FTIP ID# *(required)* LA0G1706 (FTIP Amendment 25-00)

TCWG Consideration Date: April 22, 2025

Project Description *(clearly describe project)*
The Proposed Project entails the construction of approximately 150-foot-long, 13-foot-wide right turn lane at the existing eastbound street of E Washington Boulevard at Telegraph Road (See Attachment 1). The Project will also relocate the existing storm drain catch basin, modify and upgrade the existing traffic signal (including the push button), relocate electrical lines, upgrade the traffic loop detector, adjust the traffic signal box, relocate the streetlight, and restripe and remark walkway lines and traffic signs.

Type of Project *(use Table 1 on instruction sheet)*

Intersection channelization

County	**Narrative Location/Route & Postmiles:** Southwest corner of the intersection between E Washington Boulevard and Telegraph Road **Caltrans Projects – Federal Aid Project No.** FERPL24-5362(034)
LA	

Lead Agency: City of Commerce

Contact Person	**Phone#**	**Fax#**	**Email**
Gina Nila, Public Works	(323) 722-4805 ext. 2839		

Hot Spot Pollutant of Concern *(check one or both)* **PM2.5 X** **PM10 X**

Federal Action for which Project-Level PM Conformity is Needed *(check appropriate box)*

X **Categorical Exclusion (NEPA)**	**EA or Draft EIS**	**FONSI or Final EIS**	X **PS&E or Construction**	**Other**

Scheduled Date of Federal Action:

NEPA Assignment – Project Type *(check appropriate box)*

Exempt	X **Section 326 –Categorical Exemption**	**Section 327 – Non-Categorical Exemption**

Current Programming Dates *(as appropriate)*

	PE/Environmental	**ENG**	**ROW**	**CON**
Start				6/2/2025
End				7/30/2025

Project Purpose and Need (Summary): *(attach additional sheets as necessary)*
The goal of the proposed Washington Boulevard Widening Project (Project) located at the intersection of E Washington Boulevard and Telegraph Road in Commerce, CA, is to improve the capacity efficiency and reduce congestion for eastbound traffic along E Washington Boulevard.

In 2013, TransTech Engineers, Inc. (TransTech), collected data regarding existing roadway conditions, turning movement, traffic volumes, signal phasing, and traffic collisions. Accident data was obtained for the years 2010, 2011, and 2012.

The analysis concluded that adding an exclusive right turn lane to the eastbound segment of E Washington Boulevard provided the best levels of operation for the flow of traffic in the intersection. TransTech recommended maintaining two eastbound thru lanes on E Washington Boulevard which necessitates the widening of the eastbound curb lane. (Refer to Traffic Report in Attachment 2).

Since the 2013 traffic data were over 10 years old, the City of Commerce has requested Hartzog & Crabill, Inc. (HCI) to prepare the Supplemental Traffic Signal Operations Analysis for Existing Condition, No Build and Build scenarios for the Opening Year 2025, and Horizon Year 2050 at the intersection of Washington Boulevard at Telegraph Road.

Surrounding Land Use/Traffic Generators *(especially effect on diesel traffic)*

Adjacent land uses include fast food restaurants, commercial retails, and light industrial. There are no residential land uses or any other sensitive receptor land uses within 500 feet of a small project area. The E. Washington Boulevard and Telegraph Road intersection is a signalized intersection located in an industrial area that serves as a commuter road for passenger vehicles and large axle trucks.

Land uses east of Telegraph Road and south of E. Washington Blvd include commercial retails, restaurants, and light industrial uses.

Land uses west of Telegraph Road and south of E. Washington Blvd include office, commercial, and light industrial uses. hotel, restaurants, gas stations, car dealership lots, and office uses.

Land uses east of Telegraph Road and north of E. Washington Blvd include casino/hotel with small ball rooms/convention center rooms, and light industrial uses. A fast food restaurant (Chick-Fla-A) is being proposed on the existing vacant parking lot at the northeast corner of the intersection.

Land uses west of Telegraph Road and north of E. Washington Blvd include municipal water district, light industrial uses, single-family residences (located more than 1,560 feet from the project site), and commercial retail uses.

Opening Year: Build and No Build LOS, AADT, % and # trucks, truck AADT of proposed facility

N/A

RTP Horizon Year / Design Year: Build and No Build LOS, AADT, % and # trucks, truck AADT of proposed facility

N/A

Opening Year: If facility is an interchange(s) or intersection(s), Build and No Build cross-street AADT, % and # trucks, truck AADT

The traffic analysis is based on the Existing Year and Opening Year 2025 conditions because it provides the most relevant and representative data for evaluating near-term air quality impacts. Overall vehicle LOS, V/C, AADT, truck AADT, and truck percentages for Existing and Opening Year 2025 No Build and Build Scenarios are summarized in Table 1.

Table 1. Summary of Traffic Conditions for Baseline and Opening Year 2025

Washington Blvd at Telegraph Road	Level of Services (LOS)		Volume to Capacity Ratio (V/C)		Annual Average Daily Trips (AADT)		
2025 Scenario	AM	PM	AM	PM	Total	Truck	% Truck
Baseline Year	C	D	0.724	0.850	42,260	4,530	10.72
No Build Opening Year	C	D	0.724	0.850	42,260	4,530	10.72
Build Opening Year	B	C	0.667	0.761	42,260	4,530	10.72
Change from No Build Conditions	Improve LOS	Improve LOS	Improve V/C	Improve V/C	0	0	0

Notes: Existing Baseline roadway configuration of EB lanes on E. Washington Blvd: 2 exclusive left turn (LT) lanes, 1 EB Thru lane, and 1 EB Shared Thru and RT lane.
No Build scenario configuration with existing number of EB lanes on E. Washington Blvd: 2 EB LT lanes, 1 EB Thru lane and 1 EB exclusive RT lane.
Build scenario will provide an additional lane with 2 EB LT lanes, 2 EB through lanes and 1 EB exclusive right turn lane.

RTP Horizon Year / Design Year: If facility is an interchange (s) or intersection(s), Build and No Build cross-street AADT, % and # trucks, truck AADT

The proposed project is already accounted for in SCAG's 2024 RTP/SCS modeling, the regional conformity determination inherently addresses longer-term emissions impacts. Table 2 provides the intersection LOS, V/C, AADT, truck AADT, and truck percentages for Horizon Year 2050 No Build and Build Scenarios.

Table 2. Summary of Traffic Conditions for Horizon Year 2050

Washington Blvd at Telegraph Road	Level of Services (LOS)		Volume to Capacity Ratio (V/C)		Annual Average Daily Trips (AADT)		
2050 Scenario	AM	PM	AM	PM	Total	Truck	% Truck
No Build Horizon Year	C	E	0.774	0.909	47,765	5,120	10.72
Build Horizon Year	C	D	0.713	0.814	47,765	5,120	10.72
Change from No Build Conditions	Improve LOS	Improve LOS	Improve V/C	Improve V/C	0	0	0

Notes: Roadway configuration of EB lanes on E. Washington Blvd: 2 exclusive left turn (LT) lanes, 1 EB Thru lane, and 1 EB Shared Thru and RT lane.
No Build scenario configuration with existing number of EB lanes on E. Washington Blvd: 2 EB LT lanes, 1 EB Thru lane and 1 EB exclusive RT lane.
Build scenario will provide an additional lane with 2 EB LT lanes, 2 EB through lanes and 1 EB exclusive right turn lane.

Describe potential traffic redistribution effects of congestion relief *(impact on other facilities)*

Table 1 identify a net difference of 0 for heavy truck traffic between the No-Build and Build conditions. This means that the projected number of heavy trucks on the road remains the same regardless of whether or not the proposed project is implemented. This can occur for several reasons:

1. Traffic Redistribution: The project would redistribute existing traffic rather than adding new traffic. For example, improvements would make the intersection more attractive, balancing out the overall traffic volume.

2. Capacity Constraints: The intersection is already operating at or near capacity, limiting the potential for additional heavy truck traffic.

3. Economic Factors: The local economy may not support an increase in heavy truck traffic as it is completely built out, which would keep the numbers stable.

Thereby there is a need to build the project to reduce delays, minimize points of vehicle interaction, reduce the risk of crashes, and lower emissions due to congested conditions with a Volume-to-Capacity (V/C) ratio of between 0.72 and 0.91. A V/C ratio of approximately 0.91 indicates that the heavy traffic volume is at near the top of the intersection's capacity, which typically leads to congested conditions. In such scenarios, the road operates under high-density conditions, where traffic flow is heavily restricted, and vehicles experience significant delays and stop-and-go movements.

Comments/Explanation/Details *(attach additional sheets as necessary)*

Under 40 CFR 93.123(b) - PM10 and PM2.5 Hot Spots - the following 5 criteria are utilized to determine the potential for the proposed project to qualify as a Project of Air Quality Concern (POAQC):

(i) New highway projects that have a significant number of diesel vehicles, and expanded highway projects that have a significant increase in the number of diesel vehicles;

In comparison to no-build conditions, the proposed build alternative would not significantly increase the number of diesel vehicles operating within the project study area. Refer to Table 1.

(ii) Projects affecting intersections that are at Level-of-Service D, E, or F with a significant number of diesel vehicles, or those that will change to Level-of-Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;

As shown in Tables 1 and 2, the proposed build alternative would not result in significant changes in intersection operations. Based on this information, the proposed build alternative would not significantly increase the number of diesel vehicles operating within the project study area.

(iii) New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;

The project is not a new or expanded bus or rail terminal, nor would the project adversely impact transfer points that have a significant number of diesel vehicles congregating at a single location.

(iv) Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; and

The project is not a new or expanded bus or rail terminal, nor would the project adversely impact transfer points that have a significant number of diesel vehicles congregating at a single location.

(v) Projects in or affecting locations, areas, or categories of sites which are identified in the PM10 or PM2.5 applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

The proposed build alternative is not located in nor would it affect locations, areas, or categories of sites that are identified in the PM2.5 and PM10 applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

For the reasons noted above, the proposed project would not be considered a POAQC.

ATTACHMENT A – Project Site Map

CITY OF COMMERCE

RT. LANE EB WASHINGTON BLVD. STREET WIDENING TO SB TELEGRAPH RD

GENERAL NOTES

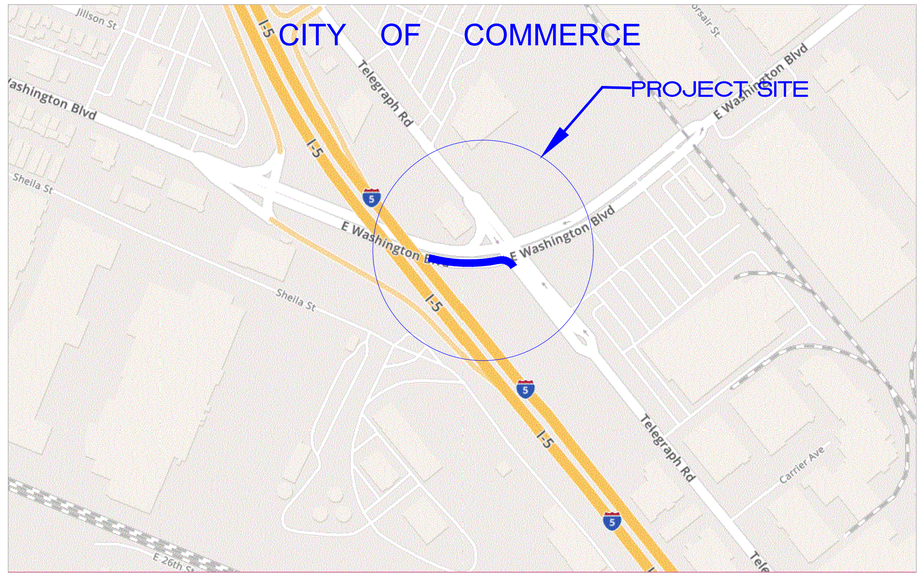
1. UNLESS OTHERWISE NOTED, ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION", LATEST EDITION WITH ALL CURRENT SUPPLEMENTS, STANDARD PLANS FOR PUBLIC CONSTRUCTION, LATEST EDITION, CALIFORNIA MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (CA MUTCD), LATEST EDITION, CALTRANS STANDARD SPECIFICATIONS, LATEST EDITION, AND CALTRANS ALL APPLICABLE STANDARDS.
2. PRIOR TO BEGINNING OF ANY WORK, THE CONTRACTOR SHALL OBTAIN A PERMIT FROM THE CITY OF COMMERCE.
3. ALL WORK COVERED BY THIS PLAN SHALL BE INSPECTED BY THE CITY ENGINEER.
4. THE CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICE ALERT (U.S.A.) 48 HOURS PRIOR TO THE START OF WORK. UPON EXPOSING ANY UTILITY'S UNDERGROUND FACILITY, THE CONTRACTOR SHALL NOTIFY UTILITY IMMEDIATELY.
5. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL UTILITIES OF EVERY NATURE, WHETHER SHOWN HEREON OR NOT, TO PROTECT THEM FROM DAMAGE WITHIN THE ALIGNMENT OF THE PROPOSED IMPROVEMENTS. THE CONTRACTOR SHALL BEAR THE TOTAL EXPENSE OF REPAIR OR REPLACEMENT OF UTILITIES DAMAGED BY OPERATIONS IN CONNECTION WITH THE PROSECUTION OF THE WORK.
6. THE CONTRACTOR SHALL NOT CONDUCT ANY OPERATIONS OR PERFORM ANY WORK PERTAINING TO THE PROJECT BETWEEN 5:00 P.M. AND 7:30 A.M. ON ANY DAY NOR ON SATURDAY, SUNDAY, HOLIDAY AT ANY TIME EXCEPT AS APPROVED BY THE ENGINEER.
7. THE CONTRACTOR SHALL PROTECT AND RESTORE EXISTING UTILITIES AND IMPROVEMENTS AS PER SECTION 5-1, 5-2- AND 7-9 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
8. THE CONTRACTOR IS ADVISED THAT UNLESS NOTED OTHERWISE IN THE CONTRACT DOCUMENTS, ALL MATERIALS REMOVED UNDER CLEARING AND GRUBBING SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED DISPOSED FROM THE JOBSITE UNLESS INSTRUCTED BY THE ENGINEER TO DO OTHERWISE.
9. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE FOR PUBLIC SAFETY AND CONVENIENCE AND SECURE THE PROJECT AS WELL AS ADJOINING PROPERTIES DURING THE DURATION OF PROJECT.
10. THE CONTRACTOR SHALL PROVIDE A TRAFFIC CONTROL PLAN FOR THE COMPLETION OF THE PROPOSED IMPROVEMENTS PER CA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) TO THE SATISFACTION OF THE ENGINEER.
11. THE CONTRACTOR SHALL PROVIDE 72-HOUR NOTIFICATION TO THE AFFECTED PROPERTIES, POLICE DEPARTMENT AND FIRE DEPARTMENT IN THE EVENT OF A CHANGE IN STREET CLOSURE TO TRAFFIC AND/OR PUBLIC SAFETY VEHICLES, PARKING RESTRICTION, AND ON EACH MONDAY DURING THE CONSTRUCTION PERIOD.
12. AS REQUIRED BY THE ENGINEER, THE CONTRACTOR SHALL FURNISH AND OPERATE A SELF-LOADING MOTOR SWEEPER WITH SPRAY NOZZLES AT LEAST TWICE EACH WORKING DAY TO KEEP PAVED AREAS ACCEPTABLY CLEAN WHEREVER CONSTRUCTION, INCLUDING RESTORATION INS INCOMPLETE.
13. ALL EXISTING PORTLAND CEMENT CONCRETE (P.C.C.) AND ASPHALT CONCRETE PAVEMENT SHALL BE SAWCUT, FULL DEPTH, TO A TRUE LINE WHERE NEW CONCRETE PAVEMENT IS TO JOIN.
14. IT SHALL BE THE CONTRACTOR RESPONSIBILITY TO NOTIFY AND COORDINATE WITH ALL AFFECTED UTILITY PURVEYOR OF THE WORK NEEDED TO ADJUST AND/OR RELOCATE UTILITY FACILITIES AS NOTED ON THE PLAN.
15. THE FOLLOWING IS A LIST OF THE UTILITY COMPANIES AND THEIR CONTACTS:

FRANCISCO LA VERNE SOUTHERN CALIFORNIA EDISON	(213) 598-1231
DUANE GREEN SOUTHERN CALIFORNIA GAS COMPANY	(310) 687-2055
BRANDON JOCSON AT&T CALIFORNIA	(323) 229-9620
JESSE GONZALEZ CHARTER CABLE	(626) 430-3570
PHILLIP DELGADO CALIFORNIA WATER SERVICE (CAL WATER)	(323) 263-4145
ROBERT FIGUEROA ALL AMERICAN PIPELINE	(562) 728-2321
EMILIO RODRIGUEZ MATRIX OIL	(562) 665-9255
JON GANZ LOS ANGELES COUNTY SANITATION DISTRICT	(562) 908-4288 EXT. 2160
NANCY RODEHEFFER FIRE DEPARTMENT	(323) 890-4132

INDEX OF PROJECT DRAWINGS

NOTICE TO CONTRACTOR

APPROVAL OF THIS PLAN BY THE ENGINEER AND CITY ENGINEER DOES NOT CONSTITUTE A REPRESENTATION AS TO THE ACCURACY OF THE LOCATION OF OR THE EXISTENCE OR NONEXISTENCE OF ANY UNDERGROUND UTILITY PIPE OR STRUCTURE WITHIN THE LIMITS OF THIS PROJECT. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS.



