Transportation Operations Technical Report
Platte Avenue Corridor Study

Colorado Springs, Colorado

Prepared for
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This report is provided as information in support of alternative evaluation and selection within the Platte Avenue Corridor Study process. Possible Improvements, analyses, and findings described in the report do not constitute study recommendations.

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1.0 EXECUTIVE SUMMARY

This Transportation Operations Technical Report has been prepared to document the findings associated with a vehicle operations analysis of the Platte Avenue Corridor as it extends from Cascade Avenue on the west to Powers Boulevard (SH-21) interchange on the east in Colorado Springs, Colorado. There are 17 existing signalized intersections along the Platte Avenue corridor within this segment, including two intersections along Academy Boulevard at the Platte Avenue eastbound and westbound ramps with the current interchange configuration. This report outlines the transportation analysis of the existing 2022 and long-term 2045 planning horizons with the existing intersection configurations and control. In addition, additional analyses were conducted to understand the feasibility related to Platte Avenue and possible future improvements for consideration.

Based on the analysis presented in this report, evaluation of the existing street network, the potential alternative concepts, and expected traffic volumes resulted in the following possible improvements as shown in **Table ES1** for the existing (2022) year and **Table ES2** for the long-term 2045 horizon. **This report is provided as information in support of alternative evaluation and selection within the Platte Avenue Corridor Study process. Possible improvements, analyses, and findings described in the report do not constitute study recommendations.**

Table ES1 – 2022 Possible Improvements

Potential Option	Improvements
Existing Network	**Platte Ave/Circle Dr (#11)** NB and SB Right Overlap Phasing
	Platte Ave/Southbound Powers Blvd Ramp (#18) Tighten SB Right Turn Radius to Reduce Vehicle Speed on SB Free Right
Platte Avenue Road Diet	**Platte Ave/Cascade Ave (#1)** WB One Lane Approach
	Platte Ave/Tejon St (#2) EB and WB One Lane Approach
	Platte Ave/Nevada Ave (#3) EB and WB One Lane Approach
	Platte Ave/Weber St (#4) EB and WB One Lane Approach
	Platte Ave/Wasatch Ave (#5) Two EB Throughs with Shared Turn Lanes Separate WB Left Turn Lane and Shared Through/Right
I-25 Connection to Platte Avenue	**Bijou St/Cascade Ave (#32)** Separate EB Left Turn Lane
Roundabout	**Platte Ave/Nevada Ave (#3)** Single Lane Approach on E/W Approaches Two Lane Approach on N/S Approaches
One-Way Couplet	**Platte Ave/Wasatch Ave (#5)** Two EB Throughs with Shared Turn Lanes Separate SB Right Turn Lane
	Platte Ave/Hancock Ave (#7) Two EB Throughs with Shared Turn Lanes
	Platte Ave/Platte Place (#9) Convert from Signal to Stop Control on the NB Approach
	Platte Ave/Boulder St (#10) Two EB Throughs with Shared Turn Lanes
	Boulder St/Wahsatch Ave (#24) Separate EB Left and Right Turn Lanes WB Dual Left Turn Lanes and Shared Through/Left Turn Lane
	Boulder St/Childrens View (#27) Shared WB Through/Left Turn Lane
Boulder Street Road Diet	**Boulder St/Wahsatch Ave (#24)** EB and WB One Lane Approach
	Boulder St/Institute St (#25) EB and WB One Lane Approach
	Boulder St/Hancock Ave (#26) EB and WB One Lane Approach
	Boulder St/Childrens View (#27) EB and WB One Lane Approach
	Boulder St/Union Blvd (#28) EB and WB One Lane Approach with Separate Left Turn Lanes

Table ES2 – 2045 Possible Improvements

Potential Option	Improvements
Existing Network	**Platte Ave/Circle Dr (#11)** Third NB Through Lane Dual SB Left Turn Lanes Separate WB Right Turn Lane with Overlap Phasing May Need Additional Improvements Beyond Feasible
	Platte Ave/Murray Blvd (#16) Third EB and WB Through Lane Absorb EB & WB Acceleration Lanes NB and SB Right Overlap Phasing Dual WB Left Turn Lanes
	Platte Ave/Wooten Road (#17) Third EB and WB Through Lane Absorb EB & WB Right Turn Deceleration and Acceleration Lanes
Platte Avenue Road Diet	**Platte Ave/Cascade Ave (#1)** Dual WB Left Turn Lane with a Shared Right
	Platte Ave/Tejon St (#2) Separate EB and WB Left Turn Lanes
	Platte Ave/Weber St (#4) Separate WB Left Turn Lane
I-25 Connection to Platte Avenue	**Bijou St/Cascade Ave (#32)** Triple NB Left Turn Lanes Requiring Widening of Bijou Street
Roundabout	**Platte Ave/Nevada Ave (#3)** Two Lanes on All Four Approaches
One-Way Couplet	**Platte Ave/Hancock Ave (#7)** Separate EB Left Turn Lane
	Platte Ave/Union Blvd (#8) Separate EB Right Turn Lane Dual SB Left Turn Lanes
	Boulder St/Union Blvd (#28) Separate WB Right Turn Lane
Boulder Street Road Diet	**Boulder St/Childrens View (#27)** Separate EB Left Turn Lane

2.0 INTRODUCTION

Kimley-Horn and Associates, Inc. has prepared this report to document the findings associated with the vehicle operations of the Platte Avenue Corridor as it extends from Cascade Avenue on the west to Powers Boulevard (SH-21) interchange on the east in Colorado Springs, Colorado. **This report is provided as information in support of alternative evaluation and selection within the Platte Avenue Corridor Study process. Possible improvements, analyses, and findings described in the report do not constitute study recommendations.**

There are 17 existing signalized intersections along the Platte Avenue corridor including two along Academy Boulevard at the Platte Avenue eastbound and westbound ramps with the current interchange configuration. This report outlines the study of the existing 2022 and long-term 2045 planning horizons with the existing intersection configurations and control. In addition, analyses were conducted to understand the feasibility of the following possible improvement alternatives:

- Platte Avenue Corridor existing and future improvements
- Platte Avenue Lane Reduction in the downtown area
- Bijou/Kiowa Lane Reduction in the downtown area
- Improve Platte Avenue connection to Interstate 25 (I-25)
- Platte Avenue/Nevada Avenue Roundabout
- Converting Platte Avenue and Boulder Street to a one-way couplet from Wahsatch Avenue to Platte Avenue/Boulder Street intersection.
- Boulder Street Lane Reduction from Wahsatch Avenue to Platte Avenue/Boulder Street intersection
- Platte Avenue and Academy Boulevard intersection improvements
- Removal or relocation of frontage roads along Platte Avenue
- Convert the FREE southbound right turn movement at Platte Avenue/Powers Boulevard Southbound Ramp to a standard right turn lane

The study intersections along Platte Avenue are shown on **Figure 1**.

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MATCH A–A

MATCH A–A

PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
VICINITY MAP (PLATTE AVENUE)

FIGURE 1

Kimley»Horn

3.0 TRAFFIC OPERATIONS ANALYSIS METHODOLOGY

Kimley-Horn's analysis of traffic operations was conducted to determine potential capacity deficiencies in the 2022 and 2045 development horizons at the identified key intersections. The acknowledged source for determining overall capacity is the current edition of the *Highway Capacity Manual (HCM)*[1].

Capacity analysis results are listed in terms of Level of Service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. It ranges from A (very little delay) to F (long delays and congestion). For intersections and roadways in this study area, standard traffic engineering practice recommends overall intersection LOS D and movement/approach LOS E as the minimum desirable thresholds for acceptable operations. **Table 1** shows the definition of level of service for signalized and unsignalized intersections.

Table 1 – Level of Service Definitions

Level of Service	Signalized Intersection Average Total Delay (sec/veh)	Unsignalized Intersection Average Total Delay (sec/veh)
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

Definitions provided from the Highway Capacity Manual, Sixth Edition, Transportation Research Board, 2016.

Study area intersections were analyzed based on average total delay analysis for signalized and unsignalized intersections. Under the unsignalized analysis, the LOS for a two-way stop-controlled intersection is determined by the computed or measured control delay and is defined for each minor movement. LOS for a two-way stop-controlled intersection is not defined for the intersection as a whole. LOS for signalized, roundabout, and all-way stop controlled intersections are defined for each approach and for the overall intersection.

The existing 2022 adjusted and long-term 2045 horizon at the study intersections were analyzed to determine what improvements may be needed at the intersections along Platte Avenue,

[1] Transportation Research Board, *Highway Capacity Manual*, Sixth Edition, Washington DC, 2016.

Boulder Street, and the alternative scenarios to accommodate existing and future projected traffic volumes. Level of service for the signalized intersections is defined based on the average total delay. The existing peak hour factor was used for the 2022 analysis while a 0.92 HCM urban standard peak hour factor was used for the 2045 long-term horizon. The signalized intersections used the signal timing sheets provided by the City of Colorado Springs (**Appendix C**). Synchro traffic analysis software was used to analyze the study area signalized intersections for the HCM level of service. The intersection level of service output sheets for all the analyses completed in the report are provided in **Appendix D**.

4.0 PLATTE AVENUE

4.1 Platte Avenue Existing Network Configuration

Platte Avenue extends east/west. It provides a connection from Downtown Colorado Springs to the east side of the City limits and US-24. Through the western portions of the study area, it provides two through lanes in each direction. Platte Avenue provides three through lanes in each direction through the Circle Drive intersection and the Academy Boulevard interchange with drop and add lanes for the ramps. To the east of the Academy Boulevard interchange, Platte Avenue again provides two through lanes in each direction. Platte Avenue has left turn lanes at major intersections along the corridor. Platte Avenue's posted speed limit steadily increases the further east along the corridor. Platte Avenue has a posted speed limit of 25 miles per hour (mph) within the Downtown Colorado Springs portion west of Wahsatch Avenue. East of Wahsatch Avenue, the posted speed limit of Platte Avenue increases to 35 mph to Circle Drive. Between Circle Drive and Chelton Road, Platte Avenue has a 40-mph posted speed limit. East of Chelton Road, Platte Avenue has a wide median with a freeway type configuration and a 50-mph posted speed limit.

The existing intersection geometry and control are illustrated on **Figures 2A** and **2B** for the western and eastern portions of the corridor, respectively (typical)**.** The following reviews the methodology and intersection operational analyses conducted as part of this exercise.

4.2 Platte Avenue Data Collection and Future Projections

Existing peak hour turning movement counts were conducted at the 17 signalized intersections along Platte Avenue and the two signalized ramp intersections for Platte Avenue along Academy Boulevard on Tuesday, September 1, 2020. Counts were conducted in 15-minute intervals during the typical morning and afternoon peak hours of adjacent street traffic from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM. Existing turning movement counts are shown on **Figures 3A** and **3B.** The counts sheets for the study intersections are provided in **Appendix A**. In addition, the Average Daily Traffic (ADT) Volumes were also collected on Tuesday, September 1, 2020, at six (6) locations along Platte Avenue.

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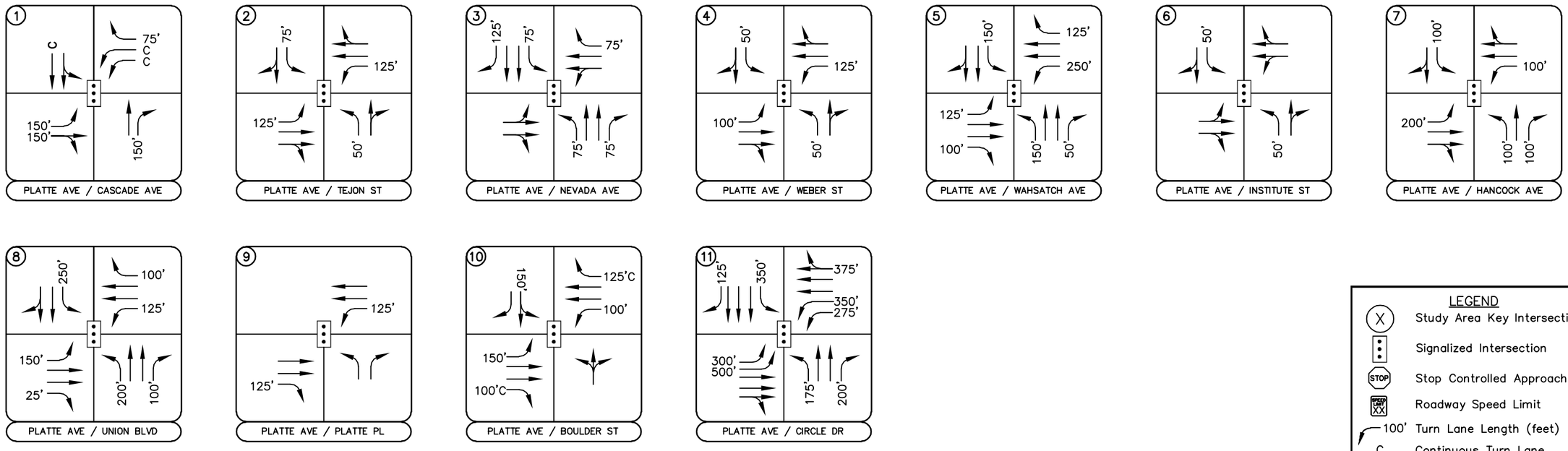
MATCH A–A ON FIGURE 2B



LEGEND

- X — Study Area Key Intersection
- Signalized Intersection
- STOP — Stop Controlled Approach
- Roadway Speed Limit
- 100' — Turn Lane Length (feet)
- C — Continuous Turn Lane

PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
EXISTING LANE CONFIGURATIONS AND CONTROL (PLATTE AVENUE)

FIGURE 2A

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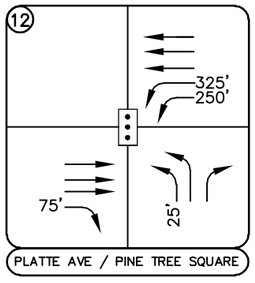
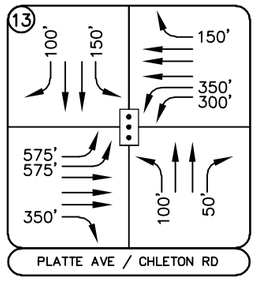
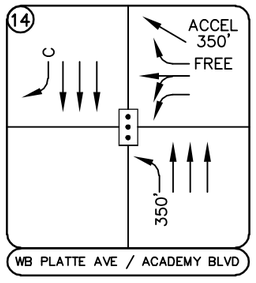
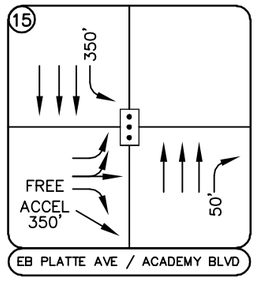
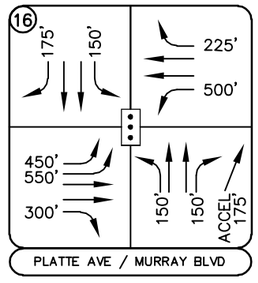
MATCH A–A ON FIGURE 2A

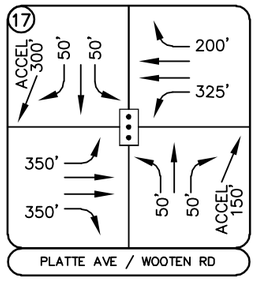


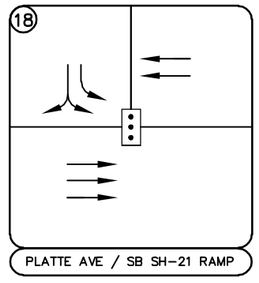


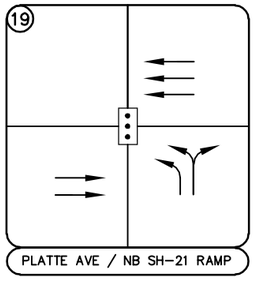












LEGEND
- X — Study Area Key Intersection
- Signalized Intersection
- STOP — Stop Controlled Approach
- SPEED LIMIT XX — Roadway Speed Limit
- 100' — Turn Lane Length (feet)
- C — Continuous Turn Lane

PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
EXISTING LANE CONFIGURATIONS AND CONTROL (PLATTE AVENUE)

FIGURE 2B

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MATCH A–A ON FIGURE 3B

Tuesday, September 1, 2020
7:45 to 8:45AM (4:30 to 5:30PM)

1

	150(217) ↓ 72(72) ↑	24(27) ↖ 283(375) ↙
3(14) → 2(10) → 12(37) ↘		150(246) ↑ 72(161) ↑

PLATTE AVE / CASCADE AVE

Tuesday, September 1, 2020
8:00 to 9:00AM (4:30 to 5:30PM)

2

	50(69) ↓ 77(153) ↓ 13(16) ↓	23(26) ↖ 229(320) ← 76(75) ↙
31(38) → 61(169) → 20(33) ↘		7(14) ↑ 55(102) ↑ 37(57) ↑

PLATTE AVE / TEJON ST

Tuesday, September 1, 2020
7:30 to 8:30AM (4:30 to 5:30PM)

3

	18(28) ↓ 286(480) ↓ 23(50) ↓	20(39) ↖ 279(364) ← 71(52) ↙
11(9) → 95(198) → 14(36) ↘		11(24) ↑ 329(510) ↑ 81(172) ↑

PLATTE AVE / NEVADA AVE

Tuesday, September 1, 2020
8:00 to 9:00AM (4:30 to 5:30PM)

4

	7(9) ↓ 134(110) ↓ 14(23) ↓	18(15) ↖ 458(459) ← 64(19) ↙
1(3) → 247(398) → 9(18) ↘		1(3) ↑ 77(175) ↑ 30(50) ↑

PLATTE AVE / WEBER ST

Tuesday, September 1, 2020
7:30 to 8:30AM (4:30 to 5:30PM)

5

	18(28) ↓ 325(317) ↓ 53(49) ↓	26(47) ↖ 384(418) ← 165(119) ↙
13(42) → 179(411) → 17(26) ↘		41(51) ↑ 210(466) ↑ 147(208) ↑

PLATTE AVE / WAHSATCH AVE

Tuesday, September 1, 2020
7:30 to 8:30AM (4:00 to 5:00PM)

6

	5(8) ↓ 22(26) ↓ 9(2) ↓	12(11) ↖ 591(548) ← 14(21) ↙
10(16) → 400(664) → 11(12) ↘		7(19) ↑ 10(22) ↑ 25(46) ↑

PLATTE AVE / INSTITUTE ST

Tuesday, September 1, 2020
7:30 to 8:30AM (4:00 to 5:00PM)

7

	9(16) ↓ 115(135) ↓ 6(10) ↓	5(9) ↖ 569(550) ← 52(57) ↙
13(29) → 553(681) → 13(20) ↘		22(22) ↑ 59(127) ↑ 41(49) ↑

PLATTE AVE / HANCOCK AVE

Tuesday, September 1, 2020
7:30 to 8:30AM (4:15 to 5:15PM)

8

	12(14) ↓ 424(449) ↓ 60(101) ↓	30(33) ↖ 560(493) ← 136(128) ↙
80(111) → 355(625) → 33(29) ↘		35(46) ↑ 554(654) ↑ 86(142) ↑

PLATTE AVE / UNION BLVD

Tuesday, September 1, 2020
7:15 to 8:15AM (4:30 to 5:30PM)

9

		754(749) ← 34(27) ↙
472(863) → 15(18) ↘		5(19) ↑ 7(42) ↑

PLATTE AVE / PLATTE PL

Tuesday, September 1, 2020
7:15 to 8:15AM (4:30 to 5:30PM)

10

	6(10) ↓ 42(80) ↓ 155(238) ↓	204(124) ↖ 772(686) ← 6(16) ↙
1(5) → 466(877) → 14(17) ↘		5(9) ↑ 32(50) ↑ 2(6) ↑

PLATTE AVE / BOULDER ST

Tuesday, September 1, 2020
7:15 to 8:15AM (4:30 to 5:30PM)

11

	94(114) ↓ 645(794) ↓ 196(183) ↓	185(267) ↖ 956(819) ← 371(347) ↙
64(186) → 546(978) → 13(41) ↘		77(91) ↑ 565(776) ↑ 209(379) ↑

PLATTE AVE / CIRCLE DR

LEGEND

(X)	Study Area Key Intersection
XXX(XXX)	Weekday AM(PM) Peak Hour Traffic Volumes
XX,XX0	Estimated Daily Traffic Volume

PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
2020 EXISTING TRAFFIC VOLUMES (PLATTE AVENUE)

FIGURE 3A

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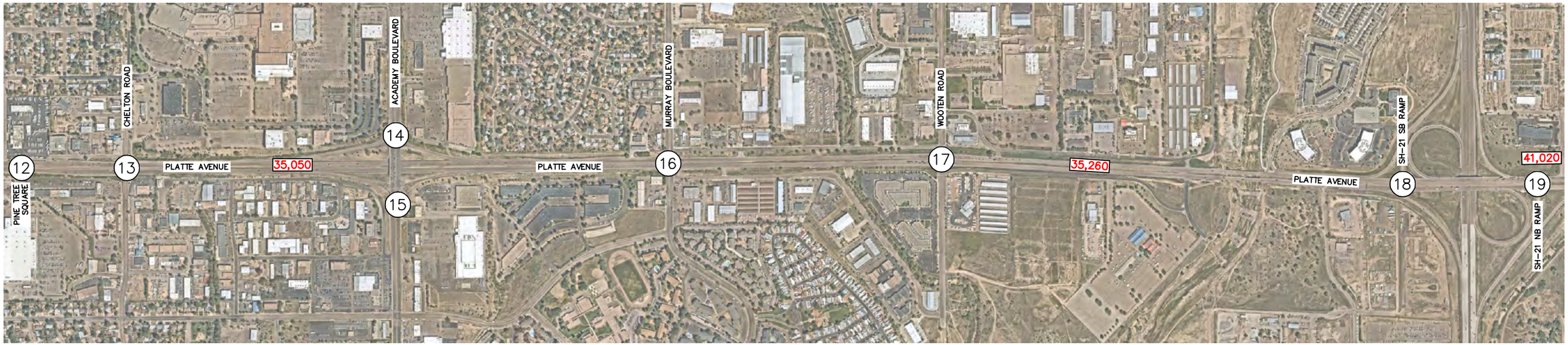
NTS 096998001

MATCH A–A ON FIGURE 3A



Tuesday, September 1, 2020
7:15 to 8:15AM (4:30 to 5:30PM)

12

		↖ 14(25)
		← 1546(1395)
		↙ 21(91)
11(13) ↗	↑ 33(131)	
904(1340) →	↑ 1(3)	
104(312) ↘	↑ 24(150)	

PLATTE AVE / PINE TREE SQUARE

Tuesday, September 1, 2020
8:00 to 9:00AM (4:45 to 5:45PM)

13

↓ 82(110)	↓ 8(40)	↙ 12(62) ↖ 37(24)
		← 1685(1196)
		↙ 113(49)
92(147) ↗	↑ 122(133)	
971(1160) →	↑ 46(87)	
96(69) ↘	↑ 73(190)	

PLATTE AVE / CHLETON RD

Tuesday, September 1, 2020
7:15 to 8:15AM (4:30 to 5:30PM)

14

↓ 158(235)	↓ 1318(1868)	↖ 164(235)
		← 1(2)
		↙ 194(218)
	↑ 86(99)	
	↑ 1156(1849)	

WB PLATTE AVE / ACADEMY BLVD

Tuesday, September 1, 2020
7:15 to 8:15AM (4:15 to 5:15PM)

15

↓ 1331(1871)	↙ 184(189)	
90(221) ↘	↑ 1179(1726)	
3(0) →	↑ 215(300)	
64(173) ↘		

EB PLATTE AVE / ACADEMY BLVD

Tuesday, September 1, 2020
7:15 to 8:15AM (4:30 to 5:30PM)

16

↓ 184(143)	↓ 219(397)	↙ 98(85) ↖ 80(99)
		← 1561(1433)
		↙ 107(192)
123(268) ↗	↑ 103(108)	
1003(1456) →	↑ 242(428)	
29(91) ↘	↑ 150(182)	

PLATTE AVE / MURRAY BLVD

Tuesday, September 1, 2020
7:30 to 8:30AM (4:15 to 5:15PM)

17

↓ 123(148)	↓ 31(5)	↙ 96(142) ↖ 59(49)
		← 1553(1544)
		↙ 94(49)
143(147) ↗	↑ 15(51)	
1044(1483) →	↑ 13(36)	
29(15) ↘	↑ 23(68)	

PLATTE AVE / WOOTEN RDT

Tuesday, September 1, 2020
7:00 to 8:00AM (4:30 to 5:30PM)

18

		↙ 417(424) ← 1373(1421)
1117(1058) →		

PLATTE AVE / SB SH–21 RAMP

Tuesday, September 1, 2020
7:00 to 8:00AM (4:30 to 5:30PM)

19

		← 2234(1830)
1179(1285) →	↑ 101(106)	↑ 1(0)

PLATTE AVE / NB SH–21 RAMP

LEGEND

(X)	Study Area Key Intersection
XXX(XXX)	Weekday AM(PM) Peak Hour Traffic Volumes
XX,XX0	Estimated Daily Traffic Volume

PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
2020 EXISTING TRAFFIC VOLUMES (PLATTE AVENUE)

FIGURE 3B

Kimley»Horn

Due to the counts being conducted during the COVD-19 pandemic, these September 2020 counts were adjusted to “normal” conditions. Data was collected in the month of September in 2019 and 2020 within the vicinity of the project site along CO-24, US-85, I-25, and Powers Boulevard. The volumes were derived from comparing the 2019 typical weekday average volume (Tuesday through Thursday) and the 2020 typical weekday average volume during the month of September during the morning and afternoon peak hour. Using the six (6) locations provided, the 2020 volumes needed to be increased by 20 percent during the morning peak hour and 12 percent during the afternoon peak hour to reach typical traffic volumes prior to the COVID-19 Pandemic. These peak hour COVID adjustment factors were further evaluated based on historical Streetlight data provided along the Platte Avenue corridor. A comparison of the traffic volume differences between the pre-pandemic level and September 2020 counts was shown to account for adjustments statistically matching the morning and afternoon peak hour adjustments of 20 percent and 12 percent, respectively. Therefore, the existing traffic volumes were adjusted based on these factors as shown on **Figures 4A** and **4B** at the study intersections along Platte Avenue**.**

