THORNTON TRANSIT STUDY

Final Plan

March 29, 2024

Prepared for

THORNTON

Prepared by

FEHR & PEERS

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C.D. No. 2024-088

RESOLUTION

A RESOLUTION AMENDING THE TRANSPORTATION AND MOBILITY MASTER PLAN TO INCLUDE THE THORNTON TRANSIT STUDY AS AN APPENDIX.

WHEREAS, the Thornton City Council adopted the Transportation and Mobility Master Plan on April 26, 2022; and

WHEREAS, the Transportation and Mobility Master Plan recommends an implementation plan to achieve its vision and goal that includes a transit study; and

WHEREAS, the Thornton Transit Study fulfils the recommendation of the Transportation and Mobility Master Plan; and

WHEREAS, the Thornton Transit Study provides a phased 10-year implementation plan for expanded and new transit services throughout Thornton; and

WHEREAS, the Thornton Transit Study further expands the information in Chapter 8: Transit Network of the Transportation and Mobility Master Plan; and

WHEREAS, the City of Thornton acknowledges the importance of transit as part of the overall transportation network.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF THORNTON, COLORADO, AS FOLLOWS:

The Thornton Transit Study in Attachment A is hereby acknowledged and adopted as Appendix D: Thornton Transit Study into the Transportation and Mobility Master Plan adopted on April 26, 2022.

PASSED AND ADOPTED at a regular meeting of the City Council of the City of Thornton, Colorado on May 14, 2024.

CITY OF THORNTON, COLORADO

Karen Bigelow, Mayor Pro Tem

ATTEST:

Kristen N. Rosenbaum, City Clerk

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Executive Summary

The Thornton Transit Study builds off the vision set by the Transportation and Mobility Master Plan (TMMP) with the following goals:

- Bring Thornton closer to implementing the TMMP's vision.
- Provide clear guidance to implement transit improvements over the next 10 years.
- Make transit a more viable mode choice for residents that do not currently have access to transit.
- Better serve those who are mobility challenged, but not served by RTD's Access-A-Ride.

Expanding public transit helps meet the mobility needs of the community, particularly for the most vulnerable community members that have limited mobility options, and is a crucial element of achieving the vision identified in the TMMP to enable residents to access all areas of Thornton in a timely manner without using a private vehicle.

Phased Transit Operating Plan

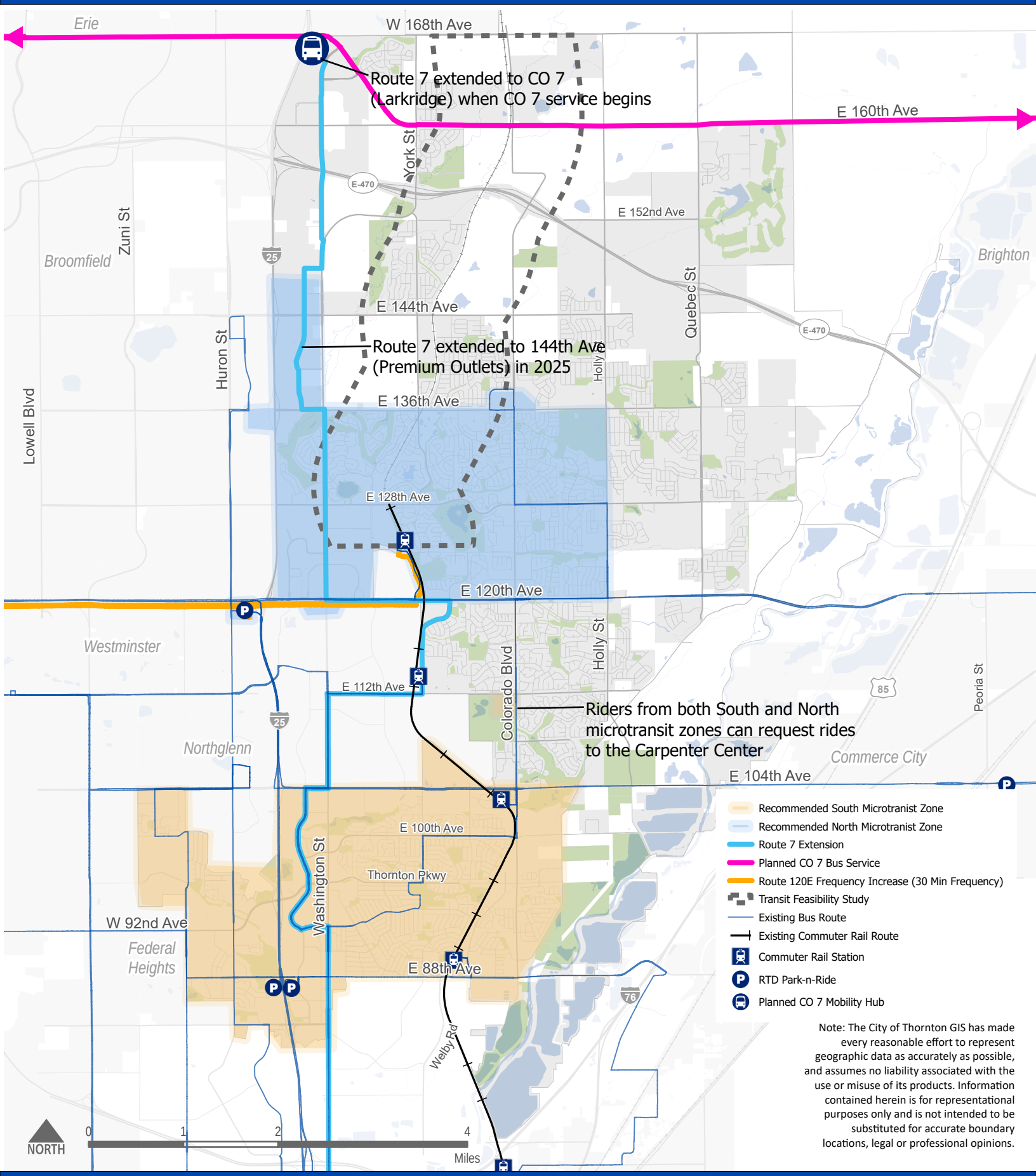
This study demonstrates that transit, and the expansion of public transit service, is a viable transportation solution within the City of Thornton. Many areas of Thornton are well suited for short-term implementation of on-demand transit service, and some corridors can support expansion of fixed-route transit service. As the city grows, additional areas will become more viable for transit expansion. This Study provides a phased-approach for gradually expanding transit service, prioritizing expansion to locations were transit is likely to be most successful first.

The preferred alternative includes three phases of transit improvements over a ten-year period between 2025 and 2034 which are shown in **Figure ES**. and **Figure ES**..

1. **Short-term: 2025 to 2027** - In the first three years the city will focus on implementing two microtransit zones, one in south Thornton and one in north Thornton, extending the Route 7 north to Larkridge along the Washington Street/Grant Street corridor, increasing service frequency on 120th Avenue west of the N Line to 30 minutes, and studying feasibility of an interim bus service between the end of the N Line and CO 7.
2. **Mid-term: 2028 to 2031** - Mid-term recommendations include making adjustments to the microtransit services to expand and improve service, increasing frequency on three bus routes to 30-minutes: the Route 7 extension, Route 93L, and Route 120L, reinstating Route 104 along 104th Avenue, extending the Route 120X along I-25 to Larkridge, and implementing an interim bus service between the end of the N Line and CO 7.
3. **Long-term: 2032 to 2034** - Long-term improvements include adjusting the services implemented in the previous phases, increasing core routes to 15-minute peak period frequencies, and evaluating additional north/south routes in North Thornton based on future development.

Short-Term Implementation (2025-2027)

