)*
Land Use Total			**196**	**94**	**102**	**83**	**58**	**26**	**3,069**
Gasoline/Service Station with Convenience Market	18	VFP	*183*	*91*	*92*	*243*	*121*	*122*	*2,930*
Pass-By Trip-ends (AM Peak = 58%, PM Peak = 42%)			*(106)*	*(53)*	*(53)*	*(102)*	*(51)*	*(51)*	*(208)*
Land Use Total			**77**	**38**	**39**	**141**	**70**	**71**	**2,722**
Mixed Use: Commercial Only	79.8	TSF	*263*	*158*	*105*	*790*	*395*	*395*	*8,778*
Internal Trip-ends			*(29)*	*(14)*	*(15)*	*(154)*	*(51)*	*(103)*	*(183)*
Pass-By Trip-ends (PM Peak = 34%)						*(216)*	*(117)*	*(99)*	*(216)*
Land Use Total			**234**	**144**	**90**	**420**	**227**	**193**	**8,379**
Mixed Use: Residential Only	404	DU	*182*	*55*	*127*	*263*	*158*	*105*	*2,020*
Internal Trip-ends			*(17)*	*(4)*	*(13)*	*(107)*	*(77)*	*(30)*	*(124)*
Land Use Total			**165**	**51**	**114**	**156**	**81**	**75**	**1,896**
Specific Plan Gross Trip-ends Total			2,782	1,646	1,136	4,335	1,974	2,361	44,678
Specific Plan Internal Trip-ends Total			(216)	(104)	(112)	(842)	(444)	(398)	(1,058)
Specific Plan Pass-By Trip-ends Total			(106)	(53)	(53)	(636)	(344)	(292)	(743)
SPECIFIC PLAN TOTAL EXTERNAL PRIMARY TRIP-ENDS			**2,460**	**1,489**	**971**	**2,857**	**1,186**	**1,671**	**42,877**

TSF = 1,000 Square Feet Gross Floor Area, DU = Dwelling Units, VFP = Vehicle Fueling Positions.

Table 4-4 – Specific Plan Net New External Primary Trip Generation

Scenario	AM Peak Hour			PM Peak Hour			Daily
	Total	In	Out	Total	In	Out	
Existing Land Use Total External Primary Trip-ends	1,286	771	515	1,500	643	857	19,244
Proposed Land Use Total External Primary Trip-ends	2,460	1,489	971	2,857	1,186	1,671	42,877
SPECIFIC PLAN NET NEW TOTAL EXTERNAL PRIMARY TRIP-ENDS	**1,174**	**718**	**456**	**1,356**	**543**	**814**	**23,633**

Project Trip Distribution

Trip distribution represents the directional orientation of traffic to and from the project site. Trip distribution is influenced by the geographical location of the site, type of land use in the study area, such as shopping centers and recreational sites, and proximity to the regional freeway system.

The trip directional orientation of traffic for the proposed project was determined based upon the existing roadway system, existing traffic patterns, and existing and future land uses. The directional distribution for the proposed residential, commercial, and business park land uses of the specific plan assumed in this study is shown on Figure 4-A, Figure 4-B, and Figure 4-C, respectively.

Project Modal Split

The traffic reducing potential of public transit has not been considered in this study. Therefore, the traffic projections provided in this report are considered conservative since public transit could reduce traffic volumes in the project area.

Project Trip Assignment

Trip assignment is the result of assigning the previously discussed trip generation numbers to the circulation system using the previously discussed trip distribution.

The project related AM peak hour and PM peak hour intersection turning movement volumes are shown on Figure 4-D and Figure 4-E, respectively.

Figure 4-A – Directional Distribution of Project Traffic (Residential)

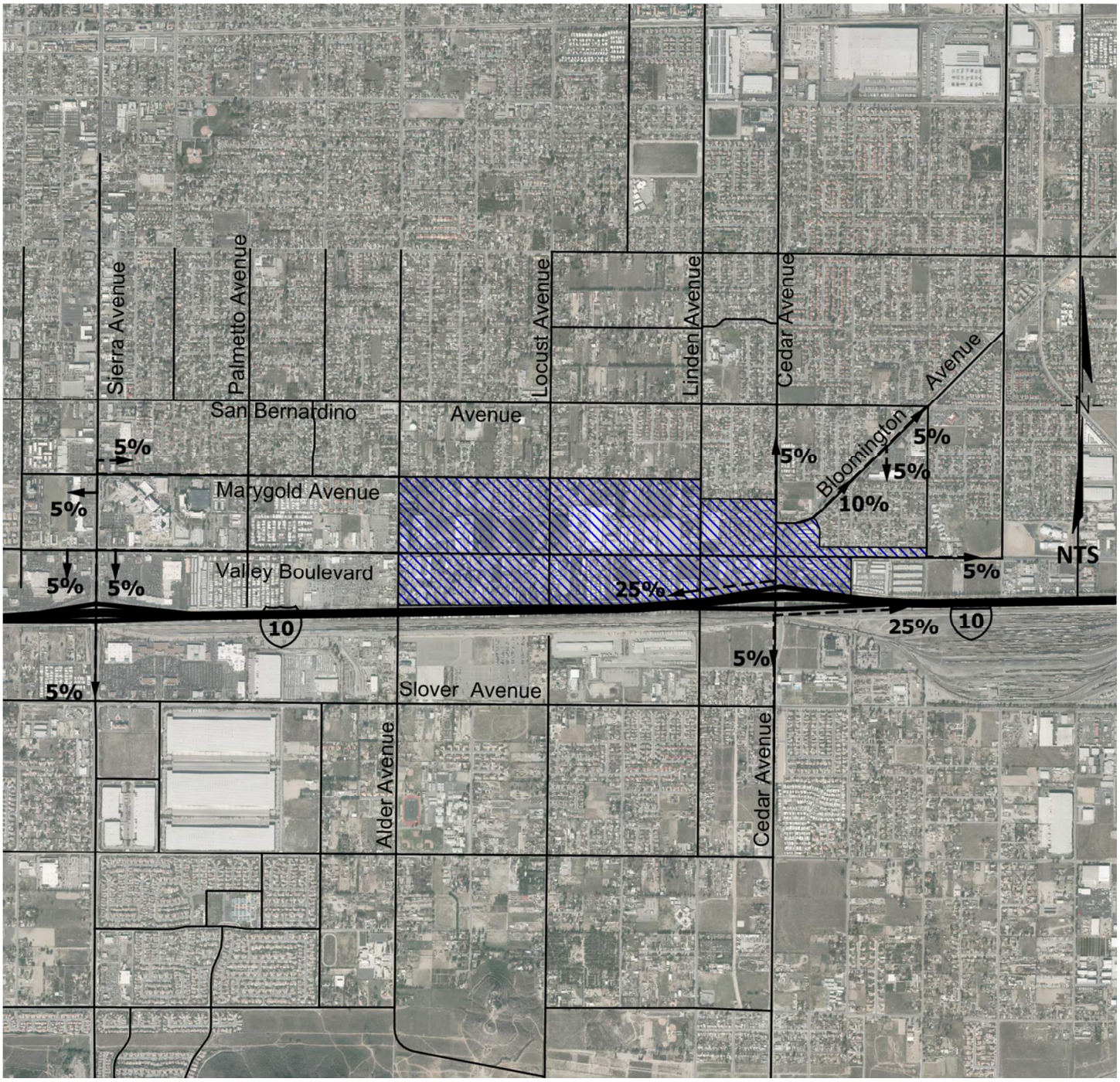


Figure 4-B – Directional Distribution of Project Traffic (Commercial)

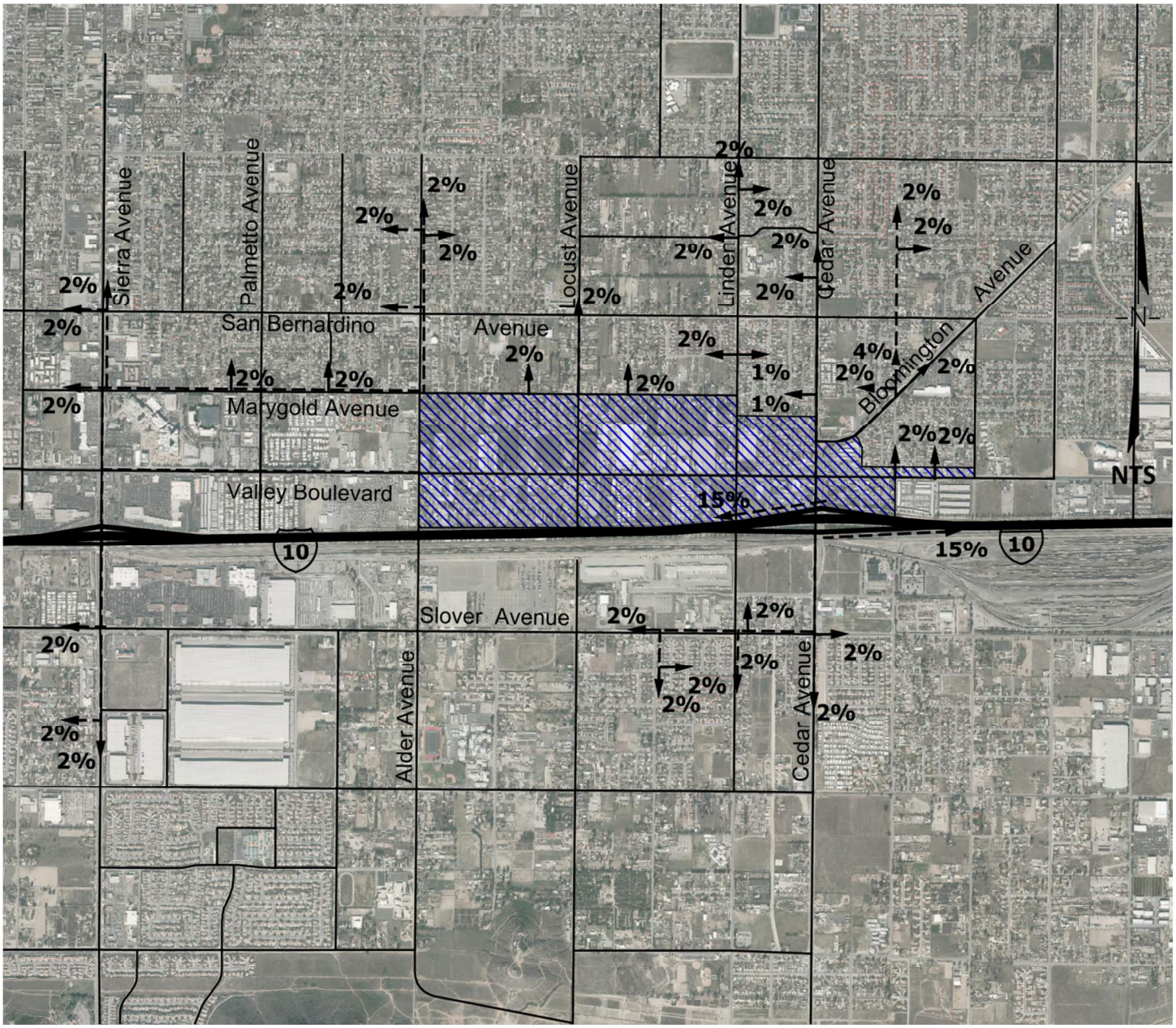


Figure 4-C – Directional Distribution of Project Traffic (Business Park)

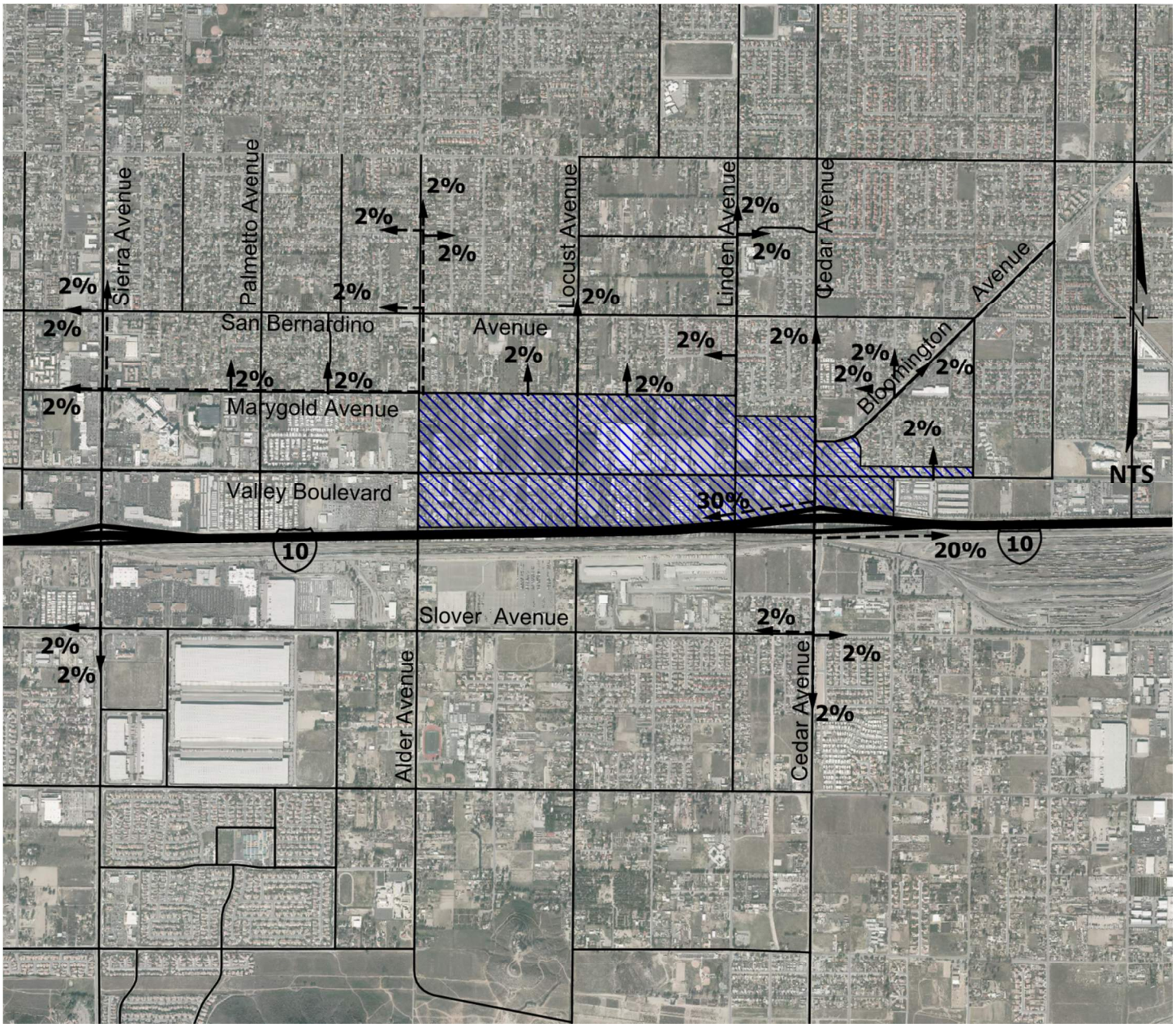
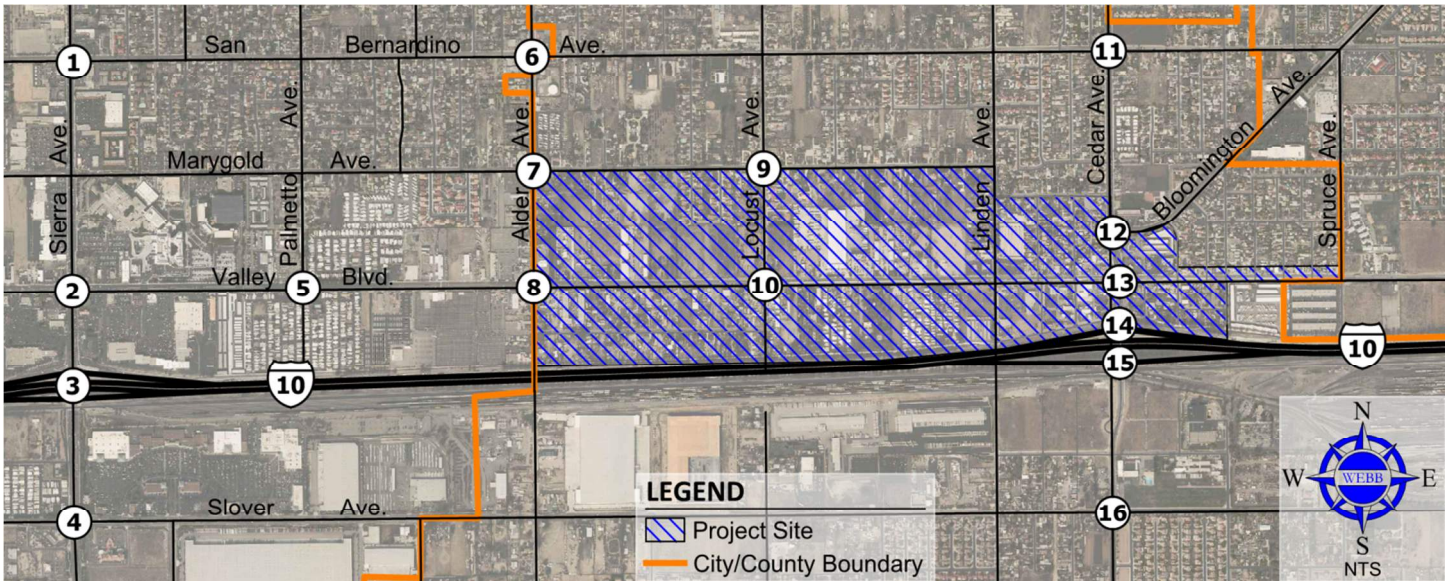
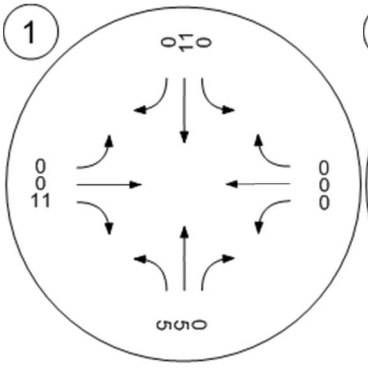
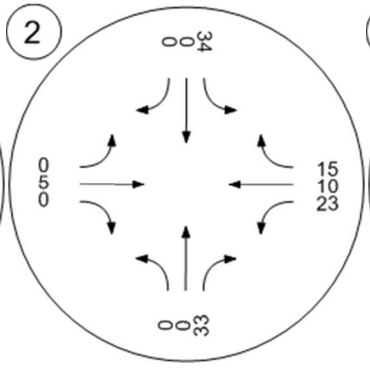


Figure 4-D – Project Only AM Peak Hour Intersection Volumes

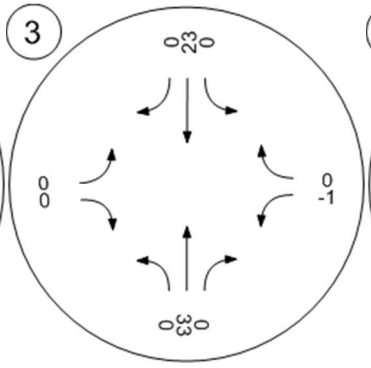




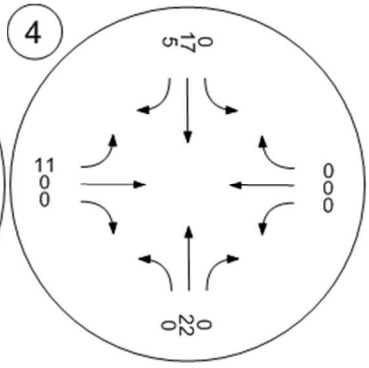
1. Sierra Avenue (NS) / San Bernardino Avenue (EW)



2. Sierra Avenue (NS) / Valley Boulevard (EW)



3. Sierra Avenue (NS) / I-10 Ramps (EW)



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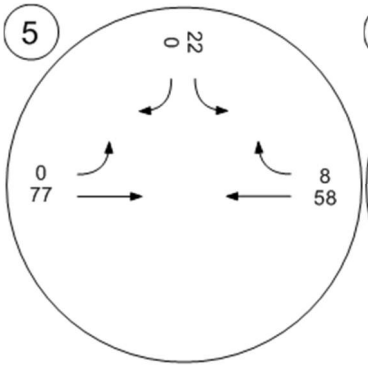

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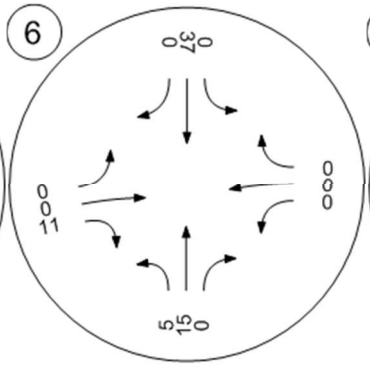

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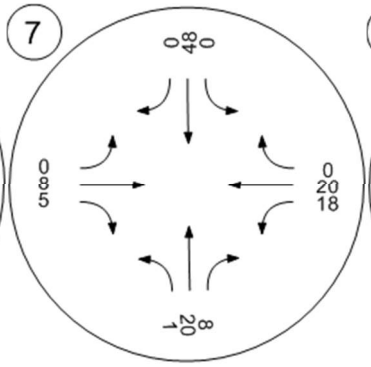

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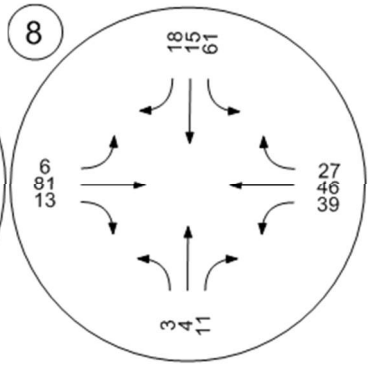
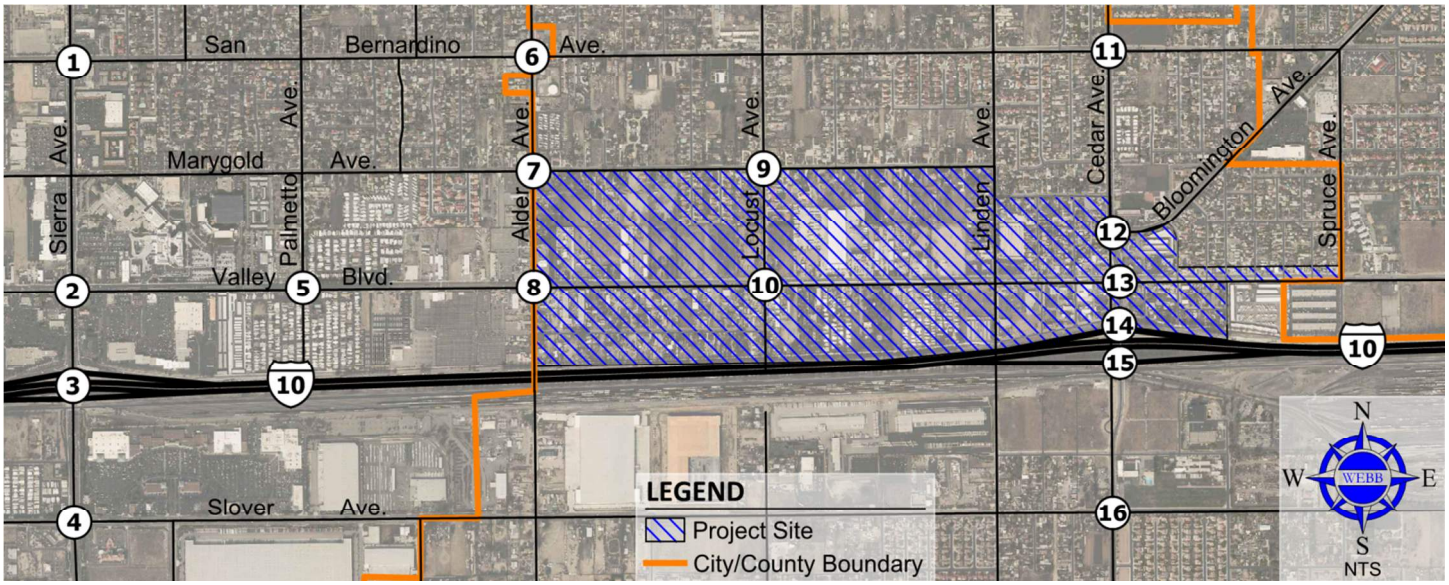
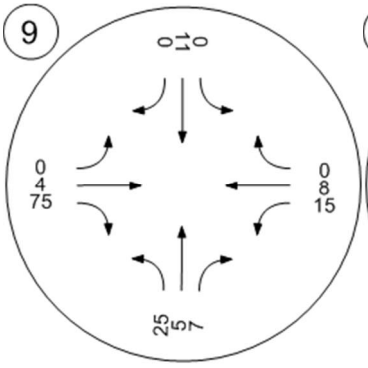