Based on information obtained from the regional transportation model provided by the transportation team and FHU, a 2.25 percent annual growth rate was applied to the eastbound and westbound through volumes from the Cascade Avenue to Boulder Street intersections while a 1.75 percent annual growth rate was applied to the turning movements and the north-south approaches. A 1.75 percent growth rate was also applied to all the movements from Circle Drive to Chelton Road intersections, whereas a 1.25 percent annual average growth rate was applied to all the movements at the intersections east of Chelton Road. These growth rates were determined and applied to the existing adjusted turning movement counts to match the 2045 traffic model projections provided by the regional transportation model. In addition to this standard traffic volume growth rate, traffic volumes associated with the buildout of Patriot Park as the north leg of Space Center Drive along Platte Avenue as obtained from the Platte Over Sand Creek Traffic Analysis prepared by HDR were included for the 2045 long-term horizon analysis as requested by the City of Colorado Springs. **Figures 5A** and **5B** illustrate the 2045 traffic volumes at the study intersections along Platte Avenue. The COVID-19 adjustment factor and growth projections are included in **Appendix B.**

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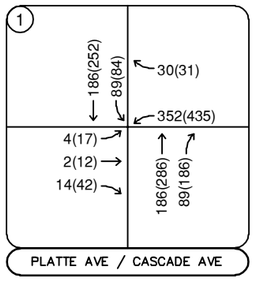
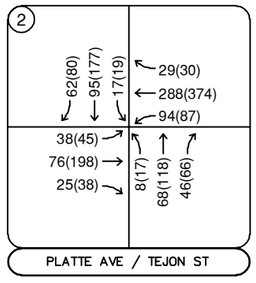
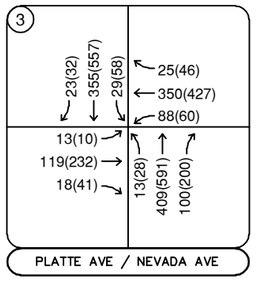
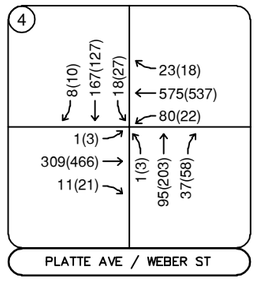
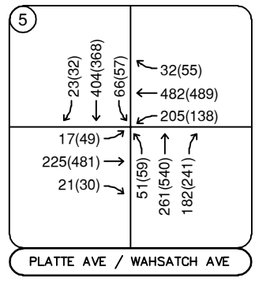
MATCH A–A ON FIGURE 4B

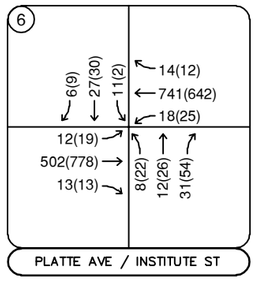


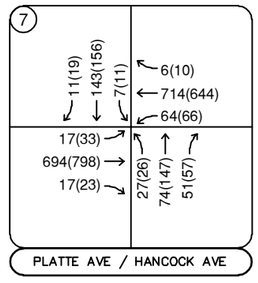


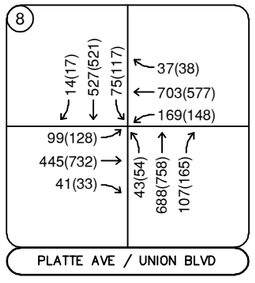


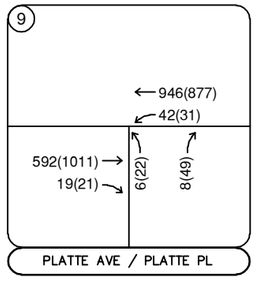


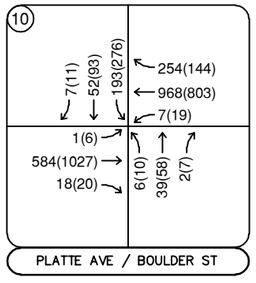


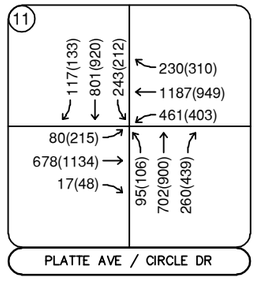












LEGEND

X — Study Area Key Intersection

XXX(XXX) — Weekday AM(PM) Peak Hour Traffic Volumes

XX,XX0 — Estimated Daily Traffic Volume

PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
2022 ADJUSTED TRAFFIC VOLUMES (PLATTE AVENUE)

FIGURE 4A

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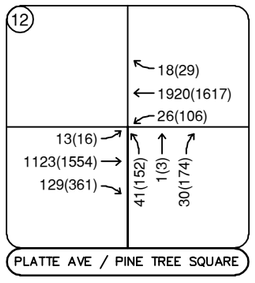
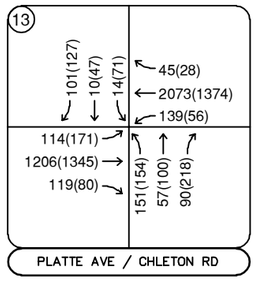
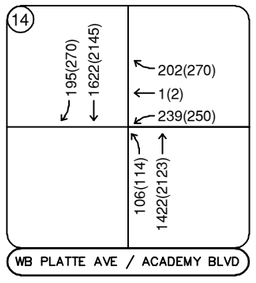
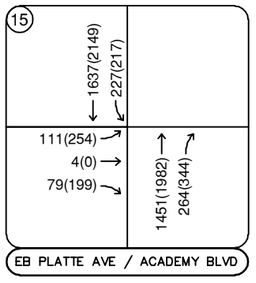
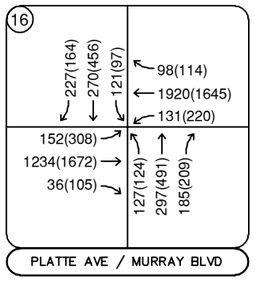
MATCH A–A ON FIGURE 4A

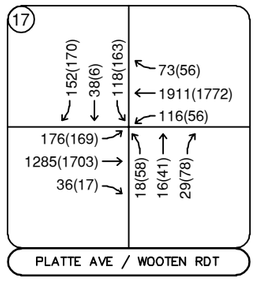


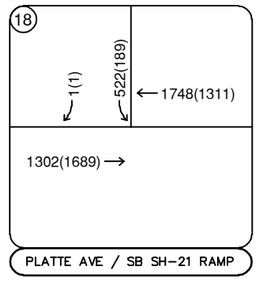


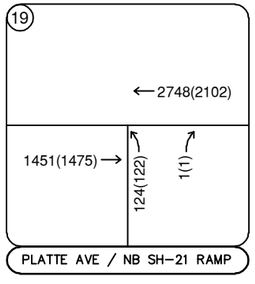












LEGEND

(X)	Study Area Key Intersection
XXX(XXX)	Weekday AM(PM) Peak Hour Traffic Volumes
XX,XX0	Estimated Daily Traffic Volume

PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
2022 ADJUSTED TRAFFIC VOLUMES (PLATTE AVENUE)

FIGURE 4B

Kimley»Horn

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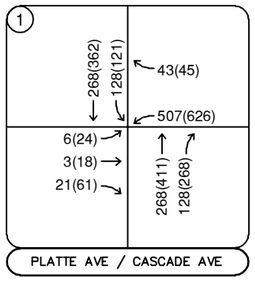
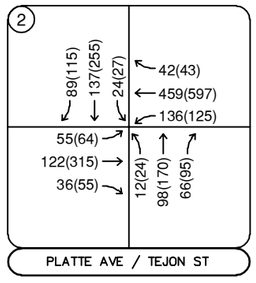
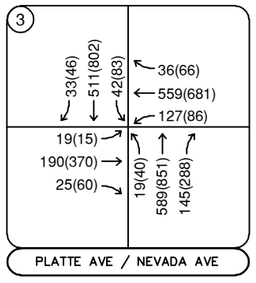
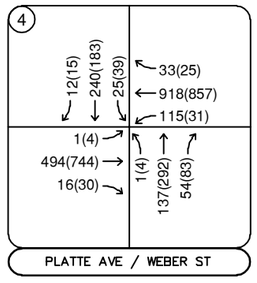
Kimley»Horn NORTH
NTS 096998001

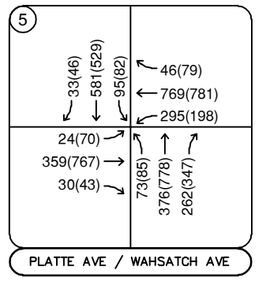
MATCH A–A ON FIGURE 5B

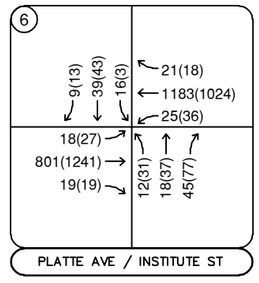


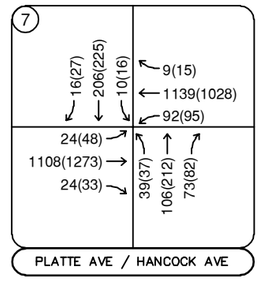


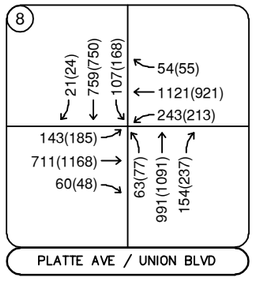


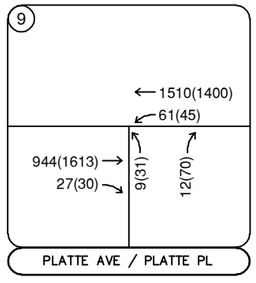


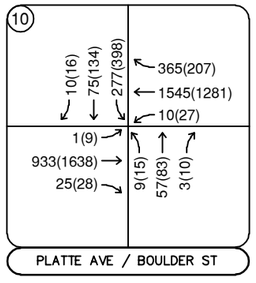


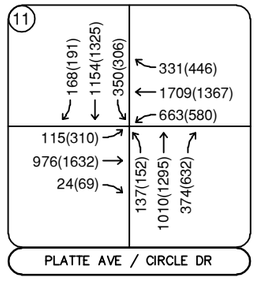












LEGEND

(X) Study Area Key Intersection

XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes

XX,XX0 Estimated Daily Traffic Volume

PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
2045 TRAFFIC VOLUMES (PLATTE AVENUE)

FIGURE 5A

Kimley»Horn

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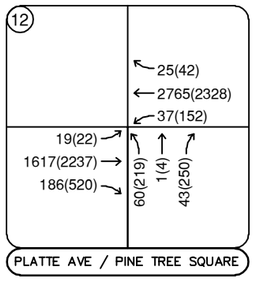
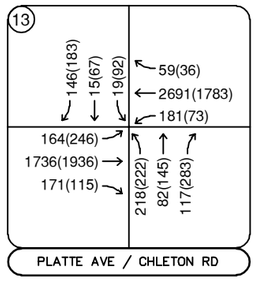
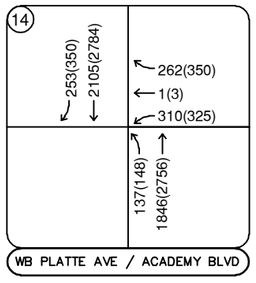
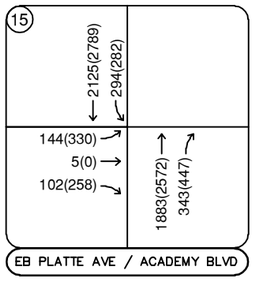
Kimley»Horn
NORTH
NTS 096998001

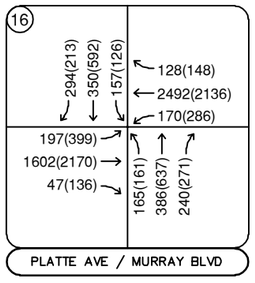
MATCH A–A ON FIGURE 5A

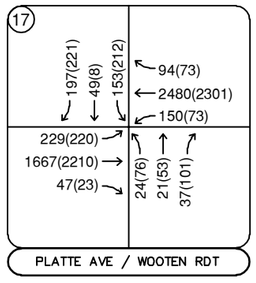


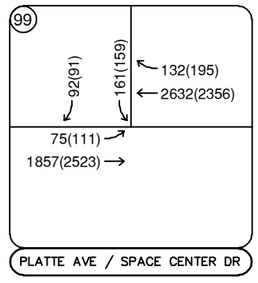


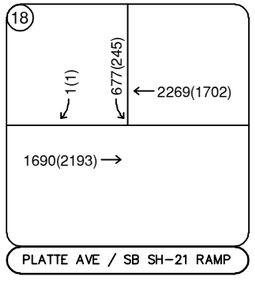


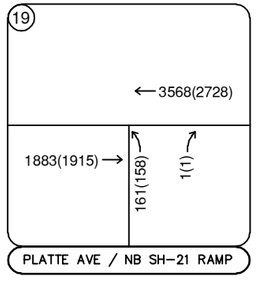












LEGEND

(X)	Study Area Key Intersection
XXX(XXX)	Weekday AM(PM) Peak Hour Traffic Volumes
XX,XX0	Estimated Daily Traffic Volume

PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
2045 TRAFFIC VOLUMES (PLATTE AVENUE)

FIGURE 5B

Kimley»Horn

4.3 Platte Avenue Traffic Operations Analysis

4.3.1 Existing 2022 Operational Analysis

Table 2 summarizes the existing intersection level of service (LOS) as well as the level of service with intersections where improvements were identified as being needed for the 2022 conditions with the existing intersection and roadway configurations. As shown, all studied signalized intersections along Platte Avenue are anticipated to operate acceptably with LOS D or better during both peak hours studied with exception of the Platte Avenue intersections at Circle Drive (#11) and Murray Boulevard (#16). Timing splits were optimized at these two intersections, as likely happens in the field with the existing actuation detection.

Further improvements at the Platte Avenue/Circle Drive (#11) intersection are needed in order to operate acceptably. The intersection will operate with LOS D during both peak hours if right turn overlap phasing is installed on the northbound and southbound approaches.

Table 2 – Platte Avenue 2022 LOS Results Table

Intersection	Movement	Control	2022 Existing Peak Hour		2022 w/ Imp Peak Hour	
			AM	PM	AM	PM
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
Platte Ave & Cascade Ave (#1)	Overall		**28.2 C**	**29.1 C**		
	Eastbound Approach		53.6 D	52.7 D		
	Westbound Approach		47.2 D	50.8 D		
	Northbound Approach		18.7 B	17.0 B		
	Southbound Approach		9.3 A	10.9 B		
Platte Ave & Tejon St (#2)	Overall		**32.7 C**	**32.0 C**		
	Eastbound Approach		43.5 D	48.6 D		
	Westbound Approach		51.0 D	50.7 D		
	Northbound Approach		5.0 A	6.5 A		
	Southbound Approach		0.2 A	0.4 A		
Platte Ave & Nevada Ave (#3)	Overall		**16.9 B**	**15.8 B**		
	Eastbound Approach		44.9 D	42.4 D		
	Westbound Approach		33.4 C	31.9 C		
	Northbound Approach		7.3 A	8.4 A		
	Southbound Approach		0.2 A	0.3 A		

Intersection	Movement	Control	2022 Existing Peak Hour		2022 w/ Imp Peak Hour	
			AM	PM	AM	PM
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
Platte Ave & Weber St (#4)	Overall		**24.2 C**	**26.4 C**		
	Eastbound Approach		26.2 C	34.1 C		
	Westbound Approach		33.3 C	36.3 D		
	Northbound Approach		7.2 A	6.6 A		
	Southbound Approach		0.3 A	0.2 A		
Platte Ave & Wahsatch Ave (#5)	Overall		**21.8 C**	**22.9 C**		
	Eastbound Approach		33.0 C	36.7 D		
	Westbound Approach		39.7 D	40.1 D		
	Northbound Approach		11.0 B	11.9 B		
	Southbound Approach		0.5 A	0.5 A		
Platte Ave & Institute St (#6)	Overall		**5.5 A**	**7.5 A**		
	Eastbound Approach		1.8 A	2.6 A		
	Westbound Approach		0.4 A	0.4 A		
	Northbound Approach		69.1 E	71.6 E		
	Southbound Approach		66.2 E	63.2 E		
Platte Ave & Hancock Ave (#7)	Overall		**10.4 B**	**19.8 B**		
	Eastbound Approach		1.0 A	0.7 A		
	Westbound Approach		1.0 A	20.0 B		
	Northbound Approach		52.5 D	57.5 E		
	Southbound Approach		58.6 E	60.3 E		
Platte Ave & Union Blvd (#8)	Overall		**28.5 C**	**28.3 C**		
	Eastbound Approach		20.0 B	4.7 A		
	Westbound Approach		3.2 A	15.6 B		
	Northbound Approach		58.4 E	59.0 E		
	Southbound Approach		33.4 C	29.6 C		

Intersection	Movement	Control	2022 Existing Peak Hour		2022 w/ Imp Peak Hour	
			AM	PM	AM	PM
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
Platte Ave & Platte Pl (#9)	Overall		**0.9 A**	**2.8 A**		
	Eastbound Approach		0.1 A	0.3 A		
	Westbound Approach		0.2 A	0.2 A		
	Northbound Approach		78.9 E	74.2 E		
Platte Ave & Boulder St (#10)	Overall		**11.6 B**	**13.7 B**		
	Eastbound Approach		0.2 A	0.6 A		
	Westbound Approach		6.3 A	9.4 A		
	Northbound Approach		49.9 D	42.6 D		
	Southbound Approach		57.6 E	55.2 E		
Platte Ave & Circle Dr (#11)	Overall		**58.8 E**	**67.0 E**	**50.8 D**	**52.4 D**
	Eastbound Approach		36.2 D	44.1 D	43.6 D	54.0 D
	Westbound Approach		67.0 E	64.0 E	58.5 E	62.4 E
	Northbound Approach		58.5 E	104.7 F	51.2 D	49.6 D
	Southbound Approach		60.9 E	53.0 D	42.8 D	40.8 D
Platte Ave & Pine Tree Square (#12)	Overall		**2.3 A**	**12.1 B**		
	Eastbound Approach		0.1 A	9.4 A		
	Westbound Approach		1.1 A	4.3 A		
	Northbound Approach		70.8 E	68.6 E		
Platte Ave & Chelton Rd (#13)	Overall		**32.5 C**	**22.5 C**		
	Eastbound Approach		39.2 D	7.2 A		
	Westbound Approach		23.7 C	21.0 C		
	Northbound Approach		50.7 D	60.8 E		
	Southbound Approach		70.0 E	57.9 E		
WB Platte Ave & Academy Blvd (#14)	Overall		**9.5 A**	**10.3 B**		
	Westbound Approach		66.0 E	65.8 E		
	Northbound Approach		3.7 A	5.9 A		
	Southbound Approach		6.9 A	8.6 A		

Intersection	Movement	Control	2022 Existing Peak Hour		2022 w/ Imp Peak Hour	
			AM	PM	AM	PM
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
EB Platte Ave & Academy Blvd (#15)	Overall		**7.1 A**	**13.2 B**		
	Eastbound Approach		69.0 E	65.7 E		
	Northbound Approach		5.6 A	12.0 B		
	Southbound Approach		4.8 A	8.7 A		
Platte Ave & Murray Blvd (#16)	Overall		**70.3 E**	**51.3 D**	**48.0 D**	
	Eastbound Approach		30.2 C	56.0 E	29.3 C	
	Westbound Approach		102.2 F	37.5 D	52.8 D	
	Northbound Approach		50.5 D	64.0 E	57.1 E	
	Southbound Approach		65.0 E	64.6 E	68.1 E	
Platte Ave & Wooten Rd (#17)	Overall		**15.7 B**	**24.5 C**		
	Eastbound Approach		7.3 A	26.7 C		
	Westbound Approach		17.7 B	17.3 B		
	Northbound Approach		56.3 E	51.7 D		
	Southbound Approach		61.9 E	65.6 E		
Platte Ave & SB SH-21 Ramp (#18)	Overall		**12.4 B**	**5.9 A**		
	Eastbound Approach		7.5 A	3.3 A		
	Westbound Approach		1.2 A	0.4 A		
	Southbound Approach		61.7 E	67.1 E		
Platte Ave & NB SH-21 Ramp (#19)	Overall		**4.9 A**	**4.4 A**		
	Eastbound Approach		0.5 A	0.6 A		
	Westbound Approach		4.4 A	3.4 A		
	Northbound Approach		68.7 E	68.6 E		

The existing possible improvements are shown on **Figures 6A** and **6B.**

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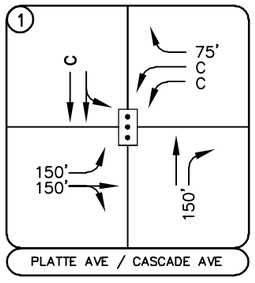
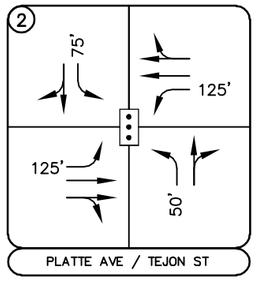
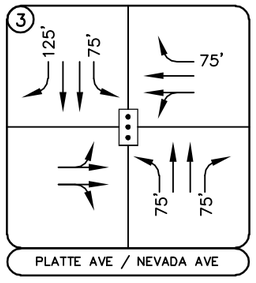
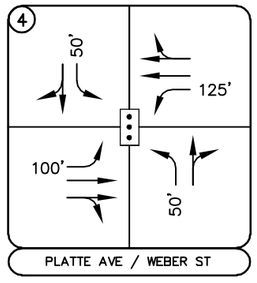
NORTH
NTS 096998001

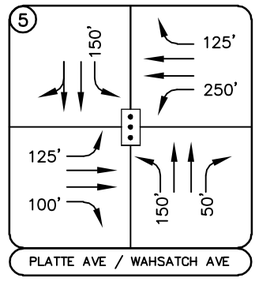
MATCH A–A ON FIGURE 6B

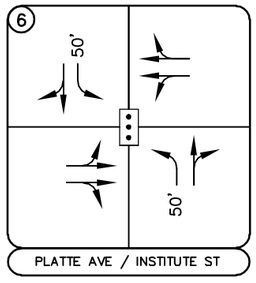


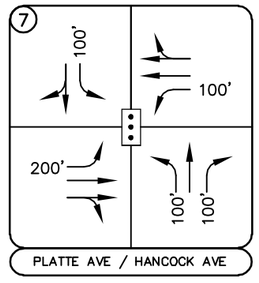


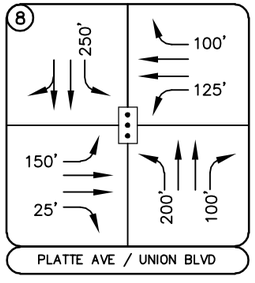


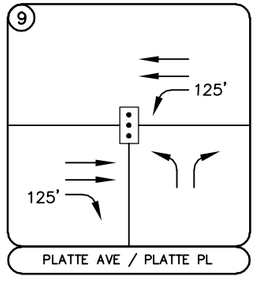


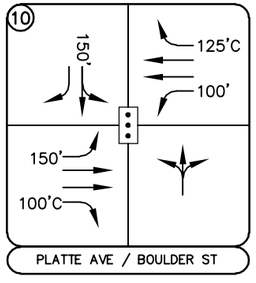


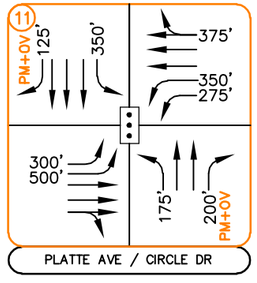












Intersections in orange have optimized split phasing timings during either morning, afternoon, or both peak hours.

LEGEND
- Study Area Key Intersection
- Signalized Intersection
- Stop Controlled Approach
- Roadway Speed Limit
- 100' Turn Lane Length (feet)
- Recommendation

PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
2022 RECOMMENDED LANE CONFIGURATIONS AND CONTROL (PLATTE AVENUE)

FIGURE 6A

Kimley»Horn

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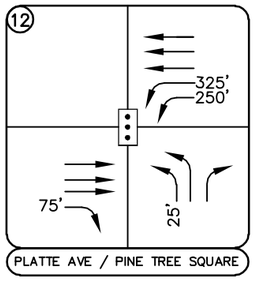
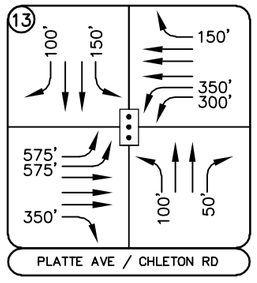
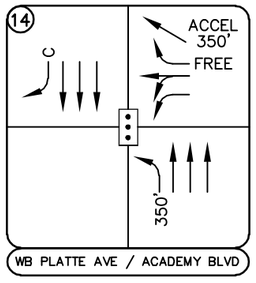
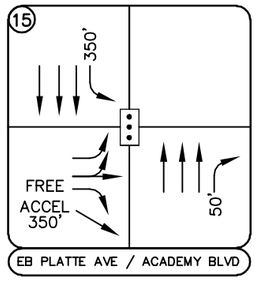
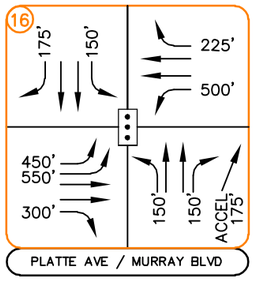
MATCH A–A ON FIGURE 6A

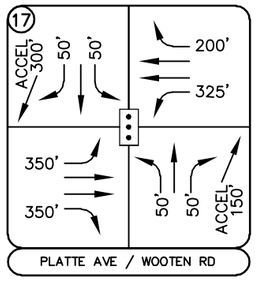


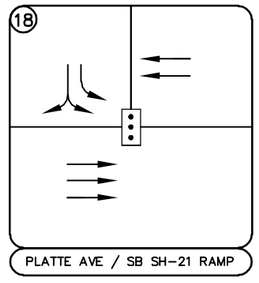


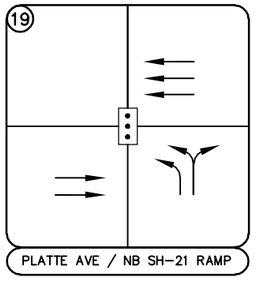












Intersections in orange have optimized split phasing timings during either morning, afternoon, or both peak hours.

LEGEND
- Study Area Key Intersection
- Signalized Intersection
- Stop Controlled Approach
- Roadway Speed Limit
- 100' Turn Lane Length (feet)
- Recommendation

PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
PLATTE AVENUE 2022 POSSIBLE IMPROVEMENTS

FIGURE 6B

Kimley»Horn

4.3.2 Future 2045 Operational Analysis

Table 3 summarizes the results of the long-term 2045 horizon level of service (LOS) analysis and provides possible improvements at the study intersections where improvements were found to be needed. In addition, the future proposed signalized intersection of Platte Avenue and Space Center Drive (#99) was included in the long-term analysis as requested by the City.

