



Town of Berthoud Planning Commission Meeting
Housing Steering Committee Work Session
Berthoud Town Hall
807 Mountain Avenue
Thursday, October 24, 2024, at 6:00 p.m.
Please note that all stated times are approximate.

1. Housing Steering Committee Work Session - 6:00 P.M.

- 1.I. Presentation: Loveland Housing Authority Overview
6:00 P.M. - 6:30 P.M. Presented by: Jeff Feneis, Executive Director

Documents:

[MEMO RE LOVELAND HOUSING AUTHORITY OVERVIEW.PDF](#)

- 1.II. Presentation: Community And Stakeholder Engagement Findings
6:30 P.M. - 7:30 P.M. Presented by: Ayres and Associates

Documents:

[MEMO RE HOUSING NEEDS ASSESSMENT.PDF](#)

2. Planning Commission Meeting - 7:30 P.M.

- 2.I. Call Meeting To Order
2.II. Pledge Of Allegiance
2.III. Roll Call
2.IV. Approval Of Meeting Minutes

Documents:

[SEPTEMBER 26 2024 PLANNING COMMISSION MEETING MINUTES.PDF](#)
[OCTOBER 10 2024 PLANNING COMMISSION MEETING MINUTES.PDF](#)

- 2.V. Public Hearing: River Trails Neighborhood Master Plan And Change Of Zone
Presented by Anne Johnson, Community Development Director

Documents:

17 NEWSPAPER PUBLICATION.PDF
00A BOARD INFORMATION SHEET RIVER TRAILS ANNEXATION
FINAL.PDF
00B STAFF REPORT ANNEXATION NMP COZ.PDF
01 RESOLUTION 2024.12.PDF
02 APPLICATION FORM.PDF
03 ANNEXATION IMPACT REPORT.PDF
03B ANNEXATION PETITION 1.PDF
03C ANNEXATION PETITION 2.PDF
03D ANNEXATION PETITION 3.PDF
04 ANNEXATION MAP.PDF
04 COZ MAP.PDF
04A COZ NARRATIVE.PDF
06A NMP NARRATIVE.PDF
06B NMP MAP.PDF
07 PRELIMINARY TRAFFIC IMPACT STUDY.PDF
08 RIVER TRAILS - MINERALS.PDF
09 RIVER TRAILS - MINERAL NOTIFICATIONS.PDF
10A REFERRAL LTWD.PDF
10B REFERRAL COUNTY ENGINEERING.PDF
10C REFERRAL SCHOOL DISTRICT.PDF
10D REFERRAL CPW.PDF
11A SPO COMMENTS CULLIGAN 2024 08 26.PDF
11B SPO COMMENTS CULLIGAN NO 2 2024 08 26.PDF
11C SPO COMMENTS FLYNN 2024 08 26.PDF
11D SPO COMMENTS HERSHMAN 2024 08 26.PDF
11E SPO COMMENTS PERRY 2024 08 26.PDF
11F SPO COMMENTS PERRY D 2024 08 26.PDF
11G SPO COMMENTS RILEY 2 2024 08 30.PDF
11H SPO COMMENTS RILEY 2024 08 30.PDF
11I SPO COMMENTS SEWCZAK 2024 08 26.PDF
11J SPO COMMENTS STONER 2024 08 26.PDF
11K SPO COMMENTS STONER 2024 08 27.PDF
11L SPO COMMENTS STONER JOYCE 2024 08 26.PDF
11M SPO COMMENTS STONER JOYCE 2024 08 28.PDF
11N STONER RE SIGN POSTING 2024 10 15.PDF
12 ANNEXATION ORDINANCE.PDF
13 NMP RESOLUTION.PDF
14 COZ ORDINANCE.PDF
15 SIGN POSTING.PDF
16A NOTICE MAILING.PDF

2.VI. Public Hearing: Fickel Farms 5th Filing Neighborhood Master Plan And Change Of Zone
Presented by Tawn Hillenbrand, Senior Planner

Documents:

MEMO RE FICKEL FARM 5TH NEIGHBORHOOD MASTER PLAN AND
CHANGE OF ZONE.PDF
A. STAFF REPORT RE FICKEL FARM NEIGHBORHOOD MASTER PLAN
AND CHANGE OF ZONE.PDF
B. RESOLUTION RE FICKEL FARM 5TH NEIGHBORHOOD MASTER
PLAN.PDF
C. ORDINANCE RE FICKEL FARM 5TH CHANGE OF ZONE.PDF
D. STAFF REPORT ATTACHMENTS RE FICKEL FARM 5TH.PDF

2.VII. Report By Staff

3. Adjourn

Join Zoom Meeting <https://us02web.zoom.us/j/86049631362> Meeting ID: 860 4963 1362

One tap mobile +17193594580,,86049631362# US

Individuals needing special accommodation may request assistance by contacting the Town Clerk at 807 Mountain Avenue, Berthoud, Colorado 80513, 970-532-2643 at least 24 hours in advance.

PLANNING COMMISSION INFORMATION

COMMUNITY DEVELOPMENT DEPARTMENT



Meeting Date:	October 24, 2024
Agenda Title/Subject:	Loveland Housing Authority Overview
Type of Item:	Presentation
Purpose:	Informational Presentation
Presented by:	Jeff Feneis

BACKGROUND:

This item will be an informational presentation. There may be additional information distributed during the presentation.

MEMORANDUM

To: Berthoud Housing Needs Assessment Steering Committee

Anne Johnson, AICP, Community Development Director

From: Josh Olhava, AICP, PCCP, Western Planning Lead

Karlyn Vasan, Community Planner

Date: 10/24/2024

Re: Housing Assessment - Steering Committee Briefing

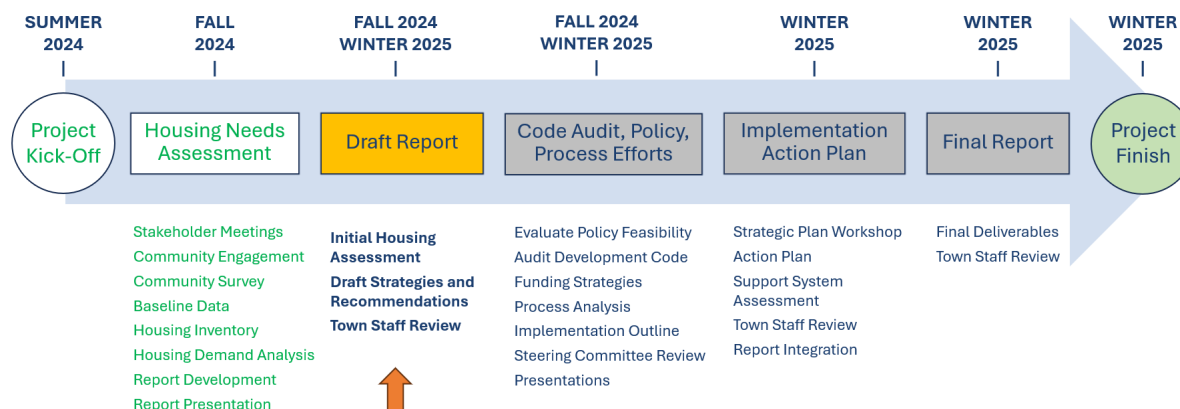
Introduction

As we continue to move forward with the community's Housing Needs Assessment, the project team has been actively engaging the community and stakeholders to gather valuable anecdotal information to support the analytical data. The information in this memo provides an overview of our recent efforts and highlights key data that will inform the housing strategies.

Some key milestones from this Fall include:

1. Developed various engagement and educational activities, posters, and one-pagers.
2. Conducted three stakeholder meetings with developers, local partners, and town staff.
3. Held two community engagement events on September 19 and October 5.
4. Launched the community housing survey on October 2.
5. Gathered and analyzed baseline community data.
6. Developed the housing demand analysis for the assessment.
7. Held regular project status meetings with the town's project team at three-week intervals.
8. Developed the initial draft of the housing needs assessment.

Project Timeline



Berthoud Data Overview

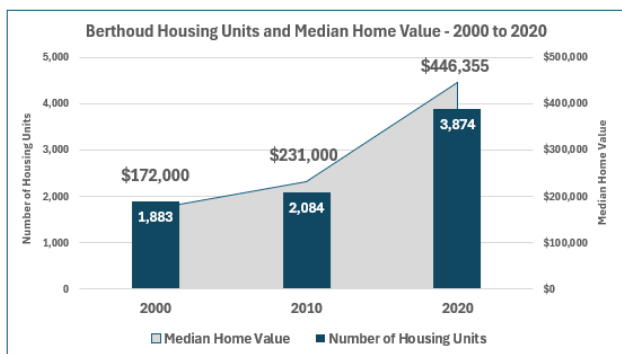
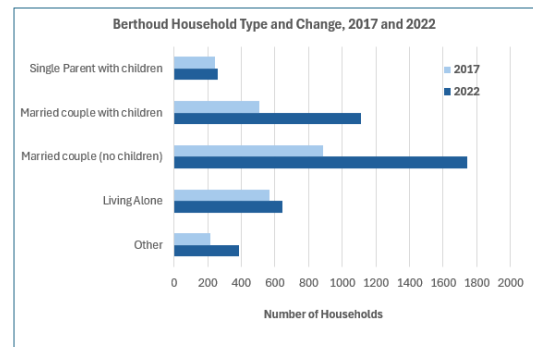
The following baseline data provides the foundation for the market study and insights to help inform the final plan's proposed housing strategies. Unless otherwise specified, data is pulled from the latest 2022 U.S. Census American Community Survey and local sources.

The following baseline data provides the foundation for the market study and insights to help inform the final plan's proposed housing strategies. Unless otherwise specified, data below is for Berthoud and pulled from the latest 2022 U.S. Census American Community Survey and local sources.

- Berthoud has experienced a total population growth of 113% from 2010 to 2022, with an additional 139% projected by 2040. Its average household size is 2.6 persons with a median age of 38.5.

Jurisdiction	2010	2022	% Change
Berthoud	5,105	10,892	113%
Longmont	86,270	98,282	14%
Loveland	66,859	76,500	14%
Greeley	92,889	109,203	18%
Johnstown	9,887	17,327	75%
Larimer County	299,630	359,363	20%
Weld County	252,825	350,176	39%

- 60% of households consist of 1-2 people; of which, 42% are married couples without children.
- Seniors (65+) represent 14% of the population; with 9% living alone.
- 92% of residents work outside Berthoud, while 84% of local employees live elsewhere.
- Median household income equals \$101,817
 - 51.4% earn over \$100K
 - 33.3% earn between \$50K-\$100K
 - 15.3% earn < \$50K (7% aged 45 to 64 yrs, 6% aged 65+)
- Affordable housing income qualification in Larimer County (under 80% AMI):
 - 2-person household = less than \$76,080
 - 4-person household = less than \$95,040
 - Weld County is 3.6% lower
- Median home values rose 160% from 2000 to 2020 to \$446,355.
- Median rent is up over 131% from 2017 to \$1,701 per month.
- Housing stock statistics:
 - 82% is single-family detached
 - 57% were built after 2000
 - 79% have 3+ bedrooms
 - 88% are owner-occupied units
- 230 new residential permits since 10/1/2023, with 30% sold at an average sale price of \$622,749. Only three have met Berthoud's Proposition 123 obligation to provide 13 housing units per year that are not greater than \$425,840 for sale and \$1,670 for rent.



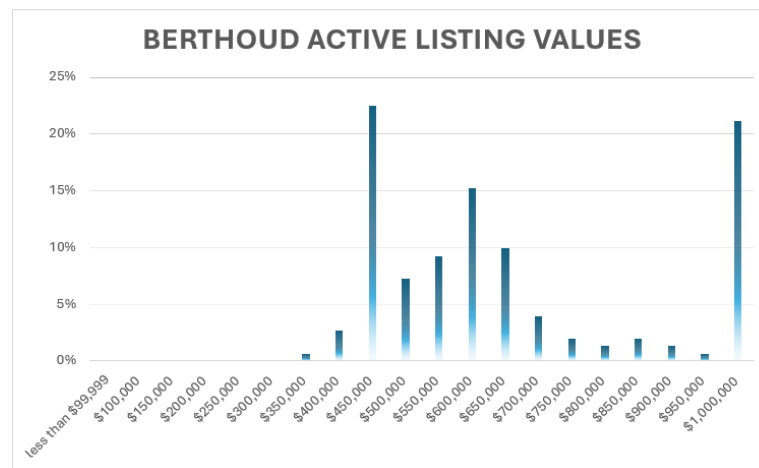
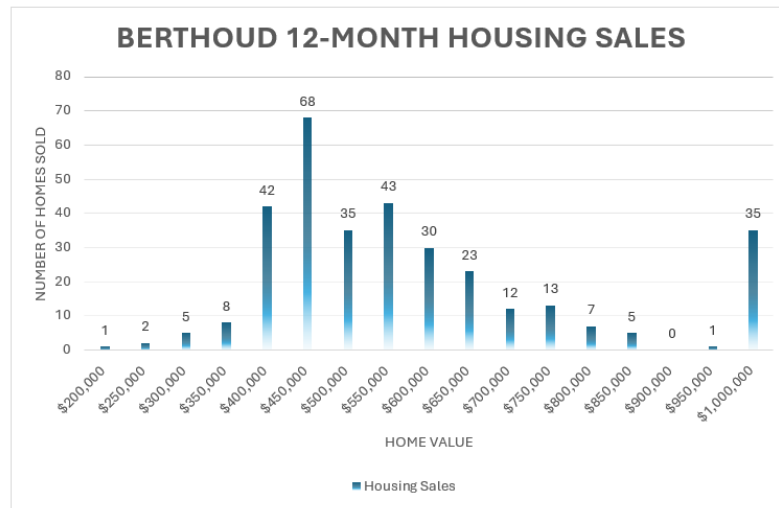
Berthoud Market Analysis Overview

For-Sale Market (Past 12 Months)

- 330 home sales; with an average sale price of \$697,209 (a 41% increase from 2022).
 - Average construction year was 2011 with 3.5 bedrooms at 2,800 sq ft
 - 20.6% of sales were between \$450K and \$499K
 - 10.6% of sales exceeded \$1M

For-Sale Market (Current Trends)

- 151 active listings; with an average listing price of \$887,215 (a 24% increase from last year).
 - Average construction year is 2017 with 3.5 bedrooms at 3,000 sq ft.
 - Average time on the market is 85.4 days
 - Price range is \$380,000 to \$3.99M



Rental Market (Current Trends)

- Eight active rental listings; with an average rent of \$2,181 per month (ranges \$1,225 to \$2,980 per month).
 - 2.6 bedrooms on average, with units ranging from 838 to 3,029 sq ft.
 - Rental units spend about 23.5 days on the market.

Engagement Overview

The project team used the baseline data and market study to shape the engagement strategy, including educational displays, one-pagers, engagement activities, and the community survey.

Stakeholder Meetings

Three meetings were held at Town Hall, with approximately 25 participants.

- Developers 9:30 a.m. September 19
- Local Partners 11:30 a.m. September 19
- Town Staff Leadership Team 12:30 p.m. September 23

Key Takeaways:

1. **Affordability Definitions:** There were varying interpretations of terms like “affordable” and “attainable” housing, as well as “workforce” housing, which can confuse community members. These terms need to be appropriately defined and discussed in the final plan.
2. **Housing Affordability:** It is widely agreed that Berthoud faces a shortage of affordable housing, especially for first-time buyers, low-income families, seniors, and people with disabilities. Many local employees cannot afford to live in Berthoud, leading to commuting from nearby towns and hiring challenges for local businesses. Flexible, non-subsidized housing solutions like accessory dwelling units (ADUs), smaller homes, and multi-generational housing were identified to potentially help address these issues.
3. **Public Perception Challenges:** Growth and higher-density housing remain controversial in the community. Concerns were raised about traffic, school capacity, crime, property values, and changes to the community’s small-town character. The phrasing of “affordable housing” is often misunderstood and associated with Section 8. To address these concerns, more transparent communication, public involvement, and educational efforts showcasing successful affordable housing projects are needed to shift perceptions and demonstrate their benefits.
4. **Regulatory and Process Improvements:** Stakeholders expressed a need to simplify and expedite the development review process, as complex regulations increase costs and cause delays. Suggestions included more flexible zoning regulations, incentivizing developers with fee reductions, and improving pre-application meetings. Creating a “Staff Advocate” for affordable housing projects was proposed to assist developers in navigating the process and to participate in public meetings. Innovative approaches to construction and sustainability were also encouraged, though high impact fees and construction defect laws are seen as barriers to housing diversity.
5. **Water, Utility Costs, and Fees:** High water fees were a major concern, with calls for a water usage study to ensure fair and accurate fees based on actual consumption. There was also a desire to see impact fees more closely tied to a home’s size, number of bathrooms, and bedrooms. The cost of energy and water conservation efforts was also noted as a factor affecting development costs.
6. **Community and Regional Collaboration:** Participants emphasized the need for regional collaboration and partnerships with neighboring municipalities and organizations to share resources and strategies for addressing housing and development challenges. Local developers, builders, and housing organizations should also be engaged to create a shared vision for housing solutions.
7. **Financial Strategies:** Stakeholders suggested exploring affordable housing funds or allocating tax revenue to support affordable housing projects. Public-private partnerships were also recommended to leverage additional resources and expertise.

Community Events

Community engagement events provided opportunities for residents to interact with the project team and share input on housing needs and preferences.

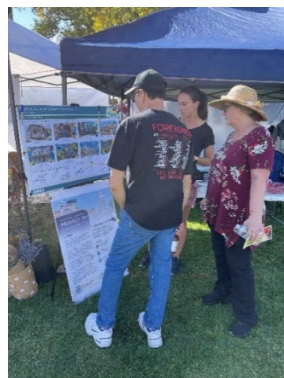
- September 19, 2024: Soccer fields, Recreation Center
- October 5, 2024: Oktoberfest booth

The project team spoke with approximately 200 residents across the two events, with most participants eager to discuss growth and housing issues.



Key Takeaways:

1. **Housing Types:** While single-family homes remained popular, most residents recognized the affordability challenges and agreed that considering different housing types made sense. Courtyard homes and duplexes were particularly well-received.
2. **Multi-family:** Many residents were open to multi-family but wanted to ensure that the maximum height reflected the community's character. There were concerns about multi-family structures obstructing mountain views, and residents highlighted the importance of placing these developments along major roadways rather than next to single-family neighborhoods.
3. **Young Residents:** Younger couples expressed a strong desire to live in Berthoud but found it difficult to find affordable homes. Even some with higher dual incomes had purchased homes in nearby Johnstown or Mead or were renting in Loveland.
4. **Multi-generational Living:** Due to high housing costs, various household compositions emerged. The team spoke with parents housing their adult working children, young families living with grandparents, and dual-income couples without children who preferred to live in Berthoud but couldn't afford to.
5. **Down-sizing:** Many older adults (including empty nesters or retirees) expressed a desire to downsize. However, they found that single-level and low-maintenance homes were hard to find and that it was often more expensive to sell their current home and buy a new, smaller home than to remain where they were.
6. **Anti-Growth:** Some residents voiced concern about continued growth, preferring that it stop. Many had recently moved to Berthoud from Longmont or Boulder in search of the quieter, rural character of Berthoud and didn't want more growth. Their concerns included increased traffic, school capacity, crime, and the potential loss of community culture.



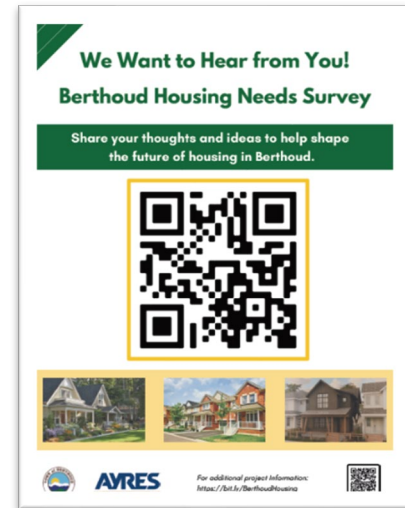
Community Survey

The online survey launched on October 2nd. It included general housing questions, as well as targeted questions for homeowners, renters, and non-Berthoud residents. The survey was promoted through various methods to ensure a broad and diverse representation of the community.

- Berthoud's e-newsletter, website, and social media
- Paper newsletter included as an insert in utility bills
- Email promotion through the steering committee and key partner organizations
- Flyer promotion at Town Hall

As of October 14, 2024, **316 people have completed the survey:**

- 224 homeowners, 27 renters, 65 non-Berthoud
- 28% aged 35 to 44 yrs, 22% aged 55 to 64 yrs
- 36% with an annual income of \$120K+, 13% under \$60K, and 17% prefer not to answer
- 49% live with a spouse/partner, 28% live with a spouse/partner and children, and 9% live alone
- 31% have lived in Berthoud 1-4 years, 28% for 5-10 years



Preliminary Survey Findings:

1. **Finding Housing:** 41% report that finding housing was *Difficult or Very Difficult*. Additionally, 46% know someone struggling to find housing. Some key reasons cited include:
 - “Need more housing for early-career professionals looking to buy smaller townhomes or duplex-type options.”
 - “Single-family homes are too expensive. Not enough townhome options. Townhome options help the renters to step into ownership without the price tag of single-family homes.”
 - “Renting a house or purchasing a house is too expensive, and there are no apartment options available in Berthoud for that transitory housing while they save. This means that they are living with parents.”
 - “New college grads / young families/city or trade workers can’t afford rent or qualify for mortgages”
2. **Housing Concerns** (*respondents could select more than one concern*):
 - 25% want more housing types
 - 27% don’t think they can afford housing
 - 27% are concerned about the quality of housing
 - 24% want more senior housing
3. **Housing Strategies:** When asked about priorities for housing in Berthoud over the next 10 years, responses were:
 - 41% prioritize building a variety of housing types and sizes
 - 24% prioritize building senior / retirement housing

Next Steps

The baseline data and engagement feedback will guide the housing projections and recommended strategies, along with the remaining deliverables for the final report.

Key Dates:

- October 24: Steering Committee – Overview of baseline data and engagement findings
- Early November: Report draft reviewed by Staff
- December 12: Steering Committee – Presentation of final draft plan with draft strategies; Steering Committee invited to review and comment on draft strategies and recommendations
- January to March 2025: Code audit, process analysis, support system assessment, implementation outline



MEETING MINUTES OF THE PLANNING COMMISSION
Town Board Room
807 Mountain Avenue, Berthoud, CO 80513
September 26, 2024, at 6:00 p.m.

1. Meeting Called To Order – Chairperson Karen Anderson
Meeting Called to Order at 6:02 p.m.
2. Pledge of Allegiance
Chairperson Anderson led the Pledge of Allegiance.
3. Roll Call

The following Commission members were present:

Karen Anderson, Chair
Abigail Smith, Vice Chair
Nick Semedallas, Commissioner
Marc Hofmans, Commissioner

The following Commission member was absent:

David Pond, Commissioner

The following Staff members were present:

Anne Johnson, Community Development Director
Lexi Weissman, Deputy Town Clerk
Luke Seeber, Town Engineer, via Zoom

4. Approval of Minutes
 - a. September 12, 2024 - Planning Commission Meeting Minutes

MOTION made by Vice Chair Smith to APPROVE the Minute for the September 12, 2024 Planning Commission Meeting. SECONDED by Commissioner Semedallas. With all those in favor, THE MOTION CARRIED.

5. Public Hearing: To Consider a Request for a Final Plat Known as Heron Lakes 17th Filing Located South of and Adjacent to West County Road 14 and West of and Adjacent to Pine Hill Drive

Chairperson Anderson opened the Public Hearing.
Deanna Rios and David Murray spoke regarding the Heron Lakes 17th Filing Final Plat.
Chairperson Anderson closed the Public Hearing.

MOTION was made by Vice Chair Smith to approve the Final Plat of Heron Lakes Seventeenth Filing due to the findings stated in the Staff Report with the Conditions of Approval found in the Findings and Recommendation section of this report and the addition of the following Condition of Approval; “Developer agrees to coordinate with the Town and the City of Loveland regarding a trail connection to be detailed in the Development Agreement. Developer agrees to design, engineer and install a curb and ramp on the south side of the road, crosswalk signs with rectangular rapid flash beacons per the Manual on Uniform Traffic Control Devices, (MUTCD) latest edition, and crosswalk striping across West County Road 14.” The two Conditions of Approval found in the Staff Report were read into the record and included the following: .

Prior to recording the plat, the applicant shall enter into a Development Agreement with the Town of Berthoud to cover all on-site and off-site improvements, as illustrated on the plans approved.

- a. The following shall be included in the Development Agreement: At the time when the City of Loveland is ready to connect the regional trail across SW 42nd Road, the developer shall install rectangular rapid flash beacons (RRFB) per MUTCD, on either side of the SW 42nd Road. The developer shall submit the final trail crossing plans to the Town for review.**
- b. The Development Agreement will outline phasing requirements for sanitary sewer provision and the timing of issuing building permits within the development in relationship to the proposed expansion to the Heron Lakes Lift Station and the proposed Marina Lift Station.**

Commissioner Semedalas SECONDED the motion. Will all those in favor, THE MOTION CARRIED.

6. Report by Staff

- New Building Permit Technician, Brenton Thompson, started this Monday.
- The Building Department have processed over 200 permits in September.
 - Many have been for roof repair after the hail storm.
- The Town is conducting interviews for a Development Review Engineer next week.
- The withdrawal of the Farmstead 3 application was approved by the Board of Trustees.
- The Board of Trustees were also presented with the Comprehensive Plan Report Card update.
- At the next meeting, Habitat for Humanity will discuss their organization, and the Commission will discuss housing.
 - At Oktoberfest on October 5, 2024, Ayres will have a booth to collect community input on housing.
 - On December 12, 2024, Ayres will be presenting the findings and making preliminary recommendations.
- New Commissioners, Mark Brodie and Stacy Sigman were appointed to the Planning Commission at the last Board of Trustees meeting.
- Progress is being made with the Farmstead 3 Filing.
- There has been no application submitted yet for a potential apartment development.

7. Adjourn

MOTION was made by Commissioner Semedalas to adjourn the September 26, 2024, Planning Commission meeting. SECONDED by Vice Chair Smith. With all in favor, THE MOTION CARRIED.

The meeting was adjourned at 7:07 p.m.

Chairperson

Secretary



**MEETING MINUTES OF THE PLANNING COMMISSION and HOUSING STEERING COMMITTEE
WORK SESSION
Town Board Room
807 Mountain Avenue, Berthoud, CO 80513
October 10, 2024, at 6:00 p.m.**

1. Meeting Called To Order – Chairperson Karen Anderson
Meeting Called to Order at 6:00 p.m.
2. Pledge of Allegiance
Chairperson Anderson led the Pledge of Allegiance
3. Roll Call

The following Commission members were present:

Karen Anderson, Chair
Abigail Smith, Vice Chair
Nick Semedallas, Commissioner
Marc Hofmans, Commissioner
Mark Brodie, Commissioner
Stacy Sigman, Commissioner

The following Commission member was absent:

Nick Semedallas, Commissioner

The following Staff members were present:

Anne Johnson, Community Development Director
Teri Reger, Planning Technician
Luke Seeber, Town Engineer, via Zoom
Erin Smith, Town Attorney, via Zoom

4. Chairperson Anderson closed the Planning Commission meeting and opened the work session of the Berthoud Housing Steering Committee at 6:05 p.m.

In addition to the Planning Commission members present for the Planning Commission meeting, the following Berthoud Housing Steering Committee members were also in attendance:

Sean Murphy, Mayor Pro-Tem
Tim Hardy, Town Trustee
Tiffany Brodie, Habitat for Humanity
Ryan Baker, Thompson Valley School District – Via Zoom
ABSENT - Jeff Feneis, Loveland Housing Authority

A. Presentation: Habitat for Humanity

Presented by Tiffany Brodie, Executive Director, Berthoud Habitat for Humanity

B. Presentation: Information regarding the Intent of Proposition 123 and The DOLA More Housing Now! Grant

Presented by Anne Johnson, Community Development Director

5. Report by Staff

The next meeting is October 24, 2024

Jeff Feneis will present information about the Loveland Housing Authority

Ayres Associates will be giving an overview of the Housing Project

Two Land Use Cases

Next meetings:

November 14, 2024

December 12, 2024, Potluck preceding the meeting.

The Town has hired an Engineer, Luke Seebers will join the ComDev team on October 28, 2024

6. Adjourn

The Work Session was adjourned at 7:25 p.m.

Chairperson

Secretary

TOWN OF BERTHOUD, COLORADO

NOTICE OF PUBLIC HEARING FOR A PROJECT

River Trails Annexation, Zoning, and Neighborhood Master Plan

PUBLIC NOTICE IS HEREBY GIVEN of a public hearing before the Berthoud Planning Commission on October 24, 2024 at the following time and place:

7:30 P.M. Planning Commission
Berthoud Town Hall
807 Mountain Avenue
Berthoud, Colorado 80513

PUBLIC NOTICE IS HEREBY GIVEN of a public hearing before the Town Board of Trustees on November 12, 2024 at the following time and place:

6:30 P.M. Town Board of Trustees
Berthoud Town Hall
807 Mountain Avenue
Berthoud, Colorado 80513

This hearing is for the purpose of taking applicant testimony and public comment on a proposed annexation, zoning and neighborhood master plan for land described below. The zoning request is for SR Suburban Residential. The hearing regarding the property described below will be for determining the eligibility of such property for annexation to the Town and the advisability of such an annexation, all as governed by the Berthoud Development Code.

A parcel of land being a part of the South half of the Southwest Quarter and part of the South half of the Southeast Quarter of Section 22, Township 4 North, Range 69 West of the 6th P.M., Town of Berthoud, County of Larimer, State of Colorado, being more particularly described as follows:

Annexation 1: A parcel of land situate in the Southwest Quarter (SW1/4) of Section Twenty-four (24), Township Four North (T.4N.), Range Sixty-nine West (R.69W.) of the Sixth Principal Meridian (6th P.M.), Town of Berthoud, County of Larimer, State of Colorado and being more particularly described as follows:

COMMENCING at the South Sixteenth corner of said SW1/4 of Section 24 and assuming the North line of the South half of said SW1/4 as bearing North 89°02'27" East, being a Grid Bearing of the Colorado State Plane Coordinate System, North Zone, North American Datum 1983/2011, a distance of 2657.78 feet Monumented by a #5 rebar with 2" aluminum cap stamped LS 13446 on the West end, and a #5 rebar with 3.25" aluminum cap stamped LS 38348 on the East end, and with all other bearings contained herein relative thereto;

THENCE North 89°02'27" East, along said North line, a distance of 30.00 feet to the POINT OF BEGINNING, also being a point on the boundary of the South First Street Annexation to the Town of Berthoud, recorded April 3, 1997, as Reception Number 19970020418 of the Records of the Larimer County Clerk and Recorder;

THENCE North 89°02'27" East, continuing along said North line and said annexation boundary, a distance of 20.00 feet;

THENCE North 00°21'20" West, continuing along said annexation boundary, a distance of 35.00 feet to a point on the North right of way of East County Road 6C, as shown on the plat of Mary V. Moore M.R.D., recorded November 2, 1993 as Reception Number 19930082235 of the Records of the Larimer County Clerk and Recorder;

THENCE North 89°02'27" East, along said North right of way, a distance of 318.75 feet;

THENCE South 82°35'32" West a distance of 311.64 feet to a point on the North line of the South half of said SW1/4;

THENCE South 04°19'57" East a distance of 362.91 feet to a point on the East line of that parcel recorded January 7, 1878 as Book G Page 580 of the Records of the Larimer County Clerk and Recorder;

THENCE North 08°56'36" West, along said East line, a distance of 178.75 feet;

THENCE South 89°38'27" West a distance of 27.84 feet to the Southeast corner of said South First Street Annexation;

THENCE North 00°23'06" West, along said annexation boundary a distance of 184.98 feet to the POINT OF BEGINNING.

Said described parcel of land contains 13,654 Square Feet or 0.313 Acres, more or less (±).

Annexation 2: A parcel of land, situate in the Southwest Quarter (SW1/4) of Section Twenty-four (24), Township Four North (T.4N.), Range Sixty-nine West (R.69W.) of the Sixth Principal Meridian (6th P.M.), Town of Berthoud, County of Larimer, State of Colorado and being more particularly described as follows:

COMMENCING at the South Sixteenth corner of said SW1/4 of Section 24 and assuming the North line of the South half of said SW1/4 as bearing North 89°02'27" East, being a Grid Bearing of the Colorado State Plane Coordinate System, North Zone, North American Datum 1983/2011, a distance of 2657.78 feet Monumented by a #5 rebar with 2" aluminum cap stamped LS 13446 on the West end, and a #5 rebar with 3.25" aluminum cap stamped LS 38348 on the East end, and with all other bearings contained herein relative thereto;

THENCE North 89°02'27" East, along said North line, a distance of 59.46 feet to the POINT OF BEGINNING;

THENCE North 82°35'32" East a distance of 311.64 feet to a point on the North right of way of East County Road 6C, as shown on the plat of Mary V. Moore M.R.D., recorded November 2, 1993 as Reception Number 19930082235 of the Records of the Larimer County Clerk and Recorder;

THENCE North 89°02'27" East, along said North right of way, a distance of 831.94 feet;

THENCE South 80°45'46" West a distance of 1036.95 feet;

THENCE South 00°32'05" East a distance of 872.85 feet to a point on the East line of that parcel recorded January 7, 1878 as Book G Page 580 of the Records of the Larimer County Clerk and Recorder;

THENCE North 08°56'36" West, along said East line, a distance of 630.95 feet;

THENCE North 04°19'57" West a distance of 362.91 feet to the POINT OF BEGINNING.

Said described parcel of land contains 141,781 Square Feet or 3.255 Acres, more or less (±).

Annexation 3: A parcel of land, situate in the South half (S1/2) of Section Twenty-four (24) and the Northwest Quarter (NW1/4) of Section Twenty-five (25), Township Four North (T.4N.), Range Sixty-nine West (R.69.W.) of the Sixth Principal Meridian (6th P.M.), Town of Berthoud, County of Larimer, State of Colorado and being more particularly described as follows:

COMMENCING at the South Sixteenth corner of said SW1/4 of Section 24 and assuming the North line of the South Half of said SW1/4 as bearing North 89°02'27" East, being a Grid Bearing of the Colorado State Plane Coordinate System, North Zone, North American Datum 1983/2011, a distance of 2657.78 feet Monumented by a #5 rebar with 2" aluminum cap stamped LS 13446 on the West end, and a #5 rebar with 3.25" aluminum cap stamped LS 38348 on the East end, and with all other bearings contained herein relative thereto;

THENCE North 89°02'27" East, along said North line, a distance of 50.37 feet;

THENCE North 00°57'33" West a distance of 35.00 feet to a point on the North right of way of East County Road 6C, as shown on the plat of Mary V. Moore M.R.D., recorded November 2, 1993 as Reception Number 19930082235 of the Records of the Larimer County Clerk and Recorder;

THENCE North 89°02'27" East, along said North right of way, a distance of 1150.69 feet to the POINT OF BEGINNING;

THENCE North 89°02'27" East, continuing along said North right of way, a distance of 792.67 feet;

THENCE South 00°19'57" East a distance of 5.00 feet to a point on the North right of way of East County Road 6C, as shown on the plat of Golden Acres Minor Land Division 02-S1964, recorded August 22, 2003 as Reception Number 20030107937 of the Records of the Larimer County Clerk and Recorder;

THENCE North 89°02'27" East, along said North right of way, a distance of 664.43 feet to a point on the East line of the North half of said SW1/4, from which the Center-South Sixteenth Corner of said Section 24 bears South 00°19'12" East a distance of 30.00 feet;

THENCE North 89°02'42" East, continuing along said North right of way, a distance of 1248.36 feet;

THENCE South 00°57'18" East a distance of 30.00 feet to a point on the North line of the South half of the Southeast Quarter of said Section 24;

THENCE South 61°08'42" West, along the approximate centerline of Rockwell Ditch, a distance of 422.20 feet;

THENCE South 23°25'42" West a distance of 142.60 feet to the approximate confluence of Rockwell Ditch and the Little Thompson River;

The following 8 courses are along the approximate centerline of said Little Thompson River.

THENCE North 75°15'42" West a distance of 89.83 feet;

THENCE South 38°48'59" West a distance of 75.80 feet;

THENCE South 30°41'09" West a distance of 150.28 feet;

THENCE South 12°10'45" West a distance of 120.83 feet;

THENCE South 40°45'06" West a distance of 110.06 feet;

THENCE South 62°50'06" West a distance of 144.57 feet;

THENCE South 67°38'42" West a distance of 325.77 feet;

THENCE South 52°17'46" West a distance of 99.24 feet to a point on the West line of the South half of the Southeast Quarter of said Section 24;

THENCE South 00°19'12" East, along said West line, a distance of 392.52 feet to the South Quarter Corner of said Section 24;
THENCE South 88°58'50" West, along the North line of the NW1/4 of Section 25, a distance of 1328.47 feet;
THENCE South 19°17'04" West a distance of 455.71 feet;
THENCE North 89°16'21" West a distance of 971.00 feet;
THENCE North 00°58'39" East a distance of 246.20 feet;
THENCE North 07°04'32" East a distance of 153.28 feet to a point on the North line of said NW1/4, from which the Northwest Corner of said Section 25 bears South 88°58'50" West a distance of 230.00 feet;
THENCE North 08°56'36" West a distance of 342.51 feet;
THENCE North 00°32'05" West a distance of 872.85 feet;
THENCE North 80°45'46" East a distance of 1036.95 feet to the POINT OF BEGINNING.

Said described parcel of land contains 4,350,328 Square Feet or 99.870 Acres, more or less ($\pm$).

GIVEN AND POSTED this _____ day of October, 2024

PLANNING COMMISSION INFORMATION

COMMUNITY DEVELOPMENT DEPARTMENT



Meeting Date:	October 24, 2024
Agenda Title/Subject:	Consideration of applications for an Annexation, change of zone and a neighborhood master plan for property known as River Trails
Type of Item:	Public Hearing
Purpose:	Consider the applicant's request for a public hearing for an annexation, change of zone and a neighborhood master plan for property known as River Trails
Presented by:	Anne Johnson, Community Development Director

ATTACHMENTS:

- Application Materials
- Resolution 2024.12
- Mineral Notification
- Referral Resources
- Surrounding Property Owner comments
- Draft Ordinance XX (24) Annexation
- Draft Ordinance XX (24) Zoning
- Draft Resolution XX (Series 2024) Neighborhood Master Plan
- Public Notice

BACKGROUND:

The applicant, River Trails, LLC (Jon Turner) through his representative, Kristin Turner of TB Group has submitted a petition to annex 98 +/- acres of land generally located east of and adjacent to 1st Street and south of and adjacent to Larimer County Road 6C. This proposed annexation is south of Mary's Farm and southeast of Heritage Ridge residential developments in the Town of Berthoud.

This one memo provides an overview of three application submittals, the Annexation, the requested Zoning, and a Neighborhood Master Plan. Each of these three applications will be separate agenda items and require separate motions of approval, approval with conditions or denial.

The applicant is proposing annexation of property from unincorporated Larimer County into the Town of Berthoud. The property being considered for Annexation is in the Town's Future Land Use area as designated on the Comprehensive Plan Future Land Use Map. Should the annexation request be approved, the applicant is requesting zoning of Suburban Residential (SR) with a Neighborhood Master Plan illustrating the proposed site configuration, amenities, compliance with the Town's Master Plans and incorporation of regional Master Plans. The subject property is currently zoned RR2, Rural Residential in Larimer County. The properties are in the southern portion of the Town's Urban Growth Boundary and the proposed zoning allocations align closely with the vision established in the 2021 Comprehensive Plan Future Land Use Map.

UPDATE/NEXT STEPS:

Should the Town Board of Trustees approve the Annexation, the Neighborhood Master Plan and the Zoning requests, the applicant shall fill a Preliminary Plat in substantial conformance with the Neighborhood Master Plan along with Construction drawings/documents.

FISCAL IMPACT AND FUND SOURCE:

An Annexation Impact Report has been prepared and presented at the November 12, 2024 hearing along with an Annexation Agreement. Both documents indicate how public services may be impacted and the applicant's agreement to fund impacts.

COMMUNITY TOUCHSTONES:

The 2021 Comprehensive Plan Future Land Use Map identifies this property as being compatible with future suburban residential development. Adherence to the intent of the 2021 Plan ensures the vision of the community established through the master planning process is upheld inclusive of the objective to establish a clear new vision for the future of Berthoud reflecting community values. The Comprehensive Plan and the Future Land Use Map are not legislative. Flexibility is required when reviewing land use activities with the Future Land Use Map. In this situation, the applicant's request is closely tied to the vision found in the Future Land Use Map. In addition, the applicant shall be held accountable in achieving the goals and action items outlined in the Comprehensive Plan and master plans affecting the properties.

RECOMMENDED ACTION(S):

Staff recommends the Planning Commission find the application submittals have been made in accordance with the application requirements as well as meeting the criteria for approval found in Chapter 30 of the Municipal Code as outlined in the attached Staff Report.

The following motion is provided for consideration:

I move to recommend approval of the River Trails Annexation to the Board of Trustees. Planning Commission's findings are based on the Criteria for Approval found in Section 30-8-102 of the Municipal Code along with findings in the attached staff report.

I move to recommend approval of the River Trails Neighborhood Master Plan to the Board of Trustees. Planning Commission's findings are based on the Criteria for Approval found in Section 30-6-106 of the Municipal Code along with findings in the attached staff report. One Condition of Approval shall be added to this motion as follows:

1. An application for annexation of County Road 6 shall be submitted to the Town prior to submittal of the Preliminary Plan. The distance shall be from the eastern property boundary to County Road 1 (County Line Road) resulting in this entire mile of County Road 6 being annexed to the Town of Berthoud.

I move to recommend approval of the River Trails Change of Zone the property to SR, Suburban Residential in accordance with the 2021 Comprehensive Plan Future Land Use Map as well as the criteria for approval found in Section 30-3-107.D of the Municipal Code along with findings in the attached staff report.

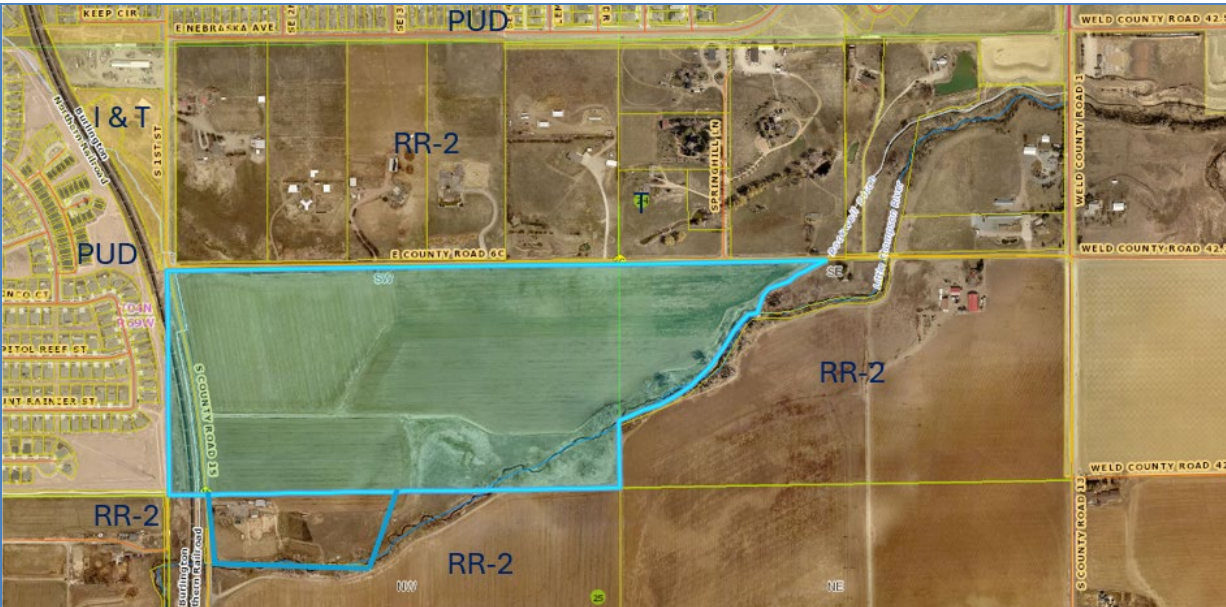


STAFF REPORT: RIVER TRAILS ANNEXATION, ZONING AND NEIGHBORHOOD MASTER PLAN

DATE: October 24, 2024

GENERAL INFORMATION

Applicant	Jon Turner, Manager, River Trails, LLC Kristin Turner, Applicant's Representative	Size: 98 +/- acres for Annexation, a Neighborhood Master Plan, and Zoning
Site Location	The properties under consideration are in unincorporated Larimer County. Parcel 9424000006 is approximately 88 acres in size and highlighted in blue on the aerial image below. Parcel 9425000003 is approximately 9.5 acres in size and is outlined in blue on the aerial image below. 	
Applicant's Request	The Applicant is requesting Annexation with a Neighborhood Master Plan and a Zoning proposal of SR, Suburban Residential.	
Surrounding Property Current Uses	<i>North:</i> Mary Moore subdivision in unincorporated Larimer County (Residential); to the north of Mary Moore subdivision is Mary's Farm subdivision in the Town of Berthoud (Residential) <i>West:</i> Heritage Ridge development in the Town of Berthoud (Residential); and undeveloped land in unincorporated Larimer County <i>South:</i> Undeveloped land in unincorporated Larimer County and Park Meadows West, a residential subdivision in unincorporated Larimer County <i>East:</i> Land in unincorporated Larimer County owned by the Future Farmers of America (FFA)	

Surrounding Properties and Current Zoning			
	<u>Land Use Code bulk standards for proposed zone district SR, Suburban Residential</u>		
Min. Lot Size	2,500 sq. ft. (detached house) 1,600 sq. ft. (townhome)		
Min. Lot Width	40-feet (detached house) 16-feet (townhomes)		
Front Setback	20-feet or 10-feet based on front loaded or rear loaded garage		
Side Setback	5-feet; 10-feet (side corner)		
Rear Setback	20-feet or 5-feet based on front loaded or rear loaded garage		
Building Height	30-feet		
<i>SURROUNDING ZONING, LAND USE AND REQUIRED BUFFERS</i>			
<u>Adjacent Zoning</u>		<u>Adjacent Land Uses</u>	<u>Setback requirements</u>
North:	RR2 Larimer & Berthoud PUD	Single-family Residential/agriculture	30' perimeter from arterial streets; 20' perimeter from collector streets
South:	RR2 Larimer		
East:	RR2 Larimer		
West:	RR2 Larimer		

Report and Process Overview

This one staff report covers the review of three application submittals, the Annexation, the requested Zoning, and a Neighborhood Master Plan. This staff report is longer than most as it is encapsulating the development review for the three applications. Each of these three applications will be separate agenda items and require separate motions of approval, approval with conditions or denial. The related items will be presented together for a comprehensive review.

Municipal Code Section 30-8-104.B outlines the processing steps for an Annexation and Zoning. Step 5 directs staff to bring the Annexation and Zoning requests to the Planning Commission prior to presenting the requests before the Board of Trustees. This step is found below:

Step 5: Planning Commission review and recommendations. The Planning Commission shall review, as a regular agenda item, the annexation application at a regular or special meeting to be held prior to the date of the public hearing before the Town Board. The Commission will make a recommendation by motion to the Town Board regarding the overall annexation of the property to the Town. The Commission's motion may be to recommend approval, approval with conditions, or denial of the annexation.

At this same meeting, the Commission may review the requested zoning of the property. Notice of the Commission's review of zoning shall be given in accordance with the requirements for an amendment to the zoning map. The Planning Commission shall recommend to the Town Board approval with or without conditions, or recommend denial of the requested zoning.

Municipal Code Section 30-6-106 outlines the Neighborhood Master Plan purpose and the process (Table 3.10 found in Section 30-30-116). A Planning Commission public hearing is a requirement for review of a Neighborhood Master Plan, and the Planning Commission's recommendation of denial, approval or approval with conditions will be presented to the Town Board of Trustees at the November 12, 2024 public hearing.

Proposal

The applicant is proposing annexation of property from unincorporated Larimer County into the Town of Berthoud. The property being considered for Annexation is in the Town's Future Land Use area as designated on the Comprehensive Plan Future Land Use Map. Should the annexation request be approved, the applicant is requesting zoning of Suburban Residential (SR) with a Neighborhood Master Plan illustrating the proposed site configuration, amenities, compliance with the Town's Master Plans and incorporation of regional Master Plans.

Background

The subject property is currently zoned RR2, Rural Residential in Larimer County. The properties are in the southern portion of the Town's Urban Growth Boundary and the proposed zoning allocations align closely with the vision established in the 2021 Comprehensive Plan Future Land Use Map.

Annexation

The act of Annexation brings properties from unincorporated Larimer or Weld County into the Town of Berthoud in compliance with the Colorado Municipal Act of 1965, C.R.S. 31-12-101 – 123, as may be amended. A meeting with the Board of Trustees was held on September 10, 2024, and it was determined that the application met the requirements of Colorado Revised Statutes and the Municipal Code. Findings of compliance are outlined in Resolution 2024.12, a copy of which is included in this packet of materials.

The process of Annexation allows Berthoud to control the quality of design and development, require the developer to incorporate local and regional trails and open space areas into the design, require parks and public amenities within the proposed development, require adjacent roads to be developed according to the Town's standards and adhere to the allowances of the Suburban Residential zone district, for example. The act of Annexation allows municipalities to control the development of territory to ensure the development is consistent with the vision of the Comprehensive Plan.

The Town of Berthoud has criteria for approval when considering Annexation. This criteria for approval is found in Section 30-8-102 of the Municipal Code and is outlined below for convenience along with staff's findings following the referral review process and detailed Code review.

30-8-102.A	Finding	Rationale
1. Annexation is a discretionary act. With the exception of a petition initiated by the Town for the annexation of an enclave, the Town Board shall exercise its sole discretion in the annexation of territory to the Town.	Yes	The proposed parcel to be considered for annexation are presented willingly by the applicant. Through Resolution 2024.12, the Town established a community of interest in the Annexation of this property.
2. The land to be annexed and the uses proposed for the land shall conform to the goals, policies and strategies of the Town of Berthoud Comprehensive Plan and to the land uses depicted on the Preferred [Future] Land Use Map, as amended. Furthermore, all annexation proceedings shall comply with the Colorado Municipal Annexation Act of 1965, as amended.	Yes	The proposed land use is Suburban Residential, consistent with the 2021 Comprehensive Plan Future Land Use Map. Future submittal stages such as the Neighborhood Master Plan to be considered at this same hearing, and the future submittals of a Preliminary Plat and the Final Plat will be required to illustrate how the local/regional trails and open spaces connect to this property. Staff review of this application has been done in coordination with the requirements of the Colorado Municipal Annexation Act.
3. At the time development occurs, certain public facilities and amenities are necessary and must be constructed as part of any territory annexed to and developed within the Town in order that the public needs may be served by such facilities. These facilities include, but are not limited to, arterial streets, bridges, public parks and recreation areas, water and sanitary sewer facilities, school sites, fire and police station sites, and storm drainage facilities. Typically, the annexation of lands to the Town shall be shown not to create any additional cost or burden on the then-existing residents of the Town to provide such public facilities in any newly annexed area.	Yes	The Annexation Assessment Impact Report provided with the application submittal addresses the impacts anticipated. Future submittal stages such as the Neighborhood Master Plan, Preliminary Plat and the Final Plat are required to illustrate public facilities and amenities necessary to serve this development. Construction documents and drawings are engineered and design plans. These documents and drawings are required elements of a Preliminary and Final Plat. Preliminary Plans have been provided with the Neighborhood Master Plan submittal. Agencies such as the Town's operations and public works teams, the fire protection district and the school district review the application at this stage of the process and will continue to review application materials and construction documents and drawings throughout the development review process. All comments from the Town Engineer, Operations and Public Works, and Planning teams will be addressed through the Preliminary Plat stage which is when detailed reviewed is performed. The Town scrutinizes each application submittal and requires any number of resubmittals to ensure the application materials inclusive of utility design and concerns of the referral entities have been met prior to scheduling public hearings.

		Development expectations for projects in the Town of Berthoud include integration into and connection to, the Town's and the Regional Master Planning open space, trail, pedestrian and traffic networks; provision of street trees, parks and public amenities; design, engineering and installation of adjacent roadways; adherence to requirements of the school district and the fire protection district; and coordination with all public utilities serving the development, for example. Staff also ensures the specifications, standards, guidelines and expectations outlined in the Town's Comprehensive Plan, Land Development Code, Landscape and Architectural Design Guidelines are met. All Special Districts are provided an opportunity to respond to an Annexation request.
4. Typically, the petitioner for annexation shall be responsible for paying application fees and the Town's full cost for processing the annexation applications and petition; from initial discussion with Town Staff before submittal of the petition, through the approval and recording of the final annexation documents.	Yes	The applicant has paid application fees and a development review deposit. The deposit is used to pay fees of third party consultants the Town utilizes, publications, mailings, recording fees and staff's time.
5. Annexed areas will not typically divide tracts of land to prevent further annexation of adjoining parcels. (For example, leaving a "gap" or a "strip" of land between property to be annexed and the adjoining property.)	Yes	This annexation does not subdivide land and does not propose to leave any land owned by the applicant adjacent to the property in unincorporated Larimer County. This annexation does leave the parcels to the north in unincorporated Larimer County as they are not party to the pending annexation.
6. The property owner shall comply with the Annexation Application requirements of this Chapter prior to submitting an annexation petition.	Yes	The applicant has complied with the application requirements and the processing regulations.

Staff has found the Annexation application materials listed in Section 30-8-103 have been submitted correctly. Referral agencies were provided with an initial review period on August 5, 2024 and a second review period on September 16, 2024. The applicant has addressed all concerns of referral agencies and the Town. Any Conditions of Approval proposed provide direction to the applicant regarding expectations for submittal of the Preliminary Plat. The first referral review period concluded prior to the Trustees hearing regarding substantial compliance with the Annexation Petition. The second referral review period concluded prior to the Planning Commission hearing on October 24, 2024. The process for considering an Annexation Petition outlined in Section 30-8-104 was followed.

Neighborhood Master Plan

The Neighborhood Master Plan is a conceptual design of the development, submitted with a rezoning or major subdivision application, and depicts the applicant's vision for the overall development. This vision includes the proposed zoning classification along with a concept for the on and off-site transportation networks and road classifications, pedestrian network, parks, open space, subdivision identity standards and other amenities. The Neighborhood Master Plan is binding on a development, and all future platting/zoning actions must follow the approved plan as presented and approved by the Town Board of Trustees. Should the applicant need to alter the Neighborhood Master Plan post-approval, a formal amendment of the plan may be required. Section 30-6-106 of the municipal code states that a Neighborhood Master Plan must consist of the following required elements:

30-6-106(E) Required Elements	Finding	Rationale
1. <u>Traffic Plan</u>: The applicant shall provide a preliminary traffic plan that addresses the following elements: i. The proposed street network connectivity to the existing road network, including all proposed access points. ii. The location and layout of all arterial and collector roads within the development. Local streets and alleys do not need to be depicted. iii. A preliminary traffic impact study prepared by a licensed traffic engineer which evaluates proposed access points, the existing street system, and any need for any road improvements (including off-site improvements) created by the proposed development.	Yes	The applicant submitted a Traffic Impact Study considering the existing background traffic and anticipated traffic movement as a result of the proposed development. The Traffic Impact Study was reviewed by the Town Engineer. The conceptual design of the Neighborhood Master Plan incorporates the findings outlined in the Traffic Impact Study for on-site and off-site improvements required. <u>County Road 6C</u> This road shall be annexed in full along the frontage of the property with the annexation request. The remainder of County Road 6C shall be annexed and improved to County Line Road prior to the submittal of a Preliminary Plat. County Road 6C shall be improved to the Rural Collector / Local standard and include a 6' tree lawn between the utility corridor and the walk in accordance with the residential tree lawn dimension. County Road 6C shall be improved from the intersection with County Road 15/1st Street to the east to County Line Road. The improvement shall consist of the entire width of the road and drainage swales on both sides of the road. The north side of the road will not be required to host the tree lawn and sidewalk. The overhead utility lines will be buried. The stormwater will be managed in swales and will not be allowed to sheet flow across streets and trails. <u>County Road 15/1st Street</u> This road shall be annexed in full along the frontage of the property with the annexation request. County Road 15/1st Street shall be improved to the Rural Collector / Local standard and include a 6' tree lawn between the utility corridor and the walk in accordance with the residential tree lawn dimension.

		Improvements to County Road 4 at State Highway 287 will be required. The extent of the improvements and the developer's proportionate share of the improvements, if any, will be finalized with a Development Agreement at the time of Final Plat. Development expectations for projects in the Town of Berthoud include integration into the Town's and Regional Master Planning open space, trail, pedestrian and traffic networks; provision of street trees, parks and public amenities; design, engineering and installation of adjacent roadways; adherence to requirements of the school district and the fire protection district; and coordination with all public utilities serving the development, for example. Staff also ensures the specifications, standards, guidelines and expectations outlined in the Town's Comprehensive Plan, Land Development Code, Landscape and Architectural Design Guidelines are met.
30-6-106(E) Required Elements	Finding	Rationale
2. <u>Open Space Plan</u>: The applicant shall provide a preliminary open space plan that addresses the following elements: i. Proposed open space distribution and location, including percentage of open space. ii. Compliance with 30-2-109(D)(4) open space elements. iii. Required buffer areas as per 30-2-109(C)(2)		The applicant has considered the Land Use Code, the Comprehensive Plan and the Master Plans affecting the property and have incorporated connection to the Regional Trail system, provided proposed site amenities and neighborhood identity features. The applicant has considered the referral comments from Colorado Parks and Wildlife and have proposed to preserve the Floodplain and Riparian Areas. The buffer requirements found in the Land Use Code have been met.
3. <u>Park(s) Plan</u>: i. Proposed park locations and types of parks as per Section 30-2-109(B)(2) and (3) ii. Proposed park acreage as per Section 30-2-109(B)(2)	Yes	The required variety of site amenities, park acreage requirements, and neighborhood identity features as required by the Land Use Code have been incorporated into the Neighborhood Master Plan.

30-6-106(E) Required Elements	Finding	Rationale
4. <u>Pedestrian Network:</u> i. Location of all trails within development, and connection to existing trail network. ii. Connectivity of sidewalks to the existing pedestrian system, including any off-site sidewalk improvements. iii. Depiction of any bike lanes or any other multi-modal features.	Yes	Regional and local trails have been incorporated into the Neighborhood Master Plan. Sidewalk connectivity has been depicted on the submitted plans.
5. <u>Zoning:</u> i. The location of zoning boundaries shall be provided with the application and depicted on the Neighborhood Master Plan. ii. The plan should show how lot diversity standards of Section 30-2-116(D)(1)(c), are met and create a mix of zoning which is harmonious with the surrounding area, and within the property itself. iii. Density and lot diversity shall be distributed throughout the project and shall not be located in only one area.	Yes	The entire site is proposed for Suburban Residential, SR zoning classification in accordance with the vision of the 2021 Comprehensive Plan Future Land Use Map. The lot diversity standards found in the Land Use Code have been met. A minimum of four housing diversity types shall be required in residential developments containing more than 50 acres according to the Development Design requirements found in the Land Use Code. The applicant has proposed four housing / lot types. Architectural diversity is reviewed by the Town.
6. <u>Overall Utility Plan:</u> i. A preliminary utility plan depicting the existing capacity of the utility system for both the proposal and any potential future development. ii. Proposed connections to the existing utility system. iii. The location of any proposed or required lift stations. iv. Utility plans for the interior of the development (such as water and sewer service lines) are not required as part of this process.	Yes	A Preliminary Utility Plan was provided with application materials, has been reviewed by the Town and referral agencies including the Town Engineer, and has been amended according to referral comments. The Preliminary Plat and Final Plat applications will include Construction drawings and documents and these documents will be continuously reviewed.

30-6-106(E) Required Elements	Finding	Rationale
7. <u>Subdivision Identity Standards:</u> i. The applicant shall provide compliance with subdivision identity standards found in Section 30-2-131.	Yes	Neighborhood identity features required by the Land Use Code have been met. In addition, the land adjacent to the floodplain/floodway and the portion of the property containing the riparian area is being preserved. Due to the sensitivity of this land, the applicant is proposing this area to be low-impact and largely a visual amenity. This amenity is not included in the active-use subdivision identity standards however, it is a large focal point of the development.

Neighborhood Master Plan Review Criteria

Section 30-6-106(G) states that the town shall use the following criteria in addition to other applicable provisions of the code to evaluate the application.

30-6-106(G) Review Criteria	Finding	Rationale
1. The land use mix within the project conforms to Berthoud's Zoning District Map and Comprehensive Plan Preferred Land Use Map and furthers the goals and policies of the Comprehensive Plan.	Yes	The entire site is proposed for Suburban Residential with SR zoning classification in accordance with the vision of the 2021 Comprehensive Plan Future Land Use Map. The lot diversity standards found in the Land Use Code have been met. A minimum of four housing diversity types shall be required in residential developments containing more than 50 acres according to the Development Design requirements found in the Land Use Code. The applicant has proposed four housing / lot types. Architectural diversity is reviewed by the Town at time of building permit. Many times, the Town will also review the architectural master plan with the Final Plat. Neighborhood identity features required by the Land Use Code have been met. In addition, the land adjacent to the floodplain/floodway and the portion of the property containing the riparian area is being preserved. Due to the sensitivity of this land, the applicant is proposing this area to be low-impact and largely a visual amenity. This amenity is not included in the active-use subdivision identity standards however, it is a large focal point of the proposed development.

30-6-106(G) Review Criteria	Finding	Rationale
2. The Neighborhood Master plan represents a functional system of land use and is consistent with the rationale and criteria set forth in this Chapter, the Town Comprehensive Plan, and the Parks, Open Space and Recreation (PORT) Plan as amended.		The high level of scrutiny expended on the Neighborhood Master Plan review at this stage in development review ensures the proposal includes land uses, open space, trail connectivity, transportation corridors, utility provision, for example that follow the criteria found in the Comprehensive Plan, Master Plans, the Municipal Code, and the engineering specifications and standards.
3. The preliminary traffic, open space, park utility and pedestrian design is adequate and functional given the existing and planned capacities of each system, and meets the standards found in this Code.	Yes	The applicant submitted a Traffic Impact Study considering the existing background traffic and anticipated traffic movement as a result of the proposed development. The Traffic Impact Study was reviewed by the Town Engineer. The conceptual design of the Neighborhood Master Plan incorporates the findings outlined in the Traffic Impact Study for on-site and off-site improvements required. <u>County Road 6C</u> This road shall be annexed in full along the frontage of the property with the annexation request. The remainder of County Road 6C shall be annexed and improved to County Line Road prior to the submittal of a Preliminary Plat. County Road 6C shall be improved to the Rural Collector / Local standard and include a 6' tree lawn between the utility corridor and the walk in accordance with the residential tree lawn dimension. County Road 6C shall be improved from the intersection with County Road 15/1st Street to the east to County Line Road. The improvement shall consist of the entire width of the road and drainage swales on both sides of the road. The north side of the road will not be required to host the tree lawn and sidewalk. The overhead utility lines will be buried. The stormwater will be managed in swales and will not be allowed to sheet flow across streets and trails. <u>County Road 15/1st Street</u> This road shall be annexed in full along the frontage of the property with the annexation request. County Road 15/1st Street shall be improved to the Rural Collector / Local standard and include a 6' tree lawn between the utility corridor and the walk in accordance with the residential tree lawn dimension. Improvements to County Road 4 at State Highway 287 will be required. The extent of the

		improvements and the developer's proportionate share of the improvements, if any, will be finalized with a Development Agreement at the time of Final Plat. Development expectations for projects in the Town of Berthoud include integration into the Town's and Regional Master Planning open space, trail, pedestrian and traffic networks; provision of street trees, parks and public amenities; design, engineering and installation of adjacent roadways; adherence to requirements of the school district and the fire protection district; and coordination with all public utilities serving the development, for example. Staff also ensures the specifications, standards, guidelines and expectations outlined in the Town's Comprehensive Plan, Land Development Code, Landscape and Architectural Design Guidelines are met. The applicant has illustrated pedestrian connectivity to the regional and local trails systems.
4. Negative impacts on adjacent land uses have been identified and satisfactorily mitigated.	Yes	Adjacent land uses include agricultural and rural residential development. The Town's standards include a recognition of the Right to Farm policy. Setbacks, tree lawns, on and off-site improvements have proposed to mitigate the impacts of the development on the road/street networks, trails, open space areas and the river corridor.
5. There is a need or desirability within the community for the development and the development will help achieve a balance of land use and/or housing types within Berthoud according to town goals.	Yes	The Town has recognized the potential development of the property to Suburban Residential uses as envisioned in the 2021 Comprehensive Plan update. The applicant has provided a Neighborhood Master Plan prepared in accordance with the Land Use Code and the Comprehensive Plan which are the public-facing documents which depict the Town's goals for future development.

Staff has found the Neighborhood Master Plan application materials have been submitted correctly. Referral agencies were provided with an initial review period on August 5, 2024 and a second review period on September 16, 2024. The applicant has addressed all concerns of referral agencies and the Town. Any Conditions of Approval proposed provide direction to the applicant regarding expectations for submittal of the Preliminary Plat. The first referral review period concluded prior to the Trustees hearing regarding substantial compliance with the Annexation Petition. The second referral review period concluded prior to the Planning Commission hearing on October 24, 2024. The process for considering a Neighborhood Master Plan was followed.

Rezoning

The subject project is currently zoned RR2 in unincorporated Larimer County. The process of annexation is accompanied with a zoning request. The applicant is requesting zoning to SR, Suburban Residential. Rezoning is addressed through an official zoning map amendment. Section 30-3-110(D) states for the purpose of establishing and maintaining sound stable and desirable development within the Town, the Zoning Map shall not be amended except when it addresses one or more of the criteria in the following table.

30-3-110(D) Zoning Map Amendment Criteria	Finding	Rationale
1. To correct a manifest error in an ordinance establishing the zoning for a specific property; or 2. To rezone an area or extend the boundary of an existing district because of changed or changing conditions in a particular area or in the Town generally; or 3. The land to be rezoned was zoned in error and as presently zoned is inconsistent with the policies and goals of the Town Comprehensive Plan; or 4. The proposed rezoning is necessary to provide land for a community-related use that was not anticipated at the time of the adoption of the Town Comprehensive Plan, and the rezoning will be consistent with the policies and goals of the Comprehensive Plan; or 5. The area requested for rezoning has changed or is changing to such a degree that it is in the public interest to encourage development or redevelopment of the area	Yes	The 5th criteria has been met. The property is in unincorporated Larimer County and the property owner seeks to develop in the Town of Berthoud, according to the Town's design, development, and engineering standards. The applicant seeks to develop in the Town and agrees to adhere to regional and local transportation, trails and open space networks pursuant to the Town's various comprehensive and master plans in effect. The applicant agrees to adhere to the Town's architectural, project diversity standards as well as provide for development amenities and preserving sensitive riparian land. The applicant has requested a zoning classification which meets the intent of the future land use envisioned in the 2021 Comprehensive Plan update.

For convenience, a comparison of the land uses determined to be appropriate in the County's RR-2 Zone District and those determined to be appropriate in the Town's SR Zone District can be found in a comparison Table on the following page. Information reviewed to populate this table was derived from Table 3.1 in the County's Land Use Code and Table 3.3 in the Town's Land Use Code. The land use categories in **green may occur in both Larimer County and in the Town of Berthoud**. The land use categories in **blue are additional land use categories that may occur in the Town of Berthoud** and not in Larimer County. The land use categories **not highlighted in a color are those additional land use categories that could be permitted in the County** and not in the Town.

The Town of Berthoud's zoning district of SR is more restrictive than what can be allowed in unincorporated Larimer County in the RR-2 zone district. The land use process required in both jurisdictions are also listed below and the development review process is either a use by right requiring a building permit, an administrative site plan process, or a process requiring a public hearing. If a County-permitted use is noted through "Right," there is no review process required.

This table is provided to further the understanding of uses contemplated as appropriate in the Town of Berthoud through the development review processes established by the Land Use Code and those uses the County has contemplated as appropriate through right (no land use process/review) or through the development review process.

Land Use Comparison		
Land Use Category	Town of Berthoud Table for Zone District SR	Larimer County Table 3.1 for Zone District RR-2
Single Family Housing	Building Permit	Building Permit
Community Garden	Administrative	Public Hearing
Elder care/day care/Safe House/Group Home	Public Hearing	Right
Assisted Living Facility and Group Homes	Administrative/Public Hearing	Right
Senior Housing/Nursing Facility	Public Hearing	Right
Short Term Rental	Permit	Permit
Wireless communication facilities	Public Hearing	Administrative/Public Hearing
Parks/Recreation (Amphitheater)	Administrative (Public Hearing)	Right
Bed and Breakfast	Public Hearing	
Child Care home for up to 12 children	Building Permit	
Public Utility	Administrative	
Workshops and custom small industry (art studio)	Public Hearing	
Agricultural Operation		Right
Nursery – Retail & Wholesale		Administrative
Tree Farm – Retail & Wholesale		Administrative
Agricultural Labor Housing		Public Hearing
Garden Supply Center		Public Hearing
Custom Meat Processing Facility		Public Hearing
Packing Facility		Public Hearing
Apiary (commercial)		Right
Commercial Feedlot or Dairy		Public Hearing
Equestrian Facility		Public Hearing
Poultry Keeping /Processing		Right/Public Hearing
Manufactured Housing		Right
Indoor Assembly (outdoor)		Right (Public Hearing)
Cemetery with Funeral Home		Public Hearing
Kennel (Outdoor uses)		Public Hearing
Pet Animal Service, Vet Hospital Large/Small Animals with outdoor space		Public Hearing
Campground		Public Hearing
Clubhouse		Public Hearing
School (Non-Public)		Administrative (Public Hearing)
RV Park		Public Hearing
Riding Stable		Public Hearing
Shooting Range		Public Hearing
Mining		Public Hearing
Radio and Television Transmission		Public Hearing
Solar facilities		Public Hearing
Wind energy facilities		Public Hearing

Staff has found the Change of Zone application materials have been submitted correctly. Referral agencies were provided with an initial review period on August 5, 2024 and a second review period on September 16, 2024. The applicant has addressed all concerns of referral agencies and the Town. Any Conditions of Approval proposed provide direction to the applicant regarding expectations for submittal of the Preliminary Plat. The first referral review period concluded prior to the Trustees hearing regarding substantial compliance with the Annexation Petition. The second referral review period concluded prior to the Planning Commission hearing on October 24, 2024. The process for considering a Change of Zone outlined in the Land Use Code was followed.

PUBLIC NOTICE AND COMMENT

Notice of the Planning Commission Public Hearing to consider the three applications was published in the *Berthoud Surveyor* and the *Loveland Reporter* the week of October 7, 2024. Because the land use applications include an Annexation request, this request is required to be published for four consecutive weeks prior to the Town Trustees public hearing. Surrounding Property Owners were notified by mailing on October 8, 2024. The property was posted with a sign by the applicant on October 8, 2010. The Notice requirements for all three application requests followed the annexation notice requirements which are the most stringent in accordance with Table 1.1. All three applications and both the Planning Commission and the Town Board of Trustees hearings were noticed concurrently.

FINDINGS AND RECOMMENDATIONS

Annexation

Staff recommends that Planning Commission recommend approval of the River Trails Annexation to the Town Board of Trustees. Staff's findings are based on the Criteria for Approval found in Section 30-8-102 of the Municipal Code as discussed in this Staff Report, the property is within the Town's 3-Mile Plan and Urban Growth Boundary, and the process found in Municipal Code Section 30-8-104.B.5.

Neighborhood Master Plan

Staff recommends that Planning Commission recommend approval of the River Trails Neighborhood Master Plan to the Town Board of Trustees with the condition listed below. Staff's findings are based on the Criteria for Approval found in Section 30-6-106 of the Municipal Code as discussed in this Staff Report.

Proposed Condition of Approval:

1. An application for annexation of County Road 6 shall be submitted to the Town prior to submittal of the Preliminary Plan. The distance shall be from the eastern property boundary to County Road 1 (County Line Road) resulting in this entire mile of County Road 6 being annexed to the Town of Berthoud.

Rezoning

Staff recommends that Planning Commission recommend approval of the River Trails request to zone the property to SR, Suburban Residential in accordance with the 2021 Comprehensive Plan Future Land Use Map, the process of for approval found in Municipal Code Section 30-8-104.B.5, and the criteria for approval found in Section 30-3-107.D of the Municipal Code as discussed in this Staff Report.

Attachments

1. Resolution of Substantial Compliance
2. Application form
3. Annexation Impact Report and Annexation Petitions
4. Annexation map
5. Change of Zone Narrative and map
6. Neighborhood Master Plan and map
7. Preliminary traffic impact study/analysis
8. Mineral ownership
9. Mineral notification
10. Referral Comments
 - a. Little Thompson Water District
 - b. Larimer County Engineering
 - c. Thompson School District
 - d. Colorado Parks and Wildlife
11. Comments from Surrounding Property Owners
12. Draft Ordinance for the Annexation
13. Draft Resolution for the Neighborhood Master Plan
14. Draft Ordinance for the Zoning
15. Sign Posting
16. Notice Postcard
17. Newspaper Publication

RESOLUTION NUMBER 12

(SERIES 2024)

A RESOLUTION REGARDING PETITION FOR ANNEXATION FILED BY RIVER TRAILS, LLC AND SETTING THE MATTER FOR A PUBLIC HEARING

WHEREAS, River Trails, LLC as property owner (“the Petitioner”), filed with the Town Clerk a Petition for Annexation on July 29, 2024 (“the Petition”); and

WHEREAS, The Town Board of Trustees of the Town of Berthoud reviewed such Petition at its meeting held on September 10, 2024.

FINDINGS

The Town Board of Trustees hereby finds and concludes that the Petition substantially complies with Section 31-12-107(1), C.R.S., and that a public hearing should be held to determine if the proposed annexation of the 245.2 +/- -acre property, commonly known as Parcel Numbers 9425000004, 9425000003 and 9424000006, further described in Exhibit A, and generally located east of and adjacent to 1st Street and south of and adjacent to Larimer County Road 6C, in Larimer County, Colorado, complies with Section 31-12-104 and Section 31-12-105, C.R.S.

NOW THEREFORE BE IT RESOLVED BY THE TOWN BOARD OF TRUSTEES OF THE TOWN OF BERTHOUD, COORADO, AS FOLLOWS:

The public hearing shall be set for November 12, 2014 beginning at 6:30 P.M., or as soon thereafter as the matter may be heard, with such hearing to be conducted at the Berthoud Town Board of Trustees Chambers, 807 Mountain Avenue, Berthoud, Colorado. The purpose of such hearing shall be to consider the Petition for Annexation and to determine whether the statutes referred to above have been complied with, whether the property is eligible for annexation, and whether the area proposed to be annexed meets the requirements of Section 31-12-104 and 31-12-105, C.R.S.

[Intentionally left blank]

MOVED, SECONDED AND ADOPTED BY THE TOWN BOARD OF TRUSTEES OF THE
TOWN OF BERTHOUD, COLORADO THIS 10th DAY OF SEPTEMBER, 2024.

TOWN OF BERTHOUD

By 
William Karspeck, Mayor

ATTEST:

By: 
Christian Samora, Town Clerk



Exhibit A: Legal Descriptions

PARCEL DESCRIPTION
RIVER TRAILS ANNEXATION NO. 1

A parcel of land situate in the Southwest Quarter (SW1/4) of Section Twenty-four (24), Township Four North (T.4N.), Range Sixty-nine West (R.69W.) of the Sixth Principal Meridian (6th P.M.), Town of Berthoud, County of Larimer, State of Colorado and being more particularly described as follows:

COMMENCING at the South Sixteenth corner of said SW1/4 of Section 24 and assuming the North line of the South half of said SW1/4 as bearing North 89°02'27" East, being a Grid Bearing of the Colorado State Plane Coordinate System, North Zone, North American Datum 1983/2011, a distance of 2657.78 feet Monumented by a #5 rebar with 2" aluminum cap stamped LS 13446 on the West end, and a #5 rebar with 3.25" aluminum cap stamped LS 38348 on the East end, and with all other bearings contained herein relative thereto;

THENCE North 89°02'27" East, along said North line, a distance of 30.00 feet to the POINT OF BEGINNING, also being a point on the boundary of the South First Street Annexation to the Town of Berthoud, recorded April 3, 1997, as Reception Number 19970020418 of the Records of the Larimer County Clerk and Recorder;

THENCE North 89°02'27" East, continuing along said North line and said annexation boundary, a distance of 20.00 feet;

THENCE North 00°21'20" West, continuing along said annexation boundary, a distance of 35.00 feet to a point on the North right of way of East County Road 6C, as shown on the plat of Mary V. Moore M.R.D., recorded November 2, 1993 as Reception Number 19930082235 of the Records of the Larimer County Clerk and Recorder;

THENCE North 89°02'27" East, along said North right of way, a distance of 318.75 feet;

THENCE South 82°35'32" West a distance of 311.64 feet to a point on the North line of the South half of said SW1/4;

THENCE South 04°19'57" East a distance of 362.91 feet to a point on the East line of that parcel recorded January 7, 1878 as Book G Page 580 of the Records of the Larimer County Clerk and Recorder;

THENCE North 08°56'36" West, along said East line, a distance of 178.75 feet;

THENCE South 89°38'27" West a distance of 27.84 feet to the Southeast corner of said South First Street Annexation;

THENCE North 00°23'06" West, along said annexation boundary a distance of 184.98 feet to the POINT OF BEGINNING.

Said described parcel of land contains 13,654 Square Feet or 0.313 Acres, more or less (±).

PARCEL DESCRIPTION
RIVER TRAILS ANNEXATION NO. 2

A parcel of land, situate in the Southwest Quarter (SW1/4) of Section Twenty-four (24), Township Four North (T.4N.), Range Sixty-nine West (R.69W.) of the Sixth Principal Meridian (6th P.M.), Town of Berthoud, County of Larimer, State of Colorado and being more particularly described as follows:

COMMENCING at the South Sixteenth corner of said SW1/4 of Section 24 and assuming the North line of the South half of said SW1/4 as bearing North 89°02'27" East, being a Grid Bearing of the Colorado State Plane Coordinate System, North Zone, North American Datum 1983/2011, a distance of 2657.78 feet Monumented by a #5 rebar with 2" aluminum cap stamped LS 13446 on the West end, and a #5 rebar with 3.25" aluminum cap stamped LS 38348 on the East end, and with all other bearings contained herein relative thereto;

THENCE North 89°02'27" East, along said North line, a distance of 59.46 feet to the POINT OF BEGINNING;

THENCE North 82°35'32" East a distance of 311.64 feet to a point on the North right of way of East County Road 6C, as shown on the plat of Mary V. Moore M.R.D., recorded November 2, 1993 as Reception Number 19930082235 of the Records of the Larimer County Clerk and Recorder;

THENCE North 89°02'27" East, along said North right of way, a distance of 831.94 feet;

THENCE South 80°45'46" West a distance of 1036.95 feet;

THENCE South 00°32'05" East a distance of 872.85 feet to a point on the East line of that parcel recorded January 7, 1878 as Book G Page 580 of the Records of the Larimer County Clerk and Recorder;

THENCE North 08°56'36" West, along said East line, a distance of 630.95 feet;

THENCE North 04°19'57" West a distance of 362.91 feet to the POINT OF BEGINNING.

Said described parcel of land contains 141,781 Square Feet or 3.255 Acres, more or less (±).

PARCEL DESCRIPTION
RIVER TRAILS ANNEXATION NO. 3

A parcel of land, situate in the South half (S1/2) of Section Twenty-four (24), Township Four North (T.4N.), Range Sixty-nine West (R.69W.) of the Sixth Principal Meridian (6th P.M.), and the Northwest Quarter (NW1/4) of Section Twenty-five (25), Township Four North (T.4N.), Range Sixty-nine West (R.69W.) of the Sixth Principal Meridian (6th P.M.), Town of Berthoud, County of Larimer, State of Colorado and being more particularly described as follows:

COMMENCING at the South Sixteenth corner of said SW1/4 of Section 24 and assuming the North line of the South Half of said SW1/4 as bearing North 89°02'27" East, being a Grid Bearing of the Colorado State Plane Coordinate System, North Zone, North American Datum 1983/2011, a distance of 2657.78 feet Monumented by a #5 rebar with 2" aluminum cap stamped LS 13446 on the West end, and a #5 rebar with 3.25" aluminum cap stamped LS 38348 on the East end, and with all other bearings contained herein relative thereto;

THENCE North 89°02'27" East, along said North line, a distance of 50.37 feet;

THENCE North 00°57'33" West a distance of 35.00 feet to a point on the North right of way of East County Road 6C, as shown on the plat of Mary V. Moore M.R.D., recorded November 2, 1993 as Reception Number 19930082235 of the Records of the Larimer County Clerk and Recorder;

THENCE North 89°02'27" East, along said North right of way, a distance of 1150.69 feet to the POINT OF BEGINNING;

THENCE North 89°02'27" East, continuing along said North right of way, a distance of 792.67 feet;
THENCE South 00°19'57" East a distance of 5.00 feet to a point on the North right of way of East County Road 6C, as shown on the plat of Golden Acres Minor Land Division 02-S1964, recorded August 22, 2003 as Reception Number 20030107937 of the Records of the Larimer County Clerk and Recorder;

THENCE North 89°02'27" East, along said North right of way, a distance of 664.43 feet to a point on the East line of the North half of said SW1/4, from which the Center-South Sixteenth Corner of said Section 24 bears South 00°19'12" East a distance of 30.00 feet;

THENCE North 89°02'42" East, continuing along said North right of way, a distance of 1248.36 feet;
THENCE South 00°57'18" East a distance of 30.00 feet to a point on the North line of the South half of the Southeast Quarter of said Section 24;

THENCE South 61°08'42" West, along the approximate centerline of Rockwell Ditch, a distance of 422.20 feet;

THENCE South 23°25'42" West a distance of 142.60 feet to the approximate confluence of Rockwell Ditch and the Little Thompson River;

The following 8 courses are along the approximate centerline of said Little Thompson River.

THENCE North 75°15'42" West a distance of 89.83 feet;
THENCE South 38°48'59" West a distance of 75.80 feet;
THENCE South 30°41'09" West a distance of 150.28 feet;
THENCE South 12°10'45" West a distance of 120.83 feet;
THENCE South 40°45'06" West a distance of 110.06 feet;

THENCE South 62°50'06" West a distance of 144.57 feet;
THENCE South 67°38'42" West a distance of 325.77 feet;

THENCE South 52°17'46" West a distance of 99.24 feet to a point on the West line of the South half of the Southeast Quarter of said Section 24;

THENCE South 00°19'12" East, along said West line, a distance of 392.52 feet to the South Quarter Corner of said Section 24;

THENCE South 00°23'40" East, along the East line of the NW1/4 of said Section 25, a distance of 970.68 feet;

THENCE North 89°56'28" West a distance of 2493.94 feet to a point on the East line of that parcel recorded January 7, 1878 as Book G Page 580 of the Records of the Larimer County Clerk and Recorder;

The following 4 courses are along the East line of said parcel.

THENCE North 02°04'42" East a distance of 624.62 feet;
THENCE North 07°20'03" East a distance of 149.82 feet;
THENCE North 07°04'32" East a distance of 153.28 feet to a point on North line of said NW1/4, from which the Northwest Corner of said Section 25 bears South 88°58'50" West a distance of 230.00 feet;
THENCE North 08°56'36" West a distance of 342.51 feet;
THENCE North 00°32'05" West a distance of 872.85 feet;
THENCE North 80°45'46" East a distance of 1036.95 feet to the POINT OF BEGINNING.

Said described parcel of land contains 6,259,750 Square Feet or 143.704 Acres, more or less (±).

PARCEL DESCRIPTION
RIVER TRAILS ANNEXATION NO. 4

A parcel of land, situate in the Northwest Quarter (NW1/4) of Section Twenty-five (25), Township Four North (T.4N.), Range Sixty-nine West (R.69W.) of the Sixth Principal Meridian (6th P.M.), Town of Berthoud, County of Larimer, State of Colorado and being more particularly described as follows:

COMMENCING at the West Quarter corner of said Section 25 and assuming the South line of said NW1/4 as bearing North 89°10'21" East, being a Grid Bearing of the Colorado State Plane Coordinate System, North Zone, North American Datum 1983/2011, a distance of 2657.58 feet Monumented by a #6 rebar with 2.5" aluminum cap stamped LS 17662 on the West end, and a #6 rebar with 2" aluminum cap stamped LS 13446 on the East end, and with all other bearings contained herein relative thereto;

THENCE North 89°10'21" East, along said South line, a distance of 90.00 feet to the POINT OF BEGINNING;

THENCE North 02°04'42" East, along the East line of that parcel recorded January 7, 1878 as Book G Page 580 of the Records of the Larimer County Clerk and Recorder, a distance of 1706.94 feet;

THENCE South 89°56'28" East a distance of 2493.94 feet to a point on the East line of said NW1/4;

THENCE South 00°23'40" East, along said East line, a distance of 1666.21 feet to the Center Quarter Corner of said Section 25;

THENCE South 89°10'21" West, along the South line of said NW1/4, a distance of 2567.58 feet to the POINT OF BEGINNING.

Said described parcel of land contains 4,266,195 Square Feet or 97.938 Acres, more or less (±).



Town of Berthoud
807 Mountain Ave.
P.O. Box 1229
Berthoud, CO 80513
970.532.2643

DEVELOPMENT REVIEW APPLICATION

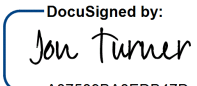
All required information must be provided before submittal will be accepted and deemed complete.
To be complete, the application must include all items identified on the submittal checklist.
Please complete both sides of application form.

Parcel Number(s): 9425000003, 9424000006		
Site Address: SE Corner of S 1st Street & E CR 6C		
Project Name: River Trails		
Brief description of project: This is a proposal for a residential development which includes a mix of product types, park space, open space and trails.		
APPLICATION TYPE (Check as appropriate):		
☒ Annexation	☐ Preliminary Subdivision Plat	☐ Final Site Plan
☒ Rezoning	☐ Final Subdivision Plat	☐ PUD Amendment
☒ Concept Plan	☐ Plat Amendment	☐ PUD Preliminary Development Plan
☐ Minor Subdivision	☐ Oil and Gas	☐ PUD Final Development Plan
☐ Special Use Review	☐ ROW Vacation	☐ Other _____
APPLICANT		
Name: Kristin Turner		
E-mail: kristin@tbgroup.us Phone: 970.532.5891	Mailing Address: 444 Mountain Avenue City/State/Zip: Berthoud, CO 80513	
CONTACT PERSON (will receive correspondence from Town Staff/Referral Agencies)		
Name: Kristin Turner		
E-mail: kristin@tbgroup.us Phone: 970.532.5891	Mailing Address: 444 Mountain Avenue City/State/Zip: Berthoud, CO 80513	
OWNER(S) (If different than applicant)		
Name: River Trails, LLC, Jon Turner Manager		
E-mail: jon@hillsidecommercialgroup.com Phone: 970.204.9393	Mailing Address: 6355 N. Fairgrounds Ave. Suite 300 City/State/Zip: 6355 N. Fairgrounds Ave. Suite 300	
CONSULTANT (Engineer, Surveyor, or Planner)		
Name: Danny Weber, Avant Civil		
E-mail: dweber@avantcivilgroup.com Phone: 970.286.7995	Mailing Address: 1337 Riverside Avenue City/State/Zip: Fort Collins, CO 80524	

LAND USE INFORMATION		
Existing Use: Vacant Proposed Use: Residential Existing Zoning: RR2 - Rural Residential (C) Proposed Zoning: (if applicable): SR and AG Number of acres: 103.43 annex/93.56 NMP Proposed Access: S CR15 & E CR 6C		
Adjacent zoning / land use:		
East Side: RR2 - Rural Residential	North Side: RR2 - Rural Residential	
West Side: PUD & RR2 - Rural Residential	South Side: RR2 - Rural Residential	
UTILITY SERVICE INFORMATION		
Water: Town of Berthoud	Sewer: Town of Berthoud	
PROJECT INFORMATION		
Number of proposed units: 416 Number of phases: TBD Number of Units per phase: TBD Number of lots proposed: 416 Lot size minimum: 20x80 Lot size maximum: 50x115 Lot size average: 35x47 Gross density (units/acre): 1.69 (annexation ac) 4.44 (NMP ac) Net density (units/acre): 5.42 du/ac Area and percent open space: 27.45 OS (29%)/ 8.74 Park (9.3%)	Non-Residential Building Area (Sq. Ft.) Proposed: N/A Non-Residential Construction Floor Area Ratio Proposed: N/A Total Number of Parking Spaces: N/A <u>Acreage of Site:</u> a. Gross: 93.56 (NMP) b. Right-of-Way: 16.90 c. Net (a-b) 76.66	
Type of Housing Proposed (please check):		
☒ Future Single Family ☒ Duplex ☐ Multi-family (# of units:) ☒ Townhouse ☐ Condominium		

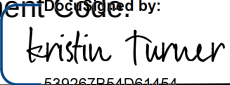
Signatures are required for ALL Property Owners and the Applicant

I hereby certify that I am the lawful owner of the parcel(s) of land that this application concerns and consent to the action. I hereby permit Town of Berthoud staff to enter upon the property for the purposes of inspection relating to the application. Building Permits will not be accepted while this application is in process.

DocuSigned by:

 Property Owner(s): _____ Date: 10/15/2024
A87509BA8EDB47D...

Property Owner(s): _____ Date: _____

In submitting the application materials and signing this application agreement, I acknowledge and agree that the application is subject to the applicable processing and public hearing requirements set forth in the Development Code:

DocuSigned by:

 Applicant: _____ Date: 10/15/2024
530267B54D61464...

FOR OFFICE USE ONLY	Received By:	Date:
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October 10, 2024

Town of Berthoud
328 Massachusetts Avenue
PO Box 1229
Berthoud, CO. 80513

RE: River Trails Property Annexation – Impact Report

Dear Town Staff:

The River Trails property is requesting annexation into the Town of Berthoud, proposing a residential development on the northern 90.56 acres. The existing homestead is not intended for development. The River Trails property is located on the east side of S County Road 15 and south of E County Road 6C. The annexation is for approximately 103.43 acres while the concept for the project includes approximately 90.56 acres of land. The report analyzes the proposed development's impact with respect to the Town of Berthoud's services.

Sincerely,

Kristin Turner
Partner, TB Group, LLC

River Trails Property Annexation Development Impact Assessment Statements

General Project Description

The River Trails property is located on the east of S County Road 15 and south of E County Road 6C. This site includes approximately 103.43 acres of land. The proposed land use is for a residential development, including open space, park space and trails.

Water

Domestic water service for the project will be provided by the Town of Berthoud. On-site water mains will be looped through the development to provide domestic water service and fire flows. The water network will connect to the Town's system in two places: 1) West, across 1st Street/CR 15, connecting in the Heritage Ridge subdivision, and 2) Northeast of the site, connecting to a waterline in Springhill Lane that extends north. Currently, there is a Little Thompson Water District (LTWD) main that runs east/west located south of Nebraska Avenue in the Farmstead West subdivision; a branch off that main extends south within Springhill Lane for approximately 725-feet (where the 2nd connection point is). As part of this project, the branch line will be disconnected from the LTWD main and extended north where it will be connected to the 12" water main within Nebraska Avenue.

Sanitary Sewer

Sanitary sewer service for the project will be provided from the Town of Berthoud. The sewer service will be connected via gravity flow to the 24" sewer main that runs on the south side of the project site conveying flows east to the wastewater treatment plant.

