



**Garden
Spot of
Colorado**

MEETING OF THE TOWN BOARD

Town Board Room

807 Mountain Avenue

Town of Berthoud, Colorado

Tuesday, April 25, 2023, 6:30 p.m.

This is an IN-PERSON meeting at the location and time noted above.

You may also join virtually using Zoom: Phone: 1-346-248-7799 or 301-715-8592

Web: www.zoom.us/join

Use this Meeting ID: 210 035 9423

The Town Board may take action on any of the following agenda items as presented or modified prior to or during the meeting and items necessary or convenient to effectuate the agenda items.

1. Regular Meeting Called To Order - Mayor William Karspeck
2. Pledge Of Allegiance - Mayor William Karspeck
3. Roll Call - Mayor William Karspeck
4. Citizen Participation
5. Scheduled Items And Estimated Time For Discussion

5.I. Consent Agenda

Presented by: Christian Samora (5 Min)

Documents:

[MEMO RE CONSENT AGENDA.PDF](#)

[A. APRIL 25, 2023 TOWN BOARD MEETING AGENDA.PDF](#)

[B. APRIL 11, 2023 TOWN BOARD MEETING MINUTES.PDF](#)

[C. MARCH 2013 BOARD REPORT.PDF](#)

[D. 2023 CHIP AND SLURRY PROJECT BID AWARD.PDF](#)

[E. 2023 ROAD IMPROVEMENTS BID AWARD.PDF](#)

5.II. Acceptance Of 1st Street Corridor Overlay Plan

Presented By: Anne Johnson (60 Min)

Resolution 2023-09 Approving the First Street Corridor Plan

Documents:

[MEMO RE 1ST STREET CORRIDOR OVERLAY PLAN.PDF](#)
[RESOLUTION 2023 09 APPROVING THE 1ST STREET CORRIDOR
PLAN.PDF](#)
[BERTHOUD 1ST STREET CORRIDOR PLAN.PDF](#)
[PROJECT SITE WEB PAGES.PDF](#)

5.III. Ludlow Neighborhood Master Plan And Rezoning - Public Hearing
Presented By: Anne Johnson (60 Min)

5.III.i. Ludlow Neighborhood Master Plan
Resolution 2023-08 Approving the Neighborhood Master Plan for the
Ludlow Property

Documents:

[MEMO RE LUDLOW NEIGHBORHOOD MASTERPLAN.PDF](#)
[STAFF REPORT RE LUDLOW NEIGHBORHOOD MASTER PLAN.PDF](#)
[RESOLUTION 2023 08 APPROVING THE NEIGHBORHOOD MASTER
PLAN FOR THE LUDLOW PROPERTY.PDF](#)
[APPLICATION MATERIALS, PUBLIC COMMENTS, AND REFERRAL
RESPONSES.PDF](#)
[PLANNING COMMISSION MINUTES DRAFT.PDF](#)

5.III.ii. Ludlow Property Rezoning
Ordinance 1318 - An Ordinance to Rezone the Ludlow Property Previously
Zoned to Planned Unit Development to Suburban Residential and Urban
Residential Districts

Documents:

[MEMO RE LUDLOW PROPERTY ZONING.PDF](#)
[STAFF REPORT RE LUDLOW PROPERTY ZONING.PDF](#)
[ORDINANCE 1318 AMENDING THE ZONING MAP OF THE TOWN OF
BERTHOUD.PDF](#)
[APPLICATION MATERIALS, PUBLIC COMMENTS AND REFERRAL
RESPONSES.PDF](#)
[PLANNING COMMISSION MINUTES DRAFT.PDF](#)

6. Elected Official Reports

1. Town Board - Tim Hardy, May Soricelli, Mike Grace, Sean Murphy, Karl Ayers, and Jeff Butler.
2. Mayor - William Karspeck
3. Staff - Town Administrator, Attorney

7. Executive Session

Pursuant to C.R.S. Section 24-6-402 (f)(I) for discussion of a personnel matter not involving: any specific employees who have requested discussion of the matter in open session; any member of this body of any elected official; the

appointment of any person to fill an office of this body or of an elected official; or personnel policies that do not require the discussion of matters personal to particular employees.

The following details are provided: Town Administrator Evaluation.

8. Approval Of Town Administrator Employment Agreement

9. Adjourn

The order of agenda items listed above is approximate and intended as a guideline for the

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

BOARD OF TRUSTEES INFORMATION



ADMINISTRATION DEPARTMENT

Meeting Date:	April 25, 2023
Agenda Title/Subject:	Consent Agenda
Type of Item:	Regular Item
Purpose:	The Consent Agenda contains routine items that can be approved with a single action by the Board.
Presented by:	Christian Samora

ATTACHMENTS:

- a) April 25, 2023, Meeting Agenda
- b) April 11, 2023, Meeting Minutes
- c) March 2023 Board Report
- d) 2023 Chip and Slurry Project Bid Award
- e) 2023 Road Improvements Bid Award

BACKGROUND:

"Consent Agenda" is a group of routine matters to be acted on with a single motion and vote. The mayor will ask if any Board Member wishes to remove an item for separate discussion. Items removed from the consent agenda should be considered immediately following adoption of the amended Consent Agenda.

UPDATE/NEXT STEPS:

Any updates or next steps for the items on the Consent Agenda will be articulated in the information sheet provided for each item on the Consent Agenda.

FISCAL IMPACT AND FUND SOURCE:

Any fiscal information for the items on the Consent Agenda will be articulated in the information sheet provided for each item on the Consent Agenda.

COMMUNITY TOUCHSTONES:

Any Community Touchstones for the items on the Consent Agenda will be articulated in the information sheet provided for each item on the Consent Agenda.

RECOMMENDED ACTION(S):

"Move to combine and approve the items on the Consent Agenda."

Followed by a second and a vote.



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MEETING OF THE TOWN BOARD

Town Board Room
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Town of Berthoud, Colorado
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Use this Meeting ID: 210 035 9423

Please note that you will need to call into the meeting if you wish to speak and do not have a microphone on your computer. If you are using a mobile device, it is highly recommended that you download the Zoom app.

The Town Board may take action on any of the following agenda items as presented or modified prior to or during the meeting and items necessary or convenient to effectuate the agenda items.

- I. REGULAR MEETING CALLED TO ORDER** – Mayor William Karspeck
- II. PLEDGE OF ALLEGIANCE** – Mayor William Karspeck
- III. ROLL CALL** – Mayor William Karspeck
- IV. CITIZEN PARTICIPATION**
- V. SCHEDULED ITEMS and ESTIMATED TIMES FOR DISCUSSION**
 - 1. Consent Agenda** (Christian Samora) (5 Min)
Consent Agenda items are considered to be routine by the Town Board and will be enacted with a single vote. There will be no separate discussion of these items. If discussion is deemed necessary, that item should be removed from the Consent Agenda and considered separately.
 - a) April 25, 2023, Meeting Agenda
 - b) April 11, 2023, Meeting Minutes
 - c) March 2023 Board Report
 - d) 2023 Chip & Slurry Project Bid Award
 - e) 2023 Road Improvements Bid Award
 - 2. Acceptance of 1st Street Corridor Overlay Plan** (Anne Johnson) (60 Min)
Resolution 2023-09 – A resolution approving the 1st Street Corridor Plan
 - 3. Ludlow Neighborhood Master Plan and Rezoning – Public Hearing** (Anne Johnson) (60 Min)
Ordinance 1318 – An Ordinance to rezone the Ludlow Property previously Zoned to Planned Unit Development to Suburban Residential and Urban Residential Districts
- VI. ELECTED OFFICIAL REPORTS** (10 Min)
 - 1.** Town Board – Tim Hardy, May Soricelli, Mike Grace, Sean Murphy, Karl Ayers, and Jeff Butler.
 - 2.** Mayor – William Karspeck

April 25, 2023, Meeting Agenda

The order of agenda items listed above is approximate and intended as a guideline for the Town Board. Individuals needing special accommodation may request assistance by contacting the Town Clerk 807 Mountain Avenue, Berthoud, Colorado 80513, 970-532-2643 at least 24 hours in advance.

3. Staff – Town Administrator, Attorney

VII. EXECUTIVE SESSION

Pursuant to C.R.S. Section 24-6-402(4)(f) for discussion of a personnel matter and not involving: any specific employees who have requested discussion of the matter in open session; any member of this body of any elected official; the appointment of any person to fill an office of this body or of an elected official; or personnel policies that do not require the discussion of matters personal to particular employees. And the following details are provided: Town Administrator Annual Evaluation

VIII. APPROVAL OF TOWN ADMINISTRATOR EMPLOYMENT AGREEMENT

IX. ADJOURN

Town Clerk or Deputy Town Clerk

William Karspeck, Mayor

April 25, 2023, Meeting Agenda

The order of agenda items listed above is approximate and intended as a guideline for the Town Board. Individuals needing special accommodation may request assistance by contacting the Town Clerk 807 Mountain Avenue, Berthoud, Colorado 80513, 970-532-2643 at least 24 hours in advance.



MEETING MINUTES OF THE TOWN BOARD

Town Board Room
807 Mountain Avenue
Town of Berthoud, Colorado
Tuesday, March 18, 2023, 6:30 p.m.

I. REGULAR MEETING CALLED TO ORDER – Mayor William Karspeck

Mayor Karspeck called the meeting to order.

II. PLEDGE OF ALLEGIANCE – Mayor William Karspeck

Mayor Karspeck led the Pledge of Allegiance.

III. ROLL CALL – Mayor William Karspeck

The following Board Members were present:

William Karspeck, Mayor
Mike Grace, Mayor Pro-Tem
Sean Murphy, Trustee
Tim Hardy, Trustee
Karl Ayers, Trustee

The following Board Members were absent:

Jeff Butler, Trustee
May Soricelli, Trustee

The following were also present:

Chris Kirk, Town Administrator
Christian Samora, Town Clerk
Erin Smith Town Attorney
Michelle Adams, Deputy Town Clerk
Jeremy Olinger, Deputy Town Administrator
Keith Knoll, Public Work Operations Manager

IV. CITIZEN PARTICIPATION

There was not any citizen participation.

V. SCHEDULED ITEMS and ESTIMATED TIMES FOR DISCUSSION

1. Consent Agenda

Consent Agenda items are considered to be routine by the Town Board and will be enacted with a single vote. There will be no separate discussion of these items. If discussion is deemed necessary, that item should be removed from the Consent Agenda and considered separately.

- a) April 11, 2023, Meeting Agenda
- b) March 28, 2023, Meeting Minutes
- c) February 2023 Financial Information
- d) PrairieStar Tolling Agreement
- e) 2023 Concrete Project Bid Award
- f) Resolution 2023.06 Opposing Senate Bill 23-213

Trustee Ayers moved to combine and approve the items on the Consent Agenda with exception to item “f” regarding Senate Bill 23-213. Trustee Murphy seconded the motion. In a 5-0 roll call vote, THE MOTION CARRIED.

2. Resolution Opposing Senate Bill 23-213

Trustee Ayers requested a brief synopsis of the proposed bill. Kirk provided a brief background regarding the bill.

Trustee Hardy moved to approve Resolution 2023-06, a resolution of the Town Board of the Town of Berthoud, Opposing Senate Bill 23-213. Trustee Murphy seconded the motion. In a 5-0 roll call vote, THE MOTION CARRIED.

3. Harvest 47 Preliminary Plat – Public Hearing Continuance

Chris Kirk gave an introduction and provided background information.

Trustee Hardy moved to approve the Harvest 47 continuance to the May 9, 2023, Town Board of Trustees Meeting. Trustee Ayers seconded the motion. In a 5-0 roll call vote, THE MOTION CARRIED.

4. Bader Minor Subdivision, Planned Unit Development Amendment, Overall Development Plan Amendment, and Final Development Plan – Public Hearing Continuance

Chris Kirk gave an introduction and provided background information.

Trustee Hardy moved to approve the Bader Minor Subdivision, Planned Unit Development, Overall Development Plan Amendment, and Final Development Plan continuance to the May 23, 2023, Town Board of Trustees Meeting. Mayor Pro-Tem Grace seconded the motion. In a 5-0 roll call vote, THE MOTION CARRIED.

5. Caretakers of Tradition Fee Waiver Request

Paul Rimsky provided an introduction and background information.

Mayor Pro-Tem Grace moved to approve the Caretakers of Tradition Building Permit Fee Waiver Request. Trustee Hardy seconded the motion. In a 5-0 roll call vote, THE MOTION CARRIED.

6. 2023 Pickle Ball Court Project Bid Award

Jeremy Olinger provided an introduction and background information.

Mayor Pro-Tem Grace moved to award the bid for the 2023 Pickle Ball Court Project to ECI Construction and to direct staff to include a budget increase to \$1.3M in the 2023 mid-year budget adjustment. Trustee Ayers seconded the motion. In a 5-0 roll call vote, THE MOTION CARRIED.

7. 5-Year Sidewalk Plan

Keith Knoll gave an introduction and provided background information.

Mayor Pro-Tem Grace moved to approve the 5-Year Sidewalk Plan. Trustee Hardy seconded the motion. In a 5-0 roll call vote, THE MOTION CARRIED.

Trustee Murphy moved to extend the meeting past 9:30 P.M. Trustee Ayers seconded the motion. In a 5-0 roll call vote, THE MOTION CARRIED.

8. Metro District Policy

(Chris Kirk)

(60 Min)

Resolution 2023-07 – A Resolution of the Town of Berthoud adopting the Berthoud Metropolitan District Policy

Chris Kirk gave an introduction and provided background information.

Mayor Pro-Tem Grace moved to approve Resolution 2023-07, a resolution of the Board of Trustees approving the Berthoud Metropolitan District Policy and direct the Town Attorney and Town Administrator to amend paragraph 4(j)(6), page 8, as further described by the Town Attorney. Trustee Murphy seconded the motion. In a 4-1 roll call vote,

April 11, 2023, Meeting Minutes

THE MOTION CARRIED. Trustee Hardy had the dissenting vote.

VI. ELECTED OFFICIAL REPORTS

(10 Min)

1. Town Board – Tim Hardy, May Soricelli, Mike Grace, Sean Murphy, Karl Ayers, and Jeff Butler.

Trustee Ayers Reported:

The PORT Committee met last week regarding an update on the trails around town. The main points were regarding asking parks to move toward looking at crossing over HWY 287, the Spartan connection to the east, and completing the Rookery trail.

The second phase of the bike park has begun.

There have been three new staff hires for the sports programs.

PORT was curious what the timeline was for the transit stop at I-25. Kirk stated that the goal would be that the stop be regularly used for micro transit.

Trustee Murphy Reported:

Murphy expressed gratitude for the resolution opposing SB 23-213.

Murphy appreciated seeing the water masterplan on the website and would appreciate the FAQ as well to help make citizens aware of regulations, like chickens, and golf cart rules.

Mayor Pro-Tem Grace Reported:

Pro-Tem Grace asked for a broadband and project tracking update.

Kirk indicated that work had begun to track different projects, which will be presented in the next month.

Kirk indicated Broadband is tentatively scheduled to be before the Town Board on May 9th.

2. Mayor – William Karspeck

Mayor Karspeck Reported:

Congresswoman Caraveo was in Berthoud for a schedule public meeting.

Karspeck asked when will the Town hear back on the micro mobility hub and asked if there was enough space for a trail connection at I-25. Kirk stated that it appears there is enough space for a trail.

Karspeck asked if the Town is still on the Lucas standards. Kirk stated the code allows the Town to use the Fort Collins alternative standards as well.

Karspeck stated that he attended the hearing for SB 23-213 virtually.

3. Staff – Town Administrator, Attorney

Administrator Kirk Reported:

Kirk thanked the Board for the RSVPs to attend the Thompson Valley School Dinner. Any additional RSVPs are needed by Friday.

Kirk indicated that he and the Assistant to the Town Administrator toured the Lone Tree Link on Demand service, which is a form of micro transit. One of the first turnkey services. Lone Tree is partnering with a third party to have a turnkey micro transit system. They received a lot of beneficial information from the city.

There is a lunch meeting set up with the City of Longmont to discuss partnership opportunities with regard to micro transit.

VII. EXECUTIVE SESSION

Trustee Ayers moved to enter into Executive Session pursuant to C.R.S. Section 24-6-402(4)(f) for discussion of a personnel matter and not involving: any specific employees who have requested discussion of the matter in open session; any member of this body or any elected official; the appointment of any person to fill an office of this body or of an elected official; or personnel policies that do not require the discussion of matters personal to particular employees. And the following details are provided: Town Administrator Annual Evaluation. Trustee Murphy seconded the motion. In a 5-0 roll call vote, THE MOTION CARRIED.

VIII. APPROVAL OF TOWN ADMINISTRATOR EMPLOYMENT AGREEMENT

There was not any action taken following Executive Session.

IX. ADJOURN

The meeting adjourned at 11:10 P.M.

Town Clerk or Deputy Town Clerk

William Karspeck, Mayor

Berthoud Board Update

April 2023



Business Development

We are celebrating National Small Business Week April 29 - May 7th.

We are excited to bring back the Town's Shop Local Program to celebrate our Berthoud storefront businesses. Our community is encouraged to spend money locally at Berthoud storefront businesses, services, and restaurants. They can then turn in any receipts totaling over \$10 for a chance to win one of 40 gift cards. More details are available at Berthoud.org.



Celebrate National Small Business Week by Shopping Local and You Could Win a \$75 Gift Card.

April 29 - May 7, 2023

We want to thank you for supporting Berthoud shops, restaurants, and services and show our appreciation to local storefront businesses for choosing Berthoud.

Here's how it works:

- Shop at any Berthoud storefront shop, service, or restaurant between Saturday, April 29, and Sunday, May 7.
- On every original receipt for \$10 or more, write your name and phone number on the back and drop them off at Town Hall.
- On Monday, May 8th at 1:00 pm, we will draw 40 names.
- Each winner will receive a \$75 gift card to a Berthoud business.
- You may enter as many receipts as you'd like, but you can only win once.
- Visit Berthoud.org for a complete list of rules.



SCAN



Recreation

Submitted by Amanda Gustafson

The team has been working on finding vendors for the upcoming Fickle Farmer's Market, and the team currently has 19 vendors registered, with an average of 12 for each of the 16 events. Finally, the operations team held its first annual Mother Son Nerf Mania event, where 80 moms and sons participated.

During this month we prepared for and kicked practices off for multiple sports programs. Youth soccer, youth flag football, Little Strikers, Little Lombardis, youth volleyball, adult women's volleyball, and 50+ pickleball all started their seasons. We have well over 500 participants throughout these programs and will be adding youth softball and bouldering which start practices/classes in April.

In total we will have at least 50 coaches whom we directly communicate with, background check, and train while also working to provide resources and support to the assistant coaches of each team.

Fitness participants continue to pack the house attending fitness classes. The fitness areas are booming with 73 people registered and attending paid fitness classes on a weekly basis and an average of 66 people per day attending free fitness classes.

Aquatics in March saw seven additional no school days upping the usage of the pools. Word is getting out that the pool is the place to be for birthday parties. The aquatics staff ensured the safety and enjoyment of two after hour party rentals, one of which consisted of more than 200 people along with 19 registered birthday parties and an untold amount of drop in birthdays throughout the month.



Supervisors worked to repair lights in the hot tub that had become loose and were no longer remaining in the wall. The filter media was changed out for the lap and activity pool along with all hairbaskets changed and cleaned. The nanobubbler system was repaired and put back online. Regular monthly draining and cleaning of the hot tub was completed as well as a UV bulb replaced, and the UV system inspected. Surge suppressors were installed to protect our heaters system from power surges and fluctuations.



Parks / Cemetery

Submitted By Sami Kouns

This month the Parks Department was finally able to get out and about to address some outdoor projects. Between the two snow storms that came at the beginning and the end of the month, playground and facility inspections were conducted that determined some playground repairs and updates were necessary.



Before



After

Graffiti was found at several parks, including Fickel Park, Bein Park, and Waggener Farm Park. It was removed promptly by hand or with a power washer to keep the Berthoud safe and beautiful.

During the warmer days, before inclement weather, fertilizer was applied to Town of Berthoud turfgrass areas to help prevent weed growth and encourage the growth of grass. On Bein South, the dirt on the ballfield was the perfect consistency to finally install the fortification panels that are already present on Bein North. The Greenlawn Cemetery featured a clean-up project that helped remove some of the leaves in the old sections to make the area more aesthetic for future burials and events. With spring sports season around the corner, the batting cages were pulled out on the Bein fields, soccer fields were painted at Waggener, and spring mowing has started on all athletic fields.



Streets

Submitted by Brandon Keegan

The Streets Department's mission for the month of March was to perform routine maintenance such as alley repair, filling potholes, and repairing signage.

There was also focus on cleaning the Nielsen greenway drain channel as well as jetting Robert's Lake drain outlet.



Grading Wastewater Road



Snow wreaks havoc on unpaved roads. We graded county road 7 and filled all of the potholes. And then used the grader to perform alley repairs.

We just purchased a work-saver grader blade. This will help with grading alleys because it has a smaller footprint than the standard grader.



The Streets crew installed a yield to pedestrian sign on Berthoud Parkway and Mountain Ave. This intersection is very busy with pedestrians going to school and the recreation center. They also removed graffiti from an existing street sign.



Forestry & Open Space

Submitted by Paul Furnas

The primary objectives for the Forestry and Open Space departments for the month of March were preparing the Town's ornamental beds for spring, keeping up with snow and ice removal, and structurally pruning young trees at parks. Tree crews wrapped up the pruning project at Fickel Park this month by finishing off the trees above Mountain Ave. The Forestry department added 1,000 new trees this month to the CoTreeView inventory for the town. Open Space improved the parking lot at Berthoud Reservoir by moving boulders around making it easier to navigate for large vehicles and to also keep vehicles within the parking lot.



Our Open Spaces don't just wake up in spring looking well-kempt and beautiful.

One of the larger projects both Forestry and Open Space has taking head-on this month is cutting back ornamental beds around town. Sites receiving spring cleaning are roundabout at 1st & Mountain, Waggener Rec Center, and Neilson trail.



The last of the trees to be pruned were the ones that extend over Mountain Ave, this project required traffic control and flagging operations

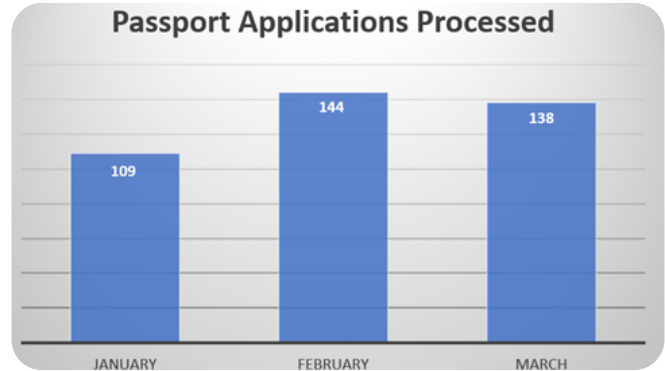


Administration & Clerk Department

Submitted by Christian Samora

Passport acceptance application volumes have remained steady. Most appointments can be accommodated within two weeks or less. Applicants travel from as far away the South Metro Denver area for passport services.

Current processing times are 10-13 weeks after the date of application, or 7-9 if expediting an application.



The Town has hired a new Information Technology Specialist, Bryan Fister. Bryan brings over 15 years of experience in the field. Bryan began work at the Town on March 30th and is quickly getting up to speed on current projects.

His hire begins the Town's transition from third-party IT support to a dedicated staff member handling any IT concerns. It is anticipated that this transition will be complete by the end of May.

This change will bring improved IT support to the organization and reduce overall costs



The Town is launching a new web-based portal to process records requests. The portal will simplify the request process and provide a solution to processing and tracking requests in a single system.

The portal will allow users to view past requests and will be provided with live links if the information being requested can be found on the Town website.

The new portal will be live on the website beginning May 15th, 2023.



Water & Wastewater Department

Submitted by Marie Mitchell

Town of Berthoud Valve Inspection and Exercising Program

Distribution System Resources LTD (DSR) has successfully performed the majority of the Valve Inspection and Exercising (I&E) Program for the Town that began March 6, 2023. Team members Cody Steuben and Bryan Catron participated in the program by working side by side with the Crew of DSR – and gaining credible on-the-job training and insight. The Nature of activity is to inspect and maintain existing Town owned valves at specific locations, with no excavation required. The project will resume on those locations that are pending approval for submitted permit applications required by the Colorado Dept of Transportation.



Heron Lake Lift Station

The Town has a number of Lift Stations that are used to pump wastewater or sewage material to a higher elevations and Pumps Station designed to raise water and not wastewater. Both systems require upkeep and monitoring to be compliant with Federal and State rules and regulations, to ensure proper function, and to be sound for the safety of our community, natural resources and public water system. This responsibility is accomplished by Ramey Environmental Compliance REC), a Colorado-based company contracted by the Town's Water Department. With over 25 years of experience, countless success stories, and awards in national recognition, REC provides services in the maintenance and operation of the Town's water and wastewater treatment facilities and systems and works closely with staff members to ensure the Town is compliant with regulatory agencies. Pictured are two REC ESD Technicians working on repairs to one of the many Lift Stations – this one is the Heron Lakes Lift Station Piping.



ACCOLADES & WELCOMES

Welcome
Welcome:

Chief Justin Williamson - Berthoud Squad

Anne Johnson - Planning Director

Bryan Fister - IT Specialist

Nate Schaefer - Lead Custodian, Recreation Center

Jacquelyn Cuba - Fitness & Active Adult Coordinator, Recreation Center.

LONGEVITY

We want to acknowledge and express our appreciation for those members of our team who have been with us for a while. Today we want to thank those with a March anniversary for helping to make Berthoud the fantastic place it is.

**Carla Gustafson -
HR & Risk Management Coordinator - 7 years**

Thank you for all that you do!



BOARD OF TRUSTEES INFORMATION



PUBLIC WORKS DEPARTMENT

Meeting Date:	April 25, 2023
Agenda Title/Subject:	Berthoud Chip & Slurry Seal Bid Award
Type of Item:	Consent Agenda
Purpose:	Board approval to Award Contract
Presented by:	Keith Knoll – Public Works Operations Manager

ATTACHMENTS:

- Project Location and Repairs
- Vance Brothers Bid Form

BACKGROUND:

Town staff received 2 Bids for the 2023 Chip & Slurry Seal Project. Vance Brothers submitted the lowest bid at \$133,122.20

As part of this project, CR 44 will have road sections patched, a full crack seal, and a chip seal applied. Turner Ave. between 3rd St. and 6th St. will have road sections patched, fully crack seal, and a slurry seal applied. These two treatments seal, protect, and prolong the life of these roadways.

COMMUNITY TOUCHSTONES:

The Board of Trustees' Less-is-More Strategic Plan set a Measurable Milestone Goal of budgeting \$1 million per year for street maintenance for five years. This increased budget focused on Berthoud's infrastructure **Resiliency**, allows funding for both new asphalt repairs and road prolonging asphalt seals, thus increasing the **Sustainability** of our roadways.

FISCAL IMPACT AND FUND SOURCE:

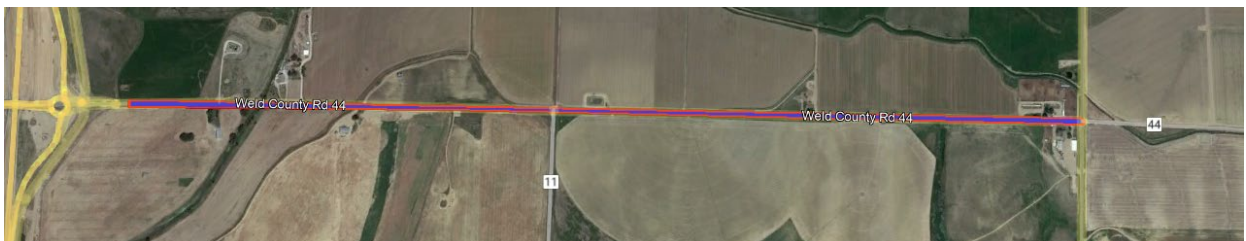
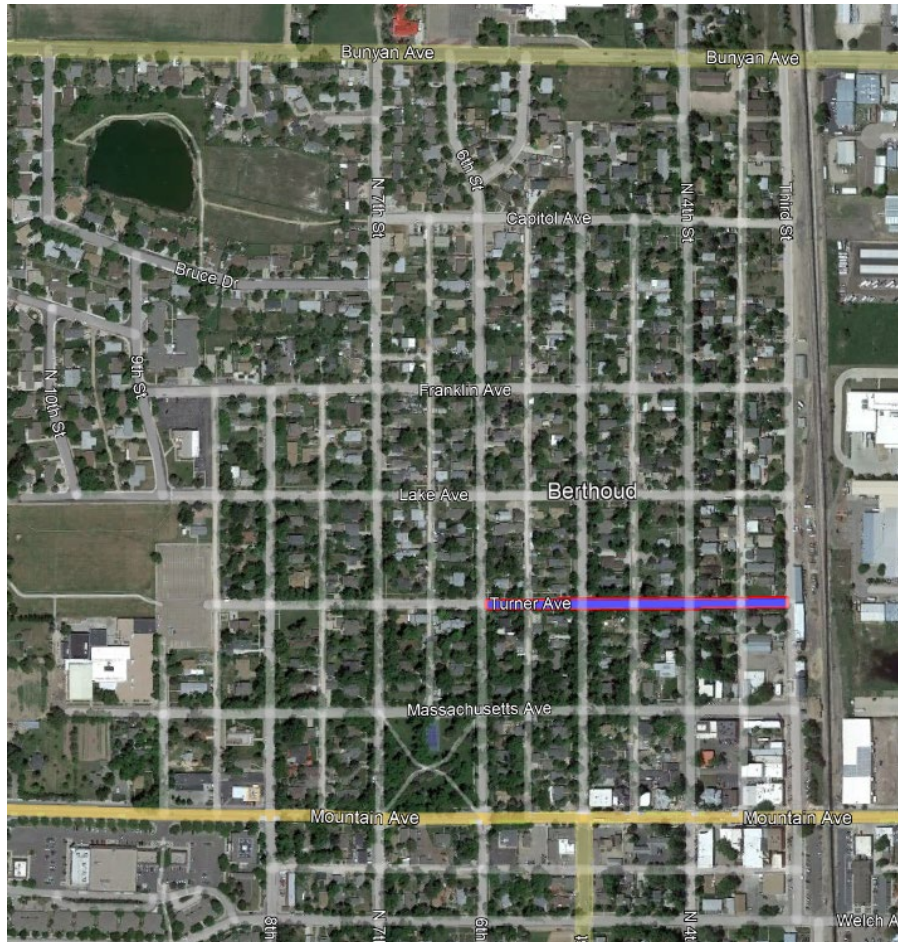
51-00-5239.00 – Street Improvements - \$133,122.20

RECOMMENDED ACTION(S):

Board Approval for town staff to award the 2023 Berthoud Chip & Slurry Seal Bid Award to Vance Brothers

Project Locations & Repairs

Road Section	Repair
Turner Ave. - 3 rd to 6 th	Slurry Seal
CR 44	Chip Seal



4. BIDDER will complete the Work in accordance with the Contract Documents for the following price(s).

The **2023 Berthoud Chip & Slurry Seal Project** This includes crack sealing, asphalt patching, chip sealing, or slurry seal, neighborhood notification, and traffic control for two locations. Exact patching, cracks sealing, and chip sealing amounts should be estimated by bidder.

Proposals and bid prices must include complete maps for location estimated, amounts of materials, costs of labor, supervision, equipment, and traffic control.

ITEM NO	ITEM DESCRIPTION	PAY UNIT	TOTAL QTY	PROJECT UNIT PRICE	PROJECT TOTAL PRICE	Notes
1	Crack Seal – CR 44	LBS	4,200	\$2.25	\$9,450.00	
2	Patching – CR 44	SY	60	\$85.00	\$5,100.00	
3	Chip Seal – CR 44	SY	16,160	\$4.30	\$69,488.00	
4	Crack Seal – Turner Ave. (3 rd St. to 6 th St.)	LBS	1,500	\$2.25	\$3,375.00	
5	Patching – Turner (3 rd St. to 6 th St.)	SY	20	\$85.00	\$1,700.00	
6	Slurry Seal – Turner (3 rd St. to 6 th St.)	SY	4,093	\$4.40	\$18,009.20	
7	Mobilization	EA	1	\$14,500.00	\$14,500.00	
7	Traffic Control	EA	1	\$11,500.00	\$11,500.00	

TOTAL PROJECT COST: \$ 133,122.20

Bidder acknowledges that quantities are not guaranteed, and final payment will be based on actual quantities determined as provided in the Contract Documents.

5. BIDDER agrees that the Work will be substantially complete and completed and ready for final payment in accordance with paragraph 14.13. in the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement. BIDDER accepts the provisions of the Agreement as to liquidated damages in case of failure to complete the Work on time.
6. The following documents are attached to and made a condition of this Bid.
- (a) Required Bid Security.
 - (b) A tabulation of subcontractors, suppliers, and other persons and organizations required to be identified in this Bid (see paragraph 8, below).
7. The terms used in this Bid, which are defined in the General Conditions of the Construction Contract included as part of the Contract Documents, have the meanings assigned to them in the General Conditions.

BOARD OF TRUSTEES INFORMATION



PUBLIC WORKS DEPARTMENT

Meeting Date:	April 25, 2023
Agenda Title/Subject:	Berthoud Road Improvements Bid Award
Type of Item:	Consent Agenda
Purpose:	Board approval to Award Contract
Presented by:	Keith Knoll – Public Works Operations Manager

ATTACHMENTS:

- Project Locations & Repairs
- Brannan Sand and Gravel Company Bid Form

BACKGROUND:

Town staff received 11 bids for the 2023 Road Improvements Project. Brannan Sand and Gravel was the low bidder at \$341,685.35.

This portion of the road improvements project will include 2" asphalt mill and overlays throughout a portion of the Old Town Berthoud neighborhood. A section of Bunyan Ct. will have a full 6" rebuild. The project is expected to begin in July, following the completion of the adjacent concrete repairs.

COMMUNITY TOUCHSTONES:

The Board of Trustees' Less-is-More Strategic Plan set a Measurable Milestone Goal of budgeting \$1 million per year for street maintenance for five years. This increased budget focused on Berthoud's infrastructure **Resiliency**, allows funding for both new asphalt repairs and road prolonging asphalt seals, thus increasing the **Sustainability** of our roadways.

FISCAL IMPACT AND FUND SOURCE:

51-00-5239.00 – Street Improvements - \$341,685.35

RECOMMENDED ACTION(S):

Board Approval for town staff to award the 2023 Berthoud Road Improvements Project to Brannan Sand and Gravel Company.

Project Locations & Repairs

Road Section	PCI Index	Repair
7th St. Place	1	Mill & Overlay
7th St. – Bunyan Ave. – Franklin Ave.	2	Mill & Overlay
Bunyan Ct.	2	6" Rebuild
6 th St. Ct.	2	Mill & Overlay
6 th St. – Small Section S. of Bunyan Ave.	2	Mill & Overlay
Franklin Ave. - 6 th -9 th	1,2	Mill & Overlay
Lake Ave. – 6 th -9 th	1,2	Mill & Overlay
6 th - Mass. – Franklin Ave.	1	Mill & Overlay
Turner Ave. - 6 th -9 th	2	Mill & Overlay
4 th – Welch Ave. to Mountain Ave.	2	Mill & Overlay
2 nd St. - North of Bunyan Ave.	2	Mill & Overlay
Turner Ave. - 3 rd to 6 th (Separate contract)	3	Slurry Seal



2023 Berthoud Road Improvements Updated Bid Sheet

ITEM NO	ITEM DESCRIPTION	PAY UNIT	TOTAL QTY	PROJECT UNIT PRICE	PROJECT TOTAL PRICE	Notes
1	2" Mill 7th St. Place, 7th St. Bunyan-Franklin, 6th St. Ct., 6th St. Section, Franklin 6th-9th, Lake 6th-9th, 6th Mass.-Franklin, Turner 6th-9th, 4th Welch-Mountain, 2nd St. North of Bunyan	SY	23,080	\$ 3.00	\$ 69,240.00	
2	Asphalt Overlay- Hot Bit. Pavement 2-inch (GR SX) (75) (PG64-22)	TON	2585	\$ 83.00	\$ 214,555.00	
3	6" Asphalt Mill Bunyan Ct.	SY	360	\$ 7.75	\$ 2,790.00	
4	6" Asphalt Overlay (3" Bottom Lift GR S) (3" Top lift GR SX) Bunyan Ct.	TON	120	\$ 98.50	\$ 11,820.00	
5	Water Valve Adjustment	EA	1	\$ 66.85	\$ 66.85	
6	Manhole Adjustment	EA	1	\$ 93.50	\$ 93.50	
5	Traffic Control	LS	1	\$ 26,350.00	\$ 26,350.00	
6	Reconditioning (if needed)	CY	1	\$ 295.00	\$ 295.00	
7	Mobilization	LS	1	\$ 16,350.00	\$ 16,350.00	
8	Asphalt Patching	SY	1	\$ 125.00	\$ 125.00	

Total \$ 341,685.35

TOWN BOARD INFORMATION



COMMUNITY DEVELOPMENT DEPARTMENT

Meeting Date:	April 25, 2023
Agenda Title/Subject:	Resolution 9 (Series 2023) approving the First Street Corridor Plan and directing staff to prepare an Ordinance to codify the plan into the Land Use Code (Chapter 30 of the Municipal Code)
Type of Item:	Regular Item
Purpose:	Approval of the First Street Corridor Plan as an outcome of the action items listed in the 2021 Comprehensive Plan amendment
Presented by:	Chris Kirk, Town Administrator Anne Johnson, Community Development Director

ATTACHMENTS:

- Resolution 9, Series 2023
- Berthoud First Street Corridor Plan
- Project site web pages

BACKGROUND:

The 2021 Comprehensive Plan update identifies the First Street Corridor Plan inclusive of design guidelines as an important key to redeveloping the corridor into an Innovation District. This shift in vision for the corridor requires attention to design standards, uses contemplated in the corridor, and public participation. The attached web pages illustrate how the project development was communicated to the public, when public workshops were held, draft documents and how to be involved.

The guiding principle of the future Innovation District is characterized as becoming, “a unique business district strategically designed to attract, retain, and cultivate talent, and improve networking and communication flows between business innovators, and residential uses will be blended into these areas to support the business community.” To do so in a meaningful and planned manner requires an overlay district master plan. The draft presented this evening embodies the vision found in the 2021 Comprehensive Plan update and shall direct the codification of this plan into the Land Use Code, Chapter 30 of the Municipal Code.

UPDATE/NEXT STEPS:

Staff and/or the consulting group shall codify the vision of the First Street Corridor Plan into the Land Use Code.

FISCAL IMPACT AND FUND SOURCE:

The intention of this Overlay District is to encourage redevelopment according to a vision

of the corridor, which is a positive impact to the Town. Retaining consulting services to aid staff in codifying the vision of the First Street Corridor Plan into Code form will ensure timely integration and continued correspondence with the properties within the proposed corridor.

COMMUNITY TOUCHSTONES:

Consideration of this request does not negatively impact community touchstones and in fact is supportive of the 2021 Comprehensive Plan update as stated previously

RECOMMENDED ACTION(S):

Staff recommends approval of the First Street Corridor Plan.

RESOLUTION NUMBER 09

(SERIES 2023)

A RESOLUTION APPROVING THE FIRST STREET CORRIDOR PLAN

WHEREAS, the Town of Berthoud, Colorado is a statutory municipality duly organized and existing as a body corporate and politic on the laws of the State of Colorado; and

WHEREAS, the Town of Berthoud, Colorado, acting through its Planning Commission is empowered pursuant to C.R.S. Section 31-23-201, et seq., to make and adopt a Comprehensive Plan; and

WHEREAS, the Town of Berthoud, Colorado adopted the 2021 Comprehensive Plan update through Resolution 2021-19 on July 13, 2021; and

WHEREAS, the Town of Berthoud through the 2021 Comprehensive Plan update acknowledged the importance of developing a Corridor Plan for First Street inclusive of design guidelines; and

WHEREAS, the Town Board of Trustees have reviewed the attached draft First Street Corridor Plan, attached hereto as Exhibit A; and

WHEREAS, the Town Board of Trustees considered the draft First Street Corridor Plan at its meeting held April 25, 2023.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES OF THE TOWN OF BERTHOUD, COLORADO:

Section 1. Plan Approval. The First Street Corridor Plan is hereby accepted as shown in Exhibit A attached hereto.

Section 2. Staff is hereby directed to prepare an ordinance and a code amendment to incorporate the First Street Corridor Plan into the Land Use Code for the Board of Trustees' consideration.

Section 3. Interpretation: This Resolution shall be so interpreted and construed to effectuate its general purpose.

Section 4. Effective Date: The provisions of this Resolution shall take effect immediately.

INTRODUCED, READ, ADOPTED, AND APPROVED on this 25th day of April, 2023.

TOWN OF BERTHOUD

By _____

William Karspeck, Mayor

ATTEST:

By: _____

Christian Samora, Town Clerk

Exhibit A: First Street Corridor Plan draft



TOWN OF BERTHOUD, COLORADO

1st Street Corridor Plan

DRAFT - FOR REVIEW PURPOSES ONLY

Last Revised: March 27, 2023



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CHAPTER 1

Overview

The Town of Berthoud continues to plan for managed growth and sustainable development, and 1st Street is an attractive location for future development for various reasons: adjacent properties are highly visible to drivers; there is convenient access to US 287 and Mountain Avenue; and Town infrastructure is in close proximity. In addition, the Comprehensive Plan and Zoning Code allow unique land uses that aren't permitted in most areas within the Town. The 1st Street Corridor Plan (Plan) sets the stage for 1st Street to serve as a central spine for one of the Town's growth areas east of the railroad.

Purpose of the Plan

The Plan provides a vision and set of goals for guiding the growth, development, redevelopment and design of the 1st Street corridor. More specifically, the Plan addresses architecture, scale, form, character and intensity of development, connectivity, multi-modal transportation, streetscapes, and landscaping within the 1st Street Corridor Study Area.

Town staff coordinated with a multidisciplinary consultant team to guide the planning effort. Input for the 1st Street Corridor Plan was sought from local residents, businesses, property owners, and community leaders, particularly through a series of three community meetings.

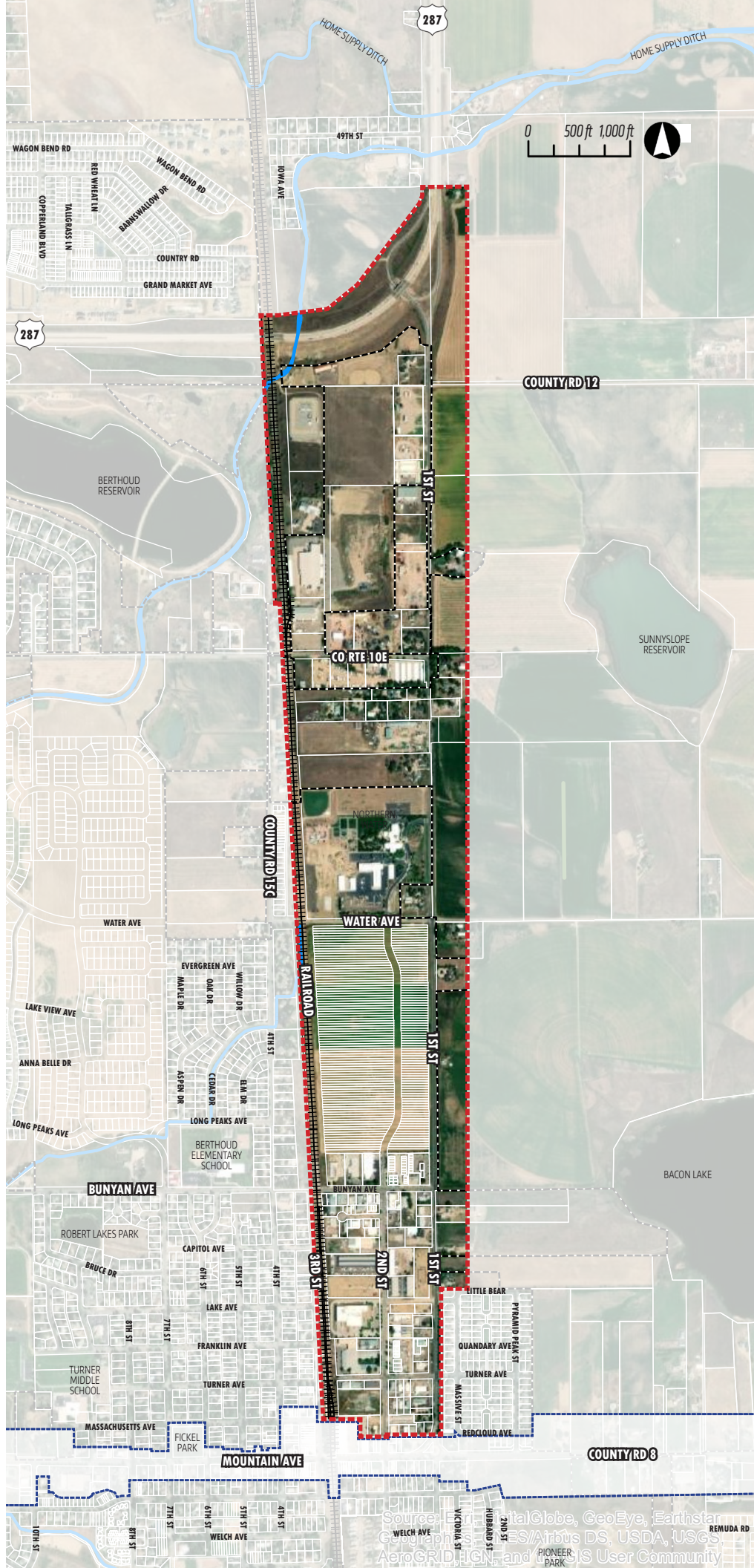
The 1st Street Corridor Plan provides Berthoud with a roadmap for accomplishing community planning objectives along the 1st Street corridor for many years to come.

PROJECT GOALS

- Identify and enhance the character of 1st Street
- Protect existing neighborhoods
- Envision distinct and memorable spaces and places that add to Berthoud's charm and boost the concept of an Innovation District along 1st Street, per the 2021 Comprehensive Plan
- Improve the experience for pedestrians, bicyclists, transit users, and motorists in a safe environment
- Create conditions and a collaborative environment where business and innovation can thrive



The 1st Street Corridor Study Area generally covers the area with US 287 on the north (including the interchange), the railroad on the west, Mountain Avenue on the south, and approximately 300 feet east of 1st Street. The corridor stretches about 2 miles from north to south.



Relationship to the Comprehensive Plan

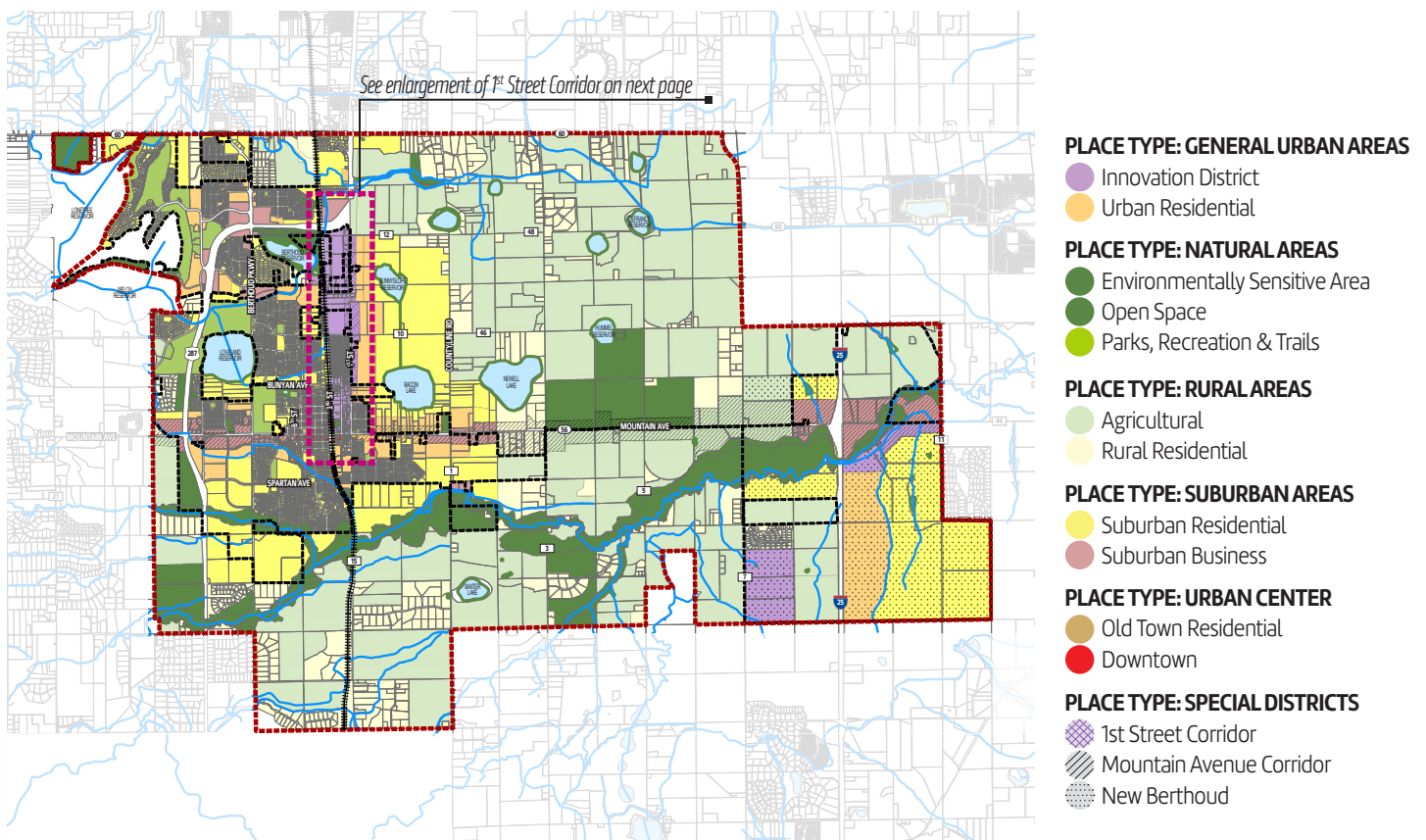
As illustrated in the map below, the Future Land Use Plan in the Town of Berthoud's 2021 Comprehensive Plan was built around a set of Character Districts that defined the land use, urban design, and character traits of Berthoud's districts and corridors.

The 1st Street Corridor is primarily characterized by two of those Character Districts, which are described in more detail on page 5. One is an **Innovation District** intended to be a distinct business district strategically designed to attract, retain, and cultivate talent in a variety of industries, from creativity, makers, and startups to technology, research, and development. **Urban Residential** uses to the east of 1st Street are also intended to support potential commercial and employment opportunities in the Innovation District.

This Plan will further articulate the desired character and function of the Study Area.



FUTURE LAND USE PLAN | 2021 BERTHOUD COMPREHENSIVE PLAN



PLACE TYPE: GENERAL URBAN AREAS

- ## PLACE TYPE: NATURAL AREAS

- PLACE TYPE: RURAL AREAS**

- PLACE TYPE: SUBURBAN AREAS**

- Suburban Residential
- Suburban Business

- PLACE TYPE: URBAN CENTER**

- Old Town Residential
● Downtown

- ## PLACE TYPE: SPECIAL DISTRICTS

- 1st Street Corridor
Mountain Avenue Corridor



Character Districts

Per the 2021 Comprehensive Plan, the 1st Street Corridor provides, "optimal opportunities for mixed use development and creation of new sub-districts...", which assumes Town annexation of unincorporated properties over time to guide future land use. As summarized below, the 1st Street Corridor is comprised of two Character Districts: the Innovation District and the Urban Residential District.

GUIDING PRINCIPLE

The 1st Street Corridor is intended to evolve into a modern innovation hub designed as a green and connected campus that provides for a range of employment and business uses catering to creatives, artisans, makers, startups, and other innovators. Residential uses can be blended into these areas to support the business community.

Innovation District | CHARACTER DISTRICT

Guiding Principle: The Innovation Character District is intended to create a unique business district strategically designed to attract, retain, and cultivate talent, and improve networking and communication flows between business innovators, and residential uses will be blended into these areas to support the business community.

Preferred Land Use: The future character and composition of the Innovation District will be guided by the preferred uses for the corridor. In particular, the Innovation District will continue to support existing technical businesses and production uses, while also integrating emerging business types that focus on research and development (R&D), technology, startups, makerspaces, and other related commercial and light industrial uses. Residential uses may also be incorporated on 2nd and/or 3rd floors in the Innovation District, but the primary uses within the district will be non-residential. The Innovation District will evolve into a unique employment center with context sensitive design that respects adjacent neighborhoods.

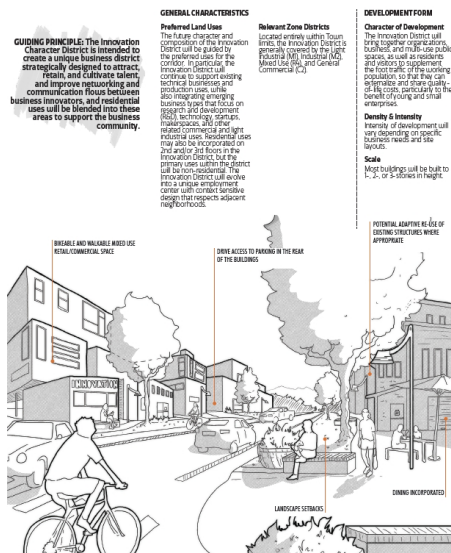
Scale: Most buildings will be built to 1, 2, or 3-stories in height.

Urban Residential | CHARACTER DISTRICT

Guiding Principle: The Urban Residential Character District will focus on human-scale design and incorporate “New Urbanism” planning and design principles such as: walkable blocks and streets, housing and shopping in close proximity, and accessible public spaces. A variety of housing types, at varying price points, will be blended together on the same block, and commercial uses can be blended into these areas to support the neighborhood.

Preferred Land Use: The dominant land use will be a mix of residential housing types, with nonresidential uses to support the neighborhoods. Housing types will include single-family detached homes, single-family attached homes, townhomes, and multi-family options. Affordable housing will also be incorporated in these neighborhoods.

Scale: Most housing types will be built at 1 to 2-stories in height. Townhomes and apartments can be up to 3 stories in certain areas.



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CHAPTER 2

Planning Process

Overview

The Project Timeline on the right shows how the Plan was developed across three project phases:

1/ DISCOVERY

Including data collection, analysis, and Public Workshop #1 to gather community input

2/ CONCEPTS

Including Public Workshop #2 to share preliminary corridor plan concepts

3/ DIRECTION

Including Public Workshop #3 to share more detailed corridor concepts

The key takeaways and general details of the three Public Workshops are provided in this chapter. In addition, the consultant team coordinated with Town staff every other week throughout the planning and design process to discuss draft concepts, outreach elements, and other deliverables to ensure the plan reflects the direction and intents envisioned by Town leaders and community members.

PROJECT TIMELINE



Public Participation

The 1st Street Corridor Plan was built upon community feedback collected from a public participation process that included a set of three Public Workshops, which are summarized on the next page. The findings from each workshop contributed to an iterative process that helped prepare and refine draft plan concepts for the corridor. Periodic updates were also provided to Town officials.

The third Public Workshop was coordinated with a meeting with the Town Board and Planning Commission to present the draft plan concepts and gather feedback from Town officials. The outcome from this step provided direction for the final plan concepts.

A complete set of exhibits, findings, and results from the three Public Workshops is provided in the Appendix.

In addition to the public workshops, the project was promoted in the community through a project website, in the Berthoud InFocus monthly newsletter (see right), and a traveling exhibit board with project information that was stationed at key locations in town.



PLAN BERTHOUD

BERTHOUD INFOCUS

JULY 2022

ISSUE NO. 92



GUIDING GROWTH

Community Calendar

As dates approach for the monthly meetings, please check the Town of Berthoud website at www.Berthoud.org where we will post updated information and changes. There will also be information about how to "digitally attend" and provide public comments.

1st Street Corridor

The Town is preparing a plan for Berthoud's 1st Street Corridor, which extends between Mountain Avenue and Hwy 287. The purpose of the project is to identify current and future needs of the 1st Street corridor and establish preferences and priorities based on those needs. The plan will provide a vision and a set of goals for guiding growth, development, redevelopment and design of the 1st Street corridor. More specifically, the plan will address architecture, scale, form, character of development, development density/intensity, connectivity, multi-modal transportation, streetscapes, landscaping and signage within the 1st Street corridor planning area.

Town staff and a local consulting team will guide the planning effort. Input for the 1st Street Corridor Plan will be sought from local residents, businesses, property owners, and community leaders. The final product - the 2022 1st Street Corridor Plan - will provide the Town with a roadmap for accomplishing community planning objectives along the corridor for many years to come.

Save the Date

A public workshop for the 1st Street Corridor Plan will be held July 21, 2022 from 6 - 7:30pm at Northern Water, 220 Water Avenue in Berthoud. This open house event will introduce the project, identify key planning issues, and provide feedback opportunity regarding corridor planning and design priorities.

For more information, please contact Curt Freese, Berthoud Community Development Director, at (970) 344-5818 or visit the project website: www.plan-tools.com/Projects/PlanBerthoud.

For questions, please call the Town of Berthoud at 970.532.2643.

Stay informed!

Please use the link below or QR code on the right to access the project website. There you can obtain additional project information, find out about upcoming meetings, access meeting summaries, and review draft documents as they become available. We encourage you to use the "Contact Us" page to get in touch with a member of the project team should you have any questions, comments, or suggestions or require more information concerning the project.



PROJECT WEBSITE www.plan-tools.com/Projects/PlanBerthoud



Public Workshop #1 | JULY 21, 2022

Intent: The first Public Workshop served as an opportunity for community members to share their thoughts on the 1st Street Corridor today. They also interacted with visual preference boards showing a variety of design and development elements to be considered for the corridor. In particular, workshop participants used dot stickers to indicate their preferences for the style of architecture and design for different land uses and a variety of corridor elements, as listed on the right.

Outcomes: Workshop findings informed the draft concepts relating to how the built environment is designed, including buildings, roadways, and streetscape.

LAND USE TYPES

- Commercial
- Industrial
- Residential
- Mixed Use

CORRIDOR ELEMENTS

- Intersection treatments
- Bike lanes
- Pedestrian crossings
- Streetscape
- Linear parks
- Green infrastructure
- Gathering spaces
- Signage and murals
- Off-street parking

NOTE: Workshop exhibits in Appendix



Public Workshop #2 | SEPTEMBER 14, 2022

Intent: The second Public Workshop enabled participants to share their comments on a series of exhibits (listed on the right) that encapsulate a general framework of how the built environment is designed, including buildings, roadways, and streetscape.

Outcomes: Workshop findings provided guidance to prepare more refined detail and finalize the draft concepts, including the preparation of 3D renderings and other graphics to illustrate the proposed look and feel of the 1st Street Corridor.

CORRIDOR CONCEPTS

Existing and modified corridor trends regarding:

- Land use
- Access and mobility
- Innovation District
- Urban Residential
- Architectural attributes
- Street right-of-way design

NOTE: Workshop exhibits in Appendix



Public Workshop #3 | DECEMBER 6, 2022

Intent: The third Public Workshop shared a gallery of 3D renderings and graphics that illustrated the overall design and character of the 1st Street Corridor.

Outcomes: Workshop findings provided feedback to finalize the graphics for inclusion in the 1st Street Corridor Plan.

GRAPHICS

- Perspectives: 1st St
- Perspectives: Bunyan Ave
- Linear Park
- Roundabout
- Jackson Parcel

NOTE: Workshop exhibits in Chapter 7



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CHAPTER 3

Opportunities & Constraints

Overview

This chapter focuses on the existing conditions of the 1st Street Corridor, including opportunities and constraints related to access, safety, connectivity, streetscape, architecture, site design, and zoning recommendations. These existing conditions are summarized on a series of maps to depict how their layouts and other physical attributes influence planning for the corridor. A series of exhibits depicting these opportunities and constraints were shared at Public Workshop #1 to collect community feedback.

Collectively, the opportunities and constraints provide a framework upon which corridor concepts are developed and proposed in Chapters 4, 5, and 6.



Existing Trends Map

TOWN ZONING DISTRICTS

PER THE 2020 BERTHOUD ZONING MAP

- R1: Single Family Residential
- R2: Limited Multi Family Residential
- R3: Multi Family Residential
- R4: Mixed Use*
- R5: Manufactured Home
- PUD: Planned Unit Development
- C1: Neighborhood Commercial
- C2: General Commercial
- M1: Light Industrial
- M2: Industrial
- T: Transition
- Ag: Agriculture

*There are presently no R4: Mixed Use Districts in and around the Study Area.

COUNTY ZONING DISTRICTS

PER THE 2019 LARIMER COUNTY ZONING MAP

- FA: Farming
- FA1: Farming
- E1: Estate Residential
- R1: Residential
- M: Multi-Family Residential
- C: Commercial
- I: Industrial

GENERAL MAP ELEMENTS

- Corridor Study Area Boundary
- Mountain Avenue Corridor

TRANSPORTATION ELEMENTS

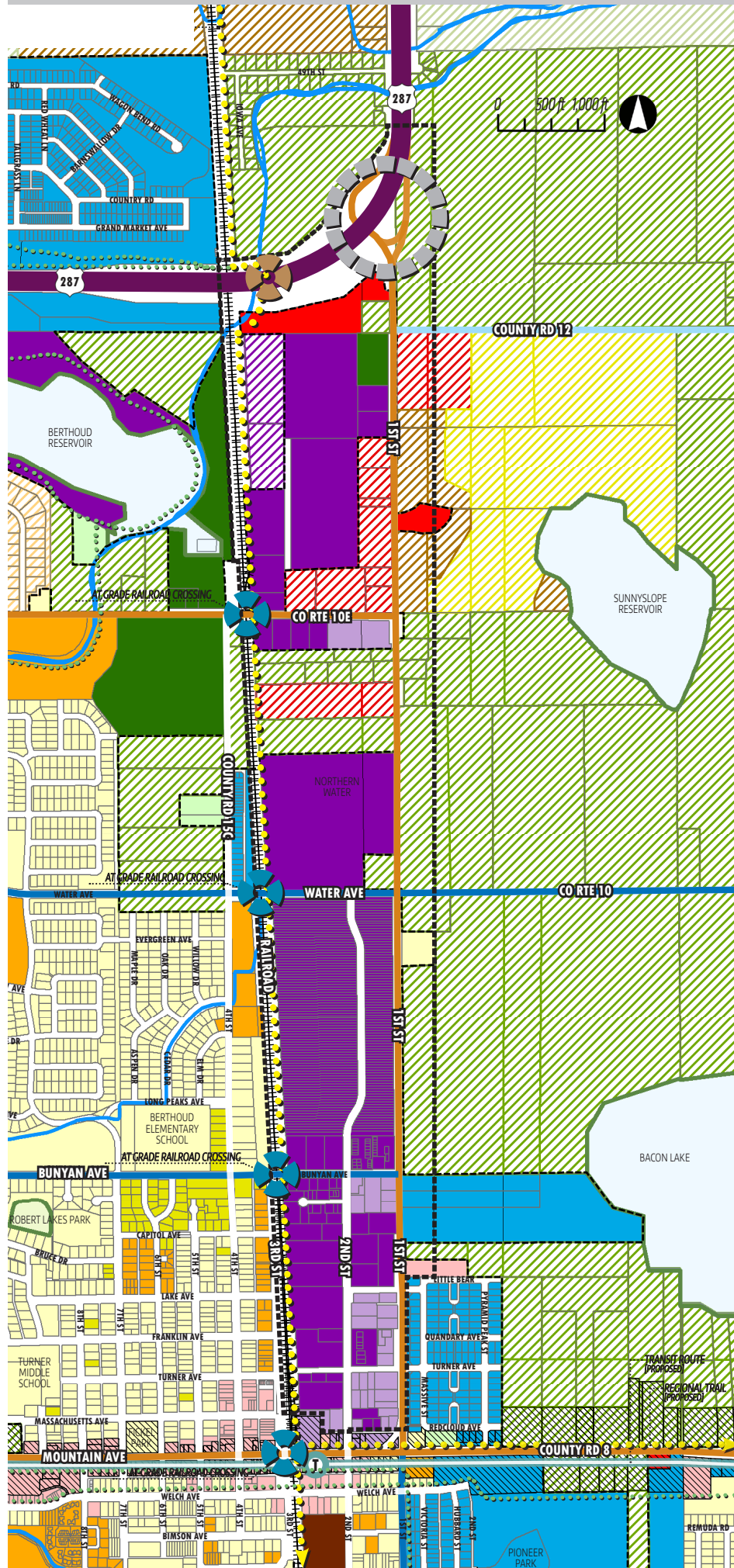
- Existing At-Grade Railroad Crossing
- Potential Trail Underpass
- Existing US 287 Partial Interchange
- Potential Local Trail
- Potential Regional Trail
- Potential Transit Route

ROADWAY CLASSIFICATION HIERARCHY

PER THE 2021 BERTHOUD COMPREHENSIVE PLAN

- Highway
- 4-Lane Arterial Road*
- 2-Lane Arterial Road
- Major Collector Road
- Minor Collector Road

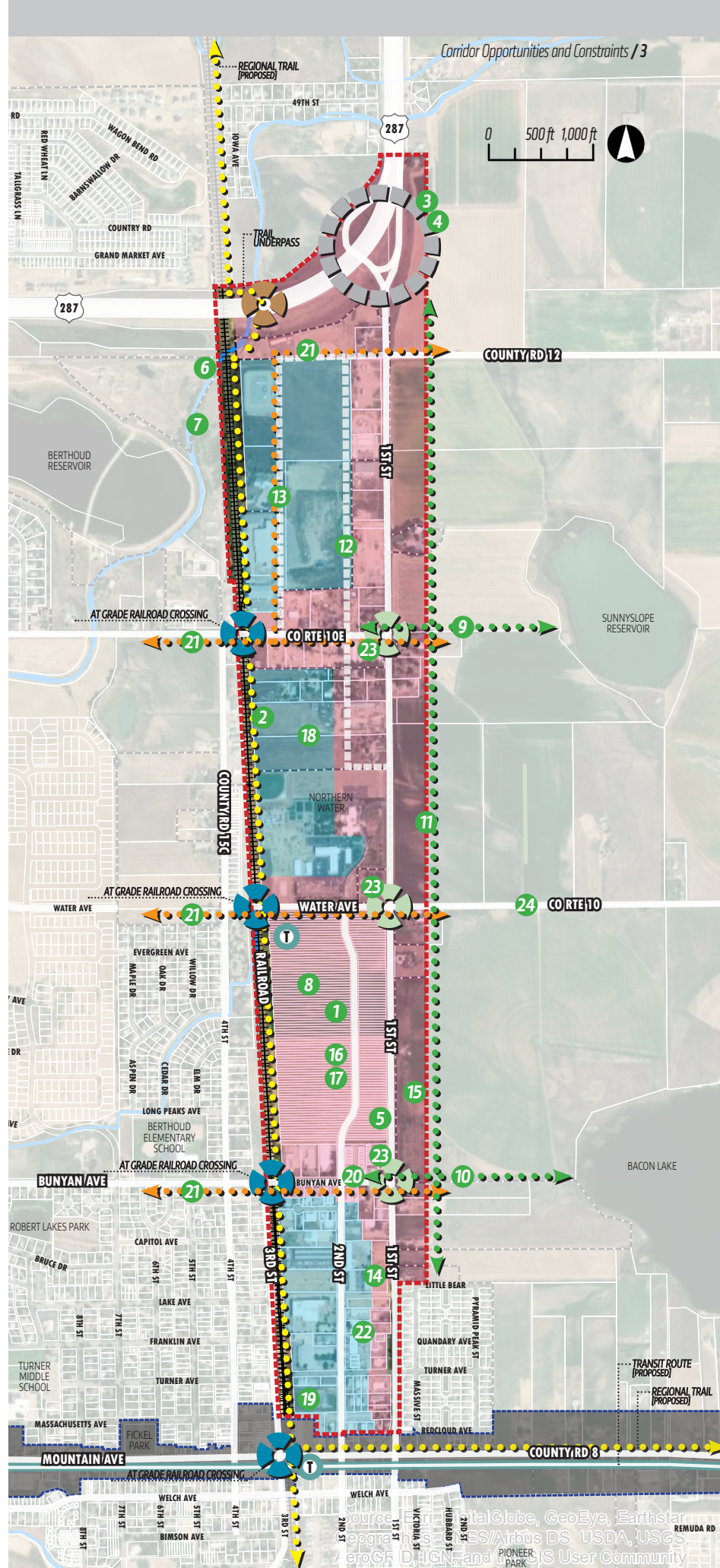
*The closest 4-lane arterial road is the northern end of Berthoud Parkway, which is located beyond the immediate Study Area to the west.



