



Identifying and prioritizing the trail gaps in  
downtown Milliken, Colorado

APRIL

2015

# TOWN OF MILLIKEN

## TRAIL & SIDEWALK GAP ANALYSIS

Prepared by Lamp Ryneerson & Associates  
For the Town of Milliken, Colorado

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## SUPPORTING AGENCIES



### KAISER PERMANENTE

This report was made possible in part through a \$100,000 Kaiser Permanente Walk and Wheel Grant Program. *The program's core purpose is to promote healthy living by encouraging alternative modes of transportation.*



Recognition goes to The Colorado Department of Transportation who awarded the Town of Milliken a \$300,000 grant to assist in the construction of the Johnstown-Milliken Trail.

## EXECUTIVE SUMMARY

Sporadic development through the years has resulted in trail and sidewalk fragments that pose a safety risk and other challenges for residents of the Town of Milliken (Town). This gap analysis identifies the following:

- location of trail and sidewalk gaps
- prioritizes the improvements to the trail system
- evaluates the design challenges
- provides solutions and location of proposed trails
- estimates costs for closing the gaps

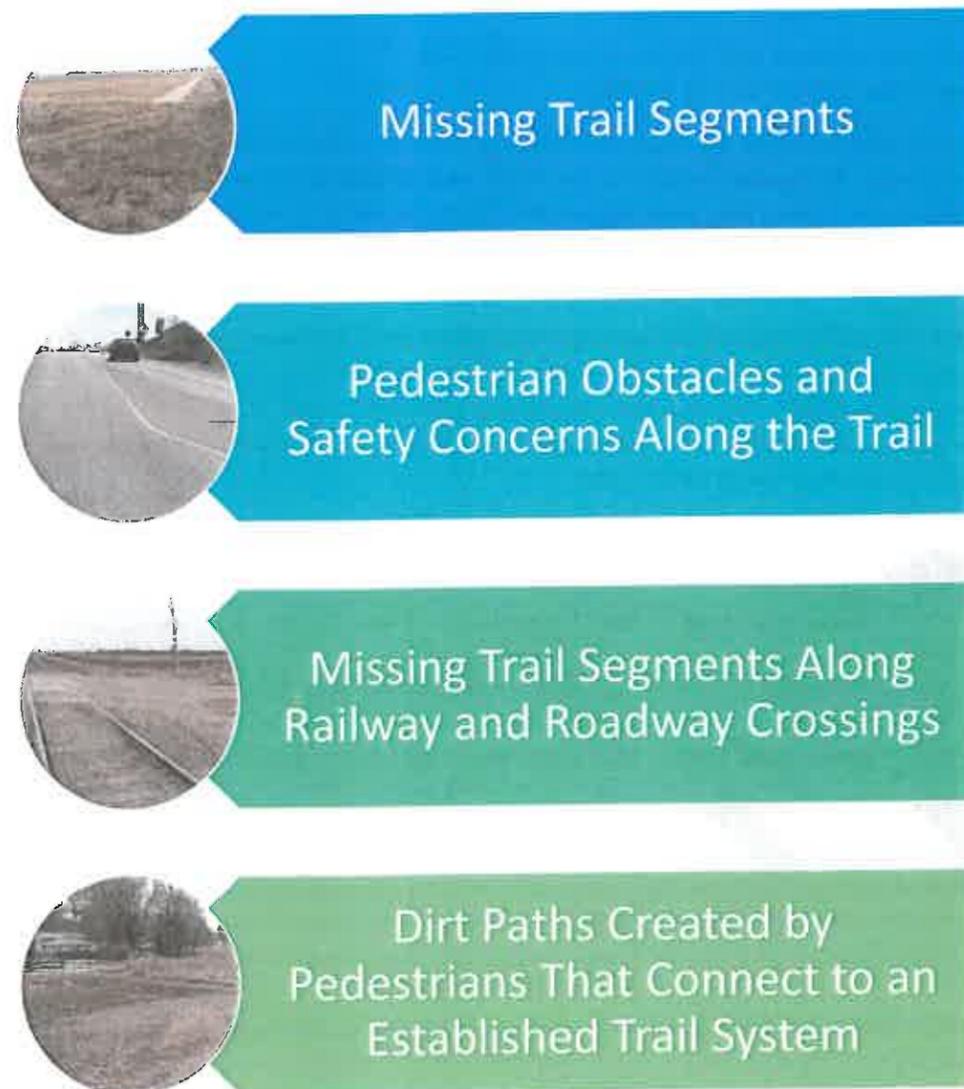
Kaiser Permanente awarded the Town of Milliken a grant to promote alternative modes of transportation within the Town. This grant, known as the Walk and Wheels grant, is designed to engage Colorado communities by promoting safe environments that foster access to a healthy outlet in order to commute to destinations within the Town and adjacent communities. A portion of the grant funds were used to prepare this report.

Connection of existing trails will promote both pedestrian and bicycle usage as well as provide safer travel routes within the Town. Trail gaps within the Town were prioritized based on input from Town Board Members and Town Staff. The evaluation of existing gaps was limited to the more central area of Milliken. Six major gaps were identified, prioritized and conceptual opinion of costs were prepared. The following information summarizes the six major gaps:

Priority	Gap Name	Location	Approximate Costs
1	Broad Street East	UPRR Crossing	\$400,000
2	Alice Avenue	UPRR Crossing	\$368,000
3	Quentine	Windmill Gate to Broad Street	\$73,000
4	Inez Blvd	UPRR Crossing	\$190,000
5	Broad Street West	Kathleen Ave. to Josephine Ave.	\$224,000
6	Quentine/Inez Blvd	Lilac St. to Dove Valley Lane	\$285,000

## TRAIL GAPS — WHAT ARE THEY?

Trail gaps are existing trails and sidewalks within the Town that have missing segments. These gaps prevent users of the trail and sidewalk system from traveling efficiently and safely throughout the Town. For the purpose of this study, the term 'trail' is referenced to include a trail or sidewalk, and consists of either concrete or a gravel type material. The gap study identifies the following types of gaps:



Trail systems promote the use of public facilities and parks within the Town. Exhibits of each gap are included in the Gap Prioritization, Recommendation and Cost Analysis section of this analysis.

## WHY COMPLETE THE GAPS IN TOWN?

A number of compelling reasons exist for gap completion within the Town of Milliken. The list is shown below and a brief explanation of each item follows:

- Safety
- Economic Development
- Community Health
- Alternative Transportation

### Safety

The National Committee for Traffic Safety addressed the issue of sidewalk availability and stated the following: "Traffic safety demands good sidewalks on each side of every residential street. Vehicular traffic and pedestrians should be segregated. It is unsafe, unreasonable and often disagreeable to pedestrians to be forced to walk on the paved roadway. Parents do not want children playing in the roadway — yet if they have roller skates, scooters or other wheeled toys, they will use the roadway unless a smooth sidewalk is available. Mothers with baby carriages and elderly persons should have sidewalks. Nearly three-fifths of the persons killed in traffic are killed at night, and walking on the roadway is a major night hazard.<sup>1</sup>" The need to complete trail gaps is essential to maintaining pedestrian safety and reducing accidents between pedestrians and vehicles.

### Economic Development

According to the National Association of Homebuilders and National Association of Realtors, a survey of 2,000 homebuyers indicated that walking/jogging/bike trails are "important to very important" in regards to an amenity desired in development.<sup>2</sup> Thus, projects with trail inclusion are becoming more marketable to both developers and homebuyers. In essence, the establishment of trails helps promote development as it is a valuable commodity to offer residents and businesses. Existing trail infrastructure within the Town will operate as the beginning stage of a trail system that will provide opportunities for future commercial and residential development. Future trail networks will integrate with the existing trails to encompass an overall usable system.

### Community Health

Studies by the National Institute of Health indicate a sedentary lifestyle as the primary reason the obesity epidemic has plagued our society. It has been determined that there is a direct correspondence between obesity and elevated medical costs. Trails provide an exercise resource for Town residents to engage in physical activities that promote health.<sup>3</sup>

### Alternative Transportation

Completing a trail system provides travel options for non-vehicular travel. Individuals choosing to travel in and around the Town can benefit from the reduced safety risk of pedestrians traveling on roadways, reduced traffic congestion and ease of access to Town facilities.