Natural Gas

The developer will work with Xcel Energy during the entitlement and design processes to address impacts on the existing natural gas system(s) surrounding the property. It is expected that the project will work with utility providers in the area to extend service lines and capacity to meet the natural gas demands of the project.

Electric

The developer will work with Xcel Energy during the entitlement and design processes to address impacts on the existing electrical system(s) surrounding the property. It is expected that the project will work with utility providers in the area to extend service lines and capacity to meet the electrical demands of the project.

Drainage

Storm water drainage will be designed to convey, detain, and release runoff flows using grading to develop drainage patterns that achieve design goals based on standard practice and regulatory requirements. The storm water design will be based on the development layout and existing topography.

Telephone

Telephone service will be provided by local available communications. The projected use is anticipated to be a typical usage similar to other residential projects of this size. It is anticipated that we will work with communications provider as we proceed through the approval and development process to ensure that the most recent technologies are available to the future residential land uses.

Streets

The River Trails property is bordered by S County Road 15 to the west and E County Road 6C to the north, both of which will provide access for this community. A preliminary traffic impact study has been submitted with this package and will be reviewed and updated as necessary as future plats move forward.

Law enforcement

Law enforcement for the River Trails property would be provided by the Larimer County sheriff through the existing agreement. It is not anticipated that there would be special security needs or a specific need for additional officers. As with all law enforcement agencies, it is understood that regular internal assessment and planning by these departments helps with planning for population growth, within the region they support.

Fire protection

Fire protection for the River Trails property would be provided by Berthoud Fire Protection District. It is not anticipated that the River Trails project would pose special fire hazards. Fire prevention requirements, fire detection, fire lanes, emergency access, etc. would be provided as required by code.

Schools

The River Trails project is within the Thompson School District. We will work with the District to identify and address any impacts of this project.

Parks and recreation

The River Trails project will be part of the River Trails metropolitan district which will include park amenities, including open spaces and trails, and active and passive recreation.

Library

The River Trails property is within the Berthoud Community Library District. We will work with the District to identify and address any impacts of this project.

Environmental considerations

The Little Thompson River runs south of the property and will generally create the division between the developed area (north of the river) and the undeveloped area (south of the river). The River Trails property has historically been used for farming and there are no additional environmentally sensitive areas.

Economic development potential

The River Trails residential development will provide the opportunity for a diverse mix of housing and is anticipated to be a positive addition to the Town of Berthoud economy. Using a multiplier of 2.5 people per household provides an estimated increase of 1,040 residents. The increase in homes and residents is expected to provide additional tax on housing as well as an increase in sales tax from new residents shopping in Berthoud.

River Trails
PETITION FOR ANNEXATION

We represent that we are the landowners of 100% of the land described in this Petition, excluding public streets, alleys, roads and easements, which is legally described on **Exhibit “A”** and depicted on **Exhibit “B”**, and affirm the following to be true and correct as of July 19, 2024, our petition for annexation is filed with the Town of Berthoud.

CONTIGUITY:

1. The perimeter of the proposed annexation has a distance of 1,439.87 feet of which 239.98 are contiguous to the existing Town Limits of Berthoud.
2. This contiguity results in a minimum of 16.6% of the perimeter (at least 1/6) of proposed annexation being contiguous to the Town of Berthoud.
3. The proposed annexation contains approximately 0.313 acres.
4. The requirements of §31-12-104 and §31-12-105 C.R.S., exist or have been met.
5. We further allege:
 - a. It is desirable and necessary that the territory be annexed to the Town of Berthoud.
 - b. A community of interest exists between the territory and the Town of Berthoud.
 - c. The territory is integrated or capable of being integrated with the Town of Berthoud.
 - d. The territory is urban or will be urbanized in the near future.
 - e. No land held in identical ownership is divided into separate parcels unless the owner of said tract has consented in writing or joins in this Petition.
 - f. No proceedings for annexation of the land described in this Petition have been commenced for annexation to another municipality.
6. The Petitioners understand that there may be a significant period of time before municipal utilities will be available, but anticipate that urbanization will be able to take place at a pace acceptable to them without immediate access to these utilities. Until urbanization takes place the petitioners intend to maintain their properties in their current uses, which uses are acceptable to the Town of Berthoud.

7. The Petitioners have submitted the petition with the intention that the property will be developed in accordance with Berthoud's Development Code, Comprehensive Plan, Municipal Code, resolutions and ordinances.
8. The Petitioners are aware that Berthoud has enacted fees and policies with the intention that growth should pay its own way and that growth should improve the health, safety and welfare of its citizens. Examples of Berthoud's fees which are acceptable to the petitioners include fees for: building, electric, construction meter, plan review, building permit administration, parks, trails and open space, public facilities infrastructure, streets, drainage, police facility infrastructure, general administration facility infrastructure, water administration, water meter, water tap, sewer tap, raw water, and other supplemental fees as appropriate.
9. The Petitioners understand that Berthoud is required by Colorado Revised Statutes to prepare and file an annexation impact report. The Petitioners will prepare a proposed annexation impact report and provide it to Berthoud for review and consideration six (6) weeks prior to the hearing.
10. The Petitioners agree to dedicate free and clear of all liens and encumbrances of any kind, and at no charge to the Town, all easements and rights-of-way for streets and other public ways and for other public purposes, within the Property as outlined in a Subdivision Improvements Agreement (approved at the time of final subdivision plat).
11. The Petitioners agree to dedicate, with the subdivision of the Property and at no cost to the Town, all required easements and right-of-way for installation and maintenance of infrastructure.
12. The Petitioners agree to design and install transportation infrastructure, utility infrastructure, and stormwater improvements to serve the Property prior to the issuance of any building permits for all or any portion of the property in accordance with Town standards. The Petitioners shall make such other improvements as required by Town ordinances and resolutions, to guarantee construction of all required improvements, and, if requested by Berthoud, to dedicate to Berthoud any or all other required improvements. The Petitioners agrees to enter into a subdivision improvements agreement pertaining to such improvements and other matters at time of final plat.
13. The Petitioners agree that oversizing agreements may exist that the Petitioners may be responsible for his/her fair share for oversizing of infrastructure. Likewise, Petitioners acknowledges that the Town may require the Petitioners to oversize infrastructure, which would be reimbursed by subsequent developers. The Petitioners acknowledge that the Town shall facilitate reimbursement of any financial participation by the Petitioners, over

and above the proportionate impact of the development. Such reimbursement shall come from new development directly connecting to the improvements.

14. The Petitioners agree to satisfy the public land dedication and landscaping requirements specified in the Town's Development Code.
15. The Petitioners agree that future development of the site will comply with any adopted infrastructure plans including but not limited to transportation, drainage, water, sewer, land use, parks, trails, open space and comprehensive plans.
16. The Petitioners agree that the design, improvement, construction, development, and use of the property shall be in conformance with, and that Petitioners shall comply with, all municipal, county, state and federal statutes, ordinances, rules and regulations.
17. The Petitioners agree that all land use approvals and building permits for the development of the Property shall be subject to requirements including, but not limited to, the payment of impact fees and development charges and other land use and development requirements in effect at the time that such proposed development applies for a building permit.
18. The Petitioners agree to convey to the Town, all water rights necessary for development and all irrigation water rights and associated carrying rights and groundwater rights associated with the property, and any related stock certificates evidencing ownership of the water rights, free and clear of all encumbrances and with all taxes and assessments related hereto paid in full, unless the Town in writing rejects any or all such water rights. Water rights may be conveyed on a pro-rata basis as building permits are issued.
19. Berthoud has various enterprise funds through which the utilities provided by Berthoud are financed. Examples of Berthoud's services are its water, wastewater and drainage utilities. Berthoud's Board of Trustees believe that the provision of utilities by Berthoud assists in complying with the *Berthoud Comprehensive Plan* and *Berthoud Development Code* and the petitioners request that Berthoud provide all utility services which are available now or in the future through Berthoud at a cost comparable to that which can be provided by any third party.
20. The Petitioners understand that the R2-J School District forms an integral part of the Berthoud community. Berthoud has enacted fees to support the acquisition of land by this School District. The Petitioners are aware of these fees and agree to financially support the District's land acquisition programs.

The terms of this Petition are binding on the heirs, devisers, successors and assigns of the parties. Therefore, the undersigned hereby request that the Town of Berthoud approve the annexation of the areas described herein.

River Trails, LLC 7-23-2024
Petitioner by John Turner Date

Petitioner Date

EXHIBIT A
PROJECT NAME
LEGAL DESCRIPTION

EXHIBIT B
PROJECT NAME
ANNEXATION MAP

River Trails
PETITION FOR ANNEXATION

We represent that we are the landowners of 100% of the land described in this Petition, excluding public streets, alleys, roads and easements, which is legally described on **Exhibit “A”** and depicted on **Exhibit “B”**, and affirm the following to be true and correct as of July 19, 2024, our petition for annexation is filed with the Town of Berthoud.

CONTIGUITY:

1. The perimeter of the proposed annexation has a distance of 4,047.24 feet of which 674.54 are contiguous to the existing Town Limits of Berthoud.
2. This contiguity results in a minimum of 16.6% of the perimeter (at least 1/6) of proposed annexation being contiguous to the Town of Berthoud.
3. The proposed annexation contains approximately 3.255 acres.
4. The requirements of §31-12-104 and §31-12-105 C.R.S., exist or have been met.
5. We further allege:
 - a. It is desirable and necessary that the territory be annexed to the Town of Berthoud.
 - b. A community of interest exists between the territory and the Town of Berthoud.
 - c. The territory is integrated or capable of being integrated with the Town of Berthoud.
 - d. The territory is urban or will be urbanized in the near future.
 - e. No land held in identical ownership is divided into separate parcels unless the owner of said tract has consented in writing or joins in this Petition.
 - f. No proceedings for annexation of the land described in this Petition have been commenced for annexation to another municipality.
6. The Petitioners understand that there may be a significant period of time before municipal utilities will be available, but anticipate that urbanization will be able to take place at a pace acceptable to them without immediate access to these utilities. Until urbanization takes place the petitioners intend to maintain their properties in their current uses, which uses are acceptable to the Town of Berthoud.

7. The Petitioners have submitted the petition with the intention that the property will be developed in accordance with Berthoud's Development Code, Comprehensive Plan, Municipal Code, resolutions and ordinances.
8. The Petitioners are aware that Berthoud has enacted fees and policies with the intention that growth should pay its own way and that growth should improve the health, safety and welfare of its citizens. Examples of Berthoud's fees which are acceptable to the petitioners include fees for: building, electric, construction meter, plan review, building permit administration, parks, trails and open space, public facilities infrastructure, streets, drainage, police facility infrastructure, general administration facility infrastructure, water administration, water meter, water tap, sewer tap, raw water, and other supplemental fees as appropriate.
9. The Petitioners understand that Berthoud is required by Colorado Revised Statutes to prepare and file an annexation impact report. The Petitioners will prepare a proposed annexation impact report and provide it to Berthoud for review and consideration six (6) weeks prior to the hearing.
10. The Petitioners agree to dedicate free and clear of all liens and encumbrances of any kind, and at no charge to the Town, all easements and rights-of-way for streets and other public ways and for other public purposes, within the Property as outlined in a Subdivision Improvements Agreement (approved at the time of final subdivision plat).
11. The Petitioners agree to dedicate, with the subdivision of the Property and at no cost to the Town, all required easements and right-of-way for installation and maintenance of infrastructure.
12. The Petitioners agree to design and install transportation infrastructure, utility infrastructure, and stormwater improvements to serve the Property prior to the issuance of any building permits for all or any portion of the property in accordance with Town standards. The Petitioners shall make such other improvements as required by Town ordinances and resolutions, to guarantee construction of all required improvements, and, if requested by Berthoud, to dedicate to Berthoud any or all other required improvements. The Petitioners agrees to enter into a subdivision improvements agreement pertaining to such improvements and other matters at time of final plat.
13. The Petitioners agree that oversizing agreements may exist that the Petitioners may be responsible for his/her fair share for oversizing of infrastructure. Likewise, Petitioners acknowledges that the Town may require the Petitioners to oversize infrastructure, which would be reimbursed by subsequent developers. The Petitioners acknowledge that the Town shall facilitate reimbursement of any financial participation by the Petitioners, over

and above the proportionate impact of the development. Such reimbursement shall come from new development directly connecting to the improvements.

14. The Petitioners agree to satisfy the public land dedication and landscaping requirements specified in the Town's Development Code.
15. The Petitioners agree that future development of the site will comply with any adopted infrastructure plans including but not limited to transportation, drainage, water, sewer, land use, parks, trails, open space and comprehensive plans.
16. The Petitioners agree that the design, improvement, construction, development, and use of the property shall be in conformance with, and that Petitioners shall comply with, all municipal, county, state and federal statutes, ordinances, rules and regulations.
17. The Petitioners agree that all land use approvals and building permits for the development of the Property shall be subject to requirements including, but not limited to, the payment of impact fees and development charges and other land use and development requirements in effect at the time that such proposed development applies for a building permit.
18. The Petitioners agree to convey to the Town, all water rights necessary for development and all irrigation water rights and associated carrying rights and groundwater rights associated with the property, and any related stock certificates evidencing ownership of the water rights, free and clear of all encumbrances and with all taxes and assessments related hereto paid in full, unless the Town in writing rejects any or all such water rights. Water rights may be conveyed on a pro-rata basis as building permits are issued.
19. Berthoud has various enterprise funds through which the utilities provided by Berthoud are financed. Examples of Berthoud's services are its water, wastewater and drainage utilities. Berthoud's Board of Trustees believe that the provision of utilities by Berthoud assists in complying with the *Berthoud Comprehensive Plan* and *Berthoud Development Code* and the petitioners request that Berthoud provide all utility services which are available now or in the future through Berthoud at a cost comparable to that which can be provided by any third party.
20. The Petitioners understand that the R2-J School District forms an integral part of the Berthoud community. Berthoud has enacted fees to support the acquisition of land by this School District. The Petitioners are aware of these fees and agree to financially support the District's land acquisition programs.

The terms of this Petition are binding on the heirs, devisers, successors and assigns of the parties. Therefore, the undersigned hereby request that the Town of Berthoud approve the annexation of the areas described herein.

River Trails LLC by
Petitioner

Dr. C. Turner

7-23-2024
Date

Petitioner

Date

EXHIBIT A
PROJECT NAME
LEGAL DESCRIPTION

EXHIBIT B
PROJECT NAME
ANNEXATION MAP

River Trails
PETITION FOR ANNEXATION

We represent that we are the landowners of 100% of the land described in this Petition, excluding public streets, alleys, roads and easements, which is legally described on **Exhibit "A"** and depicted on **Exhibit "B"**, and affirm the following to be true and correct as of July 19, 2024, our petition for annexation is filed with the Town of Berthoud.

CONTIGUITY:

1. The perimeter of the proposed annexation has a distance of 10,221.12 feet of which 1,909.80 are contiguous to the existing Town Limits of Berthoud.
2. This contiguity results in a minimum of 16.6% of the perimeter (at least 1/6) of proposed annexation being contiguous to the Town of Berthoud.
3. The proposed annexation contains approximately 99.870 acres.
4. The requirements of §31-12-104 and §31-12-105 C.R.S., exist or have been met.
5. We further allege:
 - a. It is desirable and necessary that the territory be annexed to the Town of Berthoud.
 - b. A community of interest exists between the territory and the Town of Berthoud.
 - c. The territory is integrated or capable of being integrated with the Town of Berthoud.
 - d. The territory is urban or will be urbanized in the near future.
 - e. No land held in identical ownership is divided into separate parcels unless the owner of said tract has consented in writing or joins in this Petition.
 - f. No proceedings for annexation of the land described in this Petition have been commenced for annexation to another municipality.
6. The Petitioners understand that there may be a significant period of time before municipal utilities will be available, but anticipate that urbanization will be able to take place at a pace acceptable to them without immediate access to these utilities. Until urbanization takes place the petitioners intend to maintain their properties in their current uses, which uses are acceptable to the Town of Berthoud.

7. The Petitioners have submitted the petition with the intention that the property will be developed in accordance with Berthoud's Development Code, Comprehensive Plan, Municipal Code, resolutions and ordinances.
8. The Petitioners are aware that Berthoud has enacted fees and policies with the intention that growth should pay its own way and that growth should improve the health, safety and welfare of its citizens. Examples of Berthoud's fees which are acceptable to the petitioners include fees for: building, electric, construction meter, plan review, building permit administration, parks, trails and open space, public facilities infrastructure, streets, drainage, police facility infrastructure, general administration facility infrastructure, water administration, water meter, water tap, sewer tap, raw water, and other supplemental fees as appropriate.
9. The Petitioners understand that Berthoud is required by Colorado Revised Statutes to prepare and file an annexation impact report. The Petitioners will prepare a proposed annexation impact report and provide it to Berthoud for review and consideration six (6) weeks prior to the hearing.
10. The Petitioners agree to dedicate free and clear of all liens and encumbrances of any kind, and at no charge to the Town, all easements and rights-of-way for streets and other public ways and for other public purposes, within the Property as outlined in a Subdivision Improvements Agreement (approved at the time of final subdivision plat).
11. The Petitioners agree to dedicate, with the subdivision of the Property and at no cost to the Town, all required easements and right-of-way for installation and maintenance of infrastructure.
12. The Petitioners agree to design and install transportation infrastructure, utility infrastructure, and stormwater improvements to serve the Property prior to the issuance of any building permits for all or any portion of the property in accordance with Town standards. The Petitioners shall make such other improvements as required by Town ordinances and resolutions, to guarantee construction of all required improvements, and, if requested by Berthoud, to dedicate to Berthoud any or all other required improvements. The Petitioners agrees to enter into a subdivision improvements agreement pertaining to such improvements and other matters at time of final plat.
13. The Petitioners agree that oversizing agreements may exist that the Petitioners may be responsible for his/her fair share for oversizing of infrastructure. Likewise, Petitioners acknowledges that the Town may require the Petitioners to oversize infrastructure, which would be reimbursed by subsequent developers. The Petitioners acknowledge that the Town shall facilitate reimbursement of any financial participation by the Petitioners, over

and above the proportionate impact of the development. Such reimbursement shall come from new development directly connecting to the improvements.

14. The Petitioners agree to satisfy the public land dedication and landscaping requirements specified in the Town's Development Code.
15. The Petitioners agree that future development of the site will comply with any adopted infrastructure plans including but not limited to transportation, drainage, water, sewer, land use, parks, trails, open space and comprehensive plans.
16. The Petitioners agree that the design, improvement, construction, development, and use of the property shall be in conformance with, and that Petitioners shall comply with, all municipal, county, state and federal statutes, ordinances, rules and regulations.
17. The Petitioners agree that all land use approvals and building permits for the development of the Property shall be subject to requirements including, but not limited to, the payment of impact fees and development charges and other land use and development requirements in effect at the time that such proposed development applies for a building permit.
18. The Petitioners agree to convey to the Town, all water rights necessary for development and all irrigation water rights and associated carrying rights and groundwater rights associated with the property, and any related stock certificates evidencing ownership of the water rights, free and clear of all encumbrances and with all taxes and assessments related hereto paid in full, unless the Town in writing rejects any or all such water rights. Water rights may be conveyed on a pro-rata basis as building permits are issued.
19. Berthoud has various enterprise funds through which the utilities provided by Berthoud are financed. Examples of Berthoud's services are its water, wastewater and drainage utilities. Berthoud's Board of Trustees believe that the provision of utilities by Berthoud assists in complying with the *Berthoud Comprehensive Plan* and *Berthoud Development Code* and the petitioners request that Berthoud provide all utility services which are available now or in the future through Berthoud at a cost comparable to that which can be provided by any third party.
20. The Petitioners understand that the R2-J School District forms an integral part of the Berthoud community. Berthoud has enacted fees to support the acquisition of land by this School District. The Petitioners are aware of these fees and agree to financially support the District's land acquisition programs.

The terms of this Petition are binding on the heirs, devisers, successors and assigns of the parties. Therefore, the undersigned hereby request that the Town of Berthoud approve the annexation of the areas described herein.

DocuSigned by:

Jon Turner

A87589BA8EDB47D...

Petitioner

10/14/2024

Date

Petitioner

Date

EXHIBIT A
PROJECT NAME
LEGAL DESCRIPTION

EXHIBIT B
PROJECT NAME
ANNEXATION MAP

SUPPLEMENT TO *PROJECT NAME* PETITION FOR ANNEXATION

The undersigned petitioners are requesting annexation by the Town of Berthoud of property of which they are 100% owners. The petitioners have submitted the petition with the intention that the property will be developed in accordance with Berthoud's *Development Code*, *Comprehensive Plan*, *Municipal Code*, resolutions and ordinances.

Section 1 – Capital Investment Fee

The petitioners are aware that Berthoud has enacted fees and policies with the intention that growth should pay its own way and should improve the health, safety and welfare of its citizens. Examples of Berthoud's fees, which are acceptable to the petitioners, include capital investment fees such as the water dedication fee, water system investment fee, wastewater system investment fee, parkland dedication fee, parkland development fee, public facilities fee and density transfer fee.

Section 2 – Enterprises

Berthoud has various enterprise funds through which the utilities provided by Berthoud are financed. Examples of services provided by Berthoud's enterprises are its water, wastewater and drainage utilities. Berthoud's Utility Board and the Board of Trustees believe that the provision of utilities by Berthoud assists in complying with the *Comprehensive Plan* and *Development Code* and the petitioners request that Berthoud provide all utility services which are available now or in the future through Berthoud at a cost comparable to that which can be provided by any third party.

Section 3 – Development Rate

Berthoud's *Development Code* requires that as a condition of approval for any subdivision a development agreement is executed which contains specific limitations on the rate at which the development can proceed. The petitioners understand that the growth of Berthoud is limited by the *Comprehensive Plan* and agree to comply with these limitations.

Section 4 – Open Space, Parks, Setbacks and Trails

Berthoud's citizens and its Board of Trustees have determined that open space and agriculture add to the community and have implemented sales taxes and fees to financially support trails, parks, open space and agriculture. The petitioners agree to provide land for increased setbacks, easements and/or rights-of-way for and along major arterials and for trails and open space. To the extent these setbacks, easements and/or rights-of-way improve the quality of the

property being annexed and are of a benefit to the Berthoud community, the petitioners hereby commit to providing land for these purposes.

Section 5 – R2-J School District Site Acquisition

The Thompson R2-J School District forms an integral part of the Berthoud community and Berthoud has adopted an Intergovernmental Agreement (IGA) with the District to collect fees in-lieu of dedication or land dedication to support the acquisition of land by this School District. The petitioners are aware of these fees or land dedication requirements and agree to support the District's land acquisition program.

Section 6 – Annexation Impact Report

Berthoud is required to prepare and file an annexation impact report. The petitioners have prepared an annexation impact report and provided it to Berthoud for review and consideration six (6) weeks prior to the hearing.

Section 7 – Rezoning

The petitioners will file site-specific development plans with the Town of Berthoud for review and consideration, following the approval the annexation, rezoning. The petitioner recognizes that vested rights do not occur until the time of final plat (FP) approval. In the event that the applicant pursues de-annexation prior to final plat (FP) approval, the Town agrees that it will cooperate with this request.

The petitioners intend that this supplement be attached to their Petition for Annexation and presented to the Board of Trustees for consideration in conjunction with the annexation.

OWNERSHIP CERTIFICATE

ANNEXATION NO. 1

THENCE North 89°0227" East, along said North line, a distance of 30.00 feet to the POINT OF BEGINNING, also being a point on the boundary of the South First Street Annexation to the Town of Berthoud, recorded April 3, 1997, as Reception Number 19970020418 of the Records of the Larimer County Clerk and Recorder;

THENCE North 89°0227" East, continuing along said North line and said annexation boundary, a distance of 20.00 feet;

THENCE North 00°2120" West, continuing along said annexation boundary, a distance of 35.00 feet to a point on the North half of the East 1/2 of Section 6G, as shown on the plat of Mary V. Moore M.R.D., recorded November 2, 1993 as Reception Number 19930082335 of the Records of the Larimer County Clerk and Recorder;

THENCE North 89°0227" East, along said North right of way, a distance of 318.75 feet;

THENCE South 82°3532" West a distance of 311.64 feet to a point on the North line of the South half of said SW1/4;

THENCE South 04°1957" East a distance of 362.91 feet to a point on the East line of that parcel recorded January 7, 1878 as Book G Page 580 of the Records of the Larimer County Clerk and Recorder;

THENCE North 08°5636" West, along said East line, a distance of 178.75 feet;

THENCE South 89°3827" West a distance of 27.84 feet to the Southeast corner of said South First Street Annexation;

THENCE North 00°2306" West, along said annexation boundary a distance of 184.98 feet to the POINT OF BEGINNING.

Said described parcel of land contains 13,654 Square Feet or 0.313 Acres, more or less (±)

ANNEXATION NO. 2

COMMENCING at the South Sixteenth corner of said SW1/4 of Section 24 and assuming the North line of the South half of said SW1/4 as bearing North 89°02'27" East, being a Grid Bearing of the Colorado State Plane Coordinate System, North Zone, North American Datum 1983/2011, a distance of 2657.78 feet Monumented by a #5 rebar with 25 aluminum cap stamped LS 13446 on the West end, and a #5 rebar with 3.25" aluminum cap stamped LS 38348 on the East end, and with all other bearings contained herein relative thereto;

THENCE North 89°02'22" East, along said north line, a distance of 59.46 feet to the POINT OF BEGINNING;
THENCE North 82°35'32" East a distance of 311.64 feet to a point on the North right of way of East County Road
6C, as shown on the plat of Mary V. Moore M.R.D., recorded November 2, 1993 at Recitation Number 1993008223;
THENCE North 89°02'22" East, along said North right of way, a distance of 13.93 feet to the
POINT OF BEGINNING of the Larimer County Clerk and Recorder's plat of the
THENCE South 80°45'46" West a distance of 13.0659 feet;
THENCE South 00°32'05" East a distance of 872.85 feet to a point on the East line of that parcel recorded January 7,
1878 as Book G Page 580 of the Records of the Larimer County Clerk and Recorder;
THENCE North 08°56'56" West, along said East line, a distance of 630.95 feet;
THENCE North 84°19'57" West a distance of 362.91 feet to the POINT OF BEGINNING.

Said described parcel of land contains 141,781 Square Feet or 3.255 Acres, more or less (±)

BASIS OF BEARINGS AND LINEAL UNIT DEFINITION

Assuming the North line of the South Half of the Southwest Quarter of Section 24, Township 4 North, Range 69 West of the 6th P.M., monumented as shown on this plat, as bearing North 89°02'27" East, being a Grid Bearing of the Colorado State Plane, North Zone, North American Datum 1983/2011, a distance of 2657.78 feet and with all other bearings contained herein relative thereto.

The lineal dimensions as contained herein are based upon the "U.S. Survey Foot."

TITLE COMMITMENT NOTE

For all information regarding easements, rights-of-way and title of records, Majestic Surveying, LLC relied upon Title Commitment Number FCC25208786, dated November 14, 2023, as prepared by Land Title Guarantee Company to delineate the aforesaid information. This survey does not constitute a title search by Majestic Surveying, LLC to determine ownership or easements of record.

FLOOD PLAIN NOTE

Portions of the subject property are in the regulatory floodway, zone AE, and zone X, "0.2% annual chance flood hazard, areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile" per FEMA flood maps 08069C1387H and 08069C1391H, revised January 15, 2021

NOTICE

According to Colorado law you must commence any legal action based upon any defect in this survey within three years after you first discover such defect. In no event may any action based upon any defect in this survey be commenced more than ten years from the date of the certification shown hereon. (13-80-105 C.R.S. 2012)

ALIQUOT CORNER AS DESCRIBED		FEMA REGULATORY FLOODWAY		FLOW LINE
CALCULATED POSITION		FEMA ZONE AE		BOUNDARY LINE
FENCE		FEMA ZONE X		EASEMENT LINE
TIE LINE		TOWN LIMITS (CONTIGUOUS)		RIGHT OF WAY LINE
RAILROAD TRACKS				SECTION LINE

OWNERSHIP CERTIFICATE (cont.)

ANNEXATION NO. 3

A parcel of land, situate in the South half (S1/2) of Section Twenty-four (24) and the Northwest Quarter (NW1/4) of Section Twenty-five (25), Township Four North (T.4N.), Range Sixty-nine West (R.69.W.) of the Sixth Principal Meridian (6th P.M.), Town of Berthoud, County of Larimer, State of Colorado and being more particularly described as follows:

COMMENCING at the South Sixteenth corner of said SW1/4 of Section 24 and assuming the North line of the South Half of said SW1/4 as bearing North 89°02'27" East, being a Grid Bearing of the Colorado State Plane Coordinate System, North Zone, North American Datum 1983/2011, a distance of 2657.78 feet Monumented by a #5 rebar with 2" aluminum cap stamped LS 13446 on the West end, and a #5 rebar with 3.25" aluminum cap stamped LS 38348 on the East end, and with all other bearings contained herein relative thereto;

THENCE North 89°02'27" East, along said North line, a distance of 50.37 feet;
THENCE North 00°57'33" West a distance of 35.00 feet to a point on the North right of way of East County Road
6C, as shown on the plat of Mary V. Moore M.R.D., recorded November 2, 1993 as Reception Number 1993008223;
of the Records of the Larimer County Clerk and Recorder;
THENCE North 89°02'27" East, along said North right of way, a distance of 1150.69 feet to the POINT OF
BEGINNING.

THENCE North 89°0227" East, continuing along said North right of way, a distance of 792.67 feet;
THENCE South 00°1957" East a distance of 5.00 feet to a point on the North right of way of East County Road 6C,
as shown on the plat of Golden Acres Minor Land Division 02-S1964, recorded August 22, 2003 as Reception
Number 20030107937 of the Records of the Larimer County Clerk and Recorder;
THENCE North 89°0227" East, along said North right of way, a distance of 664.43 feet to a point on the East line of
the North half of said SW1/4, from which the Center-South Sixteenth Corner of said Section 24 bears South
00°1912" East a distance of 30.00 feet;

THENCE North 89°02'42" East, continuing along said North right of way, a distance of 1248.36 feet;
THENCE South 00°57'18" East a distance of 30.00 feet to a point on the North line of the Southeast
Quarter of said Section 24;
THENCE South 61°08'42" West, along the approximate centerline of Rockwell Ditch, a distance of 422.20 feet;
THENCE South 23°25'42" West a distance of 142.60 feet to the approximate confluence of Rockwell Ditch and the
Little Thompson River;

The following 8 courses are along the approximate centerline of said Little Thompson River.

THENCE North 75°15'42" West a distance of 89.83 feet;

THENCE South 38°48'59" West a distance of 75.80 feet;

THENCE South 30°41'09" West a distance of 150.28 feet;

THENCE South 12°10'45" West a distance of 120.83 feet;

THENCE South 40°45'06" West a distance of 110.06 feet;

THENCE South 62°50'06" West a distance of 144.57 feet;

THENCE South 67°38'42" West a distance of 325.77 feet;

THENCE South 52°17'46" West a distance of 99.24 feet to a point on the West line of the South half of the Southeast Quarter of said Section 24;

THENCE South 00°19'12" East, along said West line, a distance of 392.52 feet to the South Quarter Corner of said Section 24;
THENCE South 88°58'50" West, along the North line of the NW1/4 of Section 25, a distance of 1328.47 feet;
THENCE South 19°17'04" West a distance of 455.71 feet;
THENCE North 89°16'21" West a distance of 971.00 feet;
THENCE North 00°58'39" East a distance of 246.20 feet;
THENCE North 70°04'32" East a distance of 112.28 feet to a point on the North line of said NW1/4, from which the Northwest Corner of said Section 25 bears South 88°58'50" West a distance of 230.00 feet;
THENCE North 88°56'36" West a distance of 342.51 feet;
THENCE North 00°32'05" West a distance of 872.85 feet;
THENCE North 80°45'46" East a distance of 1036.95 feet to the POINT OF BEGINNING.

Said described parcel of land contains 4,350,328 Square Feet or 99.870 Acres, more or less (±).

Said parcels contains a total of 4,505,763 Square Feet or 103.438 Acres more or less by this survey, and is subject to any existing easements and/or rights of way of record.

OWNER: RIVER TRAILS, LLC

By: _____ As: _____

Witness my hand and seal this _____ day of _____, 20 ____.

NOTARIAL CERTIFICATE

STATE OF COLORADO)
 ss
COUNTY OF LARIMER)
The foregoing instrument was acknowledged before me by _____ as _____ this _____ day of _____, 20____.

_____ day of _____, 20____.

Witness my Hand and Official Seal

My commission expires: _____.

SURVEYOR'S CERTIFICATE

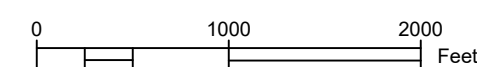
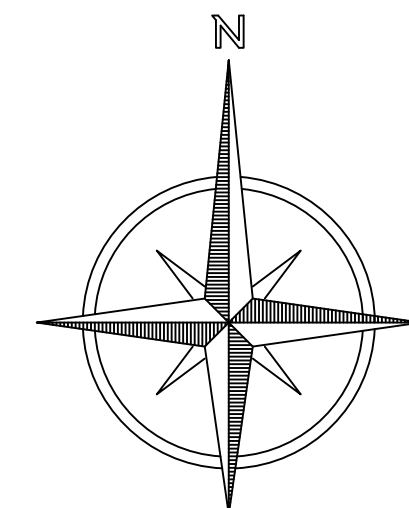
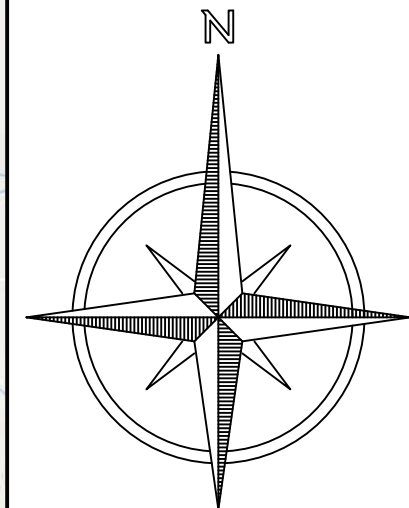
I, Steven Parks, a Colorado Licensed Professional Land Surveyor, do hereby state that this River Trails Annexation Map is an accurate representation of the property to the best of my knowledge, information, belief, and in my professional opinion.

Steven Parks - On Behalf of Majestic Surveying, LLC
Colorado Licensed Professional Land Surveyor #38348

Owner:	Jon Turner River Trails, LLC 6355 N. Fairgrounds Ave. Suite 300 Windsor, CO 970-204-9393	Developer:	Warren A. Turner Hillside Commercial Group 6355 N. Fairgrounds Ave. Suite 300 Windsor, CO 970-204-9393	Engineer:	Danny Weber Avent Civil Group 1337 Riverside Ave. #2 Fort Collins, CO 970-305-3534	Surveyor:	Majestic Surveying, LLC C/O Steven Parks, PLS 1111 Diamond Valley Drive, Suite 104 Windsor, CO 80550 970-833-5698
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PROJECT NO: 2024093	PROJECT NAME: RIVER TRAILS	REVISIONS:	DATE:	1 SHEET 1 OF 4
DATE: 07-10-2024	CLIENT: HILLSIDE DEVELOPMENT	ADDRESSED REDLINES -AU	8-28-24	
		REMOVED TOWN OF BERTHOUD PARCEL	9-30-24	
DRAWN BY: AU	FILE NAME: 2024093ANNEX	ADDRESSED REDLINES -AU	10-01-24	
CHECKED BY: SIP	SCALE: 1" = 1000'			

SHEET 1 OF 4

[illegible]

NORTHWEST CORNER
SECTION 24, T.4N., R.69W.
FOUND #6 REBAR WITH
3.25" ALUMINUM CAP, LS38209

N89°20'37"E 2660.67'

N89°27'16"E 2657.04'

CENTER-NORTH SIXTEENTH CORNER
SECTION 24, T.4N., R.69W.
FOUND #6 REBAR WITH
2.5" ALUMINUM CAP, LS12374, 1995'

EAST QUARTER CORNER
SECTION 24, T.4N., R.69W.
FOUND #6 REBAR WITH
2.5" ALUMINUM CAP, LS34174
(NOT ACCEPTED)
EAST QUARTER CORNER
SECTION 24, T.4N., R.69W.
FOUND 3.25" ALUMINUM CAP
ILLEGIBLE

SOUTH SIXTEENTH CORNER
SOUTHEAST QUARTER
SECTION 24, T.4N., R.69W.
FOUND #6 REBAR WITH
2.5" ALUMINUM CAP, LS12374

NORTH EAST CORNER
SECTION 25, T.4N., R.69W.
FOUND 3/4" STEEL PIPE WITH
2.5" ALUMINUM CAP, LS12374

NORTHWEST CORNER
SECTION 25, T.4N., R.69W.
FOUND #6 REBAR WITH
3.25" ALUMINUM CAP, LS38348

NORTH QUARTER CORNER
SECTION 25, T.4N., R.69W.
FOUND #6 REBAR WITH
3.25" ALUMINUM CAP, LS13446

WEST QUARTER CORNER
SECTION 25, T.4N., R.69W.
FOUND #6 REBAR WITH
2.5" ALUMINUM CAP, LS17662

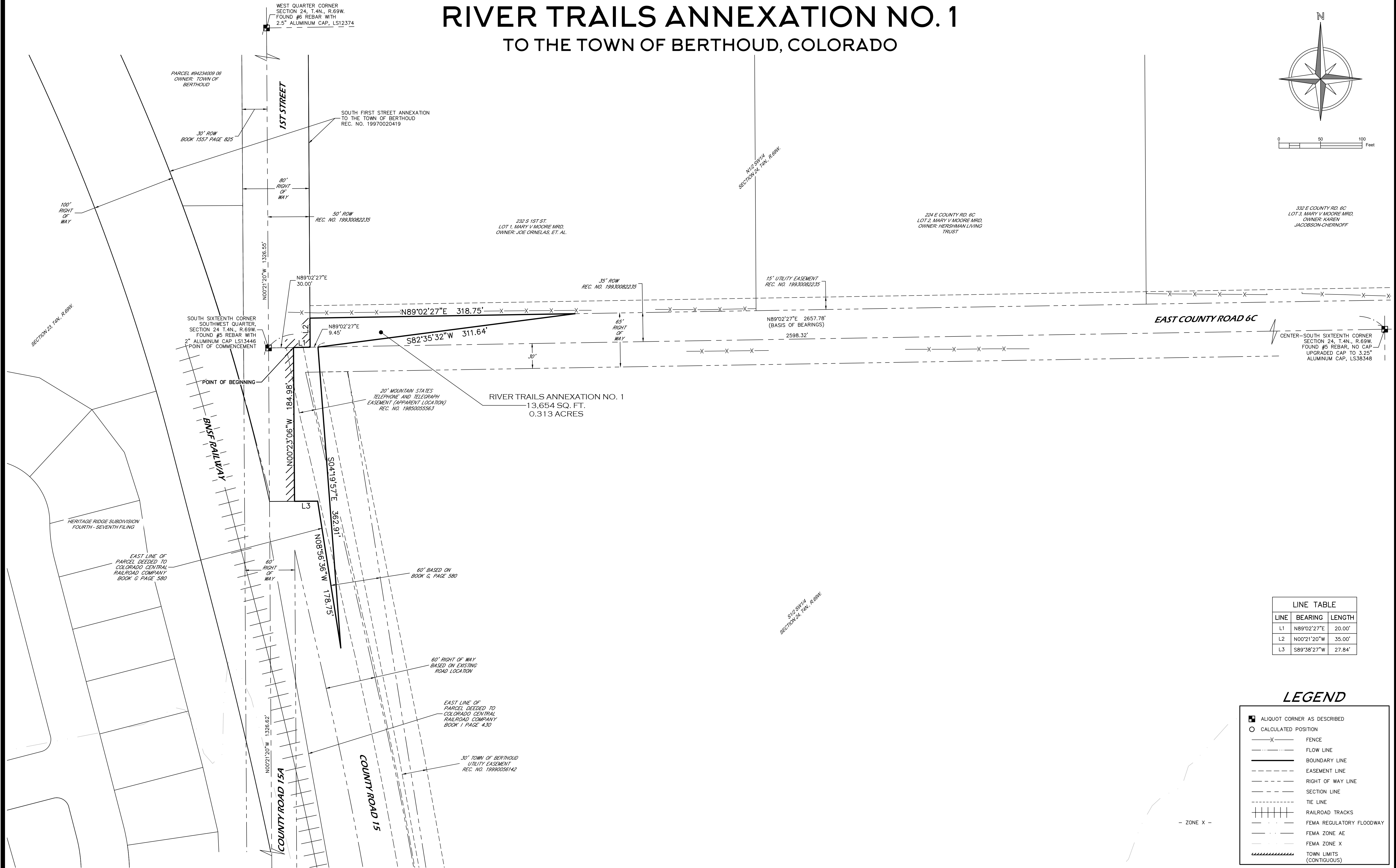
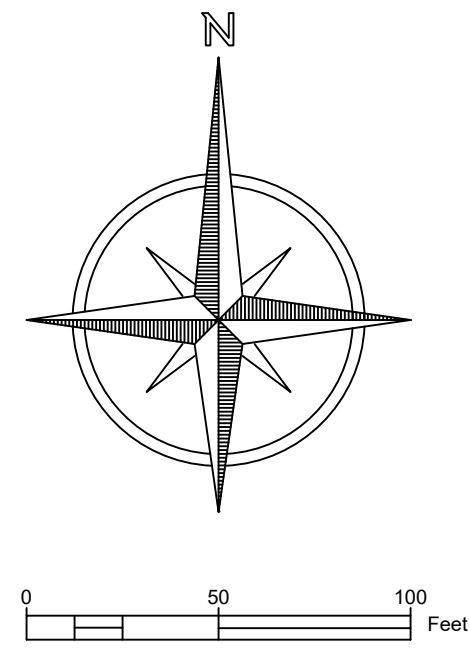
CENTER QUARTER CORNER
SECTION 25, T.4N., R.69W.
FOUND #6 REBAR WITH
2" ALUMINUM CAP, LS13446

EAST QUARTER CORNER
SECTION 25, T.4N., R.69W.
FOUND #6 REBAR WITH
2.5" ALUMINUM CAP, LS34174

Bearings and Distances:
- N00°22'03"W 2642.84'
- S00°22'03"N 2642.84'
- N00°21'20"W 2653.17'
- S00°21'20"N 2653.17'
- N00°22'47"W 2628.00'
- S00°22'47"N 2628.00'
- N89°13'33"E 2659.49'
- S00°13'33"W 2659.49'
- N89°06'21"E 2658.57'
- S00°06'21"W 2658.57'
- N89°02'27"E 2657.78'
- S00°02'27"W 2657.78'
- N88°58'50"E 2656.99'
- S00°58'50"W 2656.99'
- N89°10'21"W 2657.58'
- S00°10'21"W 2657.58'
- N89°11'10"W 2657.23'
- S00°11'10"W 2657.23'
- S00°19'12"E 2631.82'
- S00°19'12"W 2631.82'
- S00°17'41"E 2641.43'
- S00°17'41"W 2641.43'
- S00°23'54"E 2646.57'
- S00°23'54"W 2646.57'
- S00°12'12"E 2631.82'
- S00°12'12"W 2631.82'
- S00°10'12"E 2632.53'
- S00°10'12"W 2632.53'
- S00°09'42"E 2657.69'
- S00°09'42"W 2657.69'
- S00°08'39"E 2657.14'
- S00°08'39"W 2657.14'
- S00°12'12"E 2631.82'
- S00°12'12"W 2631.82'
- S00°10'12"E 2632.53'
- S00°10'12"W 2632.53'
- S00°09'42"E 2657.69'
- S00°09'42"W 2657.69'
- S00°08'39"E 2657.14'
- S00°08'39"W 2657.14'

SECTION BREAKDOWN
SCALE: 1" = 1000'

RIVER TRAILS ANNEXATION NO.1 TO THE TOWN OF BERTHOUD, COLORADO



LINE TABLE		
LINE	BEARING	LENGTH
L1	N89°02'27"E	20.00'
L2	N00°21'20"W	35.00'
L3	S89°38'27"W	27.84'

LEGEND

ALQUOT CORNER AS DESCRIBED	
CALCULATED POSITION	
FENCE	
FLOW LINE	
BOUNDARY LINE	
EASEMENT LINE	
RIGHT OF WAY LINE	
SECTION LINE	
TIE LINE	
RAILROAD TRACKS	
FEMA REGULATORY FLOODWAY	
FEMA ZONE AE	
FEMA ZONE X	
TOWN LIMITS (CONTIGUOUS)	

PRELIMINARY

Steven Parks - On Behalf of Majestic Surveying, LLC
Colorado Licensed Professional Land Surveyor #38348

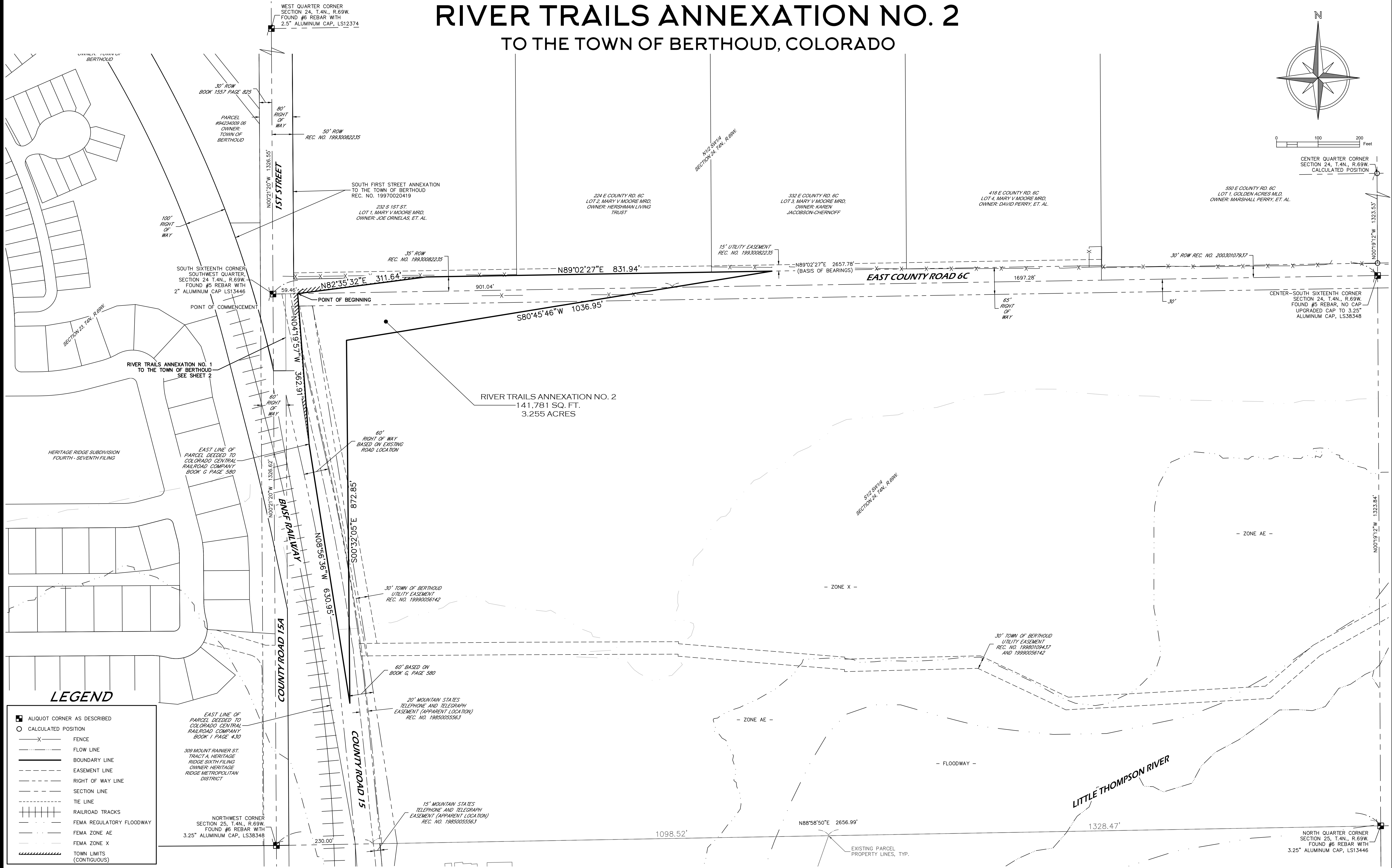
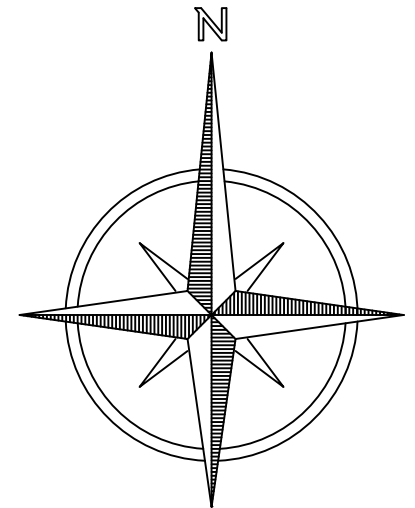
NOTICE

According to Colorado law you must commence any legal action based upon any defect in this survey within three years after you first discover such defect. In no event may any action based upon any defect in this survey be commenced more than ten years from the date of the certification shown hereon. (13-80-105 C.R.S. 2012)



PROJECT NO: 2024093	PROJECT NAME: RIVER TRAILS	REVISIONS:	DATE:
DATE: 07-10-2024	CLIENT: HILLSIDE DEVELOPMENT	ADDRESSED REDLINES -AU	8-28-24
DRAWN BY: AU	FILE NAME: 2024093ANNEX	REMOVED TOWN OF BERTHOUD PARCEL	9-30-24
CHECKED BY: SIP	SCALE: 1" = 50'	ADDRESSED REDLINES -AU	10-01-24

RIVER TRAILS ANNEXATION NO. 2 TO THE TOWN OF BERTHOUD, COLORADO



LEGEND

- ALIQUOT CORNER AS DESCRIBED
- CALCULATED POSITION
- FENCE
- FLOW LINE
- BOUNDARY LINE
- EASEMENT LINE
- RIGHT OF WAY LINE
- SECTION LINE
- TIE LINE
- RAILROAD TRACKS
- FEMA REGULATORY FLOODWAY
- FEMA ZONE AE
- FEMA ZONE X
- TOWN LIMITS (CONTIGUOUS)

PRELIMINARY

Steven Parks - On Behalf of Majestic Surveying, LLC
Colorado Licensed Professional Land Surveyor #38348

NOTICE

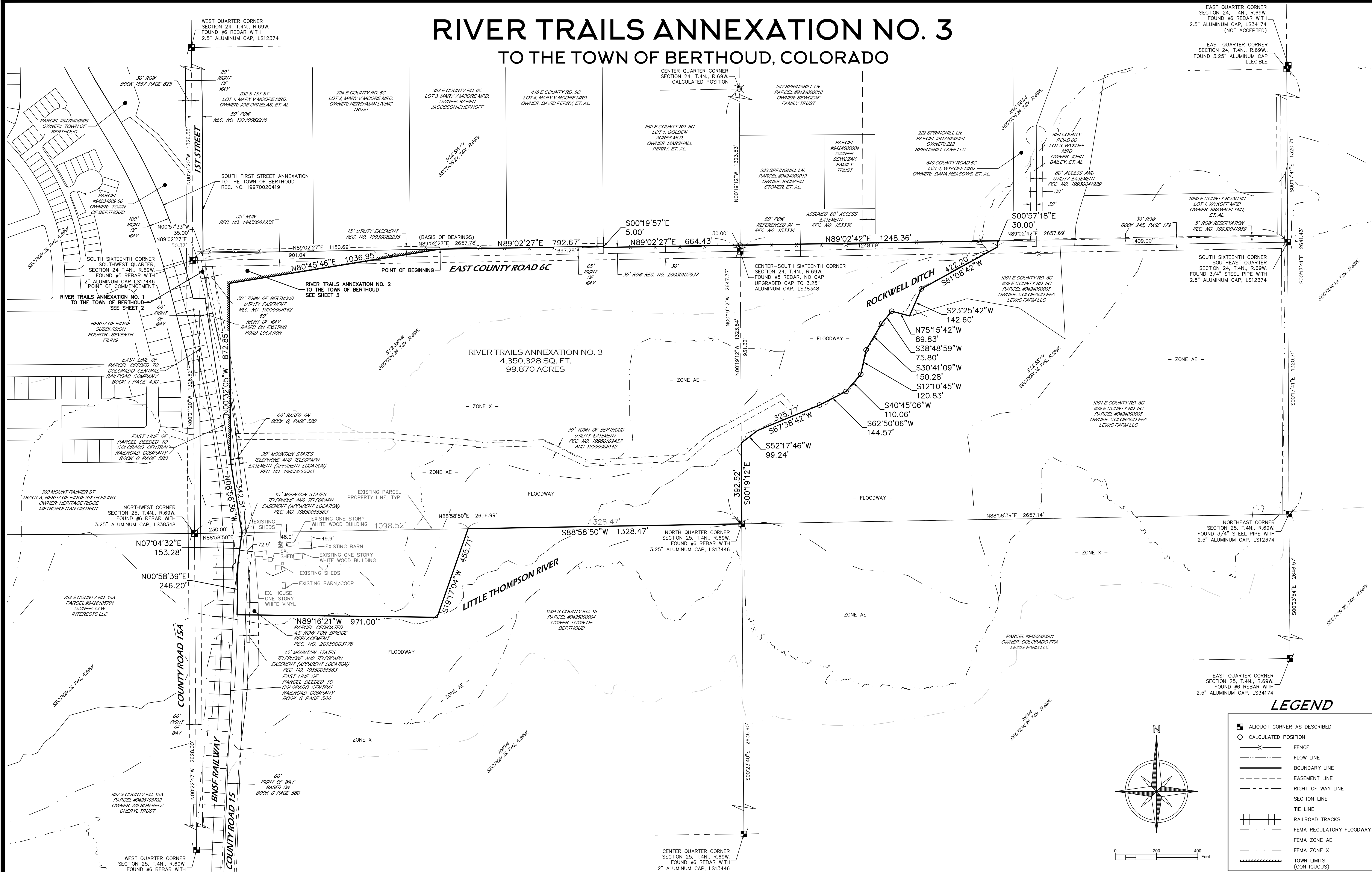
According to Colorado law you must commence any legal action based upon any defect in this survey within three years after you first discover such defect. In no event may any action based upon any defect in this survey be commenced more than ten years from the date of the certification shown hereon. (13-80-105 C.R.S. 2012)



PROJECT NO: 2024093	PROJECT NAME: RIVER TRAILS	REVISIONS:	DATE:
DATE: 07-10-2024	CLIENT: HILLSIDE DEVELOPMENT	ADDRESSED REDLINES -AU	8-28-24
DRAWN BY: AU	FILE NAME: 2024093ANNEX	REMOVED TOWN OF BERTHOUD PARCEL	9-30-24
CHECKED BY: SIP	SCALE: 1" = 100'	ADDRESSED REDLINES -AU	10-01-24

RIVER TRAILS ANNEXATION NO. 3

TO THE TOWN OF BERTHOUD, COLORADO



PRELIMINARY

Steven Parks - On Behalf of Majestic Surveying, LLC
Colorado Licensed Professional Land Surveyor #38348

NOTICE

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MAJESTIC SURVEYING, LLC 1111 DIAMOND VALLEY DRIVE #104, WINDSOR, CO 80550

PROJECT NO: 2024093	PROJECT NAME: RIVER TRAILS	REVISIONS:	DATE:
DATE: 07-10-2024	CLIENT: HILLSIDE DEVELOPMENT	ADDRESSED REDLINES -AU	8-28-24
DRAWN BY: AU	FILE NAME: 2024093ANNEX	REMOVED TOWN OF BERTHOUD PARCEL	9-30-24
CHECKED BY: SIP	SCALE: 1" = 200'	ADDRESSED REDLINES -AU	10-01-24

4

SHEET 4 OF 4

RIVER TRAILS ZONING MAP
716 S. COUNTY ROAD 15, AND VACANT LAND
SITUATE IN THE SOUTH HALF OF SECTION 24 AND THE NORTHWEST QUARTER OF SECTION 25,
TOWNSHIP 4 NORTH, RANGE 69 WEST OF THE 6TH P.M.
TOWN OF BERTHOUD, COUNTY OF LARIMER, STATE OF COLORADO

LEGAL DESCRIPTION AND DEDICATION:

A parcel of land situate in the South half of Section Twenty-four (24), Township Four North (T.4N.), Range Sixty-nine West (R.69W.) of the Sixth Principal Meridian (6th P.M.), and the Northwest quarter of Section Twenty-five (25), Township Four North (T.4N.), Range Sixty-nine West (R.69W.) of the Sixth Principal Meridian (6th P.M.), being more particularly described as follows:

All that portion of the South half (S1/2) of the Southeast Quarter (SE1/4) of Section Twenty-four (24), in Township Four (4) North, of Range Sixty-nine (69) West of the 6th P.M. lying North and West of the Center of the Little Thompson River, County of Larimer, State of Colorado,
Except that portion thereof conveyed to Joseph H. Stumpf in deed recorded January 30, 1931 in Book 600 at Page 574.

Also, the South half (S1/2) of the Southwest quarter (SW1/4) of Section Twenty-four (24), in Township Four (4) North, of Range Sixty-nine (69) West of the 6th P.M., County of Larimer, State of Colorado,
Subject to easement and right of way and occupation heretofore granted to the Colorado Central Railway Company;

Also, a tract of land described as follows: Beginning at a point on the Section line between Sections Twenty-four (24) and Twenty-five (25), in Township Four (4) North, of Range Sixty-nine (69) West of the 6th P.M., County of Larimer, State of Colorado, 1320 feet West of the Northeast corner of the Northwest quarter (NW1/4) of said Section Twenty-five (25);
Thence South 80° West 1139 feet;
Thence South 2° West 200 feet;
Thence South 88° 15' East 971 feet;
Thence North 20° 15' East 453 feet to Place of Beginning (Magnetic variation 14° 30' East);

Also, a certain tract of land in the Northwest Quarter (NW1/4) of Section Twenty-five (25), in Township Four (4) North, of Range Sixty-nine (69) West of the 6th P.M., County of Larimer, State of Colorado, described as follows:
Beginning at a point 230 feet East of the Northwest corner of said Section Twenty-five (25), on the Section line;
Thence South 200 feet;
Thence Northeasterly to a point on the North line of said Section Twenty-five (25), 80 rods East of the Northwest corner of said Section;
Thence West on the Section line to Place of Beginning;

Source: Land Title Guarantee Company Order Number FCC25208786, dated November 14, 2023

Said parcel contains 4,377,782 Square Feet or 100.500 Acres more or less by this survey.

OWNER: Jon Turner, River Trails LLC

BY: _____
Jon Turner

NOTARIAL CERTIFICATE:

STATE OF COLORADO) ss
COUNTY OF LARIMER)
The foregoing instrument was acknowledged before me this ____ day of _____, 20 __, BY
Jon Turner as Owner of River Trails, LLC
Witness my hand and official seal.

Notary Public
My commission expires: _____.

APPROVAL CERTIFICATES:

This is to certify that the rezoning of the above described property was approved by Ordinance No. _____ of the Town of Berthoud, passed and adopted on the _____ day of _____, 20 __, and the Mayor of the Town of Berthoud as authorized by said ordinance on behalf of the Town of Berthoud hereby for all acknowledges and adopts the said annexation upon which the certificate is endorsed for all indicated hereon.

Approval by the Board of Trustees of the Town of Berthoud, Colorado this _____ day of _____, 20 __.

Mayor

This forgoing map is approved for the filing and accepted by the Town of Berthoud, Colorado this _____ day of _____, 20 __.

Attest: _____
Town Clerk

SURVEYOR'S CERTIFICATE

I, Steven Parks, a Licensed Land Surveyor in the State of Colorado, do hereby state that this Zoning Map of River Trails is an accurate representation of the property to the best of my knowledge, information, belief, and in my professional opinion.

PRELIMINARY

Steven Parks - On Behalf of Majestic Surveying, LLC
Colorado Licensed Professional Land Surveyor #38348

APPROVAL CERTIFICATES:

Approved by the Planning Commission of the Town of Berthoud, Colorado this _____ day of _____, 20 __.

Chairman

The following map is approved for filing and accepted by the Town of Berthoud, Colorado this _____ day of _____, 20 __.

Attest: _____
Planning Technician

TITLE COMMITMENT NOTE

For all information regarding easements, rights-of-way and title of records, Majestic Surveying, LLC relied upon Title Commitment Number FCC25208786, dated November 14, 2023, as prepared by Land Title Guarantee Company to delineate the aforesaid information. This survey does not constitute a title search by Majestic Surveying, LLC to determine ownership or easements of record.

FLOOD PLAIN NOTE

Portions of the subject property are in the regulatory floodway, zone AE, and zone X, "0.2% annual chance flood hazard, areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile" per FEMA flood maps 08069C1387H and 08069C1391H, revised January 15, 2021.

NOTES:

- Subject Property Address: 716 S. County Road 15, and Vacant Land, Berthoud, CO 80513
- There may be other documents related to the Subject Property that were not discovered by the land surveyor or title company.
- Adjacent property owner information per the Larimer County Assessor's Map.
- Zoning information per the Town of Berthoud Zoning Map and GIS portal.
- This map does not represent a monumental land survey, it is intended only to depict the attached annexation descriptions.

PROJECT CONTACTS:

OWNER:

Jon Turner
River Trails, LLC
6355 N. Fairgrounds Ave, Suite 300
Windsor, CO
970-204-9393

SURVEYOR:

Majestic Surveying, LLC
C/O Steven Parks, PLS
1111 Diamond Valley Drive, Suite 104
Windsor, CO 80550
970-833-5698

NOTICE

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LEGAL DESCRIPTIONS OF PROPOSED REZONING

PROPOSED SUBURBAN RESIDENTIAL PARCEL (PARCEL 1)

A parcel of land situate in the South half (S1/2) of Section Twenty-four (24), Township Four North (T.4N.), Range Sixty-nine West (R.69W.) of the Sixth Principal Meridian (6th P.M.), Town of Berthoud, County of Larimer, State of Colorado and being more particularly described as follows:

COMMENCING at the Northwest corner of the S1/2 of the Southwest Quarter (SW1/4) of said Section 24 and assuming the North line of said S1/2 of said SW1/4 as bearing North 89°02'27" East, being a Grid Bearing of the Colorado State Plane Coordinate System, North Zone, North American Datum 1983/2011, a distance of 2657.78 feet Monumented by a #5 rebar with 2" aluminum cap stamped LS 13446 on the West end, and a #5 rebar with 3.25" aluminum cap stamped 38348 on the East end, and with all other bearings contained herein relative thereto;

THENCE North 89°02'27" East, along said North line, a distance of 30.00 feet to the POINT OF BEGINNING;
THENCE North 89°02'27" East, continuing along said North line, a distance of 20.00 feet;
THENCE North 00°21'20" West a distance of 35.00 feet to a point on the North right of way of East County Road 6C, as shown on the plat of Mary V. Moore M.R.D., recorded November 2, 1993 as Reception Number 19930082235 of the Records of the Larimer County Clerk and Recorder;
THENCE North 89°02'27" East, along said North right of way, a distance of 1943.37 feet;
THENCE South 00°19'57" East, a distance of 5.00 feet to a point on the North right of way of East County Road 6C, as shown on the plat of Golden Acres Minor Land Division 02-S1964, recorded August 22, 2003 as Reception Number 20030107937 of the Records of the Larimer County Clerk and Recorder;
THENCE North 89°02'27" East, along said North right of way, a distance of 664.43 feet to a point on the East line of the North half of said SW1/4, from which the Center-South Sixteenth Corner of said Section 24 bears South 00°19'12" East a distance of 30.00 feet;
THENCE North 89°02'42" East, continuing along said North right of way, a distance of 1248.36 feet;
THENCE South 00°57'18" East a distance of 30.00 feet to a point on the North line of the South half of the Southeast Quarter of said Section 24;
THENCE South 61°08'42" West, along the approximate centerline of Rockwell Ditch, a distance of 422.20 feet;
THENCE South 23°25'42" West a distance of 142.60 feet to the approximate confluence of Rockwell Ditch and the Little Thompson River;
The following 8 courses are along the centerline of said Little Thompson River.
THENCE North 75°15'42" West a distance of 89.83 feet;
THENCE South 38°48'59" West a distance of 75.80 feet;
THENCE South 30°41'09" West a distance of 150.28 feet;
THENCE South 12°10'45" West a distance of 120.83 feet;
THENCE South 40°45'06" West a distance of 110.06 feet;
THENCE South 62°50'06" West a distance of 144.57 feet;
THENCE South 67°38'42" West a distance of 325.77 feet;
THENCE South 52°17'46" West a distance of 99.24 feet to a point on the East line of the S1/2 of the SW1/4 of said Section 24;
THENCE South 00°19'12" East, along said East line, a distance of 392.52 feet to the South Quarter Corner of said Section 24, monumented by a #6 rebar with 3.25" aluminum cap stamped 13446;
THENCE South 88°58'50" West, along the South line of said SW1/4 a distance of 2426.99 feet;
THENCE North 08°56'36" West, along the East line of the parcel recorded January 7, 1878 as Book G Page 580 of the Records of the Larimer County Clerk and Recorder, a distance of 1152.21 feet;
THENCE South 89°38'27" West a distance of 27.84 feet to the Southeast corner of that parcel recorded April 3, 1997 as Reception Number 19970020418 of the Records of the Larimer County Clerk and Recorder;
THENCE North 00°23'06" West a distance of 184.98 to the POINT OF BEGINNING.

Said described parcel of land contains 4,075,517 Square Feet or 93.561 Acres, more or less (±).

PROPOSED AGRIGULTURAL PARCEL (PARCEL 2)

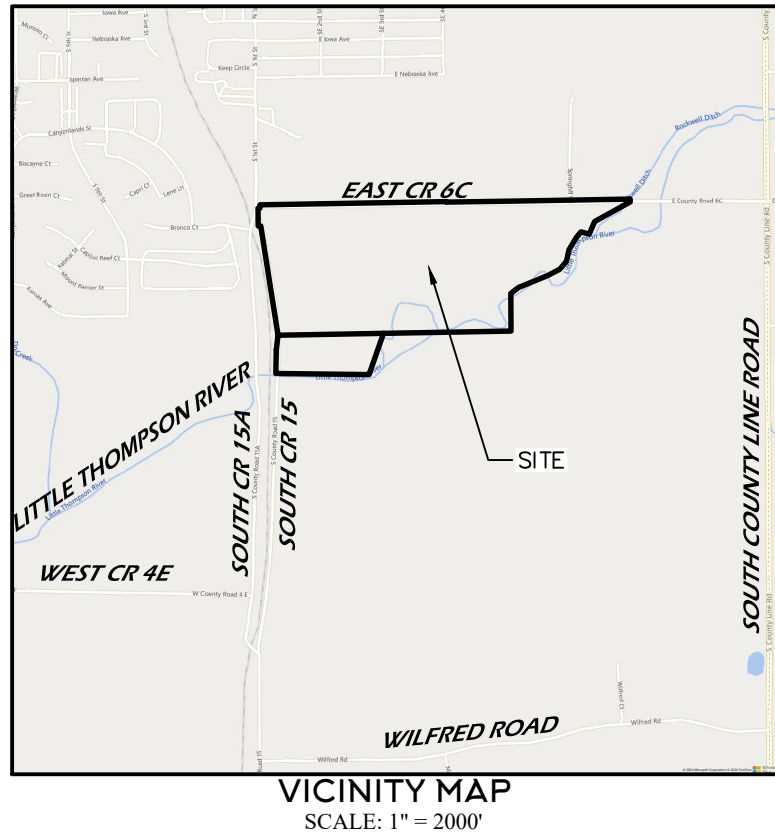
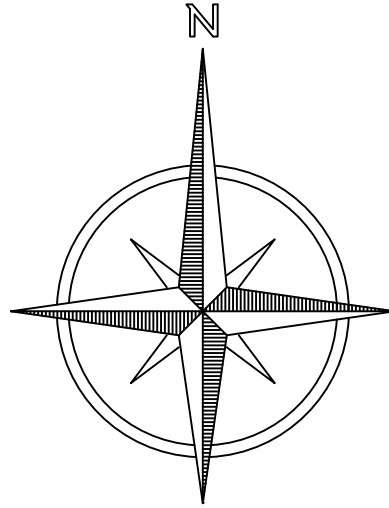
A parcel of land situate in the Northwest Quarter (NW1/4) of Section Twenty-five (25), Township Four North (T.4N.), Range Sixty-nine West (R.69W.) of the Sixth Principal Meridian (6th P.M.), Town of Berthoud, County of Larimer, State of Colorado and being more particularly described as follows:

COMMENCING at the Northwest corner of said Section 25 and assuming the North line of said NW1/4 as bearing North 88°58'50" East, being a Grid Bearing of the Colorado State Plane Coordinate System, North Zone, North American Datum 1983/2011, a distance of 2656.99 feet Monumented by a #6 rebar with 3.25" aluminum cap stamped LS 38348 on the West end and a #6 rebar with 3.25" aluminum cap stamped LS 13446 on the East end, and with all other bearings contained herein relative thereto;

THENCE North 88°58'50" East, along said North line, a distance of 230.00 feet to the POINT OF BEGINNING;
THENCE North 88°58'50" East, continuing along said North line, a distance of 1098.52 feet;
THENCE South 19°17'04" West a distance of 455.71 feet;
THENCE North 89°16'21" West a distance of 971.00 feet;
THENCE North 00°58'39" East a distance of 246.20 feet;
THENCE North 07°04'32" East, along the East line of the parcel recorded January 7, 1878 as Book G Page 580 of the Records of the Larimer County Clerk and Recorder, a distance of 153.28 feet to the POINT OF BEGINNING.

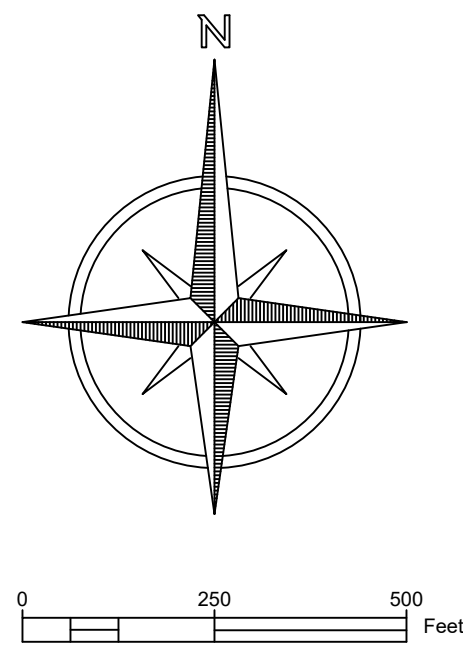
Said described parcel of land contains 430,246 Square Feet or 9.877 Acres, more or less (±).

Said parcels contain a total of 4,505,763 Square Feet or 103.438 Acres more or less by this survey, and is subject to any existing easements and/or rights of way of record.



PROJECT NO: 2024093	PROJECT NAME: RIVER TRAILS	REVISIONS:	DATE:
DATE: 07-01-2024	CLIENT: HILLSIDE DEVELOPMENT	ADDRESSED REDLINES -AU	9-12-24
		REMOVED TOWN OF BERTHOUD PARCEL	9-30-24
DRAWN BY: AU	FILE NAME: 2024093ZONE	ADDRESSED REDLINES -AU	10-01-24
CHECKED BY: SIP	SCALE: N/A		

RIVER TRAILS
ZONING MAP



LINE TABLE		
LINE	BEARING	LENGTH
L1	N89°02'27"E	20.00'
L2	N00°21'20"W	35.00'
L3	S89°38'27"W	27.84'

LEGEND

ALIQUOT CORNER AS DESCRIBED

CALCULATED POSITION

FOUND #4 REBAR WITH RED PLASTIC CAP LS 38348

X FENCE

FLOW LINE

BOUNDARY LINE

EASEMENT LINE

TIE LINE

RAILROAD TRACKS

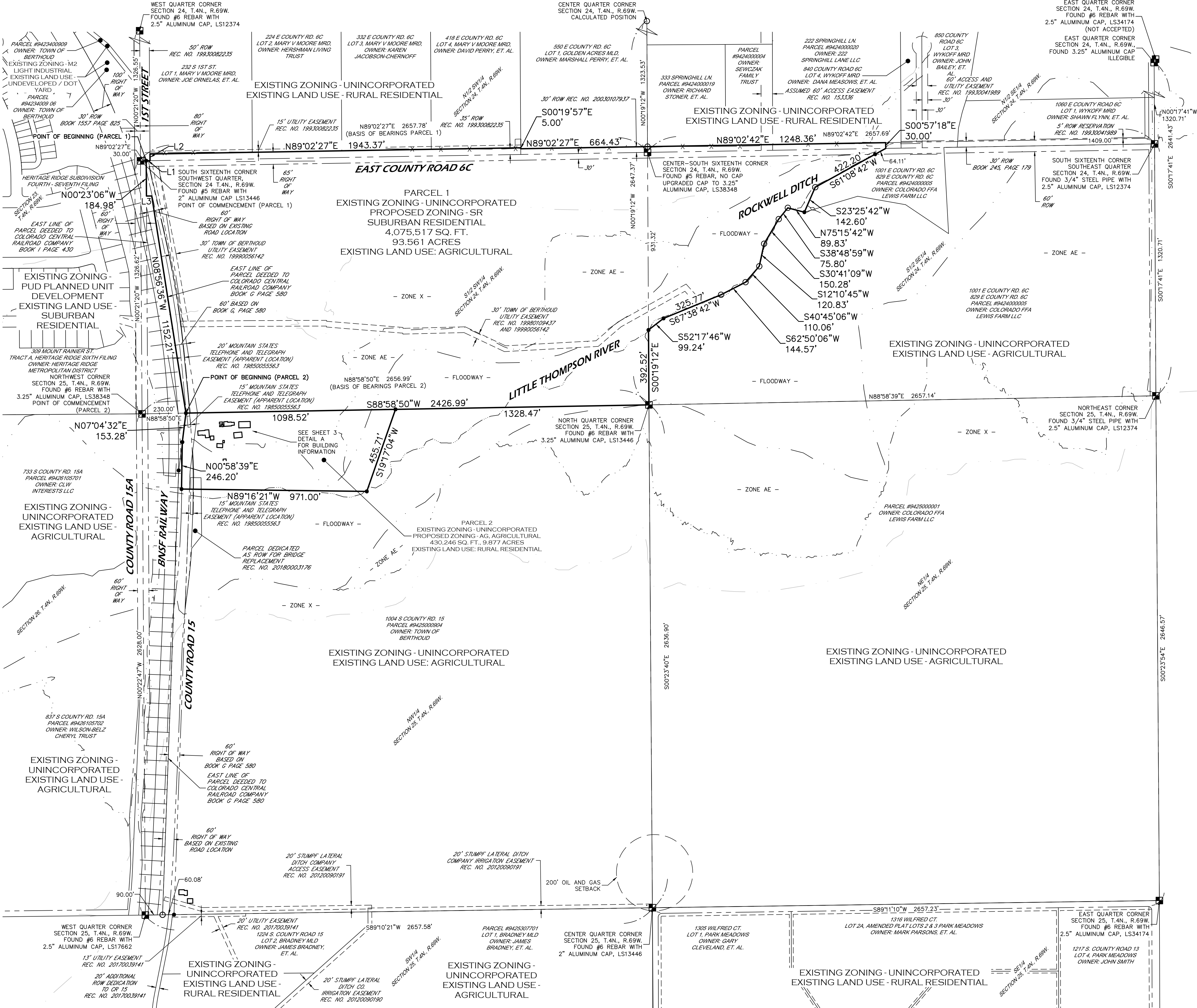
RIGHT OF WAY LINE

SECTION LINE

FEMA REGULATORY FLOODWAY

FEMA ZONE AE

FEMA ZONE X



PRELIMINARY

Steven Parks - On Behalf of Majestic Surveying, LLC
Colorado Licensed Professional Land Surveyor #38348

NOTICE

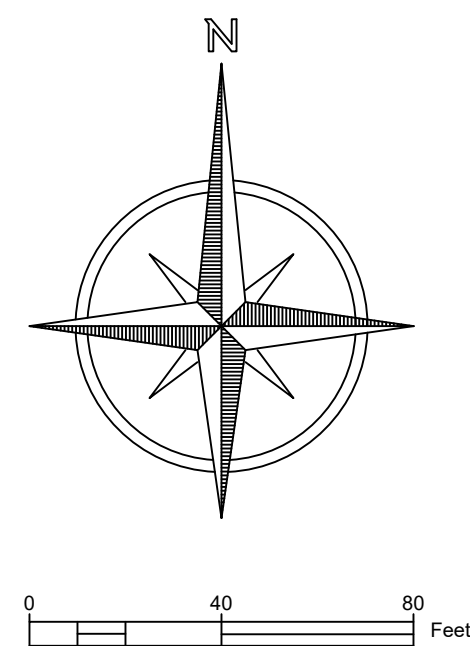
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MAJESTIC SURVEYING

MAJESTIC SURVEYING, LLC 1111 DIAMOND VALLEY DRIVE #104, WINDSOR, CO 80550

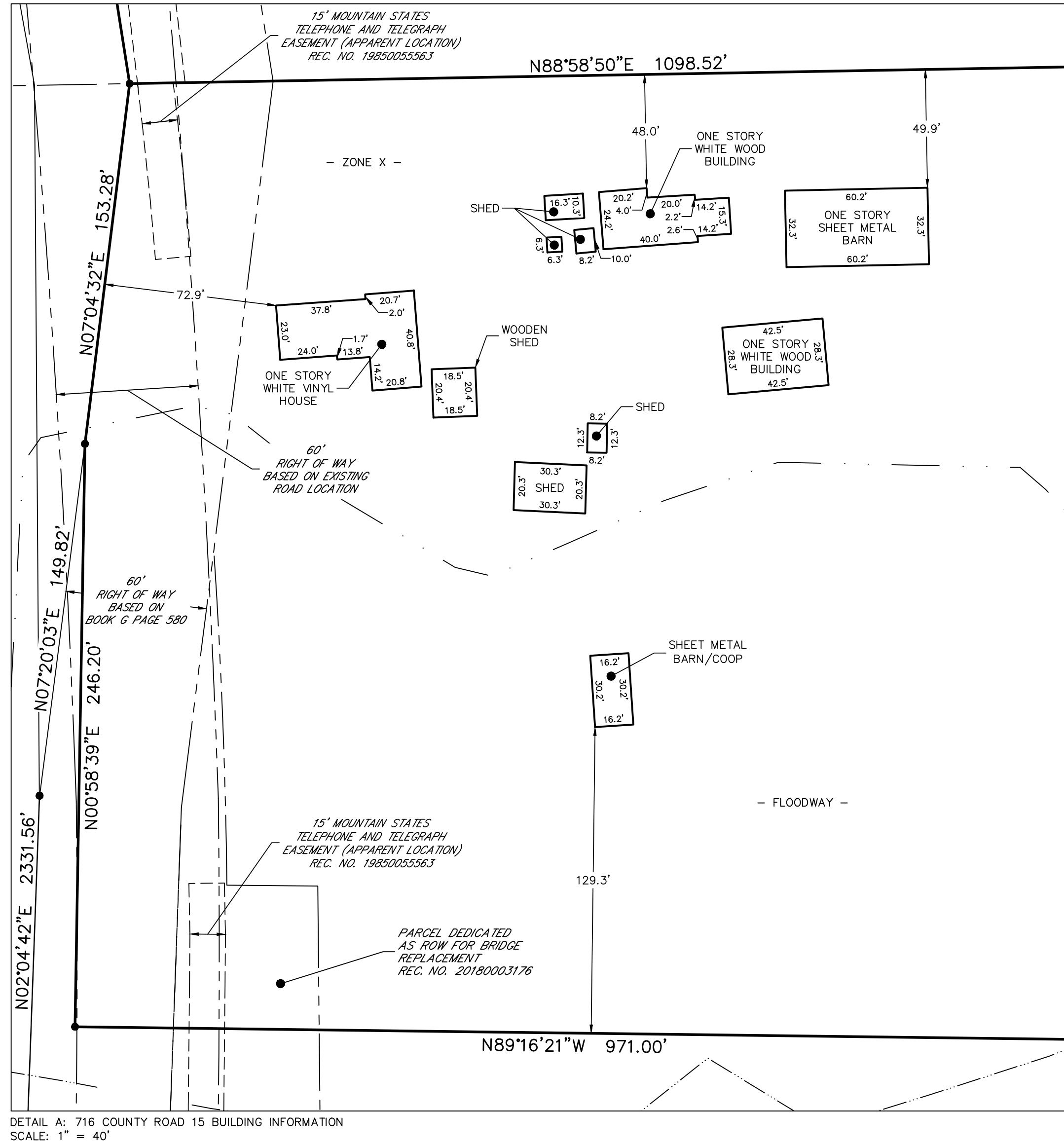
PROJECT NO: 2024093	PROJECT NAME: RIVER TRAILS	REVISIONS:	DATE:
DATE: 07-01-2024	CLIENT: HILLSIDE DEVELOPMENT	ADDRESSED REDLINES -AU	9-12-24
DRAWN BY: AU	FILE NAME: 2024093ZONE	REMOVED TOWN OF BERTHOUD PARCEL	9-30-24
CHECKED BY: SIP	SCALE: 1" = 250'	ADDRESSED REDLINES -AU	10-01-24

RIVER TRAILS ZONING MAP
PARCEL 2 EXISTING BUILDING DETAILS



LEGEND

	ALIQUOT CORNER AS DESCRIBED
	CALCULATED POSITION
	FOUND #4 REBAR WITH RED PLASTIC CAP LS 38348
	FENCE
	FLOW LINE
	BOUNDARY LINE
	EASEMENT LINE
	TIE LINE
	RAILROAD TRACKS
	RIGHT OF WAY LINE
	SECTION LINE
	FEMA REGULATORY FLOODWAY
	FEMA ZONE AE
	FEMA ZONE X



PRELIMINARY

Steven Parks - On Behalf of Majestic Surveying, LLC
Colorado Licensed Professional Land Surveyor #38348

NOTICE

According to Colorado law you must commence any legal action based upon any defect in this survey within three years after you first discover such defect. In no event may any action based upon any defect in this survey be commenced more than ten years from the date of the certification shown hereon. (13-80-105 C.R.S. 2012)

MAJESTIC SURVEYING
MAJESTIC SURVEYING, LLC 1111 DIAMOND VALLEY DRIVE #104, WINDSOR, CO 80550

PROJECT NO: 2024093	PROJECT NAME: RIVER TRAILS	REVISIONS:	DATE:
DATE: 07-01-2024	CLIENT: HILLSIDE DEVELOPMENT	ADDRESSED REDLINES -AU	9-12-24
DRAWN BY: AU	FILE NAME: 2024093ZONE	REMOVED TOWN OF BERTHOUD PARCEL	9-30-24
CHECKED BY: SIP	SCALE: 1" = 40'	ADDRESSED REDLINES -AU	10-01-24

River Trails Rezone Narrative

October 10, 2024

River Trails rezone is approximately 100.5 acres. The site is located west S County Road 15 and south of E County Road 6C. The existing zoning is Larimer County RR2-Rural Residential and we are requesting a change to Suburban Residential (SR) and Agriculture (AG).

These changes include:

1. Parcel 1: RR2 to SR (suburban residential) zoning
2. Parcel 2: RR2 to AG (agriculture) zoning

Written Statement Describing the Proposal and Addressing the Following Points:

I. Rationale for the proposed zoning:

The zone changes are intended to switch from County zoning (RR2 – Rural Residential) to Town of Berthoud zoning and be in conformance with the 2021 Comprehensive Plan. The Future Land Use Map identifies this property as suited for suburban residential development, open space and agriculture. These designations are consistent with the proposed zoning with SR zoning proposed for the northern portion of the property and AG proposed for the southern portion of the property. The Town of Berthoud owns the southern portion of the property and does not intend to develop it.

II. Present and future impacts on the existing adjacent zone districts, uses, and physical character of the surrounding area:

Impacts on existing adjacent properties are anticipated to be minimal. The property is bordered by E County Road 6C and existing residential development to the north, the Heritage Ridge subdivision to the west, and existing residential development to the north. The Town of Berthoud will acquire the property south of the Little Thompson River which will remain undeveloped and serve as a buffer to other county parcels along the edge of the Town's growth management area. The River Trails development is consistent with the comprehensive plan and will establish the pattern of a high-quality residential neighborhood in Berthoud.

III. Impact of the proposed zone on area accesses and traffic patterns:

Traffic impacts of the River Trails rezone will be minimal. A preliminary traffic study has been submitted with this package which provides information on potential improvements required at the time of plat. Access to the site will be provided at multiple locations to help spread out the traffic impacts. These access points include connections to S County Road 15 and E County Road 6C. As part of any future platting application, pedestrian connections to regional trails and the inclusion of new local trails will further enhance the overall circulation options for the community.

IV. Availability of utilities for any potential development:

Water

Domestic water service for the project will be provided by the Town of Berthoud. On-site water mains will be looped through the development to provide domestic water service and fire flows. The water network will connect to the Town's system in two places: 1) West, across 1st Street/CR 15, connecting in the Heritage Ridge subdivision, and 2) Northeast of the site, connecting to a waterline in Springhill Lane that extends north. Currently, there is a Little Thompson Water District (LTWD) main that runs east/west located south of Nebraska Avenue in the Farmstead West subdivision; a branch off that main extends south within Springhill Lane for approximately 725-feet (where the 2nd connection point is). As part of this project, the branch line will be disconnected from the LTWD main and extended north where it will be connected to the 12" water main within Nebraska Avenue.

Sanitary Sewer

Sanitary sewer service for the project will be provided from the Town of Berthoud. The sewer service will be connected via gravity flow to the 24" sewer main that runs on the south side of the project site conveying flows east to the wastewater treatment plant.

V: Present and future impacts on public facilities and services, including, but not limited to, fire, police, water, sanitation, roadways, parks, schools, and transit:

Impacts on public facilities and services are acknowledged. Due to the increase in residential units and traffic, there will be an increase in service calls for law enforcement and fire protection. Parks, open space, transportation improvements, and trails are all planned components of this development. The developer believes that by providing these facilities within the development, there will be minimal impact on existing Town facilities. Similar to all of the other development in the area, the residents will utilize the Town's parks and trail facilities. As part of the Town's review process, we understand that proposed designs will be referred to different agencies such as fire, schools, water & sanitation districts etc. and information collected from these agencies will be incorporated into future plans.

VI. The relationship between the proposal and the Town Comprehensive Plan:

The rezoning is consistent with the Town's Comprehensive Plan 2021 Land Use Goals with proposed zoning matching the Future Land Use Plan. The Future Land Use Map identifies this property for residential development which is consistent with the proposed zoning of Suburban Residential. The proposed zoning will allow for land use design which supports several goals as established in the Comprehensive Plan including but not limited to:

- Providing logical extensions of the Town's infrastructure to allow for efficient development.
- Providing logical and safe extensions of the Town's road network.
- Providing the framework for parks and open space areas to support the residential development.
- Providing access and connectivity to open space and natural areas.
- Expanding the pedestrian and bicycle trail facilities in the community.
- Expanding the opportunity for residential development and diversity of product types.

VII. Public benefits arising from the proposal:

This property currently has County zoning (RR2-Rural Residential). With annexation to the Town of Berthoud, Suburban Residential (SR) zoning is proposed for this property, consistent with the Comprehensive Plan. While similar residential density is permitted in the County, it will be a greater benefit for this property to develop as a Town of Berthoud property due to the location within the GMA (there is additional property to the east, west and south within the town's GMA) and to best align the development with the goals of the Town.

A variety of housing is planned for the proposed community, including townhomes, duplexes, and detached single family homes, offering the area residents a variety of housing options in the area. The neighborhood park, situated along the Little Thompson River will be a focal point not only for the new residents of the project but will be enjoyed by all of the town's residents. A regional trail is planned along the Little Thompson River, providing a vital connection in the Town's overall trail system. The numerous amenities will provide a high quality of life not only for the residents of the project, but for the surrounding community as well. Additionally, the increased sales and property taxes generated by the community along with the infrastructure constructed during its completion will offset any impacts on the Town.

River Trails Neighborhood Master Plan Narrative

October 10, 2024

General Description

The development proposed at River Trails includes single-family detached (front and rear loaded), duplex lots, single family attached (townhomes), parks and open space/trail connections. The site currently is located in Larimer County with RR2 -Rural Residential Zoning and an application for Suburban Residential (SR) and Agriculture (AG) zoning has been submitted along with this neighborhood master plan. The AG zoning is proposed for the existing homestead and the property located south of the Little Thompson River, which are not a part of the NMP boundary.

Land Use Area

River Trails is approximately 90.56 acres. The project has proposed development that is consistent with the Land Use Map of the Comprehensive Plan 2021, which is designated as Suburban Residential (SR). The site is located south of E County Road 6C and east of S County Road 15.

Statement of Commercial Mineral Deposits

There are no known commercial mineral deposits on this site. Mapping per the Colorado Geological Survey website has been included which defines areas of 'high potential, low potential or unknown/no potential' for mineral deposits. It appears that this property falls into both the 'high potential' and 'low potential' categories. Regardless of mineral deposit potential, the owners do not intend to explore or mine any possible minerals.

Compliance with Section 30-2-131

Based on the size of the site and the number of proposed units, eight (8) subdivision identity points will be required. The specific subdivision identity elements to be provided, will be determined at the time of plat but a minimum of 8 element points will be provided.

The following is a list of elements that is being evaluated for this site, but is subject to change, so long as the required element points are achieved at the time of plat:

1. POCKET PARK	1
2. TRAILS	1
3. PLAYGROUND	1
4. BUFFER AREAS	1
5. EXISTING TREES	1

6. POLLINATOR GARDEN/PALETTE	1
7. ALLEY LOADED STREETS	2
8. USABLE OPEN SPACE	1
TOTAL	9

Compliance with the Town Comprehensive Plan

The proposed development integrates the goals set out in the Town Comprehensive Plan in the following ways:

Land Use and Growth Management

(Goals/Objectives: 1.1.1, 1.1.2, 1.1.3, 1.6.1, 1.6.2)

The proposed development is designed to provide connections to the perimeter road network and pedestrian connections that will connect to development to the north, east and south. In addition, the layout provides continuous, direct, convenient, and safe pedestrian pathways to proposed parks and open space areas. The site is well situated for housing per the Comprehensive Plan which designates this particular property for suburban residential development. In addition, the proposed plan is consistent with the Open Space Master Plan and the Trails Master Plan. The river corridor will act as a natural separator between the Little Thompson River and the proposed development. In addition, the development of this property will serve as a larger link to the river corridor for both the residents of this subdivision, as well as the larger community. The river corridor which runs throughout Berthoud will serve as a large scale habitat area, buffer area and trail area for the community.

Circulation and Transportation

(Goals/Objectives: 2.2.1, 2.2.8, 2.2.11, 2.2.12)

This plan provides a safe and efficient transportation network that accommodates pedestrians, vehicles and bicycles. It is planned as a pedestrian oriented and walkable community with detached sidewalks, tree lawns, street trees and connections throughout the community, to adjacent neighborhoods. Several access points to the site are proposed from S County Road 15 and E County Road 6C.

Community Character and Urban Design

(Goals/Objectives: 3.1.2, 3.1.3, 3.1.4)

This plan provides a community that promotes high quality development. This development is pedestrian oriented and walkable with detached sidewalks, tree lawns and street trees. Future

residents of this community will be able to walk to adjacent subdivisions and parks. Site identity features could include a pocket park, trails, play equipment, protection of existing trees, the use of a pollinator garden plant palette, buffer areas and alley loaded streets. This property has the unique benefit of being located adjacent to the Little Thompson River which will allow for an open space corridor and trails near the natural feature. We will work with the Town during the platting process to coordinate educational opportunities and/or interpretive sign locations.