ES.1



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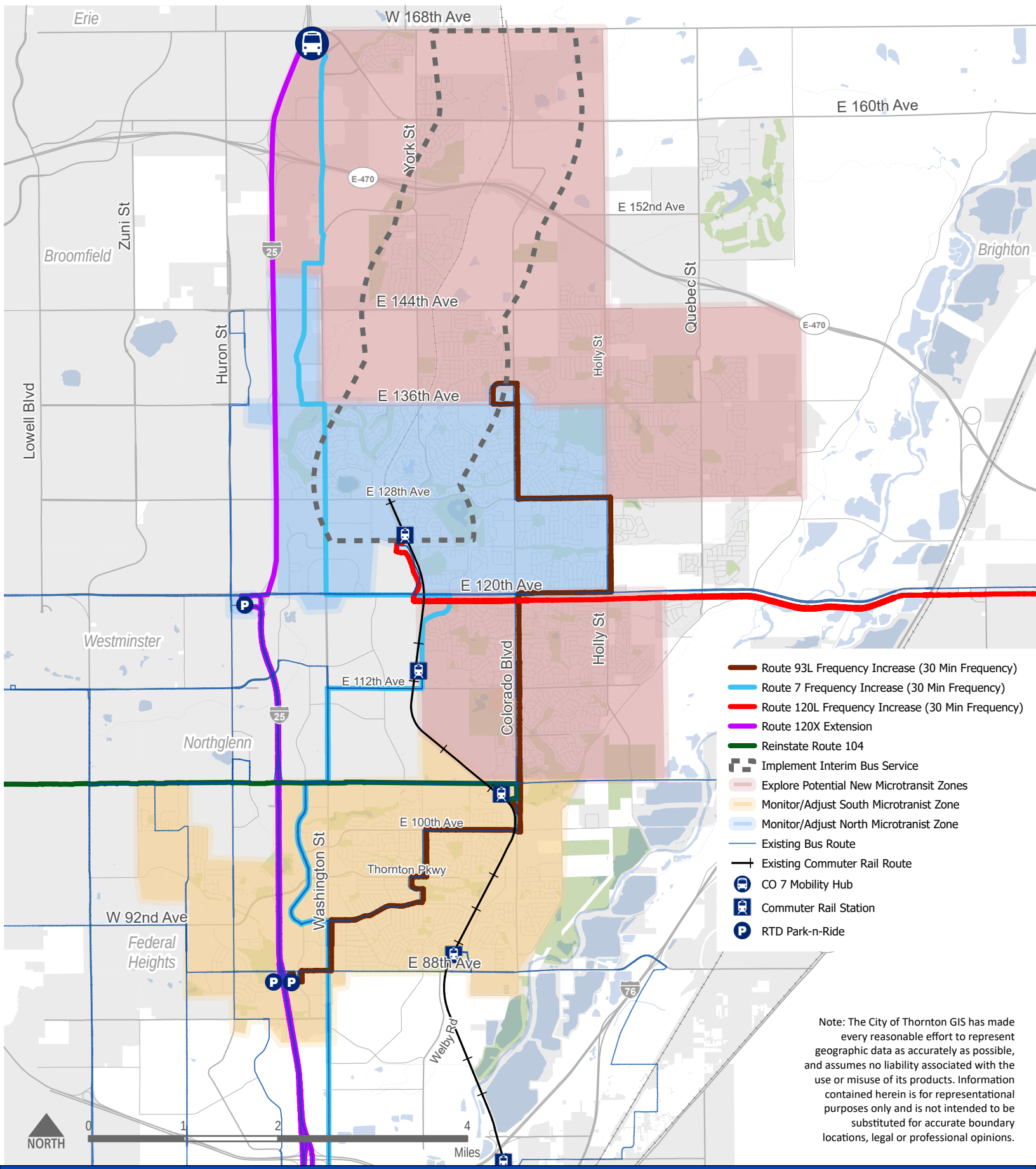
Mid-Term Implementation (2028-2031)

*These improvements are in addition to the short-term improvements

ES.2



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City of Thornton

Basemap Data: June 2023

Chapter 1 – Introduction

Purpose of the project

The Thornton Transit Study builds off the vision set by the Transportation and Mobility Master Plan (TMMP) with the following goals:

- Bring Thornton closer to implementing the TMMP's vision.
- Provide clear guidance on how to implement transit improvements throughout Thornton over the next 10 years.
- Make transit a more viable mode choice for residents that do not currently have access to transit.
- Better serve those who are mobility challenged, but not served by RTD's Access-A-Ride.

The transit study includes the following elements:

- **Transit Market Analysis.** This analysis, described in Chapter 2, includes a comprehensive demographic analysis, an evaluation of the existing transit service, an analysis of travel patterns, community input, and a review of peer communities. Chapter 2 highlights the key conclusions of the transit market analysis, while the complete transit market analysis is available in Appendix A.
- **Alternatives Analysis and Community Input.** This analysis, described in Chapter 3, includes an evaluation of five potential "bookend" alternatives for transit improvements in Thornton, including new on-demand service, improvements to existing fixed-route service, and new fixed-route service. The alternatives and evaluation criteria were created based on input from the first round of community engagement and the transit market analysis. The alternatives analysis was used to present benefits and challenges of several potential transit improvements in Thornton. Alternatives were presented to the public, and a preferred alternative for phasing and implementation was developed based on input from the public, stakeholders, and project team.
- **Preferred Alternative and Implementation Phases.** This phasing plan, described in Chapter 4, details the implementation of each transit recommendation over the next ten years. The phasing includes action items for the short-term (first three years), mid-term (three to seven years), and long-term (seven to ten years).
- **Financial Plan.** This plan, described in Chapter 5, details the estimated costs by year to implement each element of the operating plan. This chapter also includes details on funding strategies for these costs.
- **Implementation Plan.** This plan, described in Chapter 6, provides details of implementing on-demand transit and fixed-route transit options. These details include service adjustments, roles and responsibilities, strategies for managing hurdles, and other key factors to implementation.

Chapter 2 – Transit Market Analysis

This chapter highlights the key conclusions of the transit market analysis, which included a comprehensive demographic analysis, an evaluation of the existing transit service, an analysis of travel patterns, community input, and a review of peer communities. The complete transit market analysis is available in Appendix A.

Demographic Analysis

Thornton's residents are diverse in age, income, and travel characteristics. Those who are most likely to rely on transit service for transportation are youth, older adults, people with low and moderate income, people with disabilities, and households with limited access to vehicles. While there are higher concentrations of people with these characteristics in the southern portion of Thornton (generally south of 104th Avenue), there are other areas of the city with higher concentrations of these demographics as well, including:

- A high youth and older adult population north of 136th Avenue.
- Residents living under the poverty line north of 136th Avenue.
- Residents with no or limited access to vehicles in communities between 112th Avenue and 128th Avenue, and in the Todd Creek Area.

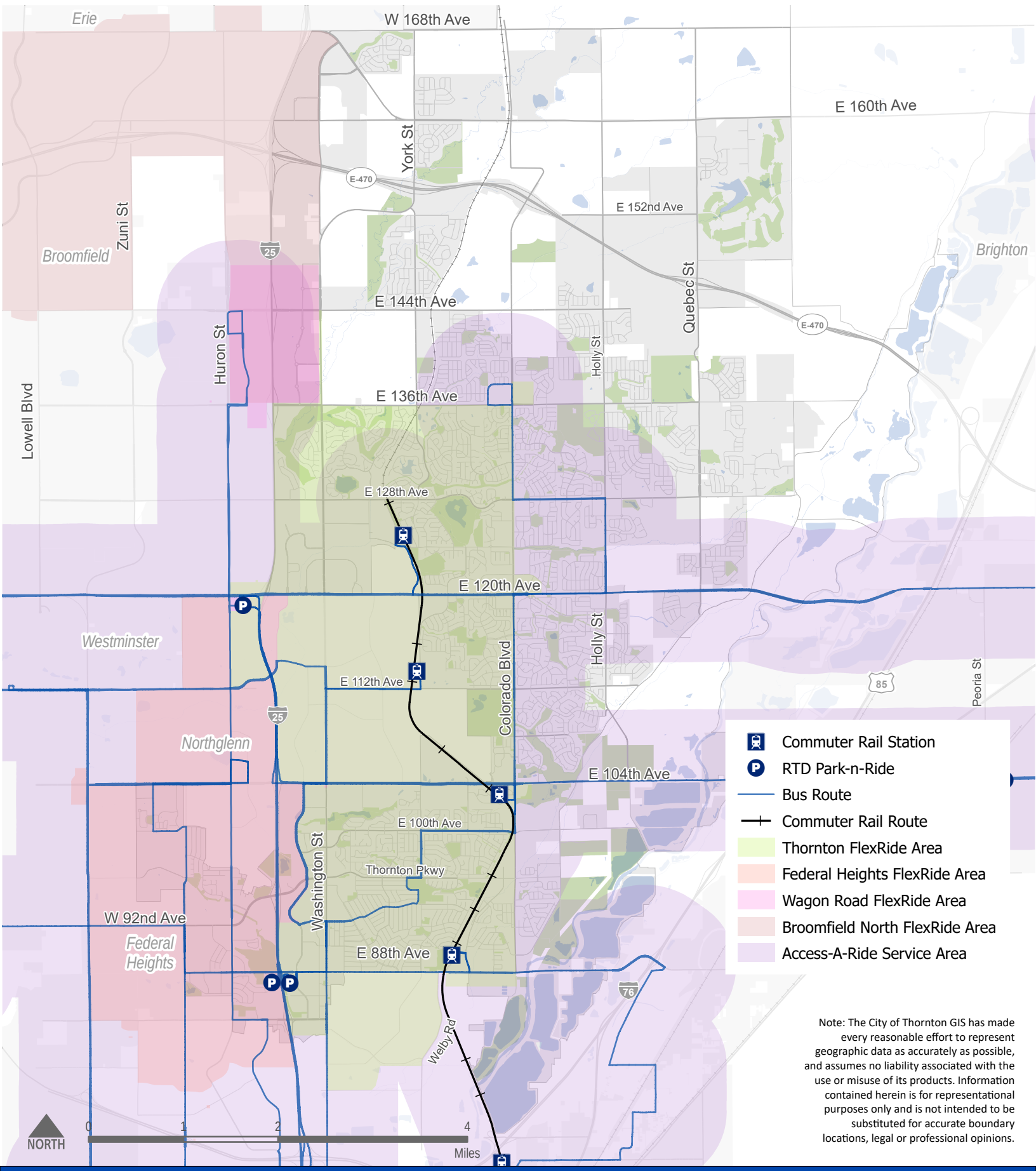
Existing Transit Service

Existing transit service in Thornton is operated by RTD and was found to be:

- **Regionally Focused** – The system is predominantly designed for regional travel, particularly to downtown Denver and the Denver International Airport, and less useful for local travel within Thornton and for east-west regional travel.
- **Limited in Geographic Coverage** – While the southwest part of Thornton (generally south of 120th Avenue and west of Colorado Boulevard) which has the highest transit propensity and is generally covered by transit there are large sections of north and eastern Thornton without any transit. This also leaves parts of these areas in north Thornton devoid of Access-a-Ride service (**Figure 1**). Additionally, many areas of southern Thornton are more than a quarter-mile walk from transit and/or have areas with missing or narrow sidewalks that add additional barriers to accessing transit (**Figure 2**).