<sup>1</sup>"Sidewalks in Suburbs." *Planning*. <<https://www.planning.org/pas/at60/report195/>>.

<sup>2</sup>"How cities use parks for economic development." *Planning*. <<https://www.planning.org/cityparks/briefingpapers/>>.

<sup>3</sup>Searns, Bob . "Benefits of Trails and Greenways." *American Trails*. Oct. 2002. <<http://www.americantrails.org/resources/benefits/1>>.

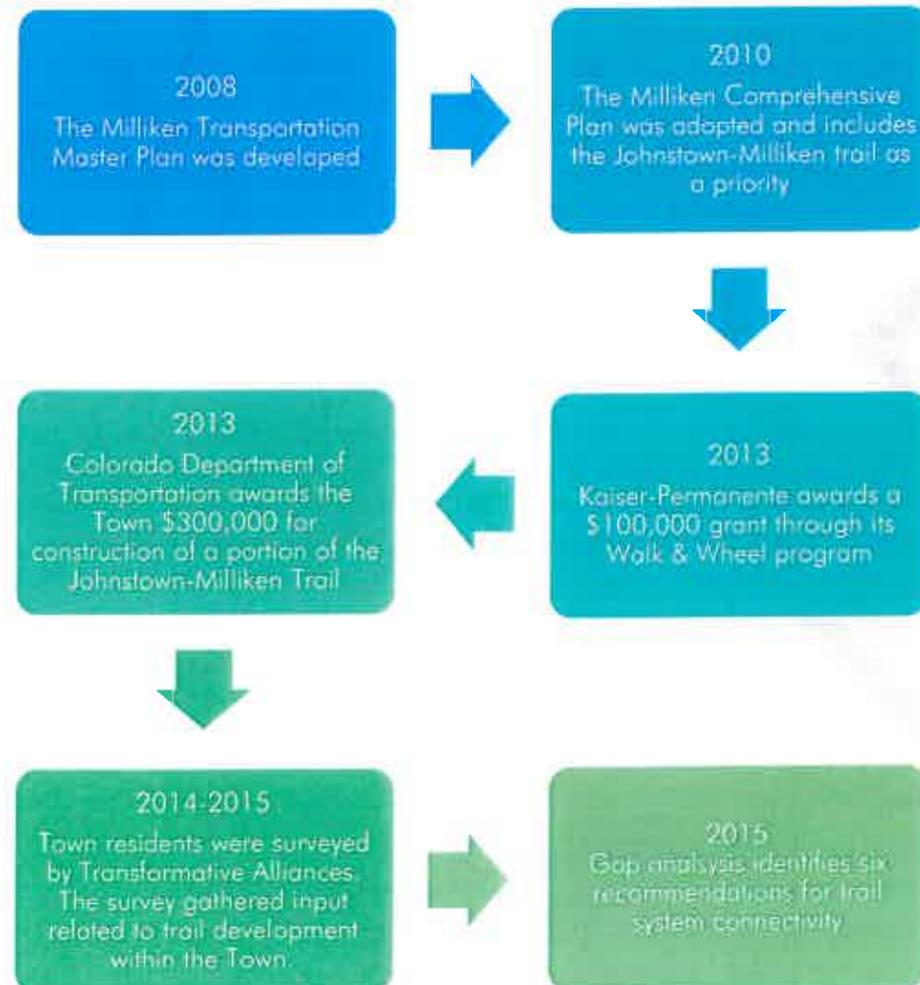
## PROJECT BACKGROUND

### Town History

Judge John David Milliken, owner of the Northwestern Land and Iron Company, annexed the Hillsboro community in 1910. The Town experienced rapid growth in the late 1960's and early 1970's which resulted in a notable development boom. In the mid-1980's original dirt roadways within the Town were paved. Sporadic development throughout the years has resulted in sidewalk fragments that pose a safety risk, as well as other challenges for residents and visitors of the Town.

### Trail Master Plan

In 2003, the Towns of Milliken and Johnstown collaborated to establish a Master Plan that identified future trail locations. The 2003 Master Plan included a proposed trail that would connect the two towns, now being referred to as the Johnstown-Milliken Trail. Since the Master Plan creation there are several notable events that have occurred:



### Trail Construction & Design

With the Town Board setting the expansion of the trail system as a priority, many actions have been taken to progress the construction of trail systems within the Town. Community Parks and trails have been incorporated into new development. Town staff has been successful at acquiring grant funds and other funding opportunities. These funds have resulted in the construction of several trail projects that include:



#### Safe Routes to School

Numerous sidewalks have been constructed within the Town to provide students a safe means of travel to and from the elementary and middle schools.



#### Highway 257 Trail Phase I

An alternative study was prepared to identify trail system options for communities to the north of the Town. The study addressed connection to downtown and outdoor amenities including the Big Thompson and Little Thompson River. With this study completed, the Town was able to receive funds for construction of a portion of a trail identified in the study. The construction beginning near the intersection of Highway 60 and Norman Avenue, extending west along Highway 60 and terminating south of the intersection of Highway 60 and Highway 257.



#### The Johnstown-Milliken Trail (JMT)

The Milliken portion of the JMT is currently in the design phase, with construction planned to begin in the fall of 2015. The proposed trail is located on the southside of Weld County Road 46 1/2, beginning at end of W. Green Street and terminating at Weld County Road 19.



CDOT will begin construction of the ADA Handicap Ramp Improvement project along the Broad Street with downtown area on in May 2015.

### Public Trail Survey

Between November 2014 and Mid-February 2015 Town residents were surveyed by Transformative Alliances. The survey gathered input related to the JMT. The survey consisted of door-to-door canvassing, an online survey and distributed paper surveys that were located at the Town Hall and Senior Center. Summary of the survey results are listed below:

- 26.8% were aware of the trail
- 15.8% intend to use the trail on a daily basis
- 32.8% intend to use the trail 3-5 times per week
- 23.2% intend to use the trail 1-2 times per week
- Only 4.5% of respondents do not intend to use the trail
- 71.5% of respondents intend to use the trail once it is connected to the Town of Johnstown

The survey results display a desire and support for a comprehensive trail system within the community.

## GAP ANALYSIS

### Gap Analysis Criteria

The documents and standards that were utilized in making recommendations for this study are listed below.

- The 2003 Master Plan was developed as a guideline for current trail development. The Master Plan includes future trail alignments to be developed, as well as trail widths, geometrics and location to adjacent roadways.
- State Highway 257 Corridor Trail Feasibility Study, July 23, 2013 by Loris and Associates was referenced for trail locations, railroad information and construction costs.
- The American Association of State Highway and Transportation Officials (AASHTO) and the AASHTO Guide for the Development of Bicycle Facilities was referenced for trail design compliance for railway approaches.
- The Americans with Disabilities Act (ADA) was reference for railway approaches and handrail requirements.

### Gap Components

The following pages and exhibits are dedicated to identifying, evaluating and summarizing each gap. Exhibit A illustrates how the Town is connected with trail systems and identifies existing and future trails, as well as the priority gaps. Town parks, schools and facilities are referenced on the map, as well as waterways and irrigation canals.

The following gaps were identified based on field observations, aerial mapping and input from Town staff. The gaps were then prioritized based on safety, associated uses, location and need.