Public Infrastructure

(Goals/Objectives: 1.8.1, 1.8.2, 4.2.5, 4.4.2, 4.6.1, 4.8.3)

The proposed development is a logical extension of the Town of Berthoud public services without placing additional burdens on existing residents and businesses. There are nearby utilities and surrounding Berthoud streets. The design allows for phasing that is both responsible and flexible. Infrastructure will be provided so as to meet the requirements of the Comprehensive Plan and/or the Land Use Code. Additional detailed design information will be provided with future platting. We will continue to work with the Town and the Fire Department to ensure adequate infrastructure and safety mechanisms (such as utility looping) are in place.

Rationale of How Neighborhood Master Plan Correlates to Proposed Zone District

The proposed residential product types directly correlate to the proposed zone district (SR). Single-family detached (front and rear loaded), townhomes, and duplex lots are envisioned for this property.

Water Dedication

Domestic water service for the project will be provided by the Town of Berthoud. On-site water mains will be looped through the development to provide domestic water service and fire flows. The water network will connect to the Town's system in two places: 1) West, across 1st Street/CR 15, connecting in the Heritage Ridge subdivision, and 2) Northeast of the site, connecting to a waterline in Springhill Lane that extends north. Currently, there is a Little Thompson Water District (LTWD) main that runs east/west located south of Nebraska Avenue in the Farmstead West subdivision; a branch off that main extends south within Springhill Lane for approximately 725-feet (where the 2nd connection point is). As part of this project, the branch line will be disconnected from the LTWD main and extended north where it will be connected to the 12" water main within Nebraska Avenue.

Stormwater

Sanitary sewer service for the project will be provided from the Town of Berthoud. The sewer service will be connected via gravity flow to the 24" sewer main that runs on the south side of the project site conveying flows east to the wastewater treatment plant.

RIVER TRAILS | JULY 2024

LEGAL DESCRIPTION

A PARCEL OF LAND SITUATE IN THE SOUTH HALF (S1/2) OF SECTION TWENTY-FOUR (24), TOWNSHIP FOUR NORTH (T.4N.), RANGE SIXTY-NINE WEST (R.69W.) OF THE SIXTH PRINCIPAL MERIDIAN (6TH P.M.), TOWN OF BERTHOUD, COUNTY OF LARIMER, STATE OF COLORADO

SUBDIVISION IDENTITY & RESIDENTIAL STANDARDS

RESIDENTIAL PRODUCT TYPES REQUIRED: 4

RESIDENTIAL PRODUCT TYPES PROVIDED: 4

SUBDIVISION IDENTITY ELEMENTS POINTS REQUIRED: 8

THE SUBDIVISION IDENTITY ELEMENTS TO BE PROVIDED WILL BE DETERMINED AT THE TIME OF PLAT. A MINIMUM OF 8 ELEMENT POINTS WILL BE PROVIDED. THE FOLLOWING IS A LIST OF ELEMENTS THAT IS BEING EVALUATED FOR THIS SITE, BUT IS SUBJECT TO CHANGE, SO LONG AS THE REQUIRED ELEMENT POINTS ARE ACHIEVED AT THE TIME OF PLAT:

1. POCKET PARK	1
2. TRAILS	1
3. PLAYGROUND	1
4. BUFFER AREAS	1
5. POLLINATOR GARDENS	1
6. EXISTING TREES	1
7. ALLEY LOADED STREETS	1
8. USEABLE OPEN SPACE	1

TOTAL : 8

TRAFFIC INFORMATION

1. UNLESS OTHERWISE NOTED ON THE PLAN, ALL STREETS ARE LOCAL STREETS.

NOTES:

1. PROPOSED LOT COUNT AND LOT SIZES ARE CONCEPTUAL AND MAY CHANGE AT TIME OF PLAT, DEPENDING ON MARKET CONDITIONS. HOWEVER, FUTURE LOT SIZES WILL ADHERE TO THE MINIMUM LOT SIZE REQUIREMENTS AND THE APPLICABLE LOT TYPE, PER TOWN OF BERTHOUD CODE.
2. DENSITY MAY SHIFT BETWEEN DEVELOPMENT AREAS SO LONG AS THE OVERALL DENSITY, AS DEPICTED IN THIS NEIGHBORHOOD MASTER PLAN, IS NOT EXCEEDED. DENSITY WITHIN A DEVELOPMENT AREA MAY NOT EXCEED THE MAXIMUM PERMITTED PER THE UNDERLYING ZONE DISTRICT. DENSITY SHIFTS MUST ADHERE TO THE NEIGHBORHOOD MASTER PLAN REQUIREMENTS PER SECTION 30-6-106-C.5 OF THE BERTHOUD MUNICIPAL CODE.
3. RESIDENTIAL PRODUCT TYPES DEPICTED ARE CONCEPTUAL AND MAY BE ADJUSTED AT PLATTING. PER THE MUNICIPAL CODE, A MINIMUM OF FOUR (4) PRODUCT TYPES WILL BE INCLUDED IN THE SUBDIVISION. RESIDENTIAL PRODUCT TYPES COULD INCLUDE BUT ARE NOT LIMITED TO: SINGLE FAMILY DETACHED, TOWNHOMES, DUPLEXES, AND OR OTHER RESIDNETIAL PRODUCT TYPES AS SPECIFIED IN THE MUNICIPAL CODE, PER ZONE DISTRICT xxx
4. THE NEIGHBORHOOD MASTER PLAN IS BINDING ON A DEVELOPMENT, AND ALL FUTURE PLATTING/ZONING ACTIONS MUST FOLLOW THE APPROVED PLAN AS PRESENTED AND APPROVED BY THE TOWN BOARD OF TRUSTEES. SHOULD THIS NEIGHBORHOOD MASTER PLAN BE ALTERED POST-APPROVAL, A FORMAL AMENDMENT OF THE PLAN MAY BE REQUIRED.
5. LOCATION OF THE REGIONAL AND NEIGHBORHOOD TRAILS ALONG THE LITTLE THOMPSON RIVER TO BE DETERMINED AT PRELIMINARY PLAT IN CONJUNCTION WITH THE TOWN OF BERTHOUD, ALONG WITH COLORADO PARKS AND WILDLIFE.



APPROVAL CERTIFICATES:

Approved by the Town of Berthoud, Colorado this _____ day of _____, 202_.

Mayor

The foregoing map is approved for filing and accepted by the Town of Berthoud, Colorado this _____ day of _____, 202_.

ATTEST:

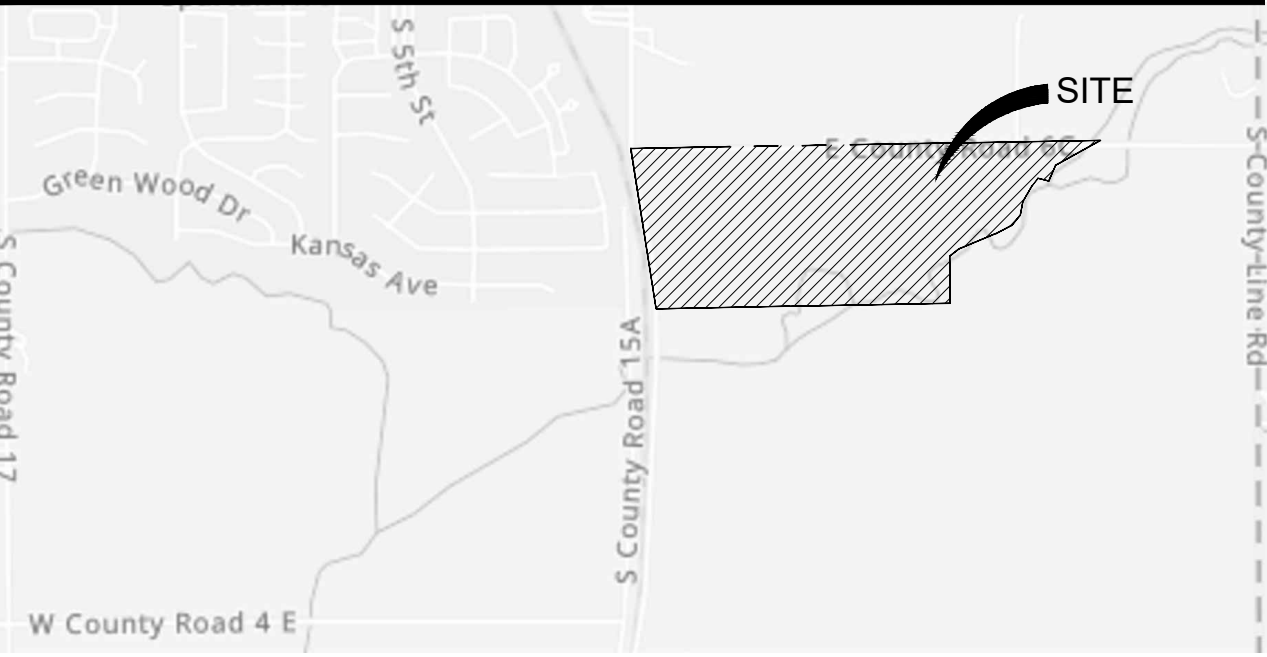
Town Clerk

APPROVAL CERTIFICATES:

Approved by the Planning Commission of the Town of Berthoud, Colorado this _____ day of _____, 202_.

Chairman

VICINITY MAP



LAND USE SUMMARY

SFD - FRONT LOADED (50' X 115')	63	
SFD - REAR LOADED (40' X 90')	125	
DUPLEXES (31' X 90')	132	
TOWNHOMES	96	
TOTAL.....	416 LOTS	
	4.45 DU/AC	

LAND USE STATISTICS

TOTAL ACREAGE =	~93.56 ACRES
SFD - FRONT LOADED (50'x115') =	~8.85 ACRES
SFD - REAR LOADED ACREAGE (40'x90') =	~10.81 ACRES
DUPLEXES ACREAGE (31'x90') =	~8.57 ACRES
TOWNHOMES ACREAGE (40'x90') =	~3.97 ACRES
OPEN SPACE ACREAGE =	~23.60 ACRES
% OF SITE AS OPEN SPACE =	27.4%
DETENTION ACREAGE =	~3.85 ACRES
% OF SITE AS DETENTION =	6.8%
PARK ACREAGE =	~8.74 ACRES
% OF SITE AS OPEN SPACE =	5.5%
ROW ACREAGE =	~16.90 ACRES
% OF SITE AS DRIVE =	20.1%
DRIVE ACREAGE =	~3.87 ACRES
% OF SITE AS DRIVE =	20.1%

SHEET INDEX

- SHEET 1 - NEIGHBORHOOD MASTER PLAN
SHEET 2 - OPEN SPACE AND CIRCULATION EXHIBIT
SHEET 3 - PARK EXHIBIT

NEIGHBORHOOD MASTER PLAN

REVISIONS

STAFF COMMENTS	09.13.24
STAFF COMMENTS	10.14.24

RIVER TRAILS | JULY 2024

PARK STATISTICS:

ESTIMATED PARK SPACE REQUIRED (APPROX. 416 UNITS)	4.16 ACRES
PARK SPACE PROVIDED	8.74 ACRES 9.34% OF SITE

NOTE: FINAL PARK SPACE REQUIREMENT WILL BE BASED ON ACTUAL FINAL UNIT COUNT. TO BE DETERMINED WITH FINAL PLATS.

LEGEND

	PROPERTY BOUNDARY
	DETACHED CONCRETE SIDEWALK - 32,635 feet
	OFF-STREET CONCRETE NEIGHBORHOOD TRAILS - 8,764 feet
	FLOODWAY ZONE
	FLOOD FRINGE ZONE
	EXISTING WETLANDS
	WETLANDS 150' BUFFER
	SEATING AREAS

OPEN SPACE STATISTICS

TOTAL OPEN SPACE REQUIRED =	93.56 AC	10.00%
TOTAL OPEN SPACE PROVIDED =	27.45 AC	29.31%
TOTAL SITE ACREAGE =	93.561 AC	

OPEN SPACE ELEMENTS

OPEN SPACE ELEMENT POINTS REQUIRED: 3

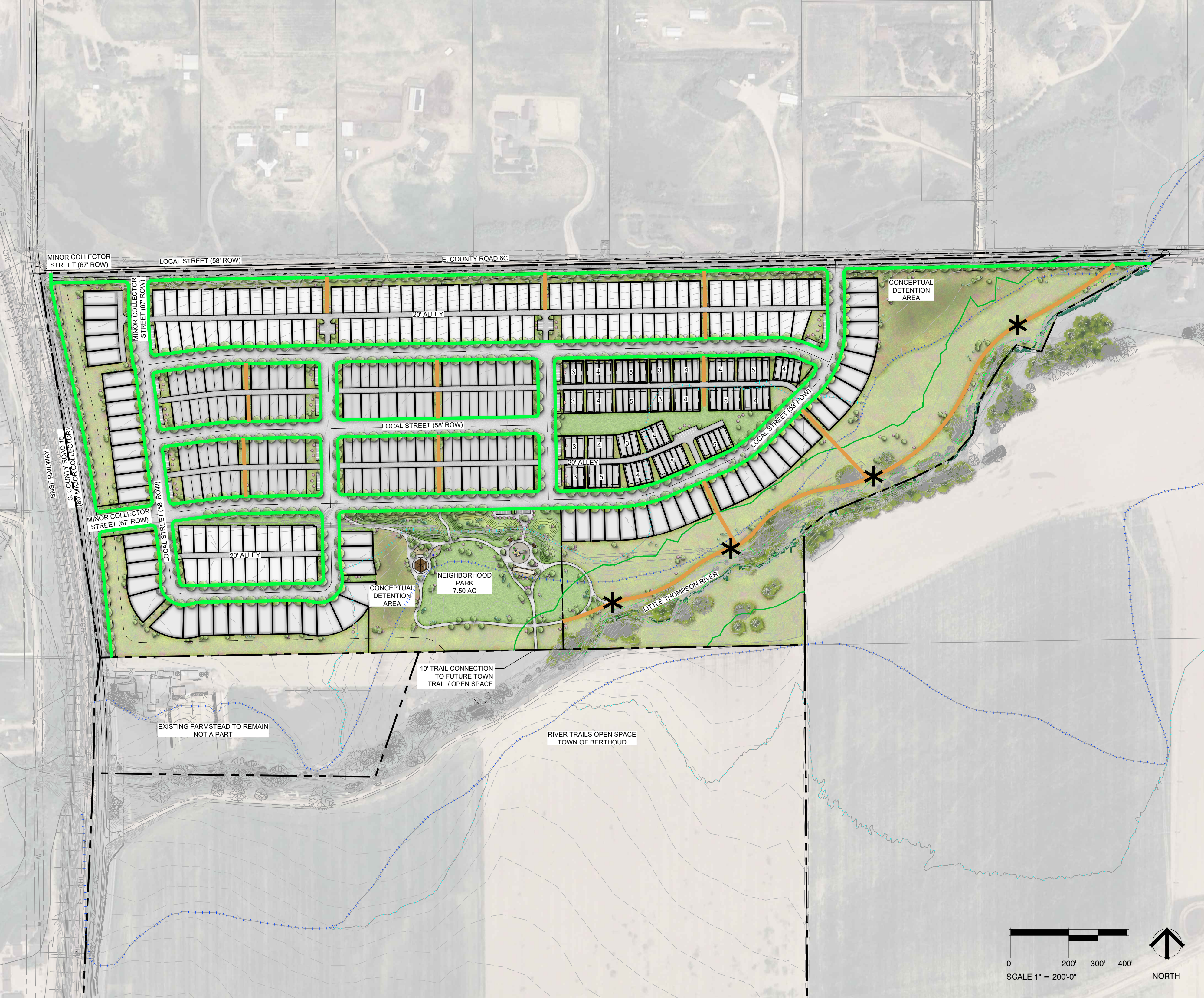
THE OPEN SPACE ELEMENTS TO BE PROVIDED WILL BE DETERMINED AT THE TIME OF PLAT. A MINIMUM OF 3 ELEMENT POINTS WILL BE PROVIDED. THE FOLLOWING IS A LIST OF ELEMENTS THAT IS BEING EVALUATED FOR THIS SITE, BUT IS SUBJECT TO CHANGE, SO LONG AS THE REQUIRED ELEMENT POINTS ARE ACHIEVED AT THE TIME OF PLAT:

1. GREEN AREA	1 OR 2
2. TRAIL HEAD	1

TOTAL : 3

PARKS & OPEN SPACE SUMMARY

PARK SPACE	8.74 ACRES
OPEN SPACE (BUFFER AREAS)	23.60 ACRES 4.45 ACRES)
DETENTION SPACE	3.85 ACRES
TOTAL	36.19 ACRES



A POLICY OF THE TOWN OF BERTHOUD: RIGHT TO FARM

THE TOWN OF BERTHOUD IS A UNIQUE COMMUNITY LOCATED WITHIN AN AGRICULTURAL AREA THAT PROVIDES MANY BENEFITS TO THE TOWN AND A VARIETY OF AGRICULTURAL PRODUCTS TO THE PEOPLE OF THE STATE OF COLORADO. AGRIBUSINESS IS AN IMPORTANT PART OF OUR STATE'S ECONOMY. THE TOWN OF BERTHOUD RECOGNIZES THAT WITHOUT THE FARMERS AND RANCHERS IN THE AREA, THE TOWN WOULD NOT MAINTAIN ITS SMALL TOWN CHARACTER, LIFESTYLE AND APPEAL. THEREFORE, IT BECOMES IMPERATIVE TO EDUCATE PEOPLE MOVING TO THIS AREA RELATIVE TO THE DAY TO DAY ACTIVITIES AND EVENTS THAT OCCUR IN AREAS OF LARIMER AND WELD COUNTIES ADJACENT TO RESIDENTIAL AREAS OF THE TOWN. THE LAWS OF COLORADO CLASSIFY IT AS A "RIGHT TO FARM" STATE. NEW AND EXISTING RESIDENTS OF THE TOWN OF BERTHOUD AND THOSE TO WHOM THE TOWN SUPPLIES MUNICIPAL SERVICES SHOULD UNDERSTAND THAT ALL OF US BENEFIT FROM THE LARGE AREAS OF OPEN FARMLANDS AND FIELDS THAT SURROUND OUR COMMUNITY. IN ORDER FOR THESE LANDS TO REMAIN PRODUCTIVE, THE FARMING AND RANCHING OPERATIONS ON THESE PROPERTIES MUST CONTINUE. THEREFORE, IT IS THE RESPONSIBILITY OF THE NEIGHBORING PROPERTY OWNERS TO UNDERSTAND AND RESEARCH THE AREA THEY ARE CONSIDERING MOVING INTO, AND FULLY UNDERSTAND AND ACCEPT THAT THE ACTIVITIES, SIGHTS, SOUNDS AND SMELLS OF AGRICULTURAL OPERATIONS ARE NORMAL FACTS OF LIFE WHEN LIVING IN THE AREAS WITHIN AND AROUND THE TOWN OF BERTHOUD. SOME INDIVIDUALS MAY NOT APPRECIATE THESE AGRICULTURAL OPERATIONS AND MAY PERCEIVE THEM AS ANNOYANCES, EYESORES OR NUISANCES. STATE LAW AND TOWN RESOLUTIONS RECOGNIZE THAT RANCHING, FARMING OR OTHER AGRICULTURAL ACTIVITIES AND OPERATIONS WITHIN THE AREAS SURROUNDING BERTHOUD SHALL NOT BE CONSIDERED TO BE NUISANCES SO LONG AS THEY ARE OPERATED IN CONFORMANCE WITH THE LAW IN A NON-NEGLIGENT MANNER. THEREFORE, LOCAL RESIDENTS SHOULD BE PREPARED TO ENCOUNTER NOISES, 24 HOUR OPERATIONS, ODORS, LIGHTS, MUD, DUST, SMOKE, CHEMICALS, MACHINERY ON PUBLIC ROADS, LIVESTOCK, STORAGE AND DISPOSAL OF FEED AND MANURE, THE APPLICATION BY SPRAYING OF OTHER CHEMICAL FERTILIZERS, SOIL AMENDMENTS, HERBICIDES AND PESTICIDES, ANYONE OR MORE OF WHICH MAY NORMALLY OCCUR AS PART OF LEGAL AND NON-NEGLIGENT AGRICULTURAL OPERATIONS. IN ADDITION, COLORADO LAW STATES THAT COLORADO IS AN OPEN RANGE STATE. PROPERTY OWNERS MUST FENCE LIVESTOCK OUT OF THEIR PROPERTY, AND NOT WITHIN IT. THERE ARE ALSO ORDINANCES WHICH REQUIRE THAT YOUR PETS BE LEASHED AND MAINTAINED ON YOUR PROPERTY. THEREFORE, PET OWNERS MUST COMPLY WITH ALL LAWS PERTAINING TO LEASH LAWS AND ANIMAL CONTROL REGULATIONS. OWNERS OF EASEMENTS AND RIGHTS-OF-WAY FOR DITCHES AND UTILITIES MUST HAVE REASONABLE ACCESS TO BURN, CONTROL WEEDS, MAINTAIN AND SERVICE THEIR LINES AND DITCHES. THESE DITCHES AND EASEMENTS ARE NOT FOR PUBLIC USE AND MAY NOT BE USED WITHOUT THE WRITTEN CONSENT OF THE DITCH OWNER. THE WATER CONTAINED IN THESE DITCHES IS PRIVATE PROPERTY AND ANY USE OF THIS WATER WITHOUT WRITTEN CONSENT IS TO BE CONSIDERED THEFT. RESIDENTS AND LANDOWNERS ARE ENCOURAGED TO LEARN MORE ABOUT THESE RIGHTS AND RESPONSIBILITIES AND THE POSITION THE STATE OF COLORADO AND THIS TOWN HAVE ADOPTED REGARDING THESE ISSUES. THE TOWN BELIEVES FARMING AND RANCHING OPERATIONS CAN PROVIDE MANY BENEFITS TO LOCAL RESIDENTS AND THAT AGRICULTURE AND RESIDENTIAL USES CAN COEXIST.

OPEN SPACE & CIRCULATION EXHIBIT

REVISIONS

STAFF COMMENTS	09.13.24
STAFF COMMENTS	10.14.24

RIVER TRAILS | JULY 2024

NEIGHBORHOOD PARK



NEIGHBORHOOD PARK ELEMENTS

ALL OF LIST A*: • ELECTRICITY • IRRIGATION • SECURITY LIGHTING • TRASH RECEPTACLES (2/AC) • WATER SERVICE • BIKE RACKS • LANDSCAPING	5 OF LIST B*: • GROUP PICNIC SHELTER (MIN SIZE 500 SF AND THREE TABLES) • PICNIC SHELTERS WITH PICNIC TABLES (2) • LOOP WALK (MIN. 2,000 LF) • TURF - APPROX. 80,062 S.F. • NATURAL AREA - APPROX. 144,327 S.F.	3 OF LIST C*: • 1 HIGH: • TRAIL HEAD WITH A MIN. OF SEVEN PARKING SPACES • 2 LOW: • CONCRETE CORN HOLE • CONCRETE CHESS / CHECKER TABLES
--	---	--

* FINAL PARK COMPONENTS TO BE DETERMINED AT PLAT.

NEIGHBORHOOD KEY MAP



POCKET PARK



POCKET PARK ELEMENTS

ALL OF LIST A*: • ELECTRICITY • IRRIGATION • SECURITY LIGHTING • TRASH RECEPTACLES (2/AC) • WATER SERVICE • BIKE RACKS • LANDSCAPING	5 OF LIST B*: • GROUP PICNIC SHELTER (MIN SIZE 500 SF AND THREE TABLES) • PICNIC SHELTERS WITH PICNIC TABLES (2) • LOOP WALK (MIN. 2,000 LF) • TURF • NATURAL AREA	3 OF LIST C*: • 1 HIGH: • TBD • 2 LOW: • TBD
--	--	--

* FINAL PARK COMPONENTS TO BE DETERMINED AT PLAT.

POCKET PARK KEY MAP



PARKS EXHIBIT

REVISIONS	
STAFF COMMENTS	09.13.24
STAFF COMMENTS	10.14.24

River Trails Transportation Impact Study Town of Berthoud

September 12, 2024
Replaces July 22, 2024

Prepared for:
River Trails LLC

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1 INTRODUCTION

This report documents the results of a study to evaluate the potential traffic impacts of the proposed River Trails Neighborhood Master Plan (NMP) in the Town of Berthoud. Rollins Consult LLC conducted the study as required for the project's development application. This study will focus on long range transportation conditions. As each phase of the proposed project is submitted, a transportation study will be performed.

PROJECT DESCRIPTION

The proposed River Trails project is located to the southeast of downtown Berthoud. The project site is located to the south of CR 6C and east of 1st Street/CR 15. Figure 1 illustrates the project location and the study area. The site is currently undeveloped.

A project site is depicted on Figure 2. The site will be developed with 188 single family homes, 132 duplex dwelling units, and 96 multi-family dwelling units. As shown in the figure, access to CR 6C is planned at two locations and access to CR 15 at one location. There will be internal pedestrian and bike trails within the site.

RIVER TRAILS | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Figure 1 – Project Location

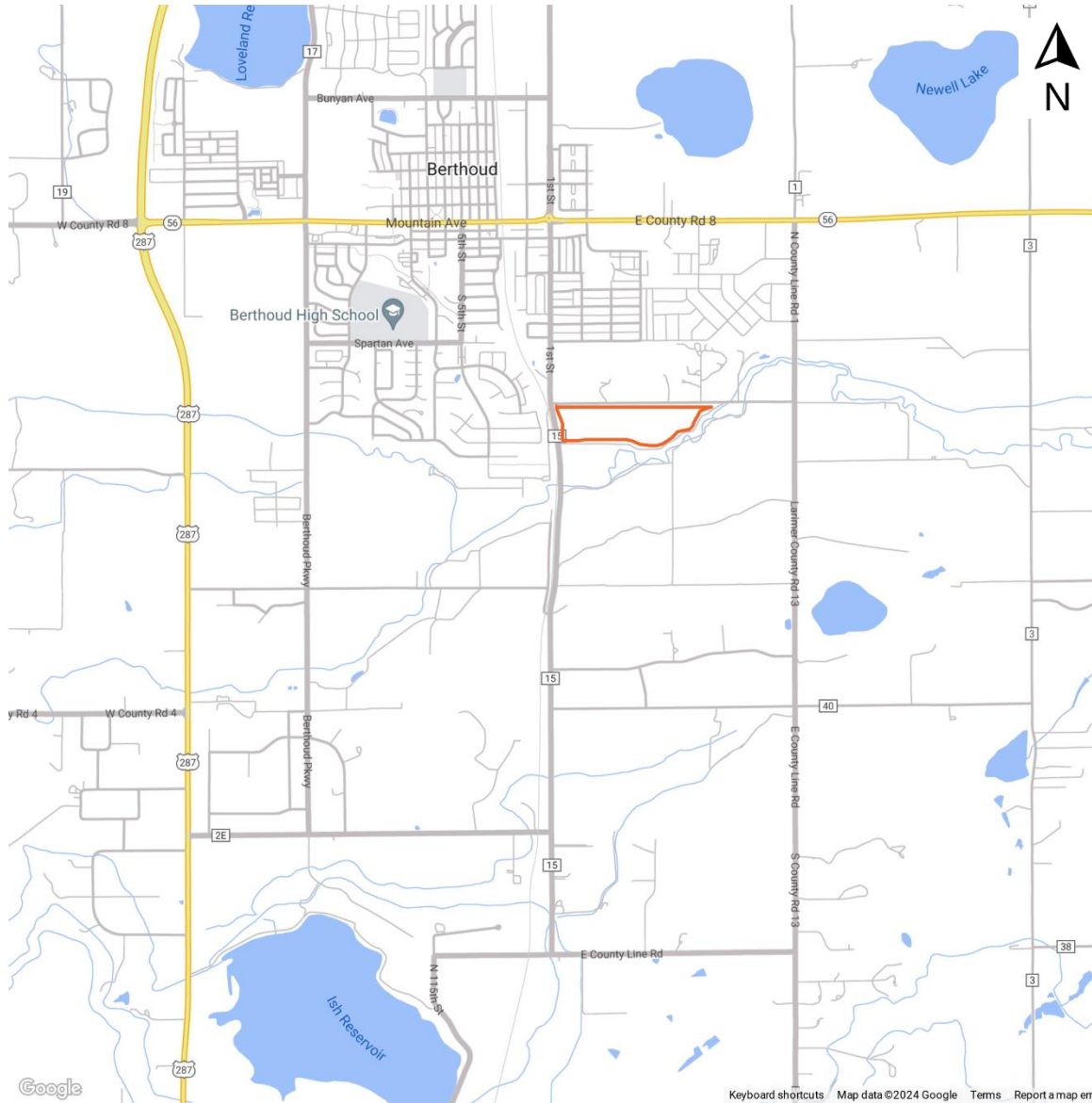
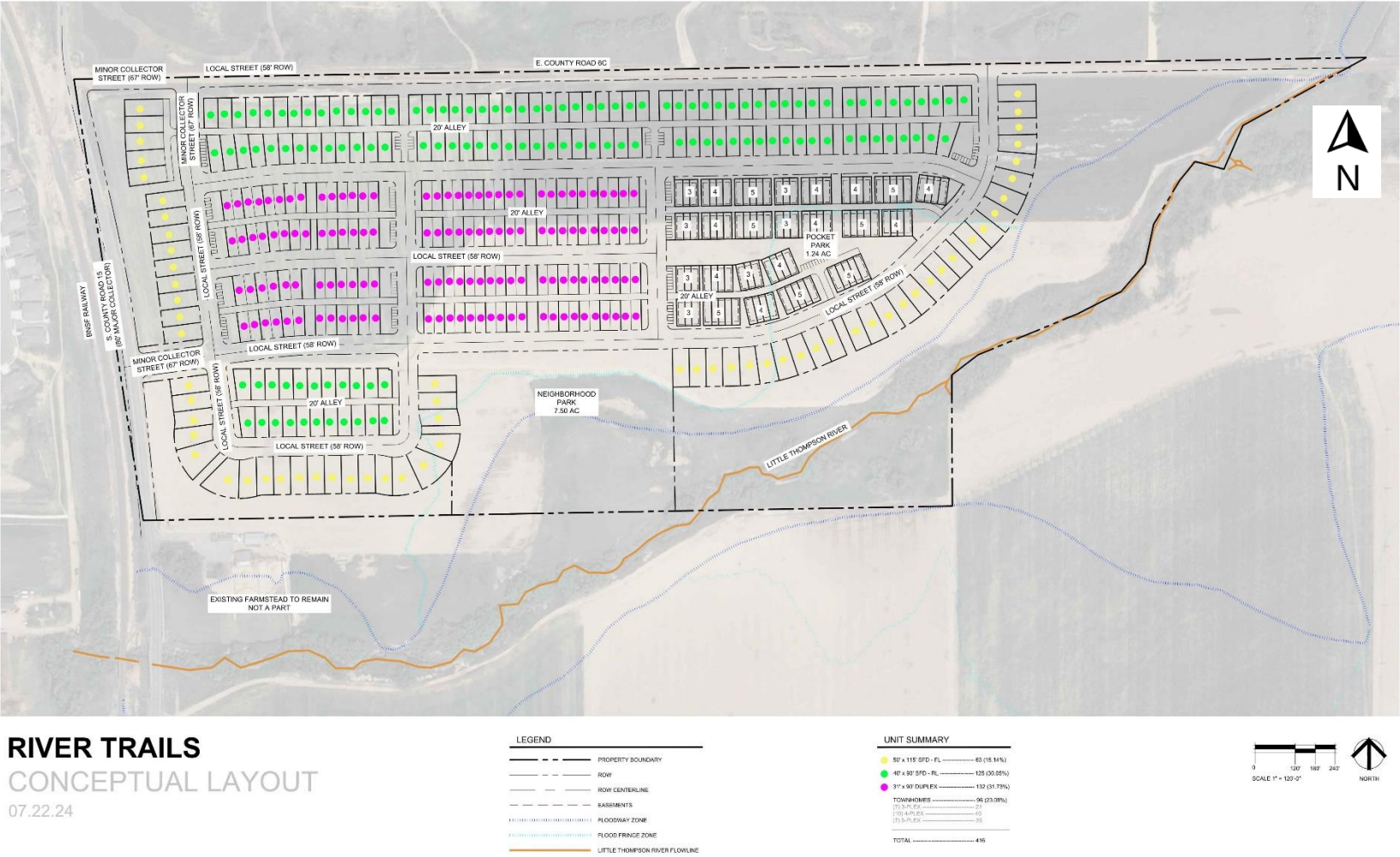


Figure 2 – Site Plan



STUDY SCOPE

The scope of work for this study was developed in conjunction with the Town of Berthoud's traffic engineering consultant. The base assumptions, technical methodologies, and geographic coverage of the study were all identified as part of the study approach. The study analyzes the potential project-generated traffic impacts on the adjacent street system.

The study evaluates the transportation system after the completion of the proposed River Trails development for the year 2042. The following transportation scenarios were analyzed for the AM and PM peak hours:

- **Existing Conditions** – The analysis of existing traffic conditions provides a basis for the remainder of the study. The existing transportation system is described. Peak hour intersection operations are evaluated.
- **Project Travel Demand** – The traffic generated by the Project will be estimated, distributed, and assigned to the transportation network.
- **2042 Background Conditions** – Future traffic conditions are projected without the proposed Project for the buildout year 2042. The background traffic will include overall growth in traffic within the area and traffic from proposed development projects near the site.
- **Total Future Conditions** – The traffic associated with the Project will be added to the Background traffic. The intersection operations will be determined.
- **Auxiliary Lanes** – The need for left-turn and right-turn lanes at the project access points will be evaluated.

The study examined 7 existing intersections, three planned project access streets, and two future intersections along Spartan Avenue. The existing study intersections are depicted on Figure 3. These were identified by the Town for inclusion in the study. The study intersections are listed below.

1. 1st Street at Mountain Avenue
2. CR 15 at CR 6C
3. CR 15 at CR 15A
4. CR 15 at CR 2E
5. CR 13 at CR 6C
6. US 287 at CR 4E
7. US 287 at CR 2E
8. 1st Street at Spartan Avenue (future)
9. US 287 at Spartan Avenue (future)
10. West Access at CR 6E
11. East Access at CR 6E
12. CR 15 at South Access

Figure 3 – Study Intersections



2 EXISTING CONDITIONS

The transportation system has numerous elements that are described in this chapter. The roadway network is described, and traffic volume information is presented for the study intersections.

ADJACENT LANDUSE

The Project site is located east of 1st Street and south of CR 6E. North of the site is rural residential, east and south is a farmstead and agricultural land, and west are the Heritage Ridge residences. The Burlington Northern Railroad is located on the west side of CR 15.

TRANSPORTATION NETWORK

The primary roadways that serve the Project site are described below. Roadway designations were provided in the Town of Berthoud *Transportation Plan Map*, 2021.

Roadway Network

1st Street/CR 15 is a north-south major collector. This two-lane road has some sidewalks on the east side between Mountain Avenue and Nebraska Avenue. There are no bike lanes on 1st Street. Most of 1st Street has no shoulders. There is parking on both side of 1st Street between Mountain and Nebraska avenues. The speed limit is 25 mph south of Mountain Avenue, 35 mph south of Nebraska Avenue, and 50 mph adjacent to the project site.

US 287 is a north-south state highway that connects cities within northern Colorado from Fort Collins south to Longmont. US 287 is a four-lane highway with paved shoulders and room for a center left-turn lane. The speed limit in the study area is 65 mph. In the study area, US 287 is categorized at a R-A, Regional Highway.

CR 13 is a two-lane north south road. It is classified as a two-lane arterial street. The speed limit is posted at 45 mph. There is no shoulder along CR 13.

Mountain Avenue is a two-lane east-west roadway that runs through downtown Berthoud. This road is also SH 56. It is classified as a two-lane Arterial by the Town and a NR-B, Non-Rural Arterial by CDOT. Between CR 13 and 1st Street, there are paved shoulders and some sidewalks on the north side near 1st Street. The speed limit is 50 mph near CR 13, reduced to 40 mph and then 25 mph east of 1st Street. West of 1st Street there are sidewalks and parking on both sides of Mountain Avenue

Nebraska Avenue is an existing east-west two-lane road. The speed limit is posted at 25 mph. There are sidewalks and parking on the north side of the street. The Town's Transportation Plan will have Nebraska Avenue connecting to Spartan Avenue. Nebraska Avenue will be a minor collector street. West of 1st Street, Spartan Avenue will be a major collector street that connects to US 287.

CR 6C is an east-west two-lane unpaved road. The speed limit is posted at 40 mph. It is classified as a local street.

CR 15A is a two-lane road which is the extension of CR 4E to the east with a connection to CR 15. This is a unpaved road that becomes paved near the intersection with CR 15.

CR 4E is a two-lane east-west road. East of Berthoud Parkway it is an unpaved road. West of Berthoud Parkway, CR 4E is paved with no shoulders or sidewalks. The speed limit is posted at 45 mph. The Transportation Plan has identified this road as a Major Collector.

CR 2E is an east-west two-lane local street. There are narrow shoulders and no sidewalks. The speed limit is posted at 45 mph.

Pedestrian, Bicycle, and Transit Network

The location of pedestrian and bicycle lanes adjacent to the roads is described above. As areas develop they will include bike lanes and sidewalks within their public rights-of-way. Berthoud has identified several pedestrian/bike trails near the project site. These are identified in the Town's *Berthoud Unified Trail Master Plan*, June 2018.

- The BNSF Fort Collins/Berthoud Trail which will be located adjacent to the Burlington Northern Railroad. Adjacent to the project site this is located to the west of 1st Street.
- The Little Thompson River Trail located to the south of the project site. This east-west trail connects east past I-25 and west towards Longmont.
- West of the project site, the Town of Berthoud Regional 10' Concrete Trail. This trail connects to the north through the Heritage Ridge development, by both Berthoud High School and Ivy Stockwell Elementary School, and to Downtown Berthoud.

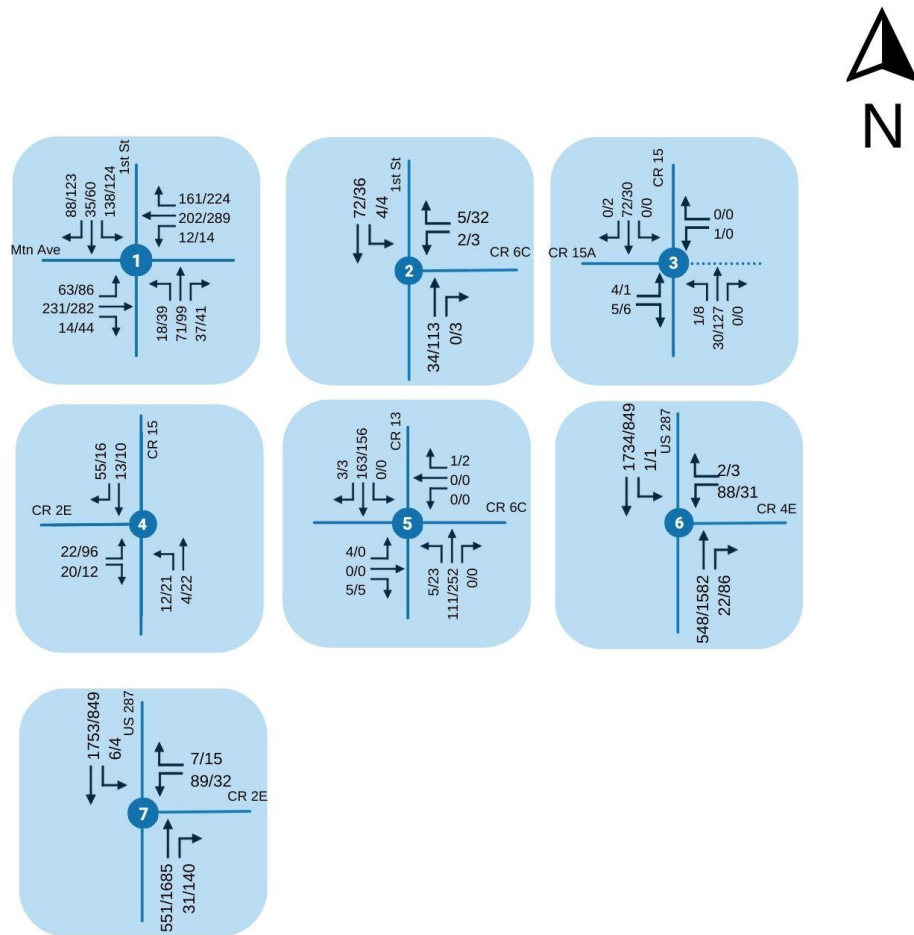
Berthoud is served by Transfort's Flex service. This is a regional bus that serves the communities of Fort Collins, Loveland, Berthoud, Longmont, and Boulder. There are stops on Mountain Avenue at 2nd and 3rd Streets. Berthoud also operates the Berthoud Area Transportation Service (BATS). It offers door-to-door service within Berthoud and offers service to Loveland and Longmont.

EXISTING TRAFFIC CONDITIONS

Existing intersection operations were evaluated for both the morning and evening peak hours. Intersection count data was collected in May 2024 while school was in session. These counts were performed at the seven existing study intersections.

Appendix A includes the intersection turning movement count data. The counts were compared to peak hour counts conducted when school was in session and the volumes were modified upward to reflect school time conditions. The resulting peak hour turning movement is provided on Figure 4. The current lane configurations of the study intersections are shown on Figure 5.

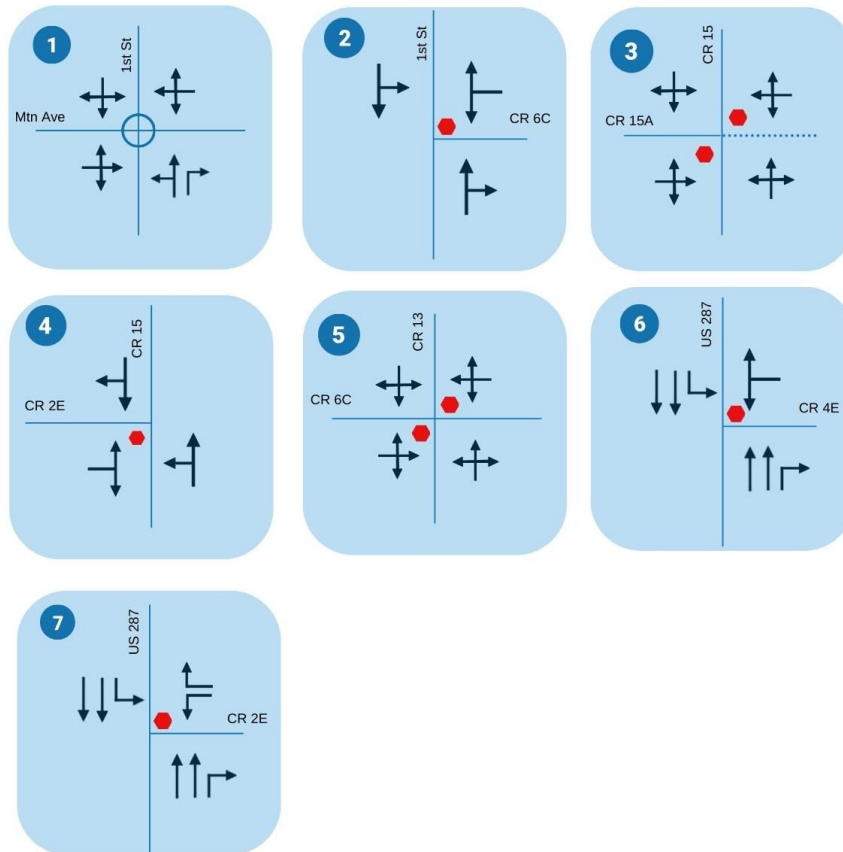
Figure 4 – Existing Peak Hour Traffic Volumes



AM/PM Peak Hour Turning Movements

= Study Intersection

Figure 5 – Existing Lane Configurations



← = Lane Configuration
● = Stop Sign
○ = Roundabout

Intersection Level of Service Analysis Methodologies

Transportation professionals evaluate intersections to determine how they are currently operating and will operate in the future. The methods employed can be found in the Transportation Research Board's, 6th Edition, 2016 *Highway Capacity Manual* (HCM). Level of service (LOS) is based on a "graded" system from LOS A, with very little to no delays to LOS F which represents excessive delays and congestion. Table 1 provides the thresholds for acceptable levels of service. The table is from the *Larimer County Urban Area Street Standards* (LCUASS), August 1, 2021.

Table 1
Intersection Level of Service Thresholds

Intersection Component	Major Intersection ¹	Minor Intersection ²	Driveway
Overall (City Limits)	LOS C	LOS C	No Limit
Overall (GMAs)	LOS D	LOS D	No Limit
Any Leg	LOS D	LOS E	No Limit
Any Movement	LOS E	LOS F	No Limit
¹ Includes all signalized and unsignalized arterial/arterial and arterial/ major collector intersections. ² Includes all unsignalized intersections (except major intersections) and high volume driveways ³ There are no LOS standards for I-25 Interchanges. ⁴ On State Highways, overall LOS D is acceptable.			

Signalized Intersection

Peak hour levels of motor vehicle delay at signalized intersections were estimated using methods provided in the HCM. This operations analysis method uses various intersection characteristics (such as traffic volumes, lane geometry, and signal phasing) to estimate the average control delay experienced by motorists traveling through an intersection. Table 2 summarizes the relationship between the average control delay per vehicle and LOS for signalized intersections.

Table 2
Signalized Intersection Level of Service Definitions

Level of Service	Average Control Delay Per Vehicle (Seconds)	Description
A	≤ 10.0	Free Flow or Insignificant Delays: Operations with very low delay, when signal progression is extremely favorable and most vehicles arrive during the green light phase. Most vehicles do not stop at all.
B	> 10.0 and ≤ 20.0	Stable Operation or Minimal Delays: Generally, occurs with good signal progression and/or short cycle lengths. More vehicles stop than with LOS A, causing higher levels of average delay. An occasional approach phase is fully utilized.
C	> 20.0 and ≤ 35.0	Stable Operation or Acceptable Delays: Higher delays resulting from fair signal progression and/or longer cycle lengths. Drivers begin having to wait through more than one red light. Most drivers feel somewhat restricted.
D	> 35.0 and ≤ 55.0	Approaching Unstable or Tolerable Delays: Influence of congestion becomes more noticeable. Longer delays result from unfavorable signal progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop. Drivers may have to wait through more than one red light. Queues may develop, but dissipate rapidly, without excessive delays.
E	> 55.0 and ≤ 80.0	Unstable Operation or Significant Delays: Considered to be the limit of acceptable delay. High delays indicate poor signal progression, long cycle lengths, and high volume to capacity ratios. Individual cycle failures are frequent occurrences. Vehicles may wait through several signal cycles. Long queues form upstream from intersection.
F	> 80.0	Forced Flow or Excessive Delays: Occurs with oversaturation when flows exceed the intersection capacity. Represents jammed conditions. Many cycle failures. Queues may block upstream intersections.

Source: Transportation Research Board, Highway Capacity Manual, 2016.

Unsignalized Intersection

Peak hour levels of motor vehicle delay at unsignalized intersections were estimated using the method from Chapter 17 of the 2016 *Highway Capacity Manual*. The delays for the entire intersection and the movement and/or approach are determined. Table 3 summarizes the relationship between the average control delay per vehicle and LOS for unsignalized intersections.

Table 3
Unsignalized Intersection Level of Service Definitions

Level of Service	Average Control Delay Per Vehicle (Seconds)	Description
A	≤ 10.0	No delay for stop-controlled approaches.
B	10.0 and ≤ 15.0	Operations with minor delay.
C	> 15.0 and ≤ 25.0	Operations with moderate delays.
D	> 25.0 and ≤ 35.0	Operations with increasingly unacceptable delays.
E	> 35.0 and ≤ 50.0	Operations with high delays, and long queues.
F	> 50.0	Operations with extreme congestion, and with very high delays and long queues unacceptable to most drivers.

Source: Transportation Research Board, Highway Capacity Manual, 2016

Existing Intersection Conditions

Using the HCM methodology, the weekday AM, and PM peak hour intersection operations were determined. The results are provided in Table 4. The Town's LOS thresholds, provided in Table 1, were utilized to evaluate existing operations. As indicated in Table 4, the study intersections are currently operating at acceptable levels of service. The detailed analysis worksheets are provided in Appendix B. It should be noted that at US 287/CR 4E and US 287/CR 2E the westbound direction operates at LOS F, this is a minor intersection, and a LOS F is considered acceptable.

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Table 4
Existing Weekday Peak-Hour Intersection Level of Service

#	Intersection	Overall Movement	Level of Service	
			AM Peak Hr	PM Peak Hr
1	1 st Street & Mountain Ave Roundabout	Overall	A	A
		EB Approach	A	A
		WB Approach	A	A
		NB Approach	A	A
		SB Approach	A	A
2	1 st Street & CR 6C T-Stop	Overall	A	A
		WB Approach	A	A
		SB RT	A	A
3	CR 15 & CR 15A Two-Way Stop	Overall	A	A
		NB LT	A	A
		EB Approach	A	A
		WB Driveway	A	A
		SB LT	A	A
4	CR 15 & CR 2E T-Stop	Overall	A	A
		NB LT	A	A
		EB Approach	A	A
5	CR 13 & CR 6C Two-Way Stop	Overall	A	
		NB LT	A	A
		EB Approach	B	A
		WB Approach	A	A
		SB LT	A	A
6	US 287 & CR 4E T-Stop	Overall	A	A
		WB LT	F	F
		WB RT	B	C
		SB LT	A	C
7	US 287 & CR 2E T-Stop	Overall	A	A
		WB LT	F	F
		WB RT	B	C
		SB LT	A	C

1. LOS calculations performed using Synchro which is based on the Transportation Research Board HCM 2016.
2. LOS is reported for both overall intersection and each constrained STOP-controlled movement or approach.

3 PROJECT TRAVEL DEMAND

This chapter provides an overview of the project and a description of the travel demand methodology to estimate vehicle trip generation, distribution, and assignment of project-generated traffic along area roadways and intersections.

PROJECT CHARACTERISTICS

The proposed River Trails project will include various residential uses. The project site plan is depicted on Figure 2. As shown on the figure, vehicular access to the project will be from locations along CR 6E and CR 15.

PROJECT TRIP GENERATION

The trip generation characteristics of the project were estimated using data from the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 11th Edition. Table 5 provides the trip generation estimated for the River Trails project. As indicated in the table, the full buildout of the project will result in an estimated net of 3,450 daily, 248 morning, and 317 evening peak hour trips.

Table 5
Estimated Trip Generation

ITE Land Use Code & Rates		Project	Project Trip Generation						
Land Use	Land Use Code	Dwelling Units KSF	Daily	AM			PM		
				IN	Out	Total	IN	Out	Total
Single-Family Detached	210	188	1804	33	99	132	113	67	180
Single Family Attached (Duplex)	215	132	955	20	43	63	43	32	75
Multi-Family Low Rise	220	96	691	13	40	53	39	23	62
Total		416	3450	65	183	248	195	122	317

Based on ITE Trip Generation 11th Edition

PROJECT TRIP DISTRIBUTION | ASSIGNMENT

The distribution of the project traffic onto the roadway system was based on the location of the project within Berthoud and northern Colorado, the roadway system, and existing traffic data. The project trip distribution is depicted on Figure 6. The resulting peak hour traffic associated with the buildout of River Trails is shown on Figure 7.

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Figure 6 – Trip Distribution

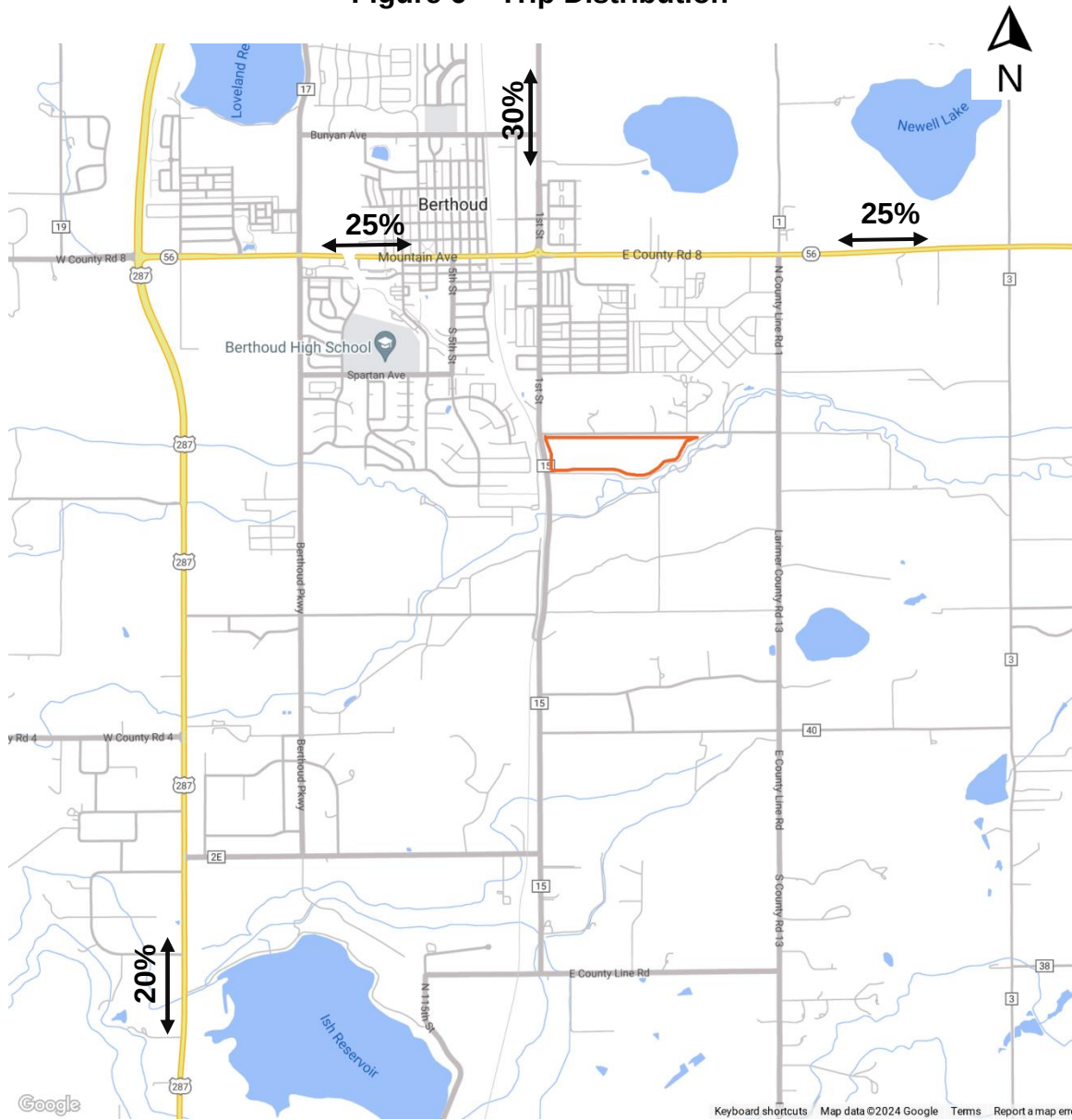
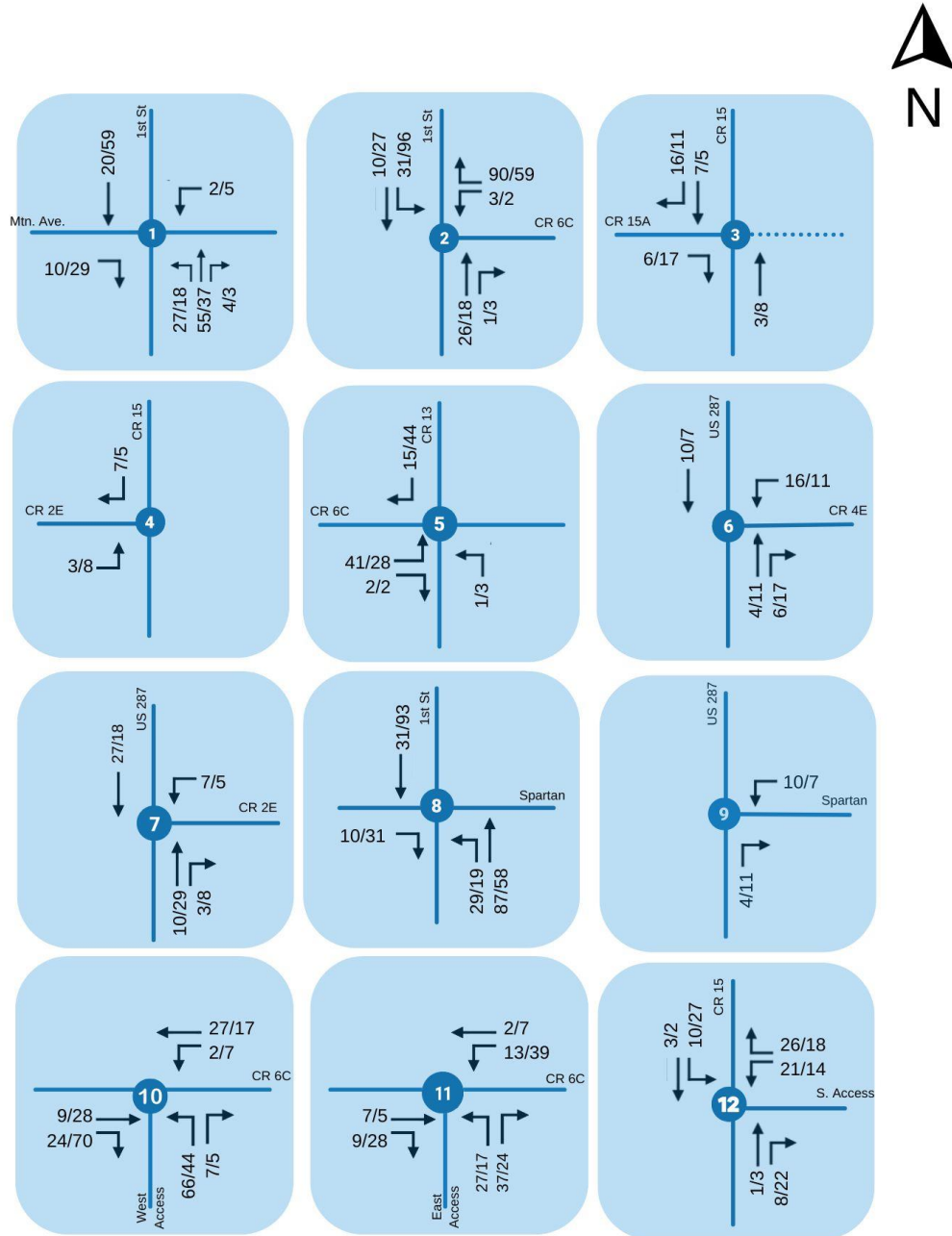


Figure 7 – Project Traffic



AM/PM Peak Hour Turning Movements

= Study Intersection

4 FUTURE TRAFFIC PROJECTIONS

Estimates of future traffic conditions both with and without the proposed Project were necessary to evaluate the potential impact of the Project on the local street system. The background base traffic scenario represents future traffic conditions without the addition of the Project, while the total scenario represents future traffic conditions with the completion of the proposed Project. These projections were developed for Year 2042. The development of these future traffic scenarios is described in this chapter. The study intersections included in the 2042 analysis are provided on Figure 8.

BACKGROUND 2042 TRAFFIC PROJECTIONS

The background traffic projections reflect growth in traffic from two primary sources: ambient growth in the existing traffic volumes due to regional growth both in and outside of the study area, and consideration of traffic generated by nearby planned projects. Each of these elements is described below.

- The growth in traffic was determined based on numerous data sources including the Colorado Department of Transportation (CDOT) and model data from the North Front Range Metropolitan Planning Organization (NFRMPO). For the study intersections on Mountain Avenue, a growth factor of 1.52 was applied. Study intersections on CR 15 and CR 13 were factored by 1.4.
- For intersections along US 287, total traffic projections from the Ludlow Farm (now called Legacy Park) Transportation Impact Study, dated November 2, 2023, were utilized. These projections include full buildout of Legacy Park, Trails at Creekview, Gateway, and Revere. These projections also include a factor of 1.1.
- The future connection of Spartan Avenue between US 287 and CR 13 was assumed to be completed by 2042. The projections for 1st Street at Spartan Avenue were developed based on projections at 1st Street and Mountain Avenue, and adjacent land use. Projections on US 287 at Spartan Avenue were obtained from the Ludlow Farm traffic study.

The resulting Background 2042 traffic projections for the study intersections are provided on Figure 9.

TOTAL TRAFFIC PROJECTIONS

The total traffic projections include both the background plus project traffic. The project-generated traffic volumes from Figure 7 were added to the Year 2042 background traffic volumes illustrated on Figure 9 to develop background plus project peak hour traffic volumes. The resulting Year 2042 total traffic is depicted on Figure 10.

Figure 8 – 2042 Study Intersections

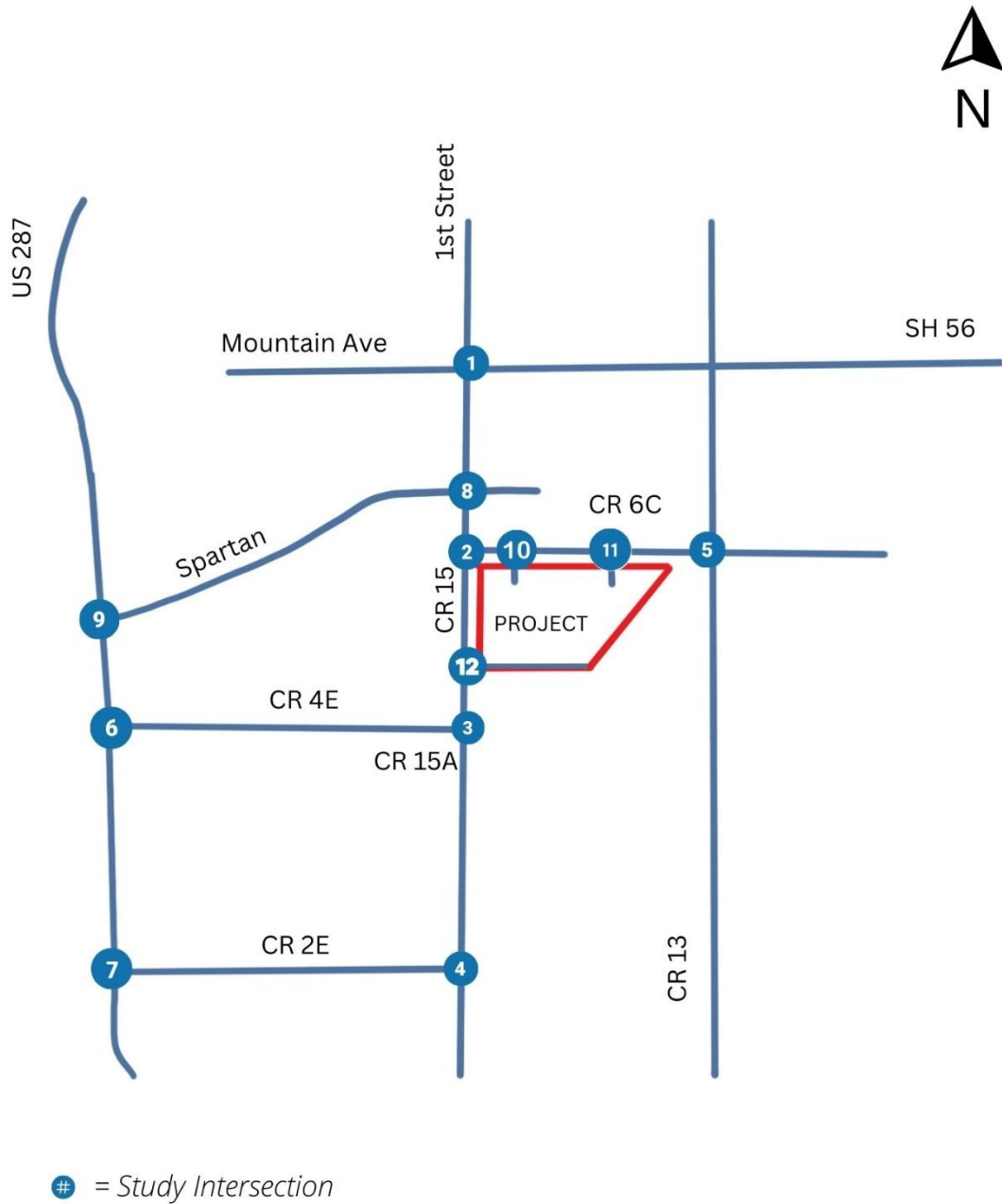
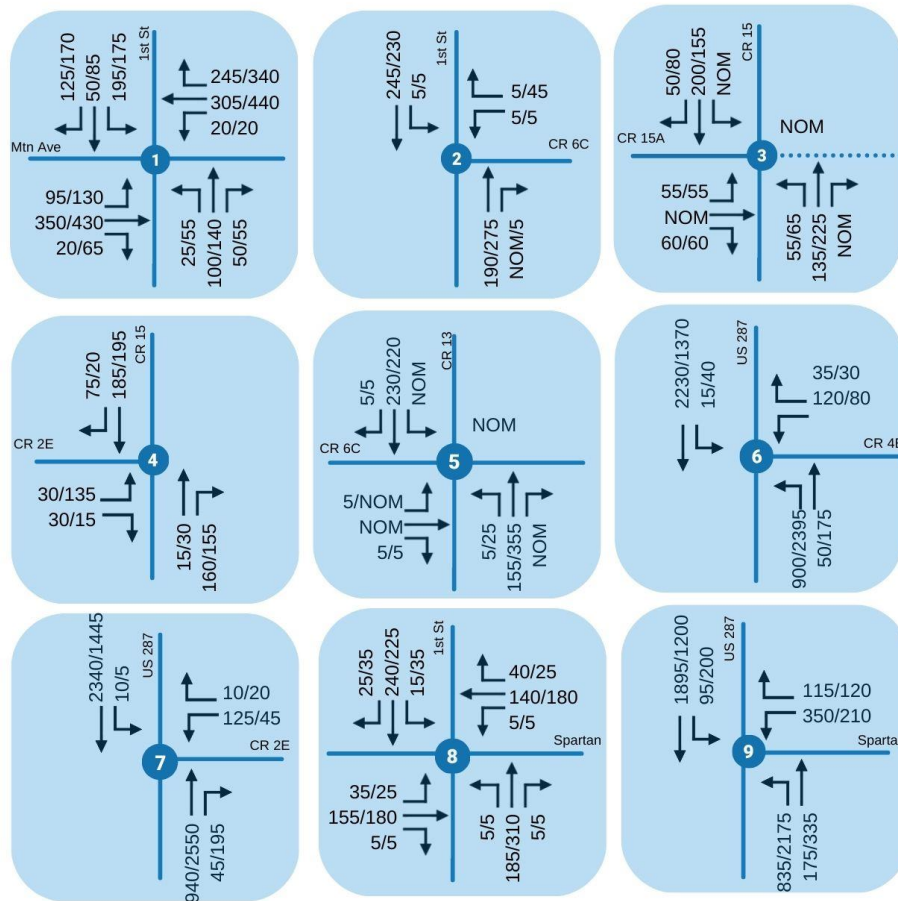


Figure 9 – Background Traffic 2042

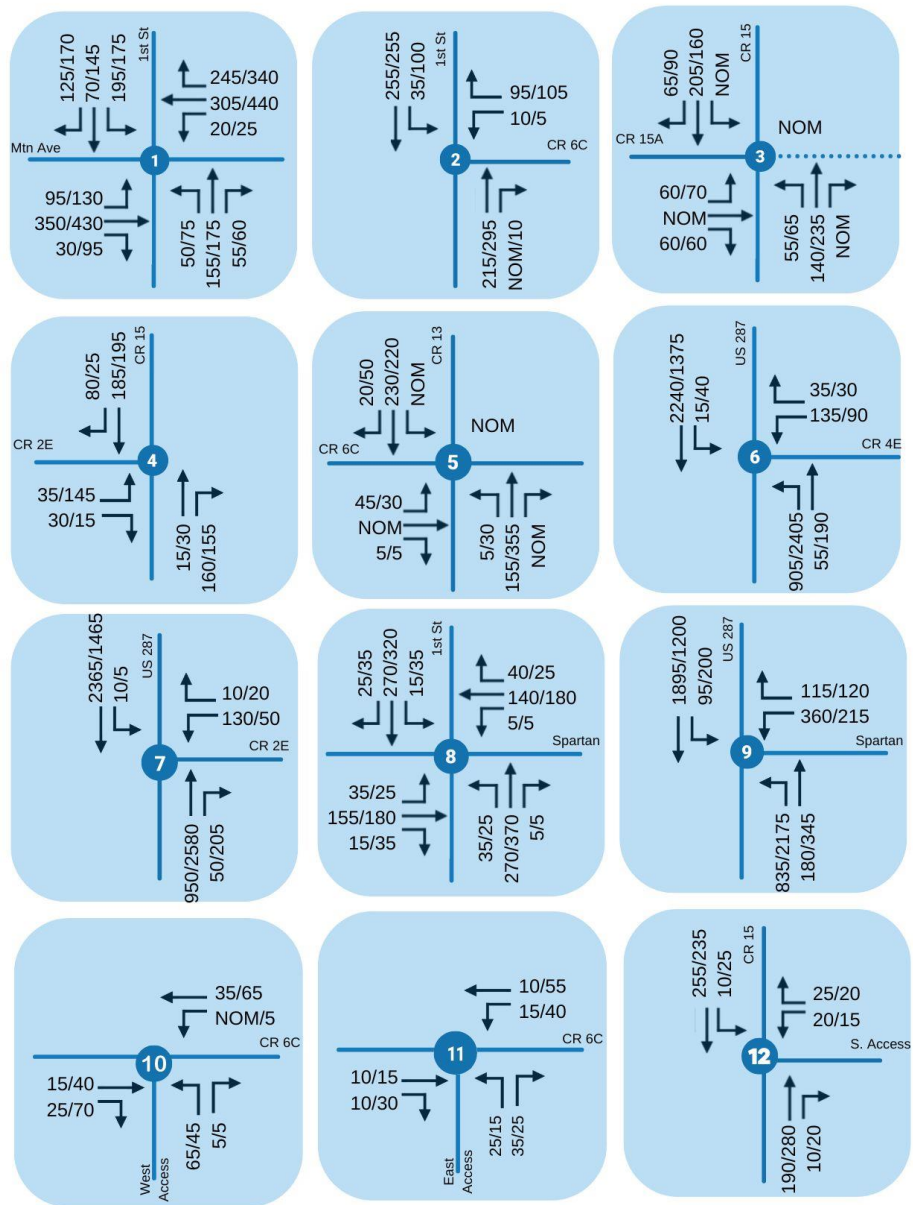


AM/PM Peak Hour Turning Movements

= Study Intersection/ NOM= Nominal

Rounded to nearest 5 vehicles

Figure 10 – Total Traffic 2042



AM/PM Peak Hour Turning Movements

= Study Intersection/ NOM= Nominal

Rounded to nearest 5 vehicles

5 AUXILIARY LANE ANALYSIS

An analysis was conducted to determine the need for auxiliary turn lanes to the project site from CR 15 and CR 13.

The guidelines from Figure 8-4 in LCUASS (provided in Appendix D) were applied to the total future projected volumes depicted on Figure 10 for 2042 total traffic conditions. Using the LCUASS criteria, it was determined that the intersection of CR 15 at CR 6C would need a southbound left-turn lane. Although the lane requirements were satisfied, the following analysis assumed no southbound left-turn lane to determine intersection operations.

6 TRAFFIC IMPACT ANALYSIS

This chapter presents an analysis of the potential impacts of the traffic generated by the proposed River Trails project on the local street system. The analysis compares the projected levels of service at each study intersection under future background and total conditions to estimate the incremental increase in the level of service caused by the proposed Project. This provides the information needed to assess the potential impact of the Project using the acceptable operations criteria.

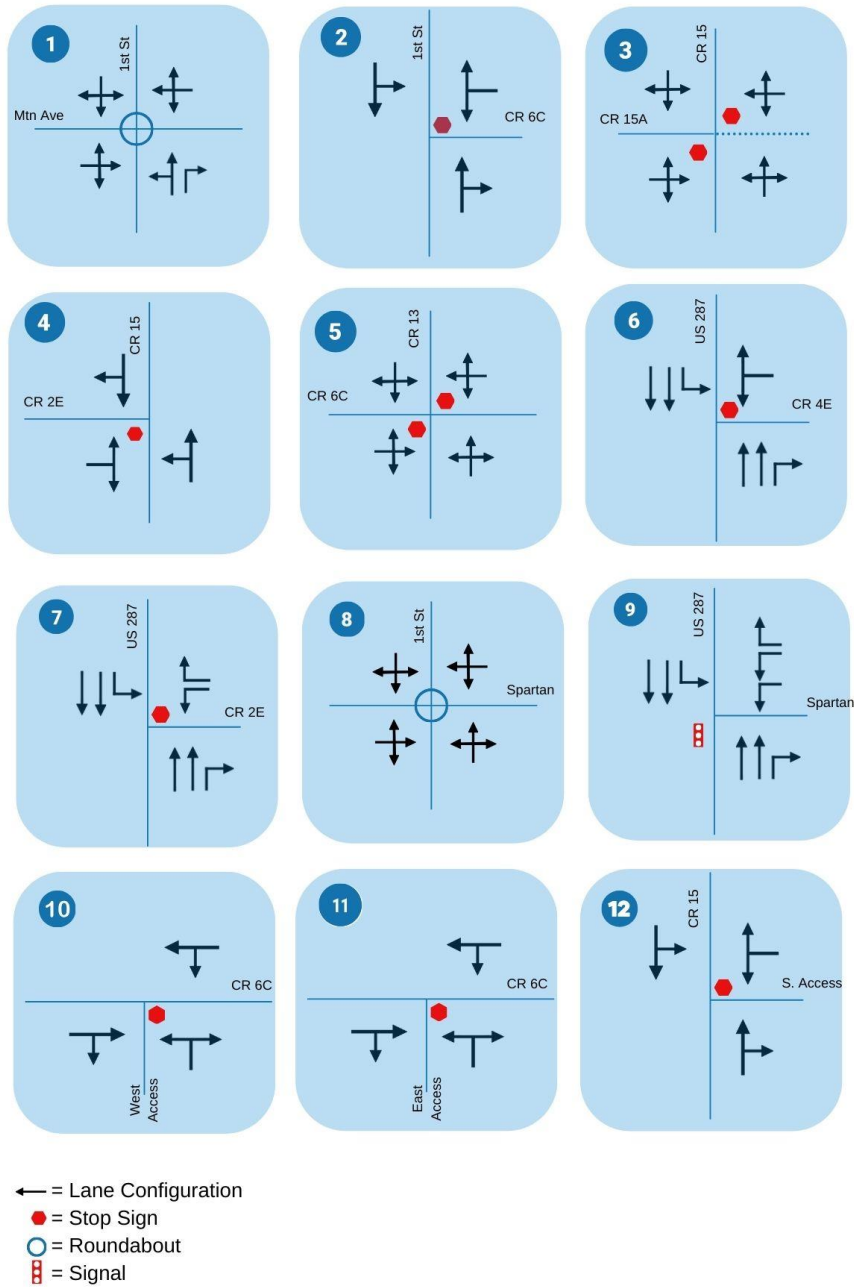
The extension of Spartan Avenue from US 287 to CR 13 was assumed in this analysis. It was assumed that the intersection of 1st Street at Spartan Avenue would be a single-lane roundabout.

FUTURE INTERSECTION TRAFFIC CONDITIONS

The future traffic projections at the twelve study intersections were analyzed to determine their operating conditions. The intersection configurations under 2042 conditions are provided on Figure 11. The analysis results are provided in Table 6 for both background and total conditions. As indicated in Table 6, the intersections are projected to operate within the acceptable limits established by the Town of Berthoud with the following exceptions:

- The intersection of US 287 and CR 2E will operate with high delays and LOS F under background and total traffic conditions. As delays become longer, the project related traffic using CR 2E to make a westbound left-turn would most likely shift to US 287 at either Spartan Avenue or CR 4E, both would be signalized in the long range future.

Figure 11
2042 Intersection Configurations



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Table 6
2042 Peak Hour Intersection Level of Service

#	Intersection	Overall Movement	Background LOS		Total LOS	
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
1	1 st Street & Mountain Ave Roundabout	Overall	A	C	B	C
		EB Approach	A	B	A	C
		WB Approach	B	D	B	D
		NB Approach	A	A	A	A
		SB Approach	A	B	A	C
2	1 st Street & CR 6C T-Stop	Overall	A	A	A	A
		WB Approach	B	B	B	B
		SB RT	A	A	A	A
3	CR 15 & CR 15A Two-Way Stop	Overall	A	A	A	A
		NB LT	A	A	A	A
		EB Approach	B	B	B	C
		WB Driveway	B	A	C	A
		SB LT	A	A	A	A
4	CR 15 & CR 2E T-Stop	Overall	A	A	A	A
		NB LT	A	A	A	A
		EB Approach	B	B	B	C
5	CR 13 & CR 6C Two-Way Stop	Overall	A	A	A	A
		NB LT	A	A	A	A
		EB Approach	B	A	B	C
		WB Approach	A	B	A	B
		SB LT	A	A	A	A
6	US 287 & CR 4E Signal	Overall	B	B	B	B
		WB LT	D	D	D	D
		WB RT	B	B	B	B
		NB T	A	C	A	C
		NB RT	A	A	A	A
		SB LT	A	A	A	A
		SB T	B	A	B	A
7	US 287 & CR 2E T-Stop	Overall	F	F	F	F
		WB LT	F	F	F	F
		WB RT	B	E	B	E
		SB LT	B	E	B	E

1. LOS calculations performed using Synchro which is based on the Transportation Research Board HCM 2016.

2. LOS is reported for both overall intersection and each constrained STOP-controlled movement or approach.

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Table 6 (continued)
2042 Peak Hour Intersection Level of Service

#	Intersection	Overall Movement	Background LOS		Total LOS	
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
8	1 st Street & Spartan Avenue Roundabout	Overall	A	A	A	A
		EB Approach	A	A	A	A
		WB Approach	A	A	A	A
		NB Approach	A	A	A	A
		SB Approach	A	A	A	A
9	US 287 & Spartan Avenue Signal	Overall	B	C	B	C
		WB LT	D	D	D	D
		WB RT	A	C	A	C
		NB T	B	D	B	D
		NB RT	A	A	A	A
		SB LT	A	E	A	E
		SB T	B	A	B	A
10	West Access & CR 6C T-Stop	Overall	-	-	A	A
		NB LT/RT	-	-	A	A
		WB LT	-	-	A	A
11	East Access & CR 6C T-Stop	Overall	-	-	A	A
		NB LT/RT	-	-	A	A
		WB LT	-	-	A	A
12	CR 15 & South Access T-Stop	Overall	-	-	A	A
		WB LT/RT	-	-	B	B
		SB LT	-	-	A	A

1. LOS calculations performed using Synchro which is based on the Transportation Research Board HCM 2016.
2. LOS is reported for both overall intersection and each constrained STOP-controlled movement or approach.

7 CONCLUSIONS

This study was undertaken to analyze the potential long range traffic impacts of the proposed River Trails property in the Town of Berthoud. The following summarizes the results of this analysis:

- The proposed River Trails project is located south of CR 6C and east of CR 15. The site is currently undeveloped.
- The traffic study analyzed the long range 2042 traffic conditions with the full buildout of the project.
- The project will include 415 residential dwelling units. Of these, 188 will be single family homes, 132 duplex units, and 96 multi-family dwellings.
- The full buildout of the project is anticipated to result in an estimated 3,443 daily, 248 morning, and 317 evening peak hour trips.
- Currently, the study intersections are at acceptable levels.
- Based on the long range total traffic projections, the need for a southbound left-turn lane on CR 15 at CR 6C is satisfied.
- The study intersections are projected to operate acceptably under the 2042 background and total traffic conditions with the noted exception listed below.
- At the intersection of US 287 and CR 2E there will be long delays for the westbound left-turn and right-turn movements. There may be a need for signalization of this location. The project related traffic will most likely redirect to the future signalized intersections on US 287 at either Spartan Avenue or CR 4E.