- Lower Visibility, Lesser Architectural Standards
- Higher Visibility, Higher Standards

- Existing At-Grade Railroad Crossing
- Potential Trail Underpass
- Existing US 287 Partial Interchange
- Potential for Enhanced Pedestrian Experience
- Potential for Improved Connectivity
- Potential Green Connection to Lake/Reservoir
- Potential Regional Trail
- Potential Transit Route
- Potential Transit Station

- 1 Mixed use or workforce housing w/ attainable rents
- 2 Regional trail parallel to railroad
- 3 Full interchange at US 287
- 4 Town gateway
- 5 Buffered on-street bike lanes on 1st St
- 6 Potential trail crossing across railroad
- 7 Town trail connecting to residential area
- 8 Potential for master planned live/work campus
- 9 Green connections to Sunnyslope Reservoir
- 10 Green connections to Bacon Lake
- 11 Greenway/linear park to serve as a method of transition between higher density urban residential and lower density suburban residential neighborhoods
- 12 2nd St extension
- 13 North/south connector using existing access road
- 14 Exemplar architecture along corridor (ex: Agile RF)
- 15 Landscaping to buffer future residential from roadway
- 16 Delineation of on- and off-street parking patterns
- 17 Design of consistent outdoor storage fencing standards
- 18 Incubator for light manufacturing w/ limited retail
- 19 Use of regional detention area for passive open space, which can be replicated on similar sites
- 20 Bunyan Ave as key east/west connector
- 21 Improvements along east/west connections
- 22 Use of industrial external building walls for public art
- 23 Enhanced pedestrian experience, transportation improvements, and building street orientation at major intersections along 1st St
- 24 LCR 10/WCR 46 could provide regional eastern connectivity and function as a parallel route to SH 56



Constraints Map

CHARACTER SUBAREAS

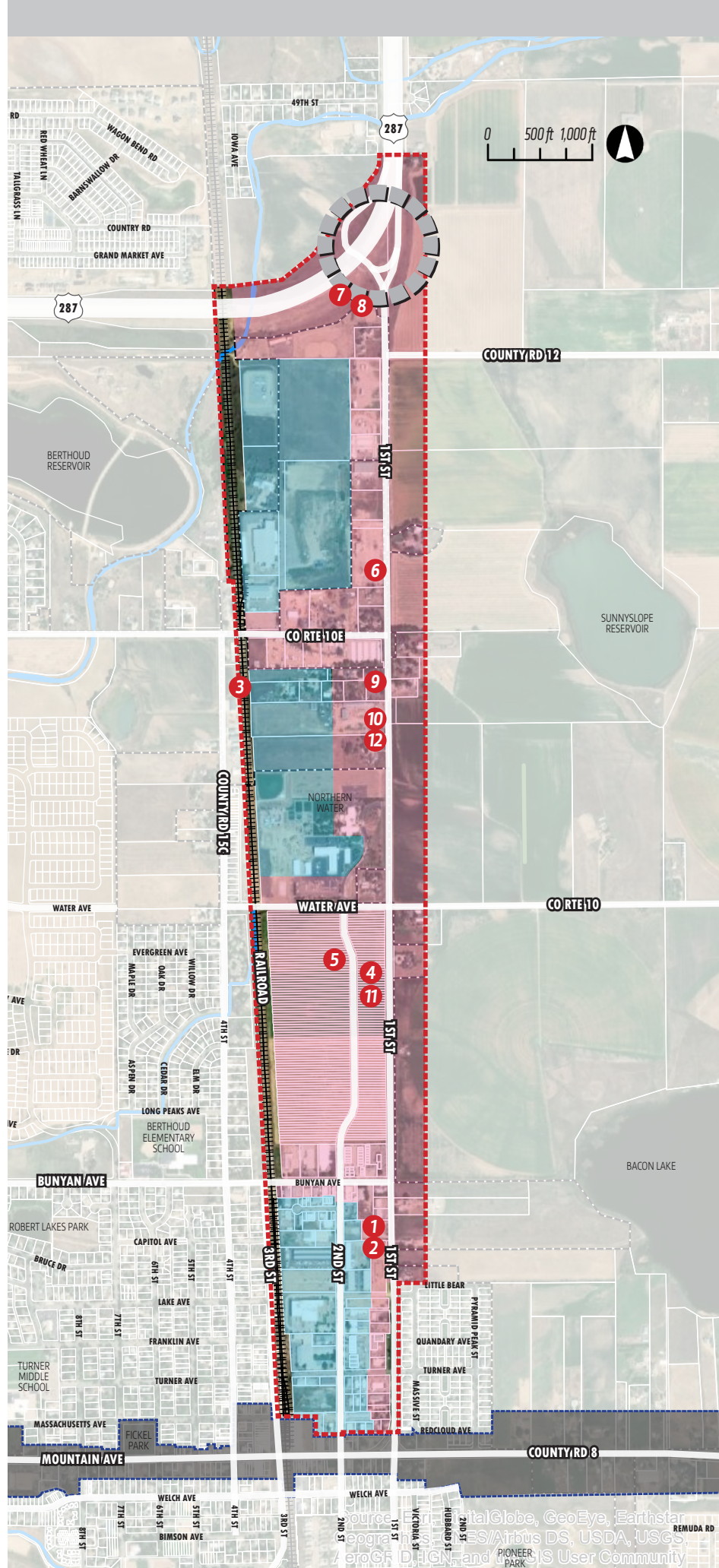
- Lower Visibility, Lesser Architectural Standards
- Higher Visibility, Higher Standards

TRANSPORTATION ELEMENTS

- Existing US 287 Partial Interchange

CONSTRAINTS

- Inconsistent multimodal infrastructure along 1st St
- Inconsistent parking orientation along 1st St
- Limited railroad crossings impact east/west circulation
- Sewer line at max capacity and need of upgrade
- Limited north/south connectivity
- Incomplete bike/pedestrian facilities
- Partial interchange limits access
- Large berms and challenging topography at US 287
- Overhead power lines
- Existing 80 ft ROW
- Limited ADA accessible infrastructure
- Frequent access points without turn lanes can create safety conflicts and make access management a challenge



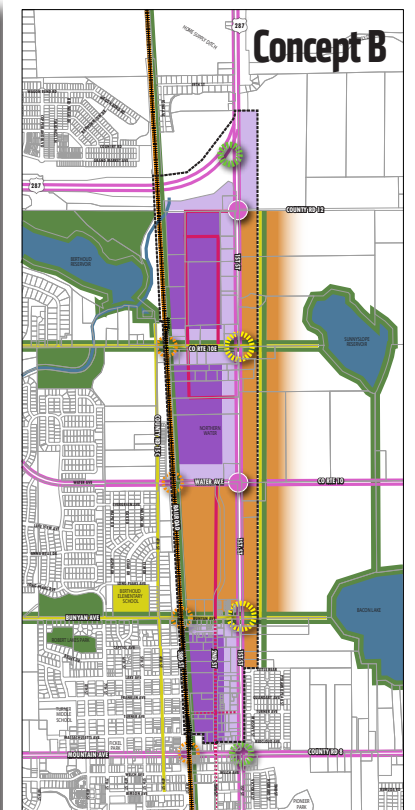
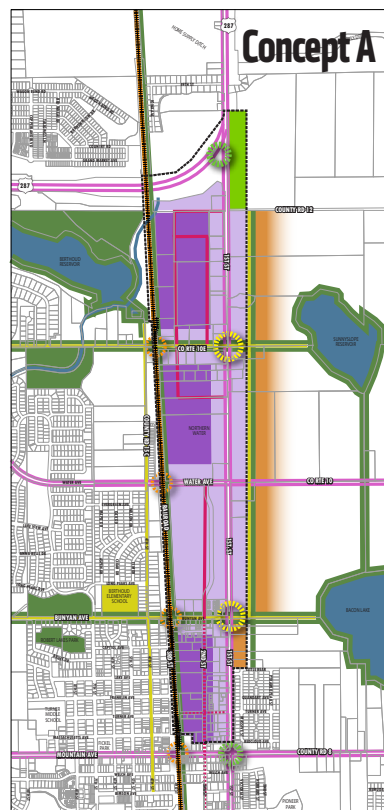


Alternative Plan Concepts

Based on community feedback from Public Workshop #1, two Modified Trends Concept Maps were created to translate the opportunities, constraints, and other existing trends. Concept A maximized the characterization of the 1st Street Corridor as an Innovation District, with industrial and mixed use emphasized as the central development trend. Concept B provided for a balanced development trend that builds upon Concept A by providing an increased secondary focus on urban residential uses to advance the corridor's housing component.

Concepts A and B and other related exhibits were shared at Public Workshop #2 to collect community feedback. The outcome from the workshop findings was a Preferred Concept Plan, including land use and transportation concepts, which are the focus of this chapter.

Concepts A and B are shown on the right, with full-page versions of both maps provided in the Appendix.



Preferred Corridor Plan

MODIFIED TREND ELEMENTS

-  Town Gateway
-  Enhanced Multimodal Intersection
-  Railroad Crossing with Enhanced Multimodal Crossings
-  Green Edge/Park/Open Space
-  Roadway with Multimodal Priority
-  Roadway with Pedestrian and Bike Modal Priority
-  Potential Local Street
-  Existing Local Street
-  Railroad
-  Potential Local Trail
-  Potential Regional Trail
-  Potential Transit Route
-  Innovation District [LOWER VISIBILITY]
-  Innovation District [HIGHER VISIBILITY]
-  Urban Residential
-  Agriculture

GENERAL MAP ELEMENTS

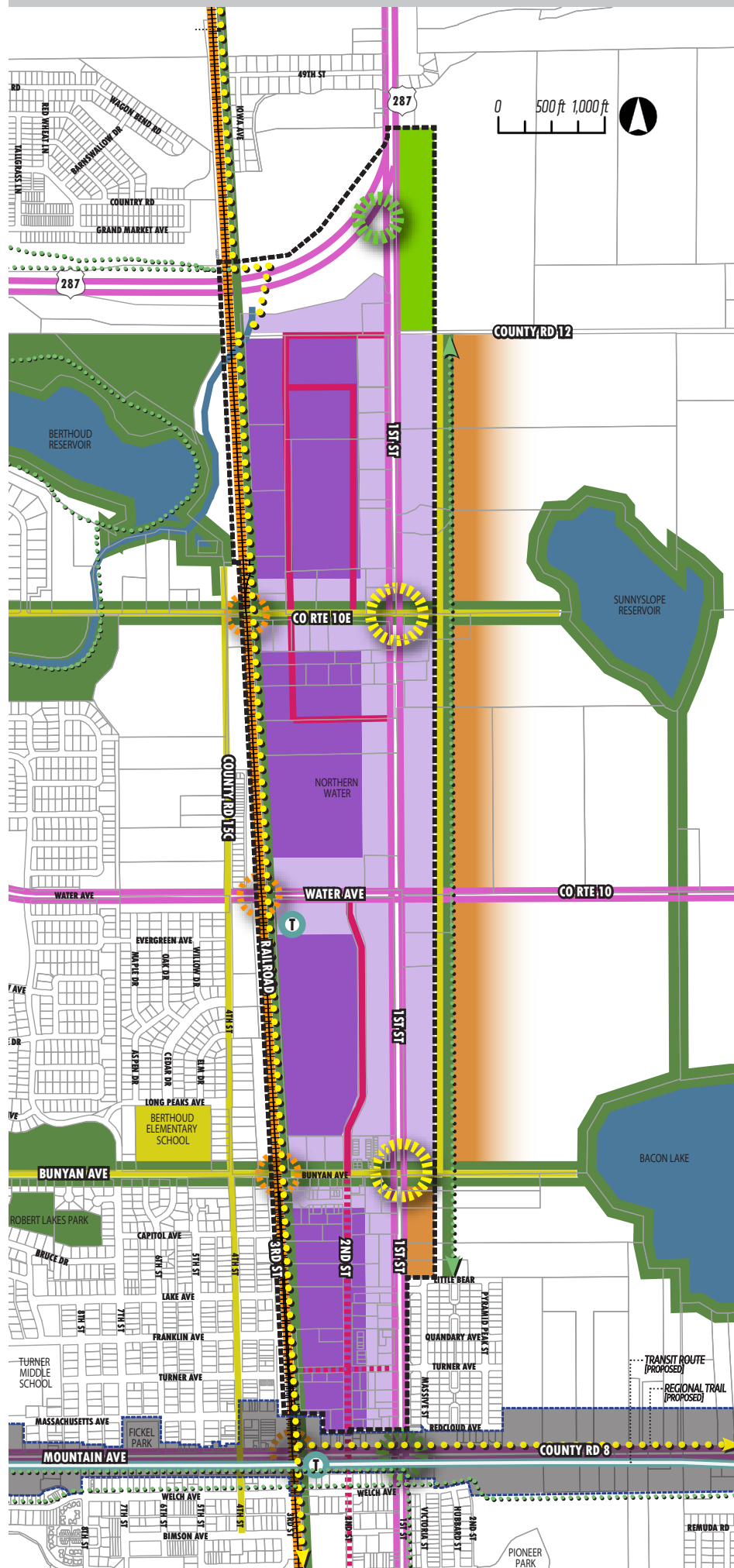
-  Corridor Study Area Boundary
-  Mountain Avenue Corridor

HIGHER & LOWER VISIBILITY AREAS

Higher and Lower Visibility Areas will have differing design standards. They will be designated within the approved corridor plan and determine the standards and requirements of the built environment.

Higher Visibility Areas are defined within 300 feet of the centerline of 1st Street, Bunyan Avenue, Water Avenue, CR10, CR10E, and CR12. Architectural Design Guidelines for Higher Visibility Areas generally intend to preserve areas of the corridor to meet a higher standard of design details and material selection. They also allow for better quality design product along visible corridors where built environment most affects pedestrian and vehicular traffic.

Lower Visibility Areas preserve the ability for small businesses to enter the market and compete at lower cost. Architectural Design Guidelines for Lower Visibility Areas generally intend to preserve areas of existing uses and promote development of future affordability within the corridor. Architecture in this area will have less stringent requirements for design and materials.



LAND USE CONCEPTS

Higher Visibility Areas

As shown on the Preferred Corridor Plan, higher visibility areas are generally located along the east and west sides of 1st Street (only the west side south of Bunyan Avenue), as well as along major east/west streets like Route 10E, Water Avenue, and Bunyan Avenue.

The preferred land uses for the Innovation District are described in detail on the Future Land Use Map on page 4. In general, the Innovation District will support existing technical businesses and production uses and incorporate emerging commercial and light industrial uses that focus on research and development (R&D), technology, startups, makerspaces, and other related uses.

In terms of architecture and form, the built environment within the higher visibility innovation areas of the 1st Street Corridor should provide opportunities for craftsmanship, ornament, proportions, and decoration that are consistent with the local industrial vernacular of the corridor area. Architecture should follow the approved Berthoud Architectural Design Guidelines for the Urban Industrial/Innovation Character District (see page 21 for details).

The precedent images below are representative of the architecture and site design anticipated for the higher visibility innovation areas.

PRECEDENT IMAGES: HIGHER VISIBILITY NON-RESIDENTIAL USES



LAND USE CONCEPTS

Lower Visibility Areas

As shown on the Preferred Corridor Plan, lower visibility areas are generally located along the western edge of the corridor, particularly along the railroad and away from major streets like 1st Street, Bunyan Avenue, and Water Avenue. Specific areas marked for lower visibility areas are located north and south of Route 10E and north and south of Bunyan Avenue.

The preferred land uses for the Innovation District are described in detail on the Future Land Use Map on page 4. In general, the Innovation District will support existing technical businesses and production uses and incorporate emerging commercial and light industrial uses that focus on research and development (R&D), technology, startups, makerspaces, and other related uses.

Regarding architecture and form, the built environment within the lower visibility innovation areas should provide economic and creative opportunities for ornament and decoration. Architecture should follow the approved Berthoud Architectural Design Guidelines for the Urban Industrial/Innovation Character District (see page 21 for details). However, leniency may be granted to properties with requirements affecting the ability to preserve existing and future affordability within the corridor.

The precedent images below are representative of the architecture and site design anticipated for the lower visibility innovation areas.

PRECEDENT IMAGES: LOWER VISIBILITY NON-RESIDENTIAL USES



LAND USE CONCEPTS

Mixed Use Areas

As shown on the Preferred Corridor Plan, mixed use areas may generally be located within both the higher and lower visibility areas of the Innovation District, which encompasses a majority of the 1st Street Corridor.

In addition to supporting existing technical businesses and production uses and integrating emerging commercial and light industrial uses, the Innovation District may also include residential uses on upper levels and other elements like parks and open space. This mixed use character would further enhance the attraction of the Innovation District as a place for residents, workers, students, creators, and others seeking a unique spot in town.

Mixed use building types should follow the approved Berthoud Architectural Design Guidelines for the Urban Downtown Character District (see page 21 for details). However, leniency may be granted for properties with requirements affecting the ability to preserve existing and future affordability within the corridor.

The precedent images below are representative of the architecture and site design anticipated for mixed use areas.

PRECEDENT IMAGES: MIXED USE AREAS



LAND USE CONCEPTS

Residential Areas

As shown on the Preferred Corridor Plan Map, residential areas may occur in either mixed use areas or neighborhoods with a mix of housing types. Mixed use areas may be located within both the higher and lower visibility areas of the Innovation District. Neighborhoods characterized as Urban Residential, which are located primarily east of 1st Street, may offer a diverse housing stock, including detached and attached single-family homes, townhomes, multi-family options, and affordable housing units.

Residential units may be provided on upper levels in mixed use buildings in the Innovation District. Urban Residential areas may include a mix of housing types, including single-family detached and attached homes, townhomes, and multifamily options. These neighborhoods will also incorporate affordable housing options where possible.

Residential architecture should follow the approved Berthoud Architectural Design Guidelines for the Urban Residential Character District (see page 21 for details).

The precedent images below are representative of the architecture and site design anticipated for residential areas.

PRECEDENT IMAGES: URBAN RESIDENTIAL AREAS



Architectural & Site Design Concepts

Based on guidance from Berthoud's 2021 Comprehensive Plan, the **2021 Architectural Design Guidelines** summarize specific design standards for architecture in the Town's various Character Districts, including the Innovation District and Urban Residential that define the 1st Street Corridor. As developers and builders propose new development along 1st Street, they are encouraged to consult the 2021 Architectural Design Guidelines for standards regarding the elements listed on the right.

Excerpts from the Architectural Design Guidelines are provided below for the Innovation District and Urban Residential Character Districts.

 **PDF Link:** 2021 Architectural Design Guidelines

General Urban Areas

URBAN INDUSTRIAL

ARCHITECTURAL DESIGN GUIDELINES



DESIGN ELEMENTS

- Site Design
- Landscaping and Screening
- Building Design

Urban Center

URBAN DOWNTOWN

ARCHITECTURAL DESIGN GUIDELINES



DESIGN ELEMENTS

- Site Planning
- Pedestrian Areas and Parking
- Scale and Massing
- Architectural Detail
- Screening
- Landscaping
- Signage
- Lighting

General Urban Areas

URBAN RESIDENTIAL

ARCHITECTURAL DESIGN GUIDELINES



DESIGN ELEMENTS

- Site Design
- Scale and Massing
- Architecture Character
- Materials and Color
- Parking and Circulation
- Roof Design
- Façade and Fenestration
- Fencing and Landscaping



Transportation Concepts

STREET TYPES & MODAL PRIORITIES

- Roadway with Multimodal Priority
- Roadway with Pedestrian and Bike Modal Priority
- Potential Local Street
- Existing Local Street

The 1st Street Corridor is intended to provide a multimodal environment that enables pedestrians, bicyclists, transit riders, and motorists to safely move to, from, and around the corridor. While the overall transportation network provides access and facilities for all modes of transport, modal priority varies as categorized below.

- **Vehicle Modal Priority:** US 287, 1st Street, Water Avenue/Route 10
- **Pedestrian & Bike Modal Priority:** Route 10E, Bunyan Avenue, potential linear park along east side of 1st Street

A set of local commercial streets are proposed west of 1st Street, including a few existing streets like 2nd Street, Turner Avenue, and Clayton Place.

TRAILS

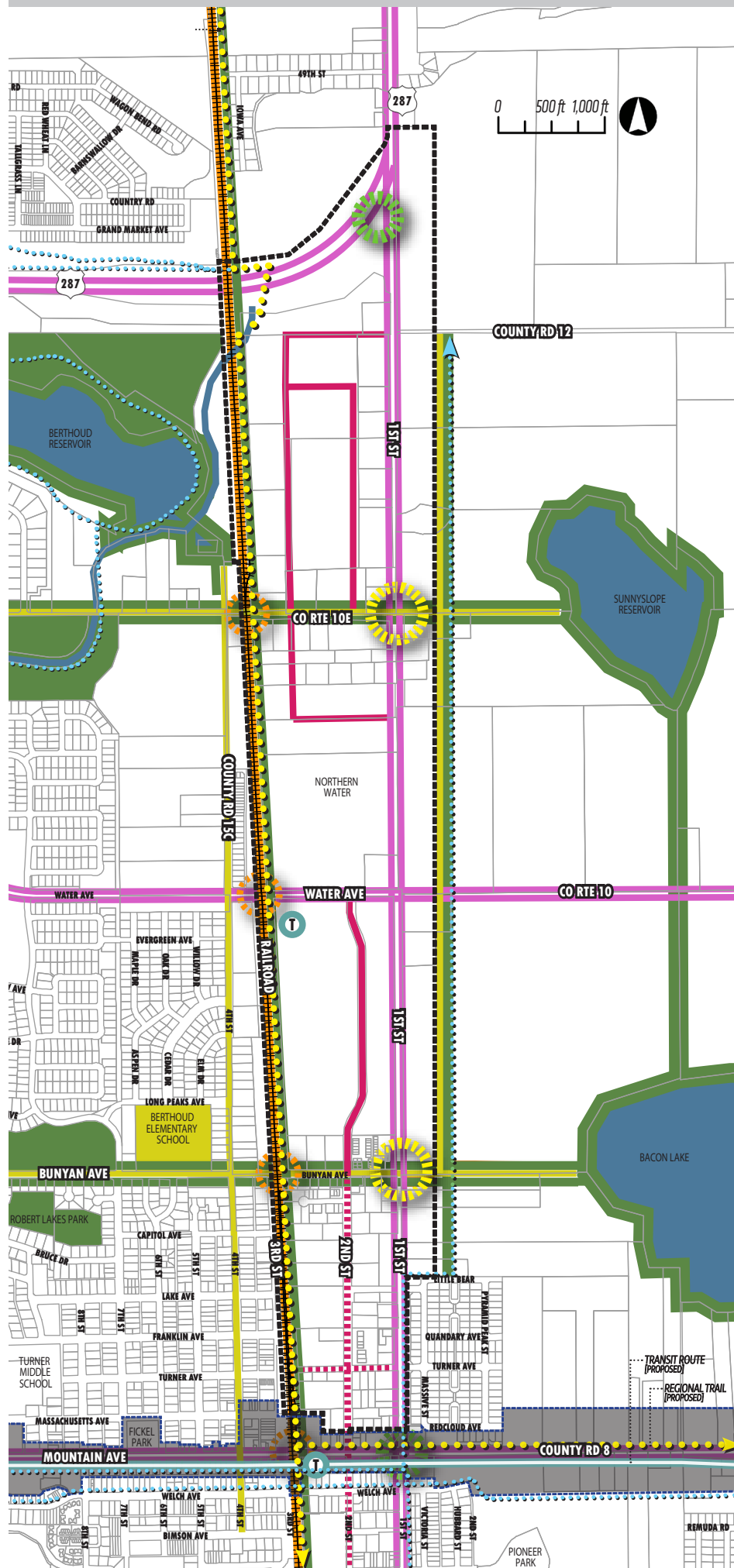
- Potential Local Trail
- Potential Regional Trail

One of the primary transportation action items from the 2021 Comprehensive Plan is to complete regional trail connections, as promoted in NFRMPO's 2021 Regional Active Transportation Plan. Potential regional trails are recommended along the railroad and Mountain Avenue/SH 56. The Regional Active Transportation (RATC) Network recommends a north/south trail along the BNSF railroad connecting Berthoud to Fort Collins (through Loveland). This regional trail would provide connections to the Little Thompson River trail, proposed to follow the Little Thompson River south of Mountain Avenue. Potential local trails are suggested in new developments, along Mountain Avenue, and around reservoirs. The recommended linear park on the east side of 1st Street may also provide trail-like access and mobility for pedestrians and bicyclists.

TRANSIT

- Potential Transit Route

The 2021 Comprehensive Plan carries forward the North I-25 Environmental Impact Statement (EIS) recommendation for a transit route along Mountain Avenue (SH 56). This route is intended to connect the Mobility Hub at I-25 to downtown Berthoud and the potential/future Passenger Rail Station. The Town is currently exploring transit service options, such as micromobility, to best meet the Town's mobility needs. Current BATS service is available along 1st Street and in the Innovation District. Any new service would also be available to this area.



Transportation Concepts

KEY EAST/WEST CONNECTORS

Bunyan Ave, Water Ave (CR10), CR10E, CR 12

Key east/west streets connect neighborhoods, community destinations, and the Innovation District. These streets should include one vehicular travel lane in each direction and prioritize the movement of bicyclists and pedestrians via enhanced multimodal facilities. Special consideration should be given to railroad crossings and the intersections of 1st Street. Intersections are focal points of crossing activity and are a critical part of the corridor. The intersections of 1st Street and CR 10E and Bunyan Avenue should be designed to prioritize the safe movement of pedestrians and bicyclists. These intersections should facilitate visibility and predictability for all users, creating an environment in which crossings feel safe, easy, and intuitive.

TRUCK ROUTES

Public feedback indicates the need to maintain and/or enhance truck and freight access to/from industrial properties. A preferred truck route and truck specific improvements (e.g., wider turning lanes) may be recommended.

PARKING

Private Parking: Private parking should be tucked behind or between buildings to minimize the visibility from public streets. Residential parking spaces should be accessed from alleyways.

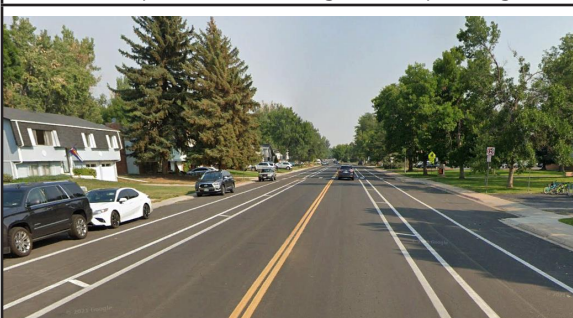
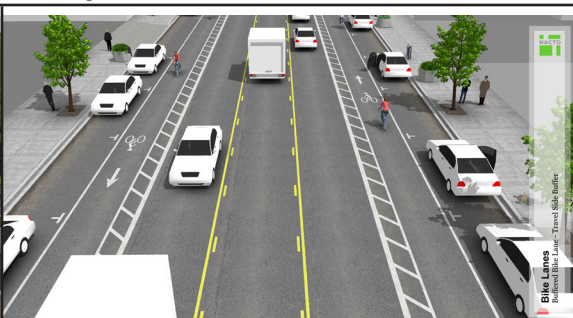
On-Street Public Parking: Parking is not recommended on 1st Street. However, public on-street parallel parking is permissible on local and collector streets, and is recommended to support adjacent commercial and mixed use land uses, such as in the Innovation District.

Local Streets: Where possible, unmetered parallel parking should be provided on both sides of local streets. The existing informal pull-in parking area should be formalized as parallel parking for consistency.

Truck Parking: There may be potential opportunities for truck parking within the Innovation District.

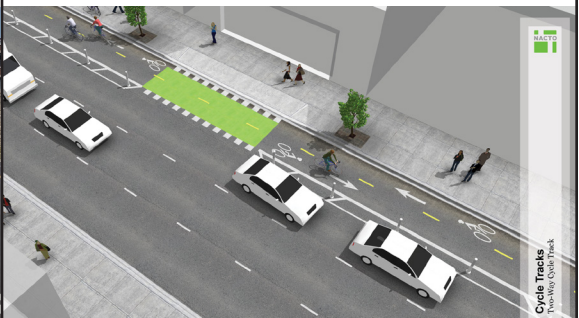
BIKE FACILITIES CONSIDERATIONS

Bicycle facilities are recommended on 1st Street, 4th Street, Bunyan Avenue, and CR 10E as these streets are key local and regional connectors to neighborhoods, community destinations, and the Innovation District. Bike lanes designate an exclusive space for bicyclists using a combination of pavement markings, signage, and/or separation. The appropriate bicycle facility type varies based on factors such as the average daily traffic (ADT) and the anticipated type(s) of cyclists using the facility. The table below informed the recommended facility type for the streets within the 1st Street Corridor Study Area.

Type	Typical Applications
Conventional Bike Lanes Conventional bike lanes designate an exclusive space for bicyclists using pavement markings and signage. Bike lanes enable bicyclists to ride at their preferred speed without interference from vehicular traffic. Bike lanes facilitate predictable behavior and movements between bicyclists and motorists.	Conventional bike lanes are typically on the right side of the street, between the adjacent travel lane and curb, road edge, or parking lane. Most helpful on streets with $\geq 3,000$ motor vehicle average daily traffic (ADT) and on streets with a posted speed ≥ 25 mph.   Source: Google Earth Location: Gate Way Park Blvd, Berthoud Source: NACTO; https://nacto.org/publication/urban-bikeway-design-guide/bike-lanes/conventional-bike-lanes/
Buffered Bike Lanes Buffered bike lanes are conventional bicycle lanes paired with a designated buffer space separating the bicycle lane from the adjacent motor vehicle travel lane and/or parking lane. Buffered bike lanes provide greater separation between motor vehicles and bicyclists.	Buffered bike lanes can be considered anywhere a standard bike lane is being considered and on streets with extra lanes or extra lane width. Most helpful on streets with higher travel speeds, higher ADT, and/or high amounts of truck traffic.   Source: Google Earth Location: Meadowlark Ave, Fort Collins Source: NACTO; https://nacto.org/publication/urban-bikeway-design-guide/bike-lanes/buffered-bike-lanes/

Transportation Concepts

BIKE FACILITIES CONSIDERATIONS [CONTINUED]

Type	Typical Applications
Cycle Tracks A cycle track is an exclusive bike facility that combines the user experience of a separated path with the on-street infrastructure of a conventional bike lane.	Most helpful on streets with parking lanes and on streets which bike lanes would cause many bicyclists to feel stress because of factors such as multiple lanes, high traffic volumes, high speed traffic, high demand for double parking, and high parking turnover. Features: A cycle track is physically separated from motor traffic and distinct from the sidewalk. Cycle tracks have different forms but all share common elements—they provide space that is intended to be exclusively or primarily used for bicycles, and are separated from motor vehicle travel lanes, parking lanes, and sidewalks. Cycle tracks may be one-way or two-way, and may be at street level, at sidewalk level, or at an intermediate level.
One Way Protected Cycle Tracks One-way protected cycle tracks are bikeways physically separated from the roadway allowing bicycle movement in one direction, typically the same direction as vehicular traffic.	Most applicable on streets with parking lanes and streets on which bike lanes would cause many bicyclists to feel stress because of factors such as multiple lanes, high traffic volumes, high speed traffic, high demand for double parking, and high parking turnover. Most helpful on streets with high bicycle volumes and streets with high ADT and speeds.  Source: Streetsblog Denver; https://denver.streetsblog.org/2017/08/31/eyes-on-the-street-the-14th-street-bike-lane-is-immediately-denvers-best/ Location: 14th St, Denver  Source: NACTO; https://nacto.org/publication/urban-bikeway-design-guide/cycle-tracks/one-way-protected-cycle-tracks/
Two Way Cycle Tracks Two-way cycle tracks (also known as on-street bike paths) are physically separated cycle tracks that allow bicycle movement in both directions on one side of the road. Two-way cycle tracks share some of the same design characteristics as one-way tracks but may require additional considerations at driveway and side-street crossings.	Most helpful on streets with few conflicts such as driveways or cross-streets on one side of the street. Also helpful on streets where more destinations are on one side thereby reducing the need to cross the street.  Source: BikeWalkKC; https://bikewalkkc.org/advocacy/gillham-corridor-complete-street-projects/ Location: Gillham Rd, Kansas City  Source: NACTO; https://nacto.org/publication/urban-bikeway-design-guide/cycle-tracks/one-way-protected-cycle-tracks/



CHAPTER 5

Corridor Character Transitions

Overview

Spanning approximately 2 miles, the 1st Street Corridor extends from the urbanized portions of Berthoud on the south to more rural areas northward. Even as the corridor manages development over time, the development expectations and supporting design guidelines seek to honor Berthoud's small town heritage and rural aesthetic.

Three specific corridor character transition areas are summarized below and described in this chapter.

1/ URBAN CHARACTER

Extending from Mountain Ave to Bunyan Ave

2/ TRANSITIONAL CHARACTER

Extending from Bunyan Ave to Water Ave

3/ RURAL CHARACTER

Extending from Water Ave to CR12/US 287



Urban Character

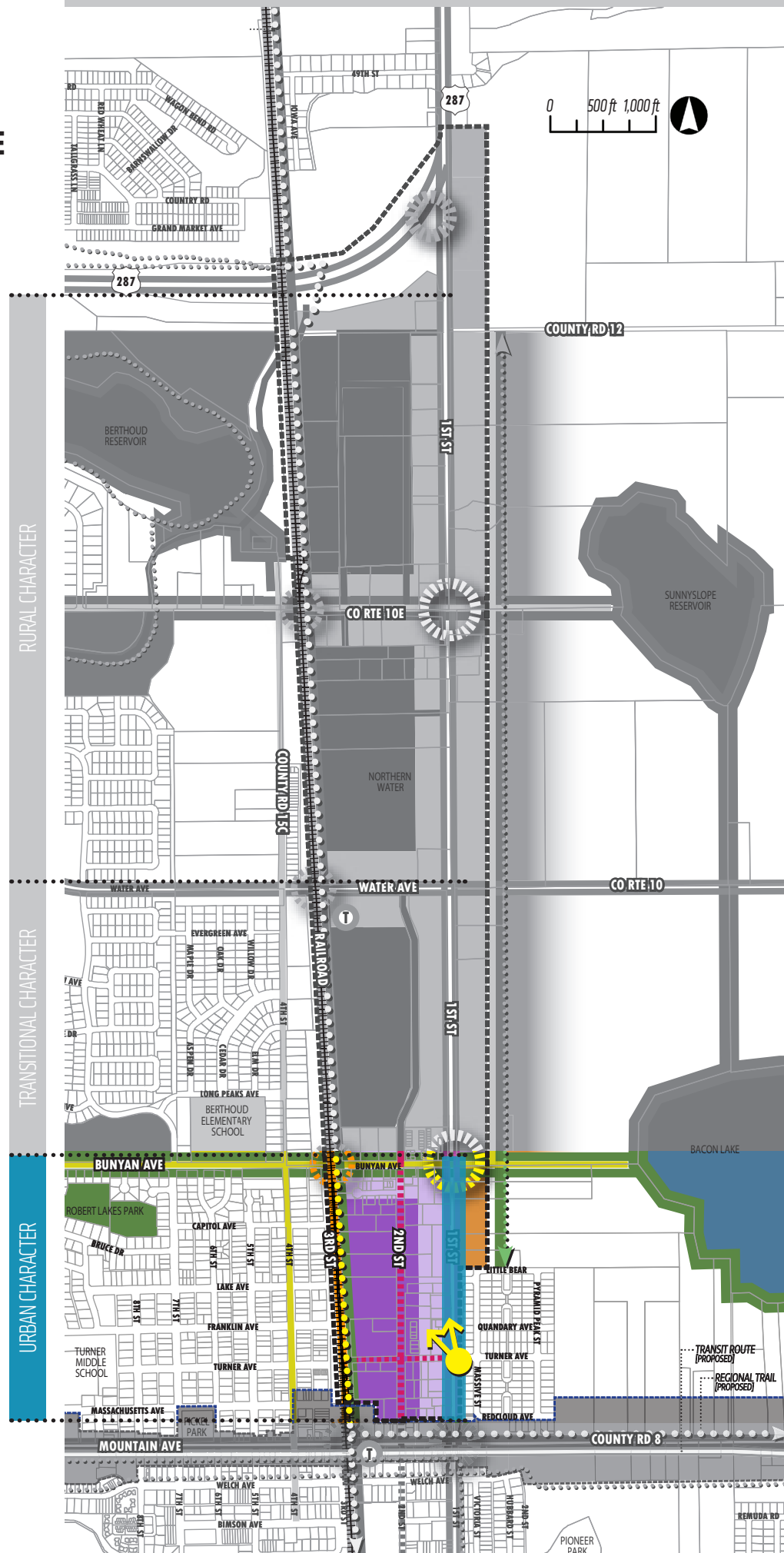
MOUNTAIN AVENUE TO BUNYAN AVENUE

CORRIDOR CHARACTER TRANSITION

This stretch of 1st Street transitions from a major arterial (Mountain Avenue) to a major collector (Bunyan Avenue). It also includes a range of uses on both sides of the corridor. A variety of existing technical businesses and production uses occupy the west side of 1st Street, while Peakview Meadows neighborhood is located on the east side.

KEY CONCEPTS

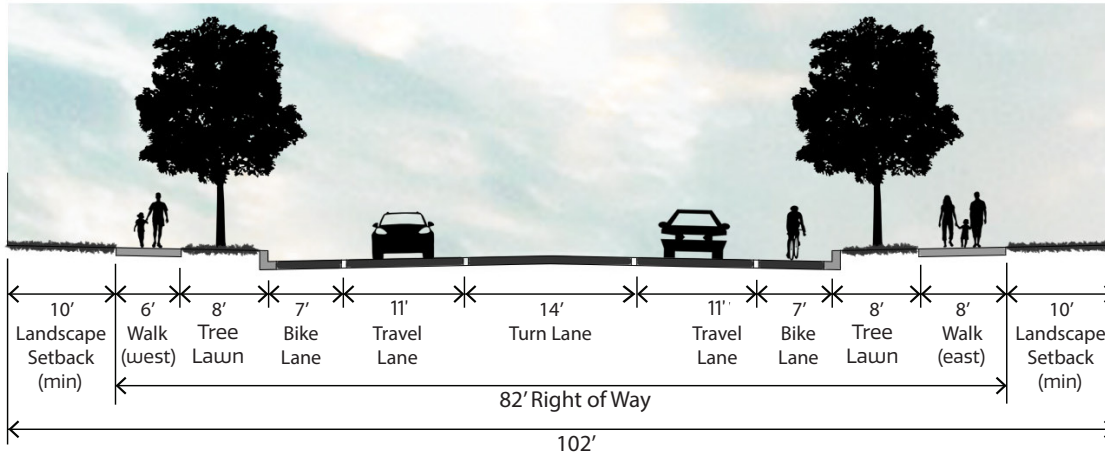
- Street, sidewalk, and right of way widths are reduced to limit impacts to existing adjacent developments and promote a more pedestrian-scale environment
- Left turn lanes maintain existing access (no raised medians)
- Buffered bike lanes on both sides of the street
- Detached sidewalks and street trees in tree lawns on both sides of the street
- Water saving landscape treatments are encouraged, where appropriate
- Increased architectural standards required when development occurs along higher visibility parcels adjacent to 1st Street
- Trees with seasonal interest are encouraged in medians and tree lawns to reinforce the Town's image as the Garden Spot. Trees with seasonal interest include flowering trees, trees with interesting leaf colors, and trees with vibrant fall color.
- Curb and gutter on both sides of the street



Urban Character

MOUNTAIN AVENUE TO BUNYAN AVENUE

CORRIDOR CHARACTER TRANSITION



Transitional Character

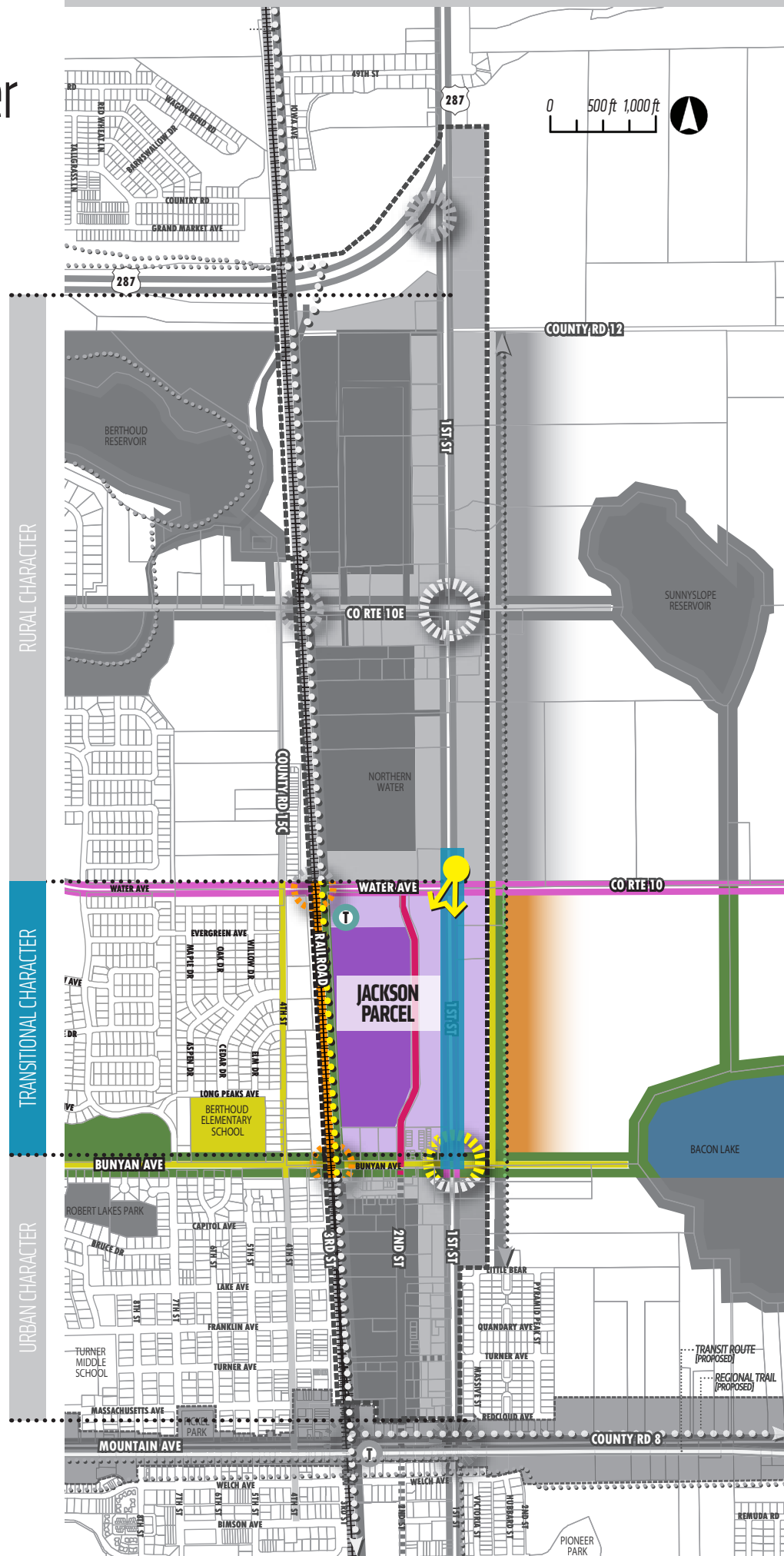
BUNYAN AVENUE TO WATER AVENUE

CORRIDOR CHARACTER TRANSITION

This stretch of 1st Street transitions from one major collector (Bunyan Avenue) to another (Water Avenue), which enables the segment to serve as transitional zone between an urban character to the south and a rural character to the north. The 80-acre Jackson Parcel, which is described in more detail on page 36, occupies a significant portion of this transitional zone. There are a few existing technical businesses and production uses along the north side of Bunyan Avenue.

KEY CONCEPTS

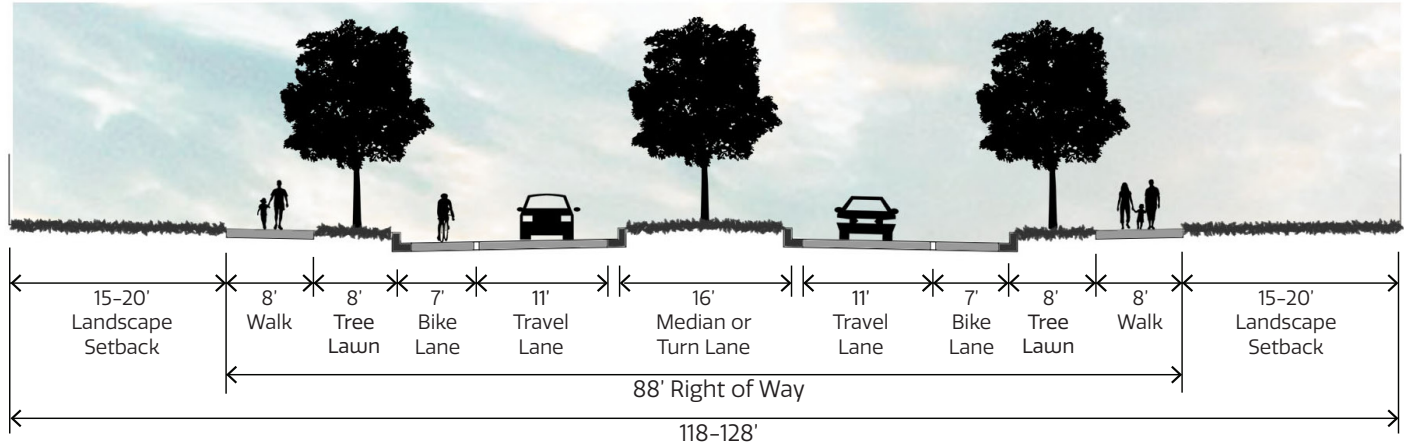
- Raised median with landscaping
- Buffered bike lanes on both sides of the street
- Detached sidewalks on both sides of the street
- Street trees in tree lawns on both sides of the street
- Water saving landscape concepts are encouraged, where appropriate
- Increased architectural standards required when development occurs along higher visibility parcels adjacent to 1st Street
- Trees with seasonal interest are encouraged in medians and tree lawns to reinforce the Town's image as the Garden Spot. Trees with seasonal interest include flowering trees, trees with interesting leaf colors, and trees with vibrant fall color.
- Curb and gutter and/or rural ditches
- Multimodal enhancements to facilitate safe pedestrian and bicyclist crossings at the intersection of 1st Street and Bunyan Avenue



Transitional Character

BUNYAN AVENUE TO WATER AVENUE

CORRIDOR CHARACTER TRANSITION



SOUTHWARD VIEW, PEDESTRIAN PERSPECTIVE



PRECEDENT IMAGES



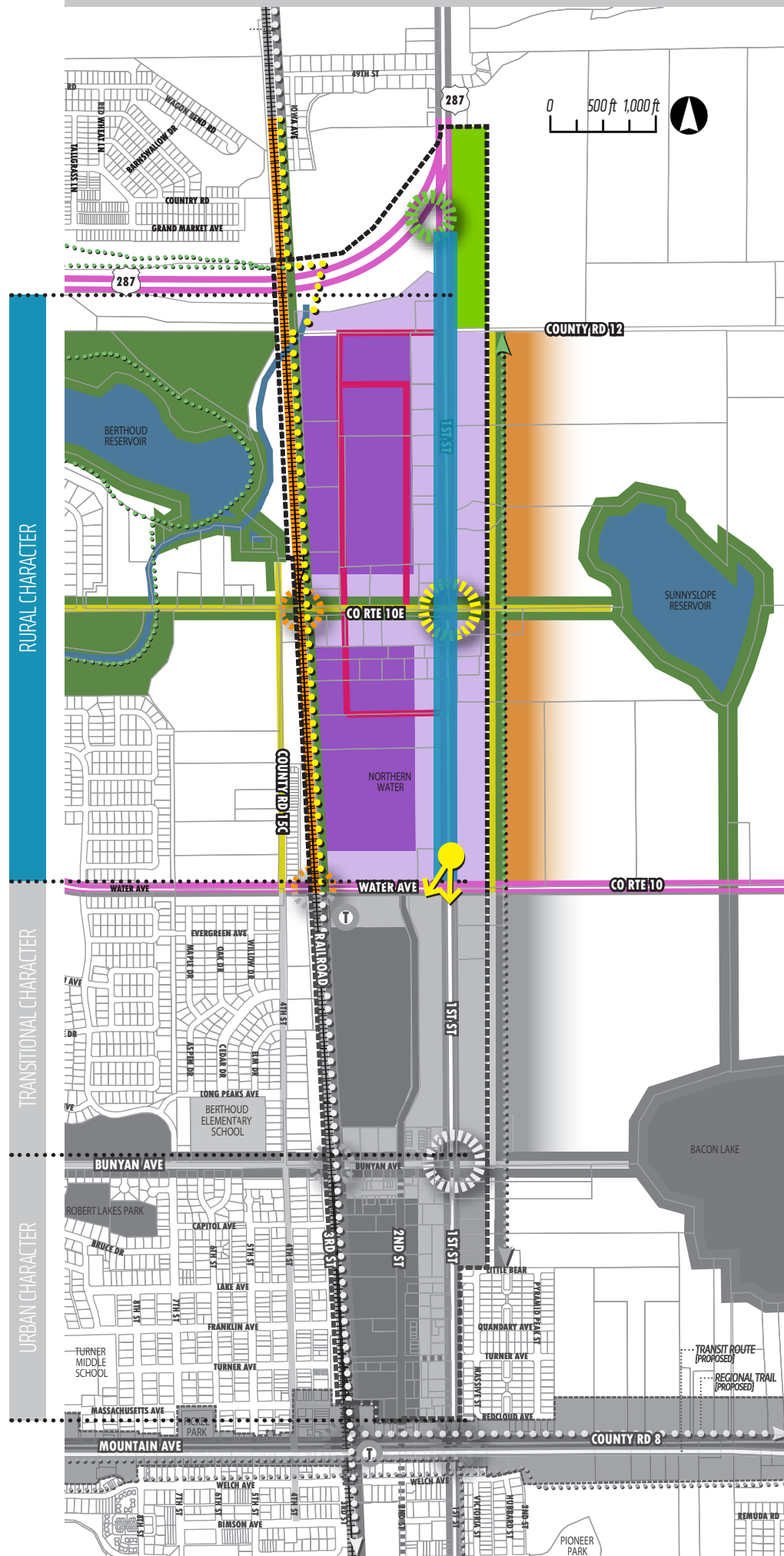
Rural Character

WATER AVENUE TO CR12/US 287 CORRIDOR CHARACTER TRANSITION

This stretch of 1st Street transitions from major collector (Water Avenue) to a minor collector (CR12) towards the US 287 interchange. The current character of this segment is predominantly rural in nature, particularly east of 1st Street. The west side includes a mix of existing technical businesses and production uses, including Northern Water's campus headquarters. A rural character is proposed for this segment, even as the corridor experiences new development.

KEY CONCEPTS

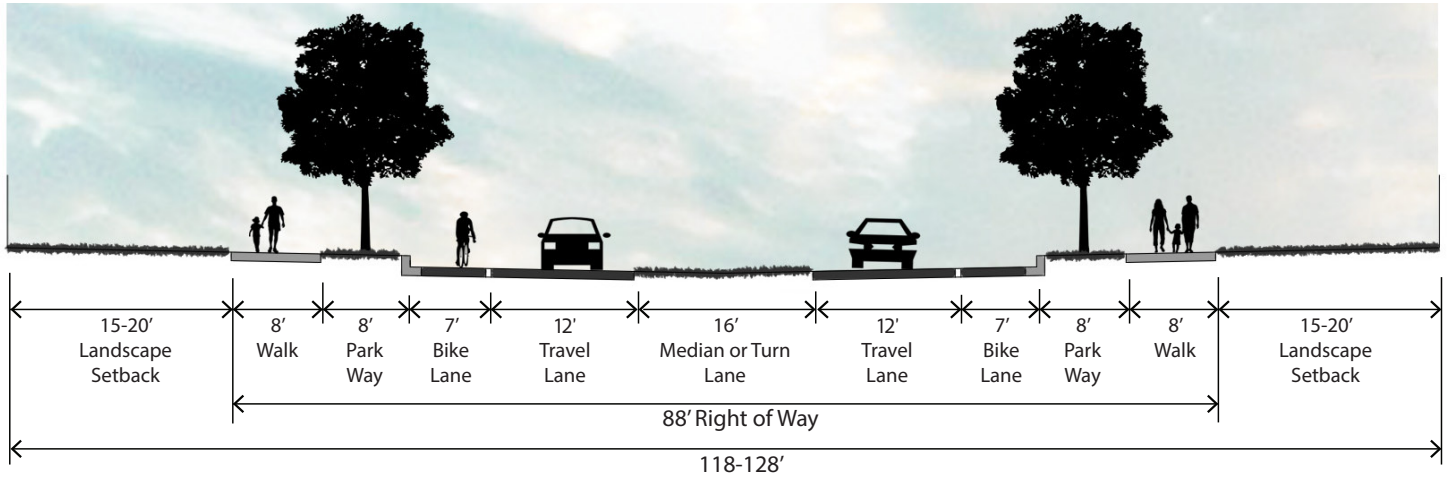
- Sparsely landscaped depressed median is more rural in character, as compared to raised median
- Buffered bike lanes on both sides of the street
- Detached sidewalks on both sides of the street
- Street trees in tree lawns on both sides of the street
- Water saving landscape concepts are encouraged, where appropriate
- Increased architectural standards when development occurs along the higher visibility parcels adjacent 1st Street and Bunyan Avenue
- Portions of tree lawn can be landscaped with water saving plants instead of bluegrass to build on Garden Spot image
- Trees with seasonal interest are encouraged in medians and tree lawns to reinforce the Town's image as the Garden Spot. Trees with seasonal interest include flowering trees, trees with interesting leaf colors, and trees with vibrant fall color.



Rural Character

WATER AVENUE TO CR12/US 287

CORRIDOR CHARACTER TRANSITION



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CHAPTER 6

Focus Areas

Overview

The land use, transportation, and urban design concepts cover the entirety of the 1st Street Corridor. This chapter highlights focus areas that will play significant roles in defining the character and development of the corridor:

1/ LINEAR PARK

A potential linear park that provides modal priority to pedestrians and bicyclists east of 1st Street.

2/ JACKSON PARCEL

The largest cohesive portion of land that will be integral to building up the Innovation District envisioned for the corridor.

3/ BUNYAN AVENUE

Major east/west connector that links the corridor to the rest of Berthoud to the west.

4/ INTERSECTIONS

Traditional and roundabout intersection treatments.

5/ US 287 INTERCHANGE

Potential conversion of the north end into a full interchange.



Focus Areas

The focus areas are shown on the map on the right. Bunyan Avenue intersects with the potential linear park and serves as the southern boundary of the Jackson parcel, which illustrates how the focus areas can influence each other.

LINEAR PARK

Potential park spans approximately 2 miles on the east side of 1st Street to provide modal priority to pedestrians and bicyclists parallel to the main corridor.

See page 35 for details

JACKSON PARCEL

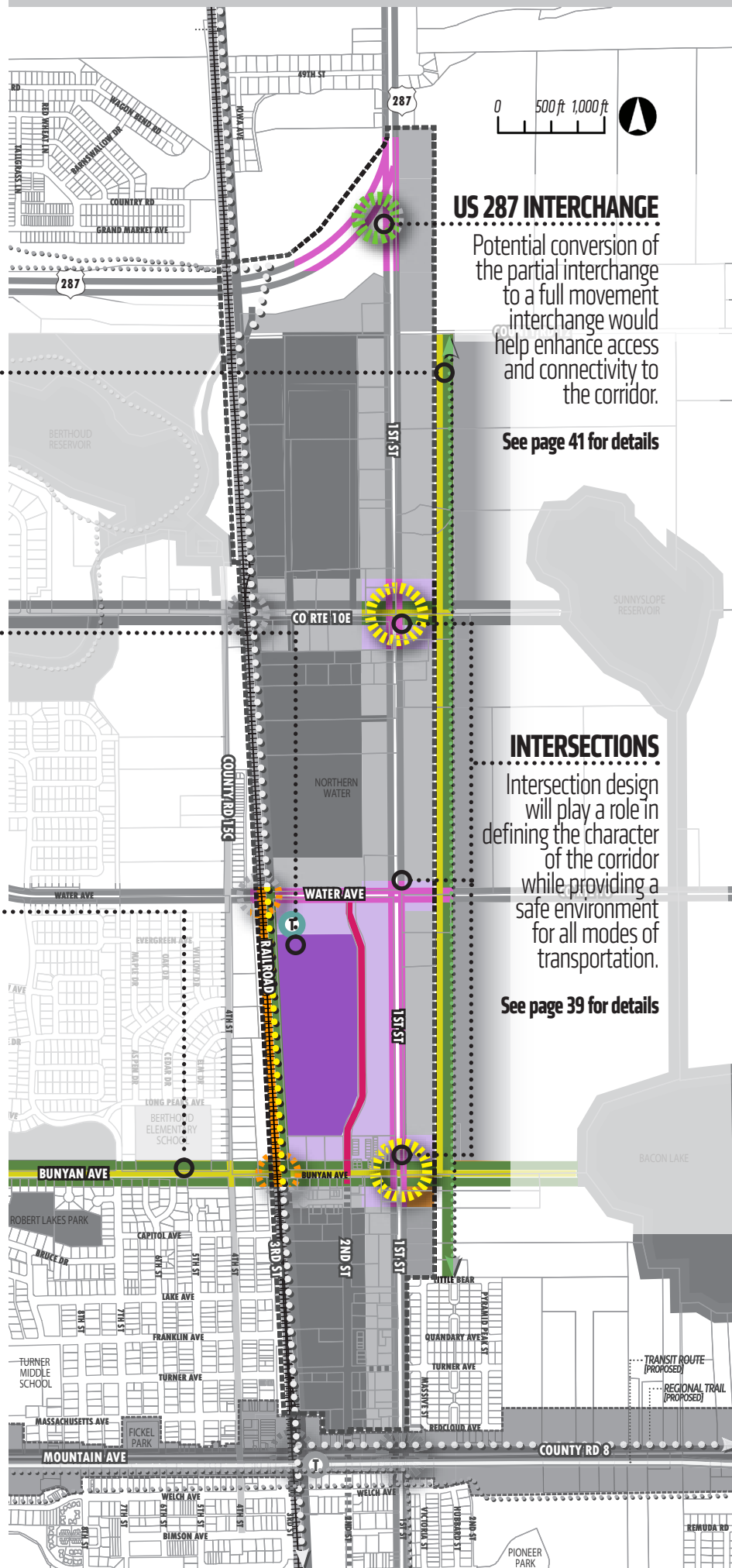
An approximately 80 acre property on the west side of 1st Street provides a unique opportunity to create a unified industrial/commercial mixed use district with options for housing, entertainment, and recreation.

See page 36 for details

BUNYAN AVE

Key east/west corridor serves as a parallel route to Mountain Avenue, linking the 1st Street Corridor to Berthoud's historic core, community destinations such as Berthoud Elementary School, Berthoud Recreation Center, Waggener Farm Park, and the Town's western growth area. A future eastern extension of Bunyan Avenue would also connect to Bacon Lake.

See page 37 for details



Linear Park

KEY CONCEPTS

- Linear park and trail extend from Peakview Meadows to CR12
- 120-foot wide park serves recreational and stormwater needs
- Uses in linear park will vary along its length
- Urban residential uses on east side front onto the park with parking behind
- Water saving landscape concepts are encouraged, where appropriate
- Increased architectural standards when development occurs along the higher visibility parcels adjacent Bunyan Avenue and the park
- Linear park will be bordered by higher visibility innovation uses on the west and urban residential on the east



NORTHWARD VIEW, AERIAL PERSPECTIVE



PRECEDENT IMAGES



Jackson Parcel

The Jackson Parcel is zoned industrial and proposed uses will include industrial innovation uses. Increased architectural standards are required for parcels with higher visibility, i.e., adjacent to 1st Street, Water Avenue, and Bunyan Avenue. Lesser architectural standards will be required for parcels with lower visibility, including those on the western side of the property by the railroad.

KEY CONCEPTS

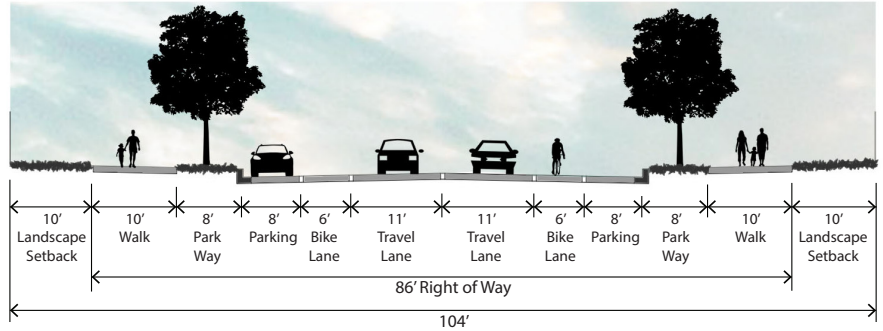
- Green edge and streetscape are important around perimeter of parcel
- Buildings front along 1st Street, 2nd Street, Water Avenue, and Bunyan Avenue to create a more pedestrian-friendly streetscape
- Increased level of walkability and bikeability
- Green space serves dual purpose (detention and gathering space)
- 1 to 2 story buildings adjacent to 1st Street, Water Avenue, and Bunyan Avenue
- Up to 3 story buildings in internal parcels
- Architectural character will be similar to the precedent images
- Parking areas are tucked behind and between buildings



Bunyan Avenue | WEST OF 1ST STREET

KEY CONCEPTS

- Buffered bike lanes on both sides of the street
- Parallel parking on both sides of the street
- Detached sidewalks on both sides of the street
- Street trees in tree lawns on both sides of the street
- Water saving landscape concepts are encouraged, where appropriate
- Increased architectural standards required when development occurs along higher visibility parcels adjacent to Bunyan Avenue



WESTWARD VIEW, PEDESTRIAN PERSPECTIVE

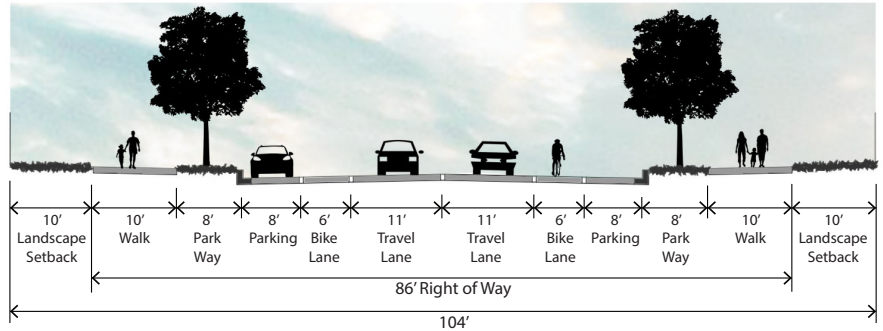


PRECEDENT IMAGES

Bunyan Avenue | EAST OF 1ST STREET

KEY CONCEPTS

- Strong visual and physical connection to Bacon Lake
- Buffered bike lanes on both sides of the street
- Parallel parking on both sides of the street
- Detached sidewalks on both sides of the street
- Street trees in tree lawns on both sides of the street
- Water saving landscape concepts are encouraged, where appropriate
- Increased architectural standards required when development occurs along higher visibility parcels adjacent to Bunyan Avenue and the park
- Linear park in the midground is bordered by higher visibility innovation uses on the west and urban residential on the east



EASTWARD VIEW, AERIAL PERSPECTIVE



PRECEDENT IMAGES



Intersections

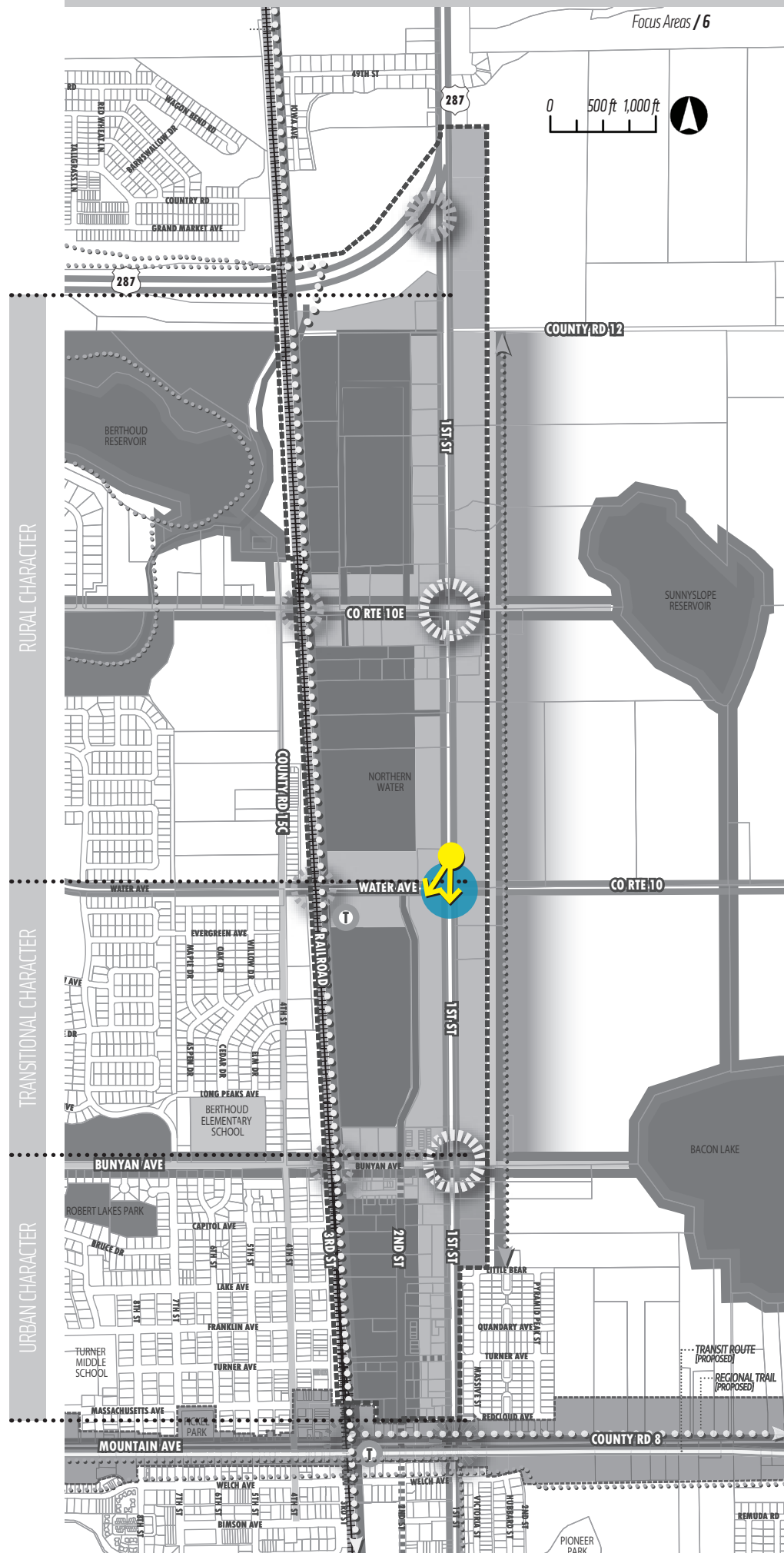
TRADITIONAL VS ROUNDABOUTS

Intersection treatments can add character to the 1st Street Corridor while also providing modal priority in a safe and appropriate manner. For example, a roundabout may be the more appropriate intersection treatment to transition from one district to another, to create a gateway, and to slow vehicular traffic.

Even though it is just outside the Study Area, the 1st Street intersection at Mountain Avenue presently has a roundabout. All other intersections along 1st Street each currently have a traditional design. However, a roundabout could be introduced at certain intersections along 1st Street, such as the Water Avenue intersection as marked on the map on the right.

KEY CONCEPTS

- Roundabouts could be used at intersections with higher vehicular priority
- At the roundabout, bikes have the option to merge on to sidewalks or share travel lanes with cars
- Center island could be a gateway and reinforce the Town's garden spot image
- Water saving landscape concepts are encouraged, where appropriate
- Roundabout will be sized appropriately to accommodate truck traffic
- Roundabouts require more space than traditional intersections and is anticipated to have a greater impact on adjacent properties



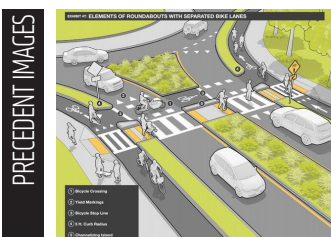
Intersections

TRADITIONAL VS ROUNDABOUTS

TRADITIONAL INTERSECTION: SOUTHWARD VIEW, PEDESTRIAN PERSPECTIVE



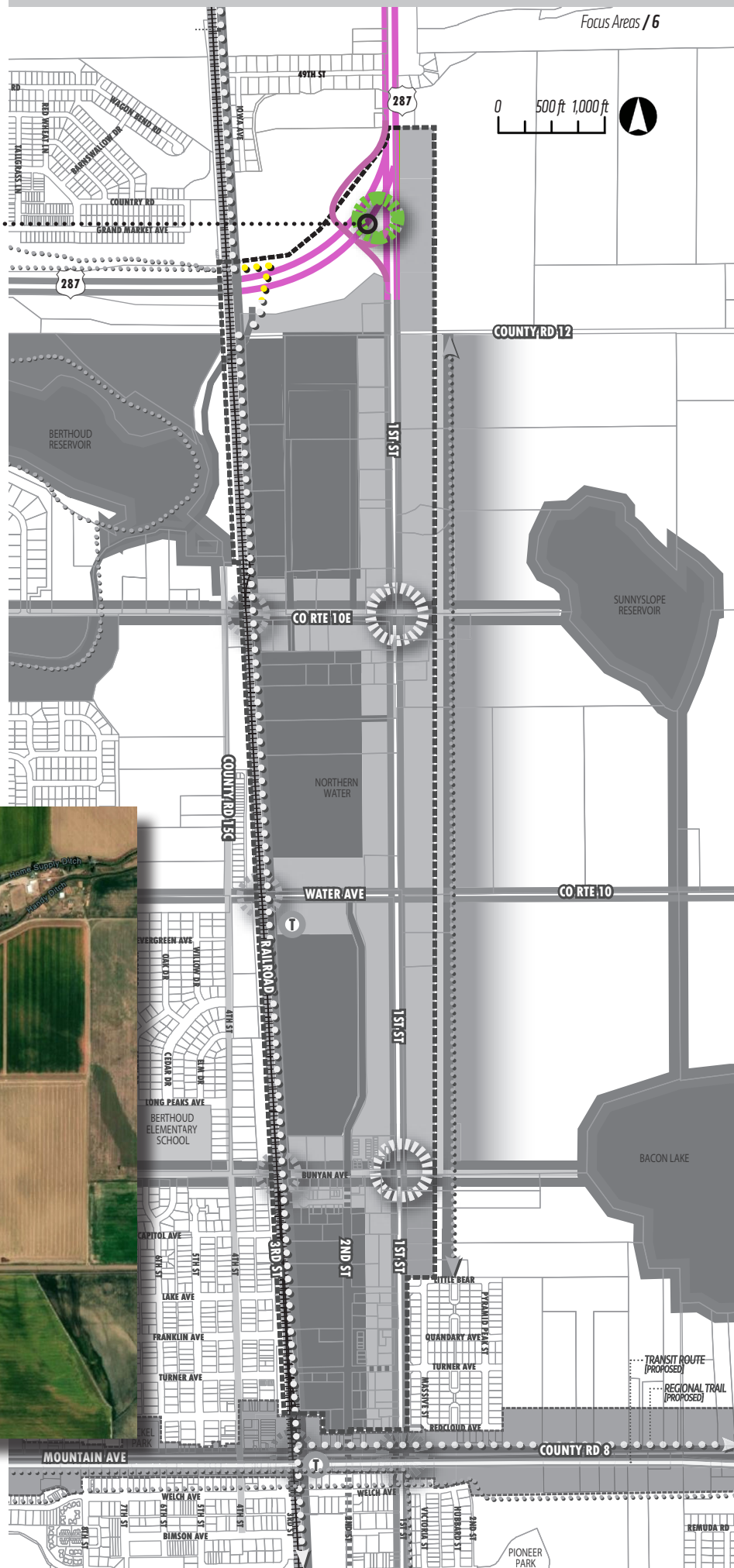
ROUNDABOUT INTERSECTION: SOUTHWARD VIEW, PEDESTRIAN PERSPECTIVE



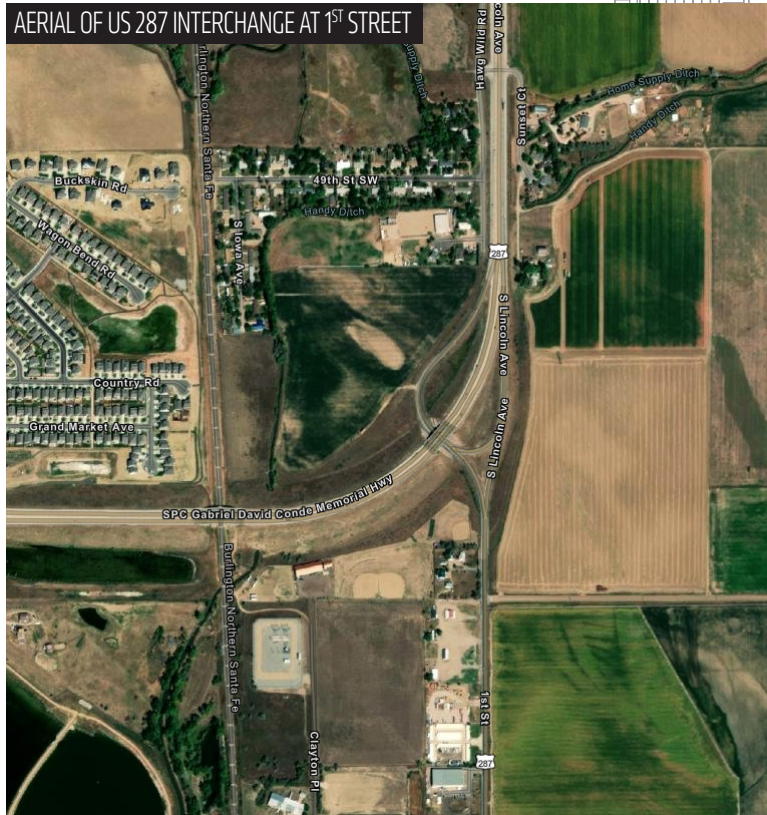
US 287 Interchange

INTERCHANGE

The US 287 interchange is currently a partial interchange; travelers northbound on 1st Street can only access northbound US 287 and southbound 1st Street can only be accessed from southbound US 287. ***It is recommended that the Town coordinate with the Colorado Department of Transportation (CDOT), the owner of US 287, to evaluate the potential impacts of converting this partial interchange to a full movement interchange.*** A full movement interchange would improve access and connectivity to the residents and businesses along 1st Street, and to the Innovation District. The full movement interchange may potentially alleviate some of the traffic and freight congestion at the other US 287 and Berthoud Parkway intersection. A full movement interchange would also likely increase the vehicular traffic of 1st Street. The US 287 and 1st Street interchange is an opportune location to create a northern gateway into Berthoud.



AERIAL OF US 287 INTERCHANGE AT 1ST STREET



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CHAPTER 7

Next Steps

Achieving the vision for the 1st Street Corridor as defined in this plan will require coordination of Town initiatives, partnerships, and resources that move projects from the drawing table to town approval meetings to groundbreakings. These projects may run a diverse range from development projects, property consolidation, and utility infrastructure improvements to streetscape enhancements, trail connections, and transit coordination.