8. Alder Avenue (NS) / Valley Boulevard (EW)

Figure 4-D – Project Only AM Peak Hour Intersection Volumes (Continued)





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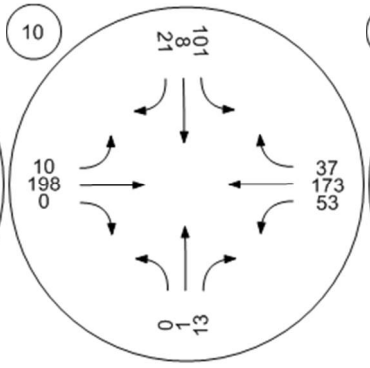

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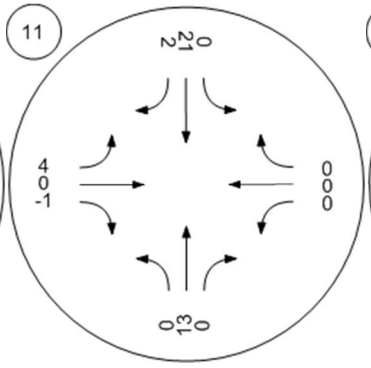

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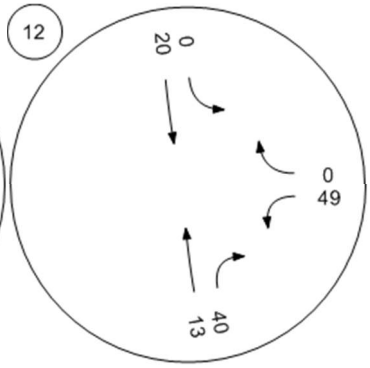

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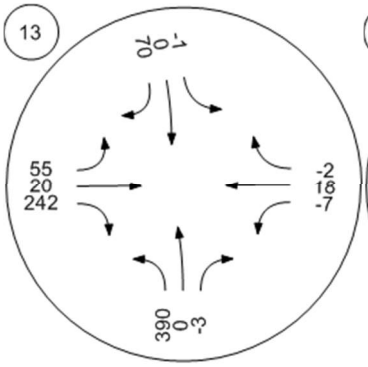

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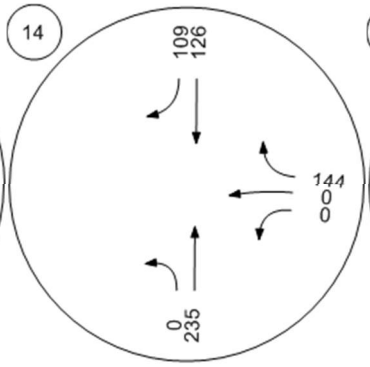
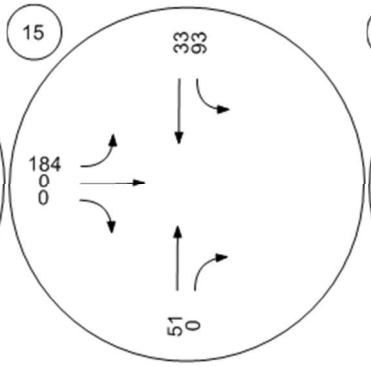


14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)



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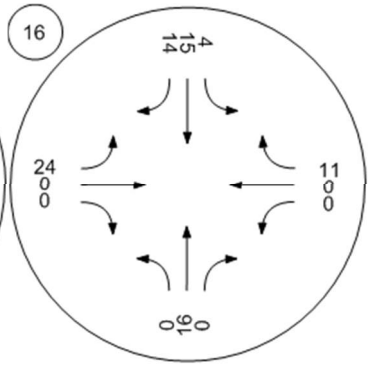
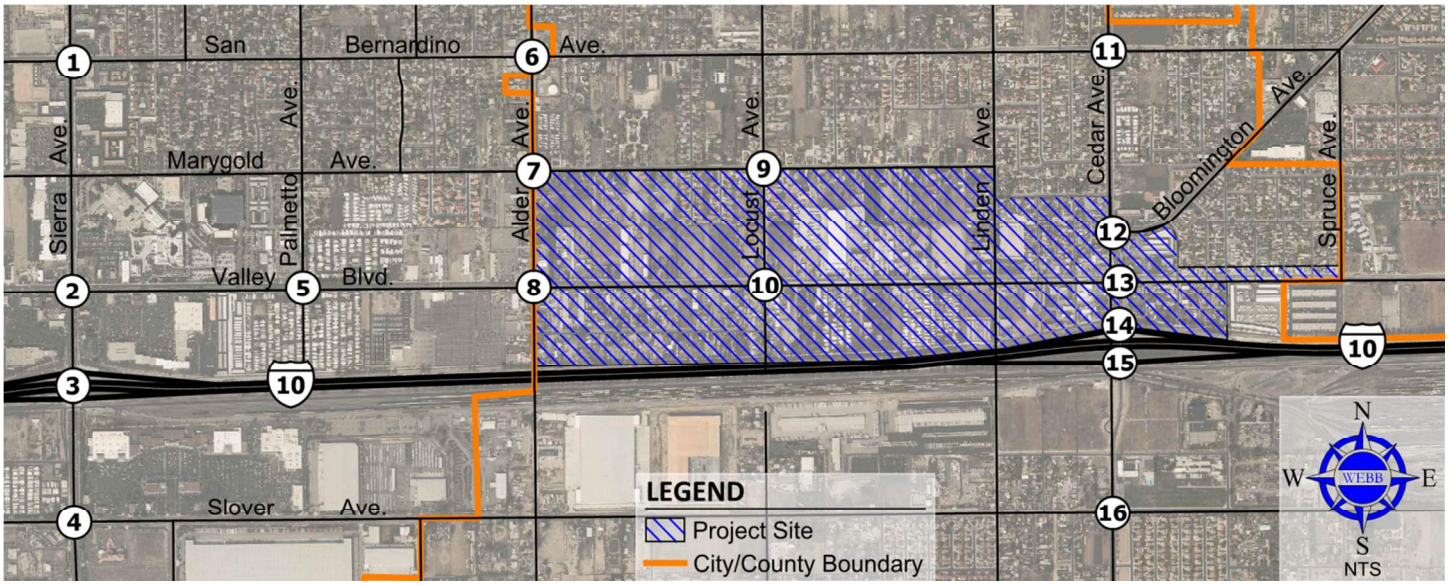
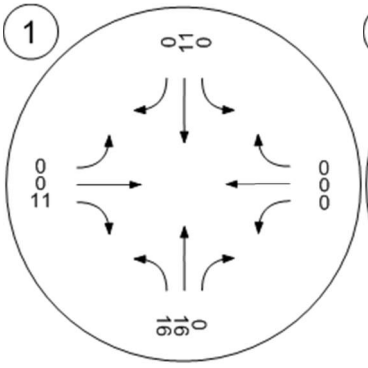


16. Cedar Avenue (NS) / Slover Avenue (EW)

Figure 4-E – Project Only PM Peak Hour Intersection Volumes





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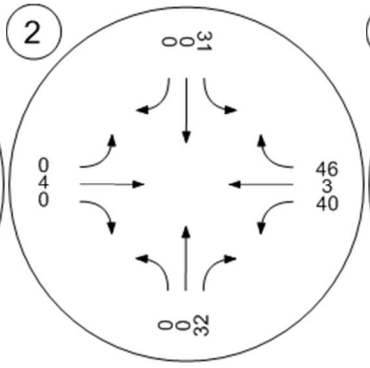

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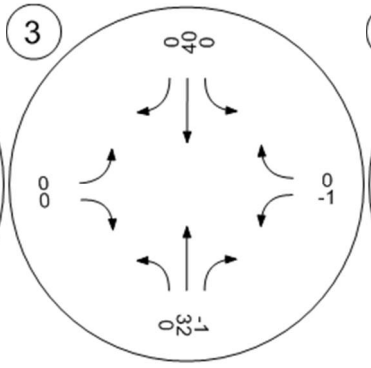
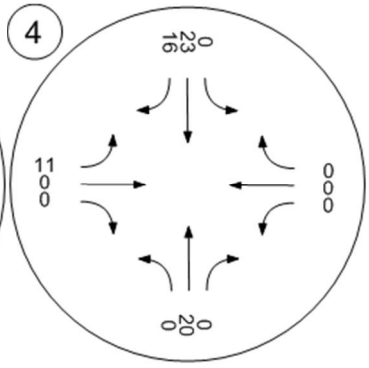
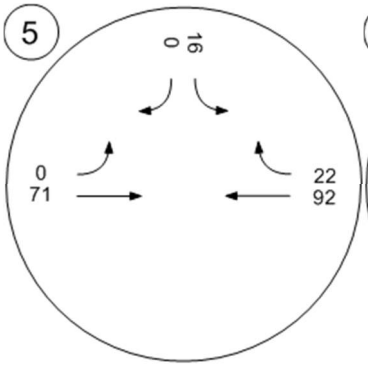


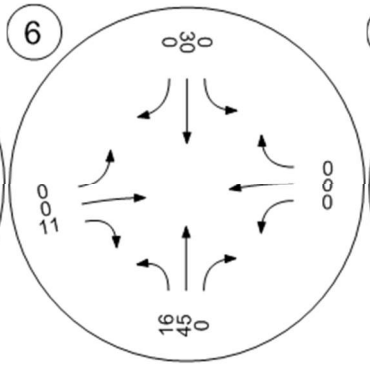
3. Sierra Avenue (NS) / I-10 Ramps (EW)



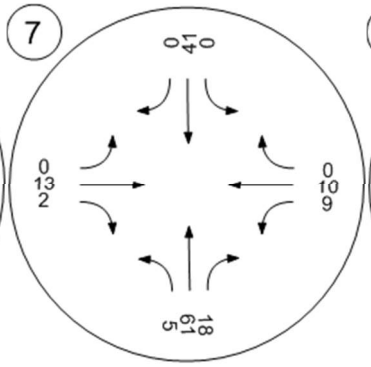
4. Sierra Avenue (NS) / Slover Avenue (EW)



5. Palmetto Avenue (NS) / Valley Boulevard (EW)



6. Alder Avenue (NS) / San Bernardino Avenue (EW)



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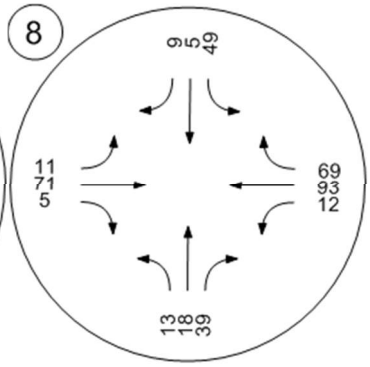
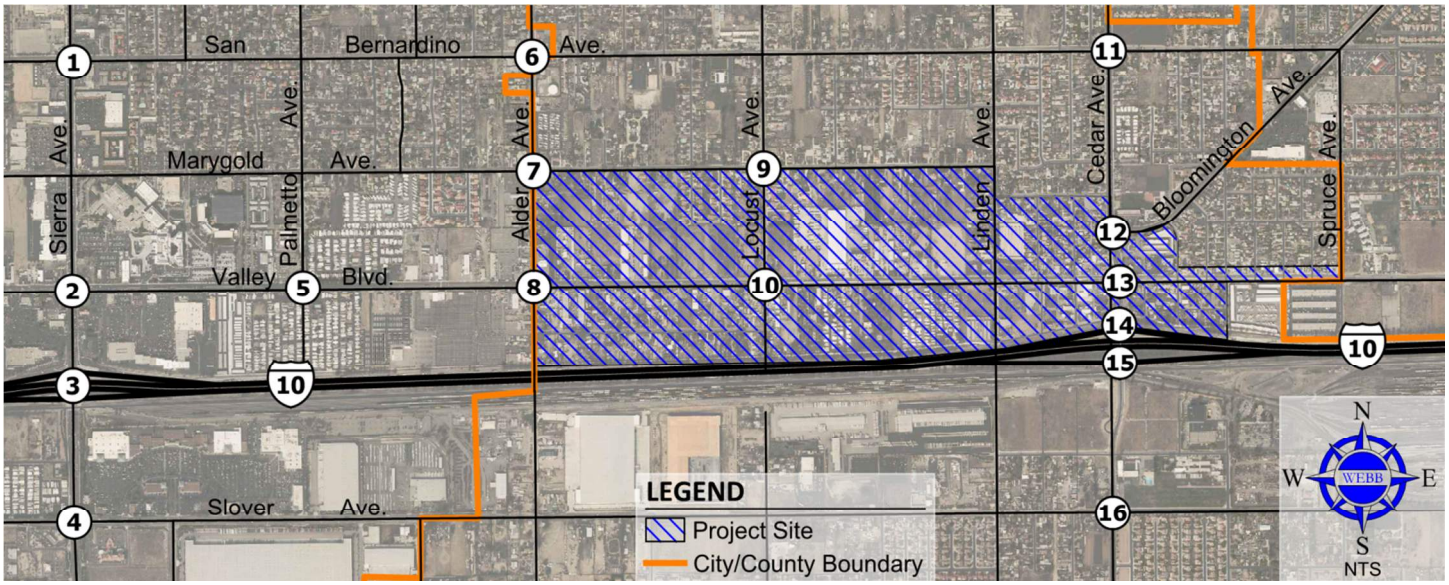
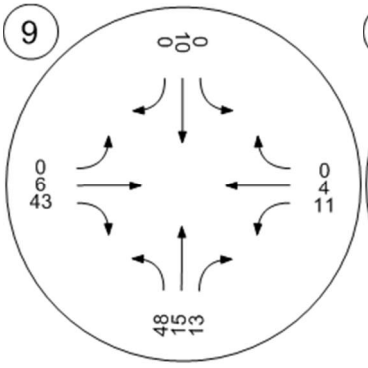


8. Alder Avenue (NS) / Valley Boulevard (EW)

Figure 4-E – Project Only PM Peak Hour Intersection Volumes (Continued)





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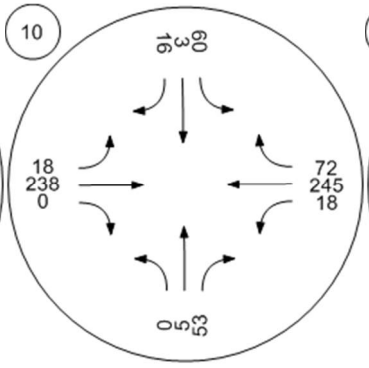
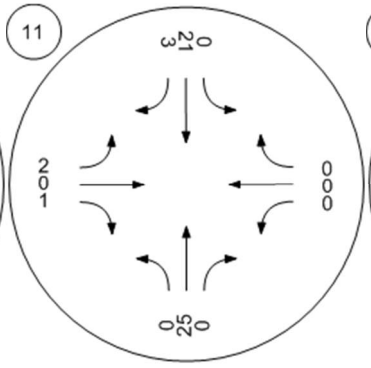
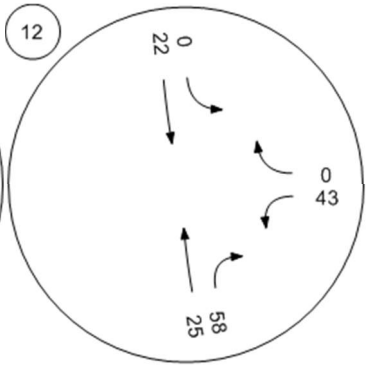


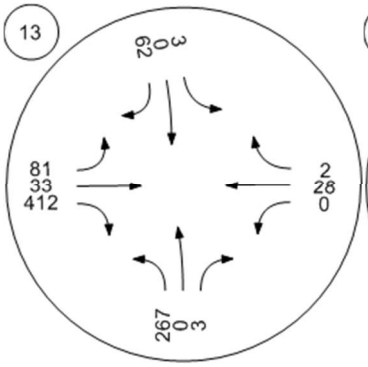
10. Locust Avenue (NS) / Valley Boulevard (EW)



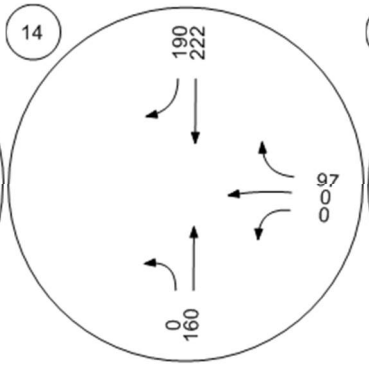
11. Cedar Avenue (NS) / San Bernardino Avenue (EW)



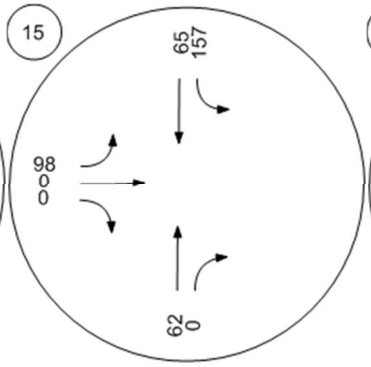
12. Cedar Avenue (NS) / Bloomington Avenue (EW)



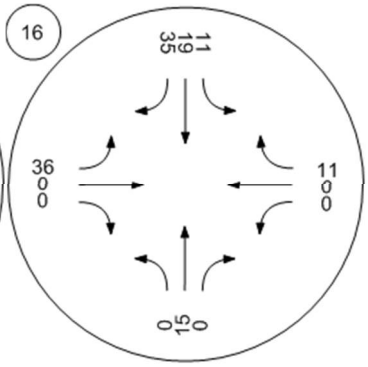
13. Cedar Avenue (NS) / Valley Boulevard (EW)



14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)



15. Cedar Avenue (NS) / I-10 Eastbound Ramps(EW)



16. Cedar Avenue (NS) / Slover Avenue (EW)

▪ San Bernardino Transportation Analysis Model

Year 2035 traffic conditions were derived from the regional travel demand model currently being used for long range planning in the County of San Bernardino. This model is commonly referred to as the San Bernardino Transportation Analysis Model (SBTAM).

The San Bernardino Associated Governments (SANBAG) developed SBTAM by refining the Southern California Association of Governments (SCAG) 2008 RTP transportation demand model. The SCAG model covers the entire SCAG region and is calibrated to year 2000 travel behavior and validated with year 2003 travel statistics. SANBAG refined this model by including certain SCAG V6 model updates, disaggregating the 402 zones within San Bernardino County to 2,521 zones, replacing the socioeconomic data within San Bernardino County with 2008 data, and adding new centroid connectors based on the new zone structure.

For future growth projections, the current city-level general plans were analyzed to determine how much growth could potentially occur in areas with vacant, developable land or potential redevelopment areas. The general plan data were collected from each jurisdiction and the forecasted SED growth from 2008 to 2035 was kept consistent with city and county-level projections.

The future circulation network is also based on the general plans of each jurisdiction. Because of this, the SBTAM model includes unfunded network improvements such as the Alder Avenue Interchange with I-10. Since this improvement is not funded, it was removed from the SBTAM model for this analysis.

The volumes have been refined and adjusted based on the National Cooperative Highway Research Program (NCHRP) methodology briefly explained below.

The model peak hour directional link volume forecasts have been refined using the growth increment approach. Existing peak hour intersection arrival and departure data is a necessary input to this approach since it serves as the starting point for the refinement process and also provides important insight into current travel patterns and the relationship between peak hour and daily traffic conditions. The initial turning movement proportions are estimated based upon the relationship of each approach leg's forecast traffic volume to the other legs' forecast volumes at the intersection. This initial estimate is then entered into a spreadsheet program consistent with the NCHRP Report 255. A linear programming algorithm is used to calculate individual turning movements which match the known directional roadway segment volumes computed in the previous step. This program computes a likely set of intersection turning movements from intersection approach counts and the initial turning proportions from each approach leg. Please see Appendix E for model output and NCHRP technical calculations.

Capacity and Level of Service and Improvement Analysis

Levels of Service – Existing Plus Project Conditions

The existing plus project scenario includes existing traffic and project only traffic. The existing plus project estimated ADT for roadways within the study area is presented in Table 5-1.

Table 5-1 – Existing Plus Project Average Daily Traffic (ADT) Volumes

Roadway Segment	ADT
Valley Boulevard between Sierra Avenue and Palmetto Avenue	33680
Valley Boulevard between Palmetto Avenue and Alder Avenue	25030
Valley Boulevard between Alder Avenue and Locust Avenue	24290
Valley Boulevard between Locust Avenue and Cedar Avenue	28280
Valley Boulevard between Cedar Avenue and Cactus Avenue	21700
Sierra Avenue between Slover Avenue and I-10 Ramps	52340
Sierra Avenue between I-10 Ramps and Valley Boulevard	62950
Sierra Avenue between Valley Boulevard and San Bernardino Avenue	42910
Alder Avenue between Valley Boulevard and Marygold Avenue	12390
Alder Avenue between Marygold Avenue and San Bernardino Avenue	12070
Locust Avenue between Valley Boulevard and Marygold Avenue	10360
Cedar Avenue between Slover Avenue and I-10 Ramps	29710
Cedar Avenue between I-10 Ramps and Valley Boulevard	47250
Cedar Avenue between Valley Boulevard and Bloomington Avenue	36610
Cedar Avenue between Bloomington Avenue and San Bernardino Avenue	25200

Table 5-2 provides the projected delays and levels of service at the study intersections under existing plus project conditions. These levels of service vary from LOS A to E. The existing plus project AM and PM peak hour intersection turning movement volumes are shown on Figure 5-A and Figure 5-B, respectively. The levels of service are based upon the existing geometrics for the study intersections. The level of service calculation worksheets are provided in Appendix E. The project is expected to have a significant impact at the following study intersections based on the identified criteria:

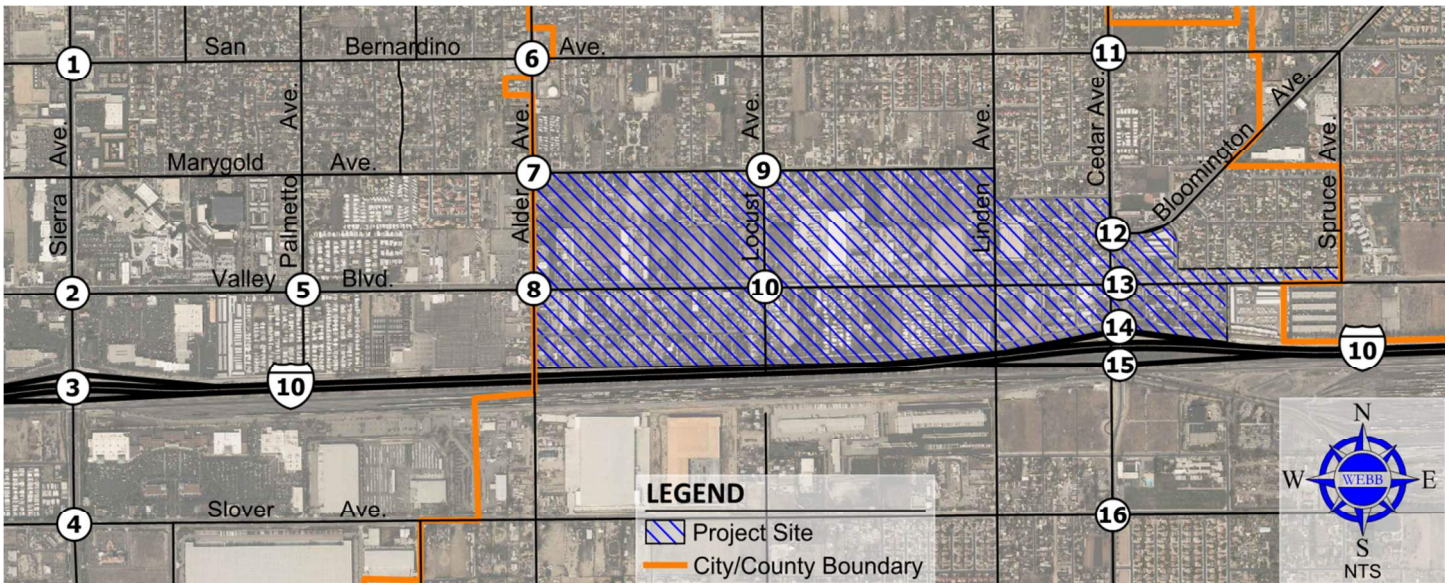
1. Sierra Avenue (NS) / San Bernardino Avenue (EW) – PM Peak Hour delay will increase from an unacceptable 37.0 seconds to 39.3 seconds.
2. Sierra Avenue (NS) / Valley Boulevard (EW) – PM Peak Hour delay will increase from an unacceptable 36.6 seconds to 38.1 seconds.
7. Alder Avenue (NS) / Marygold Avenue (EW) – PM Peak Hour LOS will degrade from an acceptable LOS C to unacceptable LOS E.
14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW) – AM Peak Hour delay will increase from an unacceptable 67.5 seconds to 91.3 seconds.
15. Cedar Avenue (NS) / I-10 Eastbound Ramps (EW) – AM Peak Hour LOS will degrade from an acceptable LOS D to unacceptable LOS E.

