

TRANSPORTATION ADVISORY BOARD

REGULAR MEETING

	AGENDA	
12:00pm	Public Comment	
12:05 pm	Trustee Liaison Update	Trustee Igel
12:10 pm	Approval of Minutes dated March 19, 2025 (packet)	
12:15pm	Colorado Department of Transportation: Project #26643 CO 7, Estes Park Bicycle/Pedestrian Study (pag	<i>Gina Fox</i> cket)
12:45pm	Multimodal Transportation Plan & Transit Development Plan Up	odate
1:00pm	Big Horn Parking Structure Design: TAB Position Letter Draft Discussion	
1:15pm	Parking & Transit Updates	Manager Klein
1:30pm	Engineering Updates	Director Muhonen
1:50 pm	Update on Past Public Comment	
1:55 pm	Other Business	
	Adjourn	

Page Lett Blank Internitionality

Town of Estes Park, Larimer County, Colorado, March 19, 2025

Minutes of a Regular meeting of the **TRANSPORTATION ADVISORY BOARD** of the Town of Estes Park, Larimer County, Colorado. Meeting held in the Municipal Building in said Town of Estes Park on the 19th day of March, 2025.

- Board: Chair Belle Morris; Vice-Chair Kristen Ekeren; Members Larry Gamble, Linda Hanick, Joan Hooper, Misti Marcantonio, Carissa Streib, and Wallace Wood; Trustee Mark Igel; Staff Liaison Dana Klein
- Attending: Chair Morris; Members Gamble, Hooper, Marcantonio, and Wood; Manager Klein; Director Muhonen; Recording Secretary McDonald; Mayor Hall; Engineer Waters
- Absent: Vice-Chair Ekeren, Member Hanick, Member Streib

Chair Morris called the meeting to order at 12:07 p.m.

PUBLIC COMMENT

Two public comments were received in writing after the meeting packet deadline. The first was a Public Comment Form submitted online by Cory La Bianca (Town citizen) expressing concern about a left turn arrow at the new Moraine Avenue roundabout. After brief discussion based on the submitted photo, it was agreed that Director Muhonen would respond to the concern by email. The second was a letter submitted to Chair Morris by Harry Kent (Town citizen) stating opposition to the Elkhorn Lodge Phase II Annexation, based on the potential impact to Elm Road. Since the TAB does not have a formal role in evaluating Community Development Department projects, discussion ensued about whether it should concern itself with this land use application matter in particular, or other development projects in general. With knowledge of the Strategic Plan, the TAB typically becomes engaged at the design phase of projects that can cause transportation issues. While the TAB has occasionally discussed specific projects would require a larger, vital discussion in the future about possibly formalizing the TAB's role in the development application process.

TRUSTEE LIAISON UPDATE

Trustee Igel introduced the topic of the Town Board's March 11 discussion of the action item "Resolution 19-25 Establishing 2025 Seasonal Paid Parking and Parking Permit Fees," explaining that the lack of a TAB letter of support had impacted the final vote. Strong discussion ensued regarding the responsibilities and nature of the TAB and its Town Board Liaison; the relevance of the TAB as an advisory board to staff and the Town Board when it comes to critical topics, although some of the public perceives that it has evolved into a project-endorsement entity; how the TAB's newer members (terms beginning April 1, 2024) have not yet had the opportunity to formally support or oppose

projects or programs that commenced prior to their terms; the importance of presenting fact-based information when updating the public about TAB activities; how TAB members expressing their opinions publicly, particularly in a letter, should specify whether the opinion is being expressed by the TAB as an entity or by the member as an individual citizen; and the TAB's obligation and commitment to feature supporting and opposing arguments when crafting a formal letter of support to the Town Board.

Since the 2025 Paid Parking Program was approved by the Town Board on March 11, it was agreed that the TAB would engage in a thoughtful, possibly moderated discussion of the topic beginning in late October; this would be after conclusion of the 2025 paid parking season and in preparation for the 2026 season.

APPROVAL OF MINUTES DATED FEBRUARY 19, 2025

It was **moved and seconded** (Morris/Marcantonio) **to approve the February 19, 2025**, **minutes**, and it passed unanimously.

FINAL DRAFT DISCUSSION: MULTIMODAL TRANSPORTATION PLAN & TRANSIT DEVELOPMENT PLAN

Manager Klein advised that staff recommends taking the final Multimodal Transportation Plan (MTP) and Transit Development Plan (TDP) documents to the Town Board for approval on April 22. Staff has been addressing proofreading edits with Kimley-Horn; TAB member feedback today should focus on overall content. Director Muhonen advised that Chair Morris would take notes today for drafting the TAB's letter of support/position; members could also email their comments to her. This letter would be voted upon by members at the TAB's April 16 meeting, then submitted that day for inclusion in the April 22 Town Board packet.

Discussion points included that the SCOTUS model of detailing majority and minority positions in its rulings would be good practice to follow when the TAB prepares letters of support for Town Board consideration; that MTP and TDP topics are distinct and should be detailed primarily in their respective documents, referenced only as necessary in each plan when their topics naturally cross over; confirmation that the project lists in each plan can be reordered or reprioritized according to need and funding availability; the benefits of having a "wrapper" statement in the plans that would acknowledge their shortcomings, emphasize their starting-point nature, and assure that modifications would be made as needed in the coming years, likely by 2030; and how MTP-TDP survey flyers were used as an outreach method to the Spanish-speaking community, but that the documents themselves are in English only.