Thornton Transit Coverage

Figure 1



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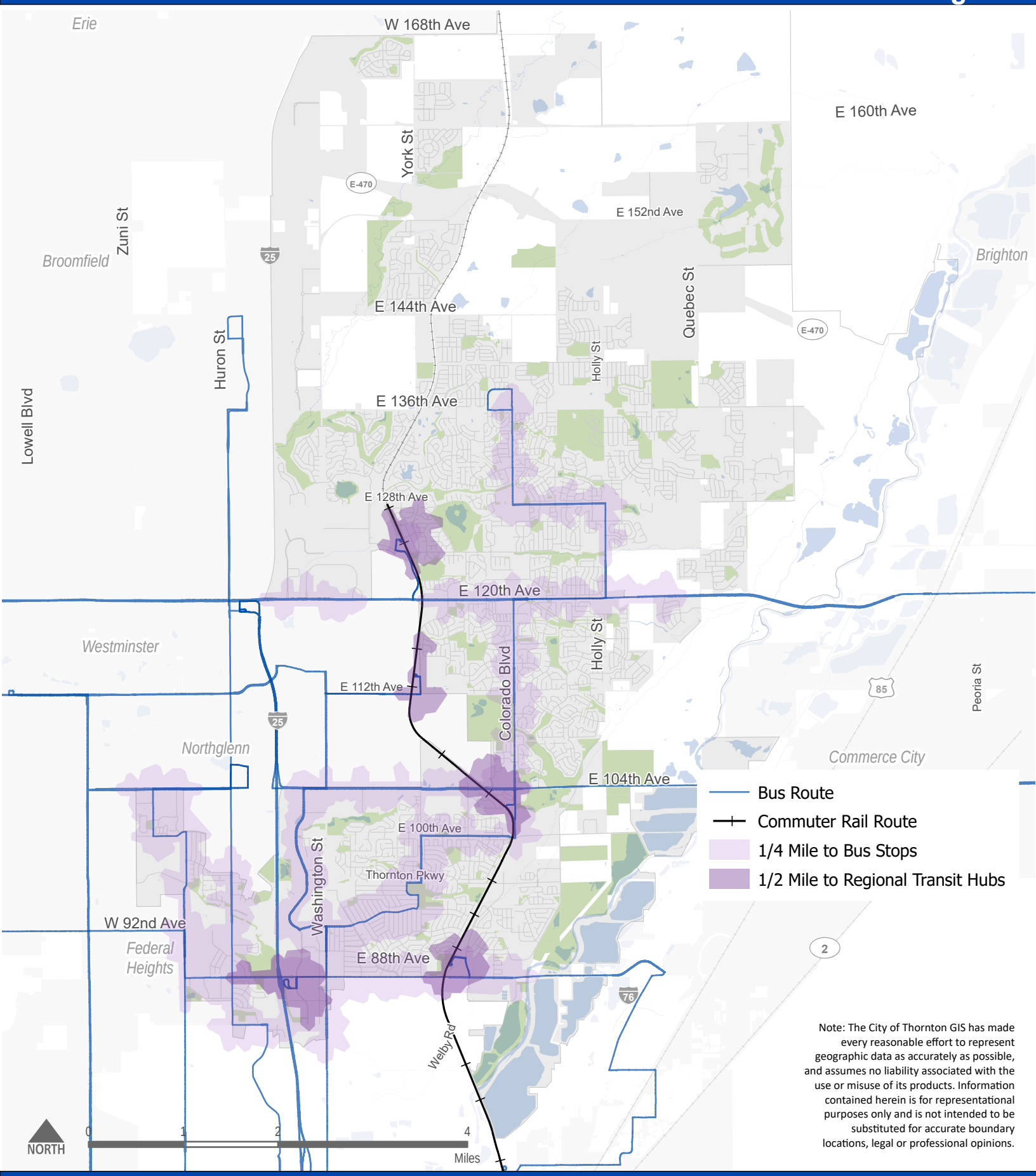
Sources: RTD, 2023
Basemap Data: June 2023

Thornton Transit Access

Figure 2



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Sources: RTD, 2023
Basemap Data: June 2023

- **Low Frequencies** – Most bus service in Thornton operates at 60-minute frequencies, with just three local routes (Route 7, Route 19, and Route 92) plus the N Line and 120X providing 30-minute all-day frequencies. The low frequency is one of the biggest barriers to using transit in Thornton, making it an impractical option for many trips (even where transit exists), especially for short trips and trips that require a transfer.
- **Limited Demand Response Service** – The three FlexRide services that operate in Thornton are designed to fill those gaps in local travel demand, but can be unreliable, difficult to coordinate transfers, and exclude many areas of Thornton. The service also suffers from lack of efficiency typically averaging less than 3 riders per hour. Additionally, because the Thornton FlexRide does not operate after 6 PM, it does not serve evening commuters/service workers.
- **Limited Connectivity Across I-25** – While service is provided on both sides of I-25, service on 104th Avenue does not connect across, and the FlexRide boundaries generally fall along I-25 making connections across I-25 via FlexRide generally impractical.

Existing Travel Patterns

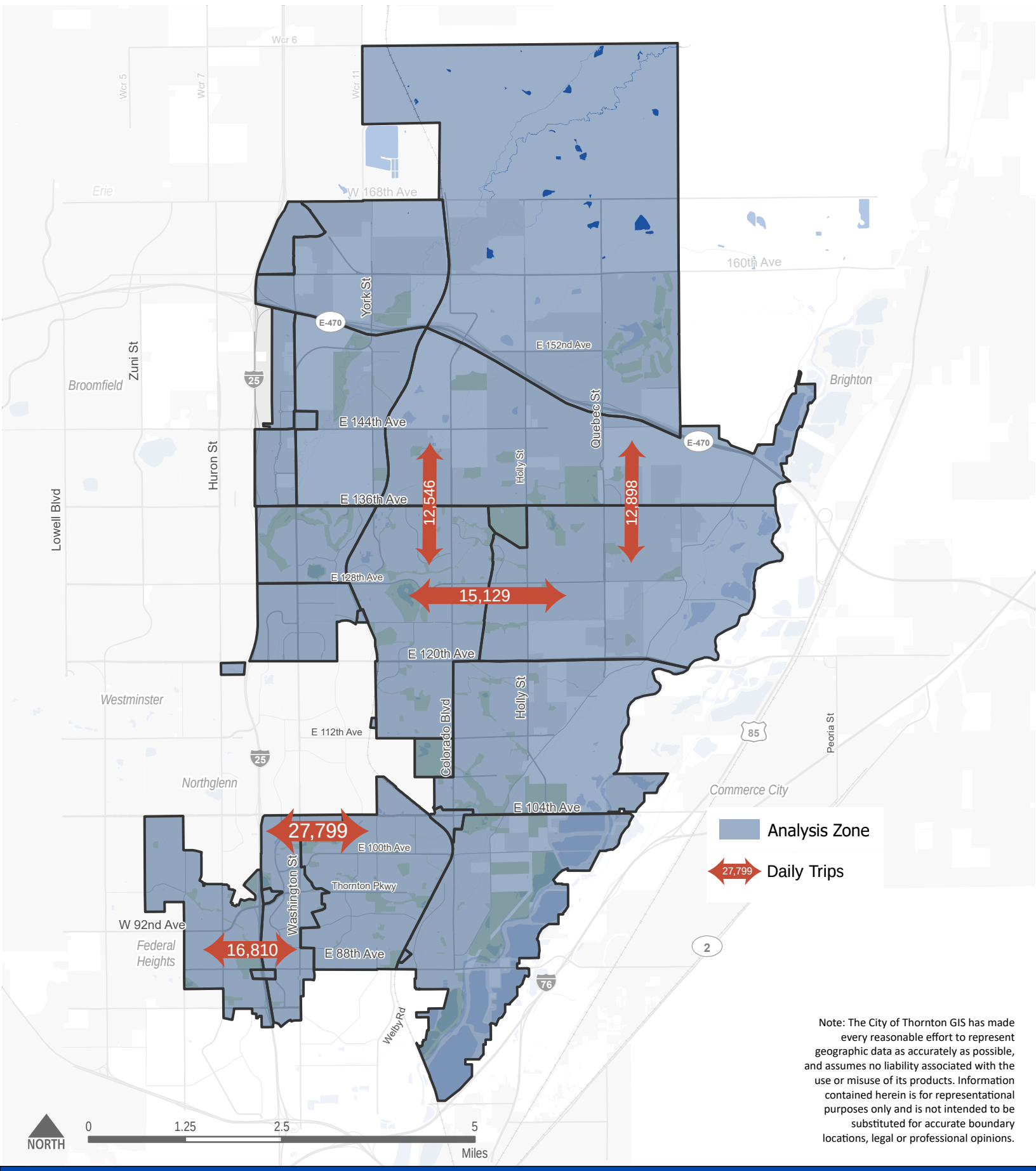
Both Longitudinal Employer-Household Dynamics (LEHD) and StreetLight (origin-destination data) analyses show that there is considerable demand for local destinations in Thornton, and nearly 50% of local trips are two to five miles. More specific takeaways include:

- Non-commute trips make up 82% of trips on weekdays.
- Nearly half of all trips in Thornton have an average speed of 10 to 20 mph from origin to destination.
- The most common trip length is two to five miles.
- The top local trip pairings occur in the southwestern part of the city going to/from the Washington Street corridor from zones directly east or west (**Figure 3**).