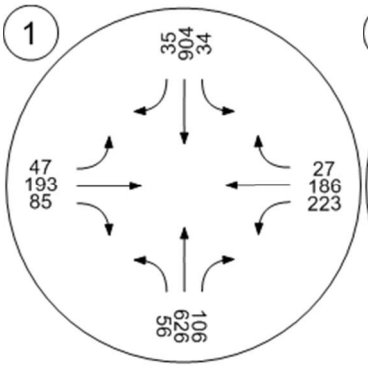
Table 5-2 – Intersection Levels of Service – Existing Plus Project Conditions

Intersection	Jurisdiction	LOS Standard	Peak Hour	Without Project			With Project		
				Traffic Control	Delay (sec)	LOS	Traffic Control	Delay (sec)	LOS
1. Sierra Avenue (NS) / San Bernardino Avenue (EW)	Fontana	C	AM PM	Signal	28.7 ***37.0***	C ***D***	Signal	29.0 ***39.3***	C ***D***
2. Sierra Avenue (NS) / Valley Boulevard (EW)	Fontana	C	AM PM	Signal	27.9 ***36.6***	C ***D***	Signal	29.2 ***38.1***	C ***D***
3. Sierra Avenue (NS) / I-10 Ramps (EW)	Caltrans	D	AM PM	Signal	25.5 28.1	C C	Signal	25.8 28.6	C C
4. Sierra Avenue (NS) / Slover Avenue (EW)	Fontana	C	AM PM	Signal	28.2 34.7	C C	Signal	28.2 34.7	C C
5. Palmetto Avenue (NS) / Valley Boulevard (EW)	Fontana	C	AM PM	Signal	22.0 17.0	C B	Signal	21.2 17.0	C B
6. Alder Avenue (NS) / San Bernardino Avenue (EW)	Fontana / County	C	AM PM	Signal	15.5 16.7	B B	Signal	15.9 17.1	B B
7. Alder Avenue (NS) / Marygold Avenue (EW)	Fontana / County	C	AM PM	AWSC	11.7 22.9	B C	AWSC	13.8 ***41.4***	B ***E***
8. Alder Avenue (NS) / Valley Boulevard (EW)	Fontana / County	C	AM PM	Signal	26.1 25.1	C C	Signal	30.8 33.0	C C
9. Locust Avenue (NS) / Marygold Avenue (EW)	County	D	AM PM	AWSC	8.8 10.7	A B	AWSC	9.6 12.9	A B
10. Locust Avenue (NS) / Valley Boulevard (EW)	County	D	AM PM	Signal	18.1 16.8	B B	Signal	23.0 22.9	C C
11. Cedar Avenue (NS) / San Bernardino Avenue (EW)	County	D	AM PM	Signal	18.7 16.8	B B	Signal	18.7 16.7	B B
12. Cedar Avenue (NS) / Bloomington Avenue (EW)	County	D	AM PM	Signal	12.4 12.2	B B	Signal	13.0 12.7	B B
13. Cedar Avenue (NS) / Valley Boulevard (EW)	County	D	AM PM	Signal	43.4 31.4	D C	Signal	30.8 33.7	C C
14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)	Caltrans	D	AM PM	Signal	***67.5*** 33.8	***E*** C	Signal	***91.3*** 43.2	***F*** D
15. Cedar Avenue (NS) / I-10 Eastbound Ramps (EW)	Caltrans	D	AM PM	Signal	39.1 39.6	D D	Signal	***55.7*** 54.8	***E*** D
16. Cedar Avenue (NS) / Slover Avenue (EW)	County	D	AM PM	Signal	21.8 25.5	C C	Signal	22.6 33.6	C C

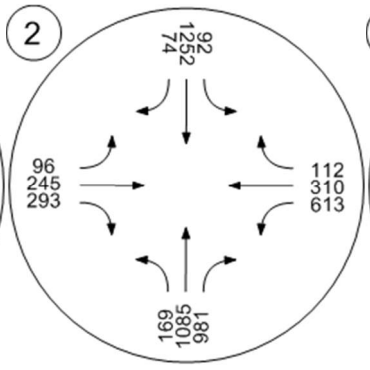
AWSC = All Way Stop Controlled
XXX = Exceeds LOS Standard
XXX = Significant Impact

Figure 5-A – Existing Plus Project AM Peak Hour Intersection Volumes

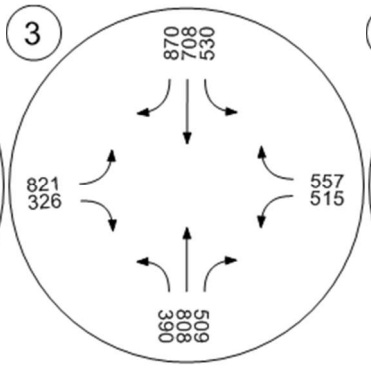




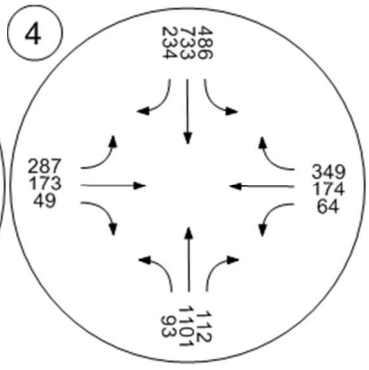
1. Sierra Avenue (NS) / San Bernardino Avenue (EW)



2. Sierra Avenue (NS) / Valley Boulevard (EW)



3. Sierra Avenue (NS) / I-10 Ramps (EW)



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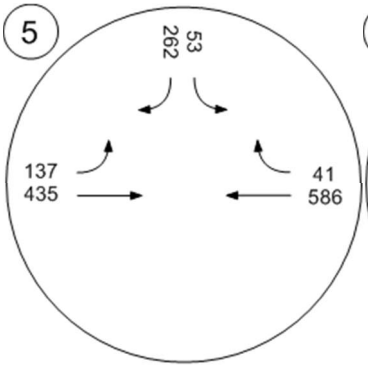
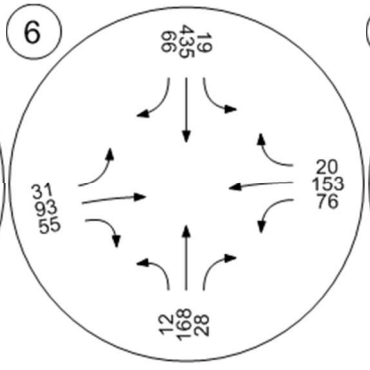
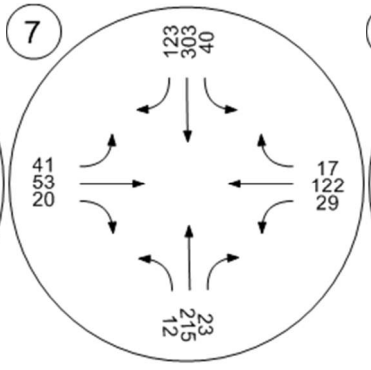


5. Palmetto Avenue (NS) / Valley Boulevard (EW)



6. Alder Avenue (NS) / San Bernardino Avenue (EW)



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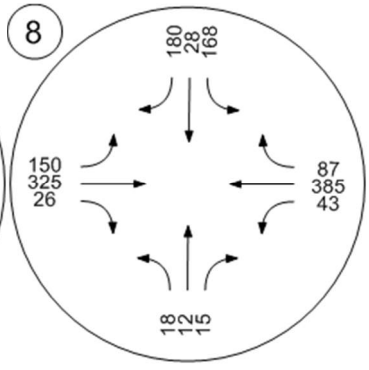
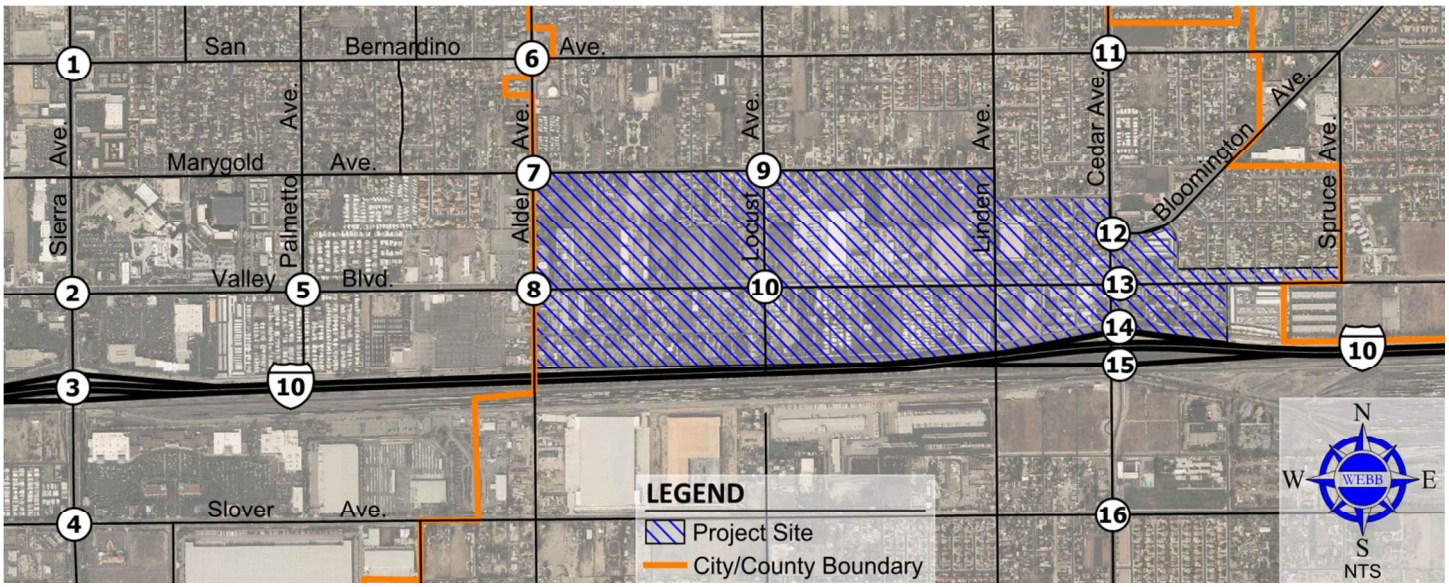
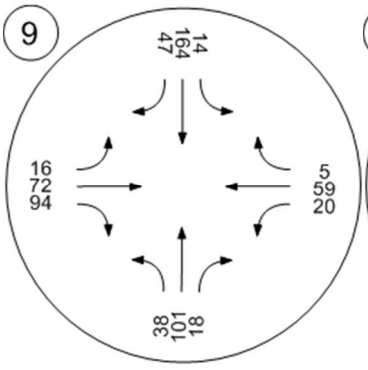


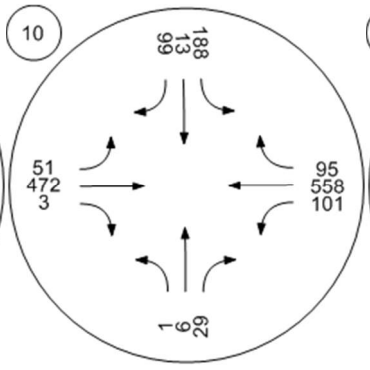
8. Alder Avenue (NS) / Valley Boulevard (EW)

Figure 5-A – Existing Plus Project AM Peak Hour Intersection Volumes (Continued)

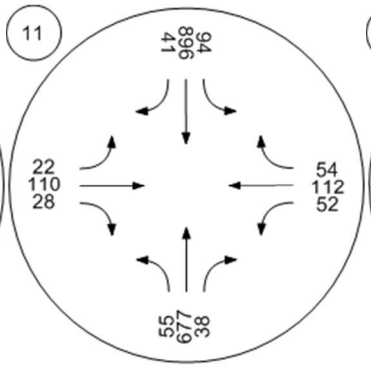




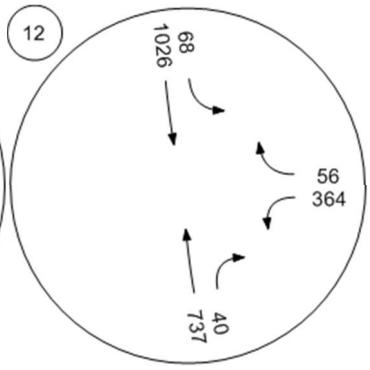
9. Locust Avenue (NS) / Marygold Avenue (EW)



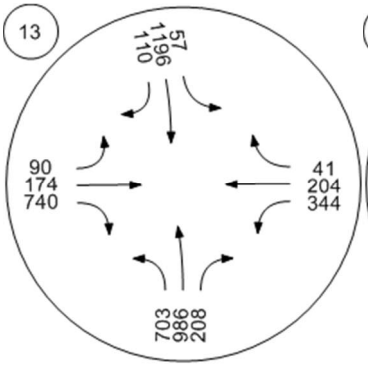
10. Locust Avenue (NS) / Valley Boulevard (EW)



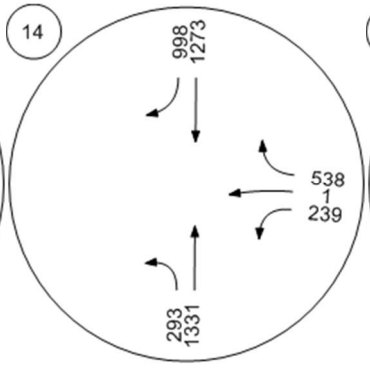
11. Cedar Avenue (NS) / San Bernardino Avenue (EW)



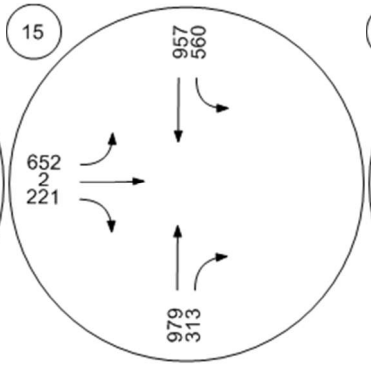
12. Cedar Avenue (NS) / Bloomington Avenue (EW)



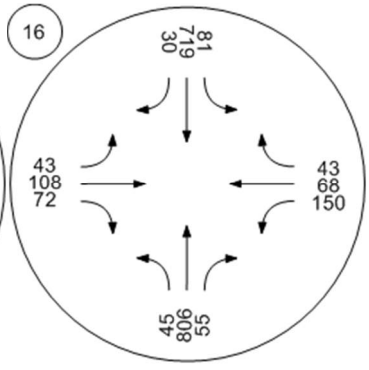
13. Cedar Avenue (NS) / Valley Boulevard (EW)



14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)

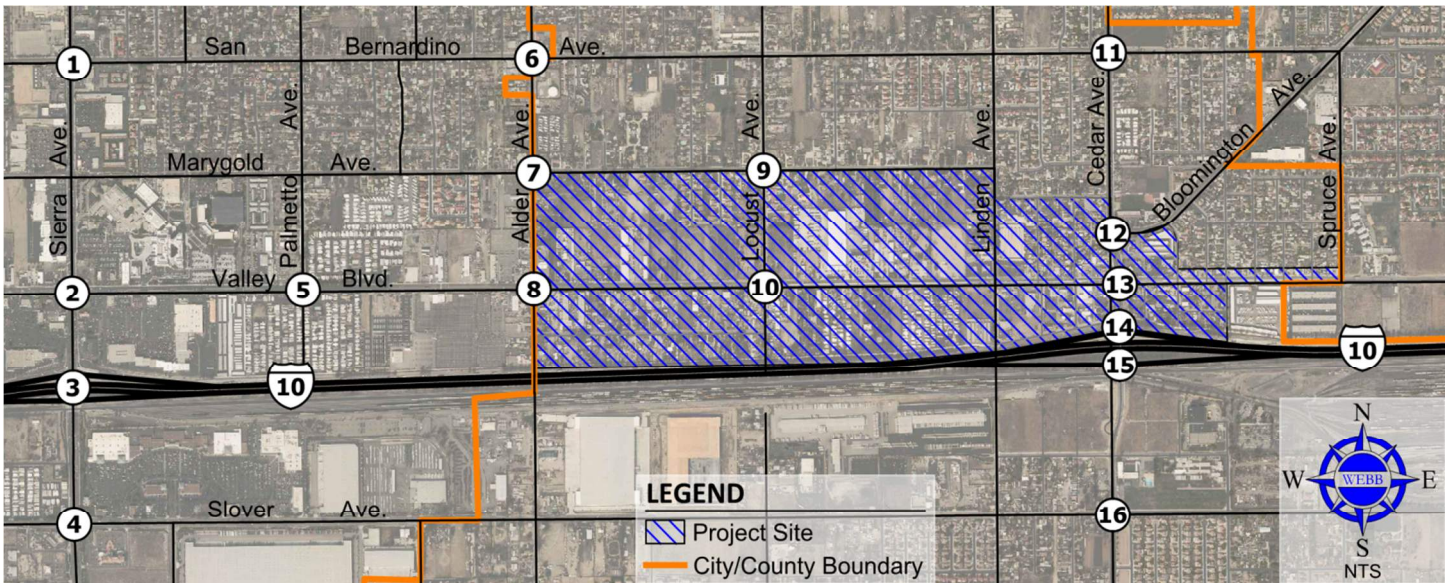


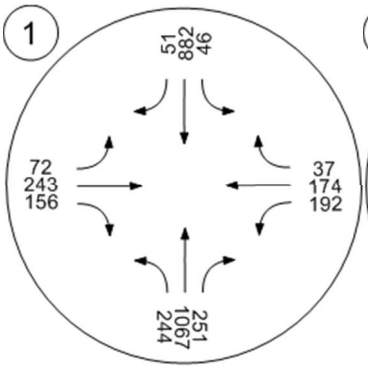
15. Cedar Avenue (NS) / I-10 Eastbound Ramps(EW)



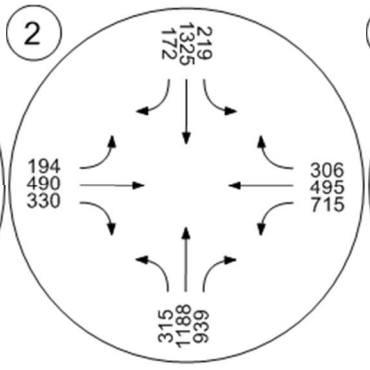
16. Cedar Avenue (NS) / Slover Avenue (EW)

Figure 5-B – Existing Plus Project PM Peak Hour Intersection Volumes

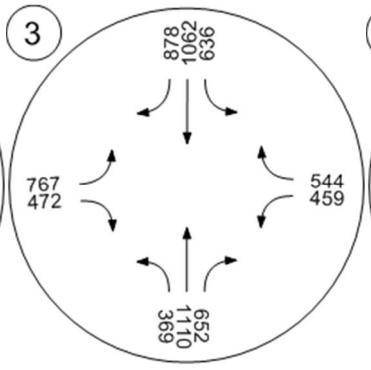




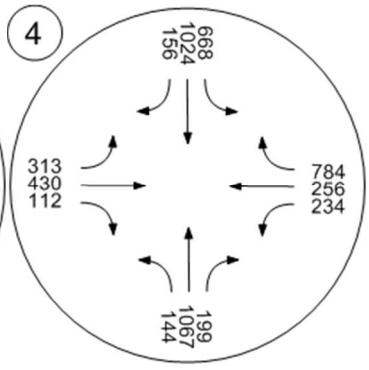
1. Sierra Avenue (NS) / San Bernardino Avenue (EW)



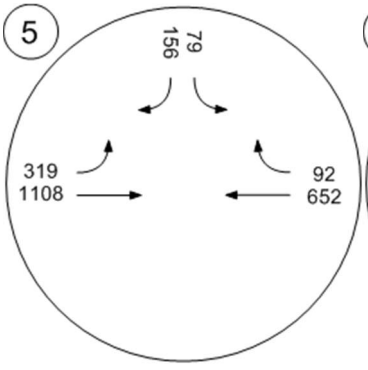
2. Sierra Avenue (NS) / Valley Boulevard (EW)



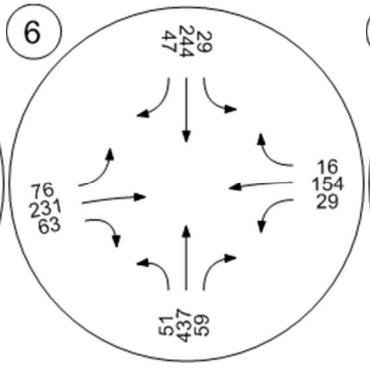
3. Sierra Avenue (NS) / I-10 Ramps (EW)



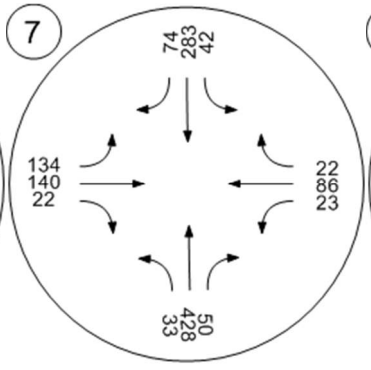
4. Sierra Avenue (NS) / Slover Avenue (EW)



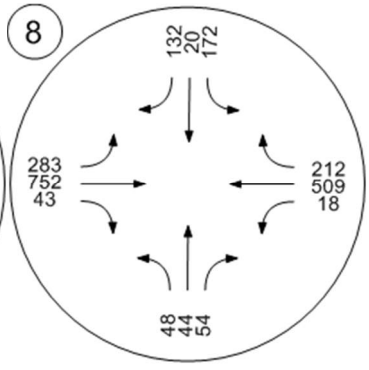
5. Palmetto Avenue (NS) / Valley Boulevard (EW)



6. Alder Avenue (NS) / San Bernardino Avenue (EW)

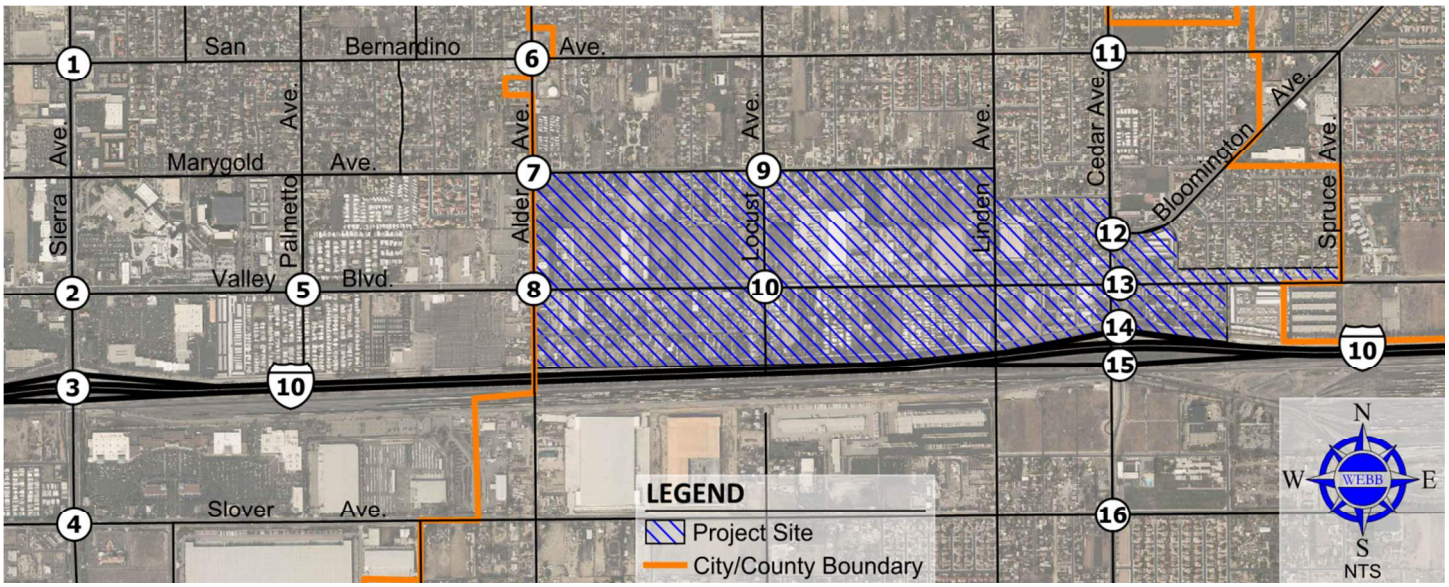


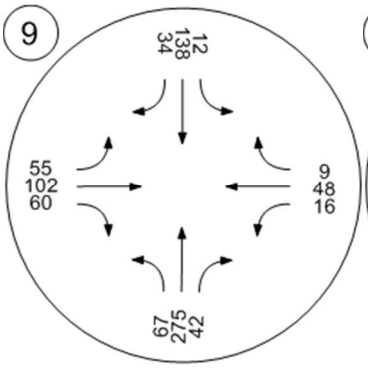
7. Alder Avenue (NS) / Marygold Avenue (EW)