Priority	Gap Name	Location	Approximate Costs
1	Broad Street East	UPRR Crossing	\$400,000
2	Alice Avenue	UPRR Crossing	\$368,000
3	Quentine	Windmill Gate to Broad Street	\$73,000
4	Inez Blvd	UPRR Crossing	\$190,000
5	Broad Street West	Kathleen Ave. to Josephine Ave.	\$224,000
6	Quentine/Inez Blvd	Lilac St. to Dove Valley Lane	\$285,000

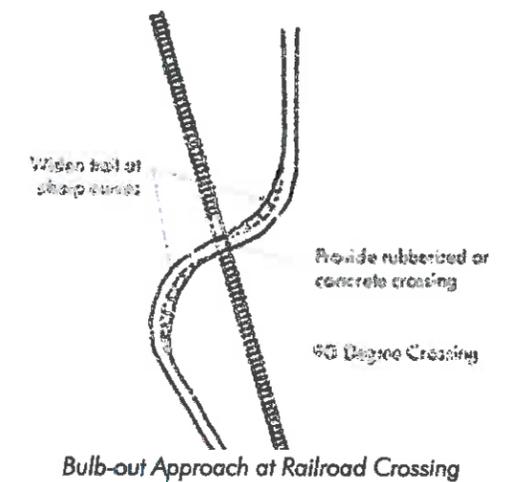
### IDENTIFYING AND PRIORITIZING THE TRAIL GAPS IN DOWNTOWN MILLIKEN, COLORADO

### Overall Gap Challenges and Recommendations

Each gap was evaluated for constructability and to meet the design guidelines of AASHTO and ADA. Construction of a few of the gaps are as simple as installing sidewalk adjacent to the roadway within the right-of-way, while others have more complicated challenges such as available right-of-way or easements, crossing railroad tracks, elevation differences and meeting ADA requirements. The challenges evaluated for each gap are summarized below:

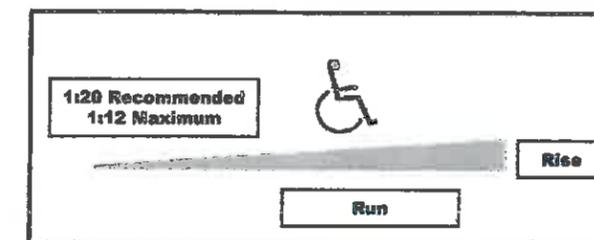
- Available Right of Way and/or Access Easement Acquisition
- Railroad Right-of-Way Encroachment and Permit Acquisition
- Safe passage for pedestrians, bicycles and wheelchairs
- Safe passage over railroad crossings
- Compliance with ADA requirements
- Meet AASHTO guidelines

Gap locations have been identified as crossing within the Union Pacific Railroad Company (UPRR) right-of-way. The Town will need to coordinate with UPRR to acquire permission and negotiate crossing agreements. There are currently five identified railway gap crossings within the Town. It is recommended that all of the crossings be presented to UPRR simultaneously to minimize the time required for negotiations and permit acquisition.



The AASHTO Guide for the Development of Bicycle Facilities recommends that the most suitable bicycle travel approach for a railroad crossing is perpendicular to the track so as to avoid bicycle tires accidentally sliding between the railway flanges, causing an accident. This potential hazard may also be for wheelchairs. The railway alignment through town is in a northwest to southeast direction. This diagonal alignment may require a "bulb-out" approach when crossing the tracks to provide a safe crossing for bicycles and wheelchairs. The illustration to the right shows an example of a "bulb-out" approach. This design will need to be coordinated with the railroad company.

ADA guidelines require that maximum longitudinal slopes be less than 12:1. That is, for every 12 inches of sidewalk travelled horizontally a 1 inch rise is the maximum vertical displacement allowed. If the vertical rise is greater than 6" with a 12:1 slope, a handrail is required (20:1 does not require a handrail). In addition, a landing is required every 30" of rise.



ADA Trail Slope Exhibit

### Trail Signage

The addition of proper signage and striping for the trails are necessary to promote safe travel throughout the Town. Signs are particularly important at the railway crossing so that users are aware of the impending crossing and the associated railway hazard. Directing bicycles from the roadway and onto the trail when crossing the railroad will help minimize accidents. These items may be addressed during a final design phase resulting in proper signage and striping at all locations.



### Geographic Information Systems

The data produced with this analysis details the current and future trail system. It serves as a tool to assist in the Town's overall growth, infrastructure needs and land development. Existing trail data was obtained through site visits, walking the trails with a GPS tracker and aerial imagery. This data was then entered into a GIS database and can be used by the Town as a tool to assist in identifying potential projects.

### Cost Analysis

A conceptual design for each gap was considered and a cost evaluation performed to assist the Town when budgeting for the design and construction, applying for grants and identifying other funding opportunities. A conceptual opinion of probable costs was then prepared for each gap. The opinion of costs include several items at the bottom to include the following:

Item	Description
Construction Cost	Construction costs that are based on material quantities
Contingency	20% markup for material and labor due to preliminary estimate and fluctuation in costs
UPRR Access Permit	Estimate for negotiation with Railroad and potential fees for Access Permit
Irrigation Ditch Crossing Agreement	Estimate for negotiation with ditch company and crossing fees.
Engineering & Project Management	Estimate includes design, project management and administrative costs based on a percentage of the construction costs.
Surveying	Estimate includes field surveying for the design and construction of the project, based on a percentage of the construction costs.
Construction Administration & Inspection	Estimate includes construction administration and inspection services during construction, based on a percentage of the construction costs.
Construction Testing	Material and Soil Testing services during construction, based on a percentage of the construction costs.

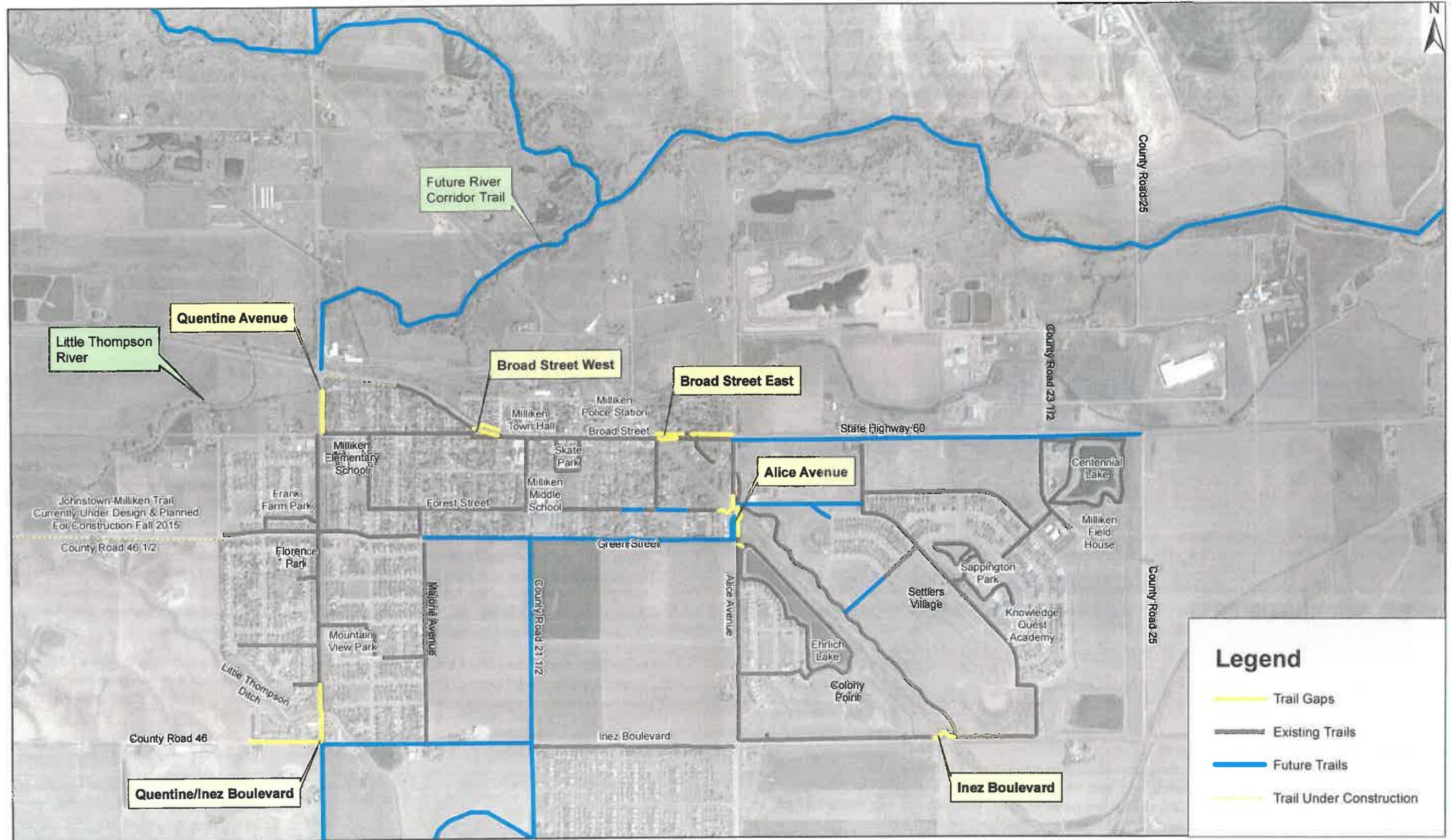
### Future Trail Development

A Trail Map & Gap Locations exhibit was prepared based on the review of several reports and documents provided by the Town and our gap analysis. Exhibit A illustrates the location of existing and future trails, as well as the trail gaps identified within this analysis. The future trails identified on the exhibit highlight the location of the main arterial trails that may either be constructed by future development or through Capital Improvement Projects by the Town.