The TAB agreed that—with safety being a priority for ages "8 to 80"—sidewalk development should take precedence over bike lanes since some areas can serve both needs; that visitor growth in Estes Park demands more and safer connectivity options; that the plans should include cycling accommodations but not be so focused on them, since the analysis of cyclist needs was mostly locals-centric; and that the TDP is better developed document than the MTP.

MULTIMODAL TRANSPORTATION PLAN & TRANSIT DEVELOPMENT PLAN: NEXT STEPS

Chair Morris will draft a TAB letter of support for members to review and vote upon at their April 16 meeting.

2025 PAID PARKING RATES: TOWN BOARD RECAP & NEXT STEPS

Given the lively discussion during the Trustee Liaison Update, Manager Klein acknowledged that having a TAB letter of support at the March 11 Town Board meeting would have been helpful. On March 25, the Town Board study session will focus on Estes Park Municipal Code (EPMC) Title 10 Parking Prohibition Revisions, which are mostly focused on relaxing overnight parking restrictions for downtown residents; and Policy 842 Parking Permits Revisions, which would be informed by any ordinance changes. Staff is discussing renaming the Post Office lot as the Baldwin Park lot, for naming consistency with other lot names and local landmarks.

PARKING & TRANSIT UPDATES

Manager Klein reported that Bustang to Estes service will resume a 41-day, weekendonly season with two buses running round-trip for \$15 per person. Applications for three projects were filed with the Upper Front Range Transportation Planning Region's (UFR TPR) Multimodal Transportation and Mitigation Options Fund (MMOF); two were approved: Moraine Avenue Trail Design and 2026-2027 Transit Operations. The intergovernmental agreement (IGA) for the CMAQ (Congestion Mitigation and Air Quality) grant was finally received; the initiatives will be undertaken in the 2025 season and completed in 2026. GoNoCo34, the transportation management organization (TMO) of which Manager Klein was elected Treasurer, continues to meet regularly and is building membership through a LinkedIn campaign. The Zero-Emission Vehicle Fleet Transition Plan is underway with the consultant, and a stakeholder workshop being planned. The Peak routes are being modified for safety and new stops. The Big Horn Parking Structure design contract requires a budget amendment before presentation to the Town Board on April 22.

ENGINEERING UPDATES

Director Muhonen reported that the design services contract for trail upgrades along Colorado Highway 7 (CO 7) and US 34 was approved on February 11. Cleave Street Improvement project updates are best followed by <u>signing up for the weekly email</u>. Resident Engineer Gina Fox of the Colorado Department of Transportation (CDOT) will attend the April 16 TAB meeting to present a recent pedestrian study that addresses ongoing crossing safety issues on CO 7; TAB members received this report by email and should read it through before the next meeting.

Discussion points included the difficulty of fully analyzing the crossing safety issues on CO 7 before the Prospector Apartments are fully occupied; the benefits of a road diet; and appreciation for the concrete work recently completed by the Street Division near the Estes Valley Recreation and Park District Community Center. Additionally, Director Muhonen summarized the TAB's discussion earlier in the meeting about the paid parking

Transportation Advisory Board – March 19, 2025 – Page 4

program; it was confirmed that the program would be analyzed again starting in October, and that no further action would be taken for the 2025 program.

UPDATE ON PAST PUBLIC COMMENT

Regarding comments Member Hooper had received about overnight parking restrictions at The Wheel Bar, the TAB briefly discussed that the currently proposed changes to the EPMC do not seem to provide language that meets the needs of bar patrons wishing to avoid driving; the language should allow for discretionary situations, if possible. For this type of EPMC administrative change, it was agreed that the TAB need not write a letter of support.

OTHER BUSINESS

None.

There being no further business, Chair Morris adjourned the meeting at 2:15 p.m.

Lani McDonald, Recording Secretary

Page Lett Blank Internitionality

Estes Park Bicycle Pedestrian Study

Safety Evaluation

February 2025



Prepared for:

CDOT Region 4 10601 W 10th Street Greeley, Colorado 80634

Prepared by:

Muller Engineering Company 7245 West Alaska Drive Suite 300 Lakewood, Colorado 80226 303.988.4939 Muller Project Number: 22-039.13



Table of Contents

Introduction1
Study Area1
Road Network2
Data Collection
Vehicle, Bicycle, and Pedestrian Data3
Traffic Counts
Historic Traffic Data Review4
Bicycle Count Data
Pedestrian Counts5
Crash Data7
Bicycle and Pedestrian Crashes7
Broadside Crashes
Traffic Analysis9
Traffic Volume Projections
Traffic Operations (Existing Geometry)10
Pedestrian Impact to Operations11
Traffic Operations (Road Diet Geometry)11
Additional Road Diet Operational Impacts12
Pedestrian Improvement Review13
Median Refuge Island at Graves Avenue13
Road Diet Lane Conversion15
Existing Cross Section15
Potential Road Diet Cross Section16
Additional Crosswalk Locations17
1 st Street to 3 rd Street
3 rd Street to Comanche Street
Comanche Street to Manford Drive
Manford Drive to Graves Avenue
Conclusions and Recommendations