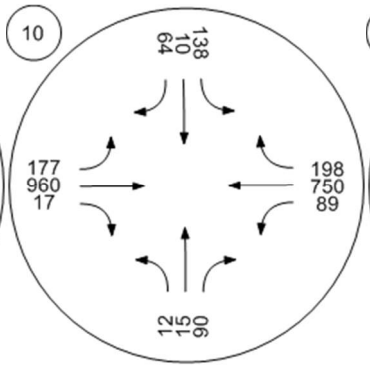
8. Alder Avenue (NS) / Valley Boulevard (EW)

Figure 5-B – Existing Plus Project PM Peak Hour Intersection Volumes (Continued)

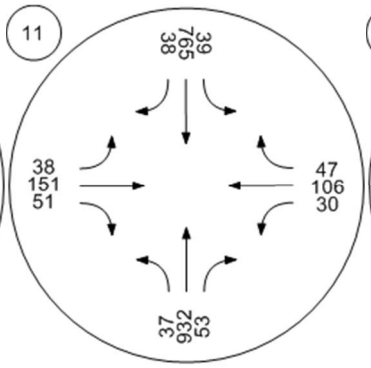




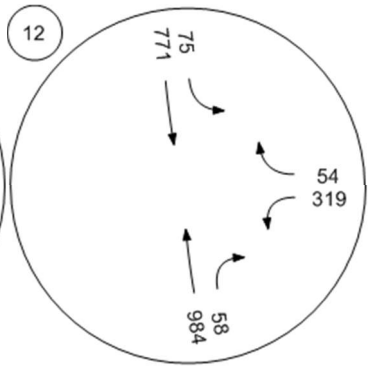
9. Locust Avenue (NS) / Marygold Avenue (EW)



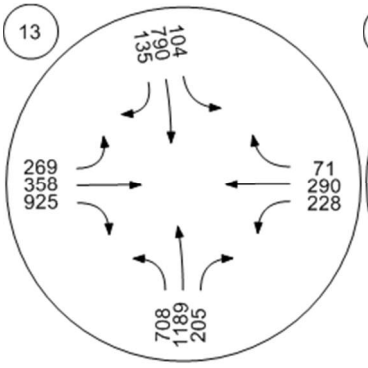
10. Locust Avenue (NS) / Valley Boulevard (EW)



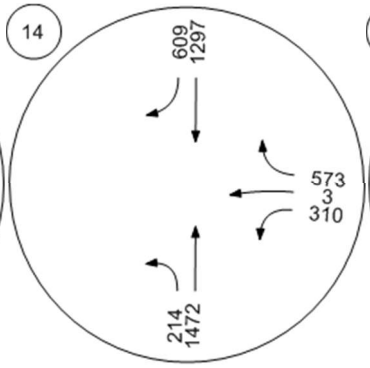
11. Cedar Avenue (NS) / San Bernardino Avenue (EW)



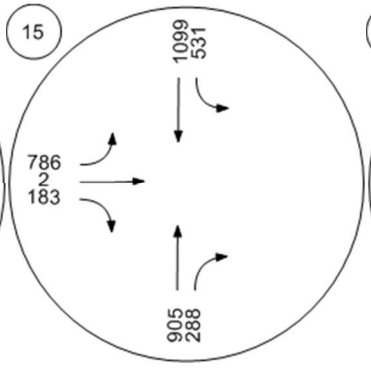
12. Cedar Avenue (NS) / Bloomington Avenue (EW)



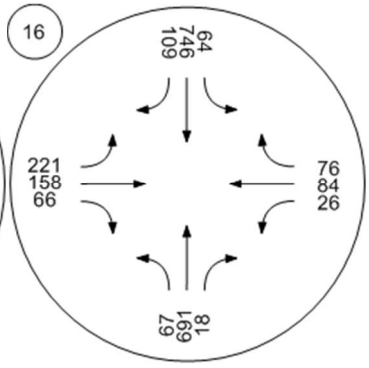
13. Cedar Avenue (NS) / Valley Boulevard (EW)



14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)



15. Cedar Avenue (NS) / I-10 Eastbound Ramps(EW)



16. Cedar Avenue (NS) / Slover Avenue (EW)

Levels of Service – Existing Plus Project with Improvements

Table 5-3 provides the projected delays and levels of service at the study intersections under existing plus project conditions with improvements. With the improvements presented in Table 6-1 and Figure 6-A, the study intersections would either operate at an acceptable LOS or at the same or better overall level of delay prior to project traffic being added. The level of service calculation worksheets are provided in Appendix E.

Table 5-3 – Intersection Levels of Service – Existing Plus Project with Improvements

Intersection	Jurisdiction	LOS Standard	Peak Hour	Without Project			With Project			With Project With Improvements		
				Traffic Control	Delay (sec)	LOS	Traffic Control	Delay (sec)	LOS	Traffic Control	Delay (sec)	LOS
1. Sierra Avenue (NS) / San Bernardino Avenue (EW)	Fontana	C	AM	Signal	28.7	C	Signal	29.0	C	Signal	27.4	C
			PM		***37.0***	***D***		***39.3***	***D***		***35.4***	***D***
2. Sierra Avenue (NS) / Valley Boulevard (EW)	Fontana	C	AM	Signal	27.9	C	Signal	29.2	C	Signal	28.9	C
			PM		***36.6***	***D***		***38.1***	***D***		***36.4***	***D***
7. Alder Avenue (NS) / Marygold Avenue (EW)	Fontana / County	C	AM	AWSC	11.7	B	AWSC	13.8	B	Signal	13.3	B
			PM		22.9	C		***41.4***	***E***		21.6	C
14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)	Caltrans	D	AM	Signal	***67.5***	***E***	Signal	***91.3***	***F***	Signal	***66.7***	***E***
			PM		33.8	C		43.2	D		32.6	C
15. Cedar Avenue (NS) / I-10 Eastbound Ramps (EW)	Caltrans	D	AM	Signal	39.1	D	Signal	***55.7***	***E***	Signal	35.3	D
			PM		39.6	D		54.8	D		35.6	D

AWSC = All Way Stop Controlled
XXX = Exceeds LOS Standard
XXX = Significant Impact

Levels of Service – Year 2035 without Project Conditions

The year 2035 without project scenario is based on the year 2035 SBTAM model and does not include the proposed project. The year 2035 without project estimated average daily traffic (ADT) for roadways within the study area is presented in Table 5-4.

Table 5-4 – Year 2035 without Project Average Daily Traffic (ADT) Volumes

Roadway Segment	ADT
Valley Boulevard between Sierra Avenue and Palmetto Avenue	28750
Valley Boulevard between Palmetto Avenue and Alder Avenue	19880
Valley Boulevard between Alder Avenue and Locust Avenue	22190
Valley Boulevard between Locust Avenue and Cedar Avenue	24370
Valley Boulevard between Cedar Avenue and Cactus Avenue	13960
Sierra Avenue between Slover Avenue and I-10 Ramps	50320
Sierra Avenue between I-10 Ramps and Valley Boulevard	68910
Sierra Avenue between Valley Boulevard and San Bernardino Avenue	41490
Alder Avenue between Valley Boulevard and Marygold Avenue	11060
Alder Avenue between Marygold Avenue and San Bernardino Avenue	15550
Locust Avenue between Valley Boulevard and Marygold Avenue	4150
Cedar Avenue between Slover Avenue and I-10 Ramps	30300
Cedar Avenue between I-10 Ramps and Valley Boulevard	48760
Cedar Avenue between Valley Boulevard and Bloomington Avenue	37270
Cedar Avenue between Bloomington Avenue and San Bernardino Avenue	25470

Table 5-5 provides the projected delays and levels of service at the study intersections under year 2035 without project conditions. These levels of service vary from LOS B to F. The year 2035 without project AM and PM peak hour intersection turning movement volumes are shown on Figure 5-C and Figure 5-D, respectively. The levels of service are based upon the existing geometrics for the study intersections. Future circulation improvements were not assumed in this analysis since they are not guaranteed to be constructed. The level of service calculation worksheets are provided in Appendix E. The following study intersections are expected to operate at an unacceptable level of service:

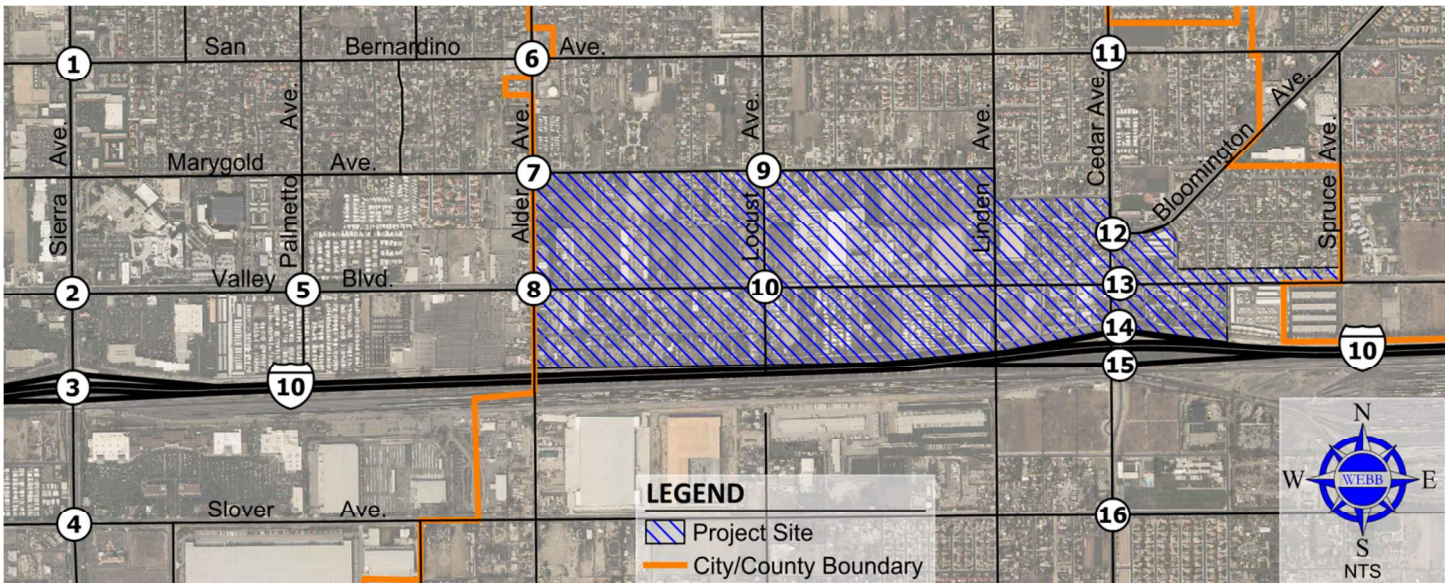
1. Sierra Avenue (NS) / San Bernardino Avenue (EW)
4. Sierra Avenue (NS) / Slover Avenue (EW)
7. Alder Avenue (NS) / Marygold Avenue (EW)
8. Alder Avenue (NS) / Valley Boulevard (EW)
14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)
15. Cedar Avenue (NS) / I-10 Eastbound Ramps (EW)
16. Cedar Avenue (NS) / Slover Avenue (EW)

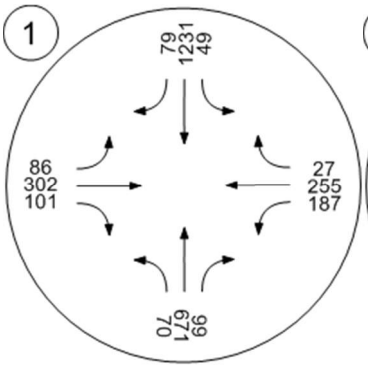
Table 5-5 – Intersection Levels of Service – Year 2035 without Project Conditions

Intersection	Jurisdiction	LOS Standard	Peak Hour	Traffic Control	Delay (sec)	LOS
1. Sierra Avenue (NS) / San Bernardino Avenue (EW)	Fontana	C	AM PM	Signal	34.9 ***47.0***	C ***D***
2. Sierra Avenue (NS) / Valley Boulevard (EW)	Fontana	C	AM PM	Signal	25.2 32.9	C C
3. Sierra Avenue (NS) / I-10 Ramps (EW)	Caltrans	D	AM PM	Signal	31.8 31.7	C C
4. Sierra Avenue (NS) / Slover Avenue (EW)	Fontana	C	AM PM	Signal	30.6 ***38.6***	C ***D***
5. Palmetto Avenue (NS) / Valley Boulevard (EW)	Fontana	C	AM PM	Signal	31.0 21.9	C C
6. Alder Avenue (NS) / San Bernardino Avenue (EW)	Fontana / County	C	AM PM	Signal	19.8 21.5	B C
7. Alder Avenue (NS) / Marygold Avenue (EW)	Fontana / County	C	AM PM	AWSC	***29.5*** ***128.2***	***D*** ***F***
8. Alder Avenue (NS) / Valley Boulevard (EW)	Fontana / County	C	AM PM	Signal	***OFL*** ***OFL***	***F*** ***F***
9. Locust Avenue (NS) / Marygold Avenue (EW)	County	D	AM PM	AWSC	11.0 22.0	B C
10. Locust Avenue (NS) / Valley Boulevard (EW)	County	D	AM PM	Signal	32.5 23.3	C C
11. Cedar Avenue (NS) / San Bernardino Avenue (EW)	County	D	AM PM	Signal	28.3 27.5	C C
12. Cedar Avenue (NS) / Bloomington Avenue (EW)	County	D	AM PM	Signal	18.7 15.7	B B
13. Cedar Avenue (NS) / Valley Boulevard (EW)	County	D	AM PM	Signal	25.8 49.1	C D
14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)	Caltrans	D	AM PM	Signal	***119.6*** ***80.4***	***F*** ***F***
15. Cedar Avenue (NS) / I-10 Eastbound Ramps (EW)	Caltrans	D	AM PM	Signal	***57.8*** ***61.5***	***E*** ***E***
16. Cedar Avenue (NS) / Slover Avenue (EW)	County	D	AM PM	Signal	34.3 ***155.5***	C ***F***

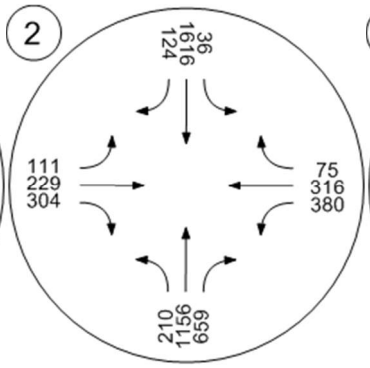
AWSC = All Way Stop Controlled
OFL = Overflow conditions; Delay > 200 sec
XXX = Exceeds LOS Standard

Figure 5-C – Year 2035 Without Project AM Peak Hour Intersection Volumes

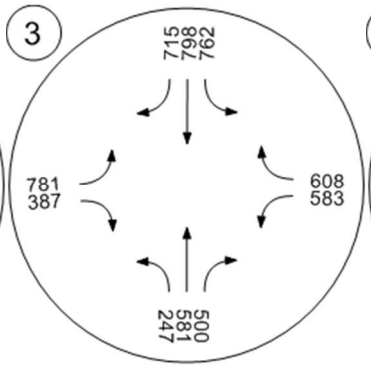




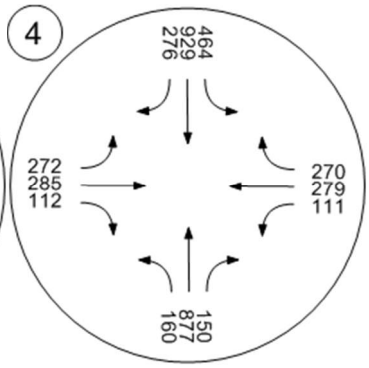
1. Sierra Avenue (NS) / San Bernardino Avenue (EW)



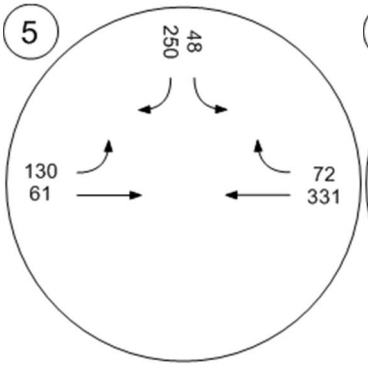
2. Sierra Avenue (NS) / Valley Boulevard (EW)



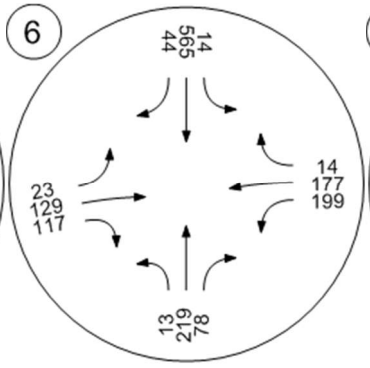
3. Sierra Avenue (NS) / I-10 Ramps (EW)



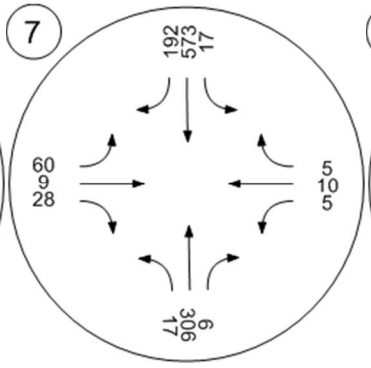
4. Sierra Avenue (NS) / Slover Avenue (EW)



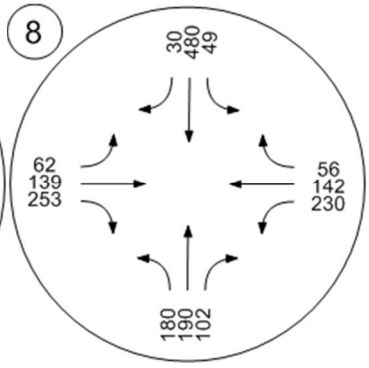
5. Palmetto Avenue (NS) / Valley Boulevard (EW)



6. Alder Avenue (NS) / San Bernardino Avenue (EW)

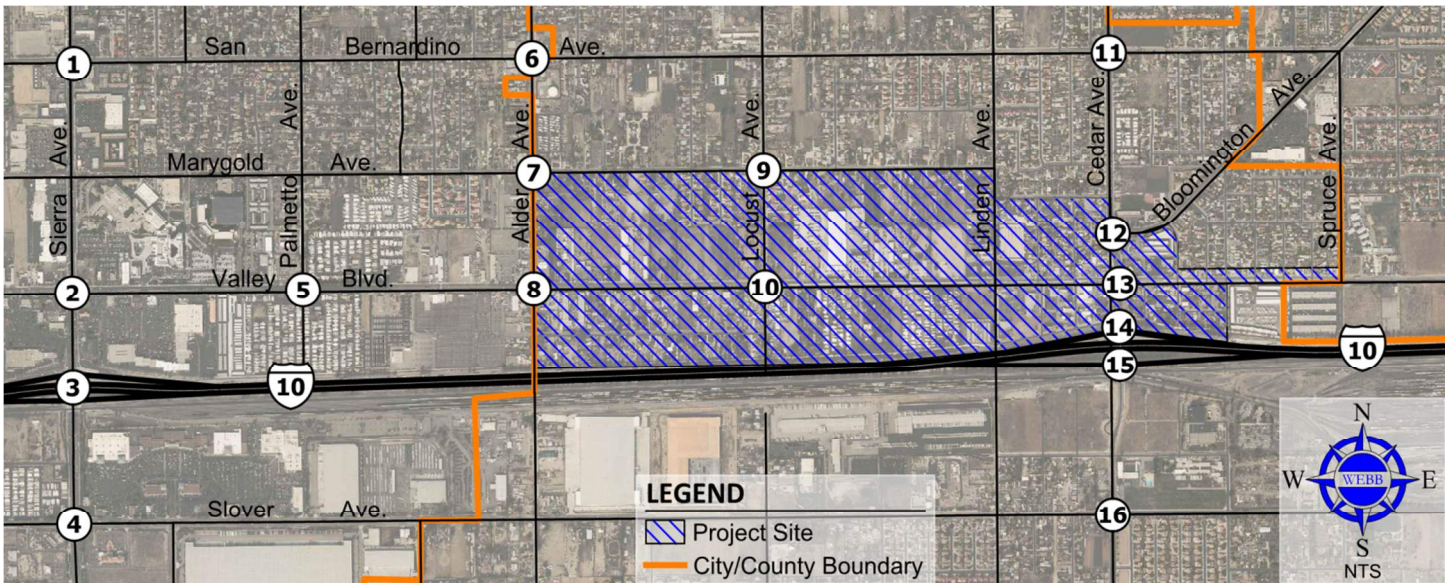


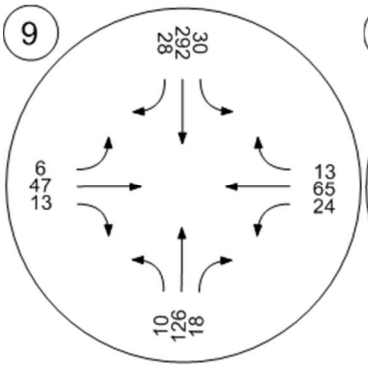
7. Alder Avenue (NS) / Marygold Avenue (EW)



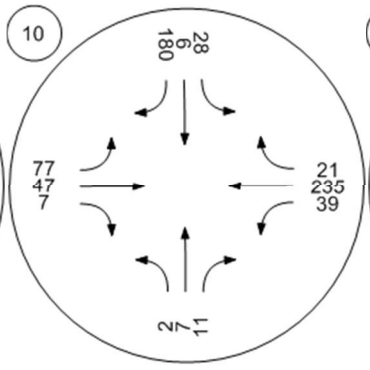
8. Alder Avenue (NS) / Valley Boulevard (EW)

Figure 5-C – Year 2035 Without Project AM Peak Hour Intersection Volumes (Continued)

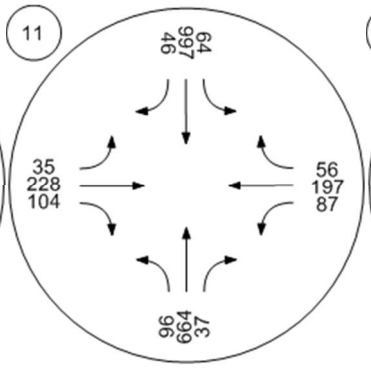




9. Locust Avenue (NS) / Marygold Avenue (EW)



10. Locust Avenue (NS) / Valley Boulevard (EW)



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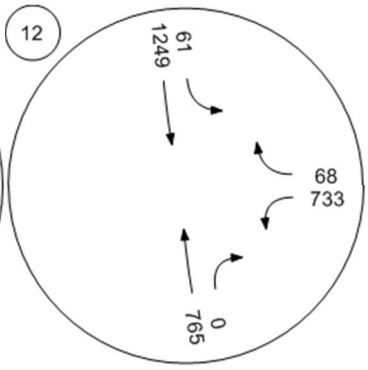

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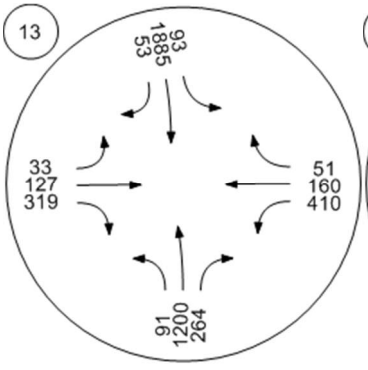
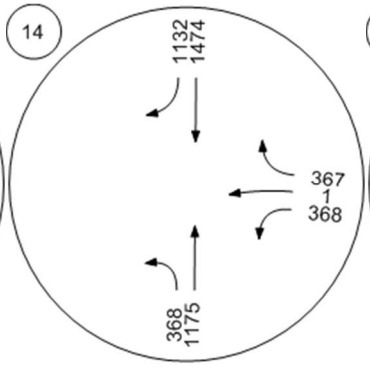
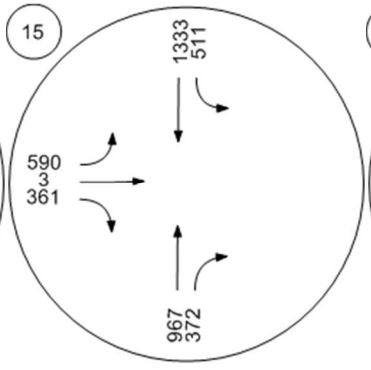