APPENDICIES

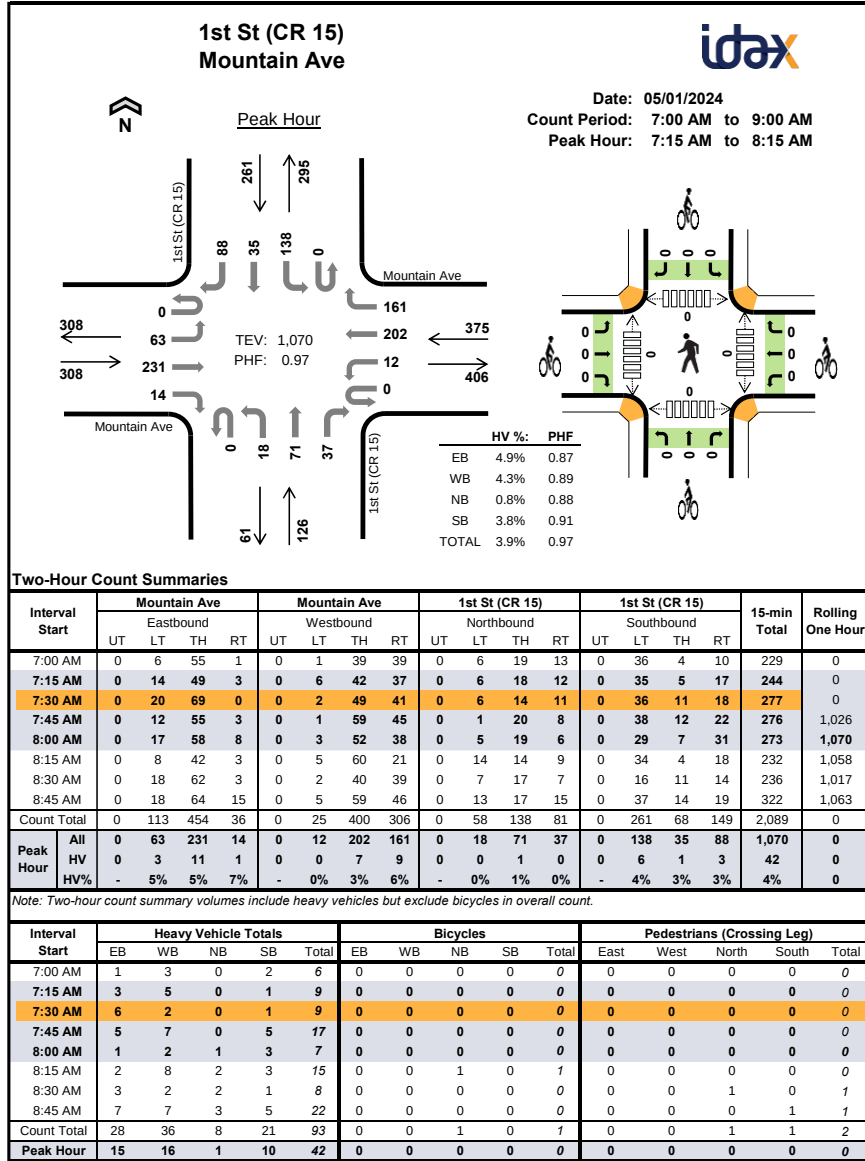
- Appendix A: Intersection Turning Movement Count Data
- Appendix B: Level of Service Worksheets
- Appendix C: LCUASS Left-Turn Warrants

Appendix A Intersection Turning Movement Count Data

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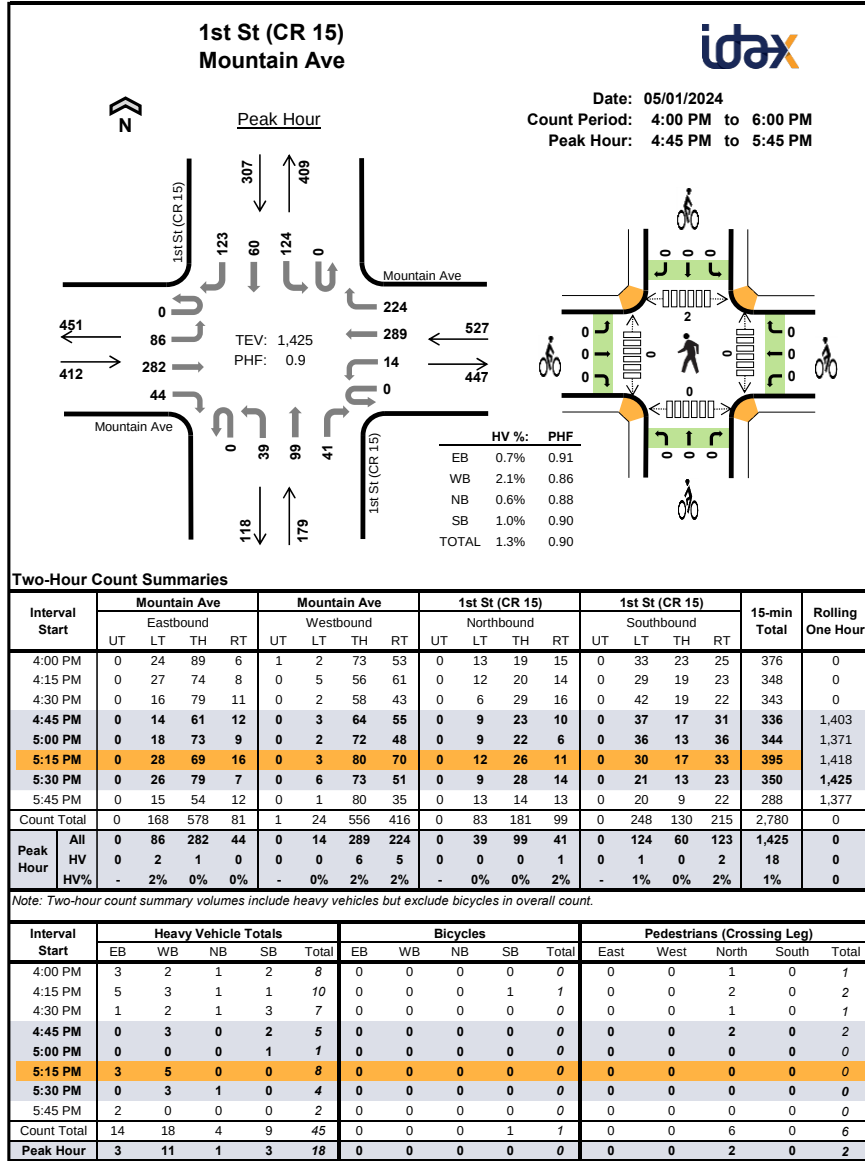


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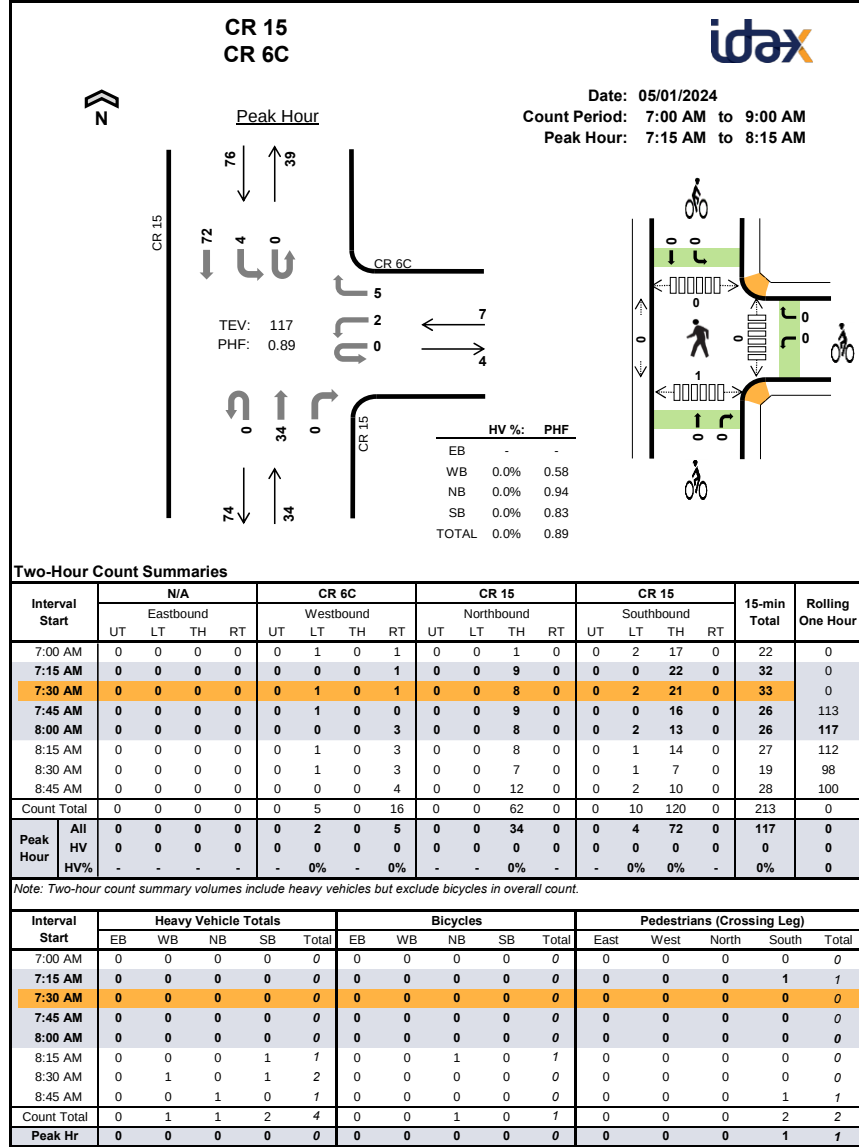
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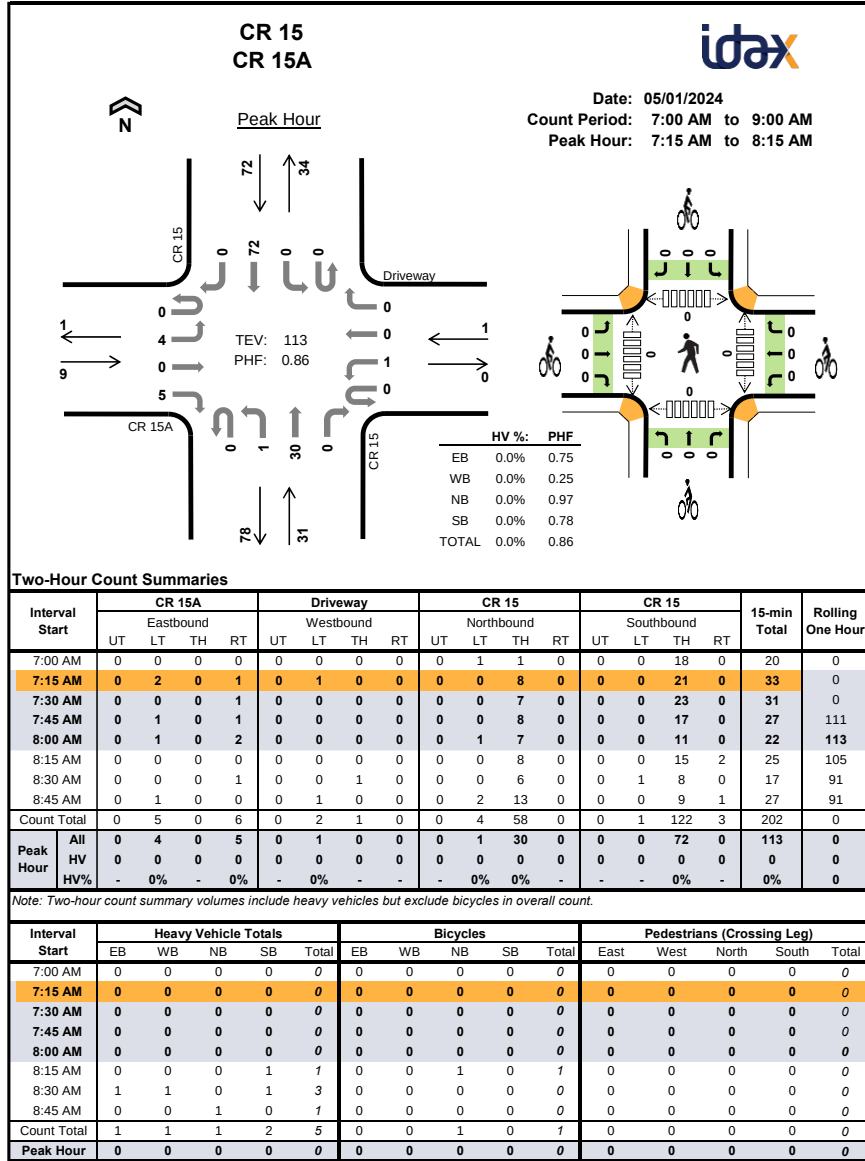


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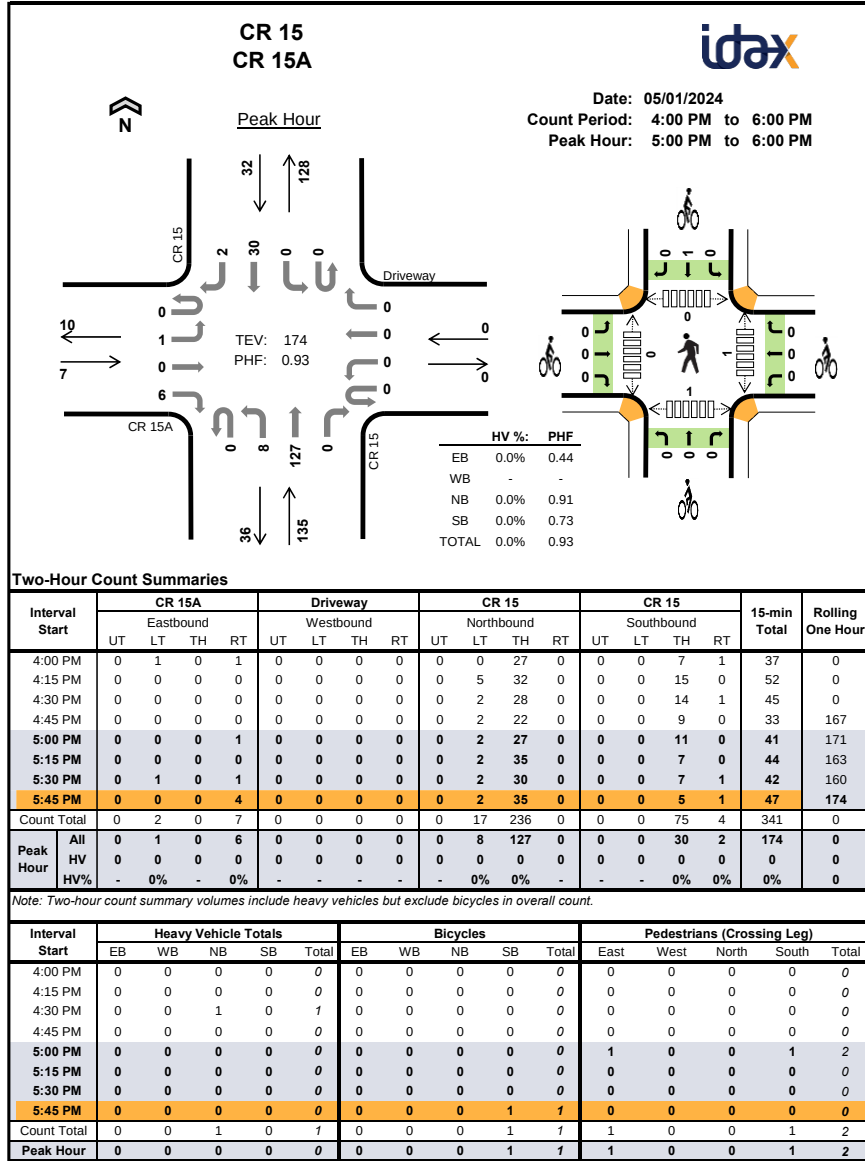
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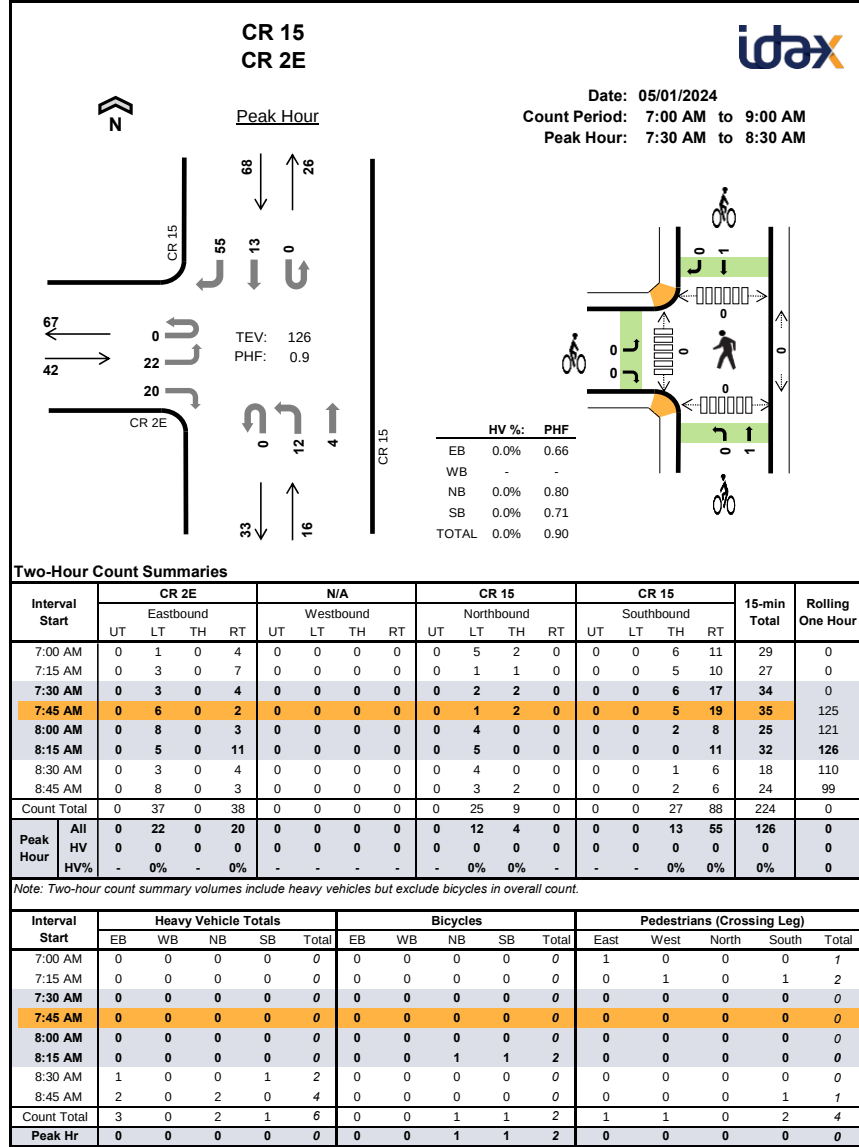
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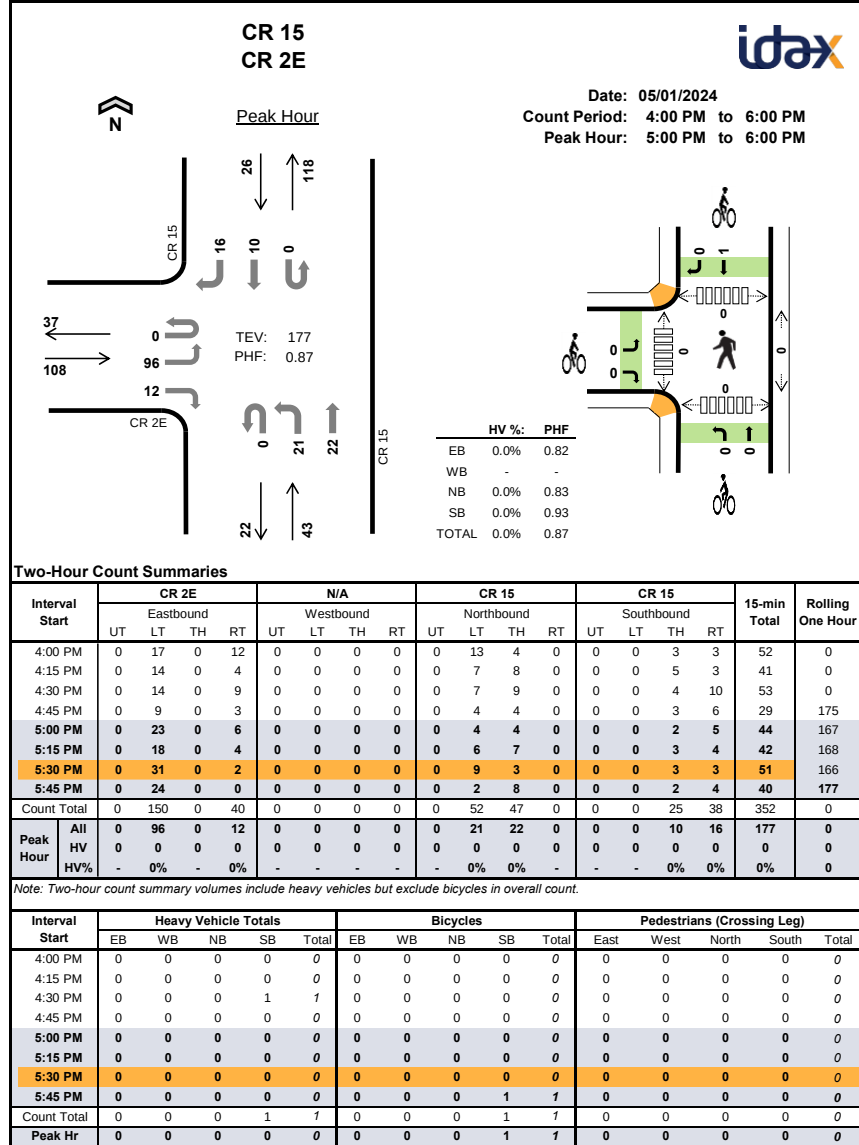
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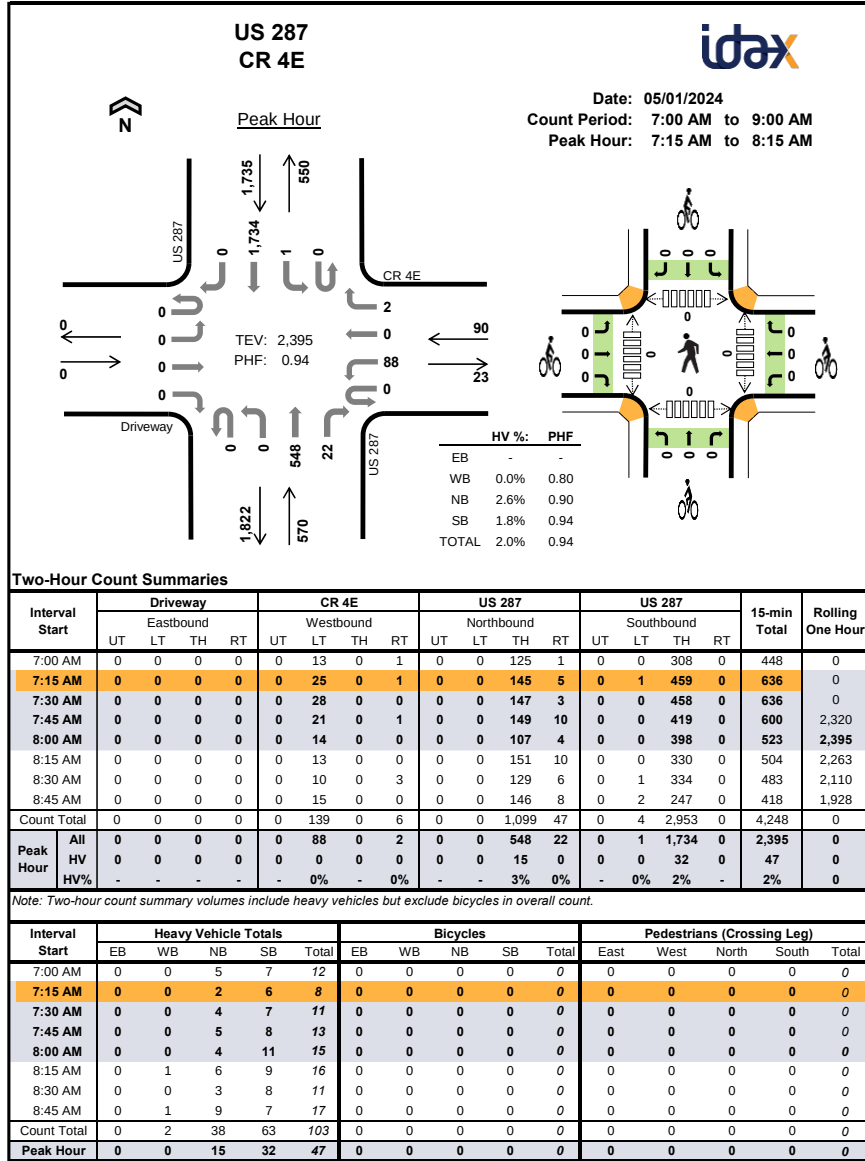


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RIVER TRAILS | TRANSPORTATION IMPACT STUDY Town of Berthoud

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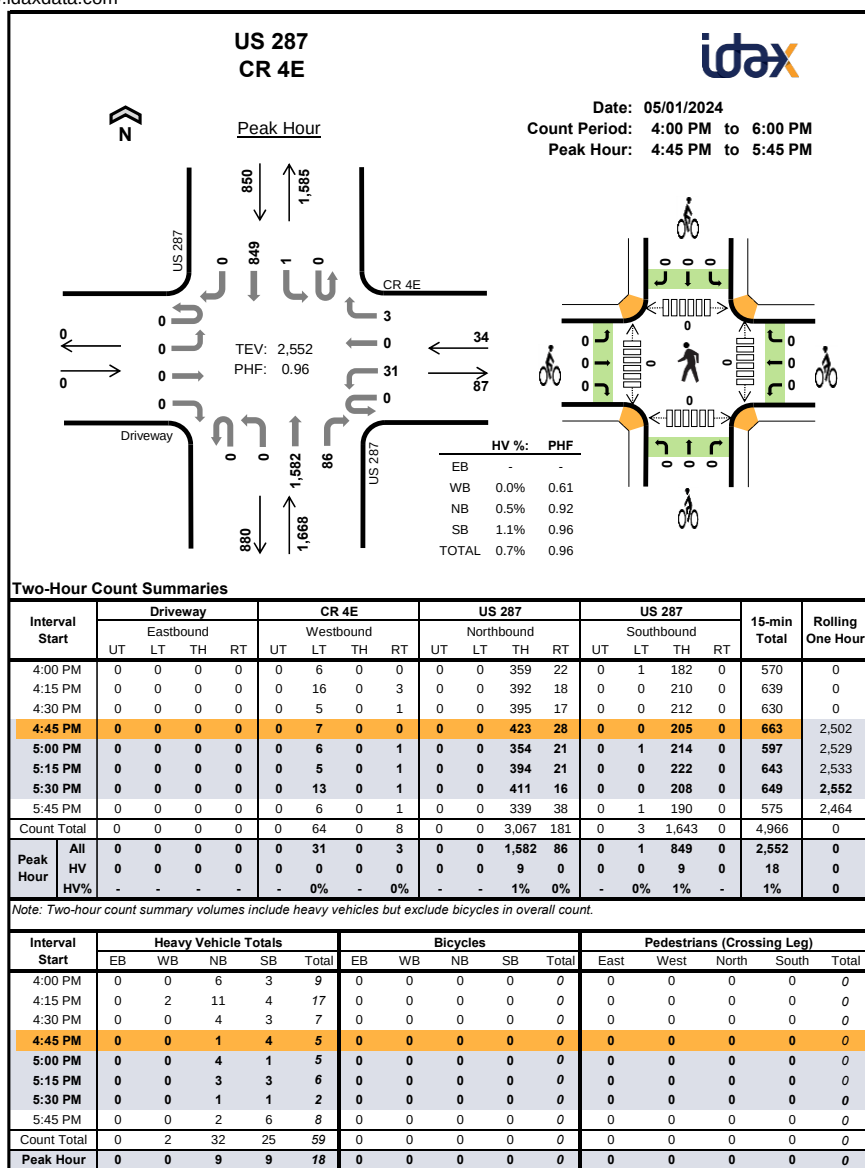
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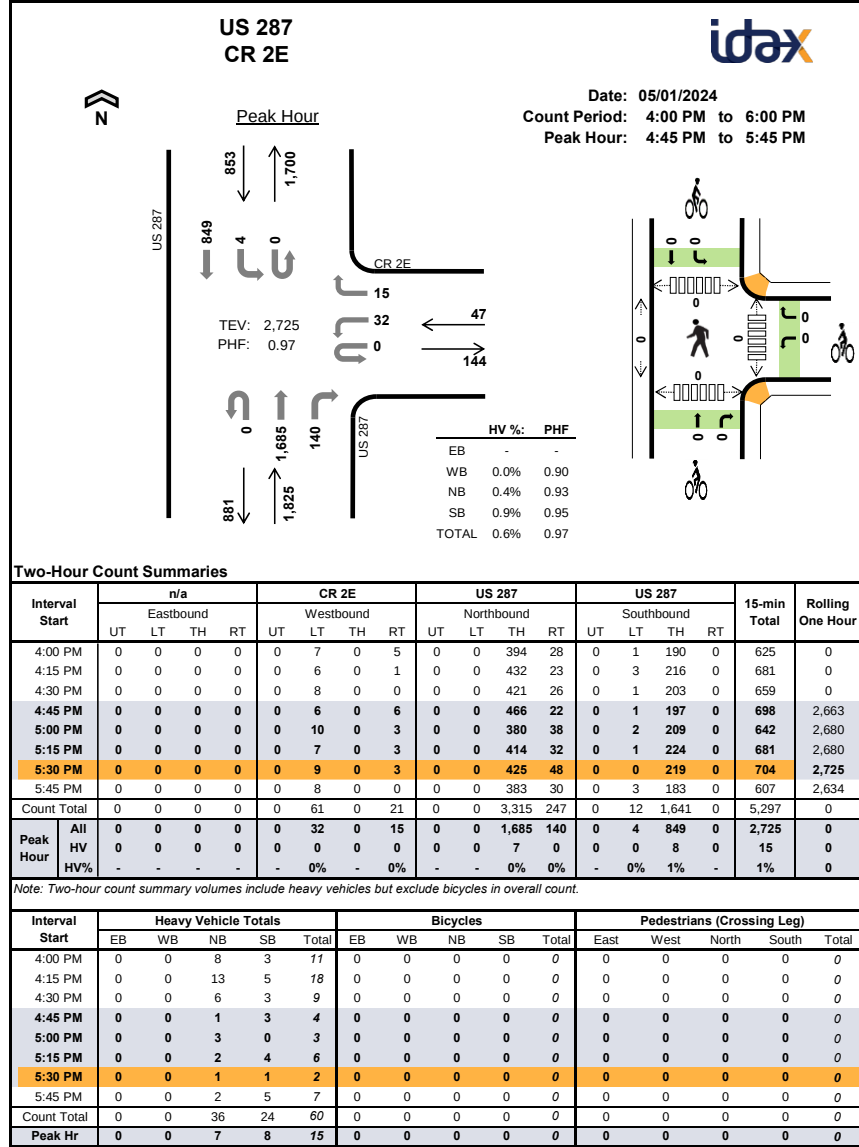
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Appendix B Level of Service Worksheets

EXISTING

RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th Roundabout
1: 1st Street & Mountain Ave

07/14/2024

Intersection					
Intersection Delay, s/veh	6.1				
Intersection LOS	A				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	2	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	317	386	130	269	
Demand Flow Rate, veh/h	331	401	132	280	
Vehicles Circulating, veh/h	197	161	464	247	
Vehicles Exiting, veh/h	330	435	64	315	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	6.2	6.6	4.7	6.0	
Approach LOS	A	A	A	A	
Lane	Left	Left	Left	Right	Left
Designated Moves	LT	TR	LT	R	LR
Assumed Moves	LT	TR	LT	R	LR
RT Channelized					
Lane Util	1.000	1.000	0.705	0.295	1.000
Follow-Up Headway, s	2.609	2.609	2.535	2.535	2.609
Critical Headway, s	4.976	4.976	4.544	4.544	4.976
Entry Flow, veh/h	331	401	93	39	280
Cap Entry Lane, veh/h	1129	1171	931	931	1073
Entry HV Adj Factor	0.959	0.962	0.984	0.974	0.959
Flow Entry, veh/h	317	386	92	38	269
Cap Entry, veh/h	1083	1126	916	907	1029
V/C Ratio	0.293	0.342	0.100	0.042	0.261
Control Delay, s/veh	6.2	6.6	4.9	4.4	6.0
LOS	A	A	A	A	A
95th %ile Queue, veh	1	2	0	0	1

Existing AM River Trails 8:28 am 07/14/2024
RR

Synchro 11 Light Report
Page 1

RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th Roundabout
1: 1st Street & Mountain Ave

07/14/2024

Intersection					
Intersection Delay, s/veh	8.7				
Intersection LOS	A				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	2	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	458	586	199	342	
Demand Flow Rate, veh/h	467	597	203	349	
Vehicles Circulating, veh/h	225	254	558	387	
Vehicles Exiting, veh/h	511	507	134	464	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	7.9	10.6	5.9	8.2	
Approach LOS	A	B	A	A	
Lane	Left	Left	Left	Right	Left
Designated Moves	LT	TR	LT	R	LR
Assumed Moves	LT	TR	LT	R	LR
RT Channelized					
Lane Util	1.000	1.000	0.768	0.232	1.000
Follow-Up Headway, s	2.609	2.609	2.535	2.535	2.609
Critical Headway, s	4.976	4.976	4.544	4.544	4.976
Entry Flow, veh/h	467	597	156	47	349
Cap Entry Lane, veh/h	1097	1065	855	855	930
Entry HV Adj Factor	0.980	0.981	0.980	0.979	0.979
Flow Entry, veh/h	458	586	153	46	342
Cap Entry, veh/h	1075	1045	837	836	910
V/C Ratio	0.426	0.561	0.183	0.055	0.375
Control Delay, s/veh	7.9	10.6	6.2	4.8	8.2
LOS	A	B	A	A	A
95th %ile Queue, veh	2	4	1	0	2

Existing PM River Trails 12:02 pm 07/14/2024
RR

Synchro 11 Light Report
Page 1

RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
2: 1st Street & CR 6C

07/14/2024

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	W	W	W	W
Traffic Vol, veh/h	2	5	34	0	4	72
Future Vol, veh/h	2	5	34	0	4	72
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mmt Flow	2	6	38	0	4	81
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	127	38	0	0	38	0
Stage 1	38	-	-	-	-	-
Stage 2	89	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	868	1034	-	-	1572	-
Stage 1	984	-	-	-	-	-
Stage 2	934	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	865	1034	-	-	1572	-
Mov Cap-2 Maneuver	865	-	-	-	-	-
Stage 1	984	-	-	-	-	-
Stage 2	931	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	8.7	0	0.4			
HCM LOS	A					
Minor Lane/Major Mmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	979	1572	-	
HCM Lane V/C Ratio	-	-	0.008	0.003	-	
HCM Control Delay (s)	-	-	8.7	7.3	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0	0	-	

Existing AM River Trails 8:28 am 07/14/2024
RR

Synchro 11 Light Report
Page 1

RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
2: 1st Street & CR 6C

07/14/2024

Intersection						
Int Delay, s/veh	1.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	3	32	113	3	4	42
Future Vol, veh/h	3	32	113	3	4	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mmt Flow	3	35	124	3	4	46
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	180	126	0	0	127	0
Stage 1	126	-	-	-	-	-
Stage 2	54	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	810	924	-	-	1459	-
Stage 1	900	-	-	-	-	-
Stage 2	969	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	808	924	-	-	1459	-
Mov Cap-2 Maneuver	808	-	-	-	-	-
Stage 1	900	-	-	-	-	-
Stage 2	966	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	9.1	0	0.6			
HCM LOS	A					
Minor Lane/Major Mmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	913	1459	-	
HCM Lane V/C Ratio	-	-	0.042	0.003	-	
HCM Control Delay (s)	-	-	9.1	7.5	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Existing PM River Trails 12:02 pm 07/14/2024
RR

Synchro 11 Light Report
Page 1

RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC

3: CR 15 & CR 15A/Private Drive way

07/14/2024

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	4	0	5	1	0	0	1	30	0	0	72	0
Future Vol, veh/h	4	0	5	1	0	0	1	30	0	0	72	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	0	6	1	0	0	1	35	0	0	84	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	121	121	84	124	121	35	84	0	0	35	0	0
Stage 1	84	84	-	37	37	-	-	-	-	-	-	-
Stage 2	37	37	-	87	84	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	854	769	975	850	769	1038	1513	-	-	1576	-	-
Stage 1	924	825	-	978	864	-	-	-	-	-	-	-
Stage 2	978	864	-	921	825	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	853	768	975	844	768	1038	1513	-	-	1576	-	-
Mov Cap-2 Maneuver	853	768	-	844	768	-	-	-	-	-	-	-
Stage 1	923	825	-	977	863	-	-	-	-	-	-	-
Stage 2	977	863	-	916	825	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	9		9.3		0.2		0					
HCM LOS	A		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1513	-	-	917	844	1576	-	-				
HCM Lane V/C Ratio	0.001	-	-	0.011	0.001	-	-	-				
HCM Control Delay (s)	7.4	0	-	9	9.3	0	-	-				
HCM Lane LOS	A	A	-	A	A	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-				

Existing AM River Trails 8:28 am 07/14/2024
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC

3: CR 15 & CR 15A/Private Drive way

07/21/2024

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	1	0	6	0	0	0	8	127	0	0	30	2
Future Vol, veh/h	1	0	6	0	0	0	8	127	0	0	30	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mmt Flow	1	0	7	0	0	0	9	148	0	0	35	2

Major/Minor	Minor2		Minor1		Major1		Major2	
Conflicting Flow All	202	202	36	206	148	37	0	148
Stage 1	36	36	-	166	-	-	-	-
Stage 2	166	166	-	40	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	4.12
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	2.218
Pot Cap-1 Maneuver	756	694	1037	752	693	899	1574	1434
Stage 1	980	865	-	836	761	-	-	-
Stage 2	836	761	-	975	864	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	752	690	1037	744	689	899	1574	1434
Mov Cap-2 Maneuver	752	690	-	744	689	-	-	-
Stage 1	974	865	-	831	756	-	-	-
Stage 2	831	756	-	968	864	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.7	0	0.4	0
HCM LOS	A	A		

Minor Lane/Major Mmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1574	-	-	984	-	1434	-	-
HCM Lane V/C Ratio	0.006	-	-	0.008	-	-	-	-
HCM Control Delay (s)	7.3	0	-	8.7	0	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	0	-	-

Existing PM River Trails 12:02 pm 07/14/2024
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Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
4: CR 15 & CR 2E

07/14/2024

Intersection						
Int Delay, s/veh	3.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	22	20	12	4	13	55
Future Vol, veh/h	22	20	12	4	13	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	22	13	4	14	61
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	75	45	75	0	-	0
Stage 1	45	-	-	-	-	-
Stage 2	30	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	928	1025	1524	-	-	-
Stage 1	977	-	-	-	-	-
Stage 2	993	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	920	1025	1524	-	-	-
Mov Cap-2 Maneuver	920	-	-	-	-	-
Stage 1	968	-	-	-	-	-
Stage 2	993	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.9	5.5		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1524	-	967	-	-	
HCM Lane V/C Ratio	0.009	-	0.048	-	-	
HCM Control Delay (s)	7.4	0	8.9	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	

Existing AM River Trails 8:28 am 07/14/2024
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
4: CR 15 & CR 2E

07/14/2024

Intersection						
Int Delay, s/veh	6.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	96	12	21	22	10	16
Future Vol, veh/h	96	12	21	22	10	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	110	14	24	25	11	18
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	93	20	29	0	-	0
Stage 1	20	-	-	-	-	-
Stage 2	73	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	907	1058	1584	-	-	-
Stage 1	1003	-	-	-	-	-
Stage 2	950	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	893	1058	1584	-	-	-
Mov Cap-2 Maneuver	893	-	-	-	-	-
Stage 1	988	-	-	-	-	-
Stage 2	950	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s	9.6		3.6		0	
HCM LOS	A					
Minor Lane/Major Mvmt	NBL		NBT EBLn1		SBT	SBR
Capacity (veh/h)	1584		- 909		-	-
HCM Lane V/C Ratio	0.015		- 0.137		-	-
HCM Control Delay (s)	7.3		0 9.6		-	-
HCM Lane LOS	A		A A		-	-
HCM 95th %tile Q(veh)	0		- 0.5		-	-

Existing PM River Trails 12:02 pm 07/14/2024
RR

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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
5: CR 13 & CR 6C/WCR 42.25

07/14/2024

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Vol, veh/h	4	0	5	0	0	1	5	111	0	0	163	3
Future Vol, veh/h	4	0	5	0	0	1	5	111	0	0	163	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mmt Flow	5	0	6	0	0	1	6	134	0	0	196	4
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	345	344	198	347	346	134	200	0	0	134	0	0
Stage 1	198	198	-	146	146	-	-	-	-	-	-	-
Stage 2	147	146	-	201	200	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	609	579	843	607	577	915	1372	-	-	1451	-	-
Stage 1	804	737	-	857	776	-	-	-	-	-	-	-
Stage 2	856	776	-	801	736	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	606	576	843	600	574	915	1372	-	-	1451	-	-
Mov Cap-2 Maneuver	606	576	-	600	574	-	-	-	-	-	-	-
Stage 1	800	737	-	853	772	-	-	-	-	-	-	-
Stage 2	851	772	-	795	736	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10.1		8.9		0.3		0					
HCM LOS	B		A									
Minor Lane/Major Mmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1372	-	-	718	915	1451	-	-				
HCM Lane V/C Ratio	0.004	-	-	0.015	0.001	-	-	-				
HCM Control Delay (s)	7.6	0	-	10.1	8.9	0	-	-				
HCM Lane LOS	A	A	-	B	A	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-				

Existing AM River Trails 8:28 am 07/14/2024
RR

Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC

5: CR 13 & CR 6C/WCR 42.25

07/14/2024

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	0	5	0	0	2	23	252	0	0	156	3
Future Vol, veh/h	0	0	5	0	0	2	23	252	0	0	156	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	3	3	3	3	3	3
Mvmt Flow	0	0	5	0	0	2	25	271	0	0	168	3

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	492	491	170	493	492	271	171	0	0	271	0	0
Stage 1	170	170	-	321	321	-	-	-	-	-	-	-
Stage 2	322	321	-	172	171	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	487	478	874	486	478	768	1400	-	-	1287	-	-
Stage 1	832	758	-	691	652	-	-	-	-	-	-	-
Stage 2	690	652	-	830	757	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	478	468	874	475	468	768	1400	-	-	1287	-	-
Mov Cap-2 Maneuver	478	468	-	475	468	-	-	-	-	-	-	-
Stage 1	815	758	-	676	638	-	-	-	-	-	-	-
Stage 2	674	638	-	825	757	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.1	9.7	0.6	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1400	-	-	874	768	1287	-	-
HCM Lane V/C Ratio	0.018	-	-	0.006	0.003	-	-	-
HCM Control Delay (s)	7.6	0	-	9.1	9.7	0	-	-
HCM Lane LOS	A	A	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0	0	0	-	-

Existing PM River Trails 12:02 pm 07/14/2024
RR

Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
6: US 287 & CR 4E

07/14/2024

Intersection						
Int Delay, s/veh	4.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↱	↱	↕↕	↱	↱	↕↕
Traffic Vol, veh/h	88	2	548	22	1	1734
Future Vol, veh/h	88	2	548	22	1	1734
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	0	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	94	2	583	23	1	1845
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1508	292	0	0	606	0
Stage 1	583	-	-	-	-	-
Stage 2	925	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	111	704	-	-	968	-
Stage 1	521	-	-	-	-	-
Stage 2	347	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	111	704	-	-	968	-
Mov Cap-2 Maneuver	111	-	-	-	-	-
Stage 1	521	-	-	-	-	-
Stage 2	347	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, s	116.2		0		0	
HCM LOS	F					
Minor Lane/Major Mvmt	NBT		NBRWBLn1WBLn2		SBL	SBT
Capacity (veh/h)	-		111 704		968	-
HCM Lane V/C Ratio	-		0.843 0.003		0.001	-
HCM Control Delay (s)	-		118.6 10.1		8.7	-
HCM Lane LOS	-		F B		A	-
HCM 95th %tile Q(veh)	-		4.9 0		0	-

Existing AM River Trails 8:28 am 07/14/2024
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Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
6: US 287 & CR 4E

07/14/2024

Intersection						
Int Delay, s/veh	2.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↵	↵	↕↕	↵	↵	↕↕
Traffic Vol, veh/h	31	3	1582	86	1	849
Future Vol, veh/h	31	3	1582	86	1	849
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	0	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	3	1648	90	1	884
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	2092	824	0	0	1738	0
Stage 1	1648	-	-	-	-	-
Stage 2	444	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	45	316	-	-	358	-
Stage 1	142	-	-	-	-	-
Stage 2	614	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	45	316	-	-	358	-
Mov Cap-2 Maneuver	45	-	-	-	-	-
Stage 1	142	-	-	-	-	-
Stage 2	612	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	178.6	0	0			
HCM LOS	F					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	45	316	358	-
HCM Lane V/C Ratio	-	-	0.718	0.01	0.003	-
HCM Control Delay (s)	-	-	194.3	16.5	15.1	-
HCM Lane LOS	-	-	F	C	C	-
HCM 95th %tile Q(veh)	-	-	2.8	0	0	-

Existing PM River Trails 12:17 pm 07/14/2024
RR

Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
7: US 287 & CR 2E

07/14/2024

Intersection						
Int Delay, s/veh	5.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↱	↱	↕↕	↱	↱	↕↕
Traffic Vol, veh/h	89	7	551	31	6	1753
Future Vol, veh/h	89	7	551	31	6	1753
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	0	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	96	8	592	33	6	1885
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1547	296	0	0	625	0
Stage 1	592	-	-	-	-	-
Stage 2	955	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	105	700	-	-	952	-
Stage 1	516	-	-	-	-	-
Stage 2	334	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	104	700	-	-	952	-
Mov Cap-2 Maneuver	104	-	-	-	-	-
Stage 1	516	-	-	-	-	-
Stage 2	332	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, s	133		0		0	
HCM LOS	F					
Minor Lane/Major Mvmt	NBT		NBRWBLn1WBLn2		SBL	SBT
Capacity (veh/h)	-		104		700	952
HCM Lane V/C Ratio	-		0.92		0.011	0.007
HCM Control Delay (s)	-		142.7		10.2	8.8
HCM Lane LOS	-		F		B	A
HCM 95th %tile Q(veh)	-		5.5		0	0

Existing AM River Trails 8:28 am 07/14/2024
RR

Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
7: US 287 & CR 2E

07/14/2024

Intersection						
Int Delay, s/veh	3.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↱	↱	↕↕	↱	↱	↕↕
Traffic Vol, veh/h	32	15	1685	140	4	849
Future Vol, veh/h	32	15	1685	140	4	849
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	0	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	15	1737	144	4	875
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	2183	869	0	0	1881	0
Stage 1	1737	-	-	-	-	-
Stage 2	446	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	39	295	-	-	315	-
Stage 1	127	-	-	-	-	-
Stage 2	612	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	38	295	-	-	315	-
Mov Cap-2 Maneuver	38	-	-	-	-	-
Stage 1	127	-	-	-	-	-
Stage 2	604	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	185.9	0	0.1			
HCM LOS	F					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	38	295	315	-
HCM Lane V/C Ratio	-	-	0.868	0.052	0.013	-
HCM Control Delay (s)	-	-	264.7	17.9	16.6	-
HCM Lane LOS	-	-	F	C	C	-
HCM 95th %tile Q(veh)	-	-	3.2	0.2	0	-

Existing PM River Trails 12:17 pm 07/14/2024
RR

Synchro 11 Light Report
Page 1

BACKGROUND 2042

RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th Roundabout
1: 1st Street & Mountain Ave

07/20/2024

Intersection					
Intersection Delay, s/veh	9.4				
Intersection LOS	A				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	2	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	480	588	181	382	
Demand Flow Rate, veh/h	499	612	185	397	
Vehicles Circulating, veh/h	285	234	686	376	
Vehicles Exiting, veh/h	488	637	98	470	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	9.4	10.6	6.4	9.0	
Approach LOS	A	B	A	A	
Lane	Left	Left	Left	Right	Left
Designated Moves	LTR	LTR	LT	R	LTR
Assumed Moves	LTR	LTR	LT	R	LTR
RT Channelized					
Lane Util	1.000	1.000	0.714	0.286	1.000
Follow-Up Headway, s	2.609	2.609	2.535	2.535	2.609
Critical Headway, s	4.976	4.976	4.544	4.544	4.976
Entry Flow, veh/h	499	612	132	53	397
Cap Entry Lane, veh/h	1032	1087	761	761	940
Entry HV Adj Factor	0.961	0.961	0.977	0.981	0.962
Flow Entry, veh/h	480	588	129	52	382
Cap Entry, veh/h	992	1045	743	746	905
V/C Ratio	0.484	0.563	0.174	0.070	0.422
Control Delay, s/veh	9.4	10.6	6.7	5.5	9.0
LOS	A	B	A	A	A
95th %ile Queue, veh	3	4	1	0	2

Background 2042 AM River Trails 12:50 pm 07/20/2024
RR

Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th Roundabout
1: 1st Street & Mountain Ave

07/20/2024

Intersection					
Intersection Delay, s/veh	20.0				
Intersection LOS	C				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	2	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	664	851	267	457	
Demand Flow Rate, veh/h	677	867	272	467	
Vehicles Circulating, veh/h	303	353	797	558	
Vehicles Exiting, veh/h	722	716	183	662	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	13.9	31.2	8.6	14.4	
Approach LOS	B	D	A	B	
Lane	Left	Left	Left	Right	Left
Designated Moves	LTR	LTR	LT	R	LTR
Assumed Moves	LTR	LTR	LT	R	LTR
RT Channelized					
Lane Util	1.000	1.000	0.779	0.221	1.000
Follow-Up Headway, s	2.609	2.609	2.535	2.535	2.609
Critical Headway, s	4.976	4.976	4.544	4.544	4.976
Entry Flow, veh/h	677	867	212	60	467
Cap Entry Lane, veh/h	1013	963	688	688	781
Entry HV Adj Factor	0.981	0.981	0.981	0.983	0.979
Flow Entry, veh/h	664	851	208	59	457
Cap Entry, veh/h	993	945	675	676	765
V/C Ratio	0.668	0.901	0.308	0.087	0.598
Control Delay, s/veh	13.9	31.2	9.2	6.3	14.4
LOS	B	D	A	A	B
95th %ile Queue, veh	5	13	1	0	4

Background 2042 PM River Trails 12:58 pm 07/20/2024
RR

Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
2: 1st Street & CR 6C

07/21/2024

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	W	W	W	W
Traffic Vol, veh/h	5	5	190	0	5	245
Future Vol, veh/h	5	5	190	0	5	245
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mmt Flow	6	6	213	0	6	275
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	500	213	0	0	213	0
Stage 1	213	-	-	-	-	-
Stage 2	287	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	530	827	-	-	1357	-
Stage 1	823	-	-	-	-	-
Stage 2	762	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	527	827	-	-	1357	-
Mov Cap-2 Maneuver	527	-	-	-	-	-
Stage 1	823	-	-	-	-	-
Stage 2	758	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	10.7	0	0.2			
HCM LOS	B					
Minor Lane/Major Mmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	644	1357	-	
HCM Lane V/C Ratio	-	-	0.017	0.004	-	
HCM Control Delay (s)	-	-	10.7	7.7	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Background 2042 AM River Trails 12:50 pm 07/20/2024
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Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
2: 1st Street & CR 6C

07/20/2024

Intersection						
Int Delay, s/veh	1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	R	S	T
Traffic Vol, veh/h	5	45	275	5	5	230
Future Vol, veh/h	5	45	275	5	5	230
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	48	296	5	5	247
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	556	299	0	0	301	0
Stage 1	299	-	-	-	-	-
Stage 2	257	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	492	741	-	-	1260	-
Stage 1	752	-	-	-	-	-
Stage 2	786	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	490	741	-	-	1260	-
Mov Cap-2 Maneuver	490	-	-	-	-	-
Stage 1	752	-	-	-	-	-
Stage 2	782	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	10.5	0	0.2			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	705	1260	-	
HCM Lane V/C Ratio	-	-	0.076	0.004	-	
HCM Control Delay (s)	-	-	10.5	7.9	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.2	0	-	

Background 2042 PM River Trails 12:58 pm 07/20/2024
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC

3: CR 15 & CR 15A/Private Drive way

07/20/2024

Intersection													
Int Delay, s/veh	3.6												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔			↔			↔		
Traffic Vol, veh/h	55	0	60	1	0	0	55	135	0	0	200	50	
Future Vol, veh/h	55	0	60	1	0	0	55	135	0	0	200	50	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	64	0	70	1	0	0	64	157	0	0	233	58	
Major/Minor	Minor2			Minor1			Major1			Major2			
Conflicting Flow All	547	547	262	582	576	157	291	0	0	157	0	0	
Stage 1	262	262	-	285	285	-	-	-	-	-	-	-	
Stage 2	285	285	-	297	291	-	-	-	-	-	-	-	
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-	
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-	
Pot Cap-1 Maneuver	448	445	777	424	428	889	1271	-	-	1423	-	-	
Stage 1	743	691	-	722	676	-	-	-	-	-	-	-	
Stage 2	722	676	-	712	672	-	-	-	-	-	-	-	
Platoon blocked, %								-	-	-	-	-	
Mov Cap-1 Maneuver	429	421	777	370	404	889	1271	-	-	1423	-	-	
Mov Cap-2 Maneuver	429	421	-	370	404	-	-	-	-	-	-	-	
Stage 1	702	691	-	682	639	-	-	-	-	-	-	-	
Stage 2	682	639	-	648	672	-	-	-	-	-	-	-	
Approach	EB			WB			NB			SB			
HCM Control Delay, s	13.4			14.8			2.3			0			
HCM LOS	B			B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1271	-	-	560	370	1423	-	-					
HCM Lane V/C Ratio	0.05	-	-	0.239	0.003	-	-	-					
HCM Control Delay (s)	8	0	-	13.4	14.8	0	-	-					
HCM Lane LOS	A	A	-	B	B	A	-	-					
HCM 95th %tile Q(veh)	0.2	-	-	0.9	0	0	-	-					

Background 2042 AM River Trails 12:50 pm 07/20/2024
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC

3: CR 15 & CR 15A/Private Drive way

07/20/2024

Intersection													
Int Delay, s/veh	3.4												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔			↔			↔		
Traffic Vol, veh/h	55	0	60	0	0	0	65	225	0	0	155	80	
Future Vol, veh/h	55	0	60	0	0	0	65	225	0	0	155	80	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	64	0	70	0	0	0	76	262	0	0	180	93	
Major/Minor	Minor2			Minor1			Major1			Major2			
Conflicting Flow All	641	641	227	676	687	262	273	0	0	262	0	0	
Stage 1	227	227	-	414	414	-	-	-	-	-	-	-	
Stage 2	414	414	-	262	273	-	-	-	-	-	-	-	
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-	
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-	
Pot Cap-1 Maneuver	388	393	812	367	370	777	1290	-	-	1302	-	-	
Stage 1	776	716	-	616	593	-	-	-	-	-	-	-	
Stage 2	616	593	-	743	684	-	-	-	-	-	-	-	
Platoon blocked, %								-	-	-	-	-	
Mov Cap-1 Maneuver	367	366	812	318	344	777	1290	-	-	1302	-	-	
Mov Cap-2 Maneuver	367	366	-	318	344	-	-	-	-	-	-	-	
Stage 1	722	716	-	573	552	-	-	-	-	-	-	-	
Stage 2	573	552	-	679	684	-	-	-	-	-	-	-	
Approach	EB			WB			NB			SB			
HCM Control Delay, s	14.4			0			1.8			0			
HCM LOS	B			A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1290	-	-	514	-	1302	-	-					
HCM Lane V/C Ratio	0.059	-	-	0.26	-	-	-	-					
HCM Control Delay (s)	8	0	-	14.4	0	0	-	-					
HCM Lane LOS	A	A	-	B	A	A	-	-					
HCM 95th %tile Q(veh)	0.2	-	-	1	-	0	-	-					

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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
4: CR 15 & CR 2E

07/20/2024

Intersection						
Int Delay, s/veh	1.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	30	30	15	160	185	75
Future Vol, veh/h	30	30	15	160	185	75
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mmt Flow	33	33	17	178	206	83
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	460	248	289	0	-	0
Stage 1	248	-	-	-	-	-
Stage 2	212	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	559	791	1273	-	-	-
Stage 1	793	-	-	-	-	-
Stage 2	823	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	551	791	1273	-	-	-
Mov Cap-2 Maneuver	551	-	-	-	-	-
Stage 1	781	-	-	-	-	-
Stage 2	823	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	11.2	0.7	0			
HCM LOS	B					
Minor Lane/Major Mmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1273	-	650	-	-	
HCM Lane V/C Ratio	0.013	-	0.103	-	-	
HCM Control Delay (s)	7.9	0	11.2	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.3	-	-	

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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
4: CR 15 & CR 2E

07/20/2024

Intersection						
Int Delay, s/veh	4.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	🚗			🚗	🚗	
Traffic Vol, veh/h	135	15	30	155	195	20
Future Vol, veh/h	135	15	30	155	195	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	155	17	34	178	224	23
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	482	236	247	0	-	0
Stage 1	236	-	-	-	-	-
Stage 2	246	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	543	803	1319	-	-	-
Stage 1	803	-	-	-	-	-
Stage 2	795	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	527	803	1319	-	-	-
Mov Cap-2 Maneuver	527	-	-	-	-	-
Stage 1	780	-	-	-	-	-
Stage 2	795	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.6	1.3		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1319	-	546	-	-	
HCM Lane V/C Ratio	0.026	-	0.316	-	-	
HCM Control Delay (s)	7.8	0	14.6	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	1.3	-	-	

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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
5: CR 13 & CR 6C/WCR 42.25

07/21/2024

Intersection													
Int Delay, s/veh	0.4												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔			↔			↔		
Traffic Vol, veh/h	5	0	5	0	0	1	5	155	0	0	230	5	
Future Vol, veh/h	5	0	5	0	0	1	5	155	0	0	230	5	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	6	0	6	0	0	1	6	187	0	0	277	6	
Major/Minor	Minor2		Minor1		Major1		Major2						
Conflicting Flow All	480	479	280	482	482	187	283	0	0	187	0	0	
Stage 1	280	280	-	199	199	-	-	-	-	-	-	-	
Stage 2	200	199	-	283	283	-	-	-	-	-	-	-	
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-	
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-	
Pot Cap-1 Maneuver	496	486	759	495	484	855	1279	-	-	1387	-	-	
Stage 1	727	679	-	803	736	-	-	-	-	-	-	-	
Stage 2	802	736	-	724	677	-	-	-	-	-	-	-	
Platoon blocked, %								-	-	-	-	-	
Mov Cap-1 Maneuver	494	484	759	489	482	855	1279	-	-	1387	-	-	
Mov Cap-2 Maneuver	494	484	-	489	482	-	-	-	-	-	-	-	
Stage 1	723	679	-	799	732	-	-	-	-	-	-	-	
Stage 2	797	732	-	718	677	-	-	-	-	-	-	-	
Approach	EB		WB		NB		SB						
HCM Control Delay, s	11.1		9.2		0.2		0						
HCM LOS	B		A										
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1279	-	-	598	855	1387	-	-					
HCM Lane V/C Ratio	0.005	-	-	0.02	0.001	-	-	-					
HCM Control Delay (s)	7.8	0	-	11.1	9.2	0	-	-					
HCM Lane LOS	A	A	-	B	A	A	-	-					
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-					

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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC

5: CR 13 & CR 6C/WCR 42.25

07/20/2024

Intersection													
Int Delay, s/veh	0.4												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔			↔			↔		
Traffic Vol, veh/h	0	0	5	0	0	2	25	355	0	0	220	5	
Future Vol, veh/h	0	0	5	0	0	2	25	355	0	0	220	5	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93	
Heavy Vehicles, %	2	2	2	2	2	2	3	3	3	3	3	3	
Mvmt Flow	0	0	5	0	0	2	27	382	0	0	237	5	
Major/Minor	Minor2			Minor1			Major1			Major2			
Conflicting Flow All	677	676	240	678	678	382	242	0	0	382	0	0	
Stage 1	240	240	-	436	436	-	-	-	-	-	-	-	
Stage 2	437	436	-	242	242	-	-	-	-	-	-	-	
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.13	-	-	4.13	-	-	
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.227	-	-	2.227	-	-	
Pot Cap-1 Maneuver	367	375	799	366	374	665	1319	-	-	1171	-	-	
Stage 1	763	707	-	599	580	-	-	-	-	-	-	-	
Stage 2	598	580	-	762	705	-	-	-	-	-	-	-	
Platoon blocked, %								-	-	-	-	-	
Mov Cap-1 Maneuver	359	365	799	356	364	665	1319	-	-	1171	-	-	
Mov Cap-2 Maneuver	359	365	-	356	364	-	-	-	-	-	-	-	
Stage 1	743	707	-	583	565	-	-	-	-	-	-	-	
Stage 2	581	565	-	757	705	-	-	-	-	-	-	-	
Approach	EB			WB			NB			SB			
HCM Control Delay, s	9.5			10.4			0.5			0			
HCM LOS	A			B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1319	-	-	799	665	1171	-	-					
HCM Lane V/C Ratio	0.02	-	-	0.007	0.003	-	-	-					
HCM Control Delay (s)	7.8	0	-	9.5	10.4	0	-	-					
HCM Lane LOS	A	A	-	A	B	A	-	-					
HCM 95th %tile Q(veh)	0.1	-	-	0	0	0	-	-					

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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings

6: US 287 & CR 4E

07/20/2024

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	120	35	900	50	15	2230
Future Volume (vph)	120	35	900	50	15	2230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.258	
Satd. Flow (perm)	1770	1583	3539	1583	481	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		37		53		
Link Speed (mph)	45		65			65
Link Distance (ft)	2121		10840			1730
Travel Time (s)	32.1		113.7			18.1
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	128	37	957	53	16	2372
Shared Lane Traffic (%)						
Lane Group Flow (vph)	128	37	957	53	16	2372
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (ft)	20	20	100	20	20	100
Trailing Detector (ft)	0	0	0	0	0	0
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						

Background 2042 AM River Trails 12:21 pm 07/20/2024
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings

6: US 287 & CR 4E

07/20/2024

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	120	35	900	50	15	2230
Future Volume (vph)	120	35	900	50	15	2230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.258	
Satd. Flow (perm)	1770	1583	3539	1583	481	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		37		53		
Link Speed (mph)	45		65			65
Link Distance (ft)	2121		10840			1730
Travel Time (s)	32.1		113.7			18.1
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	128	37	957	53	16	2372
Shared Lane Traffic (%)						
Lane Group Flow (vph)	128	37	957	53	16	2372
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (ft)	20	20	100	20	20	100
Trailing Detector (ft)	0	0	0	0	0	0
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						

Background 2042 AM River Trails 12:21 pm 07/20/2024
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Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings

6: US 287 & CR 4E

07/20/2024

Splits and Phases: 6: US 287 & CR 4E



RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings

6: US 287 & CR 4E

07/20/2024

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	80	30	2395	175	40	1370
Future Volume (vph)	80	30	2395	175	40	1370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.046	
Satd. Flow (perm)	1770	1583	3539	1583	86	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		32		123		
Link Speed (mph)	45		65			65
Link Distance (ft)	2121		10840			1730
Travel Time (s)	32.1		113.7			18.1
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	85	32	2548	186	43	1457
Shared Lane Traffic (%)						
Lane Group Flow (vph)	85	32	2548	186	43	1457
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (ft)	20	20	100	20	20	100
Trailing Detector (ft)	0	0	0	0	0	0
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						

Background 2042 PM River Trails 12:35 pm 07/20/2024
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings

6: US 287 & CR 4E

07/20/2024

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	9.5	22.5
Total Split (s)	30.5	30.5	80.0	80.0	9.5	89.5
Total Split (%)	25.4%	25.4%	66.7%	66.7%	7.9%	74.6%
Maximum Green (s)	26.0	26.0	75.5	75.5	5.0	85.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	Max	Max	None	Max
Walk Time (s)	7.0	7.0	7.0	7.0		7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0		11.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effct Green (s)	10.4	10.4	82.7	82.7	89.3	90.2
Actuated g/C Ratio	0.10	0.10	0.78	0.78	0.84	0.85
v/c Ratio	0.49	0.17	0.93	0.15	0.28	0.49
Control Delay	54.7	16.6	21.0	2.1	8.0	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.7	16.6	21.0	2.1	8.0	3.6
LOS	D	B	C	A	A	A
Approach Delay	44.3		19.7			3.7
Approach LOS	D		B			A
Queue Length 50th (ft)	55	0	759	10	4	121
Queue Length 95th (ft)	104	28	#1138	33	17	194
Internal Link Dist (ft)	2041		10760			1650
Turn Bay Length (ft)						
Base Capacity (vph)	432	410	2747	1256	151	2999
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.08	0.93	0.15	0.28	0.49
Intersection Summary						
Area Type:	Other					
Cycle Length:	120					
Actuated Cycle Length:	106.5					
Natural Cycle:	130					
Control Type:	Semi Act-Uncoord					
Maximum v/c Ratio:	0.93					
Intersection Signal Delay:	14.8			Intersection LOS: B		
Intersection Capacity Utilization	78.1%			ICU Level of Service D		
Analysis Period (min)	15					
# 95th percentile volume exceeds capacity, queue may be longer.						

Background 2042 PM River Trails 12:35 pm 07/20/2024
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings

6: US 287 & CR 4E

07/20/2024

Queue shown is maximum after two cycles.

Splits and Phases: 6: US 287 & CR 4E



RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
7: US 287 & CR 2E

07/20/2024

Intersection						
Int Delay, s/veh	61					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↱	↱	↕	↱	↱	↕
Traffic Vol, veh/h	125	10	940	45	10	2340
Future Vol, veh/h	125	10	940	45	10	2340
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	0	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mmt Flow	134	11	1011	48	11	2516
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	2291	506	0	0	1059	0
Stage 1	1011	-	-	-	-	-
Stage 2	1280	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	~ 33	512	-	-	653	-
Stage 1	312	-	-	-	-	-
Stage 2	225	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	~ 32	512	-	-	653	-
Mov Cap-2 Maneuver	~ 32	-	-	-	-	-
Stage 1	312	-	-	-	-	-
Stage 2	221	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	1568.1	0	0			
HCM LOS	F					
Minor Lane/Major Mmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	32	512	653	-
HCM Lane V/C Ratio	-	-	4.2	0.021	0.016	-
HCM Control Delay (s)	-	-	1692.6	12.2	10.6	-
HCM Lane LOS	-	-	F	B	B	-
HCM 95th %tile Q(veh)	-	-	16	0.1	0.1	-
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

Background 2042 AM River Trails 12:21 pm 07/20/2024
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Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
7: US 287 & CR 2E

07/20/2024

Intersection						
Int Delay, s/veh	71.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↱	↱	↕↕	↱	↱	↕↕
Traffic Vol, veh/h	45	20	2550	195	5	1445
Future Vol, veh/h	45	20	2550	195	5	1445
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	0	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	22	2742	210	5	1554
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	3529	1371	0	0	2952	0
Stage 1	2742	-	-	-	-	-
Stage 2	787	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	~ 4	136	-	-	118	-
Stage 1	~ 34	-	-	-	-	-
Stage 2	409	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	~ 4	136	-	-	118	-
Mov Cap-2 Maneuver	~ 4	-	-	-	-	-
Stage 1	~ 34	-	-	-	-	-
Stage 2	392	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, s	4676.2		0		0.1	
HCM LOS	F					
Minor Lane/Major Mvmt	NBT		NBRWBLn1WBLn2		SBL	SBT
Capacity (veh/h)	-		4		136	118
HCM Lane V/C Ratio	-		- 12.097		0.158	0.046
HCM Control Delay (s)	-		\$ 6738.4		36.4	37
HCM Lane LOS	-		F		E	E
HCM 95th %tile Q(veh)	-		7.9		0.5	0.1
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

Background 2042 PM River Trails 12:35 pm 07/20/2024
RR

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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th Roundabout
8: Spartan Ave & 1st Street

07/20/2024

Intersection				
Intersection Delay, s/veh	5.4			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	211	200	211	304
Demand Flow Rate, veh/h	215	204	215	310
Vehicles Circulating, veh/h	287	249	226	165
Vehicles Exiting, veh/h	188	192	276	288
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.6	5.2	5.1	5.6
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	215	204	215	310
Cap Entry Lane, veh/h	1030	1070	1096	1166
Entry HV Adj Factor	0.980	0.980	0.981	0.980
Flow Entry, veh/h	211	200	211	304
Cap Entry, veh/h	1009	1049	1075	1143
V/C Ratio	0.209	0.191	0.196	0.266
Control Delay, s/veh	5.6	5.2	5.1	5.6
LOS	A	A	A	A
95th %ile Queue, veh	1	1	1	1

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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th Roundabout
8: Spartan Ave & 1st Street

07/20/2024

Intersection				
Intersection Delay, s/veh	6.4			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	228	228	347	321
Demand Flow Rate, veh/h	233	233	354	328
Vehicles Circulating, veh/h	294	377	267	210
Vehicles Exiting, veh/h	244	244	260	400
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.8	6.4	6.9	6.1
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	233	233	354	328
Cap Entry Lane, veh/h	1022	939	1051	1114
Entry HV Adj Factor	0.979	0.979	0.981	0.979
Flow Entry, veh/h	228	228	347	321
Cap Entry, veh/h	1001	920	1031	1090
V/C Ratio	0.228	0.248	0.337	0.294
Control Delay, s/veh	5.8	6.4	6.9	6.1
LOS	A	A	A	A
95th %ile Queue, veh	1	1	1	1

Background 2042 PM River Trails 12:58 pm 07/20/2024
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings
9: US 287 & Spartan Avenue

07/20/2024

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	←	→	↑	→	←	→
Traffic Volume (vph)	350	115	835	175	95	1895
Future Volume (vph)	350	115	835	175	95	1895
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	2	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3433	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.251	
Satd. Flow (perm)	3433	1583	3539	1583	468	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		125		190		
Link Speed (mph)	30		30			30
Link Distance (ft)	1610		240			2709
Travel Time (s)	36.6		5.5			61.6
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	380	125	908	190	103	2060
Shared Lane Traffic (%)						
Lane Group Flow (vph)	380	125	908	190	103	2060
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	24		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (ft)	20	20	100	20	20	100
Trailing Detector (ft)	0	0	0	0	0	0
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						

Background 2042 AM River Trails 12:21 pm 07/20/2024
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings
9: US 287 & Spartan Avenue

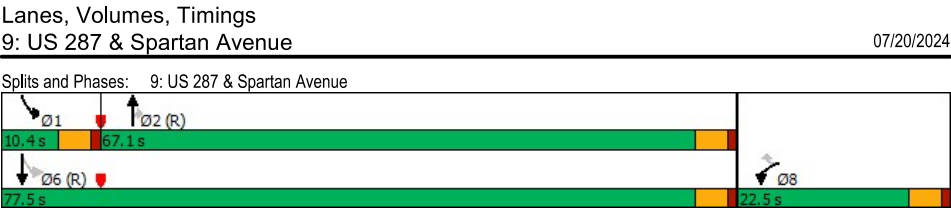
07/20/2024

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	9.5	22.5
Total Split (s)	22.5	22.5	67.1	67.1	10.4	77.5
Total Split (%)	22.5%	22.5%	67.1%	67.1%	10.4%	77.5%
Maximum Green (s)	18.0	18.0	62.6	62.6	5.9	73.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0	7.0		7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0		11.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effct Green (s)	18.0	18.0	62.6	62.6	73.0	73.0
Actuated g/C Ratio	0.18	0.18	0.63	0.63	0.73	0.73
v/c Ratio	0.62	0.32	0.41	0.18	0.25	0.80
Control Delay	42.7	9.0	10.1	1.5	5.3	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.7	9.0	10.1	1.5	5.3	11.8
LOS	D	A	B	A	A	B
Approach Delay	34.4		8.6			11.5
Approach LOS	C		A			B
Queue Length 50th (ft)	116	0	140	0	16	378
Queue Length 95th (ft)	164	49	180	24	30	478
Internal Link Dist (ft)	1530		160			2629
Turn Bay Length (ft)						
Base Capacity (vph)	617	387	2215	1062	418	2583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.32	0.41	0.18	0.25	0.80
Intersection Summary						
Area Type:	Other					
Cycle Length: 100						
Actuated Cycle Length: 100						
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green						
Natural Cycle: 75						
Control Type: Pretimed						
Maximum v/c Ratio: 0.80						
Intersection Signal Delay: 13.7	Intersection LOS: B					
Intersection Capacity Utilization 69.9%	ICU Level of Service C					
Analysis Period (min) 15						

Background 2042 AM River Trails 12:21 pm 07/20/2024
RR

Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY
 Town of Berthoud



RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings
9: US 287 & Spartan Avenue

07/21/2024

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	←	→	→	→	←	→
Traffic Volume (vph)	210	120	2175	335	200	1200
Future Volume (vph)	210	120	2175	335	200	1200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	2	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3433	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.049	
Satd. Flow (perm)	3433	1583	3539	1583	91	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		7		269		
Link Speed (mph)	30		30		30	
Link Distance (ft)	1610		240		2709	
Travel Time (s)	36.6		5.5		61.6	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	223	128	2314	356	213	1277
Shared Lane Traffic (%)						
Lane Group Flow (vph)	223	128	2314	356	213	1277
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	24		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (ft)	20	20	100	20	20	100
Trailing Detector (ft)	0	0	0	0	0	0
Turn Type	Prot	pm+ov	NA	Perm	pm+pt	NA
Protected Phases	8	1	2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	1	2	2	1	6
Switch Phase						

Background 2042 PM River Trails 12:35 pm 07/20/2024
RR

Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings
9: US 287 & Spartan Avenue

07/21/2024

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	22.5	22.5	9.5	22.5
Total Split (s)	22.5	16.0	81.5	81.5	16.0	97.5
Total Split (%)	18.8%	13.3%	67.9%	67.9%	13.3%	81.3%
Maximum Green (s)	18.0	11.5	77.0	77.0	11.5	93.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lag	Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0		7.0	7.0		7.0
Flash Dont Walk (s)	11.0		11.0	11.0		11.0
Pedestrian Calls (#/hr)	0		0	0		0
Act Effct Green (s)	18.0	34.0	77.0	77.0	93.0	93.0
Actuated g/C Ratio	0.15	0.28	0.64	0.64	0.78	0.78
v/c Ratio	0.43	0.28	1.02	0.32	0.92	0.47
Control Delay	49.3	33.7	46.0	3.1	75.0	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.3	33.7	46.0	3.1	75.0	5.4
LOS	D	C	D	A	E	A
Approach Delay	43.6		40.3			15.3
Approach LOS	D		D			B
Queue Length 50th (ft)	81	73	~1000	24	114	153
Queue Length 95th (ft)	122	128	#1133	60	#264	186
Internal Link Dist (ft)	1530		160			2629
Turn Bay Length (ft)						
Base Capacity (vph)	514	453	2270	1112	231	2742
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.28	1.02	0.32	0.92	0.47
Intersection Summary						
Area Type:	Other					
Cycle Length:	120					
Actuated Cycle Length:	120					
Offset:	0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green					
Natural Cycle:	120					
Control Type:	Pretimed					
Maximum v/c Ratio:	1.02					
Intersection Signal Delay:	32.3			Intersection LOS: C		
Intersection Capacity Utilization	88.4%			ICU Level of Service E		
Analysis Period (min)	15					

Background 2042 PM River Trails 12:35 pm 07/20/2024
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Synchro 11 Light Report
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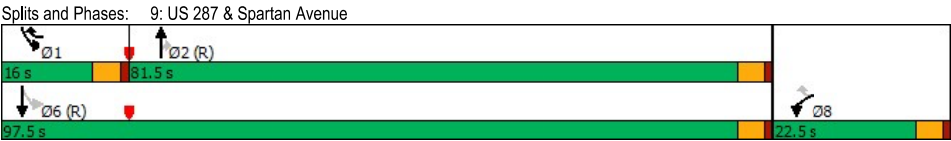
RIVER TRAILS | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings

9: US 287 & Spartan Avenue

07/21/2024

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



TOTAL 2042

RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th Roundabout
1: 1st Street & Mountain Ave

07/20/2024

Intersection					
Intersection Delay, s/veh	10.4				
Intersection LOS	B				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	2	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	490	588	269	402	
Demand Flow Rate, veh/h	509	612	274	418	
Vehicles Circulating, veh/h	306	318	686	402	
Vehicles Exiting, veh/h	514	642	129	528	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	9.9	12.6	7.6	9.8	
Approach LOS	A	B	A	A	
Lane	Left	Left	Left	Right	Left
Designated Moves	LTR	LTR	LT	R	LTR
Assumed Moves	LTR	LTR	LT	R	LTR
RT Channelized					
Lane Util	1.000	1.000	0.788	0.212	1.000
Follow-Up Headway, s	2.609	2.609	2.535	2.535	2.609
Critical Headway, s	4.976	4.976	4.544	4.544	4.976
Entry Flow, veh/h	509	612	216	58	418
Cap Entry Lane, veh/h	1010	998	761	761	916
Entry HV Adj Factor	0.962	0.961	0.981	0.983	0.962
Flow Entry, veh/h	490	588	212	57	402
Cap Entry, veh/h	971	959	746	748	881
V/C Ratio	0.504	0.613	0.284	0.076	0.456
Control Delay, s/veh	9.9	12.6	8.1	5.6	9.8
LOS	A	B	A	A	A
95th %ile Queue, veh	3	4	1	0	2

Total 2042 AM River Trails 2:15 pm 07/20/2024
RR

Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th Roundabout
1: 1st Street & Mountain Ave

07/20/2024

Intersection					
Intersection Delay, s/veh	21.7				
Intersection LOS	C				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	2	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	669	822	317	500	
Demand Flow Rate, veh/h	683	839	324	510	
Vehicles Circulating, veh/h	361	398	767	564	
Vehicles Exiting, veh/h	713	693	277	673	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	16.5	33.9	9.3	16.6	
Approach LOS	C	D	A	C	
Lane	Left	Left	Left	Right	Left
Designated Moves	LTR	LTR	LT	R	LTR
Assumed Moves	LTR	LTR	LT	R	LTR
RT Channelized					
Lane Util	1.000	1.000	0.809	0.191	1.000
Follow-Up Headway, s	2.609	2.609	2.535	2.535	2.609
Critical Headway, s	4.976	4.976	4.544	4.544	4.976
Entry Flow, veh/h	683	839	262	62	510
Cap Entry Lane, veh/h	955	919	707	707	776
Entry HV Adj Factor	0.980	0.980	0.979	0.984	0.980
Flow Entry, veh/h	669	822	256	61	500
Cap Entry, veh/h	936	901	691	695	761
V/C Ratio	0.715	0.912	0.371	0.088	0.657
Control Delay, s/veh	16.5	33.9	10.1	6.1	16.6
LOS	C	D	B	A	C
95th %ile Queue, veh	6	13	2	0	5

Total 2042 PM River Trails 2:29 pm 07/20/2024
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Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
2: 1st Street & CR 6C

07/20/2024

Intersection						
Int Delay, s/veh	2.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	R	L	T
Traffic Vol, veh/h	10	95	215	0	35	255
Future Vol, veh/h	10	95	215	0	35	255
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	107	242	0	39	287
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	607	242	0	0	242	0
Stage 1	242	-	-	-	-	-
Stage 2	365	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	460	797	-	-	1324	-
Stage 1	798	-	-	-	-	-
Stage 2	702	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	444	797	-	-	1324	-
Mov Cap-2 Maneuver	444	-	-	-	-	-
Stage 1	798	-	-	-	-	-
Stage 2	677	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	10.8	0	0.9			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	741	1324	-	
HCM Lane V/C Ratio	-	-	0.159	0.03	-	
HCM Control Delay (s)	-	-	10.8	7.8	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.6	0.1	-	

Total 2042 AM River Trails 2:15 pm 07/20/2024
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Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
2: 1st Street & CR 6C

07/21/2024

Intersection						
Int Delay, s/veh	2.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Vol, veh/h	10	95	295	10	100	255
Future Vol, veh/h	10	95	295	10	100	255
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	102	317	11	108	274
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	813	323	0	0	328	0
Stage 1	323	-	-	-	-	-
Stage 2	490	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	348	718	-	-	1232	-
Stage 1	734	-	-	-	-	-
Stage 2	616	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	312	718	-	-	1232	-
Mov Cap-2 Maneuver	312	-	-	-	-	-
Stage 1	734	-	-	-	-	-
Stage 2	553	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, s	11.8		0		2.3	
HCM LOS	B					
Minor Lane/Major Mvmt	NBT		NBRWBLn1		SBL	SBT
Capacity (veh/h)	-	-	639	1232	-	-
HCM Lane V/C Ratio	-	-	0.177	0.087	-	-
HCM Control Delay (s)	-	-	11.8	8.2	0	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.6	0.3	-	-

Total 2042 PM River Trails 2:29 pm 07/20/2024
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Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC

3: CR 15 & CR 15A/Private Drive way

07/20/2024

Intersection												
Int Delay, s/veh	3.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	60	0	60	1	0	0	55	140	0	0	205	65
Future Vol, veh/h	60	0	60	1	0	0	55	140	0	0	205	65
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	70	0	70	1	0	0	64	163	0	0	238	76
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	567	567	276	602	605	163	314	0	0	163	0	0
Stage 1	276	276	-	291	291	-	-	-	-	-	-	-
Stage 2	291	291	-	311	314	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	434	433	763	412	412	882	1246	-	-	1416	-	-
Stage 1	730	682	-	717	672	-	-	-	-	-	-	-
Stage 2	717	672	-	699	656	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	415	409	763	358	389	882	1246	-	-	1416	-	-
Mov Cap-2 Maneuver	415	409	-	358	389	-	-	-	-	-	-	-
Stage 1	689	682	-	677	634	-	-	-	-	-	-	-
Stage 2	677	634	-	635	656	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	14		15.1		2.3		0					
HCM LOS	B		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1246	-	-	538	358	1416	-	-				
HCM Lane V/C Ratio	0.051	-	-	0.259	0.003	-	-	-				
HCM Control Delay (s)	8	0	-	14	15.1	0	-	-				
HCM Lane LOS	A	A	-	B	C	A	-	-				
HCM 95th %tile Q(veh)	0.2	-	-	1	0	0	-	-				

Total 2042 AM River Trails 2:15 pm 07/20/2024
RR

Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC

3: CR 15 & CR 15A/Private Drive way

07/21/2024

Intersection													
Int Delay, s/veh	3.8												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕			↕			↕			↕		
Traffic Vol, veh/h	70	0	60	0	0	0	65	235	0	0	160	90	
Future Vol, veh/h	70	0	60	0	0	0	65	235	0	0	160	90	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	81	0	70	0	0	0	76	273	0	0	186	105	
Major/Minor	Minor2			Minor1			Major1			Major2			
Conflicting Flow All	664	664	239	699	716	273	291	0	0	273	0	0	
Stage 1	239	239	-	425	425	-	-	-	-	-	-	-	
Stage 2	425	425	-	274	291	-	-	-	-	-	-	-	
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-	
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-	
Pot Cap-1 Maneuver	374	381	800	354	356	766	1271	-	-	1290	-	-	
Stage 1	764	708	-	607	586	-	-	-	-	-	-	-	
Stage 2	607	586	-	732	672	-	-	-	-	-	-	-	
Platoon blocked, %								-	-	-	-	-	
Mov Cap-1 Maneuver	354	354	800	306	331	766	1271	-	-	1290	-	-	
Mov Cap-2 Maneuver	354	354	-	306	331	-	-	-	-	-	-	-	
Stage 1	711	708	-	565	545	-	-	-	-	-	-	-	
Stage 2	565	545	-	668	672	-	-	-	-	-	-	-	
Approach	EB			WB			NB			SB			
HCM Control Delay, s	16			0			1.7			0			
HCM LOS	C			A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1271	-	-	477	-	1290	-	-					
HCM Lane V/C Ratio	0.059	-	-	0.317	-	-	-	-					
HCM Control Delay (s)	8	0	-	16	0	0	-	-					
HCM Lane LOS	A	A	-	C	A	A	-	-					
HCM 95th %tile Q(veh)	0.2	-	-	1.3	-	0	-	-					

Total 2042 PM River Trails 2:29 pm 07/20/2024
RR

Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
4: CR 15 & CR 2E

07/21/2024

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	35	30	15	160	185	75
Future Vol, veh/h	35	30	15	160	185	75
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mmt Flow	39	33	17	178	206	83
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	460	248	289	0	-	0
Stage 1	248	-	-	-	-	-
Stage 2	212	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	559	791	1273	-	-	-
Stage 1	793	-	-	-	-	-
Stage 2	823	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	551	791	1273	-	-	-
Mov Cap-2 Maneuver	551	-	-	-	-	-
Stage 1	781	-	-	-	-	-
Stage 2	823	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.3	0.7		0		
HCM LOS	B					
Minor Lane/Major Mmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1273	-	641	-	-	
HCM Lane V/C Ratio	0.013	-	0.113	-	-	
HCM Control Delay (s)	7.9	0	11.3	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.4	-	-	

Total 2042 AM River Trails 2:15 pm 07/20/2024
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Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
4: CR 15 & CR 2E

07/21/2024

Intersection						
Int Delay, s/veh	4.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	145	15	30	155	195	25
Future Vol, veh/h	145	15	30	155	195	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	167	17	34	178	224	29
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	485	239	253	0	-	0
Stage 1	239	-	-	-	-	-
Stage 2	246	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	541	800	1312	-	-	-
Stage 1	801	-	-	-	-	-
Stage 2	795	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	525	800	1312	-	-	-
Mov Cap-2 Maneuver	525	-	-	-	-	-
Stage 1	778	-	-	-	-	-
Stage 2	795	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	15	1.3		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1312	-	542	-	-	
HCM Lane V/C Ratio	0.026	-	0.339	-	-	
HCM Control Delay (s)	7.8	0	15	-	-	
HCM Lane LOS	A	A	C	-	-	
HCM 95th %tile Q(veh)	0.1	-	1.5	-	-	

Total 2042 PM River Trails 2:29 pm 07/20/2024
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Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC

5: CR 13 & CR 6C/WCR 42.25

07/20/2024

Intersection													
Int Delay, s/veh	1.5												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔			↔			↔		
Traffic Vol, veh/h	45	0	5	0	0	1	5	155	0	0	230	20	
Future Vol, veh/h	45	0	5	0	0	1	5	155	0	0	230	20	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None	
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-	
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-	
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-	
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	54	0	6	0	0	1	6	187	0	0	277	24	
Major/Minor	Minor2			Minor1			Major1			Major2			
Conflicting Flow All	489	488	289	491	500	187	301	0	0	187	0	0	
Stage 1	289	289	-	199	199	-	-	-	-	-	-	-	
Stage 2	200	199	-	292	301	-	-	-	-	-	-	-	
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-	
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-	
Pot Cap-1 Maneuver	489	480	750	488	473	855	1260	-	-	1387	-	-	
Stage 1	719	673	-	803	736	-	-	-	-	-	-	-	
Stage 2	802	736	-	716	665	-	-	-	-	-	-	-	
Platoon blocked, %								-	-	-	-	-	
Mov Cap-1 Maneuver	487	478	750	482	471	855	1260	-	-	1387	-	-	
Mov Cap-2 Maneuver	487	478	-	482	471	-	-	-	-	-	-	-	
Stage 1	715	673	-	799	732	-	-	-	-	-	-	-	
Stage 2	797	732	-	710	665	-	-	-	-	-	-	-	
Approach	EB			WB			NB			SB			
HCM Control Delay, s	13.1			9.2			0.2			0			
HCM LOS	B			A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1260	-	-	505	855	1387	-	-					
HCM Lane V/C Ratio	0.005	-	-	0.119	0.001	-	-	-					
HCM Control Delay (s)	7.9	0	-	13.1	9.2	0	-	-					
HCM Lane LOS	A	A	-	B	A	A	-	-					
HCM 95th %tile Q(veh)	0	-	-	0.4	0	0	-	-					

Total 2042 AM River Trails 2:15 pm 07/20/2024
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Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
5: CR 13 & CR 6C/WCR 42.25

09/09/2024

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕↕↕↕↕↕↕↕↕↕↕↕											
Traffic Vol, veh/h	30	0	5	0	0	2	30	355	0	0	220	50
Future Vol, veh/h	30	0	5	0	0	2	30	355	0	0	220	50
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	3	3	3	3	3	3
Mvmt Flow	32	0	5	0	0	2	32	382	0	0	237	54
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	711	710	264	713	737	382	291	0	0	382	0	0
Stage 1	264	264	-	446	446	-	-	-	-	-	-	-
Stage 2	447	446	-	267	291	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	348	359	775	347	346	665	1265	-	-	1171	-	-
Stage 1	741	690	-	591	574	-	-	-	-	-	-	-
Stage 2	591	574	-	738	672	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	338	348	775	336	335	665	1265	-	-	1171	-	-
Mov Cap-2 Maneuver	338	348	-	336	335	-	-	-	-	-	-	-
Stage 1	717	690	-	572	556	-	-	-	-	-	-	-
Stage 2	570	556	-	733	672	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	15.9			10.4			0.6			0		
HCM LOS	C			B								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1265	-	-	368	665	1171	-	-				
HCM Lane V/C Ratio	0.026	-	-	0.102	0.003	-	-	-				
HCM Control Delay (s)	7.9	0	-	15.9	10.4	0	-	-				
HCM Lane LOS	A	A	-	C	B	A	-	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0	0	-	-				

Total 2042 PM River Trail 2:29 pm 07/20/2024
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings

6: US 287 & CR 4E

07/20/2024

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	←	→	↑	→	←	→
Traffic Volume (vph)	135	35	905	55	15	2240
Future Volume (vph)	135	35	905	55	15	2240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.254	
Satd. Flow (perm)	1770	1583	3539	1583	473	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		37		59		
Link Speed (mph)	45		65			65
Link Distance (ft)	2121		10840			1730
Travel Time (s)	32.1		113.7			18.1
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	144	37	963	59	16	2383
Shared Lane Traffic (%)						
Lane Group Flow (vph)	144	37	963	59	16	2383
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (ft)	20	20	100	20	20	100
Trailing Detector (ft)	0	0	0	0	0	0
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						

Total 2042 AM River Trails 12:41 pm 07/20/2024
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Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings

6: US 287 & CR 4E

07/20/2024

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	9.5	22.5
Total Split (s)	22.5	22.5	68.0	68.0	9.5	77.5
Total Split (%)	22.5%	22.5%	68.0%	68.0%	9.5%	77.5%
Maximum Green (s)	18.0	18.0	63.5	63.5	5.0	73.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	Max	Max	None	Max
Walk Time (s)	7.0	7.0	7.0	7.0		7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0		11.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effct Green (s)	13.3	13.3	73.9	73.9	77.7	77.7
Actuated g/C Ratio	0.13	0.13	0.74	0.74	0.78	0.78
v/c Ratio	0.62	0.15	0.37	0.05	0.04	0.87
Control Delay	51.4	13.1	6.2	1.9	3.5	13.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.4	13.1	6.2	1.9	3.5	13.2
LOS	D	B	A	A	A	B
Approach Delay	43.5		5.9			13.1
Approach LOS	D		A			B
Queue Length 50th (ft)	84	0	77	0	2	427
Queue Length 95th (ft)	144	27	187	14	8	732
Internal Link Dist (ft)	2041		10760			1650
Turn Bay Length (ft)						
Base Capacity (vph)	319	315	2614	1184	432	2750
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.12	0.37	0.05	0.04	0.87
Intersection Summary						
Area Type:	Other					
Cycle Length: 100						
Actuated Cycle Length: 100						
Natural Cycle: 90						
Control Type: Semi Act-Uncoord						
Maximum v/c Ratio: 0.87						
Intersection Signal Delay: 12.6				Intersection LOS: B		
Intersection Capacity Utilization 76.9%				ICU Level of Service D		
Analysis Period (min) 15						

Total 2042 AM River Trails 12:41 pm 07/20/2024
RR

Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings

6: US 287 & CR 4E

07/20/2024

Splits and Phases: 6: US 287 & CR 4E



RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings

6: US 287 & CR 4E

07/21/2024

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	90	30	2405	190	40	1375
Future Volume (vph)	90	30	2405	190	40	1375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.047	
Satd. Flow (perm)	1770	1583	3539	1583	88	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		32		125		
Link Speed (mph)	45		65			65
Link Distance (ft)	2121		10840			1730
Travel Time (s)	32.1		113.7			18.1
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	96	32	2559	202	43	1463
Shared Lane Traffic (%)						
Lane Group Flow (vph)	96	32	2559	202	43	1463
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (ft)	20	20	100	20	20	100
Trailing Detector (ft)	0	0	0	0	0	0
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						

Total 2042 PM River Trails 12:46 pm 07/20/2024
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Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings

6: US 287 & CR 4E

07/21/2024

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	9.5	22.5
Total Split (s)	33.5	33.5	77.0	77.0	9.5	86.5
Total Split (%)	27.9%	27.9%	64.2%	64.2%	7.9%	72.1%
Maximum Green (s)	29.0	29.0	72.5	72.5	5.0	82.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	Max	Max	None	Max
Walk Time (s)	7.0	7.0	7.0	7.0		7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0		11.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effct Green (s)	11.0	11.0	81.4	81.4	87.3	87.3
Actuated g/C Ratio	0.10	0.10	0.76	0.76	0.81	0.81
v/c Ratio	0.53	0.17	0.95	0.16	0.29	0.51
Control Delay	55.0	16.0	23.6	2.4	8.0	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.0	16.0	23.6	2.4	8.0	4.2
LOS	D	B	C	A	A	A
Approach Delay	45.2		22.1			4.3
Approach LOS	D		C			A
Queue Length 50th (ft)	60	0	~833	13	4	125
Queue Length 95th (ft)	112	27	#1143	39	17	204
Internal Link Dist (ft)	2041		10760			1650
Turn Bay Length (ft)						
Base Capacity (vph)	478	451	2683	1230	149	2878
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.07	0.95	0.16	0.29	0.51
Intersection Summary						
Area Type:	Other					
Cycle Length:	120					
Actuated Cycle Length:	107.4					
Natural Cycle:	130					
Control Type:	Semi Act-Uncoord					
Maximum v/c Ratio:	0.95					
Intersection Signal Delay:	16.7			Intersection LOS: B		
Intersection Capacity Utilization	79.0%			ICU Level of Service D		
Analysis Period (min)	15					
~ Volume exceeds capacity, queue is theoretically infinite.						