VICINITY MAP

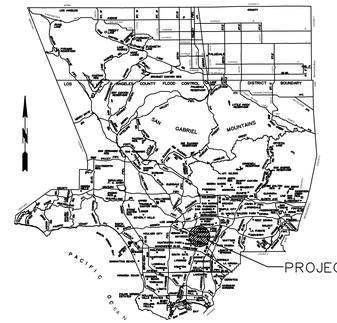
NOT TO SCALE

GENERAL SIGNING, MARKING AND STRIPING NOTES

1. ALL WORK SHALL CONFORM TO THE CALTRANS STANDARD PLANS, AND CALTRANS STANDARD SPECIFICATIONS, AND CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (CAMUTCD), ALL LATEST EDITION UNLESS NOTED OTHERWISE.
2. TRAFFIC STRIPING, RAISED PAVEMENT MARKERS, REFLECTIVE MATERIALS, THE APPLICATION OF THERMOPLASTIC STRIPING AND PAVEMENT MARKINGS, AND THE INSTALLATION OF RAISED PAVEMENT MARKERS SHALL CONFORM TO THE PROVISIONS IN THE CALTRANS STANDARD SPECIFICATIONS, SECTIONS 84, "TRAFFIC STRIPES AND PAVEMENT MARKINGS" AND SECTION 85, "PAVEMENT MARKERS".
3. STRIPING DETAILS, PAVEMENT LEGENDS AND SYMBOLS SHALL CONFORM TO THOSE IN CALTRANS STANDARD PLANS. PAVEMENT LEGENDS AND SYMBOLS SHALL BE WHITE, UNLESS NOTED OTHERWISE.
4. LANE LINE AND/OR CENTERLINE PAVEMENT DELINEATION, WHERE EXISTING OR CALLED FOR ON THE PLANS, SHALL BE PROVIDED AT ALL TIMES FOR TRAVELED WAYS OPEN TO PUBLIC TRAFFIC. WHENEVER THE WORK CAUSES OBLITERATION OF PAVEMENT DELINEATION, TEMPORARY PAVEMENT DELINEATION OR PERMANENT TRAFFIC STRIPES OF THE APPROPRIATE COLOR AND DETAIL SHALL BE IN PLACE, IN THE LOCATIONS SHOWN ON THE PLANS, PRIOR TO OPENING THE TRAVELED WAY TO PUBLIC TRAFFIC.
5. STRIPING SHALL BE CAT TRACKED AND APPROVED BY THE CITY INSPECTOR PRIOR TO FINAL INSTALLATION.
6. ALL CONFLICTING EXISTING STRIPING, PAINTED SYMBOLS AND RAISED PAVEMENT MARKERS INCLUDING THOSE ON EXISTING STRIPING, PAINTED SYMBOLS AND RAISED PAVEMENT MARKERS ON EXISTING PCC PAVEMENT SHALL BE REMOVED. THE REMOVAL OF STRIPING, PAINTED MARKINGS AND RAISED PAVEMENT MARKERS SHALL BE DONE BY SAND BLASTING OR APPROVED METHOD AND SHALL CONFORM TO THE PROVISIONS OF THE CALTRANS STANDARD SPECIFICATIONS.
7. THERMOPLASTIC PAVEMENT MARKING MATERIALS AND INSTALLATION SHALL CONFORM TO CALTRANS STANDARD SPECIFICATIONS SECTION 84-2. MATERIALS SHALL CONSIST OF EXTRUDED ALKYD BINDER THERMOPLASTIC IN CONFORMANCE WITH STATE SPECIFICATION 8010-19A. APPLICATION SHALL BE BY RIBBON OR EXTRUDED METHODS ONLY (NO SPRAYING).
8. PAVEMENT DAMAGED DUE TO REMOVING RAISED PAVEMENT MARKERS SHALL BE REPAIRED TO THE SATISFACTION OF THE CITY INSPECTOR.
9. ALL LANE LINES AT INTERSECTION APPROACHES AND DEPARTURES SHALL BEGIN AND END WITH 50-FEET (UNLESS NOTED OTHERWISE ON THE PLAN) OF 6-INCH SOLID WHITE LINE UNLESS SHOWN OTHERWISE.

GENERAL TRAFFIC CONTROL NOTES

1. ALL TRAFFIC CONTROL FOR CONSTRUCTION SHALL CONFORM TO PART 6-TEMPORARY TRAFFIC CONTROL OF THE CA-MUTCD, ANY ADDENDUMS TO OR LATEST EDITION AND O.S.H.A. REQUIREMENTS.
2. THE CONTRACTOR SHALL HAVE ALL TRAFFIC CONTROL SIGNS, DELINEATORS, ETC., PROPERLY INSTALLED PRIOR TO COMMENCING CONSTRUCTION.
3 THE CONTRACTOR SHALL MAINTAIN ALL TRAFFIC CONTROL SIGNS, DELINEATORS, ETC., TO ENSURE PROPER FLOW AND SAFETY OF TRAFFIC WHILE WORKING IN THE STREET.
4 ADDITIONAL TRAFFIC CONTROL DEVICES MAY BE REQUIRED IN THE FIELD. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY ADDITIONAL TRAFFIC CONTROL DEVICES REQUIRED BY THE CITY TO ASSURE PUBLIC SAFETY AT ALL TIMES.
5 THE CONTRACTOR SHALL UTILIZE FLAG MAN DURING CONSTRUCTION WORK AS DEEMED NECESSARY BY THE CITY ENGINEER.
6 ARROW BOARDS SHALL BE USED ON ANY LANE CLOSURE ON ARTERIAL STREETS.
7. STRIPING SHALL BE CAT TRACKED AND APPROVED BY THE ENGINEER PRIOR TO FINAL INSTALLATION.
8. MAINTAIN ONE TRAFFIC LANE ON BOTH DIRECTIONS AT ALL TIMES.
9. ALL TRAFFIC LANES SHALL BE OPEN TO TRAFFIC AT THE END OF WORK HOURS EACH DAY.
10. NO TRAFFIC LANE SHALL HAVE 1" OR MORE VERTICAL JOINS EXCEPT AT THE EDGE OF GUTTER. VERTICAL JOINTS SHALL BE RAMPED WITH TEMPORARY ASPHALT CONCRETE PAVEMENT. THE RAMP AT TRAVERSE JOINT TO TRAFFIC SHALL BE 6:1 SLOPE, AT LONGITUDINAL JOINT SHALL BE 4:1 SLOPE AND AT DRIVEWAYS SHALL BE RAMPED AT 6:1 SLOPE.
11. ANY DEVIATION TO THE TRAFFIC LANE REQUIREMENTS SHALL REQUIRE THE CITY ENGINEER'S APPROVAL A MINIMUM 24 HOURS ADVANCE NOTICE.
12. THE CONTRACTOR SHALL PROVIDE TEMPORARY STRIPING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LANE LINES TO INSURE TRAFFIC ACCESS THROUGH THE WORK ZONE.
13. SEE SPECIAL PROVISIONS OF THE CONTRACT DOCUMENTS FOR OTHER TRAFFIC CONTROL REQUIREMENTS.



LOCATION MAP

CONSTRUCTION NOTES:

1. SAW CUT AND REMOVE EXISTING IMPROVEMENTS NECESSARY TO CONSTRUCT NEW IMPROVEMENT TO INCLUDE PCC PAVEMENT, EX. PCC SIDEWALK, EX. CURB GUTTER AND RAW DIRT.
2. REMOVE EXIST. TRAFFIC SIGNAL LINE.
3. REMOVE CONFLICTING MARKING AND STRIPING BY SAND BLASTING.
10. RELOCATE EXISTING CATCH BASIN BY REMOVING EXISTING CATCH BASIN AND CONSTRUCT NEW CATCH BASIN PER SSPWC STD. PLAN 300-4, W=7' INCLUDING CONNECTOR, V=FIELD VERIFY BY CONTRACTOR TO MATCH EXISTING.
11. INSTALL #5 X 24" LONG TIE BAR AT 36" OC AT PCC JOIN PER SPPWC STD. PLAN 134-3.
12. CONSTRUCT 8" THK. PCC PAVEMENT ON 12" CAB PER SECTION DETAIL ON SHEET 2.
13. CONSTRUCT 8" THK. PCC PAVEMENT ON 12" CAB AND 8" PCC CURB TO BE CONSTRUCTED MONOLITHIC.
14. CONSTRUCT CURB & GUTTER ON 12" CRUSHED AGGREGATE PER SECTION DETAIL ON SHEET 2.
15. INSTALL #5 X 24" LONG TIE BAR AT 36" OC, WHERE NEW PCC PAVEMENT JOINT EXISTING PCC PAVEMENT. CORE DRILL, EMBED AND EPOXY THE HALF LENGTH OF TIE BAR INTO EXISTING PCC PAVEMENT.
16. CONSTRUCT 4" PCC WALK (WIDTH VARIES) FROM BACK OF CURB TO R.O.W./FACE OF EXISTING FENCE..
17. CONSTRUCT CURB RAMP PER CALTRANS STANDARD A88A & AS SHOWN ON THE PLAN TO INCLUDE RAMP, FLAT AREA, WINGS AND CURB FROM TX TO TX.
18. MODIFY EXISTING TYPE E TRAFFIC LOOPS AS SHOWN ON THE PLAN PER CALTRANS STD. PLAN ES-54A AND ES-5B INCLUDING NECESSARY CONDUCTORS AND WIRING.
19. EXTEND EXIST. 15" RCP S.D. CONNECTOR LINE AND CONNECT TO NEW CATCH BASIN PER SPPWC STD. PLAN 308-2 AND SHALL INCLUDE TO INSTALL THE NECESSARY COLLAR PER SPPWC STD. PLAN 380-4.
20. CONNECT EXISTING 10" VCP CONNECTOR S.D. TO NEW CATCH BASIN PER SPPWC STD. PLAN 332-2.
23. INSTALL W=10' BASIC CROSSWALK PER CALTRANS STD. PLAN A24F.
24. INSTALL DETAIL 38 PER CALTRANS STD PLAN A20D.
31. RELOCATE EXISTING TRAFFIC SIGNAL TYPE 15 POLE INCLUDING TRAFFIC SIGNAL, LIGHT AND PEDESTRIAN PUSH BUTTON TO HERE.
32. RELOCATE PEDESTRIAN PUSH BUTTON TO HERE: REMOVE EXISTING PEDESTRIAN PUSH BUTTON AND INSTALL A NEW ONE.
33. REMOVE AND REPLACE EXISTING TRAFFIC SIGNAL PULL BOX WITH NEW NO. 6(T) PB.
34. RELOCATE TRAFFIC SIGNAL PULL BOX AND EXTEND 3-INCH CONDUIT ELECTRICAL TRAFFIC LINE TO NEW TRAFFIC SIGNAL PULL BOX NO 6T. THE CONDUIT TO BE EXTENDED SHALL BE RIGID METAL GALVANIZED CONDUIT.
35. INSTALL NEW 3-INCH CONDUIT TO RESTORE ELECTRICAL TRAFFIC LINE CONNECTION BETWEEN PULL BOXES.
36. INSTALL 2-INCH ELECTRIC LINE CONDUIT TO RELOCATED TRAFFIC SIGNAL/LIGHT/PEDESTRIAN PUSH BUTTON INCLUDING CONDUCTORS.
37. ADJUST EXIST. TRAFFIC SIGNAL PULL BOX TO GRADE.
38. ADJUST TRAFFIC PULL BOX TO GRADE.
39. RELOCATE EXISTING STREET LIGHT TO NEW PARKWAY AREA.

SPECIAL NOTATIONS

- (A) LIMIT LINE; SAWCUT AND JOIN NEW PCC PAVEMENT TO EXISTING PCC PAVEMENT.
- (B) LIMIT LINE; BLEND ADJOINING GRADE TO THE PCC IMPROVEMENT.
- (P) PROTECT IN PLACE.

CALL BEFORE YOU DIG

Underground Service Alert
Call: TOLL FREE
811
TWO WORKING DAYS BEFORE YOU DIG

NO.	REVISIONS	REVISED BY	APPROVED BY	DATE

REGISTERED PROFESSIONAL ENGINEER
JOSEPH D. DE PERALTA
NO. C56508
EXPIRES 6-30-23
CIVIL
STATE OF CALIFORNIA

PREPARED BY:
TRANSTECH
13367 BENSON AVE.
CHINO, CA. 91710
(909) 595 8599
JN 211006

JOSEPH D. DE PERALTA, R.C.E. C056508 — DATE

ELECTRONICALLY APPROVED BY:

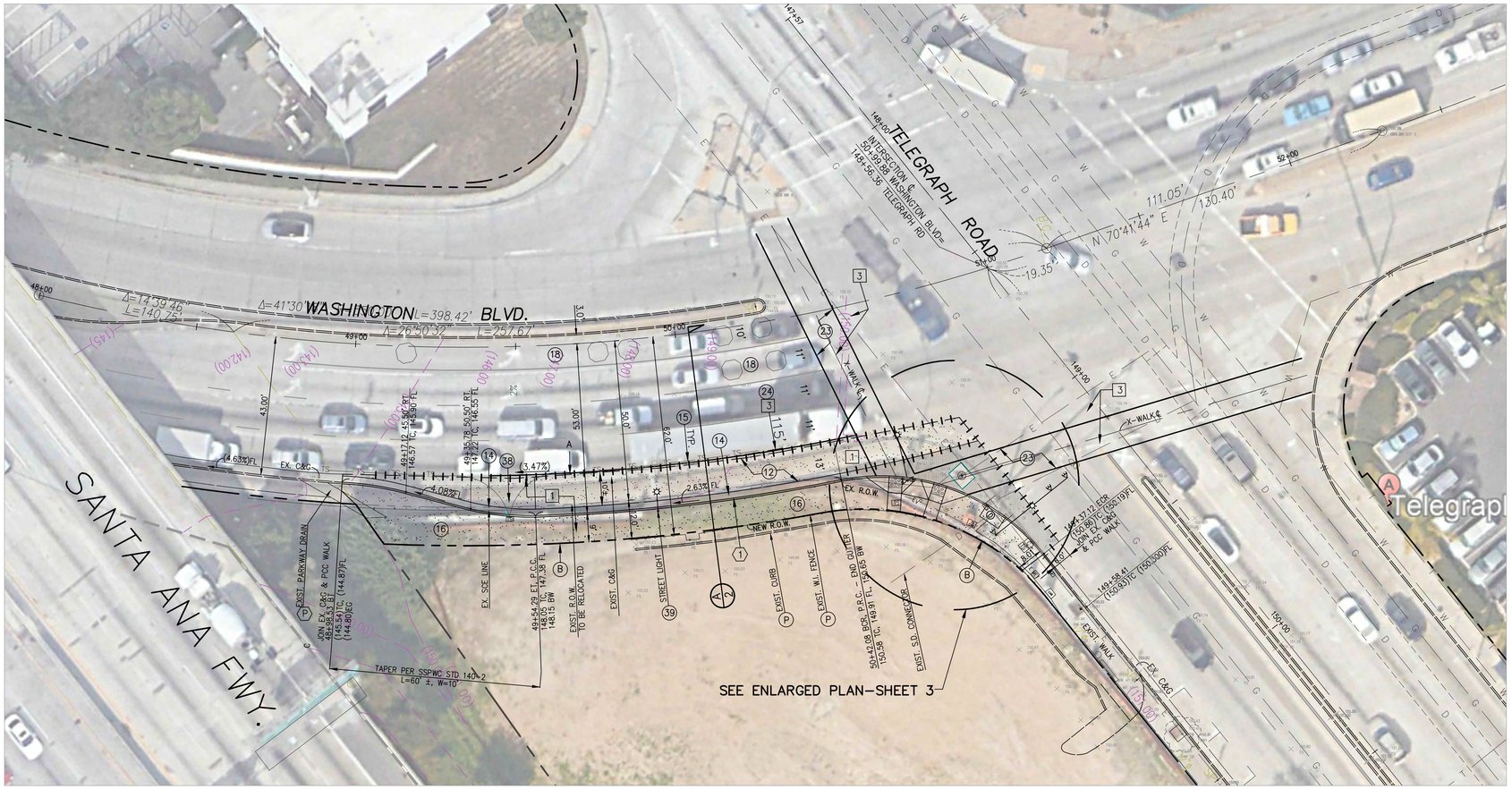
DIRECTOR OF PUBLIC WORKS & DEV. SERVICES / CITY ENGINEER — DATE

CITY OF COMMERCE
PUBLIC WORKS & DEVELOPMENT SERVICES DEPARTMENT

RT. LANE EB WASHINGTON BLVD STREET WIDENING TO SB TELEGRAPH RD IMPROVEMENT PROJECT

TITLE SHEET
GENERAL NOTES, CONSTRUCTION NOTES
VICINITY MAP, LOCATION MAP, INDEX OF PROJECT DRAWINGS, LEGEND

SHEET 1 OF 3 SHEETS | DWG. NO.