The Implementation Matrix on the following page identifies action items by achievable goal, with each action item assigned a priority level and timeframe for completion, an estimated cost range, and one or more agencies to serve as resources and potential Town partners (listed on the right).

TOWN PARTNERS

BACC	Berthoud Area Chamber of Commerce
BFPD	Berthoud Fire Protection District
BHS	Berthoud Historical Society
BRC	Berthoud Rotary Club
CCCD	Colorado Center for Community Development
CCI	Colorado Creative Industries
CDOT	Colorado Department of Transportation
CHAFA	Colorado Housing and Finance Authority
COEDIT	Colorado Office of Economic Development and International Trade
CPW	Colorado Parks and Wildlife
CWCB	Colorado Water Conservation Board
DCI	Downtown Colorado, Inc.
DOLA	Colorado Department of Local Affairs
FHA	Federal Highway Administration
LC	Larimer County
LTWD	Little Thompson Water District
NCWCD	Northern Colorado Water Conservancy District (Northern Water)
NFRMPO	North Front Range Metropolitan Planning Organization
RAFT	Berthoud Rural Alternative for Transportation
REDI	Northern Colorado Regional Economic Development Initiative
TFORT	Transfort
UC	Upstate Colorado
WC	Weld County



Implementation Matrix

Action Items	Priority	Timeframe	Cost	Town Partners
MANAGED GROWTH				
Update the Town's Three Mile Area Plan to identify and coordinate potential annexation of properties in the corridor	2	ST	\$	LC, property owners
Update the Town's Development Code as needed to support the types of development, architecture, and site features proposed for the corridor	2	ST	\$	TBD
Coordinate projects and policies that impact both 1st Street and Mountain Avenue given the proximity of the two corridors	2	ON	\$	Development community
Maintain communication with corridor property owners to be transparent with potential development proposals and corridor improvements	2	ON	\$	TBD
Develop a formalized landscape concept plan for the tree lawns and medians to guide future development and create a cohesive look throughout the 1st Street corridor.	2	ST	\$	TBD
TRANSPORTATION ENHANCEMENTS				
Coordinate multimodal transportation elements such as sidewalks, bike facilities, local and regional trails, transit stops and stations, intersection treatments, truck routes, etc. with relevant agencies	2	ON	\$	CDOT, LC, NFRMPO, TFORT
Accommodate ride share, local transit, regional transit (e.g., potential future passenger rail), and other emerging mobility technologies into the Innovation District	2	ST	\$	TBD
Apply Complete Streets principles to 1st Street and other corridors to ensure multimodal connectivity and accessibility is prioritized along the corridor	2	MT	\$\$	TBD
Coordinate with CDOT to evaluate the feasibility and impact of upgrading the US 287 partial interchange into a full movement interchange	3	LT	\$\$	CDOT
Coordinate wayfinding and signage with a community branding campaign and Town-wide wayfinding signage plan	2	ON	\$	TBD, development community
Identify preferred truck routing and access within the Innovation District	3	ST	\$	LC, TBD
INFRASTRUCTURE IMPROVEMENTS				
Work with utility companies to identify, preserve, and/or modify utility easements in the corridor	2	ON	\$	TBD
Identify and build new or extended water, sewer, and stormwater utility infrastructure	1	ON	\$\$\$	TBD
ENVIRONMENTAL SUSTAINABILITY				
Work with property owners to identify and preserve conservation easements in the corridor	3	ON	\$	Property owners, development community
HOUSING DIVERSITY				
Use findings from a housing survey to identify how the corridor can help diversify Berthoud's housing stock	2	ST	\$	CCI, CHAFA, DOLA
ECONOMIC RESILIENCY				
Use findings from a business survey to identify business retention and attraction opportunities along the corridor	2	ST	\$	BACC, COEDIT, REDI, UC

MATRIX KEY

Priority Level

1: Critical
2: Vital
3: Desirable

Timeframe

ST: Short Term (1-3 years)
MT: Mid Term (3-5 years)
LT: Long Term (5+ years)
ON: Ongoing (as needed)

Cost

\$: \$0 - \$100,000
\$\$: \$100,000 - \$500,000
\$\$\$: \$500,000+



Acknowledgements

Berthoud Town Board

William Karspeck, Mayor
Mike Grace, Mayor Pro Tem
Karl Ayers
Jeff Butler
Tim Hardy
Sean Murphy
May Soricelli

Berthoud Planning Commission

Jan Dowker, Chair
Karen Anderson, Vice Chair
Chris Kurtz, Secretary
Jon van Benthem
Melissa Feldbush
Abigail Smith
Brett Wing

Town Staff

Chris Kirk, Town Administrator
Anne Best Johnson, Community Development Director (current)
Curt Freese, Community Development Director (former)
Adam Olinger, Planner II (former)

Consultant Team

Plan Tools LLC
BHA Design
Sopher Sparr Architects
Egret & Ox Planning
Felsburg Holt & Ullevig





BERTHOUD 1ST STREET CORRIDOR PLAN

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[Meetings & Events](#)

[Documents & Exhibits](#)

[Contact Us](#)

Planning for Our Future

Welcome to the project website for the [Berthoud 1st Street Corridor Plan Project](#)!

The purpose of the project is to identify present and future needs of the 1st Street corridor and establish preferences and priorities based on those needs. The plan will provide a vision and set of goals for guiding the growth, development, redevelopment and design of the 1st Street corridor. More specifically, the plan will address architecture, scale, form, character of development, development density/intensity, connectivity, multi-modal transportation, streetscapes, landscaping and signage within the 1st Street corridor planning area.

Town staff and a local consulting team will guide the planning effort. Input for the 1st Street Corridor Plan will be sought from local residents, businesses, property owners and community leaders. The final product - the 2023 1st Street Corridor Plan - will provide the Town of Berthoud with a roadmap for accomplishing community planning objectives along the 1st Street corridor for many years to come.

Please navigate the pages on this site to obtain additional information concerning the project, find out about upcoming meetings, and review meeting summaries and draft documents as they become available. We encourage you to use the "Contact Us" page to get in touch with a member of the project team should you have any questions, comments, suggestions or require more information concerning the project.



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PROJECT SCHEDULE

Please click [here](#) to view the Project Schedule.

If you have any questions or comments regarding the project schedule, please visit the "Contact Us" page.



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JULY 21, 2022 PUBLIC WORKSHOP

The first public workshop for the 1st Street Corridor Plan was held on July 21st in the Shadow Mountain Room at Northern Water. Over 50 people attended the open house event, reviewing information regarding the project and providing input on corridor planning issues and future design priorities.

Please click [here](#) to view the Project Background exhibit displayed during the open house event.

Please click [here](#) to view the Opportunities and Constraints exhibit displayed during the open house event.

Please click [here](#) to view the choices identified by meeting participants on the Visual Preference exhibit displayed during the open house event.

Please click [here](#) for view comments received on the Corridor Aerial Strip Map exhibit displayed during the open house event.

Please click [here](#) to view photos of the open house event.

AUGUST 30, 2022 TOWN BOARD WORK SESSION

The Town Board held a work session regarding the 1st Street Corridor Plan project on August 30, 2022 at Town Hall. Please click [here](#) to view the presentation.

SEPTEMBER 14, 2022 PUBLIC WORKSHOP

The second public workshop for the 1st Street Corridor Plan was held September 14, 2022 from 6 – 7:30 pm at Northern Water, 220 Water Avenue in Berthoud. This open house event was structured to receive feedback on plan concepts. Please click [here](#) to view the exhibits and the comments received by meeting participants.

DECEMBER 6, 2022 PUBLIC WORKSHOP

The third public workshop for the 1st Street Corridor Plan was held December 6, 2022 from 5 - 6 pm at the Berthoud Town Hall. This open house event was structured to receive feedback on the [preferred plan concept](#) and [corridor renderings](#).

DECEMBER 6, 2022 TOWN BOARD/PLANNING COMMISSION WORK SESSION

Following the third public workshop, the Town Board and Planning Commission held a joint work session regarding the 1st Street Corridor Plan project. Please click [here](#) to view the presentation.

We encourage you to send us any questions, comments or suggestions using the form on the "Contact Us" page.



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PROJECT DOCUMENTS

The Town of Berthoud's 2021 Comprehensive Plan is the guiding document for accomplishing community planning objectives. The comprehensive plan lays out the community's core values, as well as outlining goals and objectives for the Town to accomplish in the years to come. One of the plan's action items is to "Prepare a 1st Street Corridor Plan that includes a comprehensive set of design guidelines similar in scope to the Mountain Avenue Corridor Plan". Please click [here](#) to view the Town's 2021 Comprehensive Plan.

Three public workshops were held during the preparation of the 1st Street Corridor Plan. Please visit the *Meetings and Events* page to view workshop exhibits.

Following the public workshops and a joint Planning Commission/Town Board worksession, a draft of the 1st Street Corridor Plan document has been assembled and refined for public review. Please click [here](#) to view the most recent version of the draft Town of Berthoud 1st Street Corridor Plan.

If you have any questions or comments regarding the draft 1st Street Corridor Plan, please use the form on the "Contact Us" page.



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Your input is very important!

Please use this form to contact us should you have any questions, comments, suggestions or require additional information regarding the 1st Street Corridor Plan Project.

Thank You!

YOUR NAME *

PHONE NUMBER *

E-MAIL ADDRESS *

* All fields are required

TOWN BOARD INFORMATION



COMMUNITY DEVELOPMENT DEPARTMENT

Meeting Date:	April 25, 2023
Agenda Title/Subject:	Resolution 8 (Series 2023), A Resolution approving the Neighborhood Master Plan for the Ludlow Property
Type of Item:	Public Hearing
Purpose:	Request to accept the amended concept plan for the development of the Ludlow property. The plan has been amended from the originally approved Planned Unit Development plans from 2010 in conformance with the 2021 Comprehensive Plan amendment.
Presented by:	Anne Johnson, Community Development Director

ATTACHMENTS:

- Staff Report
- Resolution 08 (Series 2023)
- Application materials, public comments and referral responses
- Planning Commission minutes

BACKGROUND:

The original annexation, zoning and Planned Unit Development (PUD) concept plans were approved by the Town in 2010. The application being presented is done so at staff's request to bring the envisioned project into conformance with the 2021 Comprehensive Plan update. The Ludlow project has been annexed, is currently zoned PUD, and has received approval of a concept plan illustrating land uses contemplated as appropriate for the property in 2010. The Town's vision for Mountain Avenue and future land uses have changed since 2010 and is embodied in the 2021 Comprehensive Plan update. The table below illustrates the 2010 approval with the 2023 proposed changes.

Ludlow Development 2010 Approval and 2023 Proposal		
Use Category	Acreage 2010	Acreage 2023
Commercial/Employment	107.2 +/-	34.7+/- Mixed Use w/Res. 8.4+/- Commercial
Residential/Employment	82.4 +/-	49.6+/- attached Residential
Estate Residential	34.8 +/-	60.1+/- Residential 18.7+/- Residential, lg. lot
Open Space	51.2 +/-	80.9 +/-
Rights of way	28.5 +/-	54 +/-
Total number of Residential Units	1264+	1200-1800
Total Acreage	306.4 +/-	

UPDATE/NEXT STEPS:

Tonight, the Town Board 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 Board of Trustees. The next step will be a Preliminary Plat which will 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 will 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. School bus stop locations, if needed; sanitary sewer and water main engineering designs, the need for water dedication, 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 approve the proposed Neighborhood Master Plan. 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 was requested to submit a Change of Zone and Neighborhood Master Plan by staff illustrating a change to the originally-approved development plans to bring the site into conformance with the Town’s vision of continued growth within the Town’s utility service area [Page 3-0]. Both Urban Residential and Suburban Residential zoning classifications are proposed and shall align with the Comprehensive Plan’s vision for both. Additional open space and park space coupled with greater diversity of housing types have been provided.

RECOMMENDED ACTION(S):

Planning Commission heard the request for approval of the Neighborhood Master Plan at their March 9, 2023 public hearing and voted unanimously to send their recommendation of approval to the Board of Trustees.



STAFF REPORT: LUDLOW FARMS NEIGHBORHOOD MASTER PLAN

DATE: April 25, 2023

GENERAL INFORMATION

Applicant:	Ludlow Farms, LLC – Don Hinson, Manager	Size: 306.4 acres
Site Location:	This property is located between Highway 287 and Berthoud Parkway, and south of Mountain Avenue.	
Applicant's Request:	The Applicant is requesting a Neighborhood Master Plan	
Current Zoning:	Ludlow Farms Planned Unit Development. Similar layout and design to what is currently shown in the Neighborhood Master Plan.	

ZONING DISTRICT INFORMATION

	<u>PUD</u>	<u>UR (If Rezoned)</u>	<u>SR (If Rezoned)</u>
Max Density	Set at FDP	N/A	N/A
Min. Lot Size	Set at FDP	2,000 sq.ft. for Duplex 2,500 sq.ft. for SFR	3,000 sq.ft.
Min. Lot Width	Set at FDP	N/A	20'
Front Setback	Set at FDP	8'-12' build-to line	10' rear loaded
Side Setback	Set at FDP	0' attached side, 5' unattached side, 10' corner side	5'
Rear Setback	Set at FDP	5'	5'
Building Height:	Set at FDP	30'	30'

SURROUNDING ZONING, LAND USE AND REQUIRED BUFFERS

	<u>Adjacent Zoning</u>	<u>Adjacent Land Uses</u>	<u>Setbacks for Adjacent Zoning/ Buffer required if rezoned</u>
North	PUD	Vacant (Planned for future commercial spaces)	N/A
South	R-1	Single-Family Residential	N/A
East	R-1	Single-Family Residential	N/A
West	PUD and C2	Religious Assembly and Commercial	N/A

Proposal

This is a two-part request for a Neighborhood Master Plan and a rezoning to UR (Urban Residential) and SR (Suburban Residential) for the Ludlow Farms development. The Neighborhood Master Plan shows commercial and higher density uses along the north and west portions of the site along Highway 287 and Mountain Avenue, and tapers into lower density residential uses along the south and east portions of the project. The rezoning map similarly shows UR along the northwestern portions of the project, and SR for the southeastern portions.

Background

This project is currently zoned as the Ludlow Farms PUD. The PUD was approved in 2011, in conjunction with an annexation request in 2010. The PUD proposed a similar layout of uses to what is being considered with this NMP with a slightly larger area proposed for commercial uses. The prior PUD process set development standards at the FDP stage, and no submittal was made for the project. The town has strongly encouraged PUD property owners to transition their projects to the newly created zone districts rather than continuing the PUD/FDP process. The project has had three rounds of review, and two notices have been sent to neighboring property owners.

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 platting/zoning actions must follow the approved plan or apply for an amendment of said plan. Section 30-6-106 of the municipal code states that a Neighborhood Master Plan must consist of the following required elements:

30-6-106(C) 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 Highway 287, Mountain Avenue, Berthoud Parkway, and Art (within the Harvest Ridge Subdivision to the south) ii. Minor Collectors are depicted throughout the site to provide adequate traffic flow. Additionally, Spartan Avenue would be extended through the project and provide a new access point to Highway 287. iii. A preliminary traffic impact study/analysis was provided with the submittal.

30-6-106(C) 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)	Yes	i. An open space plan was provided as part of the Neighborhood Master Plan. The plan includes more than 10% open space. ii. By code the applicant would need to provide four open space elements. The applicant has chosen to meet these requirements through a habitat area, two Green Areas (counts as two elements), and a trailhead location. iii. A wetland is identified near the southern end of the site, and a 150' buffer is provided.
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.) Parks are provided in accordance with 30-2-109(B)(2) and (3). A full list of how the project meets these requirements can be found on page 4 of the NMP.
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	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. ii. Sidewalks will be constructed along the frontages of all properties, and will then connect to the existing pedestrian system. iii. Bike lanes are proposed along all collector streets per LCUASS Standards. Additionally, the project offers a large number of trail connections with bike racks identified.
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 Master Plan identifies the project showing the proposed zoning changes. ii. The proposed zoning districts will be consistent with the neighboring residential districts to the south and east. By utilizing the new Urban Residential (UR) and Suburban Residential (SR) zoning districts, the applicant is proposing a slightly denser development than the existing neighborhoods. This area provides a good transition between the existing residences and the commercial uses to the north and west. iii. Density and diversity are distributed throughout the residential portions of the project.

30-6-106(C) Required Elements	Finding	Rationale
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 existing Town of Berthoud utilities through one connection to the north, one to the west, and three to the east.
7. <u>Subdivision Identity Standards:</u> i. The applicant shall provide compliance with subdivision identity standards found in Section 30-2-131.	Yes	i. Code requires the proposed development to provide eight subdivision identity and place elements. The applicant has chosen to provide: a pocket park(1), trails(1), playground(1), pool(2), pollinator plant palette(1), community building(2), and alley loaded streets(2).

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 Preferred Land Use plan envisions this area as Suburban business, Urban Residential, and Suburban Residential transitioning from the higher intensity uses to the northwest, and lower intensity to the south east. Additionally, the Comprehensive Plan was developed to encourage form based transect zoning from open space/ rural areas to alley-loaded urban residential lots which allow for a variety of dense, affordable residential uses such as those included in this project.
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 project will extend existing roadways to service the property allowing for a more connected neighborhood design. Additionally, the trail system proposed will allow connections throughout the project and into neighboring areas.

30-6-106(G) Review Criteria	Finding	Rationale
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.
4. Negative impacts on adjacent land uses have been identified and satisfactorily mitigated.	Yes	Impacts to neighboring properties have been mitigated through multiple access points as to not create congested roadways, as well as placing the lower intensity uses closer to existing residential, and higher intensity uses closer to existing commercial.
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	This project is substantially similar to what was originally proposed when the property was annexed into the Town. Additionally, the project offers a mix of uses that is consistent with the future land use map in the comprehensive plan.

PUBLIC NOTICE AND COMMENT

Notice of the Planning Commission Public Hearing was mailed to property owners within 1,000 feet of the subject property, a legal ad published, and the property was posted as required by the Development Code on February 23, 2023. The application was sent out to all property owners within 1,000 feet, with an invitation to comment on the request within three weeks of receipt. All comments received can be found in this packet. Additionally, the applicant voluntarily held a neighborhood meeting on April 6th at the Berthoud Recreation Center for any neighbors wishing to attend.

FINDINGS AND RECOMMENDATIONS

Neighborhood Master Plan

Planning Commission recommend a motion to approve the Neighborhood Master Plan.

Attachments

1. Application form
2. Neighborhood master plan
3. Preliminary traffic impact study/analysis
4. Conceptual Utilities Plan
5. Public Comments
6. Ludlow Overall Development Plan approved at annexation

RESOLUTION NUMBER 08

(SERIES 2023)

A RESOLUTION OF THE TOWN OF BERTHOUD BOARD OF TRUSTEES APPROVING A NEIGHBORHOOD MASTER PLAN FOR A DEVELOPMENT KNOW AS THE “LUDLOW DEVELOPMENT” IN THE TOWN OF BERTHOUD.

WHEREAS, the property under consideration is known as the “Ludlow” development; and

WHEREAS, the Town of Berthoud (“Town”) approved Ordinances 1124 and 1125 on November 9 and 30, 2010 which approved the Annexation and original Zoning of the Ludlow 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 March 9, 2023, 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 April 25, 2023 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 March 28, 2023 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 March 28 2023, 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.

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 25th day of April, 2023.

TOWN OF BERTHOUD

By _____
William Karspeck, Mayor

ATTEST:

By: _____
Christian Samora, Town Clerk

Exhibit A: Neighborhood Master Plan



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): 9422105001 - 9422405009		
Site Address: SW Corner of Mountain Avenue & Berthoud Parkway		
Project Name: Ludlow Farms		
Brief description of project: Residential and mixed-use subdivision.		
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: Ludlow Farms, LLC - JM Hinson, Manager		
E-mail: jmhinson@me.com	Mailing Address: 700 Ken Pratt Blvd Suite 113	
Phone: 1-904-945-8636	City/State/Zip: Longmont, CO 80501	
CONTACT PERSON (will receive correspondence from Town Staff/Referral Agencies)		
Name: Kristin Turner - TB Group		
E-mail: kristin@tbgroup.us	Mailing Address: 444 Mountain Avenue	
Phone: 970.532.5891	City/State/Zip: Berthoud, CO 80513	
OWNER(S) (If different than applicant)		
Name: Greg Ludlow		
E-mail: greg.ludlow5@gmail.com	Mailing Address: 1909 Sundance Drive	
Phone: (970) 302-9332	City/State/Zip: Longmont, Colorado 80504	
CONSULTANT (Engineer, Surveyor, or Planner)		
Name:		
E-mail:	Mailing Address:	
Phone:	City/State/Zip:	

LAND USE INFORMATION							
Existing Use: Vacant Proposed Use: Residential, Commercial, Mi Existing Zoning: PUD Proposed Zoning: (if applicable): SR, UR Number of acres: ~306.4 AC Proposed Access: Berthoud Parkway & Mo	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #d9e1f2;"> <th colspan="2" style="text-align: center; padding: 5px;">Adjacent zoning / land use:</th> </tr> </thead> <tbody> <tr> <td style="width: 50%; padding: 5px;">East Side: BERTHOUD PARKWAY</td> <td style="width: 50%; padding: 5px;">North Side: MOUNTAIN AVENUE</td> </tr> <tr> <td style="padding: 5px;">West Side: HWY 287</td> <td style="padding: 5px;">South Side: R1 AND LARIMER COUNTY</td> </tr> </tbody> </table>	Adjacent zoning / land use:		East Side: BERTHOUD PARKWAY	North Side: MOUNTAIN AVENUE	West Side: HWY 287	South Side: R1 AND LARIMER COUNTY
Adjacent zoning / land use:							
East Side: BERTHOUD PARKWAY	North Side: MOUNTAIN AVENUE						
West Side: HWY 287	South Side: R1 AND LARIMER COUNTY						
UTILITY SERVICE INFORMATION							
Water: Town of Berthoud	Sewer: Town of Berthoud						
PROJECT INFORMATION							
Number of proposed units: estimated 1500-1800 Number of phases: TBD - multiple Number of Units per phase: TBD Number of lots proposed: estimated 1500-1800 Lot size minimum: 4,400 sf Lot size maximum: 6,600 sf Lot size average: 5,500 sf Gross density (units/acre): 4.8-5.8 Net density (units/acre): 5.9-7.1 Area and percent open space: 67.4 AC/ 22%	Non-Residential Building Area (Sq. Ft.) Proposed: TBD - 31.2 ac estimated Non-Residential Construction Floor Area Ratio Proposed: TBD Total Number of Parking Spaces: TBD <u>Acreage of Site:</u> a. Gross: 306.4 b. Right-of-Way: 54.0 c. Net (a-b) 252.4 <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr style="background-color: #d9e1f2;"> <th colspan="2" style="text-align: center; padding: 5px;">Type of Housing Proposed (<i>please check</i>):</th> </tr> </thead> <tbody> <tr> <td style="width: 50%; padding: 5px;"> ☒ Future Single Family ☒ Duplex ☒ Multi-family (# of units: TBD) </td> <td style="width: 50%; padding: 5px;"> ☒ Townhouse ☐ Condominium </td> </tr> </tbody> </table>	Type of Housing Proposed (<i>please check</i>):		☒ Future Single Family ☒ Duplex ☒ Multi-family (# of units: TBD)	☒ Townhouse ☐ Condominium		
Type of Housing Proposed (<i>please check</i>):							
☒ Future Single Family ☒ Duplex ☒ Multi-family (# of units: TBD)	☒ 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.

Property Owner(s): DocuSigned by:
Greg Ludlow
D8BEF5D68CD544C... Date: 9/15/2022

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: DocuSigned by:
M Hinson
55A1B323E8844C3... Date: 9/15/2022

FOR OFFICE USE ONLY
Received By:
Date:

PROPERTY 1:
TRACT A AND LOTS 1 THROUGH 9, INCLUSIVE, LUDLOW FARMS
ACCORDING TO THE RECORDED CONVEYANCE PLAT, COUNTY OF
LARIMER, STATE OF COLORADO

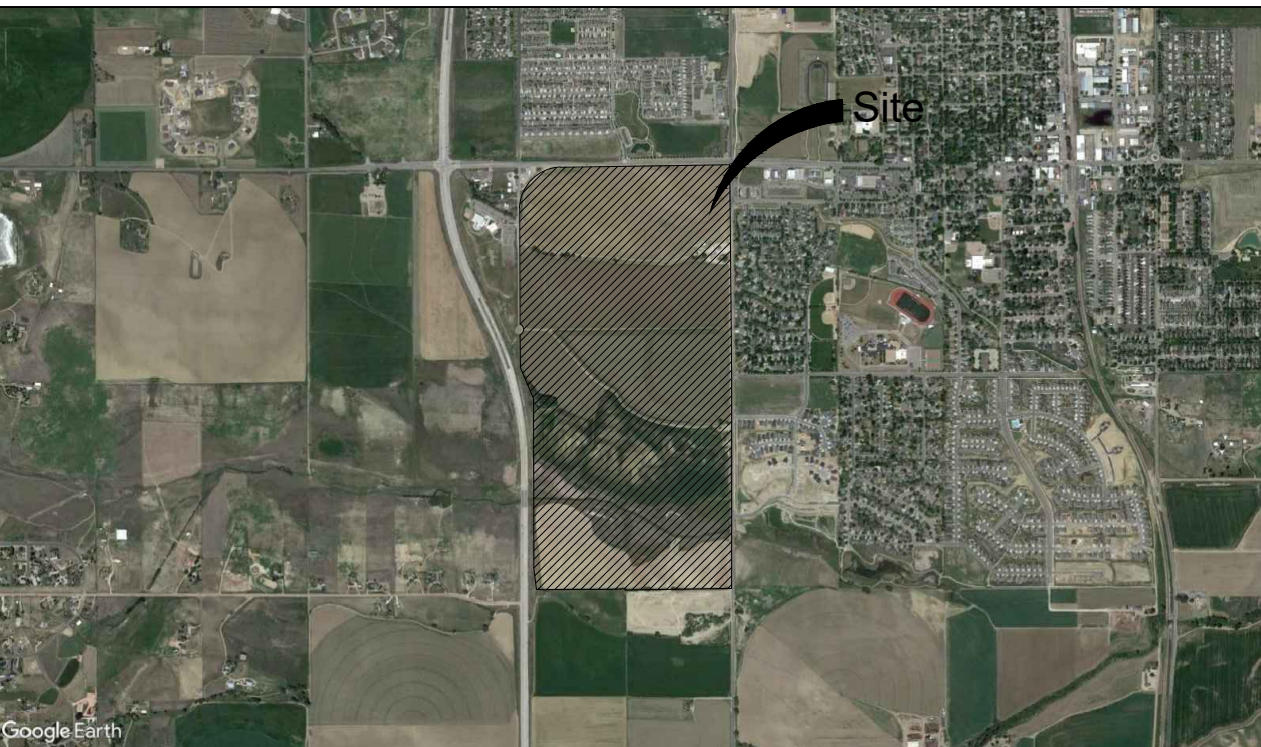
A TRACT OF LAND SITUATED IN THE NORTHWEST CORNER OF THE
NORTHEAST QUARTER OF SECTION 22, TOWNSHIP 4 NORTH OF
RANGE 69 WEST OF THE 6TH PM, MORE PARTICULARLY DESCRIBED
AS FOLLOWS:

SUBDIVISION IDENTITY & RESIDENTIAL STANDARDS

SUBDIVISION IDENTITY ELEMENTS POINTS REQUIRED: 8

1. POCKET PARK	1
2. TRAILS	1
3. PLAYGROUND	1
4. POOL	2
5. POLLINATOR PLANT PALETTE	1
6. COMMUNITY BUILDING	2
7. ALLEY LOADED STREETS	2
TOTAL :	10

1. PROPOSED LOT COUNT AND LOT SIZES ARE CONCEPTUAL AND MAY CHANGE AT TIME OF PLAT, DEPENDING ON MARKET CONDITIONS.
2. COMMERCIAL AREAS ALONG HIGHWAY 287 ARE CONCEPTUAL IN SIZE AND MAY ADJUST, DEPENDING ON MARKET CONDITIONS.
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, CONDOMINIUMS, APARTMENTS AND/OR OTHER RESIDENTIAL PRODUCT TYPES AS SPECIFIED IN THE MUNICIPAL CODE, PER ZONE DISTRICT.



SINGLE FAMILY DETACHED (40' X 110')*.....	
SINGLE FAMILY DETACHED (50' X 110')*.....	
SINGLE FAMILY DETACHED (60' X 110')*.....	
TOWNHOMES OR SFD.....	
CONDOS.....	
MIXED USE.....	
COMMERCIAL.....	

***NOTE: LOT SIZES ARE CONCEPTUAL AND SUBJECT TO CHANGE AT PLAT.**

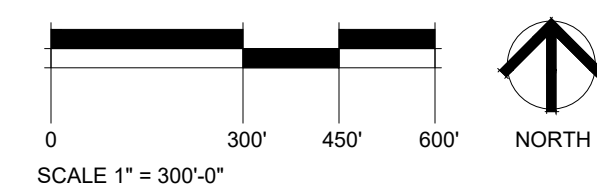
TOTAL ACREAGE	~306.4 ACRES
ROW/PRIVATE DRIVE/PARKING	~ 54.0 ACRES
% OF SITE AS ROW/DRIVE/PARKING	17.6%
OPEN SPACE ACREAGE	~76.7 ACRES
% OF SITE AS OPEN SPACE	25.0%

1. REFER TO PLAN FOR PROPOSED STREET NETWORK AND EXISTING ROAD NETWORK INCLUDING ALL ACCESS POINTS.

2. UNLESS OTHERWISE NOTED ON THE PLAN, ALL
STREETS ARE LOCAL STREETS AND/OR ALLEYS.

SHEET 1 - OVERALL NEIGHBORHOOD MASTER PLAN
SHEETS 2-3 - OPEN SPACE, CIRCULATION, & PARKS
SHEET 4 - PARKS ENLARGEMENT

TOWN OF BERTHOUD, COLORADO FINAL APPROVAL



444 Mountain Ave. | TEL 970.532.5891
 Berthoud, CO 80513 | WEB TBGroup.us

SEAL

PROJECT TITLE

LUDLOW FARMS
NEIGHBORHOOD
MASTER PLAN

BERTHOUD, CO

PREPARED FOR

OWNER:
LUDLOW FARMS,
LLC

700 KEN PRATT BLVD,
STE. 113
LONGMONT, CO 80501

[illegible]

DATE _____

SEPTEMBER 15, 2022

SHEET TITLE

OVERALL NEIGHBORHOOD MASTER PLAN

SHEET INFORMATION

Sheet Number: 1

Of: 4

PARK STATISTICS:

ESTIMATED PARK SPACE REQUIRED
(APPROX. 1500-1800 UNITS) 15-18 ACRES

PARK SPACE PROVIDED 13.54 ACRES
4.4% OF SITE

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

OPEN SPACE CALCULATIONS:

TOTAL OPEN SPACE REQUIRED= 30.6 AC 10.0%
TOTAL OPEN SPACE PROVIDED= 76.7 AC 25.0%

TOTAL SITE ACREAGE = ~306.4 AC

COMMUNITY PARK ELEMENTS:

LIST B: 3 ELEMENTS REQUIRED

- GROUP PICNIC SHELTER (500 S.F. MIN. & 3 TABLES)
- MIN. 15,000 S.F. TURF PLAY AREA (COUNTED AS 1 PER 15,000 S.F.)
- LOOP WALK (MIN. 2,000 L.F.)

LIST D: 2 ELEMENTS REQUIRED

- AMPHITHEATER
- PLAYGROUND
- SPLASH PARK
- COMMUNITY BUILDING
- POOL

LIST E: 4 ELEMENTS, + 1 RESTROOM BUILDING REQUIRED

- BBQ GRILLS (MIN. 1 PER EVERY 2 TABLES)
- BENCHES (MIN. ONE PER HALF ACRE)
- DRINKING FOUNTAINS (MIN. 1 PER EVERY 4 ACRES)
- SHADE STRUCTURES FOR COMPONENTS FROM LIST C (AT SPLASH PARK)

POCKET PARK ELEMENTS:

LIST A: ALL ELEMENTS REQUIRED

- ELECTRICITY
- IRRIGATION
- SECURITY LIGHTING
- TRASH RECEPTACLES (MIN. 2 PER AC)
- WATER SERVICE
- BIKE RACKS
- LANDSCAPING

LIST B: 3 ELEMENTS REQUIRED

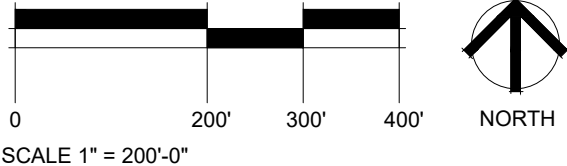
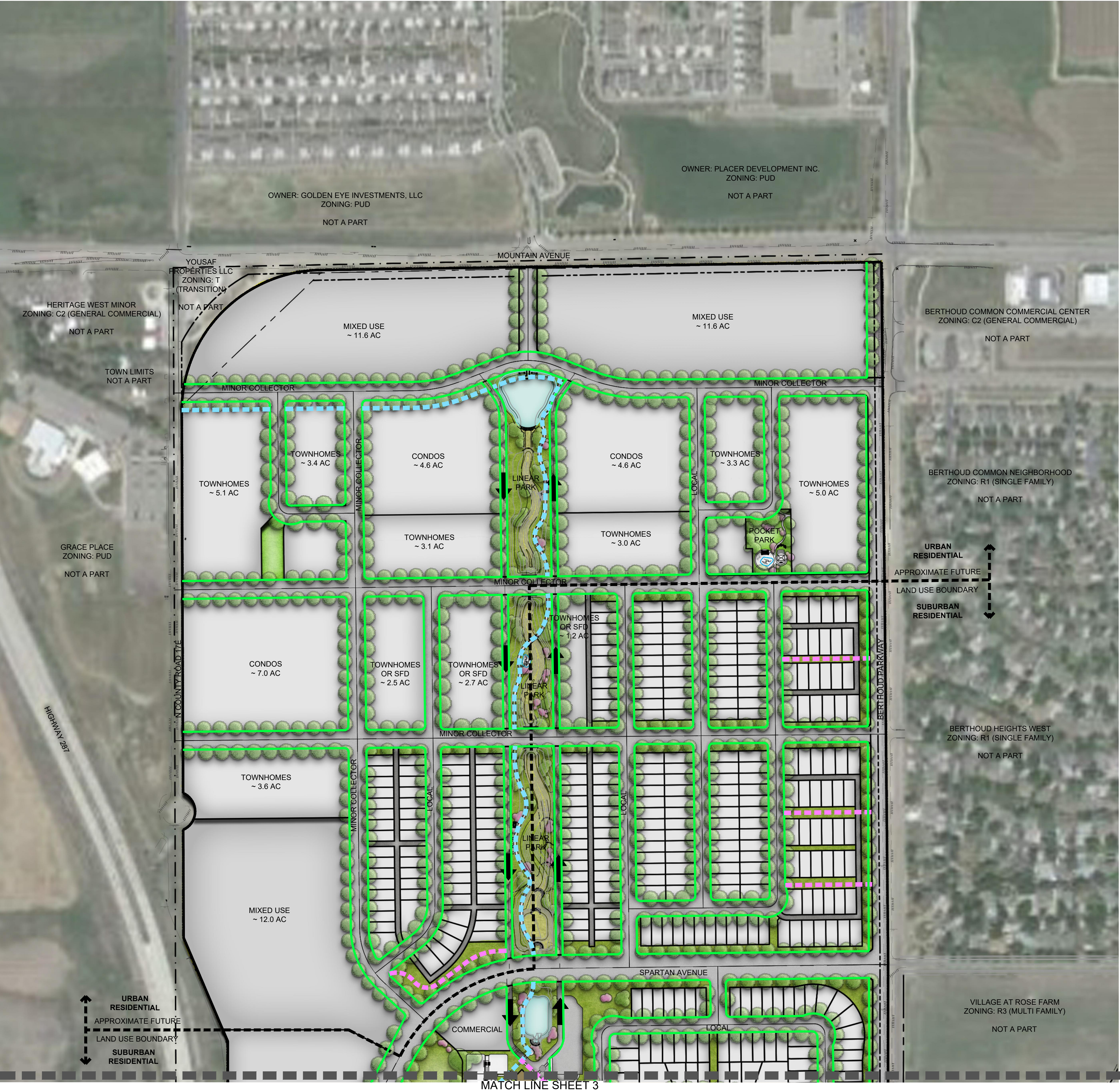
- GROUP PICNIC SHELTER (500 S.F. MIN. & 3 TABLES)
- MIN. 15,000 S.F. TURF PLAY AREA (COUNTED AS 1 PER 15,000 S.F.)
- LOOP WALK (MIN. 2,000 L.F.)

LIST D: 2 ELEMENTS REQUIRED

- COMMERCIAL-GRADE PLAYGROUND
- AMPHITHEATER

LIST E: RESTROOMS + 3 ELEMENTS REQUIRED

- PORTABLE RESTROOMS
- SHADE STRUCTURE FOR PLAYGROUND
- BENCHES (1 PER ½ ACRE)
- BBQS (1 PER 2 TABLES)



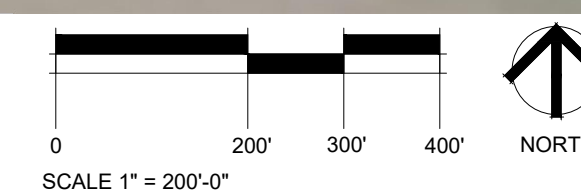
OPEN SPACE ELEMENTS	4 ELEMENTS REQUIRED
OPEN SPACE ELEMENTS	4 ELEMENTS PROVIDED

HABITAT AREA	1 ELEMENT
GREEN AREA	2 ELEMENTS
TRAILHEAD	1 ELEMENT

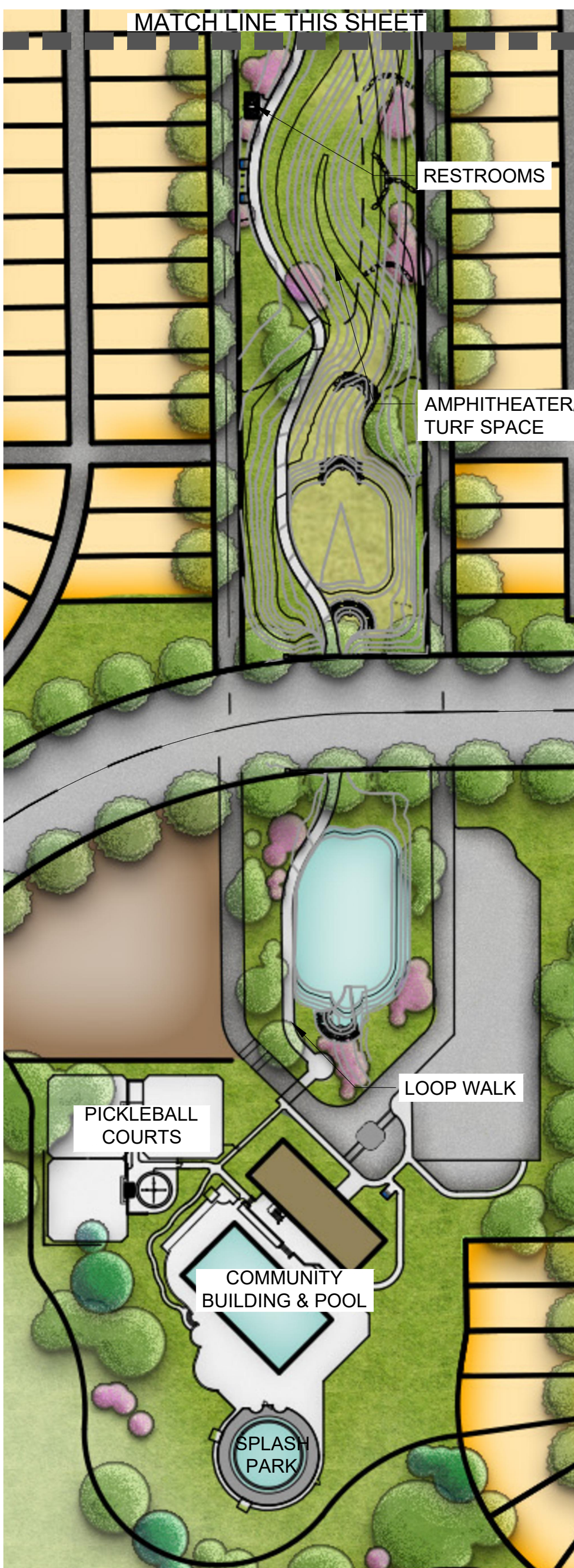
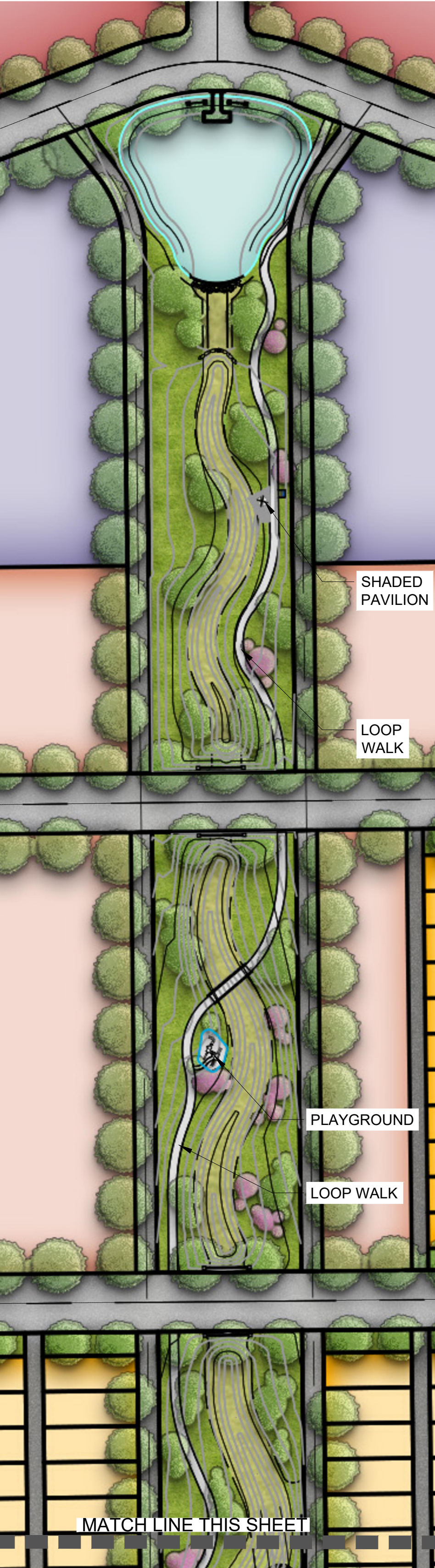
	PARK SPACE	13.5 ACRES
	OPEN SPACE	67.4 ACRES
TOTAL		80.9 ACRES

	DETACHED CONCRETE SIDEWALK - 74,976 feet
	PROPOSED TRAIL/TRAIL CONNECTION PER TOWN PORT PLAN, MATERIAL TBD - 5,383 feet
	TRAIL CONNECTION PER TOWN PLAN - 9,415 feet

*NOTE: TRAIL LOCATIONS ARE CONCEPTUAL. FINAL LOCATION TO BE DETERMINED AT PLAT.

[illegible]

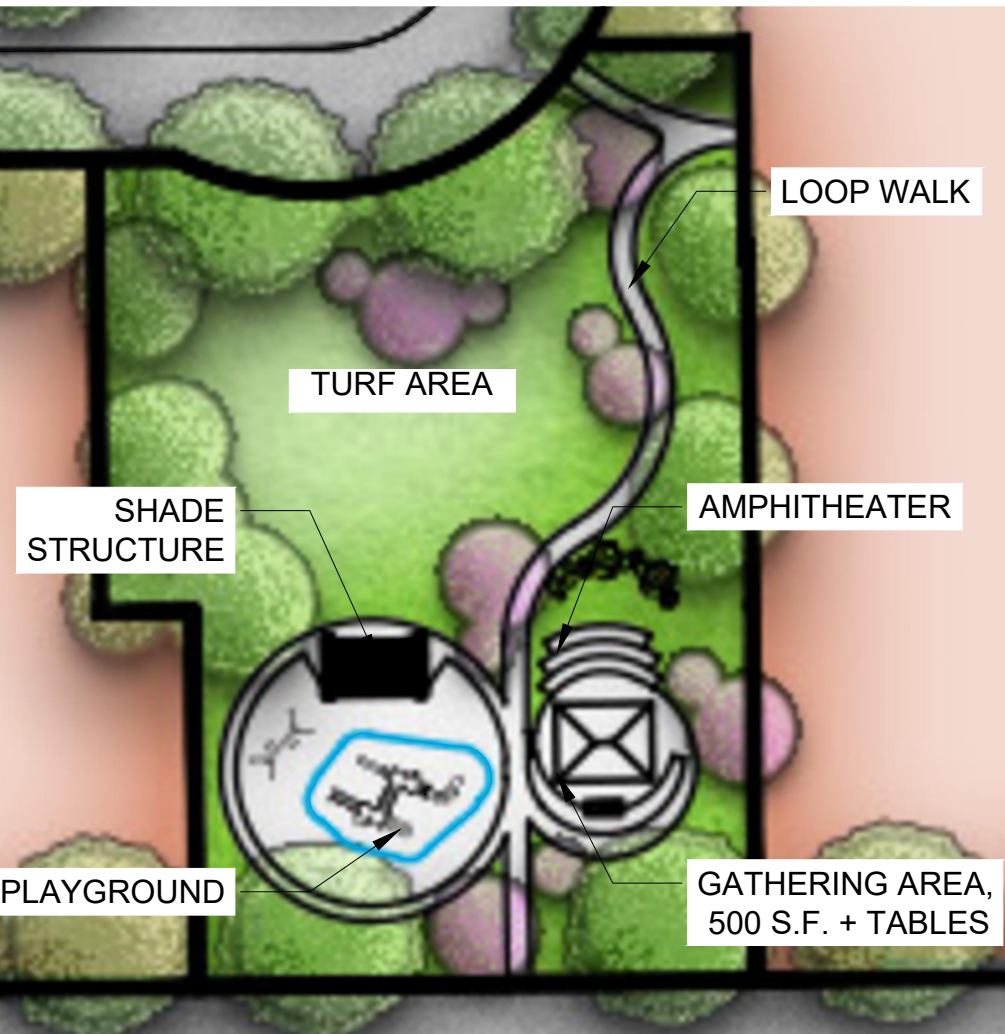
COMMUNITY PARK - A



COMMUNITY PARK ELEMENTS:

- LIST A: ALL ELEMENTS REQUIRED**
- ELECTRICITY
 - IRRIGATION
 - SECURITY LIGHTING
 - TRASH RECEPTACLES (MIN. 2 PER AC)
 - WATER SERVICE
 - BIKE RACKS
 - LANDSCAPING
- LIST B: 3 ELEMENTS REQUIRED**
- GROUP PICNIC SHELTER (500 S.F. MIN. & 3 TABLES)
 - MIN. 15,000 S.F. TURF PLAY AREA (COUNTED AS 1 PER 15,000 S.F.)
 - LOOP WALK (MIN. 2,000 L.F.)
- LIST D: 2 ELEMENTS REQUIRED**
- AMPHITHEATER
 - PLAYGROUND
 - SPLASH PARK
 - COMMUNITY BUILDING
 - POOL
- LIST E: 4 ELEMENTS, + 1 RESTROOM BUILDING REQUIRED**
- BBQ GRILLS (MIN. 1 PER EVERY 2 TABLES)
 - BENCHES (MIN. ONE PER HALF ACRE)
 - DRINKING FOUNTAINS (MIN. 1 PER EVERY 4 ACRES)
 - SHADE STRUCTURES FOR COMPONENTS FROM LIST C (AT SPLASH PARK)

POCKET PARK - B



POCKET PARK ELEMENTS:

- LIST A: ALL ELEMENTS REQUIRED**
- ELECTRICITY
 - IRRIGATION
 - SECURITY LIGHTING
 - TRASH RECEPTACLES (MIN. 2 PER AC)
 - WATER SERVICE
 - BIKE RACKS
 - LANDSCAPING
- LIST B: 3 ELEMENTS REQUIRED**
- GROUP PICNIC SHELTER (500 S.F. MIN. & 3 TABLES)
 - MIN. 15,000 S.F. TURF PLAY AREA (COUNTED AS 1 PER 15,000 S.F.)
 - LOOP WALK (MIN. 2,000 L.F.)
- LIST D: 2 ELEMENTS REQUIRED**
- COMMERCIAL-GRADE PLAYGROUND
 - AMPHITHEATER
- LIST E: RESTROOMS + 3 ELEMENTS REQUIRED**
- PORTABLE RESTROOMS
 - SHADE STRUCTURE FOR PLAYGROUND
 - BENCHES (1 PER 1/2 ACRE)
 - BBQS (1 PER 2 TABLES)



Transportation Impact Study Town of Berthoud

January 3, 2023
Original September 15, 2022

Prepared for:
Ludlow Farms LLC

Rollins Consult LLC

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1 INTRODUCTION

This report documents the results of a study to evaluate the potential traffic impacts of the proposed Ludlow Farm 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 Ludlow Farm project is located to the west of downtown Berthoud. The project site is located to the south of Mountain Avenue and east of the intersection of US 287. Figure 1 illustrates the project location and the study area. The site is currently undeveloped.

A potential project site is depicted on Figure 2. The site will be developed in numerous phases. The project was modeled with the following land uses and transportation elements:

- The potential for 526 single family homes and 1,353 multi-family dwelling units, dispersed throughout the site.
- 165,700 square feet of commercial located south of Mountain Avenue and at the intersection of US 287 and Spartan Avenue.
- A daycare center is located central to the site.
- 30,000 square feet of office use.
- The extension of Spartan Avenue from Berthoud Parkway to the west with a connection to US 287.

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Figure 1 – Project Location

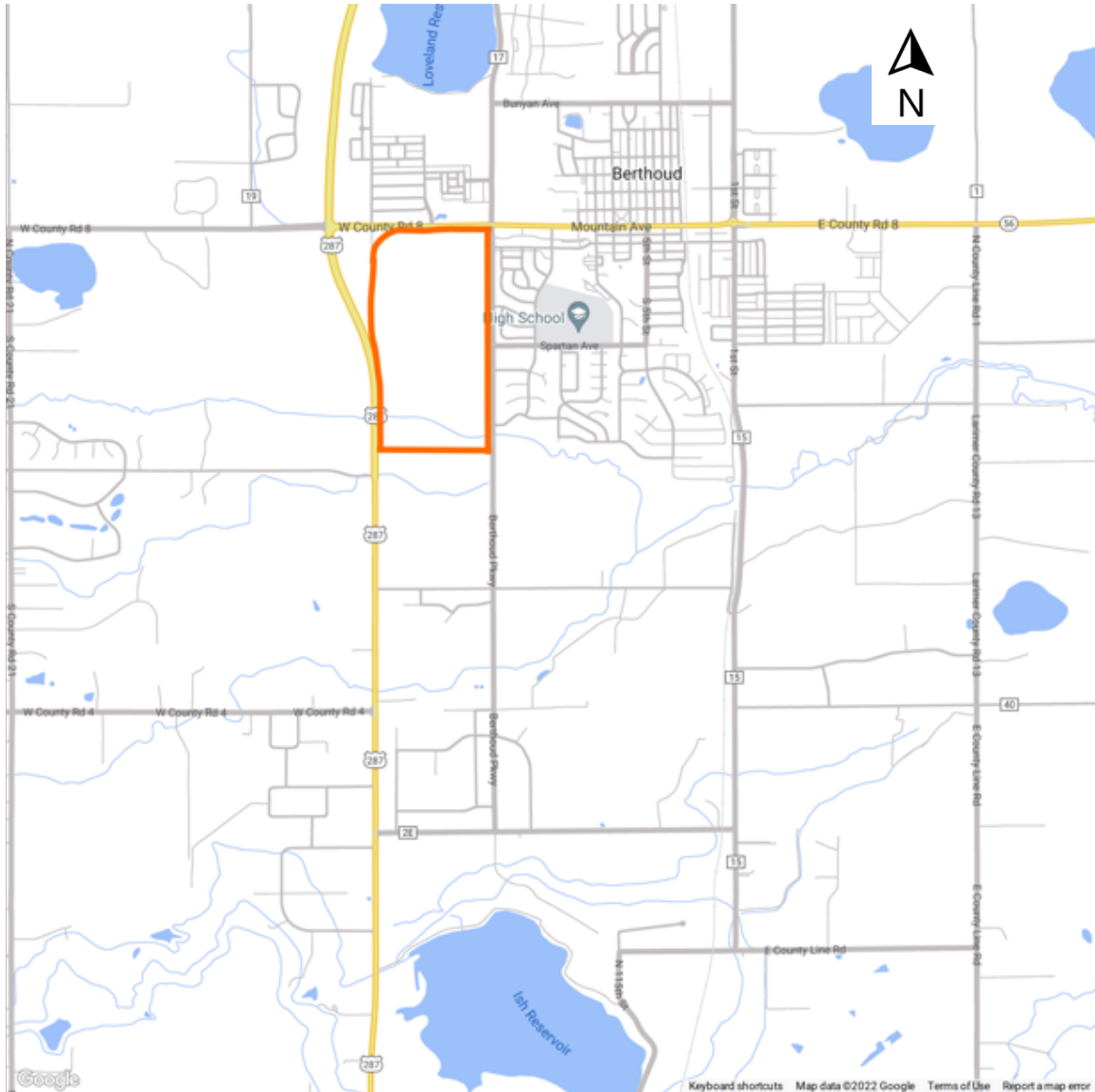
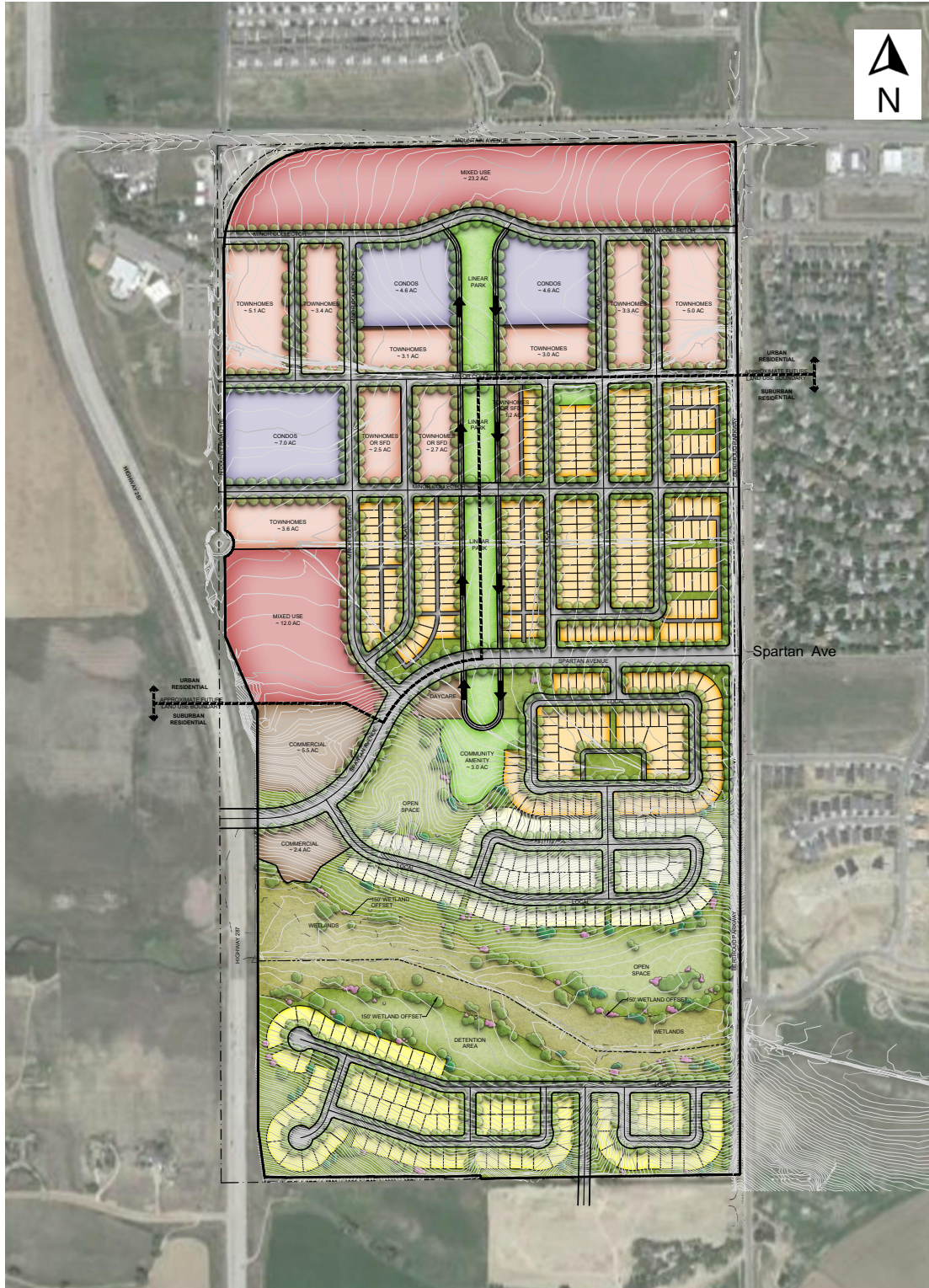


Figure 2 – Site Plan



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 Ludlow Farm 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 point will be evaluated.

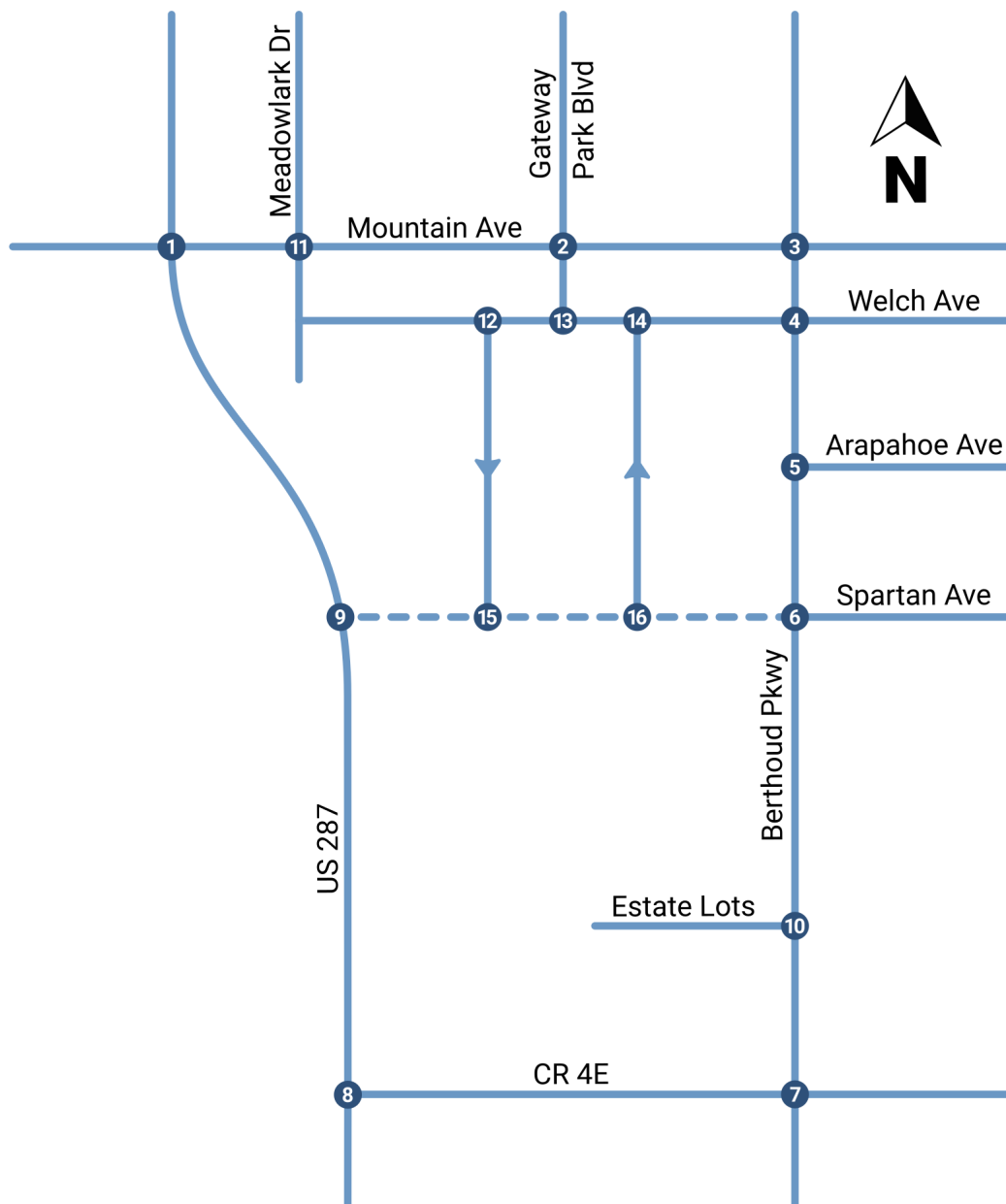
The study examined nine existing intersections, two planned project access streets, and five internal intersections along the proposed one-way streets. The study intersections are depicted on Figure 3. These were identified by the Town for inclusion in the study. The study intersections are listed below.

1. US 287 at Mountain Avenue
2. Gateway Park Boulevard at Mountain Avenue
3. Berthoud Parkway at Mountain Avenue
4. Berthoud Parkway at Welch Avenue
5. Berthoud Parkway at Arapahoe Avenue
6. Berthoud Parkway at Spartan Avenue
7. Berthoud Parkway at CR 4E
8. US 287 at CR 4E
9. US 287 at Spartan Avenue (future)
10. Berthoud Parkway at Estate Lot Access (future)

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11. Meadowlark Drive at Mountain Avenue
12. Southbound One-Way at Welch Avenue (future)
13. Gateway Park Boulevard at Welch Avenue (future)
14. Northbound One-Way at Welch Avenue (future)
15. Southbound One-Way at Spartan Avenue (future)
16. Northbound One-Way at Spartan Avenue (future)

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 US 287 and south of Mountain Avenue. East of the project site is commercial use and residential. To the west is rural undeveloped land. South of the future Ludlow Farm is residential uses. North of the site is residential and proposed commercial.

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

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.

Meadowlark Drive is a north-south two-lane local street. There is a striped shoulder and no sidewalks. North of Mountain Avenue, where development has occurred there are sidewalks.

Gateway Park Boulevard is a two-lane north-south local street. There are bike lanes and sidewalks on both sides of Gateway Park Boulevard north of Tundra Avenue. Near Mountain Avenue, there are sidewalks on the east side of the street.

Berthoud Parkway is a north-south two-lane roadway. This major collector is currently posted with a 35 to 40 mph speed limit. There are no auxiliary lanes on the road currently. Berthoud Parkway is classified as a two-lane Arterial north of Mountain Avenue and a Major Collector south of Mountain Avenue. There is a pedestrian/bike trail north of Mountain Avenue on the east side of Berthoud Parkway. To the south of Mountain Avenue, there is a paved shoulder. There are sidewalks adjacent to developed sections.

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. There are paved shoulders and a sidewalk on the north side adjacent to existing residential areas. The speed limit is posted at 45 mph adjacent to the project site and 50 mph west of US 287.

Welch Avenue is a two-lane east-west road that provides access to commercial areas along Mountain Avenue and adjacent residential areas. The speed limit is posted at

25 mph. There are sidewalks on both sides of the street. Welch Avenue is classified as a local street.

Arapahoe Avenue is a two-lane east-west local street. It has sidewalks on both sides of the street. The speed limit is 25 mph.

Spartan Avenue is a two-lane east-west roadway. It provides access to adjacent residential uses and the Berthoud High School. Spartan is classified as a minor collector east of Berthoud Parkway. The Town has identified Spartan to extend to the west and connect to US 287. The speed limit is 30 mph.

CR 4E is a two-lane east-west road that borders the south of the Project site. It is identified as a major collector. 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 two pedestrian/bike trails within the Ludlow project. These are identified in the Town's *Berthoud Unified Trail Master Plan*, June 2018. One is an east/west trail to be located in the southern area of the site and the other is a north/south trail on the western edge of the site.

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 June of 2022. These counts were performed at eight of the existing study intersections. Peak hour traffic data on Meadowlark Avenue at Mountain Avenue was obtained from the Traffic Impact Study for Gateway (northeast corner of us 287 and mountain avenue), Aldridge Transportation Consultants, LLC, October 24, 2019.

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

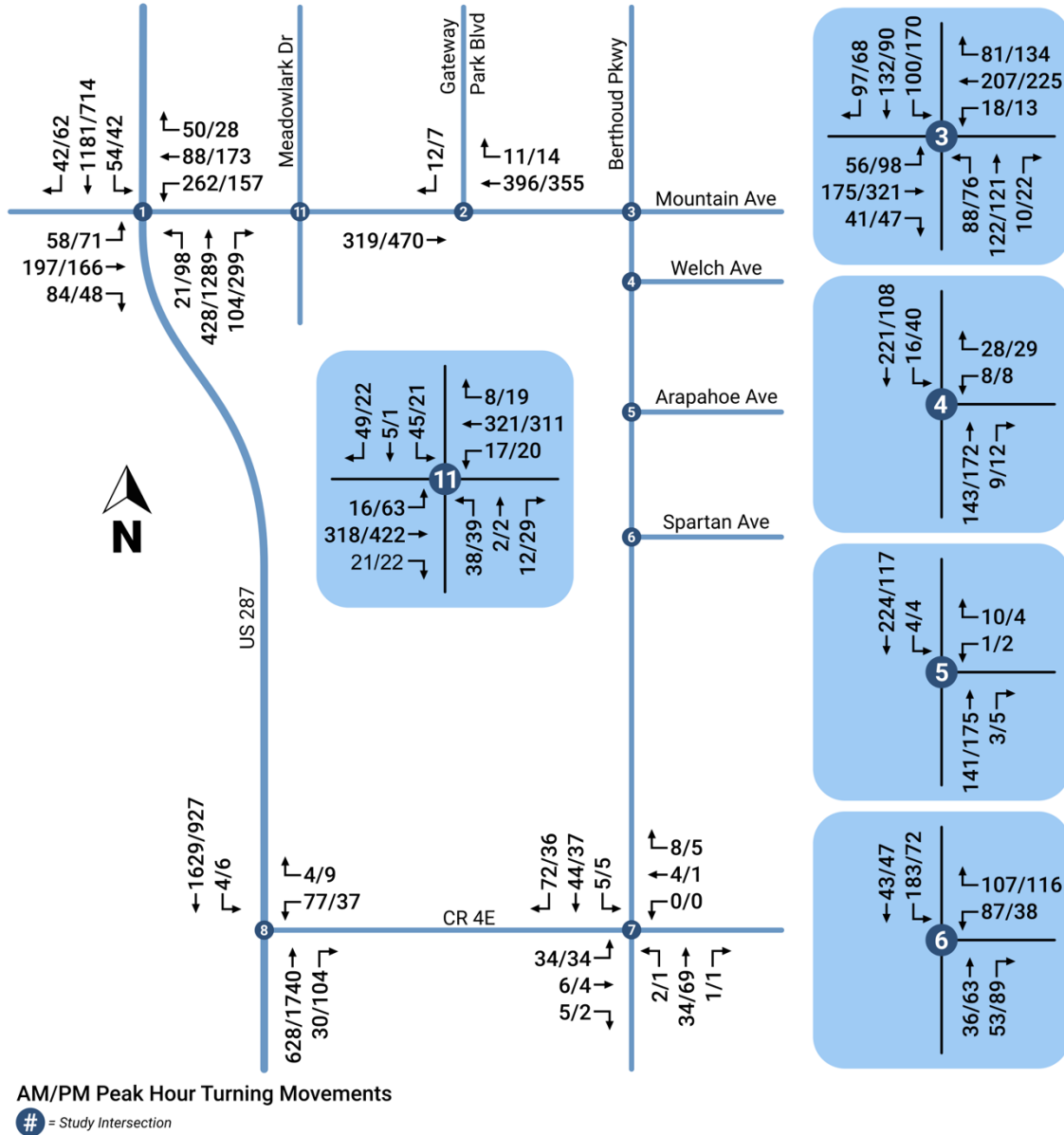
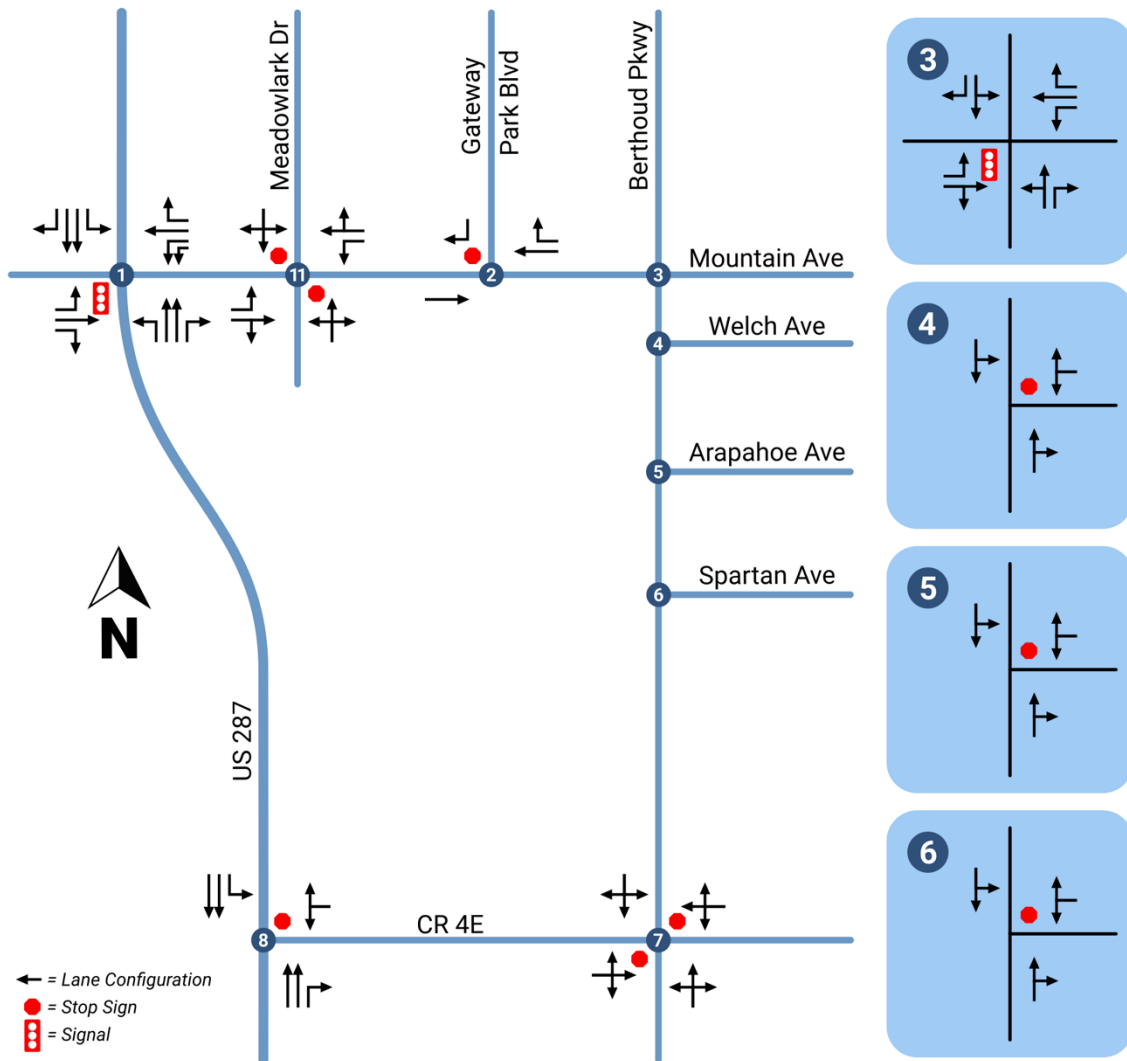


Figure 5 – Existing Lane Configurations



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 the westbound direction operates at LOS F, this is a minor intersection, and a LOS F is considered acceptable.

