



TECHNICAL MEMORANDUM

Central Avenue Complete Street Concept

Alameda, CA

Preliminary Road Diet Analysis

Date: June 16, 2015
To: Gail Payne, Public Works
From: Laurence Lewis
cc: Sarah Sutton, PlaceWorks

Project #: 18223.0

This memorandum summarizes the transportation operations analysis completed for intersections along Central Avenue between Main Street/Pacific Avenue and Sherman Street/Encinal Avenue. The analysis is intended to serve as a high-level assessment of traffic capacity issues to be addressed as part of the potential implementation of a road diet. Based on the analysis results, the project team will identify design options to address the traffic capacity issues.

The analysis was completed for the following scenarios:

Existing Traffic Volumes

- Existing Lane Configuration – assumes no changes to the number of lanes
- Three-Lane Configuration – assumes one through lane in each direction, with a left turn lane at intersections
- Two-Lane Configuration – assumes one through lane in each direction, with no left turn lane at intersections

Year 2035 Traffic Volumes

- Existing Lane Configuration – assumes no changes to the number of lanes
- Three-Lane Configuration – assumes one through lane in each direction, with a left turn lane at intersections
- Two-Lane Configuration – assumes one through lane in each direction, with no left turn lane at intersections

Each scenario was analyzed for both AM peak hour and PM peak hour conditions. The existing lane configuration is associated with Option A (Do Nothing) and Option B (Class III Bike Lanes/Sharrows). The three-lane configuration is associated with Option C (Class II Bike Lanes). The two-lane

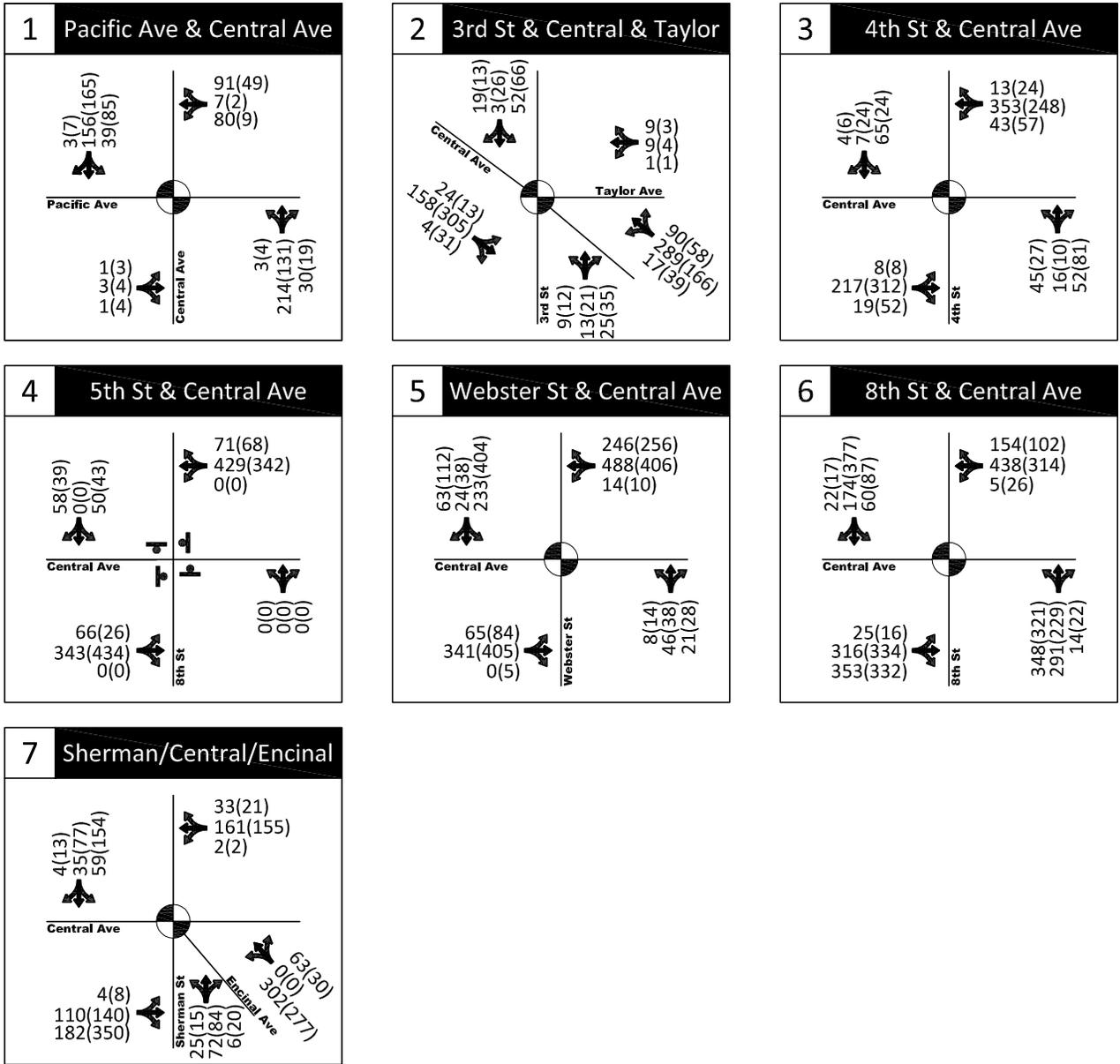
configuration is associated with Option D (Buffered Bike Lanes), Option E (One-Way Cycle Track), Option F (Two-Way Cycle Track) and Option G (Median Cycle Track). The following are the primary assumptions and limitations of the analysis:

- The analysis was completed for seven intersections along the corridor: 1) Central Avenue at Main Street/Pacific Avenue; 2) Central Avenue at Third Street/Taylor Avenue; 3) Central Avenue at Fourth Street; 4) Central Avenue at Fifth Street; 5) Central Avenue at Webster Street; 6) Central Avenue at Eighth Street; and 7) Central Avenue at Sherman Street/Encinal Avenue. These intersections were identified based on either the presence of an existing traffic signal or all-way STOP; or a complex intersection geometry with five or more approaches.
- The analysis was completed using Synchro 8 software. Capacity constraints were identified based on the overall intersection operating at or near capacity (i.e., with a volume-to-capacity ratio near or above 1.0).
- The analysis does not address mid-block driveways or side streets where traffic on Central Avenue has the right-of-way.
- The analysis assumes the same vehicular volumes for all of the lane configuration scenarios (four lanes versus three lanes or two lanes). No shift from driving to bicycling or walking was assumed with the addition of bicycle lanes. Additionally, no traffic diversion to parallel routes was assumed with the reduction in travel lanes.

Existing Volumes

Figure 1 shows existing traffic volumes for the seven intersections included in the analysis. *Figure 2* shows the bicycle and pedestrian volumes for these locations. With the existing lane configuration, the seven intersections currently operate below capacity. With a three-lane road diet, there are two capacity constraints where the overall intersection is at or above capacity: 1) the Webster Street/Central Avenue intersection and 2) the Eighth Street/Central Avenue intersection. With a two-lane road diet, the intersections of Webster Street/Central Avenue and Eighth Street/Central Avenue both experience greater delays, but there are no additional capacity constraints at the remaining analysis locations.

An end-to-end travel time analysis was completed using the intersection analysis results for each existing year scenario. The travel time is the total of 1) the through movement delay at each of the seven analysis intersections; and 2) run time along the corridor assuming a speed of 25 miles per hour. *Table 1* summarizes the results of the travel time analysis for existing year conditions. Scenarios where over-capacity conditions are projected at one or more intersections are noted in the tables.



Note: Turning movement volumes for intersections 1 and 6 are from the Alameda Point EIR. All other turning movement volumes were provided by Kittelson & Associates, 2015.