If 2045 volumes are realized, the intersections or approaches at the intersections of Cascade Avenue (#1), Union Boulevard (#8), Boulder Street (#10), Circle Drive (#11), Pine Tree Square (#12), Murray Boulevard (#16), and Wooten Road (#17) along Platte Avenue are anticipated to operate with longer delays and LOS E or LOS F during either the morning or afternoon peak hours. Timings could be optimized at these intersections. In addition, further physical improvements were recommended at the intersections of Circle Drive (#11), Murray Boulevard (#16), and Wooten Road (#17) along Platte Avenue. Additional improvements, on top of the ones identified in the existing conditions, at these three intersections are as follows:

Platte Avenue & Circle Drive (#11)

- A Third NB Through Lane and maintaining a NB Right Turn Lane
- Dual SB Left Turn Lanes (match existing SBL storage length at 350 feet)
- Separate WB Right Turn Lane (375 feet) with Overlap Right Turn Phasing

Platte Avenue & Murray Boulevard (#16)

- Third EB and WB Through Lane
- Dual WB Left Turn Lanes (match existing WBL storage length at 500 feet)
- Remove the EB & WB Acceleration Lanes from NB & SB Rights (Due to Three EB & WB Through Lanes)
- Overlap NB and SB Right Turn Phasing

Platte Avenue & Wooten Road (#17)

- Convert EB Right Turn Lane to a Shared EB Through/Right Turn Lane (Three EB Through Lanes)
- Convert WB Right Turn Lane to a Shared WB Through/Right Turn Lane (Three WB Through Lanes)
- Remove the EB Acceleration Lane from NB Right (Due to Three EB Through Lanes)
- Remove the WB Acceleration Lane from SB Right (Due to Three WB Through Lanes)

With these possible improvements, all intersections along Platte Avenue are anticipated to operate acceptably at LOS D or better during both peak hours studied, except for the Platte Avenue/Circle Drive (#11) intersection during the weekday peak hour, which may operate at LOS E or F. However, possible improvements at the intersection will likely build the intersection to the ultimate configuration without any additional intersection improvements thought to be

feasible. Regional network improvements may otherwise be necessary if future traffic volume projections are realized.

Table 3 – Platte Avenue 2045 LOS Table

Intersection	Movement	Control	2045 w/o Imp Peak Hour		2045 w/ Imp Peak Hour	
			AM	PM	AM	PM
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
Platte Ave & Cascade Ave (#1)	Overall		**51.3 D**	**38.5 D**	**40.4 D**	**23.2 C**
	Eastbound Approach		53.5 D	53.1 D	53.5 D	54.3 D
	Westbound Approach		101.6 F	75.0 E	79.9 E	34.3 C
	Northbound Approach		20.1 C	16.2 B	11.3 B	10.0 A
	Southbound Approach		12.2 B	16.2 B	13.6 B	19.6 B
Platte Ave & Tejon St (#2)	Overall		**33.3 C**	**21.2 C**		
	Eastbound Approach		47.0 D	44.6 D		
	Westbound Approach		48.7 D	22.1 C		
	Northbound Approach		8.1 A	11.1 B		
	Southbound Approach		0.4 A	0.9 A		
Platte Ave & Nevada Ave (#3)	Overall		**15.8 B**	**14.2 B**		
	Eastbound Approach		34.7 C	16.8 B		
	Westbound Approach		24.6 C	25.4 C		
	Northbound Approach		13.4 B	15.7 B		
	Southbound Approach		0.4 A	1.3 A		
Platte Ave & Weber St (#4)	Overall		**20.4 C**	**22.7 C**		
	Eastbound Approach		16.8 B	25.2 C		
	Westbound Approach		28.9 C	30.5 C		
	Northbound Approach		11.6 B	12.5 B		
	Southbound Approach		0.5 A	0.6 A		

Intersection	Movement	Control	2045 w/o Imp Peak Hour		2045 w/ Imp Peak Hour	
			AM	PM	AM	PM
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
Platte Ave & Wahsatch Ave (#5)	Overall		**26.9 C**	**25.6 C**		
	Eastbound Approach		28.4 C	29.5 C		
	Westbound Approach		51.0 D	43.1 D		
	Northbound Approach		14.3 B	20.0 B		
	Southbound Approach		1.0 A	2.3 A		
Platte Ave & Institute St (#6)	Overall		**5.7 A**	**7.9 A**		
	Eastbound Approach		2.8 A	4.4 A		
	Westbound Approach		0.9 A	0.9 A		
	Northbound Approach		67.2 E	70.2 E		
	Southbound Approach		64.5 E	60.7 E		
Platte Ave & Hancock Ave (#7)	Overall		**9.5 A**	**14.8 B**		
	Eastbound Approach		1.1 A	1.4 A		
	Westbound Approach		0.5 A	8.6 A		
	Northbound Approach		53.0 D	53.8 D		
	Southbound Approach		58.7 E	60.1 E		
Platte Ave & Union Blvd (#8)	Overall		**60.2 E**	**63.2 E**	**44.0 D**	**50.6 D**
	Eastbound Approach		49.3 D	18.7 B	50.9 D	42.0 D
	Westbound Approach		23.7 C	15.3 B	41.4 D	35.0 D
	Northbound Approach		130.8 F	166.8 F	55.8 E	75.8 E
	Southbound Approach		40.0 D	35.4 D	25.1 C	45.7 D
Platte Ave & Platte Pl (#9)	Overall		**0.9 A**	**2.6 A**		
	Eastbound Approach		0.2 A	0.3 A		
	Westbound Approach		0.4 A	0.5 A		
	Northbound Approach		77.1 E	71.6 E		

Intersection	Movement	Control	2045 w/o Imp Peak Hour		2045 w/ Imp Peak Hour	
			AM	PM	AM	PM
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
Platte Ave & Boulder St (#10)	Overall		**15.5 B**	**30.0 C**		**31.3 C**
	Eastbound Approach		0.5 A	22.0 C		31.9 C
	Westbound Approach		14.5 B	17.3 B		23.8 C
	Northbound Approach		42.0 D	37.4 D		31.0 C
	Southbound Approach		55.8 E	88.0 F		50.3 D
Platte Ave & Circle Dr (#11)	Overall		**125.8 F**	**165.6 F**	**57.4 E**	**89.3 F**
	Eastbound Approach		41.1 D	68.0 E	63.8 E	82.2 F
	Westbound Approach		152.2 F	140.4 F	59.6 E	80.6 F
	Northbound Approach		141.3 F	323.1 F	50.5 D	107.0 F
	Southbound Approach		125.6 F	126.6 F	56.1 E	88.2 F
Platte Ave & Pine Tree Square (#12)	Overall		**2.2 A**	**11.9 B**		**14.0 B**
	Eastbound Approach		0.1 A	5.6 A		15.0 B
	Westbound Approach		1.1 A	4.4 A		4.5 A
	Northbound Approach		69.6 E	88.6 F		64.5 E
Platte Ave & Chelton Rd (#13)	Overall		**44.3 D**	**26.6 C**		
	Eastbound Approach		36.8 D	7.9 A		
	Westbound Approach		47.3 D	32.2 C		
	Northbound Approach		50.7 D	62.4 E		
	Southbound Approach		67.7 E	53.0 D		
WB Platte Ave & Academy Blvd (#14)	Overall		**12.7 B**	**17.9 B**		
	Westbound Approach		65.2 E	65.6 E		
	Northbound Approach		7.2 A	11.1 B		
	Southbound Approach		10.3 B	19.3 B		

Intersection	Movement	Control	2045 w/o Imp Peak Hour		2045 w/ Imp Peak Hour	
			AM	PM	AM	PM
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
EB Platte Ave & Academy Blvd (#15)	Overall		**13.0 B**	**24.3 C**		
	Eastbound Approach		68.1 E	65.4 E		
	Northbound Approach		12.7 B	30.0 C		
	Southbound Approach		9.9 A	14.4 B		
Platte Ave & Murray Blvd (#16)	Overall		**158.3 F**	**181.2 F**	**50.4 D**	**46.6 D**
	Eastbound Approach		57.9 E	210.4 F	29.2 C	46.3 D
	Westbound Approach		262.6 F	204.1 F	57.0 E	17.2 B
	Northbound Approach		55.3 E	106.8 F	64.8 E	86.1 F
	Southbound Approach		96.8 F	96.4 F	64.0 E	88.0 F
Platte Ave & Wooten Rd (#17)	Overall		**70.4 E**	**83.3 F**	**22.2 C**	**40.1 D**
	Eastbound Approach		15.4 B	67.3 E	8.4 A	45.8 D
	Westbound Approach		110.5 F	99.8 F	23.6 C	27.8 C
	Northbound Approach		53.1 D	50.6 D	52.0 D	47.9 D
	Southbound Approach		62.0 E	99.1 F	73.1 E	72.3 E
Platte Ave & SB SH-21 Ramp (#18)	Overall		**18.3 B**	**4.2 A**		
	Eastbound Approach		0.4 A	0.A A		
	Westbound Approach		18.0 B	0.7 A		
	Southbound Approach		63.9 E	65.4 E		
Platte Ave & NB SH-21 Ramp (#19)	Overall		**9.7 A**	**5.7 A**		
	Eastbound Approach		1.0 A	1.1 A		
	Westbound Approach		11.7 B	5.4 A		
	Northbound Approach		67.6 E	67.6 E		
Platte Ave & Space Center Dr (#99)	Overall		**28.7 C**	**17.9 B**		
	Eastbound Approach		10.6 B	12.7 B		
	Westbound Approach		37.0 D	17.5 B		
	Southbound Approach		76.8 E	75.7 E		

The long-term 2045 intersection possible improvements are shown on **Figures 7A** and **7B.**

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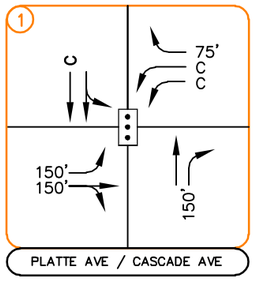
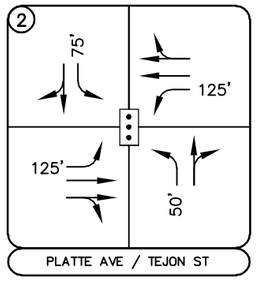
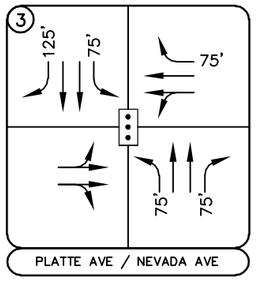
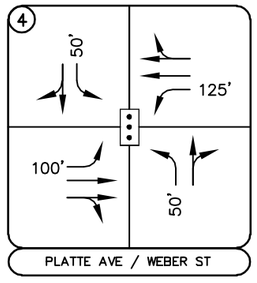
Kimley»Horn NORTH
NTS 096998001

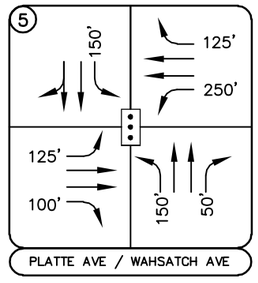
MATCH A–A ON FIGURE 7B

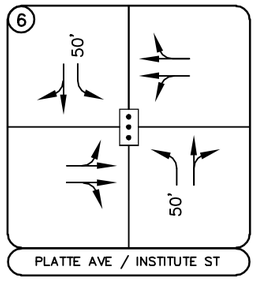


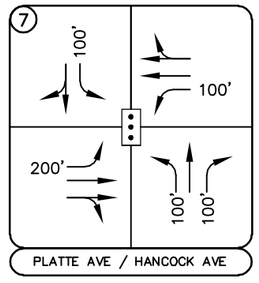


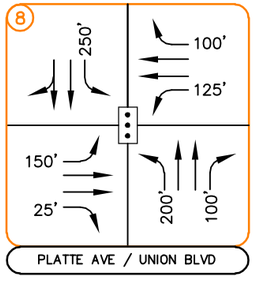


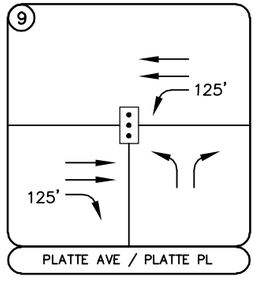


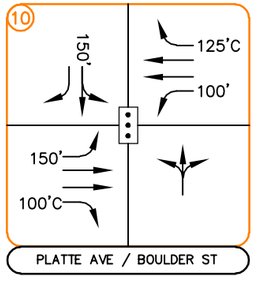


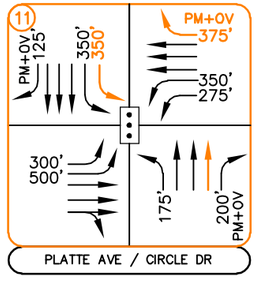












Intersections in orange have optimized split phasing timings during either morning, afternoon, or both peak hours.

LEGEND
- X — Study Area Key Intersection
- Signalized Intersection
- STOP — Stop Controlled Approach
- SPEED LIMIT XX — Roadway Speed Limit
- 100' — Turn Lane Length (feet)
- PM+OV — Permissive + Overlap
- Recommendation

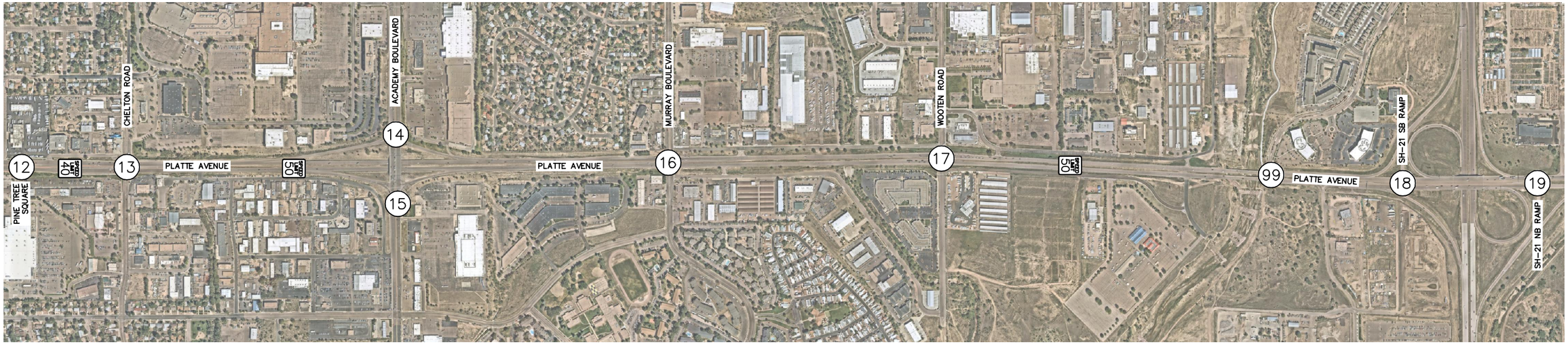
PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
PLATTE AVENUE 2045 POSSIBLE IMPROVEMENTS

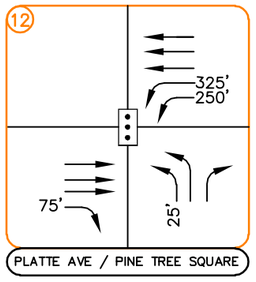
FIGURE 7A

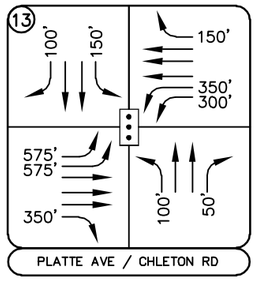
Kimley»Horn

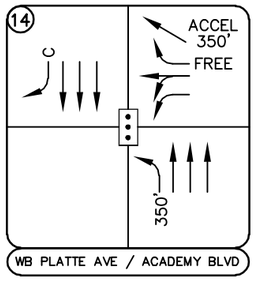
NTS 096998001

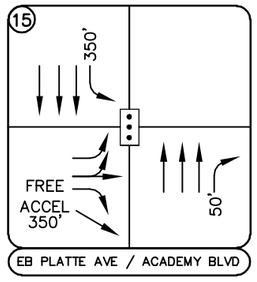
MATCH A–A ON FIGURE 7A

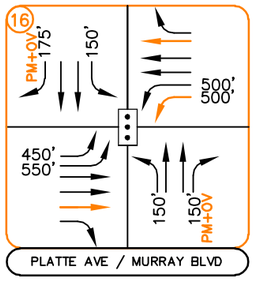


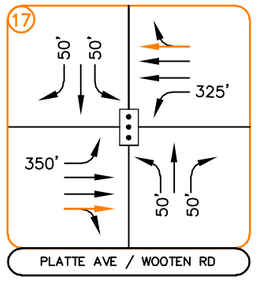


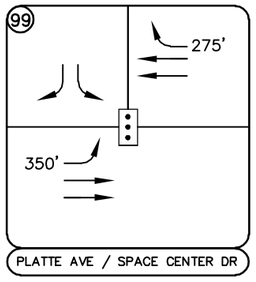


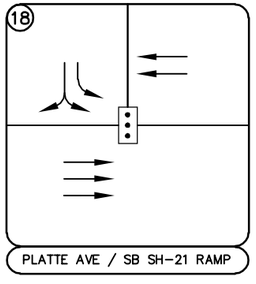


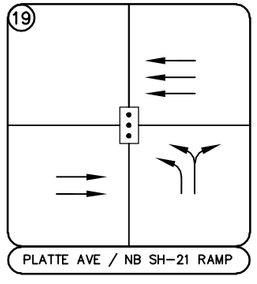












Intersections in orange have optimized split phasing timings during either morning, afternoon, or both peak hours.

LEGEND

- Study Area Key Intersection
- Signalized Intersection
- Stop Controlled Approach
- Roadway Speed Limit
- 100' Turn Lane Length (feet)
- Recommendation

PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
PLATTE AVENUE 2045 POSSIBLE IMPROVEMENTS

FIGURE 7B

5.0 BOULDER STREET CORRIDOR

5.1 Boulder Street Existing Configuration

Boulder Street exists as a three-lane roadway with one through lane in each direction and left turn lanes from Cascade Avenue to Nevada Avenue. The roadway section of Boulder Street from just east of Nevada Avenue to Union Boulevard widens to a four-lane roadway with two lanes in each direction. Left turn lanes do not exist through the intersections of Boulder Street with Weber Street, Wahsatch Avenue, and Institute Street. Left turn lanes do exist along Boulder Street at the intersections with Hancock Avenue, Childrens View, and Union Boulevard. The roadway drops back to a three-lane section with one through lane in each direction and a two-way left turn lane to the east of Union Boulevard to Platte Avenue. Boulder Street has a posted speed limit of 25 miles per hour (mph) within the Downtown Colorado Springs portion between Cascade Avenue and Wahsatch Avenue. East of Wahsatch Avenue, the posted speed limit increases to 35 mph for the remainder of the roadway to Platte Avenue. The existing intersection geometry and control are illustrated on **Figure 8** for the Boulder Street study corridor.

5.2 Data Collection and Future Projections

Existing peak hour turning movement counts were conducted at the nine (9) signalized intersections along Boulder Street on Tuesday, September 1, 2020. Counts were conducted in 15-minute intervals during the morning and afternoon peak hours of adjacent street traffic from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM. Existing turning movement counts are shown on **Figure 9** at the study intersections along Boulder Street**.** In addition, the Average Daily Traffic (ADT) Volumes were also collected on Tuesday, September 1,2020 at two (2) locations along Boulder Street. The count sheets are provided in **Appendix A.**

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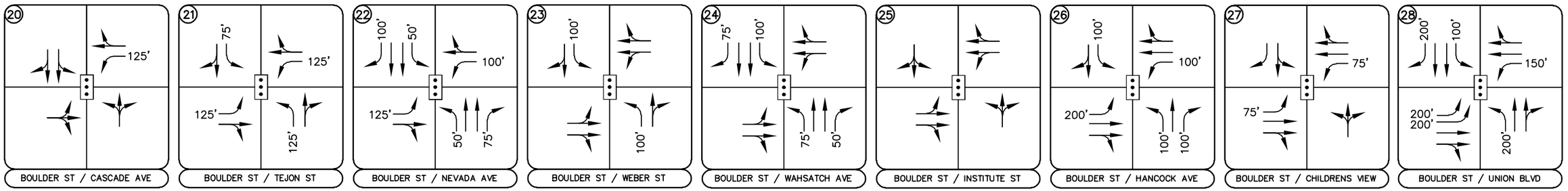

LEGEND

- Study Area Key Intersection
- Signalized Intersection
- Stop Controlled Approach
- Roadway Speed Limit
- 100' Turn Lane Length (feet)
- C Continuous Turn Lane

PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
EXISTING LANE CONFIGURATIONS AND CONTROL (BOULDER STREET)

FIGURE 8

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20 — BOULDER ST / CASCADE AVE — Tuesday, September 1, 2020, 7:30 to 8:30AM (4:30 to 5:30PM)

	13(13) ↓ 194(268) ↓ 1(0)	← 56(109) ← 3(0)
16(29) →		153(228) ↑ 38(74) ↗

21 — BOULDER ST / TEJON ST — Tuesday, September 1, 2020, 8:00 to 9:00AM (4:00 to 5:00PM)

	6(23) ↓ 68(98) ↓ 27(41) ↙	← 29(52) ← 63(81) ← 63(79)
27(64) → 23(84) → 14(21) ↘		12(11) ↑ 40(108) ↑ 8(18) ↗

22 — BOULDER ST / NEVADA AVE — Tuesday, September 1, 2020, 7:30 to 8:30AM (4:30 to 5:30PM)

	15(40) ↓ 272(464) ↓ 13(22) ↙	← 26(33) ← 130(145) ← 61(67)
4(25) → 34(104) → 6(41) ↘		17(32) ↑ 305(475) ↑ 49(62) ↗

23 — BOULDER ST / WEBER ST — Tuesday, September 1, 2020, 8:00 to 9:00AM (5:00 to 6:00PM)

	6(6) ↓ 137(112) ↓ 11(16) ↙	← 14(15) ← 172(232) ← 25(25)
1(7) → 85(148) → 5(5) ↘		2(1) ↑ 72(166) ↑ 6(35) ↗

24 — BOULDER ST / WAHSATCH AVE — Tuesday, September 1, 2020, 7:15 to 8:15AM (4:30 to 5:30PM)

	12(7) ↓ 326(286) ↓ 70(54) ↙	← 53(72) ← 200(244) ← 98(76)
2(22) → 99(191) → 55(26) ↘		10(19) ↑ 170(423) ↑ 72(94) ↗

25 — BOULDER ST / INSTITUTE ST — Tuesday, September 1, 2020, 7:15 to 8:15AM (4:45 to 5:45PM)

	17(8) ↓ 19(23) ↓ 9(15) ↙	← 9(1) ← 347(376) ← 18(9)
3(13) → 244(414) → 10(5) ↘		8(5) ↑ 10(24) ↑ 9(18) ↗

26 — BOULDER ST / HANCOCK AVE — Tuesday, September 1, 2020, 7:15 to 8:15AM (4:30 to 5:30PM)

	23(27) ↓ 72(63) ↓ 24(30) ↙	← 33(52) ← 321(368) ← 69(88)
11(33) → 240(303) → 8(9) ↘		8(12) ↑ 40(86) ↑ 25(41) ↗

27 — BOULDER ST / CHILDRENS VIEW — Tuesday, September 1, 2020, 7:15 to 8:15AM (4:00 to 5:00PM)

	67(144) ↓ 135(156) ↙	← 131(49) ← 400(377) ← 1(4)
104(27) → 165(346) → 3(2) ↘		0(2) ↑ 1(4) ↗

28 — BOULDER ST / UNION BLVD — Tuesday, September 1, 2020, 7:15 to 8:15AM (4:00 to 5:00PM)

	271(244) ↓ 399(459) ↓ 60(81) ↙	← 54(74) ← 189(140) ← 42(33)
98(222) → 124(239) → 83(75) ↘		107(65) ↑ 504(685) ↑ 53(32) ↗

LEGEND

- (X) Study Area Key Intersection
- XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes
- XX,XX0 Estimated Daily Traffic Volume

PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
2020 EXISTING TRAFFIC VOLUMES (BOULDER STREET)

FIGURE 9

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As discussed in **Section 4.2**, the same COVID-19 adjustment factors applied to the Platte Avenue intersections were applied to the existing 2020 counts along Boulder Street. The morning peak hour used a 1.20 rate while the afternoon peak hour used a 1.12 adjustment factor. Therefore, the existing traffic volumes at the study intersections along Boulder Street were adjusted based on these factors as shown on **Figure 10.**

Based on information obtained from the regional transportation model provided by the transportation team and FHU, a 1.75 percent annual average growth rate was determined and applied to the existing adjusted turning movement counts to match the 2045 projections provided by the regional transportation model. **Figure 11** illustrates the 2045 traffic volumes at the study intersections along Boulder Street. The COVID-19 adjustment factor and growth projections are included in **Appendix B.**

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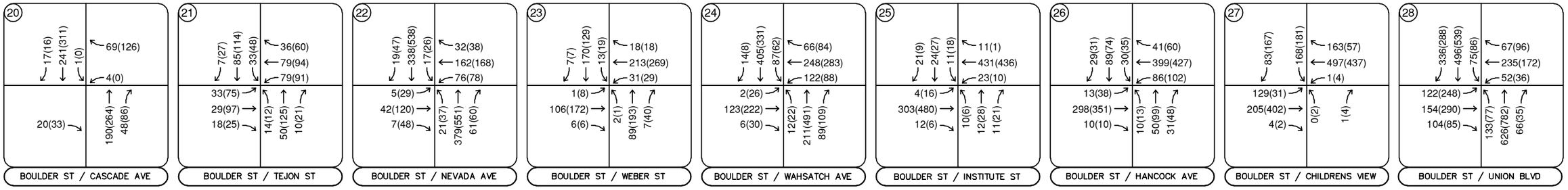

LEGEND

(X) Study Area Key Intersection

XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes

XX,XX0 Estimated Daily Traffic Volume

PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
2022 ADJUSTED TRAFFIC VOLUMES (BOULDER STREET)

FIGURE 10

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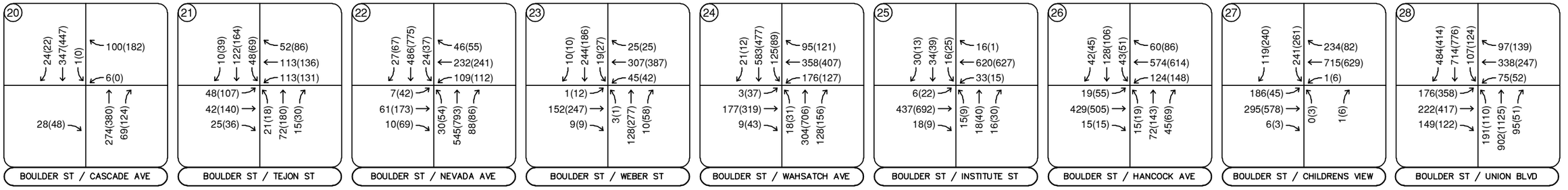

LEGEND

(X)	Study Area Key Intersection
XXX(XXX)	Weekday AM(PM) Peak Hour Traffic Volumes
XX,XX0	Estimated Daily Traffic Volume

PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
2045 TRAFFIC VOLUMES (BOULDER STREET)

FIGURE 11

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5.3 Boulder Street Traffic Operations Analysis

An analysis of Boulder Street has been provided to illustrate the intersection level of service between Cascade Avenue and Platte Avenue. As shown in **Table 4,** all intersections along Boulder Street are anticipated to operate with an overall LOS D or better during both peak hour through 2045. Timing splits at the Boulder Street with Childrens View (#27) and Union Boulevard (#28) intersections could be optimized to decrease the delay on some of the movements, as likely happens in the field with the existing actuation detection.