List of Figures

FIGURE 1: VICINITY MAP1
FIGURE 2: ROAD NETWORK
FIGURE 3: TURNING MOVEMENT COUNTS – SATURDAY 9/28/2024
FIGURE 4: BICYCLE COUNT SUMMARY – SATURDAY 9/28/2024
FIGURE 5: PEDESTRIAN COUNT DATA SUMMARY – SATURDAY 9/28/20246
FIGURE 6: CRASH TYPE DISTRIBUTION
FIGURE 7: BROADSIDE CRASH LOCATIONS
FIGURE 8: PROJECTED 2050 TRAFFIC VOLUMES
FIGURE 9: FUTURE (2050) TRAFFIC OPERATIONS WITH EXISTING LANE GEOMETRY (AFTERNOON PEAK)
FIGURE 10: FUTURE (2050) TRAFFIC OPERATIONS WITH ROAD DIET GEOMETRY (AFTERNOON PEAK)11
FIGURE 11: PEDESTRIAN ACTIVITY AT CO 7 AND GRAVES AVENUE (NORTH LEG)13
FIGURE 12: SAMPLE FRAME FROM GRAVES AVENUE VIDEO DATA
FIGURE 13: CO 7 / GRAVES AVENUE MEDIAN REFUGE ISLAND CONCEPT SKETCH
FIGURE 14: BUFFERED BIKE LANE
FIGURE 15: CROSSWALK LOCATIONS (1 ST TO 3 RD)17
FIGURE 16: COMBINED 1 ST STREET TO 3 RD STREET PED COUNTS
FIGURE 17: CROSSWALK LOCATIONS (3 RD TO MANFORD)
FIGURE 18: 3 RD STREET TO COMANCHE STREET PED COUNTS
FIGURE 19: COMBINED COMANCHE STREET TO MANFORD DRIVE PED COUNTS
FIGURE 20: CROSSWALK LOCATIONS (MANFORD TO GRAVES)
FIGURE 21: COMBINED MANFORD DRIVE TO GRAVES AVENUE PED COUNTS

List of Tables

TABLE 1: CDOT ATR DATA SUMMARY -	US 34 EAST OF MALL ROAD (I	MP 1.48)4
TABLE 2: CDOT ATR DATA SUMMARY -	US 36 WEST OF MALL ROAD (MP 64.23)4

Appendices

Appendix A

Traffic Count Data

Appendix B

Crash Data Summary

Appendix C

Synchro Output



Introduction

The goal of this study is to evaluate the bicycle and pedestrian facilities in the Town of Estes Park along Colorado Highway 7 (CO 7), aka S Saint Vrain Avenue, between 1st Street and Graves Avenue. Using field data collected on a peak traffic weekend, this study explores potential safety improvements along the roadway, at intersections, and between intersections within the study area. Traffic and crash data will form the basis for this study to determine appropriate and context sensitive solutions to improve safety for vulnerable road users along CO 7 in Estes Park.

Study Area

This study addresses CO 7 in the Town of Estes Park, Colorado between MP 0.11 and MP 0.60. The included distance is approximately ½ mile. This segment of CO 7 is classified as an urban 4-lane divided minor arterial highway. A vicinity map showing an aerial view of the study corridor is provided in **Figure 1**.



Figure 1: Vicinity Map



Figure 2: Road Network



Road Network

The typical cross-section of CO 7 includes two through lanes in each direction separated by a Two-Way Left-Turn Lane (TWLTL) median. There is on-street parking on the east side of CO 7 between 1st Street and 4th Street. The outside lane is marked as a shared vehicle / bicycle lane, commonly referred to as a "sharrow" with markings at approximately 200-ft intervals.

Including the endpoints, there are eight unsignalized intersections and one signalized intersection within the study network. There are also three major driveways and nine curb-cuts providing direct access to businesses within the study area (**Figure 2**).

The existing AADT volume from the CDOT Online Transportation Information System (OTIS) was approximately 11,000 vehicles per day (vpd) with 2% truck traffic.

Unsignalized Intersections

These side-street stop-controlled intersections generally carry two-way traffic with a single lane in each direction and no auxiliary turn lanes. The exceptions are:

- 3rd Street One-way access to CO 7 (westbound-only).
- 4th Street Provides a side street right-turn lane.
- Stanley Ave/Woodstock Dr Provides side street right-turn lanes.

Signalized Intersection

The signalized intersection at Manford Drive is configured as a 4-Leg intersection with the eastbound approach a direct access to a local business via curb-cut. The Manford Drive approach includes a shared left-turn/through lane and a right-turn lane. A southbound left-turn lane is provided, but the northbound approach remains a TWLTL.

The signal operates with permitted-only left-turn phasing (no arrows) on a 90 second cycle. There are pedestrian signal heads with push buttons to cross the south and east legs.

<u>Major Driveways</u>

The three major driveways (labeled "MD") along the corridor are distinguished by a full break in the sidewalk across the access with curbramps on each corner. The nine curb-cut access points (labeled "CC") are locations where the typically square curb drops for vehicular access. In general, there are no stop-signs posted at access points.



Data Collection

Field data was collected on Saturday, September 28th, 2024, and provided in **Appendix A**. This specific weekend day was selected because of the Elk Fest celebration in the Town of Estes Park that is generally a very well attended event. Though festival activity was primarily downtown, this was the last opportunity of the year available to record weekend traffic with the possibility of heavy pedestrian activity.