Total 2042 PM River Trails 12:46 pm 07/20/2024
RR

Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings

6: US 287 & CR 4E

07/21/2024

Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: US 287 & CR 4E



RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
7: US 287 & CR 2E

07/20/2024

Intersection						
Int Delay, s/veh	68					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↱	↱	↕↕	↱	↱	↕↕
Traffic Vol, veh/h	130	10	950	50	10	2365
Future Vol, veh/h	130	10	950	50	10	2365
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	0	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	140	11	1022	54	11	2543
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2316	511	0	0	1076	0
Stage 1	1022	-	-	-	-	-
Stage 2	1294	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	~ 32	508	-	-	644	-
Stage 1	308	-	-	-	-	-
Stage 2	221	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 31	508	-	-	644	-
Mov Cap-2 Maneuver	~ 31	-	-	-	-	-
Stage 1	308	-	-	-	-	-
Stage 2	217	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, \$	1707.2		0		0	
HCM LOS	F					
Minor Lane/Major Mvmt	NBT		NBRWBLn1WBLn2		SBL	SBT
Capacity (veh/h)	-		31 508		644	-
HCM Lane V/C Ratio	-		4.509 0.021		0.017	-
HCM Control Delay (s)	-		\$ 1837.6 12.2		10.7	-
HCM Lane LOS	-		F B		B	-
HCM 95th %tile Q(veh)	-		16.7 0.1		0.1	-
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

Total 2042 AM River Trails 12:41 pm 07/20/2024
RR

Synchro 11 Light Report
Page 1

RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
7: US 287 & CR 2E

07/20/2024

Intersection						
Int Delay, s/veh	85.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↱	↱	↕↕	↱	↱	↕↕
Traffic Vol, veh/h	50	20	2580	205	5	1465
Future Vol, veh/h	50	20	2580	205	5	1465
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	0	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	22	2774	220	5	1575
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	3572	1387	0	0	2994	0
Stage 1	2774	-	-	-	-	-
Stage 2	798	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	~4	133	-	-	114	-
Stage 1	~33	-	-	-	-	-
Stage 2	404	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	~4	133	-	-	114	-
Mov Cap-2 Maneuver	~4	-	-	-	-	-
Stage 1	~33	-	-	-	-	-
Stage 2	386	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	5259.3	0	0.1			
HCM LOS	F					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	-	4	133	114	-
HCM Lane V/C Ratio	-	-13.441	0.162	0.047	-	-
HCM Control Delay (s)	-	\$ 7348.2	37.2	38.1	-	-
HCM Lane LOS	-	-	F	E	E	-
HCM 95th %tile Q(veh)	-	-	8.6	0.6	0.1	-
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

Total 2042 PM River Trails 12:46 pm 07/20/2024
RR

Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th Roundabout
8: Spartan Ave & 1st Street

07/20/2024

Intersection				
Intersection Delay, s/veh	6.2			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	222	200	336	336
Demand Flow Rate, veh/h	226	204	343	343
Vehicles Circulating, veh/h	320	377	226	199
Vehicles Exiting, veh/h	222	192	320	382
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.9	6.1	6.4	6.2
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	226	204	343	343
Cap Entry Lane, veh/h	996	939	1096	1126
Entry HV Adj Factor	0.981	0.980	0.980	0.980
Flow Entry, veh/h	222	200	336	336
Cap Entry, veh/h	976	921	1074	1104
V/C Ratio	0.227	0.217	0.313	0.305
Control Delay, s/veh	5.9	6.1	6.4	6.2
LOS	A	A	A	A
95th %ile Queue, veh	1	1	1	1

Total 2042 AM River Trails 2:15 pm 07/20/2024
RR

Synchro 11 Light Report
Page 1

RIVER TRAILS | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th Roundabout
8: Spartan Ave & 1st Street

09/09/2024

Intersection				
Intersection Delay, s/veh	7.6			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	250	228	434	424
Demand Flow Rate, veh/h	256	233	443	433
Vehicles Circulating, veh/h	399	466	267	233
Vehicles Exiting, veh/h	267	244	388	466
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	6.9	7.2	8.1	7.6
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	256	233	443	433
Cap Entry Lane, veh/h	919	858	1051	1088
Entry HV Adj Factor	0.977	0.979	0.980	0.979
Flow Entry, veh/h	250	228	434	424
Cap Entry, veh/h	897	840	1029	1065
V/C Ratio	0.279	0.272	0.422	0.398
Control Delay, s/veh	6.9	7.2	8.1	7.6
LOS	A	A	A	A
95th %tile Queue, veh	1	1	2	2

Total 2042 PM River Trail 2:29 pm 07/20/2024
RR

Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings

9: US 287 & Spartan Avenue

07/20/2024

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	←	→	↑	→	←	→
Traffic Volume (vph)	360	115	835	180	95	1895
Future Volume (vph)	360	115	835	180	95	1895
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	2	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3433	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.251	
Satd. Flow (perm)	3433	1583	3539	1583	468	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		125		196		
Link Speed (mph)	30		30			30
Link Distance (ft)	1610		240			2709
Travel Time (s)	36.6		5.5			61.6
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	391	125	908	196	103	2060
Shared Lane Traffic (%)						
Lane Group Flow (vph)	391	125	908	196	103	2060
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	24		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (ft)	20	20	100	20	20	100
Trailing Detector (ft)	0	0	0	0	0	0
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						

Total 2042 AM River Trails 12:41 pm 07/20/2024
RR

Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings
9: US 287 & Spartan Avenue

07/20/2024

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	9.5	22.5
Total Split (s)	22.5	22.5	67.1	67.1	10.4	77.5
Total Split (%)	22.5%	22.5%	67.1%	67.1%	10.4%	77.5%
Maximum Green (s)	18.0	18.0	62.6	62.6	5.9	73.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0	7.0		7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0		11.0
Pedestrian Calls (#/hr)	0	0	0	0		0
Act Effct Green (s)	18.0	18.0	62.6	62.6	73.0	73.0
Actuated g/C Ratio	0.18	0.18	0.63	0.63	0.73	0.73
v/c Ratio	0.63	0.32	0.41	0.18	0.25	0.80
Control Delay	43.2	9.0	10.1	1.5	5.3	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.2	9.0	10.1	1.5	5.3	11.8
LOS	D	A	B	A	A	B
Approach Delay	34.9		8.6			11.5
Approach LOS	C		A			B
Queue Length 50th (ft)	120	0	140	0	16	378
Queue Length 95th (ft)	169	49	180	25	30	478
Internal Link Dist (ft)	1530		160			2629
Turn Bay Length (ft)						
Base Capacity (vph)	617	387	2215	1064	418	2583
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.32	0.41	0.18	0.25	0.80
Intersection Summary						
Area Type:	Other					
Cycle Length: 100						
Actuated Cycle Length: 100						
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green						
Natural Cycle: 75						
Control Type: Pretimed						
Maximum v/c Ratio: 0.80						
Intersection Signal Delay: 13.8				Intersection LOS: B		
Intersection Capacity Utilization 70.2%				ICU Level of Service C		
Analysis Period (min) 15						

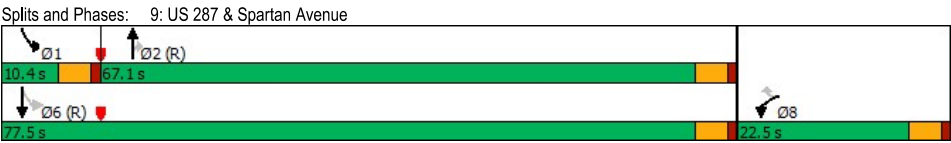
Total 2042 AM River Trails 12:41 pm 07/20/2024
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings
9: US 287 & Spartan Avenue

07/20/2024



RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings
9: US 287 & Spartan Avenue

07/21/2024

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰↱	↰	↰↱	↰	↰↱	↰↱
Traffic Volume (vph)	215	120	2175	345	200	1200
Future Volume (vph)	215	120	2175	345	200	1200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	2	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	0.97	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3433	1583	3539	1583	1770	3539
Flt Permitted	0.950				0.049	
Satd. Flow (perm)	3433	1583	3539	1583	91	3539
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		7		277		
Link Speed (mph)	30		30			30
Link Distance (ft)	1610		240			2709
Travel Time (s)	36.6		5.5			61.6
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	229	128	2314	367	213	1277
Shared Lane Traffic (%)						
Lane Group Flow (vph)	229	128	2314	367	213	1277
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	24		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1	1	2	1	1	2
Detector Template	Left	Right	Thru	Right	Left	Thru
Leading Detector (ft)	20	20	100	20	20	100
Trailing Detector (ft)	0	0	0	0	0	0
Turn Type	Prot	pm+ov	NA	Perm	pm+pt	NA
Protected Phases	8	1	2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	1	2	2	1	6
Switch Phase						

Total 2042 PM River Trails 12:46 pm 07/20/2024
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Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings

9: US 287 & Spartan Avenue

07/21/2024

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	9.5	22.5	22.5	9.5	22.5
Total Split (s)	22.5	16.0	81.5	81.5	16.0	97.5
Total Split (%)	18.8%	13.3%	67.9%	67.9%	13.3%	81.3%
Maximum Green (s)	18.0	11.5	77.0	77.0	11.5	93.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag		Lead	Lag	Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0		7.0	7.0		7.0
Flash Dont Walk (s)	11.0		11.0	11.0		11.0
Pedestrian Calls (#/hr)	0		0	0		0
Act Effct Green (s)	18.0	34.0	77.0	77.0	93.0	93.0
Actuated g/C Ratio	0.15	0.28	0.64	0.64	0.78	0.78
v/c Ratio	0.45	0.28	1.02	0.33	0.92	0.47
Control Delay	49.6	33.7	46.0	3.2	75.0	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.6	33.7	46.0	3.2	75.0	5.4
LOS	D	C	D	A	E	A
Approach Delay	43.9		40.2			15.3
Approach LOS	D		D			B
Queue Length 50th (ft)	84	73	~1000	25	114	153
Queue Length 95th (ft)	125	128	#1133	62	#264	186
Internal Link Dist (ft)	1530		160			2629
Turn Bay Length (ft)						
Base Capacity (vph)	514	453	2270	1115	231	2742
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.28	1.02	0.33	0.92	0.47
Intersection Summary						
Area Type:	Other					
Cycle Length: 120						
Actuated Cycle Length: 120						
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green						
Natural Cycle: 120						
Control Type: Pretimed						
Maximum v/c Ratio: 1.02						
Intersection Signal Delay: 32.3	Intersection LOS: C					
Intersection Capacity Utilization 88.6%	ICU Level of Service E					
Analysis Period (min) 15						

Total 2042 PM River Trails 12:46 pm 07/20/2024
RR

Synchro 11 Light Report
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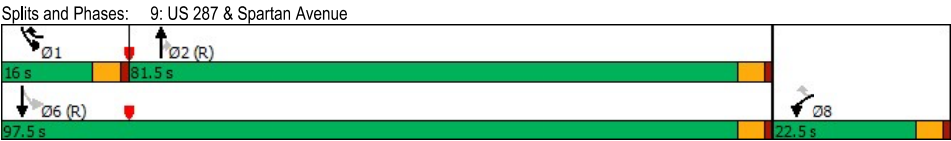
RIVER TRAILS | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings

9: US 287 & Spartan Avenue

07/21/2024

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
10: West Access & CR 6C

07/21/2024

Intersection						
Int Delay, s/veh	4.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	15	25	1	35	65	5
Future Vol, veh/h	15	25	1	35	65	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	27	1	38	71	5
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	43	0	70	30
Stage 1	-	-	-	-	30	-
Stage 2	-	-	-	-	40	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1566	-	934	1044
Stage 1	-	-	-	-	993	-
Stage 2	-	-	-	-	982	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1566	-	933	1044
Mov Cap-2 Maneuver	-	-	-	-	933	-
Stage 1	-	-	-	-	993	-
Stage 2	-	-	-	-	981	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.2		9.2	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	940	-	-	1566	-	
HCM Lane V/C Ratio	0.081	-	-	0.001	-	
HCM Control Delay (s)	9.2	-	-	7.3	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.3	-	-	0	-	

Total 2042 AM River Trails 2:15 pm 07/20/2024
RR

Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
10: West Access & CR 6C

07/21/2024

Intersection						
Int Delay, s/veh	2.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	40	70	5	65	45	5
Future Vol, veh/h	40	70	5	65	45	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	76	5	71	49	5
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	119	0	162	81
Stage 1	-	-	-	-	81	-
Stage 2	-	-	-	-	81	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1469	-	829	979
Stage 1	-	-	-	-	942	-
Stage 2	-	-	-	-	942	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1469	-	826	979
Mov Cap-2 Maneuver	-	-	-	-	826	-
Stage 1	-	-	-	-	942	-
Stage 2	-	-	-	-	938	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0.5		9.6		
HCM LOS				A		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	839	-	-	1469	-	
HCM Lane V/C Ratio	0.065	-	-	0.004	-	
HCM Control Delay (s)	9.6	-	-	7.5	0	
HCM Lane LOS	A	-	-	A	A	
HCM95th %tile Q(veh)	0.2	-	-	0	-	

Total 2042 PM River Trails 2:29 pm 07/20/2024
RR

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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
11: East Access & CR 6C

07/21/2024

Intersection						
Int Delay, s/veh	6.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↱	
Traffic Vol, veh/h	10	10	15	10	25	35
Future Vol, veh/h	10	10	15	10	25	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	11	16	11	27	38
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	22	0	60	17
Stage 1	-	-	-	-	17	-
Stage 2	-	-	-	-	43	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1593	-	947	1062
Stage 1	-	-	-	-	1006	-
Stage 2	-	-	-	-	979	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1593	-	938	1062
Mov Cap-2 Maneuver	-	-	-	-	938	-
Stage 1	-	-	-	-	1006	-
Stage 2	-	-	-	-	969	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		4.4		8.8	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	1007	-	-	1593	-	
HCM Lane V/C Ratio	0.065	-	-	0.01	-	
HCM Control Delay (s)	8.8	-	-	7.3	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

Total 2042 AM River Trails 2:15 pm 07/20/2024
RR

Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC
11: East Access & CR 6C

07/21/2024

Intersection						
Int Delay, s/veh	3.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶			↶	↶	
Traffic Vol, veh/h	15	30	40	55	15	25
Future Vol, veh/h	15	30	40	55	15	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	33	43	60	16	27
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	49	0	179	33
Stage 1	-	-	-	-	33	-
Stage 2	-	-	-	-	146	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1558	-	811	1041
Stage 1	-	-	-	-	989	-
Stage 2	-	-	-	-	881	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1558	-	787	1041
Mov Cap-2 Maneuver	-	-	-	-	787	-
Stage 1	-	-	-	-	989	-
Stage 2	-	-	-	-	855	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		3.1		9.1	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	929	-	-	1558	-	
HCM Lane V/C Ratio	0.047	-	-	0.028	-	
HCM Control Delay (s)	9.1	-	-	7.4	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-	

Total 2042 PM River Trails 2:29 pm 07/20/2024
RR

Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC

12: CR 15/1st Street & West Access

07/21/2024

Intersection						
Int Delay, s/veh	1.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	20	25	190	10	10	255
Future Vol, veh/h	20	25	190	10	10	255
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	27	207	11	11	277
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	512	213	0	0	218	0
Stage 1	213	-	-	-	-	-
Stage 2	299	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	522	827	-	-	1352	-
Stage 1	823	-	-	-	-	-
Stage 2	752	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	517	827	-	-	1352	-
Mov Cap-2 Maneuver	517	-	-	-	-	-
Stage 1	823	-	-	-	-	-
Stage 2	744	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, s	11		0		0.3	
HCM LOS	B					
Minor Lane/Major Mvmt	NBT		NBRWBLn1		SBL	SBT
Capacity (veh/h)	-		-		653	1352
HCM Lane V/C Ratio	-		-		0.075	0.008
HCM Control Delay (s)	-		-		11	7.7
HCM Lane LOS	-		-		B	A
HCM 95th %tile Q(veh)	-		-		0.2	0

Total 2042 AM River Trails 2:15 pm 07/20/2024
RR

Synchro 11 Light Report
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RIVER TRAILS | TRANSPORTATION IMPACT STUDY

Town of Berthoud

HCM 6th TWSC

12: CR 15/1st Street & West Access

09/09/2024

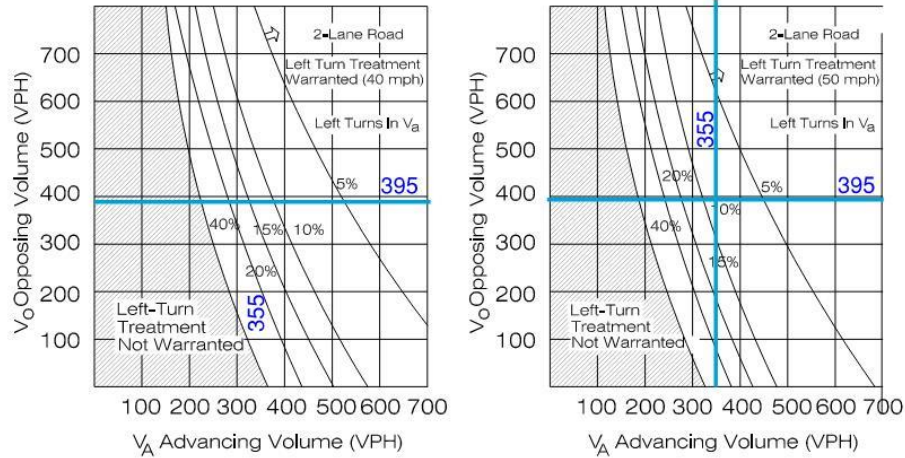
Intersection						
Int Delay, s/veh	1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔		↔	↔
Traffic Vol, veh/h	15	20	280	20	25	235
Future Vol, veh/h	15	20	280	20	25	235
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	22	304	22	27	255
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	624	315	0	0	326	0
Stage 1	315	-	-	-	-	-
Stage 2	309	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	449	725	-	-	1234	-
Stage 1	740	-	-	-	-	-
Stage 2	745	-	-	-	-	-
Platoon blocked, %		-	-	-	-	-
Mov Cap-1 Maneuver	438	725	-	-	1234	-
Mov Cap-2 Maneuver	438	-	-	-	-	-
Stage 1	740	-	-	-	-	-
Stage 2	726	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11.8	0		0.8		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	566	1234	-	
HCM Lane V/C Ratio	-	-	0.067	0.022	-	
HCM Control Delay (s)	-	-	11.8	8	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-	

Total 2042 PM River Trail 2:29 pm 07/20/2024
RR

Synchro 11 Light Report
Page 1

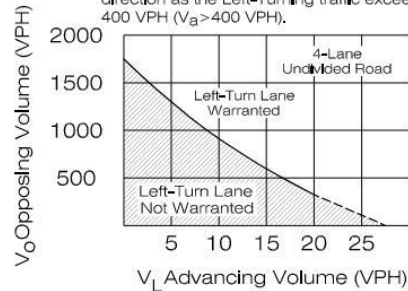
Appendix C - LCUASS Left-Turn Warrants

CR 15 at CR 6C Total 2042 Traffic PM Peak Hour



Left Turns in $V_a = 28\%$

NOTE: When $V_O < 400$ VPH (dashed line), a Left-Turn Lane is not normally warranted unless the advancing volume (V_a) in the same direction as the Left-Turning traffic exceeds 400 VPH ($V_a > 400$ VPH).



Notes: 1. Left turn lanes are required at all intersections and all-movement accesses on arterial roadways except where roundabouts are provided.

VOLUME WARRANTS FOR LEFT TURN LANES AT UNSIGNALIZED INTER.

LARIMER COUNTY
URBAN AREA
STREET STANDARDS

DESIGN
FIGURE

REVISION NO:

DATE: 12/14/00

FIGURE

8-1

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LAND SERVICES
OIL AND GAS TITLE

P.O. Box 336337
Greeley, CO 80633

Phone (970) 351-0733
Fax (970) 351-0867

LIST OF MINERAL OWNERS AND MINERAL LESSEES for NOTIFICATION
(Cynthia Ann Befus and Karen Kay Befus Property)

Subject Property:

Township 4 North, Range 69 West, 6th P.M., Larimer County, CO

Section 25: Those tracts of land being more particularly described on Exhibit A, being a part of the NW¼

Zeren Land Services, an oil and gas title research company, states that to the best of its knowledge the following is a true and accurate list of the names and addresses of the mineral owners and mineral leasehold owners entitled to notice under the Surface Development Notification Act, Colorado Revised Statutes §24-65.5-101, et seq. in the Subject Property based upon the records of the Larimer County Assessor and Clerk Recorder as of January 25, 2024 at 7:45 a.m.:

Mineral Owners:

None (entitled to notice)

Mineral Leasehold Owners:

Extraction Oil & Gas LLC
370 17th Street, Suite 5300
Denver, CO 80202

Dated this 26th day of January, 2024.

ZEREN LAND SERVICES


By: Cynthia A. E. Zeren, CPL
Certified Professional Landman #4044

At the request of **Hillside Commercial Group, Inc.** ("Client"), Zeren Land Services, an independent land consulting firm, has prepared the foregoing list of mineral estate owners entitled to notice under the Surface Development Notification Act, Colorado Revised Statutes §24-65.5-101, et seq.

Zeren Land Services, searched (i) the records of the Larimer County Assessor relating to the Subject Property for persons identified therein as mineral estate owners, and (ii) the records of the Larimer County Clerk and Recorder relating to the Subject Property for recorded requests for notification in the form specified in the Surface Development Notification Act. The results of these searches are set forth above in this List of Mineral Owners Entitled to Notice. At the date of the search, the records of the Assessor and the Clerk and Recorder were posted through January 25, 2024 at 7:45 A.M.

Zeren Land Services, agreed to prepare this listing for the Client only if the Client agreed that the liability of Zeren Land Services, would be strictly limited to the amount paid by the Client for such services. Zeren Land Services, makes no warranty, express, implied or statutory, in connection with the accuracy, completeness or sufficiency of such listing of mineral estate owners. In the event the listing proves to be inaccurate, incomplete, insufficient or otherwise defective in any way whatsoever or for any reason whatsoever, **the liability of Zeren Land Services, shall never exceed the actual amount paid by Client to Zeren Land Services, for the listing.**

In order to induce Zeren Land Services, to provide such services, **Client further agreed to indemnify and hold Zeren Land Services, its managers, members and employees, harmless from and against all claims by all persons (including, but not limited to Client) of whatever kind or character arising out of the preparation and use of each such listing of mineral estate owners, to the extent that such claims exceed the actual amount paid to Client by Zeren Land Services, for such listing.** Client specifically intends that both the foregoing limitation on liability and foregoing indemnification shall be binding and effective without regard to the cause of the claim, inaccuracy or defect, including, but not limited to, breach of representation, warranty or duty, any theory of tort or of breach of contract, or the fault or negligence of any party (including Zeren Land Services) of any kind or character (regardless of whether the fault or negligence is sole, joint, concurrent, simple or gross). **Client's use of this listing evidences Client's acceptance of, and agreement with, this limitation on liability and the indemnification.**

ZEREN LAND SERVICES

Date: January 26, 2024

By: _____

Cynthia A. E. Zeren, as President

EXHIBIT A

TOWNSHIP 4 NORTH, RANGE 69 WEST OF THE 6TH P.M.

SECTION 25: A TRACT OF LAND DESCRIBED AS FOLLOWS: BEGINNING AT A POINT ON THE SECTION LINE BETWEEN SECTIONS 24 AND 25, IN TOWNSHIP 4 NORTH, OF RANGE 69 WEST OF THE 6TH P.M., 1320 FEET WEST OF THE NORTHEAST CORNER OF THE NW¼ OF SAID SECTION 25; THENCE SOUTH 80° WEST 1139 FEET; THENCE SOUTH 2' WEST 200 FEET; THENCE SOUTH 88°15' EAST 971 FEET; THENCE NORTH 20°15' EAST 453 FEET TO PLACE OF BEGINNING (MAGNETIC VARIATION, 14°30' EAST);

ALSO, A CERTAIN TRACT OF LAND IN THE NW¼ OF SAID SECTION 25, DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT 230 FEET EAST OF THE NORTHWEST CORNER OF SAID SECTION 25, ON THE SECTION LINE; THENCE SOUTH 200 FEET; THENCE NORTHEASTERLY TO A POINT ON THE NORTH LINE OF SAID SECTION 25, 80 RODS EAST OF THE NORTHWEST CORNER OF SAID SECTION; THENCE WEST ON THE SECTION LINE TO PLACE OF BEGINNING;

ALSO, THE NW¼ OF SAID SECTION 25, EXCEPT PORTIONS CONVEYED AS SHOWN BY DEED RECORDED JANUARY 7, 1878 IN BOOK G AT PAGE 580 AND DEED RECORDED SEPTEMBER 3, 1877 IN BOOK I AT PAGE 430, AND DEED RECORDED SEPTEMBER 26, 1882 IN BOOK 33 AT PAGE 318, AND DEED RECORDED FEBRUARY 27, 1908 IN BOOK 245 AT PAGE 584 AND DEED RECORDED JANUARY 16, 2018 UNDER RECEPTION NO. 20180003176

Date: September 23, 2024

Extraction Oil & Gas LLC
370 17th Street, Suite 5300
Denver, CO 80202

Re: Public Hearing before the Town of Berthoud Planning Commission & City Council on a proposed development application.

Dear Mineral Estate Owner:

You are receiving this notice because you have been identified as a mineral estate owner as reflected in the records of the Larimer County Assessor with respect to property that is the subject of the referenced applications.

Application and Meeting Information

Application:	Annexation, Zoning and Neighborhood Master Plan
Project Name:	River Trails
Applicant Name:	Jon Turner, River Trails, LLC
Meeting Date and Time:	6:00 p.m. on October 23, 2024 Planning Commission 6:30 p.m. on November 12, 2024 Town Board
Meeting Location	Board Room, 807 Mountain Avenue, Berthoud, Colorado

Project Description

Summary of Proposed Development:	This site will allow a mix of residential product types, including single family detached, duplex, and townhomes.
General Location:	This site is located on the southeast corner of E CR 6C and S CR 15/S 1 st Street.
Existing Zoning:	Larimer County
Legal Description:	A PARCEL OF LAND SITUATE IN THE SOUTH HALF (S1/2) OF SECTION TWENTY-FOUR (24), TOWNSHIP FOUR NORTH (T.4N.), RANGE SIXTY-NINE WEST (R.69W.) OF THE SIXTH PRINCIPAL MERIDIAN (6TH P.M.), TOWN OF BERTHOUD, COUNTY OF LARIMER, STATE OF COLORADO

The list of mineral estate owners being notified of this public hearing is supplied by the applicant and derived from the current records of the Larimer County Assessor and the Larimer County Clerk and Recorder. As those records are not always current, please feel free to notify any other party who may have an interest in the minerals beneath the surface of the subject property of the scheduled public hearing.

Sincerely,

Jon Turner
River Trails, LLC

2024-10-01 LTWD Comments

Please Note: Comments noted in these plans and/or project documents may be applicable in many locations. Please address all comments consistently throughout all project plans and/or documents.

PROJECTED WATER DEMAND														
Assumptions										Calculations				
Acres	EDUs/ Taps Needed	Residents/ Capita per Unit ²	Equivalent Population	Demand (gal/cap/ day) ³	Total Area, ac ^{3,4}	Average Day Demand (gpm/cap) ³	Average Day Demand, non-residentia l (gpm/ast) ^{3,4}	Max Day Demand (gpm/cap) ³	Max Hour Demand (gpm/cap) ³	Max Hour Demand, Non-residentia l (gpm/ast) ^{3,4}	Average Day (gpm)	Average Day, non-reside ntial (gpm)	Max Day (gpm)	Max Hour non-residen tial (gpm)
0.62	422	2.66	1123	145	N/A	0.10	N/A	0.28	0.45	N/A	112	N/A	314	505
7.09	N/A	N/A	N/A	N/A	1180	N/A	0.50	N/A	N/A	0.50	N/A	590	N/A	590
Totals:											702	314	1095	
Notes:														
1*Equivalent Dwelling Units*, set to current unit count, including 189 detached, 132 duplex, and 101 townhome units (all single family)														
2Based on recent Town guidance														
3Based on Denver Water Standards														
4ast = 1,000 square feet														

PROJECTED SANITARY SEWER FLOWS																
Design Point	Design Point Location	Residential Flows							Design Details							
1	East Outfall/ Connection	Zoning/ Land Use	Area (acres)	EDUs1	Residents / Capita per Unit	Equivalent Population	Per Capita Flow Rate (GPD)2	Average Flow (GPD)	Average Flow (cfs)	Peaking Factor2	Peak Flow (cfs)	1/13 (cfs)	Total Peak Flows (cfs)	Projected Pipe Main Size (in.)	Pipe Slope (ft/ft)	Capacity Provided (cfs)4
		R1	90.62	422	2.66	1123	95	106,639	0.165	3.00	0.496	0.0702	0.566	8	0.005	0.854
Notes:																
1 "Equivalent Dwelling Units": set to current unit count, including 189 detached, 132 duplex, and 101 townhome units (all single family)																
2 Based on recent Town guidance																
3 "Infiltration and Inflow", based on City & County of Denver Department of Public Works criteria, set to 500 gallons per net acre per day																
4 Assuming a 0.5 depth/Diameter (d/D) ratio																

This existing waterline is CWCWD's 20-inch transmission line that will turn into a raw water line in the near future.

LTWD has an existing tap (Tap #3885) off of CWCWD's 20-inch line that will also need to be transferred to the Town of Berthoud.

exist. Existing 6-inch waterline comes from the east and turns south at this location.

Highlighted section does not exist.

LTWD's Existing Taps (Tap #4109 and Tap #2289) to be protected in the Town of Berthoud

6-inch PVC C900. To be abandoned per jurisdictional requirements. Existing 6-inch waterline will need to remain in service until LTWD's existing taps are transferred to the Town of Berthoud, properly abandoned, and relinquished to the District.

LTWD's Existing Tap (Tap #4110) to be transferred to the Town of Berthoud

Existing 2-inch blow off and testing station to be abandoned. Testing station to be relinquished to the District.

LTWD has an additional existing tap (Tap #752) off of CWCWD's 20-inch line that will need to be transferred to the Town of Berthoud as well.

LEGEND

MAPPING / SITE

PROPERTY BOUNDARY
OFF-WAY
LINES
MENTS
AND GUTTER
CLOSED UTILITIES

WATER LINE
FIRE HYDRANT
SANITARY LINE
IRRIGATION LATERAL
STORM DRAIN PIPE
FLARED END SECTION
STORM DRAIN INLET
STORM DRAIN MANHOLE
RIP RAP

EXISTING UTILITIES

MANHOLE
IRRIGATION PIPE
STORM DRAIN PIPE
WATER MAIN
SANITARY SEWER MAIN
FLARED END SECTION
STORM DRAIN INLET
STORM DRAIN MANHOLE
RIP RAP

RIVER TRAILS
BERTHOUD, CO
PRELIMINARY UTILITY PLAN

REVIEW SET
NOT FOR
CONSTRUCTION
The engineer preparing these plans will not be responsible for, or liable for, unauthorized changes to or uses of these plans. All changes must be approved by the Professional Engineer of these plans.

SCALE:
HORIZ: 1" = 150'
VERT: N/A

SHEET:
2 OF 2

PROJECT NO. 2402

PROJECT MANAGER: D. WEBER
SUBMITTAL DATE: 09/13/2024

AVANT CIVIL GROUP
1337 RIVERSIDE AVE. #9
FORT COLLINS, CO 80524
970.285.7995
AVANTCIVILGROUP.COM

From: [Anne Johnson](#)
To: [Traci Shambo](#)
Cc: kristin@tbgroupp.us; [Rusty McDaniel](#); [Bill Gleiforst](#)
Subject: RE: Town of Berthoud - Referral - River Trails Annexation, Zoning and Neighborhood Master Plan
Date: Wednesday, October 9, 2024 12:04:00 PM
Attachments: [image001.png](#)
[image002.png](#)
[image004.png](#)
[image005.png](#)
[image006.png](#)

Traci,

Hello. A voice mail was just left for you. The County's referral came in the day before publication is due. We were not able to meet the statutory public notice timeline and include the legal description in the notice. The annexation process includes Title work, surveying, etc. for all property to be annexed and a 1-day notice was not enough time to perform the necessary work. Once the Annexation Petition has been accepted as substantially compliant with State Statute, the public hearing has to occur within a certain period of time and a delay to accommodate this request would have delayed meeting statutory requirements per our attorney.

The applicant is aware that annexation of the additional CR 6C to County Line Road is an expectation and we've discussed having this be a condition of approval prior to submitting the Preliminary Plat.

There are a few things we'd like to understand:

- Are there any structural studies completed on the bridge?
- Does the County "own" the ROW or does the surface ownership extend to the road centerline?
- Is there an expedited method of the County conveying ROW to the Town?

A phone call with the applicant and their representative might be a good idea. Please send over dates/times that work for your team.

Thanks,
Anne

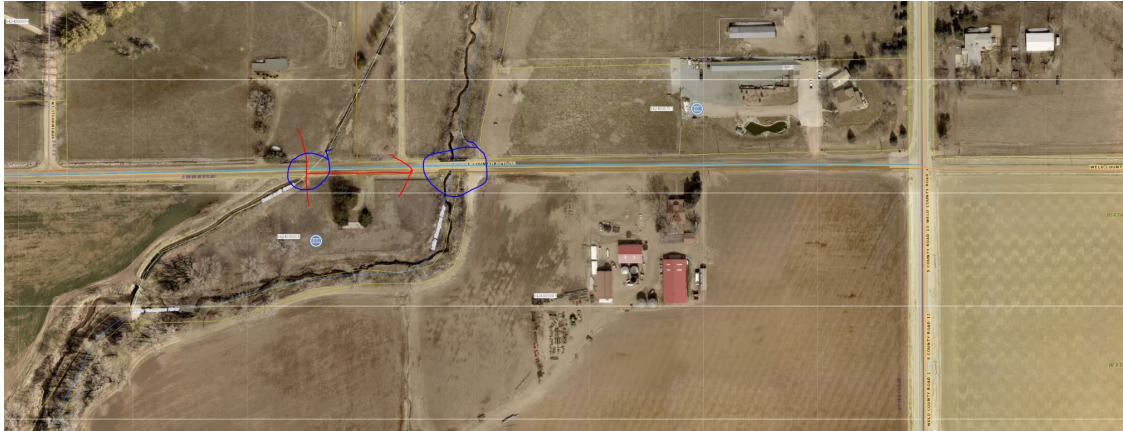
From: Traci Shambo <shambotl@co.larimer.co.us>
Sent: Monday, October 7, 2024 3:59 PM
To: Anne Johnson <AJohnson@berthoud.org>
Cc: kristin@tbgroupp.us; Rusty McDaniel <rmcdaniel@larimer.org>; Bill Gleiforst <bgleiforst@larimer.org>
Subject: Re: Town of Berthoud - Referral - River Trails Annexation, Zoning and Neighborhood Master Plan

Anne -

You are correct. We would like the segment of CR 6C east of the site to also be annexed. It seems appropriate to us to have it be under Town jurisdiction since a majority of the trip

generation will be from the Berthoud development after it builds out. Also, the County would expect that any off-site road improvements would be the developer's responsibility as a result of the increased ADTE's created by the development. We anticipate that road widening/capacity improvements, as well as paving the road, will likely be required by Larimer County as a result of the development traffic impacts so it seems that it would be more efficient to have the segment under Town jurisdiction so Berthoud could take the lead on ROW permitting, development requirements, design, review, construction, etc..

And we definitely want the adjacent ROW to be annexed in FULL.



On Mon, Oct 7, 2024 at 1:50 PM Anne Johnson <AJohnson@berthoud.org> wrote:

Oh. Gotcha. The County is requesting the additional ROW along 6C be annexed from the eastern property frontage to Weld County?

I don't know about that. Would the County be willing to discuss upgrading prior to annexation or a contribution?

Did I understand this correctly?

From: Traci Shambo <shambotl@co.larimer.co.us>

Sent: Monday, October 7, 2024 1:47 PM

To: Anne Johnson <AJohnson@berthoud.org>; kristin@tbgroupp.us

Subject: Re: Town of Berthoud - Referral - River Trails Annexation, Zoning and Neighborhood Master Plan

Anne & Kristin -

Annexation of the FULL road ROW of ROW that is adjacent to a parcel being annexed is a requirement Larimer County has with all annexations.

In this case, we also asked if the remaining ROW of CR 6C, east of the annexed parcel, could be annexed. This was more of a request given the short section of ROW that would remain in LC.

Thanks - Traci

On Mon, Oct 7, 2024 at 1:38 PM Anne Johnson <AJohnson@berthoud.org> wrote:

Hello Traci,

We will get this to the developer. It's heading to a land use hearing next week so the Annexation package is nearly complete. We can add this to the packet and a condition of approval will be that prior to submitting the Preliminary Plat, that they work with the County. It looks like the County is requesting the full width of 15 be annexed. The applicant will need to address this right away. The applicant's representative is copied on this email.

Sincerely,

Anne

From: Traci Shambo <shambotl@co.larimer.co.us>

Sent: Friday, October 4, 2024 3:24 PM

To: Anne Johnson <AJohnson@berthoud.org>

Cc: eng-devrev <eng-devrev@larimer.org>

Subject: Re: Town of Berthoud - Referral - River Trails Annexation, Zoning and Neighborhood Master Plan

Anne -

I realize that these comments below are past the due date. I still wanted to send them just in case the applicant and their team are still working on revisions to other's comments. We hope that the Town and the applicant can still address these comments from Larimer County Engineering with their next submittal. Thank you for your consideration.

County Road Impacts:

- County Staff is concerned with the increased impacts to CR 6C. This segment remains a gravel surface and the bridge over the Little Thompson is narrow (approx.. 22 ft wide). The road and structure function adequately with the current low traffic volumes but, with 400+ new lots, the road will need paving and widening to be able to accommodate the increased trip generation.
- We ask that the Town and applicant consider, and mitigate where practicable, any potential impacts of increased traffic to Springhill Lane since it is currently not a through connection to E Nebraska Ave.

Annexation limits:

- We ask that the full width of ROW for CR 15 be annexed into Berthoud at the west side of the annexation adjacent to the development.
- County Engineering Staff would like clarification if the bridge over the Little Thompson River is included in the proposed annexation. We would ask that the bridge is included as a minimum.
- We are also requesting that the full ROW for CR 6C is annexed from east of the bridge to County Line Rd (CR 13) so that there is not a 0.20 mile long enclave of CR 6C left in the County. Full annexation of this segment of roadway is important because the increased traffic on this section of road will likely require significant capacity and surface/pavement improvements, plus increased maintenance needs in the future. Given this, it is the County preference that Berthoud take ownership of the entire length of CR 6C from CR 15 to CR 13, especially since County Rd 13 is already in the Town of Berthoud at the CR 6C and CR 13 intersection.

Floodplain:

- There are several lots within this proposed development that are located within the FEMA Zone AE (Flood Fringe) floodplain. These lots will be subject to the applicable floodplain regulations in place at the time of development and any development will require a floodplain development permit prior to initiation of construction. Please note that development includes any manmade change to improved and unimproved real estate, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavating, or drilling operations or storage of equipment or materials.
- County Staff would require that Base Flood elevations be shown on the construction plans per FEMA (44 CFR 60.3 and FEMA definition of a

subdivision) regulations since this development is over 50 lots. The FEMA floodplain boundaries should be shown on the plat and include a plat note stating that the floodplain boundaries are subject to change and the applicant should contact the regulatory authority for the latest floodplain regulations and boundaries.

- Any improvements to the roads within the floodplain will require a floodplain permit. Improvements within the FEMA Zone AE (Floodway) floodplain will require a no-rise analysis performed by a CO licensed Professional Engineer versed in fluvial hydraulics. Changes to the structure over the Little Thompson River may require a FEMA CLOMR/LOMR and County Flood Review Board review.

-

-

On Mon, Aug 5, 2024 at 1:36 PM 'Anne Johnson' via eng-devrev <Eng-DevRev@co.larimer.co.us> wrote:

Hello and hope all is well.

The Town of Berthoud has received a Petition for Annexation, and applications for a Zoning Request and a Neighborhood Master Plan. The properties are currently undeveloped. The attached Project Summary Sheet and Mapping document provides a brief overview of the proposed project. If the properties are annexed and zoned, and the Neighborhood Master Plan is approved, the next steps will include a Preliminary Plan and a Final Plat. These will come at a later date and referral agencies will be contacted for comments for these applications.

Additional application materials will be available for review tomorrow. You may review at the following link by scrolling to the “River Trails” case listing:

<https://www.berthoud.org/180/Current-Development-Review-Projects>

Provide any referral comments to me before August 26, 2024. Any response not received before or on August 26, 2024 will be considered a positive response from your agency to the Town of Berthoud, and that your agency has no concerns with the proposed requests.

Let me know if you have any questions.

Sincerely,
Anne



Anne Best Johnson, AICP MBA

Community Development Director

Phone: 970.344.5818

ajohnson@berthoud.org

Berthoud.org

807 Mountain Ave. Berthoud, CO 80513

Town Hall Hours:

Monday through Thursday

0700-1730



All messages sent or received by this address may be subject to public disclosure pursuant to the Colorado Open Records Act (CORA) C.R.S. 24-72-200.1 et seq.

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Larimer County



Traci Shambo, PE, CFM

Senior Civil Engineer

Engineering Department

200 W Oak St, Fort Collins, 80522 | 3rd Floor

Phone: (970) 498-5701

tshambo@larimer.org | www.larimer.org

--

Larimer County



Traci Shambo, PE, CFM

Senior Civil Engineer

Engineering Department

200 W Oak St, Fort Collins, 80522 | 3rd Floor

Phone: (970) 498-5701

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Larimer County



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Phone: (970) 498-5701

tshambo@larimer.org | www.larimer.org

From: kristin@tbgroupp.us
To: [Anne Johnson](#)
Subject: FW: FW: Annexation - impact to school district
Date: Friday, September 20, 2024 3:41:59 PM

For your records....

TSD has confirmed that they are not requesting a school site and they project 179 students.

Best,
Kristin

Kristin Turner
Managing Partner

TB | Group

landscape architecture | planning

444 Mountain Avenue
Berthoud, Colorado 80513
970.532.5891 x105
Kristin@TBGroup.us
www.TBGroup.us

From: Ryan Baker <ryan.baker@tsd.org>
Sent: Friday, September 20, 2024 2:45 PM
To: kristin@tbgroupp.us
Subject: Re: FW: Annexation - impact to school district

Hello Kristen,

Using our standardized School Planning formula for new development I am projecting:

74 Elementary students
44 Middle student
61 High Students

Our yield ratios are broken into two categories- 1-4 attached units and 5+ attached units with the 1-4 attached unit yield ratio being slightly higher than the 5+ yield ratio.
Regarding your last statement, we do not have a site in the Ludlow development.

Let me know if you need anything else.

Best,

On Fri, Sep 20, 2024 at 1:54 PM kristin@tbgroupp.us <kristin@tbgroupp.us> wrote:

Hello –

I wanted to follow-up regarding my original email (please see below). Please let me know what information you might be able to provide.

Best,
Kristin

Kristin Turner
Managing Partner

TB | Group

landscape architecture | planning

444 Mountain Avenue
Berthoud, Colorado 80513
970.532.5891 x105
Kristin@TBGroup.us
www.TBGroup.us

From: kristin@tbgroupp.us

Sent: Tuesday, September 10, 2024 1:24 PM

To: Todd Piccone <todd.piccone@tsd.org>; ryan.baker@tsd.org

Subject: Annexation - impact to school district

Hi Todd & Ryan–

We are proposing an annexation in Berthoud. As part of that we need to include information on how this will impact the school district. In the past, this is typically information you have provided to us. Do you have a multiplier for number of students per household that I should be using to calculate anticipated number of students.

I believe you've already received this as a referral agency, but I've included the plan with unit counts and unit types for your reference. If you can assist with how I should calculate potential number of students, that would be very helpful. I am assuming you have not targeted this site for a future school site since you have the Ludlow, Heron Lakes and Farmstead properties as options but please let me know if this is not accurate.

Thank you in advance for your assistance.

Best,
Kristin

Kristin Turner
Managing Partner

TB | Group

landscape architecture | planning

444 Mountain Avenue
Berthoud, Colorado 80513
970.532.5891 x105
Kristin@TBGroup.us
www.TBGroup.us

--

Ryan Baker
Planning Manager
Thompson School District
(o) 970-613-5663 (c) 970-698-1701



COLORADO
Parks and Wildlife
Department of Natural Resources

Area 2/ Lon Hagler SWA
4207 W CR 16E
Loveland, CO 80537
P 970.472.4460

September 30th, 2024

Anne Best Johnson
Town of Berthoud
Community Development Director
807 Mountain Ave. Berthoud, CO 80513
ajohnson@berthoud.org

RE: Request for comments on the Rivers Trails Annexation, 2nd Submittal

Dear Ms. Johnson:

Thank you for the opportunity to comment on the Rivers Trails Annexation, Change of Zone and Neighborhood Master Plan. The mission of Colorado Parks and Wildlife (CPW) is to perpetuate the wildlife resources of the state, to provide a quality park system, and to provide enjoyable and sustainable outdoor recreational opportunities that educate and inspire current and future generations to serve as active stewards of Colorado's natural resources. Our goal in responding to land use proposals such as this is to provide complete, consistent, and timely information to all entities who request comment on matters within our statutory authority.

Colorado Parks and Wildlife has performed an assessment of the project for impacts to wildlife and wildlife habitat. The project site located south of E CR 6C and east of S CR 15 can be described as previously used agricultural with the Little Thompson River flowing southwest to northeast along the lower portion of the parcel.

Raptors and Other Birds

The lower 2/3 of the parcel is described as foraging habitat for raptors including bald eagles and great blue herons. Raptors, which include hawks, eagles, and owls, are protected under the Federal Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. If earthwork or other construction is to begin between February 1 and July 31st, CPW recommends that a survey for nesting raptors be performed just prior to initiation of earthwork or other construction activities. If raptor nests are detected during the survey, CPW has developed a set of seasonal restrictions and recommended setbacks (buffer zones) away from these nests to minimize disturbances to these nests. These recommendation can be found at:



Jeff Davis, Director, Colorado Parks and Wildlife
Parks and Wildlife Commission: Dallas May, Chair · Richard Reading, Vice-Chair · Karen Bailey, Secretary · Jessica Beaulieu
Marie Haskett · Tai Jacober · Jack Murphy · Gabriel Otero · Murphy Robinson · James Jay Tutchton · Eden Vardy

<https://cpw.state.co.us/Documents/WildlifeSpecies/LivingWithWildlife/Raptor-Buffer-Guidelines.pdf#search=Raptor%20nest%20guidelines>

Aquatic Habitat Serving as Wildlife Corridor

The corridor surrounding the Little Thompson River is described by CPW as a concentration area for white-tailed deer. Waterways such as rivers, ditches, creeks, and canals serve as movement corridors for many species of wildlife such as raccoons, coyotes, foxes, and deer and more. Fish species may also be present in this section of the Little Thompson River such as creek chub, longnose dace, fathead minnow, and white suckers.

Intact and functioning riparian areas and wetlands are widely recognized for their ability to perform a variety of critical ecological functions. These functions include stabilizing stream channels; providing erosion control by regulating sediment storage, transport, and distribution; providing organic matter (e.g., leaves and large woody debris) that is critical for aquatic organisms; serving as nutrient sinks for the surrounding watershed; providing water temperature control through shading; reducing flood peaks; and serving as key recharge points for renewing groundwater supplies.

Acute water quality changes due to excessive sedimentation from poor construction storm water management practices and dewatering activities can suffocate developing fish eggs attached to gravel river bottom substrate. In addition, long term impacts associated with upland and riparian vegetation removal can also contribute to changes in water quality. CPW continues to recommend a construction buffer of at least 300 feet on both sides of the Little Thompson River to avoid impacts to intact riparian areas and aquatic habitat.

Avoiding Conflicts with Wildlife

Future residents should be informed that wildlife such as fox, coyotes, raccoons, rabbits, and skunks might frequent the development area in search of food and cover. These species have adapted well to living in urban environments. CPW recommends that people moving into and residing in this area take the proper precautions to prevent unnecessary conflicts with wildlife through the use of pet leash laws and protection of their pets when not under direct supervision.

Homeowners can do their part by not inviting wildlife into their yards. Due to the potential for human-wildlife conflicts associated with this project, please consider the following recommendations when educating future homeowners about the existence of wildlife in the area:

- Pet foods and bowls should be kept indoors.



Jeff Davis, Director, Colorado Parks and Wildlife

Parks and Wildlife Commission: Dallas May, Chair · Richard Reading, Vice-Chair · Karen Bailey, Secretary · Jessica Beaulieu
Marie Haskett · Tai Jacober · Jack Murphy · Gabriel Otero · Murphy Robinson · James Jay Tutchton · Eden Vardy

- Garbage should be kept in secure containers to minimize its attractiveness to wildlife.
- Feeding wildlife, with the exception of birds, is illegal.
- "Living with Wildlife" pamphlets are available through CPW offices or online.

For further information, CPW can provide copies of the following brochures "Your Guide to Avoiding Human-Coyote Conflicts, Don't Feed the Wildlife", and "Too Close for Comfort: Avoid Conflicts with Wildlife in the City" to residents of the surrounding open space. These brochures can also be downloaded from our web site at

http://wildlife.state.co.us/Education/CoExisting_with_wildlife/.

Preble's Meadow Jumping Mouse

The proposed project area may provide suitable habitat for the federally threatened Preble's meadow jumping mouse. CPW recommends that the landowner or developer contact the USFWS for more information about this species and its distribution in the area to ensure compliance with the Endangered Species Act.

Noxious Weeds

Development projects such as this cause ground disturbance which often promotes the growth of noxious weeds within the project perimeter and the surrounding areas. Noxious weeds can reduce the value of property and the quality of wildlife habitat. Care should be taken to avoid spreading and introducing noxious weeds. Construction equipment should be cleaned periodically to remove weed seeds before unloading at the site and before removal from the site. The area should be promptly re-vegetated using seed and plant stock suitable for the site to prevent erosion and invasions by weeds. We would encourage working with the local invasive weed specialist in developing a suitable plan for the site.

Again, thank you for the opportunity to review and comment on the proposed land development project. CPW is committed to working with landowners and developers, as well as city and county agencies to minimize significant negative impacts to wildlife or habitat throughout Colorado. Should any questions or concerns arise regarding this project (including timing or scope), please feel free to contact CPW District Wildlife Manager Nicholas Cundall at 303-906-7870, or nicholas.cundall@state.co.us.

Sincerely,



Chris Mettenbrink
Assistant Area Wildlife Manager

Cc: Mark Leslie, Jason Duetsch, Nick Cundall, and file.



From: [Emmett Culligan](#)
To: [Anne Johnson](#)
Cc: [Maria Culligan](#)
Subject: River Trails Submittal
Date: Monday, August 26, 2024 12:06:46 PM

You don't often get email from emmett@ecd-co.com. [Learn why this is important](#)

Dear Ann, I think it is fair to say that those of us neighbors living along County Road 6c we were shocked upon seeing the development proposal south of County Rd 6c. Here are some thoughts regarding the Turner submittal that all of us living along this corridor would respectfully like the town managers to consider:

1. We understand that development is inevitable but is this very **hi density** proposal really appropriate in this parcel considering the Little Thompson River provides essential habitat and Thorofare for numerous wildlife species that we have all seen and personally witnessed? Keep in mind that the submittal says that no wildlife activity in the area was witnessed. On a regular basis we see Elk, bears, raptors, eagles, owls and tortoises just to name a few.

2. From a zoning stand point this level of density doesn't make sense for several reasons:

a. The Large parcel directly to the east, owned by FFA will not be developed to preserve and educate about agrarian heritage and innovative farming techniques. Placing this very high density development adjacent to this does not make sense in our opinion.

b. The 8-10 properties situated on the northside of 6c located in Larimer county and zoned rural residential would in essence become "sandwiched" in-between Berthoud's new neighborhood developments to the north and the High Density River Trails development to the south. This doesn't seem to be a logical transition. From a planning standpoint are the town managers wanting to annex all of our properties into the town as well for future development?

Ann, we understand that the Town of Berthoud is obliged to find and create incentives for "affordable housing" opportunities. However, can we not find alternative locations for this imperative considering both the existing agrarian properties as well as the documented wildlife habitat that we have all come to cherish? I think all of us agree that some sort of development will take place in this parcel but can we at least consider a less dense approach, i.e., 50-100 units instead of 350??

Thanks,

Emmett Culligan

President



ECD Metalworks
222 Springhill Lane
Berthoud, CO 80513
office - 303-433-1412
cell - 303-507-5275
fax - 303-433-1662
email - emmett@ecd-co.com
web site – www.ecd-co.com
art web site – www.emmettculligan.com

From: [Maria Culligan](#)
To: [Anne Johnson](#)
Cc: [Emmett Culligan](#)
Subject: Re: River Trails Submittal
Date: Monday, August 26, 2024 1:24:47 PM

Hello Anne,

In addition to this, I would like to add that we and some of our neighbors have livestock. we use the south gate of our property to bring in our livestock to our property. I can't imagine having to do this with the added traffic it would be so stressful to both us and the animals. Just south of us a neighbor had a few cattle escape. They came up to the "rivers Trails", and 6C. Thankfully, they were safe because that road doesn't have too much traffic on it. If any of our livestock or our neighbors livestock escapes, we would like for them to fair the same fate. With the possible added traffic, however, I doubt that they will be safe.

Second, the property just east of the "River Trails" was in a land trust that was acquired by CSU and is used by FFA. We have learned that at some point they will be teaching/learning on this property. The highly dense population west of that may make it difficult if they are trying to grow some experimental crop due to cross pollination or contamination.

We have also seen bird of prey like the bald eagles and ferruginous hawks hunt on our fields including the "river trails" fields. These birds of prey are so vital to keeping the ecosystems in our area.

Please consider these additional factors and how it will impact our in our neighbors lives since we do farm and have livestock on our properties.

Thank you for taking the time to read this and send to the appropriate committee.

Sincerely,
Maria Culligan
Sent from my iPhone

On Aug 26, 2024, at 12:09 PM, Anne Johnson <AJohnson@berthoud.org> wrote:

Dear Emmett and Maria,
Your email has been received and will be provided to the Town Board of Trustees and Planning Commission.

Sincerely,
Anne

From: Emmett Culligan <emmett@ecd-co.com>
Sent: Monday, August 26, 2024 12:07 PM
To: Anne Johnson <AJohnson@berthoud.org>

Cc: Maria Culligan <mari.mari@me.com>

Subject: River Trails Submittal

You don't often get email from emmett@ecd-co.com. [Learn why this is important](#)

Dear Ann, I think it is fair to say that those of us neighbors living along County Road 6c we were shocked upon seeing the development proposal south of County Rd 6c. Here are some thoughts regarding the Turner submittal that all of us living along this corridor would respectfully like the town managers to consider:

1. We understand that development is inevitable but is this very **hi density** proposal really appropriate in this parcel considering the Little Thompson River provides essential habitat and Thorofare for numerous wildlife species that we have all seen and personally witnessed? Keep in mind that the submittal says that no wildlife activity in the area was witnessed. On a regular basis we see Elk, bears, raptors, eagles, owls and tortoises just to name a few.

2. From a zoning stand point this level of density doesn't make sense for several reasons:

a. The Large parcel directly to the east, owned by FFA will not be developed to preserve and educate about agrarian heritage and innovative farming techniques. Placing this very high density development adjacent to this does not make sense in our opinion.

b. The 8-10 properties situated on the northside of 6c located in Larimer county and zoned rural residential would in essence become "sandwiched" in-between Berthoud's new neighborhood developments to the north and the High Density River Trails development to the south. This doesn't seem to be a logical transition. From a planning standpoint are the town managers wanting to annex all of our properties into the town as well for future development?

Ann, we understand that the Town of Berthoud is obliged to find and create incentives for "affordable housing" opportunities. However, can we not find alternative locations for this imperative considering both the existing agrarian properties as well as the documented wildlife habitat that we have all come to cherish? I think all of us agree that some sort of development will take place in this parcel but can we at least consider a less dense approach, i.e., 50-100 units instead of 350??

Thanks,

Emmett Culligan

President

<image001.gif>

ECD Metalworks
222 Springhill Lane
Berthoud, CO 80513
office - 303-433-1412
cell - 303-507-5275
fax - 303-433-1662
email - emmett@ecd-co.com
web site – www.ecd-co.com
art web site – www.emmettculligan.com

From: [Rocky Mountain](#)
To: [Anne Johnson](#)
Subject: River Trails Development South of CR 6C
Date: Monday, August 26, 2024 2:54:32 PM

You don't often get email from db.flynn88@gmail.com. [Learn why this is important](#)

Good Afternoon

We are writing regarding the River Trails Development South of CR 6C, we would like to voice concerns of the density of the proposed subdivision and the traffic hazards on County Road 6C. As long time residents of County Road 6C we feel that the unpaved road is not suited to handle the traffic of such a high density subdivision. The road has a narrow bridge "virtually single lane" and is an unpaved and is sometimes a hazardous terrain road. Traffic concerns are to an extreme with the Farmstead development (CR 13 & hwy 56) and County Road 13 being the main road used for that subdivision and with the proposed River Trails Development using 6C in two different entrances and exits would put even more traffic onto County Rd 13. There is not enough infrastructure to sustain the amount of traffic of the proposed subdivision. 6C is already used as a cut across to town and used by both commercial and private vehicles.

Also the proposed subdivision is an obtrusive amount of units for the area. The current houses along road 6C are all on at least 3+ acres and are agricultural based. The proposed development does not take into the account of the agricultural area and the density (especially the multi-family units and the closeness of the housing) would be an eye sore and decrease the property values of the current homes.

The town sewer is not big enough to support that high density. There is at least 50 days a year that it smells horrendous and we wonder it is up to regulations on size for the amount of usage especially with the addition of the Farmstead multi-family and the proposed River Trails Development. The houses along 6C are on septic and are not tied into the town sewer.

Please contact us at your convenience.

Shawn & Dana Flynn
1060 E County Rd 6C
970-390-8111, 303-588-6513

Sent from [Mail](#) for Windows

From: [David Hershman](#)
To: [Anne Johnson](#)
Subject: Proposed River trails development
Date: Monday, August 26, 2024 12:17:04 PM

[You don't often get email from hersyman@msn.com. Learn why this is important at <https://aka.ms/LearnAboutSenderIdentification>]

Hello, my name is David Hershman I live north of the proposed River trails development and seeing the proposed plan I'm totally against this much high density anywhere let alone right in front of my property. There is no room for parking no room for trees. The small units will have people moving in and out of there cause nobody will be happy living with that sort of density. The town of Berthoud should not make the same mistakes they made with the Mary's farm subdivision. The roads are too narrow if anyone parks two cars can't pass each other on the road the alleys are clear full of cars and RVs. The density is just too high and it was just not designed well, all because the developer only wanted to make lots of money and not build a better neighborhood!
Sent from my iPad

Anne Johnson
Community Development Director
Town of Berthoud
807 Mountain Ave.
P.O. Box 1229
Berthoud, CO 80513

August 23, 2024

REFERENCE: **River-Trails RR2 Subdivision** proposal and the annexation of this land into the town of Berthoud

Dear Ms. Johnson and Members of the Planning Commission,

This letter is in reference to the proposed Subdivision, River- Trails RR2, and the annexation of the land into the city of Berthoud. We are extremely concerned the above-mentioned proposed development will create an unacceptable standard of living on the new development, for the large acreage neighbors on County Road 6C (whom are not incorporated into the City of Berthoud), and the indigenous wildlife which currently migrate through and reside in the River Trail wetlands, including foxes, owls, coyotes, black bears, hawks, bald eagles, deer, and elk, which all roam and/or live on the River Trail.

We strongly believe, the placement of 400-500 small acreage lots proposed by the developer may maximize their profits, but will result in funneling of 500-700 new passenger vehicles twice daily, onto County Road 6C, and the total degradation of the existing river/wetland habitat, will negatively affect the quality of life of Berthoud and the surrounding area. The Garden City of Berthoud will be transformed into a metropolis rather than the present small town, convivial atmosphere which we currently enjoy.

Although development and expansion of the City of Berthoud is inevitable, we strongly reject the approval of develop planned numerous small lots and recommend the developer be obligated to increasing the lot sizes to 1- 1.5 acre lots thereby significantly reducing the developments impact of the southern neighborhoods of Berthoud and specifically County Rd 6C vis a vis traffic and ecology degradation.

In conclusion, we urge the Planning Commission to reject this annexation and development proposal, prioritizing the preservation of Berthoud's environment, small-town character, and agricultural integrity. Let us protect the wildlife habitat of Owl Valley and ensure that future generations can enjoy the beauty and tranquility of rural Colorado. The unique small town of Berthoud shall cherish their ability to remain a small, friendly rural and agricultural community, to be enjoyed by all.

Thank you for your time and consideration of our concern for our neighborhood and the uniqueness of our beautiful Berthoud community

Marshall & Karen Perry
550 East. County Rd 6C
Berthoud, CO 80513

August 25, 2024

Dave & Val Perry
418 E. County Road 6c
PO Box 1738
Berthoud, CO 80513

Anne Johnson
Community Development Director
Town of Berthoud
807 Mountain Ave.
P.O. Box 1229
Berthoud, CO 80513

Dear Ms. Johnson and Members of the Planning Commission,

We would like to express several concerns we have with the proposed development adjacent to County Road 6c (90-Acre River-Trails RR Subdivision) here in Berthoud.

Traffic:

With over 400 homes and assuming 2/cars per household, that is adding considerable traffic to both County Rd 15 (North/South) as well as County Rd 6c (East/West).

Traffic patterns from this development will undoubtedly impact getting into and from Berthoud, as well as down 6c from/to County Rd 1. 6c is currently a dirt road, used by locals for, exercise, walking their dogs, riding horses, as well as the High School Track Team(s) use it as part of their training.

Noise:

Today, the property we own is quiet, with amazing views, part of the reason we moved here 24 years ago. The sheer noise from over 400 homes/dogs/children/automobiles/lawn mowers, etc., will have a major impact on the peace and quiet we currently enjoy.

August 25, 2024

Wildlife Impact

This area is home to Hawks, Owl's, Foxes, Coyotes, Geese to name a few. This development will all but eliminate their homes and ultimately them.

Livestock:

The serenity that is present with the properties along CR 6c, bode well for the horses, dogs, cats, etc. that are naturally a product of country life. The increased noise, smells, pollution from this development cannot have a positive impact on them.

Property Valuation:

We have, as a great portion of our valuation, the views, and serenity that comes from living in the country. This massive development directly and negatively impacts that.

Flood:

The development area turned into a lake in the flood of 2013. Assuming they will have to mitigate this somehow, how will this further impact traffic, views, etc. Has the Corp of Engineering looked at this for future flooding & the impact it will have?

Health:

The increased pollution from this large development will substantially contribute to air, sound and ground pollution.

Schools:

What is the number of children that you have estimated that will be going to the Berthoud schools, the impact on the teachers, enough room in the classroom for extra students, busing (more pollution and noise from the buses), routes, what road will they be using County Road 6c, or County Road 15, etc., are teachers able to handle the influx of more children in their classrooms, are they overcrowded now, do they have enough help, etc. Basically, what is this going to do to the Berthoud School system and the teachers.

Properties in this area are all on acreage. Developing a subdivision of this magnitude is not keeping with the lay/landscape of the land. We feel the

August 25, 2024

developer & the Town of Berthoud should keep the landscape the same if it is developed; it should be acreage lots, not “city size” lots. We all have acreage; we’re not in the Town & don’t want to be, that is why we all bought where we bought and don’t want to see a town across from us.

We firmly stand against the River-Trails RR2 Subdivision proposal and the annexation of this land into the Town of Berthoud. You will be erasing our agricultural heritage and rural values that we and the residents on 6c hold dear.

We urge the Planning Commission to reject this annexation and development proposal, prioritize Berthoud’s environment, small-town character and agricultural integrity.

Thank you for your time and consideration.

Sincerely,
Dave and Val Perry

From: [Anne Johnson](#)
To: [Jeff Riley](#)
Bcc: kristin@tbgroup.us
Subject: RE: Berthoud - River Trails - Annexation
Date: Friday, August 30, 2024 11:35:00 AM
Attachments: [image001.png](#)

Dear Jeff,

My role is to ensure the vision in the Comprehensive Plan and the legislative requirements of the Land Use Code are met. The Town Trustees and the Planning Commission hear testimony and have a set of criteria that needs to be met for consideration of approval of any land use matter. It is important for residents and neighbors to understand the vision of the Future Land Use Map.

You may find the application file here: <https://www.berthoud.org/> Go to “Departments” and the “Planning”. On the left hand side you will see “Current Development Review Projects” and click this link and see the “River Trails” bubble.

You may find the future land use map here: <https://www.berthoud.org/> Go to “Departments” and the “Planning”. See the bubble “Comprehensive & Master Plans” and when you click on this, there are several maps and plans to review.

Sincerely,
Anne

From: Jeff Riley <JRiley@sourcefour.com>
Sent: Friday, August 30, 2024 11:15 AM
To: Anne Johnson <AJohnson@berthoud.org>
Subject: RE: Berthoud - River Trails - Annexation

You don't often get email from jriley@sourcefour.com. [Learn why this is important](#)

Thanks for the reply. Only 500 ft? That's interesting.

This link doesn't work can you try a different one?

<https://gcc02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww>

We would like to know more and provide input. My experience and the reputation of Berthoud is that input falls on deaf ears and Berthoud does whatever is good for whoever is in council at the time. Which is unfortunate. Maybe you and current council can change that.

I will discuss with the neighbors.

Jeff Riley
source four | CEO

o. 303.893.1515
m. 720.939.2013



source FOUR

www.sourcefour.com

Simplifying The Furniture Design + Selection Process

From: Anne Johnson <AJohnson@berthoud.org>

Sent: Friday, August 30, 2024 9:42 AM

To: Jeff Riley <JRiley@sourcefour.com>

Subject: Berthoud - River Trails - Annexation

Dear Jeff,

Your email has been received and will be provided to the Town Board of Trustees and the Planning Commission.

Notice to surrounding property owners within 500' of the project site will be provided once the Town has determined if there is interest in hearing the application. The first step is to determine if the application has been filed in accordance with State Statute and if there is interest by the Town to hear the proposed development. If the Town Board determines the petition has been filed correctly, then hearing dates will be established and surrounding property owners will be notified. If you'd like to understand the process of annexation and land use review, let me know when you are available so I can set aside time for you.

I encourage you to review the application file. The file can be found here:

<https://gcc02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.berthoud.org/DocumentCenter/View/281/Future-Land-Use-Map-PDF>. The Traffic Impact Analysis is included with preliminary improvements and can be found on page 95 of the 236-page packet uploaded for public review. If the project is annexed, zoned and the Neighborhood Master Plan approved, the next steps include a Preliminary and Final Plat. It is during these final two stages that details such as engineering road improvements, utilities, etc. are evaluated in greater detail.

The Future Land Use Map part of the Comprehensive Plan can be found here:

<https://www.berthoud.org/DocumentCenter/View/281/Future-Land-Use-Map-PDF> This map was established by the Town to guide future development. Suburban Residential was envisioned for this property.

The southern quarter section has been purchased by the Town for agricultural purposes. The portion of the property north of the river is proposed for development.

If you and your neighbors would like to better understand the land use planning process and the future land use map/comprehensive plan, you are welcome to set up a call with me and I can walk through these stages with you.

Sincerely,
Anne

From: Jeff Riley <JRiley@sourcefour.com>
Sent: Friday, August 30, 2024 9:26 AM
To: Anne Johnson <AJohnson@berthoud.org>
Subject: The planned development on 6C

You don't often get email from jriley@sourcefour.com. [Learn why this is important](#)

To The Town of Berthoud:

I was informed by a neighbor of the development on 6C. I have not received any information on this from the town of Berthoud.

We have lived here for 32 years and although we understand the importance of tax revenue and growth, there are concerns you are not considering that this area has a significant history of Agriculture and Ranching. This is a semi rural area and although we understand development is inevitable, this is a pocket of area that should remain as such. Putting that land in larger lots to enhance this area would be much more consistent with the local residents that reside in the area.

We would appreciate your consideration in not over building this and making it look and feel like Aurora or Highlands Ranch. That's not what Berthoud is and we hate to see this happen. This area is an asset for the town which has a rich history in caring for the land and the people that reside in it.

6C and County Road 13 (County Line Road) has become congested and out of control with extreme speeding and illegal activity. **There are 12 turn ins in less than ¼ mile between the gun club and 6C, yet there are no controls to slow people down as vehicles are entering and exiting off these roads.** These intersections include residential access, Cattle trailers, Farm Tractors, Irrigation, Farm and Sewer plant access.

The hazard and disregard for the properties are already being pushed to the limit.

What is being considered for speed and traffic congestion for this area?

After decades of functioning with low interferences, the congestion would increase this problem significantly if that area is developed in the proposed plan that I saw.

It might be worth considering moving 6C south ¼ a mile to the south side of John Sullivans property and make that an entry point to County Road 13 and 1st street.

I trust and hope a conversation and a reasonable plan is being considered after discussing one with the people that live here.

Please let us know.

Jeff Riley
321 S. County Road 13
Berthoud CO 80513
720 939 2013

From: [Anne Johnson](#)
To: [Jeff Riley](#)
Bcc: kristin@tbgroun.us
Subject: Berthoud - River Trails - Annexation
Date: Friday, August 30, 2024 9:41:00 AM

Dear Jeff,

Your email has been received and will be provided to the Town Board of Trustees and the Planning Commission.

Notice to surrounding property owners within 500' of the project site will be provided once the Town has determined if there is interest in hearing the application. The first step is to determine if the application has been filed in accordance with State Statute and if there is interest by the Town to hear the proposed development. If the Town Board determines the petition has been filed correctly, then hearing dates will be established and surrounding property owners will be notified. If you'd like to understand the process of annexation and land use review, let me know when you are available so I can set aside time for you.

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Sincerely,
Anne

From: Jeff Riley <JRiley@sourcefour.com>
Sent: Friday, August 30, 2024 9:26 AM
To: Anne Johnson <AJohnson@berthoud.org>
Subject: The planned development on 6C

■

You don't often get email from jriley@sourcefour.com. [Learn why this is important](#)

To The Town of Berthoud:

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We have lived here for 32 years and although we understand the importance of tax revenue and growth, there are concerns you are not considering that this area has a significant history of Agriculture and Ranching. This is a semi rural area and although we understand development is inevitable, this is a pocket of area that should remain as such. Putting that land in larger lots to enhance this area would be much more consistent with the local residents that reside in the area.

We would appreciate your consideration in not over building this and making it look and feel like Aurora or Highlands Ranch. That's not what Berthoud is and we hate to see this happen. This area is an asset for the town which has a rich history in caring for the land and the people that reside in it.

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The hazard and disregard for the properties are already being pushed to the limit.

What is being considered for speed and traffic congestion for this area?

After decades of functioning with low interferences, the congestion would increase this problem significantly if that area is developed in the proposed plan that I saw.

It might be worth considering moving 6C south ¼ a mile to the south side of John Sullivans property and make that an entry point to County Road 13 and 1st street.

I trust and hope a conversation and a reasonable plan is being considered after discussing one with the people that live here.

Please let us know.

Jeff Riley
321 S. County Road 13
Berthoud CO 80513
720 939 2013

From: [James Sewczak](#)
To: [Anne Johnson](#)
Subject: Rivers Trail Proposal
Date: Monday, August 26, 2024 11:41:16 AM

You don't often get email from jsewczak@zakdirt.com. [Learn why this is important](#)

August 26, 2024

James and Kerry Sewczak
247 Springhill Lane
Berthoud CO 80513

Anne Johnson
Community Development Director
807 Mountain Avenue
P.O. Box 1229
Berthoud CO 80513

Re: Proposal for Rivers Trail Development

Dear Ms. Johnson and Members of the Planning Commission:

We have lived and raised our family at our home, 247 Springhill Lane, for over 40 years. In our time in Berthoud, we have diligently worked to preserve and improve the rural culture that has been intrinsic to our little slice of heaven on Springhill Lane and this area in general. This culture has been consistently supported over decades by the adjacent Lewis and Beefus farms. This eastern area of Berthoud has already been greatly impacted by the large housing developments to the north (Farmstead) and west, across the railroad tracks. We are in full agreement with the comments sent to you from our neighbors, Rick and Joyce Stoner. Our main areas of concern are:

- The environmental impact on the subject property as well as the adjacent properties
- The loss of rural culture which sets Berthoud apart from our neighboring communities
- The limited current capacity of schools in Berthoud
- The tremendous impact that a high density development will have on the current in place infrastructure

We are owners of a heavy/highway construction company that has built numerous bridges and constructed improvements on hundreds of miles of road throughout the state of Colorado. The existing one lane bridge and gravel road on County Road 6C is highly inadequate for the density of the proposed development. In the range of \$5-6 million will be necessary for improvements to the existing one lane bridge over Little T, the existing gravel surface of CR 6C and the adjoining intersections at County Line Road on the east and First Street on the west. **Who will bear the cost of these essential improvements, the developer or the taxpayers?**

In closing, we are strongly opposed to this annexation and development as proposed.

Sincerely,

Jim and Kerry Sewczak

From: [Anne Johnson](#)
To: ["Richard Stoner"](#)
Subject: RE: River-Trails - an ecological disaster for Berthoud residents
Date: Monday, August 26, 2024 1:31:00 PM

Dear Richard,

Your comments have been received and will be presented to the Town Board of Trustees and Planning Commission.

Sincerely,

Anne

From: Richard Stoner <rstoner@agrihouse.com>
Sent: Monday, August 26, 2024 1:29 PM
To: Anne Johnson <AJohnson@berthoud.org>
Subject: River-Trails - an ecological disaster for Berthoud residents

Richard and Joyce Stoner

333 Springhill Lane
Berthoud, CO 80513
August 23, 2024

Anne Johnson

Community Development Director
Town of Berthoud
807 Mountain Ave.
P.O. Box 1229
Berthoud, CO 80513

Dear Ms. Johnson and Members of the Planning Commission,

My wife, Joyce, and I have lived at 333 Springhill Lane since 1988, where we raised our children, who graduated from Berthoud schools. Our home overlooks the 90 acres associated with the proposed River-Trails R2 subdivision. I am writing to express our deep concerns about this development and to highlight the significant environmental and infrastructural impacts that have been overlooked.

Environmental Concerns: The Impact on Owl Valley

The proposed development claims it will have minimal environmental impact on the river and surrounding areas, but this assertion is far from accurate. Our property is situated in what is locally known as "Owl Valley," named for the resident owls that have nested along the Little

Thompson River for generations. This valley is not just a picturesque location; it is a critical habitat for a wide array of wildlife, including:

- Elk
- Moose
- Eagles
- Foxes
- Bears
- Cougars
- Coyotes
- Bobcats
- Raccoons
- Beavers
- Ducks
- Geese
- Hawks
- Blue Herons
- Doves
- Flickers

I have photographic evidence of moose tracks and eagles, among other wildlife, that frequent this area. Thousands of geese use both sides of the valley as breeding grounds, and owls have made this their home. This unique ecosystem should be preserved, not disrupted by development. The balance between humans and wildlife in this area is delicate, and introducing such a large-scale project would undoubtedly tip the scales, resulting in the loss of critical habitats.

Agricultural Significance

The farmland in this valley holds significant agricultural value, contributing 65% of agricultural importance to the state, as cited in a previous Berthoud Comprehensive Growth Plan. The Lewis farm, which borders the east side of the proposed development, is part of this vital agricultural land. Disrupting this land for development not only undermines its agricultural value but also disregards the long-term sustainability of our community.

Infrastructural Concerns: Water and Access

The proposal fails to address the critical issue of water supply. The water main for this development is proposed to cross my property. However, let it be known that I will not grant an easement for any water main across my land. Springhill Lane, a private lane not maintained by the county, is also impacted by this development. The water main extension onto my property is not only unnecessary but also unfeasible. The proposal does not take into account the absence of access or easements required for such an extension.

Furthermore, the developers have overlooked the importance of the single-lane bridge on County Road 6C that crosses the Little Thompson River. This bridge is a crucial passageway for the big game animals, allowing them to cross safely under the road without interfering with vehicular traffic. Any changes to this structure could have disastrous consequences for both wildlife and public safety.

Opposition to the Development

In summary, we are unequivocally opposed to any development in this valley, particularly along County Road 6C. The environmental impact will be devastating to the wildlife and natural habitats that define Berthoud. The proposed development threatens not only the ecological balance but also the agricultural and infrastructural integrity of our community.

This area is a rare ecological treasure, a "living zoo" where big game animals gather in herds, and where the Little Thompson River serves as a vital corridor to the mountains. We urge you to reconsider this development proposal and protect the Owl Valley from irreversible damage.

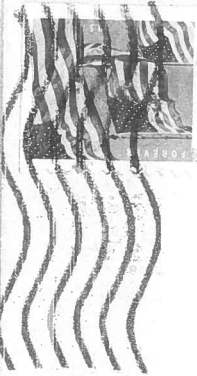
We are opposed to annexation and development of the River-Trail proposed development. Thank you for your time and consideration.

Sincerely,
Richard and Joyce Stoner

Cc: mailed on August 23rd, 2024



RICK STONER
333 SPRINGHILL LN
BERTHOUD, CO 80513-8102



DENVER CO 802

23 AUG 2024 PM 5 L

ANNE JOHANSON
TOWN OF BERTHOUD
807 MOUNTAIN
PO Box 1229
BERTHOUD, CO 80513

80513-222529



by from the valley floor to the
mountains. We will see the
some animals before they are
only the ecological services
to the wildlife and the people
in this valley. The valley floor is

Richard and Joyce Stoner

333 Springhill Lane
Berthoud, CO 80513

August 23, 2024

Anne Johnson

Community Development Director
Town of Berthoud
807 Mountain Ave.
P.O. Box 1229
Berthoud, CO 80513

RE: Objection to proposed Summary of the Proposal Annexation, Zoning and Neighborhood Master Plan (1st Submittal):

Dear Ms. Johnson and Members of the Planning Commission

My wife, Joyce, and I have lived at 333 Springhill Lane since 1988, where we raised our children, who graduated from Berthoud High School. Our home overlooks the 90 acres associated with the proposed River-Trails RR2 subdivision and annexation.

I am writing to express our deep concerns about this development and to highlight the significant environmental and infrastructural impacts that have been overlooked.

Environmental Concerns: The Impact on Owl Valley

The proposed development claims it will have minimal environmental impact on the river and surrounding areas, but this assertion is far from accurate. Our property is situated in what is locally known as "Owl Valley," named for the resident owls that have nested along the Little Thompson River for generations. This valley is not just a picturesque location; it is a critical habitat for a wide array of wildlife, including:

- Elk
- Moose
- Eagles
- Foxes
- Bears
- Cougars
- Coyotes
- Bobcats

- Raccoons
- Beavers
- Ducks
- Geese
- Hawks
- Blue Herons
- Doves
- Flickers

I have photographic evidence of moose tracks and eagles, among other wildlife, that frequent this area. Thousands of geese use both sides of the valley as breeding grounds, and owls have made this their home. This unique ecosystem should be preserved, not disrupted by development. The balance between humans and wildlife in this area is delicate, and introducing such a large-scale project would undoubtedly tip the scales, resulting in the loss of critical habitats.

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Furthermore, the developers have overlooked the importance of the single-lane bridge on County Road 6C that crosses the Little Thompson River. This bridge is a crucial passageway for the big game animals, allowing them to cross safely under the road without interfering with vehicular traffic. Any changes to this structure could have disastrous consequences for both wildlife and public safety.

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This area is a rare ecological treasure, a "living zoo" where big game animals gather in herds, and where the Little Thompson River serves as a vital corridor to the mountains. We urge you to reconsider this development proposal and protect the Owl Valley from irreversible damage.

We request that you reject the proposal in its entirety.

Thank you for your time and consideration.

Sincerely,

Richard and Joyce Stoner ^{RS}

From: [Anne Johnson](#)
To: [joyce.stoner](#)
Bcc: kristin@tbgroun.us
Subject: RE: Development at 6C
Date: Monday, August 26, 2024 4:12:00 PM

Dear Joyce,

Your email has been received and will be provided to the Town Board of Trustees and the Planning Commission.

Notice to surrounding property owners within 500' of the project site will be provided once the Town has determined if there is interest in hearing the application. The first step is to determine if the application has been filed in accordance with State Statute and if there is interest by the Town to hear the proposed development. If the Town Board determines the petition has been filed correctly, then hearing dates will be established and surrounding property owners will be notified. If you'd like to understand the process of annexation and land use review, let me know when you are available so I can set aside time for you.

I encourage you to review the application file. The file can be found here: <https://www.berthoud.org/180/Current-Development-Review-Projects>

The Future Land Use Map part of the Comprehensive Plan can be found here: <https://www.berthoud.org/DocumentCenter/View/281/Future-Land-Use-Map-PDF> This map was established by the Town to guide future development. Suburban Residential was envisioned for this property.

Sincerely,
Anne

Anne Best Johnson, AICP MBA
Community Development Director Phone: 970.344.5818
ajohnson@berthoud.org
Berthoud.org
807 Mountain Ave. Berthoud, CO 80513
Town Hall Hours:
Monday through Thursday
0700-1730

All messages sent or received by this address may be subject to public disclosure pursuant to the Colorado Open Records Act (CORA) C.R.S. 24-72-200.1 et seq.

-----Original Message-----

From: joyce stoner <joycekstoner@yahoo.com>
Sent: Monday, August 26, 2024 3:26 PM
To: Anne Johnson <AJohnson@berthoud.org>
Subject: Development at 6C

[You don't often get email from joycekstoner@yahoo.com. Learn why this is important at <https://aka.ms/LearnAboutSenderIdentification>]

Sent from my iPhone

Dear Ms. Johnson

As a resident who lives off of 6C the plans for this development are of concern. It doesn't seem quite right or proper protocol that the neighbors who will be affected were never approached and basically, found out about having over 400 homes plus apartments placed on this property. I am sure that you would agree that we should be informed of all future meetings and proceedings. The housing density that is proposed is alarming. The

town of Berthoud has long been proud of the “small town” atmosphere of this beautiful spot -please do not continue the pace of rapid growth that yet another large and dense development would erode.

I appreciate your attention to these concerns.

Sincerely,

Joyce Stoner

Springhill Lane

Date: Wednesday, August 28, 2024 7:59:05 AM

[You don't often get email from joyceekstoner@yahoo.com. Learn why this is important at <https://aka.ms/LearnAboutSenderIdentification>]

Dear Anne -
Thank you very much for your response and helping to clarify the steps of this development process. I appreciate your attention and time to this concern and for the websites provided. Thank you!
Sincerely,
Jovce Sijner

Sent from my iPhone

> On Aug 26, 2024, at 4:12 PM, Anne Johnson <AJohnson@berthoud.org> wrote:

[illegible]

> Sincerely,

> Anne Best Johnson, AICP MBA
> Community Development Director Phone: 970.344.5818
> ajohnson@berthoud.org
> Berthoud.org
> 807 Mountain Ave. Berthoud, CO 80513
> Town Hall Hours:
> Monday through Thursday
> 0700-1730

> All messages sent or received by this address may be subject to public disclosure pursuant to the Colorado Open Records Act (CORA) C.R.S. 24-72-2001 et seq.

2

> -----Original Message-----

> Sent: Monday, August 26, 2024 3:26 PM

> Subject: Development at 6C

> [You don't often get email from joyce@stonecr.]

> Sent from my iPhone

➤ As a resident who lives

> Sincerely,

> Springhill Lanc

From: [Anne Johnson](#)
To: ["Richard Stoner"](#)
Cc: [Culligan, Emmett](#); john.d.bailey@gmail.com; [Swezack](#); jem70@mailbox.org; mperry@marshalgroun-af.com; [Ron Harrison](#); mrs.bethanybailey@gmail.com; hersyman@msn.com; gmaoffy@gmail.com; joycekstoner@yahoo.com; jeffrileysf@gmail.com; [Dana Flynn](#)
Bcc: kristin@tbgroun.us; [Erin Smith](#); [Mandi Kirk](#); [Alicia Garcia](#)
Subject: RE: River-Trail development Proposal Public Notice
Date: Wednesday, October 16, 2024 6:42:00 AM

Richard,

Thank you for letting us know. See below for the sign posting requirements from Section 30-1-117.B.5 of the Municipal Code:

“When required by the notice of public hearing table (Table 1.1) in this section, the applicant must post a sign along each street frontage of the property. The Town will provide signs when a complete application is made. The applicant is responsible for erecting and maintaining the sign(s) for the time period specified and removing them after the last public hearing. Signs must be placed as near the property line as possible and in a manner that is readily visible from the street or road. Posting the property is a courtesy to the public and the failure of anyone to observe a sign does not invalidate any public hearing.”

Public notice is provided in a variety of methods from the sign posting to mailing notice and publication in the newspaper. As stated in the Town Code, posting the sign is a courtesy.

Let me know if you have any other questions and please let me know if you can identify the individual who may have tampered with the sign as it is public property, and I am sure the applicant would be glad to know who may be trespassing as well. Thank you for reporting this to me and I'll be sure to include this correspondence in the Planning Commission packet.

Sincerely,
Anne

From: Richard Stoner <rstoner@agrihouse.com>
Sent: Wednesday, October 16, 2024 4:31 AM
To: Anne Johnson <AJohnson@berthoud.org>
Cc: [Culligan, Emmett](#) <emmett@ecd-co.com>; john.d.bailey@gmail.com; [Swezack](#) <jsewczak@zakdirt.com>; jem70@mailbox.org; mperry@marshalgroun-af.com; [Ron Harrison](#) <HTScorp@msn.com>; mrs.bethanybailey@gmail.com; hersyman@msn.com; gmaoffy@gmail.com; joycekstoner@yahoo.com; [Richard Stoner <rstoner@agrihouse.com>](mailto:rstoner@agrihouse.com); jeffrileysf@gmail.com; Dana Flynn <db.flynn88@gmail.com>
Subject: River-Trail development Proposal Public Notice

Dear Anne,

I am writing to express my concern about the recent removal of the Town of Berthoud's Public Notice for the proposed River-Trail development, which was posted at the entrance of the property

on First Street and another along 6c.

Yesterday, Oct 15th, I was informed that a large white male, driving a white vehicle, was observed taking down the public notice sign and placing it face down at the farm entrance on First Street.

Given that the public notice is a legal requirement prior to the public hearing scheduled for November 12, I would like to know how these actions may affect the hearing. Specifically, will the hearing be postponed or rescheduled to ensure that the 30-day notice period is properly observed?

Thank you for your attention to this matter.

Sincerely,

Richard Stoner
333 Springhill Ln
Berthoud, Colorado 80513

TOWN OF BERTHOUD

ORDINANCE NO. XXXX

**AN ORDINANCE OF THE BOARD OF TRUSTEES OF THE TOWN OF BERTHOUD
ANNEXING PROPERTY KNOWN AS THE “RIVER TRAILS ANNEXATION NUMBERS 1, 2
AND 3” TO THE TOWN OF BERTHOUD**

WHEREAS, Resolution No. 2024-12 finding substantial compliance and initiating annexation proceedings on behalf of River Trails, LLC, owners of the parcel of property, collectively referred to herein as “River Trails Annexation Numbers 1, 2 and 3” has heretofore been adopted by the Board of Trustees of the Town of Berthoud; and

WHEREAS, by Resolution No. 2024-12 the Board of Trustees determined that the applicable provisions of Section 30 of article II of the State Constitution and Sections 31-12-104 and 31-12-105 have been met, and further determined that an election is not required under Section 31-12-107(2), and did not determine that additional terms and conditions are to be imposed; and

WHEREAS, the Board of Trustees may annex the proposed area by Ordinance pursuant to Section 31-12-111, Colorado Revised Statutes; and

WHEREAS, the Board of Trustees does hereby find and determine that it is in the best interests of the town to annex said area to the Town:

RIVER TRAILS ANNEXATION NUMBER 1:

A parcel of land situate in the Southwest Quarter (SW1/4) of Section Twenty-four (24), Township Four North (T.4N.), Range Sixty-nine West (R.69W.) of the Sixth Principal Meridian (6th P.M.), Town of Berthoud, County of Larimer, State of Colorado and being more particularly described as follows:

COMMENCING at the South Sixteenth corner of said SW1/4 of Section 24 and assuming the North line of the South half of said SW1/4 as bearing North 89°02'27" East, being a Grid Bearing of the Colorado State Plane Coordinate System, North Zone, North American Datum 1983/2011, a distance of 2657.78 feet Monumented by a #5 rebar with 2" aluminum cap stamped LS 13446 on the West end, and a #5 rebar with 3.25" aluminum cap stamped LS 38348 on the East end, and with all other bearings contained herein relative thereto;

THENCE North 89°02'27" East, along said North line, a distance of 30.00 feet to the POINT OF BEGINNING, also being a point on the boundary of the South First Street Annexation to the Town of Berthoud, recorded April 3, 1997, as Reception Number 19970020418 of the Records of the Larimer County Clerk and Recorder;

THENCE North 89°02'27" East, continuing along said North line and said annexation boundary, a distance of 20.00 feet;

THENCE North 00°21'20" West, continuing along said annexation boundary, a distance of 35.00 feet to a point on the North right of way of East County Road 6C, as shown on the plat of Mary V. Moore M.R.D., recorded November 2, 1993 as Reception Number 19930082235 of the Records of the Larimer County Clerk and Recorder;

THENCE North 89°02'27" East, along said North right of way, a distance of 318.75 feet;

THENCE South 82°35'32" West a distance of 311.64 feet to a point on the North line of the South half of said SW1/4;

THENCE South 04°19'57" East a distance of 362.91 feet to a point on the East line of that parcel recorded January 7, 1878 as Book G Page 580 of the Records of the Larimer County Clerk and Recorder;

THENCE North 08°56'36" West, along said East line, a distance of 178.75 feet;

THENCE South 89°38'27" West a distance of 27.84 feet to the Southeast corner of said South First Street Annexation;

THENCE North 00°23'06" West, along said annexation boundary a distance of 184.98 feet to the POINT OF BEGINNING.

Said described parcel of land contains 13,654 Square Feet or 0.313 Acres, more or less (±).

RIVER TRAILS ANNEXATION NUMBER 2:

A parcel of land, situate in the Southwest Quarter (SW1/4) of Section Twenty-four (24), Township Four North (T.4N.), Range Sixty-nine West (R.69W.) of the Sixth Principal Meridian (6th P.M.), Town of Berthoud, County of Larimer, State of Colorado and being more particularly described as follows:

COMMENCING at the South Sixteenth corner of said SW1/4 of Section 24 and assuming the North line of the South half of said SW1/4 as bearing North 89°02'27" East, being a Grid Bearing of the Colorado State Plane Coordinate System, North Zone, North American Datum 1983/2011, a distance of 2657.78 feet Monumented by a #5 rebar with 2" aluminum cap stamped LS 13446 on the West end, and a #5 rebar with 3.25" aluminum cap stamped LS 38348 on the East end, and with all other bearings contained herein relative thereto;

THENCE North 89°02'27" East, along said North line, a distance of 59.46 feet to the POINT OF BEGINNING;

THENCE North 82°35'32" East a distance of 311.64 feet to a point on the North right of way of East County Road 6C, as shown on the plat of Mary V. Moore M.R.D., recorded November 2, 1993 as Reception Number 19930082235 of the Records of the Larimer County Clerk and Recorder;

THENCE North 89°02'27" East, along said North right of way, a distance of 831.94 feet;

THENCE South 80°45'46" West a distance of 1036.95 feet;

THENCE South 00°32'05" East a distance of 872.85 feet to a point on the East line of that parcel recorded January 7, 1878 as Book G Page 580 of the Records of the Larimer County Clerk and Recorder;

THENCE North 08°56'36" West, along said East line, a distance of 630.95 feet;

THENCE North 04°19'57" West a distance of 362.91 feet to the POINT OF BEGINNING.

Said described parcel of land contains 141,781 Square Feet or 3.255 Acres, more or less (±).

RIVER TRAILS ANNEXATION NUMBER 3:

A parcel of land, situate in the South half (S1/2) of Section Twenty-four (24) and the Northwest Quarter (NW1/4) of Section Twenty-five (25), Township Four North (T.4N.), Range Sixty-nine West (R.69.W.) of the Sixth Principal Meridian (6th P.M.), Town of Berthoud, County of Larimer, State of Colorado and being more particularly described as follows:

COMMENCING at the South Sixteenth corner of said SW1/4 of Section 24 and assuming the North line of the South Half of said SW1/4 as bearing North 89°02'27" East , being a Grid Bearing of the Colorado State Plane Coordinate System, North Zone, North American Datum 1983/2011, a distance of 2657.78 feet Monumented by a #5 rebar with 2" aluminum cap stamped LS 13446 on the West end, and a #5 rebar with 3.25" aluminum cap stamped LS 38348 on the East end, and with all other bearings contained herein relative thereto;

THENCE North 89°02'27" East, along said North line, a distance of 50.37 feet;

THENCE North 00°57'33" West a distance of 35.00 feet to a point on the North right of way of East County Road 6C, as shown on the plat of Mary V. Moore M.R.D., recorded November 2, 1993 as Reception Number 19930082235 of the Records of the Larimer County Clerk and Recorder;

THENCE North 89°02'27" East, along said North right of way, a distance of 1150.69 feet to the POINT OF BEGINNING;

THENCE North 89°02'27" East, continuing along said North right of way, a distance of 792.67 feet;

THENCE South 00°19'57" East a distance of 5.00 feet to a point on the North right of way of East County Road 6C, as shown on the plat of Golden Acres Minor Land Division 02-S1964, recorded August 22, 2003 as Reception Number 20030107937 of the Records of the Larimer County Clerk and Recorder; THENCE North 89°02'27" East, along said North right of way, a distance of 664.43 feet to a point on the East line of the North half of said SW1/4, from which the Center-South Sixteenth Corner of said Section 24 bears South 00°19'12" East a distance of 30.00 feet;

THENCE North 89°02'42" East, continuing along said North right of way, a distance of 1248.36 feet; THENCE South 00°57'18" East a distance of 30.00 feet to a point on the North line of the South half of the Southeast Quarter of said Section 24;

THENCE South 61°08'42" West, along the approximate centerline of Rockwell Ditch, a distance of 422.20 feet;

THENCE South 23°25'42" West a distance of 142.60 feet to the approximate confluence of Rockwell Ditch and the Little Thompson River;

The following 8 courses are along the approximate centerline of said Little Thompson River.

THENCE North 75°15'42" West a distance of 89.83 feet;
THENCE South 38°48'59" West a distance of 75.80 feet;
THENCE South 30°41'09" West a distance of 150.28 feet;
THENCE South 12°10'45" West a distance of 120.83 feet;
THENCE South 40°45'06" West a distance of 110.06 feet;
THENCE South 62°50'06" West a distance of 144.57 feet;
THENCE South 67°38'42" West a distance of 325.77 feet;

THENCE South 52°17'46" West a distance of 99.24 feet to a point on the West line of the South half of the Southeast Quarter of said Section 24;

THENCE South 00°19'12" East, along said West line, a distance of 392.52 feet to the South Quarter Corner of said Section 24;

THENCE South 88°58'50" West, along the North line of the NW1/4 of Section 25, a distance of 1328.47 feet;

THENCE South 19°17'04" West a distance of 455.71 feet;

THENCE North 89°16'21" West a distance of 971.00 feet;

THENCE North 00°58'39" East a distance of 246.20 feet;

THENCE North 07°04'32" East a distance of 153.28 feet to a point on the North line of said NW1/4, from which the Northwest Corner of said Section 25 bears South 88°58'50" West a distance of 230.00 feet;

THENCE North 08°56'36" West a distance of 342.51 feet;

THENCE North 00°32'05" West a distance of 872.85 feet;

THENCE North 80°45'46" East a distance of 1036.95 feet to the POINT OF BEGINNING.

Said described parcel of land contains 4,350,328 Square Feet or 99.870 Acres, more or less (±).

NOW, THEREFORE, BE IT ORDAINED BY THE BOARD OF TRUSTEES OF THE TOWN OF BERTHOUD, COLORADO:

Section 1. That the above-described property meets all legal requirements for annexation to the Town of Berthoud, and on the request of the Owner and in the interest of the Town, said property shall be annexed to the Town.

Section 2. No Obligations Assumed: In annexing said property to the Town, the Town does not assume any obligation respecting the construction of water mains, sewer lines, gas mains, electrical service lines, streets or any other services or utilities in connection with the property hereby annexed except as may be provided by the ordinances of the Town.

Section 3. Interpretation. This Ordinance shall be so interpreted and construed to effectuate its general purpose.

Section 4. Effective Date. The provisions of this Ordinance shall take effect thirty (30) days after publication as required by law.

PASSED, ADOPTED, SIGNED, AND APPROVED this the 12th day of November, 2024.

[Intentionally Left Blank]

TOWN OF BERTHOUD

By

William Karspeck, Mayor

ATTEST:

By:

Christian Samora, Town Clerk

RESOLUTION NUMBER XX

(SERIES 2024)

A RESOLUTION OF THE TOWN OF BERTHOUD BOARD OF TRUSTEES APPROVING A NEIGHBORHOOD MASTER PLAN FOR A DEVELOPMENT KNOW AS THE “RIVER TRAILS DEVELOPMENT” IN THE TOWN OF BERTHOUD.

WHEREAS, the property under consideration is known as the “River Trails” development; and

WHEREAS, the Town of Berthoud (“Town”) approved Ordinance XXXX on November 12, 2024, which approved the Annexation of the River Trails Annexation Numbers 1, 2 and 3; and

WHEREAS, the Town of Berthoud (“Town”) approved Ordinance XXXX on November 12, 2024, which approved the Zoning to SR, Suburban Residential, of the River Trails property; and

WHEREAS, the 2021 update to the Town’s Comprehensive Plan and Future Land Use Map have envisioned the property described in Exhibit A attached hereto as appropriate for Suburban Residential development; and

WHEREAS, the developer has proposed a Neighborhood Master Plan application that has been prepared in substantial compliance with the 2021 update to the Town’s Comprehensive Plan and Future Land Use Map; and

WHEREAS, the Neighborhood Master Plan attached herein as Exhibit B has been reviewed by referral agencies to ensure the proposed development does not present a burden on service provision; and

WHEREAS, notice was properly posted in the manner required by law and a public hearing was conducted on October 24, 2024, before the Berthoud Planning Commission; and

WHEREAS, after the public hearing, the Berthoud Planning Commission made a unanimous recommendation to the Town Board of Trustees to approve the Neighborhood Master Plan as presented with the following XXXX (X):

1. An application for annexation of County Road 6 shall be submitted to the Town prior to submittal of the Preliminary Plan. The distance shall be from the eastern property boundary to County Road 1 (County Line Road) resulting in this entire mile of County Road 6 being annexed to the Town of Berthoud.

WHEREAS, notice was properly posted in a manner required by law and a public hearing was conducted on November 12, 2024, before the Board of Trustees as required by law and which public hearing incorporated the testimony of citizens which were allowed to speak during “Citizen

Participation” during this Board of Trustees meeting, and which testimony the applicant confirmed it had reviewed; and

WHEREAS, based on the testimony and evidence presented at the public hearing held on November 12, 2024, the Board of Trustees determines and finds that compliance with the Neighborhood Master Plan review criteria as provided in Section 30-6-106.E of the Berthoud Municipal Code has been demonstrated.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES OF THE TOWN OF BERTHOUD, COLORADO:

Section 1. Neighborhood Master Plan Approval. The Neighborhood Master Plan is hereby approved. The Preliminary Plat shall be submitted in substantial compliance with the Neighborhood Master Plan and the development review for the Preliminary Plat shall be processed in accordance with the Land Use Code.