Table 4 – Boulder Street LOS Table

Intersection	Movement	Control	2022 Existing Peak Hour		2045 Base Peak Hour	
			AM LOS (Delay)	PM LOS (Delay)	AM LOS (Delay)	PM LOS (Delay)
Boulder St & Cascade Ave (#20)	Overall		**11.0 B**	**11.9 B**	**10.2 B**	**11.9 B**
	Eastbound Approach		51.5 D	46.6 D	48.9 D	43.2 D
	Westbound Approach		60.7 E	45.7 E	57.8 E	53.4 D
	Northbound Approach		2.2 A	0.5 A	0.4 A	0.9 A
	Southbound Approach		1.9 A	3.2 A	2.6 A	4.6 A
Boulder St & Tejon St (#21)	Overall		**25.3 C**	**27.8 C**	**26.2 C**	**26.3 C**
	Eastbound Approach		43.4 D	52.7 D	45.0 D	50.5 D
	Westbound Approach		40.9 D	43.5 D	42.5 D	37.8 D
	Northbound Approach		0.1 A	0.2 A	0.1 A	0.3 A
	Southbound Approach		4.6 A	4.8 A	4.7 A	7.9 A
Boulder St & Nevada Ave (#22)	Overall		**12.0 B**	**13.7 B**	**13.0 B**	**13.6 B**
	Eastbound Approach		41.1 D	50.6 D	47.1 D	46.7 D
	Westbound Approach		36.0 D	35.6 D	37.8 D	25.3 C
	Northbound Approach		0.1 A	0.2 A	0.2 A	0.6 A
	Southbound Approach		5.1 A	6.0 A	6.0 A	11.2 B
Boulder St & Weber St (#23)	Overall		**20.6 C**	**20.0 B**	**21.1 C**	**19.8 B**
	Eastbound Approach		32.0 C	32.7 C	32.3 C	30.8 C
	Westbound Approach		34.6 C	34.6 C	35.6 D	34.4 C
	Northbound Approach		0.1 A	0.3 A	0.2 A	0.5 A
	Southbound Approach		5.1 A	4.7 A	5.2 A	5.7 A

Intersection	Movement	Control	2022 Existing Peak Hour		2045 Base Peak Hour	
			AM	PM	AM	PM
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
Boulder St & Wahsatch Ave (#24)	Overall		**22.9 C**	**18.0 B**	**21.3 C**	**16.3 B**
	Eastbound Approach		22.9 C	25.5 C	16.7 B	16.0 B
	Westbound Approach		43.0 D	43.4 D	41.5 D	41.1 D
	Northbound Approach		18.2 B	2.7 A	10.4 B	0.5 A
	Southbound Approach		8.5 A	7.5 A	11.9 B	13.0 B
Boulder St & Institute St (#25)	Overall		**5.5 A**	**5.5 A**	**5.9 A**	**6.2 A**
	Eastbound Approach		2.3 A	2.4 A	2.7 A	3.2 A
	Westbound Approach		2.6 A	2.3 A	3.1 A	3.0 A
	Northbound Approach		31.5 C	32.8 C	30.8 C	33.7 C
	Southbound Approach		33.0 C	32.8 C	32.5 C	31.9 C
Boulder St & Hancock Ave (#26)	Overall		**12.4 B**	**12.9 B**	**12.3 B**	**12.7 B**
	Eastbound Approach		3.2 A	2.9 A	3.9 A	4.5 A
	Westbound Approach		0.3 A	0.3 A	0.4 A	0.6 A
	Northbound Approach		47.6 D	49.7 D	46.0 D	46.0 D
	Southbound Approach		53.4 D	52.2 D	51.9 D	49.1 D
Boulder St & Children's View (#27)	Overall		**14.8 B**	**18.1 B**	**18.0 B**	**34.1 C**
	Eastbound Approach		2.2 A	1.2 A	4.1 A	1.5 A
	Westbound Approach		8.8 A	15.3 B	15.0 B	17.2 B
	Northbound Approach		40.5 D	31.9 C	35.5 D	31.9 C
	Southbound Approach		47.5 D	43.2 D	44.4 D	99.1 F
Boulder St & Union Blvd (#28)	Overall		**24.7 C**	**27.5 C**	**28.3 C**	**43.7 D**
	Eastbound Approach		62.9 E	67.1 E	63.0 E	129.2 F
	Westbound Approach		67.8 E	69.4 E	70.4 E	68.7 E
	Northbound Approach		1.8 A	1.3 A	2.3 A	1.4 A
	Southbound Approach		12.7 B	12.2 B	20.9 C	18.4 B

6.0 PLATTE AVENUE ALTERNATIVES CONCEPT DEVELOPMENT

6.1 Downtown Character Area

6.1.1 Platte Avenue Lane Reduction

An option considered is to reduce Platte Avenue to provide a single through lane in each direction through the Downtown area of Colorado Springs. **Table 5** summarizes the results of the level of service (LOS) analysis and provides lane configuration if Platte Avenue did reduce to one through lane in each direction from Cascade Avenue to Wahsatch Avenue. Analyzed with existing traffic volumes, the study intersections between Cascade Avenue and Wahsatch Avenue along Platte Avenue will operate acceptably with a single eastbound and westbound through lane shared with the left and right turn movements. Although, for efficiency of operations, separate left turn lanes could be still be considered. **Figure 12** illustrates the geometry for the existing traffic volumes with one through lane in each direction.

If 2045 traffic volumes are realized, several left turn lane improvements may be needed. The westbound approach at Cascade Avenue (#1) may need to provide a separate left turn lane and a shared left turn/right turn lane. Exclusive eastbound and westbound left turn lanes may also be needed at the Platte Avenue/Tejon Street (#2) intersection. Likewise, the westbound left turn lane at Weber Street (#4) may need to be reimplemented. **Figure 13** illustrates the geometry for the long-term 2045 horizon projected traffic volumes with one through lane in each direction.

Table 5 – Downtown Platte Avenue Road Diet LOS Table

Intersection	Movement	Control	2022 One-Lane		2045 One Lane	
			AM	PM	AM	PM
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
Platte Ave & Cascade Ave (#1)	Overall		**19.3 B**	**18.2 B**	**17.1 B**	**18.5 B**
	Eastbound Approach		25.3 C	21.8 C	31.9 C	27.0 C
	Westbound Approach		25.4 C	23.0 C	25.0 C	27.9 C
	Northbound Approach		16.9 B	14.2 B	12.9 B	11.2 B
	Southbound Approach		12.8 B	16.2 B	9.2 A	14.0 B
Platte Ave & Tejon St (#2)	Overall		**16.9 B**	**14.4 B**	**16.7 B**	**15.5 B**
	Eastbound Approach		18.3 B	15.0 B	29.4 C	24.8 C
	Westbound Approach		25.5 C	22.4 C	20.0 C	16.4 B
	Northbound Approach		9.9 A	12.9 B	12.5 B	18.0 B
	Southbound Approach		0.6 A	0.7 A	0.6 A	1.8 A

Intersection	Movement	Control	2022 One-Lane		2045 One Lane	
			AM	PM	AM	PM
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
Platte Ave & Nevada Ave (#3)	Overall		**12.5 B**	**12.4 B**	**15.1 B**	**17.0 B**
	Eastbound Approach		16.3 B	14.2 B	4.3 A	2.0 A
	Westbound Approach		22.2 C	21.5 C	18.8 B	15.7 B
	Northbound Approach		12.3 B	15.1 B	22.6 C	28.7 C
	Southbound Approach		0.2 A	0.6 A	5.4 A	11.2 B
Platte Ave & Weber St (#4)	Overall		**8.6 A**	**21.5 C**	**31.9 C**	**31.9 C**
	Eastbound Approach		1.0 A	12.3 B	5.8 A	42.3 D
	Westbound Approach		9.9 A	37.4 D	50.8 D	27.7 C
	Northbound Approach		22.3 C	16.5 B	26.6 C	33.0 C
	Southbound Approach		7.1 A	0.5 A	11.7 B	12.5 B
Platte Ave & Wahsatch Ave (#5)	Overall		**20.3 C**	**23.5 C**	**30.2 C**	**40.7 D**
	Eastbound Approach		14.4 B	36.0 D	6.0 A	48.8 D
	Westbound Approach		40.5 D	34.4 C	27.2 C	26.9 C
	Northbound Approach		13.7 B	18.3 B	32.8 C	39.9 D
	Southbound Approach		0.6 A	1.6 A	46.6 D	53.6 D

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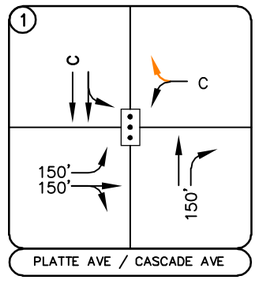

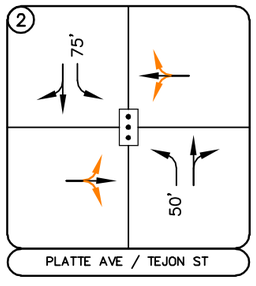

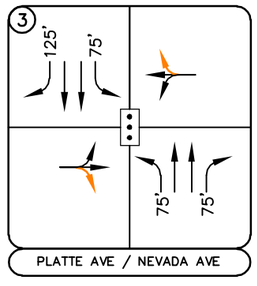

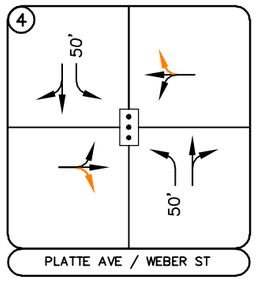

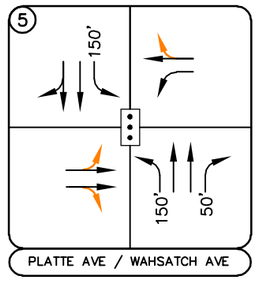

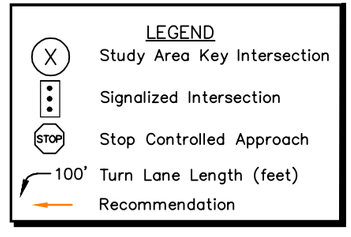

PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
2022 PLATTE AVENUE ROAD DIET POSSIBLE IMPROVEMENTS

FIGURE 12

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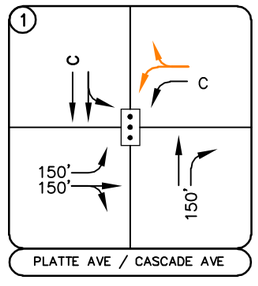

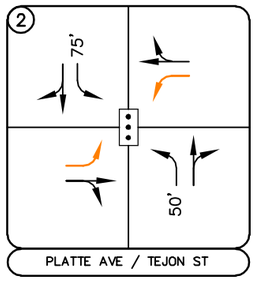

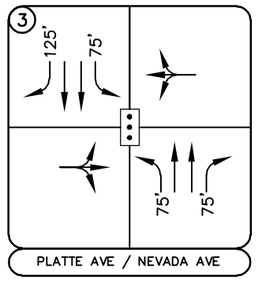

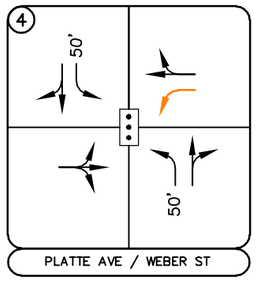

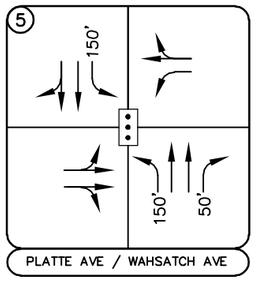

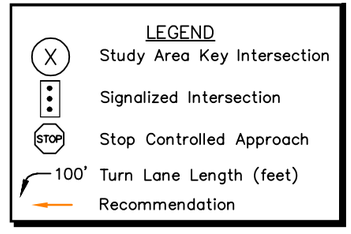

PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
2045 PLATTE AVENUE ROAD DIET POSSIBLE IMPROVEMENTS

FIGURE 13

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6.1.2 Bijou/Kiowa Lane Reduction

Existing Configuration and Data Collection

Bijou Street and Kiowa Street presently operate as a one-way couplet between Cascade Avenue and Wahsatch Avenue through Downtown Colorado Springs, with Bijou Street as a westbound street and Kiowa Street as an eastbound street. Bijou Street and Kiowa Street provide three lanes without exclusive turn lanes and a posted speed limit of 25 miles per hour (mph). The existing intersection geometry and control are illustrated on **Figure 14** for the Bijou/Kiowa Street corridor.

Existing peak hour turning movement counts were conducted at the eight (8) signalized intersections along Bijou Street and Kiowa Street on Tuesday, April 18, 2017. Counts were conducted in 15-minute intervals during the typical morning and afternoon peak hours of adjacent street traffic from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM. A one (1) percent nominal growth rate was applied to the counts to generate 2022 existing counts and future 2045 traffic counts. **Figure 15** and **Figure 16** illustrate the 2022 adjusted existing traffic volumes and 2045 traffic volumes, respectively.

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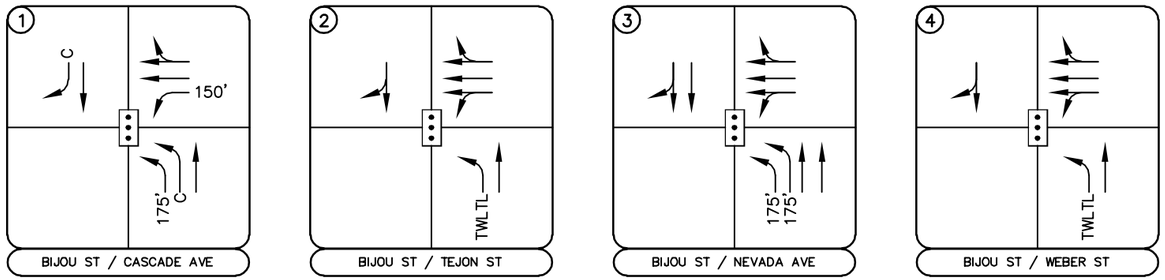

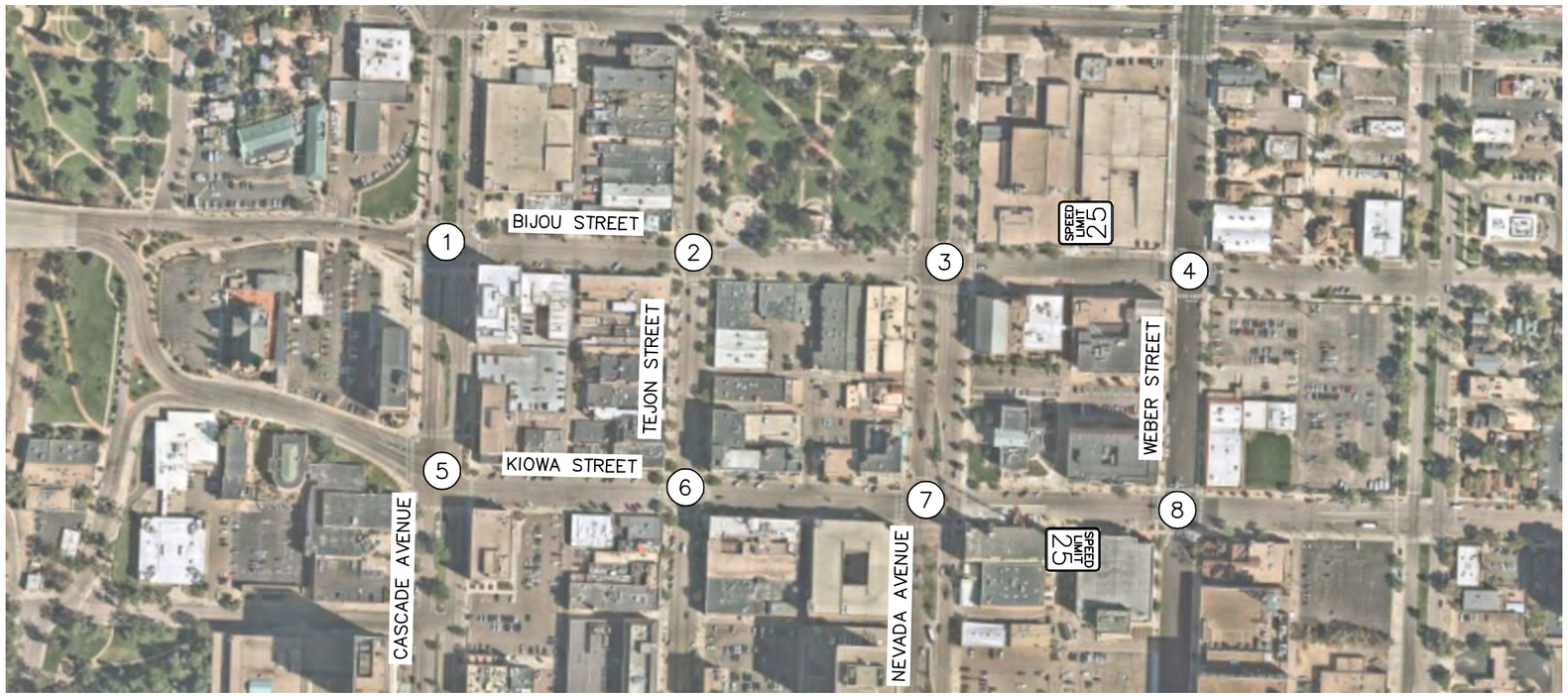

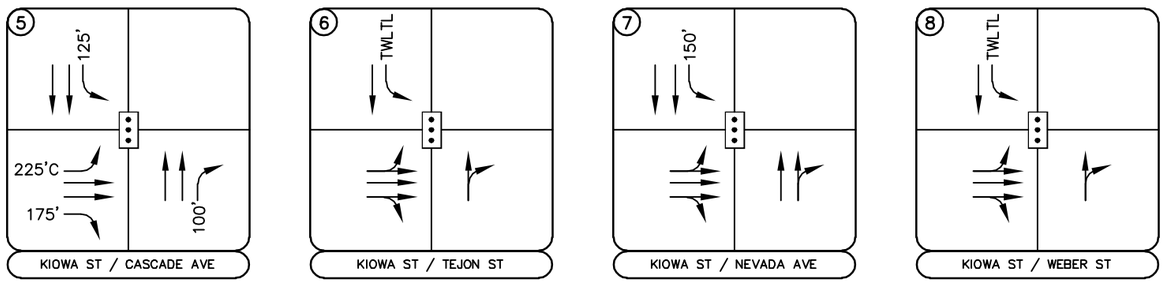

LEGEND

X	Study Area Key Intersection
	Signalized Intersection
STOP	Stop Controlled Approach
SPEED LIMIT XX	Roadway Speed Limit
100'	Turn Lane Length (feet)
C	Continuous Turn Lane

PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
BIJOU/KIOWA EXISTING GEOMETRY AND CONTROL

FIGURE 14

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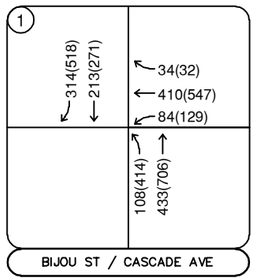

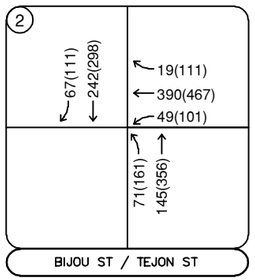

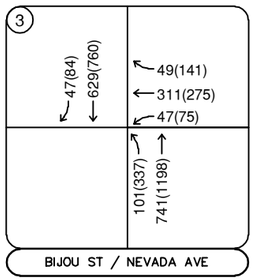

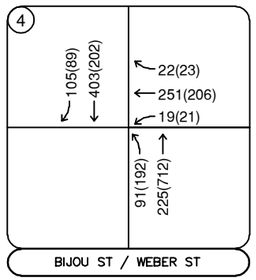

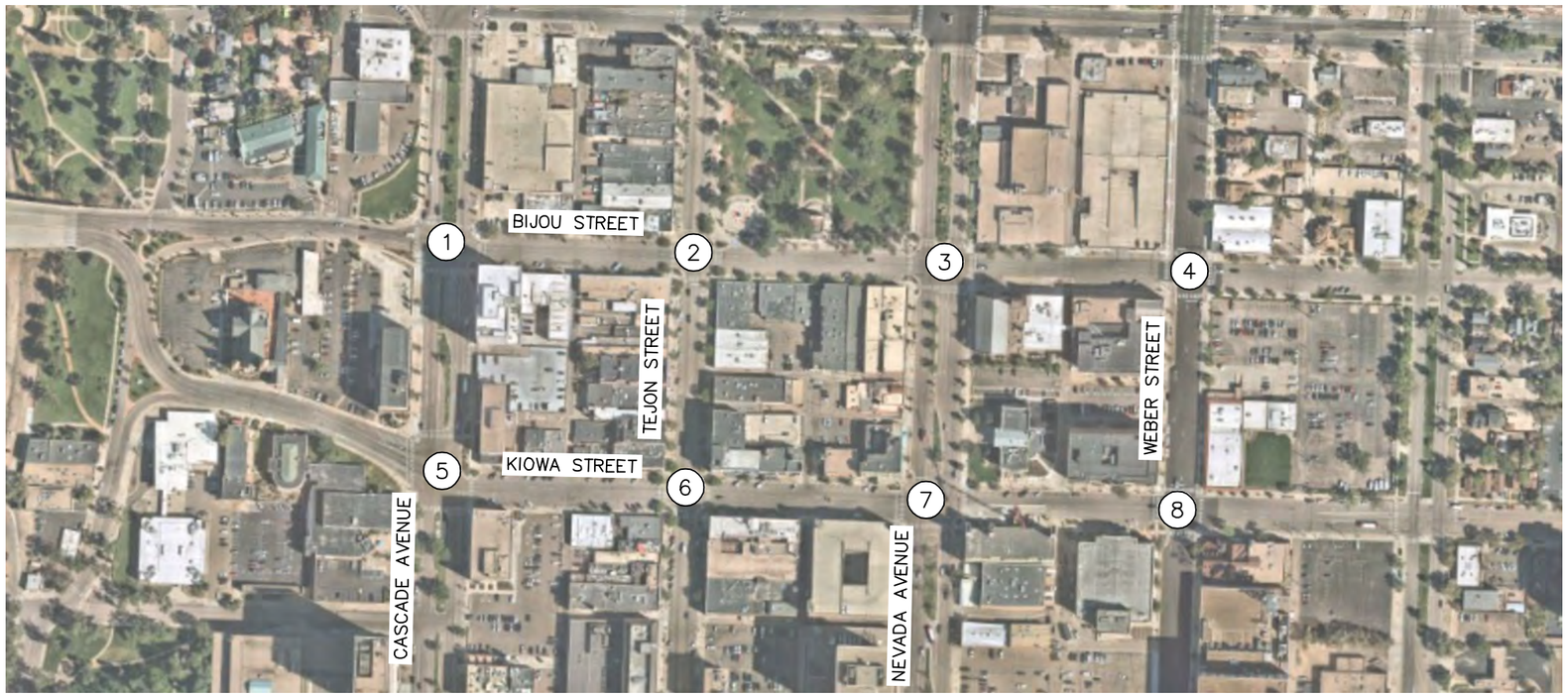

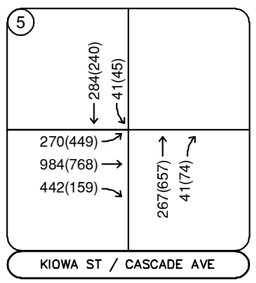

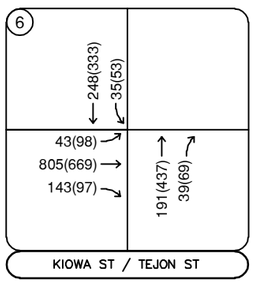

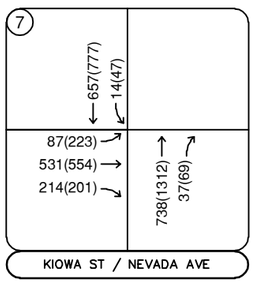

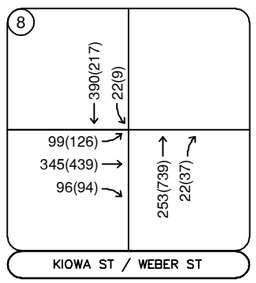

LEGEND

(X) Study Area Key Intersection

XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes

PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
BIJOU/KIOWA 2022 EXISTING ADJUSTED TRAFFIC VOLUMES

FIGURE 15

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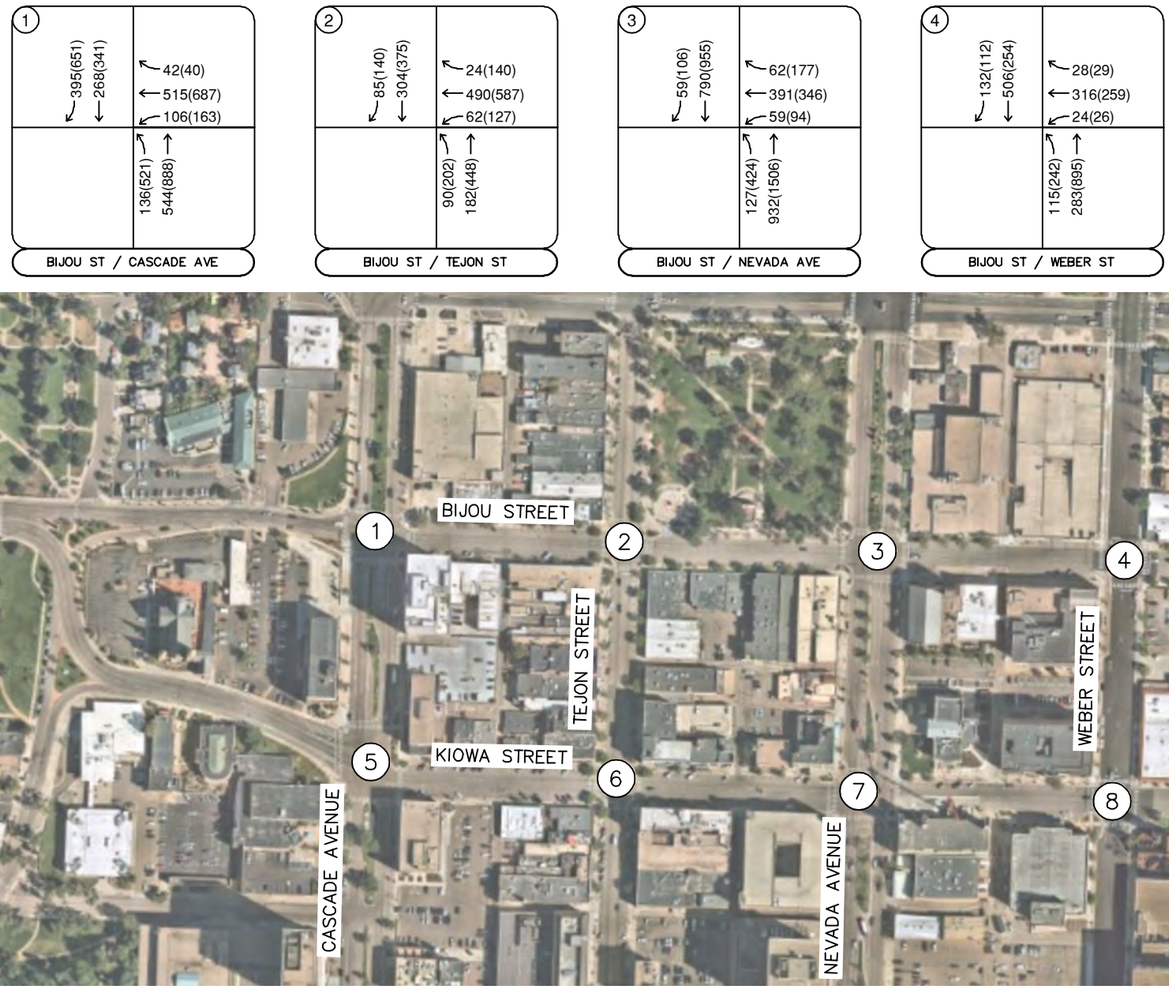

LEGEND

(X) Study Area Key Intersection

XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes

PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
BIJOU/KIOWA 2045 TRAFFIC VOLUMES

FIGURE 16

Kimley»Horn

Three Lanes to Two Lanes Reduction Feasibility

A feasibility analysis was completed at eight (8) intersections in the downtown core, four (4) along Bijou Street and four (4) along Kiowa Street, to determine if these roadways can operate acceptably with two through lanes instead of three. **Table 6** summarizes the LOS for the existing three-lane roadway geometry and the possible two lanes during existing and future conditions. As shown in **Table 6**, the Bijou Street and Kiowa Street one-way couplet will operate acceptably with two through lanes and shared turn lanes. There are three (3) intersections where separate turn lanes are recommended in addition to the two throughs, with two of these being needed today and one being needed by the long-term horizon. The intersection of Bijou Street/Cascade Avenue (#1) is recommended to keep the existing geometry with the exclusive westbound left turn lane. Likewise, the Kiowa Street/Cascade Avenue (#5) intersection is recommended to keep the existing geometry with the exclusive eastbound left and right turn lanes. If 2045 volumes are realized, the intersection of Kiowa Street/Nevada Avenue (#7) may need to provide an exclusive eastbound left turn lane. **Figure 17** illustrates the two through lane geometry for the existing traffic volume condition, while **Figure 18** illustrates the two through lane geometry for the future 2045 traffic volume condition.