CONSTRUCTION NOTES:

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2. REMOVE EXIST. TRAFFIC SIGNAL LINE.
3. REMOVE CONFLICTING MARKING AND STRIPING BY SAND BLASTING.
10. RELOCATE EXISTING CATCH BASIN BY REMOVING EXISTING CATCH BASIN AND CONSTRUCT NEW CATCH BASIN PER SSPWC STD. PLAN 300-4, W=7' INCLUDING CONNECTOR, V=FIELD VERIFY BY CONTRACTOR TO MATCH EXISTING.
11. INSTALL #5 X 24" LONG TIE BAR AT 36" OC AT PCC JOIN PER SPPWC STD. PLAN 134-3.
12. CONSTRUCT 8" THK. PCC PAVEMENT ON 12" CAB PER SECTION DETAIL ON SHEET 2.
13. CONSTRUCT 8" THK. PCC PAVEMENT ON 12" CAB AND 8" PCC CURB TO BE CONSTRUCTED MONOLITHIC.
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15. INSTALL #5 X 24" LONG TIE BAR AT 36" OC, WHERE NEW PCC PAVEMENT JOINT EXISTING PCC PAVEMENT. CORE DRILL, EMBED AND EPOXY THE HALF LENGTH OF TIE BAR INTO EXISTING PCC PAVEMENT.
16. CONSTRUCT 4" PCC WALK (WIDTH VARIES) FROM BACK OF CURB TO R.O.W./FACE OF EXISTING FENCE.
17. CONSTRUCT CURB RAMP PER CALTRANS STANDARD A88A & AS SHOWN ON THE PLAN TO INCLUDE RAMP, FLAT AREA, WINGS AND CURB FROM TX TO TX.
18. REMOVE & REINSTALL TYPE E TRAFFIC LOOP AS SHOWN ON THE PLAN PER CALTRANS STD. PLAN ES-54A AND ES-5B.
19. EXTEND EXIST. 15" RCP S.D. CONNECTOR LINE AND CONNECT TO NEW CATCH BASIN PER SPPWC STD. PLAN 308-2 AND SHALL INCLUDE TO INSTALL THE NECESSARY COLLAR PER SPPWC STD. PLAN 380-4.
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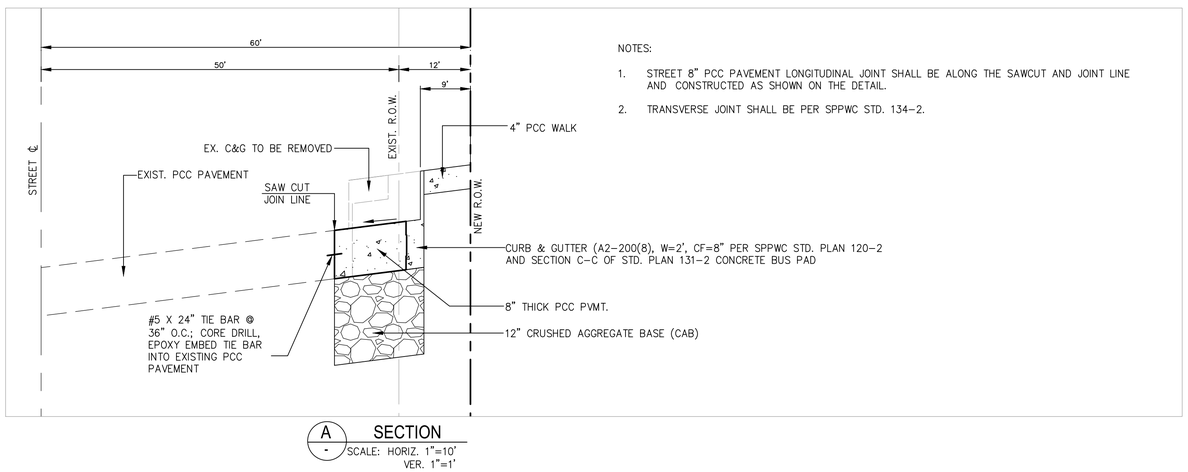
32. RELOCATE PEDESTRIAN PUSH BUTTON TO HERE: REMOVE EXISTING PEDESTRIAN PUSH BUTTON AND INSTALL A NEW ONE.
33. REMOVE AND REPLACE EXISTING TRAFFIC SIGNAL PULL BOX WITH NEW NO. 6(T) PB.
34. RELOCATE TRAFFIC SIGNAL PULL BOX AND EXTEND 3-INCH CONDUIT ELECTRICAL TRAFFIC LINE TO NEW TRAFFIC SIGNAL PULL BOX NO 6T. THE CONDUIT TO BE EXTENDED SHALL BE RIGID METAL GALVANIZED CONDUIT.
35. INSTALL NEW 3-INCH CONDUIT TO RESTORE ELECTRICAL TRAFFIC LINE CONNECTION BETWEEN PULL BOXES.
36. INSTALL 2-INCH ELECTRIC LINE CONDUIT TO RELOCATED TRAFFIC SIGNAL/LIGHT/PEDESTRIAN PUSH BUTTON INCLUDING CONDUCTORS.
37. ADJUST EXIST. TRAFFIC SIGNAL PULL BOX TO GRADE.
38. ADJUST TRAFFIC PULL BOX TO GRADE.
39. RELOCATE EXISTING STREET LIGHT TO NEW PARKWAY AREA.

SPECIAL NOTATIONS

- (A) LIMIT LINE; SAWCUT AND JOIN NEW PCC PAVEMENT TO EXISTING PCC PAVEMENT.
- (B) LIMIT LINE; BLEND ADJOINING GRADE TO THE PCC IMPROVEMENT.
- (P) PROTECT IN PLACE.

CURVE DATA

	R	DELTA	LENGHT
1	603'	9°08'17"	96.17'
2	65'	62°31'25"	70.93'



A - SECTION
SCALE: HORIZ. 1"=10'
VER. 1"=1'

NOTES:

1. STREET 8" PCC PAVEMENT LONGITUDINAL JOINT SHALL BE ALONG THE SAWCUT AND JOINT LINE AND CONSTRUCTED AS SHOWN ON THE DETAIL.
2. TRANSVERSE JOINT SHALL BE PER SPPWC STD. 134-2.

20 0 20 40
1"=20' GRAPHIC SCALE

Underground Service Alert
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TWO WORKING DAYS BEFORE YOU DIG

NO.	REVISIONS	REVISED BY	APPROVED BY	DATE

REGISTERED PROFESSIONAL ENGINEER
JOSEPH D. DE PERALTA
NO. C56508
EXPIRES 6-30-23
CIVIL
STATE OF CALIFORNIA

PREPARED BY:
TRANSTECH
13367 BENSON AVE.
CHINO, CA. 91710
(909) 595 8599
JN 211006
JOSEPH D. DE PERALTA, R.C.E. C056508 DATE

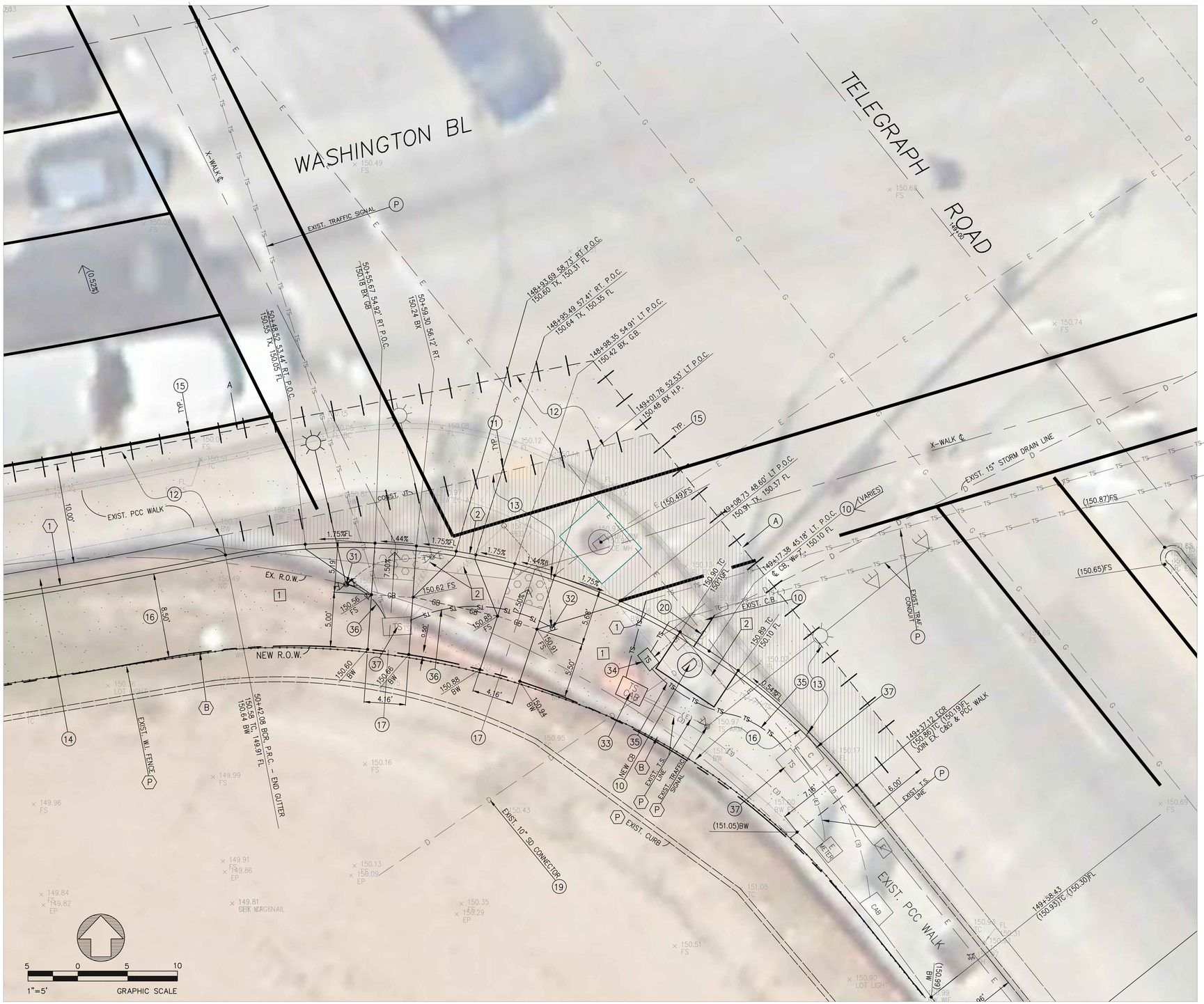
ELECTRONICALLY APPROVED BY:
DIRECTOR OF PUBLIC WORKS & DEV. SERVICES / CITY ENGINEER DATE

CITY OF COMMERCE
PUBLIC WORKS & DEVELOPMENT SERVICES DEPARTMENT

RT. LANE EB WASHINGTON BLVD STREET WIDENING TO SB TELEGRAPH RD IMPROVEMENT PROJECT

STREET WIDENING IMPROVEMENT PLAN

SHEET 2 OF 3 SHEETS | DWG. NO.



CONSTRUCTION NOTES:

1. SAW CUT AND REMOVE EXISTING IMPROVEMENTS NECESSARY TO CONSTRUCT NEW IMPROVEMENT TO INCLUDE PCC PAVEMENT, EX. PCC SIDEWALK, EX. CURB GUTTER AND RAW DIRT.
2. REMOVE EXIST. TRAFFIC SIGNAL LINE.
3. REMOVE CONFLICTING MARKING AND STRIPING BY SAND BLASTING.
10. RELOCATE EXISTING CATCH BASIN BY REMOVING EXISTING CATCH BASIN AND CONSTRUCT NEW CATCH BASIN PER SSPWC STD. PLAN 300-4, W=7' INCLUDING CONNECTOR, V=FIELD VERIFY BY CONTRACTOR TO MATCH EXISTING.
11. INSTALL #5 X 24" LONG TIE BAR AT 36" OC AT PCC JOIN PER SPPWC STD. PLAN 134-3.
12. CONSTRUCT 8" THK. PCC PAVEMENT ON 12" CAB PER SECTION DETAIL ON SHEET 2.
13. CONSTRUCT 8" THK. PCC PAVEMENT ON 12" CAB AND 8" PCC CURB TO BE CONSTRUCTED MONOLITHIC.
14. CONSTRUCT CURB & GUTTER ON 12" CRUSHED AGGREGATE PER SECTION DETAIL ON SHEET 2.
15. INSTALL #5 X 24" LONG TIE BAR AT 36" OC, WHERE NEW PCC PAVEMENT JOINT EXISTING PCC PAVEMENT. CORE DRILL, EMBED AND EPOXY THE HALF LENGTH OF TIE BAR INTO EXISTING PCC PAVEMENT.
16. CONSTRUCT 4" PCC WALK (WIDTH VARIES) FROM BACK OF CURB TO R.O.W./FACE OF EXISTING FENCE.
17. CONSTRUCT CURB RAMP PER CALTRANS STANDARD A88A & AS SHOWN ON THE PLAN TO INCLUDE RAMP, FLAT AREA, WINGS AND CURB FROM TX TO TX.
18. MODIFY EXISTING TYPE E TRAFFIC LOOPS AS SHOWN ON THE PLAN PER CALTRANS STD. PLAN ES-54A AND ES-5B INCLUDING NECESSARY CONDUCTORS AND WIRING.
19. EXTEND EXIST. 15" RCP S.D. CONNECTOR LINE AND CONNECT TO NEW CATCH BASIN PER SPPWC STD. PLAN 308-2 AND SHALL INCLUDE TO INSTALL THE NECESSARY COLLAR PER SPPWC STD. PLAN 380-4.
20. CONNECT EXISTING 10" VCP CONNECTOR S.D. TO NEW CATCH BASIN PER SPPWC STD. PLAN 332-2.
23. INSTALL W=10' BASIC CROSSWALK PER CALTRANS STD. PLAN A24F.
24. INSTALL DETAIL 38 PER CALTRANS STD PLAN A20D.
31. RELOCATE EXISTING TRAFFIC SIGNAL TYPE 15 POLE INCLUDING TRAFFIC SIGNAL, LIGHT AND PEDESTRIAN PUSH BUTTON TO HERE.
32. RELOCATE PEDESTRIAN PUSH BUTTON TO HERE: REMOVE EXISTING PEDESTRIAN PUSH BUTTON AND INSTALL A NEW ONE.
33. REMOVE AND REPLACE EXISTING TRAFFIC SIGNAL PULL BOX WITH NEW NO. 6(T) PB.
34. RELOCATE TRAFFIC SIGNAL PULL BOX AND EXTEND 3-INCH CONDUIT ELECTRICAL TRAFFIC LINE TO NEW TRAFFIC SIGNAL PULL BOX NO 6T. THE CONDUIT TO BE EXTENDED SHALL BE RIGID METAL GALVANIZED CONDUIT.
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REGISTERED PROFESSIONAL ENGINEER
JOSEPH D. DE PERALTA
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STATE OF CALIFORNIA

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JN 211006

JOSEPH D. DE PERALTA, R.C.E. C056508 — DATE

ELECTRONICALLY APPROVED BY:

DIRECTOR OF PUBLIC WORKS & DEV. SERVICES / CITY ENGINEER — DATE

CITY OF COMMERCE
PUBLIC WORKS & DEVELOPMENT SERVICES DEPARTMENT

RT. LANE EB WASHINGTON BLVD STREET WIDENING TO SB TELEGRAPH RD IMPROVEMENT PROJECT

SOUTHERLY QUADRANT - CURB RETURN ENLARGED PLAN

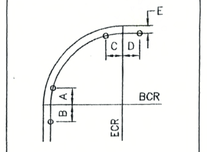
SHEET 3 OF 3 SHEETS

DWG. NO.

CONSTRUCTION NOTES

1. FURNISH AND INSTALL COMPLETE MODEL 170ATC CONTROLLER ASSEMBLY IN 332 CABINET WITH LACO-~~3E~~ 4E PROGRAM, GPS UNIVERSAL TIME BASE UNIT AND VIDEO DETECTION EQUIPMENT.
2. REMOVE EXISTING TYPE III SIGNAL METER SERVICE CABINET COMPLETE AFTER POWER TRANSFER TO NEW SERVICE CABINET, INSTALL #6 PULL BOX.
3. INSTALL 2" CONDUIT WITH 2#6 FOR SIGNAL.
4. INSTALL 2" CONDUIT WITH 2#10 FOR ILLUMINATION AND I.I.S.N.S.
5. INSTALL BATTERY BACK-UP SYSTEM COMPLETE WITH BATTERIES AND RACK MOUNTED SHELVES IN AUXILIARY CABINET, BOLT ON OR FREE STANDING.
6. CONSTRUCT PCC CONTROLLER AND SERVICE PAD AS PER CITY STANDARD DWG. NO. 202.
7. INSTALL VIDEO DETECTION CAMERA ON SIGNAL MAST ARM AS SHOWN.
8. REMOVE AND SALVAGE EXISTING CONTROLLER AND CONTROLLER CABINET COMPLETE AFTER TURN ON OF NEW SIGNAL. REMOVE EXISTING FOUNDATION.
9. REMOVE AND SALVAGE EXISTING STANDARD COMPLETE AFTER TURN ON OF NEW SIGNAL. REMOVE FOUNDATION. RECONSTRUCT SIDEWALK TO NEAREST SCORE LINE OR AS DIRECTED BY THE ENGINEER.
10. INSTALL TYPE R73-6(CA)(MOD) SIGN PER DETAIL "C" ON SIGNAL MAST ARM.
11. INSTALL TYPE R73-3(CA) SIGN ON SIGNAL MAST ARM.
12. PROVIDE PCC SIDEWALK ACCESS TO PEDESTRIAN PUSH BUTTON PER ADA REQUIREMENTS.
13. INSTALL TYPE E LOOP DETECTOR.
14. INSTALL SINGLE CHANNEL EMERGENCY VEHICLE DETECTOR.
15. FURNISH AND INSTALL COMPLETE TYPE III-BF SERVICE EQUIPMENT.
16. FURNISH AND INSTALL 332 CABINET AND FOUNDATION FOR FUTURE CCTV SYSTEM.
17. INSTALL 3" CONDUIT WITH PULL LINE FOR FUTURE CCTV WIRING.
18. INSTALL 2" CONDUIT WITH PULL LINE FOR FUTURE CCTV WIRING.