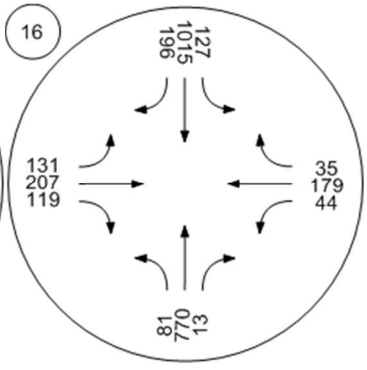
13. Cedar Avenue (NS) / Valley Boulevard (EW)



14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)

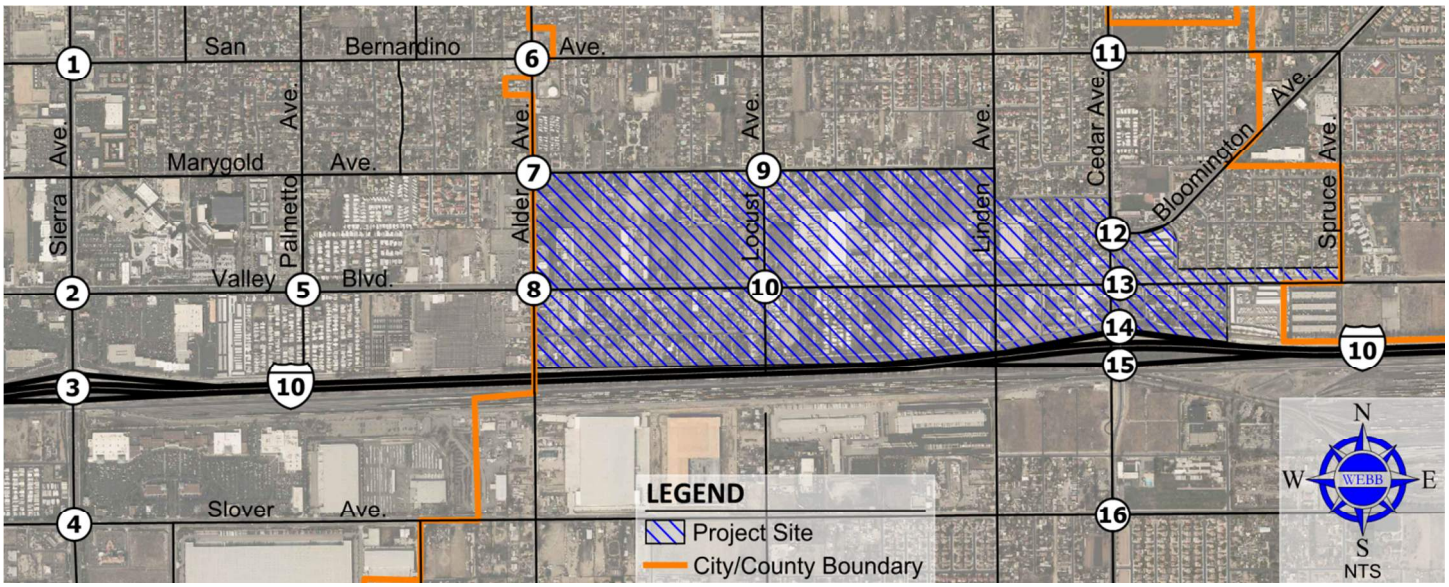


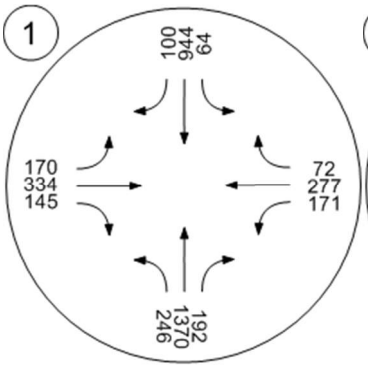
15. Cedar Avenue (NS) / I-10 Eastbound Ramps(EW)



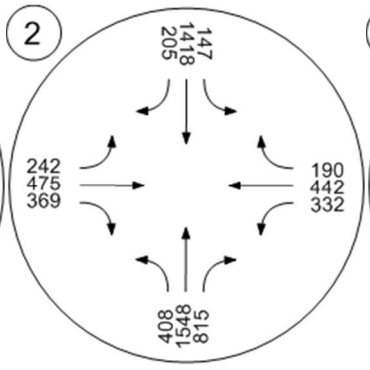
16. Cedar Avenue (NS) / Slover Avenue (EW)

Figure 5-D – Year 2035 Without Project PM Peak Hour Intersection Volumes

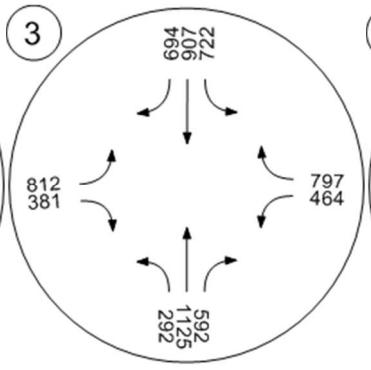




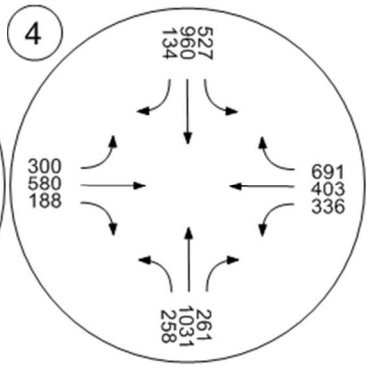
1. Sierra Avenue (NS) / San Bernardino Avenue (EW)



2. Sierra Avenue (NS) / Valley Boulevard (EW)



3. Sierra Avenue (NS) / I-10 Ramps (EW)



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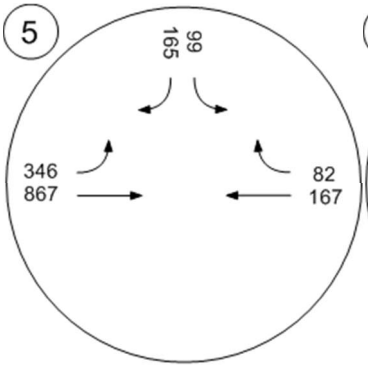
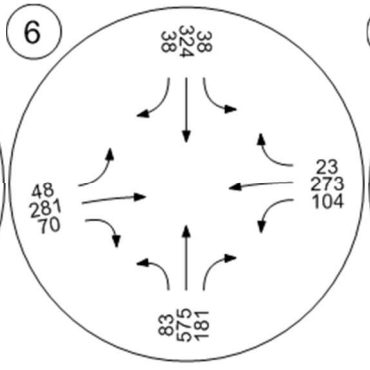
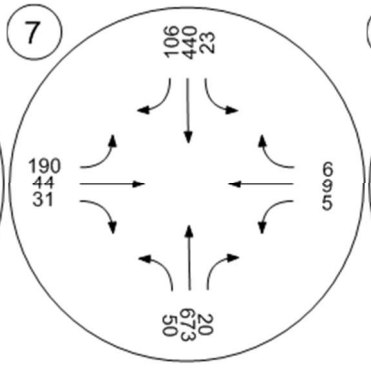


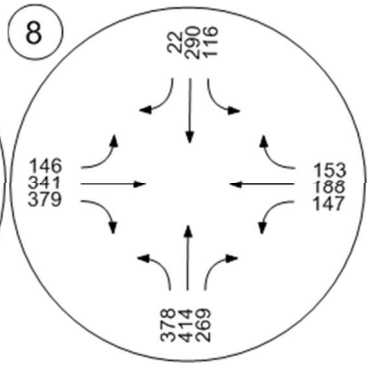
5. Palmetto Avenue (NS) / Valley Boulevard (EW)



6. Alder Avenue (NS) / San Bernardino Avenue (EW)

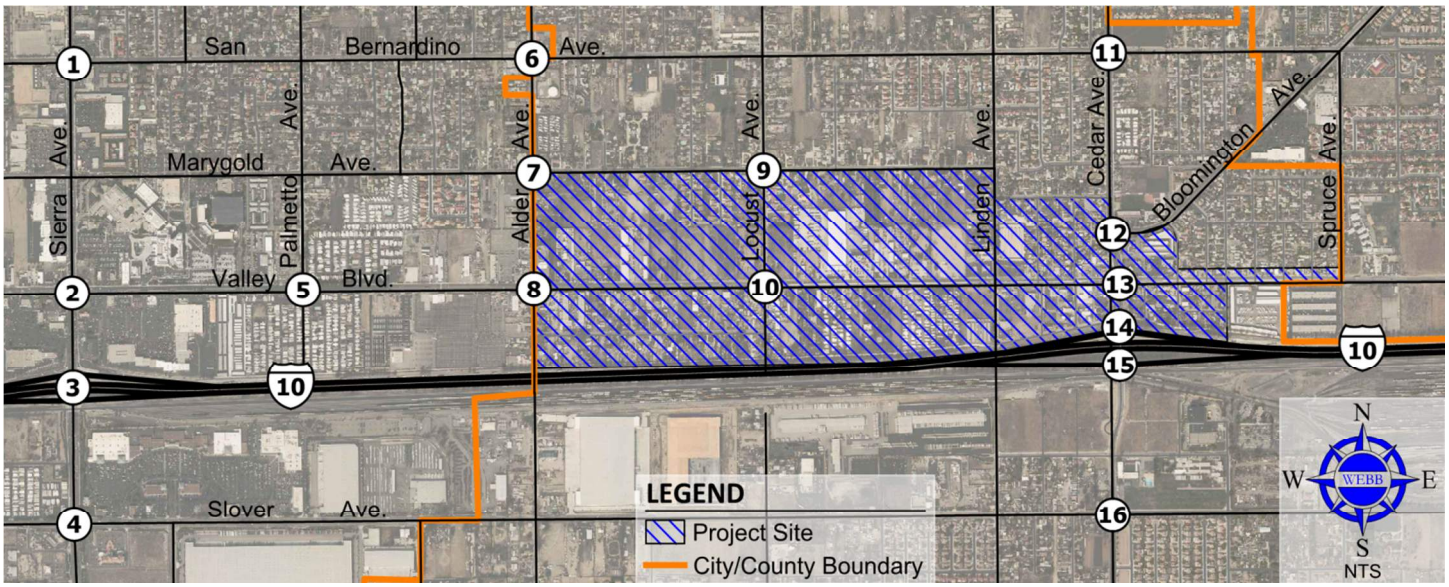


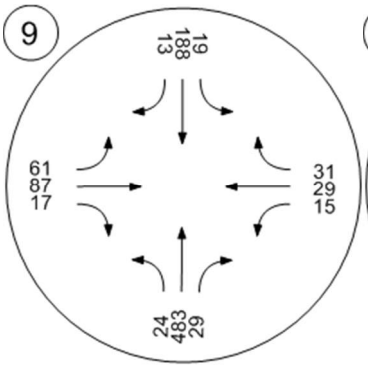
7. Alder Avenue (NS) / Marygold Avenue (EW)



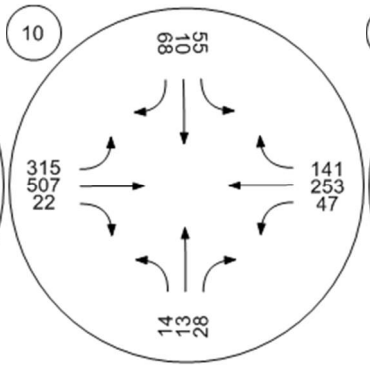
8. Alder Avenue (NS) / Valley Boulevard (EW)

Figure 5-D – Year 2035 Without Project PM Peak Hour Intersection Volumes (Continued)

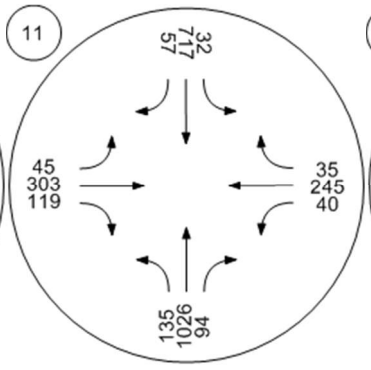




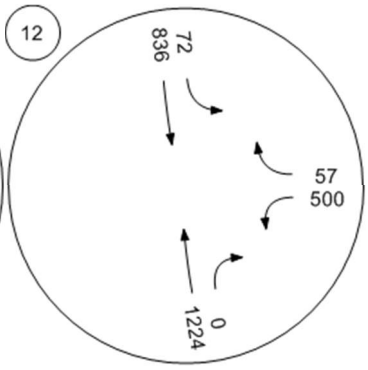
9. Locust Avenue (NS) / Marygold Avenue (EW)



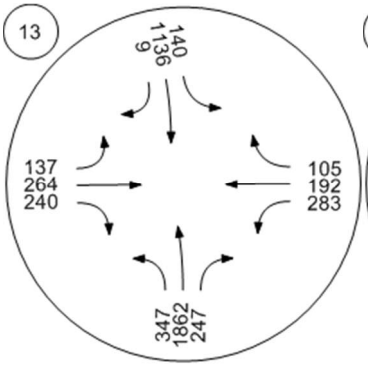
10. Locust Avenue (NS) / Valley Boulevard (EW)



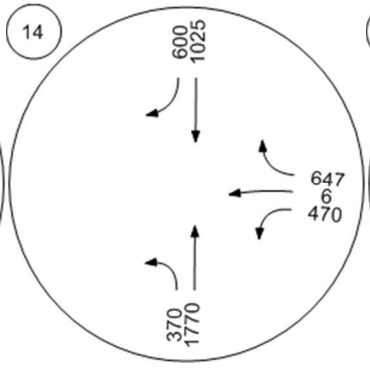
11. Cedar Avenue (NS) / San Bernardino Avenue (EW)



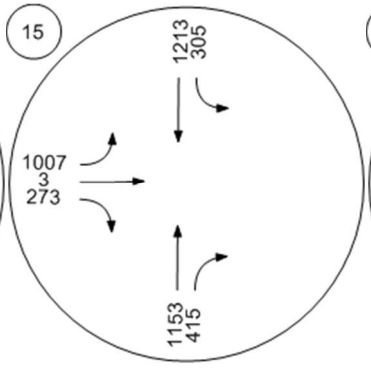
12. Cedar Avenue (NS) / Bloomington Avenue (EW)



13. Cedar Avenue (NS) / Valley Boulevard (EW)



14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)



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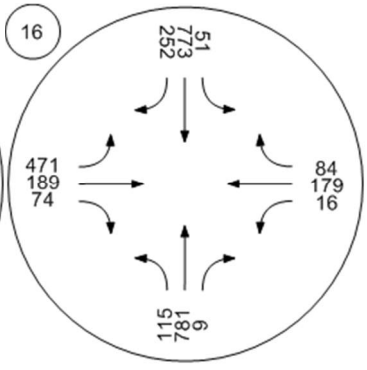


16. Cedar Avenue (NS) / Slover Avenue (EW)

Levels of Service – Year 2035 with Project Conditions

The year 2035 with project scenario is based on the year 2035 SBTAM model and includes the proposed project. The year 2035 with project estimated average daily traffic (ADT) for roadways within the study area is presented in Table 5-6.

Table 5-6 – Year 2035 with Project Average Daily Traffic (ADT) Volumes

Roadway Segment	ADT
Valley Boulevard between Sierra Avenue and Palmetto Avenue	32460
Valley Boulevard between Palmetto Avenue and Alder Avenue	24320
Valley Boulevard between Alder Avenue and Locust Avenue	27930
Valley Boulevard between Locust Avenue and Cedar Avenue	29610
Valley Boulevard between Cedar Avenue and Cactus Avenue	23200
Sierra Avenue between Slover Avenue and I-10 Ramps	52690
Sierra Avenue between I-10 Ramps and Valley Boulevard	71450
Sierra Avenue between Valley Boulevard and San Bernardino Avenue	46490
Alder Avenue between Valley Boulevard and Marygold Avenue	14670
Alder Avenue between Marygold Avenue and San Bernardino Avenue	17240
Locust Avenue between Valley Boulevard and Marygold Avenue	8970
Cedar Avenue between Slover Avenue and I-10 Ramps	34210
Cedar Avenue between I-10 Ramps and Valley Boulevard	54480
Cedar Avenue between Valley Boulevard and Bloomington Avenue	43670
Cedar Avenue between Bloomington Avenue and San Bernardino Avenue	27800

Table 5-7 provides the projected delays and levels of service at the study intersections under year 2035 with project conditions. These levels of service vary from LOS B to F. The year 2035 with project AM and PM peak hour intersection turning movement volumes are shown on Figure 5-E and Figure 5-F, respectively. The levels of service are based upon the existing geometrics for the study intersections. Future circulation improvements were not assumed in this analysis since they are not guaranteed to be constructed. The level of service calculation worksheets are provided in Appendix E. The project is expected to have a significant impact at the following study intersections based on the identified criteria:

1. Sierra Avenue (NS) / San Bernardino Avenue (EW) – AM Peak Hour LOS will degrade from an acceptable LOS C to unacceptable LOS D and PM Peak Hour delay will increase from an unacceptable 47.0 seconds to 47.9 seconds.
2. Sierra Avenue (NS) / Valley Boulevard (EW) – PM Peak Hour LOS will degrade from an acceptable LOS C to unacceptable LOS D.
4. Sierra Avenue (NS) / Slover Avenue (EW) – PM Peak Hour delay will increase from an unacceptable 38.6 seconds to 38.7 seconds.
7. Alder Avenue (NS) / Marygold Avenue (EW) – AM Peak Hour delay will increase from an unacceptable 29.5 seconds to 52.4 seconds and PM Peak Hour delay will increase from an unacceptable 128.2 seconds to 175.6 seconds.
8. Alder Avenue (NS) / Valley Boulevard (EW) – Intersection is expected to operate in overflow conditions (delay greater than 200 seconds) in both AM and PM Peak Hours.
9. Locust Avenue (NS) / Marygold Avenue (EW) – PM Peak Hour LOS will degrade from an acceptable LOS C to unacceptable LOS E.
13. Cedar Avenue (NS) / Valley Boulevard (EW) – PM Peak Hour LOS will degrade from an acceptable LOS D to unacceptable LOS E.

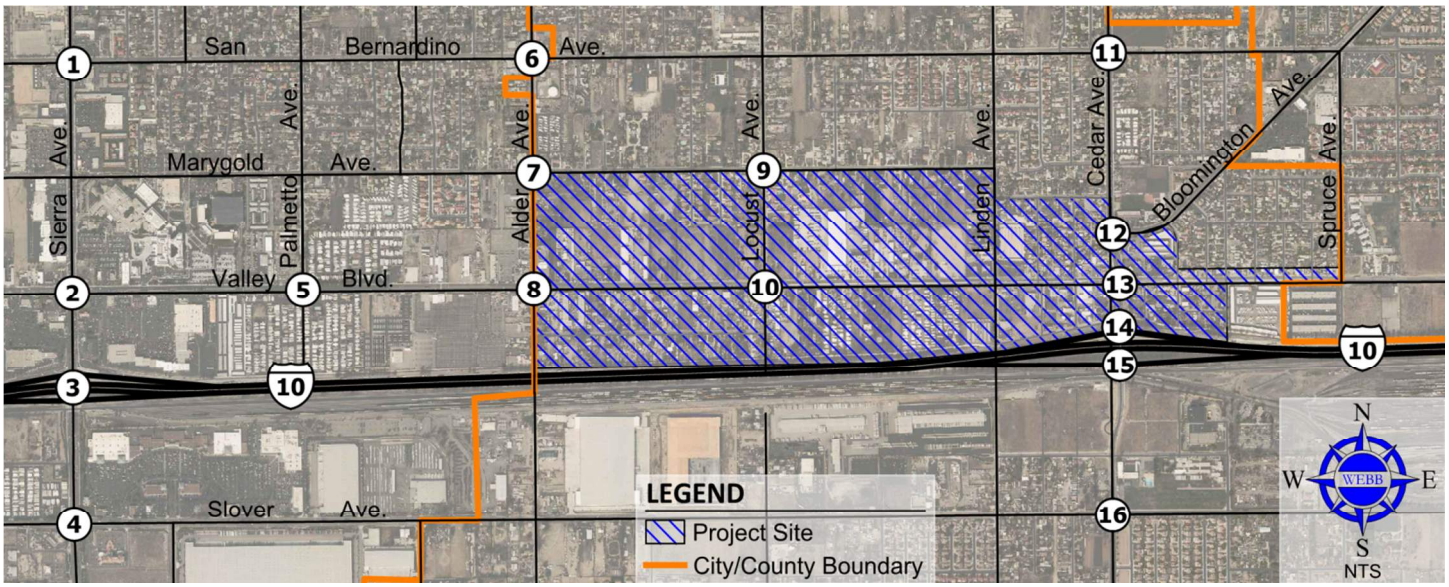
14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW) – AM Peak Hour delay will increase from an unacceptable 119.6 seconds to 134.4 seconds and PM Peak Hour delay will increase from an unacceptable 80.4 seconds to 93.6 seconds.
15. Cedar Avenue (NS) / I-10 Eastbound Ramps (EW) – AM Peak Hour delay will increase from an unacceptable 57.8 seconds to 70.7 seconds and PM Peak Hour delay will increase from an unacceptable 61.5 seconds to 84.5 seconds.
16. Cedar Avenue (NS) / Slover Avenue (EW) – PM Peak Hour delay will increase from an unacceptable 155.5 seconds to 175.3 seconds.