There is an important East-West trail corridor identified along Green Street that will provide trail users and students to navigate to and from Sappington Park and the Milliken Field House (planned for construction Fall 2015). A portion of this future trail is currently either a dirt alley, paved roadway or farmland. Until development occurs to the property south of Green Street or right of way/easements are obtained to construct a trail, this trail connection may not be feasible to build for some time.

In the short term, Forest Street has been identified as an interim solution in getting middle school students to and from the Field House. There are a few short segments of sidewalk that can be constructed, along with the Alice Avenue gap improvements, to provide a safe passage for student travelling to the Field House.

# TOWN OF MILLIKEN TRAIL GAP ANALYSIS



**EXHIBIT A  
TRAIL MAP & GAP LOCATIONS**

### Broad Street West

Completing the Broad Street trail on the west end of town provides an important link for the community along the Town's main street. Broad Street continues as Highway 60 towards the west. There is an existing concrete trail on the south side of SH 60 that begins at Kathleen Avenue and ends at Norma Avenue. Currently there is a construction project underway for the continuation of the concrete trail going west from Norma Avenue to Quentine Avenue. This construction project also includes curb returns, handicap ramps and pedestrian signals at the intersection of Highway 60 and Quentine Avenue.

In observing pedestrians near the intersection of Broad Street and Josephine Avenue there appears to be a gap. There is existing sidewalk on Kathleen Avenue and on the south side of Broad Street that includes painted crosswalks for safe crossing, however, the path to get from Kathleen Avenue to Josephine is indirect. To provide trail continuity a concrete walk could be added on the south side of Highway 60 between Kathleen and Josephine.

### Challenges

- Proposed Trail Within CDOT Right-of-way - design and construction will need to adhere CDOT process requirements and construction specifications
- Possible Utility Relocation
- Elevation and Cross slope – need for short retaining walls
- 

### Recommendations

- Define Trail Alignment and Improvements
- CDOT Coordination and Approval
- Boulder Retaining Wall Design
- Add Handicap Ramps and Painted Crosswalk at Kathleen Avenue

Refer to Exhibit B for the location and conceptual layout of the gaps along Broad Street.

### Cost Analysis

#### Broad Street West - South Side

Trail Length = 690' Trail Width = 6'

No.	Bid Item Description	Approx. Quantity	Unit	Unit Cost	Total
1	Mobilization	1	LS	\$15,000	\$15,000
1	Clear, Grubbing & Removals	8,280	SF	\$0.20	\$1,656
2	Earthwork	310	CY	\$15	\$4,650
3	6' Wide Concrete Sidewalk	4,140	SF	\$6	\$24,840
4	Aggregate Base Course (Class 6)	51	CY	\$40	\$2,040
5	Handicap Ramp	2	EA	\$2,500	\$5,000
6	Rock Retaining Wall	140	LF	\$150	\$21,000
7	Signing & Striping	1	LS	\$3,000	\$3,000
8	Erosion Control	1	LS	\$1,500	\$1,500
9	Concrete Washout Structure	1	EA	\$1,200	\$1,200
10	Soil Prep, Reseed & Mulch	0.40	AC	\$6,500	\$2,600
11	Utility Relocation	1	LS	\$5,000	\$5,000
12	Sanitary Facility	1	EA	\$400	\$400
<b>Construction Costs Subtotal</b>					<b>\$87,886</b>
Engineering & Project Management - CDOT (15%)					\$17,577
Construction Administration & Inspection CDOT (15%)					\$17,577
Surveying (5%)					\$4,394
Construction Testing (2%)					\$1,758
Contingency (20%)					\$17,577
<b>Total Project Cost</b>					<b>\$146,770</b>

This is an Opinion of Cost and supplied only as a guide. LRA is not responsible for fluctuation in cost of material, labor, design and construction administration costs.

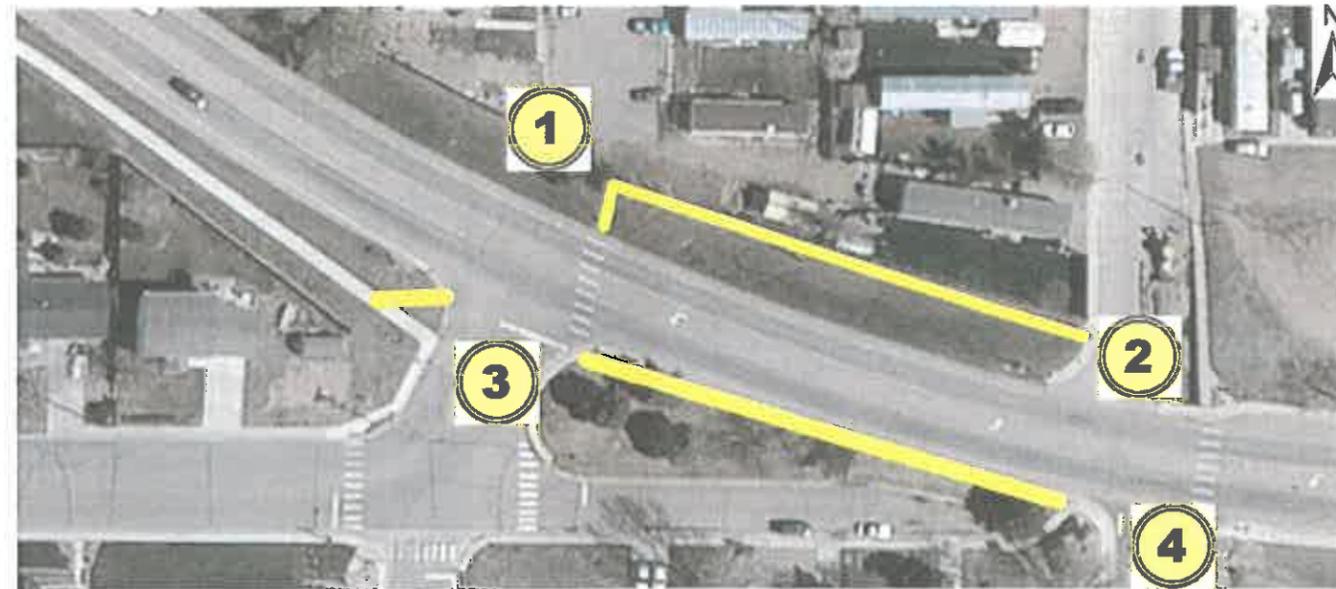
#### Broad Street West - North Side

Trail Length = 250' Trail Width = 4'

No.	Bid Item Description	Approx. Quantity	Unit	Unit Cost	Total
1	Mobilization	1	LS	\$15,000	\$15,000
1	Clear, Grubbing & Removals	2,000	SF	\$0.20	\$400
2	Earthwork	80	CY	\$15	\$1,200
3	4' Wide Concrete Sidewalk	1,000	SF	\$6	\$6,000
4	Aggregate Base Course (Class 6)	13	CY	\$40	\$520
5	Handicap Ramp	1	EA	\$2,500	\$2,500
6	Signing & Striping	1	LS	\$2,000	\$2,000
7	Erosion Control	1	LS	\$1,500	\$1,500
8	Concrete Washout Structure	1	EA	\$1,200	\$1,200
9	Soil Prep, Reseed & Mulch	0.20	AC	\$6,500	\$1,300
10	Utility Relocation	1	LS	\$1,000	\$1,000
11	Sanitary Facility	1	EA	\$400	\$400
<b>Construction Costs Subtotal</b>					<b>\$33,020</b>
Engineering & Project Management - CDOT (15%)					\$6,604
Construction Administration & Inspection CDOT (15%)					\$6,604
Surveying (5%)					\$1,651
Construction Testing (2%)					\$660
Contingency (20%)					\$6,604
<b>Total Project Cost</b>					<b>\$55,143</b>

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# EXHIBIT B - BROAD STREET WEST



### Broad Street East

Connecting Broad Street on the east end of Town will provide a continuous trail route along the Town's main street. There are gaps on both side of the street along Broad Street. The gap on the south side of Broad St., east of Dorothy Avenue, is due to the Union Pacific Railroad (UPRR) right of way. Just east of the UPRR right of way, a concrete sidewalk continues on the south side of Broad Street to the corner of Alice Avenue.