POLE LOCATION DETAIL



EXACT LOCATION BY CITY REPRESENTATIVE

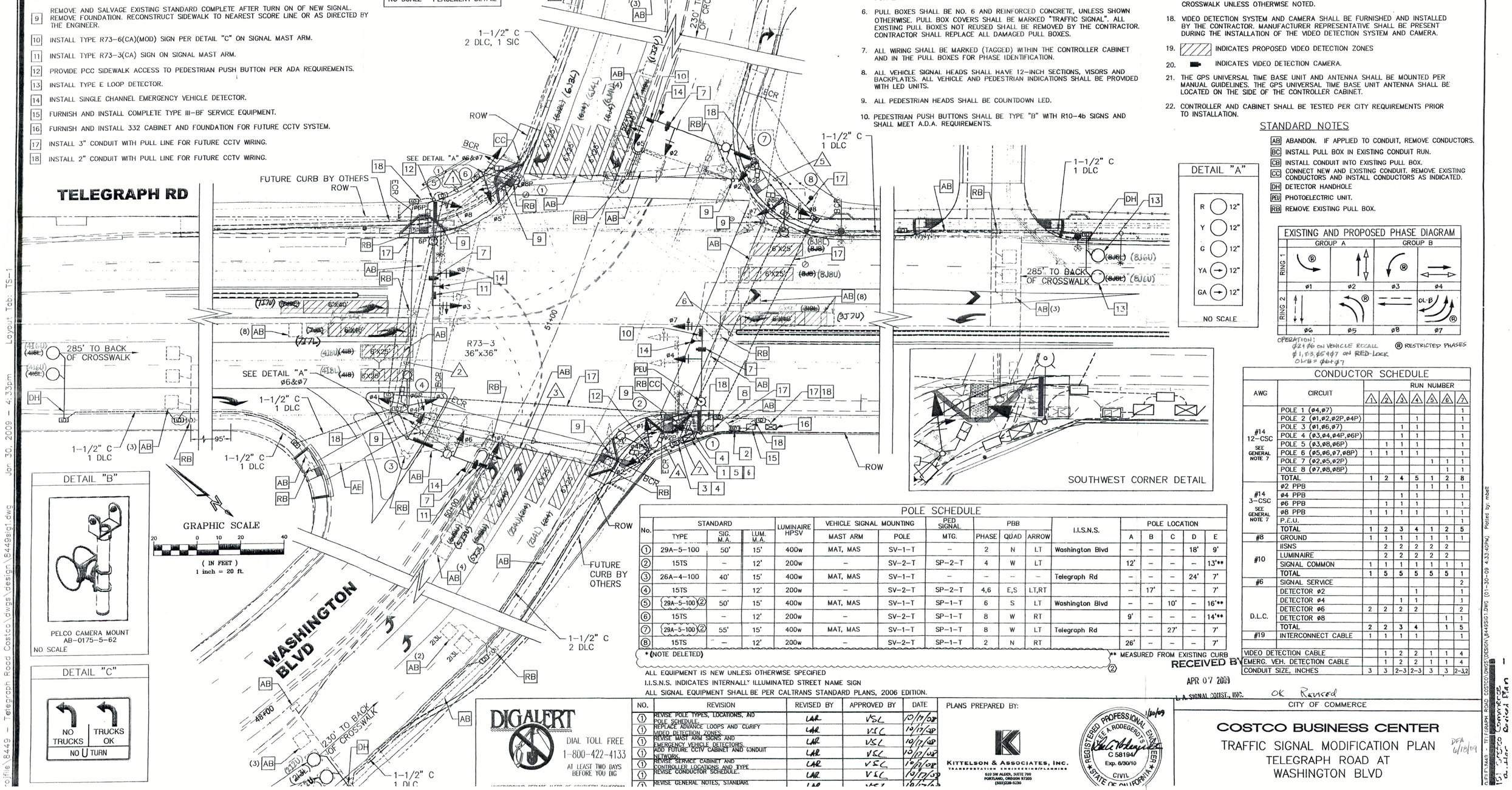
NO SCALE — SIGNAL STANDARD PLACEMENT DETAIL

GENERAL NOTES

1. ALL WORK EMBODIED IN THIS PLAN SHALL CONFORM WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (GREEN BOOK), LATEST EDITION, AND ALL SUPPLEMENTS, THE CALIFORNIA DEPARTMENT OF TRANSPORTATION STANDARD PLANS AND SPECIFICATIONS, DATED MAY 2006, AND THE STANDARD REQUIREMENTS OF THE CITY OF COMMERCE.
2. ALL EQUIPMENT AND MATERIALS SHALL BE FURNISHED BY THE CONTRACTOR.
3. AT THE TIME OF SIGNAL TURN-ON, ALL SIGNAL EQUIPMENT SHALL OPERATE ACCORDING TO THE DESIGN SPECIFIED ON THE PLAN, IN THE SPECIFICATIONS AND TO THE SATISFACTION OF THE CITY ENGINEER.
4. CONTRACTOR SHALL LOCATE ALL SUBSTRUCTURE UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION. DIG FOUNDATIONS UNTIL CLEAR OF OBSTRUCTIONS. COORDINATE POLE INSTALLATIONS WITH OVERHEAD AND UNDERGROUND UTILITY OWNERS. CONTACT UNDERGROUND SERVICE ALERT AT (800) 422-4133 AT LEAST 48 HOURS PRIOR TO CONSTRUCTION.
5. OBTAIN APPROVAL FROM THE CITY ENGINEER OR HIS FIELD REPRESENTATIVE FOR EXACT EQUIPMENT LOCATION PRIOR TO FINAL PLACEMENT.
6. PULL BOXES SHALL BE NO. 6 AND REINFORCED CONCRETE, UNLESS SHOWN OTHERWISE. PULL BOX COVERS SHALL BE MARKED "TRAFFIC SIGNAL". ALL EXISTING PULL BOXES NOT REUSED SHALL BE REMOVED BY THE CONTRACTOR. CONTRACTOR SHALL REPLACE ALL DAMAGED PULL BOXES.
7. ALL WIRING SHALL BE MARKED (TAGGED) WITHIN THE CONTROLLER CABINET AND IN THE PULL BOXES FOR PHASE IDENTIFICATION.
8. ALL VEHICLE SIGNAL HEADS SHALL HAVE 12-INCH SECTIONS, VISORS AND BACKPLATES. ALL VEHICLE AND PEDESTRIAN INDICATIONS SHALL BE PROVIDED WITH LED UNITS.
9. ALL PEDESTRIAN HEADS SHALL BE COUNTDOWN LED.
10. PEDESTRIAN PUSH BUTTONS SHALL BE TYPE "B" WITH R10-4b SIGNS AND SHALL MEET A.D.A. REQUIREMENTS.
11. ELECTRICAL SERVICE EQUIPMENT INSTALLATION AND SERVICE CONDUIT RUN DETAILS SHALL CONFORM TO SOUTHERN CALIFORNIA EDISON (SCE).
12. (XXXX) INDICATES LOOP ASSIGNMENT IN CONTROLLER CABINET. EACH ASSIGNMENT SHALL HAVE A SEPARATE LEAD-IN CABLE TO THE CONTROLLER.
13. ALL SIGNAL STANDARDS, MAST ARMS, AND LUMINAIRES SHALL CONFORM TO STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION STANDARDS.
14. ALL SIGNAL STANDARDS, MAST ARMS, POSTS, AND OTHER FERROUS MATERIALS SHALL BE GALVANIZED.
15. ALL SIGNAL EQUIPMENT SHALL BE WIRED IN ACCORDANCE WITH THE PROPOSED SIGNAL PHASE DIAGRAM.
16. TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH THE LATEST EDITIONS OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND THE CALIFORNIA SUPPLEMENT.
17. DETECTION ZONES SHALL BE CENTERED IN THE LANE AND 2 FEET INTO CROSSWALK UNLESS OTHERWISE NOTED.
18. VIDEO DETECTION SYSTEM AND CAMERA SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. MANUFACTURER REPRESENTATIVE SHALL BE PRESENT DURING THE INSTALLATION OF THE VIDEO DETECTION SYSTEM AND CAMERA.
19. ▨ INDICATES PROPOSED VIDEO DETECTION ZONES
20. ■ INDICATES VIDEO DETECTION CAMERA.
21. THE GPS UNIVERSAL TIME BASE UNIT AND ANTENNA SHALL BE MOUNTED PER MANUAL GUIDELINES. THE GPS UNIVERSAL TIME BASE UNIT ANTENNA SHALL BE LOCATED ON THE SIDE OF THE CONTROLLER CABINET.
22. CONTROLLER AND CABINET SHALL BE TESTED PER CITY REQUIREMENTS PRIOR TO INSTALLATION.

STANDARD NOTES

- AB ABANDON. IF APPLIED TO CONDUIT, REMOVE CONDUCTORS.
- BC INSTALL PULL BOX IN EXISTING CONDUIT RUN.
- CB INSTALL CONDUIT INTO EXISTING PULL BOX.
- CC CONNECT NEW AND EXISTING CONDUIT. REMOVE EXISTING CONDUCTORS AND INSTALL CONDUCTORS AS INDICATED.
- DH DETECTOR HANDHOLE
- PEU PHOTOELECTRIC UNIT.
- RB REMOVE EXISTING PULL BOX.



DETAIL "A"

NO SCALE

DETAIL "B"

PELCO CAMERA MOUNT AB-0175-5-62

NO SCALE

DETAIL "C"

SOUTHWEST CORNER DETAIL

EXISTING AND PROPOSED PHASE DIAGRAM

	GROUP A		GROUP B	
RING 1	ø1	ø2	ø3	ø4
RING 2	ø6	ø5	ø8	ø7

OL-B

OPERATION:
ø2 ø6 ON VEHICLE RECALL
ø1,ø3,ø5 ø7 ON RED-LOCK
OL-B = ø6 ø7

Ⓡ RESTRICTED PHASES

POLE SCHEDULE

No.	STANDARD TYPE	SIG. M.A.	LUM. M.A.	LUMINAIRE HPSV	VEHICLE SIGNAL MOUNTING MAST ARM	POLE	PED SIGNAL MTG.	PBB PHASE	PBB QUAD	PBB ARROW	I.I.S.N.S.	POLE LOCATION A	B	C	D	E
①	29A-5-100	50'	15'	400w	MAT, MAS	SV-1-T	–	2	N	LT	Washington Blvd	–	–	–	18'	9'
②	15TS	–	12'	200w	–	SV-2-T	SP-2-T	4	W	LT		12'	–	–	–	13'**
③	26A-4-100	40'	15'	400w	MAT, MAS	SV-1-T	–	–	–	–	Telegraph Rd	–	–	–	24'	7'
④	15TS	–	12'	200w	–	SV-2-T	SP-2-T	4,6	E,S	LT,RT		–	17'	–	–	7'
⑤	29A-5-100 (2)	50'	15'	400w	MAT, MAS	SV-1-T	SP-1-T	6	S	LT	Washington Blvd	–	–	10'	–	16'**
⑥	15TS	–	12'	200w	–	SV-2-T	SP-1-T	8	W	RT		9'	–	–	–	14'**
⑦	29A-5-100 (2)	55'	15'	400w	MAT, MAS	SV-1-T	SP-1-T	8	W	LT	Telegraph Rd	–	–	27'	–	7'
⑧	15TS	–	12'	200w	–	SV-2-T	SP-1-T	2	N	RT		26'	–	–	–	7'

* (NOTE DELETED)

** MEASURED FROM EXISTING CURB (2)

ALL EQUIPMENT IS NEW UNLESS OTHERWISE SPECIFIED

I.I.S.N.S. INDICATES INTERNALLY ILLUMINATED STREET NAME SIGN

ALL SIGNAL EQUIPMENT SHALL BE PER CALTRANS STANDARD PLANS, 2006 EDITION.

CONDUCTOR SCHEDULE

AWG	CIRCUIT	RUN NUMBER 1	2	3	4	5	6	7
#14 12-CSC SEE GENERAL NOTE 7	POLE 1 (ø4,ø7)							1
	POLE 2 (ø1,ø2,ø2P,ø4P)				1			1
	POLE 3 (ø1,ø6,ø7)			1	1			1
	POLE 4 (ø3,ø4,ø4P,ø6P)			1	1			1
	POLE 5 (ø3,ø8,ø6P)		1	1	1			1
	POLE 6 (ø5,ø6,ø7,ø8P)	1	1	1	1			1
	POLE 7 (ø2,ø5,ø2P)					1	1	1
	POLE 8 (ø7,ø8,ø8P)						1	1
	TOTAL	1	2	4	5	1	2	8
#14 3-CSC SEE GENERAL NOTE 7	ø2 PPB				1	1	1	1
	ø4 PPB			1	1			1
	ø6 PPB		1	1	1			1
	ø8 PPB	1	1	1	1		1	1
	P.E.U.							1
	TOTAL	1	2	3	4	1	2	5
#8	GROUND	1	1	1	1	1	1	1
#10	IISNS		2	2	2	2		
	LUMINAIRE		2	2	2	2	2	
	SIGNAL COMMON	1	1	1	1	1	1	1
	TOTAL	1	5	5	5	5	5	1
#6	SIGNAL SERVICE							2
D.L.C.	DETECTOR ø2				1			1
	DETECTOR ø4			1	1			1
	DETECTOR ø6	2	2	2	2			2
	DETECTOR ø8						1	1
	TOTAL	2	2	3	4		1	5
#19	INTERCONNECT CABLE	1	1	1	1			1
VIDEO DETECTION CABLE			1	2	2	1	1	4
EMERG. VEH. DETECTION CABLE			1	2	2	1	1	4
CONDUIT SIZE, INCHES		3	3	2-3	2-3	3	3	2-3.2

DIGALERT — DIAL TOLL FREE 1-800-422-4133 AT LEAST TWO DAYS BEFORE YOU DIG

NO.	REVISION	REVISED BY	APPROVED BY	DATE
①	REVISE POLE TYPES, LOCATIONS, AND POLE SCHEDULE.	LAR	VSL	10/17/08
①	REPLACE ADVANCE LOOPS AND CLARIFY VIDEO DETECTION ZONES.	LAR	VSL	10/17/08
①	REVISE MAST ARM SIGNS AND EMERGENCY VEHICLE DETECTORS.	LAR	VSL	10/17/08
①	ADD FUTURE CCTV CABINET AND CONDUIT NETWORK.	LAR	VSL	10/17/08
①	REVISE SERVICE CABINET AND CONTROLLER LOCATIONS AND TYPE	LAR	VSL	10/17/08
①	REVISE CONDUCTOR SCHEDULE.	LAR	VSL	10/17/08
①	REVISE GENERAL NOTES, STANDARD	LAR	VSL	10/17/08

PLANS PREPARED BY:

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING
610 SW ALDER, SUITE 700
PORTLAND, OREGON 97205
(503)228-5230

REGISTERED PROFESSIONAL ENGINEER — LEE A. RODEGERTS — C 58194 — Exp. 6/30/10 — CIVIL — STATE OF CALIFORNIA — 1/30/09

RECEIVED BY
APR 07 2009
L.A. SIGNAL CONST., INC.

OK Revised
CITY OF COMMERCE

COSTCO BUSINESS CENTER

TRAFFIC SIGNAL MODIFICATION PLAN
TELEGRAPH ROAD AT WASHINGTON BLVD

DFA 6/18/09

Layout Tab: TS-1

Jan 30, 2009 - 4:33pm

Profile: 8449 - TELEGRAPH ROAD COSTCO\DWGS\DESIGN\8449sig1.DWG (01-30-09 4:33:40PM) Plotted by: mbell

151 Costco Commerce a_tlor Revised Plan

ATTACHMENT B – Traffic Report

HARTZOG & CRABILL, Inc.