Section 2. Interpretation: This Resolution shall be interpreted and construed to effectuate its general purpose.

Section 3. Effective Date: The provisions of this Resolution shall take effect upon adoption.

APPROVED AND ADOPTED this 12th day of November, 2024.

TOWN OF BERTHOUD

By _____

William Karspeck, Mayor

ATTEST:

By: _____

Christian Samora, Town Clerk

Exhibit A: Legal Description

RIVER TRAILS ANNEXATION NUMBER 1:

A parcel of land situate in the Southwest Quarter (SW1/4) of Section Twenty-four (24), Township Four North (T.4N.), Range Sixty-nine West (R.69W.) of the Sixth Principal Meridian (6th P.M.), Town of Berthoud, County of Larimer, State of Colorado and being more particularly described as follows:

COMMENCING at the South Sixteenth corner of said SW1/4 of Section 24 and assuming the North line of the South half of said SW1/4 as bearing North 89°02'27" East, being a Grid Bearing of the Colorado State Plane Coordinate System, North Zone, North American Datum 1983/2011, a distance of 2657.78 feet Monumented by a #5 rebar with 2" aluminum cap stamped LS 13446 on the West end, and a #5 rebar with 3.25" aluminum cap stamped LS 38348 on the East end, and with all other bearings contained herein relative thereto;

THENCE North 89°02'27" East, along said North line, a distance of 30.00 feet to the POINT OF BEGINNING, also being a point on the boundary of the South First Street Annexation to the Town of Berthoud, recorded April 3, 1997, as Reception Number 19970020418 of the Records of the Larimer County Clerk and Recorder;

THENCE North 89°02'27" East, continuing along said North line and said annexation boundary, a distance of 20.00 feet;

THENCE North 00°21'20" West, continuing along said annexation boundary, a distance of 35.00 feet to a point on the North right of way of East County Road 6C, as shown on the plat of Mary V. Moore M.R.D., recorded November 2, 1993 as Reception Number 19930082235 of the Records of the Larimer County Clerk and Recorder;

THENCE North 89°02'27" East, along said North right of way, a distance of 318.75 feet;

THENCE South 82°35'32" West a distance of 311.64 feet to a point on the North line of the South half of said SW1/4;

THENCE South 04°19'57" East a distance of 362.91 feet to a point on the East line of that parcel recorded January 7, 1878 as Book G Page 580 of the Records of the Larimer County Clerk and Recorder;

THENCE North 08°56'36" West, along said East line, a distance of 178.75 feet;

THENCE South 89°38'27" West a distance of 27.84 feet to the Southeast corner of said South First Street Annexation;

THENCE North 00°23'06" West, along said annexation boundary a distance of 184.98 feet to the POINT OF BEGINNING.

Said described parcel of land contains 13,654 Square Feet or 0.313 Acres, more or less (±).

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Said described parcel of land contains 141,781 Square Feet or 3.255 Acres, more or less (±).

RIVER TRAILS ANNEXATION NUMBER 3:

A parcel of land, situate in the South half (S1/2) of Section Twenty-four (24) and the Northwest Quarter (NW1/4) of Section Twenty-five (25), Township Four North (T.4N.), Range Sixty-nine West (R.69.W.) of the Sixth Principal Meridian (6th P.M.), Town of Berthoud, County of Larimer, State of Colorado and being more particularly described as follows:

COMMENCING at the South Sixteenth corner of said SW1/4 of Section 24 and assuming the North line of the South Half of said SW1/4 as bearing North 89°02'27" East , being a Grid Bearing of the Colorado State Plane Coordinate System, North Zone, North American Datum 1983/2011, a distance of 2657.78 feet Monumented by a #5 rebar with 2" aluminum cap stamped LS 13446 on the West end, and a #5 rebar with 3.25" aluminum cap stamped LS 38348 on the East end, and with all other bearings contained herein relative thereto;

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THENCE North 89°02'27" East, continuing along said North right of way, a distance of 792.67 feet;

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THENCE North 89°02'42" East, continuing along said North right of way, a distance of 1248.36 feet; THENCE South 00°57'18" East a distance of 30.00 feet to a point on the North line of the South half of the Southeast Quarter of said Section 24;

THENCE South 61°08'42" West, along the approximate centerline of Rockwell Ditch, a distance of 422.20 feet;

THENCE South 23°25'42" West a distance of 142.60 feet to the approximate confluence of Rockwell Ditch and the Little Thompson River;

The following 8 courses are along the approximate centerline of said Little Thompson River.

THENCE North 75°15'42" West a distance of 89.83 feet;
THENCE South 38°48'59" West a distance of 75.80 feet;
THENCE South 30°41'09" West a distance of 150.28 feet;
THENCE South 12°10'45" West a distance of 120.83 feet;
THENCE South 40°45'06" West a distance of 110.06 feet;
THENCE South 62°50'06" West a distance of 144.57 feet;
THENCE South 67°38'42" West a distance of 325.77 feet;
THENCE South 52°17'46" West a distance of 99.24 feet to a point on the West line of the South half of the Southeast Quarter of said Section 24;

THENCE South 00°19'12" East, along said West line, a distance of 392.52 feet to the South Quarter Corner of said Section 24;

THENCE South 88°58'50" West, along the North line of the NW1/4 of Section 25, a distance of 1328.47 feet;

THENCE South 19°17'04" West a distance of 455.71 feet;
THENCE North 89°16'21" West a distance of 971.00 feet;
THENCE North 00°58'39" East a distance of 246.20 feet;

THENCE North 07°04'32" East a distance of 153.28 feet to a point on the North line of said NW1/4, from which the Northwest Corner of said Section 25 bears South 88°58'50" West a distance of 230.00 feet;

THENCE North 08°56'36" West a distance of 342.51 feet;
THENCE North 00°32'05" West a distance of 872.85 feet;
THENCE North 80°45'46" East a distance of 1036.95 feet to the POINT OF BEGINNING.

Said described parcel of land contains 4,350,328 Square Feet or 99.870 Acres, more or less (±).

Exhibit B: Neighborhood Master Plan

Final version to be inserted here

TOWN OF BERTHOUD
ORDINANCE NO. XXXX

**AN ORDINANCE AMENDING THE ZONING MAP OF THE TOWN OF BERTHOUD
TO ESTABLISH THE ZONING OF PROPERTY KNOWN AS THE “RIVER TRAILS
ANNEXATION NUMBERS 1, 2 AND 3” NEWLY ANNEXED TO THE TOWN OF
BERTHOUD**

WHEREAS, an ordinance approving the annexation of certain property known as the “Ludlow Sliver Annexation,” as more particularly described in Exhibit A attached hereto (the “Property”), to the Town of Berthoud by Ordinance No. XXXX was passed by the Board of Trustees of the Town of Berthoud on November 12, 2024; and,

WHEREAS, Section 31-12-115, Colorado Revised Statutes, requires that newly annexed property be zoned within 90 days of the effective date of the annexation ordinance; and,

WHEREAS, the Planning Commission previously has considered the zoning request related to Ordinance XXXX and pending Annexation Ordinance XXXX, and has recommended that the Property be zoned “Suburban Residential (SR)” upon its annexation into the Town; and,

WHEREAS, notice previously was been posted and published as required by law and a public hearing was conducted before the Board of Trustees on November 12, 2024, at which time the zoning of the Property to “Suburban Residential (SR)” was approved by the Board, to become effective upon the completion of the annexation of the Property into the Town more particularly described in Exhibit A and found in Exhibit B; and

WHEREAS, the Board desires the zoning approval for the Property to become effective concurrent with the legal effectiveness of Annexation Ordinance XXXX.

NOW, THEREFORE, BE IT ORDAINED BY THE BOARD OF TRUSTEES OF THE TOWN OF BERTHOUD, COLORADO:

Section 1. Upon the legal effectiveness of the annexation of the Property to the Town of Berthoud in accordance with Section 31-12-113(2)(b), Colorado Revised Statutes, the official zoning map of the Town of Berthoud shall be amended by the inclusion of the Property zoned as “Suburban Residential (SR).”

Section 2. The Property known as the “River Trails Annexation Numbers 1, 2 and 3” is hereby zoned “Suburban Residential (SR),” subject to the terms and conditions approved by the Town.

Section 3. Interpretation. This Ordinance shall be so interpreted and construed to effectuate its general purpose.

Section 4. Publication. The Town Clerk shall certify to the passage of this Ordinance, cause its contents to be published, and, when the annexation of the Property becomes effective in accordance with section 31-12-113(2) (b), Colorado Revised Statutes, shall cause the appropriate change to be made to the official Berthoud Zoning District Map.

Section 5. Effective Date: The effective date of this ordinance shall be the later of the effective date of the Annexation of “River Trails Annexation Numbers 1, 2 and 3” and thirty (30) days after publication of this ordinance.

PASSED, ADOPTED, SIGNED, AND APPROVED this the 12th day of November, 2024.

TOWN OF BERTHOUD

By _____

William Karspeck, Mayor

ATTEST:

By: _____

Christian Samora, Town Clerk

EXHIBIT A: LEGAL DESCRIPTION

RIVER TRAILS ANNEXATION NUMBER 1:

A parcel of land situate in the Southwest Quarter (SW1/4) of Section Twenty-four (24), Township Four North (T.4N.), Range Sixty-nine West (R.69W.) of the Sixth Principal Meridian (6th P.M.), Town of Berthoud, County of Larimer, State of Colorado and being more particularly described as follows:

COMMENCING at the South Sixteenth corner of said SW1/4 of Section 24 and assuming the North line of the South half of said SW1/4 as bearing North 89°02'27" East, being a Grid Bearing of the Colorado State Plane Coordinate System, North Zone, North American Datum 1983/2011, a distance of 2657.78 feet Monumented by a #5 rebar with 2" aluminum cap stamped LS 13446 on the West end, and a #5 rebar with 3.25" aluminum cap stamped LS 38348 on the East end, and with all other bearings contained herein relative thereto;

THENCE North 89°02'27" East, along said North line, a distance of 30.00 feet to the POINT OF BEGINNING, also being a point on the boundary of the South First Street Annexation to the Town of Berthoud, recorded April 3, 1997, as Reception Number 19970020418 of the Records of the Larimer County Clerk and Recorder;

THENCE North 89°02'27" East, continuing along said North line and said annexation boundary, a distance of 20.00 feet;

THENCE North 00°21'20" West, continuing along said annexation boundary, a distance of 35.00 feet to a point on the North right of way of East County Road 6C, as shown on the plat of Mary V. Moore M.R.D., recorded November 2, 1993 as Reception Number 19930082235 of the Records of the Larimer County Clerk and Recorder;

THENCE North 89°02'27" East, along said North right of way, a distance of 318.75 feet;

THENCE South 82°35'32" West a distance of 311.64 feet to a point on the North line of the South half of said SW1/4;

THENCE South 04°19'57" East a distance of 362.91 feet to a point on the East line of that parcel recorded January 7, 1878 as Book G Page 580 of the Records of the Larimer County Clerk and Recorder;

THENCE North 08°56'36" West, along said East line, a distance of 178.75 feet;

THENCE South 89°38'27" West a distance of 27.84 feet to the Southeast corner of said South First Street Annexation;

THENCE North 00°23'06" West, along said annexation boundary a distance of 184.98 feet to the POINT OF BEGINNING.

Said described parcel of land contains 13,654 Square Feet or 0.313 Acres, more or less (±).

RIVER TRAILS ANNEXATION NUMBER 2:

A parcel of land, situate in the Southwest Quarter (SW1/4) of Section Twenty-four (24), Township Four North (T.4N.), Range Sixty-nine West (R.69W.) of the Sixth Principal Meridian (6th P.M.), Town of Berthoud, County of Larimer, State of Colorado and being more particularly described as follows:

COMMENCING at the South Sixteenth corner of said SW1/4 of Section 24 and assuming the North line of the South half of said SW1/4 as bearing North 89°02'27" East, being a Grid Bearing of the Colorado State Plane Coordinate System, North Zone, North American Datum 1983/2011, a distance of 2657.78 feet Monumented by a #5 rebar with 2" aluminum cap stamped LS 13446 on the West end, and a #5 rebar with 3.25" aluminum cap stamped LS 38348 on the East end, and with all other bearings contained herein relative thereto;

THENCE North 89°02'27" East, along said North line, a distance of 59.46 feet to the POINT OF BEGINNING;

THENCE North 82°35'32" East a distance of 311.64 feet to a point on the North right of way of East County Road 6C, as shown on the plat of Mary V. Moore M.R.D., recorded November 2, 1993 as Reception Number 19930082235 of the Records of the Larimer County Clerk and Recorder;

THENCE North 89°02'27" East, along said North right of way, a distance of 831.94 feet;

THENCE South 80°45'46" West a distance of 1036.95 feet;

THENCE South 00°32'05" East a distance of 872.85 feet to a point on the East line of that parcel recorded January 7, 1878 as Book G Page 580 of the Records of the Larimer County Clerk and Recorder;

THENCE North 08°56'36" West, along said East line, a distance of 630.95 feet;

THENCE North 04°19'57" West a distance of 362.91 feet to the POINT OF BEGINNING.

Said described parcel of land contains 141,781 Square Feet or 3.255 Acres, more or less (±).

RIVER TRAILS ANNEXATION NUMBER 3:

A parcel of land, situate in the South half (S1/2) of Section Twenty-four (24) and the Northwest Quarter (NW1/4) of Section Twenty-five (25), Township Four North (T.4N.), Range Sixty-nine West (R.69.W.) of the Sixth Principal Meridian (6th P.M.), Town of Berthoud, County of Larimer, State of Colorado and being more particularly described as follows:

COMMENCING at the South Sixteenth corner of said SW1/4 of Section 24 and assuming the North line of the South Half of said SW1/4 as bearing North 89°02'27" East , being a Grid Bearing of the Colorado State Plane Coordinate System, North Zone, North American Datum 1983/2011, a distance of 2657.78 feet Monumented by a #5 rebar with 2" aluminum cap stamped LS 13446 on the West end, and a #5 rebar with 3.25" aluminum cap stamped LS 38348 on the East end, and with all other bearings contained herein relative thereto;

THENCE North 89°02'27" East, along said North line, a distance of 50.37 feet;

THENCE North 00°57'33" West a distance of 35.00 feet to a point on the North right of way of East County Road 6C, as shown on the plat of Mary V. Moore M.R.D., recorded November 2, 1993 as Reception Number 19930082235 of the Records of the Larimer County Clerk and Recorder;

THENCE North 89°02'27" East, along said North right of way, a distance of 1150.69 feet to the POINT OF BEGINNING;

THENCE North 89°02'27" East, continuing along said North right of way, a distance of 792.67 feet;

THENCE South 00°19'57" East a distance of 5.00 feet to a point on the North right of way of East County Road 6C, as shown on the plat of Golden Acres Minor Land Division 02-S1964, recorded August 22, 2003 as Reception Number 20030107937 of the Records of the Larimer County Clerk and Recorder;

THENCE North 89°02'27" East, along said North right of way, a distance of 664.43 feet to a point on the East line of the North half of said SW1/4, from which the Center-South Sixteenth Corner of said Section 24 bears South 00°19'12" East a distance of 30.00 feet;

THENCE North 89°02'42" East, continuing along said North right of way, a distance of 1248.36 feet;
THENCE South 00°57'18" East a distance of 30.00 feet to a point on the North line of the South half of the Southeast Quarter of said Section 24;

THENCE South 61°08'42" West, along the approximate centerline of Rockwell Ditch, a distance of 422.20 feet;

THENCE South 23°25'42" West a distance of 142.60 feet to the approximate confluence of Rockwell Ditch and the Little Thompson River;

The following 8 courses are along the approximate centerline of said Little Thompson River.

THENCE North 75°15'42" West a distance of 89.83 feet;
THENCE South 38°48'59" West a distance of 75.80 feet;
THENCE South 30°41'09" West a distance of 150.28 feet;
THENCE South 12°10'45" West a distance of 120.83 feet;
THENCE South 40°45'06" West a distance of 110.06 feet;
THENCE South 62°50'06" West a distance of 144.57 feet;
THENCE South 67°38'42" West a distance of 325.77 feet;

THENCE South 52°17'46" West a distance of 99.24 feet to a point on the West line of the South half of the Southeast Quarter of said Section 24;

THENCE South 00°19'12" East, along said West line, a distance of 392.52 feet to the South Quarter Corner of said Section 24;

THENCE South 88°58'50" West, along the North line of the NW1/4 of Section 25, a distance of 1328.47 feet;

THENCE South 19°17'04" West a distance of 455.71 feet;
THENCE North 89°16'21" West a distance of 971.00 feet;
THENCE North 00°58'39" East a distance of 246.20 feet;

THENCE North 07°04'32" East a distance of 153.28 feet to a point on the North line of said NW1/4, from which the Northwest Corner of said Section 25 bears South 88°58'50" West a distance of 230.00 feet;

THENCE North 08°56'36" West a distance of 342.51 feet;
THENCE North 00°32'05" West a distance of 872.85 feet;
THENCE North 80°45'46" East a distance of 1036.95 feet to the POINT OF BEGINNING.

Said described parcel of land contains 4,350,328 Square Feet or 99.870 Acres, more or less (±).

EXHIBIT B: CHANGE OF ZONE MAP

TO BE INSERTED

From: kristin@tbgroupp.us
To: [Anne Johnson](#)
Subject: FW: River trails sign posting
Date: Tuesday, October 8, 2024 3:09:22 PM

Hi Anne –

Please see below for images of the posted signs at River Trails for your records.

Best,
K

Kristin Turner
Managing Partner

TB | Group
landscape architecture | planning
444 Mountain Avenue
Berthoud, Colorado 80513
970.532.5891 x105
kristin@tbgroupp.us
www.TBGroup.us

From: Warren Turner <warrenturnergolf@gmail.com>
Sent: Tuesday, October 8, 2024 3:00 PM
To: kristin@tbgroupp.us
Subject: River trails sign posting





Sent from my iPhone

Sent from my iPhone



NOTICE OF PUBLIC HEARING

Dear Property Owner: The Town will hold Public Hearings for an Annexation, Zoning and Neighborhood Master Plan near your property.

**Scheduled Hearings at Berthoud Town Hall – 807 Mountain Ave:
Town Planning Commission**
October 24, 2024, at 7:30 p.m.

Town Trustees
November 12, 2024, at 6:30 p.m.

The applicant is requesting approval of an Annexation with Zoning to Suburban Residential and a Neighborhood Master Plan creating 416 lots. Copies of the proposed submittal documents are found on the Town's Website: <https://www.berthoud.org/180/Current-Development-Review-Projects>. Any person may appear at such hearing and present evidence upon this matter. For further information contact Anne Johnson at ajohnson@berthoud.org.

Date of Mailing: October 8, 2024

PROJECT NAME:
River Trails
Annexation, Zoning
& Neighborhood
Master Plan

**PROJECT
LOCATION:**
The property is
located south of
County Road E 6C
and east of South
County Road 15/1st
Street



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Annexation, Zoning
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Master Plan

**PROJECT
LOCATION:**
The property is
located south of
County Road E 6C
and east of South
County Road 15/1st
Street

Town of Berthoud

807 Mountain Ave.
P.O. Box 1229
Berthoud, CO 80513

Town of Berthoud

807 Mountain Ave.
P.O. Box 1229
Berthoud, CO 80513

«Name» «Name1»
«Mailing_Address»
«Mailing_City», «Mailing_State» «Mailing_Zipcode»

«Next Record»«Name» «Name1»
«Mailing_Address»
«Mailing_City», «Mailing_State» «Mailing_Zipcode»

Town of Berthoud

807 Mountain Ave.
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«Mailing_Address»
«Mailing_City», «Mailing_State» «Mailing_Zipcode»

PLANNING COMMISSION INFORMATION

COMMUNITY DEVELOPMENT DEPARTMENT



Meeting Date:	October 24, 2024
Agenda Title/Subject:	Resolution 14 (Series 2024), a Resolution approving the Fickel Farm 5th Filing Neighborhood Master Plan, and Ordinance 1345, an Ordinance amending the zoning map of the Town of Berthoud to rezone the Fickel Farm 5th Filing Property currently zoned PUD - Planned Unit Development to UR – Urban Residential.
Type of Item:	Public Hearing
Request:	Request to accept the Neighborhood Master Plan for the Fickel Farm 5th Filing property and to change the existing zoning to bring the Fickel Farm 5th Filing property into conformance with the 2021 Comprehensive Plan.
Presented by:	Tawn Hillenbrand, Senior Planner

ATTACHMENTS:

- Staff Report
- Draft Resolution 14 (Series 2024) and Draft Ordinance 1345
- Application materials

BACKGROUND:

According to project records, the subject properties were originally zoned PUD – Planned Unit Development in 1997 as part of the Fickel Farm 1st Filing. In 2021, Tract A and Tract B were included in the Fickel Farm 4th Filing Neighborhood Master Plan and Final Plat. In the 2021 approved Neighborhood Master Plan, the land use and maximum number of units was established for Tract A and Tract B.

The applicant is proposing the following two requests: Neighborhood Master Plan for the proposed Fickel Farm 5th Filing development consisting of 115 townhome lots and 50 paired home (duplex) lots with a concurrent request to Rezone the subject property from PUD – Planned Unit Development to UR – Urban Residential. The applicant is requesting a rezone from PUD to UR – Urban Residential to be more consistent with current market conditions (changing housing market) and to better align with the Town of Berthoud Comprehensive Plan. As the Town has eliminated the potential for future PUDs, the fact that previously approved PUDs are not clear regarding land uses and densities, applicants are encouraged to change the zoning of their properties to reflect the vision and values of the 2021 Comprehensive Plan.

This Neighborhood Master Plan request includes an increase to the overall density of Tract

A and Tract B, as was previously approved as part of the Fickel Farm 4th Filing Neighborhood Master Plan in 2021.

UPDATE/NEXT STEPS:

Tonight, the Planning Commission will hear two requests of the applicant. The first will be the Neighborhood Master Plan. The purpose of the Neighborhood Master Plan is to conceptualize the overall character of a future subdivision inclusive of “zoning, transportation, pedestrian network, parks, open space, subdivision identity standards and other amenities.” The second request is the Change of Zone which should be a simple public hearing if the Neighborhood Master Plan is approved as the Change of Zone is simply a map illustrating zoning boundaries which conform to the Neighborhood Master Plan

The applicant will be required to record the Neighborhood Master Plan and Change of Zone if approved by the Town Board of Trustees. Following recording of the documents, the next step would be a Preliminary Plat which would be presented in a public hearing before both the Planning Commission and the Town Board of Trustees. The Preliminary Plat review phase includes review of the Construction Documents (80%), referral agency review, analysis of the utilities and infrastructure planned for the project, off-site and on-site improvements, for example. If approved, the final planning process step would be a public hearing before the Planning Commission for a Final Plat. The Final Plat phase includes review of the Construction Documents (100%), referral agency review, analysis of the utilities and infrastructure planned for the project, off-site and on-site improvements, for example. The Final Plat can encompass all or a portion of the project. Both the Preliminary and Final platting must adhere to the Neighborhood Master Plan.

Referral agencies such as the school district, fire protection district, utility and infrastructure providers, for example have reviewed the Neighborhood Master Plan and the Change of Zone applications. Referral agency comments at this phase are incorporated into the Staff Report and are used by the applicant when they are preparing their next land use application materials for review. Sanitary sewer and water main engineering designs, the need for water dedication, and school bus stop locations, if needed, for example are reviewed at the Preliminary Plat and Final Plat stages. The developer will provide Construction Documents with these next two phases of development, and these will be reviewed by the Town Engineer and supportive agencies.

FISCAL IMPACT AND FUND SOURCE:

There is no negative impact to the Town in consideration of this request to rezone the property in conformance with the 2021 Comprehensive Plan update. Public notice is funded through fees paid by the applicant. Development review is funded through fees paid by the applicant.

COMMUNITY TOUCHSTONES:

Consideration of this request does not negatively impact community touchstones and in fact is supportive of the 2021 Comprehensive Plan update. The applicant's request for Neighborhood Master Plan and Change of Zone illustrates a change to bring the site into conformance with the Town's vision of continued growth within the Town's utility service area. The UR – Urban Residential zoning district is proposed and shall align with the vision of the Comprehensive Plan and Mountain Avenue Overlay Corridor.

RECOMMENDED ACTION(S):

Neighborhood Master Plan

Staff recommends Planning Commission make a motion to recommend approval of the Fickel

Farm 5th Filing Neighborhood Master Plan to the Town Board of Trustees.

Rezoning

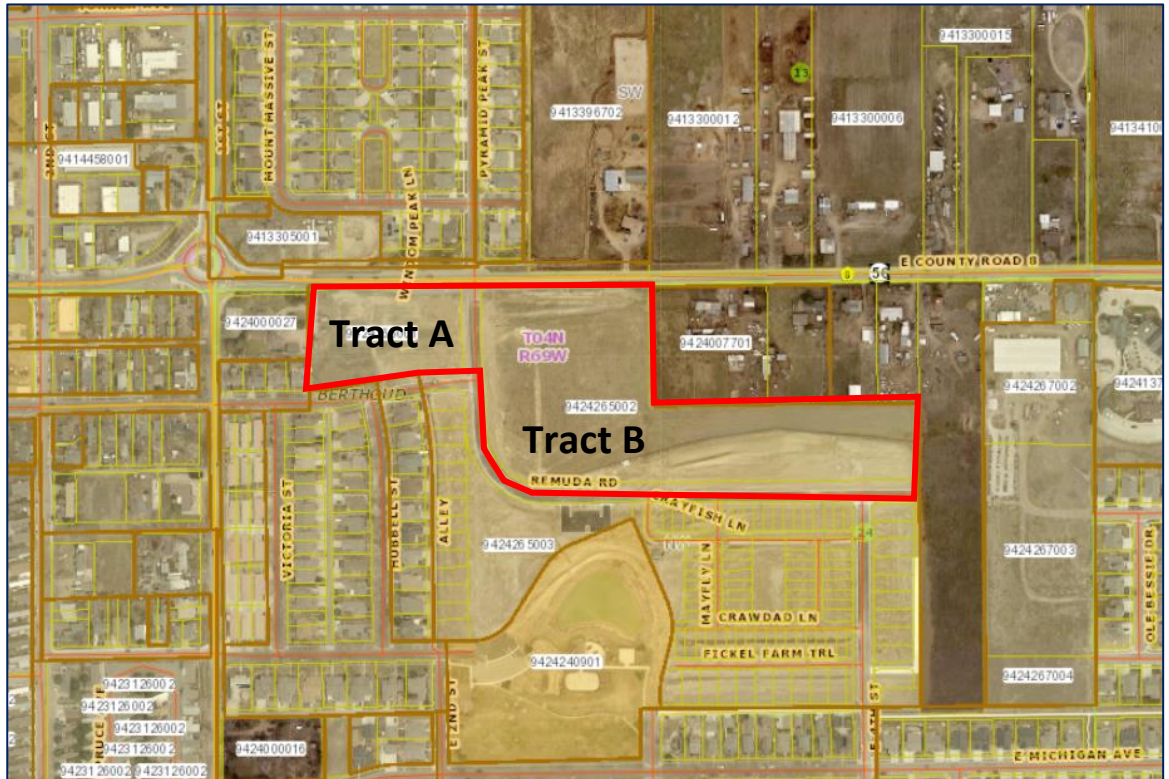
Staff recommends Planning Commission make a motion to recommend approval to the Town Board of Trustees of the Fickel Farm 5th Filing Rezone request to rezone from PUD – Planned Unit Development to UR – Urban Residential.



STAFF REPORT: FICKEL FARM 5TH FILING NEIGHBORHOOD MASTER PLAN AND REZONE

DATE: October 24, 2024

GENERAL INFORMATION

GENERAL INFORMATION		
Applicant:	Steve Wiens – StackLot LLC Kristin Turner – TB Group	Size: 14.5 acres
Site Location:	Tract A: parcel #9424265001 and Tract B: parcel #9424265002 The two subject parcels are located south of Mountain Avenue at the intersection of Pyramid Peak Street. 	
Applicant's Request:	The Applicant is requesting to rezone the subject property from PUD – Planned Unit Development to UR – Urban Residential, and Neighborhood Master Plan for a proposed residential development consisting of townhome and paired home (duplex) units.	
Current Zoning:	PUD – Planned Unit Development	
PROPOSED ZONING DISTRICT INFORMATION		
Proposed Zone District	UR – Urban Residential	
Max Density	N/A	
Min. Lot Area	Townhomes – 1,600sf for each lot/unit Paired Homes (Duplex) – 2,000sf	

Proposal

The applicant is proposing the following two requests: Neighborhood Master Plan for the proposed Fickel Farm 5th Filing development consisting of 115 townhome lots and 50 paired home (duplex) lots with a concurrent request to Rezone the subject property from PUD – Planned Unit Development to UR – Urban Residential. The applicant is requesting a rezone from PUD to UR – Urban Residential to be more consistent with current market conditions (changing housing market) and to better align with the Town of Berthoud Comprehensive Plan.

This Neighborhood Master Plan request includes an increase to the overall density of Tract A and Tract B, as was previously approved as part of the Fickel Farm 4th Filing Neighborhood Master Plan in 2021. The proposed Neighborhood Master Plan proposes an increase from the previously approved 70 total units to 165 total units; a 95-unit increase. This request would increase the overall density of the Fickel Farm Development from 171 units to 266 total units.

The Neighborhood Master Plan proposes townhome lots adjacent to Mountain Avenue with the paired home lots located further into the development along Pyramid Peak Street. The Neighborhood Master Plan includes a proposed Regional Trail connection and a pocket park.

Background

According to project records, the subject properties were originally zoned PUD – Planned Unit Development in 1997 as part of the Fickel Farm 1st Filing. In 2021, Tract A and Tract B were included in the Fickel Farm 4th Filing Neighborhood Master Plan and Final Plat. In the 2021 approved Neighborhood Master Plan, the land use and maximum number of units was established for Tract A and Tract B. The current approved land use for both Tracts is ‘Front Loaded Single-family Detached / Attached’ units with a maximum 14 units for Tract A and a maximum 56 units for Tract B.

Over the course of the last few years, the Town has phased out the PUD process and the PUD zone district is no longer a preferred zone district. The Town has strongly encouraged property owners with PUD zoned properties to transition their projects to a current zone district rather than continuing with the PUD-FDP process. As the Town has eliminated the potential for future PUDs, the fact that previously approved PUDs are not clear regarding land uses and densities, applicants are encouraged to change the zoning of their properties to reflect the vision and values of the 2021 Comprehensive Plan. The UR – Urban Residential zone district was not an available zone district at the time the Fickel Farm 4th Filing Neighborhood Master Plan was approved in 2021.

Referral Agency Review and Public Comment

The Fickel Farm 5th Filing Neighborhood Master Plan and Rezone request has had three (3) rounds of referral agency review. Referral Agencies and Staff find that all comments have been adequately addressed.

Neighbor notification was sent to adjacent property owners notifying them of the request and a public notice sign has been posted on the subject property. As of the drafting of this report, no neighbor comments have been received.

Neighborhood Master Plan

The Neighborhood Master Plan is a conceptual design of the development, submitted with a rezoning or major subdivision application, that depicts the applicant’s vision for the overall development, including zoning, transportation, pedestrian network, parks, open space, subdivision identity standards and other amenities. The Neighborhood Master Plan is binding on a development, and all future platting/zoning actions must follow the approved plan or apply for an amendment of said plan. Section 30-6-106(E) of the municipal code states that a Neighborhood Master Plan must consist of the following required elements:

30-6-106(E) Required Elements	Finding	Rationale
1. <u>Traffic Plan:</u> The applicant shall provide a preliminary traffic plan that addresses the following elements: i. The proposed street network connectivity to the existing road network, including all proposed access points. ii. The location and layout of all arterial and collector roads within the development. Local streets and alleys do not need to be depicted. iii. A preliminary traffic impact study prepared by a licensed traffic engineer which evaluates proposed access points, the existing street system, and any need for any road improvements (including off-site improvements) created by the proposed development.	Yes	i. The proposed development would connect to the existing road network via connections to Pyramid Peak Street. ii. The project does not propose arterial or collector roads within the development. Local Roads are proposed throughout the site to provide adequate traffic flow connecting to Pyramid Peak Street. iii. A preliminary traffic impact study (TIS)/analysis was provided with the submittal. The Town Engineer reviewed the TIS and was satisfied with the data provided at this phase. A TIS will be required at each subsequent application (Preliminary Plat and Final Plat) following Neighborhood Master Plan and Rezone.
2. <u>Open Space Plan:</u> The applicant shall provide a preliminary open space plan that addresses the following elements: 1. Proposed open space distribution and location, including percentage of open space. 2. Compliance with 30-2-109(D)(4) open space elements. 3. Required buffer areas as per 30-2-109(C)(2)	Yes	i. Fickel Farm is a master-planned community and includes four (4) other filings. The two subject Tracts were originally a part of the Fickel Farm 4th Filing. According to project records, open space and parks requirements were met with Fickel Farm 4th Filing and other previous filings; therefore, this request is not required to fulfill any additional open space or park requirements. ii. No additional open space elements are required for this request. iii. There are no required buffer areas with this request.
3. <u>Park(s) Plan:</u> i. Proposed park locations and types of parks as per Section 30-2-109(B)(2) and (3) ii. Proposed park acreage as per Section 30-2-109(B)(2)	Yes	(i.-ii.) See above. Open space and park requirements have been fulfilled through previous filings.
4. <u>Pedestrian Network:</u> i. Location of all trails within development, and connection to existing trail network. ii. Connectivity of sidewalks to the existing pedestrian system, including any off-site sidewalk improvements.	Yes	i. Locations of all trails are depicted on the NMP. Connections are provided to the existing trail network and additional trails are provided throughout the project, including a proposed Regional Trail adjacent to Mountain Avenue as depicted in the Berthoud Trails Master Plan.

iii. Depiction of any bike lanes or any other multi-modal features.		ii. Sidewalks will be constructed along the frontages of all properties and will then connect to the existing pedestrian system. iii. Bike lanes are not proposed nor required along the Local Roads internal to the site nor along Pyramid Peak Street which is also classified as a Local Road.
30-6-106(E) Required Elements	Finding	Rationale
5. <u>Zoning:</u> i. The location of zoning boundaries shall be provided with the application and depicted on the Neighborhood Master Plan. ii. The plan should show how lot diversity standards of Section 30-2-116(D)(1)(c), are met and create a mix of zoning which is harmonious with the surrounding area, and within the property itself. iii. Density and lot diversity shall be distributed throughout the project and shall not be located in only one area.	Yes	i. In addition to the Neighborhood Master Plan, this project also includes a rezoning request. The Neighborhood Master Plan identifies the project showing the proposed zoning changes. ii. The proposed zoning district, UR – Urban Residential, would be consistent with the existing residential districts in the area including the PUD and R3 zoning. Townhomes are proposed along Mountain Avenue with the Paired Homes located further into the development along Pyramid Peak Street. The paired homes will be adjacent to those paired homes currently under construction while the Townhomes will front Mountain Avenue, activating the streetscape. The two (2) types of lots being proposed meet the lot diversity standards contained in Section 30-2-116(D). iii. Density and diversity are distributed throughout the project as well as the Fickel Farm Development overall.
6. <u>Overall Utility Plan:</u> i. A preliminary utility plan depicting the existing capacity of the utility system for both the proposal and any potential future development. ii. Proposed connections to the existing utility system. iii. The location of any proposed or required lift stations. iv. Utility plans for the interior of the development (such as water and sewer service lines) are not required as part of this process.	Yes	(i. – iv.) A preliminary utility plan has been provided showing the water line and sewer line connections capacity and demand, and where the lines would be located to verify the project can served by utilities. The project will connect to Town of Berthoud utilities through existing connections. The Town Engineer reviewed the preliminary utility plan and is satisfied with the data provided at this phase of the project. A Utility Plan will be required at each subsequent application (Preliminary and Final Plat).
7. <u>Subdivision Identity Standards:</u> i. The applicant shall provide compliance with subdivision identity standards found in Section 30-2-131.	Yes	i. Similar to the open space and parks requirement, many of the Subdivision Identity Standards requirements were met by the Fickel Farm 4 th Filing application. However, because the applicant is requesting an increase in the overall density of the development, the required number of subdivision identity and place elements increases from six (6) to seven (7). The applicant has provided one additional

		element, a pocket park, on the Neighborhood Master Plan.
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Neighborhood Master Plan Review Criteria

Section 30-6-106(G) states that the town shall use the following criteria in addition to other applicable provisions of the code to evaluate the application.

30-6-106(G) Review Criteria	Finding	Rationale
1. The land use mix within the project conforms to Berthoud's Zoning District Map and Comprehensive Plan Preferred Land Use Map and furthers the goals and policies of the Comprehensive Plan.	Yes	The Future Land Use Map envisions this area as Urban Residential. Additionally, the portion of the property located adjacent to Mountain Avenue is in the Mountain Avenue Overlay District, specifically Berthoud East Character District. The Comprehensive Plan states that the dominant land use in the Urban Residential Character District will be a mix of residential housing types with non-residential uses to support the neighborhoods. Housing types should include single-family detached homes, single-family attached homes (paired homes), townhomes, and multi-family options. Affordable housing should also be incorporated in these areas. Urban Residential areas should generally maintain moderate to high density. The proposed Fickel Farm 5th Filing NMP proposes alley loaded Townhomes along Mountain Avenue transitioning to Paired Homes (duplexes) further into the development along Pyramid Peak Street, adjacent to the paired homes currently under construction. The proposed product type (townhomes and paired homes) and proposed increase in density address changes in the housing market including a desire for smaller homes at different price points. The proposed project meets the housing diversity standards intended for the Urban Residential Character District while also potentially providing more attainable housing options. The proposed density would be consistent with the intent of the Urban Residential Character District. The Mountain Avenue Overlay District envisions this area as Berthoud East Character District with the primary use being residential with mix-use commercial as the secondary use. The plan states that mixed-use commercial should be located near County Line Road 1, away from existing residential neighborhoods; appropriate transitions from existing residential neighborhoods are critical. The Fickel Farm 5th Filing NMP does not include a commercial

		component, which supports the concept plan for the Berthoud East Character District. The proposed development furthers the goals and policies of the Comprehensive Plan, specifically Maintaining a Strong Community Identity and Housing Diversity. The Fickel Farm 5th Filing proposes housing types listed as being preferred in the Urban Residential Character District. Additionally, the Urban Residential Character District is intended to maintain moderate to high density. The proposed housing types and densities are appropriately located and reflect transect-based planning to maintain a strong community identity while contributing to the housing diversity of the Town.
30-6-106(G) Review Criteria	Finding	Rationale
2. The Neighborhood Master plan represents a functional system of land use and is consistent with the rationale and criteria set forth in this Chapter, the Town Comprehensive Plan, and the Parks, Open Space and Recreation (PORT) Plan as amended.	Yes	The proposed plan is consistent with this criterion. The proposed project reflects transect-based planning by maintaining a higher density near the Town core and major transportation routes (SH 56). The proposed housing types and densities are consistent to what is currently being developed in Fickel Farm 4th Filing and other similar developments in the area. The project will extend existing roadways to service the proposed lots allowing for a more connected neighborhood design. Additionally, the trail system proposed will allow connections throughout the project and into neighboring areas.
3. The preliminary traffic, open space, park utility and pedestrian design is adequate and functional given the existing and planned capacities of each system, and meets the standards found in this Code.	Yes	Plans were reviewed by Town staff as well as outside referral agencies. No deficient capacity issues were identified at this phase of the project. The applicant will be required to provide updated plans and reports (i.e. – Traffic Impact Study, Drainage Report, Utility Plans) at each subsequent application (Preliminary and Final Plat).
4. Negative impacts on adjacent land uses have been identified and satisfactorily mitigated.	Yes	Impacts to neighboring properties have been mitigated. Multiple access points from Pyramid Peak Street have been proposed so as to not create congested roadways. Townhomes will be located adjacent to Mountain Avenue and will be alley loaded; meaning, garage doors will not front this primary highway in and out of town which in turn will create a more inviting, walkable street front. The proposed development is required to meet minimum lot size standards and minimum building setback standards which will further mitigate impacts on adjacent land uses.
5. There is a need or desirability within the community for the development and the development will help achieve	Yes	The proposed project is consistent with the Future Land Use Map in the Comprehensive Plan and the Mountain Avenue Corridor. The proposed

a balance of land use and/or housing types within Berthoud according to town goals.		Neighborhood Master Plan provides a balance of townhome and paired home (duplex) lots consistent with the town goals addressed in the Comprehensive Plan.
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Rezoning

According to project records, the subject properties were originally zoned PUD – Planned Unit Development in 1997 as part of the Fickel Farm 1st Filing. In 2021, Tract A and Tract B were included in the Fickel Farm 4th Filing Neighborhood Master Plan and Final Plat. In that approved Neighborhood Master Plan, land use and maximum number of units was established for Tract A and Tract B under the current PUD zoning.

Over the course of the last few years, the Town has phased out the PUD process and the PUD zone district is no longer a preferred zone district. The Town has strongly encouraged property owners with PUD zoned properties to transition their projects to a current zone district rather than continuing with the PUD-FDP process. The applicant is requesting a rezone from PUD to UR – Urban Residential to be more consistent with current market conditions (changing housing market) and to better align with the Town of Berthoud Comprehensive Plan. It should be noted that the UR – Urban Residential zone district was not an available zone district at the time the Fickel Farm 4th Filing Neighborhood Master Plan was approved in 2021.

Rezoning is addressed through an official zoning map amendment. Section 30-3-110(D) states for the purpose of establishing and maintaining sound stable and desirable development within the Town, the Zoning Map shall not be amended except when it addresses one or more of the criteria in the following table.

30-3-110(D) Zoning Map Amendment Criteria	Finding	Rationale
1. To correct a manifest error in an ordinance establishing the zoning for a specific property; or 2. To rezone an area or extend the boundary of an existing district because of changed or changing conditions in a particular area or in the Town generally; or 3. The land to be rezoned was zoned in error and as presently zoned is inconsistent with the policies and goals of the Town Comprehensive Plan; or 4. The proposed rezoning is necessary to provide land for a community-related use that was not anticipated at the time of the adoption of the Town Comprehensive Plan, and the rezoning will be consistent with the policies and goals of the Comprehensive Plan; or 5. The area requested for rezoning has changed or is changing to such a degree that it is in the public interest to encourage development or redevelopment of the area	Yes	Staff finds that the proposed rezoning meets criteria 2. The town has shifted away from Planned Unit Developments, and the proposed rezoning will help create more consistency between the project and what is intended in the Future Land Use map in the Comprehensive Plan.

Notice of the Planning Commission Public Hearing has been mailed to property owners within 500 feet of the subject property October 9, 2024, a legal ad published October 10, 2024, and the property was posted as required by the Development Code by the applicant on September 30, 2024. As of the drafting of this staff report, staff has not received any public comments on the proposed request.

FINDINGS AND RECOMMENDATIONS

Neighborhood Master Plan

Staff recommends Planning Commission make a motion to recommend approval of the Fickel Farm 5th Filing Neighborhood Master Plan to the Town Board of Trustees.

Rezoning

Staff recommends Planning Commission make a motion to recommend approval to the Town Board of Trustees of the Fickel Farm 5th Filing Rezone request to rezone from PUD – Planned Unit Development to UR – Urban Residential.

Attachments

1. Application form
2. Project Narrative
3. Neighborhood Master Plan
4. Rezoning Map
5. Preliminary traffic impact study/analysis

RESOLUTION NUMBER 14

(SERIES 2024)

A RESOLUTION OF THE TOWN OF BERTHOUD BOARD OF TRUSTEES APPROVING A NEIGHBORHOOD MASTER PLAN FOR A DEVELOPMENT KNOWN AS THE “FICKLE FARM 5TH FILING” DEVELOPMENT” IN THE TOWN OF BERTHOUD.

WHEREAS, the property under consideration is known as the “Fickel Farm 5th Filing” development; and

WHEREAS, the Town of Berthoud (“Town”) approved Ordinances 747 on August 26, 1996, which approved the Zoning of the Fickel Farm 5th Filing property to Planned Unit Development; and

WHEREAS, the applicant has reviewed the 2021 Comprehensive Plan and seeks to incorporate the Town’s new zoning classifications and conform to the land development vision outlined in the 2021 Comprehensive Plan at the request of staff; and

WHEREAS, the Neighborhood Master Plan attached herein as Exhibit A has been reviewed by referral agencies to ensure the proposed development does not present a burden on service provision; and

WHEREAS, notice was properly posted in the manner required by law and a public hearing was conducted on October 24, 2024, before the Berthoud Planning Commission; and

WHEREAS, after the public hearing, the Berthoud Planning Commission made a unanimous recommendation to the Town Board of Trustees to approve the Neighborhood Master Plan as presented; and

WHEREAS, notice was properly posted in a manner required by law and a public hearing was conducted on November 12, 2024, before the Board of Trustees as required by law and which public hearing incorporated the testimony of citizens which were allowed to speak during “Citizen Participation” during the Board of Trustees meeting held November 12, 2024, and which testimony the applicant confirmed it had reviewed; and

WHEREAS, based on the testimony and evidence presented at the public hearing and that given November 12, 2024, the Board of Trustees determines and finds that compliance with the Neighborhood Master Plan review criteria as provided in Section 30-6-106.G of the Berthoud Municipal Code has been demonstrated.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES OF THE TOWN OF BERTHOUD, COLORADO:

Section 1. NMP Approval. The Neighborhood Master Plan is hereby approved. The Preliminary Plat shall be submitted in accordance with the Neighborhood Master Plan and the processing shall follow the Land Use Code and all master plans affecting the property.

Section 2. Interpretation: This Resolution shall be interpreted and construed to effectuate its general purpose.

Section 3. Effective Date: The provisions of this Resolution shall take effect upon adoption.

APPROVED AND ADOPTED this 12th day of November 2024.

TOWN OF BERTHOUD

By _____
William Karspeck, Mayor

ATTEST:

By: _____
Christian Samora, Town Clerk

Exhibit A: Neighborhood Master Plan

ORDINANCE NO. 1345

**AN ORDINANCE AMENDING THE ZONING MAP OF THE TOWN OF BERTHOUD
TO REZONE THE FICKEL FARM 5TH FILING PROPERTY PREVIOUSLY ZONED
TO PLANNED UNIT DEVELOPMENT TO URBAN RESIDENTIAL DISTRICT.**

WHEREAS, the property under consideration is known as the “Fickel Farm 5th Filing” development and was zoned to Planned Unit Development by Ordinances 747 in 1996 by the Town of Berthoud; and

WHEREAS, the applicant has reviewed the 2021 Comprehensive Plan and seeks to incorporate the Town’s new zoning classifications and conform to the land development vision outlined in the 2021 Comprehensive Plan at the request of staff; and

WHEREAS, the Planning Commission considered the request to rezone the property at their public hearing on October 24, 2024 and moved to forward their approval of the request to the Town Board of Trustees; and

WHEREAS, notice was properly posted in the manner required by law and a public hearing was conducted on October 24, 2024, before the Berthoud Planning Commission and a public hearing was conducted on November 12, 2024, before the Board of Trustees as required by law; and

NOW, THEREFORE, BE IT ORDAINED BY THE BOARD OF TRUSTEES OF THE TOWN OF BERTHOUD, COLORADO:

Section 1. Map Revision: The official zoning map of the Town of Berthoud shall be amended hereinafter and which property is commonly known as the “Fickel Farm 5th Filing” development as described in Exhibit A, shall be rezoned from Planned Unit Development to Urban Residential (UR) as illustrated in Exhibit B.

Section 2. Interpretation: This Ordinance shall be so interpreted and construed to effectuate its general purpose.

Section 3. Publication: The Town Clerk shall certify to the passage of this Ordinance and cause its contents to be published and shall cause the appropriate change to be made to the official Berthoud Zoning District Map.

Section 4. Effective Date: The provisions of this Ordinance shall take effect thirty days after publication as required by law.

INTRODUCED, READ, ADOPTED, APPROVED, AND ORDERED PUBLISHED IN FULL on this 12th day of November 2024.

TOWN OF BERTHOUD

By _____

William Karspeck, Mayor

ATTEST:

By: _____

Christian Samora, Town Clerk

EXHIBIT A: LEGAL DESCRIPTION

Tract 1, Fickel Farm PUD Fourth Filing, Town of Berthoud, County of Larimer, State of Colorado.

Tract 2, Fickel Farm PUD Fourth Filing, Town of Berthoud, County of Larimer, State of Colorado.

EXHIBIT B: CHANGE OF ZONE MAP



Town of Berthoud
807 Mountain Ave.
P.O. Box 1229
Berthoud, CO 80513
970 532 2643

DEVELOPMENT REVIEW APPLICATION

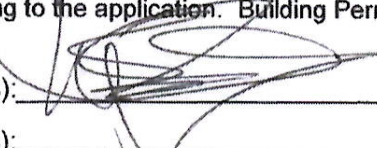
All required information must be provided before submittal will be accepted and deemed complete.
To be complete, the application must include all items identified on the submittal checklist.
Please complete both sides of application form.

Parcel Number(s): 9424265001 & 9424265002		
Site Address: Mountain Avenue and Pyramid Peak Street		
Project Name: Fickel Farm		
Brief description of project: Rezone parcels 9424265001 & 9424265002 from PUD to UR		
APPLICATION TYPE (Check as appropriate):		
☐ Annexation	☐ Preliminary Subdivision Plat	☐ Final Site Plan
☒ Rezoning	☐ Final Subdivision Plat	☐ PUD Amendment
☐ Concept Plan	☐ Plat Amendment	☐ PUD Preliminary Development Plan
☐ Minor Subdivision	☐ Oil and Gas	☐ PUD Final Development Plan
☐ Special Use Review	☐ ROW Vacation	☒ Other <u>NMP Amendment</u>
APPLICANT		
Name: StackLot L.L.C. (Steve Wiens)		
E-mail: steve@stacklot.com	Mailing Address: 5639 S. Curtice Street	
Phone: (303) 808-4523	City/State/Zip: Littleton, CO 80120	
CONTACT PERSON (will receive correspondence from Town Staff/Referral Agencies)		
Name: Will Edwards		
E-mail: Will@edwards-development.com	Mailing Address: 506 Shoshoni Street	
Phone: (307) 464-8800 ext. 1	City/State/Zip: Cheyenne, WY 82009	
OWNER(S) (If different than applicant)		
Name: Berthoud Homes LLC		
E-mail: Will@edwards-development.com	Mailing Address: Cheyenne, WY 82009	
Phone: (307) 464-8800 ext. 1	City/State/Zip: Cheyenne, WY 82009	
CONSULTANT (Engineer, Surveyor, or Planner)		
Name: See Exhibit 'A'		
E-mail:	Mailing Address:	
Phone:	City/State/Zip:	

LAND USE INFORMATION							
Existing Use: Single Family Detached, Single Family Attached and Multi-Family							
Proposed Use: UR	Adjacent zoning / land use: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">East Side: PUD</td> <td style="width: 50%;">North Side: PUD</td> </tr> <tr> <td>West Side: R1</td> <td>South Side: PUD</td> </tr> </table>	East Side: PUD	North Side: PUD	West Side: R1	South Side: PUD		
East Side: PUD		North Side: PUD					
West Side: R1		South Side: PUD					
Existing Zoning: PUD							
Proposed Zoning: (if applicable): UR							
Number of acres: 14.01							
Proposed Access: Highway 56							
UTILITY SERVICE INFORMATION							
Water: Town of Berthoud	Sewer: Town of Berthoud						
PROJECT INFORMATION							
Number of proposed units: Per Current UR Land Use Code Number of phases: One Number of Units per phase: T.B.D. Number of lots proposed: T.B.D. Lot size minimum: Per Current UR Land Use Code Lot size maximum: Per Current UR Land Use Code Lot size average: Per Current UR Land Use Code Gross density (units/acre): Per Current UR Land Use Code Net density (units/acre): Per Current UR Land Use Code Area and percent open space: Already Satisfied	Non-Residential Building Area (Sq. Ft.) Proposed: 0 Non-Residential Construction Floor Area Ratio Proposed: 0 Total Number of Parking Spaces: 0 Acreage of Site: a. Gross: 14.01 b. Right-of-Way: 0 c. Net (a-b) 14.01 Type of Housing Proposed (please check): <table style="width: 100%;"> <tr> <td>☒ Future Single Family</td> <td>☒ Townhouse</td> </tr> <tr> <td>☒ Duplex</td> <td>☒ Condominium</td> </tr> <tr> <td>☒ Multi-family</td> <td></td> </tr> </table> (# of units: T.B.D.)	☒ Future Single Family	☒ Townhouse	☒ Duplex	☒ Condominium	☒ Multi-family	
☒ Future Single Family	☒ Townhouse						
☒ Duplex	☒ Condominium						
☒ Multi-family							

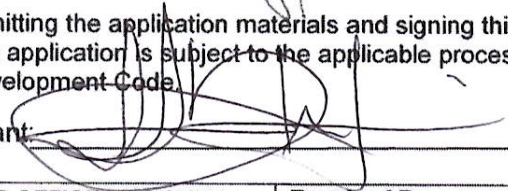
Signatures are required for ALL Property Owners and the Applicant

I hereby certify that I am the lawful owner of the parcel(s) of land that this application concerns and consent to the action. I hereby permit Town of Berthoud staff to enter upon the property for the purposes of inspection relating to the application. Building Permits will not be accepted while this application is in process.

Property Owner(s):  Date: 8/15/23

Property Owner(s): _____ Date: _____

In submitting the application materials and signing this application agreement, I acknowledge and agree that the application is subject to the applicable processing and public hearing requirements set forth in the Development Code.

Applicant:  Date: 10/5/23

FOR OFFICE USE ONLY	Received By: _____	Date: _____
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Fickel Farm Neighborhood Master Plan Narrative **July 19, 2024**

General Description

Berthoud Homes LLC has been active in the Town of Berthoud since 2016 and its principals have a long history with this community. Berthoud Homes has worked diligently, and in good faith, to build positive relationships with the community, its neighbors in Mary's Farm, and with the Town from the outset of its first project. Berthoud Homes remains committed to bringing this community special and unique development that is conservation minded and that honors Berthoud's heritage. It remains Berthoud Homes intent that any development preserves, promotes, and enhances the Berthoud community with clean, modern, and attainable country farm living.

In 2021 Berthoud Homes LLC gained unanimous approval from the Planning Commission and Board of Trustees for a Neighborhood Master Plan, Preliminary Plat and Final Plat for the development and construction of southern portion of Fickel Farms. The development consists of a combination alley loaded single family detached and duplex products. This phase of development has constructed East 4th Street and West Remuda Road, connecting Mary's Farm to Highway 56.

Berthoud Homes is actively marketing the north two north parcels (Parcel A & B) to residential developers. Perspective developers are requesting that the underlying zoning be revised to match current market conditions and Town of Berthoud Comprehensive Plan. At the time of approval of Neighborhood Master Plan in 2021 the zoning district Urban Residential was not available for consideration. The purpose of this application is to rezone the two north parcels, equaling 14.52 Acres, to Urban Residential to meet proposed developers and requirements and to bring the parcels into alignment with the Town of Berthoud's 2021 Comprehensive Plan.

This is a proposal for an amended Neighborhood Master Plan for parcels A & B only.

The proposed land use change supports the Town's land use designation in the 2021 Comprehensive Plan.

Land Use Area

Fickel Farm (Parcels A & B) is approximately 14.52 acres. The project has proposed development that is consistent with the Land Use Map of the Comprehensive Plan 2021, with an existing zoning designation of PUD, and a zoning application which is being reviewed concurrently, for proposed Urban Residential (UR) zoning. The site is located south of Mountain Avenue.

Proposed Density & Zone Change

Fickel Farm has existing PUD zoning and an approved NMP which would allow for 70 units within Parcels A & B. The Town of Berthoud requests all applicants to consider rezoning to 'straight zoning' with any new entitlement application, to ensure that the most current code will be applicable as the property is developed. Per this request, a rezoning application was submitted along with the NMP package. Since the Future Land Use Map/Comprehensive Plan designates this area as appropriate for urban residential development, UR (urban residential) zoning has been proposed, to be in conformance with these guiding documents. With urban residential zoning, the property will be required to develop with alley loaded residential product type, which is consistent with the adjacent development and character for this area. The proposed NMP includes 165 lots which is an additional 95 lots from the previously approved plan. The proposed townhomes and duplex units will result in a new product type for the community. The product type and increase in density are a result of the changing housing market, which is demanding smaller homes at different price points. The addition of townhomes along Mountain Avenue will allow for a pedestrian oriented community, an activated streetscape and a more aesthetically pleasing character than backyard fencing along this important corridor. The economics of development has also changed, which encourages strategic use of density along corridors such as Mountain Avenue. This site will benefit from the adjacent community park (Fickel Park), which was designed to serve this development as well as the existing nearby residential.

Statement of Commercial Mineral Deposits

There are no known commercial mineral deposits on this site.

Compliance with Section 30-2-131

The existing, approved Neighborhood Master Plan required six (6) subdivision identity elements were required. The additional proposed density in parcels A & B result in a requirement for one (1) additional element for a total of seven (7).

The specific subdivision identity elements to be provided, for parcels A&B, will be determined at the time of plat but a minimum of one (1) additional element points will be provided.

The following is a list of elements per the existing, approved Neighborhood Master Plan:

1. COMMUNITY GARDENS	1
2. USABLE OPEN SPACE	2
3. PLAYGROUND	1
4. ENHANCED ENTRYWAY	1
5. ALLEY LOADED STREETS, MAINTAINED BY TOWN	1
SUBTOTAL	6

The following is a list of elements that is being evaluated for the amended Neighborhood Master Plan (parcels A&B only), but is subject to change, so long as the required element points are achieved at the time of plat:

1. POCKET PARK	1
FICKEL FARM DEVELOPMENT TOTAL	7

Compliance with the Town Comprehensive Plan

The proposed development integrates the goals set out in the Town Comprehensive Plan in the following ways:

Land Use and Growth Management

(Goals/Objectives: 1.1.1, 1.1.2, 1.1.3, 1.6.1, 1.6.2)

The proposed development is designed to provide connections to the perimeter road network and pedestrian connections that will connect to development to the north, east, west and south. In addition, the layout provides continuous, direct, convenient, and safe pedestrian pathways to proposed parks and open space areas. The site is well situated for housing per the Comprehensive Plan.

Circulation and Transportation

(Goals/Objectives: 2.2.1, 2.2.8, 2.2.11, 2.2.12)

This plan provides a safe and efficient transportation network that accommodates pedestrians, vehicles and bicycles. It is planned as a pedestrian oriented and walkable community with detached sidewalks, tree lawns, street trees and connections throughout the community, to adjacent neighborhoods. Several access points to the site are proposed from Mountain Avenue, Welch Avenue and East 4th Street.

Community Character and Urban Design

(Goals/Objectives: 3.1.2, 3.1.3, 3.1.4)

This plan provides a community that promotes high quality development. This development is pedestrian oriented and walkable with detached sidewalks, tree lawns and street trees. Future residents of this community will be able to walk to adjacent subdivisions and parks.

Public Infrastructure

(Goals/Objectives: 1.8.1, 1.8.2, 4.2.5, 4.4.2, 4.6.1, 4.8.3)

The proposed development is a logical extension of the Town of Berthoud public services without placing additional burdens on existing residents and businesses. There are nearby utilities and surrounding Berthoud streets. Infrastructure will be provided so as to meet the requirements of the Comprehensive Plan and/or the Land Use Code.

Rationale of How Neighborhood Master Plan Correlates to Proposed Zone District

The proposed residential product types directly correlate to the proposed zone districts (UR). Townhomes and duplex units are envisioned for this property.

Water Dedication & Sanitary Service

Domestic water service for the project will be provided by the Town of Berthoud. The amount of water dedication, if not already accounted for, will be negotiated with the town. Per water modeling done by JVA, Inc. in December of 2016, it is anticipated that the water system for the site will have pressures ranging from 100 to 112 psi which will provide sufficient pressure throughout the site. The water system has capacity for more than 200 units and will not be a constraint to the development of parcels A & B.

Sanitary sewer service for this project will be provided from the Town of Berthoud. This development will tie-in to the Mary's Farm Sewer lines in 2nd and 4th street. The line in 2nd Street flows west to 1st street and then south to the Town Main. The main in 4th Street runs south to the new tie-in to The Farmstead sanitary sewer in Nebraska that takes flows to the new inverted siphon across the Little Thompson River and to the existing twenty-four-inch sewer main in East County Road 6C that ultimately runs to the Town of Berthoud wastewater treatment facility. With the Tracts being split on the sanitary sewer feed with approximately 1/5 going to the existing sanitary that traverses Tract 1 and the rest heading to the siphon the capacity for the sanitary sewer is a more complicated situation where the remainder of the Farmstead development and this development share what remains of the capacity to the inverted siphon which will allow for approximately 1620 more homes to be developed without surcharging that line. The neighborhood masterplan for Farmstead anticipates 1460 units which would leave 160 units possible for this site, but this is a 1st come 1st serve basis.

Impact on Present and Future Development:

Traffic/Roadways:

The existing traffic impact study allows 120 detached single-family units which would coincide with 154 attached single-family units. If additional units above either of the numbers above or a combination of the above are to be constructed an updated traffic impact study will likely be required which may require improvements to the intersection of Pyramid Peak and Highway 56.

Water:

As noted above the water system should have plenty of capacity to meet the needs of the site without impacting pressure or flows in the area.

Sanitary:

As noted above depending on the timing of the development along with the timing of the development of the Farmstead Phase 2 project the sanitary should have capacity for the development of the site, but it will need to be watched if Farmstead all the way to eastern border of the site develops prior to this site developing.

Storm:

This site will need to provide its own detention per the Fickel Farms drainage report to minimize the flow rate into the existing storm system and will need approximately 2.2 acre-feet of detention.

Parks:

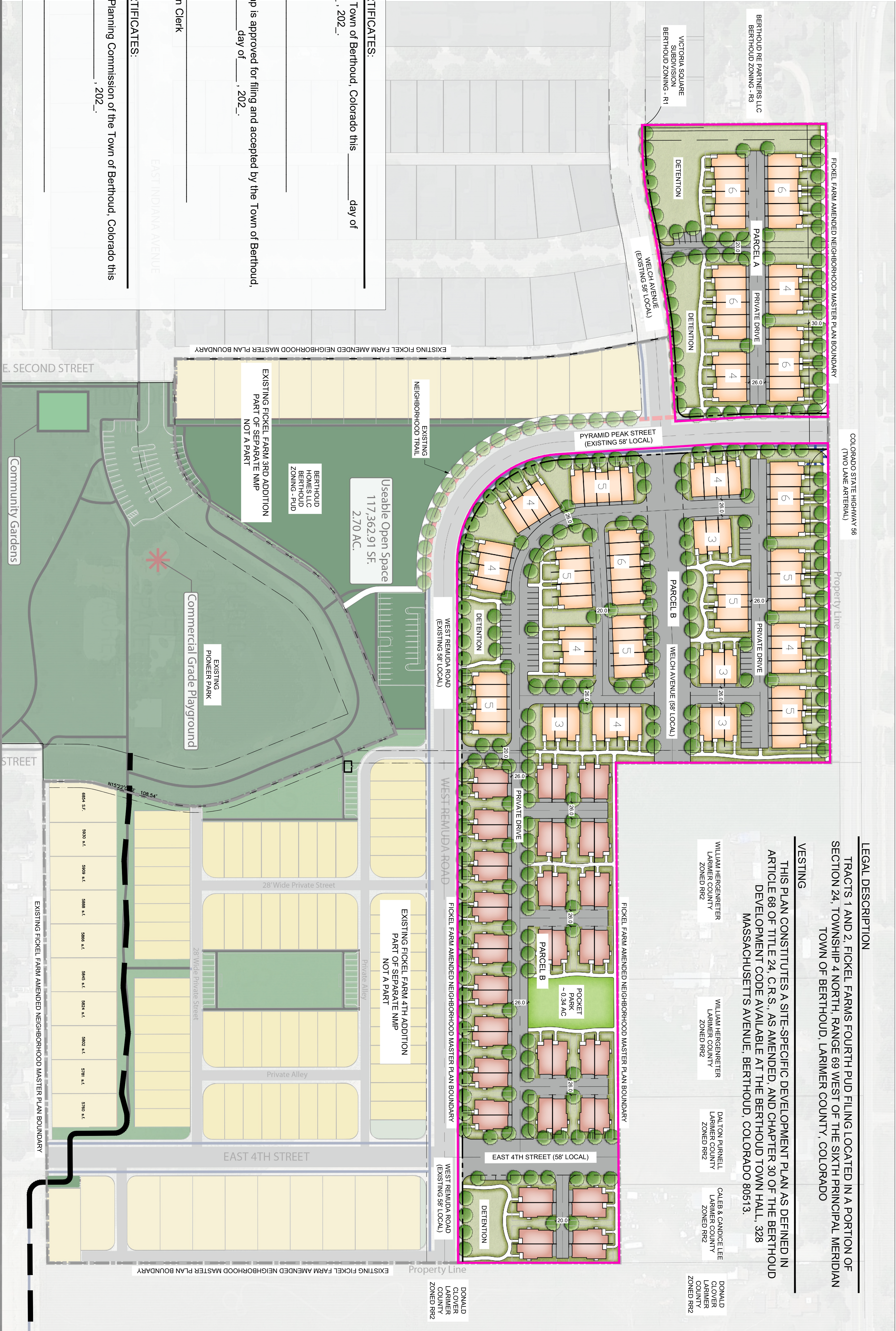
Fickel Farm PUD satisfied parkland dedication requirements with the combined park dedication by Berthoud Heights and Fickel Farm in 1996.

Fire/Police/Schools:

Based on the previously approved PUD, the number of units will approximately double but based on the small number of units (approximately 70) should only have minimal impact on the fire/police/schools in the area. If it is determined to increase the units past what is allowed via the traffic study, then this may need to be revisited.

Request for Vesting

We are requesting vesting of the proposed neighborhood master plan per 30-4-102 of the Berthoud Land Use Code.



APPROVAL CERTIFICATES:

Approved by the Town of Berthoud, Colorado this _____ day of _____, 202_.

Mayor

The foregoing map is approved for filing and accepted by the Town of Berthoud, Colorado this _____ day of _____, 202_.

ATTEST:

Town Clerk

EAST INDIANA AVENUE

APPROVAL CERTIFICATES:

Approved by the Planning Commission of the Town of Berthoud, Colorado this _____ day of _____, 202_.

Chairman

LEGAL DESCRIPTION

TRACTS 1 AND 2, FICKEL FARMS FOURTH PUD FILING LOCATED IN A PORTION OF SECTION 24, TOWNSHIP 4 NORTH, RANGE 69 WEST OF THE SIXTH PRINCIPAL MERIDIAN TOWN OF BERTHOUD, LARIMER COUNTY, COLORADO

VESTING

THIS PLAN CONSTITUTES A SITE-SPECIFIC DEVELOPMENT PLAN AS DEFINED IN ARTICLE 68 OF TITLE 24, C.R.S., AS AMENDED, AND CHAPTER 30 OF THE BERTHOUD DEVELOPMENT CODE AVAILABLE AT THE BERTHOUD TOWN HALL, 328 MASSACHUSETTS AVENUE, BERTHOUD, COLORADO 80513.

WILLIAM HERGENRETER
LARIMER COUNTY
ZONED RR2

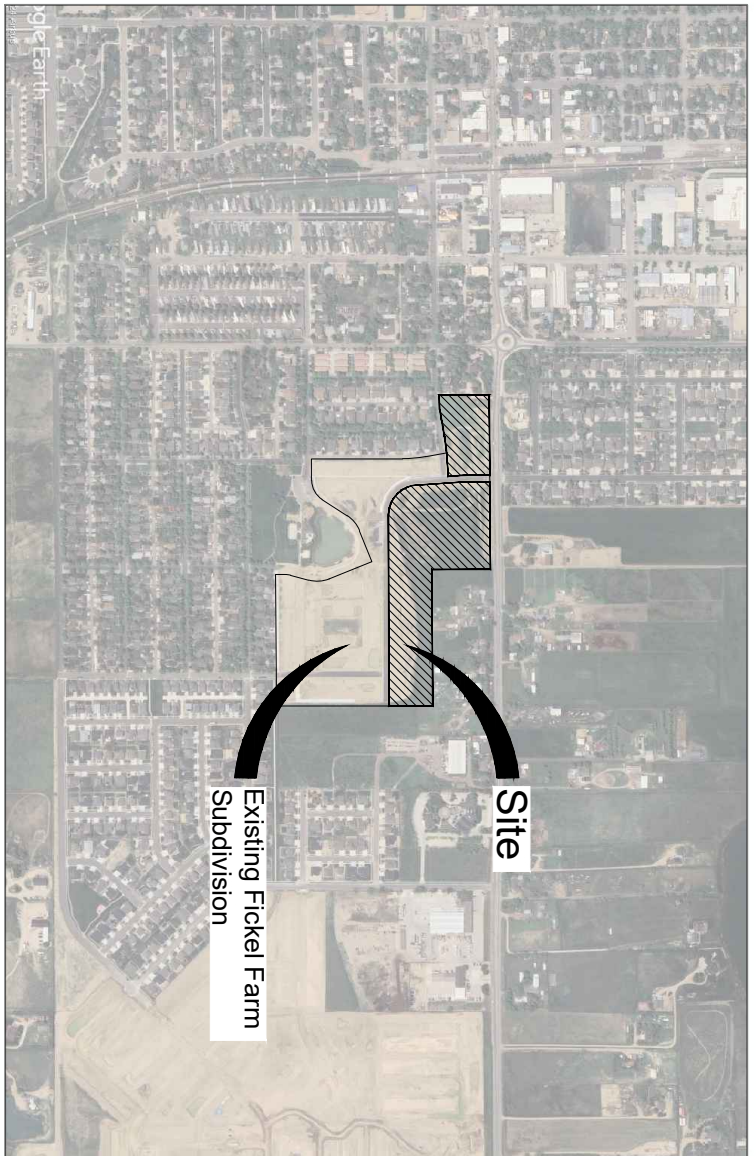
WILLIAM HERGENRETER
LARIMER COUNTY
ZONED RR2

DALTON PURNELL
LARIMER COUNTY
ZONED RR2

CALEB & CANDICE LEE
LARIMER COUNTY
ZONED RR2

DONALD
LARIMER COUNTY
ZONED RR2

VICINITY MAP



LAND USE SUMMARY

LAND USE	DENSITY
DUPLEX	50 LOTS
TOWNHOMES	115 LOTS
TOTAL =	165 LOTS

LAND USE STATISTICS

TOTAL ACREAGE =	14.52 ACRES
ROW/PRIVATE DRIVE ACREAGE =	3.01 ACRES
% OF SITE AS ROW	= 20.8%

TRAFFIC INFORMATION

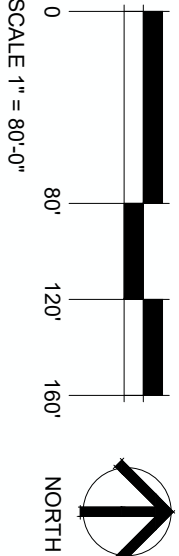
- REFER TO PLAN FOR PROPOSED STREET NETWORK AND EXISTING ROAD NETWORK INCLUDING ALL ACCESS POINTS.
- UNLESS OTHERWISE NOTED ON THE PLAN, ALL STREETS ARE LOCAL STREETS AND/OR ALLEYS.

NOTES:

- OVERALL LAYOUT MAY SHIFT DURING DESIGN, SO LONG AS OVERALL DENSITY, AS DEPICTED IN THIS NEIGHBORHOOD MASTER PLAN, IS NOT EXCEEDED. DENSITY WITHIN A DEVELOPMENT AREA MAY NOT EXCEED THE MAXIMUM PERMITTED PER THE UNDERLYING ZONE DISTRICT. DENSITY SHIFTS MUST ADHERE TO THE NEIGHBORHOOD MASTER PLAN REQUIREMENTS PER SECTION 30-6-106-C.5 OF THE BERTHOUD MUNICIPAL CODE.
- ZONING IS PROPOSED URBAN RESIDENTIAL (UR).

SHEET INDEX

- SHEET 1 - NEIGHBORHOOD MASTER PLAN
- SHEET 2 - OPEN SPACE, CIRCULATION, & PARKS EXHIBIT





SUBDIVISION IDENTITY & RESIDENTIAL STANDARDS

THE SUBDIVISION IDENTITY ELEMENTS LISTED INCLUDE ELEMENTS AT THE EXISTING FICKEL FARM DEVELOPMENTS. IN ADDITION TO NEW AMENITIES TO BE PROVIDED, SPECIFIC AMENITIES AND LOCATIONS WERE DESIGNED AS PART OF THE MASTER PLANNING FOR THE COMMUNITY, WITH THE INTENTION OF SATISFYING TOWN REQUIREMENTS FOR THE OVERALL FICKEL FARM DEVELOPMENT.

SUBDIVISION LOT UNIT COUNTS:

- PREVIOUSLY APPROVED NMP UNITS (A/B ONLY): 70
- PROPOSED NMP UNITS (A/B ONLY): 165
- PREVIOUSLY APPROVED NMP UNITS (A-N): 171
- PROPOSED AMENDED NMP UNITS (A-N): 266
- TOTAL CHANGE IN UNITS +95

SUBDIVISION IDENTITY ELEMENTS:

- PREVIOUSLY APPROVED SUBDIVISION IDENTITY ELEMENTS REQUIRED: 6
- AMENDED SUBDIVISION IDENTITY ELEMENTS REQUIRED: 1

TOTAL: 7

THE FOLLOWING IS A LIST OF ELEMENTS THAT IS BEING EVALUATED FOR THIS SITE, BUT IS SUBJECT TO CHANGE, SO LONG AS THE REQUIRED ELEMENT POINTS ARE ACHIEVED AT THE TIME OF PLAT:

SUBDIVISION IDENTITY ELEMENTS PROVIDED PER EXISTING/APPROVED NEIGHBORHOOD MASTER PLAN:

1. COMMUNITY GARDENS	1
2. USABLE OPEN SPACE	2
3. PLAYGROUND	1
4. ENHANCED ENTRYWAY	1
5. ALLEY-LOADED STREETS, MAINTAINED BY TOWN	1
SUBTOTAL:	6

PROPOSED SUBDIVISION IDENTITY ELEMENT PER AMENDED NEIGHBORHOOD MASTER PLAN:

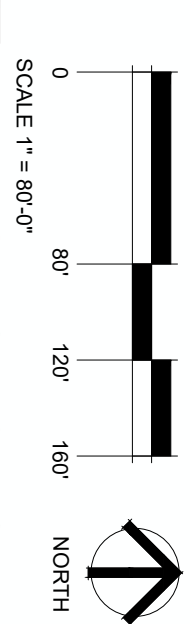
1. POCKET PARK	1
FICKEL FARM DEVELOPMENT TOTAL :	7

OPEN SPACE ELEMENTS

PARK AND OPEN SPACE REQUIREMENTS APPROVED AND SATISFIED PER THE FICKEL FARM PUD.

TRAILS AND WALKS

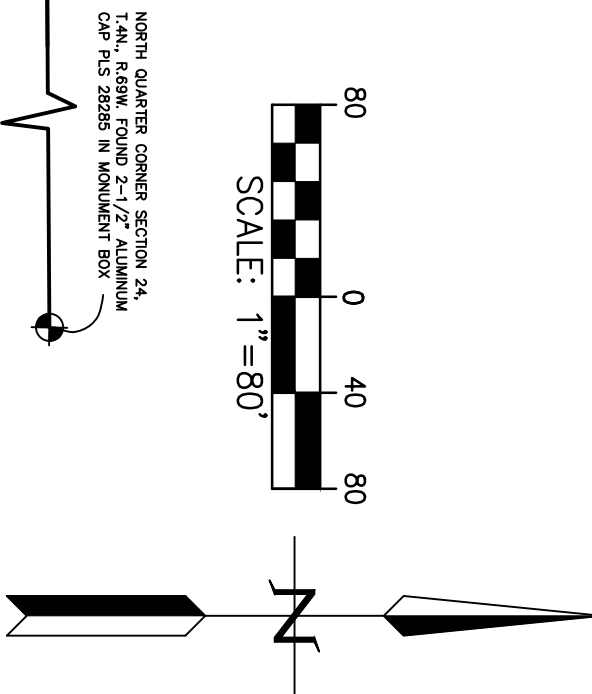
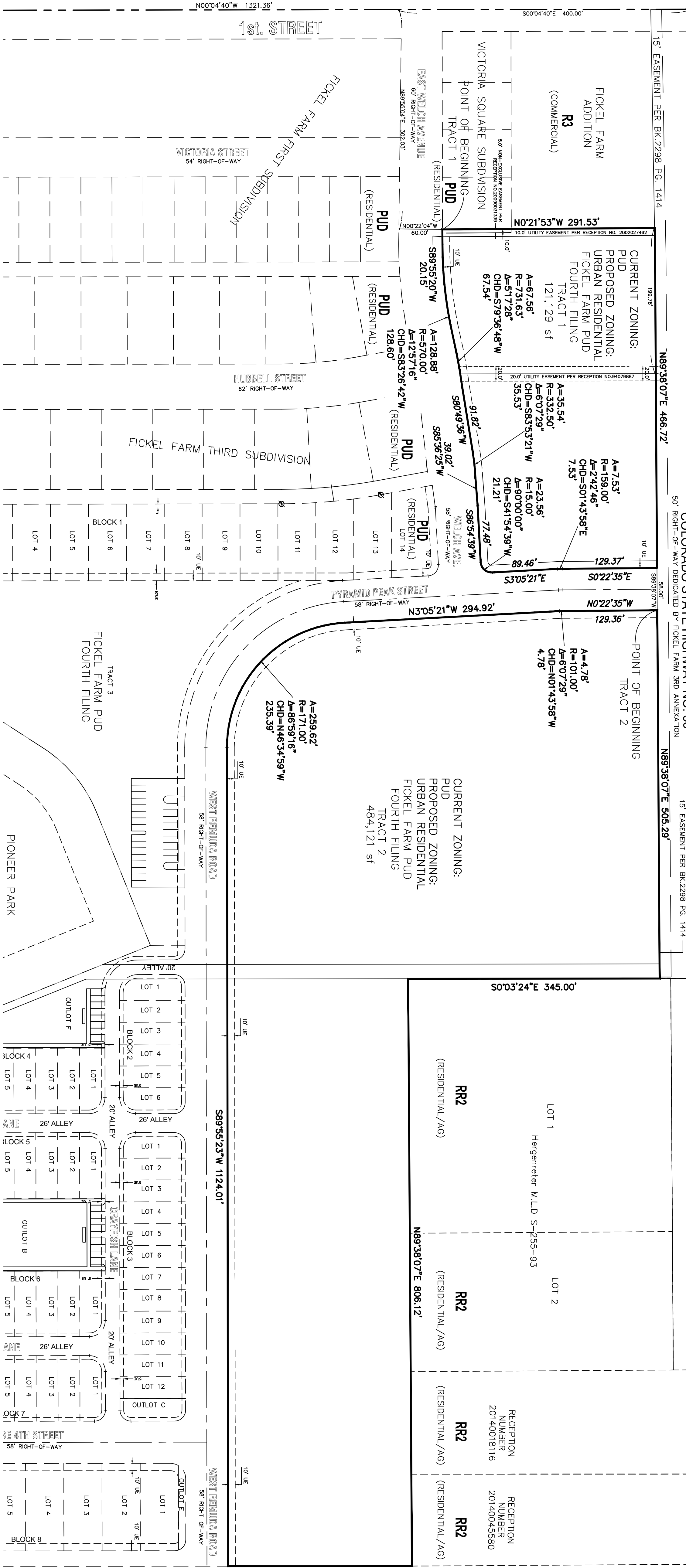
- DETACHED CONCRETE SIDEWALK (6") - 7,734 feet
- 10' REGIONAL TRAIL W/ PARALLEL 3' SOFT SURFACE TRAIL - 1,271 feet
- NEIGHBORHOOD TRAIL - 237 feet



ZONING AMENDMENT MAP

TRACTS 1 AND 2, FICKEL FARMS FOURTH PUD FILING LOCATED IN A PORTION OF SECTION 24, TOWNSHIP 4 NORTH, RANGE 69 WEST OF THE SIXTH PRINCIPAL MERIDIAN TOWN OF BERTHOUD, LARIMER COUNTY, COLORADO

NORTHWEST CORNER SECTION 24, T4N, R69W, TOWN OF BERTHOUD, LARIMER COUNTY, COLORADO
POINT OF COMMENCEMENT



PROPERTY DESCRIPTION TRACT 1

A parcel of land, being part of FICKEL FARM PUD FOURTH FILING located in the Northwest Quarter of Section 24, Township 4 North, Range 69 West of the 6th Principal Meridian, Town of Berthoud, County of Larimer, State of Colorado, and being more particularly described as follows:

- 1) North 00°21'53" West, a distance of 291.53 feet;
- 2) North 89°38'07" East, a distance of 466.72 feet;
- 3) South 00°22'35" East, a distance of 129.37 feet;
- 4) along the arc of a curve to the left having a central angle of 2°42'46", and a radius of 159.00 feet an arc length of 7.53 feet the chord of said curve bears South 01°43'58" East, a distance of 89.46 feet;
- 5) South 03°05'21" East, a distance of 89.46 feet;
- 6) along the arc of a curve to the right having a central angle of 90°00'00", and a radius of 159.00 feet an arc length of 7.53 feet the chord of said curve bears South 89°38'07" West, a distance of 466.72 feet;
- 7) South 86°54'39" West, a distance of 77.48 feet;
- 8) South 85°56'25" West, a distance of 39.02 feet;
- 9) along the arc of a curve to the left having a central angle of 06°07'29", and a radius of 332.50 feet an arc length of 35.54 feet the chord of said curve bears South 83°53'21" West, a chord length of 35.53 feet;
- 10) South 80°49'36" West, a distance of 91.82 feet;
- 11) along the arc of a curve to the left having a central angle of 05°17'29", and a radius of 731.63 feet an arc length of 61.26 feet the chord of said curve bears South 89°38'07" West, a distance of 466.72 feet;
- 12) along the arc of a curve to the right having a central angle of 12°57'46", and a radius of 570.00 feet an arc length of 128.60 feet the chord of said curve bears South 82°26'42" West, a chord length of 128.60 feet;
- 13) South 89°55'20" West, a distance of 20.15 feet to the TRUE POINT OF BEGINNING.

Contains 121,129 square feet more or less.

PROPERTY DESCRIPTION TRACT 2

A parcel of land, being part of FICKEL FARM PUD FOURTH FILING located in the Northwest Quarter of Section 24, Township 4 North, Range 69 West of the 6th Principal Meridian, Town of Berthoud, County of Larimer, State of Colorado, and being more particularly described as follows: A parcel of land in the Town of Berthoud, County of Larimer, State of Colorado located in the Northwest Quarter of Section 24, Township 4 North, Range 69 West of the 6th P.M. more particularly described as follows:

- 1) along the North line of the Northwest Quarter of said Section 24 was a distance of 400.00 feet, to a point on the westerly prolongation of the North line of the Fickel Farm P.U.D. First Filing to the Town of Berthoud;
- thence departing said West line, North 89°55'04" East, along said westerly prolongation and the North line of said Fickel Farm P.U.D. First Filing a distance of 302.03 feet to the Southwest corner of the Victoria Square Subdivision to the Town of Berthoud;
- thence along the West line of said Victoria Square Subdivision, a distance of 60.00 feet to the Southwest Corner of Tract 1, Fickel Farm PUD Fourth Filing;
- thence along the Boundary of said Tract 1, Fickel Farm PUD Fourth Filing the following two (2) courses and distances:

- 1) North 00°21'53" West, a distance of 291.53 feet;
- 2) North 89°38'07" East, a distance of 466.72 feet;

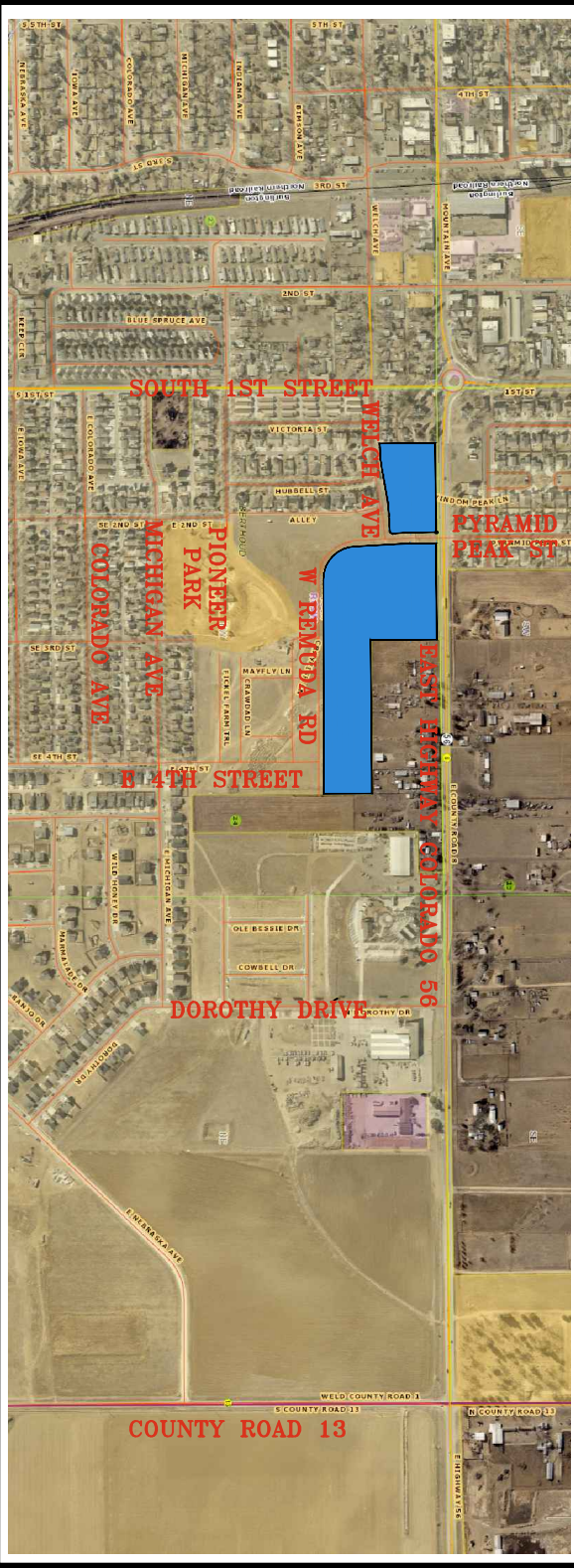
Thence South 89°38'07" West, a distance of 59.00 feet along the southerly right of way of Colorado State Highway No. 56 to the TRUE POINT OF BEGINNING.

thence along the Boundary of said Tract 2, Fickel Farm PUD Fourth Filing the following nine (9) courses and distances:

- 1) North 89°38'07" East, a distance of 505.29 feet;
- 2) South 00°03'24" East, a distance of 345.00 feet;
- 3) North 89°38'07" East, a distance of 806.12 feet;
- 4) South 00°02'07" East, a distance of 252.25 feet;
- 5) South 89°55'23" West, a distance of 1124.01 feet;
- 6) along the arc of a curve to the right having a central angle of 89°59'16", and a radius of 171.00 feet an arc length of 259.82 feet the chord of said curve bears North 46°34'59" West, a chord length of 235.39 feet;
- 7) North 03°05'21" West, a distance of 294.92 feet;
- 8) along the arc of a curve to the right having a central angle of 06°07'29", and a radius of 101.00 feet an arc length of 4.78 feet the chord of said curve bears North 01°43'58" West, a chord length of 4.78 feet;
- 9) North 00°22'35" West, a distance of 129.36 feet to the TRUE POINT OF BEGINNING.

Contains 464,121 square feet more or less.

VICINITY MAP:



APPROVAL STATEMENTS

APPROVAL CERTIFICATES:
THIS IS TO CERTIFY THAT THE REZONING OF THE ABOVE DESCRIBED PROPERTY WAS APPROVED BY ORDINANCE NO. _____ OF THE TOWN OF BERTHOUD, COLORADO, AND THAT THE TOWN OF BERTHOUD IS AUTHORIZED BY SAID ORDINANCE TO REZONE THE SAID PROPERTY TO THE ZONING DESIGNATION OF _____ ON BEHALF OF THE TOWN OF BERTHOUD HEREBY FOR ALL ACKNOWLEDGES AND ADOPTS THE SAID REZONE UPON WHICH THE CERTIFICATE IS ENDORSED FOR ALL PURPOSES INDICATED HEREON.

APPROVED BY THE BOARD OF TRUSTEES OF THE TOWN OF BERTHOUD, COLORADO THIS ____ DAY OF _____, 2024.

MAYOR _____

THE FOREGOING MAP IS APPROVED FOR FILING AND ACCEPTED BY THE TOWN OF BERTHOUD, COLORADO THIS ____ DAY OF _____, 2024.

ATTEST: TOWN CLERK _____

APPROVAL CERTIFICATES:
APPROVED BY THE PLANNING COMMISSION OF THE TOWN OF BERTHOUD, COLORADO THIS ____ DAY OF _____, 2024.

CHAIRMAN _____

THE FOREGOING MAP IS APPROVED FOR FILING AND ACCEPTED BY THE TOWN OF BERTHOUD, COLORADO THIS ____ DAY OF _____, 2024.

ATTEST: PLANNING TECHNICIAN _____

SURVEYORS STATEMENT

I, MICHAEL J. DEDECKER, A REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF COLORADO, DO HEREBY CERTIFY THAT I HAVE PERSONALLY EXAMINED THE SURVEY AND THE ACCOMPANYING PLAY ACCURATELY AND PROPERLY SHOWS SAID SUBDIVISION AND IS IN COMPLIANCE WITH THE SUBDIVISION REGULATIONS OF THE TOWN OF BERTHOUD.

MICHAEL J. DEDECKER P.L.S. 20676
FOR AND ON BEHALF OF
DEDECKER LAND SURVEYING, LLC

ZONING

CURRENT: PUD
PROPOSED: URBAN RESIDENTIAL

INDICATES SECTION LINE
INDICATES UTILITY EASEMENT
INDICATES CONTROL CORNER AS DESCRIBED HEREON
EXISTING ZONING ON ADJACENT PARCELS (WITH USE)

LEGEND

INDICATES SECTION LINE
INDICATES UTILITY EASEMENT
INDICATES CONTROL CORNER AS DESCRIBED HEREON
EXISTING ZONING ON ADJACENT PARCELS (WITH USE)

OWNERS STATEMENT

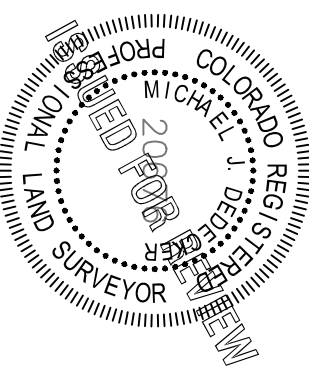
BY WILLIAM J. EDWARDS
AS MANAGER
OF BERTHOUD HOMES, LLC
STATE OF WYOMING)
COUNTY OF LARIMER)
SS

THE FOREGOING DEDICATION WAS ACKNOWLEDGED THIS ____ DAY OF _____, 2024 A.D. BY WILLIAM J. EDWARDS AS MANAGER OF BERTHOUD HOMES, LLC.

MY COMMISSION EXPIRES: _____

NOTARY PUBLIC: _____

WITNESS MY HAND AND SEAL



DATE	RECORD OF ISSUE	BY	CK.