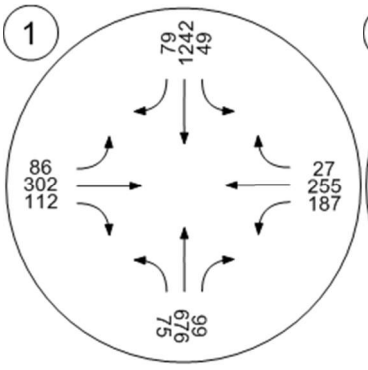
Table 5-7 – Intersection Levels of Service – Year 2035 with Project Conditions

Intersection	Jurisdiction	LOS Standard	Peak Hour	Without Project			With Project		
				Traffic Control	Delay (sec)	LOS	Traffic Control	Delay (sec)	LOS
1. Sierra Avenue (NS) / San Bernardino Avenue (EW)	Fontana	C	AM PM	Signal	34.9 ***47.0***	C ***D***	Signal	***35.6*** ***47.9***	***D*** ***D***
2. Sierra Avenue (NS) / Valley Boulevard (EW)	Fontana	C	AM PM	Signal	25.2 32.9	C C	Signal	27.4 ***41.8***	C ***D***
3. Sierra Avenue (NS) / I-10 Ramps (EW)	Caltrans	D	AM PM	Signal	31.8 31.7	C C	Signal	37.7 35.2	D D
4. Sierra Avenue (NS) / Slover Avenue (EW)	Fontana	C	AM PM	Signal	30.6 ***38.6***	C ***D***	Signal	30.6 ***38.7***	C ***D***
5. Palmetto Avenue (NS) / Valley Boulevard (EW)	Fontana	C	AM PM	Signal	31.0 21.9	C C	Signal	23.6 20.5	C C
6. Alder Avenue (NS) / San Bernardino Avenue (EW)	Fontana / County	C	AM PM	Signal	19.8 21.5	B C	Signal	20.6 22.2	C C
7. Alder Avenue (NS) / Marygold Avenue (EW)	Fontana / County	C	AM PM	AWSC	***29.5*** ***128.2***	***D*** ***F***	AWSC	***52.4*** ***175.6***	***F*** ***F***
8. Alder Avenue (NS) / Valley Boulevard (EW)	Fontana / County	C	AM PM	Signal	***OFL*** ***OFL***	***F*** ***F***	Signal	***OFL*** ***OFL***	***F*** ***F***
9. Locust Avenue (NS) / Marygold Avenue (EW)	County	D	AM PM	AWSC	11.0 22.0	B C	AWSC	12.2 ***37.4***	B ***E***
10. Locust Avenue (NS) / Valley Boulevard (EW)	County	D	AM PM	Signal	32.5 23.3	C C	Signal	29.3 27.8	C C
11. Cedar Avenue (NS) / San Bernardino Avenue (EW)	County	D	AM PM	Signal	28.3 27.5	C C	Signal	29.0 27.5	C C
12. Cedar Avenue (NS) / Bloomington Avenue (EW)	County	D	AM PM	Signal	18.7 15.7	B B	Signal	19.5 16.5	B B
13. Cedar Avenue (NS) / Valley Boulevard (EW)	County	D	AM PM	Signal	25.8 49.1	C D	Signal	41.0 ***56.4***	D ***E***
14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)	Caltrans	D	AM PM	Signal	***119.6*** ***80.4***	***F*** ***F***	Signal	***134.4*** ***93.6***	***F*** ***F***
15. Cedar Avenue (NS) / I-10 Eastbound Ramps (EW)	Caltrans	D	AM PM	Signal	***57.8*** ***61.5***	***E*** ***E***	Signal	***70.7*** ***84.5***	***E*** ***F***
16. Cedar Avenue (NS) / Slover Avenue (EW)	County	D	AM PM	Signal	34.3 ***155.5***	C ***F***	Signal	34.4 ***175.3***	C ***F***

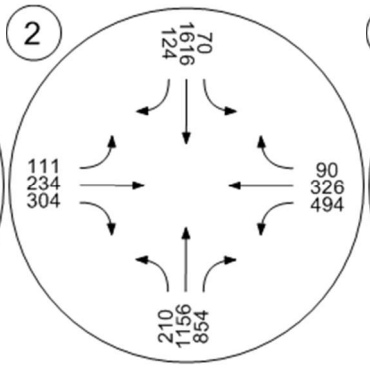
AWSC = All Way Stop Controlled
OFL = Overflow conditions; Delay > 200 sec
XXX = Exceeds LOS Standard
XXX = Significant Impact

Figure 5-E – Year 2035 With Project AM Peak Hour Intersection Volumes

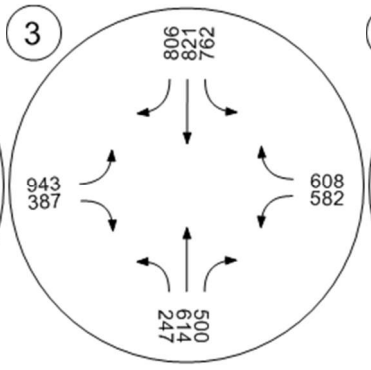




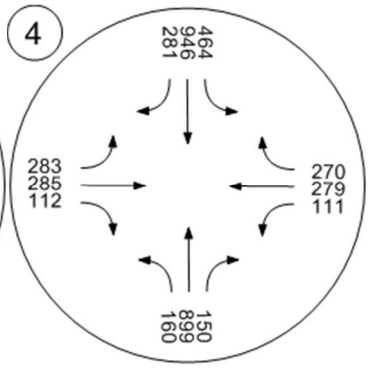
1. Sierra Avenue (NS) / San Bernardino Avenue (EW)



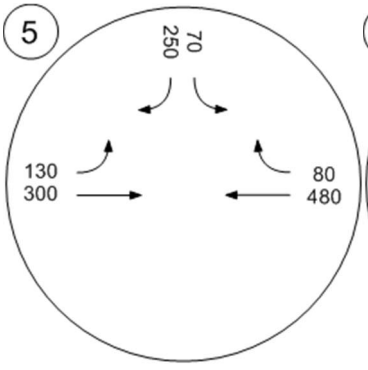
2. Sierra Avenue (NS) / Valley Boulevard (EW)



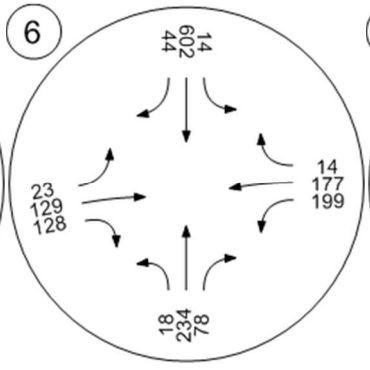
3. Sierra Avenue (NS) / I-10 Ramps (EW)



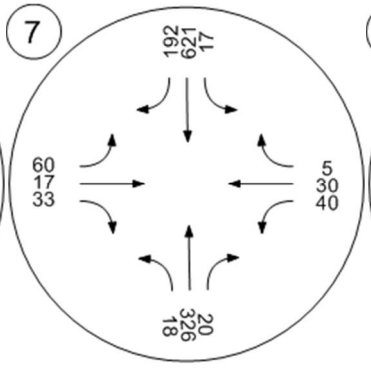
4. Sierra Avenue (NS) / Slover Avenue (EW)



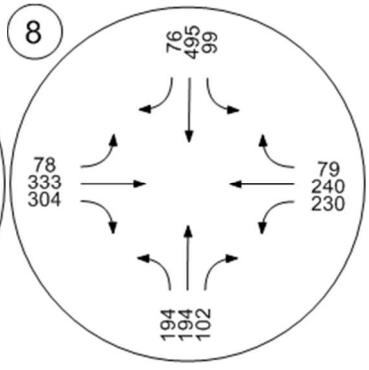
5. Palmetto Avenue (NS) / Valley Boulevard (EW)



6. Alder Avenue (NS) / San Bernardino Avenue (EW)

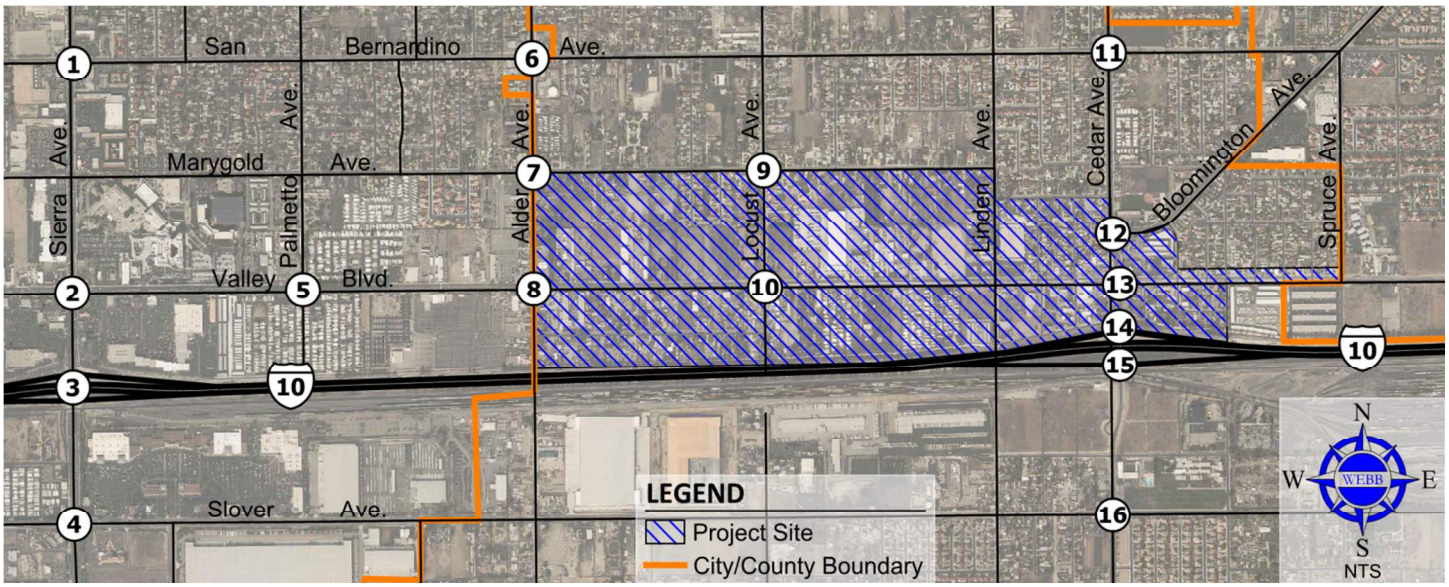


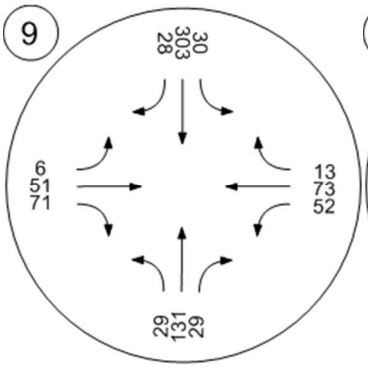
7. Alder Avenue (NS) / Marygold Avenue (EW)



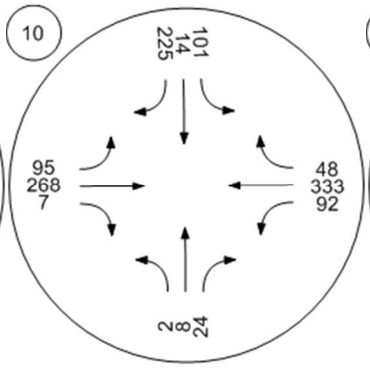
8. Alder Avenue (NS) / Valley Boulevard (EW)

Figure 5-E – Year 2035 With Project AM Peak Hour Intersection Volumes (Continued)

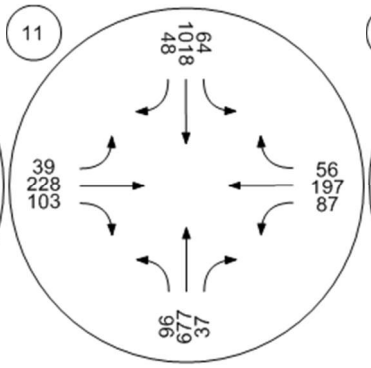




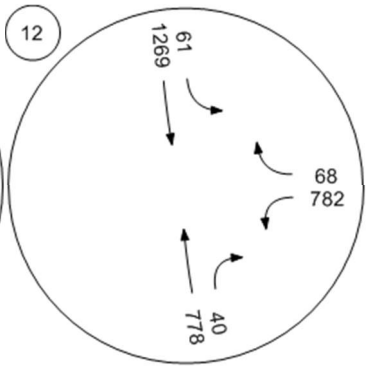
9. Locust Avenue (NS) / Marygold Avenue (EW)



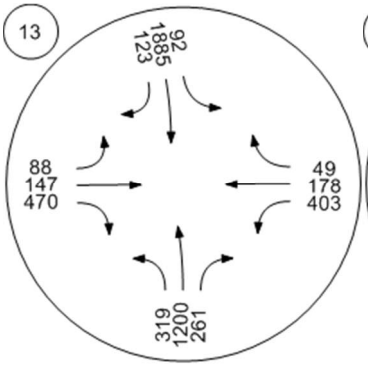
10. Locust Avenue (NS) / Valley Boulevard (EW)



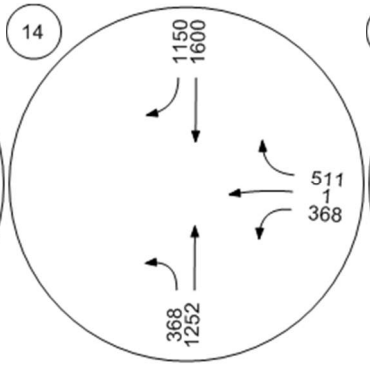
11. Cedar Avenue (NS) / San Bernardino Avenue (EW)



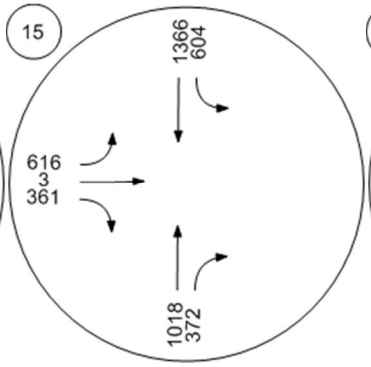
12. Cedar Avenue (NS) / Bloomington Avenue (EW)



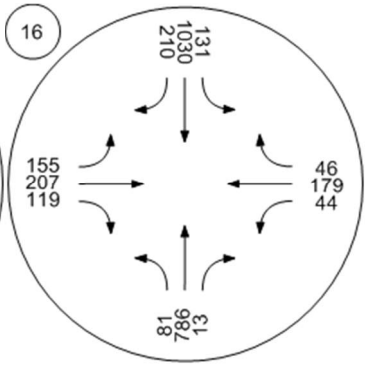
13. Cedar Avenue (NS) / Valley Boulevard (EW)



14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)

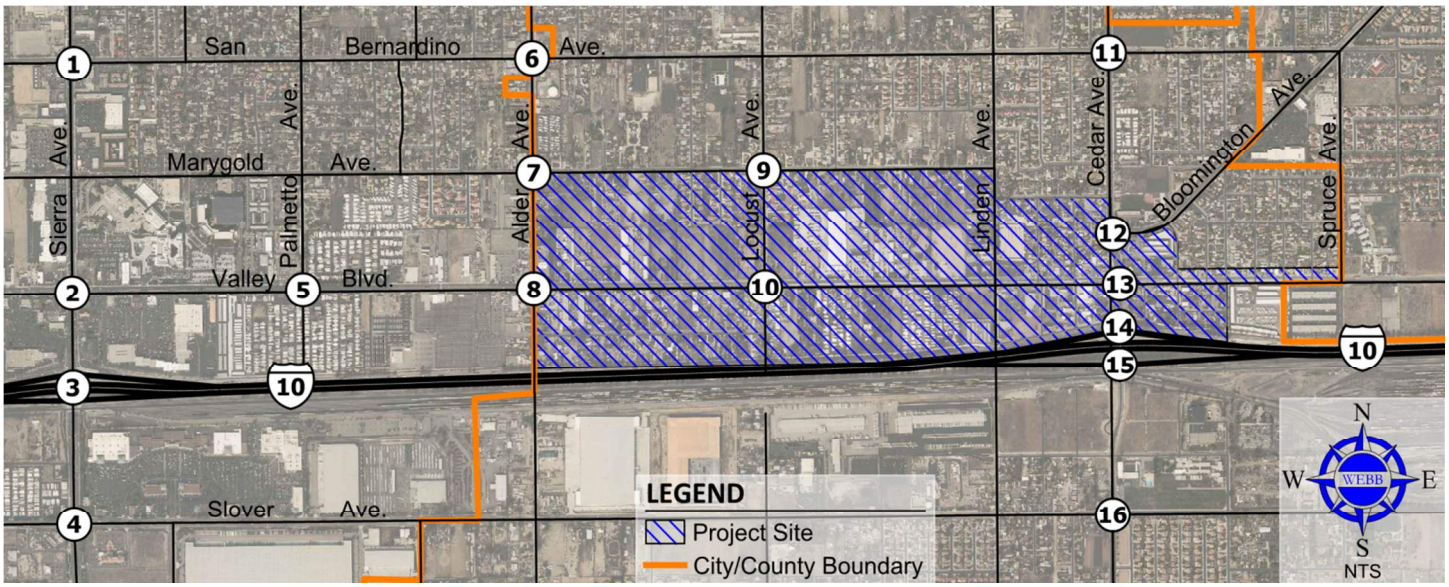


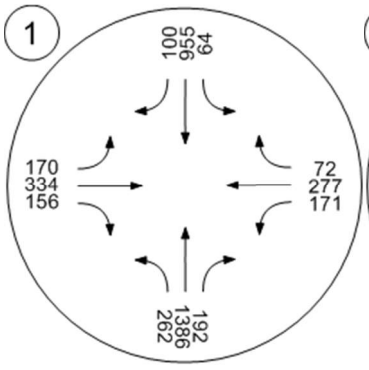
15. Cedar Avenue (NS) / I-10 Eastbound Ramps(EW)



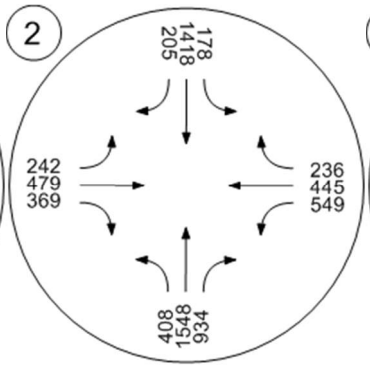
16. Cedar Avenue (NS) / Slover Avenue (EW)

Figure 5-F – Year 2035 With Project PM Peak Hour Intersection Volumes

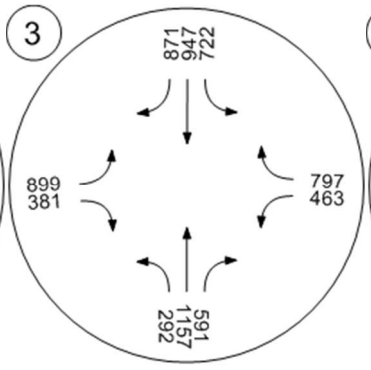




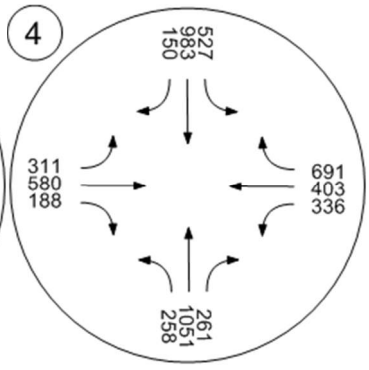
1. Sierra Avenue (NS) / San Bernardino Avenue (EW)



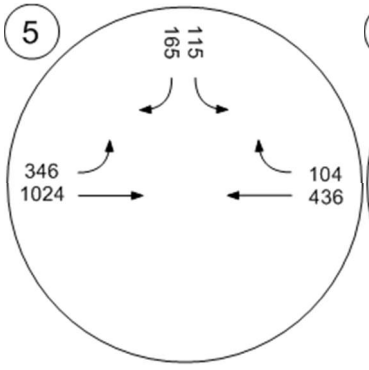
2. Sierra Avenue (NS) / Valley Boulevard (EW)



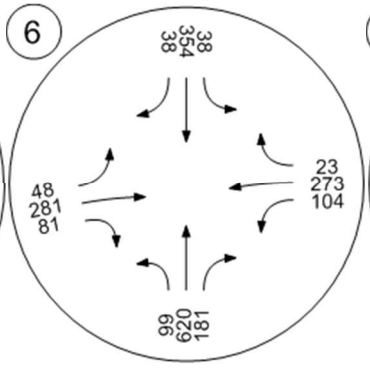
3. Sierra Avenue (NS) / I-10 Ramps (EW)



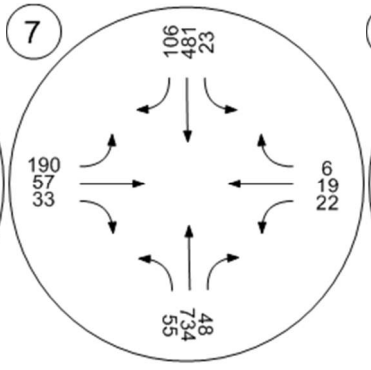
4. Sierra Avenue (NS) / Slover Avenue (EW)



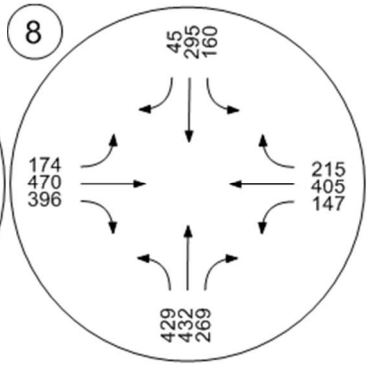
5. Palmetto Avenue (NS) / Valley Boulevard (EW)



6. Alder Avenue (NS) / San Bernardino Avenue (EW)

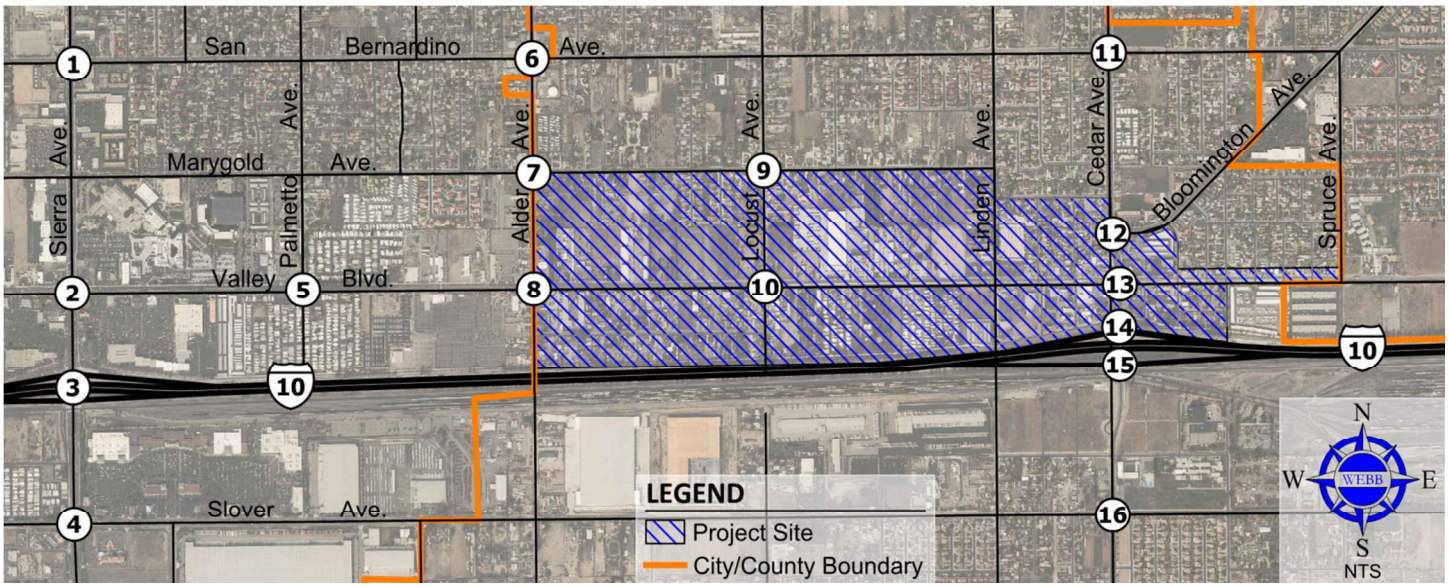


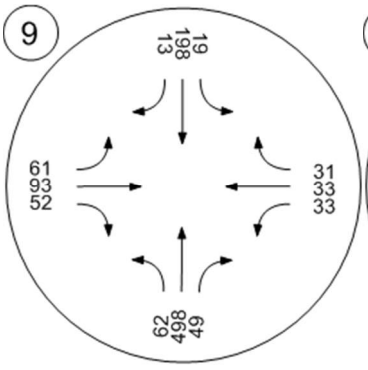
7. Alder Avenue (NS) / Marygold Avenue (EW)



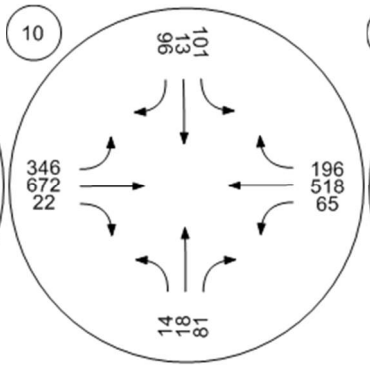
8. Alder Avenue (NS) / Valley Boulevard (EW)

Figure 5-F – Year 2035 With Project PM Peak Hour Intersection Volumes (Continued)

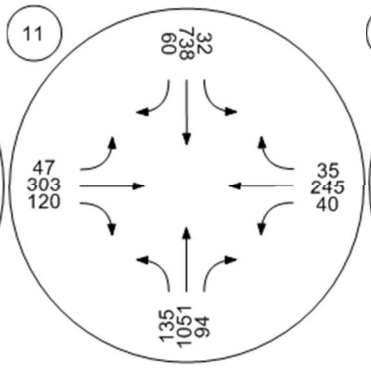




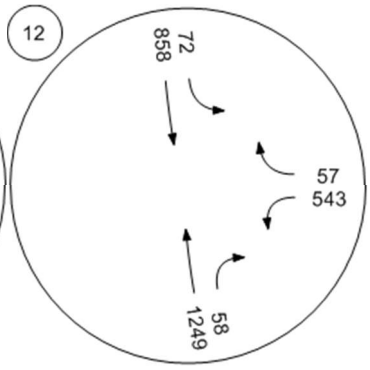
9. Locust Avenue (NS) / Marygold Avenue (EW)



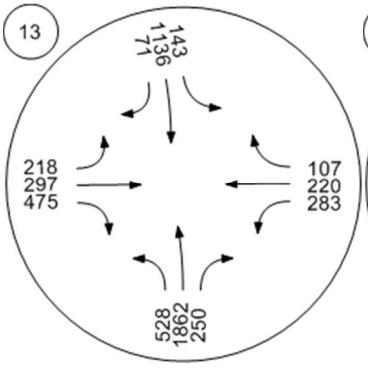
10. Locust Avenue (NS) / Valley Boulevard (EW)



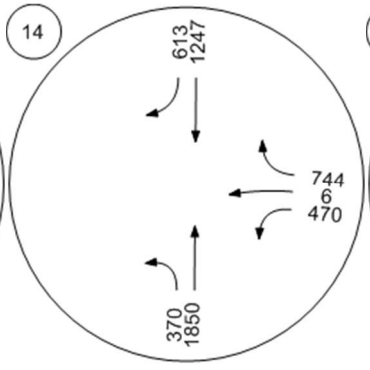
11. Cedar Avenue (NS) / San Bernardino Avenue (EW)



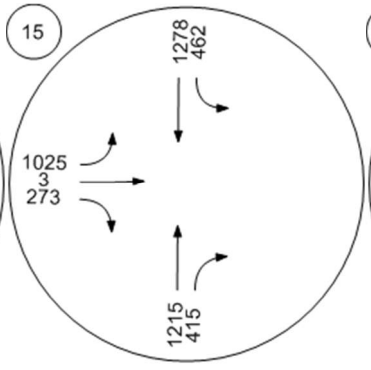
12. Cedar Avenue (NS) / Bloomington Avenue (EW)



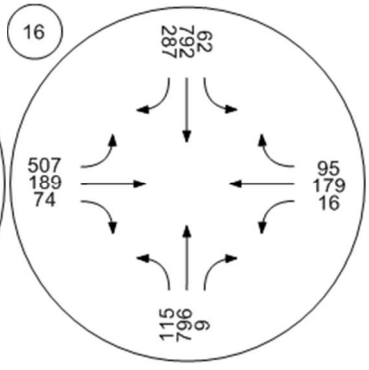
13. Cedar Avenue (NS) / Valley Boulevard (EW)



14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)



15. Cedar Avenue (NS) / I-10 Eastbound Ramps(EW)



16. Cedar Avenue (NS) / Slover Avenue (EW)

Levels of Service – Year 2035 with Project with Improvements

Table 5-8 provides the projected delays and levels of service at the study intersections under year 2035 with project conditions with improvements. With the improvements presented in Table 6-2 and Figure 6-B, the study intersections would operate at an acceptable LOS. The level of service calculation worksheets are provided in Appendix E.