Gerald J. Stock, PE, TE,
Executive Vice President

17821 E. 17th Street
Suite 245
Tustin, CA 92780

Phone: (714) 731-9455
FAX: (714) 731-9498

www.hartzog-crabill.com

April 4, 2025

Mr. Vilko Domic
Assistant City Manager
City of Commerce
2535 Commerce Way
Commerce, CA 90040

Subject: Supplemental Traffic Signal Operations Analysis for the Intersection of Telegraph Road at Washington Boulevard

Dear Mr. Domic:

As requested by the City of Commerce, Hartzog & Crabill, Inc. (HCI) prepared this Supplemental Traffic Signal Operations Analysis for the intersection of Telegraph Road at Washington Boulevard. The Traffic Signal Operations Analysis was originally prepared back in 2014 to identify the benefits on adding a dedicated eastbound (EB) right-turn lane on Washington Boulevard turning onto southbound (SB) Telegraph Road.

It is our understanding that this improvement project is funded by the federal government with Caltrans assigned to administer the funds. Because the traffic counts used in the original analysis was from 2013, Caltrans requested the City prepare an update using more recent traffic counts.

METHODOLOGY

The level of service (LOS) for the intersection for the various scenarios was calculated based on the Intersection Capacity Utilization (ICU) methodology. The following parameters were used to calculate the ICU value:

- Capacity per lane (left-turn, through or right-turn lane) = 1,600
- Capacity (reduced) for dual left-turn lanes = 2,880
- Loss time = 0.100

Based on the ICU value, the LOS was determined based on Table 1.

TABLE 1
LEVEL OF SERVICE CRITERIA

ICU Value	LOS
0.00 – 0.60	A
>0.60 – 0.70	B
>0.70 – 0.80	C
>0.80 – 0.90	D
>0.90 – 1.00	E
>1.00	F

TRAFFIC VOLUMES

Based on a search of City files, staff was able to locate traffic counts taken in 2022 (see attached). To forecast 2025 traffic volumes for existing

conditions, an ambient growth rate of one percent (1%) per year (or a total of three percent (3%)) was applied to the 2022 traffic counts. For 2050, the traffic volumes were forecasted using SCAG projected growth rates for households and employment jobs provided in the Southern California Association of Governments (SCAG) 2024-2050 Regional Transportation Plan/ Sustainable Communities Strategy (RTP/SCS). The total number of households and employment in the City were projected to increase in 2050 by approximately eight percent (8%) and three percent (3%), respectively. A conservative growth rate of eight percent (8%) was used to forecast 2050 traffic volumes.

LOS ANALYSIS

The following scenarios were analyzed for the AM and PM peak hours.

- 2025 Existing Conditions (and No Build)
- 2025 with Project (Add EB Right-Turn Lane)
- 2050 without Project
- 2050 with Project (Add EB Right-Turn Lane)

As shown in the Table 2, the intersection of Telegraph Road at Washington Boulevard operates in 2025 existing conditions at LOS C and D during the AM and PM peak hours, respectively. And for the 2025 with project scenario, the intersection would operate at LOS B and C during the AM and PM peak hours, respectively.

For the 2050 without project scenario, the intersection would operate at LOS C and E during the AM and PM peak hours, respectively. And for the 2050 with project scenario, the intersection would operate at LOS C and D during the AM and PM peak hours, respectively. See attached files for the LOS Calculation Worksheets.

TABLE 2
LEVEL OF SERVICE
TELEGRAPH ROAD AT WASHINGTON BOULEVARD

Scenario	AM Peak Hour		PM Peak Hour	
	ICU Value	LOS	ICU Value	LOS
2025 Existing Conditions (and No Build)	0.724	C	0.850	D
2025 with Project (Add EB Right-Turn Lane)	0.667	B	0.761	C
2050 without Project	0.774	C	0.909	E
2050 with Project (Add EB Right-Turn Lane)	0.713	C	0.814	D

We appreciate the opportunity to prepare this Supplemental Traffic Signal Operations Analysis for the intersection of Telegraph Road at Washington Boulevard. If there are any questions or desire additional information, please contact us at (714) 731-9455.

Sincerely,
Hartzog & Crabill, Inc.

Scott Ma

Scott Ma, P.E., T.E.
Senior Engineer

Attachments

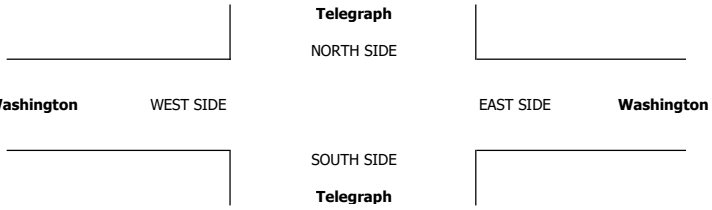
INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:	LOCATION:	Commerce	PROJECT #:	SC3581
8/24/22	NORTH & SOUTH:	Telegraph	LOCATION #:	1
WEDNESDAY	EAST & WEST:	Washington	CONTROL:	SIGNAL

	NOTES:											
PCE Adjusted	Class	1	2	3	4	5	6			AM		▲ N
	Factor	1	1.5	2	3	2	2			PM MD	◄ W	E ►
										OTHER		S ▼
										OTHER		

		NORTHBOUND Telegraph			SOUTHBOUND Telegraph			EASTBOUND Washington			WESTBOUND Washington				U-TURNS				
	LANES:	NL 1	NT 2	NR 0	SL 2	ST 2	SR 1	EL 2	ET 2	ER 0	WL 1	WT 2	WR 1	TOTAL	NB	SB	EB	WB	TTL
AM	6:00 AM	29	50	10	31	21	56	15	166	24	2	127	104	632					0
	6:15 AM	65	66	9	30	19	87	29	144	16	3	138	129	733					0
	6:30 AM	58	67	13	40	20	85	16	216	33	8	130	105	788					0
	6:45 AM	44	67	10	29	18	76	30	278	52	3	187	101	893					0
	7:00 AM	68	86	7	40	26	94	19	166	31	6	195	130	864					0
	7:15 AM	72	84	8	50	36	85	30	208	26	5	183	113	898					0
	7:30 AM	86	96	15	37	30	96	21	233	32	4	203	124	976					0
	7:45 AM	67	89	12	65	44	107	20	255	60	2	204	127	1,049					0
	8:00 AM	74	90	15	61	49	107	29	220	47	12	187	84	973					0
	8:15 AM	63	106	24	42	31	82	44	266	40	9	158	102	965					0
	8:30 AM	62	87	12	63	32	55	35	248	37	8	194	101	931					0
	8:45 AM	66	93	17	57	23	75	40	244	28	7	142	112	901					0
	VOLUMES	752	978	150	541	347	1,002	324	2,642	422	68	2,046	1,331	10,600	0	0	0	0	0
	APPROACH %	40%	52%	8%	29%	18%	53%	10%	78%	12%	2%	59%	39%						
	APP/DEPART	1,880	/	2,633	1,889	/	836	3,387	/	3,332	3,445	/	3,800	0					
	BEGIN PEAK HR		7:30 AM																
	VOLUMES	290	380	65	204	154	391	113	973	178	27	751	437	3,962					
	APPROACH %	39%	52%	9%	27%	21%	52%	9%	77%	14%	2%	62%	36%						
	PEAK HR FACTOR		0.932			0.864			0.905			0.914		0.945					
	APP/DEPART	735	/	930	749	/	358	1,264	/	1,242	1,215	/	1,432	0					
PM	04:00 PM	66	97	17	69	135	122	29	221	101	19	175	123	1,172					0
	4:15 PM	50	80	16	81	156	96	25	272	67	10	127	119	1,096					0
	4:30 PM	67	108	31	58	131	117	23	242	69	19	196	127	1,184					0
	4:45 PM	54	94	16	59	129	116	26	285	63	13	193	98	1,144					0
	5:00 PM	53	110	11	71	142	114	24	200	85	18	259	152	1,236					0
	5:15 PM	62	96	5	89	141	116	23	209	59	4	184	120	1,105					0
	5:30 PM	88	128	16	72	124	125	19	264	69	7	162	101	1,172					0
	5:45 PM	47	87	11	72	104	101	30	239	55	6	173	89	1,012					0
	6:00 PM	56	117	10	64	142	103	25	206	68	13	126	100	1,027					0
	6:15 PM	43	78	6	55	126	115	24	247	70	9	108	83	961					0
	6:30 PM	32	61	6	63	112	82	26	233	48	8	88	73	831					0
	6:45 PM	30	62	6	60	107	84	16	188	63	7	88	92	800					0
	VOLUMES	645	1,116	150	810	1,545	1,288	287	2,804	813	131	1,876	1,274	12,736	0	0	0	0	0
	APPROACH %	34%	58%	8%	22%	42%	35%	7%	72%	21%	4%	57%	39%						
	APP/DEPART	1,910	/	2,677	3,642	/	2,488	3,904	/	3,763	3,281	/	3,809	0					
	BEGIN PEAK HR		4:30 PM																
	VOLUMES	235	407	63	276	542	462	96	936	275	53	831	497	4,669					
	APPROACH %	33%	58%	9%	22%	42%	36%	7%	72%	21%	4%	60%	36%						
	PEAK HR FACTOR		0.856			0.927			0.873			0.805		0.945					
	APP/DEPART	704	/	999	1,279	/	869	1,306	/	1,274	1,380	/	1,528	0					



INTERSECTION CAPACITY UTILIZATION WORKSHEET

Intersection: Washington Boulevard at Telegraph Road

Scenario: 2025 Existing Conditions Peak-Hour: AM

Analyst: Hartzog & Crabill, Inc. Agency: City of Commerce

Movement	Phasing	Volume	Number of Lanes	Capacity	V/C Ratio	Critical V/C
NB Left	Protected	299	1	1600	0.187	*
NB Through		342	2	3200	0.128	
NB Right		67	0	-	0.128	
SB Left	Protected	210	2	2880	0.073	
SB Through		159	2	3200	0.050	*
SB Right	Free	403	1	1600	0.000	
EB Left	Protected	116	2	2880	0.040	
EB Through		1002	2	3200	0.370	*
EB Right		183	0	-	0.370	
WB Left	Protected	28	1	1600	0.018	*
WB Through		774	2	3200	0.242	
WB Right	Overlap	450	1	1600	0.208	

	Total
Sum of Critical V/C Ratios:	0.624
Adjustment for Lost Time:	0.100
Intersection Capacity Utilization (ICU):	0.724
Level of Service (LOS) - Refer to table below:	C

Notes:

1. Per Lane Capacity = 1,600 VPH
2. Dual Left-Turn Capacity = 2,880 VPH

LOS	Maximum V/C
A	0.600
B	0.700
C	0.800
D	0.900
E	1.000
F	n/a

INTERSECTION CAPACITY UTILIZATION WORKSHEET

Intersection: Washington Boulevard at Telegraph Road

Scenario: 2025 Existing Conditions Peak-Hour: PM

Analyst: Hartzog & Crabill, Inc. Agency: City of Commerce

Movement	Phasing	Volume	Number of Lanes	Capacity	V/C Ratio	Critical V/C
NB Left	Protected	242	1	1600	0.151	*
NB Through		419	2	3200	0.151	
NB Right		65	0	-	0.151	
SB Left	Protected	284	2	2880	0.099	
SB Through		558	2	3200	0.174	*
SB Right	Free	476	1	1600	0.000	
EB Left	Protected	99	2	2880	0.034	
EB Through		964	2	3200	0.390	*
EB Right		283	0	-	0.390	
WB Left	Protected	55	1	1600	0.034	*
WB Through		856	2	3200	0.268	
WB Right	Overlap	512	1	1600	0.221	

	Total
Sum of Critical V/C Ratios:	0.750
Adjustment for Lost Time:	0.100
Intersection Capacity Utilization (ICU):	0.850
Level of Service (LOS) - Refer to table below:	D

Notes:

1. Per Lane Capacity = 1,600 VPH
2. Dual Left-Turn Capacity = 2,880 VPH

LOS	Maximum V/C
A	0.600
B	0.700
C	0.800
D	0.900
E	1.000
F	n/a

INTERSECTION CAPACITY UTILIZATION WORKSHEET

Intersection: Washington Boulevard at Telegraph Road

Scenario: 2025 with Project Peak-Hour: AM

Analyst: Hartzog & Crabill, Inc. Agency: City of Commerce

Movement	Phasing	Volume	Number of Lanes	Capacity	V/C Ratio	Critical V/C
NB Left	Protected	299	1	1600	0.187	*
NB Through		342	2	3200	0.128	
NB Right		67	0	-	0.128	
SB Left	Protected	210	2	2880	0.073	
SB Through		159	2	3200	0.050	*
SB Right	Free	403	1	1600	0.000	
EB Left	Protected	116	2	2880	0.040	
EB Through		1002	2	3200	0.313	*
EB Right		183	1	1600	0.114	
WB Left	Protected	28	1	1600	0.018	*
WB Through		774	2	3200	0.242	
WB Right	Overlap	450	1	1600	0.208	

	Total
Sum of Critical V/C Ratios:	0.567
Adjustment for Lost Time:	0.100
Intersection Capacity Utilization (ICU):	0.667
Level of Service (LOS) - Refer to table below:	B

Notes:

1. Per Lane Capacity = 1,600 VPH
2. Dual Left-Turn Capacity = 2,880 VPH

LOS	Maximum V/C
A	0.600
B	0.700
C	0.800
D	0.900
E	1.000
F	n/a

INTERSECTION CAPACITY UTILIZATION WORKSHEET

Intersection: Washington Boulevard at Telegraph Road

Scenario: 2025 with Project Peak-Hour: PM

Analyst: Hartzog & Crabill, Inc. Agency: City of Commerce

Movement	Phasing	Volume	Number of Lanes	Capacity	V/C Ratio	Critical V/C
NB Left	Protected	242	1	1600	0.151	*
NB Through		419	2	3200	0.151	
NB Right		65	0	-	0.151	
SB Left	Protected	284	2	2880	0.099	
SB Through		558	2	3200	0.174	*
SB Right	Free	476	1	1600	0.000	
EB Left	Protected	99	2	2880	0.034	
EB Through		964	2	3200	0.301	*
EB Right		283	1	1600	0.177	
WB Left	Protected	55	1	1600	0.034	*
WB Through		856	2	3200	0.268	
WB Right	Overlap	512	1	1600	0.221	

	Total
Sum of Critical V/C Ratios:	0.661
Adjustment for Lost Time:	0.100
Intersection Capacity Utilization (ICU):	0.761
Level of Service (LOS) - Refer to table below:	C

Notes:

1. Per Lane Capacity = 1,600 VPH
2. Dual Left-Turn Capacity = 2,880 VPH

LOS	Maximum V/C
A	0.600
B	0.700
C	0.800
D	0.900
E	1.000
F	n/a

INTERSECTION CAPACITY UTILIZATION WORKSHEET

Intersection: Washington Boulevard at Telegraph Road

Scenario: 2050 without Project Peak-Hour: AM

Analyst: Hartzog & Crabill, Inc. Agency: City of Commerce

Movement	Phasing	Volume	Number of Lanes	Capacity	V/C Ratio	Critical V/C
NB Left	Protected	323	1	1600	0.202	*
NB Through		369	2	3200	0.138	
NB Right		72	0	-	0.138	
SB Left	Protected	227	2	2880	0.079	
SB Through		172	2	3200	0.054	*
SB Right	Free	435	1	1600	0.000	
EB Left	Protected	125	2	2880	0.043	
EB Through		1082	2	3200	0.400	*
EB Right		198	0	-	0.400	
WB Left	Protected	30	1	1600	0.019	*
WB Through		836	2	3200	0.261	
WB Right	Overlap	486	1	1600	0.225	

	Total
Sum of Critical V/C Ratios:	0.674
Adjustment for Lost Time:	0.100
Intersection Capacity Utilization (ICU):	0.774
Level of Service (LOS) - Refer to table below:	C

Notes:

1. Per Lane Capacity = 1,600 VPH
2. Dual Left-Turn Capacity = 2,880 VPH

LOS	Maximum V/C
A	0.600
B	0.700
C	0.800
D	0.900
E	1.000
F	n/a

INTERSECTION CAPACITY UTILIZATION WORKSHEET

Intersection: Washington Boulevard at Telegraph Road

Scenario: 2050 without Project Peak-Hour: PM

Analyst: Hartzog & Crabill, Inc. Agency: City of Commerce

Movement	Phasing	Volume	Number of Lanes	Capacity	V/C Ratio	Critical V/C
NB Left	Protected	261	1	1600	0.163	*
NB Through		453	2	3200	0.163	
NB Right		70	0	-	0.163	
SB Left	Protected	307	2	2880	0.107	
SB Through		603	2	3200	0.188	*
SB Right	Free	514	1	1600	0.000	
EB Left	Protected	107	2	2880	0.037	
EB Through		1041	2	3200	0.421	*
EB Right		306	0	-	0.421	
WB Left	Protected	59	1	1600	0.037	*
WB Through		924	2	3200	0.289	
WB Right	Overlap	553	1	1600	0.239	

	Total
Sum of Critical V/C Ratios:	0.809
Adjustment for Lost Time:	0.100
Intersection Capacity Utilization (ICU):	0.909
Level of Service (LOS) - Refer to table below:	E

Notes:

1. Per Lane Capacity = 1,600 VPH
2. Dual Left-Turn Capacity = 2,880 VPH

LOS	Maximum V/C
A	0.600
B	0.700
C	0.800
D	0.900
E	1.000
F	n/a

INTERSECTION CAPACITY UTILIZATION WORKSHEET

Intersection: Washington Boulevard at Telegraph Road

Scenario: 2050 with Project Peak-Hour: AM

Analyst: Hartzog & Crabill, Inc. Agency: City of Commerce

Movement	Phasing	Volume	Number of Lanes	Capacity	V/C Ratio	Critical V/C
NB Left	Protected	323	1	1600	0.202	*
NB Through		369	2	3200	0.138	
NB Right		72	0	-	0.138	
SB Left	Protected	227	2	2880	0.079	
SB Through		172	2	3200	0.054	*
SB Right	Free	435	1	1600	0.000	
EB Left	Protected	125	2	2880	0.043	
EB Through		1082	2	3200	0.338	*
EB Right		198	1	1600	0.124	
WB Left	Protected	30	1	1600	0.019	*
WB Through		836	2	3200	0.261	
WB Right	Overlap	486	1	1600	0.225	

	Total
Sum of Critical V/C Ratios:	0.613
Adjustment for Lost Time:	0.100
Intersection Capacity Utilization (ICU):	0.713
Level of Service (LOS) - Refer to table below:	C

Notes:

1. Per Lane Capacity = 1,600 VPH
2. Dual Left-Turn Capacity = 2,880 VPH

LOS	Maximum V/C
A	0.600
B	0.700
C	0.800
D	0.900
E	1.000
F	n/a

INTERSECTION CAPACITY UTILIZATION WORKSHEET

Intersection: Washington Boulevard at Telegraph Road

Scenario: 2050 with Project Peak-Hour: PM

Analyst: Hartzog & Crabill, Inc. Agency: City of Commerce

Movement	Phasing	Volume	Number of Lanes	Capacity	V/C Ratio	Critical V/C
NB Left	Protected	261	1	1600	0.163	*
NB Through		453	2	3200	0.163	
NB Right		70	0	-	0.163	
SB Left	Protected	307	2	2880	0.107	
SB Through		603	2	3200	0.188	*
SB Right	Free	514	1	1600	0.000	
EB Left	Protected	107	2	2880	0.037	
EB Through		1041	2	3200	0.325	*
EB Right		306	1	1600	0.191	
WB Left	Protected	59	1	1600	0.037	*
WB Through		924	2	3200	0.289	
WB Right	Overlap	553	1	1600	0.239	

	Total
Sum of Critical V/C Ratios:	0.714
Adjustment for Lost Time:	0.100
Intersection Capacity Utilization (ICU):	0.814
Level of Service (LOS) - Refer to table below:	D

Notes:

1. Per Lane Capacity = 1,600 VPH
2. Dual Left-Turn Capacity = 2,880 VPH

LOS	Maximum V/C
A	0.600
B	0.700
C	0.800
D	0.900
E	1.000
F	n/a

Date: January 16, 2014

To:	Alex Hamilton, Interim PW Director City of Commerce	**Pages:**	-10 pages -Attachments
From:	Jana Robbins, Sr. Transportation Analyst E jana.robbins@transtech.org T 909-595-8599 ext. 133	**Job #:**	14013
Re:	Review of Traffic Signal Operations at Telegraph Road and Washington Blvd	**Cc:**	Victor San Lucas, City of Commerce Yunus Rahi, PE., TE, Transtech Melissa Demirci, Transportation Analyst, Transtech

The City of Commerce has directed staff to conduct a review of existing traffic signal operations at the Telegraph Road and Washington Boulevard intersection as shown in **Figure 1: Aerial Proximity Map** below. The intersection is east of interstate 5. This intersection is a major transit intersection and truck route heavily used during peak and off peak hours.

Staff collected data regarding existing roadway conditions, turning movement, traffic volumes, signal phasing, and traffic collisions. Existing conditions and intersection operations, existing and proposed traffic conditions, and an accident summary are discussed in this report. Accident data was obtained from the computerized accident records system maintained by the State of California Statewide Integrated Traffic Records System (SWITRS). For purposes of this study, information available for the most recent 3 year period was used to develop the accident statistics as a part of the Engineering and Traffic Surveys. Accident data was obtained for the years 2010, 2011 and 2012. Turning movement counts were taken for peak AM and PM hours in the month of December of 2013. These counts were taken while school was in session.

Figure 1: Aerial Proximity Map

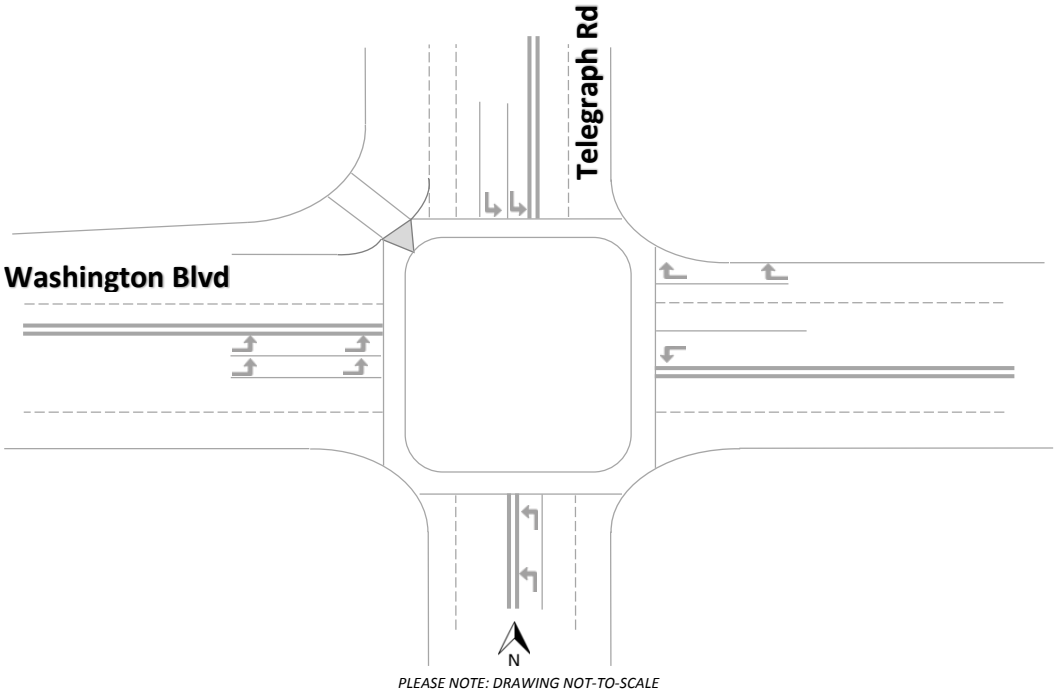
EXISTING CONDITIONS

The Washington Boulevard and Telegraph Road intersection is located in an industrial area and serves as a commuter road for large axle trucks as well as for passenger vehicles. It is a signalized intersection with no u-turns allowed. The Commerce Casinos are north of the intersection. Parking is allowed on the south leg for the southbound direction on Telegraph Road. There is a Home Depot and Costco at the south east corner of the intersection, and the Central Basin Municipal Water District in the northwest corner of the intersection. The northeast and the south west corners are vacant lots. The Metro Bus Stop #62 is located on Telegraph on the southeast corner of the intersection. See **Figure 2: Intersection Diagram** for schematic of the Washington Blvd and Telegraph Road intersection phasing and **Figure 3: Aerial Close-up of Intersection**. See **Table 1: Phasing Diagram** for signal phasing at this intersection.

Washington Boulevard: Washington Boulevard is a major east/west arterial in the City of Commerce. At the Telegraph Road intersection, Washington Blvd carries two (2) travel lanes in each direction. The road passes under interstate 5 (west of intersection). Protected left turn phasing is provided for the eastbound and westbound directions. For the eastbound direction there are two left turn lanes, one thru lane and a shared thru and right turn lane. The westbound direction provides for right turn overlap phasing in addition to the green arrow for left turn traffic as well as one left turn lane, two thru lanes and one exclusive right turn lane.

Telegraph Road: Telegraph Road is a north/south arterial in the City of Commerce. At the Washington Blvd intersection, Telegraph Road has a posted speed limit of 45 mph with two (2) travel lanes in each direction. Protected left turn phasing is provided for both north and south approaches. The northbound direction provides one left turn lane, one thru lane and a shared thru and right turn lane. The southbound direction provides two left turn lanes, two thru lanes and an exclusive right turn lane with free flowing traffic.

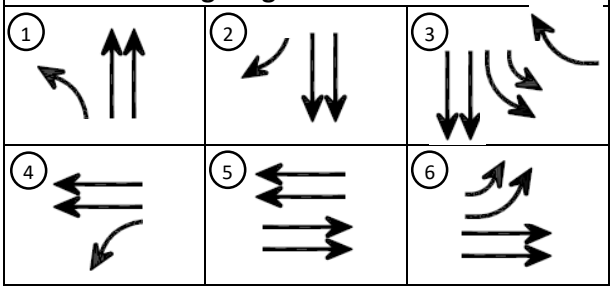
Figure 2: Intersection Diagram



PLEASE NOTE: DRAWING NOT-TO-SCALE

Below in **Table 1: Phasing Diagram** shows the signal phasing for the intersection.

Table 1: Phasing Diagram



Existing Turning Movement Counts

Turning movement counts were taken for peak AM and PM hours in the month of December of 2013. These counts were taken while school was in session. Trucks 3+ axle were counted separately and converted to passenger vehicles using a 2.0 pce factor and then added back into the count totals.

FIGURE 2:
Turning Movement Counts
AM Peak Hour Counts
Telegraph Rd and Washington Blvd

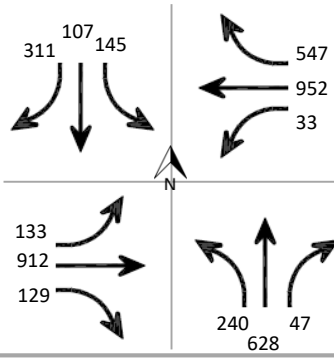
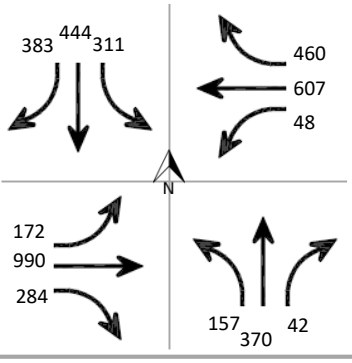


FIGURE 3:
Turning Movement Counts
PM Peak Hour Counts
Telegraph Rd and Washington Blvd



EXISTING INTERSECTION OPERATIONS

Level of Service Criteria

Roadway operations and the relationship between capacity and traffic volumes are generally expressed in terms of levels of service. These levels recognize that, while an absolute limit exists as to the amount of traffic traveling through a given intersection (the absolute capacity), the conditions that motorists experience rapidly deteriorate as traffic approaches the absolute capacity. Under such conditions, congestion is experienced.

There is generally instability in the traffic flow, which means that relatively small incidents (e.g., momentary engine stall) can cause considerable fluctuations in speeds and delay. This near-capacity situation is labeled LOS E. Levels of service are defined as LOS A through F. Beyond LOS E, capacity is exceeded, and arriving traffic will exceed the ability of the intersection to accommodate it. An upstream queue will form and continue to expand in length until the demand volume reduces.

A complete description of the meaning of level of service can be found in the Transportation Research Board's Special Report 209, *Highway Capacity Manual*. The Manual establishes the definitions for levels of service A through F. Brief descriptions of the six levels of service, as extracted from the Manual, are shown in **Table 2: Level of Service Definitions**.

TABLE 2
LEVEL OF SERVICE (LOS) DEFINITIONS

LOS	Description
A	No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication. Typically, the approach appears quite open, turns are made easily and nearly all drivers find freedom of operation.
B	This service level represents stable operation, where an occasional approach phase is fully utilized and a substantial number are approaching full use. Many drivers begin to feel restricted within platoons of vehicles.
C	This level still represents stable operating conditions. Occasionally, drivers have to wait through more than one red signal indication, and backups may develop behind turning vehicles. Most drivers feel somewhat restricted.
D	This level encompasses a zone of increasing restriction approaching instability at the intersection. Delays to approaching vehicles may be substantial during short peaks within the peak period; however, enough cycles with lower demand occur to permit periodic clearance of developing queues, thus preventing excessive backups.
E	Capacity occurs at the upper end of this service level. It represents the most vehicles that any particular intersection can accommodate. Full utilization of every signal cycle is seldom attained no matter how great the demand.

F	This level describes forced flow operations at low speeds, where volumes exceed capacity. These conditions usually result from queues of vehicles backing up from restriction downstream. Speeds are reduced substantially and stoppages may occur for short or long periods of time due to congestion. In the extreme case, both speed and volume can drop to zero.

Source: HCM 2000 Traffic Manual Chapter 16 and 17

TABLE 3
LEVEL OF SERVICE CRITERIA

Level of Service (LOS)	Two-Way or All-Way Stop Controlled Intersection		Signalized Intersection	
	Average Delay per Vehicle (sec)	V/C Ratio	Average Delay per Vehicle (sec)	V/C Ratio
A	0 - 10	> 0.60	0 - 10	> 0.60
B	> 10 - 15	> 0.60 - 0.70	> 10 - 20	> 0.60 - 0.70
C	> 15 - 25	> 0.70 – 0.80	> 20 - 35	> 0.70 – 0.80
D	> 25 - 35	> 0.80 – 0.90	> 35 - 55	> 0.80 – 0.90
E	> 35 - 50	> 0.90 – 1.00	> 55 - 80	> 0.90 – 1.00
F	> 50	> 1.00	> 80	> 1.00

Source: HCM 2000 Traffic Manual Chapter 16 and 17

The City provides for operations at the minimum acceptable threshold of LOS D.

For the study area intersections, the TRAFFIX computer software, Version 8.0 has been utilized to determine levels of service.

While the level of service concept provides an indication of the performance of the entire intersection, the single letter grade A through F cannot describe specific operational deficiencies at intersections. Progression, queue formation, and left-turn storage are example of the operational issues that affect the performance of an intersection, but do not factor into the strict calculation of level of service. However, the TRAFFIX software does provide an output that quantifies operational features at intersections, such as vehicle clearance, queue formation, and left-turn storage requirements.

The following defaults were used in the calculation of Level of Service[1]:

- 1600 capacity
- 2880 capacity for dual LT lanes
- ICU Methodology

EXISTING AND PROPOSED TRAFFIC CONDITIONS

1 Traffic Impact Analysis Report Guidelines, Los Angeles County Public Works.

Table 4 presents the intersection level of service analysis summary for existing conditions. The Intersection Capacity Utilization (ICU) method was used in determining intersection LOS for the signalized intersections. Based on the results of this analysis the intersection currently operates at LOS B and C during AM and PM Peak hours, respectively. With changes in the EB lane usage and with an additional EB lane **Tables 6 and 8** summarize the operations of the intersection. As seen in **Table 6** (Option 1) with a reconfiguration of the existing number of lanes in the EB direction the intersection will deteriorate to LOS E during both AM and PM peak hours. Option 2 **Table 8**, the roadway will provide for an additional EB lane with 2 through lanes and 1 exclusive right turn lane. With this configuration the intersection will operate at LOS B during both AM and PM peak hours, showing an improvement to conditions during the PM peak.

Detailed level of service calculation worksheets are provided in the Technical Appendix.

TABLE 4
INTERSECTION LEVEL OF SERVICE SUMMARY
Existing Intersection Geometrics
(Specifically, 2 EB LT, 1 EB Thru and 1 EB Shared Thru and RT)

Intersection	Peak Hour	Existing Conditions	
		LOS	Crit V/C
1. Telegraph Road at Washington Blvd	AM	B	0.691
	PM	C	0.748

Tables 5, 7 and 9 provide a comparison of the number of eastbound vehicles waiting in the queue for each lane during the peak periods. As seen on **Table 5**, there are currently 19 vehicles waiting in the through and right turn lane during the AM peak and 21 vehicles in the PM peak. It is assumed that 25 feet is needed for each passenger vehicle, this equates to a queue of 475 feet and 525 feet, for the AM and PM peaks, respectively. As shown in **Table 7** (Option 1), changing the existing shared and right turn lane will negatively affect the intersection by deteriorating LOS operations and lengthening the back up for eastbound traffic from 19 and 21 vehicles to 27 and 28 vehicles waiting for the EB Thru movement. In Option 2 **(Table 9)** adding an additional lane will reduce queues for EB thru traffic to 17 and 18 vehicles and for right turn traffic to 5 and 10 vehicles during peak AM and PM periods, respectively.