DEDECKER
LAND SURVEYING
4301 FAWN TRAIL
LOVELAND, COLORADO 80537
C (970) 217-2331 H (970) 663-2013



BERTHOUD HOMES LLC
FICKEL FARMS OVERALL DEVELOPMENT PLAN
PART OF THE NW 1/4 SECTION 24, T.4N., R.69W.
TOWN OF BERTHOUD, LARIMER COUNTY, COLORADO

CLIENT AND PROJECT:	PROJECT NO.	SHEET
DESCRIPTION:	1"	1 OF 1
DRAWN: MJD	NOVEMBER 27, 2023	
CHECKED:		
APPROVED:		
DATE:		

Fickel Farms Development Transportation Impact Analysis

**Prepared for:
Berthoud Homes, LLC**

Revised December 2020

DN19-0638

FEHR  PEERS



Prepared for:
Berthoud Homes, LLC

Prepared by:
Fehr & Peers

Ann Bowers, PE, PTOE, PTP



DN19-0638

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EXECUTIVE SUMMARY

This Transportation Impact Analysis (TIA) analyzes potential transportation impacts resulting from the proposed Fickel Farms Development (the Project) in Berthoud, Colorado and outlines mitigation for those impacts, if necessary. Fickel Farms is a proposed residential development to the northwest of the Farmstead development and is planned to be built before the remainder of the Farmstead Development. The existing conditions analysis includes the portions of the Farmstead Development already constructed. Fickel Farms is proposed to be constructed in two phases. See **Figure 1** for a map of the project study area. This TIA was prepared in conformance with the approved Transportation Impact Study Base Assumptions for the Farmstead Development, included in Appendix D, and the Larimer County Urban Area Street Standards (LUCASS), described in Section 2.5.1.

STUDY AREA

The study area is located in the quadrant south of State Highway (SH) 56 and east of 1st Street in Berthoud, Colorado. Primary access to the site will be via Pyramid Peaks / SH 56, a new access location on SH 56. Fickel Farms can also be accessed south of the site from Nebraska Avenue. Transportation impacts on the study area intersections were assessed for existing conditions, short range (phase 1) build-out (2023), and long range (phase 1 and 2) build-out (2040). Analysis included the evaluation of intersection and approach delay and level of service (LOS).

The Project is proposed to be constructed in two phases. In phase 1, the Project will construct 101 residential units with 35 single-family detached units and 66 single-family attached units. In phase 2, the project will construct an additional 120 single-family detached units. At full build-out, the Project will include 221 residential units with 155 single-family detached units and 66 single-family detached units.

The following intersections were analyzed during the AM and PM peak hours:

1. County Line Road / SH 56
2. 1st Street / SH 56
3. 1st Street / Nebraska Avenue
4. Pyramid Peaks / SH 56

SCENARIOS

The study intersections were analyzed for the following scenarios:

1. **Existing Conditions** – Traffic counts were collected at the study intersections on Wednesday, November 13, 2019.
2. **2023 Background** – Existing traffic volumes were projected to 2023 by applying an annual growth rate of 1.5 percent, per the Colorado Department of Transportation (CDOT) Online Transportation Information System (OTIS) future traffic factor.
3. **2040 Background** – Existing traffic volumes were projected to 2040 by applying an annual growth rate of 1.5 percent, per the Colorado Department of Transportation (CDOT) Online Transportation Information System (OTIS) future traffic factor. Farmstead project trips were also added to this scenario.
4. **2023 Build** – The Phase 1 Project Trips in addition to 2023 Background traffic volumes.
5. **2040 Build** – The Phase 1 and Phase 2 Project Trips in addition to 2040 Background traffic volumes.

FINDINGS

This study analyzed the transportation impacts from the proposed Fickel Farms development. The Project is expected to be phased. It is expected that Phase 1 of the Project will produce a net total of 794 daily trips with 56 trips in the AM peak hour and 71 trips in the PM peak hour. After Phase 2 is constructed, it is expected that the Project (Phase 1 and 2 combined) will produce a net total of 1,890 daily trips with 139 trips in the AM peak hour and 183 trips in the PM peak hour. According to the capacity analysis, it is concluded that the trips associated with the development can be accommodated with the transportation infrastructure with some mitigation. The mitigation outlined agrees with the State Highway 56 Access Control Plan. Each recommendation and the analysis associated with it are detailed in Chapters 4 and 6.

RECOMMENDATIONS

Per the CDOT Access Code, auxiliary turn lanes are warranted at the intersections of SH 56 / County Line Road and SH 56 / Pyramid Peak. In addition, for Year 2040 Background conditions, a signal is projected to meet warrants at the intersection of SH 56 / County Line Road. With these improvements, all the study intersections are shown to operate acceptably with the development of Fickel Farms.

1.0 INTRODUCTION

This Transportation Impact Analysis (TIA) analyzes potential transportation impacts resulting from the proposed Fickel Farms Development in Berthoud, Colorado. This TIA was prepared in conformance with the approved Transportation Impact Study Base Assumptions for the Farmstead Development, included in Appendix D, and the Larimer County Urban Area Street Standards (LUCASS) described in Section 5.2.1.

1.1 Project Site and Study Area Boundaries

Fickel Farms is a proposed residential development located northwest of the Farmstead development and is planned to be built before the Farmstead Development. The study area is in the quadrant south of State Highway (SH) 56 and east of 1st Street in Berthoud, Colorado. Primary access to the site will be via a new access to SH 56. Fickel Farms can also be accessed south of the site from Nebraska Avenue. Refer to **Figure 1** for a map of the study area and **Figure 2** for the site plan.

1.2 Proposed Project Description

The Project is proposed to be constructed in two phases. In phase 1, the Project will construct 101 residential units with 35 single-family detached units and 66 single-family attached units. In phase 2, the project will construct an additional 120 single-family detached units. At full build-out, the Project will include 221 residential units with 155 single-family detached units and 66 single-family detached units.

1.3 Project Scope

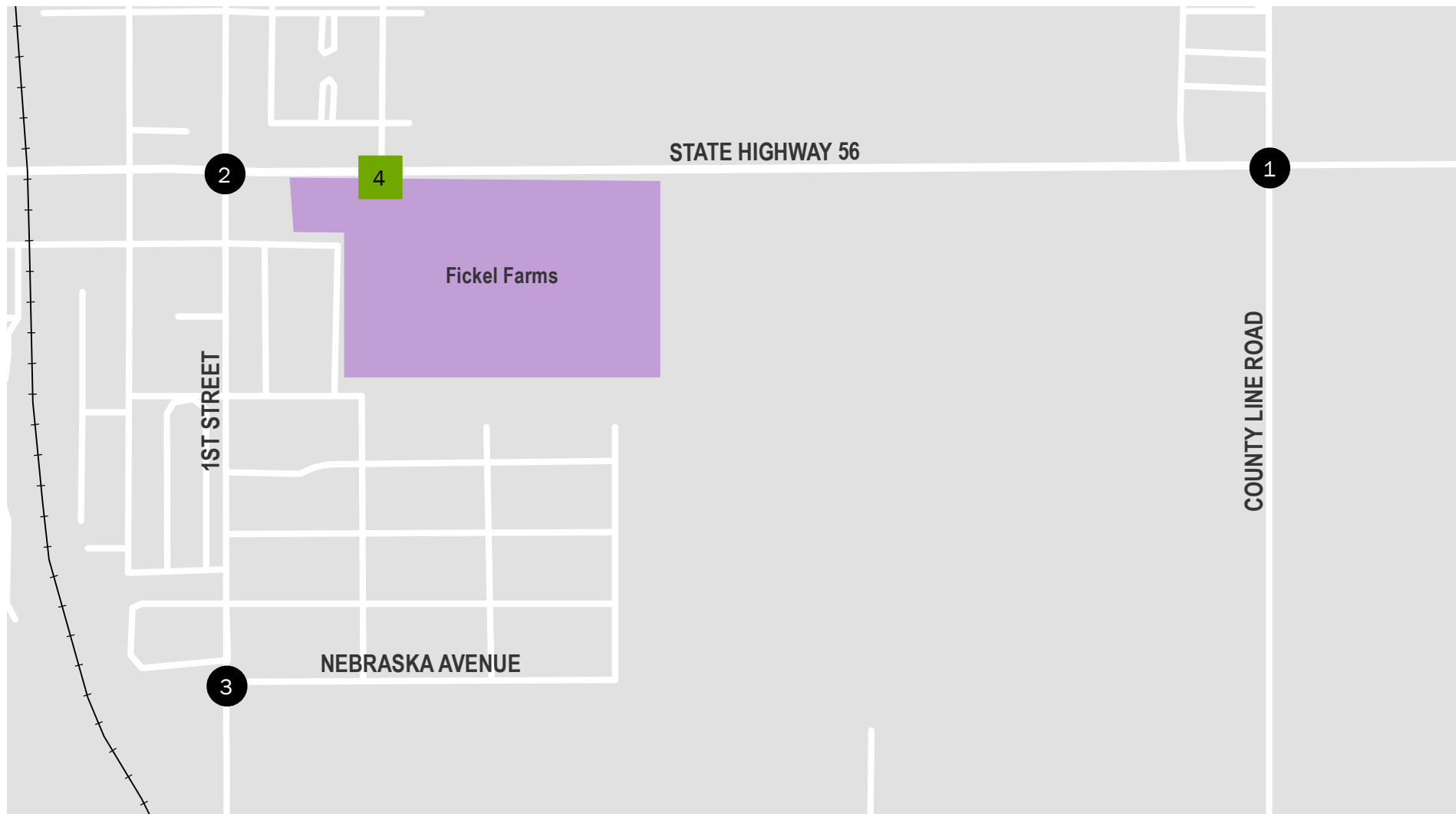
The report provides assessment of potential transportation impacts to the roadway network and study intersections associated with the construction of the Project. Transportation impacts on the study area intersections were assessed for the following five scenarios in the AM and PM peak hours: Existing, Short Range Background (2023), Short Range (phase 1) Build Conditions (2023), Long Range Background (2040), and Long Range (Phase 1 and 2) build-out (2040). Analysis included the evaluation of intersection and approach delay and level of service (LOS). It also includes an evaluation of transportation operations and recommendations of mitigation strategies when applicable.



1.3.1 Study Intersections and Site Access Locations

This study reviews the operations and impacts by the Project on three study intersections and one access points. The new site access is located on SH 56. Refer to **Figure 1** for a map of the following intersections:

1. County Line Road / SH 56
2. 1st Street / SH 56
3. 1st Street / Nebraska Avenue
4. Pyramid Peaks Road / SH 56 (new site access)



Study Intersection

Access Point

Project Site

Figure 1
Project Study Area



2.0 ANALYSIS CONSIDERATIONS

2.1 Analysis Considerations

The weekday AM and PM peak hours were included in the transportation analysis to evaluate the potential impacts on the transportation infrastructure system. The following five scenarios were analyzed:

- Existing Conditions
- 2023 Short Range Background Conditions
- 2040 Long Range Background Conditions
 - Includes Farmstead Development Project Trips
- 2023 Short Range Build Conditions
 - 2023 Background Condition plus Fickel Farms Phase 1 Project Trips
- 2040 Long Range Build Conditions
 - 2040 Background Condition plus Fickel Farms Phase 1 and Phase 2 Project Trips

2.2 Data Collection

Peak hour traffic counts were collected on November 13, 2019. These traffic counts are available in **Appendix A**.

2.3 Evaluation Methodology

The following evaluation methodology was completed as part of the transportation analysis:

1. **Determine growth rate and volumes for the short-term future scenario.** Existing traffic volumes were projected to 2023 by applying an annual growth rate of 1.5 percent per the Colorado Department of Transportation (CDOT) Online Transportation Information System (OTIS) future traffic factor.
2. **Determine growth rate and volumes for the long-term future scenario.** Existing traffic volumes were projected to 2040 by applying an annual growth rate of 1.5 percent per the Colorado Department of Transportation (CDOT) Online Transportation Information System (OTIS) future traffic factor. Farmstead project trips were also added to this scenario (see Appendix C).



3. **Evaluate the Background Scenarios.** Determine the operational performance of the study intersections with estimated traffic, existing and planned geometry, and traffic control for 2023 and 2040. The long-term 2040 Background condition also includes trips from the proposed Farmstead Development.
4. **Calculate the trip generation.** Trip generation was calculated based on the number of residential units proposed for the Fickel Farms Development. Fickel Farms will be built in two phases. Phase 1 Project trips will be added to 2023 Background Scenarios and Phase 1 and 2 Project trips will be added to 2040 Background Scenarios.
5. **Distribute and assign generated trips.** The distribution was developed from the existing daily travel patterns and by evaluating distribution from recent traffic studies. Trips were assigned through the study intersections using the distribution percentages.
6. **Evaluate the Build Scenarios.** Determine the operational performance of the study intersections with the new development for 2023 and 2040. In the 2023 scenario, it was assumed that 101 residential units would be implemented during Phase 1. In the 2040 scenario, it was assumed that full build-out of the 221 residential units would be complete.

2.4 Traffic Model Development

Transportation operations for the study area were analyzed using the Sidra Intersection 8.0 and Synchro 10.0 software program. The Sidra Intersection 8.0 software was used for roundabout capacity analysis and Synchro 10.0 was used for capacity analysis at the remaining intersections. Sidra and Synchro is based on procedures outlined in the 6th Edition of the Highway Capacity Manual. Sidra and Synchro models were developed for each scenario and include the following existing data:

- Lane configuration
- Traffic control
- Posted speed limit
- Peak Hour Factor (PHF)
- Truck percentages

2.5 Transportation Operation Analysis Methodology

The transportation operations analysis addressed unsignalized and signalized intersection operations using the procedures and methodologies contained in the Highway Capacity Manual 6th Edition (HCM), Transportation Research Board for the weekday AM and PM peak hour traffic operations. Study

intersection operations were evaluated using level-of-service calculations as analyzed in the Sidra software for roundabout intersections and Synchro software for the remaining intersections.

2.5.1 Level of Service Criteria

To measure and describe the operational status of the local roadway network and corresponding intersections, transportation engineers and planners commonly use a grading system called level-of-service (LOS) put forth by the Transportation Research Board's HCM 6th Edition. LOS characterizes the operational conditions of an intersection's traffic flow; ranging from LOS A (indicating free flow traffic conditions with little or no delay) to LOS F (representing over-saturated conditions where traffic flows exceeds the design capacity, resulting in long queues and delays). These grades represent the perspective of drivers and are an indication of the comfort and convenience associated with driving. Although LOS A through C, are desired levels, LOS D is considered acceptable. The LOS is determined differently depending on the type of control at the intersection. The Town of Berthoud follows Table 4-2 from the *Larimer County's Urban Area Street Standards* (LCUASS) to determine acceptable LOS thresholds. LCUASS Tables 4-2 is displayed in **Table 3**.

At signalized intersections, the operation analysis uses various intersection characteristics (such as traffic volumes, lane geometry, and signal phasing) to estimate the intersection's volume-to-capacity (v/c) ratio. For signalized intersections, the HCM defines the intersection LOS as the average delay per vehicle for the overall intersection, which includes all approaches.

At unsignalized intersections, the operation analysis uses various intersection characteristics (such as traffic volumes, lane geometry, and stop-controlled approaches) to estimate the intersection's volume-to-capacity (v/c) ratio. For unsignalized intersections, the HCM defines the intersection LOS as the average delay per vehicle for the worst approach for side-street stop and the average delay for the whole intersection for all-way stop and roundabout intersections. **Table 1** summarizes the relationship between delay and LOS for signalized intersections and **Table 2** summarizes the relationship between delay and LOS for unsignalized intersections.

**TABLE 1:
SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS
USING AVERAGE CONTROL VEHICULAR DELAY**

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	< 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10 to 20
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20 to 35
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35 to 55
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55 to 80
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	> 80

**TABLE 2:
UNSIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS
USING AVERAGE CONTROL VEHICULAR DELAY**

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Little or no delay.	<10
B	Short traffic delay.	>10 to 15
C	Average traffic delays.	>15 to 25
D	Long traffic delays.	>25 to 35
E	Very long traffic delays.	>35 to 50
F	Extreme traffic delays with intersection capacity exceeded.	>50

TABLE 3: LOVELAND MOTOR VEHICLE LOS STANDARDS (INTERSECTIONS)

Table 4-2
Loveland (GMA and City Limits)
Motor Vehicle LOS Standards (Intersections)

Intersection Component	Major Intersection ¹	Minor Intersection ²	Driveway
Overall (City Limits)	LOS C	LOS C	No Limit
Overall (GMAs)	LOS D	LOS D	No Limit
Any Leg	LOS D	LOS E	No Limit
Any Movement	LOS E	LOS F	No Limit
¹ Includes all signalized and unsignalized arterial/arterial and arterial/ major collector intersections. ² Includes all unsignalized intersections (except major intersections) and high volume driveways ³ There are no LOS standards for I-25 Interchanges. ⁴ On State Highways, overall LOS D is acceptable.			

Source: Larimer County Urban Area Street Standards, Chapter 4, Section 4.5



3.0 EXISTING CONDITIONS

This chapter describes the existing conditions of the roadway facilities, pedestrian and bicycle facilities, and transit service.

3.1 Roadway Network

State Highway (SH) 56 is a two-lane, east- west State Highway classified as a Non-Rural Arterial (NRB) that connects Berthoud, CO to Johnstown, CO. SH 56's western terminus is at U.S. Route 287 in Berthoud, CO and the eastern terminus is at Interstate 25 in Johnstown. There are several different posted speed limits with the project study area. In the westbound direction, the posted speed limit is 55 MPH at County Line Road until approximately $\frac{1}{4}$ east of 1st Street. The westbound posted speed limit changes to 40 MPH approximately $\frac{1}{4}$ mile east of 1st Street until approximately 600 feet from 1st Street. The westbound speed limit changes to 25MPH approximately 600 feet to the east of 1st Street and remains 25 MPH through downtown. The eastbound posted speed limit is 25 MPH through downtown Berthoud until approximately 400 feet east of 1st Street where the eastbound speed limit changes to 55 MPH through the remainder of the study area.

1st Street is a two-lane north-south local roadway that intersects SH 56 to the west of the Project. 1st Street is planned to be a Major Collector per the 2016 Street Plan. 1st Street's northern terminus is at U.S. Route 287 and the southern terminus is at County Road 6c. The posted speed limit on 1st Street is 30 MPH the intersection north of SH 56, 25 MPH from SH 56 to Nebraska Avenue and 35 MPH south of Nebraska Avenue.

Nebraska Avenue is a two-lane, east-west local street that intersects 1st Street southwest of the Project. Nebraska Avenue is planned to be a future Minor Collector per the 2016 Street Plan. Nebraska Avenue has a speed limit of 25 MPH. As part of the Farmstead development, Nebraska Avenue will become a minor collector that bisects the Project and connects east to County Line Road.

County Line Road is a two-lane north-south minor collector that intersects SH 56 to the east of the project. County Line Road is planned to be a future Two-Lane Arterial per the 2016 Street Plan. Its northern terminus is at County Road 12 and its southern terminus is at Baseline Road in Lafayette, Colorado. County Line Road has a posted speed limit of 45 MPH.

3.2 Transit Service

The Project site is not directly served by public transportation. However, approximately one mile west of the Project Site, a bus stop at **Mountain Avenue & 2nd Street/3rd Street** provides service to Longmont, Loveland, Boulder, and Fort Collins via FLEX.

3.3 Bicycle & Pedestrian Facilities

There are currently no bike facilities on roadways adjacent to or within the Project site. Sidewalks are nonexistent within a majority of the study area.

3.4 Existing Transportation and Intersection Operations

Peak hour traffic counts were collected on November 13, 2019. **Figure 3** shows the Existing Conditions peak hour volumes at the study intersections, as well as the lane configurations. **Table 5** provides the results of the capacity analysis of the Existing Conditions for the AM and PM peak hours.

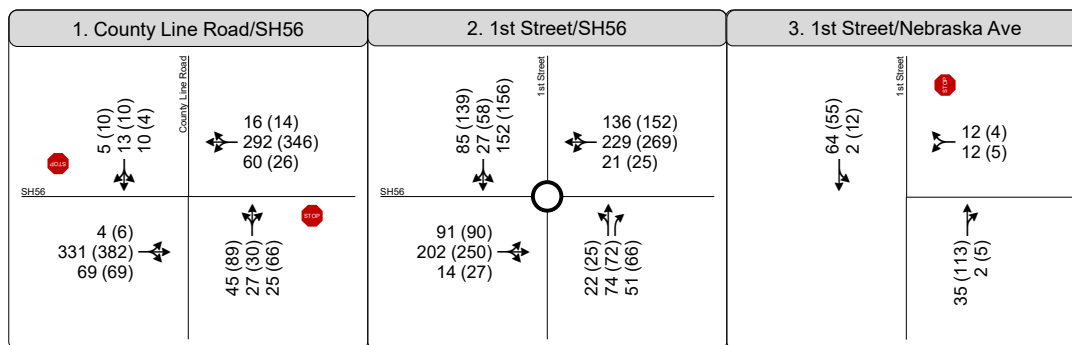
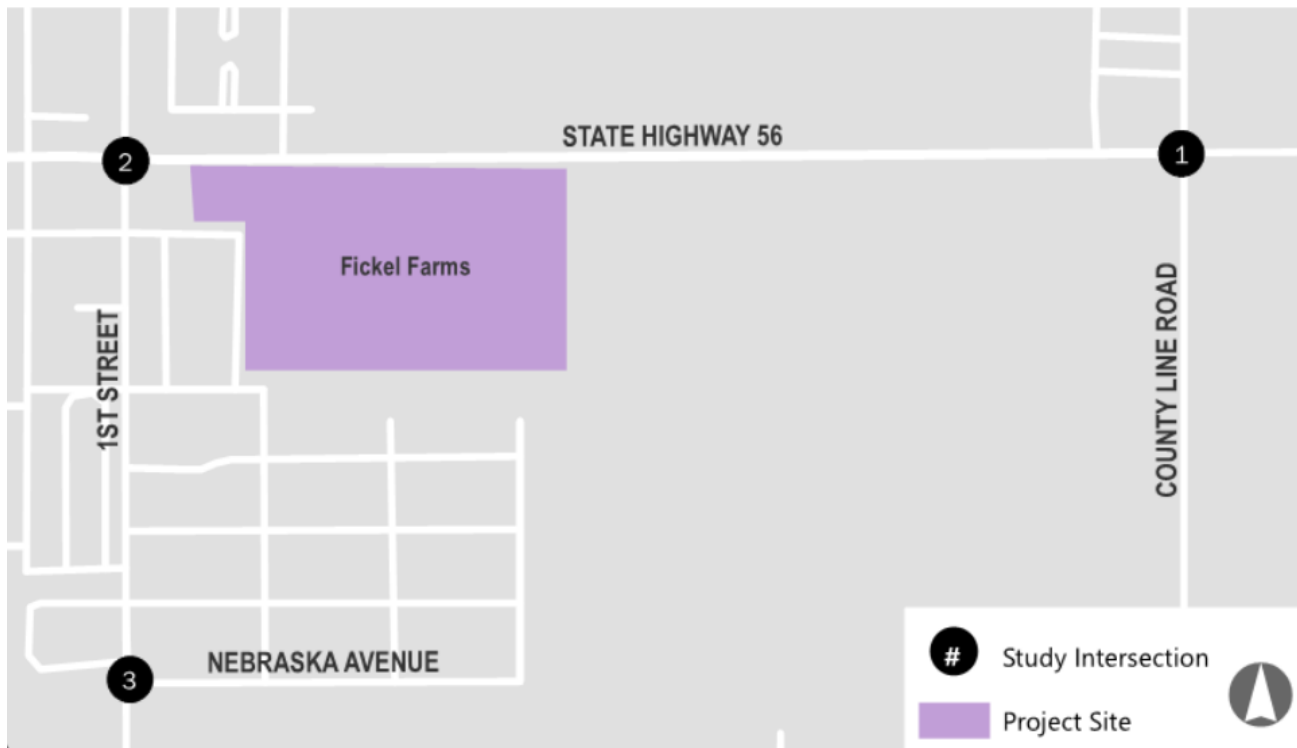


Figure 3
Peak Hour Traffic Volumes
and Lane Configurations
Existing Conditions



3.5 Existing Intersection Levels of Service Summary

Table 5 presents the delay and LOS results for the study intersections under Existing Conditions. **Appendix B** provides the LOS calculations for the Existing Conditions.

TABLE 4: EXISTING CONDITIONS INTERSECTION LEVEL OF SERVICE RESULTS

ID	Intersection	Control ¹	Approach	AM Peak Hour		PM Peak Hour		Including Auxiliary Turn Lanes per CDOT Access Code			
				Delay	LOS	Delay	LOS	AM Peak Hour		PM Peak Hour	
								Delay	LOS	Delay	LOS
1	County Line Road / SH 56	SSSC	NB	21.8	C	37.5	E	20.4	C	33.1	D
2	1st Street / SH 56	Roundabout ³	Overall	5.2	A	5.9	A	N/A			
3	1st Street / Nebraska Ave	SSSC	WB	9	A	9.5	A	N/A			

Notes:

1. Signal equals signalized intersection. SSSC indicates a side-street stop-controlled intersection.
2. Whole intersection weighted average control delay expressed in seconds per vehicle for signalized intersections.
3. Intersection analyzed using SIDRA.

The intersection of County Line Road / SH 56 operates with a delay of 21.8 seconds or LOS C in the AM peak hour and with a delay of 37.5 seconds or LOS E in the PM peak period. Per **Table 3** (*Table 4-2 in Larimer County's Urban Area Street Standards*) displayed in Section 2.5.1, LOS E is acceptable for County Line Road / SH 56 because each leg operates at LOS E or better. **All intersections operate acceptably in the Existing Conditions.**

3.5.1 Auxiliary Lane Requirements

Per the CDOT Access Code, auxiliary turn lanes are required for a Non-Rural Arterial (NRB) when the following conditions are met:

- (a) A left turn lane with storage length plus taper is required for any access with a projected peak hour left ingress turning volume greater than 25 vph. If the posted speed is greater than 40 mph, a deceleration lane and taper is required for any access with a projected peak hour left ingress turning volume greater than 10 vph. The taper length will be included within the deceleration length.
- (b) A right turn lane with storage length plus taper is required for any access with a projected peak hour right ingress turning volume greater than 50 vph. If the posted speed is greater than 40 mph, a right turn deceleration lane and taper is required for any access with a projected peak hour right ingress turning volume greater than 25 vph. The taper length will be included within the deceleration length.



(c) The issuing authority or Department may require an auxiliary lane when it is specifically identified and documented that the lane is necessary to prevent or correct an operational or safety condition or as determined by subsection 3.5.

(d) An acceleration lane is generally not required except as may be determined by subsection 3.5.

Based on the volume of westbound left turns (60 AM Peak Hour and 26 PM Peak Hour) and eastbound right turns (69 AM and PM Peak Hours) and the posted speed limit, the CDOT Access Code warrants an exclusive westbound left turn lane and eastbound right turn lane at the intersection of County Line Road / SH 56.

With the required improvements, the intersection of County Line Road / SH 56 operates at LOS C with 20.4 seconds of delay in the AM peak and at LOS D with 33.1 seconds of delay in the PM peak.

4.0 BACKGROUND CONDITIONS

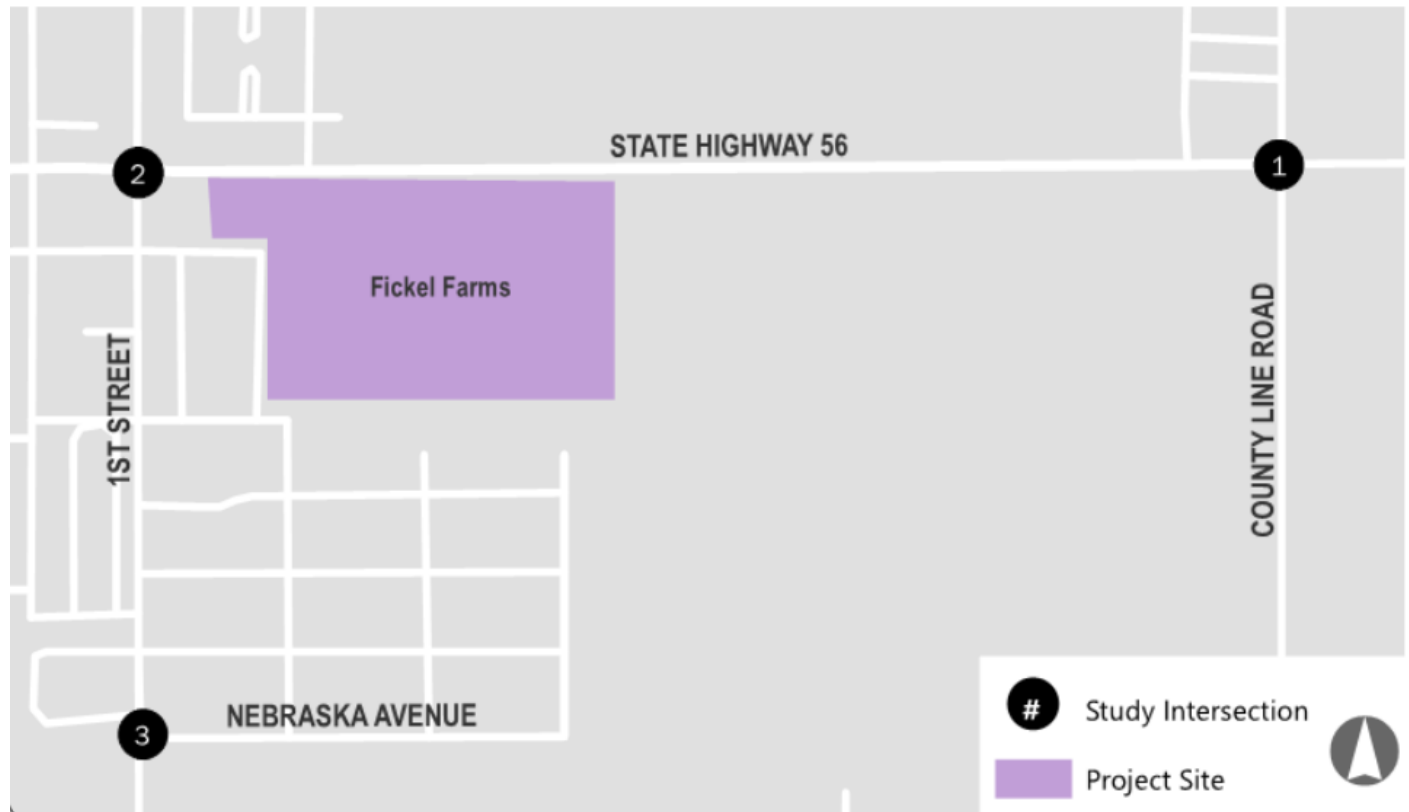
This section presents the 2023 Short Range and 2040 Long Range Background Conditions. The Background Conditions provide the baseline conditions for comparative purposes with the Build Conditions.

4.1 2023 Background Operations

To determine the 2023 Short Range Background Conditions peak hour turning movement volumes, existing traffic volumes from November 12, 2019 were increased by an annual growth rate of 1.5 percent in the AM peak hour and 1.5 percent in the PM per the CDOT Online Transportation Information System (OTIS) future traffic factor.

Figure 4 shows the projected 2023 Short Range Background Conditions peak hour volumes at the study intersections, as well as the lane configurations.

Table 6 provides the results of the capacity analysis of the 2023 Short Range Background Conditions for the AM and PM peak hours.



1. County Line Road/SH56	2. 1st Street/SH56	3. 1st Street/Nebraska Ave
SH56 County Line Road 5 (10) 14 (10) 10 (4) 17 (15) 305 (362) 63 (27) 4 (6) 346 (399) 72 (72) 47 (93) 28 (31) 26 (69)	SH56 1st Street 89 (145) 28 (61) 159 (163) 142 (159) 239 (281) 22 (26) 95 (94) 211 (261) 15 (28) 23 (26) 77 (75) 53 (69)	1st Street 67 (58) 2 (13) 13 (4) 13 (5) 37 (118) 2 (5)

Figure 4
Peak Hour Traffic Volumes
and Lane Configurations
2023 Background



4.2 2023 Background Intersection Level of Service Impacts

Table 6 presents the delay and LOS results for the study intersections under 2023 Background Conditions. **Appendix B** provides the LOS calculations for the 2023 Background Conditions.

TABLE 5: 2023 BACKGROUND CONDITIONS INTERSECTION LEVEL OF SERVICE RESULTS

ID	Intersection	Control ¹	Approach	2023 Background Conditions				Including Auxiliary Turn Lanes per CDOT Access Code			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	County Line Road / SH 56	SSSC	NB	23.8	C	45.7	E	22	C	39.2	E
2	1st Street / SH 56	Roundabout ³	WB	5.8	A	6.4	A	N/A			
3	1st Street / Nebraska Ave	SSSC	WB	9	A	9.5	A	N/A			

Notes:

1. Signal equals signalized intersection. SSSC indicates a side-street stop-controlled intersection.

2. Whole intersection weighted average control delay expressed in seconds per vehicle for signalized intersections.

3. Intersection analyzed using SIDRA.

The intersection of County Line Road / SH 56 operates with a delay of 22 seconds or LOS C in the AM peak hour and with a delay of 39.2 seconds or LOS E in the PM peak period. Per **Table 3** (*Table 4-2 in Larimer County's Urban Area Street Standards*) displayed in Section 2.5.1, LOS E is acceptable for County Line Road / SH 56 because each leg operates at LOS E or better. **All intersections operate acceptably in the 2023 Background Conditions.**

4.2.1 Auxiliary Lane Requirements

Per the CDOT Access Code, auxiliary turn lanes are required for a Non-Rural Arterial (NRB) when the following conditions are met:

(a) A left turn lane with storage length plus taper is required for any access with a projected peak hour left ingress turning volume greater than 25 vph. If the posted speed is greater than 40 mph, a deceleration lane and taper is required for any access with a projected peak hour left ingress turning volume greater than 10 vph. The taper length will be included within the deceleration length.

(b) A right turn lane with storage length plus taper is required for any access with a projected peak hour right ingress turning volume greater than 50 vph. If the posted speed is greater than 40 mph, a right turn deceleration lane and taper is required for any access with a projected peak hour right ingress turning volume greater than 25 vph. The taper length will be included within the deceleration length.



(c) The issuing authority or Department may require an auxiliary lane when it is specifically identified and documented that the lane is necessary to prevent or correct an operational or safety condition or as determined by subsection 3.5.

(d) An acceleration lane is generally not required except as may be determined by subsection 3.5.

Based on the volume of westbound left turns (63 AM Peak Hour and 27 PM Peak Hour) and eastbound right turns (72 AM and PM Peak Hours) and the posted speed limit, the CDOT Access Code warrants an exclusive westbound left turn lane and eastbound right turn lane at the intersection of County Line Road / SH 56.

With the required improvements, the intersection of County Line Road / SH 56 operates at LOS C with 22 seconds of delay in the AM peak and at LOS E with 39.2 seconds of delay in the PM peak.

4.3 2040 Background Transportation and Intersection Operations

To determine the 2040 Long Range Background Conditions peak hour turning movement volumes, existing traffic volumes from November 13, 2019 were increased by an annual growth rate of 1.5 percent in the AM peak hour and 1.5 percent in the PM per the CDOT Online Transportation Information System (OTIS) future traffic factor. In addition to the growth of the existing traffic volumes, trips from the proposed Farmstead Development were also included. Refer to **Appendix C** for a summary of assumptions and trip generation for the Farmstead Development.

Figure 5 shows the projected 2040 Long Range Background peak hour volumes at the study intersections, as well as the lane configurations.

Table 7 provides the results of the capacity analysis of the 2040 Long Range Background Conditions for the AM and PM peak hours.

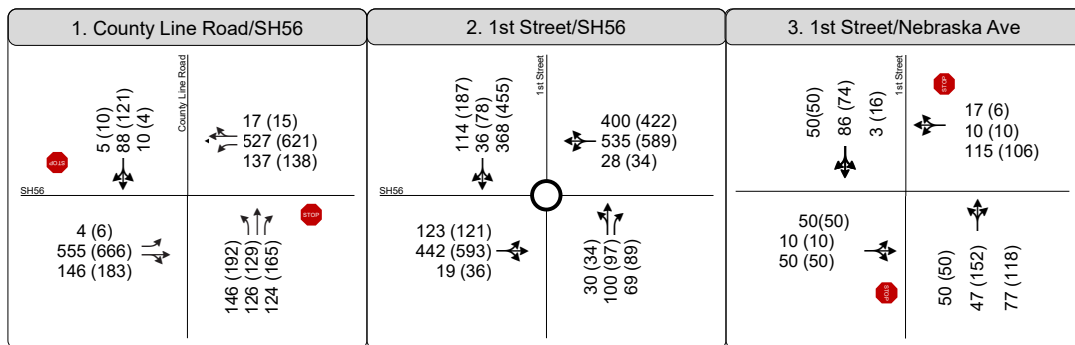
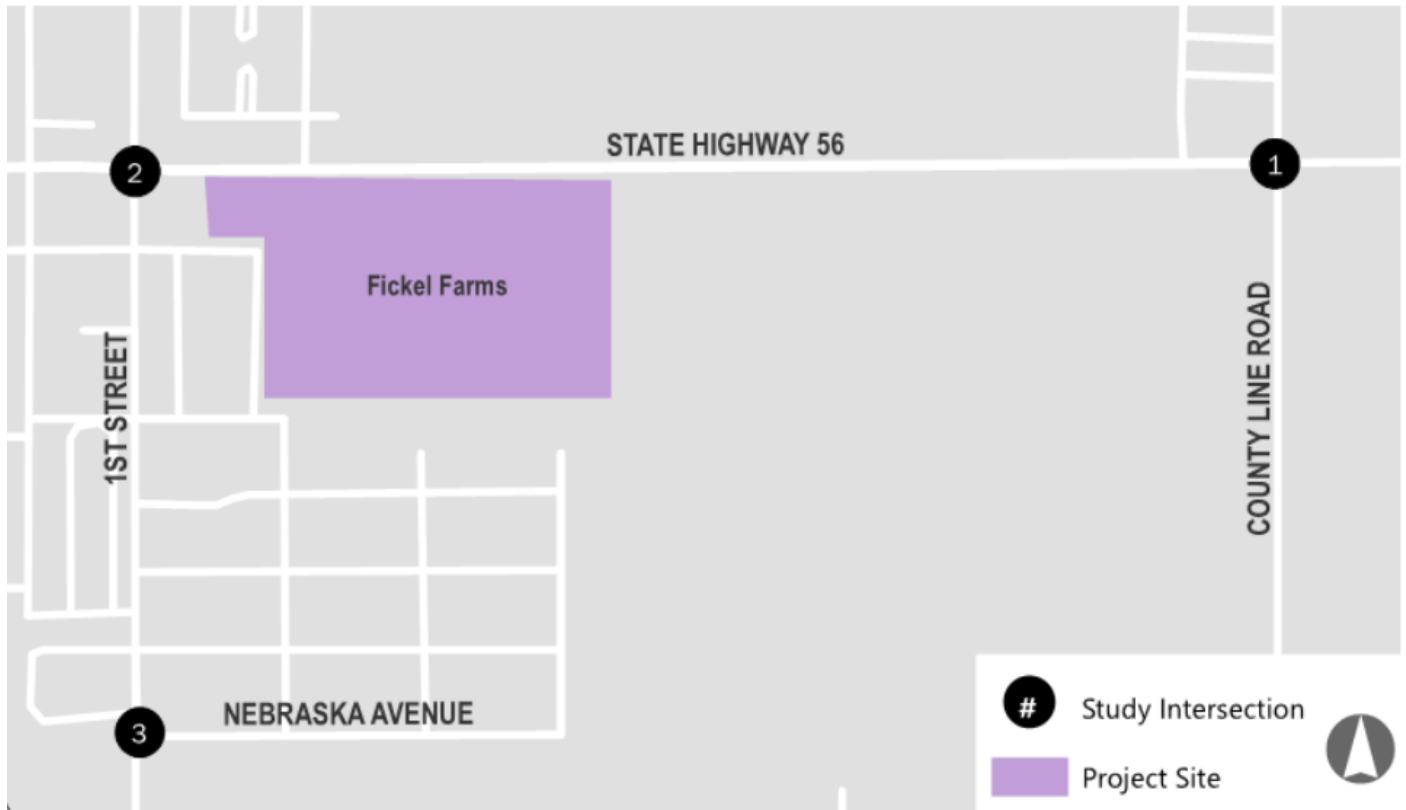


Figure 5
Peak Hour Traffic Volumes
and Lane Configurations
2040 Background Conditions



4.4 2040 Background Intersection Levels of Service and Impacts

Table 7 presents the delay and LOS results for the study intersections under 2040 Background Conditions. **Appendix B** provides the LOS calculations for the 2040 Background Conditions.

TABLE 6: 2040 BACKGROUND CONDITIONS INTERSECTION LEVEL OF SERVICE RESULTS

ID	Intersection	Control ¹	Approach	2040 Background Conditions				Mitigation (Signalization)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	County Line Road / SH 56	SSSC	NB	>300	F	>300	F	16.6	B	20.5	C
2	1st Street / SH 56	Roundabout ³	Overall	14.5	B	29.6	D	N/A			
3	1st Street / Nebraska Ave	SSSC	WB	15.1	B	17.5	C	N/A			

Notes:

1. Signal equals signalized intersection. SSSC indicates a side-street stop-controlled intersection.
2. Whole intersection weighted average control delay expressed in seconds per vehicle for signalized intersections.
3. Intersection analyzed using SIDRA.

The results indicate that the County Line Road / SH 56 intersection would operate at LOS F with a delay greater than 300 seconds in the AM and PM peak hours under 2040 Background Conditions as a side-street, stop controlled intersection. Detailed evaluation and proposed mitigation are summarized in the following bullets:

- County Line Road / SH 56 – This intersection will operate at LOS F in the AM and PM peak hours with delay greater than 300 seconds.
 - Evaluation: The excessive delay is experienced due to the high number of northbound left and westbound left-turning vehicles in the AM and PM peak hours.
 - Recommendation: Given the substantial delay for northbound and westbound left turning vehicles, a signal warrant analysis was conducted (see Section 7), concluding that a signal is warranted at the intersection. This mitigation would produce an overall delay of 16.6 seconds or LOS B in the AM peak hour and a delay of 20.5 seconds or LOS C in the PM peak hour.

The signalization of County Line Road / SH 56 aligns with the *SH 56 Corridor Access Control Plan* as it is identified as a potential signalized intersection in the future. **The results indicate that with mitigation at County Line Road / SH 56, all intersections would operate acceptably under 2040 Background Conditions.**

5.0 PROJECT TRIPS

5.1 Trip Generation

The vehicle trips associated with the Fickel Farms Residential Development were calculated from the proposed land uses. Trips were generated utilizing the MainStreet tool powered by MXD+. MainStreet is a web-based application developed by Fehr & Peers for estimating trip generation based on the Institute of Transportation Engineers (ITE) Trip Generation methodology, but also takes into account reductions such as internal capture and external walk, bike and transit trips based on the location of the project site. Reductions for internal capture and external walk, bike and transit trips were applied to the trip generation although they were minimal for the Fickel Farms development.

The Fickel Farms Residential Development will be constructed in two phases. The first phase includes 35 single-family detached housing units and 66 single-family attached housing units. The second phase includes an additional 120 single-family detached housing units.

It is expected that Phase 1 of the Project will produce a net total of 794 daily trips with 56 trips in the AM peak hour and 71 trips in the PM peak hour. After Phase 2 is constructed, it is expected that the Project (Phase 1 & 2 combined) will produce a net total of 1890 daily trips with 139 trips in the AM peak hour and 183 trips in the PM peak hour. **Table 8** and **Table 9** provide the trip generation and assumed land uses for Phase 1 and Phase 1 & 2 combined, respectively.

TABLE 7: PHASE 1 TRIP GENERATION

Land Use	ITE Code	Size	Unit	Daily Trips	AM Peak Hour					PM Peak Hour				
					In		Out		Total Trips	In		Out		Total Trips
					%	Trips	%	Trips		%	Trips	%	Trips	
Single Family Detached	210	35	DU	330	26%	7	74%	20	27	63%	22	37%	13	35
Single Family Attached	220	66	DU	483	23%	7	77%	23	30	62%	23	38%	14	37
ITE Subtotal														
				813		14		43	57		45		27	72
MXD+ Trip Reductions														
			-2%	-19	0%	0	-2%	-1	-1	-2%	-1	0%	0	-1
Fickel Farms Phase 1 Trips														
				794		14		42	56		44		27	71

Notes:

DU = dwelling unit

TABLE 8: PHASE 1 AND 2 TRIP GENERATION

Land Use	ITE Code	Size	Unit	Daily Trips	AM Peak Hour					PM Peak Hour				
					In		Out		Total Trips	In		Out		Total Trips
					%	Trips	%	Trips		%	Trips	%	Trips	
Single Family Detached	210	155	DU	1463	25%	29	75%	86	115	63%	96	37%	57	153
Single Family Attached	220	66	DU	483	23%	7	77%	23	30	62%	23	38%	14	37
ITE Subtotal														
				1946		36		109	145		119		71	190
MXD+ Trip Reductions														
			-2%	-56		-1		-5	-6		-4		-3	-7
Fickel Farms Phase 1 + 2 Trips														
				1890		35		104	139		115		68	183

Notes:

DU = dwelling unit

5.2 Trip Distribution

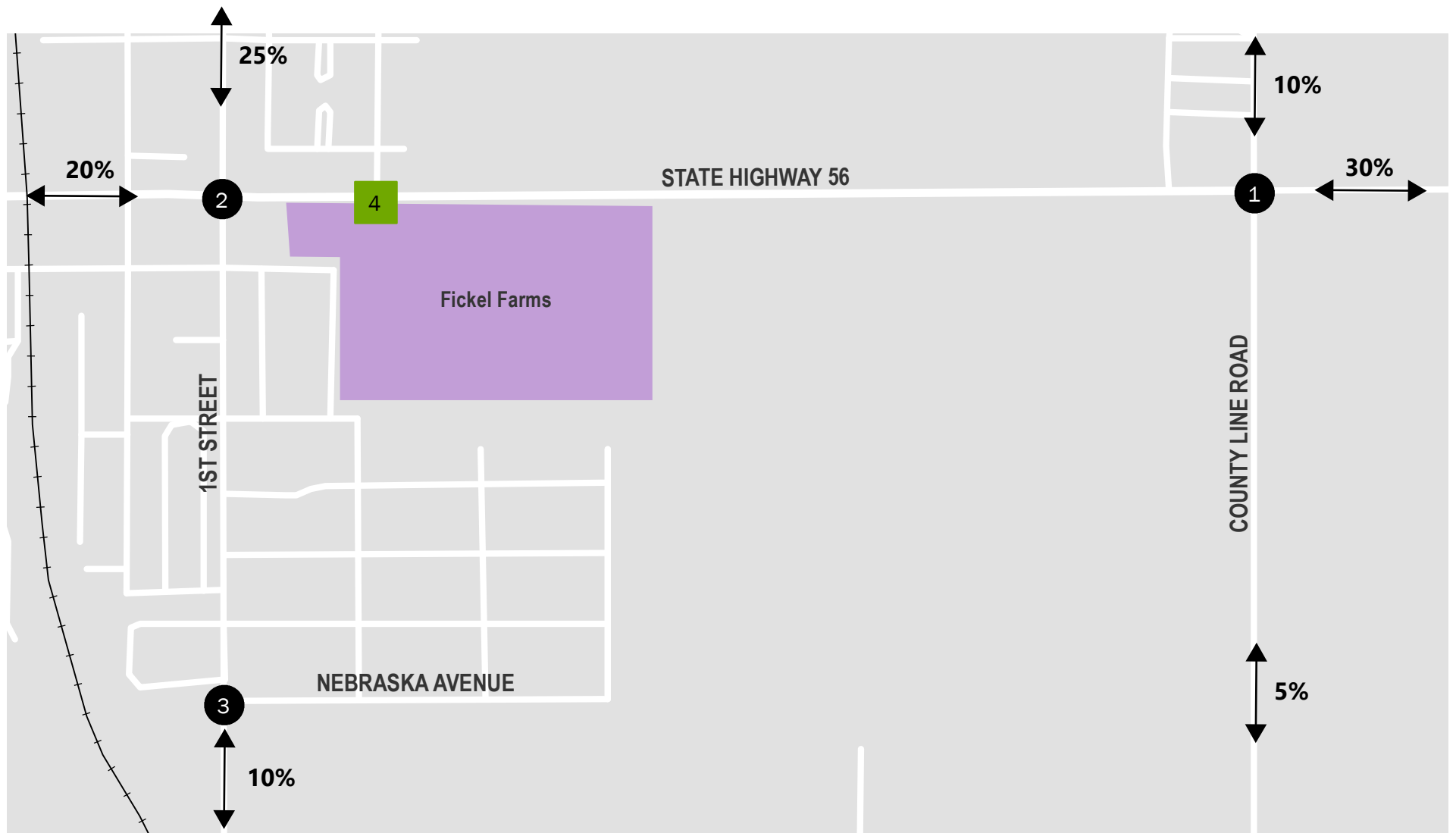
The external trip distribution values were determined from existing count data and by considering nearby land use changes. The external trip distribution is as follows:

- State Highway 56 (West of Fickel Farms): 45%
- State Highway 56 (East of County Line Road): 30%
- North County Line Road (North of SH56): 10%
- North County Line Road (South of SH 56): 5%
- E Nebraska Ave: 10%

The same travel patterns were used for inbound and outbound trips and for both peak hours. The trip distribution is illustrated on **Figure 6**.

5.3 Trip Assignment

Vehicular traffic was assigned by applying the trip distribution to the estimated trip generation. **Figure 7** displays the Project trip assignment.

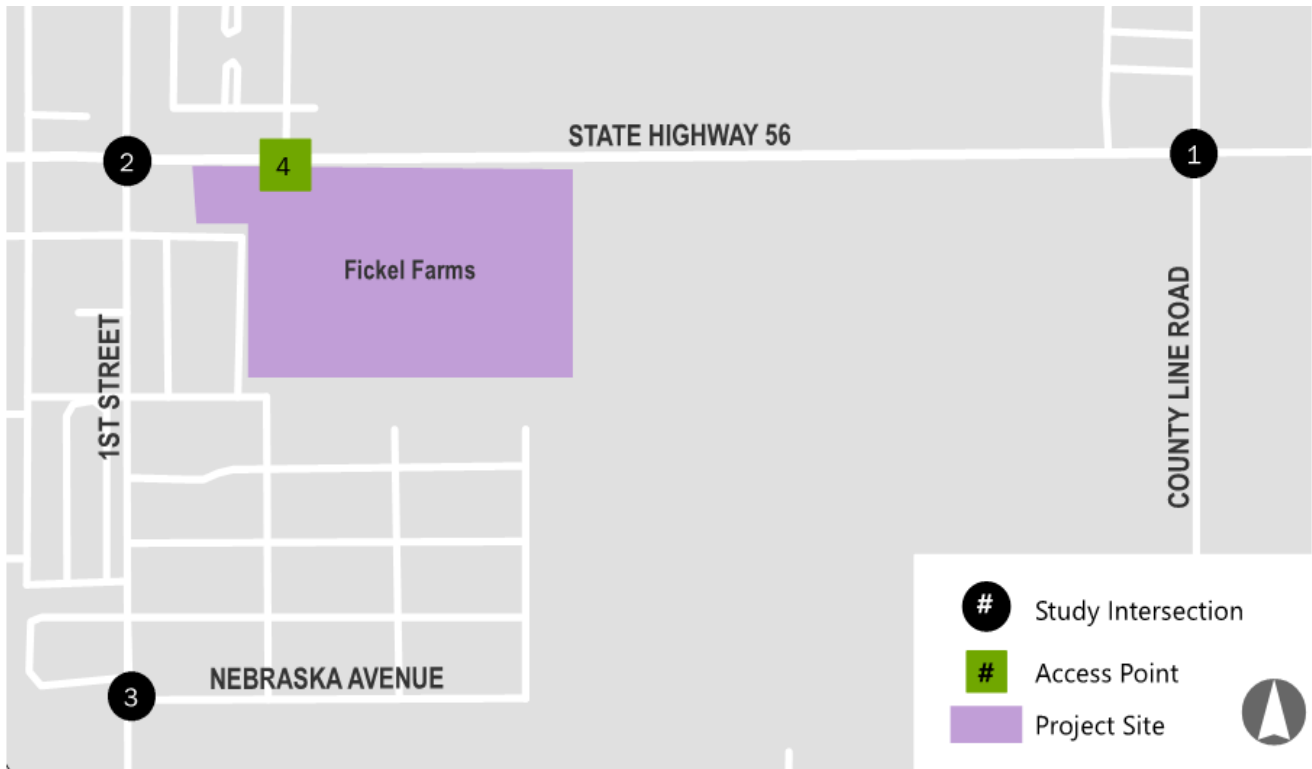


Study Intersection

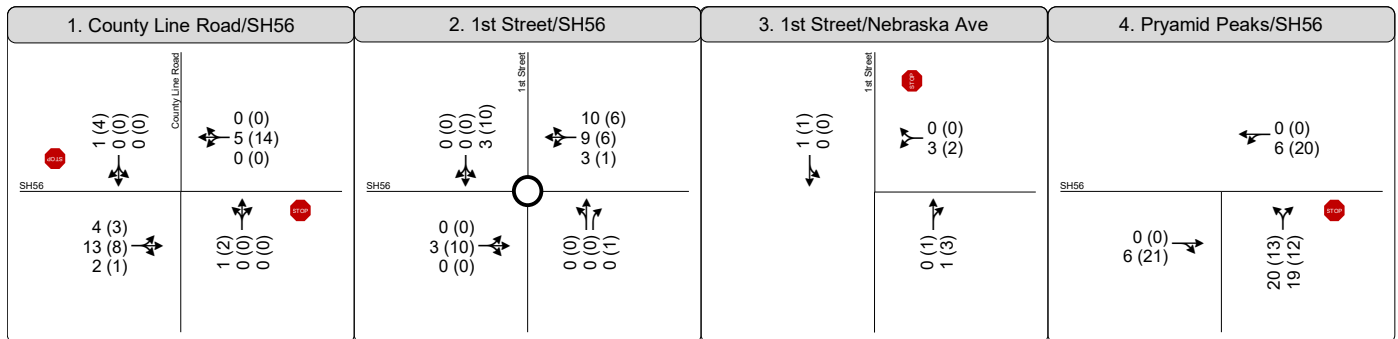
Access Point

Project Site

Figure 6
Trip Distribution



Phase 1 Trip Assignment



Phase 1 & 2 Trip Assignment

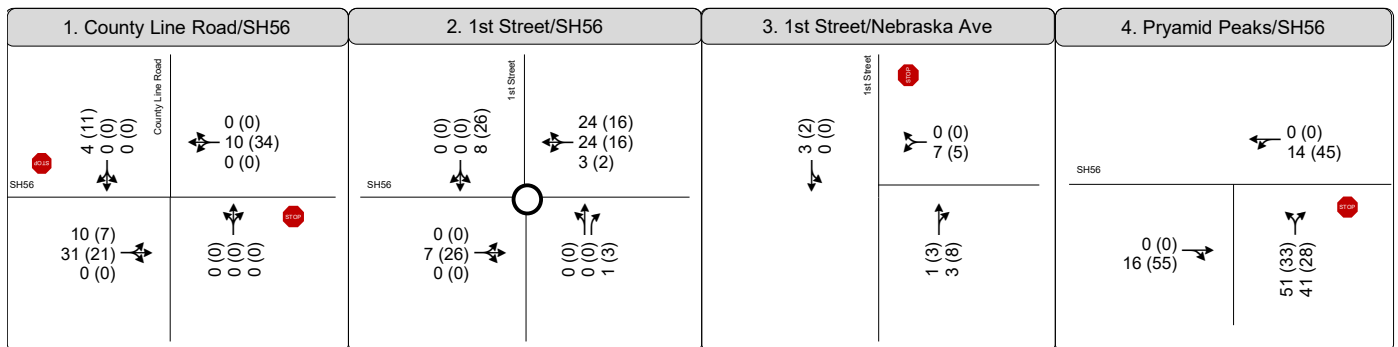


Figure 7
Peak Hour Traffic Volumes
and Lane Configurations
Trip Assignment



6.0 BUILD CONDITIONS

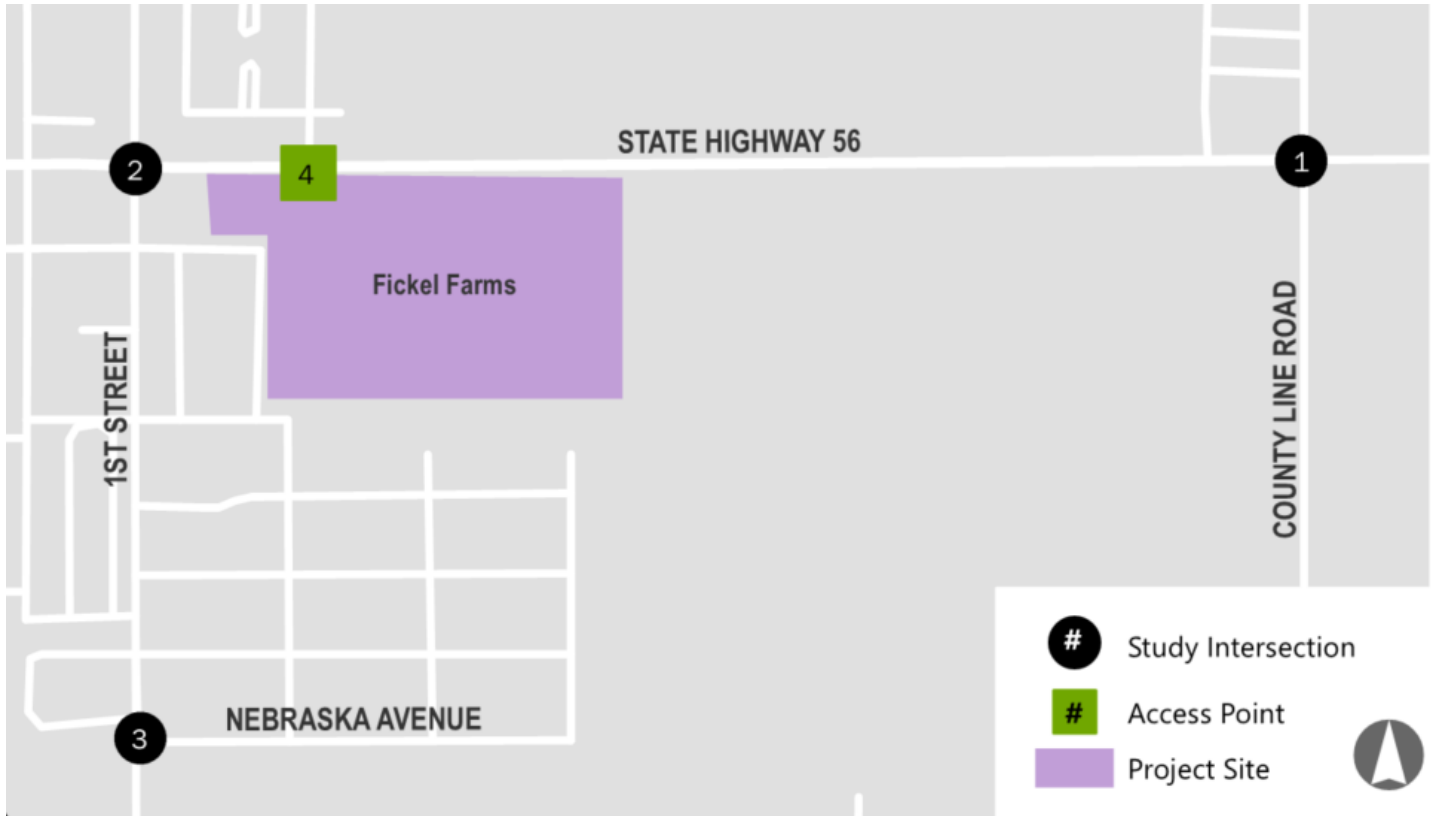
The 2023 Short Range and 2040 Long Range Build Conditions add net Project traffic to the Background Scenarios. Phase 1 net Project traffic was added to the 2023 Background Scenario and the combined Phase 1 and Phase 2 net Project traffic was added to the 2040 Background Scenario.

6.1 2023 Build Transportation and Intersection Operations

The 2023 Build Scenario combines the volumes from the 2023 Background Scenario and the Phase 1 net site generated trips associated with the Project. An analysis was conducted to evaluate the impact from the traffic generated on the study intersections.

Figure 8 shows the projected 2023 Build Conditions peak hour volumes and lane configurations at the study intersections.

Table 10 provides the results of the capacity analysis of the 2023 Build Conditions for the AM and PM peak hours. Recommendations were made for intersections that perform below the acceptable LOS criteria.



1. County Line Road/SH56	2. 1st Street/SH56	3. 1st Street/Nebraska Ave	4. Pryamid Peaks/SH56

Figure 8
 Peak Hour Traffic Volumes
 and Lane Configurations
 2023 Build Conditions



6.2 2023 Build Intersection Levels of Service and Impacts

Table 10 presents the delay and LOS results for the study intersections and access points under 2023 Build Conditions. **Appendix B** provides the LOS calculations for the 2023 Build Conditions.

TABLE 9: 2023 BUILD CONDITIONS INTERSECTION LEVEL OF SERVICE RESULTS

ID	Intersection	Control ¹	Approach	2023 Build Conditions			
				AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	County Line Road / SH 56 ⁴	SSSC	NB	23.3	C	45.7	E
2	1st Street / SH 56	Roundabout ³	Overall	5.4	A	6.3	A
3	1st Street / Nebraska Ave	SSSC	WB	9.1	A	9.6	A
4	Pyramid Peaks / SH 56	SSSC	NB	14.7	B	17.5	C

Notes:

1. Signal equals signalized intersection. SSSC indicates a side-street stop-controlled intersection.
2. Whole intersection weighted average control delay expressed in seconds per vehicle for signalized intersections.
3. Intersection analyzed using SIDRA.

The results indicate that all intersections would operate acceptably under 2023 Build Conditions.

The intersection of County Line Road / SH 56 results includes westbound left turn and eastbound right turn auxiliary lanes that were required in 2023 Background Conditions. With the required lane improvements, the intersection of County Line Road / SH 56 operates at LOS C with 23.3 seconds of delay in the AM peak and at LOS E with 45.7 seconds of delay in the PM peak. Per *Table 4-2 in Larimer County's Urban Area Street Standards*, LOS E is acceptable for County Line Road / SH 56 because each leg operates at LOS E or better.

6.3 2040 Build Transportation and Intersection Operations

The 2040 Build Scenario combines the volumes from the 2040 Background Scenario and the combined Phase 1 and Phase 2 net site generated trips associated with the Project. An analysis was conducted to evaluate the impact from the traffic generated on the study intersections.

Figure 9 shows the projected 2040 Build Conditions peak hour volumes and lane configurations at the study intersections.

Table 11 provides the results of the capacity analysis of the 2040 Build Conditions for the AM and PM peak hours.

6.4 2040 Build Intersection Levels of Service and Impacts

Table 11 presents the delay and LOS results for the study intersections under 2040 Build Conditions.

Appendix B provides the LOS calculations for the 2040 Build Conditions.

TABLE 10: 2040 BUILD CONDITIONS INTERSECTION LEVEL OF SERVICE RESULTS

ID	Intersection	Control ¹	Approach	2040 Build Conditions			
				AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	County Line Road / SH 56	Signal	NB	16.5	B	20.8	C
2	1st Street / SH 56	Roundabout ³	Overall	16.5	C	37.2	E
3	1st Street / Nebraska Ave	SSSC	WB	15.6	C	18.1	C
4	Pyramid Peaks / SH 56	SSSC	NB	81.3	F	76.4	F

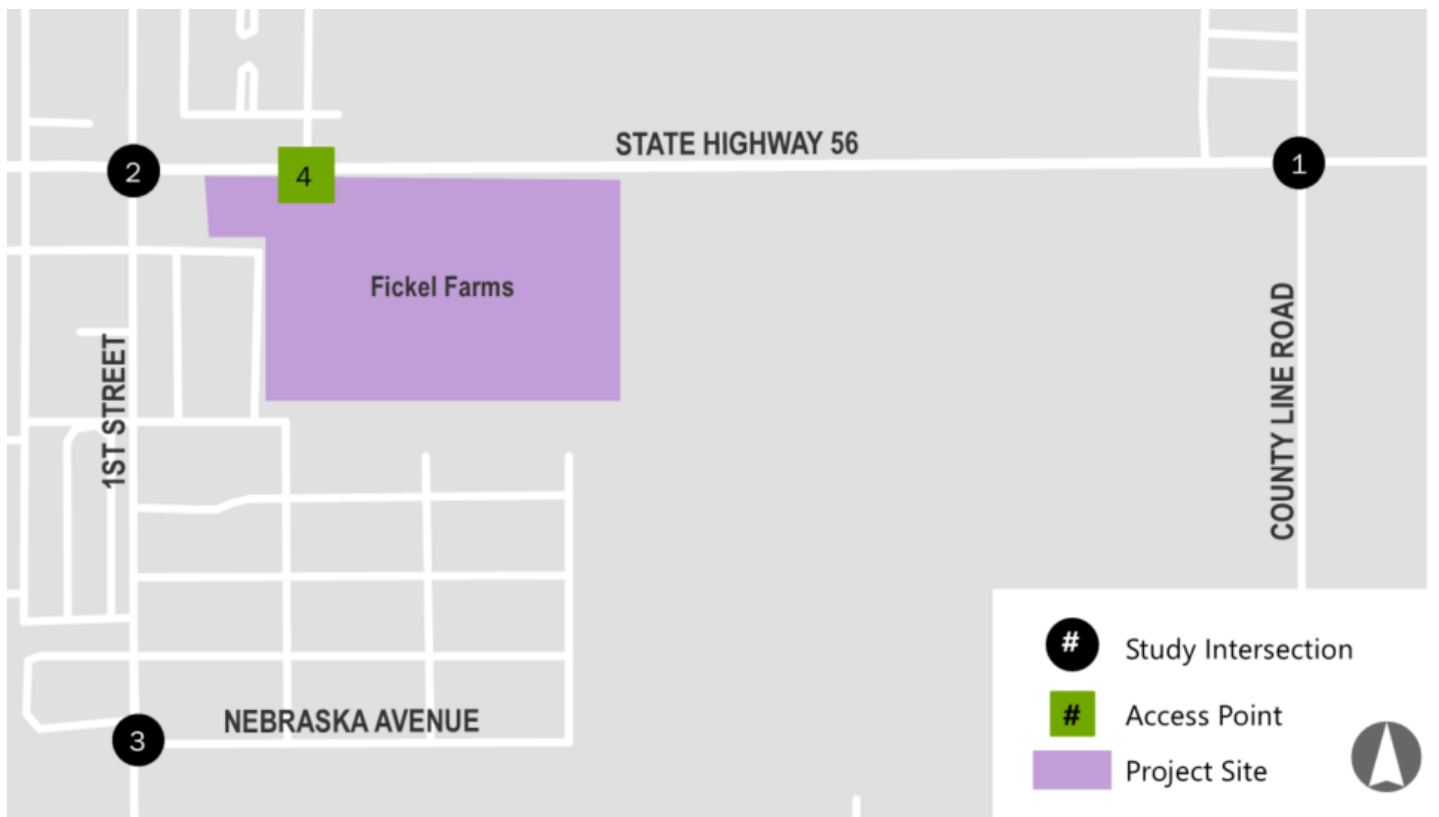
Notes:

1. Signal equals signalized intersection. SSSC indicates a side-street stop-controlled intersection.
2. Whole intersection weighted average control delay expressed in seconds per vehicle for signalized intersections.
3. Intersection analyzed using SIDRA.

Auxiliary Turn Lanes

Per the CDOT Access Code requirements outlined in section 3.5.1 and based on volumes of the westbound left turns (14 AM Peak Hour and 45 PM Peak Hour) and eastbound right turns (16 AM Peak Hour and 54 PM Peak Hour) and the posted speed limit, the CDOT Access Code warrants exclusive westbound left turn lane and eastbound right turn lane at the intersection of Pyramid Peaks Road / SH 56 due to the PM peak volumes. These lane configurations are included in the 2040 Build Conditions analysis results.

- **County Line Road / SH 56** – Per recommendations for the 2040 Background Scenario, this intersection was analyzed as a signalized intersection for the 2040 Build Scenario. It would also operate acceptably as a signalized intersection under this scenario. Signal cycle length and splits were optimized, and signal phasing remained consistent with the 2040 Background Scenario. Overall the intersection will operate at an LOS B with 16.5 seconds of delay in the AM peak hour and will operate at an LOS C with 20.8 seconds of delay in the PM peak hour.
- **Pyramid Peaks / SH 65** – This intersection will operate acceptably per Table 4-2 of the LCUASS, where a single movement can operate at LOS F. LOS F is projected even with the addition of the auxiliary westbound left-turn lane and the auxiliary eastbound right-turn lane. The SH 56 Access Control Plan identifies Pyramid Peaks Road / SH 56 as a full movement access location. Exclusive northbound left turn lane and right turn lane are recommended to be installed at this intersection.



1. County Line Road/SH56	2. 1st Street/SH56	3. 1st Street/Nebraska Ave	4. Pyramid Peaks/SH56
SH56 County Line Road Northbound (Left): 9 (21), 88 (121), 10 (4) Southbound (Left): 17 (15), 537 (655), 137 (138) Eastbound (Left): 15 (13), 586 (687), 146 (183) Westbound (Left): 146 (192), 126 (129), 124 (165)	SH56 1st Street Northbound (Left): 114 (187), 28 (78), 376 (481) Southbound (Left): 424 (438), 559 (605), 31 (36) Eastbound (Left): 123 (121), 449 (619), 19 (36) Westbound (Left): 30 (34), 100 (97), 70 (92)	1st Street Nebraska Ave Northbound (Left): 50 (50), 89 (76), 3 (16) Southbound (Left): 50 (50), 10 (10), 50 (50) Eastbound (Left): 50 (50), 48 (155), 80 (126) Westbound (Left): 16 (5), 10 (10), 122 (111)	SH56 Northbound (Left): 944 (815), 14 (45) Southbound (Left): 773 (1,015), 16 (54) Eastbound (Left): 51 (33), 41 (28)

Figure 9
Peak Hour Traffic Volumes
and Lane Configurations
2040 Build Conditions



7.0 SIGNAL WARRANT ANALYSIS

A signal warrant analysis was performed for the intersection of County Line Road / SH 56

This section summarizes the signal warrant analysis conducted for this intersection utilizing guidelines and methodology provided in the Federal Highway Administration's (FHWA) Manual on Uniform Traffic Control Devices (MUTCD, 2009 Edition).

7.1 Warrants Evaluated

Under Chapter 4C: Traffic Control Signal Needs Studies, there are nine warrants for installation of traffic control signals. In this analysis, Warrant 3: Peak Hour was evaluated. The other eight warrants were not applicable or the necessary data for those warrants is not available. The signal warrant analysis was conducted for the 2040 Background Scenario at County Line Road / SH 56.

7.2 Summary of Warrant Analysis

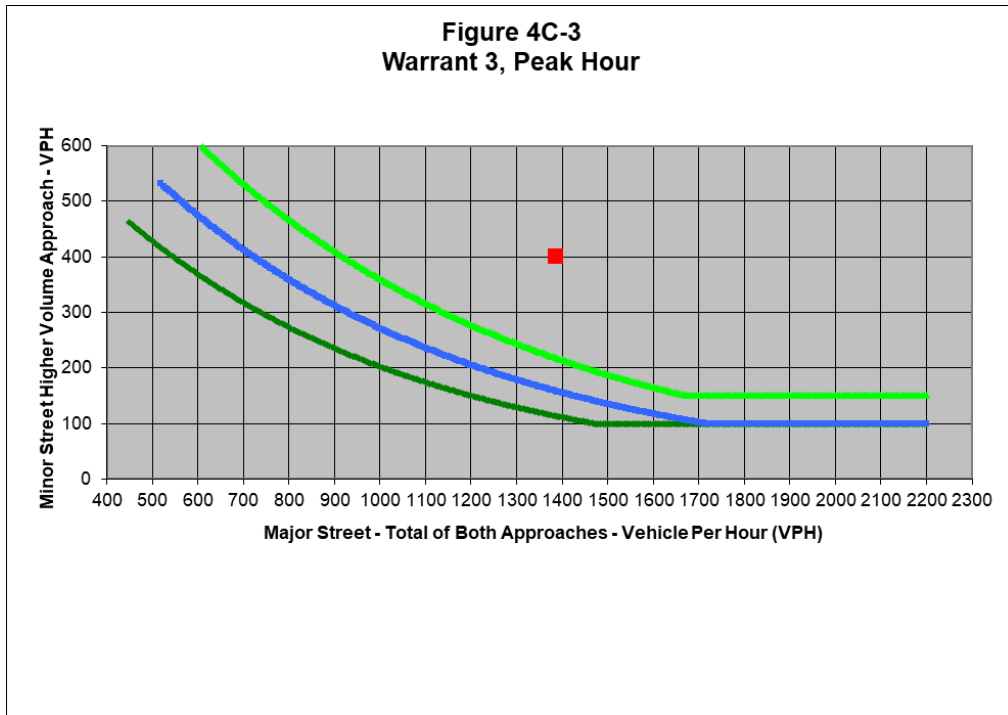
COUNTY LINE ROAD / SH 56

Figure 10 displays the chart (MUTCD 4C-3), which consists of three curves each representing different roadway geometry combinations. This analysis utilized the '1-lane & 1-lane' curve (displayed in dark green) and the AM and PM 2040 Background peak hours were plotted in red. By plotting the traffic volumes for County Line Road / SH 56 (Figure 10), it was found that both the AM and PM peak hours fall above the '1-lane & 1-lane' threshold. Thus, **Warrant 3: Peak Hour is met.**

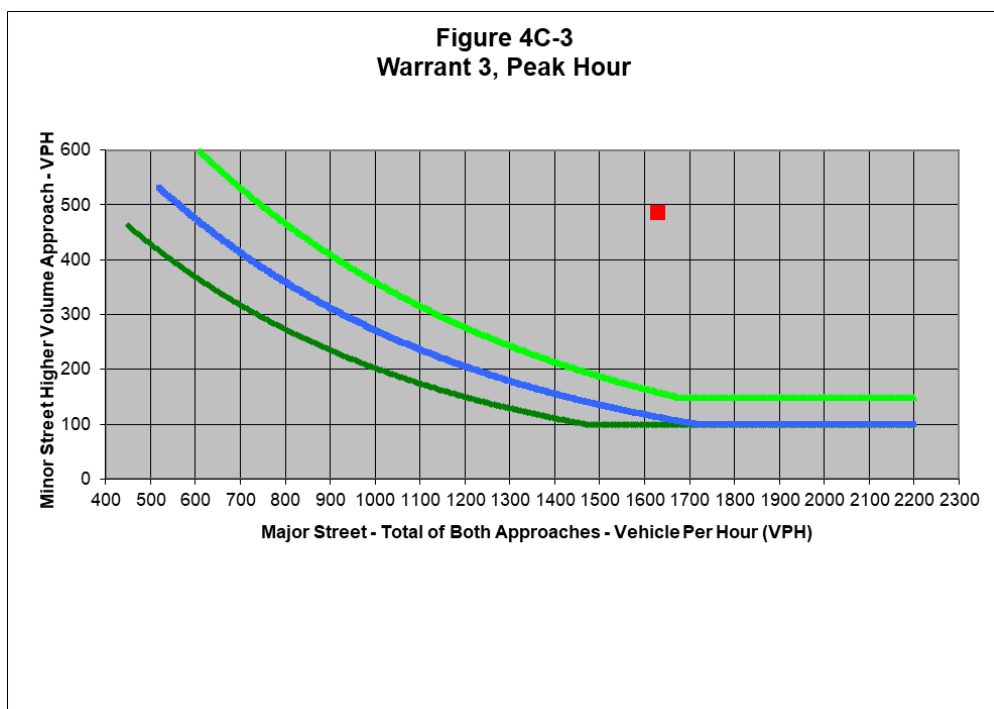


Figure 10: County Line Road / SH 56 AM and PM Peak Hour Signal Warrants

AM Peak Hour



PM Peak Hour



8.0 SUMMARY OF FINDINGS AND RECOMMENDATIONS

This study analyzed the transportation impacts from the development of the Fickel Farm Development. It is expected that Phase 1 of the Project will produce a net total of 794 daily trips with 56 trips in the AM peak hour and 71 trips in the PM peak hour. After Phase 2 is constructed, it is expected that the Project (Phase 1 and 2 combined) will produce a net total of 1,890 daily trips with 139 trips in the AM peak hour and 183 trips in the PM peak hour. The intersections of County Line Road / SH 56, 1st Street / SH 56, 1st Street / Nebraska Avenue, and Pyramid Peaks / SH 56 were studied as part of this analysis.

A brief summary of the **study results and recommendations** per scenario follows:

- **Existing Conditions:** Traffic counts were collected on Wednesday, November 13, 2019. Under this scenario, all study intersections operate acceptably. Based on the volume of westbound left turns and eastbound right turns and the posted speed limit, the CDOT Access Code warrants an exclusive westbound left turn lane and eastbound left turn lane at the intersection of County Line Road / SH 56.
- **2023 Background Conditions:** Traffic volumes are expected to increase by an annual growth rate of 1.5 percent in the AM and PM peak hours. Required exclusive westbound left turn lane and eastbound left turn lane per the CDOT Access Code at County Line Road / SH 56 were consistent with Existing Conditions. Under this scenario, all study intersections operate acceptably.
- **2040 Background Conditions:** Traffic volumes are expected to increase by an annual growth rate of 1.5 percent in the AM peak hour and 1.5 percent in the PM peak hour. This scenario also includes project trips from the Farmstead Development. Required exclusive westbound left turn lane and eastbound left turn lane per the CDOT Access Code at County Line Road / SH 56 were consistent with Existing Conditions. Under this scenario, the County Line Road / SH 56 intersection is projected to operate unacceptably as a signalized intersection.
 - **County Line Road / SH 56** – Given the substantial delay for northbound and westbound left turning vehicles, a signal warrant analysis was conducted (see Section 7), concluding that a signal is warranted at this intersection. standards.



- **2023 Build Conditions:** Phase 1 Project trips were added to the 2023 Background Conditions. Required exclusive westbound left turn lane and eastbound left turn lane per the CDOT Access Code at County Line Road / SH 56 were consistent with 2023 Background Conditions. Under this scenario, all intersections operate acceptably.

- **2040 Build Conditions:** Phase 1 and Phase 2 Project trips were added to the 2040 Background Condition. Proposed mitigation measures at the County Line Road / SH 56 intersection are consistent with the 2040 Background Scenario. Under this scenario, all intersections operate acceptably.