Top Trip Pairs within Thornton

March - April 2022

Figure 3



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Sources: StreetLight Data, March to April 2022, Fehr & Peers
Basemap Data: June 2023

- Most regional trips are destined for Commerce City and Broomfield, but there are also many trips headed to Brighton, Westminster, and to communities along the north I-25 corridor.
- In 2019, the highest concentration of work locations for Thornton residents was along the north I-25 corridor and Downtown Denver. There were also notable nodes in Boulder, Brighton, Broomfield, and at the Anschutz Medical Campus in Aurora.
- Of trips that originate in Thornton's top transit propensity zones, most are destined to adjacent neighborhoods, so trips are predominantly short and close.
- Most people traveling from Thornton to one of the six regional transit hubs in (or near) Thornton originate in the zones immediately around a station. The two exceptions are the Wagon Road park-n-ride and the Crossroads at 104th Station, both of which have much larger travel sheds than the other transit hubs.
- The Carpenter Recreation Center and Thornton Active Adult Center draw people from all areas of Thornton in a fairly evenly distributed manner, while the Trail Winds Recreation Center has a much higher share of trips originating from northern Thornton, with fewer people coming from south Thornton.
- While the Amazon facility (specifically the employee lot) draws trips from across Thornton, there are particularly higher concentrations of trips originating in south Thornton.

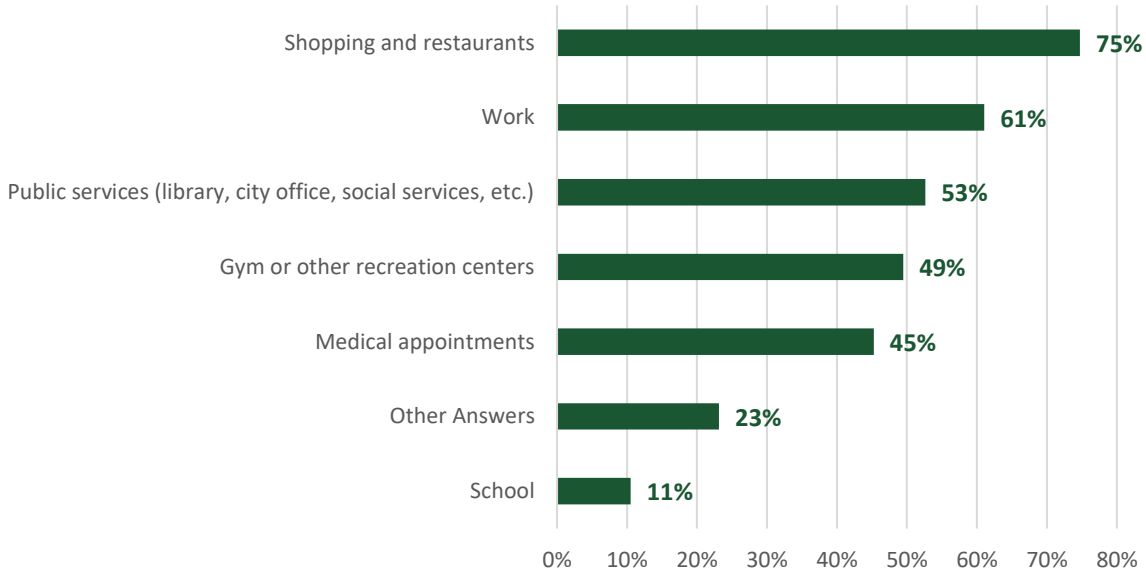
Community Input

Community input was provided through public outreach and a dedicated stakeholder working group throughout the project. This stakeholder group was made up of local and regional partners, including staff from various City of Thornton departments, DRCOG, RTD, and CDOT, who met three times throughout the project and guided the process. Public input was sought multiple times throughout the project, including during the market analysis phase to gain input on existing experiences and desired improvements, a survey to react to draft alternatives, and a final survey to provide input on the final draft. The following are key takeaways from the community input gathered during the initial survey on existing experiences and desired improvements:

- A disproportionately high percentage of survey respondents live in north Thornton (as compared to the actual population distribution) meaning respondents from south Thornton, which has a higher percentage of transit-reliant population, may be underrepresented in the survey.

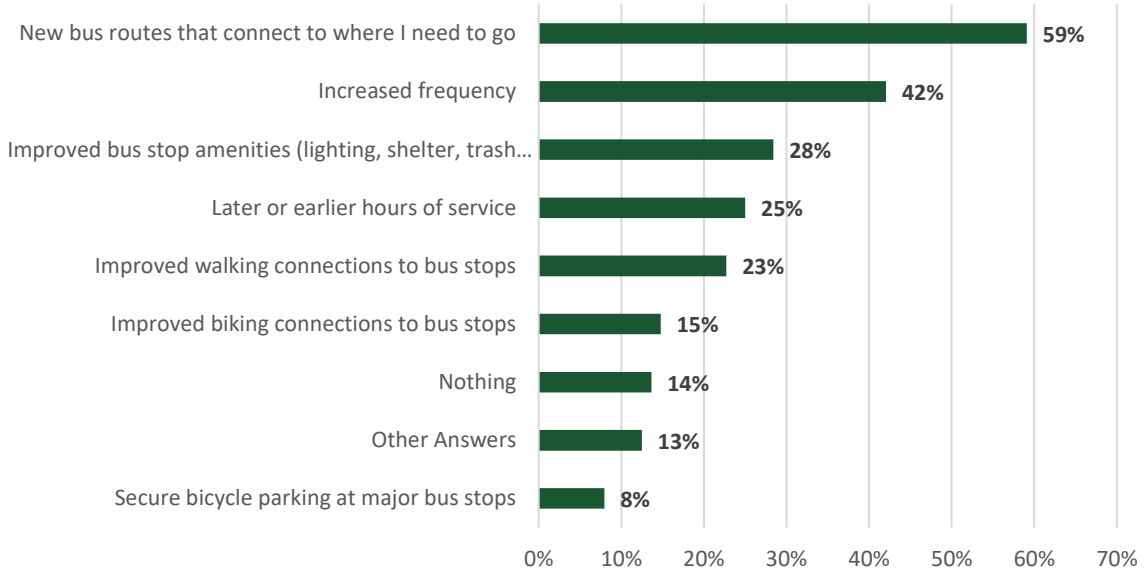
- The top desired destinations for transit include shopping and restaurants, work, and public services (**Figure 4**).

Figure 4: Desired Destinations Using Public Transit



- The top desired transit improvements include increased frequency (particularly along the N-Line), earlier and later hours of service, and additional first/last mile transit service within Thornton to connect to the rail stations (**Figure 5**).

Figure 5: Desired Bus Service Improvements



- For both existing FlexRide and with any new on-demand service, residents' top priority is being able to be guaranteed a ride within 15 to 30 minutes of a request, followed by a convenient booking platform and consistent, professional drivers.
- Other characteristics that impact first/last mile connections like bicycle and pedestrian facilities are important to consider when planning new services.
- Desired destinations are dispersed throughout the community.
- The FlexRide can be challenging to use as it's not always available and difficult to make transfers.
- Traveling from one side of I-25 to the other and making most local trips in general in Thornton is very difficult due to the low frequency of existing transit service, lack of transit service in some areas, and need to transfer.

Peer Community Analysis

When looking at communities that are like Thornton, such as Lafayette, CO; Kent, WA; and Tracy, CA; local transit service is supplemental and complimentary to regional service. Further, the local services in these communities focus on ensuring access to a wide variety of areas throughout the community by providing a mix of fixed-route services and on-demand services.

Potential Transit Travel Markets

Primary transit travel markets (groups with common demographic characteristics) are important to identify to inform the service alternatives, the service plan, and associated marketing strategies. Through the transit market analysis, including analysis of demographics, existing transit service, community input, and existing travel patterns, the following potential key transit travel markets were identified.

Young Users and School Trips

Youth between the ages of 10 and 17 make up 13% of Thornton's population. These riders may not have a driver's license or access to a vehicle and may be a market for increased ridership. These young users may be more open to app-based on-demand services than other user groups. Typically, the largest demand of trips for this travel market is to get to and from school and to after school activity centers and jobs. This population group is distributed across most of Thornton.

Older Adults

People aged 65 and over make up 10% of Thornton's population. Older adults may be more interested in a new service that picks up and drops them off closer to where they need to go, and areas with missing or uncomfortable sidewalks are going to be a significant barrier to using fixed-route transit. The most desired trip types by this group are to grocery stores, medical facilities and services, and community centers (including the Active Adults Center). Through the active adults focus group, it was made clear that transit improvements are highly supported among this group. While there are several areas of Thornton with higher concentrations of older adults, these areas are distributed across the city, with a notable population in the 55+ community of Todd Creek that is far from any existing transit service.

Individuals and Families with Lower Incomes

Census data showed that people with low and moderate income are mostly in the southern portion of Thornton, but there are other areas to the north where a large portion of the population is living under the poverty line. A low cost, reliable transit service that connects low-income families and individuals with shopping options, local services, and jobs could be an important mobility option for these riders.

People with Limited Access to a Vehicle

About 3% of Thornton households do not own a vehicle, and 14% only have one vehicle. Even in households with one vehicle, there may be people who need to get around but don't have the option to drive, particularly youth and older adults, either because they cannot drive, someone else in the house is using the vehicle, or they choose not to have a vehicle. Transportation for these populations is often challenging, due to the limitations in driving a personal automobile or consistent access to a personal automobile. In some census tracts in Thornton over 5% of households do not have a vehicle, particularly in the southwest, southeast, and in the Todd Creek 55+ neighborhood. By expanding transit options and connections, a new transit service could improve mobility for those who would otherwise have a difficult time accessing the places that they need to go.

People with Limited Mobility or Mobility Assistance Devices

Given that 9% of Thornton residents households have a disability, and those community members may have mobility needs, there is an opportunity to provide a more convenient option using an on-demand solution, especially for those residents that do not meet eligibility requirements for paratransit but may not be able to easily use existing bus services.