Vehicle, Bicycle, and Pedestrian Data

Traffic data was collected at the intersections of 1st Avenue, Manford Avenue, and Graves Avenue by Ridgeview Data Collection (9/28/2024) over a 13-hour period from 6:00 a.m. through 7:00 p.m. including motor vehicle, bicycle, and pedestrian volumes. In addition, mid-block bicycles and pedestrians crossing CO 7 were collected over the same period using cameras positioned at eight locations along the corridor.

Traffic Counts

The vehicular traffic counts were collected as a basis for operational analysis along the study corridor. The count data was reviewed to determine the peak period of traffic over the course of the day. Peak traffic occurred between 2:00 p.m. and 3:00 p.m. and is shown in **Figure 3** along with the morning and evening peak hour traffic volumes.



Figure 3: Turning Movement Counts – Saturday 9/28/2024



Historic Traffic Data Review

As stated, the intent of the data collection was to capture traffic conditions on a peak day. While there are no automated traffic recorders (ATR) located on CO 7, continuous count data stations are located on US 34 and US 36 on the east side of the Town of Estes Park. The ATR data confirmed that Saturdays in September had the highest ADTs for both US 34 **(Table 1)** and US 36 **(Table 2)** in 2024, with both ATR locations reporting 9/28/2024 as the highest single day of the year.

US 34	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Jan	3,530	3,760	3,990	4,020	4,020	4,340	4,130
Feb	4,060	4,160	3,930	4,090	4,190	4,450	3,750
Mar	3,840	4,180	4,650	4,320	3,710	4,290	5,340
Apr	5,260	4,630	4,620	4,840	5,050	5,340	4,460
May	6,970	6,420	5,700	5,720	6,160	6,930	7,340
Jun	9,150	7,520	7,610	8,110	8,090	8,750	9,270
Jul	9,250	8,480	8,770	9,210	10,180	10,590	11,250
Aug	8,560	6,860	7,100	7,000	7,660	8,640	9,660
Sep	9,600	7,870	7,160	7,160	7,870	9,100	10,950
Oct	7,830	5,950	6,210	6,000	6,660	7,910	8,750
Nov	4,560	4,450	4,160	4,150	4,010	5,450	5,060
Dec	4,350	4,240	4,130	3,820	4,590	4,830	4,960

Table 1: CDOT ATR Data Summary – US 34 east of Mall Road (MP 1.48)

Table 2: CDOT ATR Data Summary – US 36 west of Mall Road (MP 64.23)

US 36	Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	4,670	3,920	3,970	3,930	3,980	4,560	5,190
2	5,410	4,340	3,750	4,030	4,280	4,830	4,700
3	5,390	4,400	4,760	4,570	3,810	4,990	6,980
4	6,880	4,950	4,760	5,250	5,410	6,560	5,610
5	9,600	7,680	6,390	6,320	7,090	8,820	10,100
6	13,250	9,260	8,880	9,670	9,920	11,280	12,900
7	13,740	10,810	10,250	9,740	12,250	12,810	15,090
8	13,330	9,700	9,280	8,900	9,100	11,680	14,150
9	14,290	10,190	8,090	8,250	9,310	11,870	15,310
10	11,700	7,960	7,080	7,090	7,930	10,170	11,960
11	6,540	4,810	4,440	3,820	4,500	5,960	6,840
12	5,990	4,810	4,510	4,160	4,990	5,580	6,400

In addition, while the directional distribution of northbound versus southbound on CO 7 traffic was close to even (about 52%), the planning-level directional distribution is not much higher according to OTIS (57%). Therefore, it is likely that analysis based on the field data represents peak traffic conditions within the study segment.



Bicycle Count Data

The turning movement counts included bicycle traffic data over the full 13-hour count period (9/28/2024). Due to the relatively low volume, this data was summarized based on the highest hourly volume as well as the daily total. The mid-block crossing bicycle traffic volumes were summarized in a similar manner. **Figure 4** shows the highest hour and daily total bicycle counts collected in the field.





There were only about five to ten bicyclists observed traversing the full study area over the course of the day and were not concentrated in any time-period. Bicycle traffic crossing CO 7 was infrequent with the signalized intersection of Manford Avenue showing the highest overall concentration of crossing traffic.

Pedestrian Counts

The pedestrian counts are a critical component of this study and are summarized in greater detail in **Figure 5**. This graphic shows the total pedestrian crossings at the marked and unmarked crosswalks along with the mid-block crossing counts over the full count period. The max hour counts, and daily totals are shown for each location with charts to the right showing the distribution of pedestrians over the course of the day.



CDOT Region 4



Figure 5: Pedestrian Count Data Summary – Saturday 9/28/2024



Most of the pedestrian crossing traffic occurred at the marked crosswalks (158 of 255); however, this only represents about 60% of total pedestrian crossings. It is important to note that there were no more than 7 crossings per hour at any of the unmarked crossing count locations along the corridor.

Combined, there were 33 mid-block crossings between 1st Street and 3rd Street distributed throughout the day, which is a little more than half what was observed at the 1st Street crosswalk. Similarly, the combined pedestrian activity between Comanche Street and Manford Drive was also 33 crossings between the mid-block count and pedestrians crossing the north leg of the Manford Drive intersection, which does not have a marked crosswalk.