Table 6 – Bijou/Kiowa Lane Reduction LOS Table

Intersection	Movement	Control	2022 Existing (3-Lanes)		2022 Existing (2-Lanes)		2045 (2-Lanes)	
			AM Peak Hour LOS (Delay)	PM Peak Hour LOS (Delay)	AM Peak Hour LOS (Delay	PM Peak Hour LOS (Delay	AM Peak Hour LOS (Delay)	PM Peak Hour LOS (Delay)
Bijou St & Cascade Ave (#1)	Overall		**23.2 C**	**28.3 C**	**23.2 C**	**28.3 C**	**24.3 C**	**41.0 D**
	Westbound Approach		50.4 D	49.4 D	*50.3 D	*49.4 D	*49.5 D	*49.4 D
	Northbound Approach		10.7 B	18.0 B	10.7 B	18.0 B	11.4 B	16.3 D
	Southbound Approach		8.8 A	24.1 C	8.8 A	24.1 C	12.3 B	68.7 E
Bijou St & Tejon St (#2)	Overall		**27.3 C**	**24.6 C**	**27.9 C**	**26.0 C**	**27.9 C**	**27.9 C**
	Westbound Approach		52.3 D	50.6 D	51.7 D	49.9 D	50.6 D	49.5 D
	Northbound Approach		5.7 A	2.4 A	7.2 A	4.4 A	5.8 A	4.2 A
	Southbound Approach		5.4 A	9.7 A	7.1 A	13.7 B	9.8 A	21.8 C

Intersection	Movement	Control	2022 Existing (3-Lanes)		2022 Existing (2-Lanes)		2045 (2-Lanes)	
			AM Peak Hour LOS (Delay)	PM Peak Hour LOS (Delay)	AM Peak Hour LOS (Delay	PM Peak Hour LOS (Delay	AM Peak Hour LOS (Delay)	PM Peak Hour LOS (Delay)
Bijou St & Nevada Ave (#3)	Overall		**20.3 C**	**19.1 B**	**20.3 C**	**22.5 C**	**21.8 C**	**31.4 C**
	Westbound Approach		52.1 D	51.6 D	51.5 D	50.9 D	50.4 D	49.6 D
	Northbound Approach		0.7 A	3.5 A	1.0 A	10.1 B	2.5 A	24.0 C
	Southbound Approach		25.5 C	28.5 C	25.5 C	28.5 C	28.5 C	34.3 C
Bijou St & Weber St (#4)	Overall		**15.4 B**	**10.3 B**	**15.6 B**	**10.2 B**	**16.1 B**	**9.9 A**
	Westbound Approach		53.5 D	54.5 D	52.6 D	53.8 D	50.6 D	52.0 D
	Northbound Approach		0.4 A	0.7 A	0.5 A	0.7 A	1.0 A	0.4 A
	Southbound Approach		2.9 A	2.0 A	3.8 A	2.5 A	5.7 A	3.4 A
Kiowa St & Cascade Ave (#5)	Overall		**24.2 C**	**27.0 C**	**25.3 C**	**27.0 C**	**30.0 C**	**29.3 C**
	Eastbound Approach		*^27.3 C	*^36.2 D	*^27.0 C	*^36.1 D	*^33.3 C	*^36.1 D
	Northbound Approach		15.4 B	13.6 B	15.4 B	13.6 B	17.6 B	19.4 B
	Southbound Approach		16.7 B	16.8 B	25.6 C	16.8 B	24.2 C	21.5 C
Kiowa St & Tejon St (#6)	Overall		**34.0 C**	**29.0 C**	**37.5 D**	**32.3 C**	**54.4 D**	**41.3 D**
	Eastbound Approach		48.2 D	48.8 D	52.1 D	50.8 D	77.0 E	56.9 E
	Northbound Approach		13.3 B	16.2 B	18.6 B	23.6 C	21.1 C	43.1 D
	Southbound Approach		1.3 A	1.7 A	1.9 A	2.5 A	2.3 A	4.0 A
Kiowa St & Nevada Ave (#7)	Overall		**24.6 C**	**28.8 C**	**29.9 C**	**35.2 D**	**31.6 C**	**45.3 D**
	Eastbound Approach		48.5 D	48.0 D	48.6 D	50.9 D	*45.9 D	47.0 D
	Northbound Approach		8.1 A	16.0 B	12.7 B	25.4 C	16.5 B	46.8 D
	Southbound Approach		14.0 B	27.4 C	26.7 C	33.1 C	31.1 C	40.5 D
Kiowa St & Weber St (#8)	Overall		**23.9 C**	**25.8 C**	**24.5 C**	**28.8 C**	**24.8 C**	**40.4 D**
	Eastbound Approach		51.8 D	50.9 D	51.6 D	51.5 D	51.2 D	49.8 D
	Northbound Approach		4.1 A	10.5 B	6.0 A	15.7 B	8.7 A	42.5 D
	Southbound Approach		0.6 A	5.2 A	1.5 A	7.8 A	1.1 A	5.9 A

* = Separate Left Turn Lane on Major Street
^ = Separate Right Turn Lane on Major Street

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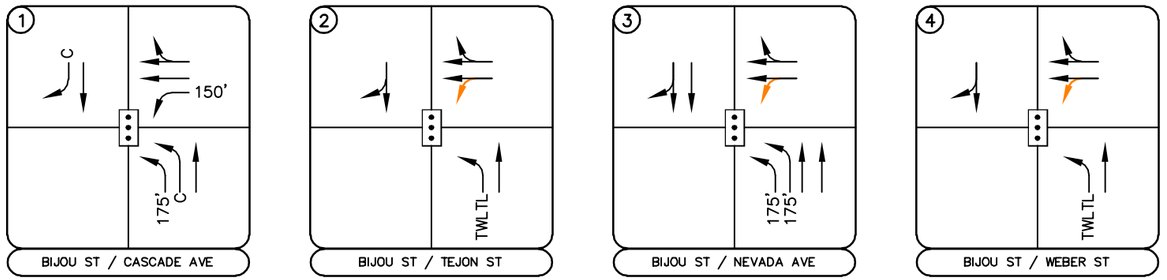

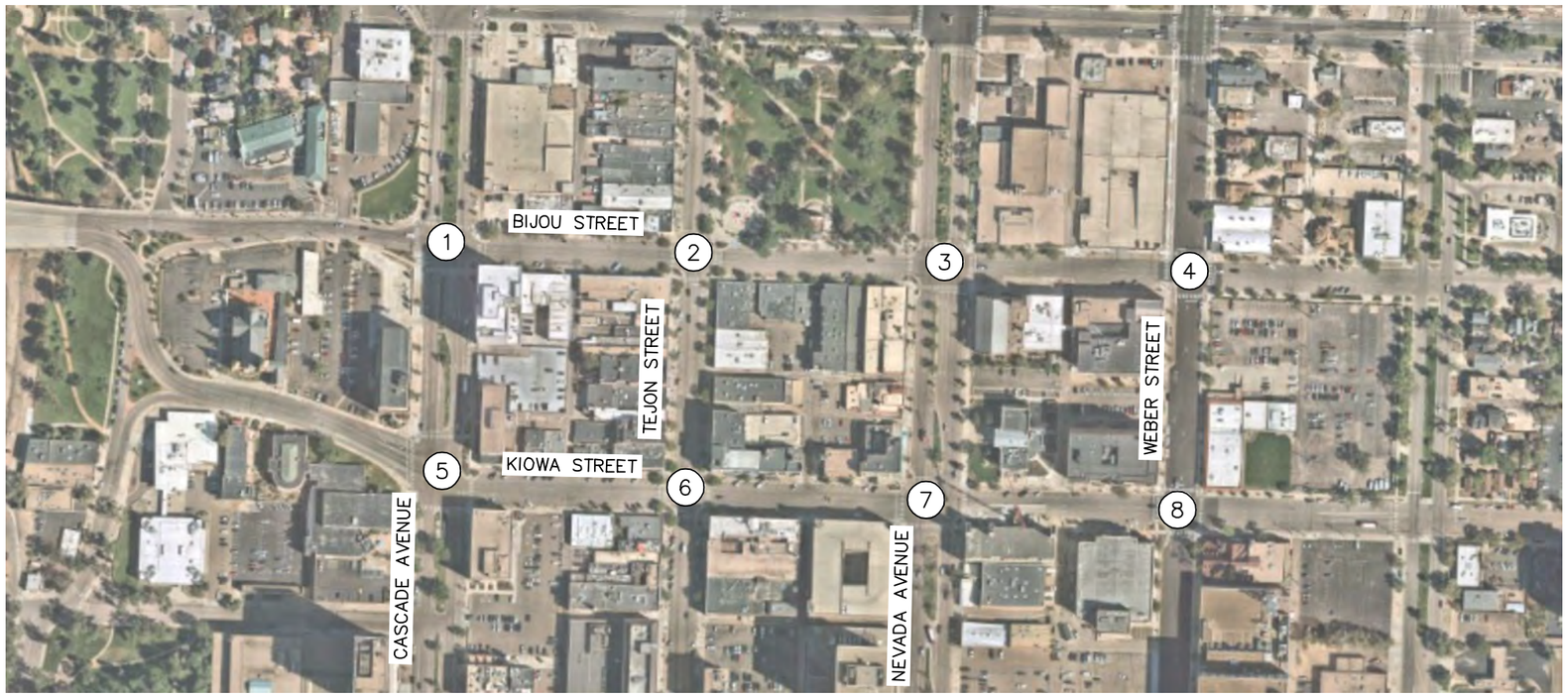

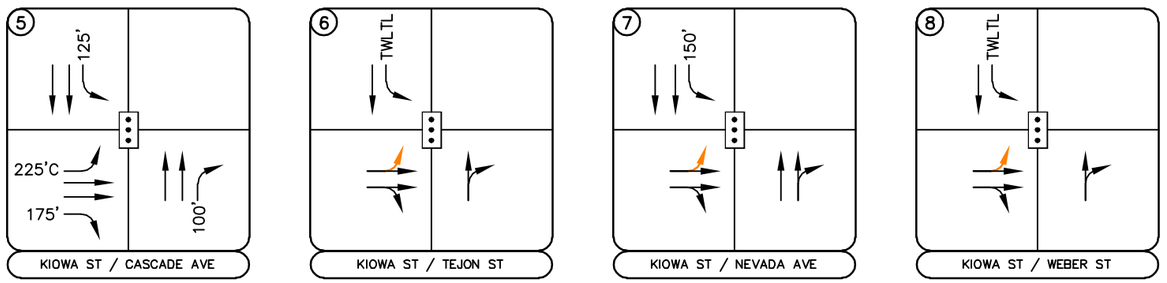

LEGEND
- X — Study Area Key Intersection
- Signalized Intersection
- STOP — Stop Controlled Approach
- 100' — Turn Lane Length (feet)
- Recommendation

PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
BIJOU/KIOWA 2022 POSSIBLE IMPROVEMENTS

FIGURE 17

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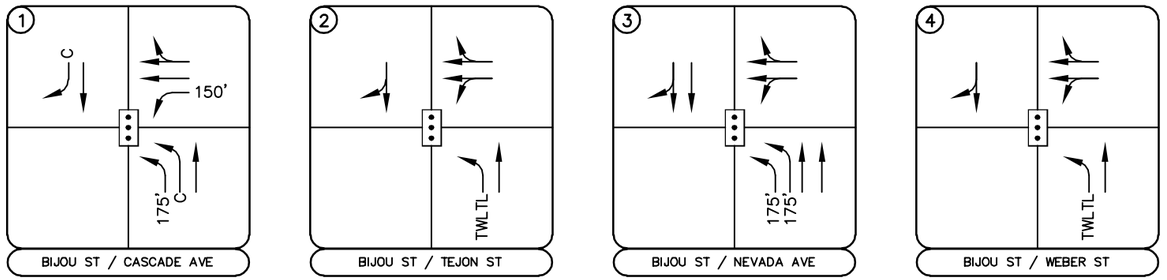
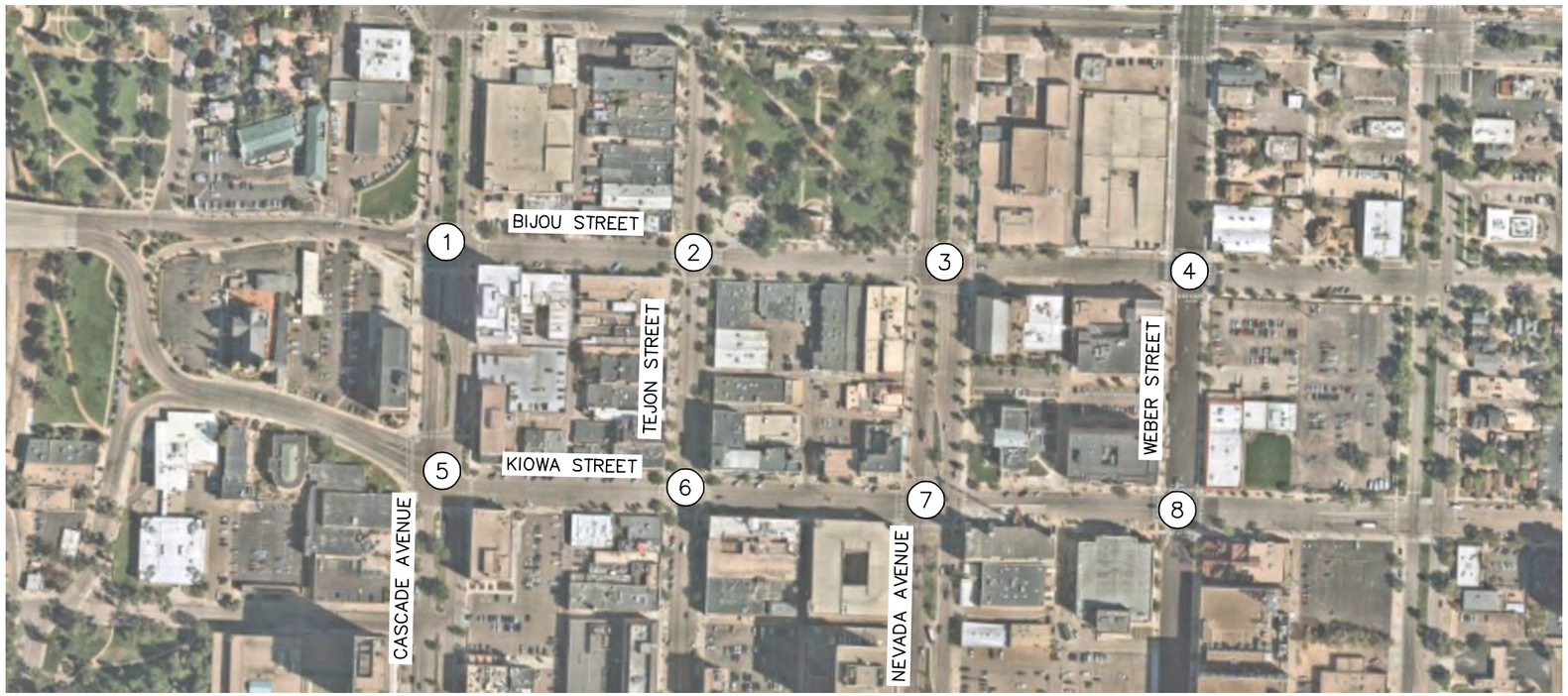
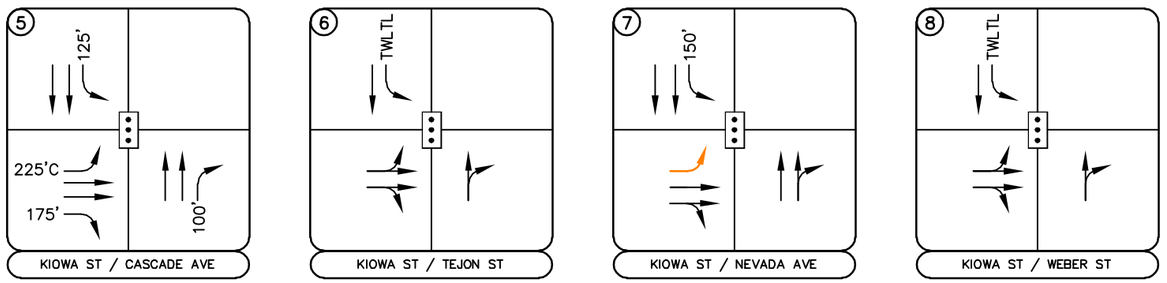






LEGEND
- X — Study Area Key Intersection
- Signalized Intersection
- STOP — Stop Controlled Approach
- 100' — Turn Lane Length (feet)
- Recommendation

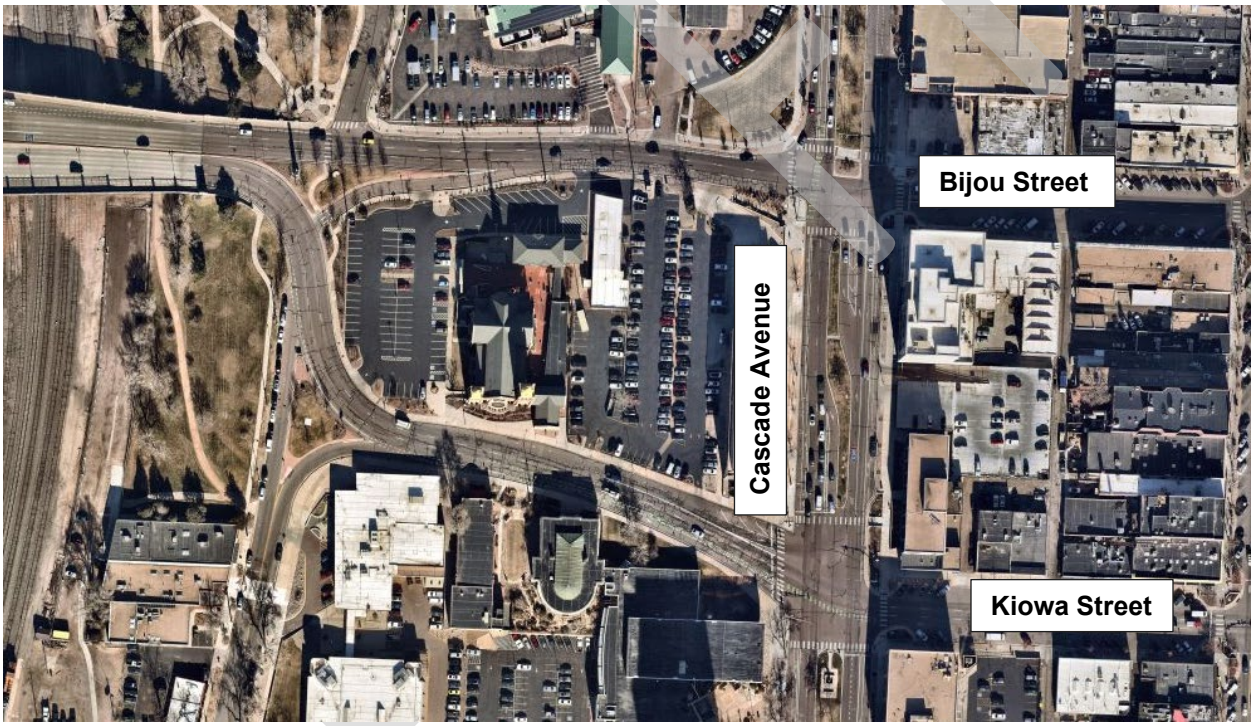
PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
BIJOU/KIOWA 2045 POSSIBLE IMPROVEMENTS

FIGURE 18

Kimley»Horn

6.1.3 I-25 Connection to Platte Avenue

Currently, the northern downtown area of Colorado Springs is accessed from I-25 at Bijou Street. Bijou Street and Kiowa Street are one-way couplets within Downtown Colorado Springs with Bijou Street being one-way westbound and Kiowa Street, the roadway one block to the south, being one-way eastbound. Since Platte Avenue is one block north of Bijou Street, which provides westbound flow to connect to I-25, a connection from Platte Avenue to I-25 is provided via one block southbound travel route between Platte Avenue and Bijou Street. Much of this traffic likely uses Cascade Avenue southbound to connect to Bijou Street. However, to also provide a more efficient connection from I-25 to Platte Avenue, geometry modifications at the Bijou Street and Cascade Avenue intersection were considered. The existing Bijou Street configuration and Bijou Street/Cascade Avenue intersection are shown on the following aerial photograph.



Westbound Bijou Street on the approach to Cascade Avenue includes a left turn lane and two through lanes. Likewise, dual left turn lanes from northbound Cascade Avenue to westbound Bijou Street are provided. Therefore, only two westbound receiving lanes are needed along Bijou Street from the Cascade Avenue intersection, but there are three through receiving lanes provided. A single eastbound approach could be considered then for Bijou Street to Cascade Avenue. This travel path would provide a more efficient connection to Platte Avenue instead of drivers being diverted southward onto Kiowa Street and then needing to travel northbound two

blocks to access Platte Avenue. If this single lane eastbound Bijou Street connection to Cascade Avenue were provided, the eastbound lane would need to travel south of a new separate westbound left turn lane for access to Sierra Madre Street in the western one-way diverging location. It is believed that the configuration could be accommodated, however much of the existing triangle shaped median island in the Bijou Street eastbound reroute would need to be modified. An operational analysis was performed with a single eastbound left turn/right turn lane at the Bijou Street/Cascade Avenue intersection. It was found that the overall intersection would operate acceptably with existing traffic volumes. If 2045 volumes are realized, then triple northbound left turn lanes may be needed at Bijou Street/Cascade Avenue intersection with the eastbound approach lane. If this occurs, then this option may no longer be feasible as widening of Bijou Street would be required. **Table 7** summarizes the LOS for the existing signal timing and geometry at the two affected intersections.