Table 5-8 – Intersection Levels of Service – Year 2035 with Project with Improvements

Intersection	Jurisdiction	LOS Standard	Peak Hour	Without Project			With Project			With Project With Improvements		
				Traffic Control	Delay (sec)	LOS	Traffic Control	Delay (sec)	LOS	Traffic Control	Delay (sec)	LOS
1. Sierra Avenue (NS) / San Bernardino Avenue (EW)	Fontana	C	AM PM	Signal	34.9 ***47.0***	C ***D***	Signal	***35.6*** ***47.9***	***D*** ***D***	Signal	29.6 34.8	C C
2. Sierra Avenue (NS) / Valley Boulevard (EW)	Fontana	C	AM PM	Signal	25.2 32.9	C C	Signal	27.4 ***41.8***	C ***D***	Signal	26.7 34.2	C C
4. Sierra Avenue (NS) / Slover Avenue (EW)	Fontana	C	AM PM	Signal	30.6 ***38.6***	C ***D***	Signal	30.6 ***38.7***	C ***D***	Signal	28.8 35.0	C C
7. Alder Avenue (NS) / Marygold Avenue (EW)	Fontana / County	C	AM PM	AWSC	***29.5*** ***128.2***	***D*** ***F***	AWSC	***52.4*** ***175.6***	***F*** ***F***	Signal	11.0 19.2	B B
8. Alder Avenue (NS) / Valley Boulevard (EW)	Fontana / County	C	AM PM	Signal	***OFL*** ***OFL***	***F*** ***F***	Signal	***OFL*** ***OFL***	***F*** ***F***	Signal	34.2 33.7	C C
9. Locust Avenue (NS) / Marygold Avenue (EW)	County	D	AM PM	AWSC	11.0 22.0	B C	AWSC	12.2 ***37.4***	B ***E***	AWSC	12.0 14.0	B B
13. Cedar Avenue (NS) / Valley Boulevard (EW)	County	D	AM PM	Signal	25.8 49.1	C D	Signal	41.0 ***56.4***	D ***E***	Signal	28.2 31.8	C C
14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)	Caltrans	D	AM PM	Signal	***119.6*** ***80.4***	***F*** ***F***	Signal	***134.4*** ***93.6***	***F*** ***F***	Signal	39.9 43.1	D D
15. Cedar Avenue (NS) / I-10 Eastbound Ramps (EW)	Caltrans	D	AM PM	Signal	***57.8*** ***61.5***	***E*** ***E***	Signal	***70.7*** ***84.5***	***E*** ***F***	Signal	40.9 51.8	D D
16. Cedar Avenue (NS) / Slover Avenue (EW)	County	D	AM PM	Signal	34.3 ***155.5***	C ***F***	Signal	34.4 ***175.3***	C ***F***	Signal	30.0 53.3	C D

AWSC = All Way Stop Controlled
OFL = Overflow conditions; Delay > 200 sec
XXX = Exceeds LOS Standard
XXX = Significant Impact

▪ Traffic Impacts and Level of Service Analysis

Proposed Mitigation Measures – Existing Plus Project Conditions

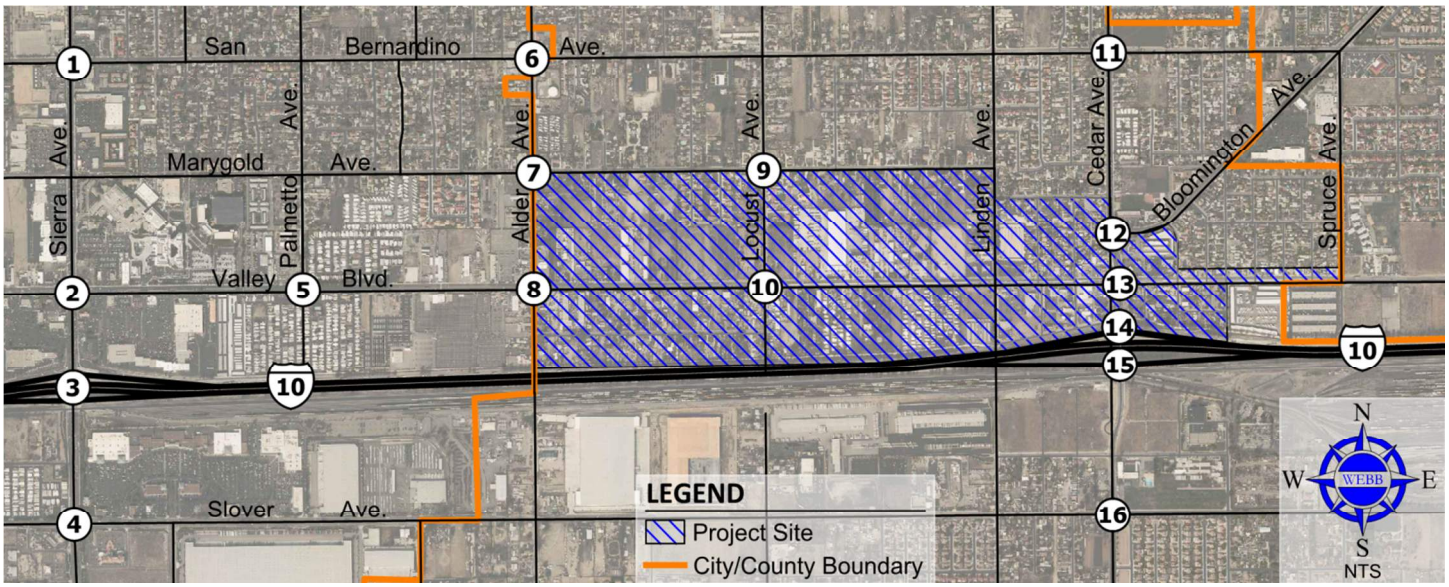
Table 6-1 and Figure 6-A present the improvements needed at the study intersections in existing plus project conditions in order to achieve a satisfactory level of service or improve the overall level of delay to the same or better than the level of delay prior to project traffic being added.

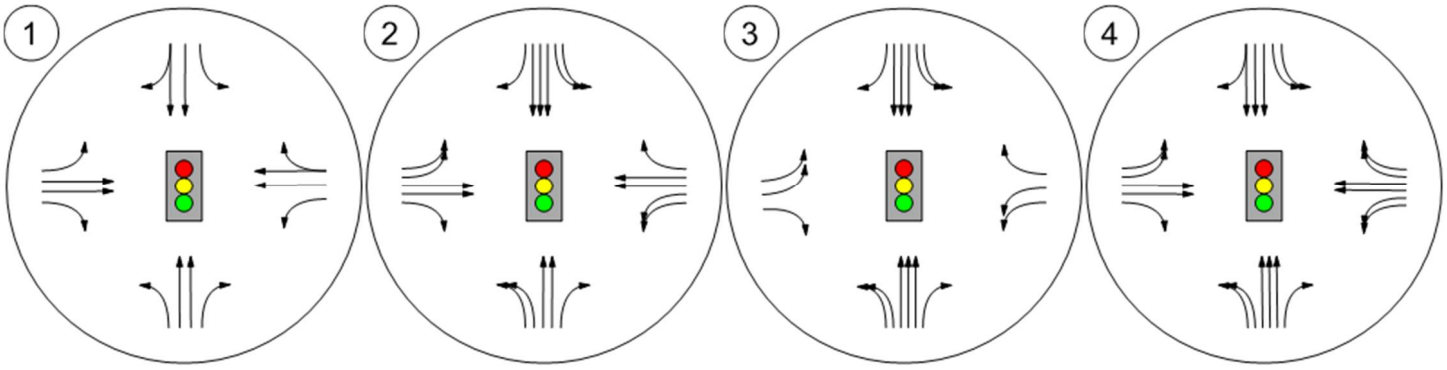
Table 6-1 – Summary of Improvements for Existing Plus Project Conditions

Intersection	Scenario	Northbound			Southbound			Eastbound			Westbound			Traffic Control
		L	T	R	L	T	R	L	T	R	L	T	R	
1. Sierra Avenue (NS) / San Bernardino Avenue (EW)	Existing	1	2	1	1	2	S	1	2	S	1	2	S	Signal
	Improvements	1	2	1	1	2	S	1	2	***1ol***	1	2	S	Signal
2. Sierra Avenue (NS) / Valley Boulevard (EW)	Existing	2	2	1ol	2	3	S	2	2	1ol	2	2	1ol	Signal
	Improvements	2	2	1ol	2	3	***1ol***	2	2	1ol	2	2	1ol	Signal
3. Sierra Avenue (NS) / I-10 Ramps (EW)	Existing	2	3	1f	2	3	1f	2	NA	1f	2	NA	1f	Signal
4. Sierra Avenue (NS) / Slover Avenue (EW)	Existing	2	3	1	2	3	S	2	2	1	2	2	2ol	Signal
5. Palmetto Avenue (NS) / Valley Boulevard (EW)	Existing	NA	NA	NA	NA	LR	NA	1	2	NA	NA	3	S	Signal
6. Alder Avenue (NS) / San Bernardino Avenue (EW)	Existing	1	2	S	1	2	S	1	2	S	1	2	S	Signal
7. Alder Avenue (NS) / Marygold Avenue (EW)	Existing	S	1	1	S	1	1	S	1	S	S	1	S	AWSC
	Improvements	S	1	1	S	1	1	S	1	S	S	1	S	***Signal***
8. Alder Avenue (NS) / Valley Boulevard (EW)	Existing	S	1	1	S	1	S	1	2	S	1	2	S	Signal
9. Locust Avenue (NS) / Marygold Avenue (EW)	Existing	S	1	1	S	1	1	S	1	S	S	1	S	AWSC
10. Locust Avenue (NS) / Valley Boulevard (EW)	Existing	S	1	S	S	1	S	1	2	S	1	2	S	Signal
11. Cedar Avenue (NS) / San Bernardino Avenue (EW)	Existing	1	2	S	1	2	S	1	1	1	1	2	S	Signal
12. Cedar Avenue (NS) / Bloomington Avenue (EW)	Existing	NA	2>	1f	1	2	NA	NA	NA	NA	2	NA	1	Signal
13. Cedar Avenue (NS) / Valley Boulevard (EW)	Existing	2	2	1ol	2	3	S	2	1	2ol	2	2	S	Signal
14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)	Existing	1	2	NA	NA	3	1	NA	NA	NA	S	TR	1	Signal
	Improvements	***2***	***3***	NA	NA	3	1	NA	NA	NA	S	TR	1	Signal
15. Cedar Avenue (NS) / I-10 Eastbound Ramps (EW)	Existing	NA	3	1	1	2	NA	1	LT	S	NA	NA	NA	Signal
	Improvements	NA	3	1	***2***	***3***	NA	1	LT	S	NA	NA	NA	Signal
16. Cedar Avenue (NS) / Slover Avenue (EW)	Existing	1	2	S	1	2	S	1	1	S	1	1	1ol	Signal

AWSC = All Way Stop Controlled
NA = Not Applicable
S = Lane is shared with through movement
LR = Lane shared by left-turn and right-turn movements
LT = Lane shared by left-turn and through movements
TR = Lane shared by through and right-turn movements
> = Right-turn movement also allowed from shared through and right-turn lane
f = Free right-turn movement
ol = Overlap right-turn movement with left-turn movement

Figure 6-A – Summary of Improvements for Existing Plus Project



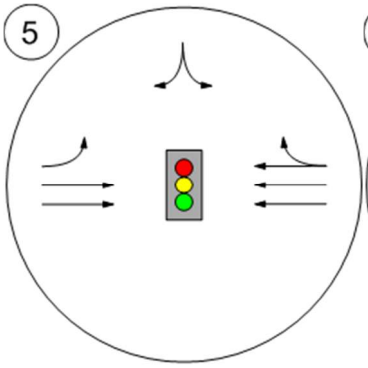


1. Sierra Avenue (NS) / San Bernardino Avenue (EW)

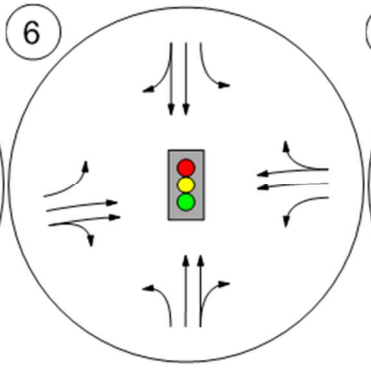
2. Sierra Avenue (NS) / Valley Boulevard (EW)

3. Sierra Avenue (NS) / I-10 Ramps (EW)

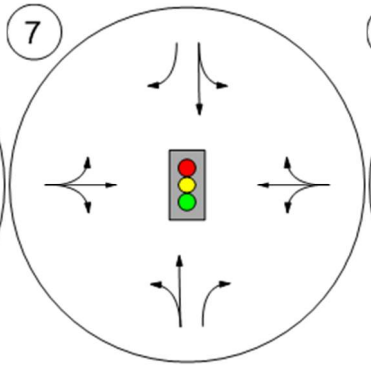
4. Sierra Avenue (NS) / Slover Avenue (EW)



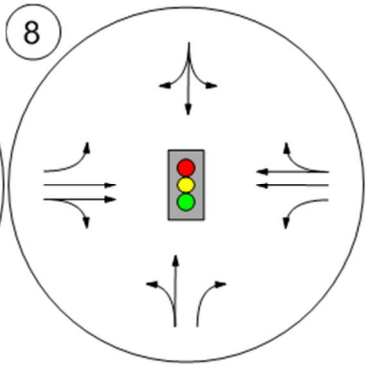
5. Palmetto Avenue (NS) / Valley Boulevard (EW)



6. Alder Avenue (NS) / San Bernardino Avenue (EW)

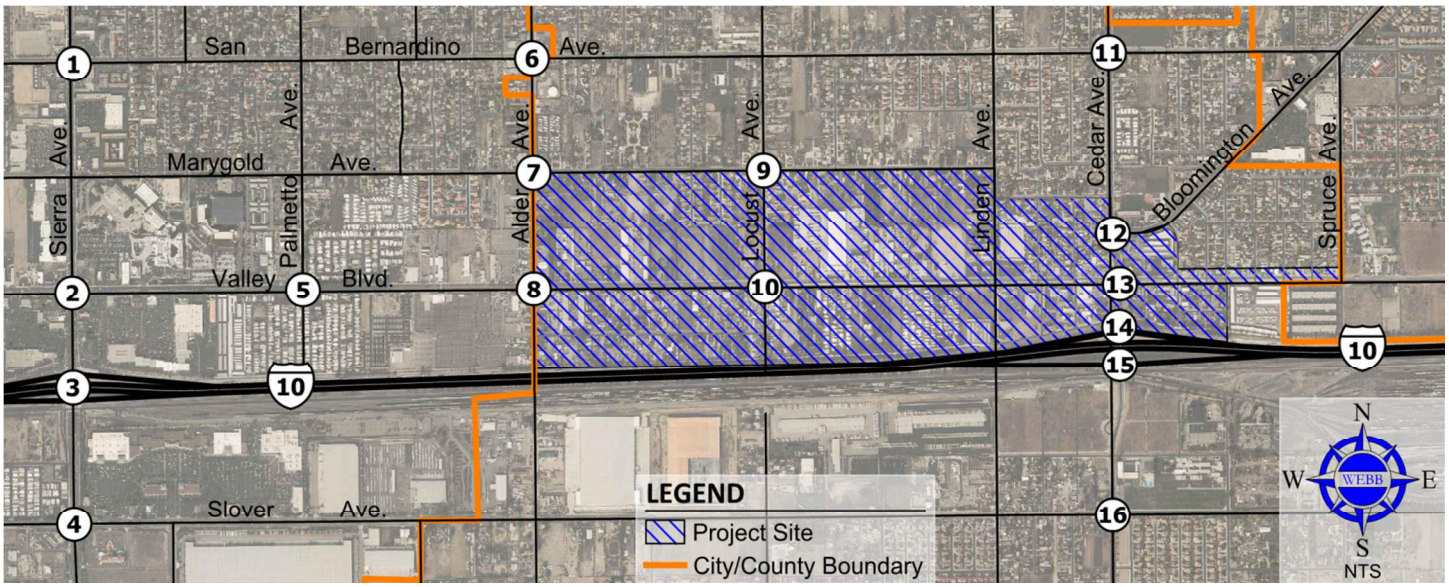


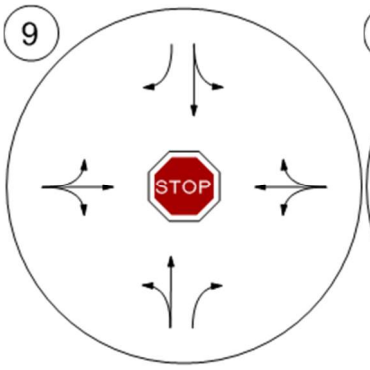
7. Alder Avenue (NS) / Marygold Avenue (EW)



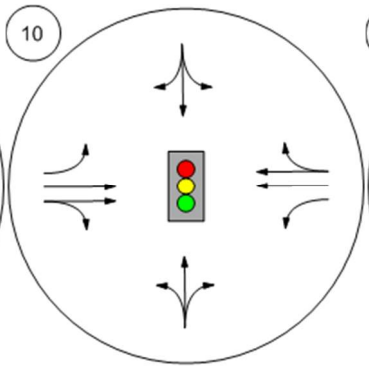
8. Alder Avenue (NS) / Valley Boulevard (EW)

Figure 6-A – Summary of Improvements for Existing Plus Project (Continued)

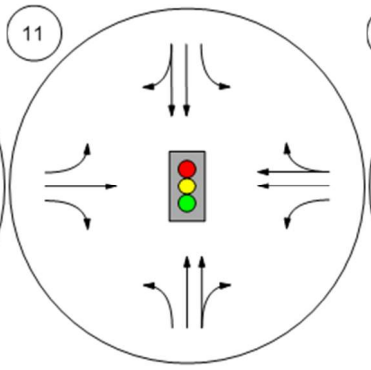




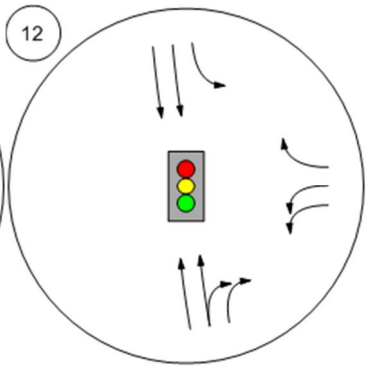
9. Locust Avenue (NS) / Marygold Avenue (EW)



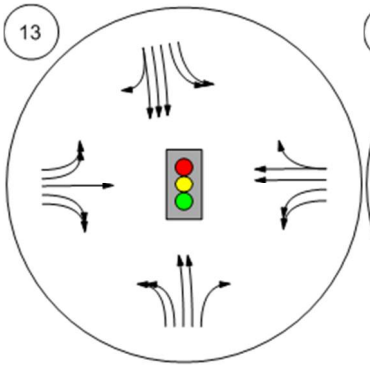
10. Locust Avenue (NS) / Valley Boulevard (EW)



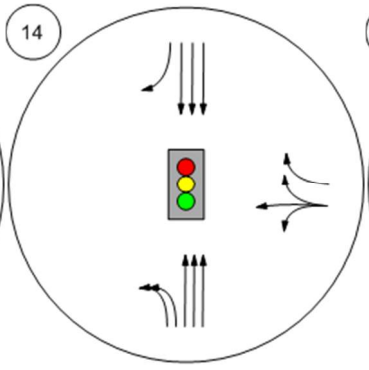
11. Cedar Avenue (NS) / San Bernardino Avenue (EW)



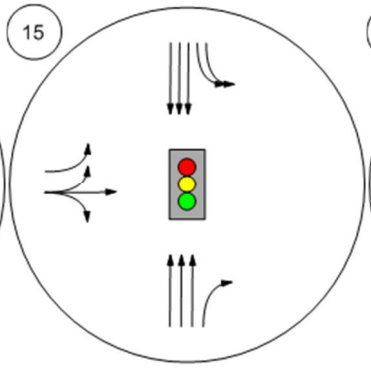
12. Cedar Avenue (NS) / Bloomington Avenue (EW)



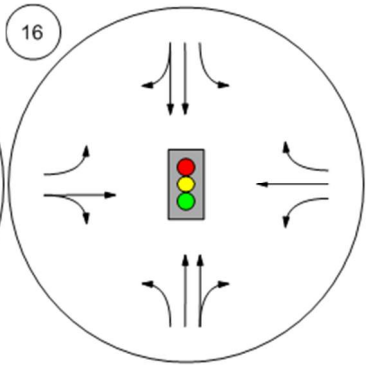
13. Cedar Avenue (NS) / Valley Boulevard (EW)



14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)



15. Cedar Avenue (NS) / I-10 Eastbound Ramps(EW)



16. Cedar Avenue (NS) / Slover Avenue (EW)

Proposed Mitigation Measures – Year 2035 with Project Conditions

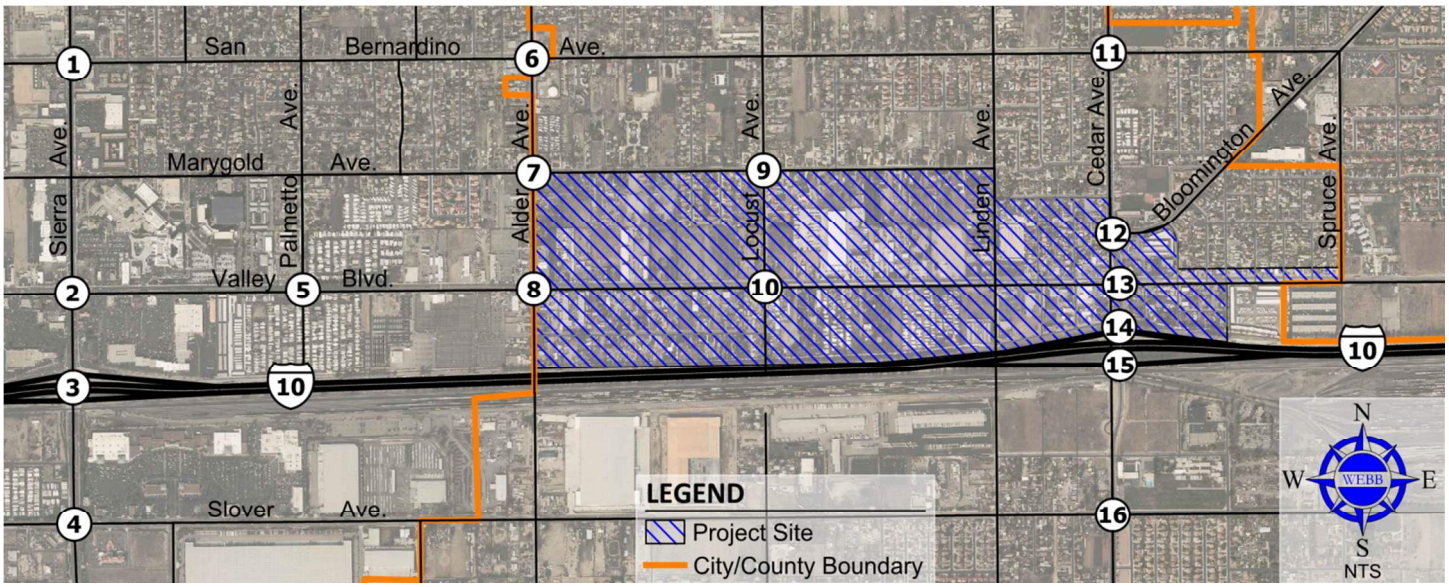
Table 6-2 and Figure 6-B present the improvements needed in order to achieve a satisfactory level of service at the study intersections in year 2035 with project conditions.