There was generally more pedestrian crossing traffic in the afternoon and evening time periods, though it is interesting to note that the mid-block crossing activity between Graves Avenue and Manford Drive almost exclusively occurred in the morning between nine and noon.

Crash Data

The crash history for the ten-year period between January 1, 2015, and December 31, 2024, was examined to evaluate crash patterns (summary provided in **Appendix B**). There were 54 crashes were reported along CO 7 between MP 0.11 and MP 0.60. Of these, there were eight (8) injury collisions resulting in 12 injuries; there were no fatal collisions and none of the crashes reported serious injuries. *Broadside* crashes were the most common crash type observed accounting for 41% of all crashes (**Figure 6**).



Figure 6: Crash Type Distribution

All Other Types (7)	
bicycle	2
approach turn	2
pedestrian	1
involving other object	1
head on	1

Bicycle and Pedestrian Crashes

There were two *bicycle* type crashes and one *pedestrian* type crash during the ten-year study period. The two *bicycle* crashes occurred in July 2017. The first was at the Manford Drive intersection where an eastbound cyclist crossing with the light was struck by a westbound vehicle making a left-turn. The second occurred at the 4th Street intersection where a southbound cyclist on the wrong side of the road crossed in front of a westbound vehicle as they were leaving a stopped position. It is worth noting that both cyclists were minors.



CDOT Region 4

February 2025

Figure 7: Broadside Crash Locations



The pedestrian crash occurred in August 2022 at the Comanche Street intersection when a pedestrian on a stand-up scooter rode into the path of an eastbound vehicle turning right onto southbound CO 7. This crash did not result in injury.

It should be noted that none of these collisions involved mid-block crossings.

Broadside Crashes

There were 22 *broadside* collisions during the ten-year study period, representing 41% of the total crashes along this segment of CO 7. Of these, four (4) crashes resulted in six (6) evident injuries (none serious). Most occurred at intersections (19 of 22) with the remaining crashes at driveway locations (3 of 22).

The location of *broadside* type crashes within the study area are shown graphically in **Figure 7**. Though there was a high frequency of crashes at the 4th Street intersection, it should be noted that most of these occurred in 2015 (4 of 7) with only one crash reported in the past several years. Conversely, most of the crashes at the Stanley Avenue/Woodstock Drive intersection occurred in the past two years (3 of 4).

Most *broadside* crashes involved traffic turning left or crossing CO 7 from the side streets (15 of 22) with the remaining crashes turning right to merge with CO 7 traffic (7 of 22).

Impact on Alternatives

In general, the observed pattern of *broadside* type crashes at unsignalized intersection should be considered when evaluating the potential for a road diet along CO 7. Removing the outside through lanes may reduce available gaps for turning traffic, making it more difficult to turn across or onto CO 7 safely. However, at the same time it allows drivers to focus their attention on a single lane, rather than two, which simplifies the scanning process.



Traffic Analysis

The purpose of the traffic analysis in the context of this study was focused on the potential impact to roadway operations if the outside through lane were repurposed as a bike lane. This is referred to as a Road Diet in a general sense, though it should be noted that the term is more appropriately used when converting a 4-lane roadway with no median to a 2-lane roadway with TWLTL median.

Traffic Volume Projections

The traffic counts collected in the field were projected out to 2050 using growth rates derived from the CDOT OTIS system. The 2050 AADT volume projection of approximately 13,200 vehicles per day (vpd), which works out to a growth rate of 0.68% growth per year or a growth factor of 1.20. There was no data available specific to the side-streets, but growth rates are often lower than that of the mainline highway if there are no major redevelopment projects. Therefore, applying the same 1.20 growth factor to both mainline and side-street traffic volumes should yield a conservative estimate of future traffic volumes. There was no need to apply seasonal adjustments as the factors would cancel out.

The 2050 traffic volume projections for the AM Peak, Afternoon Peak, and PM Peak are shown in Figure 8.



Figure 8: Projected 2050 Traffic Volumes

The remainder of the traffic analysis section focuses on the Afternoon Peak traffic volumes as these were consistently higher and provide a reasonably conservative estimate of operations.



Traffic Operations (Existing Geometry)

Traffic operations analysis was performed using the software tool Synchro[™] using the Highway Capacity Manual 6th Edition (HCM) methodology for signalized and two-way stop-controlled intersections. While the TWLTL would allow for two-stage left-turns at the unsignalized intersections, no median storage was assumed to provide a conservative estimate of operations. Traffic analysis output for all three peak periods is provided in **Appendix C**.

The analysis focused on the Afternoon Peak traffic volumes as these were consistently higher than the AM or PM peak periods. **Figure 9** shows the results of the traffic analysis and includes the traffic volumes, Levels of Service (LOS) with delay, and Volume to Capacity (V/C) ratios for the signalized and stop-controlled intersections.



Figure 9: Future (2050) Traffic Operations with Existing Lane Geometry (Afternoon Peak)

Even under projected traffic volumes, the signalized intersection at CO 7 and Manford Drive is expected to operate at LOS A with no movements operating worse than LOS D during the peak period using the existing 90 second cycle length with permissive left-turn phasing. The side-street traffic at 1st Street is expected to operate at LOS C, and while the Graves Avenue side-street traffic will experience LOS F conditions based on delay, the queue lengths are not expected to be longer than one or two vehicles. It is not unusual for stop-controlled side-street traffic approaching an arterial to experience long delays on occasion, though it should be noted that two-stage left-turns could substantially reduce wait times.