Table 7 – Bijou/Kiowa at Cascade LOS Table

Intersection	Movement	Control	2022 Existing		2022 w/ Imp		2045 w/o Imp		2045 w/ Imp	
			AM Peak Hour LOS (Delay)	PM Peak Hour LOS (Delay)	AM Peak Hour LOS (Delay	PM Peak Hour LOS (Delay	AM Peak Hour LOS (Delay	PM Peak Hour LOS (Delay	AM Peak Hour LOS (Delay)	PM Peak Hour LOS (Delay)
Bijou St & Cascade Ave (#32)	Overall		**21.4 C**	**29.2 C**	**36.6 D**	**50.2 D**	**22.4 C**	**48.8 D**	**38.8 D**	**51.1 D**
	Eastbound Approach				66.4 E	76.8 E			73.0 E	70.3 E
	Westbound Approach		52.0 D	48.7 D	50.6 D	47.8 D	49.1 D	54.7 D	47.7 D	52.9 D
	Northbound Approach		14.6 B	22.8 C	34.8 C	53.4 D	14.5 B	34.8 C	41.1 D	58.2 E
	Southbound Approach		7.9 A	19.5 B	18.7 B	42.5 D	12.0 B	57.5 E	19.6 B	36.0 D
Kiowa St & Cascade Ave (#33)	Overall		**26.2 C**	**23.7 C**	**25.1 C**	**19.1 B**	**24.4 C**	**23.8 C**	**23.6 C**	**19.9 B**
	Eastbound Approach		33.0 C	43.2 D	29.2 C	37.8 D	29.4 C	38.2 D	25.9 C	33.7 C
	Northbound Approach		11.8 B	6.8 A	14.1 B	8.6 A	15.5 B	11.4 B	18.2 B	13.4 B
	Southbound Approach		5.3 A	3.4 A	17.4 B	1.3 A	7.7 A	8.8 A	18.9 B	4.8 A

6.1.4 Platte Avenue and Nevada Roundabout

The intersection of Platte Avenue and Nevada Avenue (#3) currently operates as a signalized intersection with a statue of General William Jackson Palmer centered in the middle. The statue location causes drivers wishing to turn left to drive past the statue to make a left turn, which is an unorthodox and more difficult maneuver. The aerial below illustrates the existing intersection configuration, with Platte Avenue as the east-west street, and Nevada Avenue as the north-south street with North being up (typical).

Platte Avenue and Nevada Avenue Intersection

It is believed that a safer intersection configuration would be to restrict left turns at the intersection and force those drivers to turn left at other adjacent intersections within the street grid, or that a roundabout be constructed with the statue placed in the middle of the center circulating island. As a roundabout, drivers would have more simple left turns circulating around the statue within a roundabout center circular island. With a roundabout and single-lane eastbound and westbound approach and two-lane approaches on north-south Nevada Avenue, the intersection would operate at LOS A during the morning peak hour and at LOS C during the afternoon peak hour. Due to the high number and concentration of pedestrian crossings at this intersection, especially with Palmer High School located on the northeast corner, signalized crosswalks on each leg of the roundabout intersection could be installed. These signalized crosswalks could operate with an exclusive pedestrian phase to control traffic entering the roundabout and concentrate pedestrian movements to single crossing times so that the roundabout can operate without pedestrian interruptions until the exclusive signalized

pedestrian crossing phase is activated. This exclusive pedestrian phase could also be implemented to provide a pedestrian crossing into the center of the roundabout if desired so that people could visit the statue. If the City is interested in further exploring operations of a roundabout with an exclusive pedestrian crossing signal phase, additional study is recommended (likely with a Vissim evaluation prepared to model the operations of the roundabout with an exclusive pedestrian signalized crossing phase).

By 2045, it was found that the east-west approaches of Platte Avenue may need to provide two lane entries to accommodate future traffic volumes if projections are realized. Since the single eastbound and westbound approaches of Platte Avenue appear to work acceptably in the short-term horizon, a roundabout of this configuration could be first installed, and future traffic volumes could continue to be monitored. It is possible that the future traffic volume growth projections won't be realized, or that drivers will adjust and reroute on the surrounding street network as needed if delays increase at the roundabout intersection. It is believed that the surrounding street network is adequate to accommodate additional east/west traffic volume if reroute traffic movements occur. Otherwise, the left turn restrictions at the intersection could be considered to improve the safety and operations of the intersection. **Table 8** summarizes the level of service for the roundabout control intersection.

Table 8 – Platte Avenue & Nevada Avenue Roundabout LOS Table

Intersection	Movement	Control	2022 1 Lane E/W vs 2 Lane N/S		2045 2 Lane E/W vs 2 Lane N/S	
			AM Peak Hour LOS (Delay)	PM Peak Hour LOS (Delay)	AM Peak Hour LOS (Delay)	PM Peak Hour LOS (Delay)
Platte Ave & Nevada Ave (#3)	Overall		**8.4 A**	**15.6 C**	**10.3 B**	**25.0 C**
	Northbound Approach		5.2 A	8.3 A	7.2 A	18.5 C
	Westbound Approach		13.9 B	35.4 E	12.9 B	32.5 D
	Southbound Approach		6.7 A	9.6 A	12.1 B	31.1 D
	Eastbound Approach		6.7 A	13.5 B	10.3 B	15.0 B

6.2 Central Corridor

6.2.1 Boulder Street and Platte Avenue One-Way Couplet Analysis

A further traffic analysis was completed for Platte Avenue and Boulder Street with these two roadways serving as a one-way couplet between Wahsatch Avenue and the intersection of Platte Avenue/Boulder Street (#10). This alternative was considered to possibly improve operations of the Platte Avenue and Union Boulevard (#8) intersection, which was found to operate with long delays and poor LOS in 2045 with the existing intersection configuration. Likewise, the other intersections along the corridor may benefit, and the additional street space can be used for multimodal enhancements. Platte Avenue would serve as the eastbound roadway, while Boulder Street would serve as the westbound roadway, as this directional configuration is most compatible with the existing Platte Avenue and Boulder Street intersection to the east.

Figure 19 illustrates the 2022 traffic volumes with the necessary reroute of traffic movements with Boulder Street operating as one-way westbound and Platte Avenue operating as one-way eastbound, while **Figure 20** illustrates the 2045 traffic volumes.

Table 9 summarizes the existing and 2045 horizon operational LOS analysis at the signalized intersections along these two corridors. Of note, the signal timing including the cycle length, yellow and all-red timing, and the control type have all remained the same from the existing signal timing sheets provided by the City of Colorado Springs. As shown in **Table 9**, the intersections along the Boulder Street and Platte Avenue corridors are anticipated to operate acceptably with two through lanes and shared turn lanes with exception of two (2) intersections where separate turn lanes are recommended in the 2022 traffic volume condition.

Table 9 – One-Way Couplet LOS Table

Intersection	Movement	Control	2022 One-Way		2045 One-Way	
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
Platte Ave & Wahsatch Ave (#5)	Overall		**11.3 B**	**21.4 C**	**15.0 B**	**45.5 D**
	Eastbound Approach		34.8 C	54.1 D	54.9 D	67.3 E
	Northbound Approach		10.8 B	16.5 B	15.7 B	33.5 C
	Southbound Approach		4.5 A	3.8 A	2.1 A	39.5 D

Intersection	Movement	Control	2022 One-Way		2045 One-Way	
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
Platte Ave & Institute St (#6)	Overall		**10.0 A**	**12.5 B**	**10.9 B**	**16.9 B**
	Eastbound Approach		2.7 A	5.1 A	4.4 A	10.7 B
	Northbound Approach		66.1 E	64.6 E	63.2 E	65.8 E
	Southbound Approach		64.1 E	59.9 E	62.1 E	56.7 E
Platte Ave & Hancock Ave (#7)	Overall		**36.6 D**	**41.7 D**	**45.0 D**	**53.7 D**
	Eastbound Approach		29.2 C	39.7 D	42.1 D	56.2 E
	Northbound Approach		47.2 D	40.0 D	43.9 D	37.8 D
	Southbound Approach		55.7 E	49.5 D	55.8 E	54.0 D
Platte Ave & Union Blvd (#8)	Overall		**46.2 D**	**41.1 D**	**45.6 D**	**44.9 D**
	Eastbound Approach		40.5 D	45.5 D	51.1 D	42.4 D
	Northbound Approach		53.4 D	52.8 D	51.1 D	66.8 E
	Southbound Approach		48.0 D	17.1 B	29.9 C	21.8 C
Platte Ave & Platte Pl (#9)	Overall		**0.1 A**	**1.7 A**	**17.5 B**	**5.5 A**
	Eastbound Approach		0.1 A	0.4 A	14.6 B	1.6 A
	Northbound Approach		0.0 A	65.9 E	64.9 E	64.0 E
Platte Ave & Platte Pl (#9)	Northbound Right		9.3 A	11.1 B	10.4 B	17.5 C
Platte Ave & Boulder St (#10)	Overall		**4.5 A**	**4.0 A**	**7.0 A**	**11.7 B**
	Eastbound Approach		3.0 A	1.3 A	1.1 A	12.8 B
	Westbound Approach		3.1 A	2.8 A	8.7 A	6.6 A
	Northbound Approach		66.1 E	69.0 E	68.5 E	64.5 E
Boulder St & Wahsatch Ave (#24)	Overall		**24.2 C**	**21.7 C**	**35.5 D**	**53.3 D**
	Eastbound Approach		18.6 B	5.8 A	13.7 B	17.7 B
	Westbound Approach		28.0 C	27.8 C	43.3 D	75.4 E
	Northbound Approach		15.7 B	13.7 B	14.5 B	34.3 C
	Southbound Approach		20.0 C	21.2 C	29.1 C	26.9 C

Intersection	Movement	Control	2022 One-Way		2045 One-Way	
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
Boulder St & Institute St (#25)	Overall		**15.8 B**	**22.1 C**	**30.0 C**	**20.8 C**
	Westbound Approach		14.5 B	21.1 C	29.7 C	19.7 B
	Northbound Approach		32.4 C	31.6 C	32.0 C	32.9 C
	Southbound Approach		37.4 D	32.3 C	33.8 C	30.7 C
Boulder St & Hancock Ave (#26)	Overall		**33.7 C**	**33.6 C**	**36.0 D**	**37.5 D**
	Westbound Approach		31.0 C	30.3 C	34.3 C	35.1 D
	Northbound Approach		48.0 D	47.8 D	45.0 D	51.5 D
	Southbound Approach		49.4 D	48.7 D	47.2 D	46.2 D
Boulder St & Children's View (#27)	Overall		**19.7 B**	**26.2 C**	**31.1 C**	**31.2 C**
	Westbound Approach		14.5 B	18.7 B	26.0 C	24.6 C
	Northbound Approach		0.0 A	34.2 C	0.0 A	30.8 C
	Southbound Approach		59.1 E	57.8 E	70.6 E	65.7 E
Boulder St & Union Blvd (#28)	Overall		**38.9 D**	**23.9 C**	**49.3 D**	**29.0 C**
	Westbound Approach		53.3 D	49.1 D	55.1 E	44.7 D
	Northbound Approach		30.8 C	2.4 A	28.6 C	5.5 A
	Southbound Approach		28.4 C	21.1 C	69.1 E	39.9 D

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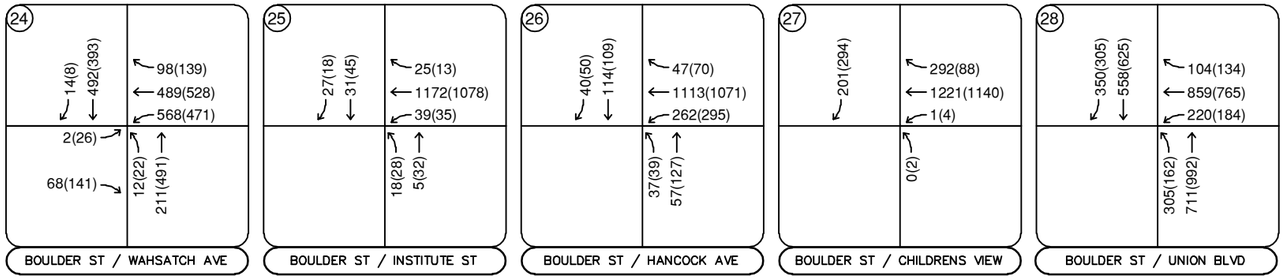

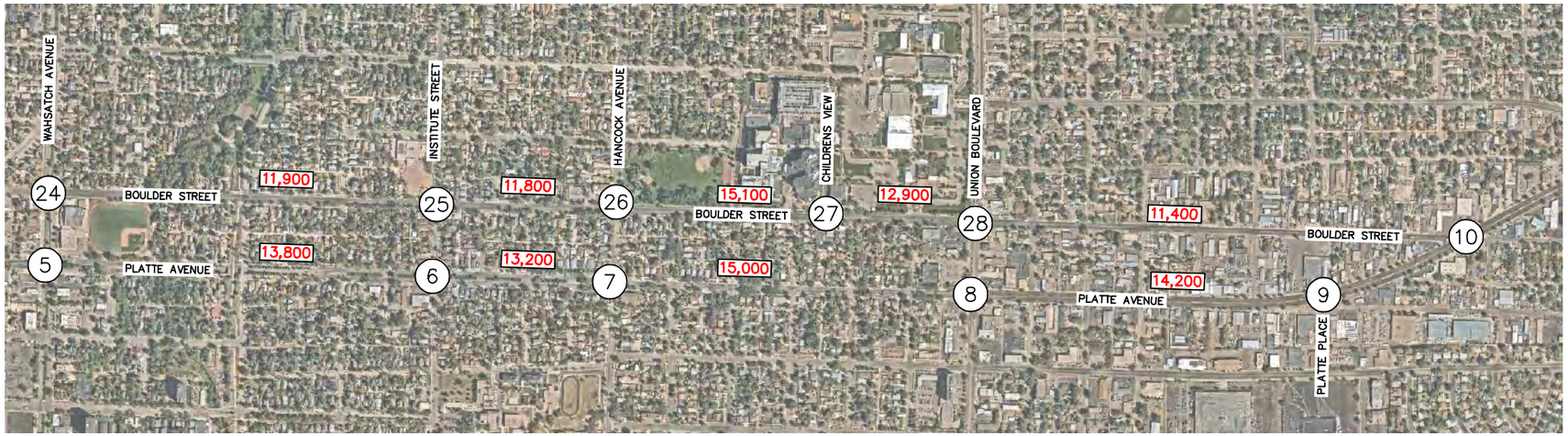

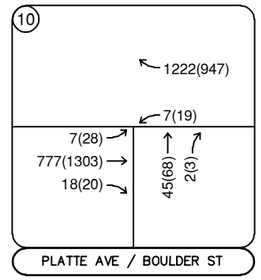

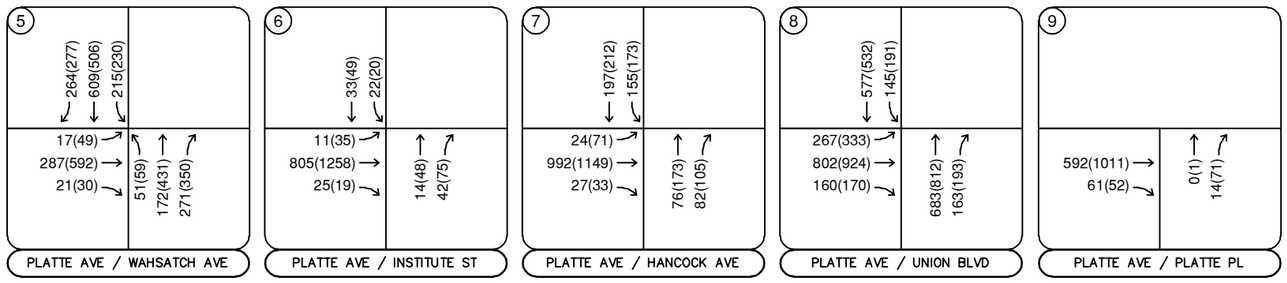

LEGEND

(X) Study Area Key Intersection

XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes

XX,XX0 Estimated Daily Traffic Volume

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COLORADO SPRINGS, COLORADO
2022 ONE-WAY COUPLET TRAFFIC VOLUMES

FIGURE 19

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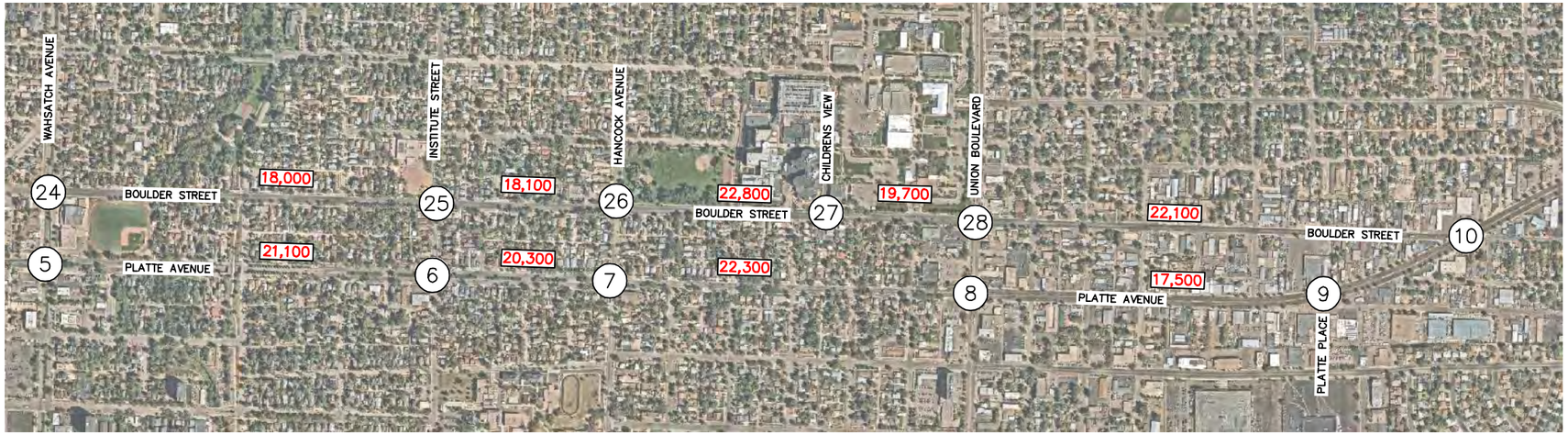

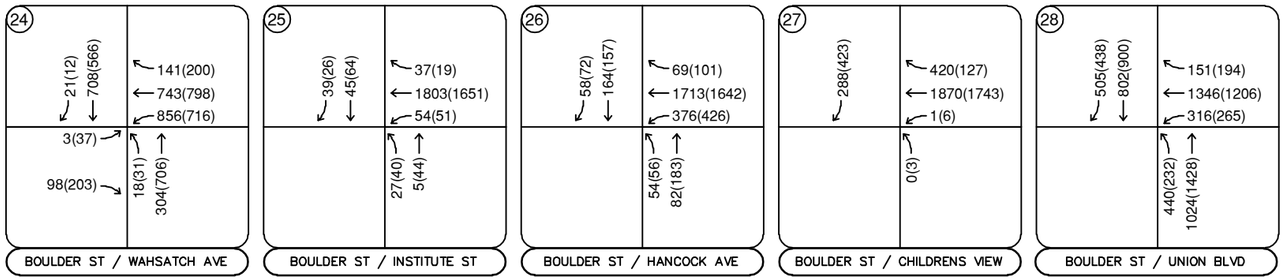

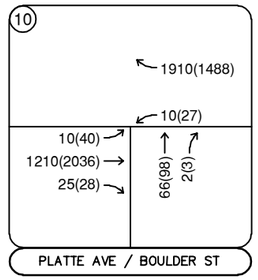

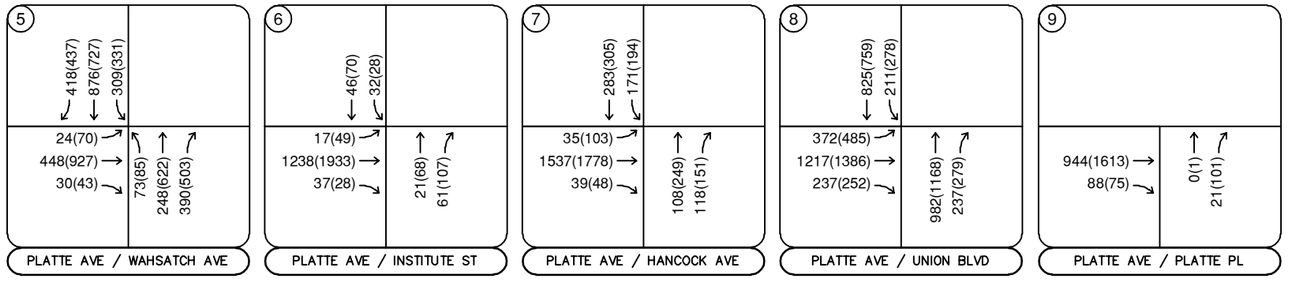

LEGEND

(X) Study Area Key Intersection

XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes

XX,XX0 Estimated Daily Traffic Volume

NORTH
NTS 096998001

PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
2045 ONE-WAY COUPLET TRAFFIC VOLUMES

FIGURE 20

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2022 Operations for One-Way Couplet

The intersection of Platte Avenue and Union Boulevard (#8) would keep the exclusive eastbound left turn lane for the existing 2022 condition with conversion to one-way flow. With the one-way couplet, the signalized intersection of Platte Avenue and Platte Place (#9) can be converted to stop-control along Platte Place. In addition, the intersection of Platte Avenue and Boulder Street (#10) will need to be reconfigured to accommodate the Boulder Street and Platte Avenue one-way conversion. Therefore, the southwest approach of Platte Avenue would provide two right turn lanes onto Boulder Street (one-way westbound) and a left turn lane. The intersection of Boulder Street/Wahsatch Avenue (#24) would provide dual westbound left turn lanes with the one-way conversion. The intersection of Boulder Street/Hancock Avenue (#26) would keep the exclusive westbound left turn lane.

2045 Operations for One-Way Couplet

If 2045 volumes are realized, a separate eastbound left turn lane at the Platte Avenue/Hancock Avenue (#7) intersection may be needed. In addition, dual southbound left turn lanes and a separate eastbound right turn lane may be needed at the Platte Avenue/Union Boulevard (#8) intersection. An exclusive westbound right turn lane may also be needed at the Boulder Street/Union Boulevard (#28) intersection if 2045 traffic volumes are realized. **Figure 21** and **Figure 22** illustrate the appropriate roadway geometry along Boulder Street and Platte Avenue under the one-way couplet conversion for existing and future 2045 traffic volume conditions, respectively.

Table 10 summarizes the existing and future average daily traffic volumes (ADT) under the existing two-way configuration along Platte Avenue and Boulder Street and the proposed one-way couplet.

Table 10 – One-Way Couplet ADT Comparison

Roadway Segment	Two-Way 2022	Two-Way 2045	One-Way 2022	One-Way 2045
Platte Avenue				
Wahsatch Avenue to Institute Street	15,700	24,600	13,800	21,100
Institute Street to Hancock Avenue	16,100	25,500	13,200	20,300
Hancock Avenue to Union Boulevard	16,900	26,700	15,000	22,300
Union Boulevard to Boulder Street	19,100	30,100	14,200	22,100
Boulder Street				
Wahsatch Avenue to Institute Street	10,000	14,500	11,900	18,000
Institute Street to Hancock Avenue	8,900	12,800	11,800	18,100
Hancock Avenue to Childrens View	10,800	15,500	15,100	22,800
Childrens View to Union Boulevard	11,800	16,900	12,900	19,700
Union Boulevard to Platte Avenue	7,200	10,400	11,400	17,500

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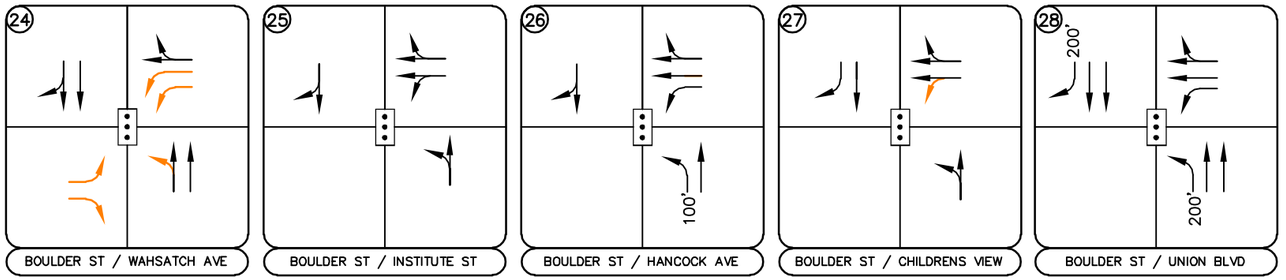

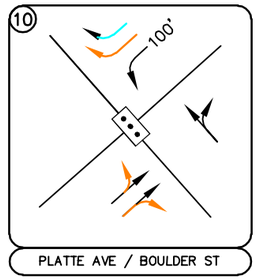

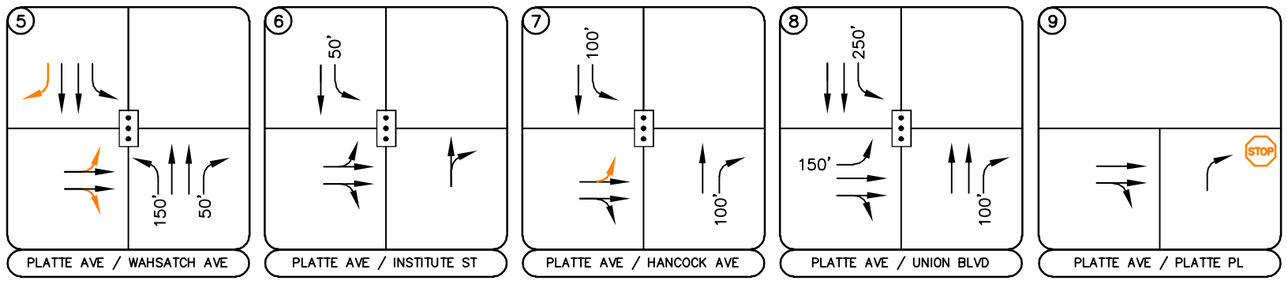

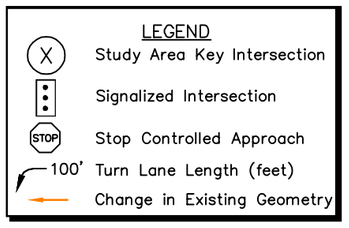

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COLORADO SPRINGS, COLORADO
2022 ONE-WAY COUPLET POSSIBLE IMPROVEMENTS

FIGURE 21

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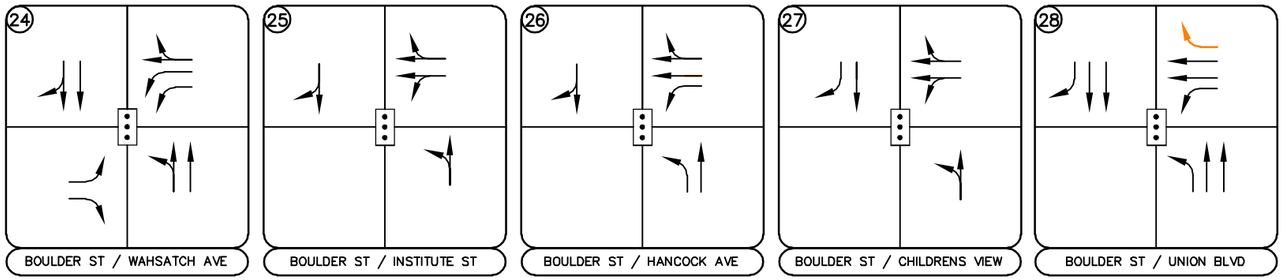

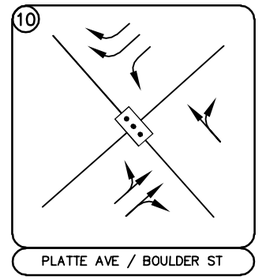

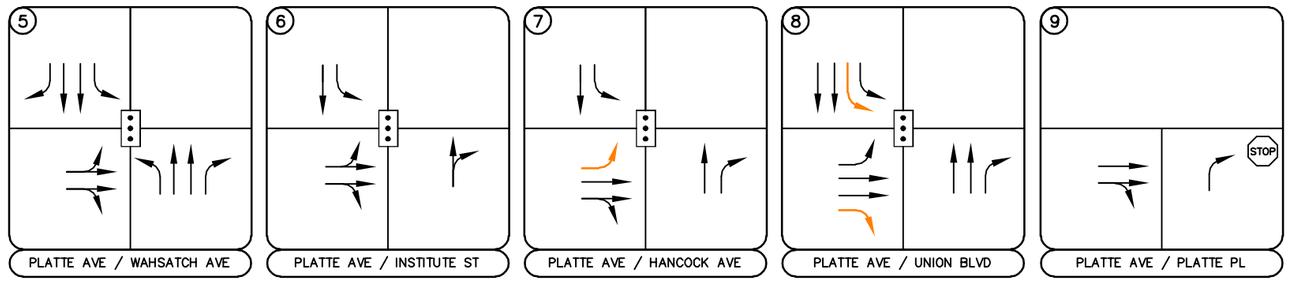

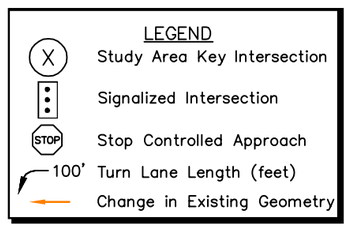

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PLATTE AVENUE CORRIDOR STUDY
COLORADO SPRINGS, COLORADO
2045 ONE-WAY COUPLET POSSIBLE IMPROVEMENTS

FIGURE 22

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6.2.2 Boulder Street Lane Reduction

Upon review of existing traffic volumes along Boulder Street, it is apparent that the existing street network could likely allow Boulder Street to provide just a single through lane in each direction if desired. **Table 11** summarizes the results of the level of service (LOS) analysis and provides lane configuration guidance if Boulder Street did reduce to one through lane in each direction from Wahsatch Avenue to Platte Avenue.