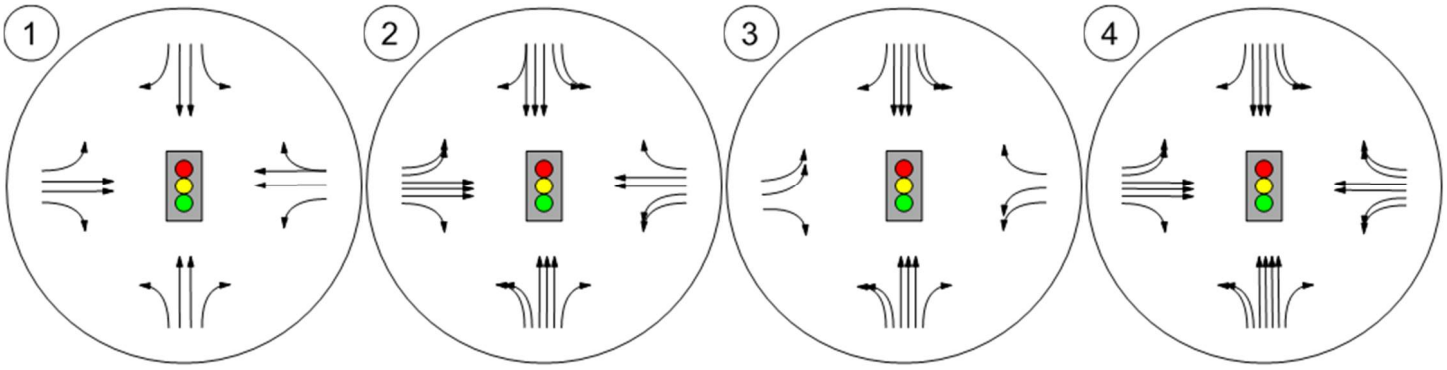
Table 6-2 – Summary of Improvements for Year 2035 with Project Conditions

Intersection	Scenario	Northbound			Southbound			Eastbound			Westbound			Traffic Control
		L	T	R	L	T	R	L	T	R	L	T	R	
1. Sierra Avenue (NS) / San Bernardino Avenue (EW)	Existing	1	2	1	1	2	S	1	2	S	1	2	S	Signal
	Improvements	1	2	***1ol***	1	2	***1***	1	2	***1***	1	2	S	Signal
2. Sierra Avenue (NS) / Valley Boulevard (EW)	Existing	2	2	1ol	2	3	S	2	2	1ol	2	2	1ol	Signal
	Improvements	2	***3***	1ol	2	3	S	2	***3***	1ol	2	2	1ol	Signal
3. Sierra Avenue (NS) / I-10 Ramps (EW)	Existing	2	3	1f	2	3	1f	2	NA	1f	2	NA	1f	Signal
4. Sierra Avenue (NS) / Slover Avenue (EW)	Existing	2	3	1	2	3	S	2	2	1	2	2	2ol	Signal
	Improvements	2	***4***	***1ol***	2	3	***1ol***	2	***3***	***1ol***	2	2	2ol	Signal
5. Palmetto Avenue (NS) / Valley Boulevard (EW)	Existing	NA	NA	NA	NA	LR	NA	1	2	NA	NA	3	S	Signal
6. Alder Avenue (NS) / San Bernardino Avenue (EW)	Existing	1	2	S	1	2	S	1	2	S	1	2	S	Signal
7. Alder Avenue (NS) / Marygold Avenue (EW)	Existing	S	1	1	S	1	1	S	1	S	S	1	S	AWSC
	Improvements	***1***	1	***S***	***1***	1	***S***	S	1	S	S	1	S	***Signal***
8. Alder Avenue (NS) / Valley Boulevard (EW)	Existing	S	1	1	S	1	S	1	2	S	1	2	S	Signal
	Improvements	***2***	***2***	***1ol***	***1***	***2***	***1ol***	***2***	2	***1ol***	***2***	2	S	Signal
9. Locust Avenue (NS) / Marygold Avenue (EW)	Existing	S	1	1	S	1	1	S	1	S	S	1	S	AWSC
	Improvements	S	***2***	***S***	S	1	1	S	1	S	S	1	S	AWSC
10. Locust Avenue (NS) / Valley Boulevard (EW)	Existing	S	1	S	S	1	S	1	2	S	1	2	S	Signal
11. Cedar Avenue (NS) / San Bernardino Avenue (EW)	Existing	1	2	S	1	2	S	1	1	1	1	2	S	Signal
12. Cedar Avenue (NS) / Bloomington Avenue (EW)	Existing	NA	2>	1f	1	2	NA	NA	NA	NA	2	NA	1	Signal
13. Cedar Avenue (NS) / Valley Boulevard (EW)	Existing	2	2	1ol	2	3	S	2	1	2ol	2	2	S	Signal
	Improvements	2	***3***	1ol	2	3	S	2	1	2ol	2	2	S	Signal
14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)	Existing	1	2	NA	NA	3	1	NA	NA	NA	S	TR	1	Signal
	Improvements	***2***	***3***	NA	NA	3	***1ol***	NA	NA	NA	***NA***	***LR***	1	Signal
15. Cedar Avenue (NS) / I-10 Eastbound Ramps (EW)	Existing	NA	3	1	1	2	NA	1	LT	S	NA	NA	NA	Signal
	Improvements	NA	3	1	***2***	***3***	NA	1	LT	S	NA	NA	NA	Signal
16. Cedar Avenue (NS) / Slover Avenue (EW)	Existing	1	2	S	1	2	S	1	1	S	1	1	1ol	Signal
	Improvements	1	2	S	1	2	S	***2***	1	S	1	1	1ol	Signal

AWSC = All Way Stop Controlled
NA = Not Applicable
S = Lane is shared with through movement
LR = Lane shared by left-turn and right-turn movements
LT = Lane shared by left-turn and through movements
TR = Lane shared by through and right-turn movements
> = Right-turn movement also allowed from shared through and right-turn lane
f = Free right-turn movement
ol = Overlap right-turn movement with left-turn movement

Figure 6-B – Summary of Improvements for Year 2035 with Project



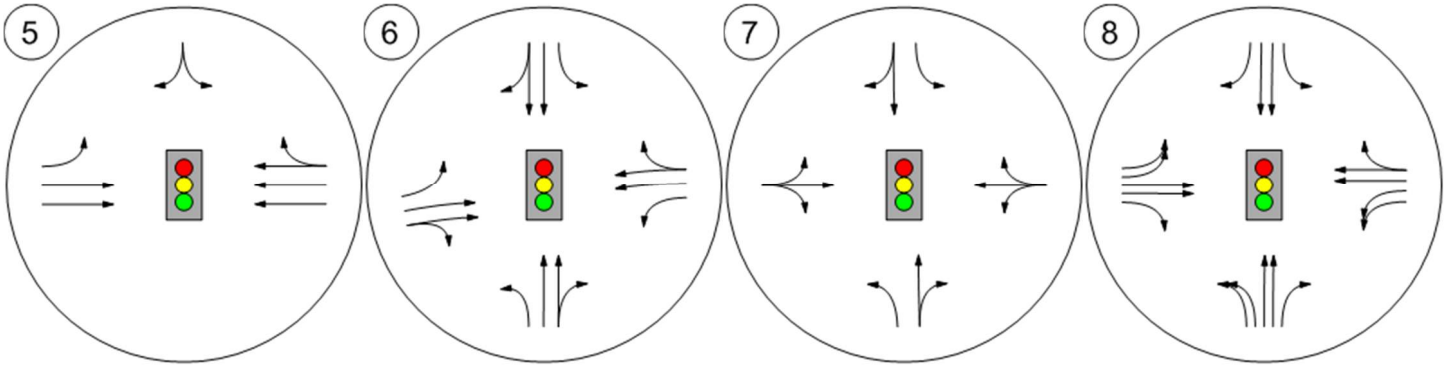


1. Sierra Avenue (NS) / San Bernardino Avenue (EW)

2. Sierra Avenue (NS) / Valley Boulevard (EW)

3. Sierra Avenue (NS) / I-10 Ramps (EW)

4. Sierra Avenue (NS) / Slover Avenue (EW)



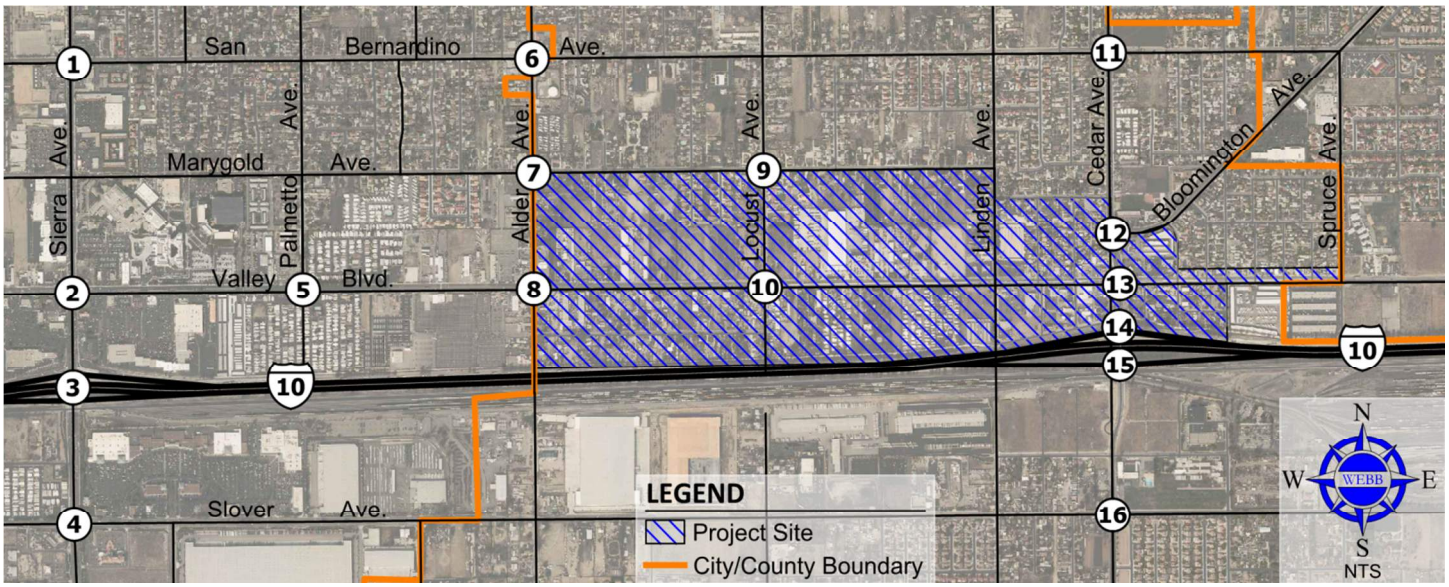
5. Palmetto Avenue (NS) / Valley Boulevard (EW)

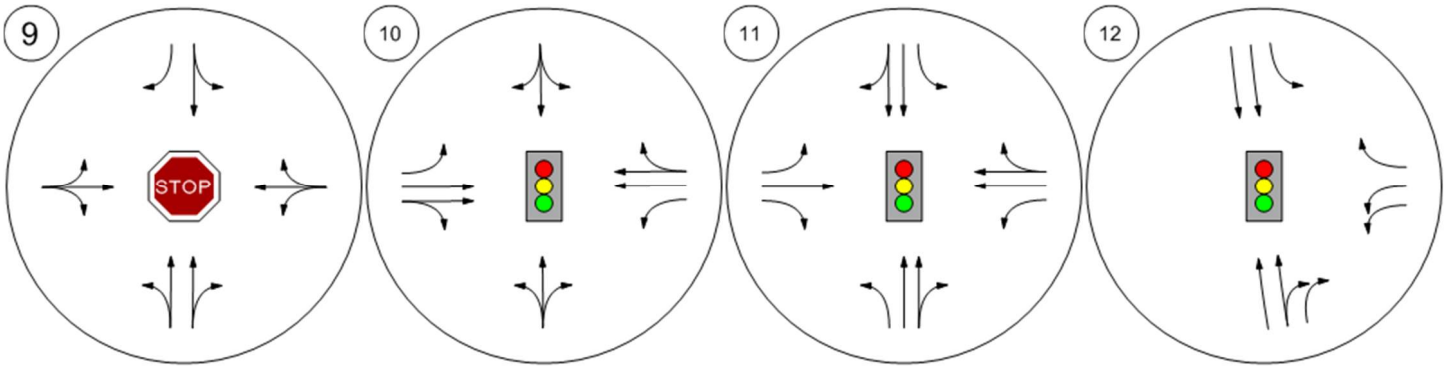
6. Alder Avenue (NS) / San Bernardino Avenue (EW)

7. Alder Avenue (NS) / Marygold Avenue (EW)

8. Alder Avenue (NS) / Valley Boulevard (EW)

Figure 6-B – Summary of Improvements for Year 2035 with Project (Continued)



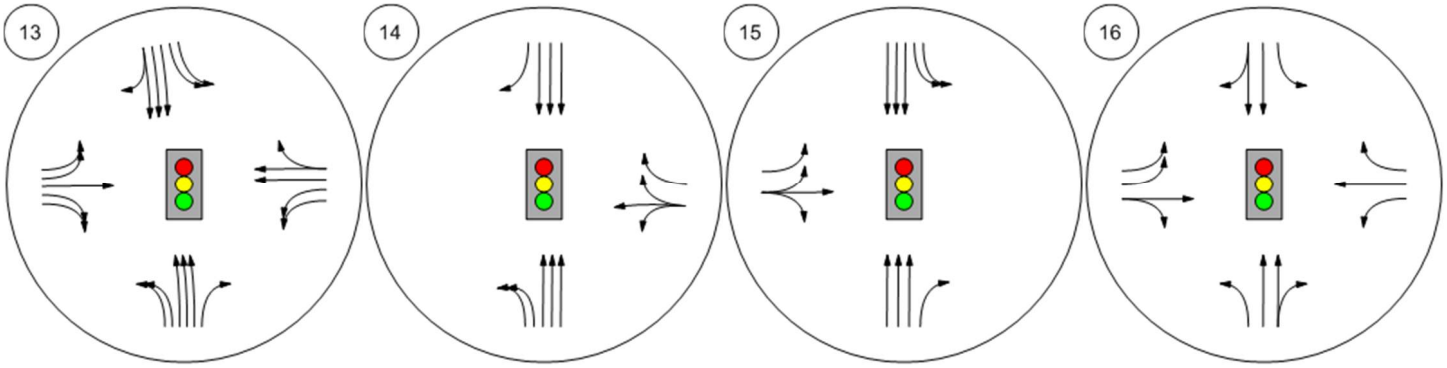


9. Locust Avenue (NS) / Marygold Avenue (EW)

10. Locust Avenue (NS) / Valley Boulevard (EW)

11. Cedar Avenue (NS) / San Bernardino Avenue (EW)

12. Cedar Avenue (NS) / Bloomington Avenue (EW)



13. Cedar Avenue (NS) / Valley Boulevard (EW)

14. Cedar Avenue (NS) / I-10 Westbound Ramps (EW)

15. Cedar Avenue (NS) / I-10 Eastbound Ramps(EW)

16. Cedar Avenue (NS) / Slover Avenue (EW)

Traffic Signal Warrants

The California MUTCD states that the satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal. Peak hour traffic signal warrant analysis should only be considered as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal. Intersections that exceed the peak hour warrant are more likely to meet one or more of the other volume based signal warrants. The Manual on Uniform Traffic Control Devices (MUTCD) also advises that a traffic control signal should not be installed unless:

- One or more of the traffic signal warrants is satisfied;
- An engineering study indicates that installing a traffic control signal will improve the overall safety and/or operation of the intersection; and
- It will not seriously disrupt progressive traffic flow.

For existing traffic conditions, the peak hour traffic control signal warrant is satisfied for the following study area unsignalized intersection (see Appendix D for technical calculations):

7. Alder Avenue (NS) / Marygold Avenue (EW)

For existing plus project traffic conditions, year 2035 without project conditions, and year 2035 with project conditions, no additional study area unsignalized intersections are expected to meet the peak hour traffic control signal warrant (see Appendix D for technical calculations).

The following study area unsignalized intersection does not satisfy the peak hour traffic control signal warrant in any study scenario (see Appendix D for technical calculations):

9. Locust Avenue (NS) / Marygold Avenue (EW)

Congestion Management Program

Per San Bernardino Congestion Management Plan (CMP) Appendix A, "Jurisdictions that have implemented qualifying development mitigation programs that achieve development contribution requirements established by the SANBAG Development Mitigation Nexus Study are not required to prepare TIA reports for CMA review."

The Valley Corridor Specific Plan lies within the City of Rialto Sphere of Influence and is subject to the County of San Bernardino Regional Transportation Development Mitigation Plan Fee Schedule. Therefore, a CMP TIA report is not required for this project.

Circulation Recommendations

Project Specific Improvements

This traffic impact analysis demonstrates that the direct traffic impacts generated by Valley Corridor Specific Plan can be mitigated to less than significant levels if the following recommended intersection improvements are adopted.

- Modify the intersection of Sierra Avenue and San Bernardino Avenue to include the following geometrics:
  Northbound: One left-turn lane. Two through lanes. One right-turn lane.
  Southbound: One left-turn lane. One through lane. One shared through and right-turn lane.

Eastbound: One left-turn lane. Two through lanes. ***Add one right-turn lane with overlap phase.***
Westbound: One left-turn lane. One through lane. One shared through and right-turn lane.
This improvement is in the City of Fontana and the County of San Bernardino would have no jurisdiction to implement the mitigation. It may also require additional right-of-way and may not be feasible to implement. A significant impact will remain if this mitigation measure cannot be implemented.

- Modify the intersection of Sierra Avenue and Valley Boulevard to include the following geometrics:
  Northbound: Two left-turn lanes. Two through lanes. One right-turn lane with overlap phase.
  Southbound: Two left-turn lanes. Three through lanes. ***Add one right-turn lane with overlap phase.***
  Eastbound: Two left-turn lanes. Two through lanes. One right-turn lane with overlap phase.
  Westbound: Two left-turn lanes. Two through lanes. One right-turn lane with overlap phase.
  This improvement is in the City of Fontana and the County of San Bernardino would have no jurisdiction to implement the mitigation. It may also require additional right-of-way and may not be feasible to implement. A significant impact will remain if this mitigation measure cannot be implemented.

- Install a traffic signal at the intersection of Alder Avenue and Marygold Avenue with the following existing geometrics:
  Northbound: One shared left-turn and through lane. One right-turn lane.
  Southbound: One shared left-turn and through lane. One right-turn lane.
  Eastbound: One shared left-turn, through, and right-turn lane.
  Westbound: One shared left-turn, through, and right-turn lane.

- Modify the intersection of Cedar Avenue and I-10 Westbound Ramps to include the following geometrics:
  Northbound: One left-turn lane. ***Add second left-turn lane.*** Two through lanes. ***Add third through lane.***
  Southbound: Three through lanes. One right-turn lane.
  Eastbound: Not applicable.
  Westbound: One shared left-turn, through, and right-turn lane. One right-turn lane.
  This improvement is within Caltrans right-of-way and the County of San Bernardino would have no jurisdiction to implement the mitigation. These improvements are consistent with the Cedar Avenue Overcrossing Widening project. The payment of County of San Bernardino Regional Transportation Development Mitigation Fees would contribute the project's fair share of these interchange improvements based on the Development Mitigation Nexus Study (Appendix K of the SANBAG CMP).

- Modify the intersection of Cedar Avenue and I-10 Eastbound Ramps to include the following geometrics:
  Northbound: Three through lanes. One right-turn lane.
  Southbound: One left-turn lane. ***Add second left-turn lane.*** Two through lanes. ***Add third through lane.***
  Eastbound: One left-turn lane. One shared left-turn, through, and right-turn lane.
  Westbound: Not applicable.
  This improvement is within Caltrans right-of-way and the County of San Bernardino would have no

jurisdiction to implement the mitigation. These improvements are consistent with the Cedar Avenue Overcrossing Widening project. The payment of County of San Bernardino Regional Transportation Development Mitigation Fees would contribute the project's fair share of these interchange improvements based on the Development Mitigation Nexus Study (Appendix K of the SANBAG CMP).

Cumulative Improvements

The cumulative traffic impacts generated by Valley Corridor Specific Plan and other projects included in the SBTAM model can be mitigated to meet the required level of service if the following improvements are adopted. Because these are cumulative impacts, the project should not be solely responsible to implement these measures, but should be required to pay a fair share contribution.

- Modify the intersection of Sierra Avenue and San Bernardino Avenue to include the following geometrics:
  Northbound: One left-turn lane. Two through lanes. One right-turn lane ***with overlap phase***.
  Southbound: One left-turn lane. Two through lanes. ***Add one right-turn lane.***
  Eastbound: One left-turn lane. Two through lanes. ***Add one right-turn lane.***
  Westbound: One left-turn lane. One through lane. One shared through and right-turn lane.

- Modify the intersection of Sierra Avenue and Valley Boulevard to include the following geometrics:
  Northbound: Two left-turn lanes. Two through lanes. ***Add third through lane.*** One right-turn lane with overlap phase.
  Southbound: Two left-turn lanes. Two through lanes. One shared through and right-turn lane.
  Eastbound: Two left-turn lanes. Two through lanes. ***Add third through lane.*** One right-turn lane with overlap phase.
  Westbound: One left-turn lane. One through lane. One shared through and right-turn lane.

- Modify the intersection of Sierra Avenue and Slover Avenue to include the following geometrics:
  Northbound: Two left-turn lanes. Three through lanes. ***Add fourth through lane.*** One right-turn lane ***with overlap phase.***
  Southbound: Two left-turn lanes. Three through lanes. ***Add one right-turn lane with overlap phase.***
  Eastbound: Two left-turn lanes. Two through lanes. ***Add third through lane.*** One right-turn lane ***with overlap phase.***
  Westbound: Two left-turn lanes. Two through lanes. Two right-turn lanes with overlap phase.

- Install a traffic signal at the intersection of Alder Avenue and Marygold Avenue to include the following geometrics:
  Northbound: One left-turn lane. One shared through and right-turn lane.
  Southbound: One left-turn lane. One shared through and right-turn lane.
  Eastbound: One shared left-turn, through, and right-turn lane.
  Westbound: One shared left-turn, through, and right-turn lane.

- Modify the intersection of Alder Avenue and Valley Boulevard to include the following geometrics:
  Northbound: ***Add two left-turn lanes.*** One through lane. ***Add second through lane.*** One right-turn lane ***with overlap phase.***
  Southbound: ***Add one left-turn lane.*** One through lane. ***Add second through lane. Add right-***

turn lane with overlap phase.
Eastbound: One left-turn lane. ***Add second left-turn lane.*** Two through lanes. Add right-turn lane ***with overlap phase.***
Westbound: One left-turn lane. ***Add second left-turn lane.*** One through lane. One shared through and right-turn lane.

- Modify the intersection of Locust Avenue and Marygold Avenue to include the following geometrics:
  Northbound: One shared left-turn and through lane. ***Modify right-turn lane to shared through and right-turn lane.***
  Southbound: One shared left-turn and through lane. One right-turn lane.
  Eastbound: One shared left-turn, through, and right-turn lane.
  Westbound: One shared left-turn, through, and right-turn lane.

- Modify the intersection of Cedar Avenue and Valley Boulevard to include the following geometrics:
  Northbound: Two left-turn lanes. Two through lanes. ***Add third through lane.*** One right-turn lane with overlap phase.
  Southbound: Two left-turn lanes. Two through lanes. One shared through and right-turn lane.
  Eastbound: Two left-turn lanes. One through lane. Two right-turn lanes with overlap phase.
  Westbound: Two left-turn lanes. One through lane. One shared through and right-turn lane.

- Modify the intersection of Cedar Avenue and I-10 Westbound Ramps to include the following geometrics:
  Northbound: One left-turn lane. ***Add second left-turn lane.*** Two through lanes. ***Add third through lane.***
  Southbound: Three through lanes. One right-turn lane ***with overlap phase***.
  Eastbound: Not applicable.
  Westbound: ***Modify shared left-turn, through, and right-turn lane to shared left-turn and right-turn lane (restrict through movement).*** One right-turn lane.

- Modify the intersection of Cedar Avenue and I-10 Eastbound Ramps to include the following geometrics:
  Northbound: Three through lanes. One right-turn lane.
  Southbound: One left-turn lane. ***Add second left-turn lane.*** Two through lanes. ***Add third through lane.***
  Eastbound: One left-turn lane. One shared left-turn, through, and right-turn lane.
  Westbound: Not applicable.

- Modify the intersection of Cedar Avenue and Slover Avenue to include the following geometrics:
  Northbound: One left-turn lane. One through lane. One shared through and right-turn lane.
  Southbound: One left-turn lane. One through lane. One shared through and right-turn lane.
  Eastbound: One left-turn lane. ***Add second left-turn lane.*** One shared through and right-turn lane.
  Westbound: One left-turn lane. One through lane. One right-turn lane with overlap phase.