Pedestrian Impact to Operations

It is interesting to note that increasing the pedestrians crossing CO 7 improves side-street operations at Manford Drive with minimal impact to CO 7 through traffic. This occurs because pedestrian crossing times are programmed to be longer than the minimum green time assigned to the associated vehicle phase, resulting in additional green time for the side-street when the pedestrian crossing is activated.

Traffic Operations (Road Diet Geometry)

Traffic operations analysis for the Road Diet geometry was estimated by removing one of the through lanes in each direction at the 1st Street and Manford Drive intersections and using a shared through/right-turn lane on the southbound approach to Graves Avenue. The TWLTL was not used for two-stage left-turns to maintain a conservative analysis.

The analysis again focused on the Afternoon Peak traffic and the results of the traffic analysis showing the traffic volumes, Levels of Service (LOS) with delay, and Volume to Capacity (V/C) ratios for the signalized and stop-controlled intersections is provided in **Figure 10**.



Figure 10: Future (2050) Traffic Operations with Road Diet Geometry (Afternoon Peak)

The future traffic operations analysis results were not substantially altered by the Road Diet geometry implemented in the models. There is a slight increase in delay at the 1st Street intersection but no other decreases in LOS. The main observable impact is in the CO 7 through movement V/C ratios at Manford



Drive, which go from 0.26 to 0.51 between the two scenarios. This indicates that even with one fewer through lane, there is still reserve capacity at the intersection.

Additional Road Diet Operational Impacts

It is important to note that while the other stop-controlled intersections were not specifically addressed in this analysis, the impact to operations could be more significant than those observed at 1st Street and Graves Avenue. Estimating operations at Stanley Avenue / Woodstock Drive with 20 left-turns per hour to and from the side streets shows delays increase from 40 s/veh to 75 s/veh with the outside lane removed. Though queues remain in the one to two vehicle range, this type of change in delays may increase driver frustration and should at least be acknowledged as a potential impact.



Pedestrian Improvement Review

This section discusses the various pedestrian improvements that were considered for this segment of CO 7 in terms of feasibility and potential impacts to the roadway, pedestrian, and cycling environment. After initial consideration of multiple options, the main improvements discussed here include the addition of a median refuge island at Graves Avenue, the potential for a road diet lane conversion, and adding new crossings along CO 7.

Median Refuge Island at Graves Avenue

The existing crosswalk on the north leg at Graves Avenue is controlled by Rapid Rectangular Flashing Beacon (RRFB) and painted crosswalk markings. The pedestrian data collected on Saturday, 9/28/2024 counted 61 pedestrians with up to 15 crossing in any one-hour period. Activity was heavier in the afternoon and evening time periods as shown in **Figure 11**.

Figure 11: Pedestrian Activity at CO 7 and Graves Avenue (North Leg)



Citizens have expressed concerns that drivers to not always stop when pedestrians are waiting to cross even when the RRFB is flashing. This behavior was also observed during the field visit, where one or two vehicles might continue without stopping for pedestrians. The video used for the traffic counts at the Graves Avenue intersection was reviewed to provide a qualitative assessment of compliance with the RRFB crosswalk. A sample frame is shown in **Figure 12**.

Figure 12: Sample Frame from Graves Avenue Video Data





The following observations were made:

- Not all pedestrians trigger the RRFB before crossing. This was usually observed when there were already sufficient gaps to cross CO 7; mostly in the morning but occasionally observed later in the day.
- The traffic lane closest to the pedestrian would usually stop when with the RRFB. Vehicles that were too close to the intersection when the RRFB was triggered (within 3 seconds or so) would not stop, but subsequent vehicles usually did.
- The traffic lane on the other side of the road from the pedestrian would not consistently stop while the pedestrian was still on the curb. However, they were consistently observed slowing or stopping for pedestrians after they entered the roadway.
- None of the observed pedestrians were seen stopping in the middle of the intersection, though there was some hesitation to confirm that traffic was stopping. Several pedestrians were observed fast-walking or jogging across the intersection, more often in the afternoon when traffic was heavier, as though concerned.

It should be noted that a driver that does not stop immediately after the RRFB is activated might be too close to the intersection to stop without hard braking when factors like perception/reaction time are considered. From the perspective of the pedestrian, it might seem like these drivers should be stopping and lead to the perception that more drivers are failing to yield than is truly reasonable.

The risk to pedestrians is that drivers yielding on the near side might encourage the pedestrian to cross into the median where they could be stranded if traffic on the far side does not stop appropriately. Depending on traffic, there may not be any traffic on one approach or another when the pedestrian starts to cross, making it difficult for the pedestrian to know if they will be able to cross the entirety of the roadway without conflicting vehicles.

A median refuge island that is at least 6-ft wide would allow pedestrians to focus on crossing one direction of traffic at a time, then pause in the median if needed to wait for traffic to stop or an appropriate gap. Ideally, a push button to actuate the RRFB would be placed in the median to re-activate the flashers should too much time elapse. This would also make it easier for drivers on the far side of the roadway to perceive when they are expected to stop.