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Town of Berthoud

Table 4
Existing Weekday Peak-Hour Intersection Level of Service

#	Intersection	Overall Movement	Level of Service	
			AM Peak Hr	PM Peak Hr
1	US 287 & Berthoud Parkway Signal	Overall	C	C
		EB LT	D	E
		EB T	E	E
		EB RT	A	A
		WB LT	E	E
		WB T	C	D
		WB RT	A	A
		NB LT	B	B
		NB T	B	C
		NB RT	A	A
		SB LT	B	B
		SB T	C	B
		SB RT	A	A
2	Gateway PK Blvd & Mountain Ave Right-In-Right-Out	Overall	A	A
		SB RT	B	B
3	Berthoud Pkwy & Mountain Ave Signal	Overall	B	B
		EB LT	A	B
		EB T/RT	B	B
		WB LT	A	A
		WB T	B	C
		WB RT	A	A
		NB LT/T	B	B
		NB RT	A	A
		SB LT/T	B	B
		SB RT	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.

LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Table 4 (continued)
Existing Weekday Peak-Hour Intersection Level of Service

#	Intersection	Overall Movement	Level of Service	
			AM Peak Hr	PM Peak Hr
4	Berthoud Pkwy & Welch Ave T-Stop	Overall	A	A
		WB LT/RT	B	B
		SB LT	A	A
5	Berthoud Pkwy & Arapahoe Ave T-Stop	Overall	A	A
		WB LT/RT	A	A
		SB LT	A	A
6	Berthoud Pkwy & Spartan Ave T-Stop	Overall	A	A
		WB LT/RT	C	B
		SB LT	A	A
7	Berthoud Pkwy & CR 4E Two-Way Stop	Overall	A	A
		NB LT	A	A
		EB Approach	A	A
		WB Approach	A	A
		SB LT	A	A
8	US 287 & CR 4E T-Stop	Overall	A	A
		WB Approach	F	F
		SB LT	A	C
11	Meadowlark Dr & Mountain Ave Two-Way Stop	Overall	A	A
		NB Approach	C	C
		EB LT	A	A
		WB LT	A	A
		SB Approach	C	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 Ludlow Farm project will include various uses. The project is envisioned to be phased. The project site plan is depicted on Figure 2. As shown on the figure, vehicular access to the project will be from locations along Mountain Avenue, Berthoud Parkway, and US 287.

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 Ludlow Farm project. As indicated in the table, the full buildout of the project will result in an estimated net of 18,835 daily, 815 morning, and 1,445 evening peak hour trips.

The net trips take into account an internal capture (trips that happen within the Ludlow project site) based on the mixture of residential/office/commercial. This estimate was determined based on data from National Cooperative Highway Research Program (NCHRP) Report 285, Enhancing Internal Trip Capture Estimation for Mixed-Use Developments, 2011. Appendix C provides the internal trip calculation worksheets. A 15 percent internal capture was applied to the PM peak hour and relevant daily volumes. The net trips also account for pass by trips on both Mountain Avenue and US 287. Based on data from the ITE *Trip Generation Handbook*, 3rd Edition, 2017. For commercial uses, the pass by trips range from 16% up to 66% and is dependent on the size of the commercial site and its location. A pass by trip is already present on the road. It is therefore not a new trip. Note that at the project's access points, all the trips should be present and no pass by discount is taken.

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	526	4,647	88	250	337	298	175	473
Multi-Family Low Rise	220	1353	8,748	106	336	442	379	223	602
Shop Ctr > 150 KSF	820	165.7	6,133	86	53	139	270	293	563
Day Care Center	565	15	714	87	78	165	78	88	167
General Office	710	30	407	52	7	59	10	51	61
INITIAL TOTAL			20,649	420	723	1,143	1,037	830	1,867
Internal Capture - PM 15%			(280)				(156)	(125)	(280)
Pass-By Trip Reduction Commercial 25%			(1533)				(68)	(73)	(141)
Total Reductions				0	0	0	(224)	(198)	(421)
TOTAL			18,836	420	723	1,143	813	632	1,446

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 and indicates the distribution for residential and commercial/office uses. The resulting peak hour traffic associated with the buildout of Ludlow Farm is shown on Figure 7.

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Figure 6 – Trip Distribution

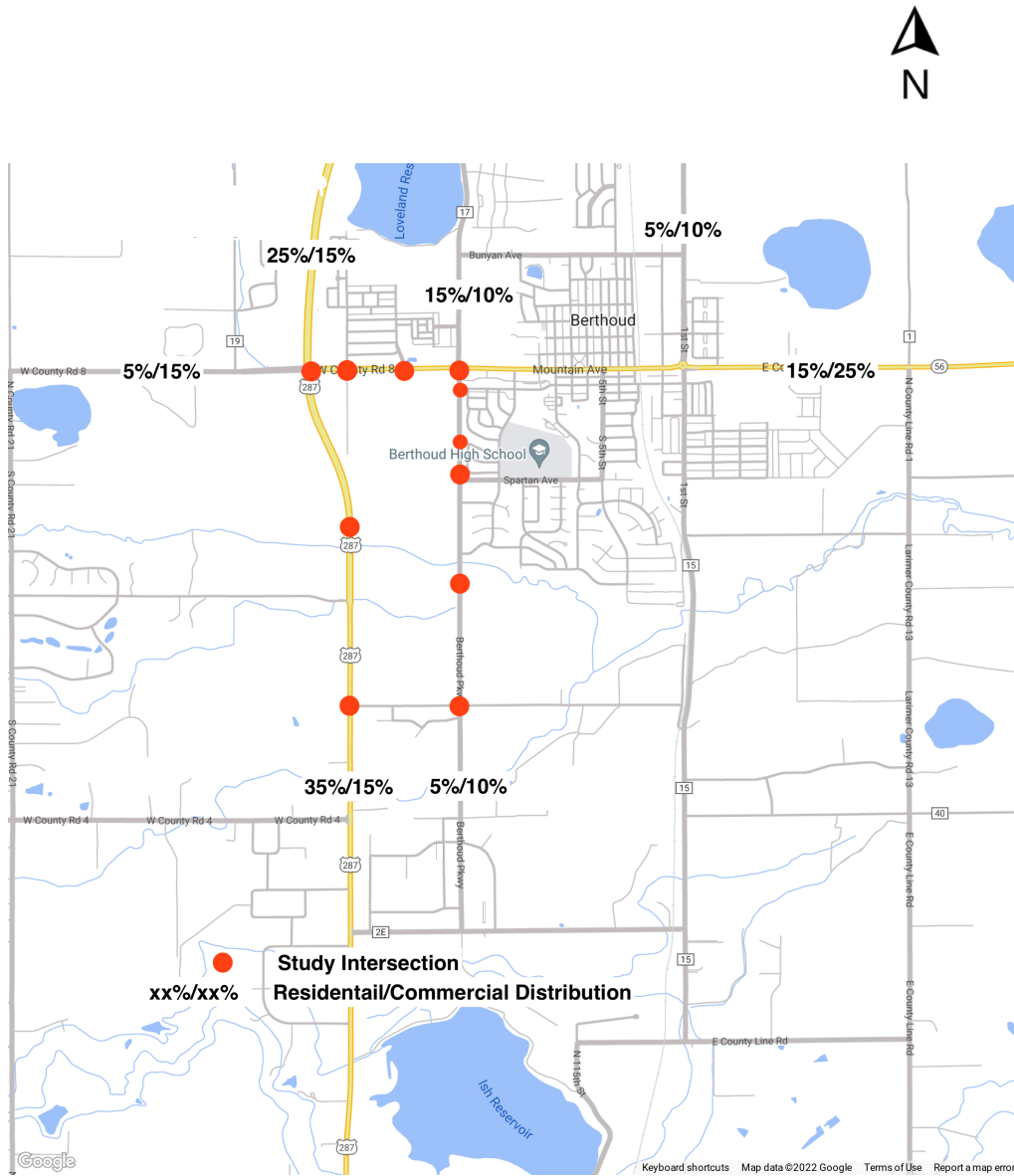
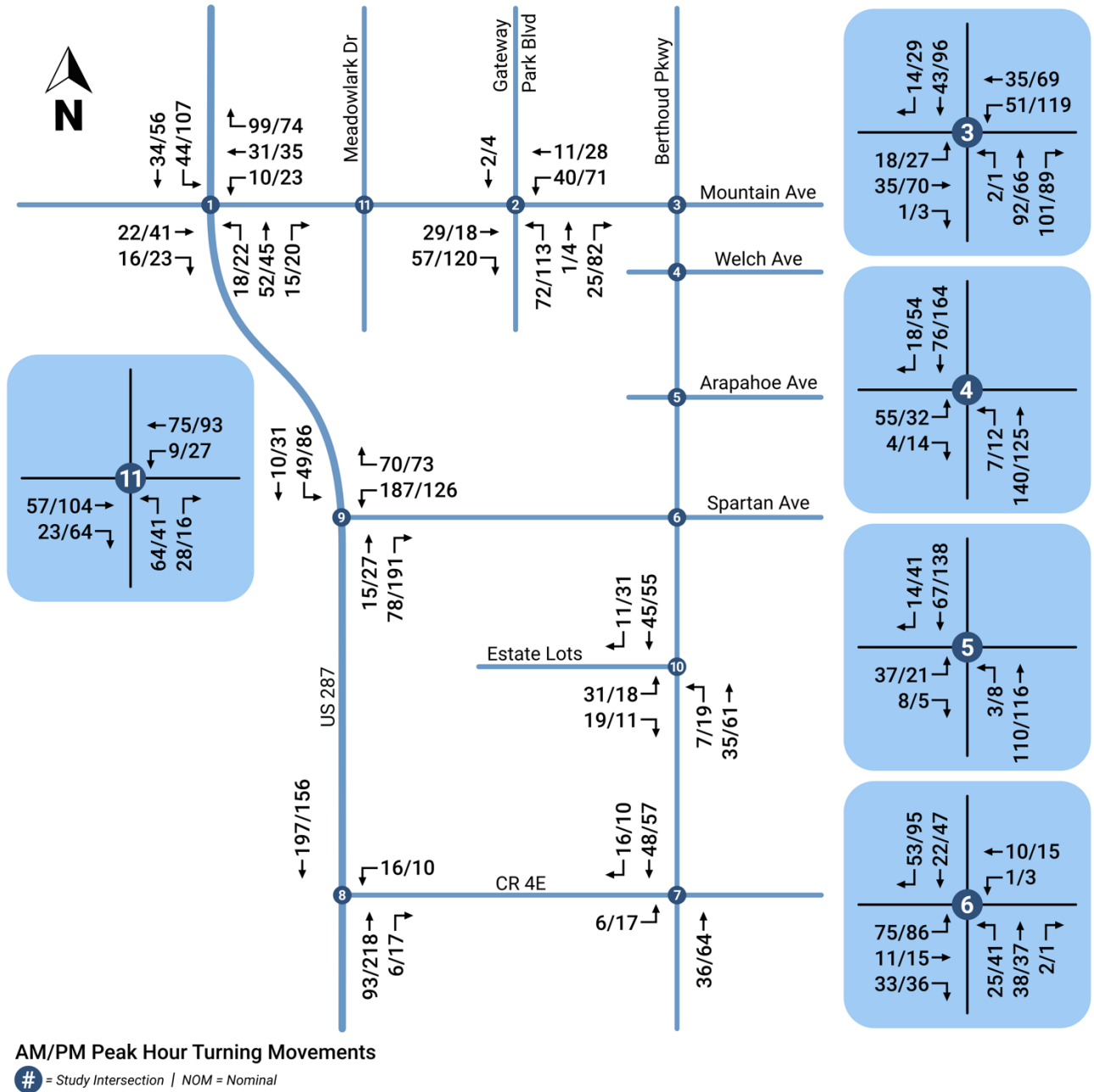


Figure 7 – Project Traffic



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.

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 **areawide/ambient growth** in traffic was determined based on the direction from the Colorado Department of Transportation (CDOT). The 20 year growth factors were from 1.18 to 1.39. Because numerous other projects' traffic will also be included, a 20 year growth factor of 1.10 was applied.
- The future connection of Spartan Avenue between Berthoud Parkway and US 287 was assumed. Traffic was modified by shifting traffic to this future connection.
- The future traffic related to the **other proposed projects** was added to the background traffic. Three proposed projects were included as follows.
 - Traffic Impact Study for Gateway (northeast corner of US 287 and Mountain Avenue), Aldridge Transportation Consultants, LLC, October 24, 2019
 - Trails at Creekview (northeast corner Berthoud Parkway and CR 4E) Rollins Consult LLC, January 27, 2022.
 - The upcoming Revere project (northwest corner of US 287 and Mountain Avenue) is being prepared by Rollins Consult LLC

The resulting Background 2042 traffic projections for the study intersections are provided on Figure 8.

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 8 to develop background plus project peak hour traffic volumes. The resulting Year 2042 total traffic is depicted on Figure 9.

Figure 8 – Background Traffic 2042

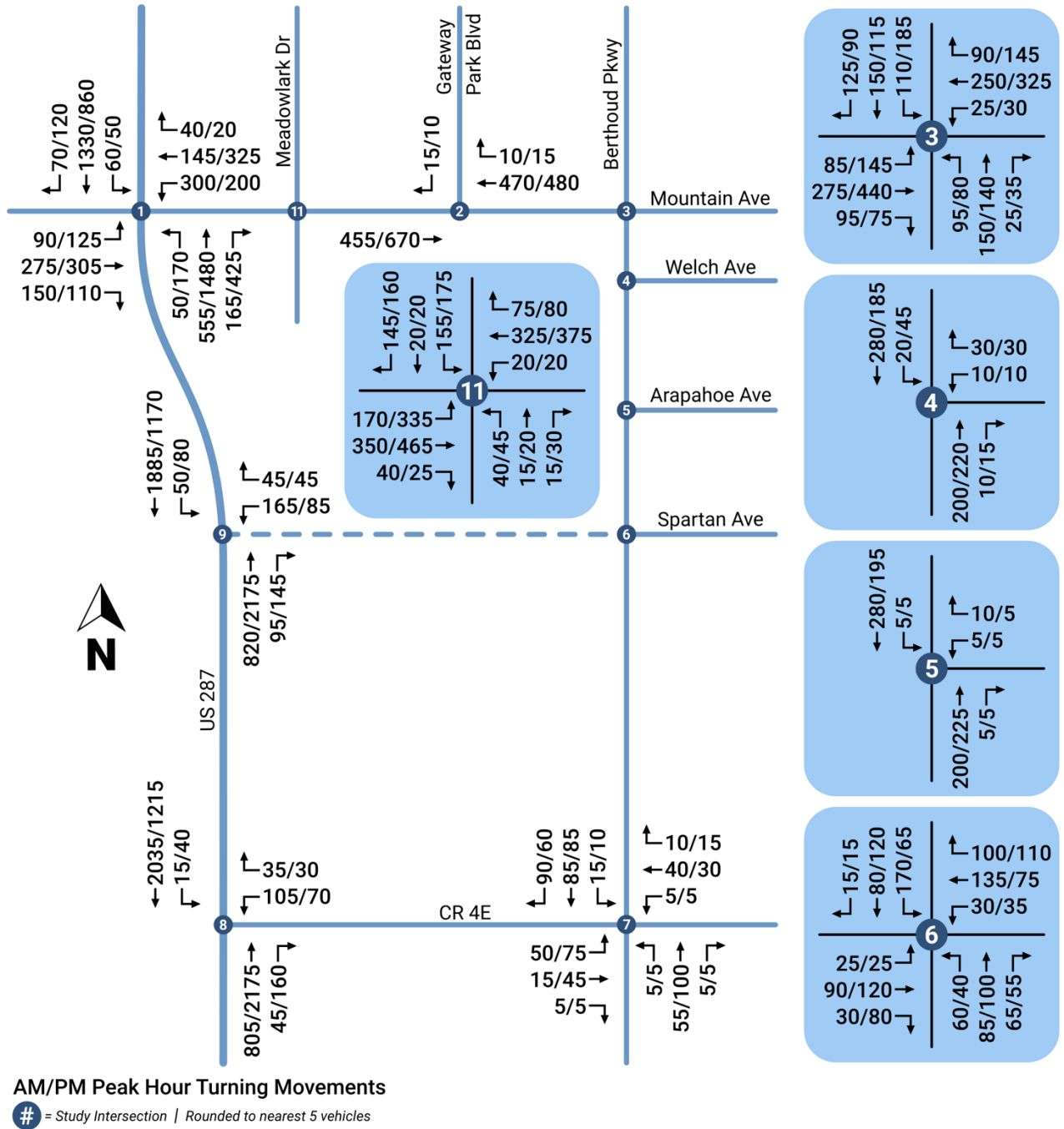
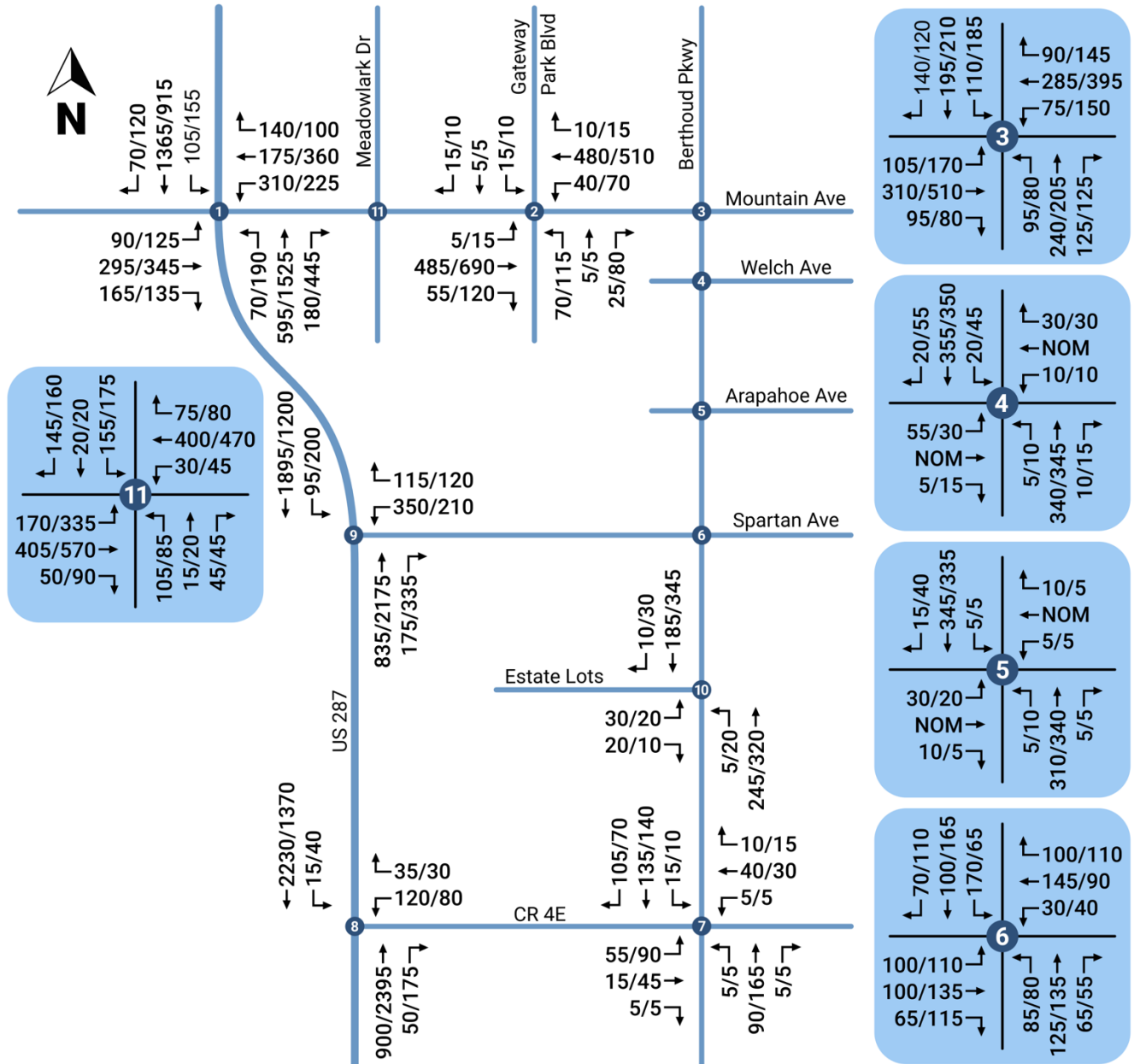


Figure 9 – Total Traffic 2042



AM/PM Peak Hour Turning Movements

= Study Intersection | Rounded to nearest 5 vehicles | NOM = Nominal

5 AUXILIARY LANE ANALYSIS

An analysis was conducted to determine the need for auxiliary turn lanes to the project site from US 287, Mountain Avenue, and Berthoud Parkway.

The guidelines from Figure 8-4 in LCUASS (provided in Appendix D) were applied to the total future projected volumes depicted on Figure 9 for 2042 total traffic conditions. Using the LCUASS criteria, it was determined that several auxiliary lanes satisfy the turn lane criteria. The following lanes are required under 2042 Total conditions.

US 287

- A northbound right-turn lane at Spartan Avenue

Mountain Avenue

- An eastbound right-turn lane at Gateway Park Boulevard

Berthoud Parkway

- A southbound right-turn lane at both Welch and Arapahoe Avenues
- A southbound right-turn lane at Spartan Avenue

These lanes will be assumed for the analysis of the study intersection operations for 2042 conditions. However, for the future roundabout at Berthoud Parkway and Spartan Avenue, it will be assumed that each leg is a single lane.

6 TRAFFIC IMPACT ANALYSIS

This chapter presents an analysis of the potential impacts of the traffic generated by the proposed Ludlow Farm 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.

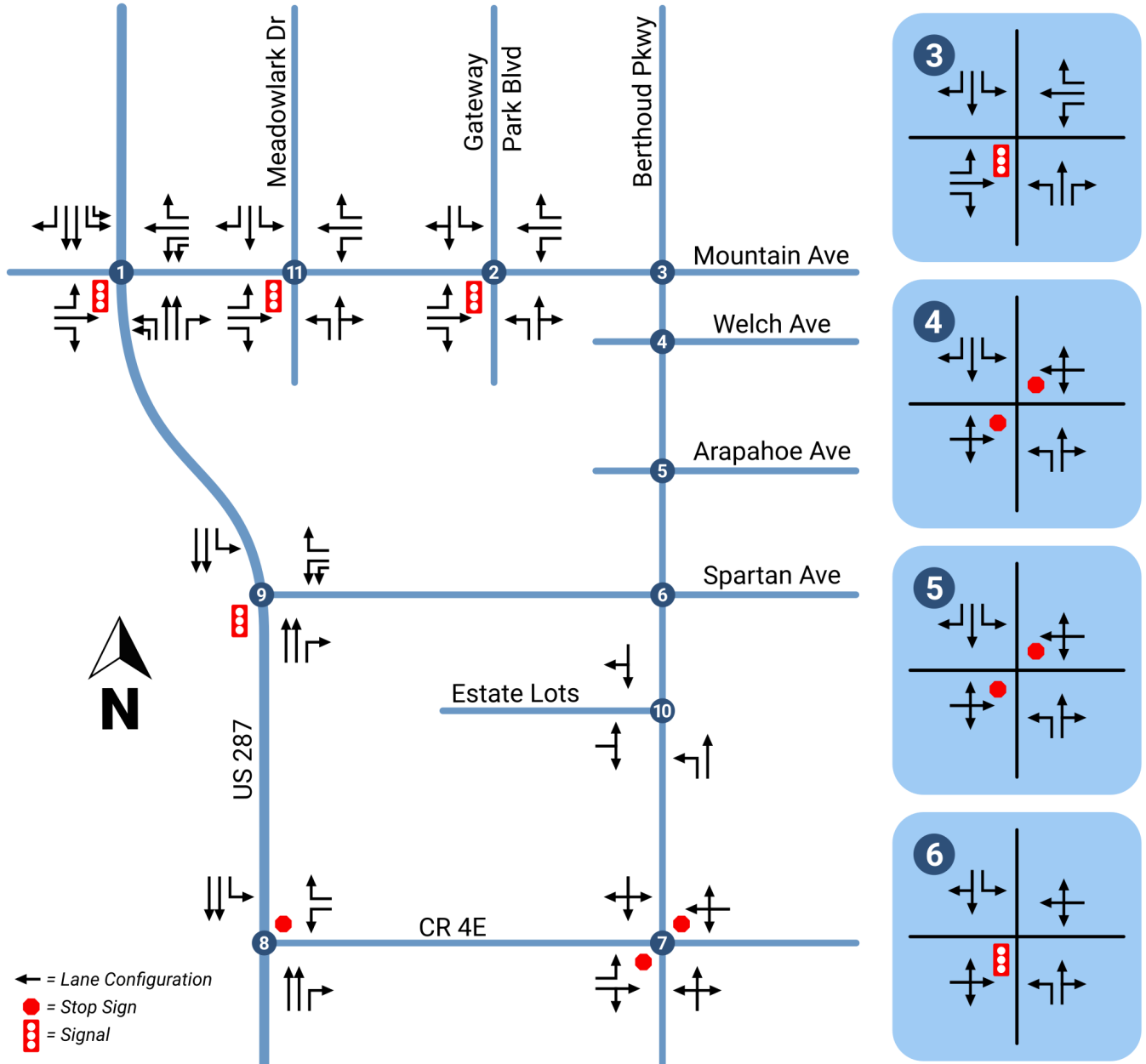
The extension of Spartan Avenue from Berthoud Parkway to US 287 is proposed as part of the project. It should be noted that without this future roadway extension, the future traffic conditions on Mountain Avenue would be over capacity. This is critical for the intersections along Mountain Avenue at US 287 and Berthoud Parkway. This improvement is part of the Ludlow ODP.

FUTURE INTERSECTION TRAFFIC CONDITIONS

The future traffic projections at the eleven external study intersections were analyzed to determine their operating conditions. An analysis of the proposed one-way internal streets is provided in the following section of the report. The analysis of future conditions was performed with both signalized intersections and roundabouts at Berthoud Parkway/Mountain Avenue, Berthoud Parkway/Spartan Avenue, and Gateway Park Boulevard/ Mountain Avenue. The intersection configurations under background 2042 conditions are provided on Figure 10. The analysis results are provided in Table 6 for both background and total conditions (signalized intersection) and in Table 7 for the three potential roundabout intersections. 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:

- At the intersection of US 287 and Mountain Avenue, the westbound left-turn and eastbound through movements are projected to experience long delays under both background and total traffic conditions. As traffic volumes on US 287 increase, the cross streets are expected to experience longer delays. Overall, the intersection will operate at an acceptable level of service.
- The intersection of US 287 and CR 4E will operate with high delays and LOS F under background and total traffic conditions. This location may require signalization. The operations with a signal are provided in Table 8 and indicate the intersection would operate at acceptable levels.

Figure 10
2042 Intersection Configurations



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Table 6
2042 Peak Hour Intersection Level of Service

#	Intersection	Overall Movement	Background		Total	
			AM	PM	AM	PM
1	US 287 & Berthoud Parkway Signal	Overall	C	C	C	D
		EB LT	D	E	D	E
		EB T	E	F	E	F
		EB RT	A	A	A	A
		WB LT	E	F	E	F
		WB T	C	E	C	E
		WB RT	A	A	B	A
		NB LT	D	D	D	D
		NB T	B	C	B	D
		NB RT	A	A	A	A
		SB LT	D	E	D	E
		SB T	C	C	D	C
		SB RT	A	A	A	A
2	Gateway PK Blvd & Mountain Ave Signal	Overall	A	A	B	B
		EB LT	-	-	A	A
		EB T	-	-	B	C
		EB RT	-	-	A	A
		WB LT	-	-	B	C
		WB T	-	-	C	B
		WB RT	-	-	A	A
		NB LT/T	-	-	B	B
		NB RT	-	-	A	A
		SB LT/T	-	-	B	B
		SB RT	B	B	A	B
3	Berthoud Pkwy & Mountain Ave Signal	Overall	B	B	B	B
		EB LT	B	B	B	B
		EB T	C	C	C	C
		EB RT	A	A	A	A
		WB LT	A	A	A	B
		WB T	C	C	C	C
		WB RT	A	A	A	A
		NB LT	B	B	B	B
		NB T	B	B	B	B
		NB RT	A	A	A	A
		SB LT	B	B	B	C
		SB T	B	B	B	B
		SB RT	A	A	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.

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

#	Intersection	Overall Movement	Background		Total	
			AM	PM	AM	PM
4	Berthoud Pkwy & Welch Ave T-Stop	Overall	A	A	A	A
		NB LT	-	-	A	A
		EB LT/T/RT	-	-	C	C
		WB LT/T/RT	B	B	B	B
		SB LT	A	A	A	A
5	Berthoud Pkwy & Arapahoe Ave T-Stop	Overall	A	A	A	A
			-	-	A	A
			-	-	C	C
		WB LT/RT	B	B	B	B
		SB LT	A	A	A	A
6	Berthoud Pkwy & Spartan Ave All-Way Stop (Background) Signal (Total)	Overall	B	B	B	B
		EB LT/T/RT	B	B	C	C
		WB LT/T/RT	B	B	B	B
		NB LT	B	B	A	B
		NB T/RT	B	B	A	A
		SB LT	B	B	A	A
		SB T/RT	B	B	A	A
7	Berthoud Pkwy & CR 4E Two-Way Stop	Overall	A	A	A	A
		NB LT	A	A	A	A
		EB LT	B	B	B	B
		EB T/RT	B	B	B	B
		WB Approach	B	B	B	B
		SB LT	A	A	A	A
8	US 287 & CR 4E T-Stop	Overall	D	F	F	F
		WB LT	F	F	F	F
		WB RT	B	D	B	E
		SB LT	B	D	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		Total	
			AM	PM	AM	PM
9	US 287 & Spartan Ave Signal	Overall	B	C	B	D
		WB LT	D	D	D	D
		WB RT	B	B	A	B
		NB T	A	D	B	D
		NB RT	A	A	A	A
		SB LT	A	C	A	D
		SB T	B	A	C	B
10	Berthoud Pkwy & Estate Lot Access T-Stop	Overall	-	-	A	A
		NB LT	-	-	A	A
		EB LT/RT	-	-	B	B
11	Meadowlark Dr & Mountain Ave Signal	Overall	B	B	B	B
		EB LT	B	B	B	B
		EB T/RT	B	B	-	-
		EB T	-	-	B	B
		EB RT	-	-	A	A
		WB LT	B	A	B	B
		WB T	B	B	C	B
		WB RT	A	A	A	A
		NB L/T/R	B	C	-	-
		NB LT	-	-	C	D
		NB T/RT	-	-	A	B
		SB LT	C	D	C	D
		SB T	B	C	B	D
		SB RT	A	A	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

Table 7 - Roundabout
2042 Peak Hour Intersection Level of Service

#	Intersection	Overall Movement	Background		Total	
			AM	PM	AM	PM
2	Gateway Park Blvd & Mountain Ave Roundabout	Overall	-	-	A	B
		EB LT/T	-	-	A	A
		EB RT	-	-	A	A
		WB LT/T/RT	-	-	A	A
		NB LT/T/RT	-	-	A	A
		SB LT/T/RT	-	-	A	A
3	Berthoud Pkwy & Mountain Ave Roundabout	Overall	B	C	A	C
		EB LT/T	B	D	A	E
		EB RT	A	A	A	A
		WB LT/T/RT	B	C	-	-
		WB LT/T	-	-	A	C
		WB RT	-	-	A	A
		NB LT/T/R	B	C	-	-
		NB LT/T	-	-	B	C
		NB RT	-	-	A	A
		SB LT/T/RT	B	C	-	-
		SB LT/T	-	-	A	C
		SB RT	-	-	A	A
6	Berthoud Pkwy & Spartan Ave Roundabout	Overall	A	A	A	A
		EB Entry	A	A	A	A
		WB Entry	A	A	A	A
		NB Entry	A	A	A	A
		SB Entry	A	A	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

As indicated in Table 7, the intersections are projected to operate within the acceptable limits established by the Town of Berthoud with the following noted operations, at the intersection of Berthoud Parkway and Mountain Avenue the potential roundabout will require two lanes on Mountain Avenue and single lanes with exclusive right-turn lanes on Berthoud Parkway. The eastbound direction has an estimated queue length of 15 vehicles. Pedestrian crossings at this roundabout will be challenging especially for vulnerable users such as youth and older adults.

Table 8
2042 Peak Hour Intersection Level of Service With Improvements

#	Intersection	Overall Movement	Background		Total	
			AM	PM	AM	PM
8	US 287 & CR 4E Signal	Overall	A	A	B	B
		WB LT	D	C	C	C
		WB RT	B	C	C	C
		NB T	A	B	A	B
		NB RT	A	A	A	A
		SB LT	A	A	A	C
		SB T	A	A	B	A

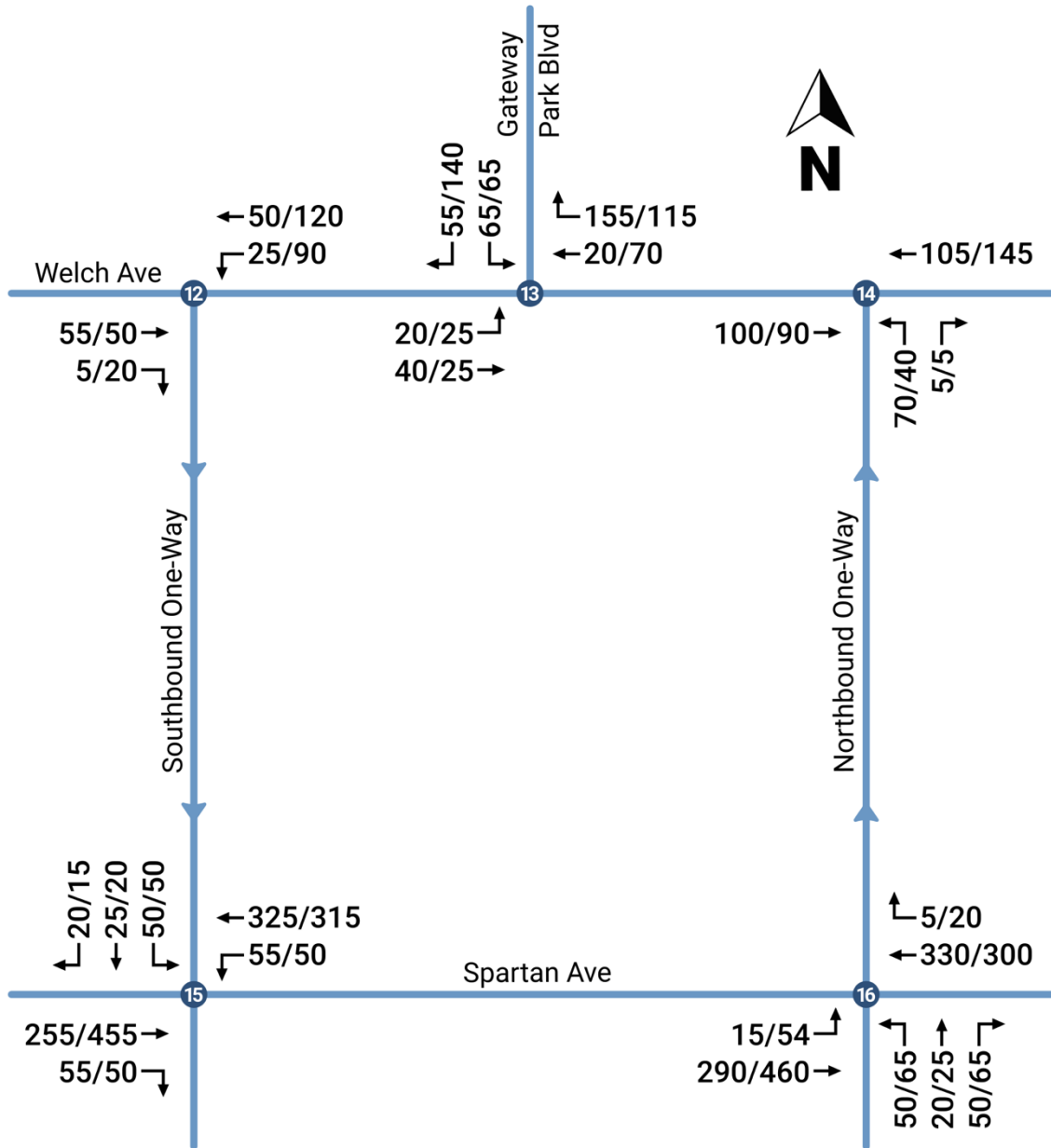
1. LOS calculations performed using Synchro which is based on the Transportation Research Board HCM 2016.
2. LOS is reported for both overall intersection and each constrained STOP-controlled movement or approach

INTERNAL ONE-WAY STREETS

The core of the Ludlow ODP includes a central park area framed by one-way streets. The intersection of the one-way streets was analyzed on both the north and south ends. The projected traffic volumes are depicted on Figure 11. The expected peak hour volumes were factored upward by 25% to ensure that the intersection spacing and configurations would operate well. The spacing between the one-way pairs along Spartan Avenue is approximately 177 feet (flow line to flow line). Along Welch Avenue between Gateway Park Boulevard and the one-way street the intersection spacing is between approximately 160 and 165 feet (flow line to flow line).

The results of the intersection level of service analysis and queue lengths are provided in Table 9. As indicated in the table, each of the intersections along both Welch Avenue and Spartan Avenue are expected to operate acceptably with the full buildout of the Ludlow ODP. The intersection configurations are provided on Figure 12, no left-turn lanes will be necessary on either Welch or Spartan Avenues. The access spacing as proposed is anticipated to operate with minimal delays and minor vehicular stacking.

Figure 11
2042 One-Way Peak Hour Traffic Volumes



AM/PM Peak Hour Turning Movements

= Study Intersection | Rounded to nearest 5 vehicles

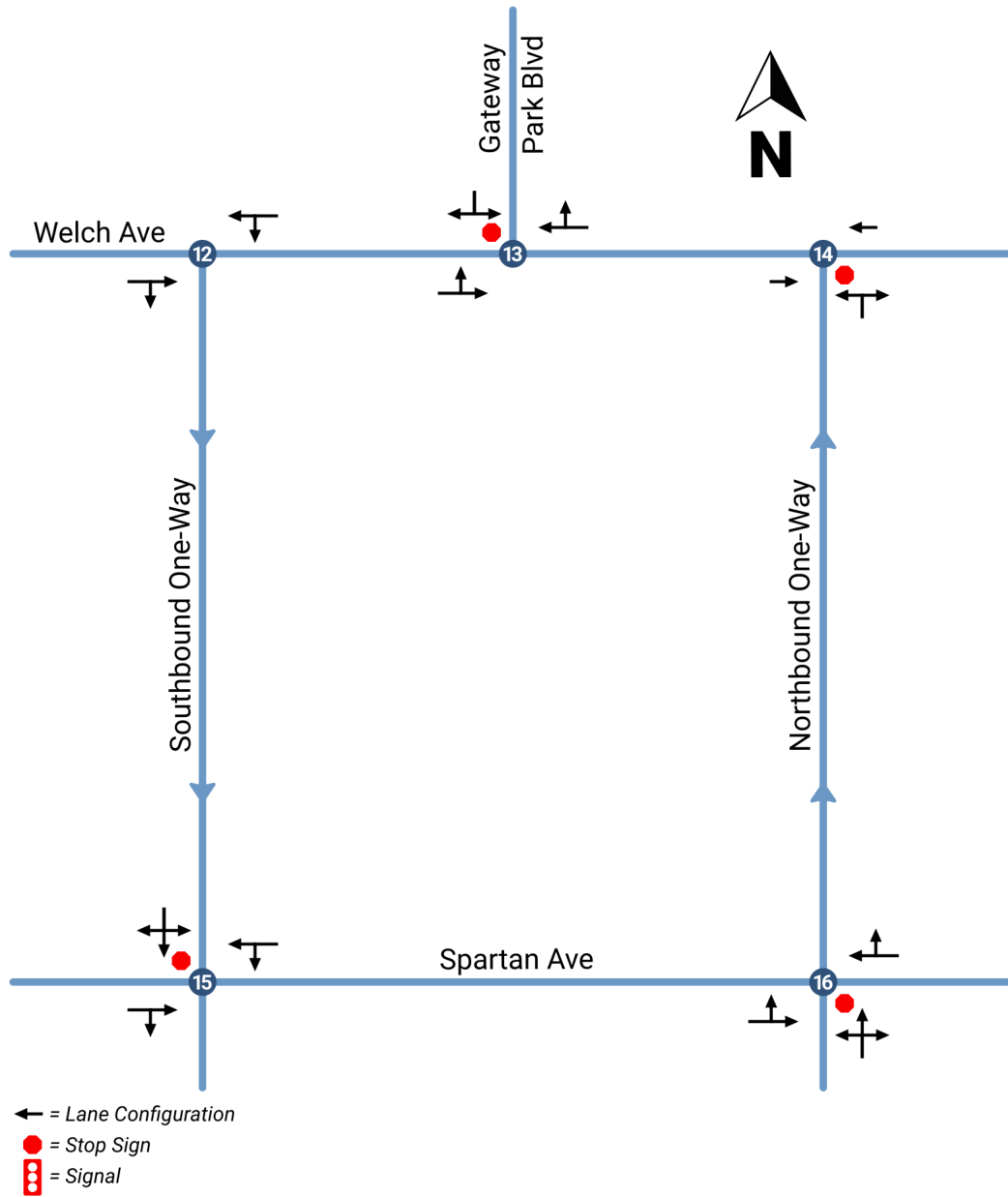
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Table 9
2042 One-Way Peak Hour Intersection Level of Service

#	Intersection	Overall Movement	Level of Service/ Queue(veh)	
			AM Peak Hr	PM Peak Hr
12	SB One-Way & Welch Ave T-Stop	Overall	A	A
		WB LT/T	A / 0.1	A / 0.2
13	Gateway PK Blvd & Welch Ave T-Stop	Overall	A	A
		EB LT/T	A / 0.1	A / 0.1
		SB LT/RT	B / 0.6	B / 1.2
14	NB One-Way & Welch Ave T-Stop	Overall	A	A
		NB LT/RT	B / 0.4	B / 0.2
15	SB One-Way & Spartan Ave T-Stop	Overall	A	A
		WB LT/T	A / 0.2	A / 0.2
		SB LT/T/RT	C / 1.0	C / 1.2
16	NB One-Way & Spartan Ave T-Stop	Overall	A	A
		NB LT/T/RT	B / 1.0	C / 2.3
		EB LT/T	A / 0	A / 0.1

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.

Figure 12
2042 One-Way Intersection Configurations



7 CONCLUSIONS

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

- The proposed Ludlow Farm project is located south of Mountain Avenue and east of US 287. The site is currently undeveloped.
- The traffic study analyzed the long range 2042 traffic conditions with the full buildout of the project.
- The proposed project includes the extension of Spartan Avenue from Berthoud Parkway to US 287. This future connection will benefit the transportation network and relieve the potential for Mountain Avenue to exceed capacity in the long range future.
- The project was modeled with 526 single family homes and 1,353 multi-family dwellings that are located throughout the site. A total of 165,700 square feet of commercial located adjacent to Mountain Avenue and at US 287/Spartan Avenue. Office uses are proposed at 30,000 square feet. A 15,000 square foot daycare center is also proposed
- The full buildout of the project is anticipated to result in an estimated 18,835 daily, 1,145 morning, and 1,445 evening peak hour trips.
- Currently, the study intersections are at acceptable levels.
- Several right-turn lanes are required to access the project site. These are in the eastbound direction at Gateway Park/Mountain, northbound at US 287/Spartan, and southbound along Berthoud Parkway at Welch, Arapahoe, and Spartan Avenues (unless Spartan Avenue at Berthoud Parkway is a roundabout).
- The study intersections are projected to operate acceptably under the 2042 background and total traffic conditions with the noted exceptions listed below.
- At the intersection of US 287 and Mountain Avenue, the westbound left-turn and eastbound through movements are projected to experience long delays under both background and total traffic conditions. As traffic volumes on US 287 increase, the cross streets are expected to experience longer delays. Overall, the intersection will operate at an acceptable level of service.
- The intersection of Gateway Park Boulevard and Mountain Avenue works both as signalized and a single-lane roundabout with an eastbound right-turn lane.
- The signalized intersection of Berthoud Parkway and Mountain Avenue will operate acceptably. A roundabout will require a thorough/left-turn lane and exclusive free flow right-turn lanes. The free flow right-turn lanes would be similar to the northbound approach at the existing roundabout of 1st Street and Mountain Avenue. Under background conditions, this is required in the

eastbound direction. Under total traffic conditions, each approach requires right turns.

- The intersection of Berthoud Parkway and Spartan Avenue works as both a signalized intersection and a single lane roundabout.
- The intersection of US 287 and CR 4E will operate with high delays and LOS F under background and total traffic conditions. This location may require signalization. The operations with a signal at the intersection would operate at acceptable levels.
- The internal one-way streets that frame the central park will operate at good levels of service at the proposed spacing. No left-turn lanes are required on Welch Avenue and Spartan Avenue where they intersect the one-way street.

APPENDICIES

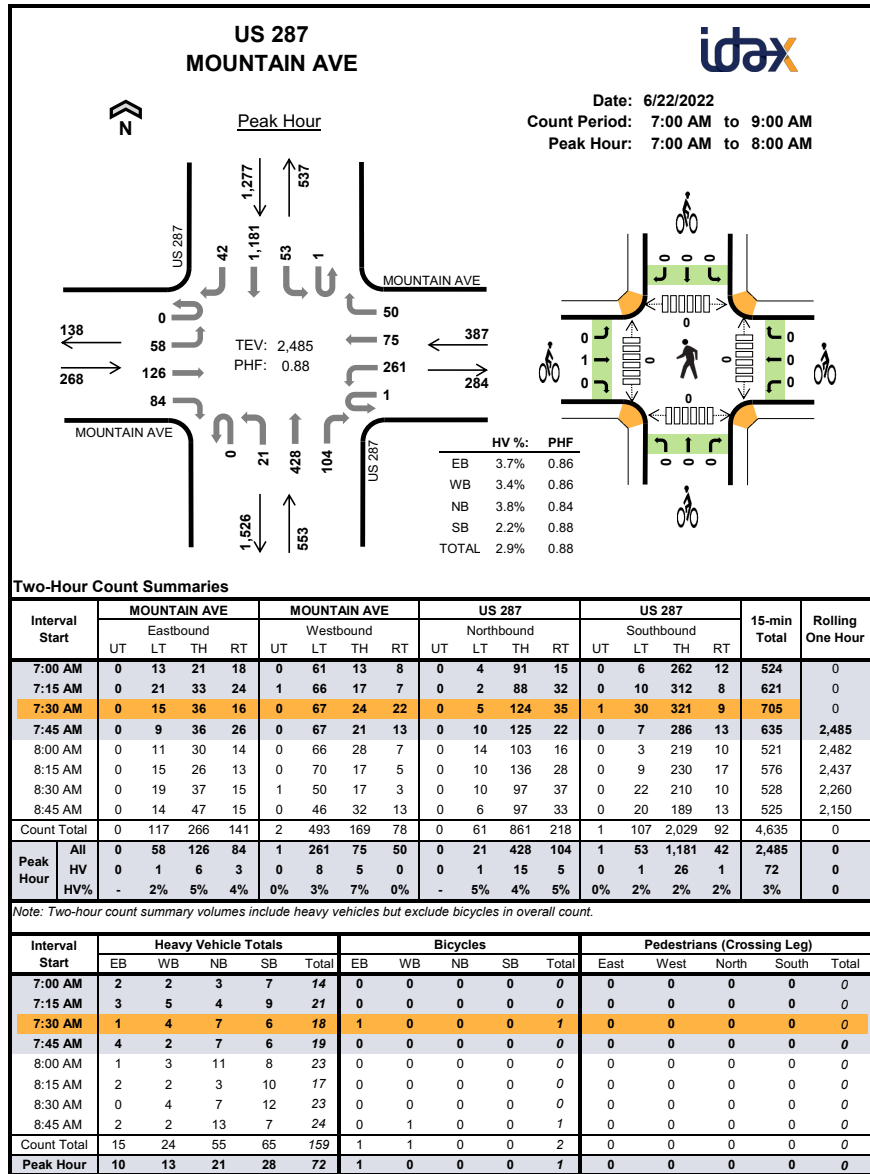
- Appendix A: Intersection Turning Movement Count Data
- Appendix B: Level of Service Worksheets
- Appendix C: NCHRP Internal Trip Capture
- Appendix D: Right-Turn Warrants

Appendix A Intersection Turning Movement Count Data

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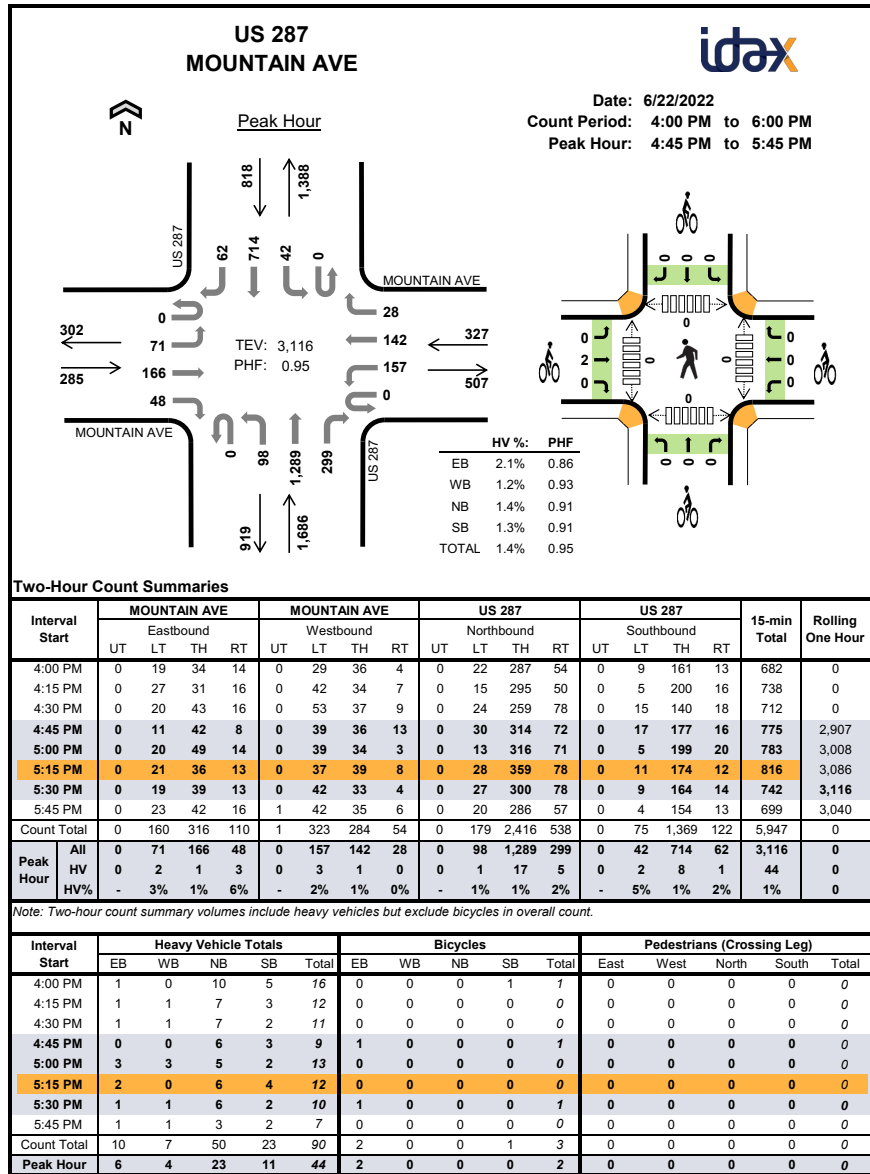
Project Manager: (720) 646-1008

project.manager.co@idaxdata.com

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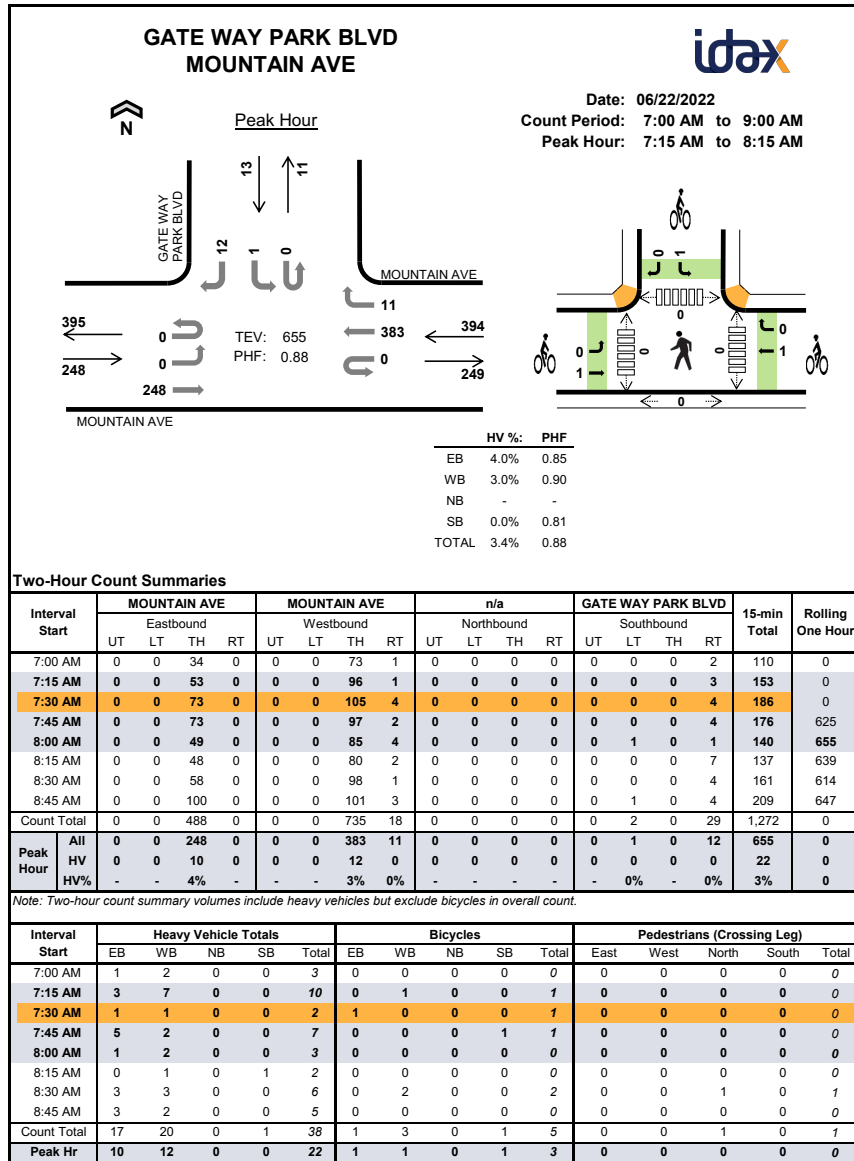
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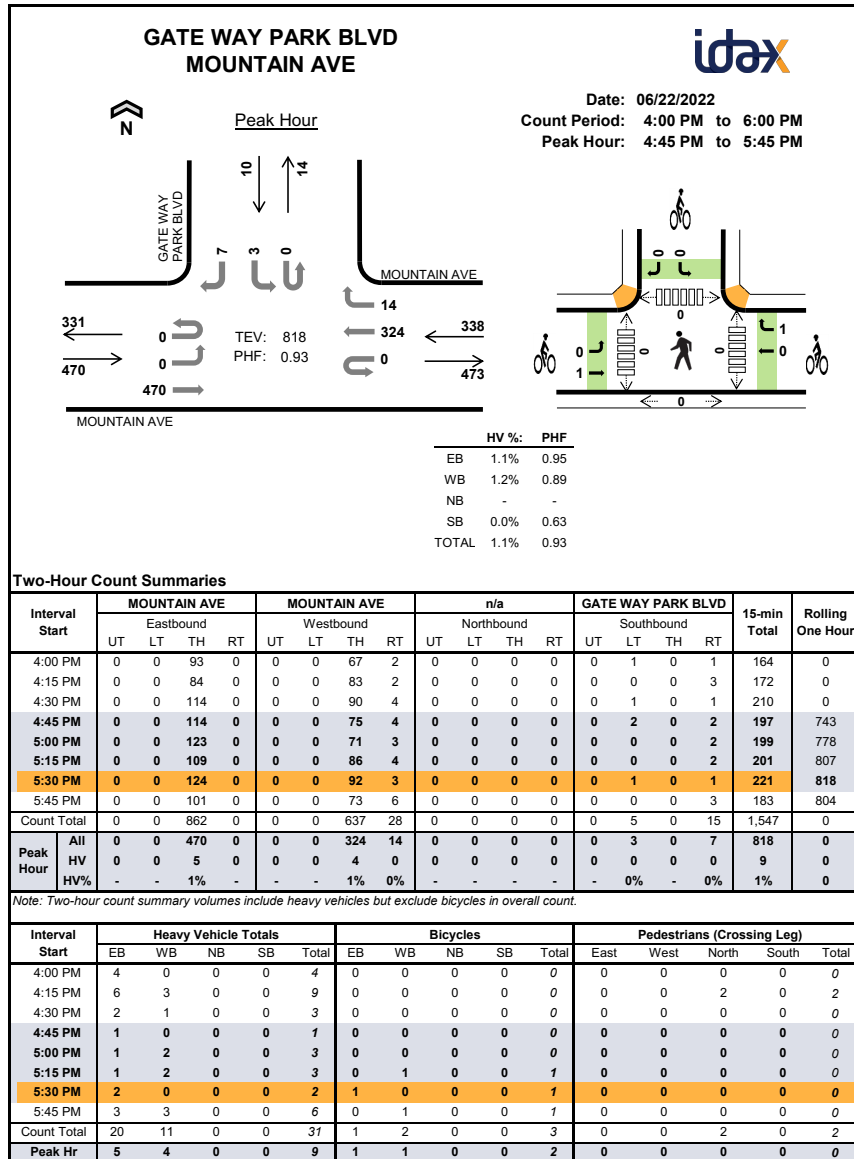
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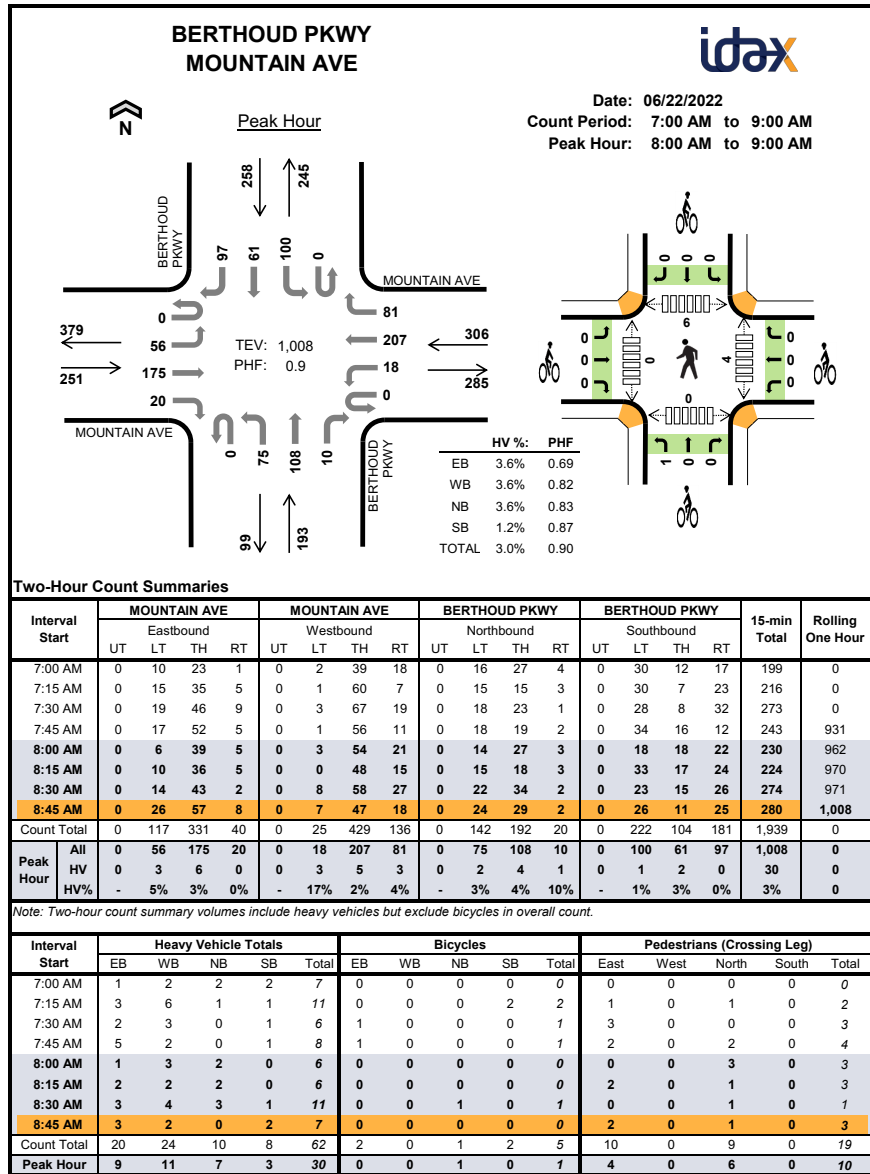
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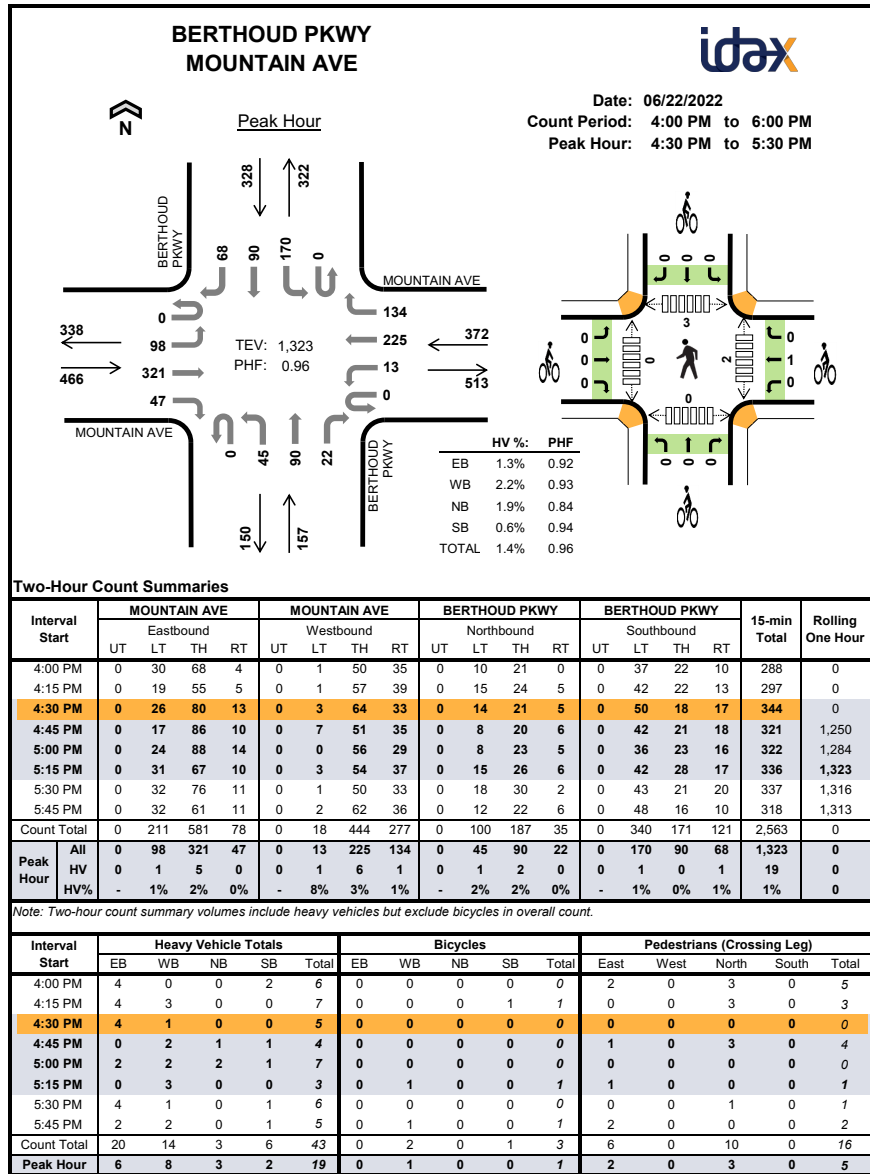
Project Manager: (720) 646-1008

project.manager.co@idaxdata.com

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Project Manager: (720) 646-1008

project.manager.co@idaxdata.com

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Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

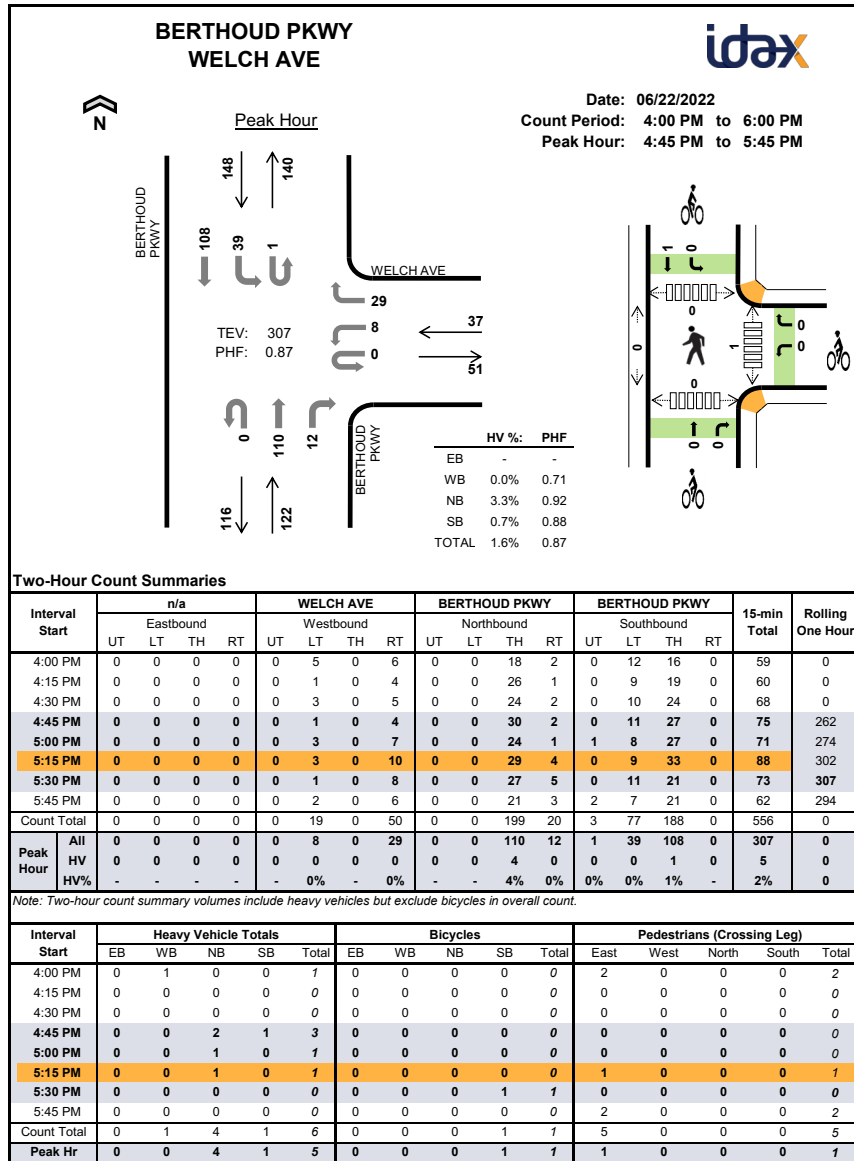
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	1	2	3	0	0	0	0	0	1	0	0	0	1
7:15 AM	0	0	1	1	2	0	1	1	1	3	1	0	0	0	1
7:30 AM	0	0	0	1	1	0	1	0	0	1	3	0	0	0	3
7:45 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	2	0	2	0	0	0	0	0	1	0	0	0	1
8:30 AM	0	0	1	2	3	0	0	0	0	0	3	0	0	0	3
8:45 AM	0	0	0	2	2	0	0	0	0	0	1	0	0	0	1
Count Total	0	0	6	8	14	0	2	1	1	4	5	0	0	0	10
Peak Hr	0	0	3	4	7	0	0	0	0	0	5	0	0	0	5