There are no existing sidewalks on the north side of Broad Street, east of Dorothy Avenue, except for a small portion just east of Cora Avenue. Several dirt paths appear to be used by pedestrians, bicycles and other modes of transportation, including wheel chairs, to access the residential area north of Broad Street.

### Challenges

- UPRR Right-of-Way Access Permit Acquisition - Requesting the use of the UPRR Right of Way and negotiating the access permit will be a lengthy process and may be cost prohibitive to the Town proceeding forward.
- Skewed Railroad Alignment – safety concerns at crossing rails for bicycles and wheelchairs.
- Proposed Trail Within CDOT Right-of-way - design and construction will need to adhere CDOT process requirements and construction specifications
- Possible Utility Relocation – there is a potential that utilities may need to be relocated on the north side of Broad Street.
- Safely crossing of Broad Street and side streets.

### Recommendations

- Define Trail Alignment and Improvements
- UPRR Right-of-Way Access Permit Acquisition – Begin conversations with UPRR regarding the proposed crossings, begin negotiations in acquiring permission and access permits.
- Perpendicular Travel Over Railway – provide “bulb out” to safely cross rails for bicycles and wheelchairs
- Define Trail Alignment and Improvements
- CDOT Coordination and Approval Signing and Striping to Divert Bicycle Traffic to Trail at Railroad Crossing
- Add Handicap Ramps and Painted Crosswalk at Dorothy Ave., Aragon Ct., Cora Ave., Beulah Ave. & Alice Avenue
- Coordination w/ Utility Companies for potential utility relocation

Refer to Exhibit C for the location and conceptual layout of the gaps along Broad Street.

### Cost Analysis

#### Broad Street East - South Side

Trail Length = 215' Trail Width = 6'

No.	Bid Item Description	Approx. Quantity	Unit	Unit Cost	Total
1	Mobilization	1	LS	\$15,000	\$15,000
1	Clear, Grubbing & Removals	2,580	SF	\$0.20	\$516
2	Earthwork	100	CY	\$15	\$1,500
3	6' Wide Concrete Sidewalk	1,290	SF	\$6	\$7,740
4	Aggregate Base Course (Class 6)	16	CY	\$40	\$640
5	Handicap Ramp	1	EA	\$2,500	\$2,500
6	At-Grade Railroad Crossing (UPRR)	1	LS	\$50,000	\$50,000
7	Traffic Control/Flagging (UPRR)	5	EA	\$900	\$4,500
8	Signing & Striping	1	LS	\$3,000	\$3,000
9	Erosion Control	1	LS	\$1,500	\$1,500
10	Concrete Washout Structure	1	EA	\$1,200	\$1,200
11	Soil Prep, Reseed & Mulch	0.10	AC	\$6,500	\$650
12	Utility Relocation	1	LS	\$1,000	\$1,000
13	Sanitary Facility	1	EA	\$400	\$400
<b>Construction Costs Subtotal</b>					<b>\$90,146</b>
UPRR Access Permit					\$25,000
Engineering & Project Management - CDOT (20%)					\$18,029
Construction Administration & Inspection CDOT (20%)					\$18,029
Surveying (5%)					\$4,507
Construction Testing (2%)					\$1,803
Contingency (20%)					\$18,029
<b>Total Project Cost</b>					<b>\$175,544</b>

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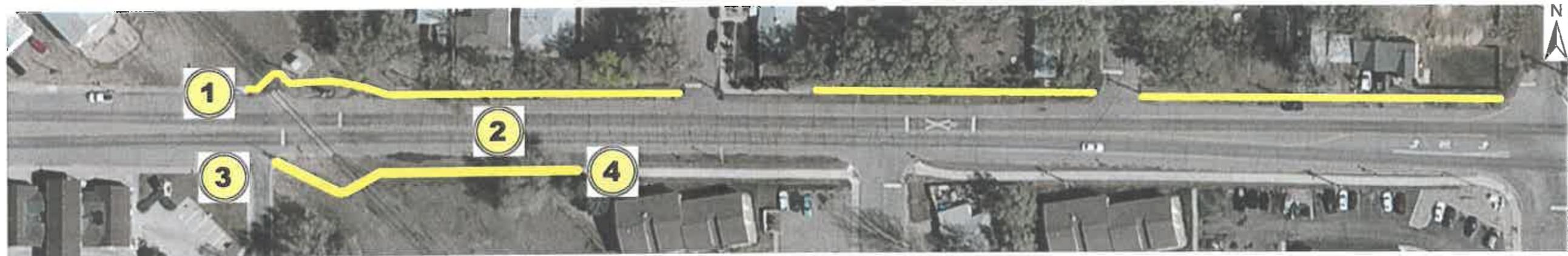
#### Broad Street East - North Side

Trail Length = 840' Trail Width = 4'

No.	Bid Item Description	Approx. Quantity	Unit	Unit Cost	Total
1	Mobilization	1	LS	\$15,000	\$15,000
1	Clear, Grubbing & Removals	6,720	SF	\$0.20	\$1,344
2	Earthwork	250	CY	\$15	\$3,750
3	4' Wide Concrete Sidewalk	3,360	SF	\$6	\$20,160
4	Aggregate Base Course (Class 6)	42	CY	\$40	\$1,680
5	Handicap Ramp	4	EA	\$2,500	\$10,000
6	At-Grade Railroad Crossing (UPRR)	1	LS	\$50,000	\$50,000
7	Traffic Control/Flagging (UPRR)	5	EA	\$900	\$4,500
8	Signing & Striping	1	LS	\$5,000	\$5,000
9	Erosion Control	1	LS	\$2,500	\$2,500
10	Concrete Washout Structure	1	EA	\$1,200	\$1,200
11	Soil Prep, Reseed & Mulch	0.40	AC	\$6,500	\$2,600
12	Utility Relocation	1	LS	\$1,000	\$1,000
13	Sanitary Facility	1	EA	\$400	\$400
<b>Construction Costs Subtotal</b>					<b>\$119,134</b>
UPRR Access Permit					\$25,000
Engineering & Project Management - CDOT (15%)					\$23,827
Construction Administration & Inspection CDOT (15%)					\$23,827
Surveying (5%)					\$5,957
Construction Testing (2%)					\$2,383
Contingency (20%)					\$23,827
<b>Total Project Cost</b>					<b>\$223,954</b>

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# EXHIBIT C - BROAD STREET EAST



### Alice Avenue

Trail gaps were identified along both side of the street along Alice Avenue at the UPRR Right-of-Way. There is existing trails on both side of the railroad right of way on the east side of Alice Avenue, as well as an existing trail on the west side of Alice Avenue, just north of the railroad right of way. Dirt paths have been established by users, visibly identifying highly used areas where the gaps exist. One the west side of Alice Ave. there is a short dirt path creating a connection between Forest Street and Alice Avenue, traveling adjacent to and over the tracks, then paralleling Alice Avenue. There is also a dirt path on the east side Alice Ave. connecting the existing trails on either side of the railroad.

There is also a small gap on the east side of Alice Ave., just south of the railroad where a dirt path has been established connecting the existing sidewalk along Alice Ave. to the crusher fine trail that navigates around Ehrlich Lake.

The connection of the west side along Alice Avenue will have some challenges due to Forest Street being much lower than the existing railroad. ADA requirements will need to be addressed during the design phase.

### Challenges

- Determining the Best Alignment for Trail Usage – Establishing an alignment on the west side of Alice Avenue to connect Forest Street and allow for the railroad crossing will be a challenge due to the elevation difference as well as the diagonal alignment of the tracks.
- Multiple Access Points to the Trail System
- UPRR Right-of-Way Access Permit Acquisition - Requesting the use of the UPRR Right of Way and negotiating the access permit will be a lengthy process and may be cost prohibitive to the Town proceeding forward.
- Skewed Railroad Alignment – safety concerns at crossing rails for bicycles and wheelchairs.
- Safely crossing of Alice Avenue and Forest Street.
- ADA Compliance

### Recommendations

- Define Trail Alignment and Improvements
- UPRR Right-of-Way Access Permit Acquisition – Begin conversations with UPRR regarding the proposed crossings, begin negotiations in acquiring permission and access permits.
- Connect Forest Street to Alice Avenue
- Add pedestrian crosswalk and handicap ramp at commercial access drive just north of UPRR
- ADA Compliant Design
- Perpendicular Travel Over Railway = provide “bulb out” to safely cross rails for bicycles and wheelchairs

Refer to Exhibit D for the location and conceptual layout of the gaps along Alice Avenue.