Commuters and Service Workers

While RTD does provide some service to regional destinations, particularly to Downton Denver and Denver International Airport, there are many service-oriented jobs within and near Thornton with varying schedules that are not well served by existing transit service. People working service jobs often do not have access to a vehicle and depend on transit or a friend or family member to get to work.

First/Last Mile Access

There are six regional transit hubs in or adjacent to Thornton that provide bus and/or rail service to destinations throughout the Denver region. While many people use these regional services (or would like to), these hubs are difficult to access without a vehicle from most of Thornton. Improving access via transit to these regional hubs was one of the most desirable transit improvements identified by the community and a potential travel market that is not well served today.

Short, Community-Based Trips

The most common trip type in Thornton are short community-based trips of two to five miles. This market is not currently well-served by RTD and there may be an opportunity for Thornton to fill this gap as the existing transit service is designed largely to serve longer regional and commuter trips. While these trips

occur across the city there are particularly high concentrations in south Thornton where densities are higher and there are numerous commercial destinations (particularly around the Washington Street corridor).

Chapter 3 – Alternatives Analysis and Community Input

Five alternatives were evaluated as opportunities for transit improvements in Thornton. The alternatives included variations of new on-demand service, improvements to existing fixed-route service, and new fixed-route service. The alternatives were created based on input from the first round of community engagement and the transit market analysis. The alternatives were intended to be bookends to demonstrate the different benefits and challenges of several transit improvement options in Thornton, with the preferred alternative likely to be a subset or variation of the alternatives.

Description of Alternatives

The project team developed five potential improvements to public transit in Thornton, including two microtransit (on-demand shuttle) options and three options for improving standard bus service.

Microtransit Alternatives

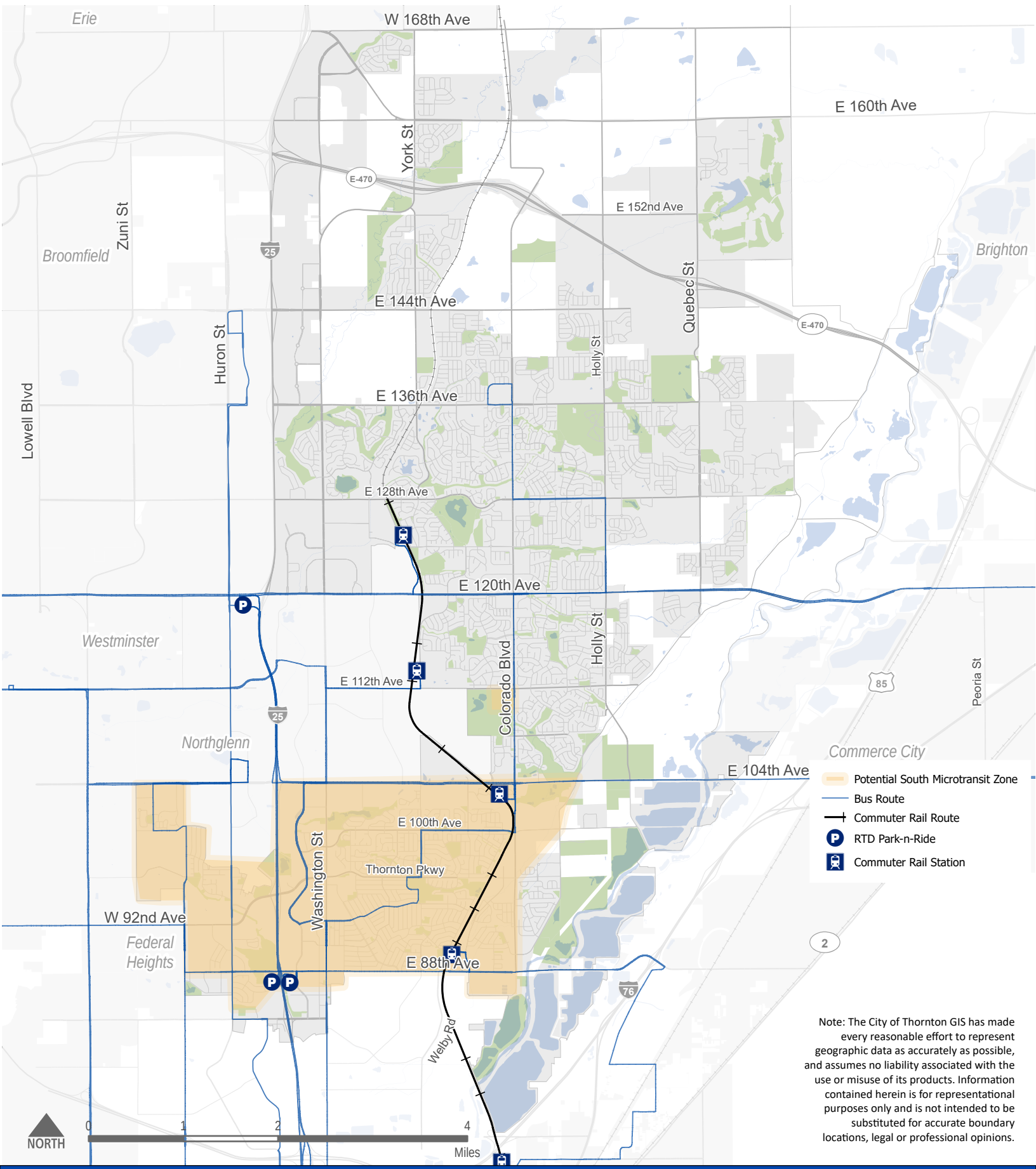
Microtransit is an on-demand transportation service where a ride can be requested from any origin to any destination within a fixed zone. Rides are requested through a smartphone app or phone call and response times are about 15 to 30 minutes after a request is made. A new microtransit service would use either SUVs, minivans, passenger vans, or minibuses (like FlexRide). With any option there will always be at least one vehicle available that is wheelchair/mobility device accessible (ADA compliant). Microtransit alternatives were assumed to be fare free and for purposes of the analysis were assumed to operate 14 hours a day, six days per week.

Alternative 1: South Microtransit Zone

Alternative 1 would provide microtransit service to the southern region of Thornton, generally between 88th Avenue and 104th Avenue, and from Zuni Street to Colorado Boulevard (**Figure 6**). The zone would also provide access to the Margaret W. Carpenter Recreation Center and Thornton Active Adult Center at 112th Avenue and Colorado Boulevard. The zone was slightly modified after community input, as described later in this chapter.

Alternative 1: South Microtransit Zone

Figure 6



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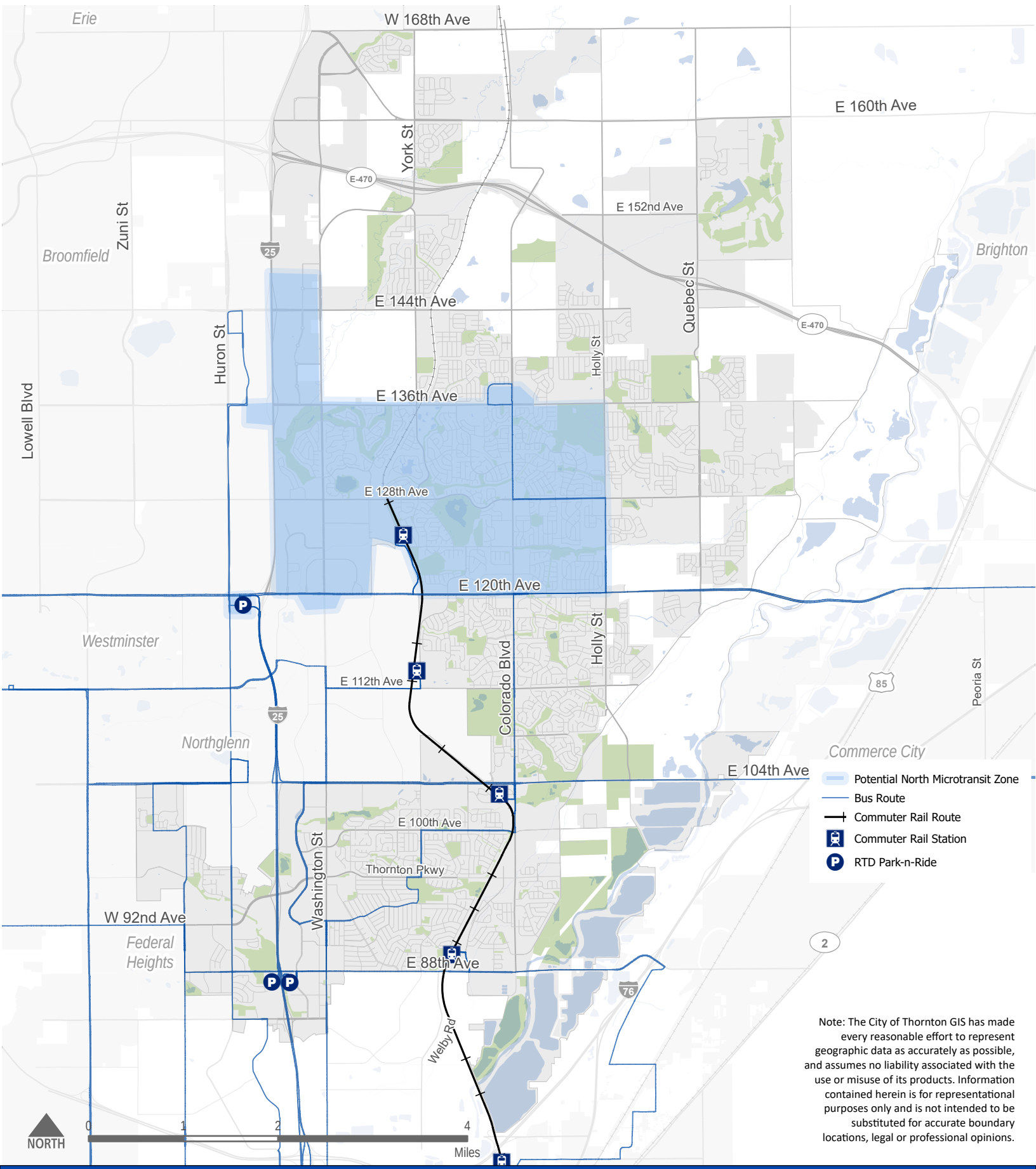
Basemap Data: June 2023

Alternative 2: North Microtransit Zone

Alternative 2 would provide microtransit service to the northern region of Thornton, generally between 120th Avenue and 136th Avenue, and from I-25 to Holly Street (**Figure 7**). The zone would also provide access to the Denver Premium Outlets and the Wagon Road Park-n-Ride in Westminster. The zone was slightly modified after community input, as described later in this chapter.