A median refuge island should be feasible within the existing roadway width across the north leg with some adjustments to the approach geometry. Perhaps the simplest method would be to widen the TWLTL median by 6-ft and remove the southbound right-turn lane, instead striping the approach with a left-turn lane and shared through/right-turn lane, with the remaining width as a painted shoulder. This change may require a similar change further upstream to properly redirect traffic. A conceptual sketch is shown in **Figure 13**.





Figure 13: CO 7 / Graves Avenue Median Refuge Island Concept Sketch

The presence of a median refuge island should help improve compliance with the RRFB signal and would help encourage pedestrians to use this crossing rather than attempt to cross at mid-block locations.

Road Diet Lane Conversion

The Town of Estes Park wanted CDOT Region 4 to explore the possibility and implication of a Road Diet along this segment of CO 7, converting the outside lane between 1st Street and Graves Avenue to a bike-lane.

Existing Cross Section

There are two main cross-sections through most of the corridor with curb and gutter on either side of the roadway:

- Between 1st Street and 4th Street includes:
 - 2x 11-ft lanes southbound
 - o 1x 14-ft TWLTL median
 - 2x 11-ft lanes northbound
 - 1x 8-ft parking lane
- From 4th Street to south of Stanley Avenue/Woodstock Drive
 - 2x 11-ft lanes southbound
 - 1x 16-ft TWLTL median
 - 2x 11-ft lanes northbound

The outside lane in the southbound direction becomes a right-turn only lane about 250-ft south of the Stanley Avenue/Woodstock Drive intersection through the Graves Avenue intersection. The roadway changes to a two-lane roadway with TWLTL median and 10-ft wide combination shoulder (about 4-ft paved).



Figure 14: Buffered Bike Lane



Potential Road Diet Cross Section

The outside through lane in each direction could be repurposed to a buffered bike lane between 1st Street and Graves Avenue with a 6-ft bicycle lane and 5-ft painted buffer. A concept sketch showing the buffered bike lane configuration is shown in **Figure 14**.

Access Considerations

In addition to the named street intersections, there are multiple access points that would necessitate breaks in the buffer for vehicles going to and from the local businesses with CO 7 frontage. These breaks are most frequent on the southbound side of the roadway between 1st Street and Manford Drive. However, while there are fewer access points in the northbound direction, there is on-street parking that would likely need to be maintained.

Parking Considerations

There is a striped parking lane between 1st Street and 4th Street on the east side of CO 7. This is generally wide enough that parked cars can open doors with minimal risk of interference with cyclists in the bike lane. However, there are optional configurations for parking adjacent to bike lanes that may help mitigate conflicts.

Turning Traffic Considerations

While the TWLTL would remain for left-turn traffic, drivers would be expected to turn right from the through lanes. Given the through traffic volumes observed in the field and the 35-mph posted speed limit, this isn't expected to cause operational issues along the roadway. However, there is a risk that drivers will still cross over the striping when making turns, potentially using the buffered bike lane as a de-facto turn lane near intersections and access points.

Adding vertical elements such as flex-post delineators or other barriers within the bike-lane buffer would help discourage this behavior and create a more protected environment for cyclists. Maintenance becomes a consideration with any kind of vertical element, as they require replacement or repair on a regular basis and can complicate snow removal.

Maintenance Considerations

With or without vertical elements, the buffered bike lane striping needs to be maintained at a high level of conspicuity to remain effective.

Partial Implementation

The segment of CO 7 between Manford Drive and Graves Avenue has fewer access points and no on-street parking. There are fewer constraints to implementing a buffered bike lane along this segment.



Figure 15: Crosswalk Locations



Additional Crosswalk Locations

The potential mid-block crosswalk locations between 1st Street and Manford Drive are shown graphically in **Figure 15**. Turning movements from CO 7 to side-streets or access points are shown as it is generally undesirable to position mid-block crosswalks where vehicles may be waiting to turn. Left-turns for traffic turning onto CO 7 are similarly marked but are less emphasized since drivers should yield prior to turning across CO 7.

Locations shown in green are generally located where there are no direct turning conflicts with its location, and in blue where there are only left-turn conflicts from the side-street. Locations shown in red cut across the path of left-turns from the median and where right-turns from the side-street would conflict with the crosswalk.

1st Street to 3rd Street

There were 58 crossings with up to 15 in any one hour at the marked crosswalk on the south leg of 1^{st} Street. There were another 33 midblock crossings with up to 11 in any one hour between 1^{st} Street and 3^{rd} Street (**Figure 16**).

Figure 16: Combined 1st Street to 3rd Street Ped Counts



The northern crosswalk location shown in **Figure 15** is less than 250-ft from the existing marked crosswalk with parking for active businesses on the east side of CO 7. This might compromise the visibility of waiting pedestrians unless some parking was removed.

The southern location in this area would be recommended as it should be far enough removed from the adjacent turning paths to allow for a median refuge island to be built without modifying the roadway. It may be desirable to add a painted bulb-out to remove one or two parking spaces to the south of the crosswalk to reduce the likelihood of parked vehicles blocking line-of-sight to waiting pedestrians.



User Community

Figure 17: Crosswalk Locations (3rd to Manford)



3rd Street to Comanche Street

There were only six mid-block crossings between 3rd Street and Comanche Street, with four occurring in a one-hour period (**Figure 18**)

Figure 18: 3rd Street to Comanche Street Ped Counts



The intersection spacing and access locations may not work for a midblock crosswalk in this area without conflicting with median traffic, as shown in **Figure 17**. In addition, there are drainage inlets on the west side of CO 7 that could limit placement options.