Turning movements by type

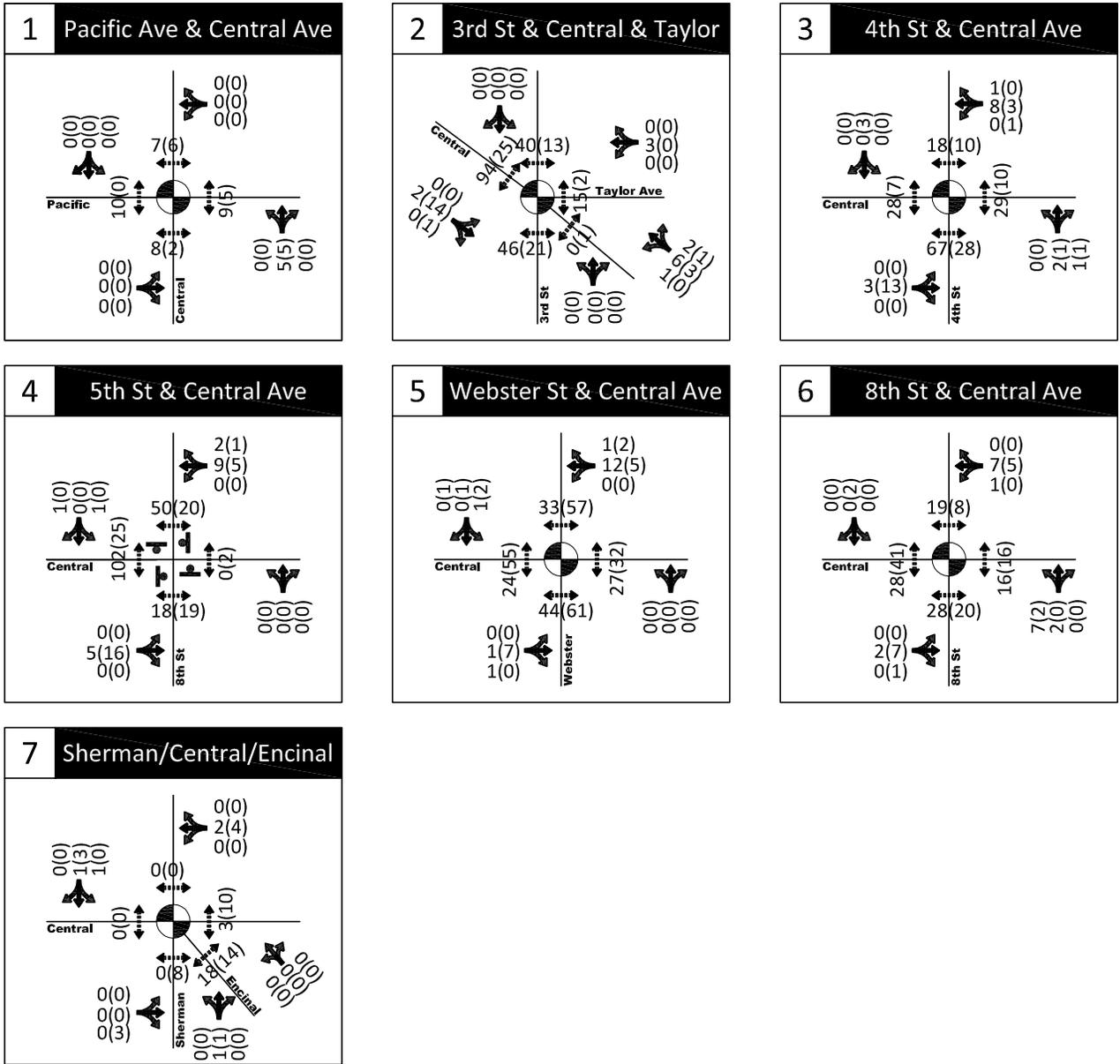
- Pedestrian
- Bicyclist

AM(PM) - Peak Hour Traffic Volume

- Traffic Signal
- Stop Control

Existing Vehicular Movements
Alameda, CA

Figure
1



Note: Turning movement and crossing volumes for intersections 1 and 6 are from the Alameda Point EIR. All other volumes were provided by Kittelson & Associates, 2015.