For the existing conditions, the study intersections along Boulder Street between Wahsatch Avenue to Platte Avenue will operate acceptably with one eastbound and westbound through lane shared with the left and right turn movement. Although at signalized intersections, separate left turn lanes improve the efficiency of operations and should be considered if possible. **Figure 23** illustrates the recommended geometry for the existing conditions. If 2045 volumes are realized, an exclusive eastbound left turn lane may be needed at the Boulder Street/Childrens View (#27) intersection. **Figure 24** illustrates the identified geometry needs for the long-term 2045 horizon.

Table 11 – Boulder Street Road Diet LOS Table

Intersection	Movement	Control	2022 One-Lane		2045 One Lane	
			AM	PM	AM	PM
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
Boulder St & Wahsatch Ave (#24)	Overall		**22.1 C**	**16.0 B**	**24.1 C**	**18.4 B**
	Eastbound Approach		10.7 B	15.8 B	2.6 A	2.0 A
	Westbound Approach		40.2 D	41.3 D	38.3 D	39.1 D
	Northbound Approach		13.5 B	0.3 A	15.0 B	6.8 A
	Southbound Approach		14.8 B	11.7 B	23.2 C	24.1 C
Boulder St & Institute St (#25)	Overall		**6.1 A**	**6.1 A**	**6.8 A**	**7.4 A**
	Eastbound Approach		2.8 A	3.2 A	3.5 A	4.9 A
	Westbound Approach		3.3 A	2.9 A	4.2 A	3.9 A
	Northbound Approach		31.5 C	32.8 C	30.8 C	33.8 C
	Southbound Approach		33.0 C	32.8 C	32.5 C	31.9 C

Intersection	Movement	Control	2022 One-Lane		2045 One Lane	
			AM	PM	AM	PM
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
Boulder St & Hancock Ave (#26)	Overall		**13.0 B**	**13.5 B**	**13.0 B**	**14.7 B**
	Eastbound Approach		3.9 A	3.6 A	5.0 A	6.3 A
	Westbound Approach		1.2 A	1.1 A	1.2 A	3.5 A
	Northbound Approach		47.7 D	49.8 D	46.2 D	46.4 D
	Southbound Approach		53.5 D	52.4 D	52.2 D	49.5 D
Boulder St & Children's View (#27)	**Overall**		**13.8 B**	**17.6 B**	**19.8 B**	**18.7 B**
	Eastbound Approach		1.4 A	1.3 A	9.0 A	1.6 A
	Westbound Approach		7.1 A	14.9 B	14.9 B	16.4 B
	Northbound Approach		40.6 D	31.5 C	36.1 D	29.5 C
	Southbound Approach		47.6 D	41.4 D	47.3 D	43.1 D
Boulder St & Union Blvd (#28)	**Overall**		**25.0 C**	**38.9 D**	**46.2 D**	**41.0 D**
	Eastbound Approach		47.1 D	49.5 D	45.6 D	56.6 E
	Westbound Approach		61.5 E	68.0 E	67.7 E	75.9 E
	Northbound Approach		3.0 A	39.7 D	47.9 D	24.3 C
	Southbound Approach		21.6 C	21.1 C	35.6 D	36.1 D

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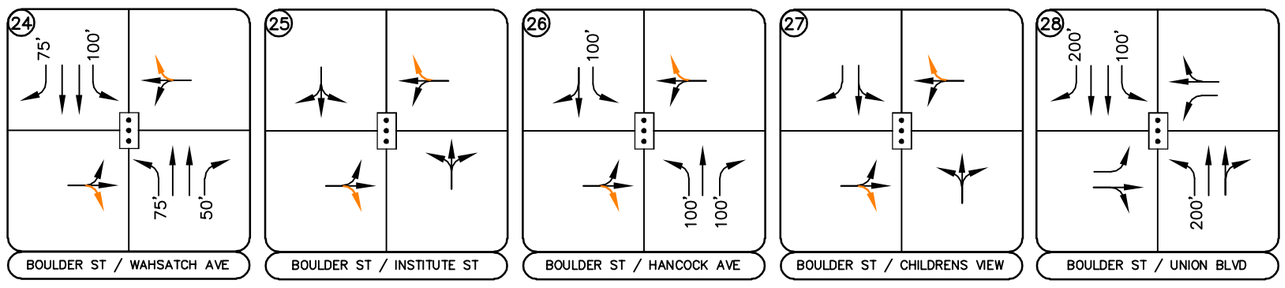

LEGEND
- X — Study Area Key Intersection
- Signalized Intersection
- STOP — Stop Controlled Approach
- 100' — Turn Lane Length (feet)
- Change in Existing Geometry

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2022 BOULDER STREET ROAD DIET POSSIBLE IMPROVEMENTS

FIGURE 23

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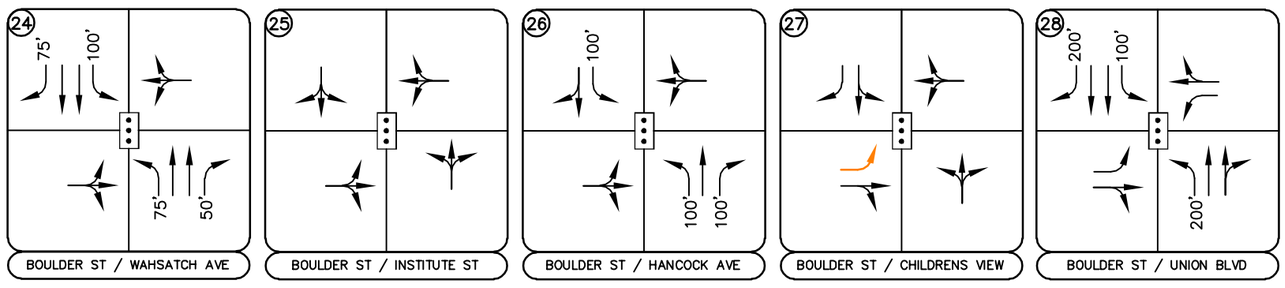

LEGEND
- Study Area Key Intersection
- Signalized Intersection
- Stop Controlled Approach
- 100' Turn Lane Length (feet)
- Change in Existing Geometry

PLATTE AVENUE CORRIDOR STUDY
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2045 BOULDER STREET ROAD DIET POSSIBLE IMPROVEMENTS

FIGURE 24

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6.3 Eastern Reaches Character Area

6.3.1 Platte Avenue and Academy Quadrant Intersection

Currently, Platte Avenue provides interchange on and off-ramps to Academy Boulevard. Two conceptual designs were developed to remove the interchange ramps based on the following conceptual schematics:

- Ultimate scenario that would place quadrant roads in all four quadrants and add three (3) new signalized intersections
- Initial partial scenario that would place quadrant roads along Platte Avenue and connect them to Academy Boulevard.

Traffic volumes were estimated for the future traffic anticipated to be re-routed to these two schematics. The following discussion includes the requirements of each scenario.

For the ultimate conceptual schematic, the intersections would be anticipated to operate acceptably with this conversion. However, Platte Avenue was found to require three through lanes westbound with these new traffic signals along Platte Avenue. But this is no different than the 2045 horizon analysis previously prepared where it was identified that the traffic volumes along Platte Avenue may require three through lanes in each direction through this area with the existing interchange configuration. Three through lanes along Platte Avenue under the Academy Boulevard bridge may not be feasible due to the narrow column spacing width. Therefore, the incremental right-in/right-out or three-quarter movement access intersections may be a preferred interim condition with the ultimate geometry being signalized intersections in those locations with a new Academy Boulevard bridge if and when Platte Avenue needs to be reconstructed as a six-lane roadway. The identified configuration is shown on **Figure 25**.

For the incremental conceptual schematic, the intersections are anticipated to operate acceptably with this conversion. In this scenario, the Platte Avenue intersections with restricted right-in/right-out movements work very well. If possible, both of these access intersections could be considered with three-quarter movements to improve accessibility and lessen the reroute. The geometry for the recommended configuration is also shown on **Figure 25** with the anticipated signalized intersections along Academy Boulevard.

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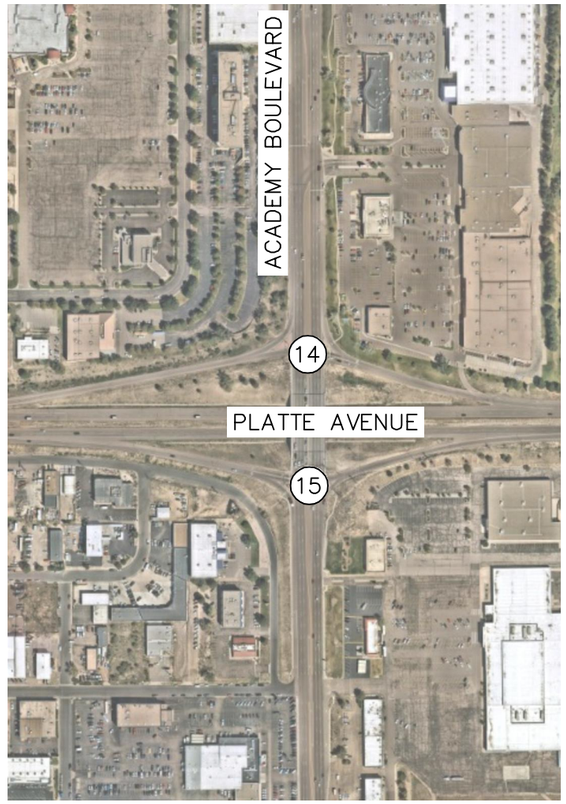
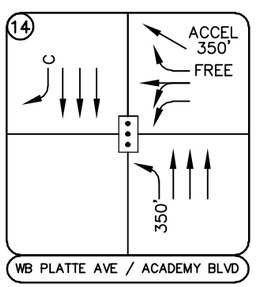
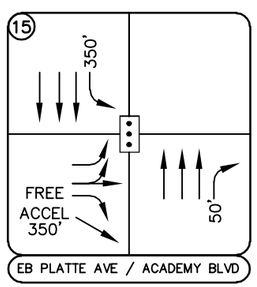
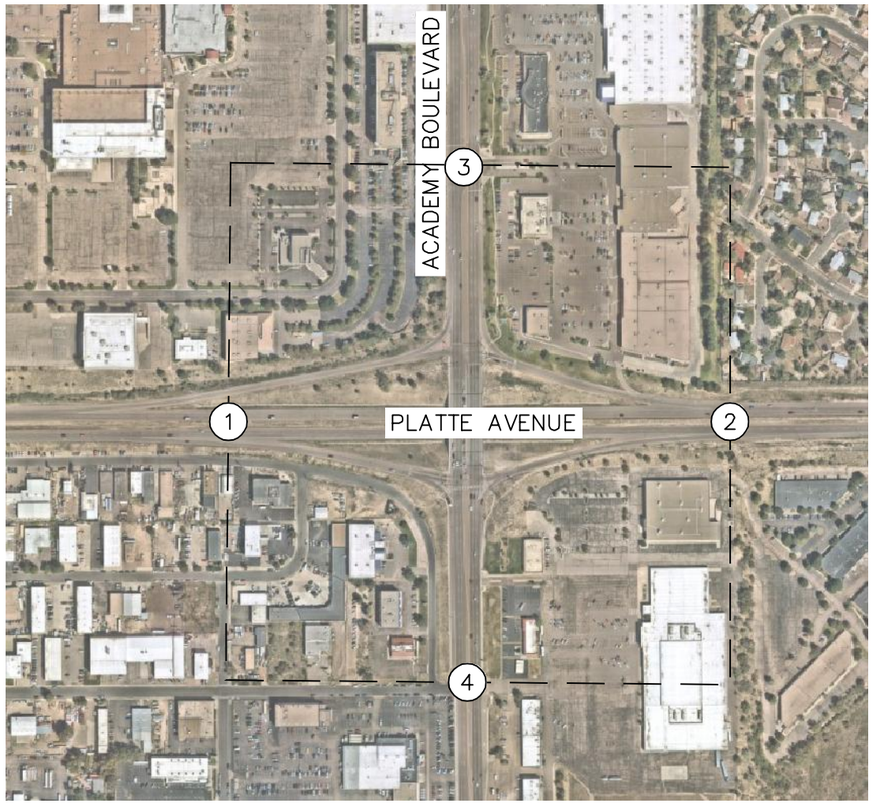
EXISTING

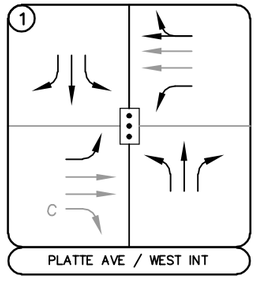


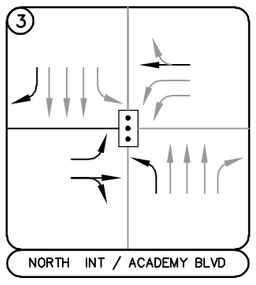


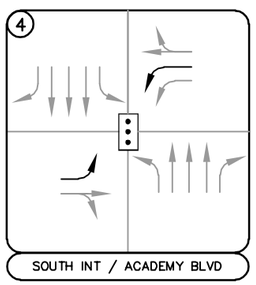


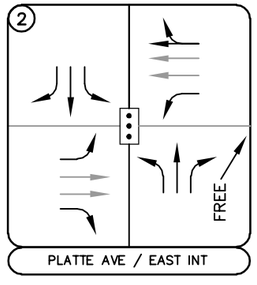
ULTIMATE











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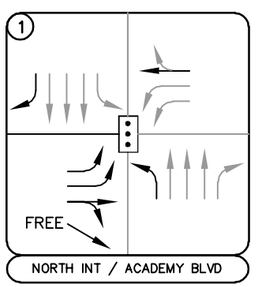

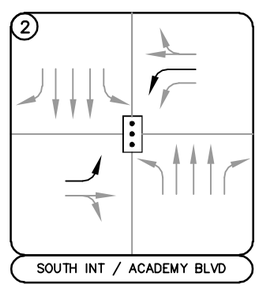

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PLATTE AVENUE & ACADEMY QUADRANT

FIGURE 25

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6.3.2 Removal or Relocation of Frontage Roads Along Platte Avenue

There are two half-mile long frontage road segments along Platte Avenue that are recommended to be relocated or removed and consolidated in standard access locations due to traffic issues caused from Frontage Road intersections near Platte Avenue. Removal of the adjacent Frontage Road intersections would improve operations and safety along the Platte Avenue Corridor. The western Frontage Road segment between Murray Boulevard (western north/south roadway in photo) and Wooten Road (eastern north/south roadway in photo) is shown on the following aerial photograph.

Platte Avenue between Murray Boulevard (west) and Wooten Road (east)

The frontage road that runs along north side of Platte Avenue in this area is named Edison Avenue and the Frontage Road running along the south side of Platte Avenue is the Platte Avenue Service Road. Both the north and south Frontage Roads have right-in/right-out intersections with Murray Boulevard, with Edison Avenue being 50 feet away (measured edge to edge) and South Platte Avenue Service Road being 75 feet away (also measured edge to edge). Relocation of these frontage road intersections would be recommended if redevelopment occurs on the northeast and southeast corners of the Platte Avenue/Murray Boulevard

intersection. Otherwise, the City could consider removal of these Frontage Road intersections with direct access to the area provided from a new intersection along Platte Avenue at a quarter-mile spacing, with possible signalized full turning movements or three-quarter turning movements with left turns from Platte Avenue allowed but left turns to Platte Avenue restricted. In addition, the Edison Avenue north frontage road eastern connection at Wooten Road provides full turning movements, only 50 feet north of Platte Avenue. This frontage road intersection should be relocated to align with the newly realigned frontage road on the east side of Wooten Road if redevelopment occurs or removed with a cul-de-sac with alternate access to Platte Avenue provided.

In addition, there are frontage roads along both sides of Platte Avenue in the eastern section between Wooten Road on the west and Babcock Road on the east. This section of the Frontage Roads is shown on the following aerial photo.

Platte Avenue between Wooten Road (west) and Space Center Drive (east)

As previously noted, the northern Edison Street frontage road intersection along Wooten Road has already been relocated further to the north with the gas station recently constructed on the northeast corner of the Platte Avenue/Wooten Road intersection. However, the southern Town Center Drive frontage road intersection with Wooten Road operates with full turning movements in close proximity to Platte Avenue with only about a 50-foot separation. This Town Center Drive south frontage road access should either be restricted to right-in/right-out movements only, be relocated to the south as redevelopment occurs on the southeast corner of the Platte Avenue/Wooten Street intersection, or be removed entirely with a cul-de-sac with alternate intersection access provided along Platte Avenue between Wooten Road and the proposed new

signalized intersection of Platte Avenue/Space Center Drive to the east (shown on the eastern edge of the aerial photograph). The most desirable option would be to create standard street network intersection(s) between Wooten Road and Space Center Drive as redevelopment occurs in the area so that the close proximity Frontage Road intersections could be removed.

6.3.3 Powers Boulevard Southbound Ramp (#18)

With the development of Patriot Park to the north of Platte Avenue along the Space Center Drive roadway, it is understood that the intersection of Platte Avenue and Space Center Drive will be signalized with full turning movements allowed. At the existing Platte Avenue/Space Center Drive intersection, the eastbound right turn is currently a forced right turn lane created from the acceleration lane for the southbound high-speed curve free right turn movement for the southbound Powers Boulevard off ramp at Platte Avenue (#18). An aerial photograph of Platte Avenue between Space Center Drive and Powers Boulevard (SH-21) Southbound Ramps is provided as follows.

Platte Avenue between Space Center Drive (west) and Powers Boulevard (SH-21) Ramps (east)

Based on signalization of the Space Center Drive intersection with only 900 feet of separation between the gore points of the intersections, it is recommended that the existing large radius high speed southbound right turn free movement from the Powers Boulevard southbound offramp be reconstructed as a standard tighter radius right turn lane at the Platte Avenue/Powers Boulevard Southbound Ramp signalized intersection to the east. This will improve the weaving conditions by providing approximately 300 feet of increased distance with the relocation and will reduce the offramp vehicle speed from off-ramp traffic. This will also provide a greater separation to the back of queue for the westbound approach to the future signalized Platte Avenue/Space Center Drive intersection to the west. An exclusive right turn lane is recommended to be provided at the Platte Avenue and Southbound SH-21 Ramp (#18) intersection with the existing southbound dual left turn lanes to remain. A free southbound right turn movement is still needed; however, it is recommended that it be reconstructed in the immediate signalized intersection area of the Platte Avenue and Powers Boulevard (SH-21) southbound right turn off ramp with a smaller radius to reduce the speed of traffic entering westbound Platte Avenue. This should be discussed with CDOT. When this occurs, the existing “EXIT 30 MPH” off ramp advisory speed sign for the southbound free right turn should be removed from the Powers Boulevard (SH-21) Southbound Off Ramp.

7.0 CONCLUSIONS

This transportation operations technical report has been prepared to document the findings of a vehicle operational analysis associated with the Platte Avenue Corridor as it extends from Cascade Avenue on the west to Powers Boulevard (SH-21) interchange on the east in Colorado Springs, Colorado. **This report is provided as information in support of alternative evaluation and selection within the Platte Avenue Corridor Study process. Possible improvements, analyses, and findings described in the report do not constitute study recommendations.** This report outlines the transportation study of vehicle operations of the existing 2022 and long-term 2045 planning horizons with the existing intersection configurations and control. In addition, analyses were conducted to understand the feasibility related to Platte Avenue and possible future improvements of different alternatives being considered. The following summary provides a brief discussion of each of these analyses.

7.1 Platte Avenue Corridor – Existing and Future Improvement Needs

The following provides the traffic operation improvement needs along Platte Avenue based on the existing configuration of the corridor. Optimized timing splits would improve operations of the Platte Avenue intersections with Circle Drive (#11) and Murray Boulevard (#16) to decrease overall and approach delays. Since these signalized intersections are actuated, it is likely that the timing splits are optimized real time with vehicle detection being provided. In addition to optimized timings splits, Platte Avenue/Circle Drive (#11) is recommended to provide northbound and southbound right turn overlap phasing.

Of note, the possible improvements at the Platte Avenue/Circle Drive intersection will likely build the intersection to the ultimate configuration without any additional intersection improvements thought to be feasible.

In 2045, other than ensuring that optimized timing splits are utilized at various signalized intersections along the corridor, improvements were noted on top of those identified in the existing conditions at the Platte Avenue intersections with Circle Drive (#11), Murray Boulevard (#16), and Wooten Road (#17) as follows.

<u>Platte Avenue & Circle Drive (#11)</u>

- Dual SB Left Turn Lanes
- Third NB Through Lane
- Separate WB Right Turn Lane with Overlap Right Turn Phasing

Platte Avenue & Murray Boulevard (#16)

- Third EB and WB Through Lane
- Dual WB Left Turn Lanes
- NB and SB Overlap Right Turn Phasing
- Remove the EB & WB Acceleration Lanes from NB & SB Rights (Due to Three EB & WB Through Lanes)

Platte Avenue & Wooten Road

- Convert EB Right Turn Lane to a Shared EB Through/Right Turn Lane (Three EB Through Lanes)
- Convert WB Right Turn Lane to a Shared WB Through/Right Turn Lane (Three WB Through Lanes)
- Remove the EB Acceleration Lane from NB Right (Due to Three EB Through Lanes)
- Remove the WB Acceleration Lane from SB Right (Due to Three WB Through Lanes)

Even with these improvements, the intersection of Platte Avenue/Circle Drive (#11) may operate at LOS E during the morning peak hour and LOS F during the afternoon peak hour. However, the existing configuration and previously identified possible improvements at the intersections will likely mean they are or will be built to the ultimate configuration without any additional intersection improvements thought to be feasible. Regional network improvements may otherwise be necessary if future traffic volume projections are realized.

7.2 Downtown Platte Avenue Lane Reduction

Platte Avenue can be reduced to provide a single through lane in each direction through the Downtown area of Colorado Springs without rerouting traffic to any adjacent streets. For the existing conditions, the study intersections between Cascade Avenue and Wahsatch Avenue along Platte Avenue will operate acceptably with a single eastbound and westbound through lane shared with the left and right turn movements. Although separate left turn lanes could be considered at the signalized intersections since these improve the efficiency of operations.

If 2045 volumes are realized, several left turn lane improvements may be needed with the lane reduction. The westbound Platte Avenue approach at Cascade Avenue (#1) may need to provide a separate left turn lane and a shared left turn/right turn lane. In addition, exclusive eastbound and westbound left turn lane may be needed at the Platte Avenue/Tejon Street (#2) intersection. In addition, a separate westbound left turn lane may be needed at the Platte Avenue/Weber Street (#4) intersection. As mentioned, left turn lanes improve efficiency of operations of the signalized intersections, so these left turn lanes could be considered for implementation if the through lane reduction improvements are provided.

7.3 Downtown Bijou/Kiowa Lane Reduction

The Bijou Street and Kiowa Street one-way couplet is anticipated to operate acceptably with two through lanes and shared turn lanes without a reroute of traffic volumes to any other adjacent streets. There are three intersections where separate turn lanes would be needed in addition to the two through lanes, with two of these being needed today and one being needed by the long-term 2045 horizon. The intersection of Bijou Street/Cascade Avenue is recommended to keep the existing geometry with the exclusive westbound left turn lane. Likewise, the Kiowa Street/Cascade Avenue intersection would keep the existing geometry with the exclusive eastbound left and right turn lanes. If 2045 volumes are realized, the intersection of Kiowa Street/Nevada Avenue may need to provide an exclusive eastbound left turn lane in addition to the two eastbound through lanes.