### Cost Analysis

**Alice Avenue - West Side**  
Trail Length = 380' Trail Width = 6'

No.	Bid Item Description	Approx. Quantity	Unit	Unit Cost	Total
1	Mobilization	1	LS	\$15,000	\$15,000
1	Clear, Grubbing & Removals	4,560	SF	\$0.20	\$912
2	Earthwork	680	CY	\$15	\$10,200
3	6' Wide Concrete Sidewalk	2,280	SF	\$6	\$13,680
4	Aggregate Base Course (Class 6)	28	CY	\$40	\$1,120
5	At-Grade Railroad Crossing (UPRR)	1	LS	\$50,000	\$50,000
6	Traffic Control/Flagging (UPRR)	5	EA	\$900	\$4,500
7	Signing & Striping	1	LS	\$2,500	\$2,500
8	Erosion Control	1	LS	\$2,500	\$2,500
9	Concrete Washout Structure	1	EA	\$1,200	\$1,200
10	Soil Prep, Reseed & Mulch	0.20	AC	\$6,500	\$1,300
11	Utility Relocation	1	LS	\$3,500	\$3,500
12	Sanitary Facility	1	EA	\$400	\$400
<b>Construction Costs Subtotal</b>					<b>\$106,812</b>
UPRR Access Permit					\$25,000
Engineering & Project Management (10%)					\$10,681
Construction Administration (10%)					\$10,681
Surveying (5%)					\$5,341
Construction Testing (2%)					\$2,136
Contingency (20%)					\$21,362
<b>Total Project Cost</b>					<b>\$182,014</b>

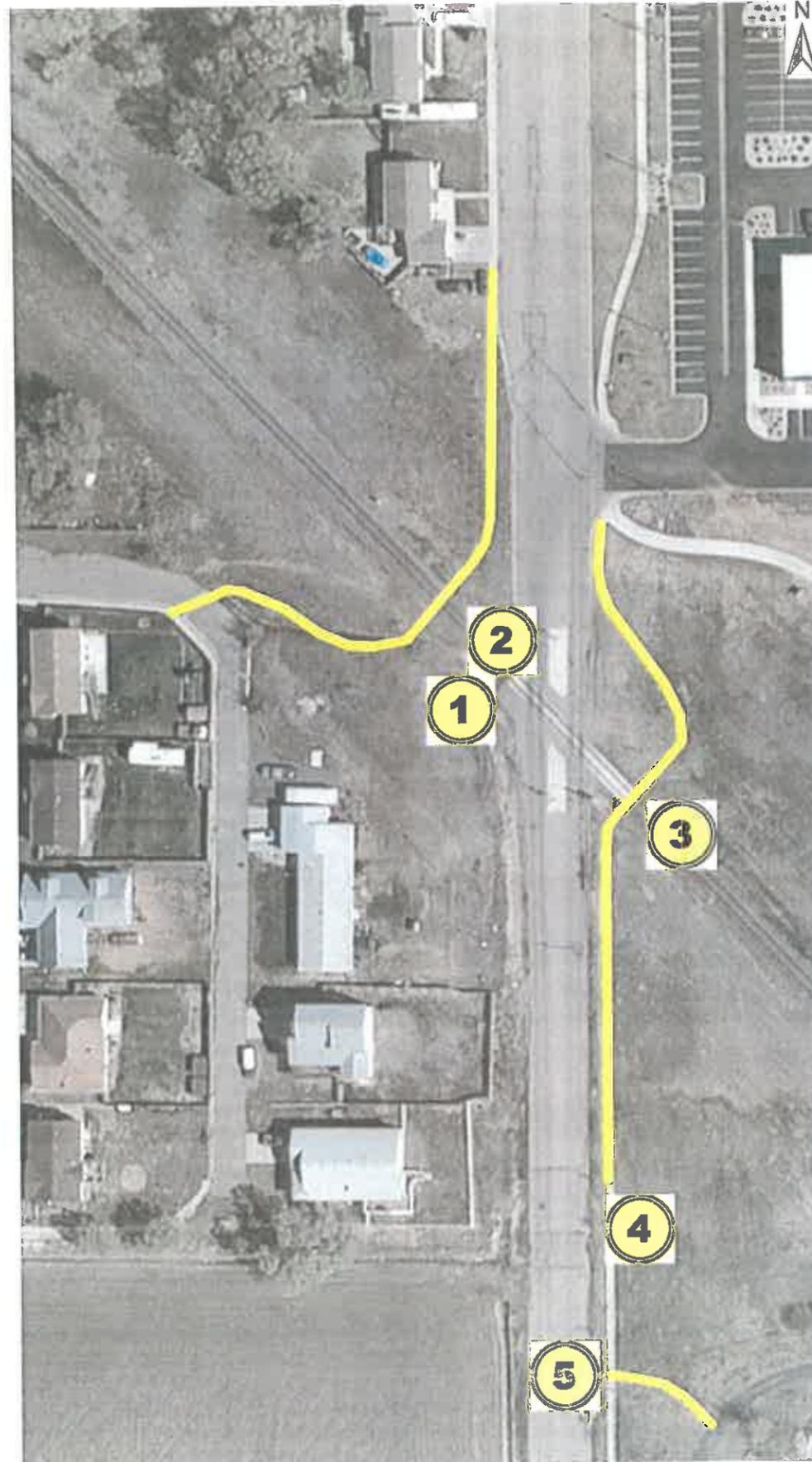
This is an Opinion of Cost and supplied only as a guide. LRA is not responsible for fluctuation in cost of material, labor, design and construction administration costs.

**Alice Avenue - East Side**  
Trail Length = 470' Trail Width = 5'

No.	Bid Item Description	Approx. Quantity	Unit	Unit Cost	Total
1	Mobilization	1	LS	\$15,000	\$15,000
1	Clear, Grubbing & Removals	4,700	SF	\$0.20	\$940
2	Earthwork	700	CY	\$15	\$10,500
3	5' Wide Concrete Sidewalk	2,350	SF	\$6	\$14,100
4	Aggregate Base Course (Class 6)	29	CY	\$40	\$1,160
5	At-Grade Railroad Crossing (UPRR)	1	LS	\$50,000	\$50,000
6	Traffic Control/Flagging (UPRR)	5	EA	\$900	\$4,500
7	Signing & Striping	1	LS	\$3,500	\$3,500
8	Erosion Control	1	LS	\$2,500	\$2,500
9	Concrete Washout Structure	1	EA	\$1,200	\$1,200
10	Soil Prep, Reseed & Mulch	0.30	AC	\$6,500	\$1,950
11	Utility Relocation	1	LS	\$3,500	\$3,500
12	Sanitary Facility	1	EA	\$400	\$400
<b>Construction Costs Subtotal</b>					<b>\$109,250</b>
UPRR Access Permit					\$25,000
Engineering & Project Management (10%)					\$10,925
Construction Administration (10%)					\$10,925
Surveying (5%)					\$5,463
Construction Testing (2%)					\$2,185
Contingency (20%)					\$21,850
<b>Total Project Cost</b>					<b>\$185,598</b>

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# EXHIBIT D - ALICE AVENUE



**Quentine Avenue**

The Quentine Avenue gap is located on the east side between the south side of Windmill Gateway and Broad Street. There are seven residential homes along the east side of the street that have driveway access points, consisting of either asphalt or concrete. Sidewalk exists along one of the residential properties. During field observations, there were pedestrians and young bicyclists within the roadway as they travel to and from Elementary School at the corner of Quentine Avenue and Broad Street. This existing gap requires users to walk and bicycle on dirt paths and landscaping through the existing residential properties.

Gap challenges exist as a result of residents parking vehicles along the east side of Quentine Avenue. Travelers have a choice to make - either move further out into the north bound traffic lane to accommodate parked vehicles or travel through residential property.

Establishing a trail along the east side of Quentine Avenue seems easily achievable and the following outlines the challenges and recommendation.