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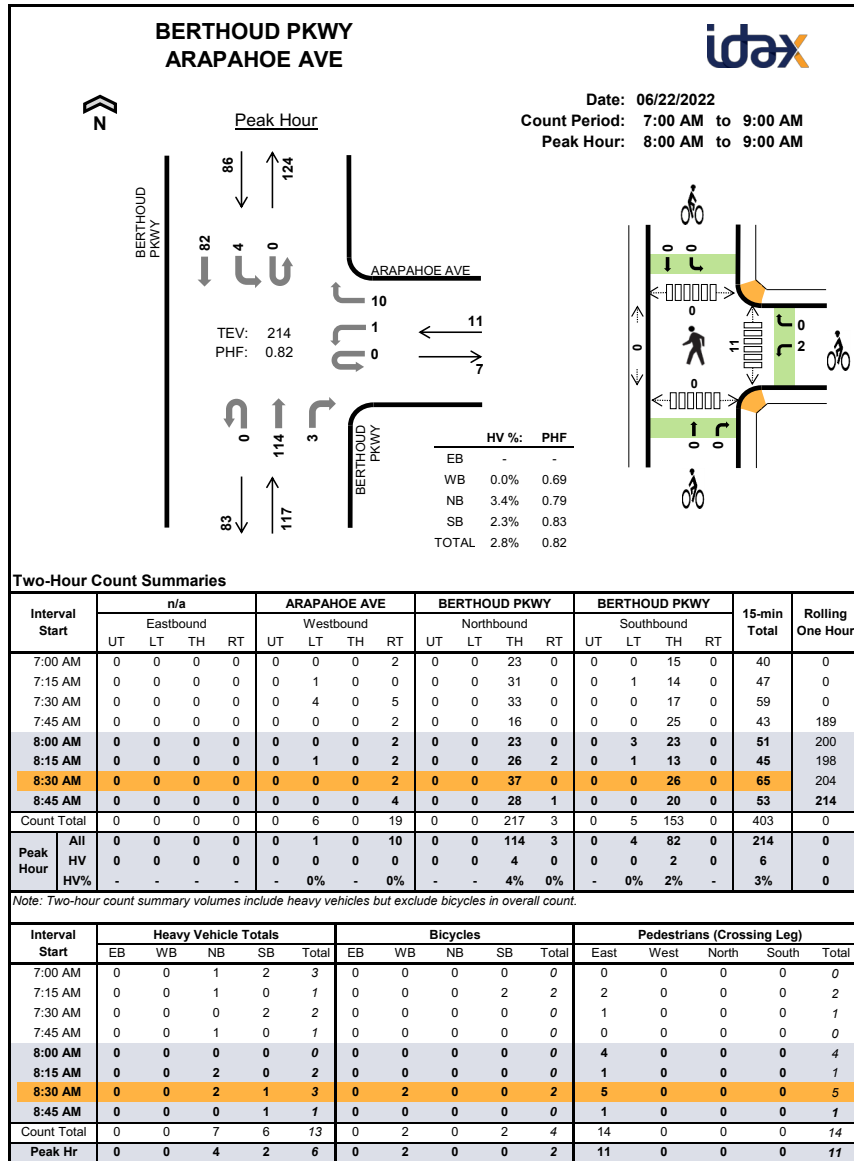
Project Manager: (720) 646-1008

project.manager.co@idaxdata.com

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Town of Berthoud

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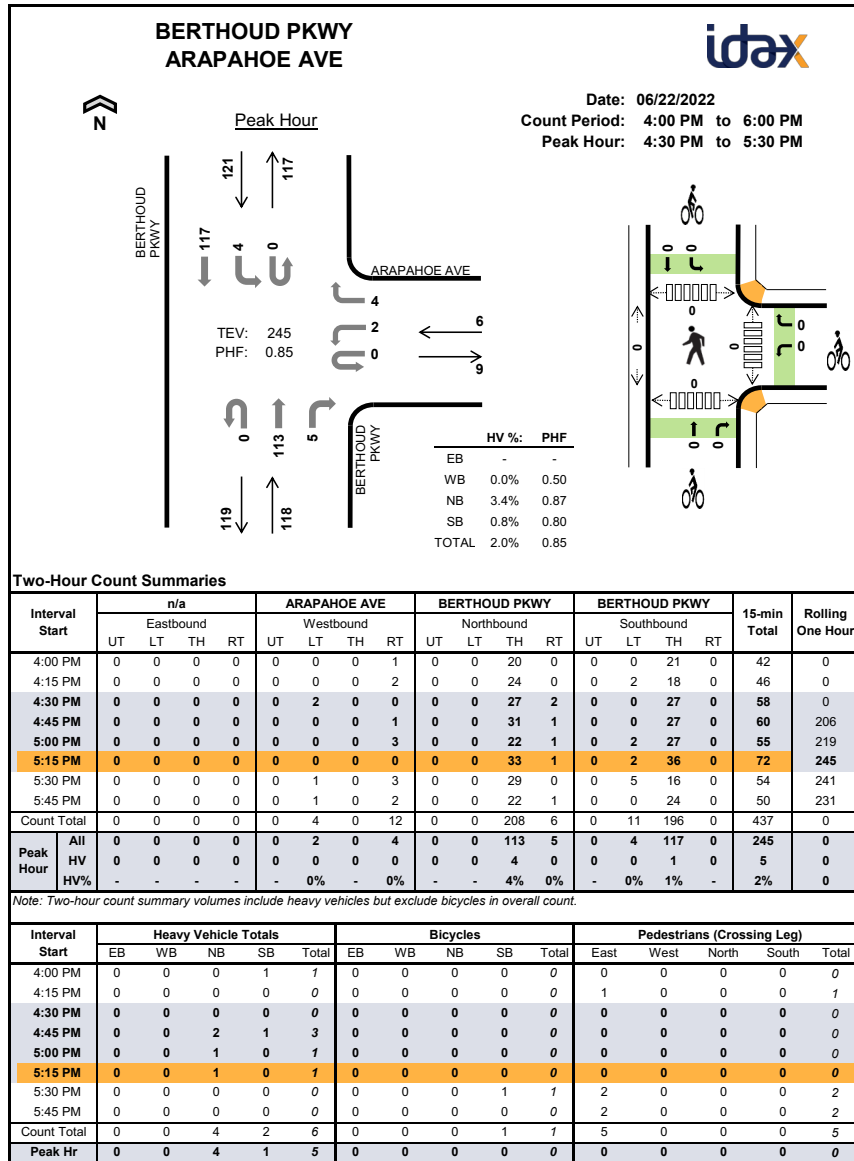
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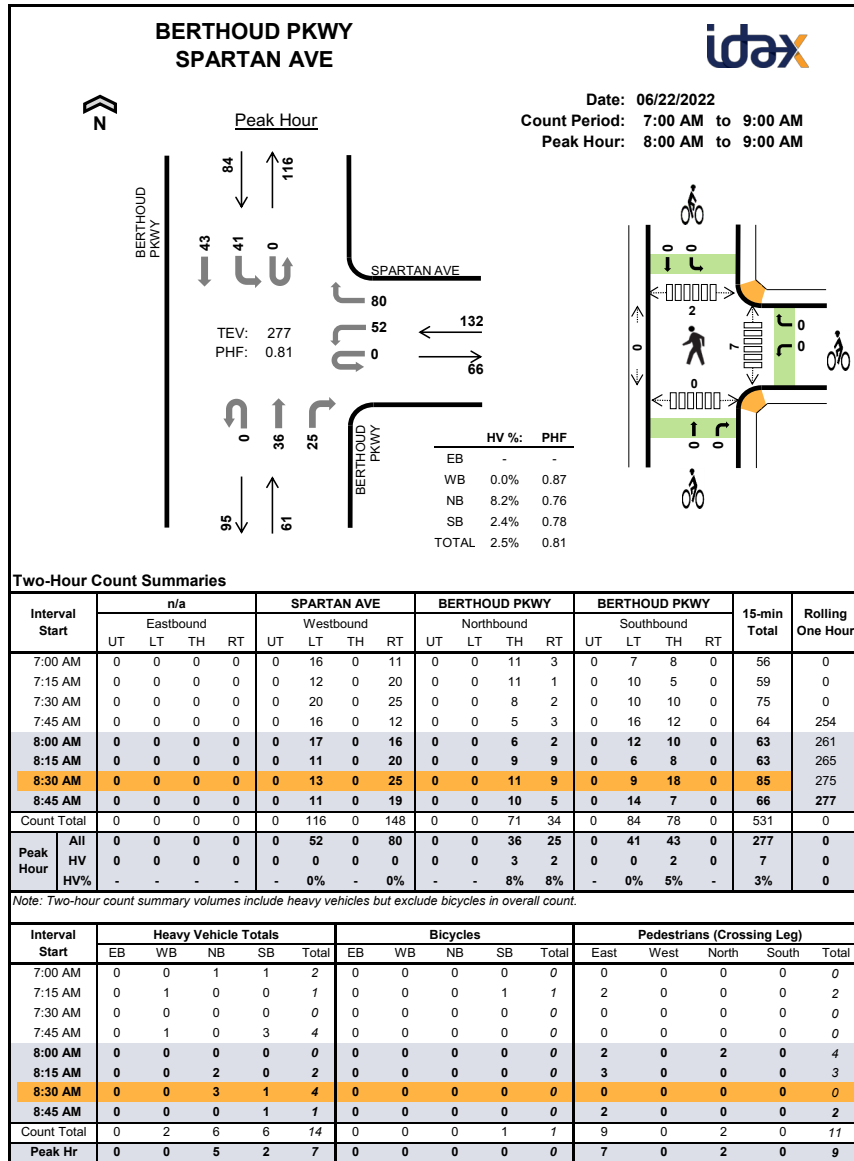
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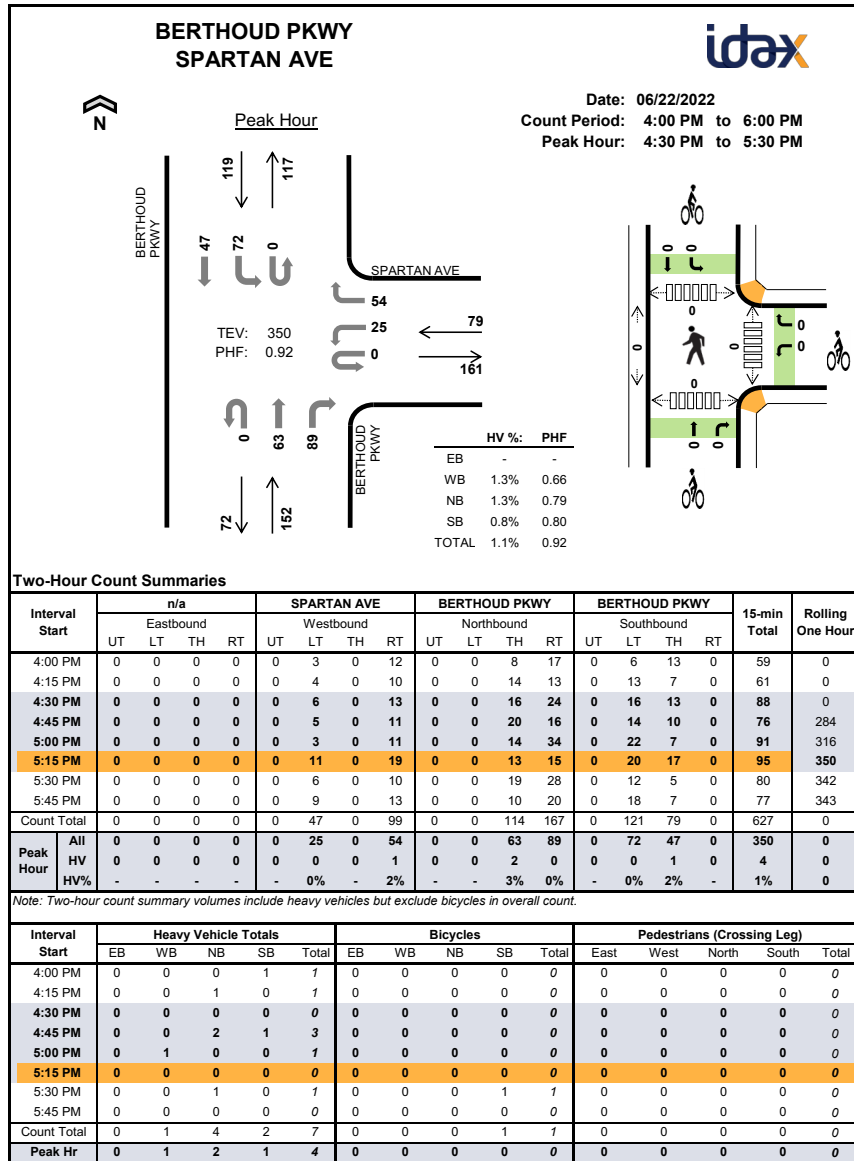


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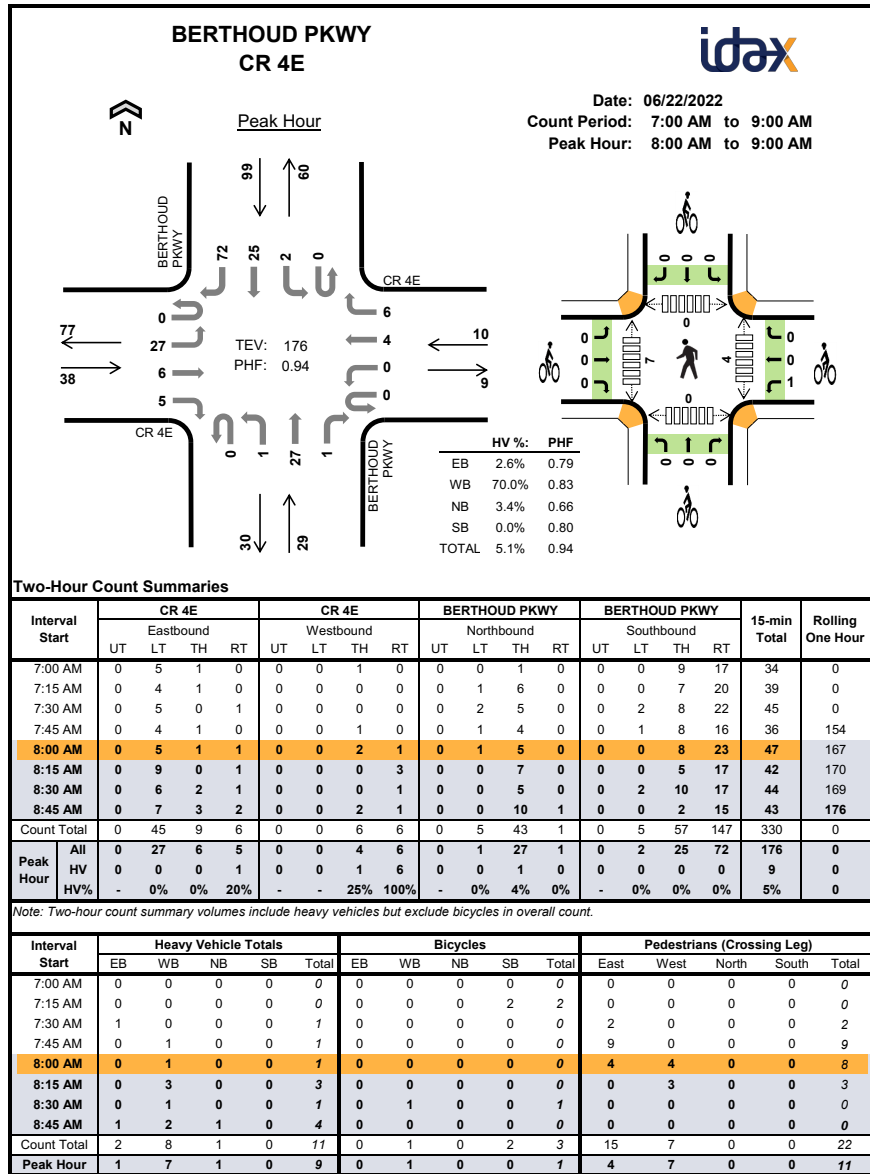
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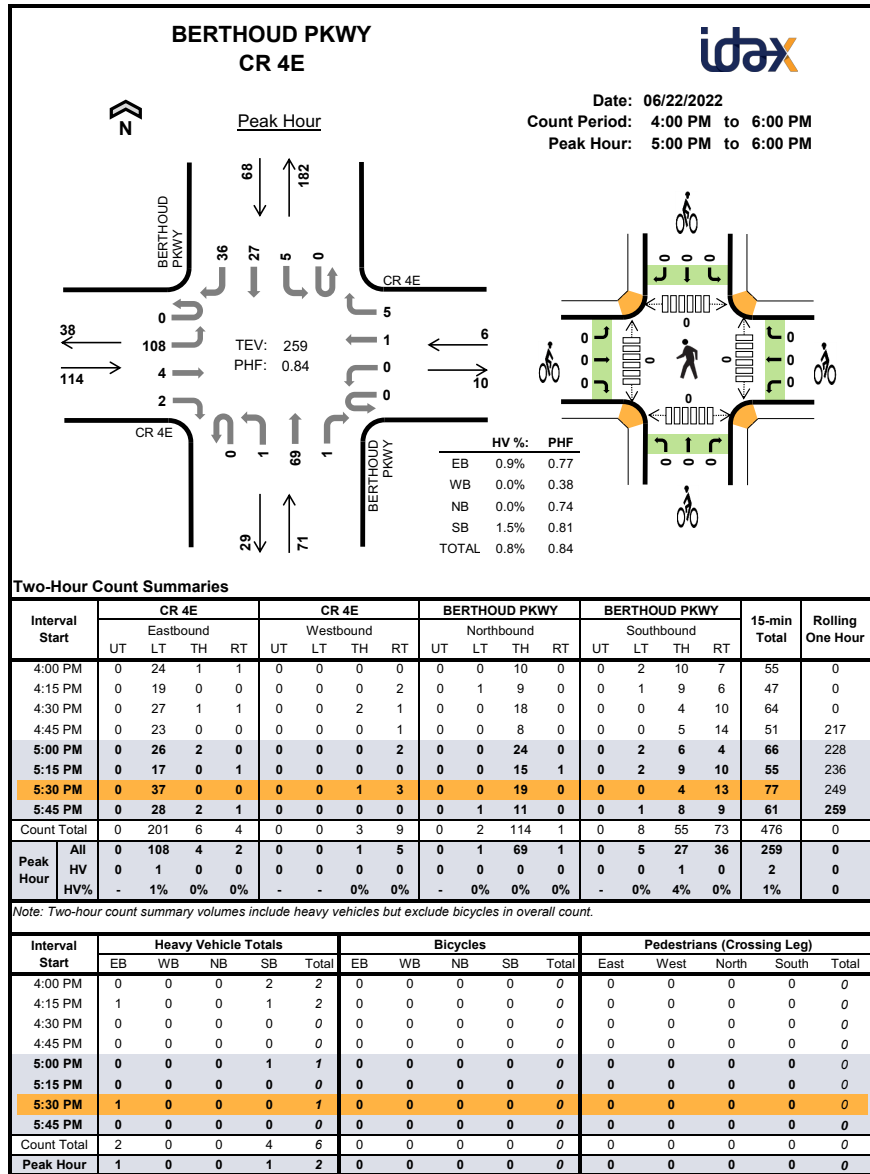
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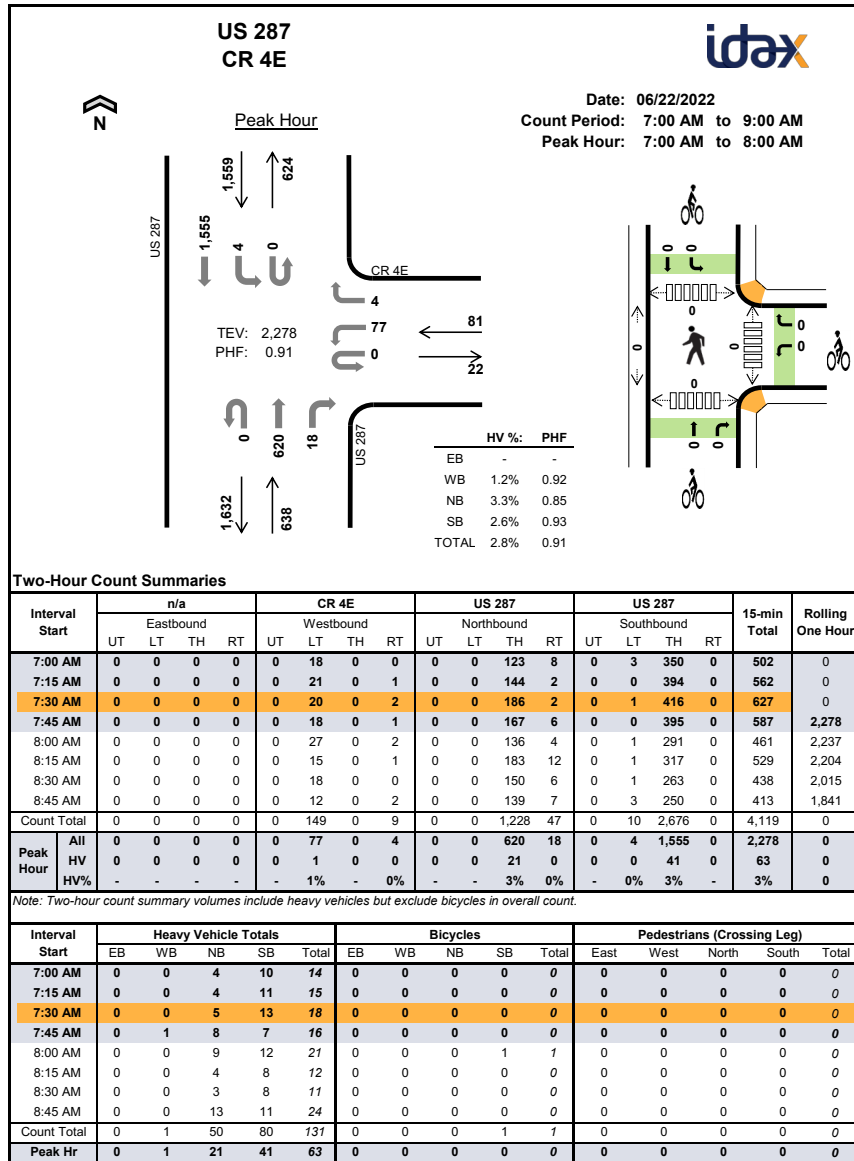
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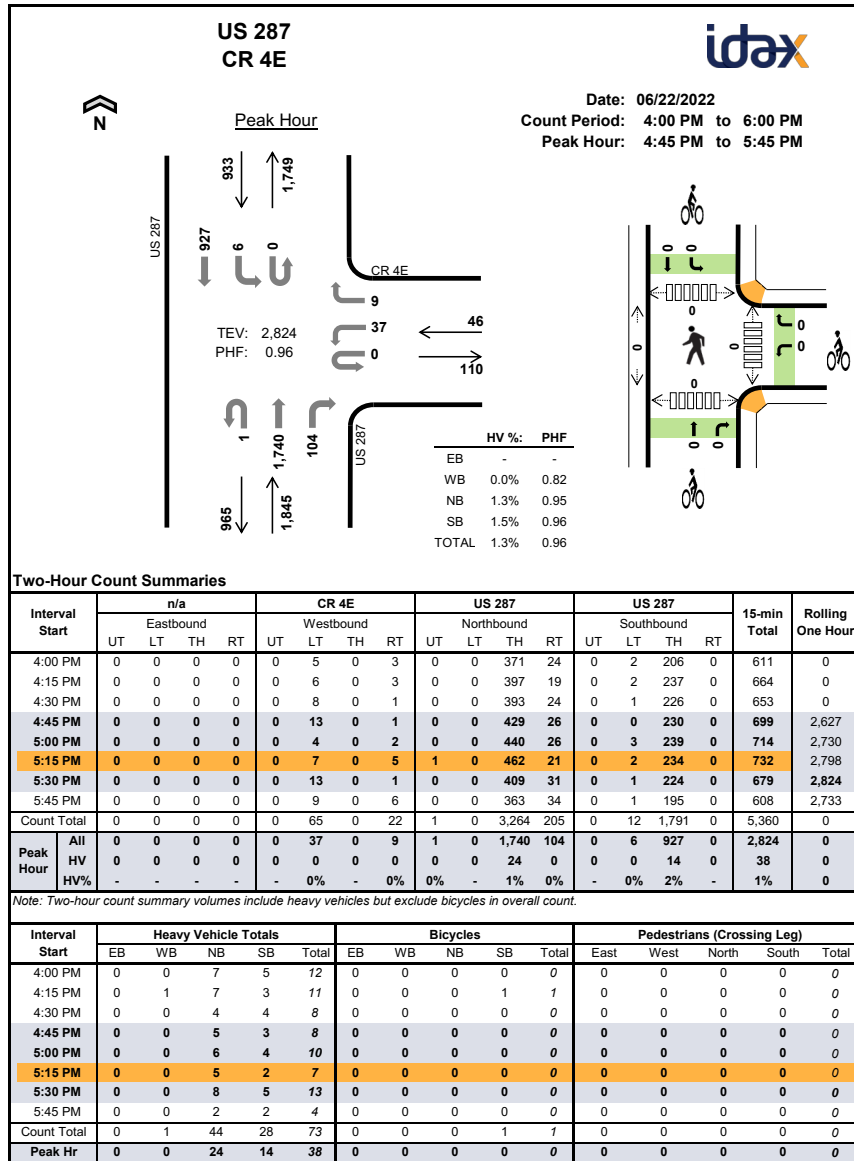
Project Manager: (720) 646-1008

project.manager.co@idaxdata.com

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Appendix B Level of Service Worksheets

EXISTING

LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings

1: US 287 & Mountain

09/12/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	197	84	262	88	50	21	428	104	54	1181	42
Future Volume (vph)	58	197	84	262	88	50	21	428	104	54	1181	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1660	1568	3400	1845	1568	1752	3505	1568	1752	3505	1568
Flt Permitted	0.950			0.950			0.099			0.416		
Satd. Flow (perm)	1752	1660	1568	3400	1845	1568	183	3505	1568	767	3505	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			213			213			213			164
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		3408			2270			654			2586	
Travel Time (s)		51.6			34.4			8.1			32.1	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Parking (#/hr)		0										
Adj. Flow (vph)	66	224	95	298	100	57	24	486	118	61	1342	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	66	224	95	298	100	57	24	486	118	61	1342	48
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.14	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Free	Prot	NA	Free	pm+pt	NA	Free	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free	2		Free	6		6
Detector Phase	7	4		3	8		5	2		1	6	6
Switch Phase												

Existing AM 7:00 am 06/22/2022 Existing AM
RR

Synchro 11 Light Report
Page 1

LUDLOW FARM | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings

1: US 287 & Mountain

09/12/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	22.5
Total Split (s)	13.9	23.0		16.0	25.1		9.5	51.4		9.6	51.5	51.5
Total Split (%)	13.9%	23.0%		16.0%	25.1%		9.5%	51.4%		9.6%	51.5%	51.5%
Maximum Green (s)	9.4	18.5		11.5	20.6		5.0	46.9		5.1	47.0	47.0
Yellow Time (s)	3.5	3.5		3.5	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		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	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		4.5	4.5	4.5
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	C-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)	8.3	16.8	100.0	11.5	22.1	100.0	54.4	50.3	100.0	56.4	54.3	54.3
Actuated g/C Ratio	0.08	0.17	1.00	0.12	0.22	1.00	0.54	0.50	1.00	0.56	0.54	0.54
v/c Ratio	0.46	0.80	0.06	0.76	0.25	0.04	0.13	0.28	0.08	0.13	0.70	0.05
Control Delay	53.8	61.6	0.1	56.5	34.9	0.0	11.3	15.8	0.1	10.5	20.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.8	61.6	0.1	56.5	34.9	0.0	11.3	15.8	0.1	10.5	20.9	0.1
LOS	D	E	A	E	C	A	B	B	A	B	C	A
Approach Delay		45.1			44.7			12.7			19.7	
Approach LOS		D			D			B			B	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 25.5

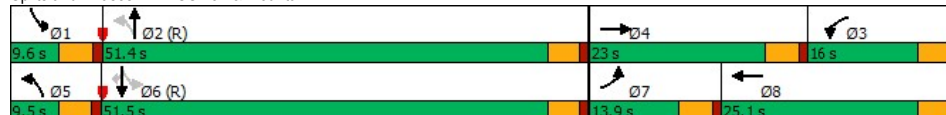
Intersection LOS: C

Intersection Capacity Utilization 69.7%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: US 287 & Mountain



Existing AM 7:00 am 06/22/2022 Existing AM
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Synchro 11 Light Report
Page 2

LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC

2: Mountain & Gate Way

08/24/2022

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑	↑		↑
Traffic Vol, veh/h	0	319	396	11	0	12
Future Vol, veh/h	0	319	396	11	0	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	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	363	450	13	0	14
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	-	0	-	0	-	450
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.327
Pot Cap-1 Maneuver	0	-	-	-	0	607
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	607
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		11.1		
HCM LOS	B					
Minor Lane/Major Mvmt	EBT	WBT	WBR SBLn1			
Capacity (veh/h)	-	-	607			
HCM Lane V/C Ratio	-	-	0.022			
HCM Control Delay (s)	-	-	11.1			
HCM Lane LOS	-	-	B			
HCM 95th %tile Q(veh)	-	-	0.1			

Existing AM 7:00 am 06/22/2022 Existing AM
RR

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC

2: Mountain & Gate Way

08/24/2022

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑	↑		↑
Traffic Vol, veh/h	0	470	355	14	0	7
Future Vol, veh/h	0	470	355	14	0	7
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	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	505	382	15	0	8
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	-	382
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.327
Pot Cap-1 Maneuver	0	-	-	-	0	663
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	663
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		10.5		
HCM LOS				B		
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	663		
HCM Lane V/C Ratio	-	-	-	0.011		
HCM Control Delay (s)	-	-	-	10.5		
HCM Lane LOS	-	-	-	B		
HCM 95th %tile Q(veh)	-	-	-	0		

Existing PM 5:00 pm 06/22/2022

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings

3: Berthoud Pkwy & Mountain

09/13/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	175	91	18	207	81	88	122	10	100	132	97
Future Volume (vph)	56	175	91	18	207	81	88	122	10	100	132	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.949				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.979			0.979	
Satd. Flow (prot)	1752	1751	0	1752	1845	1568	0	1806	1568	0	1806	1568
Flt Permitted	0.512			0.568				0.780			0.778	
Satd. Flow (perm)	944	1751	0	1048	1845	1568	0	1439	1568	0	1435	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		51				119			119			119
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		1257			3652			531			2550	
Travel Time (s)		19.0			55.3			10.3			49.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	62	194	101	20	230	90	98	136	11	111	147	108
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	295	0	20	230	90	0	234	11	0	258	108
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

Existing AM 7:00 am 06/22/2022 Existing AM
RR

Synchro 11 Light Report
Page 1

LUDLOW FARM | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings

3: Berthoud Pkwy & Mountain

09/13/2022

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	9.5	22.5		9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.5	22.5		9.5	22.5	22.5	23.0	23.0	23.0	23.0	23.0	23.0
Total Split (%)	17.3%	40.9%		17.3%	40.9%	40.9%	41.8%	41.8%	41.8%	41.8%	41.8%	41.8%
Maximum Green (s)	5.0	18.0		5.0	18.0	18.0	18.5	18.5	18.5	18.5	18.5	18.5
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	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	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	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	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	Max	Max	Max	Max	Max	Max
Walk Time (s)		7.0			7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0			11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0			0	0	0	0	0	0	0	0
Act Effct Green (s)	15.5	14.7		13.9	11.2	11.2		19.2	19.2		19.2	19.2
Actuated g/C Ratio	0.35	0.33		0.31	0.25	0.25		0.43	0.43		0.43	0.43
v/c Ratio	0.15	0.48		0.05	0.50	0.19		0.38	0.01		0.42	0.15
Control Delay	8.8	12.8		7.9	19.0	3.2		13.9	0.0		14.5	3.4
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	8.8	12.8		7.9	19.0	3.2		13.9	0.0		14.5	3.4
LOS	A	B		A	B	A		B	A		B	A
Approach Delay		12.1			14.2			13.3			11.2	
Approach LOS		B			B			B			B	

Intersection Summary

Area Type: Other

Cycle Length: 55

Actuated Cycle Length: 44.7

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 12.6

Intersection LOS: B

Intersection Capacity Utilization 57.7%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 3: Berthoud Pkwy & Mountain

23 s	9.5 s	22.5 s
23 s	9.5 s	22.5 s

Existing AM 7:00 am 06/22/2022 Existing AM
RR

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings

3: Berthoud Pkwy & Mountain

09/13/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	321	47	13	225	134	76	121	22	170	90	68
Future Volume (vph)	98	321	47	13	225	134	76	121	22	170	90	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.981				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.981			0.968	
Satd. Flow (prot)	1752	1810	0	1752	1845	1568	0	1810	1568	0	1786	1568
Flt Permitted	0.454			0.459				0.801			0.684	
Satd. Flow (perm)	837	1810	0	847	1845	1568	0	1478	1568	0	1262	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13				140			109			109
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		1257			3652			531			2550	
Travel Time (s)		19.0			55.3			10.3			49.7	
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
Adj. Flow (vph)	102	334	49	14	234	140	79	126	23	177	94	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	102	383	0	14	234	140	0	205	23	0	271	71
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

Existing PM 5:00 pm 06/22/2022

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings

3: Berthoud Pkwy & Mountain

09/13/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	9.5	22.5		9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	10.0	24.0		9.5	23.5	23.5	26.5	26.5	26.5	26.5	26.5	26.5
Total Split (%)	16.7%	40.0%		15.8%	39.2%	39.2%	44.2%	44.2%	44.2%	44.2%	44.2%	44.2%
Maximum Green (s)	5.5	19.5		5.0	19.0	19.0	22.0	22.0	22.0	22.0	22.0	22.0
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	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	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	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	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	Max	Max	Max	Max	Max	Max
Walk Time (s)		7.0			7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0			11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0			0	0	0	0	0	0	0	0
Act Effct Green (s)	19.5	18.5		16.3	12.5	12.5	22.4	22.4		22.4	22.4	22.4
Actuated g/C Ratio	0.38	0.36		0.32	0.24	0.24	0.43	0.43		0.43	0.43	0.43
v/c Ratio	0.25	0.58		0.04	0.52	0.29	0.32	0.03		0.50	0.10	0.10
Control Delay	10.9	17.5		9.0	22.1	5.3	13.6	0.1		16.8	1.8	1.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	10.9	17.5		9.0	22.1	5.3	13.6	0.1		16.8	1.8	1.8
LOS	B	B		A	C	A	B	A		B	A	A
Approach Delay		16.1			15.6		12.2			13.7		
Approach LOS		B			B		B			B		

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 51.7

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 14.8

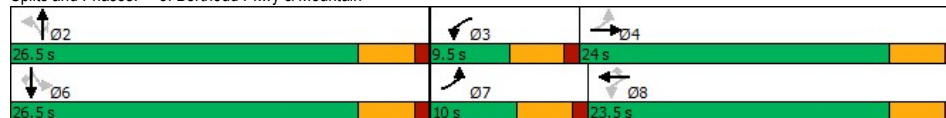
Intersection LOS: B

Intersection Capacity Utilization 63.6%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 3: Berthoud Pkwy & Mountain



Existing PM 5:00 pm 06/22/2022

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC

4: Welch & Berthoud Pkwy

08/24/2022

Intersection						
Int Delay, s/veh	1.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	T	T
Traffic Vol, veh/h	8	28	143	9	16	221
Future Vol, veh/h	8	28	143	9	16	221
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	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	9	33	168	11	19	260
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	472	174	0	0	179	0
Stage 1	174	-	-	-	-	-
Stage 2	298	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	549	867	-	-	1391	-
Stage 1	854	-	-	-	-	-
Stage 2	751	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	540	867	-	-	1391	-
Mov Cap-2 Maneuver	540	-	-	-	-	-
Stage 1	854	-	-	-	-	-
Stage 2	739	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	10	0	0.5			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	764	1391	-	
HCM Lane V/C Ratio	-	-	0.055	0.014	-	
HCM Control Delay (s)	-	-	10	7.6	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.2	0	-	

Existing AM 7:00 am 06/22/2022 Existing AM
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC

4: Welch & Berthoud Pkwy

08/24/2022

Intersection						
Int Delay, s/veh	1.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	T	T
Traffic Vol, veh/h	8	29	172	12	40	108
Future Vol, veh/h	8	29	172	12	40	108
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, %	3	3	3	3	3	3
Mvmt Flow	9	33	198	14	46	124
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	421	205	0	0	212	0
Stage 1	205	-	-	-	-	-
Stage 2	216	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	587	833	-	-	1352	-
Stage 1	827	-	-	-	-	-
Stage 2	818	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	565	833	-	-	1352	-
Mov Cap-2 Maneuver	565	-	-	-	-	-
Stage 1	827	-	-	-	-	-
Stage 2	788	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	10	0	2.1			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	756	1352	-	
HCM Lane V/C Ratio	-	-	0.056	0.034	-	
HCM Control Delay (s)	-	-	10	7.8	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-	

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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC

5: Berthoud Pkwy & Arapahoe

08/24/2022

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	10	141	3	4	224
Future Vol, veh/h	1	10	141	3	4	224
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	82	82	82	82	82	82
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	1	12	172	4	5	273
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	457	174	0	0	176	0
Stage 1	174	-	-	-	-	-
Stage 2	283	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	560	867	-	-	1394	-
Stage 1	854	-	-	-	-	-
Stage 2	763	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	558	867	-	-	1394	-
Mov Cap-2 Maneuver	558	-	-	-	-	-
Stage 1	854	-	-	-	-	-
Stage 2	760	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.4	0		0.1		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	825	1394	-	
HCM Lane V/C Ratio	-	-	0.016	0.003	-	
HCM Control Delay (s)	-	-	9.4	7.6	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC

5: Berthoud Pkwy & Arapahoe

08/24/2022

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	T	T
Traffic Vol, veh/h	2	4	175	5	4	117
Future Vol, veh/h	2	4	175	5	4	117
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	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	2	5	206	6	5	138
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	357	209	0	0	212	0
Stage 1	209	-	-	-	-	-
Stage 2	148	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	639	829	-	-	1352	-
Stage 1	824	-	-	-	-	-
Stage 2	877	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	636	829	-	-	1352	-
Mov Cap-2 Maneuver	636	-	-	-	-	-
Stage 1	824	-	-	-	-	-
Stage 2	873	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	9.8	0	0.3			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	753	1352	-	
HCM Lane V/C Ratio	-	-	0.009	0.003	-	
HCM Control Delay (s)	-	-	9.8	7.7	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0	0	-	

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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC

6: Spartan & Berthoud Pkwy

08/24/2022

Intersection						
Int Delay, s/veh	8.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	T	T
Traffic Vol, veh/h	87	107	36	53	183	43
Future Vol, veh/h	87	107	36	53	183	43
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	81	81	81	81	81	81
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	107	132	44	65	226	53
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	582	77	0	0	109	0
Stage 1	77	-	-	-	-	-
Stage 2	505	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	474	981	-	-	1475	-
Stage 1	943	-	-	-	-	-
Stage 2	604	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	399	981	-	-	1475	-
Mov Cap-2 Maneuver	399	-	-	-	-	-
Stage 1	943	-	-	-	-	-
Stage 2	509	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	15.1	0	6.4			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	593	1475	-	
HCM Lane V/C Ratio	-	-	0.404	0.153	-	
HCM Control Delay (s)	-	-	15.1	7.9	0	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	1.9	0.5	-	

Existing AM 7:00 am 06/22/2022 Existing AM
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC

6: Spartan & Berthoud Pkwy

08/24/2022

Intersection						
Int Delay, s/veh	5.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	T	T
Traffic Vol, veh/h	38	116	63	89	72	47
Future Vol, veh/h	38	116	63	89	72	47
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	81	81	81	81	81	81
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	47	143	78	110	89	58
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	369	133	0	0	188	0
Stage 1	133	-	-	-	-	-
Stage 2	236	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	629	913	-	-	1380	-
Stage 1	891	-	-	-	-	-
Stage 2	801	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	587	913	-	-	1380	-
Mov Cap-2 Maneuver	587	-	-	-	-	-
Stage 1	891	-	-	-	-	-
Stage 2	747	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	10.9	0	4.7			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	803	1380	-	
HCM Lane V/C Ratio	-	-	0.237	0.064	-	
HCM Control Delay (s)	-	-	10.9	7.8	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.9	0.2	-	

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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC

7: Berthoud Pkwy & CR 4E

08/24/2022

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Traffic Vol, veh/h	34	6	5	0	4	8	2	34	1	5	44	72
Future Vol, veh/h	34	6	5	0	4	8	2	34	1	5	44	72
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	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	36	6	5	0	4	9	2	36	1	5	47	77

Major/Minor	Minor2		Minor1		Major1		Major2	
Conflicting Flow All	143	137	86	142	175	37	124	0
Stage 1	96	96	-	41	41	-	-	-
Stage 2	47	41	-	101	134	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-
Pot Cap-1 Maneuver	824	752	970	825	717	1032	1457	-
Stage 1	908	814	-	971	859	-	-	-
Stage 2	964	859	-	903	784	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	811	749	970	813	714	1032	1457	-
Mov Cap-2 Maneuver	811	749	-	813	714	-	-	-
Stage 1	907	812	-	970	858	-	-	-
Stage 2	950	858	-	888	782	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	9.7		9.1		0.4		0.3	
HCM LOS	A		A					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1457	-	-	817	899	1567	-
HCM Lane V/C Ratio	0.001	-	-	0.059	0.014	0.003	-
HCM Control Delay (s)	7.5	0	-	9.7	9.1	7.3	0
HCM Lane LOS	A	A	-	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0	0	-

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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC
 7: Berthoud Pkwy & CR 4E

08/24/2022

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Traffic Vol, veh/h	34	4	2	0	1	5	1	69	1	5	37	36
Future Vol, veh/h	34	4	2	0	1	5	1	69	1	5	37	36
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	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	40	5	2	0	1	6	1	82	1	6	44	43

Major/Minor	Minor2		Minor1		Major1		Major2	
Conflicting Flow All	166	163	66	166	184	83	87	0
Stage 1	78	78	-	85	85	-	-	-
Stage 2	88	85	-	81	99	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-
Pot Cap-1 Maneuver	796	728	995	796	708	974	1503	-
Stage 1	928	828	-	920	822	-	-	-
Stage 2	917	822	-	925	811	-	-	-
Platoon blocked, %								-
Mov Cap-1 Maneuver	787	724	995	787	704	974	1503	-
Mov Cap-2 Maneuver	787	724	-	787	704	-	-	-
Stage 1	927	825	-	919	821	-	-	-
Stage 2	909	821	-	914	808	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.9	9	0.1	0.5
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1503	-	-	788	915	1508	-
HCM Lane V/C Ratio	0.001	-	-	0.06	0.008	0.004	-
HCM Control Delay (s)	7.4	0	-	9.9	9	7.4	0
HCM Lane LOS	A	A	-	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0	0	-

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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

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

08/24/2022

Intersection						
Int Delay, s/veh	4.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	N	N	S	S
Traffic Vol, veh/h	77	4	628	30	4	1629
Future Vol, veh/h	77	4	628	30	4	1629
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	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	85	4	690	33	4	1790
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1593	345	0	0	723	0
Stage 1	690	-	-	-	-	-
Stage 2	903	-	-	-	-	-
Critical Hdwy	6.86	6.96	-	-	4.16	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	-	-	2.23	-
Pot Cap-1 Maneuver	97	648	-	-	869	-
Stage 1	456	-	-	-	-	-
Stage 2	353	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	97	648	-	-	869	-
Mov Cap-2 Maneuver	97	-	-	-	-	-
Stage 1	456	-	-	-	-	-
Stage 2	351	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	135.8	0	0			
HCM LOS	F					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	101	869	-	
HCM Lane V/C Ratio	-	-	0.881	0.005	-	
HCM Control Delay (s)	-	-	135.8	9.2	-	
HCM Lane LOS	-	-	F	A	-	
HCM 95th %tile Q(veh)	-	-	5.1	0	-	

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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

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

08/24/2022

Intersection						
Int Delay, s/veh	6.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	37	9	1740	104	6	927
Future Vol, veh/h	37	9	1740	104	6	927
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	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	39	9	1813	108	6	966
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	2308	907	0	0	1921	0
Stage 1	1813	-	-	-	-	-
Stage 2	495	-	-	-	-	-
Critical Hdwy	6.86	6.96	-	-	4.16	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	-	-	2.23	-
Pot Cap-1 Maneuver	~ 32	277	-	-	300	-
Stage 1	114	-	-	-	-	-
Stage 2	575	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 31	277	-	-	300	-
Mov Cap-2 Maneuver	~ 31	-	-	-	-	-
Stage 1	114	-	-	-	-	-
Stage 2	564	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	\$ 397.6	0		0.1		
HCM LOS	F					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	38	300	-	
HCM Lane V/C Ratio	-	-	1.261	0.021	-	
HCM Control Delay (s)	-	-	\$ 397.6	17.3	-	
HCM Lane LOS	-	-	F	C	-	
HCM 95th %tile Q(veh)	-	-	4.9	0.1	-	
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

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Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC
11: Meadowlark & Mountain

12/28/2022

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	16	318	21	17	321	8	38	2	12	45	5	49
Future Vol, veh/h	16	318	21	17	321	8	38	2	12	45	5	49
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	18	361	24	19	365	9	43	2	14	51	6	56

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	374	0	0	385	0	0	848	821	373	825	829	370
Stage 1	-	-	-	-	-	-	409	409	-	408	408	-
Stage 2	-	-	-	-	-	-	439	412	-	417	421	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1179	-	-	1168	-	-	280	308	671	290	305	673
Stage 1	-	-	-	-	-	-	617	594	-	618	595	-
Stage 2	-	-	-	-	-	-	595	593	-	611	587	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1179	-	-	1168	-	-	247	298	671	276	296	673
Mov Cap-2 Maneuver	-	-	-	-	-	-	247	298	-	276	296	-
Stage 1	-	-	-	-	-	-	608	585	-	609	585	-
Stage 2	-	-	-	-	-	-	532	584	-	587	578	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			0.4			20.5			17.8		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	291	1179	-	-	1168	-	-	392
HCM Lane V/C Ratio	0.203	0.015	-	-	0.017	-	-	0.287
HCM Control Delay (s)	20.5	8.1	-	-	8.1	-	-	17.8
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.7	0	-	-	0.1	-	-	1.2

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Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC
 11: Meadowlark & Mountain

12/28/2022

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			↕			↕	
Traffic Vol, veh/h	63	422	21	20	311	19	39	2	29	21	1	22
Future Vol, veh/h	63	422	21	20	311	19	39	2	29	21	1	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	68	459	23	22	338	21	42	2	32	23	1	24

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	359	0	0	482	0	0	1012	1010	471	1017	1011	349
Stage 1	-	-	-	-	-	-	607	607	-	393	393	-
Stage 2	-	-	-	-	-	-	405	403	-	624	618	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1194	-	-	1075	-	-	217	239	591	215	239	692
Stage 1	-	-	-	-	-	-	482	485	-	630	604	-
Stage 2	-	-	-	-	-	-	620	598	-	471	479	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1194	-	-	1075	-	-	197	221	591	190	221	692
Mov Cap-2 Maneuver	-	-	-	-	-	-	197	221	-	190	221	-
Stage 1	-	-	-	-	-	-	455	457	-	594	592	-
Stage 2	-	-	-	-	-	-	585	586	-	418	452	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1			0.5			23.2			19.3		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	273	1194	-	-	1075	-	-	300
HCM Lane V/C Ratio	0.279	0.057	-	-	0.02	-	-	0.159
HCM Control Delay (s)	23.2	8.2	-	-	8.4	-	-	19.3
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	1.1	0.2	-	-	0.1	-	-	0.6

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Synchro 11 Light Report
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BACKGROUND 2042

LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings

1: US 287 & Mountain

09/13/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	275	150	300	145	40	50	555	165	60	1330	70
Future Volume (vph)	90	275	150	300	145	40	50	555	165	60	1330	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	1660	1568	3400	1845	1568	3400	3505	1568	3400	3505	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	1660	1568	3400	1845	1568	3400	3505	1568	3400	3505	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			213			164			213			213
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		3408			2270			654			2586	
Travel Time (s)		51.6			34.4			8.1			32.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Parking (#/hr)		0										
Adj. Flow (vph)	98	299	163	326	158	43	54	603	179	65	1446	76
Shared Lane Traffic (%)												
Lane Group Flow (vph)	98	299	163	326	158	43	54	603	179	65	1446	76
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.14	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Free	Prot	NA	Over	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			Free						Free			Free
Detector Phase	7	4		3	8	1	5	2		1	6	
Switch Phase												

Background 2042 AM 7:00 am 06/22/2022 Background 2042 AM

Synchro 11 Light Report
Page 1

LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings

1: US 287 & Mountain

09/13/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5	9.5	9.5	22.5		9.5	22.5	
Total Split (s)	11.4	25.0		15.5	29.1	10.0	9.5	49.5		10.0	50.0	
Total Split (%)	11.4%	25.0%		15.5%	29.1%	10.0%	9.5%	49.5%		10.0%	50.0%	
Maximum Green (s)	6.9	20.5		11.0	24.6	5.5	5.0	45.0		5.5	45.5	
Yellow Time (s)	3.5	3.5		3.5	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	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	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	4.5		4.5	4.5	
Lead/Lag	Lead	Lead		Lag	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	C-Max			None	C-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)	6.7	19.9	100.0	11.2	26.4	5.5	5.1	47.5	100.0	5.5	47.9	100.0
Actuated g/C Ratio	0.07	0.20	1.00	0.11	0.26	0.06	0.05	0.48	1.00	0.06	0.48	1.00
v/c Ratio	0.43	0.91	0.10	0.86	0.33	0.18	0.31	0.36	0.11	0.35	0.86	0.05
Control Delay	50.8	71.1	0.1	66.3	32.9	1.6	50.8	18.1	0.1	50.9	30.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.8	71.1	0.1	66.3	32.9	1.6	50.8	18.1	0.1	50.9	30.7	0.1
LOS	D	E	A	E	C	A	D	B	A	D	C	A
Approach Delay		46.9			51.0			16.4			30.1	
Approach LOS		D			D			B			C	

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 32.6

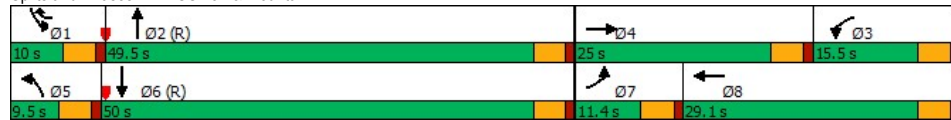
Intersection LOS: C

Intersection Capacity Utilization 71.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: US 287 & Mountain



Background 2042 AM 7:00 am 06/22/2022 Background 2042 AM

Synchro 11 Light Report
Page 2

LUDLOW FARM | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings

1: US 287 & Mountain

09/13/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	305	110	200	325	20	170	1480	425	50	860	120
Future Volume (vph)	125	305	110	200	325	20	170	1480	425	50	860	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	1660	1568	3400	1845	1568	3400	3505	1568	3400	3505	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	1660	1568	3400	1845	1568	3400	3505	1568	3400	3505	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			238			193			238			238
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		3408			2270			654			2586	
Travel Time (s)		51.6			34.4			8.1			32.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Parking (#/hr)		0										
Adj. Flow (vph)	136	332	120	217	353	22	185	1609	462	54	935	130
Shared Lane Traffic (%)												
Lane Group Flow (vph)	136	332	120	217	353	22	185	1609	462	54	935	130
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.14	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Free	Prot	NA	Over	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			Free						Free			Free
Detector Phase	7	4		3	8	1	5	2		1	6	
Switch Phase												

Background 2042 PM 4:00 pm 06/22/2022 Background 2042 PM
RR

Synchro 11 Light Report
Page 1

LUDLOW FARM | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings

1: US 287 & Mountain

09/13/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5	9.5	9.5	22.5		9.5	22.5	
Total Split (s)	11.0	28.0		11.5	28.5	9.5	15.6	61.0		9.5	54.9	
Total Split (%)	10.0%	25.5%		10.5%	25.9%	8.6%	14.2%	55.5%		8.6%	49.9%	
Maximum Green (s)	6.5	23.5		7.0	24.0	5.0	11.1	56.5		5.0	50.4	
Yellow Time (s)	3.5	3.5		3.5	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	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	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	4.5		4.5	4.5	
Lead/Lag	Lead	Lead		Lag	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	C-Max			None	C-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)	6.5	23.3	110.0	7.2	24.0	5.0	10.3	58.4	110.0	5.0	51.2	110.0
Actuated g/C Ratio	0.06	0.21	1.00	0.07	0.22	0.05	0.09	0.53	1.00	0.05	0.47	1.00
v/c Ratio	0.68	0.95	0.08	0.97	0.88	0.09	0.58	0.86	0.29	0.35	0.57	0.08
Control Delay	68.4	80.2	0.1	105.5	65.3	0.7	49.2	25.8	0.1	57.5	23.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.4	80.2	0.1	105.5	65.3	0.7	49.2	25.8	0.1	57.5	23.3	0.1
LOS	E	F	A	F	E	A	D	C	A	E	C	A
Approach Delay		61.1			77.7			22.4			22.3	
Approach LOS		E			E			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 34.6

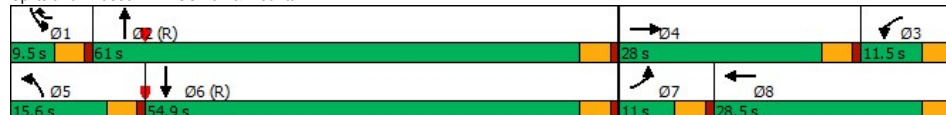
Intersection LOS: C

Intersection Capacity Utilization 81.8%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 1: US 287 & Mountain



LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC

2: Mountain & Gate Way

09/13/2022

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑	↑		↑
Traffic Vol, veh/h	0	455	470	10	0	15
Future Vol, veh/h	0	455	470	10	0	15
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	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	495	511	11	0	16
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	-	0	-	0	-	511
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.327
Pot Cap-1 Maneuver	0	-	-	-	0	561
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	561
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		11.6		
HCM LOS	B					
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	561		
HCM Lane V/C Ratio	-	-	-	0.029		
HCM Control Delay (s)	-	-	-	11.6		
HCM Lane LOS	-	-	-	B		
HCM 95th %tile Q(veh)	-	-	-	0.1		

Background 2042 AM 7:00 am 06/22/2022 Background 2042 AM

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC

2: Mountain & Gate Way

09/13/2022

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑	↑		↑
Traffic Vol, veh/h	0	670	480	15	0	10
Future Vol, veh/h	0	670	480	15	0	10
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	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	728	522	16	0	11
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	-	0	-	0	-	522
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.327
Pot Cap-1 Maneuver	0	-	-	-	0	553
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	553
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB	SB			
HCM Control Delay, s	0	0	11.6			
HCM LOS	B					
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	553		
HCM Lane V/C Ratio	-	-	-	0.02		
HCM Control Delay (s)	-	-	-	11.6		
HCM Lane LOS	-	-	-	B		
HCM 95th %tile Q(veh)	-	-	-	0.1		

Background 2042 PM 4:00 pm 06/22/2022 Background 2042 PM
RR

Synchro 11 Light Report
Page 1

LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 2010 Roundabout
 3: Berthoud Pkwy & Mountain

09/13/2022

Intersection					
Intersection Delay, s/veh	12.2				
Intersection LOS	B				
Approach	EB		WB		NB
Entry Lanes	2		1		1
Conflicting Circle Lanes	1		1		1
Adj Approach Flow, veh/h	494		397		293
Demand Flow Rate, veh/h	509		409		302
Vehicles Circulating, veh/h	320		369		527
Vehicles Exiting, veh/h	526		460		302
Follow-Up Headway, s	3.186		3.186		3.186
Ped Vol Crossing Leg, #/h	0		0		0
Ped Cap Adj	1.000		1.000		1.000
Approach Delay, s/veh	10.1		12.5		12.3
Approach LOS	B		B		B
Lane	Left	Right	Left	Left	Left
Designated Moves	LT	R	LTR	LTR	LTR
Assumed Moves	LT	R	LTR	LTR	LTR
RT Channelized					
Lane Util	0.792	0.208	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193	5.193
Entry Flow, veh/h	403	106	409	302	432
Cap Entry Lane, veh/h	821	821	781	667	747
Entry HV Adj Factor	0.970	0.972	0.970	0.971	0.970
Flow Entry, veh/h	391	103	397	293	419
Cap Entry, veh/h	796	797	758	647	725
V/C Ratio	0.491	0.129	0.524	0.453	0.578
Control Delay, s/veh	11.3	5.8	12.5	12.3	14.4
LOS	B	A	B	B	B
95th %tile Queue, veh	3	0	3	2	4

Background 2042 AM 7:00 am 06/22/2022 Background 2042 AM

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 2010 Roundabout
 3: Berthoud Pkwy & Mountain

09/13/2022

Intersection					
Intersection Delay, s/veh	22.3				
Intersection LOS	C				
Approach	EB		WB		SB
Entry Lanes	2		1		1
Conflicting Circle Lanes	1		1		1
Adj Approach Flow, veh/h	718		544		424
Demand Flow Rate, veh/h	739		561		437
Vehicles Circulating, veh/h	370		410		488
Vehicles Exiting, veh/h	555		738		483
Follow-Up Headway, s	3.186		3.186		3.186
Ped Vol Crossing Leg, #/h	0		0		0
Ped Cap Adj	1.000		1.000		1.000
Approach Delay, s/veh	25.9		21.9		17.2
Approach LOS	D		C		C
Lane	Left	Right	Left	Left	Left
Designated Moves	LT	R	LTR	LTR	LTR
Assumed Moves	LT	R	LTR	LTR	LTR
RT Channelized					
Lane Util	0.886	0.114	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193	5.193
Entry Flow, veh/h	655	84	561	286	437
Cap Entry Lane, veh/h	780	780	750	477	694
Entry HV Adj Factor	0.970	0.976	0.970	0.970	0.971
Flow Entry, veh/h	636	82	544	277	424
Cap Entry, veh/h	757	762	728	463	673
V/C Ratio	0.839	0.108	0.748	0.599	0.630
Control Delay, s/veh	28.5	5.8	21.9	21.7	17.2
LOS	D	A	C	C	C
95th %tile Queue, veh	10	0	7	4	4

Background 2042 PM 4:00 pm 06/22/2022 Background 2042 PM
 RR

Synchro 11 Light Report
 Page 1

LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC

4: Welch & Berthoud Pkwy

09/12/2022

Intersection						
Int Delay, s/veh	1.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	T	T
Traffic Vol, veh/h	10	30	200	10	20	280
Future Vol, veh/h	10	30	200	10	20	280
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	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	12	35	235	12	24	329
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	618	241	0	0	247	0
Stage 1	241	-	-	-	-	-
Stage 2	377	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	451	795	-	-	1313	-
Stage 1	797	-	-	-	-	-
Stage 2	691	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	441	795	-	-	1313	-
Mov Cap-2 Maneuver	441	-	-	-	-	-
Stage 1	797	-	-	-	-	-
Stage 2	676	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	10.9	0	0.5			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	662	1313	-	
HCM Lane V/C Ratio	-	-	0.071	0.018	-	
HCM Control Delay (s)	-	-	10.9	7.8	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-	

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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC

4: Welch & Berthoud Pkwy

09/12/2022

Intersection						
Int Delay, s/veh	1.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	10	30	220	15	45	185
Future Vol, veh/h	10	30	220	15	45	185
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	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	12	35	259	18	53	218
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	592	268	0	0	277	0
Stage 1	268	-	-	-	-	-
Stage 2	324	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	467	768	-	-	1280	-
Stage 1	775	-	-	-	-	-
Stage 2	731	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	445	768	-	-	1280	-
Mov Cap-2 Maneuver	445	-	-	-	-	-
Stage 1	775	-	-	-	-	-
Stage 2	697	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11	0		1.6		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	650	1280		
HCM Lane V/C Ratio	-	-	0.072	0.041		
HCM Control Delay (s)	-	-	11	7.9		
HCM Lane LOS	-	-	B	A		
HCM 95th %tile Q(veh)	-	-	0.2	0.1		

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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC

5: Berthoud Pkwy & Arapahoe

09/12/2022

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	T	T
Traffic Vol, veh/h	5	5	200	5	5	280
Future Vol, veh/h	5	5	200	5	5	280
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	82	82	82	82	82	82
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	6	6	244	6	6	341
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	600	247	0	0	250	0
Stage 1	247	-	-	-	-	-
Stage 2	353	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	462	789	-	-	1310	-
Stage 1	792	-	-	-	-	-
Stage 2	709	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	459	789	-	-	1310	-
Mov Cap-2 Maneuver	459	-	-	-	-	-
Stage 1	792	-	-	-	-	-
Stage 2	705	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	11.3	0	0.1			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	580	1310	-	
HCM Lane V/C Ratio	-	-	0.021	0.005	-	
HCM Control Delay (s)	-	-	11.3	7.8	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC

5: Berthoud Pkwy & Arapahoe

09/12/2022

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	T	T
Traffic Vol, veh/h	5	5	225	5	5	195
Future Vol, veh/h	5	5	225	5	5	195
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	82	82	82	82	82	82
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	6	6	274	6	6	238
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	527	277	0	0	280	0
Stage 1	277	-	-	-	-	-
Stage 2	250	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	510	759	-	-	1277	-
Stage 1	767	-	-	-	-	-
Stage 2	789	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	507	759	-	-	1277	-
Mov Cap-2 Maneuver	507	-	-	-	-	-
Stage 1	767	-	-	-	-	-
Stage 2	785	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	11	0	0.2			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	608	1277	-	
HCM Lane V/C Ratio	-	-	0.02	0.005	-	
HCM Control Delay (s)	-	-	11	7.8	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th Roundabout

6: Spartan Ave/Spartan & Berthoud Pkwy

09/12/2022

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	158	307	250	325
Demand Flow Rate, veh/h	163	316	257	334
Vehicles Circulating, veh/h	356	203	345	256
Vehicles Exiting, veh/h	234	399	174	263
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.5	6.0	6.5	6.6
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LT	TR	LTR	LR
Assumed Moves	LT	TR	LTR	LR
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	163	316	257	334
Cap Entry Lane, veh/h	960	1122	971	1063
Entry HV Adj Factor	0.970	0.970	0.972	0.973
Flow Entry, veh/h	158	307	250	325
Cap Entry, veh/h	931	1088	944	1034
V/C Ratio	0.170	0.282	0.265	0.314
Control Delay, s/veh	5.5	6.0	6.5	6.6
LOS	A	A	A	A
95th %tile Queue, veh	1	1	1	1

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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th Roundabout
 6: Spartan & Berthoud Pkwy

09/12/2022

Intersection				
Intersection Delay, s/veh	5.5			
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	244	261	234	244
Demand Flow Rate, veh/h	252	268	241	250
Vehicles Circulating, veh/h	278	199	244	172
Vehicles Exiting, veh/h	144	286	286	295
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	5.5	5.6	5.1
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LT	R	TR	L
Assumed Moves	LT	R	TR	L
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	252	268	241	250
Cap Entry Lane, veh/h	1039	1126	1076	1158
Entry HV Adj Factor	0.969	0.972	0.972	0.974
Flow Entry, veh/h	244	261	234	244
Cap Entry, veh/h	1007	1095	1046	1128
V/C Ratio	0.242	0.238	0.224	0.216
Control Delay, s/veh	5.9	5.5	5.6	5.1
LOS	A	A	A	A
95th %tile Queue, veh	1	1	1	1

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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC
7: Berthoud Pkwy & CR 4E

09/12/2022

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↱		↰	↱	
Traffic Vol, veh/h	50	15	5	5	40	10	5	55	5	15	85	90
Future Vol, veh/h	50	15	5	5	40	10	5	55	5	15	85	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	0	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	53	16	5	5	43	11	5	59	5	16	90	96

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	269	244	138	253	290	62	186	0	0	64	0	0
Stage 1	170	170	-	72	72	-	-	-	-	-	-	-
Stage 2	99	74	-	181	218	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	682	656	908	698	619	1000	1382	-	-	1532	-	-
Stage 1	830	756	-	935	833	-	-	-	-	-	-	-
Stage 2	905	831	-	818	721	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	631	646	908	673	609	1000	1382	-	-	1532	-	-
Mov Cap-2 Maneuver	631	646	-	673	609	-	-	-	-	-	-	-
Stage 1	827	747	-	931	830	-	-	-	-	-	-	-
Stage 2	846	828	-	786	712	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	10.9			11			0.6			0.6		
HCM LOS	B			B								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1382	-	-	631	696	662	1532	-	-
HCM Lane V/C Ratio	0.004	-	-	0.084	0.031	0.088	0.01	-	-
HCM Control Delay (s)	7.6	0	-	11.2	10.3	11	7.4	0	-
HCM Lane LOS	A	A	-	B	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.1	0.3	0	-	-

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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 2010 TWSC

7: Berthoud Pkwy & CR 4E

09/12/2022

Intersection												
Int Delay, s/veh	4.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	75	45	5	5	30	15	5	100	5	10	85	60
Future Vol, veh/h	75	45	5	5	30	15	5	100	5	10	85	60
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	0	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	80	48	5	5	32	16	5	106	5	11	90	64

Major/Minor	Minor2		Minor1		Major1		Major2	
Conflicting Flow All	287	265	122	290	295	109	154	0
Stage 1	144	144	-	119	119	-	-	-
Stage 2	143	121	-	171	176	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-
Pot Cap-1 Maneuver	663	639	926	660	615	942	1420	-
Stage 1	856	776	-	883	795	-	-	-
Stage 2	857	794	-	829	752	-	-	-
Platoon blocked, %								-
Mov Cap-1 Maneuver	620	631	926	612	608	942	1420	-
Mov Cap-2 Maneuver	620	631	-	612	608	-	-	-
Stage 1	853	770	-	879	792	-	-	-
Stage 2	805	791	-	767	746	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.4	10.7	0.3	0.5
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1420	-	-	620	652	681	1473	-	-
HCM Lane V/C Ratio	0.004	-	-	0.129	0.082	0.078	0.007	-	-
HCM Control Delay (s)	7.5	0	-	11.7	11	10.7	7.5	0	-
HCM Lane LOS	A	A	-	B	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.3	0.3	0	-	-

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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

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

09/13/2022

Intersection						
Int Delay, s/veh	27.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↱	↱	↕↕	↱	↱	↕↕
Traffic Vol, veh/h	105	35	805	45	15	2035
Future Vol, veh/h	105	35	805	45	15	2035
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	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	114	38	875	49	16	2212
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	2013	438	0	0	924	0
Stage 1	875	-	-	-	-	-
Stage 2	1138	-	-	-	-	-
Critical Hdwy	6.86	6.96	-	-	4.16	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	-	-	2.23	-
Pot Cap-1 Maneuver	~ 50	564	-	-	729	-
Stage 1	366	-	-	-	-	-
Stage 2	265	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	~ 49	564	-	-	729	-
Mov Cap-2 Maneuver	~ 49	-	-	-	-	-
Stage 1	366	-	-	-	-	-
Stage 2	259	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s\$	592.1	0		0.1		
HCM LOS	F					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	49	564	729	-
HCM Lane V/C Ratio	-	-	2.329	0.067	0.022	-
HCM Control Delay (s)	-	-	\$ 785.5	11.8	10.1	-
HCM Lane LOS	-	-	F	B	B	-
HCM 95th %tile Q(veh)	-	-	11.8	0.2	0.1	-
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

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

09/13/2022

Intersection						
Int Delay, s/veh	104.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	70	30	2175	160	40	1215
Future Vol, veh/h	70	30	2175	160	40	1215
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	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	76	33	2364	174	43	1321
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	3111	1182	0	0	2538	0
Stage 1	2364	-	-	-	-	-
Stage 2	747	-	-	-	-	-
Critical Hdwy	6.86	6.96	-	-	4.16	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	-	-	2.23	-
Pot Cap-1 Maneuver	~ 9	181	-	-	171	-
Stage 1	~ 56	-	-	-	-	-
Stage 2	426	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 7	181	-	-	171	-
Mov Cap-2 Maneuver	~ 7	-	-	-	-	-
Stage 1	~ 56	-	-	-	-	-
Stage 2	319	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, \$	3836.9		0		1.1	
HCM LOS	F					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	7	181	171	-
HCM Lane V/C Ratio	-	-	10.87	0.18	0.254	-
HCM Control Delay (s)	-	\$	5468.8	29.2	33.1	-
HCM Lane LOS	-	-	F	D	D	-
HCM 95th %tile Q(veh)	-	-	11.2	0.6	1	-
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

Background 2042 PM 4:00 pm 06/22/2022 Background 2042 PM
 RR

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings

9: Berthoud Pkwy & Spartan Ave

09/13/2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	165	45	820	95	50	1885
Future Volume (vph)	165	45	820	95	50	1885
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	0.850		0.850			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1752	1568	3505	1568	1752	3505
Flt Permitted	0.950				0.266	
Satd. Flow (perm)	1752	1568	3505	1568	491	3505
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		49		103		
Link Speed (mph)	30		30			30
Link Distance (ft)	2742		273			2639
Travel Time (s)	62.3		6.2			60.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	179	49	891	103	54	2049
Shared Lane Traffic (%)						
Lane Group Flow (vph)	179	49	891	103	54	2049
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	
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		6
Minimum Split (s)	22.5	22.5	22.5	22.5	9.5	22.5
Total Split (s)	26.0	26.0	84.4	84.4	9.6	94.0
Total Split (%)	21.7%	21.7%	70.3%	70.3%	8.0%	78.3%
Maximum Green (s)	21.5	21.5	79.9	79.9	5.1	89.5
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	
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)	21.5	21.5	79.9	79.9	89.5	89.5
Actuated g/C Ratio	0.18	0.18	0.67	0.67	0.75	0.75
v/c Ratio	0.57	0.15	0.38	0.10	0.13	0.78
Control Delay	53.1	12.7	9.6	1.5	4.7	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.1	12.7	9.6	1.5	4.7	12.1

Background 2042 AM 7:00 am 06/22/2022 Background 2042 AM

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY

Town of Berthoud

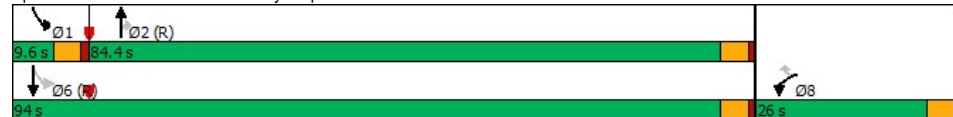
Lanes, Volumes, Timings

9: Berthoud Pkwy & Spartan Ave

09/13/2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
LOS	D	B	A	A	A	B
Approach Delay	44.5		8.7			11.9
Approach LOS	D		A			B
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:	75					
Control Type:	Pretimed					
Maximum v/c Ratio:	0.78					
Intersection Signal Delay:	13.2			Intersection LOS: B		
Intersection Capacity Utilization	68.7%			ICU Level of Service C		
Analysis Period (min)	15					

Splits and Phases: 9: Berthoud Pkwy & Spartan Ave



Background 2042 AM 7:00 am 06/22/2022 Background 2042 AM

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings

9: Berthoud Pkwy & Spartan Ave

09/13/2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	85	45	2150	145	80	1170
Future Volume (vph)	85	45	2150	145	80	1170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt	0.850		0.850			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1752	1568	3505	1568	1752	3505
Flt Permitted	0.950				0.051	
Satd. Flow (perm)	1752	1568	3505	1568	94	3505
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		49		139		
Link Speed (mph)	30		30			30
Link Distance (ft)	2742		273			2639
Travel Time (s)	62.3		6.2			60.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	49	2337	158	87	1272
Shared Lane Traffic (%)						
Lane Group Flow (vph)	92	49	2337	158	87	1272
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	
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		6
Minimum Split (s)	22.5	22.5	22.5	22.5	9.5	22.5
Total Split (s)	22.5	22.5	78.0	78.0	9.5	87.5
Total Split (%)	20.5%	20.5%	70.9%	70.9%	8.6%	79.5%
Maximum Green (s)	18.0	18.0	73.5	73.5	5.0	83.0
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	
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	73.5	73.5	83.0	83.0
Actuated g/C Ratio	0.16	0.16	0.67	0.67	0.75	0.75
v/c Ratio	0.32	0.16	1.00	0.14	0.60	0.48
Control Delay	44.2	12.7	37.1	1.8	29.6	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.2	12.7	37.1	1.8	29.6	5.9

Background 2042 PM 4:00 pm 06/22/2022 Background 2042 PM
RR

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY **Town of Berthoud**

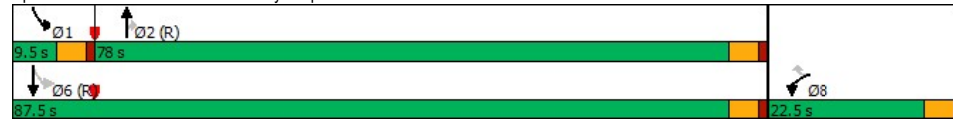
Lanes, Volumes, Timings

9: Berthoud Pkwy & Spartan Ave

09/13/2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
LOS	D	B	D	A	C	A
Approach Delay	33.2		34.8			7.4
Approach LOS	C		C			A
Intersection Summary						
Area Type:	Other					
Cycle Length: 110						
Actuated Cycle Length: 110						
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green						
Natural Cycle: 110						
Control Type: Pretimed						
Maximum v/c Ratio: 1.00						
Intersection Signal Delay: 25.5				Intersection LOS: C		
Intersection Capacity Utilization 78.7%				ICU Level of Service D		
Analysis Period (min) 15						

Splits and Phases: 9: Berthoud Pkwy & Spartan Ave



LUDLOW FARM | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings

11: Meadowlark & Mountain

12/28/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	350	40	20	325	75	40	15	15	155	20	145
Future Volume (vph)	170	350	40	20	325	75	40	15	15	155	20	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.985				0.850		0.971				0.850
Flt Protected	0.950			0.950				0.972		0.950		
Satd. Flow (prot)	1752	1817	0	1752	1845	1568	0	1741	0	1752	1845	1568
Flt Permitted	0.467			0.406				0.862		0.737		
Satd. Flow (perm)	861	1817	0	749	1845	1568	0	1544	0	1360	1845	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8				82		16				158
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		929			1340			2256			516	
Travel Time (s)		21.1			30.5			51.3			11.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	380	43	22	353	82	43	16	16	168	22	158
Shared Lane Traffic (%)												
Lane Group Flow (vph)	185	423	0	22	353	82	0	75	0	168	22	158
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60		60	60		60	60		60	60		60
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Minimum Split (s)	22.5	22.5		22.5	22.5	22.5	22.5	22.5		22.5	22.5	22.5
Total Split (s)	55.0	55.0		55.0	55.0	55.0	45.0	45.0		45.0	45.0	45.0
Total Split (%)	55.0%	55.0%		55.0%	55.0%	55.0%	45.0%	45.0%		45.0%	45.0%	45.0%
Maximum Green (s)	50.5	50.5		50.5	50.5	50.5	40.5	40.5		40.5	40.5	40.5
Yellow Time (s)	3.5	3.5		3.5	3.5	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	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	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		4.5	4.5	4.5
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0		0	0	0
Act Effct Green (s)	50.5	50.5		50.5	50.5	50.5		40.5		40.5	40.5	40.5
Actuated g/C Ratio	0.50	0.50		0.50	0.50	0.50		0.40		0.40	0.40	0.40
v/c Ratio	0.43	0.46		0.06	0.38	0.10		0.12		0.31	0.03	0.22
Control Delay	12.2	10.6		13.2	16.7	3.3		15.6		22.2	18.2	3.9
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	12.2	10.6		13.2	16.7	3.3		15.6		22.2	18.2	3.9

Background 2042 AM 7:00 am 06/22/2022 Background 2042 AM

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings
11: Meadowlark & Mountain