Table 5
Back of Queue and Delay Per Vehicle for Eastbound Movements - Existing Conditions

Intersection	Peak Hour	Back of Queue for Each EB Movement		
		EB Left (2 lanes)	EB Thru (1+1)	EB Right (1 lane)
1. Telegraph and Washington	AM Q	4	19	19
	AM Delay	47.1 sec/veh	18.6 sec/veh	23.3 sec/veh
	PM Q	5	21	21
	PM Delay	36.7 sec/veh	17 sec/veh	20.1 sec/veh

TABLE 6
INTERSECTION LEVEL OF SERVICE SUMMARY
Option 1 - Intersection Geometrics
(Specifically, 2 EB LT, 1 EB Thru and 1 EB Exclusive RT)

Intersection	Peak Hour	Existing Conditions	
		LOS	Crit V/C
1. Telegraph Road at Washington Blvd	AM	E	0.935
	PM	E	0.969

Table 7
Back of Queue and Delay Per Vehicle for Option 1 Conditions

Intersection	Peak Hour	Back of Queue for Each EB Movement		
		EB Left (2 lanes)	EB Thru (1+1)	EB Right (1 lane)
1. Telegraph and Washington	AM	4	27	3
	AM Delay	42.4 sec/veh	26.7 sec/veh	7.5 sec/veh
	PM	5	28	7
	PM Delay	34.8 sec/veh	20.8 sec/veh	7.3 sec/veh

TABLE 8
INTERSECTION LEVEL OF SERVICE SUMMARY
Option 2 - Intersection Geometrics
(Specifically, 2 EB LT, 2 EB Thru and 1 EB Exclusive RT)

Intersection	Peak Hour	Existing Conditions	
		LOS	Crit V/C
1. Telegraph Road at Washington Blvd	AM	B	0.688
	PM	B	0.660

Table 9
Back of Queue and Delay Per Vehicle for Option 2 Conditions

Intersection	Peak Hour	Back of Queue for Each EB Movement		
		EB Left	EB Thru	EB Right
1. Telegraph and Washington	AM	4	17	5
	AM Delay	47.2 sec/veh	17.5 sec/veh	13.3 sec/veh
	PM	5	18	10
	PM Delay	37.9 sec/veh	17.8 sec/veh	14.6 sec/veh

ACCIDENT SUMMARY

Accident data was obtained from the computerized accident records system maintained by the State of California Statewide Integrated Traffic Records System (SWITRS). For purposes of this study, information available for the most recent 3 year period was used to develop the accident statistics as a part of the Engineering and Traffic Surveys. Accident data was obtained for the years 2010, 2011 and 2012. There were a total of 24 accidents within the intersection over a 3 year period. **Table 10: Accident Summary Table** summarizes the accidents and **Figure 4: Accident Location Map** provides a schematic of the approximate locations.

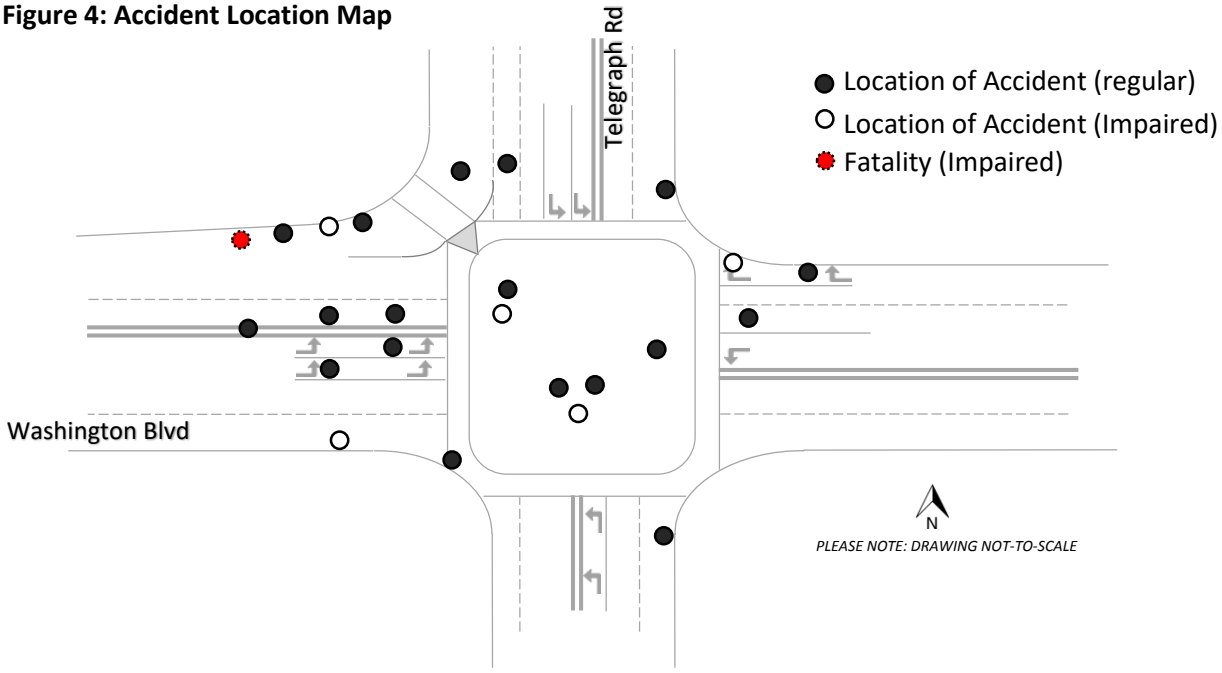
- 2012 – 2 accidents
- 2011 – 7 accidents
- 2010 – 15 accidents

Table 10: Accident Summary Table

No.	Date	Location	Dist.	Time	Day	Collision Type	Severity	Factor
2012								
1	02/13/12	Telegraph/Washington	1	11:15	Mon	Sideswipe /speed	PDO	WB LT hit WB LT
2	02/11/12	Telegraph/Washington	250’ W	16:30	Sat	Hit object	PDO	EB thru hit object (impaired)
2011								
1	10/10/11	Washington/Telegraph	313’ W	02:26	Mon	Hit object	FATAL	WB Thru (impaired)
2	03/20/11	Washington/Telegraph	300’ W	18:00	Sun	Sideswipe	PDO	LT EB hit LT EB
3	02/26/11	Washington/Telegraph	1	13:15	Sat	Broadside	PDO	WB LT hit SB thru
4	02/22/11	Washington/Telegraph	10’ E	07:00	Tue	Rearend	PDO	WB thru hit stopped WB veh
5	02/01/11	Washington/Telegraph	1	19:00	Tue	Sideswipe	PDO	SB RT hit SB RT
6	01/21/11	Telegraph/Washington	25’ W	12:35	Fri	Broadside	PDO	EB LT hit EB LT
7	01/09/11	Washington/Telegraph	214’ S	17:25	Sun	Hit object	PDO	WB thru hit object
2010								
1	12/30/10	Telegraph/Washington	1	21:23	Thu	Broadside	PDO	EB LT (impaired) hit WB thru and SB stopped
2	12/19/10	Telegraph/Washington	1	06:20	Sun	Broadside	INJ	EB thru hit NB LT
3	11/11/10	Washington/Telegraph	158’ W	02:25	Thu	Hit object	INJ	WB thru hit object (impaired)

No.	Date	Location	Dist.	Time	Day	Collision Type	Severity	Factor
4	11/04/10	Washington/Telegraph	15’ W	04:15	Thu	Rearend	PDO	WB RT hit WB RT
5	10/21/10	Washington/Telegraph	11’ N	07:00	Thu	Rearend	PDO	SB thru hit SB thru
6	10/17/10	Telegraph/Washington	75’ E	09:00	Sun	Hit Object / Speed	PDO	EB RT hit object
7	09/02/10	Washington/Telegraph	150’ W	06:40	Thu	Hit object	PDO	WB thru hit object
8	08/12/10	Telegraph/Washington	44’ W	03:00	Thu	Hit object	PDO	WB RT hit object (impaired)
9	07/15/10	Telegraph/Washington	120’ N	16:00	Thu	Broadside	PDO	SB thru hit WB thru
10	05/17/10	Telegraph/Washington	10’ N	19:45	Mon	Hit object	PDO	WB RT hit object
11	04/26/10	Washington/Telegraph	80’ W	01:28	Mon	Hit object	PDO	WB thru hit object
12	03/18/10	Washington/Telegraph	1	23:00	Thu	Rearend	PDO	EB thru hit EB stopped (impaired)
13	02/16/10	Washington/Telegraph	139’ W	12:30	Tue	Sideswipe	INJ	WB thru hit EB thru
14	02/02/10	Telegraph/Washington	55’ E	07:50	Tue	Rearend / Speed	PDO	WB thru hit stopped WB thru veh
15	01/08/10	Washington/Telegraph	80’ W	17:55	Fri	Rearend / Speed	PDO	WB thru hit stopped WB veh

Figure 4: Accident Location Map



SUMMARY

As seen in Tables 8 and 9, the alternative that will provide for the best levels of operation and queues for the EB flow of traffic is Option 2; adding an exclusive right turn lane while maintaining two through lanes. This option will require widening of the EB curb lane.

ATTACHMENTS

- Attachment 1: Turning Movement Counts
- Attachment 2: Axle Count Peak Hour Summary
- Attachment 3: AM, PM Peak Hour

Turning Movement Count

TURNING MOVEMENT COUNT

Prepared by: G.E. Traffic Surveys

PROJECT NAME: City of Commerce - Washington and Telegraph Operations Analysis
PROJECT NO: 14013
DATE: December 5, 2013
PASSENGER CARS

TIME	N-S STREET: Telegraph Road							E-W STREET: Washington Blvd							PED COUNT			
	NORTH BOUND			SOUTH BOUND			N-S	EAST BOUND			WEST BOUND			E-W				
	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	TOTAL	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	TOTAL	NL	SL	EL	WL
07:00-07:15	38	124	8	35	22	55	282	26	196	16	5	165	143	551	2	4	2	2
07:15-07:30	56	129	10	30	28	62	315	29	168	21	4	235	118	575		1	2	
07:30-07:45	70	184	9	37	26	68	394	28	182	21	0	177	144	552		4	5	
07:45-08:00	52	159	7	40	31	65	354	29	244	27	3	207	114	624		0	2	
08:00-08:15	36	128	3	28	22	68	285	31	214	44	6	199	109	603		3	6	
08:15-08:30	49	140	16	23	25	58	311	42	191	32	2	133	101	501		7	2	1
08:30-08:45	53	113	11	49	21	67	314	36	185	32	3	157	109	522		1	0	
08:45-09:00	53	108	8	36	29	42	276	43	153	25	2	112	79	414		1	1	
11:00-11:15							0							0				
11:15-11:30							0							0				
11:30-11:45							0							0				
11:45-12:00							0							0				
12:00-12:15							0							0				
12:15-12:30							0							0				
12:30-12:45							0							0				
12:45-13:00							0							0				
16:00-16:15	28	92	9	52	94	60	335	42	220	71	10	127	137	607	1	4		
16:15-16:30	43	88	6	86	98	82	403	50	252	56	12	137	107	614		1		
16:30-16:45	30	93	11	62	112	87	395	37	216	48	13	129	111	554	1	2		1
16:45-17:00	34	79	2	97	126	90	428	37	208	61	11	110	81	508	1	0	2	
17:00-17:15	28	82	5	58	94	79	346	46	247	53	3	126	86	561	1	3	6	3
17:15-17:30	29	84	2	73	83	84	355	26	234	51	11	139	134	595	4	1	5	
17:30-17:45	26	113	6	64	115	79	403	19	226	40	12	122	135	554	0	3		
17:45-18:00	31	104	6	59	87	71	358	49	249	51	11	124	114	598	1		3	

PEAK-HOUR VOLUME ANALYSIS

CALCULATED PEAK HOUR VOLUMES-AM

263 SR 107 ST 135 SL

117 EL — WR 485
808 ET — 07:15-08:15 — WT 818
113 ER — WL 13

214 NL 600 NT 29 NR

ADJUSTED PEAK HOUR VOLUMES-AM

SR ST SL

____ EL — WR ____
____ ET — WT ____
____ ER — WL ____

NL NT NR

CALCULATED PEAK HOUR VOLUMES-NOON

0 SR 0 ST 0 SL

0 EL — WR 0
0 ET — 11:00-12:00 — WT 0
0 ER — WL 0

0 NL 0 NT 0 NR

ADJUSTED PEAK HOUR VOLUMES-NOON

SR ST SL

____ EL — WR ____
____ ET — WT ____
____ ER — WL ____

NL NT NR

CALCULATED PEAK HOUR VOLUMES-PM

319 SR 430 ST 297 SL

166 EL — WR 436
896 ET — 16:00-17:00 — WT 503
236 ER — WL 46

135 NL 352 NT 28 NR

ADJUSTED PEAK HOUR VOLUMES-PM

SR ST SL

____ EL — WR ____
____ ET — WT ____
____ ER — WL ____

NL NT NR

Turning Movement Count

TURNING MOVEMENT COUNT

Prepared by: G.E. Traffic Surveys

PROJECT NAME: City of Commerce - Washington and Telegraph Operations Analysis
PROJECT NO: 14013
DATE: December 5, 2013
TRUCKS 3+ AXLE

TIME	N-S STREET: Telegraph Road							E-W STREET: Washington Blvd							PED COUNT			
	NORTH BOUND			SOUTH BOUND			N-S	EAST BOUND			WEST BOUND			E-W				
	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	TOTAL	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	TOTAL	NL	SL	EL	WL
07:00-07:15	4	4	1			3	12	3	10			9	12	34				
07:15-07:30	2					5	7	2	12	1		17	5	37				
07:30-07:45	4	3	2	3		4	16	2	13	3		10	5	33				
07:45-08:00	4	2	2		1	4	13	1	13	5	2	19	12	52				
08:00-08:15	4	3	4	1		6	18	1	17	3	3	12	5	41				
08:15-08:30	5	1	0	1		4	11	0	10	1	4	20	6	41				
08:30-08:45	2	7	4	1		5	19	1	10	1	2	17	9	40				
08:45-09:00	2	3	1	2		9	17	6	15	3	1	18	11	54				
11:00-11:15							0							0				
11:15-11:30							0							0				
11:30-11:45							0							0				
11:45-12:00							0							0				
12:00-12:15							0							0				
12:15-12:30							0							0				
12:30-12:45							0							0				
12:45-13:00							0							0				
16:00-16:15	2	1	2	2	6	6	19		13	4	3	6	4	30				
16:15-16:30	3	1	0	0	3	7	14	1	20	5	1	4	2	33				
16:30-16:45	3	3	1	1	2	6	16	2	15	8	1	14	4	44				
16:45-17:00	1	2	1	2	2	8	16	0	11	4		9	6	30				
17:00-17:15	5	1	1	2	1	7	17	1	12	4		12	1	30				
17:15-17:30	2	3	4	2	2	11	24	0	9	8		17	1	35				
17:30-17:45	0	2	2	1	2	9	16	1	16	9	1	9	5	41				
17:45-18:00	7	3	2	1	2	4	19		12	3		6	7	28				

PEAK-HOUR VOLUME ANALYSIS

CALCULATED PEAK HOUR VOLUMES-AM

		SR	ST	SL		
		24	0	5		
8	EL				WR	31
52	ET		08:00-09:00		WT	67
8	ER				WL	10
		NL	NT	NR		
		13	14	9		

ADJUSTED PEAK HOUR VOLUMES-AM

		SR	ST	SL		
	EL				WR	
	ET				WT	
	ER				WL	
		NL	NT	NR		

CALCULATED PEAK HOUR VOLUMES-NOON

		SR	ST	SL		
		0	0	0		
0	EL				WR	0
0	ET		11:00-12:00		WT	0
0	ER				WL	0
		NL	NT	NR		
		0	0	0		

ADJUSTED PEAK HOUR VOLUMES-NOON

		SR	ST	SL		
	EL				WR	
	ET				WT	
	ER				WL	
		NL	NT	NR		

CALCULATED PEAK HOUR VOLUMES-PM

		SR	ST	SL		
		32	7	7		
3	EL				WR	12
47	ET		16:30-17:30		WT	52
24	ER				WL	1
		NL	NT	NR		
		11	9	7		

ADJUSTED PEAK HOUR VOLUMES-PM

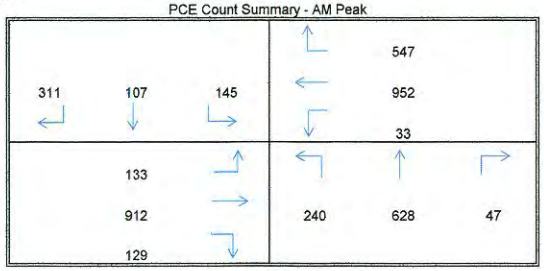
		SR	ST	SL		
	EL				WR	
	ET				WT	
	ER				WL	
		NL	NT	NR		