Turning movements by type

- Pedestrian
- Bicyclist

AM(PM) - Peak Hour Traffic Volume

- Traffic Signal
- Stop Control

**Pedestrian and Bicycle Movements
Alameda, CA**

**Figure
2**

Table 1: Existing Year End-to-End Travel Time Comparison

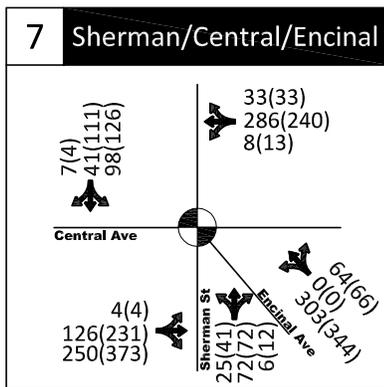
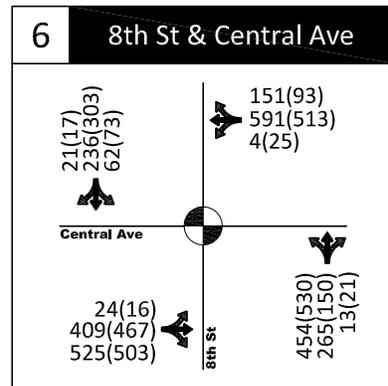
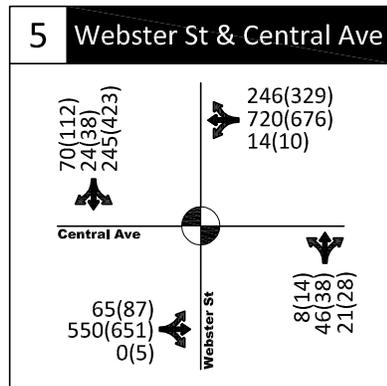
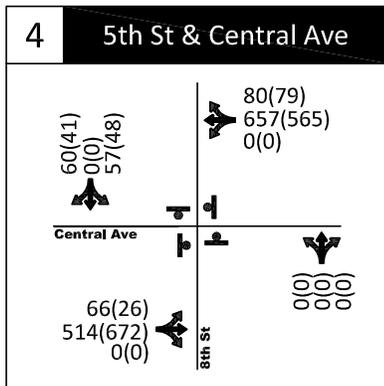
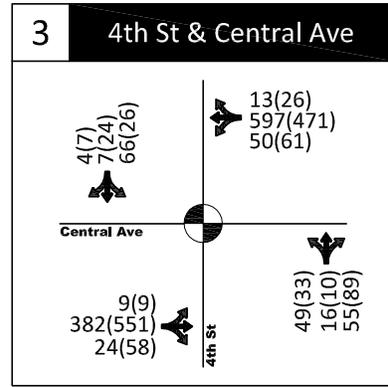
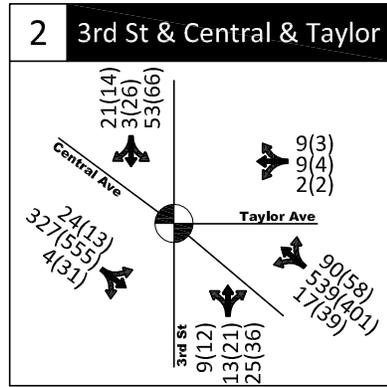
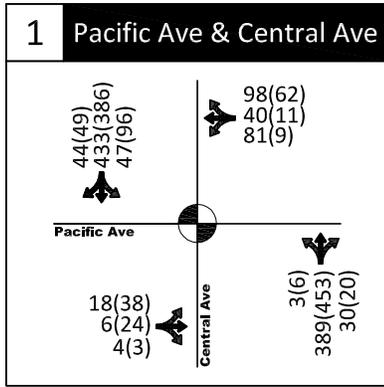
Time Period/ Direction	Existing Lane Configuration	3-Lane Road Diet	2-Lane Road Diet
Weekday AM Peak (7 – 9 AM)			
Eastbound	6.9 min	7.6 min	11.7 min (1)
Westbound	6.8 min	15.2 min (1)	16.8 min (1)
Weekday PM Peak (4 – 6 PM)			
Eastbound	6.5 min	10.8 min (1)	17.4 min (1)
Westbound	7.0 min	8.6 min	14.1 min (1)

(1) Travel time increases due to over-capacity conditions at one or more intersections.

Year 2035 Volumes

Figure 3 shows Year 2035 forecast volumes for the seven analysis intersections along Central Avenue. The volumes are consistent with the forecasts developed as part of the Alameda Point EIR and include the buildout of Alameda Point as well as the cumulative buildout of other future development. With the existing lane geometry, there is one projected capacity constraint at the Webster Street/Central Avenue intersection. With a three-lane road diet, there are three projected capacity constraints: 1) the Fifth Street/Central Avenue intersection, which currently operates under all-way STOP control; 2) the Webster Street/Central Avenue intersection; and 3) the Eighth Street/Central Avenue intersection. With a two-lane road diet, there are projected capacity constraints at the Sherman Street/Encinal Avenue/Central Avenue intersection.

An end-to-end travel time analysis was completed using the intersection analysis results for each Year 2035 scenario. The travel time is the total of 1) the through movement delay at each of the seven analysis intersections; and 2) run time along the corridor assuming a speed of 25 miles per hour. Table 2 summarizes the travel time analysis results for Year 2035 conditions. Scenarios where over-capacity conditions are projected at one or more intersections are noted in the tables.



Turning movements by type

- Pedestrian
- Bicyclist

AM(PM) - Peak Hour Traffic Volume

- Traffic Signal
- Stop Control

**Year 2035 Vehicular Movements
Alameda, CA**

**Figure
3**

Table 2: Year 2035 End-to-End Travel Time Comparison

Time Period/ Direction	Existing Lane Configuration	3-Lane Road Diet	2-Lane Road Diet
Weekday AM Peak (7 – 9 AM)			
Eastbound	8.4 min	9.4 min	17.1 min (1)
Westbound	8.9 min	22.4 min (1)	27.2 min (1)
Weekday PM Peak (4 – 6 PM)			
Eastbound	9.1 min (1)	20.0 min (1)	48.1 min (1)
Westbound	10.7 min (1)	14.5 min (1)	27.1 min (1)

(1) Travel time increases due to over-capacity conditions at one or more intersections.

Initial Recommendations

The following are the initial recommendations regarding the potential implementation of a road diet along Central Avenue:

- Add a traffic signal at the Central Avenue/Third Street/Taylor Avenue intersection.
- Maintain four through lanes at the Central Avenue/Webster Street and Central Avenue/Eighth Street intersections.
- Evaluate the long-term need for a traffic signal at the Central Avenue/Fifth Street intersection.
- Modify signal timing and coordination along the corridor in conjunction with any lane modifications.

Once a preferred option is selected, the project team will evaluate the lane configuration at each intersection in more detail to develop the final concept recommendation for the corridor.