12/28/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	B		B	B	A		B		C	B	A
Approach Delay		11.0			14.1			15.6			13.6	
Approach LOS		B			B			B			B	
Intersection Summary												
Area Type:	Other											
Cycle Length: 100												
Actuated Cycle Length: 100												
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green												
Natural Cycle: 45												
Control Type: Pretimed												
Maximum v/c Ratio: 0.46												
Intersection Signal Delay: 12.8						Intersection LOS: B						
Intersection Capacity Utilization 51.2%						ICU Level of Service A						
Analysis Period (min) 15												

Splits and Phases: 11: Meadowlark & Mountain

 Ø2 (R)	 Ø4
45 s	55 s
 Ø6 (R)	 Ø8
45 s	55 s

LUDLOW FARM | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings

11: Meadowlark & Mountain

12/28/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	335	460	25	20	375	80	45	20	30	175	20	160
Future Volume (vph)	335	460	25	20	375	80	45	20	30	175	20	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992				0.850		0.957				0.850
Flt Protected	0.950			0.950				0.977		0.950		
Satd. Flow (prot)	1752	1830	0	1752	1845	1568	0	1725	0	1752	1845	1568
Flt Permitted	0.470			0.390				0.868		0.686		
Satd. Flow (perm)	867	1830	0	719	1845	1568	0	1532	0	1265	1845	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5				87		21				174
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		929			1340			2256			516	
Travel Time (s)		14.1			20.3			51.3			11.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	364	500	27	22	408	87	49	22	33	190	22	174
Shared Lane Traffic (%)												
Lane Group Flow (vph)	364	527	0	22	408	87	0	104	0	190	22	174
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		6
Minimum Split (s)	22.5	22.5		22.5	22.5	22.5	22.5	22.5		22.5	22.5	22.5
Total Split (s)	75.0	75.0		75.0	75.0	75.0	35.0	35.0		35.0	35.0	35.0
Total Split (%)	68.2%	68.2%		68.2%	68.2%	68.2%	31.8%	31.8%		31.8%	31.8%	31.8%
Maximum Green (s)	70.5	70.5		70.5	70.5	70.5	30.5	30.5		30.5	30.5	30.5
Yellow Time (s)	3.5	3.5		3.5	3.5	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	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	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		4.5	4.5	4.5
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	11.0	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0	0	0	0		0	0	0
Act Effct Green (s)	70.5	70.5		70.5	70.5	70.5	30.5	30.5		30.5	30.5	30.5
Actuated g/C Ratio	0.64	0.64		0.64	0.64	0.64	0.28	0.28		0.28	0.28	0.28
v/c Ratio	0.66	0.45		0.05	0.35	0.08		0.24		0.54	0.04	0.31
Control Delay	17.6	11.5		7.7	10.1	1.8		26.1		40.7	29.5	6.2
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	0.0
Total Delay	17.6	11.5		7.7	10.1	1.8		26.1		40.7	29.5	6.2

Background 2042 PM 4:00 pm 06/22/2022 Background 2042 PM
RR

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY

Town of Berthoud

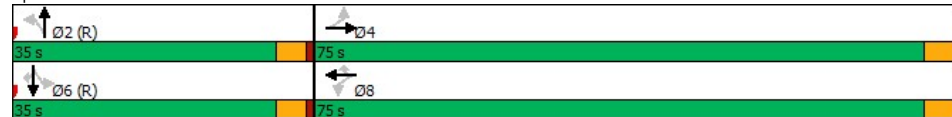
Lanes, Volumes, Timings

11: Meadowlark & Mountain

12/28/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	B		A	B	A		C		D	C	A
Approach Delay		14.0			8.6			26.1			24.5	
Approach LOS		B			A			C			C	
Intersection Summary												
Area Type:	Other											
Cycle Length: 110												
Actuated Cycle Length: 110												
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green												
Natural Cycle: 60												
Control Type: Pretimed												
Maximum v/c Ratio: 0.66												
Intersection Signal Delay: 15.3							Intersection LOS: B					
Intersection Capacity Utilization 65.9%							ICU Level of Service C					
Analysis Period (min) 15												

Splits and Phases: 11: Meadowlark & Mountain



LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

TOTAL 2042

Lanes, Volumes, Timings
1: US 287 & Mountain

12/28/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	295	165	310	175	145	70	595	180	105	1365	70
Future Volume (vph)	90	295	165	310	175	145	70	595	180	105	1365	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	1660	1568	3400	1845	1568	3400	3505	1568	3400	3505	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	1660	1568	3400	1845	1568	3400	3505	1568	3400	3505	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			262			164			262			262
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		3408			822			654			2586	
Travel Time (s)		51.6			12.5			8.1			32.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Parking (#/hr)		0										
Adj. Flow (vph)	98	321	179	337	190	158	76	647	196	114	1484	76
Shared Lane Traffic (%)												
Lane Group Flow (vph)	98	321	179	337	190	158	76	647	196	114	1484	76
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.14	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Free	Prot	NA	Over	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			Free						Free			Free
Detector Phase	7	4		3	8	1	5	2		1	6	
Switch Phase												

Total 2042 AM 7:00 am 06/22/2022 Total 2042 AM
RR

Synchro 11 Light Report
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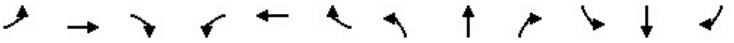
LUDLOW FARM | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings

1: US 287 & Mountain

12/28/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5	9.5	9.5	22.5		9.5	22.5	
Total Split (s)	13.4	27.0		15.3	28.9	17.7	9.5	40.0		17.7	48.2	
Total Split (%)	13.4%	27.0%		15.3%	28.9%	17.7%	9.5%	40.0%		17.7%	48.2%	
Maximum Green (s)	8.9	22.5		10.8	24.4	13.2	5.0	35.5		13.2	43.7	
Yellow Time (s)	3.5	3.5		3.5	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	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	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	4.5		4.5	4.5	
Lead/Lag	Lead	Lead		Lag	Lag	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	C-Max			None	C-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)	7.9	21.6	100.0	11.2	27.0	8.9	5.1	40.4	100.0	8.9	46.1	100.0
Actuated g/C Ratio	0.08	0.22	1.00	0.11	0.27	0.09	0.05	0.40	1.00	0.09	0.46	1.00
v/c Ratio	0.37	0.90	0.11	0.89	0.38	0.55	0.43	0.46	0.12	0.38	0.92	0.05
Control Delay	47.3	66.4	0.1	60.3	23.5	16.7	45.2	18.7	0.2	46.1	36.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.3	66.4	0.1	60.3	23.5	16.7	45.2	18.7	0.2	46.1	36.7	0.1
LOS	D	E	A	E	C	B	D	B	A	D	B	A
Approach Delay		43.5			40.0			17.0			35.6	
Approach LOS		D			D			B			D	

Intersection Summary

Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 33.2	Intersection LOS: C
Intersection Capacity Utilization 80.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: US 287 & Mountain



Total 2042 AM 7:00 am 06/22/2022 Total 2042 AM
RR

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings

1: US 287 & Mountain

12/28/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	345	135	225	360	100	190	1525	445	155	915	120
Future Volume (vph)	125	345	135	225	360	100	190	1525	445	155	915	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	1660	1568	3400	1845	1568	3400	3505	1568	3400	3505	1568
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3400	1660	1568	3400	1845	1568	3400	3505	1568	3400	3505	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			177			177			183			177
Link Speed (mph)		45			45			55			55	
Link Distance (ft)		3408			822			654			2586	
Travel Time (s)		51.6			12.5			8.1			32.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Parking (#/hr)		0										
Adj. Flow (vph)	136	375	147	245	391	109	207	1658	484	168	995	130
Shared Lane Traffic (%)												
Lane Group Flow (vph)	136	375	147	245	391	109	207	1658	484	168	995	130
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.14	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			Free			Free			Free			Free
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												

Total 2042 PM 2:17 pm 09/11/2022 Total 2042 PM

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings

1: US 287 & Mountain

12/28/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5		9.5	22.5		9.5	22.5		9.5	22.5	
Total Split (s)	12.0	32.9		14.1	35.0		17.5	60.0		13.0	55.5	
Total Split (%)	10.0%	27.4%		11.8%	29.2%		14.6%	50.0%		10.8%	46.3%	
Maximum Green (s)	7.5	28.4		9.6	30.5		13.0	55.5		8.5	51.0	
Yellow Time (s)	3.5	3.5		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		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		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		4.5	4.5	
Lead/Lag	Lead	Lead		Lag	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		None	C-Max		None	C-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)	7.5	28.2	120.0	9.8	30.5	120.0	11.8	55.5	120.0	8.5	52.2	120.0
Actuated g/C Ratio	0.06	0.24	1.00	0.08	0.25	1.00	0.10	0.46	1.00	0.07	0.44	1.00
v/c Ratio	0.64	0.96	0.09	0.88	0.84	0.07	0.62	1.02	0.31	0.70	0.65	0.08
Control Delay	69.4	83.1	0.1	74.8	48.0	0.1	53.6	46.7	0.1	70.8	29.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.4	83.1	0.1	74.8	48.0	0.1	53.6	46.7	0.1	70.8	29.5	0.1
LOS	E	F	A	E	D	A	D	D	A	E	C	A
Approach Delay		61.7			49.8			37.7			31.9	
Approach LOS		E			D			D			C	

Intersection Summary

Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 113.5 (95%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 41.1	Intersection LOS: D
Intersection Capacity Utilization 86.2%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: US 287 & Mountain



Total 2042 PM 2:17 pm 09/11/2022 Total 2042 PM

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings

2: Mountain & Gate Way

12/28/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	485	55	40	480	10	70	5	25	15	5	15
Future Volume (vph)	5	485	55	40	480	10	70	5	25	15	5	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.873			0.886	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1845	1568	1752	1845	1568	1752	1610	0	1752	1634	0
Flt Permitted	0.266			0.261			0.744			0.736		
Satd. Flow (perm)	491	1845	1568	481	1845	1568	1372	1610	0	1358	1634	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			60			33		27			16	
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		1447			1257			342			493	
Travel Time (s)		21.9			19.0			7.8			11.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	527	60	43	522	11	76	5	27	16	5	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	527	60	43	522	11	76	32	0	16	21	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	0	0	2	1	0	0		1	0	
Detector Template	Left	Thru	Thru	Thru	Thru	Right	Thru	Thru		Left	Thru	
Leading Detector (ft)	20	100	0	0	100	20	0	0		20	0	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	0	0	6	20	0	0		20	0	
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex				Cl+Ex		
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94							
Detector 2 Size(ft)		6			6							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	4	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	

Total 2042 AM 7:00 am 06/22/2022 Total 2042 AM
RR

Synchro 11 Light Report
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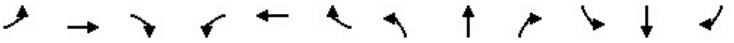
LUDLOW FARM | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings

2: Mountain & Gate Way

12/28/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5		22.5	22.5	
Total Split (s)	27.0	27.0	27.0	27.0	27.0	27.0	23.0	23.0		23.0	23.0	
Total Split (%)	54.0%	54.0%	54.0%	54.0%	54.0%	54.0%	46.0%	46.0%		46.0%	46.0%	
Maximum Green (s)	22.5	22.5	22.5	22.5	22.5	22.5	18.5	18.5		18.5	18.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	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	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	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	4.5	4.5		4.5	4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	
Act Effct Green (s)	18.9	18.9	18.9	18.9	18.9	18.9	22.1	22.1		22.1	22.1	
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.38	0.38	0.44	0.44		0.44	0.44	
v/c Ratio	0.03	0.76	0.10	0.24	0.75	0.02	0.13	0.04		0.03	0.03	
Control Delay	4.4	15.2	1.0	12.8	20.3	1.3	10.7	5.6		10.1	6.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	4.4	15.2	1.0	12.8	20.3	1.3	10.7	5.6		10.1	6.4	
LOS	A	B	A	B	C	A	B	A		B	A	
Approach Delay	13.7			19.4			9.2			8.0		
Approach LOS	B			B			A			A		

Intersection Summary

Area Type: Other

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 15.7

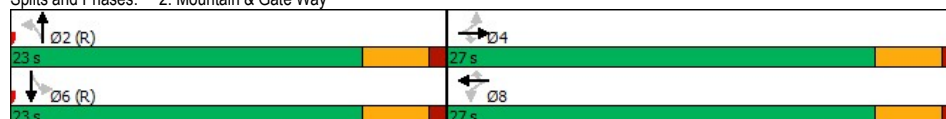
Intersection LOS: B

Intersection Capacity Utilization 51.3%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 2: Mountain & Gate Way



Total 2042 AM 7:00 am 06/22/2022 Total 2042 AM
RR

Synchro 11 Light Report
Page 2

LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings

2: Mountain & Gate Way

12/28/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	690	120	70	510	15	115	5	80	10	5	10
Future Volume (vph)	15	690	120	70	510	15	115	5	80	10	5	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.858			0.897	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1845	1568	1752	1845	1568	1752	1583	0	1752	1655	0
Flt Permitted	0.313			0.153			0.747			0.697		
Satd. Flow (perm)	577	1845	1568	282	1845	1568	1378	1583	0	1286	1655	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			130			27			87			11
Link Speed (mph)		45			45				30			30
Link Distance (ft)		1447			1257				342			493
Travel Time (s)		21.9			19.0				7.8			11.2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	750	130	76	554	16	125	5	87	11	5	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	750	130	76	554	16	125	92	0	11	16	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	0	0	2	1	0	0		1	0	
Detector Template	Left	Thru	Thru	Thru	Thru	Right	Thru	Thru		Left	Thru	
Leading Detector (ft)	20	100	0	0	100	20	0	0		20	0	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	0	0	6	20	0	0		20	0	
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex	Cl+Ex				Cl+Ex		
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94							
Detector 2 Size(ft)		6			6							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Detector Phase	4	4	4	8	8	8	2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	

Total 2042 PM 2:17 pm 09/11/2022 Total 2042 PM

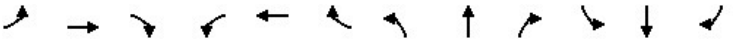
Synchro 11 Light Report
Page 1

LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings

2: Mountain & Gate Way

12/28/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5		22.5	22.5	
Total Split (s)	37.0	37.0	37.0	37.0	37.0	37.0	23.0	23.0		23.0	23.0	
Total Split (%)	61.7%	61.7%	61.7%	61.7%	61.7%	61.7%	38.3%	38.3%		38.3%	38.3%	
Maximum Green (s)	32.5	32.5	32.5	32.5	32.5	32.5	18.5	18.5		18.5	18.5	
Yellow Time (s)	3.5	3.5	3.5	3.5	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	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	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	4.5	4.5		4.5	4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	
Act Effct Green (s)	29.2	29.2	29.2	29.2	29.2	29.2	21.8	21.8		21.8	21.8	
Actuated g/C Ratio	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.36		0.36	0.36	
v/c Ratio	0.06	0.84	0.16	0.55	0.62	0.02	0.25	0.15		0.02	0.03	
Control Delay	8.7	23.1	3.2	28.2	14.1	2.1	16.9	5.4		14.7	10.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	8.7	23.1	3.2	28.2	14.1	2.1	16.9	5.4		14.7	10.1	
LOS	A	C	A	C	B	A	B	A		B	B	
Approach Delay	19.9			15.5			12.0			12.0		
Approach LOS	B			B			B			B		

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 17.2

Intersection LOS: B

Intersection Capacity Utilization 64.8%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 2: Mountain & Gate Way

	
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Total 2042 PM 2:17 pm 09/11/2022 Total 2042 PM

Synchro 11 Light Report
Page 2

LUDLOW FARM | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings

3: Berthoud Pkwy & Mountain

12/28/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	310	95	70	285	90	95	240	125	110	195	140
Future Volume (vph)	105	310	95	70	285	90	95	240	125	110	195	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1845	1568	1752	1845	1568	1752	1845	1568	1752	1845	1568
Flt Permitted	0.399			0.448			0.625			0.566		
Satd. Flow (perm)	736	1845	1568	826	1845	1568	1153	1845	1568	1044	1845	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			119			119			136			152
Link Speed (mph)		45			45			35			35	
Link Distance (ft)		1257			3652			531			2550	
Travel Time (s)		19.0			55.3			10.3			49.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	114	337	103	76	310	98	103	261	136	120	212	152
Shared Lane Traffic (%)												
Lane Group Flow (vph)	114	337	103	76	310	98	103	261	136	120	212	152
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

Total 2042 AM 7:00 am 06/22/2022 Total 2042 AM
RR

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings

3: Berthoud Pkwy & Mountain

12/28/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	10.0	22.9	22.9	9.6	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (%)	18.2%	41.6%	41.6%	17.5%	40.9%	40.9%	40.9%	40.9%	40.9%	40.9%	40.9%	40.9%
Maximum Green (s)	5.5	18.4	18.4	5.1	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	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	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	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	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	20.0	16.7	16.7	18.5	14.4	14.4	23.6	23.6	23.6	23.6	23.6	23.6
Actuated g/C Ratio	0.36	0.30	0.30	0.34	0.26	0.26	0.43	0.43	0.43	0.43	0.43	0.43
v/c Ratio	0.31	0.60	0.18	0.21	0.64	0.20	0.21	0.33	0.18	0.27	0.27	0.20
Control Delay	10.6	21.1	3.6	9.4	23.8	3.6	14.3	14.3	3.9	15.3	13.7	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.6	21.1	3.6	9.4	23.8	3.6	14.3	14.3	3.9	15.3	13.7	3.8
LOS	B	C	A	A	C	A	B	B	A	B	B	A
Approach Delay		15.7			17.5			11.5			11.0	
Approach LOS		B			B			B			B	

Intersection Summary

Area Type: Other

Cycle Length: 55

Actuated Cycle Length: 55

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 13.9

Intersection LOS: B

Intersection Capacity Utilization 54.5%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: Berthoud Pkwy & Mountain

 Ø2 (R)	 Ø3	 Ø4
22.5 s	9.6 s	22.9 s
 Ø5 (R)	 Ø7	 Ø8
22.5 s	10 s	22.5 s

Total 2042 AM 7:00 am 06/22/2022 Total 2042 AM
RR

Synchro 11 Light Report
Page 2

LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC

4: Welch & Berthoud Pkwy

12/31/2022

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	↔
Traffic Vol, veh/h	55	1	5	10	1	30	5	340	10	20	355	20
Future Vol, veh/h	55	1	5	10	1	30	5	340	10	20	355	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	-	-	-	-	-	-	0	-	-	0	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	60	1	5	11	1	33	5	370	11	22	386	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	833	821	386	830	838	376	408	0	0	381	0	0
Stage 1	430	430	-	386	386	-	-	-	-	-	-	-
Stage 2	403	391	-	444	452	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	287	308	660	288	301	668	1145	-	-	1172	-	-
Stage 1	601	582	-	635	608	-	-	-	-	-	-	-
Stage 2	622	605	-	591	569	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	267	301	660	280	294	668	1145	-	-	1172	-	-
Mov Cap-2 Maneuver	267	301	-	280	294	-	-	-	-	-	-	-
Stage 1	599	571	-	632	606	-	-	-	-	-	-	-
Stage 2	588	603	-	574	558	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	21.7			13.1			0.1			0.4		
HCM LOS	C			B								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1145	-	-	281	488	1172	-	-
HCM Lane V/C Ratio	0.005	-	-	0.236	0.091	0.019	-	-
HCM Control Delay (s)	8.2	-	-	21.7	13.1	8.1	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.9	0.3	0.1	-	-

Total 2042 AM 7:00 am 06/22/2022 Total 2042 AM
RR

Synchro 11 Light Report
Page 1

LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC

4: Welch & Berthoud Pkwy

12/28/2022

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	30	1	15	10	1	30	10	345	15	45	350	55
Future Vol, veh/h	30	1	15	10	1	30	10	345	15	45	350	55
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	-	-	-	-	-	-	0	-	-	0	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	33	1	16	11	1	33	11	375	16	49	380	60

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	900	891	380	922	943	383	440	0	0	391	0	0
Stage 1	478	478	-	405	405	-	-	-	-	-	-	-
Stage 2	422	413	-	517	538	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	258	281	665	250	262	662	1115	-	-	1162	-	-
Stage 1	566	554	-	620	597	-	-	-	-	-	-	-
Stage 2	607	592	-	539	521	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	235	266	665	234	248	662	1115	-	-	1162	-	-
Mov Cap-2 Maneuver	235	266	-	234	248	-	-	-	-	-	-	-
Stage 1	560	531	-	614	591	-	-	-	-	-	-	-
Stage 2	570	586	-	503	499	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	19.4			14			0.2			0.8		
HCM LOS	C			B								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1115	-	-	299	445	1162	-	-
HCM Lane V/C Ratio	0.01	-	-	0.167	0.1	0.042	-	-
HCM Control Delay (s)	8.3	-	-	19.4	14	8.2	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.3	0.1	-	-

Total 2042 PM 2:17 pm 09/11/2022 Total 2042 PM

Synchro 11 Light Report
Page 1

LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC

5: Berthoud Pkwy & Arapahoe

12/28/2022

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	↕
Traffic Vol, veh/h	30	1	10	5	1	10	5	310	5	5	345	15
Future Vol, veh/h	30	1	10	5	1	10	5	310	5	5	345	15
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	-	-	-	-	-	-	0	-	-	0	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	33	1	11	5	1	11	5	337	5	5	375	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	741	737	375	749	751	340	391	0	0	342	0	0
Stage 1	385	385	-	350	350	-	-	-	-	-	-	-
Stage 2	356	352	-	399	401	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	331	345	669	327	338	700	1162	-	-	1211	-	-
Stage 1	636	609	-	664	631	-	-	-	-	-	-	-
Stage 2	659	630	-	625	599	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	323	342	669	319	335	700	1162	-	-	1211	-	-
Mov Cap-2 Maneuver	323	342	-	319	335	-	-	-	-	-	-	-
Stage 1	633	607	-	661	628	-	-	-	-	-	-	-
Stage 2	645	627	-	611	597	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	16.1			12.7			0.1			0.1		
HCM LOS	C			B								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1162	-	-	370	486	1211	-	-
HCM Lane V/C Ratio	0.005	-	-	0.12	0.036	0.004	-	-
HCM Control Delay (s)	8.1	-	-	16.1	12.7	8	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.1	0	-	-

Total 2042 AM 7:00 am 06/22/2022 Total 2042 AM
RR

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC

5: Berthoud Pkwy & Arapahoe

12/28/2022

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	20	1	5	5	1	5	10	340	5	5	335	40
Future Vol, veh/h	20	1	5	5	1	5	10	340	5	5	335	40
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	-	-	-	-	-	-	0	-	-	0	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	22	1	5	5	1	5	11	370	5	5	364	43

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	772	771	364	794	812	373	407	0	0	375	0	0
Stage 1	374	374	-	395	395	-	-	-	-	-	-	-
Stage 2	398	397	-	399	417	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	315	330	679	305	312	671	1146	-	-	1178	-	-
Stage 1	645	616	-	628	603	-	-	-	-	-	-	-
Stage 2	626	602	-	625	590	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	308	325	679	299	308	671	1146	-	-	1178	-	-
Mov Cap-2 Maneuver	308	325	-	299	308	-	-	-	-	-	-	-
Stage 1	639	614	-	622	597	-	-	-	-	-	-	-
Stage 2	614	596	-	616	588	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	16.4			14.3			0.2			0.1		
HCM LOS	C			B								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1146	-	-	345	401	1178	-	-
HCM Lane V/C Ratio	0.009	-	-	0.082	0.03	0.005	-	-
HCM Control Delay (s)	8.2	-	-	16.4	14.3	8.1	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.1	0	-	-

Total 2042 PM 2:17 pm 09/11/2022 Total 2042 PM

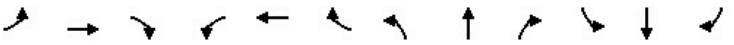
Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings

6: Spartan Ave/Spartan & Berthoud Pkwy

12/28/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	100	100	65	30	145	100	85	125	65	170	100	70
Future Volume (vph)	100	100	65	30	145	100	85	125	65	170	100	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.967			0.951			0.949			0.938	
Flt Protected		0.981			0.995		0.950			0.950		
Satd. Flow (prot)	0	1750	0	0	1746	0	1752	1751	0	1752	1730	0
Flt Permitted		0.713			0.949		0.641			0.628		
Satd. Flow (perm)	0	1272	0	0	1665	0	1182	1751	0	1158	1730	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		34			60			54			73	
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		2716			4520			2200			580	
Travel Time (s)		61.7			102.7			42.9			11.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	109	71	33	158	109	92	136	71	185	109	76
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	289	0	0	300	0	92	207	0	185	185	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	0	0		1	0		0	2		1	2	
Detector Template	Thru	Thru		Left	Thru		Thru	Thru		Left	Thru	
Leading Detector (ft)	0	0		20	0		0	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	0	0		20	0		0	6		20	6	
Detector 1 Type				Cl+Ex			Cl+Ex			Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type							Cl+Ex			Cl+Ex		
Detector 2 Channel												
Detector 2 Extend (s)							0.0			0.0		
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	

Total 2042 AM 7:00 am 06/22/2022 Total 2042 AM
RR

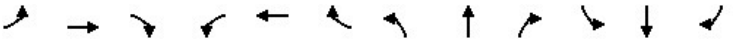
Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings

6: Spartan Ave/Spartan & Berthoud Pkwy

12/28/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	30.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	25.5	25.5		25.5	25.5		25.5	25.5		25.5	25.5	
Yellow Time (s)	3.5	3.5		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		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		4.5			4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		14.0			14.0			25.8			25.8	
Actuated g/C Ratio		0.29			0.29			0.53			0.53	
v/c Ratio		0.75			0.58			0.15			0.30	
Control Delay		26.2			16.1			8.3			9.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		26.2			16.1			8.3			9.8	
LOS		C			B			A			A	
Approach Delay		26.2			16.1			7.0			7.7	
Approach LOS		C			B			A			A	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 48.8

Natural Cycle: 45

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 13.8

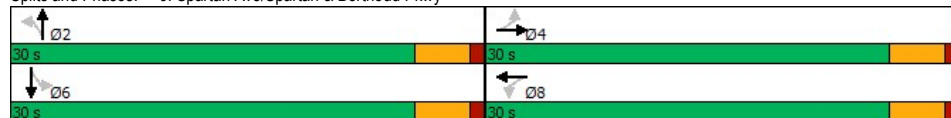
Intersection LOS: B

Intersection Capacity Utilization 65.1%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 6: Spartan Ave/Spartan & Berthoud Pkwy

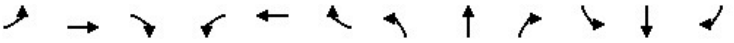


LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings

6: Spartan Ave/Spartan & Berthoud Pkwy

12/28/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	110	135	115	40	90	110	80	135	55	65	165	110
Future Volume (vph)	110	135	115	40	90	110	80	135	55	65	165	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.957			0.938			0.957			0.940	
Flt Protected		0.985			0.992		0.950			0.950		
Satd. Flow (prot)	0	1739	0	0	1716	0	1752	1765	0	1752	1734	0
Flt Permitted		0.811			0.906		0.562			0.628		
Satd. Flow (perm)	0	1432	0	0	1568	0	1037	1765	0	1158	1734	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		49			89		43			70		
Link Speed (mph)		30			30		35			35		
Link Distance (ft)		2716			4520		2200			580		
Travel Time (s)		61.7			102.7		42.9			11.3		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	147	125	43	98	120	87	147	60	71	179	120
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	392	0	0	261	0	87	207	0	71	299	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0		12			12		
Link Offset(ft)		0			0		0			0		
Crosswalk Width(ft)		16			16		16			16		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	0	0		1	0		0	2		1	2	
Detector Template	Thru	Thru		Left	Thru		Thru	Thru		Left	Thru	
Leading Detector (ft)	0	0		20	0		0	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	0	0		20	0		0	6		20	6	
Detector 1 Type				Cl+Ex			Cl+Ex			Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)								94			94	
Detector 2 Size(ft)								6			6	
Detector 2 Type								Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)								0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	

Total 2042 PM 2:17 pm 09/11/2022 Total 2042 PM

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings

6: Spartan Ave/Spartan & Berthoud Pkwy

12/28/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5		22.5	22.5	
Total Split (s)	30.0	30.0		30.0	30.0		30.0	30.0		30.0	30.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	25.5	25.5		25.5	25.5		25.5	25.5		25.5	25.5	
Yellow Time (s)	3.5	3.5		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		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		4.5			4.5			4.5			4.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		17.1			17.1			25.8			25.8	
Actuated g/C Ratio		0.33			0.33			0.50			0.50	
v/c Ratio		0.78			0.45			0.17			0.12	
Control Delay		24.9			11.1			10.3			9.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		24.9			11.1			10.3			9.8	
LOS		C			B			B			A	
Approach Delay		24.9			11.1			8.8			8.8	
Approach LOS		C			B			A			A	

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 52

Natural Cycle: 45

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 14.0

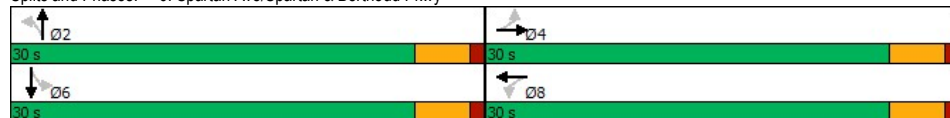
Intersection LOS: B

Intersection Capacity Utilization 66.2%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 6: Spartan Ave/Spartan & Berthoud Pkwy



Total 2042 PM 2:17 pm 09/11/2022 Total 2042 PM

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC

7: Berthoud Pkwy & CR 4E

12/31/2022

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	55	15	5	5	40	10	5	90	5	15	135	105
Future Vol, veh/h	55	15	5	5	40	10	5	90	5	15	135	105
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	0	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	60	16	5	5	43	11	5	98	5	16	147	114

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	374	349	204	358	404	101	261	0	0	103	0	0
Stage 1	236	236	-	111	111	-	-	-	-	-	-	-
Stage 2	138	113	-	247	293	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	581	573	834	596	534	952	1298	-	-	1483	-	-
Stage 1	765	708	-	892	802	-	-	-	-	-	-	-
Stage 2	863	800	-	755	668	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	531	563	834	572	525	952	1298	-	-	1483	-	-
Mov Cap-2 Maneuver	531	563	-	572	525	-	-	-	-	-	-	-
Stage 1	762	699	-	888	799	-	-	-	-	-	-	-
Stage 2	803	797	-	723	659	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	12.2			12			0.4			0.4		
HCM LOS	B			B								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1298	-	-	531	613	576	1483	-	-
HCM Lane V/C Ratio	0.004	-	-	0.113	0.035	0.104	0.011	-	-
HCM Control Delay (s)	7.8	0	-	12.6	11.1	12	7.5	0	-
HCM Lane LOS	A	A	-	B	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.1	0.3	0	-	-

Total 2042 AM 7:00 am 06/22/2022 Total 2042 AM
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Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC

7: Berthoud Pkwy & CR 4E

12/31/2022

Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	90	45	5	5	30	15	5	165	5	10	140	40
Future Vol, veh/h	90	45	5	5	30	15	5	165	5	10	140	40
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	0	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	98	49	5	5	33	16	5	179	5	11	152	43

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	412	390	174	415	409	182	195	0	0	184	0	0
Stage 1	196	196	-	192	192	-	-	-	-	-	-	-
Stage 2	216	194	-	223	217	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	549	544	867	546	531	858	1372	-	-	1385	-	-
Stage 1	803	737	-	807	740	-	-	-	-	-	-	-
Stage 2	784	738	-	777	721	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	508	537	867	500	524	858	1372	-	-	1385	-	-
Mov Cap-2 Maneuver	508	537	-	500	524	-	-	-	-	-	-	-
Stage 1	800	730	-	804	737	-	-	-	-	-	-	-
Stage 2	732	735	-	714	715	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	13.2			11.7			0.2			0.4		
HCM LOS	B			B								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1372	-	-	508	558	590	1385	-	-
HCM Lane V/C Ratio	0.004	-	-	0.193	0.097	0.092	0.008	-	-
HCM Control Delay (s)	7.6	0	-	13.8	12.1	11.7	7.6	0	-
HCM Lane LOS	A	A	-	B	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0.3	0.3	0	-	-

Total 2042 PM 2:17 pm 09/11/2022 Total 2042 PM

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

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

12/31/2022

Intersection						
Int Delay, s/veh	52.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↰	↰↰	↰	↰	↰↰
Traffic Vol, veh/h	120	35	900	50	15	2230
Future Vol, veh/h	120	35	900	50	15	2230
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	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	130	38	978	54	16	2424
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	2222	489	0	0	1032	0
Stage 1	978	-	-	-	-	-
Stage 2	1244	-	-	-	-	-
Critical Hdwy	6.86	6.96	-	-	4.16	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	-	-	2.23	-
Pot Cap-1 Maneuver	~ 36	522	-	-	663	-
Stage 1	323	-	-	-	-	-
Stage 2	233	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	~ 35	522	-	-	663	-
Mov Cap-2 Maneuver	~ 35	-	-	-	-	-
Stage 1	323	-	-	-	-	-
Stage 2	227	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, \$	1134.8	0		0.1		
HCM LOS	F					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	35	522	663	-
HCM Lane V/C Ratio	-	-	3.727	0.073	0.025	-
HCM Control Delay (s)	-	\$	1462.2	12.4	10.6	-
HCM Lane LOS	-	-	F	B	B	-
HCM 95th %tile Q(veh)	-	-	15.2	0.2	0.1	-
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

Total 2042 AM 7:00 am 06/22/2022 Total 2042 AM
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Synchro 11 Light Report
 Page 1

LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

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

12/31/2022

Intersection						
Int Delay, s/veh	292.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↰	↰↰	↰	↰	↰↰
Traffic Vol, veh/h	80	30	2395	175	40	1370
Future Vol, veh/h	80	30	2395	175	40	1370
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	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	87	33	2603	190	43	1489
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	3434	1302	0	0	2793	0
Stage 1	2603	-	-	-	-	-
Stage 2	831	-	-	-	-	-
Critical Hdwy	6.86	6.96	-	-	4.16	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	-	-	2.23	-
Pot Cap-1 Maneuver	~ 5	150	-	-	135	-
Stage 1	~ 41	-	-	-	-	-
Stage 2	386	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	~ 3	150	-	-	135	-
Mov Cap-2 Maneuver	~ 3	-	-	-	-	-
Stage 1	~ 41	-	-	-	-	-
Stage 2	263	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay (s)	10873.8	0	1.2			
HCM LOS	F					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	3	150	135	-
HCM Lane V/C Ratio	-	-	28.986	0.217	0.322	-
HCM Control Delay (s)	-	-	14938.2	35.5	43.8	-
HCM Lane LOS	-	-	F	E	E	-
HCM 95th %tile Q(veh)	-	-	13	0.8	1.3	-
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

Total 2042 PM 2:17 pm 09/11/2022 Total 2042 PM

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

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

12/28/2022

						
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 Util. Factor	0.97	1.00	0.95	1.00	1.00	0.95
Frt	0.850		0.850			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3400	1568	3505	1568	1752	3505
Flt Permitted	0.950				0.251	
Satd. Flow (perm)	3400	1568	3505	1568	463	3505
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		125		190		
Link Speed (mph)	30		30			30
Link Distance (ft)	2716		245			2668
Travel Time (s)	61.7		5.6			60.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
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	
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		6
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	
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	0.33	0.41	0.18	0.25	0.81
Control Delay	42.9	9.1	10.1	1.5	6.3	20.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.9	9.1	10.1	1.5	6.3	20.7

Total 2042 AM 7:00 am 06/22/2022 Total 2042 AM
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Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY Town of Berthoud

Lanes, Volumes, Timings

9: US 287 & Spartan Ave

12/28/2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
LOS	D	A	B	A	A	C
Approach Delay	34.5		8.7			20.0
Approach LOS	C		A			B
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: 0.81						
Intersection Signal Delay: 18.6				Intersection LOS: B		
Intersection Capacity Utilization 69.9%				ICU Level of Service C		
Analysis Period (min) 15						

Splits and Phases: 9: US 287 & Spartan Ave



Total 2042 AM 7:00 am 06/22/2022 Total 2042 AM
RR

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

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

12/28/2022

						
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 Util. Factor	0.97	1.00	0.95	1.00	1.00	0.95
Frt	0.850		0.850			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3400	1568	3505	1568	1752	3505
Flt Permitted	0.950				0.049	
Satd. Flow (perm)	3400	1568	3505	1568	90	3505
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		130		157		
Link Speed (mph)	30		30			30
Link Distance (ft)	2716		245			2668
Travel Time (s)	61.7		5.6			60.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	228	130	2364	364	217	1304
Shared Lane Traffic (%)						
Lane Group Flow (vph)	228	130	2364	364	217	1304
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	
Turn Type	Prot	Perm	NA	pm+ov	pm+pt	NA
Protected Phases	8		2	8	1	6
Permitted Phases		8		2		6
Minimum Split (s)	22.5	22.5	22.5	22.5	9.5	22.5
Total Split (s)	20.0	20.0	82.0	20.0	18.0	100.0
Total Split (%)	16.7%	16.7%	68.3%	16.7%	15.0%	83.3%
Maximum Green (s)	15.5	15.5	77.5	15.5	13.5	95.5
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		Lead	
Lead-Lag Optimize?			Yes		Yes	
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)	15.5	15.5	77.5	97.5	95.5	95.5
Actuated g/C Ratio	0.13	0.13	0.65	0.81	0.80	0.80
v/c Ratio	0.52	0.41	1.04	0.28	0.84	0.47
Control Delay	53.5	12.2	53.9	2.0	46.5	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.5	12.2	53.9	2.0	46.5	11.5

Total 2042 PM 2:17 pm 09/11/2022 Total 2042 PM

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC

10: Berthoud Pkwy & Estate Lot Access

12/31/2022

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W		W	↑	↑	
Traffic Vol, veh/h	30	20	5	245	185	10
Future Vol, veh/h	30	20	5	245	185	10
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	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	33	22	5	266	201	11
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	483	207	212	0	-	0
Stage 1	207	-	-	-	-	-
Stage 2	276	-	-	-	-	-
Critical Hdwy	6.43	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	2.227	-	-	-
Pot Cap-1 Maneuver	541	831	1352	-	-	-
Stage 1	825	-	-	-	-	-
Stage 2	768	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	539	831	1352	-	-	-
Mov Cap-2 Maneuver	539	-	-	-	-	-
Stage 1	822	-	-	-	-	-
Stage 2	768	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	11.3	0.2	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT EBLn1	SBT	SBR		
Capacity (veh/h)	1352	-	627	-		
HCM Lane V/C Ratio	0.004	-	0.087	-		
HCM Control Delay (s)	7.7	-	11.3	-		
HCM Lane LOS	A	-	B	-		
HCM 95th %tile Q(veh)	0	-	0.3	-		

Total 2042 AM 7:00 am 06/22/2022 Total 2042 AM
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Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY Town of Berthoud

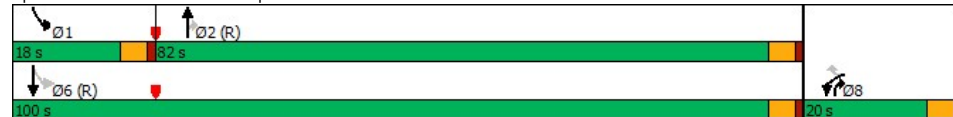
Lanes, Volumes, Timings

9: US 287 & Spartan Ave

12/28/2022

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
LOS	D	B	D	A	D	B
Approach Delay	38.5		47.0		16.5	
Approach LOS	D		D		B	
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:	140					
Control Type:	Pretimed					
Maximum v/c Ratio:	1.04					
Intersection Signal Delay:	36.3			Intersection LOS: D		
Intersection Capacity Utilization	88.4%			ICU Level of Service E		
Analysis Period (min)	15					

Splits and Phases: 9: US 287 & Spartan Ave



Total 2042 PM 2:17 pm 09/11/2022 Total 2042 PM

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC

10: Berthoud Pkwy & Estate Lot Access

12/31/2022

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W		W	↑	↑	
Traffic Vol, veh/h	30	20	5	245	185	10
Future Vol, veh/h	30	20	5	245	185	10
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	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	33	22	5	266	201	11
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	483	207	212	0	-	0
Stage 1	207	-	-	-	-	-
Stage 2	276	-	-	-	-	-
Critical Hdwy	6.43	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	2.227	-	-	-
Pot Cap-1 Maneuver	541	831	1352	-	-	-
Stage 1	825	-	-	-	-	-
Stage 2	768	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	539	831	1352	-	-	-
Mov Cap-2 Maneuver	539	-	-	-	-	-
Stage 1	822	-	-	-	-	-
Stage 2	768	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	11.3	0.2	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT EBLn1	SBT	SBR		
Capacity (veh/h)	1352	-	627	-		
HCM Lane V/C Ratio	0.004	-	0.087	-		
HCM Control Delay (s)	7.7	-	11.3	-		
HCM Lane LOS	A	-	B	-		
HCM 95th %tile Q(veh)	0	-	0.3	-		

Total 2042 AM 7:00 am 06/22/2022 Total 2042 AM
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th TWSC

10: Berthoud Pkwy & Estate Lot Access

12/31/2022

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W		W	↑	↑	
Traffic Vol, veh/h	20	10	20	320	345	30
Future Vol, veh/h	20	10	20	320	345	30
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	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	22	11	22	348	375	33
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	784	392	408	0	-	0
Stage 1	392	-	-	-	-	-
Stage 2	392	-	-	-	-	-
Critical Hdwy	6.43	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	2.227	-	-	-
Pot Cap-1 Maneuver	361	655	1145	-	-	-
Stage 1	681	-	-	-	-	-
Stage 2	681	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	354	655	1145	-	-	-
Mov Cap-2 Maneuver	354	-	-	-	-	-
Stage 1	668	-	-	-	-	-
Stage 2	681	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	14.3	0.5	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT EBLn1	SBT	SBR		
Capacity (veh/h)	1145	-	418	-		
HCM Lane V/C Ratio	0.019	-	0.078	-		
HCM Control Delay (s)	8.2	-	14.3	-		
HCM Lane LOS	A	-	B	-		
HCM 95th %tile Q(veh)	0.1	-	0.3	-		

Total 2042 PM 2:17 pm 09/11/2022 Total 2042 PM

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings
11: Mountain & Meadowlark

12/28/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	405	50	30	400	75	105	15	45	155	20	145
Future Volume (vph)	170	405	50	30	400	75	105	15	45	155	20	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.887				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1845	1568	1752	1845	1568	1752	1636	0	1752	1845	1568
Flt Permitted	0.407			0.402			0.743			0.715		
Satd. Flow (perm)	751	1845	1568	742	1845	1568	1371	1636	0	1319	1845	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			54			82		49				158
Link Speed (mph)		45			45			30			30	
Link Distance (ft)		822			1447			2668			493	
Travel Time (s)		12.5			21.9			60.6			11.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	440	54	33	435	82	114	16	49	168	22	158
Shared Lane Traffic (%)												
Lane Group Flow (vph)	185	440	54	33	435	82	114	65	0	168	22	158
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5		22.5	22.5	22.5
Total Split (s)	57.0	57.0	57.0	57.0	57.0	57.0	43.0	43.0		43.0	43.0	43.0
Total Split (%)	57.0%	57.0%	57.0%	57.0%	57.0%	57.0%	43.0%	43.0%		43.0%	43.0%	43.0%
Maximum Green (s)	52.5	52.5	52.5	52.5	52.5	52.5	38.5	38.5		38.5	38.5	38.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	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	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	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	4.5	4.5		4.5	4.5	4.5
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effect Green (s)	52.5	52.5	52.5	52.5	52.5	52.5	38.5	38.5		38.5	38.5	38.5
Actuated g/C Ratio	0.52	0.52	0.52	0.52	0.52	0.52	0.38	0.38		0.38	0.38	0.38
v/c Ratio	0.47	0.45	0.06	0.08	0.45	0.10	0.22	0.10		0.33	0.03	0.23
Control Delay	16.1	12.9	3.7	18.8	25.1	8.5	22.0	8.4		24.0	19.4	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	16.1	12.9	3.7	18.8	25.1	8.5	22.0	8.4		24.0	19.4	4.2

Total 2042 AM 7:00 am 06/22/2022 Total 2042 AM
RR

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings

11: Mountain & Meadowlark

12/28/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	B	A	B	C	A	C	A		C	B	A
Approach Delay		13.1			22.2			17.1			14.7	
Approach LOS		B			C			B			B	
Intersection Summary												
Area Type:	Other											
Cycle Length: 100												
Actuated Cycle Length: 100												
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green												
Natural Cycle: 50												
Control Type: Pretimed												
Maximum v/c Ratio: 0.47												
Intersection Signal Delay: 16.7						Intersection LOS: B						
Intersection Capacity Utilization 57.0%						ICU Level of Service B						
Analysis Period (min) 15												

Splits and Phases: 11: Mountain & Meadowlark

 Ø2 (R)	 Ø4
43 s	57 s
 Ø6 (R)	 Ø8
43 s	57 s

Total 2042 AM 7:00 am 06/22/2022 Total 2042 AM
RR

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

Lanes, Volumes, Timings
11: Mountain & Meadowlark

12/28/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	335	570	90	45	470	80	85	20	45	175	20	160
Future Volume (vph)	335	570	90	45	470	80	85	20	45	175	20	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.896				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1845	1568	1752	1845	1568	1752	1653	0	1752	1845	1568
Flt Permitted	0.421			0.358			0.743			0.711		
Satd. Flow (perm)	777	1845	1568	660	1845	1568	1371	1653	0	1312	1845	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			98			87		49				174
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		822			1447			2668			493	
Travel Time (s)		18.7			32.9			60.6			11.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	364	620	98	49	511	87	92	22	49	190	22	174
Shared Lane Traffic (%)												
Lane Group Flow (vph)	364	620	98	49	511	87	92	71	0	190	22	174
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60		60	60		60	60		60	60		60
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5		22.5	22.5	22.5
Total Split (s)	89.0	89.0	89.0	89.0	89.0	89.0	31.0	31.0		31.0	31.0	31.0
Total Split (%)	74.2%	74.2%	74.2%	74.2%	74.2%	74.2%	25.8%	25.8%		25.8%	25.8%	25.8%
Maximum Green (s)	84.5	84.5	84.5	84.5	84.5	84.5	26.5	26.5		26.5	26.5	26.5
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	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	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	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	4.5	4.5		4.5	4.5	4.5
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	0
Act Effect Green (s)	84.5	84.5	84.5	84.5	84.5	84.5	26.5	26.5		26.5	26.5	26.5
Actuated g/C Ratio	0.70	0.70	0.70	0.70	0.70	0.70	0.22	0.22		0.22	0.22	0.22
v/c Ratio	0.67	0.48	0.09	0.11	0.39	0.08	0.30	0.18		0.66	0.05	0.36
Control Delay	19.5	13.0	3.9	10.9	14.4	5.1	42.4	16.8		54.8	37.5	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	19.5	13.0	3.9	10.9	14.4	5.1	42.4	16.8		54.8	37.5	7.9

Total 2042 PM 2:17 pm 09/11/2022 Total 2042 PM

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY

Town of Berthoud

Lanes, Volumes, Timings

11: Mountain & Meadowlark

12/28/2022

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	B	B	A	B	B	A	D	B		D	D	A
Approach Delay		14.3			12.9			31.2			32.7	
Approach LOS		B			B			C			C	
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:	65											
Control Type:	Pretimed											
Maximum v/c Ratio:	0.67											
Intersection Signal Delay:	18.2					Intersection LOS: B						
Intersection Capacity Utilization	70.9%					ICU Level of Service C						
Analysis Period (min)	15											

Splits and Phases: 11: Mountain & Meadowlark

 Ø2 (R)	 Ø4
Ø1 s	Ø9 s
 Ø6 (R)	 Ø8
Ø1 s	Ø9 s

Total 2042 PM 2:17 pm 09/11/2022 Total 2042 PM

Synchro 11 Light Report
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TOTAL 2042 WITH ROUNDABOUT

LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th Roundabout
 2: Mountain & Gate Way

01/01/2023

Intersection					
Intersection Delay, s/veh	7.1				
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	592	576	108	37	
Demand Flow Rate, veh/h	610	593	111	37	
Vehicles Circulating, veh/h	65	88	564	660	
Vehicles Exiting, veh/h	632	587	49	21	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	6.7	7.9	6.3	5.7	
Approach LOS	A	A	A	A	
Lane	Left	Bypass	Left	Left	Left
Designated Moves	LT	R	LTR	LTR	LTR
Assumed Moves	LT	R	LTR	LTR	LTR
RT Channelized	Yield				
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	62	4.976	4.976	4.976
Entry Flow, veh/h	548	1313	593	111	37
Cap Entry Lane, veh/h	1291	0.971	1261	776	704
Entry HV Adj Factor	0.971	60	0.972	0.972	0.996
Flow Entry, veh/h	532	1274	576	108	37
Cap Entry, veh/h	1254	0.047	1226	754	701
V/C Ratio	0.424	3.2	0.470	0.143	0.053
Control Delay, s/veh	7.1	A	7.9	6.3	5.7
LOS	A	0	A	A	A
95th %tile Queue, veh	2		3	0	0

Total 2042 AM 7:00 am 06/22/2022 Total 2042 AM
 RR

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th Roundabout
 2: Mountain & Gate Way

01/01/2023

Intersection					
Intersection Delay, s/veh	10.0				
Intersection LOS	B				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	896	646	217	27	
Demand Flow Rate, veh/h	922	665	224	27	
Vehicles Circulating, veh/h	94	150	800	778	
Vehicles Exiting, veh/h	711	874	83	37	
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	9.9	11.4	6.3	
Approach LOS	A	A	B	A	
Lane	Left	Bypass	Left	Left	Left
Designated Moves	LT	R	LTR	LTR	LTR
Assumed Moves	LT	R	LTR	LTR	LTR
RT Channelized		Yield			
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	134	4.976	4.976	4.976
Entry Flow, veh/h	788	1268	665	224	27
Cap Entry Lane, veh/h	1254	0.971	1184	610	624
Entry HV Adj Factor	0.971	130	0.972	0.968	0.995
Flow Entry, veh/h	766	1231	646	217	27
Cap Entry, veh/h	1218	0.106	1151	591	621
V/C Ratio	0.629	3.8	0.562	0.367	0.043
Control Delay, s/veh	11.0	A	9.9	11.4	6.3
LOS	B	0	A	B	A
95th %tile Queue, veh	5		4	2	0

Total 2042 PM 2:17 pm 09/11/2022 Total 2042 PM

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th Roundabout
 3: Berthoud Pkwy & Mountain

01/01/2023

Intersection									
Intersection Delay, s/veh	8.3								
Intersection LOS	A								
Approach	EB		WB		NB		SB		
Entry Lanes	2		2		1		1		
Conflicting Circle Lanes	1		1		1		1		
Adj Approach Flow, veh/h	554		490		500		484		
Demand Flow Rate, veh/h	570		504		515		499		
Vehicles Circulating, veh/h	426		492		588		509		
Vehicles Exiting, veh/h	425		471		408		487		
Ped Vol Crossing Leg, #/h	0		0		0		0		
Ped Cap Adj	1.000		1.000		1.000		1.000		
Approach Delay, s/veh	8.9		8.6		8.8		6.7		
Approach LOS	A		A		A		A		
Lane	Left	Right	Left	Right	Left	Bypass	Left	Bypass	
Designated Moves	LT	R	LT	R	LT	R	LT	R	
Assumed Moves	LT	R	LT	R	LT	R	LT	R	
RT Channelized						Free		Free	
Lane Util	0.814	0.186	0.800	0.200	1.000		1.000		
Follow-Up Headway, s	2.535	2.535	2.535	2.535	2.609		2.609		
Critical Headway, s	4.544	4.544	4.544	4.544	4.976	140	4.976	157	
Entry Flow, veh/h	464	106	403	101	375	1957	342	1957	
Cap Entry Lane, veh/h	964	964	908	908	758	0.971	821	0.971	
Entry HV Adj Factor	0.972	0.972	0.972	0.970	0.971	136	0.970	152	
Flow Entry, veh/h	451	103	392	98	364	1900	332	1900	
Cap Entry, veh/h	936	936	882	881	736	0.072	796	0.080	
V/C Ratio	0.481	0.110	0.444	0.111	0.495	0.0	0.417	0.0	
Control Delay, s/veh	9.8	4.9	9.5	5.2	12.1	A	9.8	A	
LOS	A	A	A	A	B	0	A	0	
95th %tile Queue, veh	3	0	2	0	3		2		

Total 2042 AM 7:00 am 06/22/2022 Total 2042 AM
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th Roundabout
 3: Berthoud Pkwy & Mountain

01/01/2023

Intersection									
Intersection Delay, s/veh	21.6								
Intersection LOS	C								
Approach	EB		WB		NB		SB		
Entry Lanes	2		2		1		1		
Conflicting Circle Lanes	1		1		1		1		
Adj Approach Flow, veh/h	826		750		446		559		
Demand Flow Rate, veh/h	852		773		460		576		
Vehicles Circulating, veh/h	610		511		969		700		
Vehicles Exiting, veh/h	532		778		493		584		
Ped Vol Crossing Leg, #/h	0		0		0		0		
Ped Cap Adj	1.000		1.000		1.000		1.000		
Approach Delay, s/veh	37.0		13.9		15.0		14.2		
Approach LOS	E		B		B		B		
Lane	Left	Right	Left	Right	Left	Bypass	Left	Bypass	
Designated Moves	LT	R	LT	R	LT	R	LT	R	
Assumed Moves	LT	R	LT	R	LT	R	LT	R	
RT Channelized						Free		Free	
Lane Util	0.894	0.106	0.789	0.211	1.000		1.000		
Follow-Up Headway, s	2.535	2.535	2.535	2.535	2.609		2.609		
Critical Headway, s	4.544	4.544	4.544	4.544	4.976	140	4.976	134	
Entry Flow, veh/h	762	90	610	163	320	1957	442	1957	
Cap Entry Lane, veh/h	815	815	892	892	514	0.971	676	0.971	
Entry HV Adj Factor	0.970	0.967	0.971	0.969	0.970	136	0.971	130	
Flow Entry, veh/h	739	87	592	158	310	1900	429	1900	
Cap Entry, veh/h	791	788	866	865	498	0.072	656	0.068	
V/C Ratio	0.935	0.110	0.684	0.183	0.623	0.0	0.654	0.0	
Control Delay, s/veh	40.7	5.7	16.1	6.0	21.5	A	18.5	A	
LOS	E	A	C	A	C	0	C	0	
95th %tile Queue, veh	14	0	6	1	4		5		

Total 2042 PM 2:17 pm 09/11/2022 Total 2042 PM

Synchro 11 Light Report
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th Roundabout

6: Spartan Ave/Spartan & Berthoud Pkwy

01/01/2023

Intersection				
Intersection Delay, s/veh	7.4			
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	289	300	299	370
Demand Flow Rate, veh/h	297	309	308	381
Vehicles Circulating, veh/h	337	347	415	292
Vehicles Exiting, veh/h	336	376	219	364
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	7.9	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	297	309	308	381
Cap Entry Lane, veh/h	979	969	904	1024
Entry HV Adj Factor	0.972	0.972	0.971	0.970
Flow Entry, veh/h	289	300	299	370
Cap Entry, veh/h	951	941	877	994
V/C Ratio	0.304	0.319	0.341	0.372
Control Delay, s/veh	6.9	7.2	7.9	7.6
LOS	A	A	A	A
95th %tile Queue, veh	1	1	2	2

Total 2042 AM 7:00 am 06/22/2022 Total 2042 AM
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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th Roundabout

6: Spartan Ave/Spartan & Berthoud Pkwy

01/01/2023

Intersection				
Intersection Delay, s/veh	7.3			
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	392	261	294	370
Demand Flow Rate, veh/h	404	269	303	381
Vehicles Circulating, veh/h	301	365	348	235
Vehicles Exiting, veh/h	315	286	357	399
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.0	6.8	7.1	7.0
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	404	269	303	381
Cap Entry Lane, veh/h	1015	951	968	1086
Entry HV Adj Factor	0.969	0.970	0.969	0.970
Flow Entry, veh/h	392	261	294	370
Cap Entry, veh/h	984	923	938	1053
V/C Ratio	0.398	0.283	0.313	0.351
Control Delay, s/veh	8.0	6.8	7.1	7.0
LOS	A	A	A	A
95th %tile Queue, veh	2	1	1	2

Total 2042 PM 2:17 pm 09/11/2022 Total 2042 PM

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BACKGROUND & TOTAL 2042 WITH IMPROVEMENTS

LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th Signalized Intersection Summary
8: US 287 & CR 4E

01/02/2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↱	↰	↰	↱
Traffic Volume (veh/h)	120	35	900	50	15	2230
Future Volume (veh/h)	120	35	900	50	15	2230
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	130	38	978	54	16	2424
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	185	165	2579	1150	472	2579
Arrive On Green	0.10	0.10	0.73	0.73	0.73	0.73
Sat Flow, veh/h	1767	1572	3618	1572	542	3618
Grp Volume(v), veh/h	130	38	978	54	16	2424
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1572	542	1763
Q Serve(g_s), s	3.9	1.2	5.7	0.5	0.6	32.5
Cycle Q Clear(g_c), s	3.9	1.2	5.7	0.5	6.3	32.5
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	185	165	2579	1150	472	2579
V/C Ratio(X)	0.70	0.23	0.38	0.05	0.03	0.94
Avail Cap(c_a), veh/h	578	515	2579	1150	472	2579
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.8	22.6	2.7	2.1	3.9	6.3
Incr Delay (d2), s/veh	4.8	0.7	0.4	0.1	0.1	8.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.5	1.0	0.1	0.1	7.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	28.5	23.3	3.2	2.1	4.0	14.7
LnGrp LOS	C	C	A	A	A	B
Approach Vol, veh/h	168		1032			2440
Approach Delay, s/veh	27.3		3.1			14.6
Approach LOS	C		A			B
Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		44.7			44.7	10.3
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		28.0			28.0	18.0
Max Q Clear Time (g_c+I1), s		7.7			34.5	5.9
Green Ext Time (p_c), s		7.4			0.0	0.3
Intersection Summary						
HCM 6th Ctrl Delay			12.0			
HCM 6th LOS			B			

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LUDLOW FARM | TRANSPORTATION IMPACT STUDY
Town of Berthoud

HCM 6th Signalized Intersection Summary
8: US 287 & CR 4E

01/02/2023

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↕	↰	↱	↕
Traffic Volume (veh/h)	80	30	2395	175	40	1370
Future Volume (veh/h)	80	30	2395	175	40	1370
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	87	33	2603	190	43	1489
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	130	116	2737	1221	134	2737
Arrive On Green	0.07	0.07	0.78	0.78	0.78	0.78
Sat Flow, veh/h	1767	1572	3618	1572	97	3618
Grp Volume(v), veh/h	87	33	2603	190	43	1489
Grp Sat Flow(s),veh/h/ln	1767	1572	1763	1572	97	1763
Q Serve(g_s), s	2.9	1.2	37.9	1.8	8.7	9.8
Cycle Q Clear(g_c), s	2.9	1.2	37.9	1.8	46.6	9.8
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	130	116	2737	1221	134	2737
V/C Ratio(X)	0.67	0.29	0.95	0.16	0.32	0.54
Avail Cap(c_a), veh/h	530	472	2737	1221	134	2737
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.1	26.3	5.7	1.7	28.6	2.6
Incr Delay (d2), s/veh	5.8	1.3	9.0	0.3	6.2	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.5	7.7	0.3	0.8	1.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	32.9	27.6	14.8	2.0	34.8	3.4
LnGrp LOS	C	C	B	A	C	A
Approach Vol, veh/h	120		2793			1532
Approach Delay, s/veh	31.4		13.9			4.3
Approach LOS	C		B			A
Timer - Assigned Phs		2			6	8
Phs Duration (G+Y+Rc), s		51.1			51.1	8.9
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		33.0			33.0	18.0
Max Q Clear Time (g_c+I1), s		39.9			48.6	4.9
Green Ext Time (p_c), s		0.0			0.0	0.2
Intersection Summary						
HCM 6th Ctrl Delay			11.1			
HCM 6th LOS			B			

Total 2042 PM 2:17 pm 09/11/2022 Total 2042 PM

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Appendix C NCHRP Internal Trip Capture

NCHRP 684 Internal Trip Capture Estimation Tool						
Project Name:		Ludlow			Organization:	
Project Location:		Berthoud CO			Performed By:	
Scenario Description:		Full Buildout			Date:	
Analysis Year:		2040			Checked By:	
Analysis Period:		PM Street Peak Hour			Date:	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ¹		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				61	10	51
Retail				682	328	355
Restaurant				0		
Cinema/Entertainment				0		
Residential				1,075	678	398
Hotel				0		
All Other Land Uses ²				0		
				1,818	1,016	804

Table 2-P: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses ²						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		10	0	0	1	0
Retail	3		0	0	92	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	6	33	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	1,820	1,016	804
Internal Capture Percentage	16%	14%	18%
External Vehicle-Trips ⁵	1,530	871	659
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	90%	22%
Retail	13%	27%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	14%	10%
Hotel	N/A	N/A

¹Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

²Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

³Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

⁴Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-P.

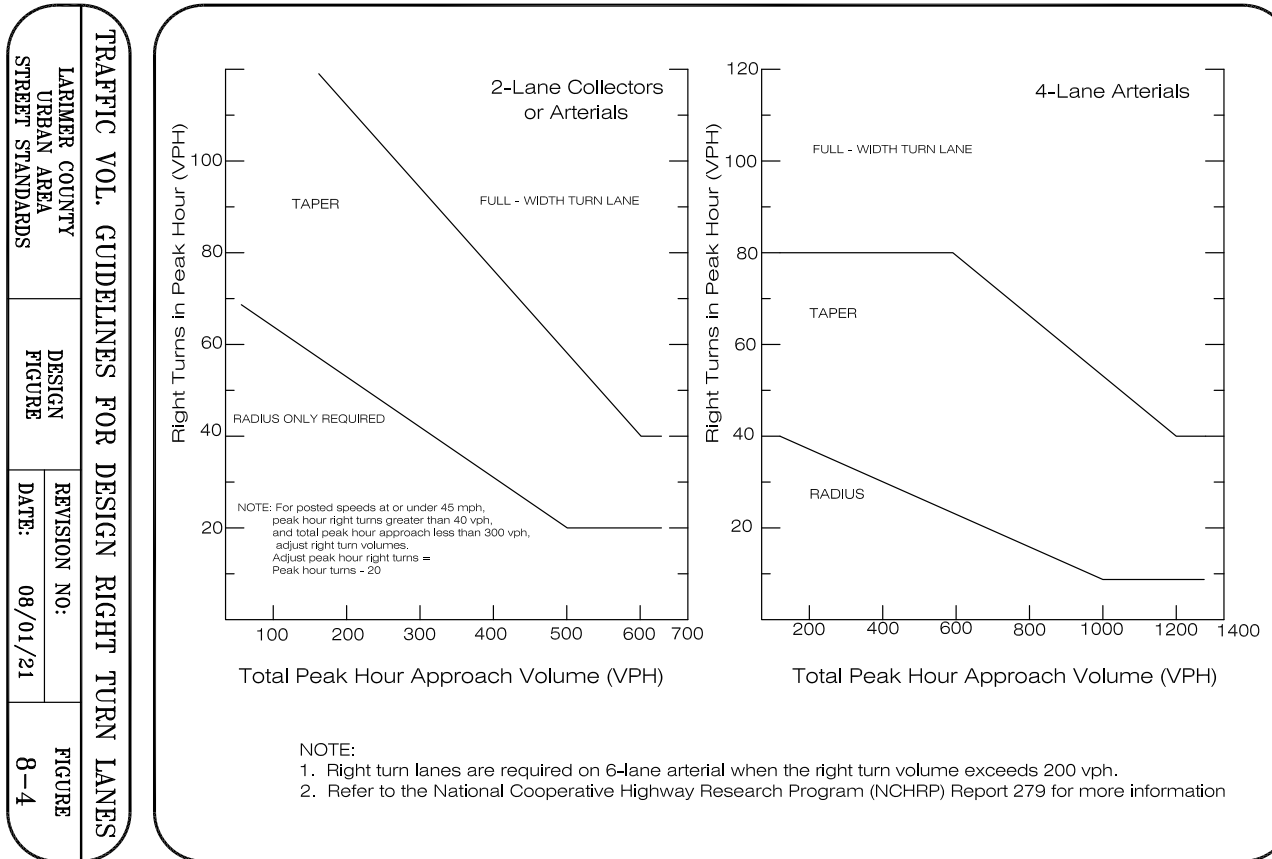
⁵Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

⁶Person-Trips

^{*}Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Appendix D LCUASS Right-Turn Warrants



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HIGHER DENSITY SANITARY SEWER PROJECTED FLOW																			
Design Point Location	Design Point	Area (acres)	Single Family/Townhome Acres	Commercial Acres	Condo Acres	Assumptions:						Calculations:							
						Single Family/Townhome DU/acre	Condo DU/acre	Capita Per Unit ¹	Peak Flow Factor ¹	Per Capita Flow Rate ¹ (GPD)	Commercial Flowrate ¹ (gal/acre/d)	Total DUs	Residential Population	Residential Avg Demand (MGD)	Commercial Avg Demand (MGD)	Total Average Demand (MGD)	Peak Demand Flow (cfs)	Infiltration (10% of Avg Demand cfs)	Total Peak Sewage Flow (cfs)
Design Point 1	1	68.2	47.8	5.8	14.6	6.1	14.0	2.66	3	95	720	496	1318	0.125	0.004	0.129	0.60	0.02	0.52
Design Point 2	2	180.5	142.4	34.1	8.4	6.1	14.0	2.66	3	95	720	986	2622	0.249	0.025	0.274	1.27	0.04	1.31
Design Point 3	3	50.8	50.8	0.0	0.0	6.1	14.0	2.66	3	95	720	310	824	0.078	0.000	0.078	0.36	0.01	0.38
	Total:	299.5	241.0	39.9	23.0							1791				0.481			2.31

LOWER DENSITY SANITARY SEWER PROJECTED FLOW																			
Design Point Location	Design Point	Area (acres)	Single Family/Townhome Acres	Commercial Acres	Condo Acres	Assumptions:						Calculations:							
						Single Family/Townhome DU/acre	Condo DU/acre	Capita Per Unit ¹	Peak Flow Factor ¹	Per Capita Flow Rate ¹ (GPD)	Commercial Flowrate ¹ (gal/acre/d)	Total DUs	Residential Population	Residential Avg Demand (MGD)	Commercial Avg Demand (MGD)	Total Average Demand (MGD)	Peak Demand Flow (cfs)	Infiltration (10% of Avg Demand cfs)	Total Peak Sewage Flow (cfs)
Design Point 1	1	68.2	47.8	5.8	14.6	5.0	13.0	2.66	3	95	720	429	1140	0.108	0.004	0.112	0.52	0.02	0.54
Design Point 2	2	180.5	142.4	34.1	8.4	5.0	13.0	2.66	3	95	720	821	2183	0.207	0.025	0.232	1.08	0.04	1.11
Design Point 3	3	50.8	50.8	0.0	0.0	5.0	13.0	2.66	3	95	720	254	676	0.064	0.000	0.064	0.30	0.01	0.31
	Total:	299.5	241.0	39.9	23.0							1503				0.409			1.96

- NEIGHBORHOOD MASTER PLAN NOTES:
- PER FEMA MAP NUMBER 08069C1386H PANEL 1386 OF 1420, DATED 1/15/2021, A PORTION OF THIS TRACT OF LAND IS WITHIN A FEMA DESIGNATED SPECIAL FLOOD HAZARD AREA ZONE A AND IS SUBJECT TO INUNDATION WITHOUT A BASE FLOOD ELEVATION. CLOM/LOMR MAY NEED TO BE PURSUED UPON DETAILED DESIGN OF THE DEVELOPMENT.
 - NO GEOLOGIC HAZARDS ARE KNOWN ON THIS SITE.
 - CONCEPT DRAINAGE: DEVELOPED RUNOFF WILL BE DETAINED AND TREATED FOR WATER QUALITY IN MULTIPLE DETENTION PONDS LOCATED THROUGHOUT THE SITE. THE ALLOWABLE 100-YEAR RELEASE RATE IS BASED ON THE HISTORICAL 100-YEAR RELEASE RATE IN COMPLIANCE WITH THE 2011 TOWN OF BERTHOUD MASTER DRAINAGE PLAN.
 - WATER SERVICE WILL BE PROVIDED BY THE TOWN OF BERTHOUD. WATER WILL BE ACQUIRED THROUGH A COMBINATION OF THE WELCH CONTRACT WATER AND A CASH-IN-LIEU TRANSACTION WITH THE TOWN.
 - SEWER SERVICE WILL BE PROVIDED BY THE TOWN OF BERTHOUD. SEWER ALLOTMENT FOR THIS SITE WAS SET IN THE DOCUMENT "REVERE, PUD BERTHOUD, COLORADO REIMBURSEMENT AGREEMENT" DATED JULY 28, 2008. THE AVERAGE DEMAND ALLOTTED WAS 0.330 MGD MAKING THE PEAK DEMAND 1.56 CFS WITH A PEAKING FACTOR OF 3. THE CAPACITY OF THE EXISTING DRY CREEK INTERCEPTOR WILL NEED TO BE STUDIED BY THE TOWN OF BERTHOUD TO ASSURE THERE IS AVAILABLE CAPACITY FOR THE LUDLOW SUBDIVISION.
 - LITTLE THOMPSON WATER DISTRICT (LTWD) 2" WATERLINE ALONG BERTHOUD PARKWAY WILL BE ABANDONED OR REMOVED IN ACCORDANCE WITH LTWD AND TOWN OF BERTHOUD REQUIREMENTS PRIOR TO ANY UTILITY CONNECTIONS ALONG BERTHOUD PARKWAY. LTWD TAP #433 AND SAMPLING/TEST STATION SHALL BE REMOVED AND RELINQUISHED TO LTWD AT TIME OF ABANDONMENT OF 2" WATERLINE. LTWD 2" BLOWOFF SHALL BE REMOVED AT TIME OF ABANDONMENT OF 2" WATERLINE.

HIGHER DENSITY WATER IMPACTS																
Description/ Land Use	Acres	Single Family Townhome Acres	Commercial Acres	Condo Acres	Assumptions:						Calculations:					
					Residential					Commercial	Total DUs	Average Day		Max Day		
					Single Family/Townhome DU/acre	Condo DU/acre	Cap/unit ²	Avg Day ² (gpcd)	Max Day ² (gpcd)	Avg Day ² (gal/ac)		Max Day Peaking Factor ²	Residential (gpm)	Commercial (gpm)	Residential (gpm)	Commercial (gpm)
North Portion	68.2	47.8	5.8	14.6	6.1	14.0	2.66	162	369	800	2.5	496	148	3	338	8
Middle Half	180.5	142.4	34.1	8.4	6.1	14.0	2.66	162	369	800	2.5	986	295	19	672	47
South Portion	50.8	50.8	0.0	0.0	6.1	14.0	2.66	162	369	800	2.5	310	93	0	211	0
TOTAL =	299.5	241.0	39.9	23.0								1791	558			1,276

LOWER DENSITY WATER IMPACTS																
Description/ Land Use	Acres	Single Family Townhome Acres	Commercial Acres	Condo Acres	Assumptions:						Calculations:					
					Residential					Commercial	Total DUs	Average Day		Max Day		
					Single Family/Townhome DU/acre	Condo DU/acre	Cap/unit ²	Avg Day ² (gpcd)	Max Day ² (gpcd)	Avg Day ² (gal/ac)		Max Day Peaking Factor ²	Residential (gpm)	Commercial (gpm)	Residential (gpm)	Commercial (gpm)
North Portion	68.2	47.8	5.8	14.6	5.0	13.0	2.66	162	369	800	2.5	429	128	3	292	8
Middle Half	180.5	142.4	34.1	8.4	5.0	13.0	2.66	162	369	800	2.5	821	246	19	559	47
South Portion	50.8	50.8	0.0	0.0	5.0	13.0	2.66	162	369	800	2.5	254	76	0	173	0
TOTAL =	299.5	241.0	39.9	23.0								1503	472			1,080

¹Assumptions taken from Berthoud wastewater System Master Plan, dated March 23, 2011.
²Assumptions taken from Berthoud Water System Master Plan, dated February 1, 2011.