Comanche Street to Manford Drive

There were 39 crossings with up to 11 in any one hour at the marked crosswalk on the south leg of the signalized intersection at Manford Drive. There were another 33 mid-block crossings with up to 8 in any one hour north of the intersection to Comanche Street, including those crossing the north leg of Manford Drive that does not have a marked crosswalk (Figure 19).

Figure 19: Combined Comanche Street to Manford Drive Ped Counts



The potential mid-block crosswalk locations shown in **Figure 17** are not ideal. There is little room between Comanche Street and 4th Street and multiple crossing conflicts.

Adding the north leg crosswalk at the Manford Drive intersection may have the highest potential to encourage pedestrians to cross at a protected location. Though it should be noted that this crosswalk creates the potential for "right-hook" conflicts with drivers making a westbound right-turn focused on northbound traffic.



February 2025

Figure 20: Crosswalk Locations (Manford to Graves)





There are marked crosswalks on the north and south ends of this segment with 39 pedestrians counted crossing the south leg of Manford Drive and 61 pedestrians counted crossing the north leg of Graves Avenue, with up to 11 or 15 per hour, respectively. There were only 20 pedestrians counted crossing CO 7 between these two intersections, up to 8 per hour, as shown in **Figure 21**.

Figure 21: Combined Manford Drive to Graves Avenue Ped Counts



There are fewer access points along this segment of CO 7 that would interfere with a mid-block crossing as shown in **Figure 20**. A mid-block crosswalk with median refuge could be added between Manford Drive and Stanley Avenue/Woodstock Drive. However, there was very little pedestrian activity observed in this vicinity.

Most of the pedestrian activity was observed in the vicinity of the Stanley Avenue/Woodstock Drive intersection. A marked crosswalk with RRFB could be added on either CO 7 approach (or both), but there is not enough room to provide a median refuge and maintain the existing lane geometry.

The sidewalk on the east side of CO 7 in the first block south of the Stanley Avenue/Woodstock Drive intersection is lower than the roadway with a slope that precludes a mid-block crossing.

No crosswalks are shown in the block north of Graves Avenue due to proximity to the existing RRFB crossing. However, it should be noted that it may be possible to add a median refuge by combining the southbound lanes into a shared through/right-turn lane in lieu of a separate right-turn lane.



Conclusions and Recommendations

This study focused on CO 7 between 1st Street and Graves Avenue based on bicycle and pedestrian counts collected on Saturday, September 28th, 2024, during the annual Elk Festival in the Town of Estes Park. While there is evidence that this was a peak traffic day for the town, festival activities were concentrated the downtown area and may not represent peak pedestrian activity on CO 7. There were two *bicycle* crashes and one *pedestrian* crash in the most recent ten years of available crash data (2015 – 2024), and there were 22 *broadside* type crashes spread out over the 0.50-mile study segment.

There were between 8 and 14 cyclists traveling along CO 7 in the outside lane during the 13-hour count period, with only a few observed crossing at mid-block locations. The safety and comfort of cyclists could be improved by converting the outside lane to a buffered bike lane, similar to a road diet. The roadway has sufficient capacity to handle the projected 2050 traffic volumes with the reduced laneage on CO 7, though side-street delays would likely increase due to fewer gaps on the roadway. This could be partially mitigated by widening the TWLTL to encourage two-stage left-turns, but there is the potential for this measure to increase the frequency of *broadside* type crashes.

The buffered bike lane would also require multiple breaks for intersections and business access north of Manford Drive, which could result in drivers crossing the painted buffer unless vertical elements such as flexible-post delineators were added to discourage the behavior. Additional maintenance would be required for replacement and activities such as snow removal would require additional logistics. Though technically feasible, this type of road diet may be difficult to justify based on the limited number of crashes and low severity at the observed level of activity.

The marked crosswalk with actuated RRFB control on the north leg of Graves Avenue was the most used pedestrian crossing along the corridor with 61 pedestrians observed with as many as 15 crossing in a one-hour period. Anecdotal evidence and field observations agree that there may be an issue with driver compliance with the RRFB signals. It may be feasible to reconfigure the southbound approaches leading up to Graves Avenue to use a shared through/right-turn lane to gain sufficient width to provide a median refuge at this location to improve the safety and comfort of pedestrians and help improve compliance. The potential road diet type improvements may allow more flexibility in how the cross section could be adjusted for the median refuge.

Based on the pedestrian count data, most pedestrian activity was concentrated at the marked crosswalk locations at 1st Street, Manford Drive, and Graves Avenue. The highest concentrations of mid-block crossings were observed between 1st Avenue and 3rd Avenue, and between Comanche Street and Manford Drive (33 crossings, each). A marked crosswalk with median refuge could be added between 2nd Street and 3rd Street along with actuated RRFB control as a safer crossing location. While there may not be a viable mid-block crossing location south of Comanche Street, adding a marked crosswalk with push button actuation on the north side of Manford Drive should provide a safer alternative to crossing mid-block in this access heavy area. The pedestrian activity observed south of Manford Drive may not be sufficient to warrant an additional crosswalk location at this time.





TRAFFIC COUNT DATA



APPENDIX B

CRASH DATA SUMMARY





SYNCHRO OUTPUT