7.4 Improved I-25 Connection to and from Platte Avenue

Since Platte Avenue is one block north of Bijou Street, which provides westbound flow to connect to I-25, a connection from Platte Avenue to I-25 is provided via one block southbound travel route between Platte Avenue and Bijou Street. Much of this traffic likely uses Cascade Avenue southbound to connect to Bijou Street, and this connection is likely acceptable. However, to also provide a more efficient connection from Interstate 25 to Platte Avenue, consideration may be given to geometry modifications at the Bijou Street and Cascade Avenue intersection. Westbound Bijou Street on the approach to Cascade Avenue includes a left turn lane and two through lanes. Likewise, dual left turn lanes from northbound Cascade Avenue to westbound Bijou Street are provided. Therefore, only two westbound receiving lanes are needed along Bijou Street from the Cascade Avenue intersection, but three lanes are provided. A single eastbound approach could be considered then for Bijou Street to Cascade Avenue. This travel path would provide a more efficient connection to Platte Avenue instead of drivers being diverted southward onto Kiowa Street and then needing to travel northbound two blocks to access Platte Avenue. If this single lane eastbound Bijou Street connection to Cascade Avenue were provided, the eastbound lane would need to travel south of a new separate westbound left turn lane for access to Sierra Madre Street in the western one-way diverging location west of Cascade Avenue. It is believed that the configuration could be accommodated, however much of the existing triangle shaped median island in the Bijou Street eastbound reroute would need to be modified. The Bijou Street and Cascade Avenue intersection would operate acceptably with existing conditions with a new eastbound left turn lane. If 2045 volume are realized, then triple northbound left turn lanes may be needed at Bijou Street/Cascade

Avenue intersection with the eastbound approach. If this occurs, then this option may no longer be feasible as widening of Bijou Street would be required.

7.5 Platte Avenue/Nevada Avenue Roundabout

The Platte Avenue and Nevada Avenue intersection currently operates signalized with a statue of General William Jackson Palmer centered in the middle. The statue location causes drivers wishing to turn left to drive past the statue to make a left turn, which is an unorthodox and more difficult maneuver. It is believed that a safer intersection configuration would be to restrict left turns at the intersection and force those drivers to turn left at other adjacent intersections within the street grid, or that a roundabout be constructed with the statue placed in the middle of the center circulating island. As a roundabout, drivers would have more simple left turns circulating around the statue within a roundabout center circular island. With a roundabout and single-lane approaches on east/west Platte Avenue and two-lane approaches on north/south Nevada Avenue, the intersection would operate acceptably with existing traffic volumes. Due to the high number and concentration of pedestrian crossings at this intersection, especially with Palmer High School located on the northeast corner, signalized crosswalks on each leg of the roundabout intersection could be installed. These signalized crosswalks could operate with an exclusive pedestrian phase to control traffic entering the roundabout and concentrate pedestrian movements to single crossing times so that the roundabout can operate without pedestrian interruptions until the exclusive signalized pedestrian crossing phase is activated. This exclusive pedestrian phase could also be implemented to provide a pedestrian crossing into the center of the roundabout if desired so that people could visit the statue.

By 2045, it was found that the east/west approaches of Platte Avenue may need to provide two lane entries. However, a two-by-two roundabout can sometimes pose issues with crossing traffic movements circulating and crossing paths at exit points of the roundabout. Therefore, since the single eastbound and westbound approaches of Platte Avenue work acceptably in the short-term horizon, a roundabout of this configuration could be first installed, and future traffic volumes could continue to be monitored. It’s possible that the future traffic volume growth projections won’t be realized, or that drivers will adjust and reroute on the surrounding street network as needed if delays increase at the roundabout intersection. It is believed that the surrounding street network is adequate to accommodate additional east/west traffic volume if reroute traffic movements occur. Otherwise, the left turn restrictions at the intersection could be considered to improve the safety and operations of the intersection.

7.6 Platte Ave. and Boulder St. One-Way Couplet (Wahsatch Ave. to Platte Ave./Boulder St.)

A further traffic analysis was completed for Platte Avenue and Boulder Street with these roadways serving as a one-way couplet with two through lanes in each direction between Wahsatch Avenue and the intersection of Platte Avenue/Boulder Street. This alternative was considered to improve operations of the intersections along the corridor with the additional street space used for multi-modal enhancements. Platte Avenue is recommended to be the eastbound roadway while Boulder Street is recommended to be the westbound roadway, as this directional configuration works best at the existing Platte Avenue and Boulder Street intersection to the east. The intersections along the Boulder Street and Platte Avenue corridors are anticipated to operate acceptably with two through lanes and shared turn lanes with exception of the following four intersections where separate turn lanes are recommended for the 2022 existing conditions:

- Platte Avenue/Union Boulevard (#8) exclusive eastbound left turn lane
- Boulder Street/Wahsatch Avenue (#24) dual westbound left turn lanes (and one westbound through/right turn lane)
- Boulder Street/Hancock Avenue (#26) exclusive westbound left turn lane
- Boulder Street/Union Boulevard (#28) exclusive westbound left turn lane

Likewise, the signalized intersection of Platte Avenue/Platte Place (#9) can be converted to stop-control along northbound Platte Place. In addition, the intersection of Platte Avenue and Boulder Street will need to be reconfigured to accommodate the Boulder Street and Platte Avenue one-way conversion. Therefore, the southwest approach of Platte Avenue would provide two right turn lanes onto Boulder Street (one-way westbound) and a left turn lane.

If 2045 volumes are realized, a separate eastbound left turn lane at the Platte Avenue/Hancock Avenue (#7) intersection may be needed. In addition, dual southbound left turn lanes and a separate westbound right turn lane may be needed at the Platte Avenue/Union Boulevard (#8) intersection. Additionally, an exclusive westbound right turn lane may be needed at the Boulder Street/Wahsatch Avenue (#28) intersection if 2045 traffic volumes are realized.

7.7 Boulder Street Lane Reduction (Wahsatch Avenue to Platte Avenue/Boulder Street)

For the existing conditions, the study intersections along Boulder Street between Wahsatch Avenue and Platte Avenue will operate acceptably with one eastbound and westbound through lane shared with the left and right turn movements. Although, at signalized intersections, separate left turn lanes improve the efficiency of operations and should be considered if possible. If 2045 traffic volumes are realized, an exclusive eastbound left turn lane may be needed at the Boulder Street/Childrens View (#27) intersection.

7.8 Platte Avenue and Academy Boulevard Quadrant Intersection Improvements

Currently, Platte Avenue provides interchange on and off-ramps to Academy Boulevard. It is believed that this interchange could be removed for a more standard intersection configuration with a new street network to be considered when redevelopment occurs within the quadrants of the existing interchange. The initial implementation of right-in/right-out or three-quarter movement access intersections along Platte Avenue may be a preferred interim condition with the ultimate geometry being signalized intersections in those locations with a new Academy Boulevard bridge if and when Platte Avenue needs to be reconstructed as a six-lane roadway.

7.9 Platte Avenue Frontage Roads Removal or Relocation

There are two half-mile long frontage road segments along Platte Avenue that are recommended to be relocated or removed and consolidated in standard access locations due to traffic issues caused from Frontage Road intersections near Platte Avenue. Removal of the adjacent Frontage Road intersections would improve operations and safety along the Platte Avenue Corridor. The western Frontage Road segment between Murray Boulevard and Wooten Road is named Edison Avenue and the Frontage Road running along the south side of Platte Avenue is the Platte Avenue Service Road. Both the north and south Frontage Roads have right-in/right-out intersections with Murray Boulevard, with Edison Avenue being 50 feet away (measured edge to edge) and South Platte Avenue Service Road being 75 feet away (also measured edge to edge). Relocation of these frontage road intersections would be recommended if redevelopment occurs on the northeast and southeast corners of the Platte Avenue/Murray Boulevard intersection. Otherwise, the City could consider removal of these Frontage Road intersections with direct access to the area provided from a new intersection along Platte Avenue at a quarter-mile spacing, with possible signalized full turning movements

or three-quarter turning movements with left turns from Platte Avenue allowed but left turns to Platte Avenue restricted. In addition, the Edison Avenue north frontage road eastern connection at Wooten Road provides full turning movements, only 50 feet north of Platte Avenue. This frontage road intersection should be relocated to align with the newly realigned frontage road on the east side of Wooten Road if redevelopment occurs or removed with a cul-de-sac with alternate access to Platte Avenue provided.

In addition, there are frontage roads along both sides of Platte Avenue in the eastern section between Wooten Road on the west and Babcock Road on the east. The northern Edison Street frontage road intersection along Wooten Road has already been relocated further to the north with the gas station recently constructed on the northeast corner of the Platte Avenue/Wooten Road intersection. However, the southern Town Center Drive frontage road intersection with Wooten Road operates with full turning movements near Platte Avenue with only about a 50-foot separation. This Town Center Drive south frontage road access should either be restricted to right-in/right-out movements only, be relocated to the south as redevelopment occurs on the southeast corner of the Platte Avenue/Wooten Street intersection or be removed entirely with a cul-de-sac with alternate intersection access provided along Platte Avenue between Wooten Road and the proposed new signalized intersection of Platte Avenue/Space Center Drive to the east. The most desirable option would be to create standard street network intersection(s) between Wooten Road and Space Center Drive as redevelopment occurs in the area so that the proximity Frontage Road intersections could be removed.

7.10 Platte Avenue/Powers Boulevard High Speed Southbound Ramp

Based on signalization of the Platte Avenue/Space Center Drive intersection with only 900 feet of separation west of the gore point of the Platte Avenue and Powers Boulevard southbound right turn, it is recommended that the existing large radius high speed southbound right turn from the Powers Boulevard southbound offramp be reconstructed as a standard tighter radius right turn lane at the Platte Avenue/Powers Boulevard Southbound Ramp signalized intersection to the east. This will improve the weaving conditions by providing approximately 300 feet of increased distance with the relocation and will reduce the offramp vehicle speed from off-ramp traffic. This will also provide a greater separation to the back of queue for the westbound approach to the future signalized Platte Avenue/Space Center Drive intersection to the west. An exclusive right turn lane is recommended to be provided at the Platte Avenue and Southbound SH-21 Ramp intersection with the existing southbound dual left turn lanes to remain. A free

southbound right turn movement is still needed; however, it is recommended that it be reconstructed in the immediate signalized intersection area of the Platte Avenue and Powers Boulevard (SH-21) southbound right turn off ramp with a smaller radius to reduce the speed of traffic entering westbound Platte Avenue. When this occurs, the existing “EXIT 30 MPH” off ramp advisory speed sign for the southbound free right turn should be removed from the Powers Boulevard (SH-21) Southbound Off Ramp.

7.11 Summary of Improvements

Based on the analysis presented in this report, evaluation of the existing street network, the proposed alternative concepts, and expected traffic volumes resulted in the following possible improvements as shown in **Table 12** for the existing (2022) year and **Table 13** for the long-term 2045 horizon.

Table 12 – 2022 Possible Improvements

Potential Option	Improvements
Existing Network	**Platte Ave/Circle Dr (#11)** NB and SB Right Overlap Phasing
	Platte Ave/Southbound Powers Blvd Ramp (#18) Tighten SB Right Turn Radius to Reduce Vehicle Speed on SB Free Right
Platte Avenue Road Diet	**Platte Ave/Cascade Ave (#1)** WB One Lane Approach
	Platte Ave/Tejon St (#2) EB and WB One Lane Approach
	Platte Ave/Nevada Ave (#3) EB and WB One Lane Approach
	Platte Ave/Weber St (#4) EB and WB One Lane Approach
	Platte Ave/Wasatch Ave (#5) Two EB Throughs with Shared Turn Lanes Separate WB Left Turn Lane and Shared Through/Right
I-25 Connection to Platte Avenue	**Bijou St/Cascade Ave (#32)** Separate EB Left Turn Lane
Roundabout	**Platte Ave/Nevada Ave (#3)** Single Lane Approach on E/W Approaches Two Lane Approach on N/S Approaches
One-Way Couplet	**Platte Ave/Wasatch Ave (#5)** Two EB Throughs with Shared Turn Lanes Separate SB Right Turn Lane
	Platte Ave/Hancock Ave (#7) Two EB Throughs with Shared Turn Lanes
	Platte Ave/Platte Place (#9) Convert from Signal to Stop Control on the NB Approach
	Platte Ave/Boulder St (#10) Two EB Throughs with Shared Turn Lanes
	Boulder St/Wahsatch Ave (#24) Separate EB Left and Right Turn Lanes WB Dual Left Turn Lanes and Shared Through/Left Turn Lane
	Boulder St/Childrens View (#27) Shared WB Through/Left Turn Lane
Boulder Street Road Diet	**Boulder St/Wahsatch Ave (#24)** EB and WB One Lane Approach
	Boulder St/Institute St (#25) EB and WB One Lane Approach
	Boulder St/Hancock Ave (#26) EB and WB One Lane Approach
	Boulder St/Childrens View (#27) EB and WB One Lane Approach
	Boulder St/Union Blvd (#28) EB and WB One Lane Approach with Separate Left Turn Lanes

Table 13 – 2045 Possible Improvements

Potential Option	Improvements
Existing Network	**Platte Ave/Circle Dr (#11)** Third NB Through Lane Dual SB Left Turn Lanes Separate WB Right Turn Lane with Overlap Phasing May Need Additional Improvements Beyond Feasible
	Platte Ave/Murray Blvd (#16) Third EB and WB Through Lane Absorb EB & WB Acceleration Lanes NB and SB Right Overlap Phasing Dual WB Left Turn Lanes
	Platte Ave/Wooten Road (#17) Third EB and WB Through Lane Absorb EB & WB Right Turn Deceleration and Acceleration Lanes
Platte Avenue Road Diet	**Platte Ave/Cascade Ave (#1)** Dual WB Left Turn Lane with a Shared Right
	Platte Ave/Tejon St (#2) Separate EB and WB Left Turn Lanes
	Platte Ave/Weber St (#4) Separate WB Left Turn Lane
I-25 Connection to Platte Avenue	**Bijou St/Cascade Ave (#32)** Triple NB Left Turn Lanes Requiring Widening of Bijou Street
Roundabout	**Platte Ave/Nevada Ave (#3)** Two Lanes on All Four Approaches
One-Way Couplet	**Platte Ave/Hancock Ave (#7)** Separate EB Left Turn Lane
	Platte Ave/Union Blvd (#8) Separate EB Right Turn Lane Dual SB Left Turn Lanes
	Boulder St/Union Blvd (#28) Separate WB Right Turn Lane
Boulder Street Road Diet	**Boulder St/Childrens View (#27)** Separate EB Left Turn Lane

APPENDICES

To request a copy of the appendices to this report, please contact the City of Colorado Springs Department of Traffic and Transportation Engineering at 719-385-5908.

Appendix A

Intersection Count Sheets

Appendix B

COVID Adjustment Factor and Future Traffic Projections

Appendix C

Signal Timing Worksheets

Appendix D

Intersection Analysis Worksheets

Platte Avenue LOS

Boulder Street LOS

Platte Avenue Lane Reduction LOS

Bijou/Kiowa Lane Reduction LOS

Bijou/Kiowa & Cascade Avenue LOS

Platte Avenue & Nevada Avenue Roundabout LOS

Platte/Boulder One-Way Couplet LOS

Boulder Street Lane Reduction LOS

Platte Avenue LOS

Boulder Street LOS

Platte Avenue Lane Reduction LOS

Bijou/Kiowa Lane Reduction LOS

Bijou/Kiowa & Cascade Avenue LOS

Platte Avenue & Nevada Avenue Roundabout LOS

Platte/Boulder One-Way Couplet LOS

Boulder Street Lane Reduction LOS

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096998001 – Platte Avenue

Appendix E

Platte Avenue & Academy Quadrant Schematics

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Memorandum

To:	Todd Frisbie, P.E., PTOE / City of Colorado Springs
From:	Curtis Rowe, P.E., PTOE / Kimley-Horn and Associates
Date:	January 6, 2023
Project:	Platte Avenue
Subject:	Union Boulevard with Platte Avenue and Boulder Street Evaluations

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This memorandum is supplemental to the Platte Avenue Transportation Operations Technical Report completed in January of 2023 by Kimley-Horn and Associates. This memorandum is provided as information in support of alternative evaluation and selection within the Platte Avenue Corridor Study process. Possible improvements, analyses and findings described in the memorandum do not constitute study recommendations.

Along the east/west Platte Avenue and Boulder Street corridors, the intersections with the north/south roadway of Union Boulevard operate with higher delays than adjacent intersections along the Platte Avenue and/or Boulder Street corridors. This memorandum identifies the existing and future 2045 intersection operations and queue lengths at these two intersections for purposes to identify possibly physical improvements that could be completed maintaining the existing two-way operations. The existing geometry and turn lane lengths are shown in **Figure 1.**

Intersection Analysis Methodology

Capacity analysis results are listed in terms of Level of Service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. It ranges from A (very little delay) to F (long delays and congestion). For intersections and roadways in this study area, common traffic engineering practice recommends LOS D as the minimum desirable thresholds for acceptable operations. **Table 1** below shows the definition of LOS for signalized intersections.

Table 1: Level of Service Definitions

Level of Service	Signalized Intersection Average Total Delay (sec/veh)
A	≤ 10
B	> 10 and ≤ 20
C	> 20 and ≤ 35
D	> 35 and ≤ 55
E	> 55 and ≤ 80
F	> 80

Definitions provided from the Highway Capacity Manual, Sixth Edition, Transportation Research Board, 2016.

Intersection Operational Analysis

Existing 2022 and long-term 2045 traffic volumes at the two study intersections were analyzed to determine improvements that may be needed along Union Boulevard to accommodate existing and future projected traffic volumes. Level of service for the signalized intersections is defined based on the average total delay. The existing peak hour factors were used for the 2022 analysis while a 0.92 HCM urban standard peak hour

factor was used for the long-term horizon. The signalized intersections utilized the signal timing sheets provided by the City of Colorado Springs from the original traffic study. Synchro traffic analysis software was used to analyze the study area signalized intersections for the HCM level of service. The calculations for the level of service at the study intersections are attached.

The 2022 and 2045 traffic volumes are attached as **Figure 2. T**hese 2022 and 2045 traffic volumes identified the level of service at the two study intersections with the analysis results shown in **Table 2.**

Table 2: LOS Results Table

Intersection	Movement	Control	2022 Existing Peak Hour		2022 w/ Imp Peak Hour		2045 Peak Hour		2045 w/ Imp Peak Hour	
			AM	PM	AM	PM	AM	PM	AM	PM
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
Platte Ave & Union Blvd (#8)	**Overall**		**28.5 C**	**28.3 C**	**36.7 D**	**37.5 D**	**60.2 E**	**63.2 E**	**41.4 D**	**42.2 D**
	Eastbound Approach		20.0 B	4.7 A	31.0 C	33.8 C	43.3 D	18.7 B	34.1 C	49.5 D
	Westbound Approach		3.2 A	15.6 B	32.0 C	33.9 C	23.7 C	15.3 B	36.1 D	46.9 D
	Northbound Approach		58.4 E	57.0 E	51.0 D	50.9 D	130.8 F	166.8 F	61.8 E	44.2 D
	Southbound Approach		33.8 C	29.6 C	29.5 C	26.6 C	40.0 D	35.4 D	29.8 C	22.3 C
Boulder St & Union Blvd (#28)	**Overall**		**24.7 C**	**27.5 C**	**26.8 C**	**29.0 C**	**28.3 C**	**43.7 D**	**32.3 C**	**34.9 C**
	Eastbound Approach		62.9 E	67.1 E	62.4 E	59.6 E	63.0 E	129.2 F	60.0 E	54.5 E
	Westbound Approach		67.8 E	69.4 E	63.5 D	65.0 E	70.4 E	68.7 E	65.5 E	64.8 E
	Northbound Approach		1.8 A	1.3 A	11.7 B	13.9 B	2.3 A	1.4 A	17.6 B	22.7 C
	Southbound Approach		12.7 B	12.2 B	11.3 B	10.9 B	20.9 C	18.4 B	21.0 C	23.4 C

As shown in **Table** 2, the overall intersections operate acceptably at the two (2) study intersections during the existing scenario during both peak hours. Although, the northbound approach at the Platte Avenue and Union Boulevard (#8) intersection operates at LOS E and the eastbound and westbound approaches at the Boulder Street and Union Boulevard intersection operate at LOS E during both peak hours. In 2045, the overall Platte Avenue and Union Boulevard intersection may operate with long delays and LOS E during both peak hours with the existing configuration. In addition, the northbound approach of this intersection is projected to operate at LOS F. At the Boulder Street and Union Boulevard intersection (#28), the overall intersection is anticipated to operate acceptably, but long delays will still occur eastbound and westbound, with the eastbound approach operating with very long delays and LOS F during the weekday afternoon peak hour. Therefore, physical improvements may be warranted at these two intersections to improve overall operations for all approaches.

In addition to the intersection level of service operational analysis, a queuing analysis was performed. As shown in **Table 3**, the queues reported identify some movements exceeding the provided storage lengths in the existing horizon. Therefore, based on the operational and queueing analysis for the 2022 existing conditions, the Platte Avenue/Union Boulevard (#8) intersection is recommended to provide eastbound and westbound dual left turn lanes. To accommodate these, the separate eastbound and westbound right turn lanes could be absorbed as shared through/right turn lanes on these eastbound and westbound approaches. At the Boulder Street/Union Boulevard (#28) intersection, it is recommended that the protected-only

westbound left turn phasing be modified to protected-permitted left turn phasing. Likewise, overlap right turn phasing is recommended for the southbound right turn movement.

Table 3: 2022 Queue Analysis Results Table

Intersection	Movement	Storage Length (ft)	2022 Existing Peak Hour		2022 w/ Imp Peak Hour		Recommended Storage Length (ft)
			AM	PM	AM	PM	
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	
Platte Ave & Union Blvd (#8)	Eastbound Left	150'	81'	193'	89'	180'	**200' DL**
	Eastbound Right	25'	63'	44'	-	-	-
	Westbound Left	125'	185'	145'	136' DL	150' DL	**175'+50'S DL**
	Westbound Right	100'	17'	149'	-	-	-
	Northbound Left	200'	197'	76'	55'	108'	200'
	Northbound Through	*400'*	371'	357'	305'	360'	*400'*
	Northbound Right	100'	168'	172'	160'	172'	**175'**
	Southbound Left	250'	71'	75'	63'	87'	**175'+50'S**
	Southbound Through	*400'*	276'	194'	285'	159'	*400'*
Boulder St & Union Blvd (#28)	Eastbound Left	200' DL	122' DL	213' DL	114' DL	161' DL	200' DL
	Westbound Left	150'	107'	89'	157'	48'	150'
	Northbound Left	200'	96'	57'	86'	66'	**175'+50'S**
	Northbound Through	*400'*	62'	97'	97'	98'	*400'*
	Southbound Left	150'	54'	88'	84'	85'	150'
	Southbound Right	200'	107	75'	94'	116'	200'

Red Text = Queue Exceeds Existing Storage; **Blue** Text = Recommendation; *Italicize* Text = Distance Between Intersections; T = Taper, S = Shared Taper

The 2045 horizon projected queues are summarized in **Table 4**. These show some movements exceeding the provided storage lengths as well. Therefore, to improve operations in this horizon, the intersection of Platte Avenue/Union Boulevard (#8) is recommended to have three through lanes in each direction. The separate right turn lanes could be absorbed with the outside through being a shared through/right turn lane. In addition, dual northbound and southbound left turn lanes are also recommended. With these geometry improvements, the intersection will operate with LOS D during both peak hours. In addition, three through lanes on the northbound and southbound approaches of Union Boulevard through the Boulder Street (#28) intersection are needed.

As stated previously, some movements exceed the existing storage lengths. At the Platte Avenue/Union Boulevard (#8) intersection for the existing scenario, the eastbound left turn lane is recommended to include dual left turn lanes with a length of 200 feet. In order for the dual westbound left turn lanes to be extended from 125 feet to 175 feet, the existing shared taper for the back-to back left turn lanes to the east is recommended to be reduced to 50 feet. The northbound right turn lane can be extended to 175 feet and the southbound left turn lane is recommended to be reduced from 250 feet to 175 feet to accommodate back-to-back left turns for the northbound left turn lane for Boulder Street with a 50-foot shared taper. By 2045, dual northbound and southbound left turn lanes are recommended. In addition, the northbound right turn is recommended to be converted to a third through lane with a shared right turn movement.

Table 4: 2045 Queue Analysis Results Table

Intersection	Movement	Storage Length (ft)	2045 Peak Hour		2045 w/ Imp Peak Hour		Recommended Storage Length (ft)
			AM	PM	AM	PM	
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	
Platte Ave & Union Blvd (#8)	Eastbound Left	150’	216’	202’	184’ DL	195’ DL	**200’ DL**
	Eastbound Right	25’	69’	54’	-	-	-
	Westbound Left	125’	177’	152’	159’ DL	146’ DL	**175’+50’S DL**
	Westbound Right	100’	109’	109’	-	-	-
	Northbound Left	200’	198’	262’	115’ DL	159’ DL	200’ **DL**
	Northbound Through	*400’*	735’	790’	339’	280’	*400’*
	Northbound Right	100’	114’	150’	-	-	-
	Southbound Left	250’	244’	194’	70’ DL	75’ DL	**175’+50’S DL**
	Southbound Through	*400’*	320’	220’	178’	164’	*400’*
Boulder St & Union Blvd (#28)	Eastbound Left	200’ DL	159’ DL	238’ DL	193’ DL	191’ DL	200’ DL
	Westbound Left	150’	151’	81’	72’	100’	150’
	Northbound Left	200’	151’	77’	110’	61’	**175’+50’S**
	Northbound Through	*400’*	123’	176’	95’	129’	*400’*
	Southbound Left	150’	132’	139’	127’	152’	150’
	Southbound Right	200’	253’	121’	-	-	**-**

The northbound left turn lane at the Boulder Street/Union Boulevard (#28) intersection is recommended to provide a length of 175 feet with a 50-foot shared taper in 2022 with the southbound left turn lane at the Platte Avenue/Union Boulevard (#8) intersection for the 400-foot length available along Union Boulevard between Boulder Street and Platte Avenue to the south. The separate southbound right turn lane will be absorbed into the third southbound through lane.

Conclusion and Recommendations

The following provides a list of lane modifications needed to provide acceptable operations based on the analyses at the two (2) study intersections. Reported level of service/delay and the reported 95th percentile queues have been used as metrics for identifying the needed configurations:

2022 Horizon

Platte Avenue & Union Boulevard (#8)

- Dual EBL turn lanes with 200 feet of length plus 150-foot taper
- Remove EBR and convert second through to a shared through/right
- Dual WBL turn lanes at 175 feet with a 50-foot shared taper
- SBL turn lane at 175 feet with a 50-foot shared taper

Boulder Street & Union Boulevard (#28)

- NBL turn lane at 175 feet with a 50-foot shared taper
- Converted WBL protected-only left turn phasing to protected/permitted
- Add overlap right turn phasing on SBR

2045 Horizon

Platte Avenue & Union Boulevard (#8)

- Three EB, WB, NB, and SB through lanes with shared right turns
- Dual NBL turn lane at 200 feet with 50-foot shared taper
- Dual SBL turn lane at 175 feet with 50-foot shared taper

Boulder Street & Union Boulevard (#28)

- Three NB and SB through lanes with shared right turn lanes