Alternative 2: North Microtransit Zone

Figure 7



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Fixed-Route Buses

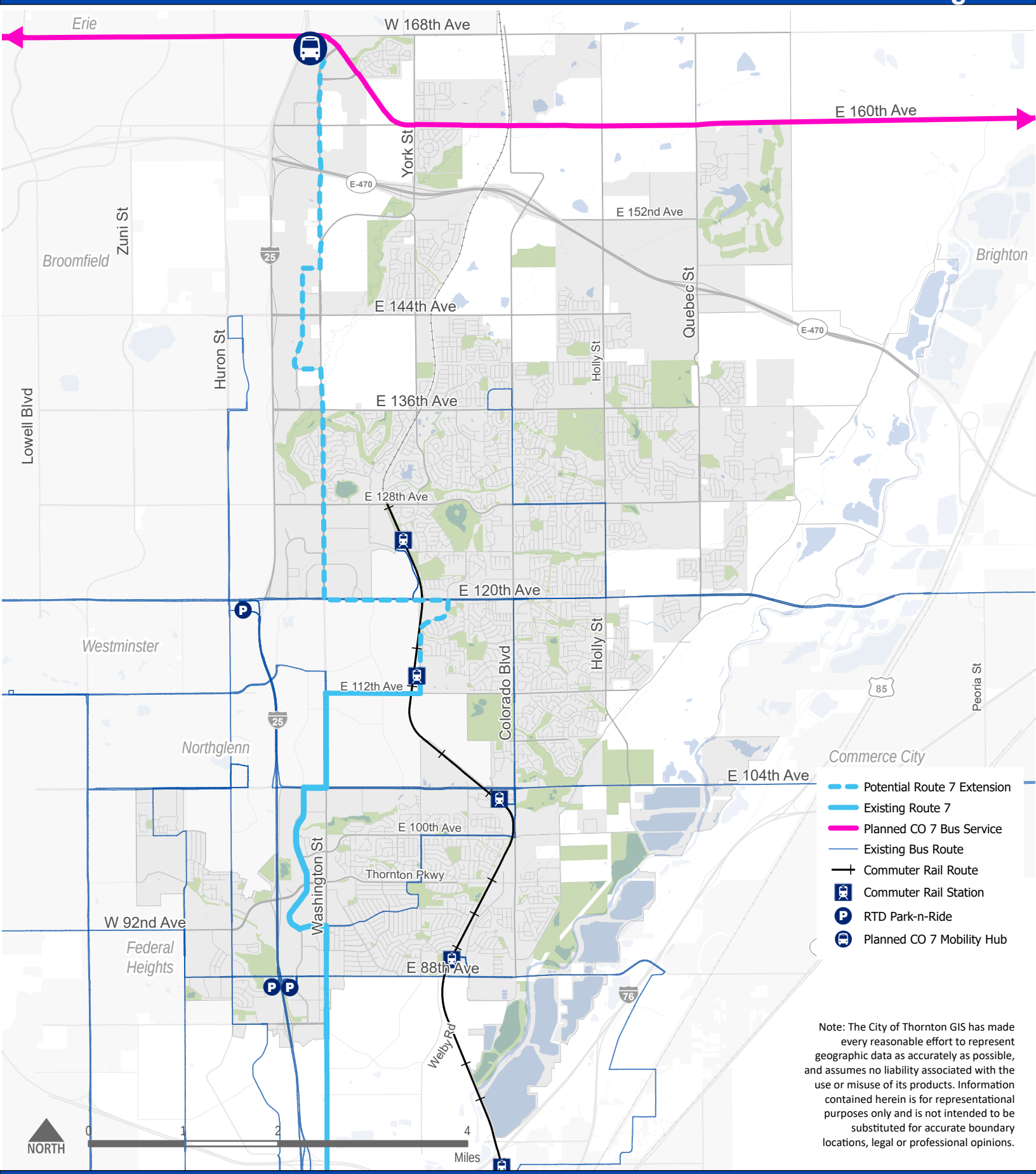
Eleven traditional bus routes (known as "fixed-route" buses) operated by RTD currently serve Thornton in some capacity. These are bus routes that run between set stops on set schedules. Based on input from the first round of community engagement, extending the existing Route 7 (Alternative 3), increasing frequency of existing routes on 120th Avenue (Alternative 4), and increasing frequency on the existing Route 93L (Alternative 5) were identified as opportunities for potential service improvements. Any changes to RTD routes will require interagency coordination between the City of Thornton, RTD, and neighboring communities. The evaluation conducted for this study only analyzed the impacts of these improvements within Thornton. Additional recommendations to fixed-route service were made after community input, as described in Chapter 4.

Alternative 3: Extend Route 7

Alternative 3 would extend the existing Route 7 from its current terminus at the Northglenn – 112th Station to the Larkridge Shopping Center near I-25 and CO 7 where it would connect with the planned Bus Rapid Transit (BRT) line along CO 7 and future Bustang stop on I-25 (**Figure 8**). The current route provides service between the 38th & Blake Rail Station in Denver and the Northglenn & 112th Rail Station at 30-minute frequencies throughout the day. The extension would also operate at 30-minute frequencies.

Alternative 3: Extend Route 7

Figure 8



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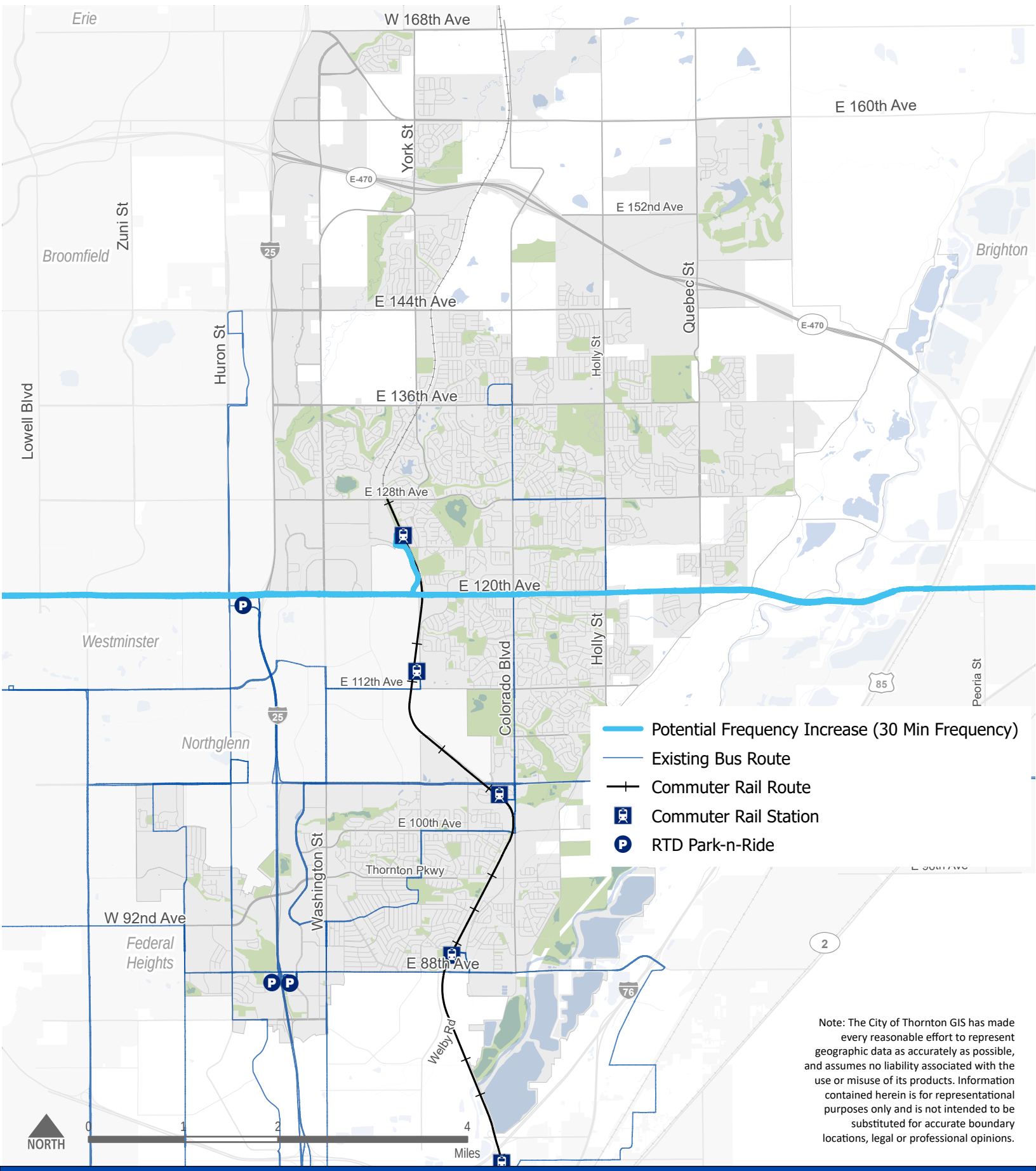
Alternative 4: Increase Frequency on 120th Avenue

Alternative 4 would increase bus frequency (how often the bus comes) on 120th Avenue within Thornton (**Figure 9**) from 60-minutes to 30-minutes throughout the day. Currently, 120th Avenue is served by the Route 120E between the US 36 & Broomfield Station in Broomfield and the Eastlake & 124th Station, and the Route 120L between the Eastlake & 124th Station and the US 85 & Bridge St Park-n-Ride in Brighton. Both routes currently travel at 60-minute frequencies.