February 28, 2023

From: [Steven Allen](#)
To: [Will Charles](#)
Cc: [Wendy Allen](#)
Subject: Ludlow Farms Development
Date: Friday, March 31, 2023 9:49:38 AM

[EXTERNAL EMAIL] DO NOT CLICK links or attachments unless you recognize the sender and know the content is safe.

Good morning Will,

I am writing to you as I was unable to attend either of the March meetings, Planning Commission or Town Board, as I was out of town on both dates.

Were either recorded such that they could be watched at a later date? If not, are there meeting minutes available that can be sent to me.

As a landowner and resident of the Harvest subdivision that butts up against this proposed development, I have an extreme concern regarding the proposed road into the Harvest subdivision. I purchased into the Harvest subdivision as it is a small private subdivision with a limited number of homes. I am concerned about the traffic that an exit from the Ludlow Farms development would bring past my home into the Harvest subdivision. I would like to hear about proposed options from the Ludlow developers for placement of another exit not into the Harvest subdivision.

Regards,
Steven Allen

From: [Anne Johnson](#)
To: [natasha w](#)
Cc: [kristin@tbgroun.us](#); [Will Charles](#)
Subject: RE: No to Ludlow farm plans
Date: Thursday, March 30, 2023 10:23:33 AM

[EXTERNAL EMAIL] DO NOT CLICK links or attachments unless you recognize the sender and know the content is safe.

Hello Natasha,

Your comment is being provided to the Developer's representative as well as the Town's Planner and will be provided to the Town Board at the public hearing.

Sincerely,

Anne

From: natasha w <thecowojos@yahoo.com>

Sent: Thursday, March 30, 2023 10:11 AM

To: Anne Johnson <AJohnson@berthoud.org>

Subject: No to Ludlow farm plans

Thank you for the callback Anne. Please see below. Thank you! Natasha

Hello, I am writing as a concerned citizen and neighbor about the excessive home project planned for Ludlow farm off Mountain and Berthoud Parkway. That large number of homes can not be supported by Berthoud we simply don't have the needed infrastructure, roads, police, fire and especially water. Our water costs are outrageous and the quality is subpar already. The overcrowded schools is another issue but I'm aware that's a bond issue. However the board and town of Berthoud has a responsibility to its residents and community. Just go on Facebook and read all the concerns and no's. Enough is enough, the board can deny this project, enact a building moratorium or cap again. Please save our community and reject the Ludlow farm proposal. The board needs to represent the people of Berthoud and we say no. Thank you for your consideration! The Wojo Family

From: [Anne Johnson](#)
To: [Amy Lane](#); [William Karspeck](#); [Mike Grace](#); [Tim Hardy](#); [May Soricelli](#); [Sean Murphy](#); [Karl Ayers](#); [Jeff Butler](#); [Christian Samora](#)
Cc: [Chris Kirk](#)
Subject: RE: Ludlow Farm Development
Date: Monday, March 13, 2023 12:32:12 PM
Attachments: [jmaae001.png](#)
[jmaae002.png](#)
[jmaae003.png](#)
[jmaae004.png](#)

[EXTERNAL EMAIL] DO NOT CLICK links or attachments unless you recognize the sender and know the content is safe.

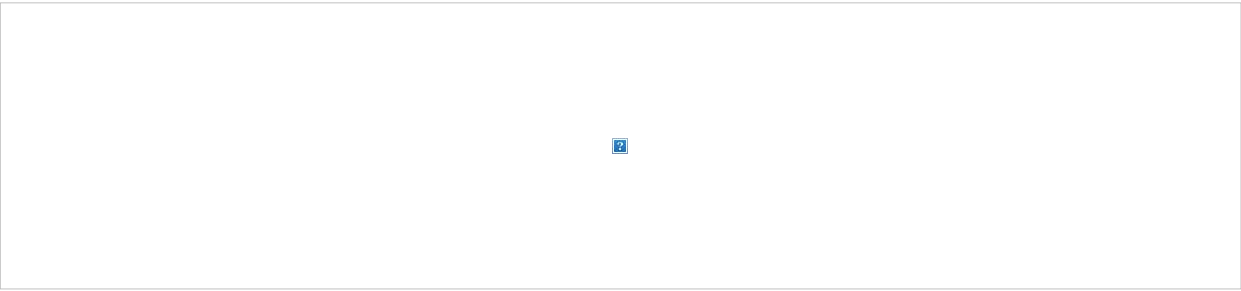
Dear Ms. Lane,
Thank you for providing input. This information will be provided to the applicant and included in the Trustees packet for the upcoming hearing.
Sincerely,
Anne



Anne Best Johnson, AICP MBA
Community Development Director
Phone: 970.344.5818
ajohnson@berthoud.org
Berthoud.org
807 Mountain Ave. Berthoud, CO 80513
Hours: 0700-1730 Monday - Thursday

From: Amy Lane <amy@tracysteam.com>
Sent: Monday, March 13, 2023 12:21 PM
To: William Karspeck <WKarspeck@berthoud.org>; Mike Grace <MGrace@berthoud.org>; Tim Hardy <THardy@berthoud.org>; May Soricelli <MSoricelli@berthoud.org>; Sean Murphy <smurphy@berthoud.org>; Karl Ayers <kayers@berthoud.org>; Jeff Butler <JButler@berthoud.org>; Anne Johnson <AJohnson@berthoud.org>; Christian Samora <CSamora@berthoud.org>
Subject: Ludlow Farm Development

Hello All,
I just wanted to send an email with my concerns for the Ludlow Farm Development. I am concerned about the traffic, the overcrowding of the schools and whether we have enough water to support this development. I am a Realtor as well as a homeowner in Berthoud. I know most people think that all Realtors want tons of growth. I want smart growth. Not the overcrowding. Berthoud isn't designed to handle all of this growth. I know people move here because of the cute town atmosphere. We are starting to lose that small town atmosphere. This development is just too large for such a small community. I hope that you will reconsider re-designing this development to be less dense.
Thank You for your Consideration
Amy Lane
--



From: [Anne Johnson](#)
To: kristin@tbgroun.us; [Will Charles](#)
Subject: Berthoud - Information from a neighbor - Ludlow?
Date: Friday, March 10, 2023 4:02:00 PM

[EXTERNAL EMAIL] DO NOT CLICK links or attachments unless you recognize the sender and know the content is safe.

From: kelly <mustharley@aol.com>
Sent: Friday, March 10, 2023 3:59 PM
To: William Karspeck <WKarspeck@berthoud.org>; Mike Grace <MGrace@berthoud.org>; Tim Hardy <THardy@berthoud.org>; Karl Ayers <kayers@berthoud.org>; Sean Murphy <smurphy@berthoud.org>; Butler@berthoud.org; May Soricelli <MSoricelli@berthoud.org>; Chris Kirk <CKirk@berthoud.org>; Anne Johnson <AJohnson@berthoud.org>; Christian Samora <CSamora@berthoud.org>

Subject: New building

HI,

I am writing to you to voice my concern on the massive building project that was passed by the planing committee the other night. Please really look closely at what is being planned. Please have one or two lawyers go over the proposal I . I feel it is too big. What about water and taxes and open space , roads , schools ?

Make sure the new owner/developer does what they say. I use to live in another town that is being over developed and the developer of the downtown/ home area really screwed over the town . He promised all these things he would do and build and they gave him the green light .

He then did not do any of it. He then broke up the parcel of land he was going to develop and sold it in pieces to other builders. Then they started complaining about not having infrastructure and parks and stuff that was promised and nothing was done.

I was at the meeting when he showed up and the whole town board did not even know the person they were dealing with the whole time was just an employee and had no say on what went on. The developer said too bad he could do what he wanted and didn't have to do anything he promised and said you did not read your contract too good. So be very very careful on what you agree to and really read the fine print .

Thank you for your time
Kelly Macaulay

Request Type: General Concern
Request ID Number: 8
Date Submitted: 3/9/2023
Date Closed: (open)
Date Printed: 3/27/2023 5:10:38 PM

Request Location: 97 Sioux drive
Berthoud, Co 80513

Submitter Information: Jim Marquis
97 Sioux drive
Berthoud, CO 80513

Priority: Normal
Assigned To: Unassigned

Phone: (none specified)
Email:
James.n.marquis@gmail.com

Date/Person

3/11/2023 11:07:00 PM

Comments

Email sent to: Brenda.burkett@civicplus.com

Can you take a look at this?

3/9/2023 11:06:47 PM
(anonymous)

Your Request ID Number is 8.

Brief Description How do I voice opposition to the Ludlow Farm development plan? This is too much growth in too confined of a subdivision. I live on Sioux Drive and the planning commission just voted to zone my backyard as urban residential despite a claimed plan on the developers part to "feather" the highest density development eastward toward my neighborhood. This is unacceptable.

Problem Location

Street Number and Name 97

Sioux drive

Address Line 2

City Berthoud

State Co

Zip Code 80513

Photograph No file was uploaded

Your Information

Name Jim Marquis

Street Number and Name 97

Sioux drive

Address Line 2

City Berthoud

State CO

Zip Code 80513

Phone Number

Fax Number

Email Address James.n.marquis@gmail.com

Preferred Contact Method email

September 22, 2022

Community Development Department

Berthoud CO 80513

I am responding to the development proposal called the Ludlow Subdivision, just west of where I live. Of course, I hate to see the farm ground go, as part of Berthoud's charm is its agricultural heritage which is slipping away rather quickly. But if we need to keep approving these massive developments, then we must change how they are constructed and built.

Just my simple mathematics shows that this proposed subdivision, based on Berthoud's current water usage, will suck almost half the amount of water that the entire town is now using, between 216,000 and 430,000 gallons of new water usage. Water is becoming more and more in short supply. It doesn't matter that the city has many water rights outstanding if the water, because of shortfall of precipitation and hotter weather, just isn't there. Do water rights on this land come with this proposal?

So what I am trying to say is, if we must approve these subdivisions, then we must change how they are constructed, oriented, supplied with energy and still give wildlife a fair chance at life. This could mean no gas lines installed, electricity only. Will the grid stand for this, or will the developer have to supply the energy needed?

No polluting fireplaces. Induction ranges required. Heat pump heating and cooling systems or even requiring geothermic systems for the best efficiency.

No areas of Bluegrass. Only native grasses and plants allowed for lawns and parkways. Water conserving trees only. Proper orientation of the houses for best efficiency in heating and cooling.

If we have to build, then we have to build smarter! Here are some ideas to tickle your minds and encourage you to think like I am suggesting. If the city can waste \$30,000 on a silly ballot proposal, then investing in someone with knowledge of sustainable building and living should be considered.

<https://www.casbe.org.au/what-we-do/sustainable-subdivisions/>

<https://6c5pw269zs2tv6x0418kzx2k-wpengine.netdna-ssl.com/wp-content/uploads/2020/09/3.0-Energy.pdf>

<https://6c5pw269zs2tv6x0418kzx2k-wpengine.netdna-ssl.com/wp-content/uploads/2020/09/5.0-Integrated-Water-Management.pdf>

David Luck

100 Bein Street

Berthoud CO 80513, 303-887-4192

Adam Olinger

From: Katie Erbes <Victoriandreams8@hotmail.com>
Sent: Friday, September 23, 2022 9:35 AM
To: Curt Freese; Adam Olinger
Subject: Ludlow Farms

Per your "Neighborhood Notice" we received yesterday. We have lived here for 26 years and enough is enough of the housing, Do we want to be another overgrown town? Loveland is now almost connected to Fort Collins and Greeley; We have 9 miles from Berthoud to Longmont. Loveland is building enough housing, Longmont is building enough housing, Greeley is building enough housing and Mead is now overgrowing. Why does Berthoud want to do this?

You see Firestone and Frederick grown together and you don't even know where each town begins or ends.

Bring in business for this outgrown town as it is now. We need schools, another grocery store, another fast-food business. Why you ask? Because A & W is loaded at all times, Hays is too small for a town like ours that is overgrown already and schools? Where are we putting all these children right now? Overloaded schools?

These towns such as Loveland and Longmont are so close that we can go to the markets there for shopping, eating and entertainment. Housing won't bring shopping here; it will just make a small town big with more crime.

Why do you want to make a small town with so much new housing when there is plenty of new housing all around us?

I say "NO" to this and if that needs to be put on the vote, I would vote "NO" Listen to those that have lived here a long time. Keep Berthoud small and safe.

When they said they were building homes over on Spartan St we were concerned about that and the trees that were at one time there, well we went to meetings about those trees and the council said they would not be cut down. Well guess what happen, they were cut down and I still have a video tape showing that and the disappointment that the town council did not listen to the people of Berthoud.

Is this going to be happening again? I bet a lot of Berthoud residents don't want this and I bet you won't listen again.

Kay Erbes

Adam Olinger

From: Steven Allen <drspallen@sbcglobal.net>
Sent: Sunday, October 2, 2022 7:22 PM
To: Curt Freese; Adam Olinger
Cc: cnmmidwifewendy@gmail.com
Subject: Ludlow Farms Development

Good morning,

I recently received a letter from the Town of Berthoud regarding a new development in the vicinity of my home in Berthoud. Before, I provide some comment, I would like to take a minute to introduce myself.

Steven Allen and spouse, Wendy, currently from Libertyville, Illinois, but soon to be permanent residents of Berthoud residing in the Harvest Ridge North development. Over the past 25 years my family and I have vacationed in the state of Colorado multiple times every year. It did not take long for us to realize that Colorado would someday be our destination for retirement. Over the past 5 years, our visits focused on exploring the various towns up and down the front range resulting in us discovering Berthoud, which is perfectly suited for the lifestyle we are looking for in retirement. When we settled in Libertyville, over 30 years ago, the surrounding area was a lot like Berthoud today, undergoing rapid expansion. With this in mind, you should be able to understand where I am coming from with my comments and question in regard to the Ludlow Farms development.

Assume 1500 units as stated in the letter, also assume 2 residents per unit resulting in an influx of 3000 new community members.

1. How is the developer addressing this influx of residents in regard to the overall infrastructure of the town of Berthoud?
2. What commercial development is being proposed to support the growing population? For example, the current community does not have a major grocery store. Is there already commitment from commercial investors to establish new businesses?
3. What support will be provided for our First Responders, Police, Fire and EMTs?

Let's now assume half of these units, 750, will be a family of four, 2 adults and eventually two school age children.

1. Can the current Berthoud schools support 1500 additional students over time?
2. How is the developer addressing the expansion that may be need for both the elementary and secondary school systems?

Development location, this development is in a recognized flood plain.

1. What is being done or will be done by the developer to address the risk this may pose to new homeowners?
2. Could these plans impact the surrounding developments that are already underway with many homes already complete?

Thank you for the opportunity to share our thoughts with you, as we are looking forward to being active members of our new community.

Regards,
Steven & Wendy Allen

Adam Olinger

From: Curt Freese
Sent: Monday, October 3, 2022 8:12 AM
To: Adam Olinger
Subject: FW: Ludlow Farms



Curt Freese, AICP
Community Development Director

Phone: 970-532-2643
Fax: 970-532-0640
cfreese@berthoud.org
Berthoud.org
807 Mountain Ave. Berthoud, CO 80513



From: Jeanene Imerzel <jeanene.imerzel@gmail.com>
Sent: Friday, September 30, 2022 9:48 AM
To: Curt Freese <CFreese@berthoud.org>
Subject: Ludlow Farms

Good morning,

We received the neighborhood notice and have concerns that this development could block our mountain views here in Rose Farm Acres. We are fine with growth but prefer the park side to be on Berthoud Pkwy as opposed to 287 where there are no houses.

Thank you
Jeanene Imerzel

Adam Olinger

From: Chris Shepherd <docshep97@aol.com>
Sent: Sunday, October 2, 2022 10:20 AM
To: Adam Olinger; Curt Freese
Subject: Ludlow development

I have received the neighborhood notice regarding the Ludlow development and wish to comment. The developers of this subdivision do have the right to propose whatever they want, but I believe this massive development would create many problems for the city of Berthoud.

Since this addition would increase the size of this nice town by about 40% using the 2020 population number (10300), the current infrastructure of this town would have to be changed completely. At this point, there is only one main road running from Hwy 287 to I-25 (Mountain Ave.). The residents of the Ludlow development would most likely use this street for access to I-25. Are the residents of this historic town ready and willing to have the road widened to four lanes which would eliminate the wonderful businesses along the way and require the felling of the gorgeous trees. This would also eliminate the on street parking and require off street parking lots. There must have been a reason that Hwy 287 was routed around the middle of town when it was expanded many years ago.

Access to Hwy 287 is also a concern. At this point the only relatively safe access is Mountain Ave. Attempting to access southbound 287 from 2E and 4E is very dangerous. Can 287 withstand the huge influx of traffic. There were two fatal accidents on 287 this last week alone.

Does the developer have water rights? If there are 1800 homes with only two residents in each, the town will increase by 3600 new residents and that's a low estimate. This will increase the need for Berthoud town to provide safe drinking water, lawn irrigation and an increase in waste treatment.

Berthoud schools are full. Would there be building of enough new schools to accommodate the influx. City services would need to increase. At this point, snow plowing for the residential areas is not at the top of the list.

How about public safety. I know the town had its own police department. Would this need to be recreated? The availability of recruiting new police officers might be difficult. Even the postal department is having a hard find hiring employees.

I hope that the planning commission thinks of how this huge development would affect the residents of this town. This is a very nice small town with a safe and engaging personality.

Will this proposal also be sent to all of the residents of Berthoud instead of just the few surrounding the area? The folks of Berthoud need to know. What would be the benefit for Berthoud if the gateway to the historic town is changed forever.

Thanks for your time.

Christine Shepherd
1100 Monroe Ave
Berthoud

Adam Olinger

From: Curt Freese
Sent: Monday, October 3, 2022 2:57 PM
To: Adam Olinger
Subject: FW: Ludlow Farms Development comments



Curt Freese, AICP
Community Development Director

Phone: 970-532-2643

Fax: 970-532-0640

cfreese@berthoud.org

Berthoud.org

807 Mountain Ave. Berthoud, CO 80513



From: M Moden <MODEN5685@msn.com>
Sent: Monday, October 3, 2022 2:50 PM
To: Curt Freese <CFreese@berthoud.org>
Subject: Ludlow Farms Development comments

I have lived and worked in Berthoud since 1999 so I have watched it grow over the years and appreciate the "small town" feel we have here.

My concern with the Ludlow Farms Development is that in my opinion future development should be spread out farther - perhaps 4-6 year increments to allow for the economy to level out and assure a need for it before adding an additional 1500-1800 more residences to the community.

With as much building that has taken place here in Berthoud in the past few years I am quite sure that in the near future, Berthoud will be full of vacant homes and rental homes as the market will price folks right out of buying their dream (and even renting). Berthoud also has developments where "METRO TAX" has been implemented and I for one hope that this will be a thing of the past as it too prices home buyers right out of the market without them even knowing it!

I know Berthoud wants to keep up with other surrounding communities, but growth isn't always the answer. Be careful Berthoud.....don't ruin a good thing!

Marie Moden-Homeowner
110 Bein St
Berthoud, Co 80513
970-218-2763 cell

Adam Olinger

From: Jeanne <jeannepo@frii.com>
Sent: Wednesday, October 5, 2022 11:41 AM
To: Curt Freese; Adam Olinger
Subject: Neighborhood Notice - Ludlow Farms

I am writing in regards to the Neighborhood Notice I received from the Community Development Department in Berthoud regarding the proposal for Ludlow Farms.

Being 30 year Berthoud residents, we have seen MUCH growth in recent years for Berthoud. In 1992 when we moved here, there were 4 schools (two elementary, 1 middle and 1 HS). With the thousands of new homes that have gone in in the past 5 years, there have been no new schools built.

Also, your proposal includes access to this development from Hwy 287. This is unacceptable. As is (I live ¼ mile from the intersection of W Rd 4/287) we see regular and sometimes fatal accidents between Hwy 56 and Hwy 66. And, rarely is there law enforcement for speeders. Adding more traffic, by means of an intersection is just adding to the number of accidents we will witness in the area.

As Berthoud residents, we are highly against the proposed development, Ludlow Farms, due to the above mentioned concerns.

Thank you,

Tom and Jeanne Poirier

Adam Olinger

From: Jennifer Talbott <jenniferjeantalbott@gmail.com>
Sent: Thursday, October 6, 2022 12:54 PM
To: Curt Freese; Adam Olinger
Subject: Ludlow Farms Neighborhood Notice Comments

I am writing this in response to the letter I received regarding the Ludlow Farms property. I have several concerns regarding this proposed project as I am sure many fellow neighbors do. With the rapid growth of Berthoud there are several things that will be affected and I would like to know how the town plans to address these. I understand growth is essential to economic improvement but also feel that Berthoud is growing rapidly without addressing issues that will arise.

My concerns with Ludlow Farms are:

- The traffic increase to Berthoud Parkway and surrounding roads. Berthoud Parkway is already extremely busy and with the projected amount of housing that is going in this area's traffic is going to become a problem with more accidents, road disintegration and flow.
- Is there a projection to build more schools in the very near future? Our already crowded schools are going to become unmanageable for staff and facilities.
- Crime that will come with this much growth-our already very small police presence will have to be increased.
- Water resources-Our already strained water system will be stretched even further.
- There are several other new communities being built near this area and adding all of these at the same time is going to cause several issues.

I would love to be of any help and am not here to just complain but rather to find solutions. I come from a long history of realtors and understand building is inevitable but the size of this community and number of units is what is most concerning.

Thanks,
Jennifer Talbott

Adam Olinger

From: Lisa Morris <lisakmorris@gmail.com>
Sent: Thursday, October 6, 2022 12:56 PM
To: Adam Olinger; cfreesee@berthoud.com
Cc: Shawn Nelson
Subject: Ludlow Farms

Hello,

To whom this may concern, we received the summary proposal for the above mentioned neighborhood and were directed to submit comments/concerns to you. We live in the newly built Richmond Homes, just a few blocks Southwest of Berthoud High School.

Our main questions/concerns are the following:

1. Being so close to the high school and aware that for years the town of Berthoud wasn't "growing". What is the plan for the schools in the area to support the undoubtable group that this community will cause to the schools?

2. What is going to be done for the roads/sidewalks to support the number of families that this community will be adding to the town of Berthoud?

Specifically, Berthoud Parkway, will this road be converted into a 4 lane road to support the amount of commuting traffic that this development will eventually cause?

With that as well, will there be bike paths/lanes on the roadways?

Will the sidewalks be wide enough to support many people walking together OR will it be the mini sidewalks that only really allow groups to only walk single file?

3. Along with the roads, what will be done for parking in this neighborhood? If you drive through other neighborhoods with condos, townhouses and single family residences there is rarely enough parking and the streets do not accommodate two way traffic if vehicles are parked on both sides of the street.

The neighborhood "Prairie Star", on the Southeast corner of Berthoud Parkway and Highway 287 is a perfect example. I know part of the issue is that there is no requirement for people to park in their garage, so most people in Prairie Star are using their garage for storage and not parking. As well as the assumption that one family only has one vehicle, when in truth on average the average family of four has a minimum of four vehicles.

4. Our neighborhood is dealing with many drainage issues, which in turn we believe is causing an abundance of mosquitoes in the neighborhood. Will there be anyone to monitor, test and ensure that this issue doesn't happen to this new neighborhood as well?

Thank you for your time and please let me know if you have any available answers to these concerns.

Lisa & Shawn Nelson
303-525-7869

Adam Olinger

From: Curt Freese
Sent: Thursday, October 6, 2022 11:01 AM
To: Adam Olinger
Subject: FW: Comments Ludlow Farms

Curt Freese, AICP
Community Development Director

Phone: 970-532-2643
Fax: 970-532-0640
cfreese@berthoud.org
Berthoud.org
807 Mountain Ave. Berthoud, CO 80513

-----Original Message-----

From: Wendy McCauley <55goodwitch@gmail.com>
Sent: Thursday, October 6, 2022 10:19 AM
To: Curt Freese <CFreese@berthoud.org>
Subject: Comments Ludlow Farms

My comments are regarding Spartan Ave. It appears based on the Drawings provided that Spartan Ave will become much busier given the location of the high school and use as an artery to other roads leading downtown or out of Berthoud. I would ask that a reduced speed limit be posted and also some type of traffic calming circles be installed. Long straight roads tend to encourage speeding and in some cases careless driving behavior. Also more traffic equals more noise.

People are attracted to Berthoud for many reasons, a couple being. it is a pleasure to walk safely about town for folks of all ages, and has a small town feel. I hope the planning committee will ensure that these important attributes are kept in mind when finalizing the plans for the roadways.

Some things we will loose are inevitable, our beautiful view of the mountains and the stars.

Thank you for contacting us much appreciated 409 Cheyenne.

Sent from my iPhone

Community Development Department
PO Box 1229
Berthoud, CO 80513

Thank you for the opportunity to comment on the LUDLOW FARMS application.

This response to the development review proposal identified as LUDLOW Farms development, is comprised of comments and concerns of multiple residents of Sioux Drive. While the proposal generally adheres to the guidelines set forth in the 2021 Comprehensive Master Plan of the Town of Berthoud, there are many concerns and apprehensions about the implementation of the structures, amenities and commerce in practice.

To begin with, is it truly in the best interest of the Town to promote the development of 3-story condominiums in light of the strong citizen desire to maintain the “natural beauty of the area” and “small town feel?” Does it present the best image of the Town to have these placed so prominently that they’re the first thing a visitor sees as they enter the town from the west? Additionally, will a concentration of 3-story condominiums require the Town to bear the burden of procuring expensive fire trucks and other high dollar safety equipment, hiring of several additional first responders and possibly construction of additional fire stations? Does the TOWN even have equipment presently to evacuate residents and extinguish a fire in a 3-story structure of this density?

Regarding the overall layout of the proposed development, there is an opportunity here to make South Berthoud Parkway feel significantly more like a “Parkway”. A large portion, or the entirety, of the “LINEAR PARK” could be shifted to run adjacent to SBP from Welch to Spartan with the benefit of drawing more ‘feeling of community’ from surrounding neighborhoods with better access to trails and greenspace, and better foot and bike traffic access to the new commercial endeavors of this proposal. The posted speed limit could be lowered to 35 or even 30 to enhance safety and the sense of parkway while still maintaining the Major Collector attributes set forth in the 2021 Comprehensive Plan.

Vehicle access from the north and east should only be at points coincident with existing roads (Gateway, Welch, Arapahoe, Spartan). The identified “Minor Collector” proposed along the “Approximate Future Land Use Boundary” line that intersects South Berthoud Parkway must be eliminated. There is absolutely no need for any future or existing resident to bear the imposition of frequent headlights shining directly into their residence. (It just so happens to appear to be coincident to the family room windows at 103 Sioux Dr).

Architectural innovations should be minimized to maintain the cohesive feel of “small rural town” such as that feel of Mary's Farm which blends rural into suburban seamlessly and elegantly. Architectural innovations such as those in Prairie Star could best be suited for New Berthoud promoting a higher level of modern urbanization according to the 2021 Comprehensive Plan, while minimizing a disorganized blend of styles along the Mountain Corridor and adjacent neighborhoods.

There is no apparent consideration for school load increases with the introduction of 1500-1800 residences and the potential for 200-500 students. Should at least an elementary school be part of this proposal? It would fit nicely into the traffic access both vehicular and pedestrian.

With the proposed concentration density of residences, there's a very high concern over the increase in light and noise pollution. Will all lighting be downward directed and held to a minimum especially in the condominium, townhouse and commercial/mixed use areas while still providing a safe environment for residents and visitors? Minimal, aesthetically pleasing lighting along a widened South Berthoud Parkway greenspace, similar to that along North Berthoud Parkway trail would be very attractive and effective while at the same time still allowing a view of Berthoud's nighttime sky.

The Traffic Study conducted for evaluation of lane and flow adjustments should be deemed irrelevant as it was conducted on June 22, 2021 when there were no schools in session and we were still in 'work from home' mode by many normal commuters. At a minimum an updated study should be conducted to account for more 'normal' traffic.

Is this a good development to consider additional Senior housing, both unassisted and assisted living styles? Should a general emergency medical facility be considered as part of the mixed-use establishments to better serve the Town?

While it would be naive to think that the primary reason for my move to Berthoud 26 years ago, would continue unencumbered in perpetuity (small rural town with a great view of the mountain range), many of these ideas will minimize the impact of blocking the view and maintain the small-town feel. Not a totally bad trade-off. In the bigger picture however, each new development added to the city should always strive to enhance the beauty and appeal of the place people call – and want to call – home.

Recognizing that family-owned farms are a thing of the past, does it mean that they must be converted to high density housing to the excessive economic benefit of the developer and TOWN coffers? In light of other growth developments in the planning or implementation phases, could satisfactory economic gains be met with 1000-1200 residences and strong industrial and commercial endeavors?

A concern for the implementation of the proposed development would be the barren land when the economy is not conducive to rapid construction of the next phase. It would be beneficial to the environment, and the neighboring residents, to leave or plant sufficient erosion control crops (weeds are not a good crop) to minimize dust and runoff.

Finally, construction vehicle traffic on SBP should be minimized during plan implementation to avoid excessive wear on the newly rebuilt road (per the 2024 project plan).

Thank you for considering these comments and ideas. We look forward to the developer's comments and proposed resolutions.

Richard Alexander 103 Sioux Dr.	Steve Vettori 107 Sioux Drive	Laurel Tollefsrud 101 Sioux Dr	Susan Ellis 109 Sioux Dr

Adam Olinger

From: Curt Freese
Sent: Monday, October 10, 2022 9:39 AM
To: Adam Olinger
Subject: Fwd: Ludlow Farms comment

Sent from my iPhone

Begin forwarded message:

From: Kimberly McNally <kimberlyamcnally@gmail.com>
Date: October 10, 2022 at 9:21:08 AM MDT
To: ailinger@berthoud.org, Curt Freese <CFreese@berthoud.org>
Subject: **Ludlow Farms comment**

Town of Berthoud
Community Development Department,

I don't want more houses in this area.
You have allowed this sweet town to turn into a bedroom community.
We don't have the infrastructure to handle anymore traffic.
Mountain Ave is a 2 lane road through town and unless you want to remove the oak trees, it can never be anything wider.
Traffic is so bad at most times you can't cross the street on foot let alone cross streets in a car.
I'm near the high school and pulling out onto 10th or Berthoud Parkway can be very hard due to school traffic.
Parking in the business district is almost impossible therefore the businesses will suffer rather than flourish. People will go shop in other towns due to parking constraints.
One grocery store? Get real.
Almost all restaurants are closed on Monday!!!
Police force is lacking to. Crime has gone up.
My one comment probably doesn't count but I'm so tired of more houses and houses and apartments and townhouses.
Taxes, you have to be raking them in. Why do you keep raising ours?

Kim McNally
--

Kimberly McNally

Adam Olinger

From: natasha w <thecowojos@yahoo.com>
Sent: Monday, October 10, 2022 4:54 PM
To: Adam Olinger; wkatspeck@berthoud.org; Karl Ayers; Sean Murphy
Subject: Ludlow farm berthoud parkway and mountain

Hello Adam thank you for your time last week and filling me in on the plans for ludlow farm on the west corner of berthoud parkway and mountain. As a resident and homeowner were asking the board deny the proposal and bring back a growth cap for Berthoud. The excess building is unneeded and without proper infrastructure, affordable water, schools (yes I know this is Thompson school district but the schools are overcrowded period and voters will not approve) but the board can say no and should say no to protect the quality of our schools and do more for our water its going to keep being an issue. The water here is outrageously expensive and barely passes standards. Our water in Berthoud is some of the most expensive in the state besides Vail. Without proper infrastructure and water, building needs to stop the small town charm of Berthoud is being lost and the board can say no. Please listen to your residents look on Facebook over 200 comments saying no and enough. Preserve Berthoud and put back a building freeze, it's needed. Plus builders need to be paying for the road damage their causing like on Berthoud parkway it's not fair our tax dollars are being wasted on their wear and tear make the builders pay on the front end. Stop destroying the Berthoud we love, deny the ludlow proposal. The board needs to address the current issues and stop the excess building. Thank you, the Wojciechowski's

Adam Olinger

From: Carole <cvwhitt@aol.com>
Sent: Monday, October 10, 2022 6:17 PM
To: Adam Olinger
Subject: Ludlow Farms

How can you people vote in more homes in Berthoud when so many of us seniors cannot afford the higher taxes?

I am an 82-year-old senior and cannot get my taxes lowered for at 3 more years because I haven't lived in my home 10 years yet.

It's getting so difficult for some of us to go anywhere around town like we used to.

It doesn't seem plausible to add more homes when we don't even have a post office that can handle more. It just doesn't make sense.

My family has several businesses here in Berthoud, and there isn't much parking around so many of them. So instead of increasing their sales it will tak from them.

Please Please, no more here
Thank you

Carole Whittington

Adam Olinger

From: John Stocklin <stocklinphotography@gmail.com>
Sent: Monday, October 10, 2022 8:34 PM
To: Adam Olinger
Subject: Ludlow Farms Proposal

Hello,

John Stocklin here!

First of all, thank you for doing all the amazing things that you do for our wonderful community, it really means a lot.

I would like to formally oppose the Ludlow Farms proposal, it is just frankly not a good idea. There is a ton of growth already happening in town which is expected but we can't only focus on single family / multifamily dwellings.

We need more schools and other service items such as grocery stores etc. Not to mention the infrastructure should probably be improved before adding 1500+ homes PLUS the influx of at least 3000 people if not more.

Please please say no to this, it'll be such a bad idea for Berthoud.

Much appreciated and thank you.

Cheers,

John

Adam Olinger

From: Curt Freese
Sent: Monday, October 10, 2022 9:06 PM
To: Adam Olinger
Subject: Fwd: Ludlow Farms

Sent from my iPhone

Begin forwarded message:

From: rkurcab <rkurcab@yahoo.com>
Date: October 10, 2022 at 9:03:27 PM MDT
To: Curt Freese <CFreese@berthoud.org>
Subject: **Ludlow Farms**

To whom it may concern,

We feel that the proposed subdivision is too large in scope for the town of Berthoud. At build out this would increase the current population of the town by over 40% by itself. The small lot sizes and townhomes and condos bring a high density which is not in character with the town. This would put a strain on the downtown and infrastructure in place. The entrance at 287 would also greatly increase traffic through other neighborhoods in the area and the high school area.

Views of the mountains from Mountain Ave, which has been deemed important to the town, would be impacted by the project, especially on the north end with townhomes and condos.

If this development does go forward it should be scaled way back with less density.

Thank you for your consideration,

Richard Kurcab
Sandra Nickerson

Sent from my Galaxy Tab® S2

Adam Olinger

From: Curt Freese
Sent: Monday, October 10, 2022 9:18 PM
To: Adam Olinger
Subject: Fwd: Ludlow Farms opposition

Sent from my iPhone

Begin forwarded message:

From: Shannan Johnson <shannanmjohnson@gmail.com>
Date: October 10, 2022 at 9:17:08 PM MDT
To: Adam Olinger <aolinger@berthoud.org>, Curt Freese <CFreese@berthoud.org>
Subject: **Ludlow Farms opposition**

I would like to formally oppose the proposed developments at Ludlow Farms. The mere fact that Berthoud is currently building in multiple new developments with no foreseeable plan for immediate increase in schooling capacity is more than enough to oppose this. Our elementary students are currently in classes at Ivy Stockwell with very high student to teacher ratio already. Most new developments would be expected to have a large proportion of families with young children...where will they all go? Perhaps a smaller development with larger lots and more single family homes would be appropriate; we are already set to have additional multi-family units built at the corner of Berthoud Parkway and Spartan, an already busy area when school is in session. Berthoud Parkway in this area will become very congested. The draw of living in a community like this is the small town feel, beautiful mountain views, and ample farmland. Packing in homes into this development goes against all of that. It's too many new residential units!!!

Please consider scaling back the residential plan at this site.

Adam Olinger

From: Curt Freese
Sent: Monday, October 10, 2022 9:21 PM
To: Adam Olinger
Subject: Fwd: opposition

Sent from my iPhone

Begin forwarded message:

From: Amy Stocklin <amystocklin@gmail.com>
Date: October 10, 2022 at 8:41:20 PM MDT
To: Adam Olinger <aolinger@berthoud.org>, Curt Freese <CFreese@berthoud.org>
Subject: **opposition**

First of all, thank you for doing all the amazing things that you do for our wonderful community, it really means a lot.

I would like to formally oppose the Ludlow Farms proposal, it is just frankly not a good idea. There is a ton of growth already happening in town which is expected but we can't only focus on single-family / multifamily dwellings. We in no way have the infrastructure that is needed for what is being proposed.

We need more schools and other service items such as grocery stores etc. Not to mention the infrastructure should probably be improved before adding 1500+ homes PLUS the influx of at least 3000 people if not more.

Please please say no to this, it'll be such a bad idea for Berthoud.

Much appreciated and thank you.

Amy Porto

Adam Olinger

From: Derrik Johnson <dj8skate@gmail.com>
Sent: Monday, October 10, 2022 9:31 PM
To: Adam Olinger; Curt Freese
Subject: Ludlow Farms proposal

Good evening,

I'd like to voice my opposition to the proposal of development for the Ludlow Farms community. As a Berthoud resident in a community next to the proposed development (I live in Rose Farm Acres), the impact on our community would be significant. I would be happy to share the many ways we would be impacted, but to name a few I know that our schools will be impacted negatively as they are at capacity as it is. The new community would surely grow faster than any schools could be built, stressing our education system well beyond its limits and negatively impacting my children and their classmates. Furthermore, the recreation center is new and is already near capacity. It cannot support thousands more people. Finally, the development of the new community would impact both the noise levels and beautiful mountain views that were key factors in our decision to move to this neighborhood. Please feel free to reach out for further discussion if needed. Thank you.

Derrik Johnson

Adam Olinger

From: DaveandDianne Michael <dandmichael1985@gmail.com>
Sent: Monday, October 10, 2022 9:52 PM
To: Adam Olinger
Subject: Ludlow Farms proposal opposition

Hello,

We are at a bit of a disadvantage because my husband and I are out of town so we don't have access to the proposal specifics that we received in the mail.

But we are strongly opposed to the Ludlow Farms development. A project of that size would completely change the small town feel of Berthoud with that one community. Adding that many homes doesn't give Berthoud time to catch up on resources, such as police department, fire department, water, schools, mail carriers, etc.

At first, we weren't going to speak up because it doesn't feel like the city planners listen to the citizens, but we decided we should at least try.

We understand growth happens, but this growth is excessive.

Several of the city council candidates said they wanted to keep Berthoud's small town charm, but this isn't it!

Thank you for your consideration,
Dianne and Dave Michael
1099 Blue Bell Rd., Berthoud

Adam Olinger

From: Brandon Watkins <bwatkins6688@gmail.com>
Sent: Monday, October 10, 2022 10:21 PM
To: Curt Freese; Adam Olinger
Cc: Kelsey Wood
Subject: Ludlow Farms Proposal

Hello,

The Ludlow Farms proposal cannot be approved. Berthoud does not have the infrastructure, retail, water supply, school system capacity, or resources to properly build 1800 housing units in this area. Berthoud has seen sustained growth for several years now, increasing its economy and creating jobs. However, we have reached the point of growth going too far. Berthoud is losing its identity by turning every farm into a housing development. I understand the financial benefit of this massive development is enticing to the city, but I urge you to halt this project and consider the long term effects of destroying our agricultural land and not ensuring a sustainable, gradual growth plan. Small communities like Berthoud are rapidly disappearing. If this project is approved, there will no longer be any defining line between Longmont, Berthoud, and Loveland. We need small, iconic communities like Berthoud to stand up to big development and tell them enough is enough. Please do not allow this project to move forward.

-Brandon Watkins

Sent from my iPhone

Adam Olinger

From: Jessica Erickson <jerickson1005@gmail.com>
Sent: Monday, October 10, 2022 10:27 PM
To: Adam Olinger; Curt Freese
Subject: Ludlow Farms Opposition

To whom it may concern,

Hello, my name is Jessica Erickson and I am a concerned resident of Berthoud. Our town infrastructure cannot sustain a development of this magnitude. I also have a young child and I am already concerned about the lack of schools for our community. Adding another large neighborhood that will, no doubt, be filled with school age children will wreak havoc on our already filled schools.

I am also concerned about how this development will affect the safety of our community along with traffic, noise and environmental impacts.

Overall, this is not a good choice for Berthoud.

Please do not approve this development.

Thank you,
Jessica

Adam Olinger

From: Aron Erickson <aron.broman@gmail.com>
Sent: Monday, October 10, 2022 10:35 PM
To: Adam Olinger; Curt Freese
Subject: Ludlow farms proposal opposition

Dear Adam and Curt,

I am a concerned resident in Berthoud and against the approval of the Ludlow farms proposal. This development is extensive for the town of Berthoud without the infrastructure to support it. The town needs to propose improvements to energy, water, roads, and schools before considering additional home developments in the area. Schools in Berthoud can't handle the student population levels as it is and also can't hire or support enough teachers to handle proper teaching standards.

Traffic, noise, and safety are additional concerns for properties surrounding this proposed development. Current developments in the area have not provided proper safety standards and theft has increased in these areas. Further the development location is in a marshy area. This will cause future development problems with drainage issues and settling concerns.

I would prefer Berthoud maintain it's small hometown feel and grow responsibly to maintain proper infrastructure. I moved to this town recently because of it's unique character. Please consider denying this proposal.

Thank you,
Aron Erickson

Adam Olinger

From: Rhonda Callahan <rhondacallahan@gmail.com>
Sent: Monday, October 10, 2022 11:00 PM
To: Adam Olinger
Subject: No to ludlow farms.

There is enough traffic..not enough schools. Not enough water..you are being irresponsible and it's been 2 years and you can't get a cross walk marked for the kids in the neighborhoods we all ready have..be responsible for the families all ready here!!!

Sent from my iPhone

Adam Olinger

From: KAAREN CARONE <kcee369@aol.com>
Sent: Wednesday, October 12, 2022 6:57 PM
To: Adam Olinger; Curt Freese
Subject: Ludlow Farms proposal opposition

1,800 additional homes in this area creates a hazard insofar as safety, traffic, air quality, and the quality of life of current residents are concerned. There must also be concern regarding water supplies to the area. Please deny this proposal.

Kaaren Carone

Please email your thoughts to both email addresses below:

cfreese@berthoud.org

Cheers!

Sent from my iPad

Adam Olinger

From: Richard Calvo <rcalv002@gmail.com>
Sent: Thursday, October 13, 2022 8:14 AM
To: Curt Freese; Adam Olinger
Subject: Community Development: Ludlow Farms

Hello!

We received this proposal in the mail and we are completely against it. It's the only space around our neighborhood that is still open. It is also the only view of the mountains for us. There has been construction all around us since we moved here and this sounds like another huge, lengthy construction mess.

Adam Olinger

From: Kathleen Tabor <kathy.tabor@icloud.com>
Sent: Wednesday, October 12, 2022 3:00 PM
To: Adam Olinger
Cc: kathleen Tabor
Subject: Neighborhood notice Ludlow

Town of Berthoud

I apologize for the lateness but Covid is visiting my household. My husband and I received your letter regarding the Ludlow property proposal and we are homeowners impacted by this densely planned development (as is the rest of Berthoud). The town is unrecognizable as Berthoud anymore. All you see as you drive through town are great expanses of grey rooftops in densely built developments . Gone are lots that allow for privacy in exchange for a few feet distance between homes.

I can't believe an unbiased, thorough environmental impact study was done before these developments were approved. We are building too rapidly for our infrastructure .Where is the water for all these new homes going to come from? How are the police going to handle the increase in traffic, accidents and crime ? The same for our schools, fire department and roadways.

When are you going to cap the growth in this town as so many have requested? How are you going to protect existing neighborhoods from these densely populated developments from using the same resources? I already see it in our parks and along 10th street- the trash and traffic. When the Rose Farm went in I saw that tree lawns were included as open space. Are children supposed to include that as a park space to play in? No, they have to go to the closest available park in the Berthoud Heights West development. The town board members are approving more homes in less space and approve leaving only a small percentage as open space. Only developers/builders would have this type of mind set that would approve these type of developments and unbridled growth. Squeeze the land for as many dollars as possible.

Address the density and open space issue and put a growth cap back in place. Protect our resources and the people that have called this town home for so many years. You might as well change the town insignia to a mountain of rooftops instead of mountains because that is all you'll be capable of seeing.

Kathy Tabor
305 Cheyenne Drive
Berthoud. Co80513

Adam Olinger

From: Jeremy Olinger
Sent: Monday, October 24, 2022 4:49 PM
To: Adam Olinger
Subject: FW: Email contact from Berthoud, CO



Jeremy Olinger, CPRP
Deputy Town Administrator

Phone: 970.344.5824
jolinger@berthoud.org
Berthoud.org
807 Mountain Ave. Berthoud,
CO 80513



From: Berthoud, CO <webmaster@berthoud.org>
Sent: Monday, October 24, 2022 3:44 PM
To: Jeremy Olinger <jolinger@berthoud.org>
Subject: Email contact from Berthoud, CO

Message submitted from the <Berthoud, CO> website.

Site Visitor Name: Greg
Site Visitor Email: Gwojo321@yahoo.com

Please bring back the building cap for berthoud between water costs and usage, infrastructure, schools, the loss of farms and habitat for animals it's to much. We are against ludlow farm building thousands of homes bring back the building cap before berthoud is lost.



LAND USE SUMMARY:

Notes:

Notes:

Preferred Land Use
Allowed Land Use
Permitted as second story residential in these zones
Permitted if primary land use is commercial
Not Allowed, Use may be considered with Special Review by Town of Berthoud Town Board



Planning Commission Minutes – March 09, 2023

- 1. Call to Order** – The Planning Commission convened a regular meeting on March 09, 2023.
Chairwoman Dowker called the meeting to order at 6:00 p.m.

- 2. Roll Call** – Members present:
- | | |
|------------------|-------------------|
| Jan Dowker | (Chairwoman) |
| Karen Anderson | (Vice Chairwoman) |
| Chris Kurtz | (Secretary) |
| Melissa Feldbush | (Commissioner) |
| Abigail Smith | (Commissioner) |
| Brett Wing | (Commissioner) |
- Staff present:
- | | |
|-------------------|--|
| Anne Johnson | (Community Development Director) |
| Will Charles | (Baseline Engineering – Principal Planner) |
| Michelle Tovar | (Deputy Town Clerk) |
| Jonathan Mitchell | (Permit Technician) |

- 3. Consent Agenda** – Minutes from the February 23, 2023 Planning Commission Meeting.

MOTION made by Commissioner Anderson to APPROVE the Minutes for February 23, 2022.

SECONDED by Commissioner Wing.

Abstained by Commissioner Feldbush due to not attending the meeting.

With those all in favor, THE MOTION CARRIED.

- 4. Public Hearing: Farmstead Acres Minor Subdivision (Terra Forma Solutions, Todd Johnson agent)**

Director Johnson introduced the Applicant's request for a minor subdivision to separate the existing parcel into four (4) lots.

Presented by Will Charles of Baseline Engineering.

Public Comment was opened at 6:14 p.m.

Public Comment was closed at 6:14 p.m.

MOTION made by Commissioner Kurtz to VACATE the Minor Subdivision Approval on February 23, 2023 relating to this case because a Public Hearing was not held prior to the MOTION and VOTE.

SECONDED by Commissioner Anderson.

With all in favor, THE MOTION CARRIED.

MOTION made by Commissioner Kurtz to APPROVE the Minor Subdivision with the following condition:

- 01. The Applicant shall provide an updated title commitment dated no more than thirty (30) days from the date of conditional approval.**

SECONDED by Commissioner Anderson.

With all in favor, THE MOTION CARRIED

5. Public Hearing: Heron Lakes 17th Filing (Three Lakes Development Inc., Jim Birdsall - agent)

Director Johnson introduced the request for a preliminary plat for the creation of 132 lots intended for single family residential. Additionally, as part of the preliminary plat, the applicant is requesting a waiver to curb and gutter requirements along County Road 14.

Presented by Will Charles of Baseline Engineering.

Public Comment was opened at 6:32 p.m.

John Baker shared his concerns about the added traffic to County Road 14. He would like to see improvements on Country Road 14 such as shoulders and sidewalks.

Public Comment was closed at 6:35 p.m.

MOTION made by Commissioner Anderson to DENY the waiver of the requirement that the applicant not construct a curb and gutter along County Road 14 for the reasons stated in the attached memo from the Town's Development Review Engineer dated February 28, 2023.

MOTION made by Commissioner Anderson to AMEND her MOTION to DENY the waiver of the requirement that the applicant construct a curb and gutter along County Road 14 for the reasons stated in the attached memo from the Town's Development Review Engineer dated February 28, 2023.

SECONDED by Commissioner Kurtz.

With all in favor, THE MOTION CARRIED.

MOTION made by Commissioner Wing to RECOMMEND APPROVAL of the Preliminary Plat to the Board of Trustees, subject to the following conditions:

- 01. The Applicant shall revise their plan to include a curb and gutter along County Road 14 which shall be constructed in the future by the Applicant for their proportionate share of the improvements when the Town makes such improvements on adjacent properties.**
- 02. The Applicant shall apply for or receive approval of Rezoning prior to approval of Final Plat.**

SECONDED by Commissioner Anderson.

With all in favor, THE MOTION CARRIED.

6. Public Hearing: Ludlow Farms NMP and Rezoning (Ludlow Farms, LLC – Don Hinson, Manager)

Director Johnson introduced the request of rezoning to Suburban Residential (SR) and Urban Residential (UR) from the Ludlow Farms Planned Unit Development (PUD) and a Neighborhood Master Plan.

Presented by Will Charles of Baseline Engineering.

Public Comment (Rezoning) was opened at 8:04 p.m.

Public Comment (Rezoning) was closed at 8:05 p.m.

MOTION made by Commissioner Anderson to RECOMMEND APPROVAL of the Rezoning to the Town Board with the following condition:

- 01. The rezoning will be approved only upon approval of the Neighborhood Master Plan.**

SECONDED by Commissioner Wing.

With all in favor, THE MOTION CARRIED.

Public Comment (Neighborhood Master Plan) was opened at 8:15 p.m.

George Garmany was concerned about the traffic along Berthoud Parkway. He would like to see one additional access point onto Highway 287.

Kaitlin Shepherd was concerned about gentrification and high home prices.

Carl Tabor agreed with previous statements regarding traffic.

Aron Erickson agreed with previous comments made. He expressed concern about schools and noise and light pollution created from construction.

Derrick Johnson agreed with previous statements. His biggest concern was about schools, and was concerned about traffic increases.

Dianne Michael was concerned about Berthoud losing its small-town feel, the increase in population, and the general character of the town.

Jay Mueller was concerned about the population growth and would like to see the growth to stop.

Christine Torres addressed the concerns about the schools and the importance of the funding from the growth.

Chris Shepherd was concerned about traffic access to Interstate 25.

Anita Conner expressed her concern about the added growth.

Public Comment (Neighborhood Master Plan) was closed at 8:35 p.m.

Chairwoman Dowker asked Applicant about the affordable housing in the development.

Applicant Hinson expressed the desire to work with Mission Homes and David Gregg and to provide for the community.

Commissioner Feldbush and Commissioner Smith both appreciate the use of affordable housing and expressed its importance.

MOTION made by Commissioner Wing to RECOMMEND APPROVAL of the Neighborhood Master Plan to the Board of Trustees.

SECONDED by Commissioner Anderson.

With all in favor, THE MOTION CARRIED.

7. Reports –

Commissioner Anderson, Commissioner Dowker, and Commissioner Smith wanted to thank the commissioners for all their work and support.

Director Johnson:

- She shall be preparing a Planning Commissioner electronic notebook with links for commissioners to helpful information, maps, and more.
- She has reached out to DOLA for commissioner training and information.
- She is currently developing an Active Projects list for the Town of Berthoud website.
- All future participation for Planning Commission meetings shall be in-person.

8. Adjourn –

The meeting was adjourned at 10:33 p.m.

CHAIRPERSON

SECRETARY

TOWN BOARD INFORMATION



COMMUNITY DEVELOPMENT DEPARTMENT

Meeting Date:	April 25, 2023
Agenda Title/Subject:	Ordinance 1318, An Ordinance amending the zoning map of the Town of Berthoud to rezone the Ludlow Property previously zoned Planned Unit Development to Suburban Residential and Urban Residential
Type of Item:	Public Hearing
Purpose:	Request to change the zone of previously zoned property in conformance with the 2021 Comprehensive Plan amendment
Presented by:	Anne Johnson, Community Development Director

ATTACHMENTS:

- Staff Report
- Ordinance 1318
- Application materials, public comments and referral responses
- Planning Commission minutes

BACKGROUND:

The original annexation, zoning and Planned Unit Development concept plans were approved by the Town in 2010. The application being presented is done so at staff's request to bring the envisioned zoning districts into conformance with the 2021 Comprehensive Plan update.

UPDATE/NEXT STEPS:

Tonight, the Town Board will hear two requests of the applicant. This is the second request which is a proposal to rezone the property. A Change of Zone is a relatively simple public hearing if the Neighborhood Master Plan is approved as the Change of Zone is 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 Board of Trustees. The next step will be a Preliminary Plat which will 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 will 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. School bus stop locations, if needed; sanitary sewer and water main engineering designs, the need for water dedication, 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 was requested to submit a Change of Zone and Neighborhood Master Plan by staff illustrating a change to the originally-approved development plans to bring the site into conformance with the Town's vision of continued growth within the Town's utility service area [Page 3-0]. Both Urban Residential and Suburban Residential zoning classifications are proposed and shall align with the Comprehensive Plan's vision for both. Additional open space and park space coupled with greater diversity of housing types have been provided.

RECOMMENDED ACTION(S):

Planning Commission heard the request to rezone the property at their March 9, 2023 public hearing and voted unanimously to send their recommendation of approval to the Board of Trustees.



STAFF REPORT: LUDLOW FARMS REZONING

DATE: April 25, 2023

GENERAL INFORMATION

Applicant:	Ludlow Farms, LLC – Don Hinson, Manager	Size: 306.4 acres
Site Location:	This property is located between Highway 287 and Berthoud Parkway, and south of Mountain Avenue.	
Applicant's Request:	The Applicant is requesting a rezoning to Suburban Residential (SR) and Urban Residential (UR) from the Ludlow Farms Planned Unit Development (PUD).	
Current Zoning:	Ludlow Farms Planned Unit Development. Similar layout and design to what is currently shown in the Neighborhood Master Plan.	

ZONING DISTRICT INFORMATION

	<u>PUD</u>	<u>UR</u>	<u>SR</u>
Max Density	Set at FDP	N/A	N/A
Min. Lot Size	Set at FDP	2,000 sq.ft. for Duplex 2,500 sq.ft. for SFR	3,000 sq.ft.
Min. Lot Width	Set at FDP	N/A	20'
Front Setback	Set at FDP	8'-12' build-to line	10' rear loaded
Side Setback	Set at FDP	0' attached side, 5' unattached side, 10' corner side	5'
Rear Setback	Set at FDP	5'	5'
Building Height:	Set at FDP	30'	30'

SURROUNDING ZONING, LAND USE AND REQUIRED BUFFERS

	<u>Adjacent Zoning</u>	<u>Adjacent Land Uses</u>	<u>Setbacks for Adjacent Zoning/ Buffer required if rezoned</u>
North	PUD	Vacant (Planned for future commercial spaces)	N/A
South	R-1	Single-Family Residential	N/A
East	R-1	Single-Family Residential	N/A
West	PUD and C2	Religious Assembly and Commercial	N/A

Proposal

This is a two-part request for a Neighborhood Master Plan and a rezoning to UR (Urban Residential) and SR (Suburban Residential) for the Ludlow Farms development. The Neighborhood Master Plan shows commercial and higher density uses along the north and west portions of the site along Highway 287 and Mountain Avenue, and tapers into lower density residential uses along the south and east portions of the project. The rezoning map similarly shows UR along the northwestern portions of the project, and SR for the southeastern portions.

Background

This project is currently zoned as the Ludlow Farms PUD. The PUD was approved in 2011, in conjunction with an annexation request in 2010. The PUD proposed a similar layout of uses to what is being considered with this Rezoning, with a slightly larger area proposed for commercial uses. The prior PUD process set development standards at the FDP stage, and no submittal was made for the project. The town has strongly encouraged PUD property owners to transition their projects to the newly created zone districts rather than continuing the PUD/FDP process. The project has had three rounds of review, and two notices have been sent to neighboring property owners.

Rezoning

The site is currently zoned PUD as part of the Ludlow Farms Planned Unit Development. This PUD was approved in 2011 in conjunction with an annexation approved in 2010. The approved PUD plan shares a similar vision for the area to what is proposed in the rezoning. An FDP plan is still required for the PUD, and rather than continuing through the now removed PUD process, staff has recommended the applicant instead rezone the property. The applicant has requested to rezone the property from PUD to UR (Urban Residential) and SR (Suburban Residential). If approved the rezoning would result in properties to the north and west zoned UR, and properties to the south and east zoned SR. The commercial and higher density areas would be focused in the UR areas, while the lower density residential uses would be rezoned SR.

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 criterion 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.

PUBLIC NOTICE AND COMMENT

Notice of the Planning Commission Public Hearing was mailed to property owners within 1,000 feet of the subject property, a legal ad published, and the property was posted as required by the Development Code on February 23, 2023. The application was sent out to all property owners within 1,000 feet, with an invitation to comment on the request within three weeks of receipt. All comments received can be found in this packet. Additionally, the applicant voluntarily held a neighborhood meeting on April 6th at the Berthoud Recreation Center for any neighbors wishing to attend.

FINDINGS AND RECOMMENDATIONS

Rezoning

Planning Commission recommended a motion to approve the Rezoning request.

Attachments

1. Application form
2. Rezoning map
3. Public Comment
4. Ludlow Overall Development Plan approved at annexation

ORDINANCE NO. 1318

**AN ORDINANCE AMENDING THE ZONING MAP OF THE TOWN OF BERTHOUD
TO REZONE THE LUDLOW PROPERTY PREVIOUSLY ZONED TO PLANNED UNIT
DEVELOPMENT TO SUBURBAN RESIDENTIAL AND URBAN RESIDENTIAL
DISTRICTS**

WHEREAS, the property under consideration, which property is more specifically described in Exhibit A attached hereto and incorporated herein by this reference, is known as the “Ludlow” development and was zoned to Planned Unit Development by Ordinances 1124 and 1125 in 2010 by the Town of Berthoud upon annexation; 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, notice was properly posted in the manner required by law and the Planning Commission considered the request to rezone the property at its public hearing on March 9, 2023 and moved to forward its recommendation for 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 April 25, 2023 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 March 28, 2023 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 March 28 2023, the Board of Trustees determines and finds that compliance with the criteria for amendments to the official zoning map set forth in Section 30-3-110.D of the Berthoud Municipal Code has been demonstrated.

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 “Ludlow” development as described in Exhibit A, shall be rezoned from Planned Unit Development to Suburban Residential (SR) and Urban Residential (UR) as illustrated in Exhibit B.

Section 2. Interpretation: This Ordinance shall be 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 25th day of April, 2023.

TOWN OF BERTHOUD

By _____

William Karspeck, Mayor

ATTEST:

By: _____

Christian Samora, Town Clerk

EXHIBIT A: LEGAL DESCRIPTION

Parcel 1:

Tract A, and Lots 1 through 9, inclusive, Ludlow Farms according to the recorded Conveyance Plat, County of Larimer, State of Colorado

Parcel 2:

A tract of land situated in the Northwest Corner of the Northeast Quarter of Section 22, Township 4 North of Range 69 West of the 6th PM, more particularly described as follows:

Beginning at the Northwest corner of this tract from whence the North Quarter of said Section 22 bears North $46^{\circ}17'$ West 42.4 feet distant; thence South $0^{\circ}20'$ East along a line which is 30 feet East of and parallel to quarter section line a distance of 486.4 feet to the TRUE POINT OF BEGINNING; thence North $43^{\circ}54'$ East 718.4 feet to a point 30 feet South of the North line of said Section 22; thence along a curve to the left, said curve having a central angle of $87^{\circ}12'34''$, a radius of 543.00 feet, an arc length of 826.50 feet, a chord bearing South $44^{\circ}04'22''$ West, a distance of 748.99 feet to the TRUE POINT OF BEGINNING,

County of Larimer, State of Colorado

EXHIBIT B: CHANGE TO ZONING MAP



Property 1:
Tract A, and Lots 1 through 9, inclusive, Ludlow Farms according to the recorded Conveyance Plat, County of Larimer, State of Colorado

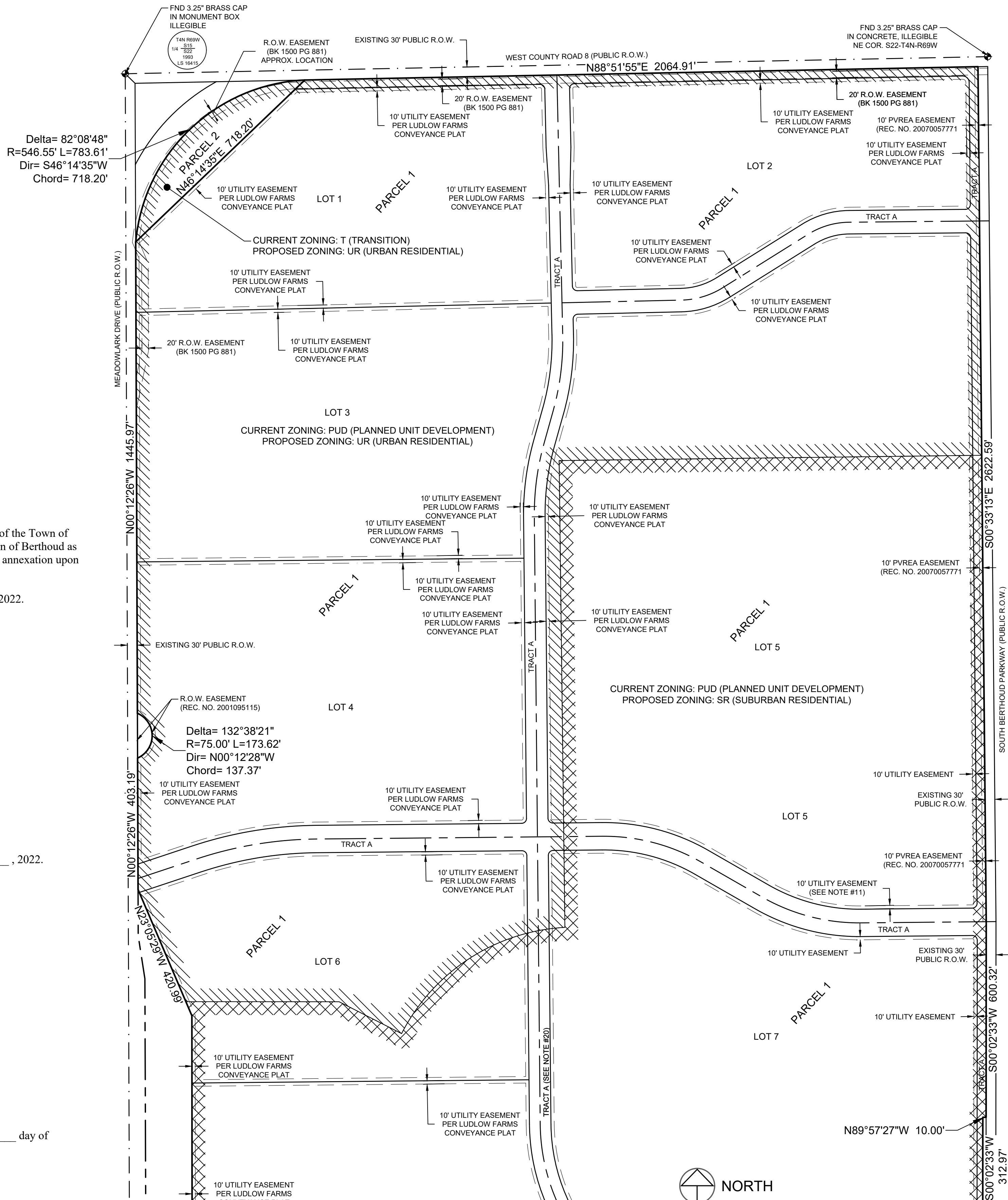
Property 2:
A tract of land situated in the Northwest Corner of the Northeast Quarter of Section 22, Township 4 North of Range 69 West of the 6th PM, more particularly described as follows:
Beginning at the Northwest corner of this tract from whence the North Quarter of said Section 22 bears North 46°17' West 42.4 feet distant; thence South 0°20' East along a line which is 30 feet East of and parallel to quarter section line a distance of 486.4 feet to the TRUE POINT OF BEGINNING; thence North 43°54' East 718.4 feet to a point 30 feet South of the North line of said Section 22; thence along a curve to the left, said curve having a central angle of 87°12'34" a radius of 543.00 feet, an arc length of 826.50 feet, a chord bearing South 44°04'22" West, a distance of 748.99 feet to the TRUE POINT OF BEGINNING,
County of Larimer, State of Colorado

- 1) First National Title Insurance Company, Commitment No. 830003001-SE, dated 08/30/2022 at 8:00 a.m. was used in the preparation of this document.
- 2) The Basis of Bearings is the North line of Ludlow Farms - Conveyance Plat as bearing North 88°51'55" East, and monumented as shown on drawing.
- 3) Northern Engineering relied upon the plat of Ludlow Farms Conveyance Plat recorded at Reception Number 20110018205 Larimer County Clerk and Recorder.
- 4) This is not a statutory boundary survey, lines ran or shown have not been evaluated for title rights either written or unwritten.
- 5) This map is not a land survey or improvement survey plat, and it is not to be relied upon for the establishment of fence, building, or other future improvement lines.
- 6) Adjacent property owner information per the Larimer County Land information Locator.
- 7) Zoning information per the Official Zoning map, Town of Berthoud, dated October, 2021 .
- 8) Parcel 1 of Subject Property contains 13,067,650 square feet or 299.99 acres, more or less.
Parcel 2 of Subject Property contains 66,183 square feet or 1.52 acres, more or less.

I, Robert C. Tessely, a Colorado Registered Professional Land Surveyor, do hereby state that this map of land proposed to be rezoned in the County of Larimer, State of Colorado was prepared under my direct supervision from existing documents of record and that the same is true and correct to the best of my knowledge, information and belief.

Notary Public

LOCATED IN THE EAST HALF OF SECTION 22, TOWNSHIP 4 NORTH, RANGE 69 WEST OF THE 6TH P.M.,
TOWN OF BERTHOUD, COUNTY OF LARIMER, STATE OF COLORADO

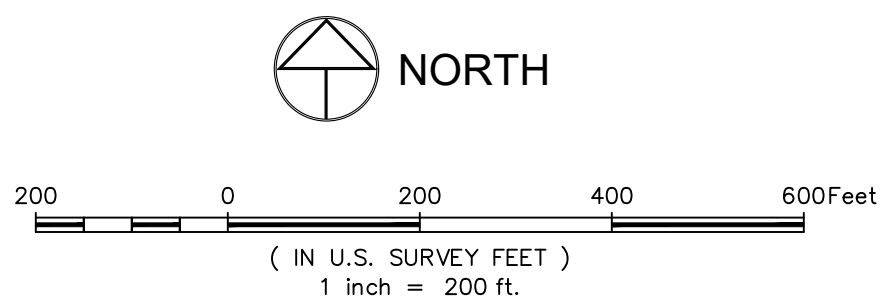


By: _____
Larimer County Clerk and Recorder

Of 2 Sheets

LUDLOW FARMS REZONE MAP

LOCATED IN THE EAST HALF OF SECTION 22, TOWNSHIP 4 NORTH, RANGE 69 WEST OF THE 6TH P.M.,
TOWN OF BERTHOUD, COUNTY OF LARIMER, STATE OF COLORADO



LEGEND:

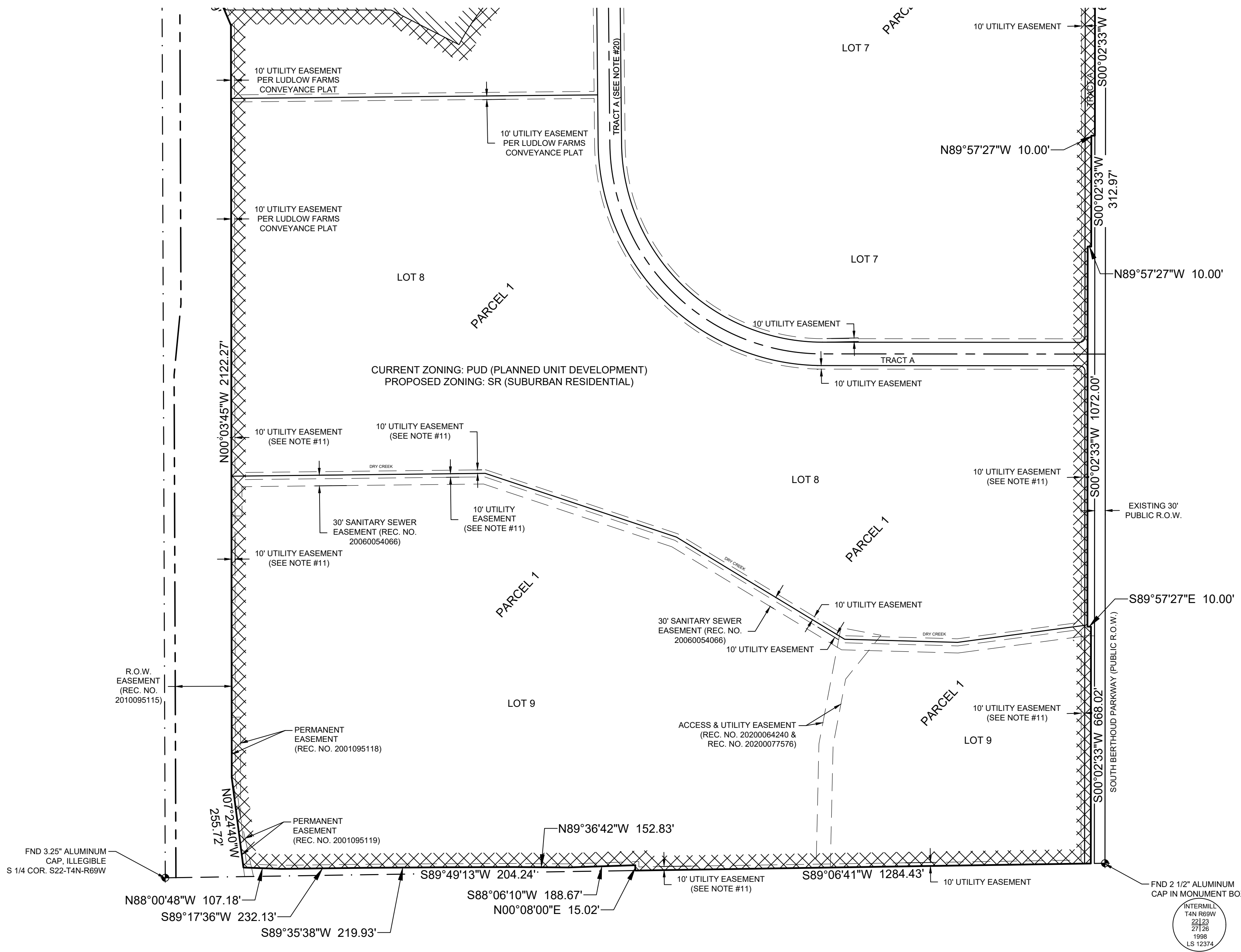
- PROPOSED REZONING BOUNDARY SR
- PROPOSED REZONING BOUNDARY UR
- SECTION LINE
- PROPERTY BOUNDARY
- SECTION CORNER MONUMENT

DRAFT
09-15-22

PRELIMINARY - NOT FOR CONSTRUCTION,
RECORDING PURPOSES OR IMPLEMENTATION

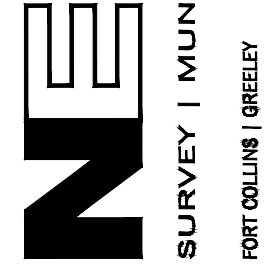
PRELIMINARY

For and on behalf of Northern Engineering Services, Inc.
Robert C. Tessely
Colorado Registered Professional Land Surveyor No. 38470



NOTICE:
According to Colorado law you must commence any legal action based upon any defect in this survey within three years after you discover such defect. In no event may any action based upon any defect in this survey be commenced more than ten years after the date of the certificate shown herein.