**Challenges**

- Right-of-Way & Easements – there appears to be sufficient right of way to construct a 4’ wide sidewalk however further investigation and determination of the right of way will be required. Additional right of way or easements may be need to be acquired.
- Trail Alignment – the trail can be constructed adjacent to the curb & gutter, however the driveways will need to be evaluated to determine if they are ADA accessible. If driveways need to be reconstructed, there will be transitions required from the new driveway access to the existing driveways.
- Elevation Differences – there are a few properties at the north end of the gap that will need some retaining walls or other means of transitioning the new trail to the existing ground.
- Drainage & Existing Landscaping – there is an existing storm pipe that will need to be extended, as well landscaping features that will need to be addressed during the design stage.
- Coordination with Property Owners – there will need to be coordination and correspondence with all of the property adjacent to the gap to negotiate the construction of the trail.

**Recommendations**

- Locate existing right of way limits and determine if any additional right of way or easements are needed.
- Define Trail Alignment and Improvements
- Coordinate with property owners early during the design process
- Design to include storm pipe extension, landscaping, driveway transitions and potential short retaining walls.

Refer to Exhibit E for the location and conceptual layout of the gap along Quentine Avenue.

**Cost Analysis**

**Quentine Avenue**

Trail Length = 480' Trail Width = 4'

No.	Bid Item Description	Approx. Quantity	Unit	Unit Cost	Total
1	Mobilization	1	LS	\$10,000	\$10,000
1	Clear, Grubbing & Removals	3,840	SF	\$0.20	\$768
2	Earthwork	150	CY	\$15	\$2,250
3	4' Wide Concrete Sidewalk	1,920	SF	\$6	\$11,520
4	Aggregate Base Course (Class 6)	24	CY	\$40	\$960
5	Driveway Transitions	2,880	SF	\$6	\$17,280
6	Signing & Striping	1	LS	\$1,000	\$1,000
7	Erosion Control	1	LS	\$1,500	\$1,500
8	Concrete Washout Structure	1	EA	\$1,200	\$1,200
9	Soil Prep, Reseed & Mulch	0.30	AC	\$6,500	\$1,950
10	Utility Relocation	1	LS	\$1,000	\$1,000
11	Sanitary Facility	1	EA	\$400	\$400
<b>Construction Costs Subtotal</b>					<b>\$49,828</b>
Engineering & Project Management (10%)					\$4,983
Construction Administration (8%)					\$3,986
Surveying (5%)					\$2,491
Construction Testing (2%)					\$997
Contingency (20%)					\$9,966
<b>Total Project Cost</b>					<b>\$72,251</b>

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# EXHIBIT E - QUENTINE AVENUE



### Inez Boulevard

There is a gap along the north side of Inez Boulevard where it crosses the UPRR. There are existing concrete trails on either side of the railroad right of way. Inez Boulevard is a dirt road heavily used by trucks serving the oil and gas industry. Currently users need to leave the trail and navigate along the dirt road, cross over the railroad tracks and then get back on the trail. This is a safety concern and connecting this gap would promote safe trail usage and make it an asset for future development.

#### Challenges

- Determining the Best Alignment for Trail Usage – Establishing an alignment to allow for the railroad crossing will be a challenge due to the elevation differences as well as the diagonal alignment of the tracks.
- UPRR Right-of-Way Access Permit Acquisition - Requesting the use of the UPRR Right of Way and negotiating the access permit will be a lengthy process and may be cost prohibitive to the Town proceeding forward.
- Skewed Railroad Alignment – safety concerns at crossing rails for bicycles and wheelchairs.
- ADA Compliance

#### Recommendations

- Define Trail Alignment and Improvements
- UPRR Right-of-Way Access Permit Acquisition – Begin conversations with UPRR regarding the proposed crossings, begin negotiations in acquiring permission and access permits.
- ADA Compliant Design
- Perpendicular Travel Over Railway – provide “bulb out” to safely cross rails for bicycles and wheelchairs

Refer to Exhibit F for the location and conceptual layout of the gap along Inez Boulevard.

### Cost Analysis

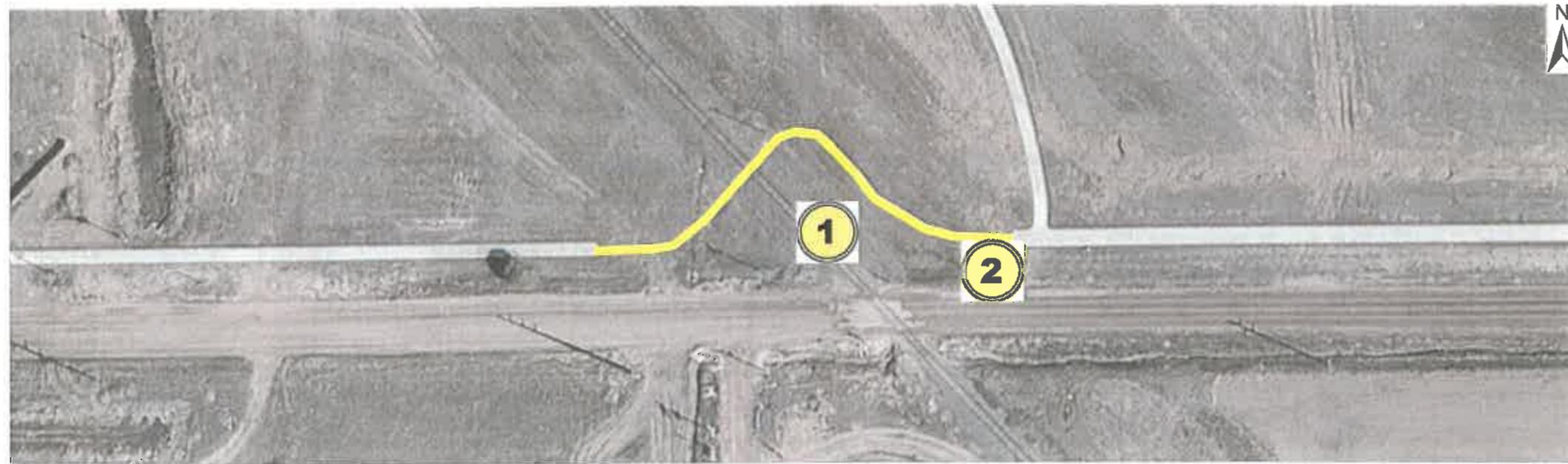
#### Inez Boulevard

Trail Length = 300' Trail Width = 10'

No.	Bid Item Description	Approx. Quantity	Unit	Unit Cost	Total
1	Mobilization	1	LS	\$15,000	\$15,000
1	Clear, Grubbing & Removals	6,000	SF	\$0.20	\$1,200
2	Earthwork	890	CY	\$15	\$13,350
3	10' Wide Concrete Sidewalk	3,000	SF	\$6	\$18,000
4	Aggregate Base Course (Class 6)	37	CY	\$40	\$1,480
5	At-Grade Railroad Crossing (UPRR)	1	LS	\$50,000	\$50,000
6	Traffic Control/Flagging (UPRR)	5	EA	\$900	\$4,500
7	Signing & Striping	1	LS	\$1,500	\$1,500
8	Erosion Control	1	LS	\$2,500	\$2,500
9	Concrete Washout Structure	1	EA	\$1,200	\$1,200
10	Soil Prep, Reseed & Mulch	0.20	AC	\$6,500	\$1,300
11	Utility Relocation	1	LS	\$1,500	\$1,500
12	Sanitary Facility	1	EA	\$400	\$400
<b>Construction Costs Subtotal</b>					<b>\$111,930</b>
UPRR Access Permit					\$25,000
Engineering & Project Management (10%)					\$11,193
Construction Administration (10%)					\$11,193
Surveying (5%)					\$5,597
Construction Testing (2%)					\$2,239
Contingency (20%)					\$22,386
<b>Total Project Cost</b>					<b>\$189,537</b>

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# EXHIBIT F - INEZ BOULEVARD



**Quentine Avenue / Inez Boulevard**

Currently there is an existing ten foot concrete trail along the west side of Quentine Avenue between Broad Street and Lilac Street. Town staff commented that continuing the concrete trail southerly and westerly to the Dove Valley Subdivision (a senior living community) would be of some benefit and provides an opportunity to connect the residents to greater Milliken and the future trail system.