Alternative 4: Increase Frequency on 120th Avenue

Figure 9



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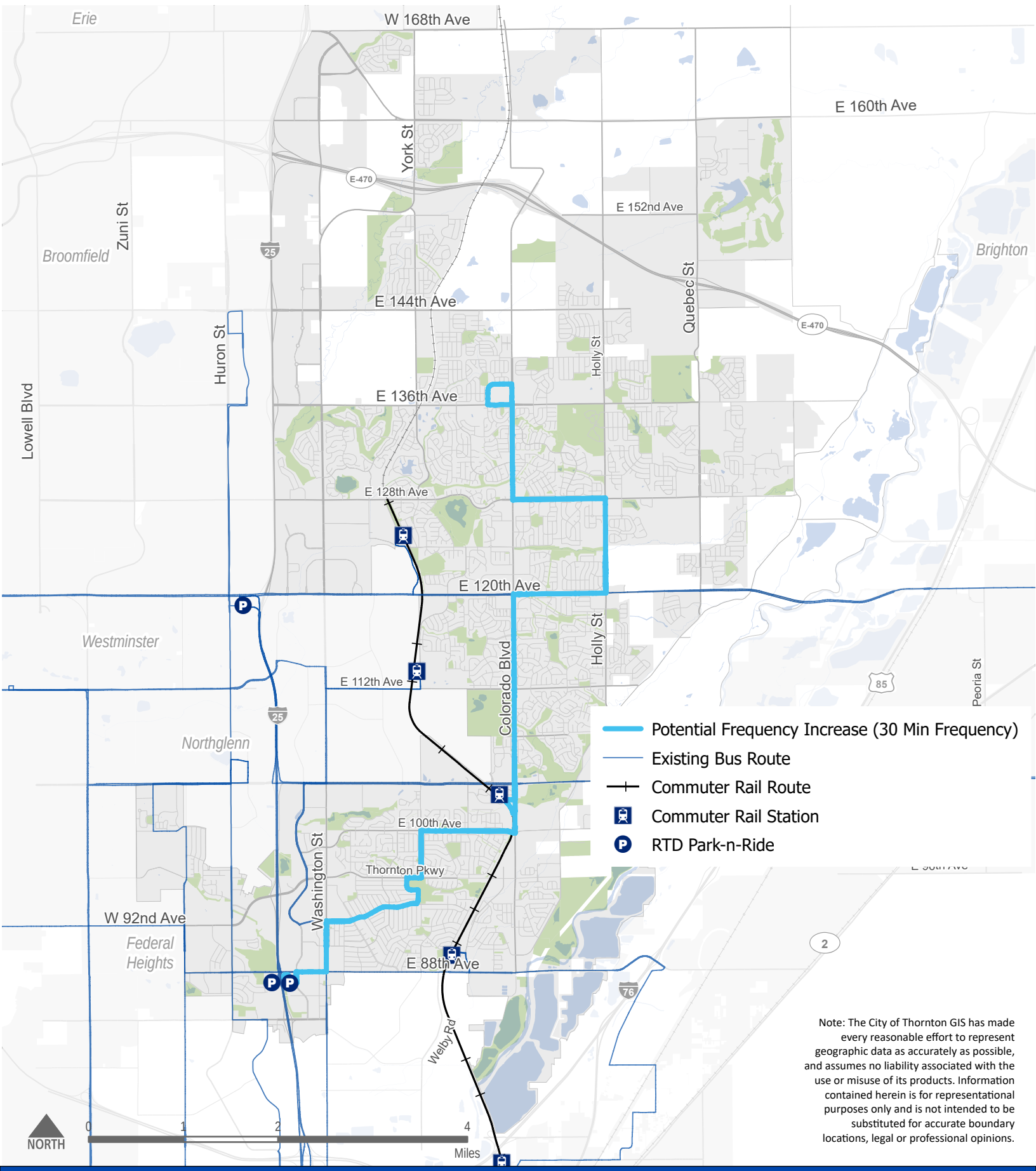
Alternative 5: Increase Frequency on Route 93L

Alternative 5 would increase the frequency of the existing Route 93L (**Figure 10**) from 60-minutes to 30-minutes throughout the day. The 93L currently provides service between the Thornton Park-n-Ride (near 88th Avenue and I-25) and 138th & Cherrywood Park Road at 60-minute frequencies throughout the day.

Alternative 5: Increase Route 93L Frequency

Figure 10



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Evaluation Criteria

Each alternative was evaluated based on a set of criteria that was informed by the first round of public engagement, such as how each alternative serves different demographic groups and destinations across Thornton. Each evaluation criteria are displayed in **Table 1**, along with what was measured, and the methodology used to measure each evaluation criteria. For microtransit alternatives, the analysis was performed for the area of the proposed zone. For fixed-route alternatives, the analysis was performed for the area within a quarter mile of the proposed route alignment.

Table 1: Evaluation Criteria

Evaluation Criteria	Metric	Methodology	Data Source(s)
Ridership Potential	Average Weekday Riders	Estimates of transit ridership at full build-out of each alternative based on peer communities, population and employment forecasts, and research.	Denver Area On-Demand Services, DRCOG Small-Area Forecasts, Transit Cooperative Research Program (TCRP)
Cost	Annual Operating Cost	Estimates of annual operating cost at full build-out of each alternative based on peer communities and RTD cost per revenue estimates	Denver Area On-Demand Services, RTD
Ease of Implementation	Qualitative Ability to Implement	Qualitative assessment of logistical needs for implementing each alternative, including need for vehicles, bus stops, drivers, coordination with partner agencies, etc.	Peer Communities
Equity Index	Number of Census Tracts with High and Medium Equity Scores Served	Using DRCOG's equity index tool, classified Thornton's census tracts by natural breaks of the final equity index score. Alternatives that serve census tracts classified in the top two classes (more likely to be historically disadvantaged) were counted.	DRCOG Equity Index
Connect to Active Transportation Network	Number of Trailheads Served	Using Thornton's trails and trailheads data, calculated number of trailheads served by alternatives.	City of Thornton
Connection to Future Transit Lines	Connection to Future CO 7 BRT	Assessed if the alternative provided access to the future CO 7 Bus Rapid Transit line.	N/A

Area Not Served by Existing 30-Minute Transit Frequencies	Percent of Area Not Currently Served by 30-Minute Transit Frequencies or Better	For microtransit, calculated the percentage of the proposed microtransit zone area that is farther than a quarter mile from an existing bus route that operates at 30-minute frequency or better and farther than a half mile from a transit hub (park-n-ride). For fixed-route alternatives, the same calculation was performed for the area within a quarter mile of the proposed route.	RTD
Area Not Served by Existing Transit	Percent of Area Not Currently Served by FlexRide or 60-Minute Transit Frequencies	For microtransit alternatives, calculated the portion of the proposed zone area not currently within one of the following: a quarter mile of an existing fixed route bus, a half mile from a transit hub, or within an existing FlexRide zone. For fixed-route alternatives, the same calculation was completed for the area within a quarter mile buffer around the proposed route.	RTD
Travel Markets Served			
Schools	Number of Middle/High Schools Served	Number of Thornton middle and high schools directly served by alternatives.	City of Thornton
Student Trips	Number of Middle/High School Students Served	Number of students attending Thornton middle and high schools directly served by alternatives.	City of Thornton
Older Adults (Quantitative)	Percent of Thornton's Older Adults Served	Percent of older adults directly served by alternatives compared to the total of older adults in Thornton.	U.S Census
Older Adults (Qualitative)	Ease of Access for Older Adults	Qualitative Assessment of average distance a user would need to walk to access on-demand service vs. fixed-route transit service.	N/A
Low-Income Families (Quantitative)	Percent of Thornton's Low-Moderate Income Population Served	Number of low-income families directly served by alternatives compared to the total number of low-income families in Thornton.	U.S Census

Low-Income Families (Qualitative)	Ease of Access (likely fare) for Low-Moderate Income Population	Qualitative Assessment of fare required for on-demand vs. fixed-route transit options.	N/A
People with Limited Access to Vehicles	Percent of Thornton's Households with One or Fewer Vehicles Served	Number of households with limited access to vehicles directly served by alternatives compared to the total number of households with limited access to vehicles in Thornton.	U.S Census
People with Disabilities	Percent of Thornton's Disability Population Served	Number of individuals with disabilities directly served by alternatives compared to the number of individuals with disabilities in Thornton.	CDPHE
Access to Service Jobs	Percent of Thornton's High and Medium Employment Concentrations Served	Total area of high and medium employment concentrations as designated by DRCOG directly served by alternatives compared to the total area of high and medium employment concentrations in Thornton.	DRCOG Employment Concentrations
First/Final Mile Access	Number of Regional Transit Hubs Served	Count of regional transit hubs (rail stations or park-and-ride stops) directly served by alternatives.	N/A
Short Community-Based Trips	Number of Key Destinations Served	Number of key destinations within Thornton (including schools, medical centers and hospitals, grocery stores, community and recreation centers, libraries, social services, and other desired destinations from public input) directly served by alternatives.	City of Thornton, First Round of Community Input

Alternatives Analysis Findings

The alternatives were scored relative to each other on a qualitative scale of high-medium-low for each evaluation criteria based on the resulting metrics. Both the quantitative and qualitative results are displayed in **Figure 11**.