Appendix A: Existing Traffic Counts





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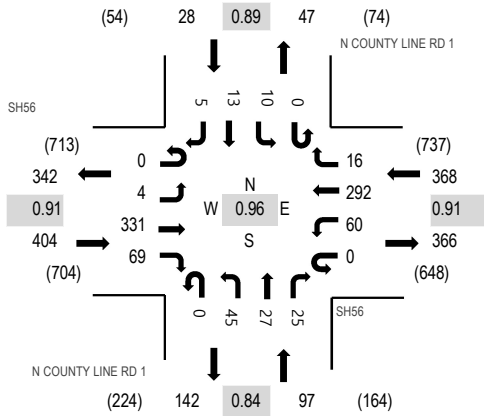
Location: 1 N COUNTY LINE RD 1 & SH56 AM

Date: Wednesday, November 13, 2019

Peak Hour: 07:00 AM - 08:00 AM

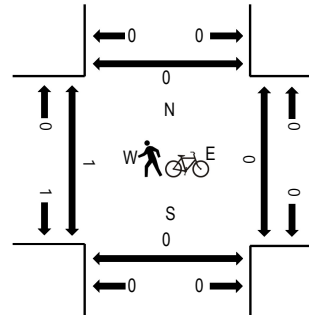
Peak 15-Minutes: 07:15 AM - 07:30 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	SH56 Eastbound				SH56 Westbound				N COUNTY LINE RD 1 Northbound				N COUNTY LINE RD 1 Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	1	87	17	0	17	76	3	0	10	5	5	0	2	3	0	226	897	1	0	0	0
7:15 AM	0	2	90	19	0	13	72	4	0	4	12	9	0	4	3	2	234	856	0	0	0	0
7:30 AM	0	1	84	18	0	16	64	4	0	14	4	5	0	1	4	2	217	795	0	0	0	0
7:45 AM	0	0	70	15	0	14	80	5	0	17	6	6	0	3	3	1	220	786	0	0	0	0
8:00 AM	0	0	74	8	0	7	70	2	0	9	2	4	0	3	4	2	185	762	0	0	0	0
8:15 AM	0	0	51	11	0	8	84	2	0	9	2	3	0	0	3	0	173		0	0	0	0
8:30 AM	0	0	64	14	0	6	94	3	0	7	5	5	0	3	3	4	208		0	0	0	0
8:45 AM	0	3	65	10	0	8	81	4	0	10	4	7	0	3	0	1	196		0	0	0	0
Count Total	0	7	585	112	0	89	621	27	0	80	40	44	0	19	23	12	1,659		1	0	0	0
Peak Hour	0	4	331	69	0	60	292	16	0	45	27	25	0	10	13	5	897		1	0	0	0



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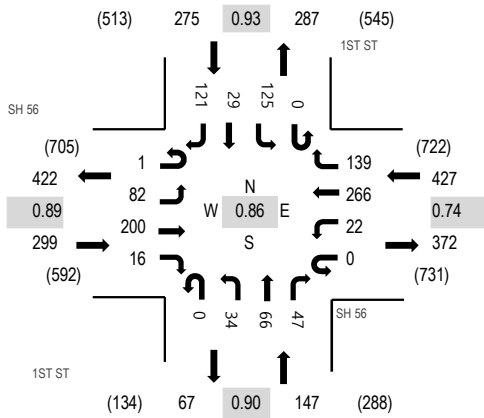
Location: 2 1ST ST & SH 56 AM

Date: Wednesday, November 13, 2019

Peak Hour: 07:30 AM - 08:30 AM

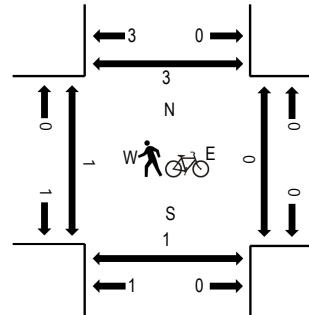
Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	SH 56 Eastbound				SH 56 Westbound				1ST ST Northbound				1ST ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	22	47	6	0	7	42	26	0	8	13	16	0	42	6	14	249	1,105	1	0	0	0
7:15 AM	0	23	52	3	0	6	46	22	0	4	20	12	0	43	5	22	258	1,119	0	0	0	0
7:30 AM	0	19	46	3	0	2	52	39	0	6	20	15	0	38	9	17	266	1,148	0	0	0	0
7:45 AM	1	27	57	2	0	6	89	49	0	4	21	8	0	29	7	32	332	1,115	0	0	0	0
8:00 AM	0	19	44	5	0	6	57	25	0	7	12	14	0	32	9	33	263	1,010	1	0	0	1
8:15 AM	0	17	53	6	0	8	68	26	0	17	13	10	0	26	4	39	287		0	0	0	0
8:30 AM	0	27	48	5	0	4	38	20	0	8	16	14	0	21	9	23	233		0	0	0	0
8:45 AM	0	21	39	0	0	7	45	32	0	5	16	9	0	16	9	28	227		0	0	1	0
Count Total	1	175	386	30	0	46	437	239	0	59	131	98	0	247	58	208	2,115		2	0	1	1
Peak Hour	1	82	200	16	0	22	266	139	0	34	66	47	0	125	29	121	1,148		1	0	0	1



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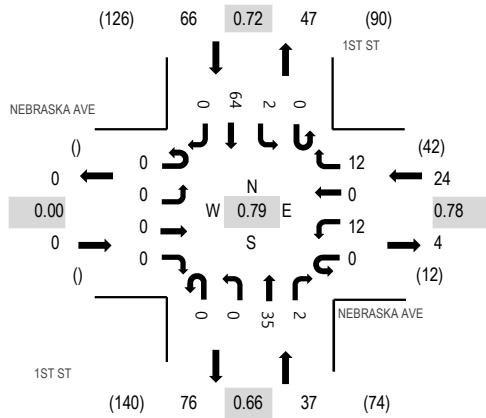
Location: 3 1ST ST & NEBRASKA AVE AM

Date: Wednesday, November 13, 2019

Peak Hour: 07:00 AM - 08:00 AM

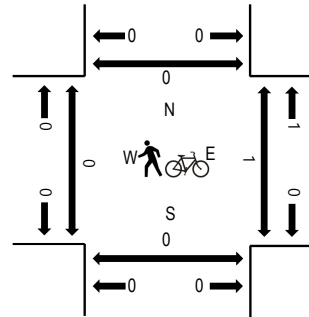
Peak 15-Minutes: 07:15 AM - 07:30 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	NEBRASKA AVE Eastbound				NEBRASKA AVE Westbound				1ST ST Northbound				1ST ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	0	0	0	1	0	5	0	0	8	0	0	0	23	0	37	127	0	0	0	0
7:15 AM	0	0	0	0	0	1	0	3	0	0	13	1	0	1	21	0	40	119	0	0	0	0
7:30 AM	0	0	0	0	0	3	0	3	0	0	5	0	0	0	11	0	22	103	0	1	0	0
7:45 AM	0	0	0	0	0	7	0	1	0	0	9	1	0	1	9	0	28	119	0	0	0	0
8:00 AM	0	0	0	0	0	1	0	3	0	0	7	0	0	1	17	0	29	115	0	0	1	0
8:15 AM	0	0	0	0	0	2	0	3	0	0	9	1	0	2	7	0	24		0	0	0	0
8:30 AM	0	0	0	0	0	6	0	2	0	0	9	1	0	1	19	0	38		0	1	0	0
8:45 AM	0	0	0	0	0	1	0	0	0	0	10	0	0	2	11	0	24		0	0	0	0
Count Total	0	0	0	0	0	22	0	20	0	0	70	4	0	8	118	0	242		0	2	1	0
Peak Hour	0	0	0	0	0	12	0	12	0	0	35	2	0	2	64	0	127		0	1	0	0



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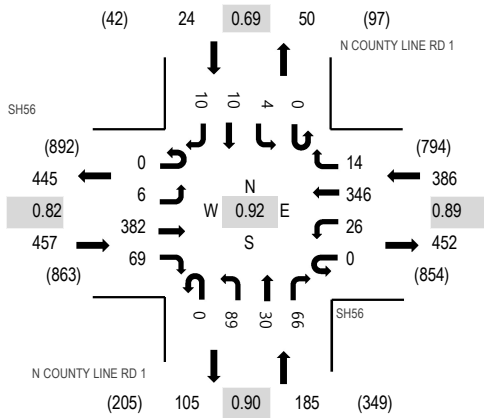
Location: 1 N COUNTY LINE RD 1 & SH56 PM

Date: Wednesday, November 13, 2019

Peak Hour: 04:00 PM - 05:00 PM

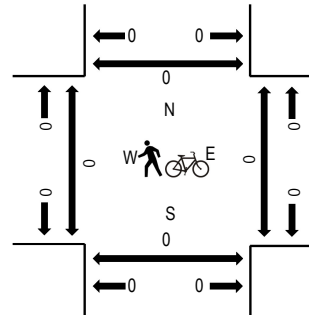
Peak 15-Minutes: 04:00 PM - 04:15 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	SH56 Eastbound				SH56 Westbound				N COUNTY LINE RD 1 Northbound				N COUNTY LINE RD 1 Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	2	118	19	0	9	89	4	0	18	7	17	0	0	2	2	287	1,052	0	0	0	0
4:15 PM	0	0	90	9	0	5	85	5	0	24	8	19	0	1	4	4	254	1,032	0	0	0	0
4:30 PM	0	3	83	21	0	8	87	2	0	17	8	14	0	1	1	3	248	1,028	0	0	0	0
4:45 PM	0	1	91	20	0	4	85	3	0	30	7	16	0	2	3	1	263	1,032	0	0	0	0
5:00 PM	0	0	95	20	0	7	89	3	0	24	9	15	0	1	3	1	267	996	0	0	0	0
5:15 PM	0	0	97	14	0	6	91	1	0	16	4	18	0	2	0	1	250		0	0	0	0
5:30 PM	0	2	86	16	0	6	107	2	0	10	9	9	0	0	4	1	252		0	0	0	0
5:45 PM	0	0	61	15	0	7	86	3	0	21	14	15	0	3	2	0	227		0	0	0	0
Count Total	0	8	721	134	0	52	719	23	0	160	66	123	0	10	19	13	2,048		0	0	0	0
Peak Hour	0	6	382	69	0	26	346	14	0	89	30	66	0	4	10	10	1,052		0	0	0	0



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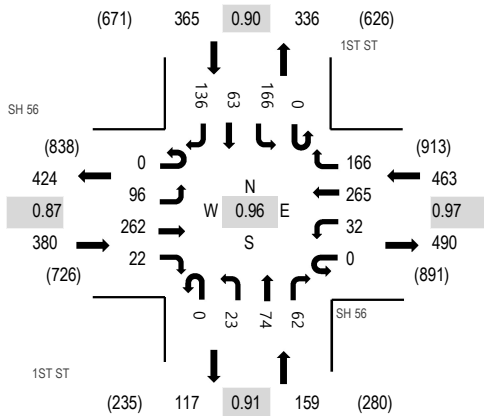
Location: 2 1ST ST & SH 56 PM

Date: Wednesday, November 13, 2019

Peak Hour: 04:30 PM - 05:30 PM

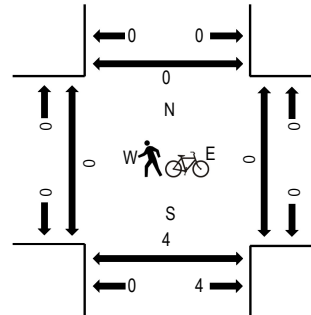
Peak 15-Minutes: 04:30 PM - 04:45 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	SH 56 Eastbound				SH 56 Westbound				1ST ST Northbound				1ST ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	28	73	12	0	6	69	33	0	9	14	18	0	42	14	34	352	1,329	1	1	1	1
4:15 PM	0	19	53	8	0	5	68	40	0	5	19	12	0	36	12	31	308	1,328	1	1	0	3
4:30 PM	0	23	60	4	0	8	73	43	0	5	23	17	0	43	15	43	357	1,367	0	0	0	0
4:45 PM	0	20	64	3	0	6	59	36	0	6	16	19	0	35	17	31	312	1,324	0	0	1	0
5:00 PM	0	25	74	10	0	8	66	45	0	6	19	12	0	31	23	32	351	1,261	0	0	2	0
5:15 PM	0	28	64	5	0	10	67	42	0	6	16	14	0	57	8	30	347		0	0	0	0
5:30 PM	0	23	60	5	0	10	72	38	0	8	10	7	0	33	18	30	314		0	0	0	0
5:45 PM	0	18	42	5	0	8	64	37	0	2	11	6	0	19	15	22	249		0	0	0	0
Count Total	0	184	490	52	0	61	538	314	0	47	128	105	0	296	122	253	2,590		2	2	4	4
Peak Hour	0	96	262	22	0	32	265	166	0	23	74	62	0	166	63	136	1,367		0	0	3	0



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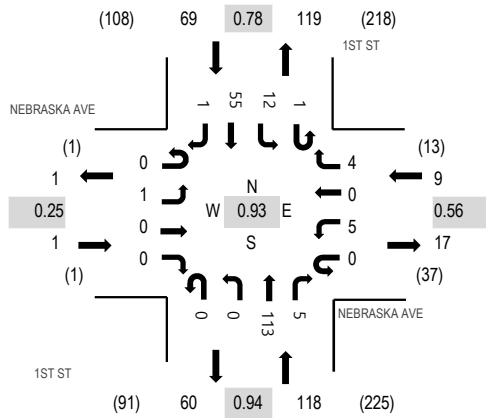
Location: 3 1ST ST & NEBRASKA AVE PM

Date: Wednesday, November 13, 2019

Peak Hour: 04:00 PM - 05:00 PM

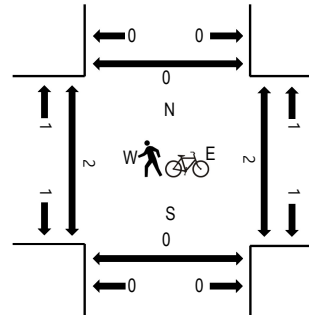
Peak 15-Minutes: 04:30 PM - 04:45 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	NEBRASKA AVE Eastbound				NEBRASKA AVE Westbound				1ST ST Northbound				1ST ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	0	0	0	0	2	0	0	0	0	20	1	0	5	16	1	45	197	0	1	0	0
4:15 PM	0	1	0	0	0	0	0	2	0	0	28	1	0	4	12	0	48	197	0	0	0	0
4:30 PM	0	0	0	0	0	1	0	0	0	0	32	3	1	3	13	0	53	184	2	1	0	0
4:45 PM	0	0	0	0	0	2	0	2	0	0	33	0	0	0	14	0	51	166	0	0	0	0
5:00 PM	0	0	0	0	0	1	0	0	0	0	30	5	0	2	7	0	45	150	1	0	0	0
5:15 PM	0	0	0	0	0	0	0	2	0	0	16	4	0	4	9	0	35		0	0	0	0
5:30 PM	0	0	0	0	0	0	0	1	0	0	25	0	0	3	6	0	35		0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	25	2	0	0	8	0	35		0	0	0	2
Count Total	0	1	0	0	0	6	0	7	0	0	209	16	1	21	85	1	347		3	2	0	2
Peak Hour	0	1	0	0	0	5	0	4	0	0	113	5	1	12	55	1	197		2	2	0	0

Appendix B: Intersection Level of Service Calculations



Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	331	69	60	292	16	45	27	25	10	13	5
Future Vol, veh/h	4	331	69	60	292	16	45	27	25	10	13	5
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	4	4	4	6	6	6	3	3	3	0	0	0
Mvmt Flow	4	345	72	63	304	17	47	28	26	10	14	5
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	321	0	0	417	0	0	838	836	381	855	864	314
Stage 1	-	-	-	-	-	-	389	389	-	439	439	-
Stage 2	-	-	-	-	-	-	449	447	-	416	425	-
Critical Hdwy	4.14	-	-	4.16	-	-	7.13	6.53	6.23	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Follow-up Hdwy	2.236	-	-	2.254	-	-	3.527	4.027	3.327	3.5	4	3.3
Pot Cap-1 Maneuver	1228	-	-	1121	-	-	285	302	664	281	294	731
Stage 1	-	-	-	-	-	-	633	607	-	601	582	-
Stage 2	-	-	-	-	-	-	587	572	-	618	590	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1228	-	-	1121	-	-	257	280	664	235	273	730
Mov Cap-2 Maneuver	-	-	-	-	-	-	257	280	-	235	273	-
Stage 1	-	-	-	-	-	-	630	605	-	599	542	-
Stage 2	-	-	-	-	-	-	529	533	-	564	588	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			1.4			21.8			18.9		
HCM LOS							C			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	314	1228	-	-	1121	-	-	289				
HCM Lane V/C Ratio	0.322	0.003	-	-	0.056	-	-	0.101				
HCM Control Delay (s)	21.8	7.9	0	-	8.4	0	-	18.9				
HCM Lane LOS	C	A	A	-	A	A	-	C				
HCM 95th %tile Q(veh)	1.4	0	-	-	0.2	-	-	0.3				

HCM 6th TWSC
1: County Line Road & SH56

Required by CDOT
Existing AM
10/09/2020

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	331	69	60	292	16	45	27	25	10	13	5
Future Vol, veh/h	4	331	69	60	292	16	45	27	25	10	13	5
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	150	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	4	4	4	6	6	6	3	3	3	0	0	0
Mvmt Flow	4	345	72	63	304	17	47	28	26	10	14	5
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	321	0	0	417	0	0	802	800	345	855	864	314
Stage 1	-	-	-	-	-	-	353	353	-	439	439	-
Stage 2	-	-	-	-	-	-	449	447	-	416	425	-
Critical Hdwy	4.14	-	-	4.16	-	-	7.13	6.53	6.23	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Follow-up Hdwy	2.236	-	-	2.254	-	-	3.527	4.027	3.327	3.5	4	3.3
Pot Cap-1 Maneuver	1228	-	-	1121	-	-	301	317	696	281	294	731
Stage 1	-	-	-	-	-	-	662	629	-	601	582	-
Stage 2	-	-	-	-	-	-	587	572	-	618	590	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1228	-	-	1121	-	-	274	298	696	240	276	730
Mov Cap-2 Maneuver	-	-	-	-	-	-	274	298	-	240	276	-
Stage 1	-	-	-	-	-	-	659	626	-	599	549	-
Stage 2	-	-	-	-	-	-	536	540	-	566	588	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			1.4			20.4			18.6		
HCM LOS							C			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	334	1228	-	-	1121	-	-	293				
HCM Lane V/C Ratio	0.303	0.003	-	-	0.056	-	-	0.1				
HCM Control Delay (s)	20.4	7.9	0	-	8.4	-	-	18.6				
HCM Lane LOS	C	A	A	-	A	-	-	C				
HCM 95th %tile Q(veh)	1.2	0	-	-	0.2	-	-	0.3				

Intersection						
Int Delay, s/veh	1.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	12	12	35	2	2	64
Future Vol, veh/h	12	12	35	2	2	64
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	4	4	3	3	2	2
Mvmt Flow	15	15	44	3	3	81
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	133	47	0	0	47	0
Stage 1	46	-	-	-	-	-
Stage 2	87	-	-	-	-	-
Critical Hdwy	6.44	6.24	-	-	4.12	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.336	-	-	2.218	-
Pot Cap-1 Maneuver	856	1017	-	-	1560	-
Stage 1	971	-	-	-	-	-
Stage 2	931	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	854	1016	-	-	1560	-
Mov Cap-2 Maneuver	854	-	-	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	929	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9	0		0.2		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	928	1560	-	
HCM Lane V/C Ratio	-	-	0.033	0.002	-	
HCM Control Delay (s)	-	-	9	7.3	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Intersection												
Int Delay, s/veh	7.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	382	69	26	346	14	89	30	66	4	10	10
Future Vol, veh/h	6	382	69	26	346	14	89	30	66	4	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	4	4	4	4	4	4	8	8	8
Mvmt Flow	6	415	75	28	376	15	97	33	72	4	11	11
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	391	0	0	490	0	0	917	912	453	957	942	385
Stage 1	-	-	-	-	-	-	465	465	-	440	440	-
Stage 2	-	-	-	-	-	-	452	447	-	517	502	-
Critical Hdwy	4.13	-	-	4.14	-	-	7.14	6.54	6.24	7.18	6.58	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.18	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.18	5.58	-
Follow-up Hdwy	2.227	-	-	2.236	-	-	3.536	4.036	3.336	3.572	4.072	3.372
Pot Cap-1 Maneuver	1162	-	-	1063	-	-	251	272	603	231	257	650
Stage 1	-	-	-	-	-	-	574	560	-	584	567	-
Stage 2	-	-	-	-	-	-	583	570	-	530	532	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1162	-	-	1063	-	-	231	261	603	178	246	649
Mov Cap-2 Maneuver	-	-	-	-	-	-	231	261	-	178	246	-
Stage 1	-	-	-	-	-	-	570	556	-	580	548	-
Stage 2	-	-	-	-	-	-	542	551	-	436	528	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.6			37.5			17.9		
HCM LOS							E			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	303	1162	-	-	1063	-	-	306				
HCM Lane V/C Ratio	0.664	0.006	-	-	0.027	-	-	0.085				
HCM Control Delay (s)	37.5	8.1	0	-	8.5	0	-	17.9				
HCM Lane LOS	E	A	A	-	A	A	-	C				
HCM 95th %tile Q(veh)	4.4	0	-	-	0.1	-	-	0.3				

HCM 6th TWSC
1: County Line Road & SH56

CDOT Required
Existing PM
10/09/2020

Intersection												
Int Delay, s/veh	6.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗	↖	↘			↕			↕	
Traffic Vol, veh/h	6	382	69	26	346	14	89	30	66	4	10	10
Future Vol, veh/h	6	382	69	26	346	14	89	30	66	4	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	150	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	4	4	4	4	4	4	8	8	8
Mvmt Flow	6	415	75	28	376	15	97	33	72	4	11	11
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	391	0	0	490	0	0	879	874	415	957	942	385
Stage 1	-	-	-	-	-	-	427	427	-	440	440	-
Stage 2	-	-	-	-	-	-	452	447	-	517	502	-
Critical Hdwy	4.13	-	-	4.14	-	-	7.14	6.54	6.24	7.18	6.58	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.18	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.18	5.58	-
Follow-up Hdwy	2.227	-	-	2.236	-	-	3.536	4.036	3.336	3.572	4.072	3.372
Pot Cap-1 Maneuver	1162	-	-	1063	-	-	266	286	633	231	257	650
Stage 1	-	-	-	-	-	-	602	582	-	584	567	-
Stage 2	-	-	-	-	-	-	583	570	-	530	532	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1162	-	-	1063	-	-	246	277	633	182	249	649
Mov Cap-2 Maneuver	-	-	-	-	-	-	246	277	-	182	249	-
Stage 1	-	-	-	-	-	-	598	578	-	580	552	-
Stage 2	-	-	-	-	-	-	547	555	-	440	528	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.6			33.1			17.7		
HCM LOS							D			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	322	1162	-	-	1063	-	-	309				
HCM Lane V/C Ratio	0.624	0.006	-	-	0.027	-	-	0.084				
HCM Control Delay (s)	33.1	8.1	0	-	8.5	-	-	17.7				
HCM Lane LOS	D	A	A	-	A	-	-	C				
HCM 95th %tile Q(veh)	4	0	-	-	0.1	-	-	0.3				

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	4	113	5	12	55
Future Vol, veh/h	5	4	113	5	12	55
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	11	11	1	1	1	1
Mvmt Flow	5	4	122	5	13	59
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	210	126	0	0	127	0
Stage 1	125	-	-	-	-	-
Stage 2	85	-	-	-	-	-
Critical Hdwy	6.51	6.31	-	-	4.11	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.399	-	-	2.209	-
Pot Cap-1 Maneuver	759	901	-	-	1465	-
Stage 1	879	-	-	-	-	-
Stage 2	916	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	752	900	-	-	1465	-
Mov Cap-2 Maneuver	752	-	-	-	-	-
Stage 1	879	-	-	-	-	-
Stage 2	908	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	9.5	0	1.3			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	811	1465	-	
HCM Lane V/C Ratio	-	-	0.012	0.009	-	
HCM Control Delay (s)	-	-	9.5	7.5	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0	0	-	

Intersection												
Int Delay, s/veh	3.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	346	72	63	305	17	47	28	26	10	14	5
Future Vol, veh/h	4	346	72	63	305	17	47	28	26	10	14	5
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	4	4	4	6	6	6	3	3	3	0	0	0
Mvmt Flow	4	360	75	66	318	18	49	29	27	10	15	5
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	336	0	0	435	0	0	876	874	398	893	902	328
Stage 1	-	-	-	-	-	-	406	406	-	459	459	-
Stage 2	-	-	-	-	-	-	470	468	-	434	443	-
Critical Hdwy	4.14	-	-	4.16	-	-	7.13	6.53	6.23	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Follow-up Hdwy	2.236	-	-	2.254	-	-	3.527	4.027	3.327	3.5	4	3.3
Pot Cap-1 Maneuver	1212	-	-	1104	-	-	268	287	649	264	280	718
Stage 1	-	-	-	-	-	-	620	596	-	586	570	-
Stage 2	-	-	-	-	-	-	572	560	-	604	579	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1212	-	-	1104	-	-	239	265	649	218	258	717
Mov Cap-2 Maneuver	-	-	-	-	-	-	239	265	-	218	258	-
Stage 1	-	-	-	-	-	-	618	594	-	584	528	-
Stage 2	-	-	-	-	-	-	511	519	-	548	577	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			1.4			23.8			19.9		
HCM LOS							C			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	295	1212	-	-	1104	-	-	271				
HCM Lane V/C Ratio	0.357	0.003	-	-	0.059	-	-	0.111				
HCM Control Delay (s)	23.8	8	0	-	8.5	0	-	19.9				
HCM Lane LOS	C	A	A	-	A	A	-	C				
HCM 95th %tile Q(veh)	1.6	0	-	-	0.2	-	-	0.4				

HCM 6th TWSC
1: County Line Road & SH56

Required by CDOT
Short Range Background 2023 - AM
09/29/2020

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗	↖	↗			↕			↕	
Traffic Vol, veh/h	4	346	72	63	305	17	47	28	26	10	14	5
Future Vol, veh/h	4	346	72	63	305	17	47	28	26	10	14	5
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	200	200	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	4	4	4	6	6	6	3	3	3	0	0	0
Mvmt Flow	4	360	75	66	318	18	49	29	27	10	15	5
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	336	0	0	435	0	0	838	836	360	893	902	328
Stage 1	-	-	-	-	-	-	368	368	-	459	459	-
Stage 2	-	-	-	-	-	-	470	468	-	434	443	-
Critical Hdwy	4.14	-	-	4.16	-	-	7.13	6.53	6.23	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Follow-up Hdwy	2.236	-	-	2.254	-	-	3.527	4.027	3.327	3.5	4	3.3
Pot Cap-1 Maneuver	1212	-	-	1104	-	-	285	302	682	264	280	718
Stage 1	-	-	-	-	-	-	650	620	-	586	570	-
Stage 2	-	-	-	-	-	-	572	560	-	604	579	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1212	-	-	1104	-	-	258	283	682	222	262	717
Mov Cap-2 Maneuver	-	-	-	-	-	-	258	283	-	222	262	-
Stage 1	-	-	-	-	-	-	647	618	-	584	536	-
Stage 2	-	-	-	-	-	-	519	526	-	550	577	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			1.4			22			19.7		
HCM LOS							C			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	316	1212	-	-	1104	-	-	275				
HCM Lane V/C Ratio	0.333	0.003	-	-	0.059	-	-	0.11				
HCM Control Delay (s)	22	8	0	-	8.5	-	-	19.7				
HCM Lane LOS	C	A	A	-	A	-	-	C				
HCM 95th %tile Q(veh)	1.4	0	-	-	0.2	-	-	0.4				

Intersection						
Int Delay, s/veh	1.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	13	13	37	2	2	67
Future Vol, veh/h	13	13	37	2	2	67
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	4	4	3	3	2	2
Mvmt Flow	16	16	47	3	3	85
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	140	50	0	0	50	0
Stage 1	49	-	-	-	-	-
Stage 2	91	-	-	-	-	-
Critical Hdwy	6.44	6.24	-	-	4.12	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.336	-	-	2.218	-
Pot Cap-1 Maneuver	848	1013	-	-	1557	-
Stage 1	968	-	-	-	-	-
Stage 2	928	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	846	1012	-	-	1557	-
Mov Cap-2 Maneuver	846	-	-	-	-	-
Stage 1	968	-	-	-	-	-
Stage 2	926	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9	0		0.2		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	922	1557	-	
HCM Lane V/C Ratio	-	-	0.036	0.002	-	
HCM Control Delay (s)	-	-	9	7.3	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Intersection												
Int Delay, s/veh	8.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	399	72	27	362	15	93	31	69	4	10	10
Future Vol, veh/h	6	399	72	27	362	15	93	31	69	4	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	4	4	4	4	4	4	8	8	8
Mvmt Flow	6	434	78	29	393	16	101	34	75	4	11	11
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	409	0	0	512	0	0	956	952	473	999	983	402
Stage 1	-	-	-	-	-	-	485	485	-	459	459	-
Stage 2	-	-	-	-	-	-	471	467	-	540	524	-
Critical Hdwy	4.13	-	-	4.14	-	-	7.14	6.54	6.24	7.18	6.58	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.18	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.18	5.58	-
Follow-up Hdwy	2.227	-	-	2.236	-	-	3.536	4.036	3.336	3.572	4.072	3.372
Pot Cap-1 Maneuver	1144	-	-	1043	-	-	236	257	587	217	243	635
Stage 1	-	-	-	-	-	-	560	548	-	571	556	-
Stage 2	-	-	-	-	-	-	570	558	-	515	520	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1144	-	-	1043	-	-	216	246	587	164	233	634
Mov Cap-2 Maneuver	-	-	-	-	-	-	216	246	-	164	233	-
Stage 1	-	-	-	-	-	-	556	544	-	567	536	-
Stage 2	-	-	-	-	-	-	529	538	-	418	516	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.6			45.7			18.7		
HCM LOS							E			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	286	1144	-	-	1043	-	-	289				
HCM Lane V/C Ratio	0.734	0.006	-	-	0.028	-	-	0.09				
HCM Control Delay (s)	45.7	8.2	0	-	8.6	0	-	18.7				
HCM Lane LOS	E	A	A	-	A	A	-	C				
HCM 95th %tile Q(veh)	5.3	0	-	-	0.1	-	-	0.3				

HCM 6th TWSC

1: County Line Road & SH56

Short Range Background 2023 PM

09/29/2020

Intersection												
Int Delay, s/veh	7.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕	↕	↕			↕			↕	
Traffic Vol, veh/h	6	399	72	27	362	15	93	31	69	4	10	10
Future Vol, veh/h	6	399	72	27	362	15	93	31	69	4	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	200	200	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	4	4	4	4	4	4	8	8	8
Mvmt Flow	6	434	78	29	393	16	101	34	75	4	11	11
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	409	0	0	512	0	0	917	913	434	999	983	402
Stage 1	-	-	-	-	-	-	446	446	-	459	459	-
Stage 2	-	-	-	-	-	-	471	467	-	540	524	-
Critical Hdwy	4.13	-	-	4.14	-	-	7.14	6.54	6.24	7.18	6.58	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.18	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.18	5.58	-
Follow-up Hdwy	2.227	-	-	2.236	-	-	3.536	4.036	3.336	3.572	4.072	3.372
Pot Cap-1 Maneuver	1144	-	-	1043	-	-	251	271	618	217	243	635
Stage 1	-	-	-	-	-	-	588	571	-	571	556	-
Stage 2	-	-	-	-	-	-	570	558	-	515	520	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1144	-	-	1043	-	-	231	262	618	168	234	634
Mov Cap-2 Maneuver	-	-	-	-	-	-	231	262	-	168	234	-
Stage 1	-	-	-	-	-	-	584	567	-	567	540	-
Stage 2	-	-	-	-	-	-	533	542	-	423	516	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.6			39.2			18.5		
HCM LOS							E			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	305	1144	-	-	1043	-	-	292				
HCM Lane V/C Ratio	0.688	0.006	-	-	0.028	-	-	0.089				
HCM Control Delay (s)	39.2	8.2	0	-	8.6	-	-	18.5				
HCM Lane LOS	E	A	A	-	A	-	-	C				
HCM 95th %tile Q(veh)	4.7	0	-	-	0.1	-	-	0.3				

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	4	118	5	13	58
Future Vol, veh/h	5	4	118	5	13	58
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	11	11	1	1	1	1
Mvmt Flow	5	4	127	5	14	62
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	220	131	0	0	132	0
Stage 1	130	-	-	-	-	-
Stage 2	90	-	-	-	-	-
Critical Hdwy	6.51	6.31	-	-	4.11	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.399	-	-	2.209	-
Pot Cap-1 Maneuver	749	895	-	-	1459	-
Stage 1	874	-	-	-	-	-
Stage 2	911	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	742	894	-	-	1459	-
Mov Cap-2 Maneuver	742	-	-	-	-	-
Stage 1	874	-	-	-	-	-
Stage 2	902	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	9.5	0	1.4			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	803	1459	-	
HCM Lane V/C Ratio	-	-	0.012	0.01	-	
HCM Control Delay (s)	-	-	9.5	7.5	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0	0	-	

HCM 6th Signalized Intersection Summary

1: County Line Road & SH56

Long Range Background 2040 - AM

09/29/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	492	376	270	437	27	438	120	285	17	81	14
Future Volume (veh/h)	15	492	376	270	437	27	438	120	285	17	81	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1811	1811	1811	1856	1856	1856	1900	1900	1900
Adj Flow Rate, veh/h	16	512	392	281	455	28	456	125	297	18	84	15
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	4	6	6	6	3	3	3	0	0	0
Cap, veh/h	64	619	537	378	887	55	570	165	392	80	138	23
Arrive On Green	0.34	0.34	0.34	0.11	0.53	0.53	0.17	0.34	0.34	0.10	0.10	0.10
Sat Flow, veh/h	21	1797	1560	3346	1688	104	3428	487	1158	160	1329	219
Grp Volume(v), veh/h	528	0	392	281	0	483	456	0	422	117	0	0
Grp Sat Flow(s),veh/h/ln	1818	0	1560	1673	0	1792	1714	0	1645	1708	0	0
Q Serve(g_s), s	3.8	0.0	14.5	5.4	0.0	11.6	8.4	0.0	15.1	1.7	0.0	0.0
Cycle Q Clear(g_c), s	17.6	0.0	14.5	5.4	0.0	11.6	8.4	0.0	15.1	4.2	0.0	0.0
Prop In Lane	0.03		1.00	1.00		0.06	1.00		0.70	0.15		0.13
Lane Grp Cap(c), veh/h	682	0	537	378	0	942	570	0	556	240	0	0
V/C Ratio(X)	0.77	0.00	0.73	0.74	0.00	0.51	0.80	0.00	0.76	0.49	0.00	0.00
Avail Cap(c_a), veh/h	865	0	697	441	0	1160	701	0	955	571	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	19.9	0.0	18.9	28.3	0.0	10.2	26.5	0.0	19.4	28.3	0.0	0.0
Incr Delay (d2), s/veh	3.4	0.0	2.8	5.7	0.0	0.4	5.4	0.0	2.2	1.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	0.0	4.6	2.2	0.0	3.2	3.5	0.0	5.2	1.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.3	0.0	21.7	34.0	0.0	10.6	31.8	0.0	21.6	29.9	0.0	0.0
LnGrp LOS	C	A	C	C	A	B	C	A	C	C	A	A
Approach Vol, veh/h		920			764			878			117	
Approach Delay, s/veh		22.6			19.2			26.9			29.9	
Approach LOS		C			B			C			C	
Timer - Assigned Phs		2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s		26.8	12.0	27.2	15.5	11.3		39.2				
Change Period (Y+Rc), s		4.5	4.5	4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s		38.3	8.7	29.5	13.5	20.3		42.7				
Max Q Clear Time (g_c+I1), s		17.1	7.4	19.6	10.4	6.2		13.6				
Green Ext Time (p_c), s		2.5	0.1	3.2	0.5	0.4		2.7				
Intersection Summary												
HCM 6th Ctrl Delay			23.4									
HCM 6th LOS			C									

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	492	376	270	437	27	438	120	285	17	81	14
Future Vol, veh/h	15	492	376	270	437	27	438	120	285	17	81	14
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	4	4	4	6	6	6	3	3	3	0	0	0
Mvmt Flow	16	513	392	281	455	28	456	125	297	18	84	15
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	483	0	0	905	0	0	1823	1786	709	1983	1968	470
Stage 1	-	-	-	-	-	-	741	741	-	1031	1031	-
Stage 2	-	-	-	-	-	-	1082	1045	-	952	937	-
Critical Hdwy	4.14	-	-	4.16	-	-	7.13	6.53	6.23	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Follow-up Hdwy	2.236	-	-	2.254	-	-	3.527	4.027	3.327	3.5	4	3.3
Pot Cap-1 Maneuver	1069	-	-	735	-	-	~ 59	~ 81	432	46	~ 63	598
Stage 1	-	-	-	-	-	-	~ 407	421	-	284	313	-
Stage 2	-	-	-	-	-	-	~ 262	304	-	314	346	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1069	-	-	735	-	-	-	~ 37	432	-	~ 29	597
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	~ 37	-	-	~ 29	-
Stage 1	-	-	-	-	-	-	~ 394	407	-	275	149	-
Stage 2	-	-	-	-	-	-	~ 53	144	-	66	335	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			4.7								
HCM LOS							-			-		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	1069	-	-	735	-	-	-				
HCM Lane V/C Ratio	-	0.015	-	-	0.383	-	-	-				
HCM Control Delay (s)	-	8.4	0	-	12.9	0	-	-				
HCM Lane LOS	-	A	A	-	B	A	-	-				
HCM 95th %tile Q(veh)	-	0	-	-	1.8	-	-	-				
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined				*: All major volume in platoon				

HCM 6th TWSC
3: 1st Street & Nebraska Ave

12/18/2020

Intersection												
Int Delay, s/veh	6.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	50	10	50	115	10	17	50	47	77	3	86	50
Future Vol, veh/h	50	10	50	115	10	17	50	47	77	3	86	50
Conflicting Peds, #/hr	0	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	79	92	79	92	79	79	79	79	92
Heavy Vehicles, %	2	2	2	4	2	4	2	3	3	2	2	2
Mvmt Flow	54	11	54	146	11	22	54	59	97	4	109	54
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	377	408	136	393	387	109	163	0	0	156	0	0
Stage 1	144	144	-	216	216	-	-	-	-	-	-	-
Stage 2	233	264	-	177	171	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.14	6.52	6.24	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.14	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.14	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.536	4.018	3.336	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	580	533	913	563	547	939	1416	-	-	1424	-	-
Stage 1	859	778	-	782	724	-	-	-	-	-	-	-
Stage 2	770	690	-	820	757	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	538	509	913	503	522	938	1416	-	-	1424	-	-
Mov Cap-2 Maneuver	538	509	-	503	522	-	-	-	-	-	-	-
Stage 1	823	776	-	749	694	-	-	-	-	-	-	-
Stage 2	709	661	-	758	755	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	11.7		15.1		2		0.2					
HCM LOS	B		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1416	-	-	657	534	1424	-	-				
HCM Lane V/C Ratio	0.038	-	-	0.182	0.333	0.003	-	-				
HCM Control Delay (s)	7.6	0	-	11.7	15.1	7.5	0	-				
HCM Lane LOS	A	A	-	B	C	A	A	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.7	1.5	0	-	-				

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	568	519	319	522	24	497	124	339	11	107	24
Future Vol, veh/h	18	568	519	319	522	24	497	124	339	11	107	24
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	4	4	4	4	4	4	8	8	8
Mvmt Flow	19	617	564	347	567	26	540	135	368	12	116	26
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	593	0	0	1181	0	0	2283	2224	899	2463	2493	581
Stage 1	-	-	-	-	-	-	937	937	-	1274	1274	-
Stage 2	-	-	-	-	-	-	1346	1287	-	1189	1219	-
Critical Hdwy	4.13	-	-	4.14	-	-	7.14	6.54	6.24	7.18	6.58	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.18	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.18	5.58	-
Follow-up Hdwy	2.227	-	-	2.236	-	-	3.536	4.036	3.336	3.572	4.072	3.372
Pot Cap-1 Maneuver	978	-	-	584	-	-	~ 28	~ 43	~ 335	20	~ 28	502
Stage 1	-	-	-	-	-	-	~ 315	341	-	199	232	-
Stage 2	-	-	-	-	-	-	~ 185	233	-	223	246	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	978	-	-	584	-	-	-	~ 4	~ 335	-	~ 3	502
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	~ 4	-	-	~ 3	-
Stage 1	-	-	-	-	-	-	~ 293	317	-	185	~ 26	-
Stage 2	-	-	-	-	-	-	-	~ 26	-	-	229	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			7.3								
HCM LOS							-			-		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	978	-	-	584	-	-	-				
HCM Lane V/C Ratio	-	0.02	-	-	0.594	-	-	-				
HCM Control Delay (s)	-	8.8	0	-	19.8	0	-	-				
HCM Lane LOS	-	A	A	-	C	A	-	-				
HCM 95th %tile Q(veh)	-	0.1	-	-	3.9	-	-	-				
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon						

HCM 6th Signalized Intersection Summary

1: County Line Road & SH56

Long Range Background 2040 - PM

10/07/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	568	519	319	522	24	497	124	339	11	107	24
Future Volume (veh/h)	18	568	519	319	522	24	497	124	339	11	107	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1841	1841	1841	1841	1841	1841	1781	1781	1781
Adj Flow Rate, veh/h	19	617	564	347	567	26	540	135	368	12	116	26
Peak Hour Factor	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	4	4	4	4	4	4	8	8	8
Cap, veh/h	51	690	603	397	961	44	601	153	416	50	156	33
Arrive On Green	0.38	0.38	0.38	0.12	0.55	0.55	0.18	0.35	0.35	0.12	0.12	0.12
Sat Flow, veh/h	25	1800	1572	3401	1746	80	3401	436	1189	59	1270	270
Grp Volume(v), veh/h	636	0	564	347	0	593	540	0	503	154	0	0
Grp Sat Flow(s),veh/h/ln	1824	0	1572	1700	0	1826	1700	0	1625	1599	0	0
Q Serve(g_s), s	11.0	0.0	31.0	9.0	0.0	19.5	14.0	0.0	26.2	2.6	0.0	0.0
Cycle Q Clear(g_c), s	29.5	0.0	31.0	9.0	0.0	19.5	14.0	0.0	26.2	8.4	0.0	0.0
Prop In Lane	0.03		1.00	1.00		0.04	1.00		0.73	0.08		0.17
Lane Grp Cap(c), veh/h	740	0	603	397	0	1005	601	0	568	240	0	0
V/C Ratio(X)	0.86	0.00	0.94	0.87	0.00	0.59	0.90	0.00	0.88	0.64	0.00	0.00
Avail Cap(c_a), veh/h	761	0	621	397	0	1026	601	0	732	400	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	26.1	0.0	26.7	39.1	0.0	13.5	36.2	0.0	27.5	38.1	0.0	0.0
Incr Delay (d2), s/veh	9.6	0.0	21.4	18.9	0.0	0.9	16.3	0.0	10.3	2.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.0	0.0	13.6	4.5	0.0	6.6	6.8	0.0	10.9	3.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.7	0.0	48.1	57.9	0.0	14.3	52.5	0.0	37.9	41.0	0.0	0.0
LnGrp LOS	D	A	D	E	A	B	D	A	D	D	A	A
Approach Vol, veh/h		1200			940			1043			154	
Approach Delay, s/veh		41.5			30.4			45.5			41.0	
Approach LOS		D			C			D			D	
Timer - Assigned Phs		2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s		36.0	15.0	39.0	20.4	15.6		54.0				
Change Period (Y+Rc), s		4.5	4.5	4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s		40.5	10.5	35.5	15.9	20.1		50.5				
Max Q Clear Time (g_c+I1), s		28.2	11.0	33.0	16.0	10.4		21.5				
Green Ext Time (p_c), s		2.5	0.0	1.4	0.0	0.5		3.5				
Intersection Summary												
HCM 6th Ctrl Delay			39.6									
HCM 6th LOS			D									

Intersection												
Int Delay, s/veh	5.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	50	10	50	106	10	5	50	152	118	16	74	50
Future Vol, veh/h	50	10	50	106	10	5	50	152	118	16	74	50
Conflicting Peds, #/hr	0	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	93	92	93	92	93	93	93	93	92
Heavy Vehicles, %	2	2	2	11	2	11	2	1	1	1	1	2
Mvmt Flow	54	11	54	114	11	5	54	163	127	17	80	54
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	485	539	107	509	503	228	134	0	0	290	0	0
Stage 1	141	141	-	335	335	-	-	-	-	-	-	-
Stage 2	344	398	-	174	168	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.21	6.52	6.31	4.12	-	-	4.11	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.21	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.21	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.599	4.018	3.399	2.218	-	-	2.209	-	-
Pot Cap-1 Maneuver	492	449	947	460	471	789	1451	-	-	1278	-	-
Stage 1	862	780	-	660	643	-	-	-	-	-	-	-
Stage 2	671	603	-	807	759	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	458	423	947	406	444	788	1451	-	-	1278	-	-
Mov Cap-2 Maneuver	458	423	-	406	444	-	-	-	-	-	-	-
Stage 1	823	769	-	630	614	-	-	-	-	-	-	-
Stage 2	625	576	-	739	748	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	12.6		17.5		1.2		0.9					
HCM LOS	B		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1451	-	-	593	417	1278	-	-				
HCM Lane V/C Ratio	0.037	-	-	0.202	0.312	0.013	-	-				
HCM Control Delay (s)	7.6	0	-	12.6	17.5	7.9	0	-				
HCM Lane LOS	A	A	-	B	C	A	A	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.7	1.3	0	-	-				

Intersection						
Int Delay, s/veh	0.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑↓	
Traffic Vol, veh/h	494	21	20	465	13	12
Future Vol, veh/h	494	21	20	465	13	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	537	23	22	505	14	13
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	560	0	1098	549
Stage 1	-	-	-	-	549	-
Stage 2	-	-	-	-	549	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1011	-	235	535
Stage 1	-	-	-	-	579	-
Stage 2	-	-	-	-	579	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1011	-	228	535
Mov Cap-2 Maneuver	-	-	-	-	228	-
Stage 1	-	-	-	-	579	-
Stage 2	-	-	-	-	562	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.4		17.5	
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	315	-	-	1011	-	
HCM Lane V/C Ratio	0.086	-	-	0.022	-	
HCM Control Delay (s)	17.5	-	-	8.6	-	
HCM Lane LOS	C	-	-	A	-	
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-	

Intersection												
Int Delay, s/veh	8.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗	↖	↗			↕			↕	
Traffic Vol, veh/h	9	407	73	27	376	15	95	31	69	4	10	14
Future Vol, veh/h	9	407	73	27	376	15	95	31	69	4	10	14
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	200	250	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	4	4	4	4	4	4	8	8	8
Mvmt Flow	10	442	79	29	409	16	103	34	75	4	11	15
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	425	0	0	521	0	0	951	945	442	1031	1016	418
Stage 1	-	-	-	-	-	-	462	462	-	475	475	-
Stage 2	-	-	-	-	-	-	489	483	-	556	541	-
Critical Hdwy	4.13	-	-	4.14	-	-	7.14	6.54	6.24	7.18	6.58	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.18	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.18	5.58	-
Follow-up Hdwy	2.227	-	-	2.236	-	-	3.536	4.036	3.336	3.572	4.072	3.372
Pot Cap-1 Maneuver	1129	-	-	1035	-	-	238	260	611	206	232	622
Stage 1	-	-	-	-	-	-	576	561	-	559	547	-
Stage 2	-	-	-	-	-	-	557	549	-	505	511	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1129	-	-	1035	-	-	216	249	611	157	222	621
Mov Cap-2 Maneuver	-	-	-	-	-	-	216	249	-	157	222	-
Stage 1	-	-	-	-	-	-	569	554	-	552	532	-
Stage 2	-	-	-	-	-	-	517	534	-	411	504	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.6			45.7			18.3		
HCM LOS							E			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	288	1129	-	-	1035	-	-	301				
HCM Lane V/C Ratio	0.736	0.009	-	-	0.028	-	-	0.101				
HCM Control Delay (s)	45.7	8.2	0	-	8.6	-	-	18.3				
HCM Lane LOS	E	A	A	-	A	-	-	C				
HCM 95th %tile Q(veh)	5.3	0	-	-	0.1	-	-	0.3				

Intersection						
Int Delay, s/veh	1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	4	119	8	13	59
Future Vol, veh/h	7	4	119	8	13	59
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	11	11	1	1	1	1
Mvmt Flow	8	4	128	9	14	63
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	224	134	0	0	137	0
Stage 1	133	-	-	-	-	-
Stage 2	91	-	-	-	-	-
Critical Hdwy	6.51	6.31	-	-	4.11	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.399	-	-	2.209	-
Pot Cap-1 Maneuver	745	892	-	-	1453	-
Stage 1	871	-	-	-	-	-
Stage 2	910	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	738	891	-	-	1453	-
Mov Cap-2 Maneuver	738	-	-	-	-	-
Stage 1	871	-	-	-	-	-
Stage 2	901	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.6	0		1.4		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	787	1453	-	
HCM Lane V/C Ratio	-	-	0.015	0.01	-	
HCM Control Delay (s)	-	-	9.6	7.5	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0	0	-	

Intersection												
Int Delay, s/veh	3.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	359	74	63	310	17	48	28	26	10	14	6
Future Vol, veh/h	8	359	74	63	310	17	48	28	26	10	14	6
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	4	4	4	6	6	6	3	3	3	0	0	0
Mvmt Flow	8	374	77	66	323	18	50	29	27	10	15	6
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	341	0	0	451	0	0	905	902	413	921	931	333
Stage 1	-	-	-	-	-	-	429	429	-	464	464	-
Stage 2	-	-	-	-	-	-	476	473	-	457	467	-
Critical Hdwy	4.14	-	-	4.16	-	-	7.13	6.53	6.23	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Follow-up Hdwy	2.236	-	-	2.254	-	-	3.527	4.027	3.327	3.5	4	3.3
Pot Cap-1 Maneuver	1207	-	-	1089	-	-	256	276	637	253	269	713
Stage 1	-	-	-	-	-	-	602	582	-	582	567	-
Stage 2	-	-	-	-	-	-	568	557	-	587	565	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1207	-	-	1089	-	-	227	253	637	207	247	712
Mov Cap-2 Maneuver	-	-	-	-	-	-	227	253	-	207	247	-
Stage 1	-	-	-	-	-	-	597	577	-	577	524	-
Stage 2	-	-	-	-	-	-	506	515	-	529	560	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			1.4			25.4			20.4		
HCM LOS							D			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	281	1207	-	-	1089	-	-	265				
HCM Lane V/C Ratio	0.378	0.007	-	-	0.06	-	-	0.118				
HCM Control Delay (s)	25.4	8	0	-	8.5	0	-	20.4				
HCM Lane LOS	D	A	A	-	A	A	-	C				
HCM 95th %tile Q(veh)	1.7	0	-	-	0.2	-	-	0.4				

HCM 6th TWSC
1: County Line Road & SH56

CDOT Required
Short Range Total AM
10/07/2020

Intersection												
Int Delay, s/veh	3.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	359	74	63	310	17	48	28	26	10	14	6
Future Vol, veh/h	8	359	74	63	310	17	48	28	26	10	14	6
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	200	200	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	4	4	4	6	6	6	3	3	3	0	0	0
Mvmt Flow	8	374	77	66	323	18	50	29	27	10	15	6
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	341	0	0	451	0	0	866	863	374	921	931	333
Stage 1	-	-	-	-	-	-	390	390	-	464	464	-
Stage 2	-	-	-	-	-	-	476	473	-	457	467	-
Critical Hdwy	4.14	-	-	4.16	-	-	7.13	6.53	6.23	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Follow-up Hdwy	2.236	-	-	2.254	-	-	3.527	4.027	3.327	3.5	4	3.3
Pot Cap-1 Maneuver	1207	-	-	1089	-	-	272	291	670	253	269	713
Stage 1	-	-	-	-	-	-	632	606	-	582	567	-
Stage 2	-	-	-	-	-	-	568	557	-	587	565	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1207	-	-	1089	-	-	244	271	670	211	250	712
Mov Cap-2 Maneuver	-	-	-	-	-	-	244	271	-	211	250	-
Stage 1	-	-	-	-	-	-	626	601	-	577	532	-
Stage 2	-	-	-	-	-	-	514	523	-	531	560	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			1.4			23.3			20.2		
HCM LOS							C			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	301	1207	-	-	1089	-	-	268				
HCM Lane V/C Ratio	0.353	0.007	-	-	0.06	-	-	0.117				
HCM Control Delay (s)	23.3	8	0	-	8.5	-	-	20.2				
HCM Lane LOS	C	A	A	-	A	-	-	C				
HCM 95th %tile Q(veh)	1.5	0	-	-	0.2	-	-	0.4				

Intersection						
Int Delay, s/veh	2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	13	37	3	2	68
Future Vol, veh/h	16	13	37	3	2	68
Conflicting Peds, #/hr	0	1	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	4	4	3	3	2	2
Mvmt Flow	20	16	47	4	3	86
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	141	50	0	0	51	0
Stage 1	49	-	-	-	-	-
Stage 2	92	-	-	-	-	-
Critical Hdwy	6.44	6.24	-	-	4.12	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.336	-	-	2.218	-
Pot Cap-1 Maneuver	847	1013	-	-	1555	-
Stage 1	968	-	-	-	-	-
Stage 2	927	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	845	1012	-	-	1555	-
Mov Cap-2 Maneuver	845	-	-	-	-	-
Stage 1	968	-	-	-	-	-
Stage 2	925	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.1	0		0.2		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	913	1555	-	
HCM Lane V/C Ratio	-	-	0.04	0.002	-	
HCM Control Delay (s)	-	-	9.1	7.3	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Intersection						
Int Delay, s/veh	0.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↕	
Traffic Vol, veh/h	423	6	6	358	20	19
Future Vol, veh/h	423	6	6	358	20	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	460	7	7	389	22	21
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	467	0	867	464
Stage 1	-	-	-	-	464	-
Stage 2	-	-	-	-	403	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1094	-	323	598
Stage 1	-	-	-	-	633	-
Stage 2	-	-	-	-	675	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1094	-	320	598
Mov Cap-2 Maneuver	-	-	-	-	320	-
Stage 1	-	-	-	-	633	-
Stage 2	-	-	-	-	670	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.1		14.7	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	414	-	-	1094	-	
HCM Lane V/C Ratio	0.102	-	-	0.006	-	
HCM Control Delay (s)	14.7	-	-	8.3	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.3	-	-	0	-	

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	523	376	270	447	27	438	120	285	17	81	18
Future Vol, veh/h	25	523	376	270	447	27	438	120	285	17	81	18
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	4	4	4	6	6	6	3	3	3	0	0	0
Mvmt Flow	26	545	392	281	466	28	456	125	297	18	84	19
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	494	0	0	937	0	0	1888	1849	741	2046	2031	481
Stage 1	-	-	-	-	-	-	793	793	-	1042	1042	-
Stage 2	-	-	-	-	-	-	1095	1056	-	1004	989	-
Critical Hdwy	4.14	-	-	4.16	-	-	7.13	6.53	6.23	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.1	5.5	-
Follow-up Hdwy	2.236	-	-	2.254	-	-	3.527	4.027	3.327	3.5	4	3.3
Pot Cap-1 Maneuver	1059	-	-	715	-	-	~ 53	~ 74	415	42	~ 58	589
Stage 1	-	-	-	-	-	-	~ 380	399	-	280	309	-
Stage 2	-	-	-	-	-	-	~ 258	301	-	294	327	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1059	-	-	715	-	-	~ 32	415	-	~ 25	588	
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 32	-	-	~ 25	-	
Stage 1	-	-	-	-	-	-	~ 359	377	-	264	141	-
Stage 2	-	-	-	-	-	-	~ 46	137	-	53	309	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			4.8								
HCM LOS							-			-		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	1059	-	-	715	-	-	-				
HCM Lane V/C Ratio	-	0.025	-	-	0.393	-	-	-				
HCM Control Delay (s)	-	8.5	0	-	13.3	0	-	-				
HCM Lane LOS	-	A	A	-	B	A	-	-				
HCM 95th %tile Q(veh)	-	0.1	-	-	1.9	-	-	-				
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s				+: Computation Not Defined				*: All major volume in platoon		

HCM 6th Signalized Intersection Summary

1: County Line Road & SH56

Long Range Total AM - Mitigate

10/07/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	523	376	270	447	27	438	120	285	17	81	18
Future Volume (veh/h)	25	523	376	270	447	27	438	120	285	17	81	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1841	1841	1841	1811	1811	1811	1856	1856	1856	1900	1900	1900
Adj Flow Rate, veh/h	26	545	392	281	466	28	456	125	297	18	84	19
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	4	6	6	6	3	3	3	0	0	0
Cap, veh/h	68	642	569	371	914	55	556	161	383	75	134	28
Arrive On Green	0.37	0.37	0.37	0.11	0.54	0.54	0.16	0.33	0.33	0.10	0.10	0.10
Sat Flow, veh/h	40	1759	1560	3346	1691	102	3428	487	1158	153	1285	268
Grp Volume(v), veh/h	571	0	392	281	0	494	456	0	422	121	0	0
Grp Sat Flow(s),veh/h/ln	1798	0	1560	1673	0	1793	1714	0	1645	1706	0	0
Q Serve(g_s), s	7.6	0.0	14.9	5.7	0.0	12.2	9.0	0.0	16.1	2.0	0.0	0.0
Cycle Q Clear(g_c), s	20.5	0.0	14.9	5.7	0.0	12.2	9.0	0.0	16.1	4.6	0.0	0.0
Prop In Lane	0.05		1.00	1.00		0.06	1.00		0.70	0.15		0.16
Lane Grp Cap(c), veh/h	710	0	569	371	0	969	556	0	544	237	0	0
V/C Ratio(X)	0.80	0.00	0.69	0.76	0.00	0.51	0.82	0.00	0.78	0.51	0.00	0.00
Avail Cap(c_a), veh/h	843	0	688	412	0	1127	628	0	874	528	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	20.5	0.0	18.8	30.1	0.0	10.2	28.3	0.0	21.0	30.0	0.0	0.0
Incr Delay (d2), s/veh	4.9	0.0	2.2	7.1	0.0	0.4	7.7	0.0	2.4	1.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.8	0.0	4.7	2.4	0.0	3.5	3.9	0.0	5.7	1.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.3	0.0	21.0	37.2	0.0	10.6	36.0	0.0	23.5	31.7	0.0	0.0
LnGrp LOS	C	A	C	D	A	B	D	A	C	C	A	A
Approach Vol, veh/h	963		775			878			121			
Approach Delay, s/veh	23.6		20.3			30.0			31.7			
Approach LOS	C		C			C			C			
Timer - Assigned Phs	2		3		4		5		6		8	
Phs Duration (G+Y+Rc), s	27.6		12.3		30.0		15.8		11.8		42.3	
Change Period (Y+Rc), s	4.5		4.5		4.5		4.5		4.5		4.5	
Max Green Setting (Gmax), s	37.1		8.6		30.8		12.8		19.8		43.9	
Max Q Clear Time (g_c+I1), s	18.1		7.7		22.5		11.0		6.6		14.2	
Green Ext Time (p_c), s	2.4		0.1		3.0		0.3		0.4		2.8	
Intersection Summary												
HCM 6th Ctrl Delay	25.1											
HCM 6th LOS	C											

Intersection												
Int Delay, s/veh	6.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	50	10	50	122	10	16	50	48	80	3	89	50
Future Vol, veh/h	50	10	50	122	10	16	50	48	80	3	89	50
Conflicting Peds, #/hr	0	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	79	92	79	92	79	79	79	79	92
Heavy Vehicles, %	2	2	2	4	2	4	2	3	3	2	2	2
Mvmt Flow	54	11	54	154	11	20	54	61	101	4	113	54
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	384	418	140	401	395	113	167	0	0	162	0	0
Stage 1	148	148	-	220	220	-	-	-	-	-	-	-
Stage 2	236	270	-	181	175	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.14	6.52	6.24	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.14	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.14	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.536	4.018	3.336	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	574	526	908	556	542	934	1411	-	-	1417	-	-
Stage 1	855	775	-	778	721	-	-	-	-	-	-	-
Stage 2	767	686	-	816	754	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	533	502	908	496	517	933	1411	-	-	1417	-	-
Mov Cap-2 Maneuver	533	502	-	496	517	-	-	-	-	-	-	-
Stage 1	818	773	-	745	690	-	-	-	-	-	-	-
Stage 2	706	657	-	754	752	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	11.8		15.6		1.9		0.2					
HCM LOS	B		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1411	-	-	652	524	1417	-	-				
HCM Lane V/C Ratio	0.039	-	-	0.183	0.354	0.003	-	-				
HCM Control Delay (s)	7.7	0	-	11.8	15.6	7.5	0	-				
HCM Lane LOS	A	A	-	B	C	A	A	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.7	1.6	0	-	-				

Intersection						
Int Delay, s/veh	8.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↕	
Traffic Vol, veh/h	878	16	14	905	51	41
Future Vol, veh/h	878	16	14	905	51	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	954	17	15	984	55	45
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	971	0	1977	963
Stage 1	-	-	-	-	963	-
Stage 2	-	-	-	-	1014	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	710	-	68	310
Stage 1	-	-	-	-	370	-
Stage 2	-	-	-	-	350	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	710	-	65	310
Mov Cap-2 Maneuver	-	-	-	-	65	-
Stage 1	-	-	-	-	370	-
Stage 2	-	-	-	-	334	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.2		168.3	
HCM LOS					F	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	100	-	-	710	-	
HCM Lane V/C Ratio	1	-	-	0.021	-	
HCM Control Delay (s)	168.3	-	-	10.2	-	
HCM Lane LOS	F	-	-	B	-	
HCM 95th %tile Q(veh)	6.1	-	-	0.1	-	

HCM 6th TWSC
4: Pryamid Peaks & SH56

CDOT Required
Long Range Total AM
10/11/2020

Intersection						
Int Delay, s/veh	7.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	878	16	14	905	51	41
Future Vol, veh/h	878	16	14	905	51	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	954	17	15	984	55	45
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	971	0	1968	954
Stage 1	-	-	-	-	954	-
Stage 2	-	-	-	-	1014	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	710	-	69	314
Stage 1	-	-	-	-	374	-
Stage 2	-	-	-	-	350	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	710	-	68	314
Mov Cap-2 Maneuver	-	-	-	-	68	-
Stage 1	-	-	-	-	374	-
Stage 2	-	-	-	-	343	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.2		153.7	
HCM LOS					F	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	104	-	-	710	-	
HCM Lane V/C Ratio	0.962	-	-	0.021	-	
HCM Control Delay (s)	153.7	-	-	10.2	-	
HCM Lane LOS	F	-	-	B	-	
HCM 95th %tile Q(veh)	5.9	-	-	0.1	-	

HCM 6th TWSC

4: Pryamid Peaks & SH56

Intersection						
Int Delay, s/veh	4.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↖	↑	↖	↗
Traffic Vol, veh/h	878	16	14	905	51	41
Future Vol, veh/h	878	16	14	905	51	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	200	-	250	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	954	17	15	984	55	45
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	971	0	1968	954
Stage 1	-	-	-	-	954	-
Stage 2	-	-	-	-	1014	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	710	-	69	314
Stage 1	-	-	-	-	374	-
Stage 2	-	-	-	-	350	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	710	-	68	314
Mov Cap-2 Maneuver	-	-	-	-	68	-
Stage 1	-	-	-	-	374	-
Stage 2	-	-	-	-	343	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.2		97.9	
HCM LOS	F					
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	68	314	-	-	710	-
HCM Lane V/C Ratio	0.815	0.142	-	-	0.021	-
HCM Control Delay (s)	161.8	18.4	-	-	10.2	-
HCM Lane LOS	F	C	-	-	B	-
HCM 95th %tile Q(veh)	3.8	0.5	-	-	0.1	-

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	589	519	319	556	24	497	124	339	11	107	35
Future Vol, veh/h	25	589	519	319	556	24	497	124	339	11	107	35
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	4	4	4	4	4	4	8	8	8
Mvmt Flow	27	640	564	347	604	26	540	135	368	12	116	38
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	630	0	0	1204	0	0	2365	2300	922	2539	2569	618
Stage 1	-	-	-	-	-	-	976	976	-	1311	1311	-
Stage 2	-	-	-	-	-	-	1389	1324	-	1228	1258	-
Critical Hdwy	4.13	-	-	4.14	-	-	7.14	6.54	6.24	7.18	6.58	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.18	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.18	5.58	-
Follow-up Hdwy	2.227	-	-	2.236	-	-	3.536	4.036	3.336	3.572	4.072	3.372
Pot Cap-1 Maneuver	947	-	-	573	-	-	~ 24	~ 38	~ 325	17	~ 25	478
Stage 1	-	-	-	-	-	-	~ 300	327	-	190	222	-
Stage 2	-	-	-	-	-	-	~ 175	223	-	212	236	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	947	-	-	573	-	-	-	~ 2	~ 325	-	~ 1	478
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	~ 2	-	-	~ 1	-
Stage 1	-	-	-	-	-	-	~ 268	292	-	170	~ 14	-
Stage 2	-	-	-	-	-	-	-	~ 14	-	-	211	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			7.3								
HCM LOS							-			-		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	947	-	-	573	-	-	-				
HCM Lane V/C Ratio	-	0.028	-	-	0.605	-	-	-				
HCM Control Delay (s)	-	8.9	0	-	20.4	0	-	-				
HCM Lane LOS	-	A	A	-	C	A	-	-				
HCM 95th %tile Q(veh)	-	0.1	-	-	4	-	-	-				
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s				+: Computation Not Defined				*: All major volume in platoon		

HCM 6th Signalized Intersection Summary

1: County Line Road & SH56

Long Range Total PM - Mitigate

10/07/2020

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	589	522	319	556	24	506	124	339	11	107	35
Future Volume (veh/h)	25	589	522	319	556	24	506	124	339	11	107	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1841	1841	1841	1841	1841	1841	1781	1781	1781
Adj Flow Rate, veh/h	27	640	567	347	604	26	550	135	368	12	116	38
Peak Hour Factor	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	4	4	4	4	4	4	8	8	8
Cap, veh/h	56	691	616	382	968	42	580	153	416	48	152	47
Arrive On Green	0.39	0.39	0.39	0.11	0.55	0.55	0.17	0.35	0.35	0.13	0.13	0.13
Sat Flow, veh/h	39	1764	1572	3401	1752	75	3401	436	1189	52	1157	359
Grp Volume(v), veh/h	667	0	567	347	0	630	550	0	503	166	0	0
Grp Sat Flow(s),veh/h/ln	1803	0	1572	1700	0	1827	1700	0	1625	1568	0	0
Q Serve(g_s), s	16.6	0.0	31.8	9.3	0.0	21.8	14.8	0.0	27.0	2.9	0.0	0.0
Cycle Q Clear(g_c), s	33.0	0.0	31.8	9.3	0.0	21.8	14.8	0.0	27.0	9.6	0.0	0.0
Prop In Lane	0.04		1.00	1.00		0.04	1.00		0.73	0.07		0.23
Lane Grp Cap(c), veh/h	746	0	616	382	0	1009	580	0	569	247	0	0
V/C Ratio(X)	0.89	0.00	0.92	0.91	0.00	0.62	0.95	0.00	0.88	0.67	0.00	0.00
Avail Cap(c_a), veh/h	762	0	630	382	0	1026	580	0	684	360	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	27.0	0.0	26.8	40.6	0.0	14.2	38.0	0.0	28.3	38.9	0.0	0.0
Incr Delay (d2), s/veh	12.8	0.0	18.8	25.0	0.0	1.2	25.1	0.0	11.5	3.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.9	0.0	13.5	5.0	0.0	7.5	7.8	0.0	11.4	3.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.8	0.0	45.6	65.6	0.0	15.3	63.1	0.0	39.8	42.1	0.0	0.0
LnGrp LOS	D	A	D	E	A	B	E	A	D	D	A	A
Approach Vol, veh/h		1234			977			1053			166	
Approach Delay, s/veh		42.5			33.2			52.0			42.1	
Approach LOS		D			C			D			D	
Timer - Assigned Phs		2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s		37.0	14.9	40.8	20.3	16.7		55.7				
Change Period (Y+Rc), s		4.5	4.5	4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s		39.0	10.4	37.1	15.8	18.7		52.0				
Max Q Clear Time (g_c+I1), s		29.0	11.3	35.0	16.8	11.6		23.8				
Green Ext Time (p_c), s		2.2	0.0	1.3	0.0	0.4		3.8				
Intersection Summary												
HCM 6th Ctrl Delay			42.7									
HCM 6th LOS			D									

Intersection												
Int Delay, s/veh	5.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	50	10	50	111	10	5	50	155	126	16	76	50
Future Vol, veh/h	50	10	50	111	10	5	50	155	126	16	76	50
Conflicting Peds, #/hr	0	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	93	92	93	92	93	93	93	93	92
Heavy Vehicles, %	2	2	2	11	2	11	2	1	1	1	1	2
Mvmt Flow	54	11	54	119	11	5	54	167	135	17	82	54
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	495	553	109	519	513	236	136	0	0	302	0	0
Stage 1	143	143	-	343	343	-	-	-	-	-	-	-
Stage 2	352	410	-	176	170	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.21	6.52	6.31	4.12	-	-	4.11	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.21	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.21	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.599	4.018	3.399	2.218	-	-	2.209	-	-
Pot Cap-1 Maneuver	485	441	945	453	465	781	1448	-	-	1265	-	-
Stage 1	860	779	-	654	637	-	-	-	-	-	-	-
Stage 2	665	595	-	805	758	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	451	415	945	399	437	780	1448	-	-	1265	-	-
Mov Cap-2 Maneuver	451	415	-	399	437	-	-	-	-	-	-	-
Stage 1	820	767	-	624	608	-	-	-	-	-	-	-
Stage 2	618	568	-	737	747	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	12.7		18.1		1.2		0.9					
HCM LOS	B		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1448	-	-	586	410	1265	-	-				
HCM Lane V/C Ratio	0.038	-	-	0.204	0.331	0.014	-	-				
HCM Control Delay (s)	7.6	0	-	12.7	18.1	7.9	0	-				
HCM Lane LOS	A	A	-	B	C	A	A	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.8	1.4	0	-	-				

Intersection						
Int Delay, s/veh	14.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↕	
Traffic Vol, veh/h	1137	54	45	1043	33	28
Future Vol, veh/h	1137	54	45	1043	33	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1236	59	49	1134	36	30
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1295	0	2498	1266
Stage 1	-	-	-	-	1266	-
Stage 2	-	-	-	-	1232	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	535	-	~ 32	206
Stage 1	-	-	-	-	265	-
Stage 2	-	-	-	-	275	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	535	-	~ 24	206
Mov Cap-2 Maneuver	-	-	-	-	~ 24	-
Stage 1	-	-	-	-	265	-
Stage 2	-	-	-	-	207	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.5		\$ 541.3	
HCM LOS					F	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	40	-	-	535	-	
HCM Lane V/C Ratio	1.658	-	-	0.091	-	
HCM Control Delay (s)	\$ 541.3	-	-	12.4	-	
HCM Lane LOS	F	-	-	B	-	
HCM 95th %tile Q(veh)	6.9	-	-	0.3	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

HCM 6th TWSC
4: Pyramid Peaks & SH56

CDOT Required
Long Range Total PM - Mitigate
10/11/2020

Intersection						
Int Delay, s/veh	9.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↖	↑	↘	
Traffic Vol, veh/h	1137	54	45	1043	33	28
Future Vol, veh/h	1137	54	45	1043	33	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	250	250	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1236	59	49	1134	36	30
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1295	0	2468	1236
Stage 1	-	-	-	-	1236	-
Stage 2	-	-	-	-	1232	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	535	-	~ 33	215
Stage 1	-	-	-	-	274	-
Stage 2	-	-	-	-	275	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	535	-	~ 30	215
Mov Cap-2 Maneuver	-	-	-	-	~ 30	-
Stage 1	-	-	-	-	274	-
Stage 2	-	-	-	-	250	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.5		\$ 370.3	
HCM LOS	F					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	50	-	-	535	-	
HCM Lane V/C Ratio	1.326	-	-	0.091	-	
HCM Control Delay (s)	\$ 370.3	-	-	12.4	-	
HCM Lane LOS	F	-	-	B	-	
HCM 95th %tile Q(veh)	6.1	-	-	0.3	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

HCM 6th TWSC
4: Pyramid Peaks & SH56

Mitigate - Exclusive NBL & NBR
Long Range Total PM - Mitigate
10/11/2020

Intersection						
Int Delay, s/veh	6.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↖	↑	↖	↗
Traffic Vol, veh/h	1137	54	45	1043	33	28
Future Vol, veh/h	1137	54	45	1043	33	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	250	250	-	250	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1236	59	49	1134	36	30
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1295	0	2468	1236
Stage 1	-	-	-	-	1236	-
Stage 2	-	-	-	-	1232	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	535	-	~ 33	215
Stage 1	-	-	-	-	274	-
Stage 2	-	-	-	-	275	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	535	-	~ 30	215
Mov Cap-2 Maneuver	-	-	-	-	~ 30	-
Stage 1	-	-	-	-	274	-
Stage 2	-	-	-	-	250	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.5		242.2	
HCM LOS	F					
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	30	215	-	-	535	-
HCM Lane V/C Ratio	1.196	0.142	-	-	0.091	-
HCM Control Delay (s)	\$ 426.9	24.5	-	-	12.4	-
HCM Lane LOS	F	C	-	-	B	-
HCM 95th %tile Q(veh)	4.1	0.5	-	-	0.3	-
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

MOVEMENT SUMMARY

 **Site: 101 [1st/SH56 - AM]**

1st/SH56 - Existing AM
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 1st Street												
3	L2	22	2.0	0.134	4.6	LOS A	0.7	17.4	0.49	0.35	0.49	25.0
8	T1	74	2.0	0.134	4.6	LOS A	0.7	17.4	0.49	0.35	0.49	24.5
18	R2	51	2.0	0.134	4.4	LOS A	0.7	17.4	0.49	0.35	0.49	23.9
Approach		147	2.0	0.134	4.5	LOS A	0.7	17.4	0.49	0.35	0.49	24.3
East: SH 56												
1	L2	21	2.0	0.305	5.6	LOS A	1.7	43.4	0.38	0.24	0.38	28.6
6	T1	229	2.0	0.305	5.6	LOS A	1.7	43.4	0.38	0.24	0.38	28.2
16	R2	136	2.0	0.305	5.6	LOS A	1.7	43.4	0.38	0.24	0.38	27.5
Approach		386	2.0	0.305	5.6	LOS A	1.7	43.4	0.38	0.24	0.38	28.0
North: 1st Street												
7	L2	152	2.0	0.222	5.0	LOS A	1.2	30.3	0.43	0.30	0.43	27.8
4	T1	27	2.0	0.222	5.0	LOS A	1.2	30.3	0.43	0.30	0.43	27.5
14	R2	85	2.0	0.222	5.0	LOS A	1.2	30.3	0.43	0.30	0.43	26.8
Approach		264	2.0	0.222	5.0	LOS A	1.2	30.3	0.43	0.30	0.43	27.4
West: SH 56												
5	L2	91	2.0	0.246	5.1	LOS A	1.4	34.4	0.38	0.24	0.38	24.7
2	T1	202	2.0	0.246	5.1	LOS A	1.4	34.4	0.38	0.24	0.38	24.2
12	R2	14	2.0	0.246	5.1	LOS A	1.4	34.4	0.38	0.24	0.38	23.6
Approach		307	2.0	0.246	5.1	LOS A	1.4	34.4	0.38	0.24	0.38	24.3
All Vehicles		1104	2.0	0.305	5.2	LOS A	1.7	43.4	0.41	0.27	0.41	26.2

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Intersection and Approach LOS values are based on average delay for all movements (v/c not used).

Roundabout Capacity Model: SIDRA Standard.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101 [1st/SH56 - PM]**

1st/SH56 - Existing PM
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 1st												
3	L2	25	2.0	0.155	4.9	LOS A	0.8	21.0	0.53	0.40	0.53	24.9
8	T1	72	2.0	0.155	4.9	LOS A	0.8	21.0	0.53	0.40	0.53	24.4
18	R2	66	2.0	0.155	4.7	LOS A	0.8	21.0	0.53	0.40	0.53	23.8
Approach		163	2.0	0.155	4.9	LOS A	0.8	21.0	0.53	0.40	0.53	24.2
East: SH 56												
1	L2	25	2.0	0.353	6.2	LOS A	2.1	53.1	0.40	0.25	0.40	28.4
6	T1	269	2.0	0.353	6.2	LOS A	2.1	53.1	0.40	0.25	0.40	28.0
16	R2	152	2.0	0.353	6.2	LOS A	2.1	53.1	0.40	0.25	0.40	27.3
Approach		446	2.0	0.353	6.2	LOS A	2.1	53.1	0.40	0.25	0.40	27.8
North: 1st												
7	L2	156	2.0	0.307	6.1	LOS A	1.8	45.5	0.50	0.37	0.50	27.7
4	T1	58	2.0	0.307	6.1	LOS A	1.8	45.5	0.50	0.37	0.50	27.3
14	R2	139	2.0	0.307	6.1	LOS A	1.8	45.5	0.50	0.37	0.50	26.6
Approach		353	2.0	0.307	6.1	LOS A	1.8	45.5	0.50	0.37	0.50	27.2
West: SH 56												
5	L2	90	2.0	0.304	5.8	LOS A	1.8	45.5	0.45	0.30	0.45	24.5
2	T1	250	2.0	0.304	5.8	LOS A	1.8	45.5	0.45	0.30	0.45	24.1
12	R2	27	2.0	0.304	5.8	LOS A	1.8	45.5	0.45	0.30	0.45	23.5
Approach		367	2.0	0.304	5.8	LOS A	1.8	45.5	0.45	0.30	0.45	24.1
All Vehicles		1329	2.0	0.353	5.9	LOS A	2.1	53.1	0.46	0.32	0.46	26.1

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Intersection and Approach LOS values are based on average delay for all movements (v/c not used).

Roundabout Capacity Model: SIDRA Standard.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101 [1st/SH56 - AM]**

1st/SH56 - Short Term Background AM
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 1st Street												
3	L2	23	2.0	0.142	4.7	LOS A	0.7	18.6	0.50	0.37	0.50	24.9
8	T1	77	2.0	0.142	4.7	LOS A	0.7	18.6	0.50	0.37	0.50	24.4
18	R2	53	2.0	0.142	4.5	LOS A	0.7	18.6	0.50	0.37	0.50	23.8
Approach		153	2.0	0.142	4.6	LOS A	0.7	18.6	0.50	0.37	0.50	24.3
East: SH 56												
1	L2	22	2.0	0.320	5.8	LOS A	1.8	46.3	0.39	0.25	0.39	28.5
6	T1	239	2.0	0.320	5.8	LOS A	1.8	46.3	0.39	0.25	0.39	28.1
16	R2	142	2.0	0.320	5.8	LOS A	1.8	46.3	0.39	0.25	0.39	27.4
Approach		403	2.0	0.320	5.8	LOS A	1.8	46.3	0.39	0.25	0.39	27.9
North: 1st Street												
7	L2	159	2.0	0.234	5.2	LOS A	1.3	32.4	0.45	0.31	0.45	27.8
4	T1	28	2.0	0.234	5.2	LOS A	1.3	32.4	0.45	0.31	0.45	27.4
14	R2	89	2.0	0.234	5.2	LOS A	1.3	32.4	0.45	0.31	0.45	26.7
Approach		276	2.0	0.234	5.2	LOS A	1.3	32.4	0.45	0.31	0.45	27.4
West: SH 56												
5	L2	95	2.0	0.259	5.2	LOS A	1.4	36.8	0.40	0.25	0.40	24.6
2	T1	211	2.0	0.259	5.2	LOS A	1.4	36.8	0.40	0.25	0.40	24.1
12	R2	15	2.0	0.259	5.2	LOS A	1.4	36.8	0.40	0.25	0.40	23.6
Approach		321	2.0	0.259	5.2	LOS A	1.4	36.8	0.40	0.25	0.40	24.3
All Vehicles		1153	2.0	0.320	5.3	LOS A	1.8	46.3	0.42	0.28	0.42	26.2

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Intersection and Approach LOS values are based on average delay for all movements (v/c not used).

Roundabout Capacity Model: SIDRA Standard.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101 [1st/SH56 - PM]**

1st/SH56 - Short Term Background PM
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 1st												
3	L2	26	2.0	0.164	5.1	LOS A	0.9	22.6	0.55	0.42	0.55	24.8
8	T1	75	2.0	0.164	5.1	LOS A	0.9	22.6	0.55	0.42	0.55	24.3
18	R2	69	2.0	0.164	4.9	LOS A	0.9	22.6	0.55	0.42	0.55	23.7
Approach		170	2.0	0.164	5.0	LOS A	0.9	22.6	0.55	0.42	0.55	24.2
East: SH 56												
1	L2	26	2.0	0.371	6.4	LOS A	2.2	56.9	0.42	0.27	0.42	28.3
6	T1	281	2.0	0.371	6.4	LOS A	2.2	56.9	0.42	0.27	0.42	27.9
16	R2	159	2.0	0.371	6.4	LOS A	2.2	56.9	0.42	0.27	0.42	27.2
Approach		466	2.0	0.371	6.4	LOS A	2.2	56.9	0.42	0.27	0.42	27.7
North: 1st												
7	L2	163	2.0	0.325	6.3	LOS A	1.9	49.1	0.52	0.39	0.52	27.6
4	T1	61	2.0	0.325	6.3	LOS A	1.9	49.1	0.52	0.39	0.52	27.2
14	R2	145	2.0	0.325	6.3	LOS A	1.9	49.1	0.52	0.39	0.52	26.5
Approach		369	2.0	0.325	6.3	LOS A	1.9	49.1	0.52	0.39	0.52	27.1
West: SH 56												
5	L2	94	2.0	0.320	6.0	LOS A	1.9	48.8	0.47	0.32	0.47	24.5
2	T1	261	2.0	0.320	6.0	LOS A	1.9	48.8	0.47	0.32	0.47	24.0
12	R2	28	2.0	0.320	6.0	LOS A	1.9	48.8	0.47	0.32	0.47	23.4
Approach		383	2.0	0.320	6.0	LOS A	1.9	48.8	0.47	0.32	0.47	24.1
All Vehicles		1388	2.0	0.371	6.1	LOS A	2.2	56.9	0.47	0.34	0.47	26.0

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Intersection and Approach LOS values are based on average delay for all movements (v/c not used).

Roundabout Capacity Model: SIDRA Standard.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101 [1st/SH56 - AM]**

1st/SH56 - Long Term Background AM
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 1st Street												
3	L2	30	2.0	0.292	9.2	LOS A	2.0	51.6	0.85	0.79	0.85	23.8
8	T1	100	2.0	0.292	9.2	LOS A	2.0	51.6	0.85	0.79	0.85	23.3
18	R2	69	2.0	0.292	8.4	LOS A	2.0	51.6	0.85	0.79	0.85	22.8
Approach		199	2.0	0.292	8.9	LOS A	2.0	51.6	0.85	0.79	0.85	23.2
East: SH 56												
1	L2	28	2.0	0.807	18.2	LOS C	19.9	504.5	0.85	1.01	1.40	24.7
6	T1	535	2.0	0.807	18.2	LOS C	19.9	504.5	0.85	1.01	1.40	24.4
16	R2	400	2.0	0.807	18.2	LOS C	19.9	504.5	0.85	1.01	1.40	23.8
Approach		963	2.0	0.807	18.2	LOS C	19.9	504.5	0.85	1.01	1.40	24.2
North: 1st Street												
7	L2	368	2.0	0.602	13.3	LOS B	6.9	174.7	0.89	1.00	1.22	25.1
4	T1	36	2.0	0.602	13.3	LOS B	6.9	174.7	0.89	1.00	1.22	24.8
14	R2	114	2.0	0.602	13.3	LOS B	6.9	174.7	0.89	1.00	1.22	24.2
Approach		518	2.0	0.602	13.3	LOS B	6.9	174.7	0.89	1.00	1.22	24.9
West: SH 56												
5	L2	123	2.0	0.583	11.4	LOS B	6.3	159.7	0.79	0.81	1.00	23.2
2	T1	442	2.0	0.583	11.4	LOS B	6.3	159.7	0.79	0.81	1.00	22.8
12	R2	19	2.0	0.583	11.4	LOS B	6.3	159.7	0.79	0.81	1.00	22.2
Approach		584	2.0	0.583	11.4	LOS B	6.3	159.7	0.79	0.81	1.00	22.8
All Vehicles		2264	2.0	0.807	14.5	LOS B	19.9	504.5	0.84	0.94	1.21	23.9

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Intersection and Approach LOS values are based on average delay for all movements (v/c not used).

Roundabout Capacity Model: SIDRA Standard.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101 [1st/SH56 - PM]**

1st/SH56 - Long Term Background PM
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 1st												
3	L2	34	2.0	0.469	17.3	LOS C	4.2	105.5	1.00	1.10	1.20	22.0
8	T1	97	2.0	0.469	17.3	LOS C	4.2	105.5	1.00	1.10	1.20	21.6
18	R2	89	2.0	0.469	15.7	LOS C	4.2	105.5	1.00	1.10	1.20	21.1
Approach		220	2.0	0.469	16.7	LOS C	4.2	105.5	1.00	1.10	1.20	21.5
East: SH 56												
1	L2	34	2.0	0.881	24.4	LOS D	30.6	778.0	0.99	1.35	1.89	23.1
6	T1	589	2.0	0.881	24.4	LOS D	30.6	778.0	0.99	1.35	1.89	22.9
16	R2	422	2.0	0.881	24.4	LOS D	30.6	778.0	0.99	1.35	1.89	22.4
Approach		1045	2.0	0.881	24.4	LOS C	30.6	778.0	0.99	1.35	1.89	22.7
North: 1st												
7	L2	455	2.0	0.932	40.8	LOS E	26.5	673.7	1.00	1.90	2.79	19.4
4	T1	78	2.0	0.932	40.8	LOS E	26.5	673.7	1.00	1.90	2.79	19.2
14	R2	187	2.0	0.932	40.8	LOS E	26.5	673.7	1.00	1.90	2.79	18.9
Approach		720	2.0	0.932	40.8	LOS E	26.5	673.7	1.00	1.90	2.79	19.2
West: SH 56												
5	L2	121	2.0	0.874	29.7	LOS D	21.9	555.1	1.00	1.75	2.30	19.6
2	T1	593	2.0	0.874	29.7	LOS D	21.9	555.1	1.00	1.75	2.30	19.3
12	R2	36	2.0	0.874	29.7	LOS D	21.9	555.1	1.00	1.75	2.30	18.9
Approach		750	2.0	0.874	29.7	LOS D	21.9	555.1	1.00	1.75	2.30	19.3
All Vehicles		2735	2.0	0.932	29.6	LOS D	30.6	778.0	1.00	1.59	2.18	20.6

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Intersection and Approach LOS values are based on average delay for all movements (v/c not used).

Roundabout Capacity Model: SIDRA Standard.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Organisation: FEHR AND PEERS | Processed: Sunday, October 11, 2020 4:40:04 PM

Project: C:\Users\insilva\Desktop\Farmstead\Fickle Farms TIA\SIDRA\1st&SH56_LongBackground_R1.sip8

MOVEMENT SUMMARY

 **Site: 101 [1st/SH56 - AM]**

1st/SH56 - Short Term Total AM
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 1st Street												
3	L2	23	2.0	0.142	4.7	LOS A	0.7	18.8	0.51	0.38	0.51	24.9
8	T1	77	2.0	0.142	4.7	LOS A	0.7	18.8	0.51	0.38	0.51	24.4
18	R2	53	2.0	0.142	4.5	LOS A	0.7	18.8	0.51	0.38	0.51	23.8
Approach		153	2.0	0.142	4.6	LOS A	0.7	18.8	0.51	0.38	0.51	24.3
East: SH 56												
1	L2	25	2.0	0.338	6.0	LOS A	2.0	49.8	0.40	0.26	0.40	28.4
6	T1	248	2.0	0.338	6.0	LOS A	2.0	49.8	0.40	0.26	0.40	28.1
16	R2	152	2.0	0.338	6.0	LOS A	2.0	49.8	0.40	0.26	0.40	27.3
Approach		425	2.0	0.338	6.0	LOS A	2.0	49.8	0.40	0.26	0.40	27.8
North: 1st Street												
7	L2	162	2.0	0.238	5.2	LOS A	1.3	33.3	0.46	0.32	0.46	27.7
4	T1	28	2.0	0.238	5.2	LOS A	1.3	33.3	0.46	0.32	0.46	27.4
14	R2	89	2.0	0.238	5.2	LOS A	1.3	33.3	0.46	0.32	0.46	26.7
Approach		279	2.0	0.238	5.2	LOS A	1.3	33.3	0.46	0.32	0.46	27.4
West: SH 56												
5	L2	95	2.0	0.262	5.3	LOS A	1.5	37.5	0.41	0.26	0.41	24.6
2	T1	214	2.0	0.262	5.3	LOS A	1.5	37.5	0.41	0.26	0.41	24.1
12	R2	15	2.0	0.262	5.3	LOS A	1.5	37.5	0.41	0.26	0.41	23.5
Approach		324	2.0	0.262	5.3	LOS A	1.5	37.5	0.41	0.26	0.41	24.2
All Vehicles		1181	2.0	0.338	5.4	LOS A	2.0	49.8	0.43	0.29	0.43	26.2

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Intersection and Approach LOS values are based on average delay for all movements (v/c not used).

Roundabout Capacity Model: SIDRA Standard.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101 [1st/SH56 - PM]**

1st/SH56 - Short Term Total PM
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 1st												
3	L2	26	2.0	0.168	5.2	LOS A	0.9	23.3	0.56	0.44	0.56	24.8
8	T1	75	2.0	0.168	5.2	LOS A	0.9	23.3	0.56	0.44	0.56	24.3
18	R2	70	2.0	0.168	5.0	LOS A	0.9	23.3	0.56	0.44	0.56	23.7
Approach		171	2.0	0.168	5.1	LOS A	0.9	23.3	0.56	0.44	0.56	24.1
East: SH 56												
1	L2	27	2.0	0.382	6.5	LOS A	2.3	59.3	0.42	0.27	0.42	28.3
6	T1	287	2.0	0.382	6.5	LOS A	2.3	59.3	0.42	0.27	0.42	27.9
16	R2	165	2.0	0.382	6.5	LOS A	2.3	59.3	0.42	0.27	0.42	27.1
Approach		479	2.0	0.382	6.5	LOS A	2.3	59.3	0.42	0.27	0.42	27.6
North: 1st												
7	L2	173	2.0	0.335	6.5	LOS A	2.0	51.3	0.53	0.40	0.53	27.5
4	T1	61	2.0	0.335	6.5	LOS A	2.0	51.3	0.53	0.40	0.53	27.2
14	R2	145	2.0	0.335	6.5	LOS A	2.0	51.3	0.53	0.40	0.53	26.5
Approach		379	2.0	0.335	6.5	LOS A	2.0	51.3	0.53	0.40	0.53	27.1
West: SH 56												
5	L2	94	2.0	0.331	6.2	LOS A	2.0	51.2	0.48	0.34	0.48	24.4
2	T1	271	2.0	0.331	6.2	LOS A	2.0	51.2	0.48	0.34	0.48	24.0
12	R2	28	2.0	0.331	6.2	LOS A	2.0	51.2	0.48	0.34	0.48	23.4
Approach		393	2.0	0.331	6.2	LOS A	2.0	51.2	0.48	0.34	0.48	24.0
All Vehicles		1422	2.0	0.382	6.3	LOS A	2.3	59.3	0.48	0.35	0.48	26.0

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Intersection and Approach LOS values are based on average delay for all movements (v/c not used).

Roundabout Capacity Model: SIDRA Standard.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101 [1st/SH56 - AM]**

1st/SH56 - Long Term Total AM
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 1st Street												
3	L2	30	2.0	0.147	5.6	LOS A	1.1	27.5	0.82	0.67	0.82	24.6
8	T1	100	2.0	0.147	5.6	LOS A	1.1	27.5	0.82	0.67	0.82	24.2
18	R2	70	2.0	0.108	6.8	LOS A	0.7	17.2	0.79	0.68	0.79	23.2
Approach		200	2.0	0.147	6.0	LOS A	1.1	27.5	0.81	0.67	0.81	23.9
East: SH 56												
1	L2	31	2.0	0.406	6.2	LOS A	2.7	69.4	0.48	0.32	0.48	28.5
6	T1	559	2.0	0.406	6.2	LOS A	2.7	69.4	0.48	0.32	0.48	28.1
16	R2	424	2.0	0.356	6.5	LOS A	2.2	55.3	0.48	0.33	0.48	27.0
Approach		1014	2.0	0.406	6.3	LOS A	2.7	69.4	0.48	0.32	0.48	27.6
North: 1st Street												
7	L2	376	2.0	0.362	6.8	LOS A	2.6	66.8	0.73	0.60	0.73	26.7
4	T1	36	2.0	0.362	6.8	LOS A	2.6	66.8	0.73	0.60	0.73	26.4
14	R2	114	2.0	0.142	6.0	LOS A	0.8	20.2	0.65	0.54	0.65	27.1
Approach		526	2.0	0.362	6.6	LOS A	2.6	66.8	0.71	0.59	0.71	26.8
West: SH 56												
5	L2	123	2.0	0.406	6.8	LOS A	3.0	76.8	0.66	0.52	0.66	24.3
2	T1	449	2.0	0.406	6.6	LOS A	3.0	76.8	0.65	0.50	0.65	23.9
12	R2	19	2.0	0.093	5.1	LOS A	0.5	12.4	0.56	0.42	0.56	23.9
Approach		591	2.0	0.406	6.6	LOS A	3.0	76.8	0.65	0.50	0.65	24.0
All Vehicles		2331	2.0	0.406	6.4	LOS A	3.0	76.8	0.60	0.46	0.60	26.1

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Intersection and Approach LOS values are based on average delay for all movements (v/c not used).

Roundabout Capacity Model: SIDRA Standard.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101 [1st/SH56 - AM]**

1st/SH56 - Long Term Total AM
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 1st Street												
3	L2	30	2.0	0.300	9.5	LOS A	2.1	53.5	0.86	0.80	0.86	23.7
8	T1	100	2.0	0.300	9.5	LOS A	2.1	53.5	0.86	0.80	0.86	23.3
18	R2	70	2.0	0.300	8.7	LOS A	2.1	53.5	0.86	0.80	0.86	22.7
Approach		200	2.0	0.300	9.2	LOS A	2.1	53.5	0.86	0.80	0.86	23.2
East: SH 56												
1	L2	31	2.0	0.850	21.4	LOS D	25.6	650.5	0.92	1.19	1.66	23.8
6	T1	559	2.0	0.850	21.4	LOS D	25.6	650.5	0.92	1.19	1.66	23.6
16	R2	424	2.0	0.850	21.4	LOS D	25.6	650.5	0.92	1.19	1.66	23.0
Approach		1014	2.0	0.850	21.4	LOS C	25.6	650.5	0.92	1.19	1.66	23.3
North: 1st Street												
7	L2	376	2.0	0.639	15.0	LOS C	8.0	203.4	0.94	1.10	1.36	24.6
4	T1	36	2.0	0.639	15.0	LOS C	8.0	203.4	0.94	1.10	1.36	24.4
14	R2	114	2.0	0.639	15.0	LOS C	8.0	203.4	0.94	1.10	1.36	23.8
Approach		526	2.0	0.639	15.0	LOS C	8.0	203.4	0.94	1.10	1.36	24.4
West: SH 56												
5	L2	123	2.0	0.599	11.9	LOS B	6.8	173.4	0.81	0.86	1.06	23.1
2	T1	449	2.0	0.599	11.9	LOS B	6.8	173.4	0.81	0.86	1.06	22.6
12	R2	19	2.0	0.599	11.9	LOS B	6.8	173.4	0.81	0.86	1.06	22.1
Approach		591	2.0	0.599	11.9	LOS B	6.8	173.4	0.81	0.86	1.06	22.7
All Vehicles		2331	2.0	0.850	16.5	LOS C	25.6	650.5	0.89	1.05	1.37	23.4

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Intersection and Approach LOS values are based on average delay for all movements (v/c not used).

Roundabout Capacity Model: SIDRA Standard.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 101 [1st/SH56 - PM]**

1st/SH56 - Long Term Total PM
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 1st												
3	L2	34	2.0	0.217	12.0	LOS B	1.5	39.1	0.95	0.91	0.95	22.9
8	T1	97	2.0	0.217	10.7	LOS B	1.9	47.2	0.97	0.89	0.97	22.8
18	R2	92	2.0	0.217	8.7	LOS A	1.9	47.2	1.00	0.87	1.00	22.8
Approach		223	2.0	0.217	10.1	LOS B	1.9	47.2	0.98	0.89	0.98	22.8
East: SH 56												
1	L2	36	2.0	0.443	6.7	LOS A	3.2	80.0	0.50	0.34	0.50	28.3
6	T1	605	2.0	0.443	6.7	LOS A	3.2	80.0	0.50	0.34	0.50	27.9
16	R2	438	2.0	0.371	6.7	LOS A	2.3	59.4	0.49	0.35	0.49	26.9
Approach		1079	2.0	0.443	6.7	LOS A	3.2	80.0	0.50	0.34	0.50	27.5
North: 1st												
7	L2	481	2.0	0.446	8.2	LOS A	3.5	88.6	0.80	0.69	0.80	26.2
4	T1	78	2.0	0.326	8.2	LOS A	2.1	53.6	0.75	0.68	0.75	27.3
14	R2	187	2.0	0.326	8.2	LOS A	2.1	53.6	0.75	0.68	0.75	26.5
Approach		746	2.0	0.446	8.2	LOS A	3.5	88.6	0.78	0.69	0.78	26.4
West: SH 56												
5	L2	121	2.0	0.386	8.6	LOS A	2.6	66.6	0.75	0.66	0.75	23.7
2	T1	619	2.0	0.386	7.6	LOS A	2.9	73.9	0.75	0.63	0.75	23.7
12	R2	36	2.0	0.386	7.1	LOS A	2.9	73.9	0.75	0.62	0.75	23.4
Approach		776	2.0	0.386	7.8	LOS A	2.9	73.9	0.75	0.64	0.75	23.7
All Vehicles		2824	2.0	0.446	7.7	LOS A	3.5	88.6	0.68	0.56	0.68	25.7

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Intersection and Approach LOS values are based on average delay for all movements (v/c not used).

Roundabout Capacity Model: SIDRA Standard.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 **Site: 101 [1st/SH56 - PM]**

1st/SH56 - Long Term Total PM
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 1st												
3	L2	34	2.0	0.515	20.2	LOS C	4.8	122.7	1.00	1.15	1.28	21.4
8	T1	97	2.0	0.515	20.2	LOS C	4.8	122.7	1.00	1.15	1.28	21.1
18	R2	92	2.0	0.515	18.4	LOS C	4.8	122.7	1.00	1.15	1.28	20.6
Approach		223	2.0	0.515	19.4	LOS C	4.8	122.7	1.00	1.15	1.28	20.9
East: SH 56												
1	L2	36	2.0	0.909	27.9	LOS D	36.1	916.6	1.00	1.48	2.08	22.3
6	T1	605	2.0	0.909	27.9	LOS D	36.1	916.6	1.00	1.48	2.08	22.1
16	R2	438	2.0	0.909	27.9	LOS D	36.1	916.6	1.00	1.48	2.08	21.6
Approach		1079	2.0	0.909	27.9	LOS D	36.1	916.6	1.00	1.48	2.08	21.9
North: 1st												
7	L2	481	2.0	0.991	53.9	LOS F	34.2	868.3	1.00	2.21	3.38	17.4
4	T1	78	2.0	0.991	53.9	LOS F	34.2	868.3	1.00	2.21	3.38	17.3
14	R2	187	2.0	0.991	53.9	LOS F	34.2	868.3	1.00	2.21	3.38	17.0
Approach		746	2.0	0.991	53.9	LOS F	34.2	868.3	1.00	2.21	3.38	17.3
West: SH 56												
5	L2	121	2.0	0.933	39.1	LOS E	28.2	715.8	1.00	2.05	2.78	18.1
2	T1	619	2.0	0.933	39.1	LOS E	28.2	715.8	1.00	2.05	2.78	17.9
12	R2	36	2.0	0.933	39.1	LOS E	28.2	715.8	1.00	2.05	2.78	17.5
Approach		776	2.0	0.933	39.1	LOS E	28.2	715.8	1.00	2.05	2.78	17.9
All Vehicles		2824	2.0	0.991	37.2	LOS E	36.1	916.6	1.00	1.80	2.55	19.3

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Intersection and Approach LOS values are based on average delay for all movements (v/c not used).

Roundabout Capacity Model: SIDRA Standard.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Appendix C



Appendix C

Farmstead Development Assumptions

Project Background

The proposed Farmstead development will be developed east of the Fickel Farms Development. The development includes a variety of housing units, commercial buildings, a school, parks, and industrial land uses.

Trip Generation

The vehicle trips associated with the Farmstead development were calculated from the proposed land uses. Trips were generated utilizing the MainStreet tool powered by MXD+. MainStreet is a web-based application developed by Fehr & Peers for estimating trip generation based on the Institute of Transportation Engineers (ITE) Trip Generation methodology, but also takes into account reductions such as internal capture and external walk, bike and transit trips based on the location of the project site. Reductions for internal capture and external walk, bike and transit trips were applied to the trip generation although they were minimal for the Farmstead development.

It is expected that the Farmstead development will produce a net total of 22,801 daily trips with 1,902 trips in the AM peak hour and 2,296 trips in the PM peak hour. **Table A1** displays the trip generation for Farmstead.

TABLE A1. FARMSTEAD DEVELOPMENT TRIP GENERATION

Land Use	ITE Code	Size	Unit	Daily Trips	AM Peak Hour					PM Peak Hour				
					In		Out		Total Trips	In		Out		Total Trips
					%	Trips	%	Trips		%	Trips	%	Trips	
Single Family Detached	210	1144	DU	10799	25%	212	75%	635	847	63%	714	37%	419	1133
Single Family Attached	220	259	DU	1896	23%	27	77%	92	119	63%	91	37%	54	145
Multi-Family	221	476	DU	2589	26%	44	74%	127	171	61%	127	39%	82	209
Commercial	820	113	KSF	4259	62%	66	38%	40	106	48%	206	52%	224	430
School	520	500	Students	945	54%	181	46%	154	335	48%	41	52%	44	85
Public Park	411	17	Acres	14	NA	0	NA	0	0	NA	1	50%	1	2
Industrial	110	463	KSF	2299	NA	285	NA	39	324	13%	38	87%	254	292
ITE Subtotal														
				22,801		815		1,087	1,902		1,218		1,078	2,296
MXD+ Trip Reductions														
			-4%	-976	-9%	-75	-9%	-101	-176	-9%	-105	-9%	-93	-198
Total New Project Trips - Fickel Farm + Farmstead														
				21,825		740		986	1,726		1,113		985	2,098

Key: DU = Dwelling units, KSF = Thousand Square Feet

Appendix D: Base Assumptions Sheet



Attachment A Transportation Impact Study Base Assumptions

Project Information				
Project Name Farmstead Development				
Project Location South of SH56, east and west of County Line Road				
TIS Assumptions				
Type of Study	Full: Yes		Intermediate:	
Study Area Boundaries	North: SH 56		South: Property Line	
	East: Property Line		West: Property Line	
Study Years	Short Range: 2025		Long Range: 2045	
Future Traffic Growth Rate				
Study Intersections	1. All access drives		5.	
	2. SH 56/County Line Rd		6.	
	3. SH 56 / 1st Street		7.	
	4. 1st Street / Nebraska Ave		8.	
Time Period for Study	AM: 7:00-9:00	PM: 4:00-6:00	Sat Noon: N/A	
Trip Generation Rates	Per ITE			
Trip Adjustment Factors	Passby: Per ITE		Captive Per MXD Market:	
Overall Trip Distribution	SEE ATTACHED SKETCH			
Mode Split Assumptions				
Committed Roadway Improvements	None known			
Other Traffic Studies	None known			
Areas Requiring Special Study				

Date: October 30, 2019

Traffic Engineer: Ann Bowers

Local Entity Engineer: _____