SECTION:	TOWNSHIP:	RANGE:
22	4 N	69 W of the 6th PM

**NORTHERN
ENGINEERING**

SURVEY | MUNICIPAL | LAND DEVELOPMENT

FORT COLLINS | GREELEY 970.231.4188 NORTHERNENGINEERING.COM

PROJECT:	DATE:	SCALE:	REVIEWED BY:
1859-001	10/15/22	1" = 200'	R. Tessely
CLIENT:	DRAWN BY:		
LUDLOW FARMS LLC	M. Kincode		

LUDLOW FARMS REZONE MAP
CITY OF FORT COLLINS
LARIMER COUNTY, COLORADO



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.

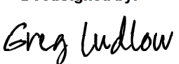
Parcel Number(s): 9422105001 - 9422405009		
Site Address: SW Corner of Mountain Avenue & Berthoud Parkway		
Project Name: Ludlow Farms		
Brief description of project: Residential and mixed-use subdivision.		
APPLICATION TYPE (Check as appropriate):		
☐ Annexation	☐ Preliminary Subdivision Plat	☐ Final 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: Ludlow Farms, LLC - JM Hinson, Manager		
E-mail: jmhinson@me.com	Mailing Address: 700 Ken Pratt Blvd Suite 113	
Phone: 1-904-945-8636	City/State/Zip: Longmont, CO 80501	
CONTACT PERSON (will receive correspondence from Town Staff/Referral Agencies)		
Name: Kristin Turner - TB Group		
E-mail: kristin@tbgroup.us	Mailing Address: 444 Mountain Avenue	
Phone: 970.532.5891	City/State/Zip: Berthoud, CO 80513	
OWNER(S) (If different than applicant)		
Name: Greg Ludlow		
E-mail: greg.ludlow5@gmail.com	Mailing Address: 1909 Sundance Drive	
Phone: (970) 302-9332	City/State/Zip: Longmont, Colorado 80504	
CONSULTANT (Engineer, Surveyor, or Planner)		
Name:		
E-mail:	Mailing Address:	
Phone:	City/State/Zip:	

LAND USE INFORMATION							
Existing Use: Vacant Proposed Use: Residential, Commercial, Mi Existing Zoning: PUD Proposed Zoning: (if applicable): SR, UR Number of acres: ~306.4 AC Proposed Access: Berthoud Parkway & Mo	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #d9e1f2;"> <th colspan="2" style="text-align: center; padding: 5px;">Adjacent zoning / land use:</th> </tr> </thead> <tbody> <tr> <td style="width: 50%; padding: 5px;">East Side: BERTHOUD PARKWAY</td> <td style="width: 50%; padding: 5px;">North Side: MOUNTAIN AVENUE</td> </tr> <tr> <td style="padding: 5px;">West Side: HWY 287</td> <td style="padding: 5px;">South Side: R1 AND LARIMER COUNTY</td> </tr> </tbody> </table>	Adjacent zoning / land use:		East Side: BERTHOUD PARKWAY	North Side: MOUNTAIN AVENUE	West Side: HWY 287	South Side: R1 AND LARIMER COUNTY
Adjacent zoning / land use:							
East Side: BERTHOUD PARKWAY	North Side: MOUNTAIN AVENUE						
West Side: HWY 287	South Side: R1 AND LARIMER COUNTY						
UTILITY SERVICE INFORMATION							
Water: Town of Berthoud	Sewer: Town of Berthoud						
PROJECT INFORMATION							
Number of proposed units: estimated 1500-1800 Number of phases: TBD - multiple Number of Units per phase: TBD Number of lots proposed: estimated 1500-1800 Lot size minimum: 4,400 sf Lot size maximum: 6,600 sf Lot size average: 5,500 sf Gross density (units/acre): 4.8-5.8 Net density (units/acre): 5.9-7.1 Area and percent open space: 67.4 AC/ 22%	Non-Residential Building Area (Sq. Ft.) Proposed: TBD - 31.2 ac estimated Non-Residential Construction Floor Area Ratio Proposed: TBD Total Number of Parking Spaces: TBD <u>Acreage of Site:</u> a. Gross: 306.4 b. Right-of-Way: 54.0 c. Net (a-b) 252.4 <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr style="background-color: #d9e1f2;"> <th colspan="2" style="text-align: center; padding: 5px;">Type of Housing Proposed (<i>please check</i>):</th> </tr> </thead> <tbody> <tr> <td style="width: 50%; padding: 5px;"> ☒ Future Single Family ☒ Duplex ☒ Multi-family (# of units: TBD) </td> <td style="width: 50%; padding: 5px;"> ☒ Townhouse ☐ Condominium </td> </tr> </tbody> </table>	Type of Housing Proposed (<i>please check</i>):		☒ Future Single Family ☒ Duplex ☒ Multi-family (# of units: TBD)	☒ Townhouse ☐ Condominium		
Type of Housing Proposed (<i>please check</i>):							
☒ Future Single Family ☒ Duplex ☒ Multi-family (# of units: TBD)	☒ 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.

Property Owner(s):

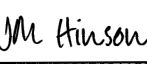
DocuSigned by:

D8BEF5D68CD544C...

Date: 9/15/2022

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:

DocuSigned by:

55A1B323E8844C3...

Date: 9/15/2022

FOR OFFICE USE ONLY
Received By:
Date:

LUDLOW FARMS REZONE MAP

LOCATED IN THE EAST HALF OF SECTION 22, TOWNSHIP 4 NORTH, RANGE 69 WEST OF THE 6TH P.M.,
TOWN OF BERTHOUD, COUNTY OF LARIMER, STATE OF COLORADO

DESCRIPTION OF REZONING AREA PUD & T TO URBAN RESIDENTIAL & SUBURBAN RESIDENTIAL:

Parcel 1:
Tract A, and Lots 1 through 9, inclusive, Ludlow Farms according to the recorded Conveyance Plat, County of Larimer, State of Colorado

Parcel 2:
A tract of land situated in the Northwest Corner of the Northeast Quarter of Section 22, Township 4 North of Range 69 West of the 6th PM, more particularly described as follows:
Beginning at the Northwest corner of this tract from whence the North Quarter of said Section 22 bears North 46°17' West 42.4 feet distant; thence South 0°20' East along a line which is 30 feet East of and parallel to quarter section line a distance of 486.4 feet to the TRUE POINT OF BEGINNING; thence North 43°54' East 718.4 feet to a point 30 feet South of the North line of said Section 22; thence along a curve to the left, said curve having a central angle of 87°12'34", a radius of 543.00 feet, an arc length of 826.50 feet, a chord bearing South 44°04'22" West, a distance of 748.99 feet to the TRUE POINT OF BEGINNING,
County of Larimer, State of Colorado

NOTES:

- 1) First National Title Insurance Company, Commitment No. 830003001-SE, dated 08/30/2022 at 8:00 a.m. was used in the preparation of this document.
- 2) The Basis of Bearings is the North line of Ludlow Farms - Conveyance Plat as bearing North 88°51'55" East, and monumented as shown on drawing.
- 3) Northern Engineering relied upon the plat of Ludlow Farms Conveyance Plat recorded at Reception Number 20110018205 Larimer County Clerk and Recorder.
- 4) This is not a statutory boundary survey, lines ran or shown have not been evaluated for title rights either written or unwritten.
- 5) This map is not a land survey plat or improvement survey plat, and it is not to be relied upon for the establishment of fence, building, or other future improvement lines.
- 6) Adjacent property owner information per the Larimer County Land information Locator.
- 7) Zoning information per the Official Zoning map, Town of Berthoud, dated October, 2021 .
- 8) Parcel 1 of Subject Property contains 13,067,650 square feet or 299.99 acres, more or less.
Parcel 2 of Subject Property contains 66,183 square feet or 1.52 acres, more or less.
- 9) Proposed Zone UR (Urban Residential) contains 5,069,393 square feet or 116.380 acres, more or less.
Proposed Zone SR (Suburban Residential) contains 8,064,440 square feet or 185.131 acres, more or less.

OWNER:

BY: _____

STATE OF COLORADO)
)SS
COUNTY OF LARIMER)

The foregoing instrument was acknowledged before me this ____ day of _____, 2022, by
_____ as _____ of .

Witness my hand and official seal

My commission expires: _____

Notary Public

LIENHOLDER:

BY: _____

STATE OF COLORADO)
)SS
COUNTY OF LARIMER)

The foregoing instrument was acknowledged before me this ____ day of _____, 2022, by
_____ as _____ of .

Witness my hand and official seal

My commission expires: _____

Notary Public

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 _____, 2022, and that 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 purposes indicated hereon.

Approved by the Board of Trustees of the Town of Berthoud, Colorado this ____ day of _____, 2022.

Mayor

The foregoing map is approved for filing and accepted by the Town of Berthoud, Colorado this ____ day of _____, 2022.

ATTEST: _____
Town Clerk

APPROVAL CERTIFICATES:

Approved by the Planning Commission of the Town of Berthoud, Colorado this ____ day of _____, 2022.

Chairman

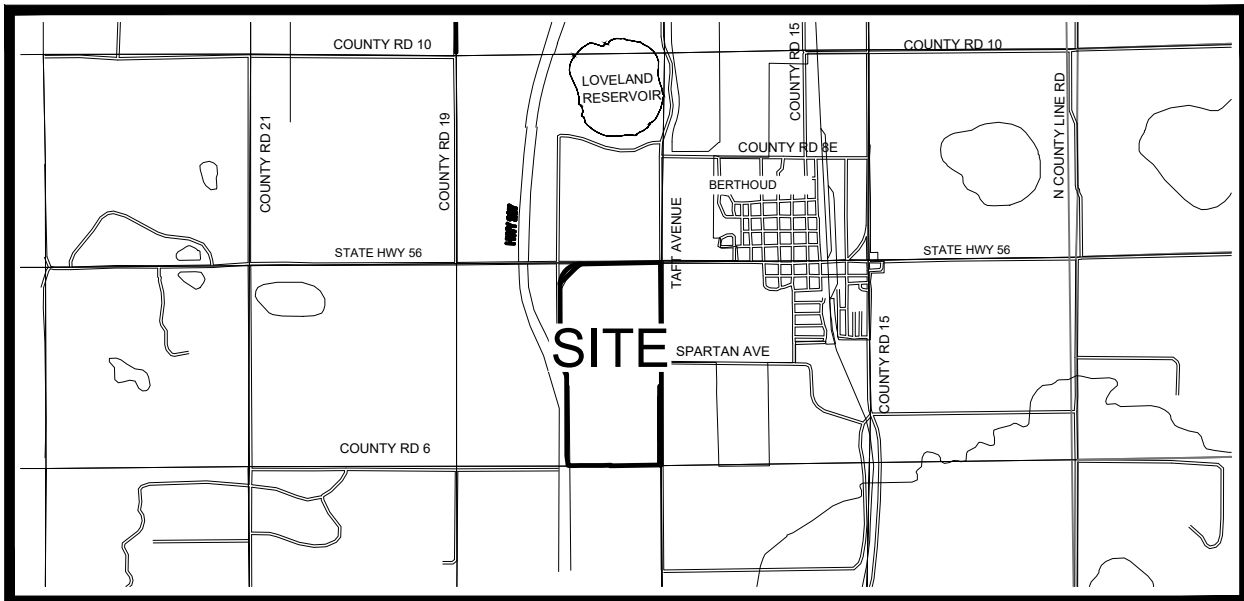
The foregoing map is approved for filing and accepted by the Town of Berthoud, Colorado this ____ day of _____, 2022.

ATTEST: _____
Planning Technician

LARIMER COUNTY CLERK & RECORDER CERTIFICATE:

This Rezoning Map was accepted for filing in the Office of the Larimer County Clerk & Recorder on this ____ day of _____, 2022, A.D. at _____ M. in Book _____, Page _____, Reception No. _____

By: _____
Larimer County Clerk and Recorder



 **VICINITY MAP**
1" = 2000'

SURVEYOR'S STATEMENT

I, Robert C. Tessely, a Colorado Registered Professional Land Surveyor, do hereby state that this map of land proposed to be rezoned in the County of Larimer, State of Colorado was prepared under my direct supervision from existing documents of record and that the same is true and correct to the best of my knowledge, information and belief.

For and on behalf of Northern Engineering Services, Inc.
Robert C. Tessely
Colorado Registered Professional Land Surveyor No. 38470

DRAFT
03-01-23
PRELIMINARY - NOT FOR CONSTRUCTION,
RECORDING PURPOSES OR IMPLEMENTATION

NOTICE:
According to Colorado law you must commence any legal action based upon any defect in this survey within three years after you discover such defect. In no event may any action based upon any defect in this survey be commenced more than ten years after the date of the certificate shown herein.

SECTION: 22	TOWNSHIP: 4 N	RANGE: 69 W of the 6th PM
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**NORTHERN
ENGINEERING**

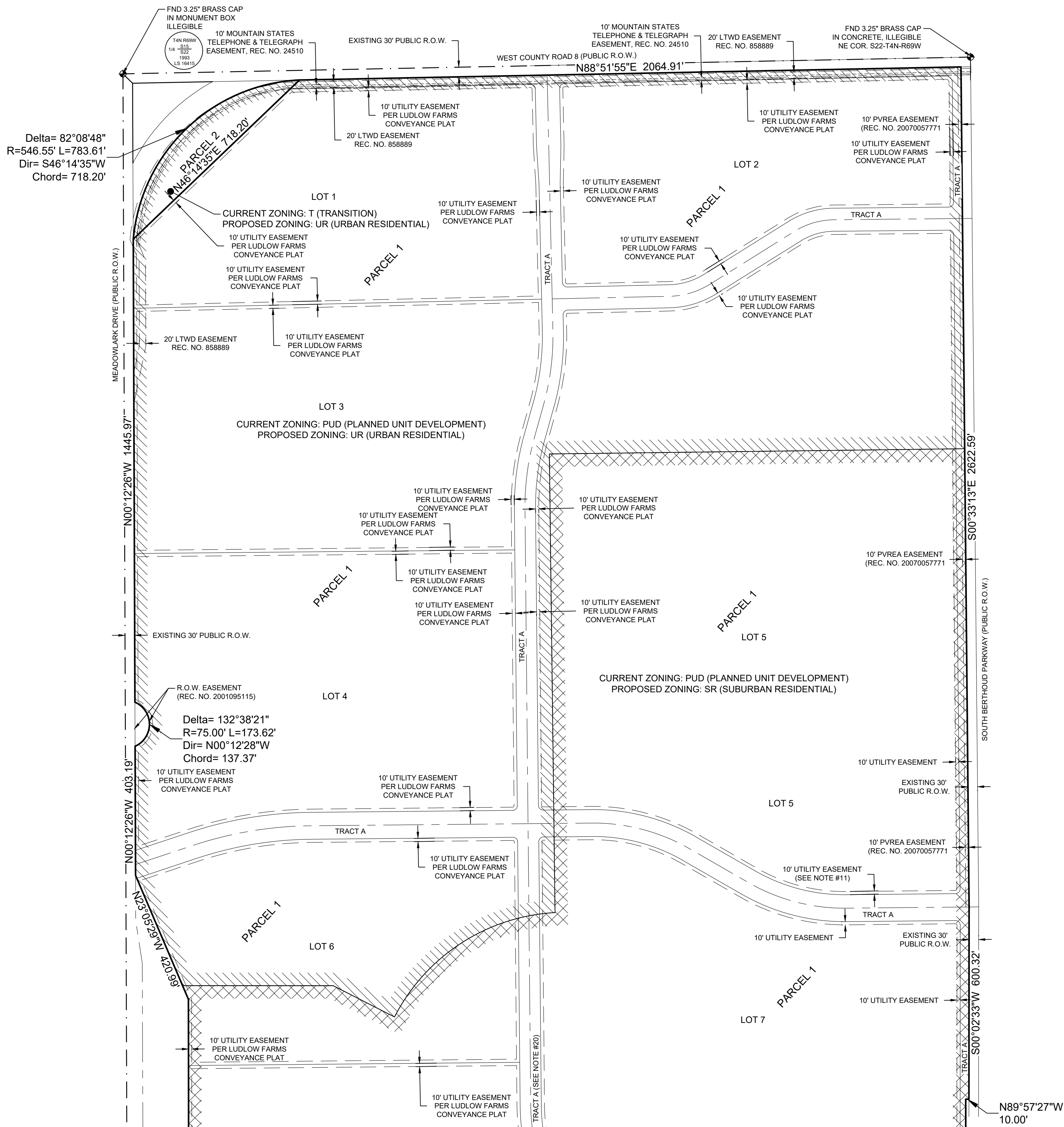
SURVEY | MUNICIPAL | LAND DEVELOPMENT
FORT COLLINS | GREELEY 970.231.1188
NORTHERNENGINEERING.COM

PROJECT: 1659-001	DATE: 03/01/23	SCALE: As shown	REVIEWED BY: R. Tessely
CLIENT: LUDLOW FARMS LLC	DRAWN BY: M. Kinode		

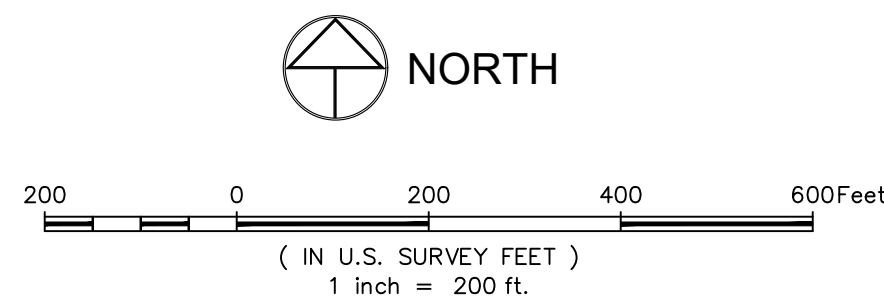
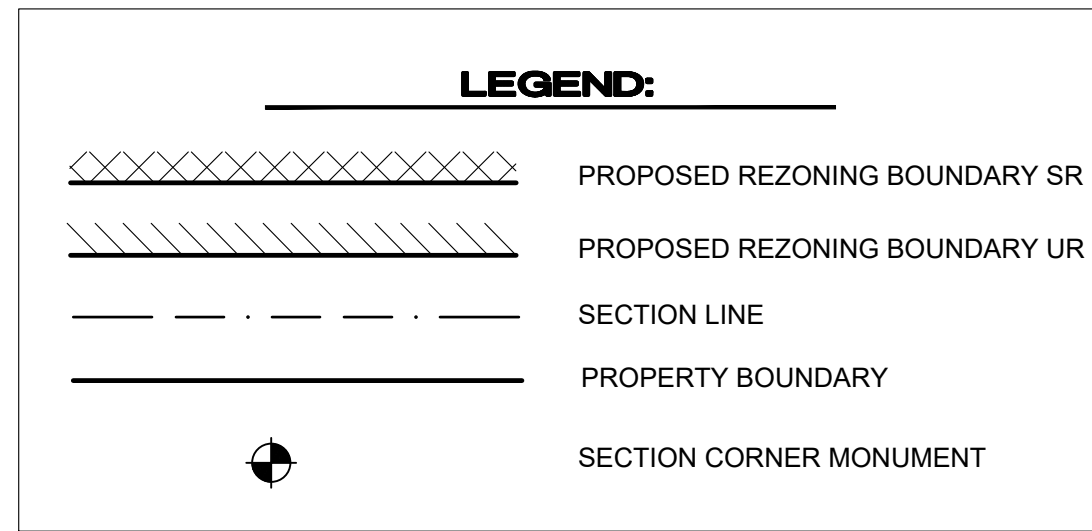
LUDLOW FARMS REZONE MAP
TOWN OF BERTHOUD
LARIMER COUNTY, COLORADO

LUDLOW FARMS REZONE MAP

LOCATED IN THE EAST HALF OF SECTION 22, TOWNSHIP 4 NORTH, RANGE 69 WEST OF THE 6TH P.M.,
TOWN OF BERTHOUD, COUNTY OF LARIMER, STATE OF COLORADO



SEE SHEET 3



DRAFT
03-01-23
PRELIMINARY - NOT FOR CONSTRUCTION,
RECORDING PURPOSES OR IMPLEMENTATION

PRELIMINARY

For and on behalf of Northern Engineering Services, Inc.
Robert C. Tesseley
Colorado Registered Professional Land Surveyor No. 38470

NOTICE:
According to Colorado law you must commence any legal action based upon any defect in this survey within three years after you discover such defect. In no event may any action based upon any defect in this survey be commenced more than ten years after the date of the certificate shown herein.

SECTION:
22
TOWNSHIP:
4 N
RANGE:
69 W of the 6th PM

NORTHERN ENGINEERING
SURVEY | MUNICIPAL | LAND DEVELOPMENT
FORT COLLINS | GREELEY 970.221.1188
NORTHERNENGINEERING.COM

PROJECT:
1859-001
CLIENT:
LUDLOW FARMS LLC
DATE:
03/01/23
SCALE:
1" = 200'
REVIEWED BY:
R. Tesseley

LUDLOW FARMS REZONE MAP
TOWN OF BERTHOUD
LARIMER COUNTY, COLORADO

Sheet
2
Of 3 Sheets

DRAWING FILENAME: S:\Survey\2023\1859-001\Map\Map\1859-001 Ludlow Rezone.dwg LAYOUT NAME: Sheet 2 DATE: Feb 28, 2023 - 3:59pm CAD OPERATOR: rmls
LIST OF REVISIONS: [None]

LOCATED IN THE EAST HALF OF SECTION 22, TOWNSHIP 4 NORTH, RANGE 69 WEST OF THE 6TH P.M.,
TOWN OF BERTHOUD, COUNTY OF LARIMER, STATE OF COLORADO

[illegible]

	PROPOSED REZONING BOUNDARY SR
	PROPOSED REZONING BOUNDARY UR
	SECTION LINE
	PROPERTY BOUNDARY
	SECTION CORNER MONUMENT



For and on behalf of Northern Engineering Services, Inc.
Robert C. Tessely
Colorado Registered Professional Land Surveyor No. 38470

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TOWNSHIP:
4 N

SCALE: 1" = 200'

CLIENT: JUDLOW FARM

Of 3 Sheets

From: [Steven Allen](#)
To: [Will Charles](#)
Cc: [Wendy Allen](#)
Subject: Ludlow Farms Development
Date: Friday, March 31, 2023 9:49:38 AM

[EXTERNAL EMAIL] DO NOT CLICK links or attachments unless you recognize the sender and know the content is safe.

Good morning Will,

I am writing to you as I was unable to attend either of the March meetings, Planning Commission or Town Board, as I was out of town on both dates.

Were either recorded such that they could be watched at a later date? If not, are there meeting minutes available that can be sent to me.

As a landowner and resident of the Harvest subdivision that butts up against this proposed development, I have an extreme concern regarding the proposed road into the Harvest subdivision. I purchased into the Harvest subdivision as it is a small private subdivision with a limited number of homes. I am concerned about the traffic that an exit from the Ludlow Farms development would bring past my home into the Harvest subdivision. I would like to hear about proposed options from the Ludlow developers for placement of another exit not into the Harvest subdivision.

Regards,
Steven Allen

From: [Anne Johnson](#)
To: [natasha w](#)
Cc: [kristin@tbgroun.us](#); [Will Charles](#)
Subject: RE: No to Ludlow farm plans
Date: Thursday, March 30, 2023 10:23:33 AM

[EXTERNAL EMAIL] DO NOT CLICK links or attachments unless you recognize the sender and know the content is safe.

Hello Natasha,

Your comment is being provided to the Developer's representative as well as the Town's Planner and will be provided to the Town Board at the public hearing.

Sincerely,

Anne

From: natasha w <thecowojos@yahoo.com>

Sent: Thursday, March 30, 2023 10:11 AM

To: Anne Johnson <AJohnson@berthoud.org>

Subject: No to Ludlow farm plans

Thank you for the callback Anne. Please see below. Thank you! Natasha

Hello, I am writing as a concerned citizen and neighbor about the excessive home project planned for Ludlow farm off Mountain and Berthoud Parkway. That large number of homes can not be supported by Berthoud we simply don't have the needed infrastructure, roads, police, fire and especially water. Our water costs are outrageous and the quality is subpar already. The overcrowded schools is another issue but I'm aware that's a bond issue. However the board and town of Berthoud has a responsibility to its residents and community. Just go on Facebook and read all the concerns and no's. Enough is enough, the board can deny this project, enact a building moratorium or cap again. Please save our community and reject the Ludlow farm proposal. The board needs to represent the people of Berthoud and we say no. Thank you for your consideration! The Wojo Family

From: [Anne Johnson](#)
To: [Amy Lane](#); [William Karspeck](#); [Mike Grace](#); [Tim Hardy](#); [May Soricelli](#); [Sean Murphy](#); [Karl Ayers](#); [Jeff Butler](#); [Christian Samora](#)
Cc: [Chris Kirk](#)
Subject: RE: Ludlow Farm Development
Date: Monday, March 13, 2023 12:32:12 PM
Attachments: [jmaae001.png](#)
[jmaae002.png](#)
[jmaae003.png](#)
[jmaae004.png](#)

[EXTERNAL EMAIL] DO NOT CLICK links or attachments unless you recognize the sender and know the content is safe.

Dear Ms. Lane,
Thank you for providing input. This information will be provided to the applicant and included in the Trustees packet for the upcoming hearing.
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
Hours: 0700-1730 Monday - Thursday

From: Amy Lane <amy@tracysteam.com>

Sent: Monday, March 13, 2023 12:21 PM

To: William Karspeck <WKarspeck@berthoud.org>; Mike Grace <MGrace@berthoud.org>; Tim Hardy <THardy@berthoud.org>; May Soricelli <MSoricelli@berthoud.org>; Sean Murphy <smurphy@berthoud.org>; Karl Ayers <kayers@berthoud.org>; Jeff Butler <JButler@berthoud.org>; Anne Johnson <AJohnson@berthoud.org>; Christian Samora <CSamora@berthoud.org>

Subject: Ludlow Farm Development

Hello All,
I just wanted to send an email with my concerns for the Ludlow Farm Development. I am concerned about the traffic, the overcrowding of the schools and whether we have enough water to support this development. I am a Realtor as well as a homeowner in Berthoud. I know most people think that all Realtors want tons of growth. I want smart growth. Not the overcrowding. Berthoud isn't designed to handle all of this growth. I know people move here because of the cute town atmosphere. We are starting to lose that small town atmosphere. This development is just too large for such a small community. I hope that you will reconsider re-designing this development to be less dense.
Thank You for your Consideration
Amy Lane
--



From: [Anne Johnson](#)
To: kristin@tbgroun.us; [Will Charles](#)
Subject: Berthoud - Information from a neighbor - Ludlow?
Date: Friday, March 10, 2023 4:02:00 PM

[EXTERNAL EMAIL] DO NOT CLICK links or attachments unless you recognize the sender and know the content is safe.

From: kelly <mustharley@aol.com>
Sent: Friday, March 10, 2023 3:59 PM
To: William Karspeck <WKarspeck@berthoud.org>; Mike Grace <MGrace@berthoud.org>; Tim Hardy <THardy@berthoud.org>; Karl Ayers <kayers@berthoud.org>; Sean Murphy <smurphy@berthoud.org>; Butler@berthoud.org; May Soricelli <MSoricelli@berthoud.org>; Chris Kirk <CKirk@berthoud.org>; Anne Johnson <AJohnson@berthoud.org>; Christian Samora <CSamora@berthoud.org>

Subject: New building

HI,

I am writing to you to voice my concern on the massive building project that was passed by the planing committee the other night. Please really look closely at what is being planned. Please have one or two lawyers go over the proposal I . I feel it is too big. What about water and taxes and open space , roads , schools ?

Make sure the new owner/developer does what they say. I use to live in another town that is being over developed and the developer of the downtown/ home area really screwed over the town . He promised all these things he would do and build and they gave him the green light .

He then did not do any of it. He then broke up the parcel of land he was going to develop and sold it in pieces to other builders. Then they started complaining about not having infrastructure and parks and stuff that was promised and nothing was done.

I was at the meeting when he showed up and the whole town board did not even know the person they were dealing with the whole time was just an employee and had no say on what went on. The developer said too bad he could do what he wanted and didn't have to do anything he promised and said you did not read your contract too good. So be very very careful on what you agree to and really read the fine print .

Thank you for your time
Kelly Macaulay

Request Type: General Concern
Request ID Number: 8
Date Submitted: 3/9/2023
Date Closed: (open)
Date Printed: 3/27/2023 5:10:38 PM

Request Location: 97 Sioux drive
Berthoud, Co 80513

Submitter Information: Jim Marquis
97 Sioux drive
Berthoud, CO 80513

Priority: Normal
Assigned To: Unassigned

Phone: (none specified)
Email:
James.n.marquis@gmail.com

Date/Person

3/11/2023 11:07:00 PM

Comments

Email sent to: Brenda.burkett@civicplus.com

Can you take a look at this?

3/9/2023 11:06:47 PM
(anonymous)

Your Request ID Number is 8.

Brief Description How do I voice opposition to the Ludlow Farm development plan? This is too much growth in too confined of a subdivision. I live on Sioux Drive and the planning commission just voted to zone my backyard as urban residential despite a claimed plan on the developers part to "feather" the highest density development eastward toward my neighborhood. This is unacceptable.

Problem Location

Street Number and Name 97

Sioux drive

Address Line 2

City Berthoud

State Co

Zip Code 80513

Photograph No file was uploaded

Your Information

Name Jim Marquis

Street Number and Name 97

Sioux drive

Address Line 2

City Berthoud

State CO

Zip Code 80513

Phone Number

Fax Number

Email Address James.n.marquis@gmail.com

Preferred Contact Method email

September 22, 2022

Community Development Department

Berthoud CO 80513

I am responding to the development proposal called the Ludlow Subdivision, just west of where I live. Of course, I hate to see the farm ground go, as part of Berthoud's charm is its agricultural heritage which is slipping away rather quickly. But if we need to keep approving these massive developments, then we must change how they are constructed and built.

Just my simple mathematics shows that this proposed subdivision, based on Berthoud's current water usage, will suck almost half the amount of water that the entire town is now using, between 216,000 and 430,000 gallons of new water usage. Water is becoming more and more in short supply. It doesn't matter that the city has many water rights outstanding if the water, because of shortfall of precipitation and hotter weather, just isn't there. Do water rights on this land come with this proposal?

So what I am trying to say is, if we must approve these subdivisions, then we must change how they are constructed, oriented, supplied with energy and still give wildlife a fair chance at life. This could mean no gas lines installed, electricity only. Will the grid stand for this, or will the developer have to supply the energy needed?

No polluting fireplaces. Induction ranges required. Heat pump heating and cooling systems or even requiring geothermic systems for the best efficiency.

No areas of Bluegrass. Only native grasses and plants allowed for lawns and parkways. Water conserving trees only. Proper orientation of the houses for best efficiency in heating and cooling.

If we have to build, then we have to build smarter! Here are some ideas to tickle your minds and encourage you to think like I am suggesting. If the city can waste \$30,000 on a silly ballot proposal, then investing in someone with knowledge of sustainable building and living should be considered.

<https://www.casbe.org.au/what-we-do/sustainable-subdivisions/>

<https://6c5pw269zs2tv6x0418kzx2k-wpengine.netdna-ssl.com/wp-content/uploads/2020/09/3.0-Energy.pdf>

<https://6c5pw269zs2tv6x0418kzx2k-wpengine.netdna-ssl.com/wp-content/uploads/2020/09/5.0-Integrated-Water-Management.pdf>

David Luck

100 Bein Street

Berthoud CO 80513, 303-887-4192

Adam Olinger

From: Katie Erbes <Victoriandreams8@hotmail.com>
Sent: Friday, September 23, 2022 9:35 AM
To: Curt Freese; Adam Olinger
Subject: Ludlow Farms

Per your "Neighborhood Notice" we received yesterday. We have lived here for 26 years and enough is enough of the housing, Do we want to be another overgrown town? Loveland is now almost connected to Fort Collins and Greeley; We have 9 miles from Berthoud to Longmont. Loveland is building enough housing, Longmont is building enough housing, Greeley is building enough housing and Mead is now overgrowing. Why does Berthoud want to do this?

You see Firestone and Frederick grown together and you don't even know where each town begins or ends.

Bring in business for this outgrown town as it is now. We need schools, another grocery store, another fast-food business. Why you ask? Because A & W is loaded at all times, Hays is too small for a town like ours that is overgrown already and schools? Where are we putting all these children right now? Overloaded schools?

These towns such as Loveland and Longmont are so close that we can go to the markets there for shopping, eating and entertainment. Housing won't bring shopping here; it will just make a small town big with more crime.

Why do you want to make a small town with so much new housing when there is plenty of new housing all around us?

I say "NO" to this and if that needs to be put on the vote, I would vote "NO" Listen to those that have lived here a long time. Keep Berthoud small and safe.

When they said they were building homes over on Spartan St we were concerned about that and the trees that were at one time there, well we went to meetings about those trees and the council said they would not be cut down. Well guess what happen, they were cut down and I still have a video tape showing that and the disappointment that the town council did not listen to the people of Berthoud.

Is this going to be happening again? I bet a lot of Berthoud residents don't want this and I bet you won't listen again.

Kay Erbes

Adam Olinger

From: Steven Allen <drspallen@sbcglobal.net>
Sent: Sunday, October 2, 2022 7:22 PM
To: Curt Freese; Adam Olinger
Cc: cnmmidwifewendy@gmail.com
Subject: Ludlow Farms Development

Good morning,

I recently received a letter from the Town of Berthoud regarding a new development in the vicinity of my home in Berthoud. Before, I provide some comment, I would like to take a minute to introduce myself.

Steven Allen and spouse, Wendy, currently from Libertyville, Illinois, but soon to be permanent residents of Berthoud residing in the Harvest Ridge North development. Over the past 25 years my family and I have vacationed in the state of Colorado multiple times every year. It did not take long for us to realize that Colorado would someday be our destination for retirement. Over the past 5 years, our visits focused on exploring the various towns up and down the front range resulting in us discovering Berthoud, which is perfectly suited for the lifestyle we are looking for in retirement. When we settled in Libertyville, over 30 years ago, the surrounding area was a lot like Berthoud today, undergoing rapid expansion. With this in mind, you should be able to understand where I am coming from with my comments and question in regard to the Ludlow Farms development.

Assume 1500 units as stated in the letter, also assume 2 residents per unit resulting in an influx of 3000 new community members.

1. How is the developer addressing this influx of residents in regard to the overall infrastructure of the town of Berthoud?
2. What commercial development is being proposed to support the growing population? For example, the current community does not have a major grocery store. Is there already commitment from commercial investors to establish new businesses?
3. What support will be provided for our First Responders, Police, Fire and EMTs?

Let's now assume half of these units, 750, will be a family of four, 2 adults and eventually two school age children.

1. Can the current Berthoud schools support 1500 additional students over time?
2. How is the developer addressing the expansion that may be need for both the elementary and secondary school systems?

Development location, this development is in a recognized flood plain.

1. What is being done or will be done by the developer to address the risk this may pose to new homeowners?
2. Could these plans impact the surrounding developments that are already underway with many homes already complete?

Thank you for the opportunity to share our thoughts with you, as we are looking forward to being active members of our new community.

Regards,
Steven & Wendy Allen

Adam Olinger

From: Curt Freese
Sent: Monday, October 3, 2022 8:12 AM
To: Adam Olinger
Subject: FW: Ludlow Farms



Curt Freese, AICP
Community Development Director

Phone: 970-532-2643
Fax: 970-532-0640
cfreese@berthoud.org
Berthoud.org
807 Mountain Ave. Berthoud, CO 80513



From: Jeanene Imerzel <jeanene.imerzel@gmail.com>
Sent: Friday, September 30, 2022 9:48 AM
To: Curt Freese <CFreese@berthoud.org>
Subject: Ludlow Farms

Good morning,

We received the neighborhood notice and have concerns that this development could block our mountain views here in Rose Farm Acres. We are fine with growth but prefer the park side to be on Berthoud Pkwy as opposed to 287 where there are no houses.

Thank you
Jeanene Imerzel

Adam Olinger

From: Chris Shepherd <docshep97@aol.com>
Sent: Sunday, October 2, 2022 10:20 AM
To: Adam Olinger; Curt Freese
Subject: Ludlow development

I have received the neighborhood notice regarding the Ludlow development and wish to comment. The developers of this subdivision do have the right to propose whatever they want, but I believe this massive development would create many problems for the city of Berthoud.

Since this addition would increase the size of this nice town by about 40% using the 2020 population number (10300), the current infrastructure of this town would have to be changed completely. At this point, there is only one main road running from Hwy 287 to I-25 (Mountain Ave.). The residents of the Ludlow development would most likely use this street for access to I-25. Are the residents of this historic town ready and willing to have the road widened to four lanes which would eliminate the wonderful businesses along the way and require the felling of the gorgeous trees. This would also eliminate the on street parking and require off street parking lots. There must have been a reason that Hwy 287 was routed around the middle of town when it was expanded many years ago.

Access to Hwy 287 is also a concern. At this point the only relatively safe access is Mountain Ave. Attempting to access southbound 287 from 2E and 4E is very dangerous. Can 287 withstand the huge influx of traffic. There were two fatal accidents on 287 this last week alone.

Does the developer have water rights? If there are 1800 homes with only two residents in each, the town will increase by 3600 new residents and that's a low estimate. This will increase the need for Berthoud town to provide safe drinking water, lawn irrigation and an increase in waste treatment.

Berthoud schools are full. Would there be building of enough new schools to accommodate the influx. City services would need to increase. At this point, snow plowing for the residential areas is not at the top of the list.

How about public safety. I know the town had its own police department. Would this need to be recreated? The availability of recruiting new police officers might be difficult. Even the postal department is having a hard find hiring employees.

I hope that the planning commission thinks of how this huge development would affect the residents of this town. This is a very nice small town with a safe and engaging personality.

Will this proposal also be sent to all of the residents of Berthoud instead of just the few surrounding the area? The folks of Berthoud need to know. What would be the benefit for Berthoud if the gateway to the historic town is changed forever.

Thanks for your time.

Christine Shepherd
1100 Monroe Ave
Berthoud

Adam Olinger

From: Curt Freese
Sent: Monday, October 3, 2022 2:57 PM
To: Adam Olinger
Subject: FW: Ludlow Farms Development comments



Curt Freese, AICP
Community Development Director

Phone: 970-532-2643
Fax: 970-532-0640
cfreese@berthoud.org
Berthoud.org
807 Mountain Ave. Berthoud, CO 80513



From: M Moden <MODEN5685@msn.com>
Sent: Monday, October 3, 2022 2:50 PM
To: Curt Freese <CFreese@berthoud.org>
Subject: Ludlow Farms Development comments

I have lived and worked in Berthoud since 1999 so I have watched it grow over the years and appreciate the "small town" feel we have here.

My concern with the Ludlow Farms Development is that in my opinion future development should be spread out farther - perhaps 4-6 year increments to allow for the economy to level out and assure a need for it before adding an additional 1500-1800 more residences to the community.

With as much building that has taken place here in Berthoud in the past few years I am quite sure that in the near future, Berthoud will be full of vacant homes and rental homes as the market will price folks right out of buying their dream (and even renting). Berthoud also has developments where "METRO TAX" has been implemented and I for one hope that this will be a thing of the past as it too prices home buyers right out of the market without them even knowing it!

I know Berthoud wants to keep up with other surrounding communities, but growth isn't always the answer. Be careful Berthoud.....don't ruin a good thing!

Marie Moden-Homeowner
110 Bein St
Berthoud, Co 80513
970-218-2763 cell

Adam Olinger

From: Jeanne <jeannepo@frii.com>
Sent: Wednesday, October 5, 2022 11:41 AM
To: Curt Freese; Adam Olinger
Subject: Neighborhood Notice - Ludlow Farms

I am writing in regards to the Neighborhood Notice I received from the Community Development Department in Berthoud regarding the proposal for Ludlow Farms.

Being 30 year Berthoud residents, we have seen MUCH growth in recent years for Berthoud. In 1992 when we moved here, there were 4 schools (two elementary, 1 middle and 1 HS). With the thousands of new homes that have gone in in the past 5 years, there have been no new schools built.

Also, your proposal includes access to this development from Hwy 287. This is unacceptable. As is (I live ¼ mile from the intersection of W Rd 4/287) we see regular and sometimes fatal accidents between Hwy 56 and Hwy 66. And, rarely is there law enforcement for speeders. Adding more traffic, by means of an intersection is just adding to the number of accidents we will witness in the area.

As Berthoud residents, we are highly against the proposed development, Ludlow Farms, due to the above mentioned concerns.

Thank you,

Tom and Jeanne Poirier

Adam Olinger

From: Jennifer Talbott <jenniferjeantalbott@gmail.com>
Sent: Thursday, October 6, 2022 12:54 PM
To: Curt Freese; Adam Olinger
Subject: Ludlow Farms Neighborhood Notice Comments

I am writing this in response to the letter I received regarding the Ludlow Farms property. I have several concerns regarding this proposed project as I am sure many fellow neighbors do. With the rapid growth of Berthoud there are several things that will be affected and I would like to know how the town plans to address these. I understand growth is essential to economic improvement but also feel that Berthoud is growing rapidly without addressing issues that will arise.

My concerns with Ludlow Farms are:

- The traffic increase to Berthoud Parkway and surrounding roads. Berthoud Parkway is already extremely busy and with the projected amount of housing that is going in this area's traffic is going to become a problem with more accidents, road disintegration and flow.
- Is there a projection to build more schools in the very near future? Our already crowded schools are going to become unmanageable for staff and facilities.
- Crime that will come with this much growth-our already very small police presence will have to be increased.
- Water resources-Our already strained water system will be stretched even further.
- There are several other new communities being built near this area and adding all of these at the same time is going to cause several issues.

I would love to be of any help and am not here to just complain but rather to find solutions. I come from a long history of realtors and understand building is inevitable but the size of this community and number of units is what is most concerning.

Thanks,
Jennifer Talbott

Adam Olinger

From: Lisa Morris <lisakmorris@gmail.com>
Sent: Thursday, October 6, 2022 12:56 PM
To: Adam Olinger; cfreesee@berthoud.com
Cc: Shawn Nelson
Subject: Ludlow Farms

Hello,

To whom this may concern, we received the summary proposal for the above mentioned neighborhood and were directed to submit comments/concerns to you. We live in the newly built Richmond Homes, just a few blocks Southwest of Berthoud High School.

Our main questions/concerns are the following:

1. Being so close to the high school and aware that for years the town of Berthoud wasn't "growing". What is the plan for the schools in the area to support the undoubtable group that this community will cause to the schools?

2. What is going to be done for the roads/sidewalks to support the number of families that this community will be adding to the town of Berthoud?

Specifically, Berthoud Parkway, will this road be converted into a 4 lane road to support the amount of commuting traffic that this development will eventually cause?

With that as well, will there be bike paths/lanes on the roadways?

Will the sidewalks be wide enough to support many people walking together OR will it be the mini sidewalks that only really allow groups to only walk single file?

3. Along with the roads, what will be done for parking in this neighborhood? If you drive through other neighborhoods with condos, townhouses and single family residences there is rarely enough parking and the streets do not accommodate two way traffic if vehicles are parked on both sides of the street.

The neighborhood "Prairie Star", on the Southeast corner of Berthoud Parkway and Highway 287 is a perfect example. I know part of the issue is that there is no requirement for people to park in their garage, so most people in Prairie Star are using their garage for storage and not parking. As well as the assumption that one family only has one vehicle, when in truth on average the average family of four has a minimum of four vehicles.

4. Our neighborhood is dealing with many drainage issues, which in turn we believe is causing an abundance of mosquitoes in the neighborhood. Will there be anyone to monitor, test and ensure that this issue doesn't happen to this new neighborhood as well?

Thank you for your time and please let me know if you have any available answers to these concerns.

Lisa & Shawn Nelson
303-525-7869

Adam Olinger

From: Curt Freese
Sent: Thursday, October 6, 2022 11:01 AM
To: Adam Olinger
Subject: FW: Comments Ludlow Farms

Curt Freese, AICP
Community Development Director

Phone: 970-532-2643
Fax: 970-532-0640
cfreese@berthoud.org
Berthoud.org
807 Mountain Ave. Berthoud, CO 80513

-----Original Message-----

From: Wendy McCauley <55goodwitch@gmail.com>
Sent: Thursday, October 6, 2022 10:19 AM
To: Curt Freese <CFreese@berthoud.org>
Subject: Comments Ludlow Farms

My comments are regarding Spartan Ave. It appears based on the Drawings provided that Spartan Ave will become much busier given the location of the high school and use as an artery to other roads leading downtown or out of Berthoud. I would ask that a reduced speed limit be posted and also some type of traffic calming circles be installed. Long straight roads tend to encourage speeding and in some cases careless driving behavior. Also more traffic equals more noise.

People are attracted to Berthoud for many reasons, a couple being. it is a pleasure to walk safely about town for folks of all ages, and has a small town feel. I hope the planning committee will ensure that these important attributes are kept in mind when finalizing the plans for the roadways.

Some things we will loose are inevitable, our beautiful view of the mountains and the stars.

Thank you for contacting us much appreciated 409 Cheyenne.

Sent from my iPhone

Community Development Department
PO Box 1229
Berthoud, CO 80513

Thank you for the opportunity to comment on the LUDLOW FARMS application.

This response to the development review proposal identified as LUDLOW Farms development, is comprised of comments and concerns of multiple residents of Sioux Drive. While the proposal generally adheres to the guidelines set forth in the 2021 Comprehensive Master Plan of the Town of Berthoud, there are many concerns and apprehensions about the implementation of the structures, amenities and commerce in practice.

To begin with, is it truly in the best interest of the Town to promote the development of 3-story condominiums in light of the strong citizen desire to maintain the “natural beauty of the area” and “small town feel?” Does it present the best image of the Town to have these placed so prominently that they’re the first thing a visitor sees as they enter the town from the west? Additionally, will a concentration of 3-story condominiums require the Town to bear the burden of procuring expensive fire trucks and other high dollar safety equipment, hiring of several additional first responders and possibly construction of additional fire stations? Does the TOWN even have equipment presently to evacuate residents and extinguish a fire in a 3-story structure of this density?

Regarding the overall layout of the proposed development, there is an opportunity here to make South Berthoud Parkway feel significantly more like a “Parkway”. A large portion, or the entirety, of the “LINEAR PARK” could be shifted to run adjacent to SBP from Welch to Spartan with the benefit of drawing more ‘feeling of community’ from surrounding neighborhoods with better access to trails and greenspace, and better foot and bike traffic access to the new commercial endeavors of this proposal. The posted speed limit could be lowered to 35 or even 30 to enhance safety and the sense of parkway while still maintaining the Major Collector attributes set forth in the 2021 Comprehensive Plan.

Vehicle access from the north and east should only be at points coincident with existing roads (Gateway, Welch, Arapahoe, Spartan). The identified “Minor Collector” proposed along the “Approximate Future Land Use Boundary” line that intersects South Berthoud Parkway must be eliminated. There is absolutely no need for any future or existing resident to bear the imposition of frequent headlights shining directly into their residence. (It just so happens to appear to be coincident to the family room windows at 103 Sioux Dr).

Architectural innovations should be minimized to maintain the cohesive feel of “small rural town” such as that feel of Mary's Farm which blends rural into suburban seamlessly and elegantly. Architectural innovations such as those in Prairie Star could best be suited for New Berthoud promoting a higher level of modern urbanization according to the 2021 Comprehensive Plan, while minimizing a disorganized blend of styles along the Mountain Corridor and adjacent neighborhoods.

There is no apparent consideration for school load increases with the introduction of 1500-1800 residences and the potential for 200-500 students. Should at least an elementary school be part of this proposal? It would fit nicely into the traffic access both vehicular and pedestrian.

With the proposed concentration density of residences, there's a very high concern over the increase in light and noise pollution. Will all lighting be downward directed and held to a minimum especially in the condominium, townhouse and commercial/mixed use areas while still providing a safe environment for residents and visitors? Minimal, aesthetically pleasing lighting along a widened South Berthoud Parkway greenspace, similar to that along North Berthoud Parkway trail would be very attractive and effective while at the same time still allowing a view of Berthoud's nighttime sky.

The Traffic Study conducted for evaluation of lane and flow adjustments should be deemed irrelevant as it was conducted on June 22, 2021 when there were no schools in session and we were still in 'work from home' mode by many normal commuters. At a minimum an updated study should be conducted to account for more 'normal' traffic.

Is this a good development to consider additional Senior housing, both unassisted and assisted living styles? Should a general emergency medical facility be considered as part of the mixed-use establishments to better serve the Town?

While it would be naive to think that the primary reason for my move to Berthoud 26 years ago, would continue unencumbered in perpetuity (small rural town with a great view of the mountain range), many of these ideas will minimize the impact of blocking the view and maintain the small-town feel. Not a totally bad trade-off. In the bigger picture however, each new development added to the city should always strive to enhance the beauty and appeal of the place people call – and want to call – home.

Recognizing that family-owned farms are a thing of the past, does it mean that they must be converted to high density housing to the excessive economic benefit of the developer and TOWN coffers? In light of other growth developments in the planning or implementation phases, could satisfactory economic gains be met with 1000-1200 residences and strong industrial and commercial endeavors?

A concern for the implementation of the proposed development would be the barren land when the economy is not conducive to rapid construction of the next phase. It would be beneficial to the environment, and the neighboring residents, to leave or plant sufficient erosion control crops (weeds are not a good crop) to minimize dust and runoff.

Finally, construction vehicle traffic on SBP should be minimized during plan implementation to avoid excessive wear on the newly rebuilt road (per the 2024 project plan).

Thank you for considering these comments and ideas. We look forward to the developer's comments and proposed resolutions.

Richard Alexander 103 Sioux Dr.	Steve Vettori 107 Sioux Drive	Laurel Tollefsrud 101 Sioux Dr	Susan Ellis 109 Sioux Dr

Adam Olinger

From: Curt Freese
Sent: Monday, October 10, 2022 9:39 AM
To: Adam Olinger
Subject: Fwd: Ludlow Farms comment

Sent from my iPhone

Begin forwarded message:

From: Kimberly McNally <kimberlyamcnally@gmail.com>
Date: October 10, 2022 at 9:21:08 AM MDT
To: ailinger@berthoud.org, Curt Freese <CFreese@berthoud.org>
Subject: **Ludlow Farms comment**

Town of Berthoud
Community Development Department,

I don't want more houses in this area.

You have allowed this sweet town to turn into a bedroom community.

We don't have the infrastructure to handle anymore traffic.

Mountain Ave is a 2 lane road through town and unless you want to remove the oak trees, it can never be anything wider.

Traffic is so bad at most times you can't cross the street on foot let alone cross streets in a car.

I'm near the high school and pulling out onto 10th or Berthoud Parkway can be very hard due to school traffic.

Parking in the business district is almost impossible therefore the businesses will suffer rather than flourish. People will go shop in other towns due to parking constraints.

One grocery store? Get real.

Almost all restaurants are closed on Monday!!!

Police force is lacking to. Crime has gone up.

My one comment probably doesn't count but I'm so tired of more houses and houses and apartments and townhouses.

Taxes, you have to be raking them in. Why do you keep raising ours?

Kim McNally

--

Kimberly McNally

Adam Olinger

From: natasha w <thecowojos@yahoo.com>
Sent: Monday, October 10, 2022 4:54 PM
To: Adam Olinger; wkatspeck@berthoud.org; Karl Ayers; Sean Murphy
Subject: Ludlow farm berthoud parkway and mountain

Hello Adam thank you for your time last week and filling me in on the plans for ludlow farm on the west corner of berthoud parkway and mountain. As a resident and homeowner were asking the board deny the proposal and bring back a growth cap for Berthoud. The excess building is unneeded and without proper infrastructure, affordable water, schools (yes I know this is Thompson school district but the schools are overcrowded period and voters will not approve) but the board can say no and should say no to protect the quality of our schools and do more for our water its going to keep being an issue. The water here is outrageously expensive and barely passes standards. Our water in Berthoud is some of the most expensive in the state besides Vail. Without proper infrastructure and water, building needs to stop the small town charm of Berthoud is being lost and the board can say no. Please listen to your residents look on Facebook over 200 comments saying no and enough. Preserve Berthoud and put back a building freeze, it's needed. Plus builders need to be paying for the road damage their causing like on Berthoud parkway it's not fair our tax dollars are being wasted on their wear and tear make the builders pay on the front end. Stop destroying the Berthoud we love, deny the ludlow proposal. The board needs to address the current issues and stop the excess building. Thank you, the Wojciechowski's

Adam Olinger

From: Carole <cvwhitt@aol.com>
Sent: Monday, October 10, 2022 6:17 PM
To: Adam Olinger
Subject: Ludlow Farms

How can you people vote in more homes in Berthoud when so many of us seniors cannot afford the higher taxes?

I am an 82-year-old senior and cannot get my taxes lowered for at 3 more years because I haven't lived in my home 10 years yet.

It's getting so difficult for some of us to go anywhere around town like we used to.

It doesn't seem plausible to add more homes when we don't even have a post office that can handle more. It just doesn't make sense.

My family has several businesses here in Berthoud, and there isn't much parking around so many of them. So instead of increasing their sales it will tak from them.

Please Please, no more here
Thank you

Carole Whittington

Adam Olinger

From: John Stocklin <stocklinphotography@gmail.com>
Sent: Monday, October 10, 2022 8:34 PM
To: Adam Olinger
Subject: Ludlow Farms Proposal

Hello,

John Stocklin here!

First of all, thank you for doing all the amazing things that you do for our wonderful community, it really means a lot.

I would like to formally oppose the Ludlow Farms proposal, it is just frankly not a good idea. There is a ton of growth already happening in town which is expected but we can't only focus on single family / multifamily dwellings.

We need more schools and other service items such as grocery stores etc. Not to mention the infrastructure should probably be improved before adding 1500+ homes PLUS the influx of at least 3000 people if not more.

Please please say no to this, it'll be such a bad idea for Berthoud.

Much appreciated and thank you.

Cheers,

John

Adam Olinger

From: Curt Freese
Sent: Monday, October 10, 2022 9:06 PM
To: Adam Olinger
Subject: Fwd: Ludlow Farms

Sent from my iPhone

Begin forwarded message:

From: rkurcab <rkurcab@yahoo.com>
Date: October 10, 2022 at 9:03:27 PM MDT
To: Curt Freese <CFreese@berthoud.org>
Subject: **Ludlow Farms**

To whom it may concern,

We feel that the proposed subdivision is too large in scope for the town of Berthoud. At build out this would increase the current population of the town by over 40% by itself. The small lot sizes and townhomes and condos bring a high density which is not in character with the town. This would put a strain on the downtown and infrastructure in place. The entrance at 287 would also greatly increase traffic through other neighborhoods in the area and the high school area.

Views of the mountains from Mountain Ave, which has been deemed important to the town, would be impacted by the project, especially on the north end with townhomes and condos.

If this development does go forward it should be scaled way back with less density.

Thank you for your consideration,

Richard Kurcab
Sandra Nickerson

Sent from my Galaxy Tab® S2

Adam Olinger

From: Curt Freese
Sent: Monday, October 10, 2022 9:18 PM
To: Adam Olinger
Subject: Fwd: Ludlow Farms opposition

Sent from my iPhone

Begin forwarded message:

From: Shannan Johnson <shannanmjohnson@gmail.com>
Date: October 10, 2022 at 9:17:08 PM MDT
To: Adam Olinger <aolinger@berthoud.org>, Curt Freese <CFreese@berthoud.org>
Subject: **Ludlow Farms opposition**

I would like to formally oppose the proposed developments at Ludlow Farms. The mere fact that Berthoud is currently building in multiple new developments with no foreseeable plan for immediate increase in schooling capacity is more than enough to oppose this. Our elementary students are currently in classes at Ivy Stockwell with very high student to teacher ratio already. Most new developments would be expected to have a large proportion of families with young children...where will they all go? Perhaps a smaller development with larger lots and more single family homes would be appropriate; we are already set to have additional multi-family units built at the corner of Berthoud Parkway and Spartan, an already busy area when school is in session. Berthoud Parkway in this area will become very congested. The draw of living in a community like this is the small town feel, beautiful mountain views, and ample farmland. Packing in homes into this development goes against all of that. It's too many new residential units!!!

Please consider scaling back the residential plan at this site.

Adam Olinger

From: Curt Freese
Sent: Monday, October 10, 2022 9:21 PM
To: Adam Olinger
Subject: Fwd: opposition

Sent from my iPhone

Begin forwarded message:

From: Amy Stocklin <amystocklin@gmail.com>
Date: October 10, 2022 at 8:41:20 PM MDT
To: Adam Olinger <aolinger@berthoud.org>, Curt Freese <CFreese@berthoud.org>
Subject: **opposition**

First of all, thank you for doing all the amazing things that you do for our wonderful community, it really means a lot.

I would like to formally oppose the Ludlow Farms proposal, it is just frankly not a good idea. There is a ton of growth already happening in town which is expected but we can't only focus on single-family / multifamily dwellings. We in no way have the infrastructure that is needed for what is being proposed.

We need more schools and other service items such as grocery stores etc. Not to mention the infrastructure should probably be improved before adding 1500+ homes PLUS the influx of at least 3000 people if not more.

Please please say no to this, it'll be such a bad idea for Berthoud.

Much appreciated and thank you.

Amy Porto

Adam Olinger

From: Derrik Johnson <dj8skate@gmail.com>
Sent: Monday, October 10, 2022 9:31 PM
To: Adam Olinger; Curt Freese
Subject: Ludlow Farms proposal

Good evening,

I'd like to voice my opposition to the proposal of development for the Ludlow Farms community. As a Berthoud resident in a community next to the proposed development (I live in Rose Farm Acres), the impact on our community would be significant. I would be happy to share the many ways we would be impacted, but to name a few I know that our schools will be impacted negatively as they are at capacity as it is. The new community would surely grow faster than any schools could be built, stressing our education system well beyond its limits and negatively impacting my children and their classmates. Furthermore, the recreation center is new and is already near capacity. It cannot support thousands more people. Finally, the development of the new community would impact both the noise levels and beautiful mountain views that were key factors in our decision to move to this neighborhood. Please feel free to reach out for further discussion if needed. Thank you.

Derrik Johnson

Adam Olinger

From: DaveandDianne Michael <dandmichael1985@gmail.com>
Sent: Monday, October 10, 2022 9:52 PM
To: Adam Olinger
Subject: Ludlow Farms proposal opposition

Hello,

We are at a bit of a disadvantage because my husband and I are out of town so we don't have access to the proposal specifics that we received in the mail.

But we are strongly opposed to the Ludlow Farms development. A project of that size would completely change the small town feel of Berthoud with that one community. Adding that many homes doesn't give Berthoud time to catch up on resources, such as police department, fire department, water, schools, mail carriers, etc.

At first, we weren't going to speak up because it doesn't feel like the city planners listen to the citizens, but we decided we should at least try.

We understand growth happens, but this growth is excessive.

Several of the city council candidates said they wanted to keep Berthoud's small town charm, but this isn't it!

Thank you for your consideration,
Dianne and Dave Michael
1099 Blue Bell Rd., Berthoud

Adam Olinger

From: Brandon Watkins <bwatkins6688@gmail.com>
Sent: Monday, October 10, 2022 10:21 PM
To: Curt Freese; Adam Olinger
Cc: Kelsey Wood
Subject: Ludlow Farms Proposal

Hello,

The Ludlow Farms proposal cannot be approved. Berthoud does not have the infrastructure, retail, water supply, school system capacity, or resources to properly build 1800 housing units in this area. Berthoud has seen sustained growth for several years now, increasing its economy and creating jobs. However, we have reached the point of growth going too far. Berthoud is losing its identity by turning every farm into a housing development. I understand the financial benefit of this massive development is enticing to the city, but I urge you to halt this project and consider the long term effects of destroying our agricultural land and not ensuring a sustainable, gradual growth plan. Small communities like Berthoud are rapidly disappearing. If this project is approved, there will no longer be any defining line between Longmont, Berthoud, and Loveland. We need small, iconic communities like Berthoud to stand up to big development and tell them enough is enough. Please do not allow this project to move forward.

-Brandon Watkins

Sent from my iPhone

Adam Olinger

From: Jessica Erickson <jerickson1005@gmail.com>
Sent: Monday, October 10, 2022 10:27 PM
To: Adam Olinger; Curt Freese
Subject: Ludlow Farms Opposition

To whom it may concern,

Hello, my name is Jessica Erickson and I am a concerned resident of Berthoud. Our town infrastructure cannot sustain a development of this magnitude. I also have a young child and I am already concerned about the lack of schools for our community. Adding another large neighborhood that will, no doubt, be filled with school age children will wreak havoc on our already filled schools.

I am also concerned about how this development will affect the safety of our community along with traffic, noise and environmental impacts.

Overall, this is not a good choice for Berthoud.

Please do not approve this development.

Thank you,
Jessica

Adam Olinger

From: Aron Erickson <aron.broman@gmail.com>
Sent: Monday, October 10, 2022 10:35 PM
To: Adam Olinger; Curt Freese
Subject: Ludlow farms proposal opposition

Dear Adam and Curt,

I am a concerned resident in Berthoud and against the approval of the Ludlow farms proposal. This development is extensive for the town of Berthoud without the infrastructure to support it. The town needs to propose improvements to energy, water, roads, and schools before considering additional home developments in the area. Schools in Berthoud can't handle the student population levels as it is and also can't hire or support enough teachers to handle proper teaching standards.

Traffic, noise, and safety are additional concerns for properties surrounding this proposed development. Current developments in the area have not provided proper safety standards and theft has increased in these areas. Further the development location is in a marshy area. This will cause future development problems with drainage issues and settling concerns.

I would prefer Berthoud maintain it's small hometown feel and grow responsibly to maintain proper infrastructure. I moved to this town recently because of it's unique character. Please consider denying this proposal.

Thank you,
Aron Erickson

Adam Olinger

From: Rhonda Callahan <rhondacallahan@gmail.com>
Sent: Monday, October 10, 2022 11:00 PM
To: Adam Olinger
Subject: No to ludlow farms.

There is enough traffic..not enough schools. Not enough water..you are being irresponsible and it's been 2 years and you can't get a cross walk marked for the kids in the neighborhoods we all ready have..be responsible for the families all ready here!!!

Sent from my iPhone

Adam Olinger

From: KAAREN CARONE <kcee369@aol.com>
Sent: Wednesday, October 12, 2022 6:57 PM
To: Adam Olinger; Curt Freese
Subject: Ludlow Farms proposal opposition

1,800 additional homes in this area creates a hazard insofar as safety, traffic, air quality, and the quality of life of current residents are concerned. There must also be concern regarding water supplies to the area. Please deny this proposal.

Kaaren Carone

Please email your thoughts to both email addresses below:

cfreese@berthoud.org

Cheers!

Sent from my iPad

Adam Olinger

From: Richard Calvo <rcalv002@gmail.com>
Sent: Thursday, October 13, 2022 8:14 AM
To: Curt Freese; Adam Olinger
Subject: Community Development: Ludlow Farms

Hello!

We received this proposal in the mail and we are completely against it. It's the only space around our neighborhood that is still open. It is also the only view of the mountains for us. There has been construction all around us since we moved here and this sounds like another huge, lengthy construction mess.

Adam Olinger

From: Kathleen Tabor <kathy.tabor@icloud.com>
Sent: Wednesday, October 12, 2022 3:00 PM
To: Adam Olinger
Cc: kathleen Tabor
Subject: Neighborhood notice Ludlow

Town of Berthoud

I apologize for the lateness but Covid is visiting my household. My husband and I received your letter regarding the Ludlow property proposal and we are homeowners impacted by this densely planned development (as is the rest of Berthoud). The town is unrecognizable as Berthoud anymore. All you see as you drive through town are great expanses of grey rooftops in densely built developments . Gone are lots that allow for privacy in exchange for a few feet distance between homes.

I can't believe an unbiased, thorough environmental impact study was done before these developments were approved. We are building too rapidly for our infrastructure .Where is the water for all these new homes going to come from? How are the police going to handle the increase in traffic, accidents and crime ? The same for our schools, fire department and roadways.

When are you going to cap the growth in this town as so many have requested? How are you going to protect existing neighborhoods from these densely populated developments from using the same resources? I already see it in our parks and along 10th street- the trash and traffic. When the Rose Farm went in I saw that tree lawns were included as open space. Are children supposed to include that as a park space to play in? No, they have to go to the closest available park in the Berthoud Heights West development. The town board members are approving more homes in less space and approve leaving only a small percentage as open space. Only developers/builders would have this type of mind set that would approve these type of developments and unbridled growth. Squeeze the land for as many dollars as possible.

Address the density and open space issue and put a growth cap back in place. Protect our resources and the people that have called this town home for so many years. You might as well change the town insignia to a mountain of rooftops instead of mountains because that is all you'll be capable of seeing.

Kathy Tabor
305 Cheyenne Drive
Berthoud. Co80513

Adam Olinger

From: Jeremy Olinger
Sent: Monday, October 24, 2022 4:49 PM
To: Adam Olinger
Subject: FW: Email contact from Berthoud, CO



Jeremy Olinger, CPRP
Deputy Town Administrator

Phone: 970.344.5824
jolinger@berthoud.org
Berthoud.org
807 Mountain Ave. Berthoud,
CO 80513



From: Berthoud, CO <webmaster@berthoud.org>
Sent: Monday, October 24, 2022 3:44 PM
To: Jeremy Olinger <jolinger@berthoud.org>
Subject: Email contact from Berthoud, CO

Message submitted from the <Berthoud, CO> website.

Site Visitor Name: Greg
Site Visitor Email: Gwojo321@yahoo.com

Please bring back the building cap for berthoud between water costs and usage, infrastructure, schools, the loss of farms and habitat for animals it's to much. We are against ludlow farm building thousands of homes bring back the building cap before berthoud is lost.



LAND USE SUMMARY:



D) The maximum dwelling unit per acre is intended to place a density cap on the future development of individual parcels within these larger parcels.

Notes:	
Preferred	Preferred Land Use
Allowed	Allowed Land Use
Allowed*	Permitted as second story residential in these zones
Allowed**	Permitted if primary land use is commercial
-	Not Allowed, Use may be considered with Special Review by Town of Berthoud Town Board



Planning Commission Minutes – March 09, 2023

- 1. Call to Order** – The Planning Commission convened a regular meeting on March 09, 2023.
Chairwoman Dowker called the meeting to order at 6:00 p.m.

- 2. Roll Call** – Members present:
- | | |
|------------------|-------------------|
| Jan Dowker | (Chairwoman) |
| Karen Anderson | (Vice Chairwoman) |
| Chris Kurtz | (Secretary) |
| Melissa Feldbush | (Commissioner) |
| Abigail Smith | (Commissioner) |
| Brett Wing | (Commissioner) |
- Staff present:
- | | |
|-------------------|--|
| Anne Johnson | (Community Development Director) |
| Will Charles | (Baseline Engineering – Principal Planner) |
| Michelle Tovar | (Deputy Town Clerk) |
| Jonathan Mitchell | (Permit Technician) |

- 3. Consent Agenda** – Minutes from the February 23, 2023 Planning Commission Meeting.

MOTION made by Commissioner Anderson to APPROVE the Minutes for February 23, 2022.

SECONDED by Commissioner Wing.

Abstained by Commissioner Feldbush due to not attending the meeting.

With those all in favor, THE MOTION CARRIED.

- 4. Public Hearing: Farmstead Acres Minor Subdivision (Terra Forma Solutions, Todd Johnson agent)**

Director Johnson introduced the Applicant's request for a minor subdivision to separate the existing parcel into four (4) lots.

Presented by Will Charles of Baseline Engineering.

Public Comment was opened at 6:14 p.m.

Public Comment was closed at 6:14 p.m.

MOTION made by Commissioner Kurtz to VACATE the Minor Subdivision Approval on February 23, 2023 relating to this case because a Public Hearing was not held prior to the MOTION and VOTE.

SECONDED by Commissioner Anderson.

With all in favor, THE MOTION CARRIED.

MOTION made by Commissioner Kurtz to APPROVE the Minor Subdivision with the following condition:

- 01. The Applicant shall provide an updated title commitment dated no more than thirty (30) days from the date of conditional approval.**

SECONDED by Commissioner Anderson.

With all in favor, THE MOTION CARRIED

5. Public Hearing: Heron Lakes 17th Filing (Three Lakes Development Inc., Jim Birdsall - agent)

Director Johnson introduced the request for a preliminary plat for the creation of 132 lots intended for single family residential. Additionally, as part of the preliminary plat, the applicant is requesting a waiver to curb and gutter requirements along County Road 14.

Presented by Will Charles of Baseline Engineering.

Public Comment was opened at 6:32 p.m.

John Baker shared his concerns about the added traffic to County Road 14. He would like to see improvements on Country Road 14 such as shoulders and sidewalks.

Public Comment was closed at 6:35 p.m.

MOTION made by Commissioner Anderson to DENY the waiver of the requirement that the applicant not construct a curb and gutter along County Road 14 for the reasons stated in the attached memo from the Town's Development Review Engineer dated February 28, 2023.

MOTION made by Commissioner Anderson to AMEND her MOTION to DENY the waiver of the requirement that the applicant construct a curb and gutter along County Road 14 for the reasons stated in the attached memo from the Town's Development Review Engineer dated February 28, 2023.

SECONDED by Commissioner Kurtz.

With all in favor, THE MOTION CARRIED.

MOTION made by Commissioner Wing to RECOMMEND APPROVAL of the Preliminary Plat to the Board of Trustees, subject to the following conditions:

- 01. The Applicant shall revise their plan to include a curb and gutter along County Road 14 which shall be constructed in the future by the Applicant for their proportionate share of the improvements when the Town makes such improvements on adjacent properties.**
- 02. The Applicant shall apply for or receive approval of Rezoning prior to approval of Final Plat.**

SECONDED by Commissioner Anderson.

With all in favor, THE MOTION CARRIED.

6. Public Hearing: Ludlow Farms NMP and Rezoning (Ludlow Farms, LLC – Don Hinson, Manager)

Director Johnson introduced the request of rezoning to Suburban Residential (SR) and Urban Residential (UR) from the Ludlow Farms Planned Unit Development (PUD) and a Neighborhood Master Plan.

Presented by Will Charles of Baseline Engineering.

Public Comment (Rezoning) was opened at 8:04 p.m.

Public Comment (Rezoning) was closed at 8:05 p.m.

MOTION made by Commissioner Anderson to RECOMMEND APPROVAL of the Rezoning to the Town Board with the following condition:

- 01. The rezoning will be approved only upon approval of the Neighborhood Master Plan.**

SECONDED by Commissioner Wing.

With all in favor, THE MOTION CARRIED.

Public Comment (Neighborhood Master Plan) was opened at 8:15 p.m.

George Garmany was concerned about the traffic along Berthoud Parkway. He would like to see one additional access point onto Highway 287.

Kaitlin Shepherd was concerned about gentrification and high home prices.

Carl Tabor agreed with previous statements regarding traffic.

Aron Erickson agreed with previous comments made. He expressed concern about schools and noise and light pollution created from construction.

Derrick Johnson agreed with previous statements. His biggest concern was about schools, and was concerned about traffic increases.

Dianne Michael was concerned about Berthoud losing its small-town feel, the increase in population, and the general character of the town.

Jay Mueller was concerned about the population growth and would like to see the growth to stop.

Christine Torres addressed the concerns about the schools and the importance of the funding from the growth.

Chris Shepherd was concerned about traffic access to Interstate 25.

Anita Conner expressed her concern about the added growth.

Public Comment (Neighborhood Master Plan) was closed at 8:35 p.m.

Chairwoman Dowker asked Applicant about the affordable housing in the development.

Applicant Hinson expressed the desire to work with Mission Homes and David Gregg and to provide for the community.

Commissioner Feldbush and Commissioner Smith both appreciate the use of affordable housing and expressed its importance.

MOTION made by Commissioner Wing to RECOMMEND APPROVAL of the Neighborhood Master Plan to the Board of Trustees.

SECONDED by Commissioner Anderson.

With all in favor, THE MOTION CARRIED.

7. Reports –

Commissioner Anderson, Commissioner Dowker, and Commissioner Smith wanted to thank the commissioners for all their work and support.

Director Johnson:

- She shall be preparing a Planning Commissioner electronic notebook with links for commissioners to helpful information, maps, and more.
- She has reached out to DOLA for commissioner training and information.
- She is currently developing an Active Projects list for the Town of Berthoud website.
- All future participation for Planning Commission meetings shall be in-person.

8. Adjourn –

The meeting was adjourned at 10:33 p.m.

CHAIRPERSON

SECRETARY