AXLE COUNT PEAK HOUR SUMMARY

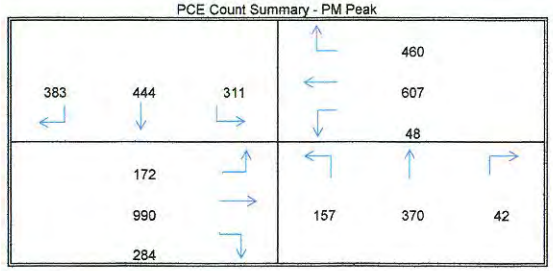
Location	TELEGRAPH AND WASHINGTON CITY OF COMMERCE																		
Peak Hour:	AM Peak																		
Direction		North Bound (Telegraph)				South Bound (Telegraph)				East Bound (Washington)				West Bound (Washington)					
Veh Type	Pce Factor	LT	THRU	RT	Total	LT	THRU	RT	Total	LT	THRU	RT	Total	LT	THRU	RT	Total	**Total**	**% of Total**
Car/2 axle Veh	7:15-8:15	214	600	29		135	107	263		117	808	113		13	818	485			
Ttl w/pce factor	1.0	214	600	29	843	135	107	263	505	117	808	113	1038	13	818	485	1316	**3702**	**0.88**
3+ Axle Truck	08:00-9:00	13	14	9		5	0	24		8	52	8		10	67	31			
Ttl w/pce factor	2.0	26	28	18	72	10	0	48	58	16	104	16	136	20	134	62	216	**482**	**0.12**
Local Bus		0	0	0		0	0	0		0	0	0		0	0	0			
Ttl w/pce factor	1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0.00**
Total Movement	AM Peak	240	628	47	915	145	107	311	563	133	912	129	1174	33	952	547	1532	**4184**	
Location																			
Peak Hour:	PM Peak																		
Direction		North Bound				South Bound				East Bound				West Bound					
Veh Type	Pce Factor	LT	THRU	RT	Total	LT	THRU	RT	Total	LT	THRU	RT	Total	LT	THRU	RT	Total	**Total**	**% of Total**
Car/2 axle Veh	16:00-17:00	135	352	28		297	430	319		166	896	236		46	503	436			
Ttl w/pce factor	1.0	135	352	28	515	297	430	319	1046	166	896	236	1298	46	503	436	985	**3844**	**0.90**
3+ Axle Truck	16:30-17:30	11	9	7		7	7	32		3	47	24		1	52	12			
Ttl w/pce factor	2.0	22	18	14	54	14	14	64	92	6	94	48	148	2	104	24	130	**424**	**0.10**
Local Bus		0	0	0		0	0	0		0	0	0		0	0	0			
Ttl w/pce factor	1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0.00**
Total Movement	PM Peak	157	370	42	569	311	444	383	1138	172	990	284	1446	48	607	460	1115	**4268**	

Input areas in Yellow

PCE Count Summary - AM Peak



PCE Count Summary - PM Peak



MITIG8 - Existing ConditionThu Jan 16, 2014 10:02:55 Page 1-1

City of Commerce: Telegraph Washington Operations Analysis
Existing Conditions
AM Peak

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 Telegraph at Washington

Cycle (sec):	120	Critical Vol./Cap.(X):	0.691
Loss Time (sec):	10	Average Delay (sec/veh):	24.3
Optimal Cycle:	51	Level Of Service:	B

Street Name:	Telegraph Rd						Washington Blvd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ignore			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1	1 0	2 0	2	0 1	2 0	1	1 0	1 0	2	0 1
Volume Module: >> Count Date: 5 Dec 2013 << AM Peak												
Base Vol:	240	628	47	145	107	311	133	912	129	33	952	547
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	240	628	47	145	107	311	133	912	129	33	952	547
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	240	628	47	145	107	311	133	912	129	33	952	547
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	240	628	47	145	107	0	133	912	129	33	952	547
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	240	628	47	145	107	0	133	912	129	33	952	547
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	240	628	47	145	107	0	133	912	129	33	952	547
OvlAdjVol:												466
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.86	0.14	2.00	2.00	1.00	2.00	1.75	0.25	1.00	2.00	1.00
Final Sat.:	1600	2977	223	2880	3200	1600	2880	2803	397	1600	3200	1600
Capacity Analysis Module:												
Vol/Sat:	0.15	0.21	0.21	0.05	0.03	0.00	0.05	0.33	0.33	0.02	0.30	0.34
OvlAdjV/S:												0.29
Crit Moves:		****		****				****		****		
Green/Cycle:	0.32	0.32	0.32	0.08	0.07	0.00	0.07	0.49	0.49	0.03	0.45	0.53
Volume/Cap:	0.47	0.66	0.66	0.66	0.47	0.00	0.66	0.66	0.66	0.66	0.66	0.65
Delay/Veh:	25.4	28.4	40.5	46.5	42.3	0.0	47.1	18.6	23.3	62.1	20.5	16.9
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	25.4	28.4	40.5	46.5	42.3	0.0	47.1	18.6	23.3	62.1	20.5	16.9
DesignQueue:	11	16	16	5	3	0	4	19	19	2	19	19

```
Existing Conditions        Tue Dec 10, 2013 14:42:30                Page 3-1
--------------------------------------------------------------------------------
          City of Commerce - Telegraph Washington Operations Analysis
                              Existing Conditions
                                   PM Peak
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #1 Telegraph at Washington
********************************************************************************
Cycle (sec):          120                Critical Vol./Cap.(X):          0.748
Loss Time (sec):       10                Average Delay (sec/veh):         26.2
Optimal Cycle:         60                Level Of Service:                   C
********************************************************************************
Street Name:            Telegraph Rd                    Washington Blvd
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Ignore           Include          Ovl
Min. Green:     0    0    0     0    0    0     0    0    0     0    0    0
Y+R:          4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0
Lanes:        1  0  1  1  0    2  0  2  0  1    2  0  1  1  0    1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2013 << Existing PM Peak
Base Vol:      157  370   42   311  444  383   172  990  284    48  607  460
Growth Adj:   1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:   157  370   42   311  444  383   172  990  284    48  607  460
User Adj:     1.00 1.00 1.00  1.00 1.00 0.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:      1.00 1.00 1.00  1.00 1.00 0.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:    157  370   42   311  444    0   172  990  284    48  607  460
Reduct Vol:      0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:   157  370   42   311  444    0   172  990  284    48  607  460
PCE Adj:      1.00 1.00 1.00  1.00 1.00 0.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:      1.00 1.00 1.00  1.00 1.00 0.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:   157  370   42   311  444    0   172  990  284    48  607  460
OvlAdjVol:                                                              287
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1600 1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600
Adjustment:   1.00 1.00 1.00  0.90 1.00 1.00  0.90 1.00 1.00  1.00 1.00 1.00
Lanes:        1.00 1.80 0.20  2.00 2.00 1.00  2.00 1.55 0.45  1.00 2.00 1.00
Final Sat.:   1600 2874  326  2880 3200 1600  2880 2487  713  1600 3200 1600
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.10 0.13 0.13  0.11 0.14 0.00  0.06 0.40 0.40  0.03 0.19 0.29
OvlAdjV/S:                                                              0.18
Crit Moves:   ****            ****            ****            ****
Green/Cycle:  0.14 0.18 0.18  0.15 0.19 0.00  0.14 0.55 0.55  0.04 0.45 0.60
Volume/Cap:   0.73 0.73 0.73  0.73 0.73 0.00  0.42 0.73 0.73  0.73 0.42 0.48
Delay/Veh:    46.0 39.4 58.7  41.7 38.1  0.0  36.7 17.0 20.1  64.4 17.4 10.8
Delay Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:   46.0 39.4 58.7  41.7 38.1  0.0  36.7 17.0 20.1  64.4 17.4 10.8
DesignQueue:     9   12   12     9   12    0     5   21   21     3   12   13
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************

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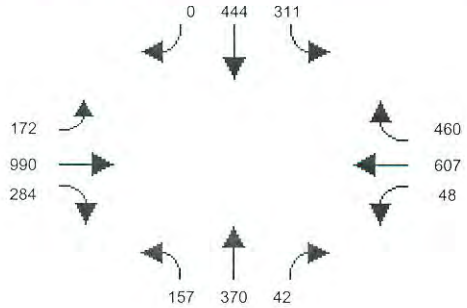
Intersection Graphic Report
Final Volume (Base Alternative)
Existing Conditions

Intersection #1: Telegraph at Washington



MITIG8 - Existing ConditionThu Jan 16, 2014 10:04:19 Page 1-1

City of Commerce: Telegraph Washington Operations Analysis
Existing Conditions
AM Peak option 1

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 Telegraph at Washington

Cycle (sec):	120	Critical Vol./Cap.(X):	0.935
Loss Time (sec):	10	Average Delay (sec/veh):	29.9
Optimal Cycle:	130	Level Of Service:	E

Street Name:	Telegraph Rd						Washington Blvd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ignore			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1	1 0	2 0	2	0 1	2 0	1	0 1	1 0	2	0 1
Volume Module: >> Count Date: 5 Dec 2013 << AM Peak												
Base Vol:	240	628	47	145	107	311	133	912	129	33	952	547
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	240	628	47	145	107	311	133	912	129	33	952	547
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	240	628	47	145	107	311	133	912	129	33	952	547
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	240	628	47	145	107	0	133	912	129	33	952	547
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	240	628	47	145	107	0	133	912	129	33	952	547
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	240	628	47	145	107	0	133	912	129	33	952	547
OvlAdjVol:												466
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.86	0.14	2.00	2.00	1.00	2.00	1.00	1.00	1.00	2.00	1.00
Final Sat.:	1600	2977	223	2880	3200	1600	2880	1600	1600	1600	3200	1600
Capacity Analysis Module:												
Vol/Sat:	0.15	0.21	0.21	0.05	0.03	0.00	0.05	0.57	0.08	0.02	0.30	0.34
OvlAdjV/S:												0.29
Crit Moves:		****		****				****		****		
Green/Cycle:	0.23	0.23	0.23	0.05	0.05	0.00	0.09	0.61	0.61	0.02	0.55	0.60
Volume/Cap:	0.65	0.93	0.93	0.93	0.65	0.00	0.54	0.93	0.13	0.93	0.54	0.57
Delay/Veh:	35.1	49.0	106.2	80.3	49.1	0.0	42.4	26.7	7.5	131.9	13.6	11.6
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	35.1	49.0	106.2	80.3	49.1	0.0	42.4	26.7	7.5	131.9	13.6	11.6
DesignQueue:	13	18	18	5	3	0	4	27	3	2	15	16

future. Geometrics option 1

MITIG8 - Existing ConditionTue Dec 10, 2013 14:44:27 Page 1-1

City of Commerce - Telegraph Washington Operations Analysis
Existing Conditions
PM Peak

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 Telegraph at Washington

Cycle (sec):	120	Critical Vol./Cap.(X):	0.969
Loss Time (sec):	10	Average Delay (sec/veh):	39.1
Optimal Cycle:	130	Level Of Service:	E

Street Name:	Telegraph Rd						Washington Blvd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ignore			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1	0 1	1 0	2	0 2	0 1	2	0 1	0 1	1	0 2	0 1
Volume Module: >> Count Date: 5 Dec 2013 << Existing PM Peak												
Base Vol:	157	370	42	311	444	383	172	990	284	48	607	460
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	157	370	42	311	444	383	172	990	284	48	607	460
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	157	370	42	311	444	383	172	990	284	48	607	460
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	157	370	42	311	444	0	172	990	284	48	607	460
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	157	370	42	311	444	0	172	990	284	48	607	460
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	157	370	42	311	444	0	172	990	284	48	607	460
OvlAdjVol:												287
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.80	0.20	2.00	2.00	1.00	2.00	1.00	1.00	1.00	2.00	1.00
Final Sat.:	1600	2874	326	2880	3200	1600	2880	1600	1600	1600	3200	1600
Capacity Analysis Module:												
Vol/Sat:	0.10	0.13	0.13	0.11	0.14	0.00	0.06	0.62	0.18	0.03	0.19	0.29
OvlAdjV/S:												0.18
Crit Moves:	****				****			****			****	
Green/Cycle:	0.10	0.13	0.13	0.11	0.14	0.00	0.16	0.64	0.64	0.03	0.51	0.62
Volume/Cap:	0.97	0.97	0.97	0.97	0.97	0.00	0.37	0.97	0.28	0.97	0.37	0.46
Delay/Veh:	86.0	67.2	130.7	71.1	64.0	0.0	34.8	30.8	7.3	129.6	13.7	9.5
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	86.0	67.2	130.7	71.1	64.0	0.0	34.8	30.8	7.3	129.6	13.7	9.5
DesignQueue:	10	12	12	9	13	0	5	28	7	3	10	12

MITIG8 - Existing ConditionThu Jan 16, 2014 10:04:53 Page 1-1

City of Commerce: Telegraph Washington Operations Analysis
Existing Conditions
AM Peak Option 2

Level Of Service Computation Report
ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)

Intersection #1 Telegraph at Washington

Cycle (sec):	120	Critical Vol./Cap.(X):	0.688
Loss Time (sec):	10	Average Delay (sec/veh):	23.7
Optimal Cycle:	51	Level Of Service:	B

Street Name:	Telegraph Rd						Washington Blvd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ignore			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1	1 0	2 0	2	0 1	2 0	2	0 1	1 0	2	0 1
Volume Module: >> Count Date: 5 Dec 2013 << AM Peak												
Base Vol:	240	628	47	145	107	311	133	912	129	33	952	547
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	240	628	47	145	107	311	133	912	129	33	952	547
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	240	628	47	145	107	311	133	912	129	33	952	547
User Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	240	628	47	145	107	0	133	912	129	33	952	547
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	240	628	47	145	107	0	133	912	129	33	952	547
PCE Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	240	628	47	145	107	0	133	912	129	33	952	547
OvlAdjVol:												466
Saturation Flow Module:												
Sat/Lane:	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
Adjustment:	1.00	1.00	1.00	0.90	1.00	1.00	0.90	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.86	0.14	2.00	2.00	1.00	2.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1600	2977	223	2880	3200	1600	2880	3200	1600	1600	3200	1600
Capacity Analysis Module:												
Vol/Sat:	0.15	0.21	0.21	0.05	0.03	0.00	0.05	0.28	0.08	0.02	0.30	0.34
OvlAdjV/S:												0.29
Crit Moves:		****		****			****				****	
Green/Cycle:	0.32	0.32	0.32	0.08	0.07	0.00	0.07	0.49	0.49	0.04	0.45	0.53
Volume/Cap:	0.46	0.66	0.66	0.66	0.46	0.00	0.66	0.59	0.17	0.59	0.66	0.65
Delay/Veh:	25.3	28.3	40.2	46.4	42.2	0.0	47.2	17.5	13.3	53.9	20.6	16.9
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	25.3	28.3	40.2	46.4	42.2	0.0	47.2	17.5	13.3	53.9	20.6	16.9
DesignQueue:	11	16	16	5	3	0	4	17	5	2	19	19

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geometrics

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MITIG8 - Existing ConditionTue Dec 10, 2013 14:44:50                 Page 1-1
------------------------------------------------------------------------------
          City of Commerce - Telegraph Washington Operations Analysis
                              Existing Conditions
                                   PM Peak
------------------------------------------------------------------------------
                        Level Of Service Computation Report
          ICU 1(Loss as Cycle Length %) Method (Future Volume Alternative)
******************************************************************************
Intersection #1 Telegraph at Washington
******************************************************************************
Cycle (sec):          120                 Critical Vol./Cap.(X):          0.660
Loss Time (sec):       10                 Average Delay (sec/veh):         24.8
Optimal Cycle:         47                 Level Of Service:                   B
******************************************************************************
Street Name:            Telegraph Rd                 Washington Blvd
Approach:       North Bound      South Bound      East Bound      West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Ignore           Include          Ovl
Min. Green:     0    0    0     0    0    0     0    0    0     0    0    0
Y+R:          4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0
Lanes:        1  0  1  1  0    2  0  2  0  1    2  0  2  0  1    1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 5 Dec 2013 << Existing PM Peak
Base Vol:     157  370   42   311  444  383   172  990  284    48  607  460
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  157  370   42   311  444  383   172  990  284    48  607  460
Added Vol:      0    0    0     0    0    0     0    0    0     0    0    0
PasserByVol:    0    0    0     0    0    0     0    0    0     0    0    0
Initial Fut:  157  370   42   311  444  383   172  990  284    48  607  460
User Adj:    1.00 1.00 1.00  1.00 1.00 0.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 0.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:   157  370   42   311  444    0   172  990  284    48  607  460
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  157  370   42   311  444    0   172  990  284    48  607  460
PCE Adj:     1.00 1.00 1.00  1.00 1.00 0.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 0.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:  157  370   42   311  444    0   172  990  284    48  607  460
OvlAdjVol:                                                              287
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1600 1600 1600  1600 1600 1600  1600 1600 1600  1600 1600 1600
Adjustment:  1.00 1.00 1.00  0.90 1.00 1.00  0.90 1.00 1.00  1.00 1.00 1.00
Lanes:       1.00 1.80 0.20  2.00 2.00 1.00  2.00 2.00 1.00  1.00 2.00 1.00
Final Sat.:  1600 2874  326  2880 3200 1600  2880 3200 1600  1600 3200 1600
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.10 0.13 0.13  0.11 0.14 0.00  0.06 0.31 0.18  0.03 0.19 0.29
OvlAdjV/S:                                                              0.18
Crit Moves:  ****            ****            ****            ****
Green/Cycle: 0.16 0.20 0.20  0.17 0.22 0.00  0.13 0.49 0.49  0.05 0.41 0.58
Volume/Cap:  0.63 0.63 0.63  0.63 0.63 0.00  0.46 0.63 0.36  0.63 0.46 0.49
Delay/Veh:   40.0 35.0 44.8  37.3 33.9  0.0  37.9 17.8 14.6  53.3 20.0 11.7
Delay Adj:   1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:  40.0 35.0 44.8  37.3 33.9  0.0  37.9 17.8 14.6  53.3 20.0 11.7
DesignQueue:    9   11   11     9   12    0     5   18   10     3   12   14

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