**Challenges**

- Right-of-Way & Easements – there appears to be sufficient right of way to construct a 10’ wide trail however further investigation and determination of the right of way will be required. Additional right of way or easements may be need to be acquired.
- Costs – the costs associated with this gap may be significant and will only serve a small amount of users currently. With future development, this gap could be included with roadway improvements and subdivision projects.
- Crossing the Little Thompson Ditch – Coordination with the irrigation company will be required in order to cross the ditch. There appears to sufficient space to construct the trail without extending the irrigation culvert.
- Utility Relocation – there is a potential that utilities may need to be relocated and storm pipe extended on the north side of Inez Boulevard.

**Recommendations**

- Locate existing right of way limits and determine if any additional right of way or easements are needed.
- Define Trail Alignment and Improvements
- Prepare cost estimates during preliminary design to evaluate the possibility of cost savings
- Coordinate with property owners early during the design process
- Design to include storm pipe extension, utility relocations, and landscaping restoration.

Refer to Exhibit G for the location and conceptual layout of the gap along Quentine Avenue / Inez Boulevard.

**Cost Analysis**

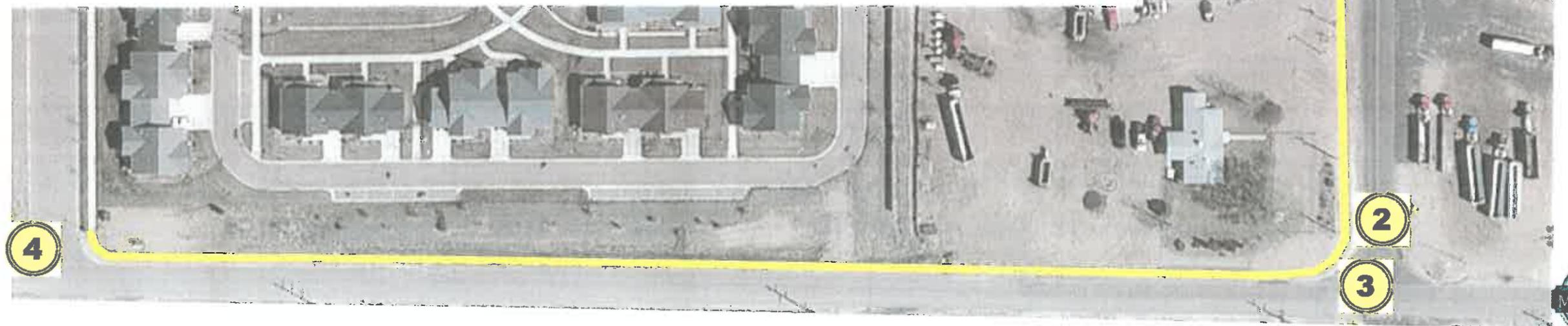
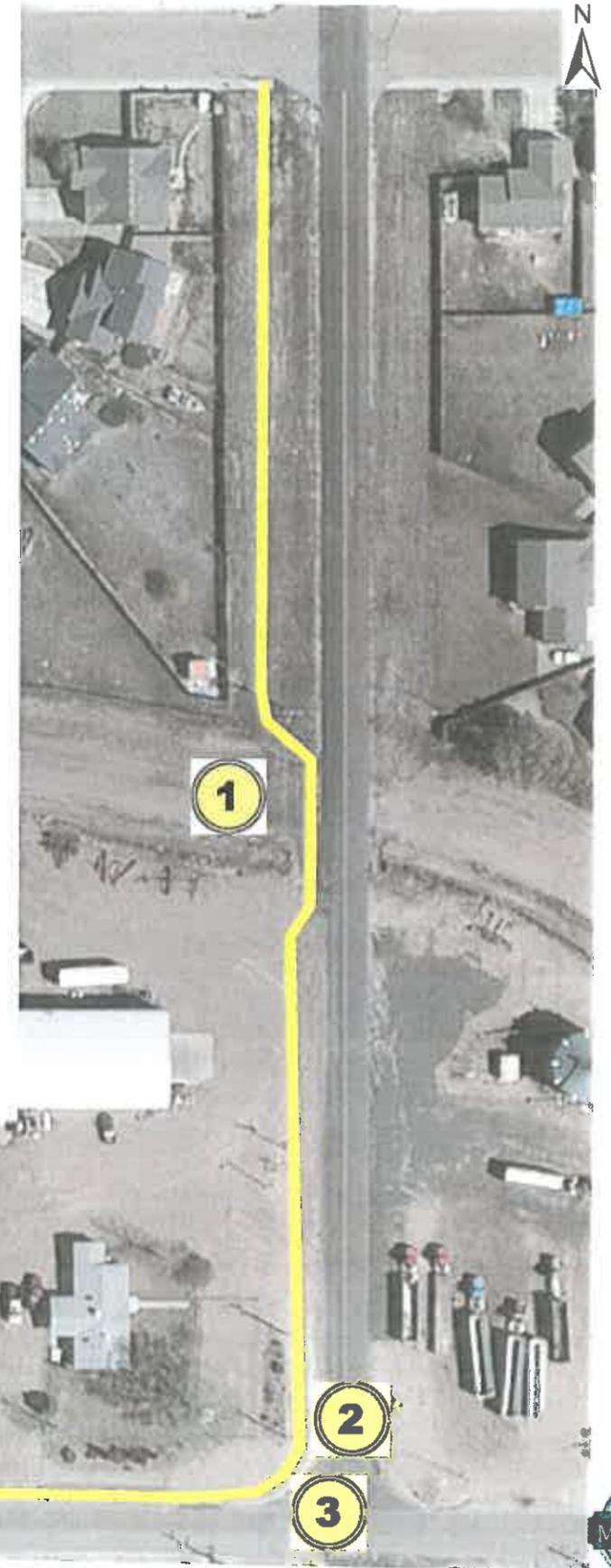
**Quentine Ave. / Inez Blvd.**

Trail Length = 1650’ Trail Width = 10’

No.	Bid Item Description	Approx. Quantity	Unit	Unit Cost	Total
1	Mobilization	1	LS	\$10,000	\$20,000
1	Clear, Grubbing & Removals	33,000	SF	\$0.20	\$6,600
2	Earthwork	1,230	CY	\$15	\$18,450
3	10' Wide Concrete Sidewalk	16,500	SF	\$6	\$99,000
4	Aggregate Base Course (Class 6)	202	CY	\$40	\$8,080
5	Handicap Ramp	3	EA	\$2,500	\$7,500
6	Signing & Striping	1	LS	\$5,000	\$5,000
7	Erosion Control	1	LS	\$5,000	\$5,000
8	Concrete Washout Structure	1	EA	\$1,200	\$1,200
9	Soil Prep, Reseed & Mulch	0.80	AC	\$6,500	\$5,200
10	Utility Relocation	1	LS	\$2,500	\$2,500
11	Sanitary Facility	1	EA	\$400	\$400
<b>Construction Costs Subtotal</b>					<b>\$178,930</b>
Irrigation Ditch Crossing Agreement					\$25,000
Engineering & Project Management (10%)					\$17,893
Construction Administration (8%)					\$14,314
Surveying (5%)					\$8,947
Construction Testing (2%)					\$3,579
Contigency (20%)					\$35,786
<b>Total Project Cost</b>					<b>\$284,449</b>

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# EXHIBIT G - QUENTINE AVENUE & INEZ BOULEVARD





## REFERENCES

<sup>1</sup>"Sidewalks in Suburbs." Planning. <<https://www.planning.org/pas/at60/report95/>>.

<sup>2</sup>"How cities use parks for economic development." Planning. <<https://www.planning.org/cityparks/briefingpapers/>>.

<sup>3</sup>Searns, Bob . "Benefits of Trails and Greenways." American Trails. Oct. 2002. <<http://www.americantrails.org/resources/benefits/1>>.

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A Policy on Geometric Design. Washington, D.C.: American Association of State Highway and Transportation Officials, 1994.

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DRAFT

Identifying and prioritizing the trail gaps in  
downtown Milliken, Colorado

APRIL

2015



# TOWN OF MILLIKEN

## TRAIL & SIDEWALK GAP ANALYSIS

Prepared by Lamp Rynearson & Associates  
For the Town of Milliken, Colorado



**LAMP RYNEARSON**  
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