Figure 11: Alternatives Analysis Results

Legend:	Higher Feasibility	Medium Feasibility	Lower Feasibility		
Evaluation Criteria	**Metric**	**South Thornton Microtransit Zone**	**North Thornton Microtransit Zone**	**Extend Route 7**	**Increase 120th Frequency**	**Increase 93L Frequency**
Ridership Potential	***Average Weekday Riders***	200-300	125-225	300-425	125-200	125-175
Cost	***Annual Operating Cost***	$975k-$1.2M	$800k-$1M	$2M-$3.3M	$675K-$1.1M	$1.2M-$1.9M
Ease of Implementation	***Qualitative Ability to Implement***	High	High	Low	Medium	Medium
Equity Index	***Number of Census Tracts with High and Medium Equity Scores Served***	8	2	1	1	3
Connect to Active Transportation Network	***Number of Trailheads Served***	3	1	0	0	1
Connection to Future Transit Lines	***Connection to Future CO-7 BRT***	No	No	Yes	No	No
Area Not Served by Existing 30-Minute Transit Frequencies	***Percent of Area Not Currently Served by 30-Minute Transit Frequencies or Better***	47%	91%	95%	83%	76%
Area Not Served by Existing Transit	***Percent of Area Not Currently Served by Flex Ride or 60-Minute Transit Frequencies***	2%	12%	20%	0%	0%
Travel Markets Served						
Schools	***Number of Middle/High Schools Served***	12	8	4	0	5
Student Trips	***Number of Middle/High School Students Served***	7,390	6,555	1,589	0	4,891
Older Adults (Quantitative)	***Percent of Thornton's Older Adults Served***	33%	29%	9%	11%	23%
Older Adults (Qualitative)	***Ease of Access for Older Adults***	+	+	-	-	-
Low-Income Families (Quantitative)	***Percent of Thornton's Low-Moderate Income Population Served***	54%	17%	7%	11%	24%
Low-Income Families (Qualitative)	***Ease of Access (likely fare) for Low-Moderate Income Population***	+	+	-	-	-
People with Limited Access to Vehicles	***Percent of Thornton's Households with One or Fewer Vehicles Served***	55%	19%	8%	12%	23%
People with Disabilities	***Percent of Thornton's Disability Population Served***	43%	21%	9%	12%	24%
Access to Service Jobs	***Percent of Thornton's High and Medium Employment Concentrations Served***	42%	34%	21%	12%	24%
First/Final Mile Access	***Number of Regional Transit Hubs Served***	3	2	1	2	1
Short Community-Based Trips	***Number of Key Destinations Served***	76	33	17	12	39

Key findings of the alternatives analysis are summarized below by alternative:

- **Alternative 1: South Microtransit Zone.** This alternative had more "high" scores across the different evaluation criteria than any of the other alternatives. Specifically, this alternative scored the best for serving the travel markets identified in the travel market analysis. It also scores well in cost and ease of implementation. It was middle-of-the road in terms of ridership potential as compared to the other alternatives. This alternative does not score as well as the others in serving areas that are not currently being served by transit, as the south microtransit zone would overlap with the areas in Thornton with some of the best existing transit services. Overall Alternative 1 scored the best among the criteria evaluated, but it would also be in an area with the most existing transit coverage in Thornton.
- **Alternative 2: North Microtransit Zone.** Alternative 2 had the second highest number of high and medium scores among the alternatives. Alternative 2 scores relatively high among travel markets served, but not as high as Alternative 1. In particular, this zone does not serve as many schools, low-income families, people with limited access to vehicles, or people with a disability as Alternative 1 does. Similar to Alternative 1, Alternative 2 scores high in terms of minimizing cost and ease of implementation, but ridership is not expected to be as high as Alternative 1. Alternative 2 also scored the highest among all alternatives in serving areas that are currently underserved/unserved by transit, as this zone is in an area of Thornton that has minimal existing transit options today.
- **Alternative 3: Extend Route 7.** This alternative performed the lowest among all alternatives in terms of travel markets served. However, Alternative 3 has the highest ridership potential among all of the alternatives, scored the best at connecting to future transit lines and serving areas that are currently underserved by transit. This alternative may also be the most challenging to implement due to both the need to coordinate with RTD (similar to the other fixed-route alternatives) and the additional need to construct bus stops and access to the bus stops along the route.
- **Alternative 4: Increase Frequency on 120th Avenue.** Compared to all the other alternatives, this alternative scored the lowest when comparing all evaluation criteria. It should be reiterated that scoring lower than the other alternatives does not mean that this alternative does not accomplish the desired goals of new transit services in Thornton. Rather, it means that other alternatives might be better suited to serve transportation needs. The area in which Alternative 4 scores highest is in minimizing cost. Ease of implementation, its ability to serve areas that are currently underserved by transit, and providing first/final mile access were all medium scores, while the alternative scored lower in all other metrics as compared to the others.
- **Alternative 5: Increase Frequency on Route 93L.** This alternative scores in the middle compared to the other alternatives. Alternative 5 serves the identified travel markets better than the other two fixed-route alternatives, but not as well as the microtransit alternatives. Cost is in the middle compared to the other alternatives and ridership potential is on the low end compared to other alternatives. Because of the travel markets served this alternative scored better on the equity index than compared to Alternatives 2, 3, and 4.

Community Input on Alternatives

Through a virtual open house and an online survey, all five alternatives and their scoring from the alternatives analysis were presented to the public. In both the open house and the online survey, it was made clear that the alternative improvements shown were still in draft phase and intended to represent bookends for purposes of comparison analysis. The public was made aware that final recommendations may be a subset, combination, or variation of one or all the five improvements and will be refined based on community feedback and further analysis.

Participants of these community engagement efforts were asked to provide input on the evaluation criteria used in the alternatives analysis, preference of alternatives, and preferred service characteristics (days of the week and times of day). Between the virtual open house and the online survey, the project received input from 57 people. For this round of the online survey (there was another one completed during the transit market analysis phase of the project), the largest portion of respondents (31%) indicated they live in Ward 2, which covers the southeast portion of the City **(Figure 12)**. A map of the ward geographies at the moment of this survey is provided in **Figure 13**. There was also a significant portion of respondents who do not live within the city boundaries of Thornton, and the survey received the least number of responses from Ward 1. These are important to note when understanding how respondents' residences impact their choices to answers throughout the survey.

Figure 12: Which City of Thornton Ward do you live in?

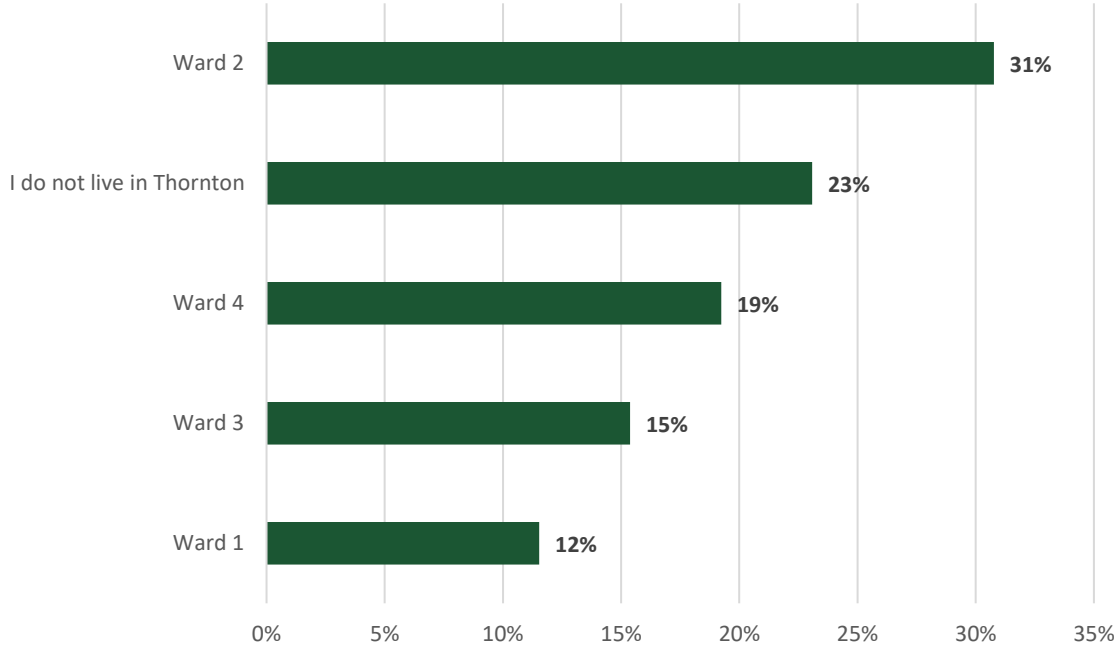
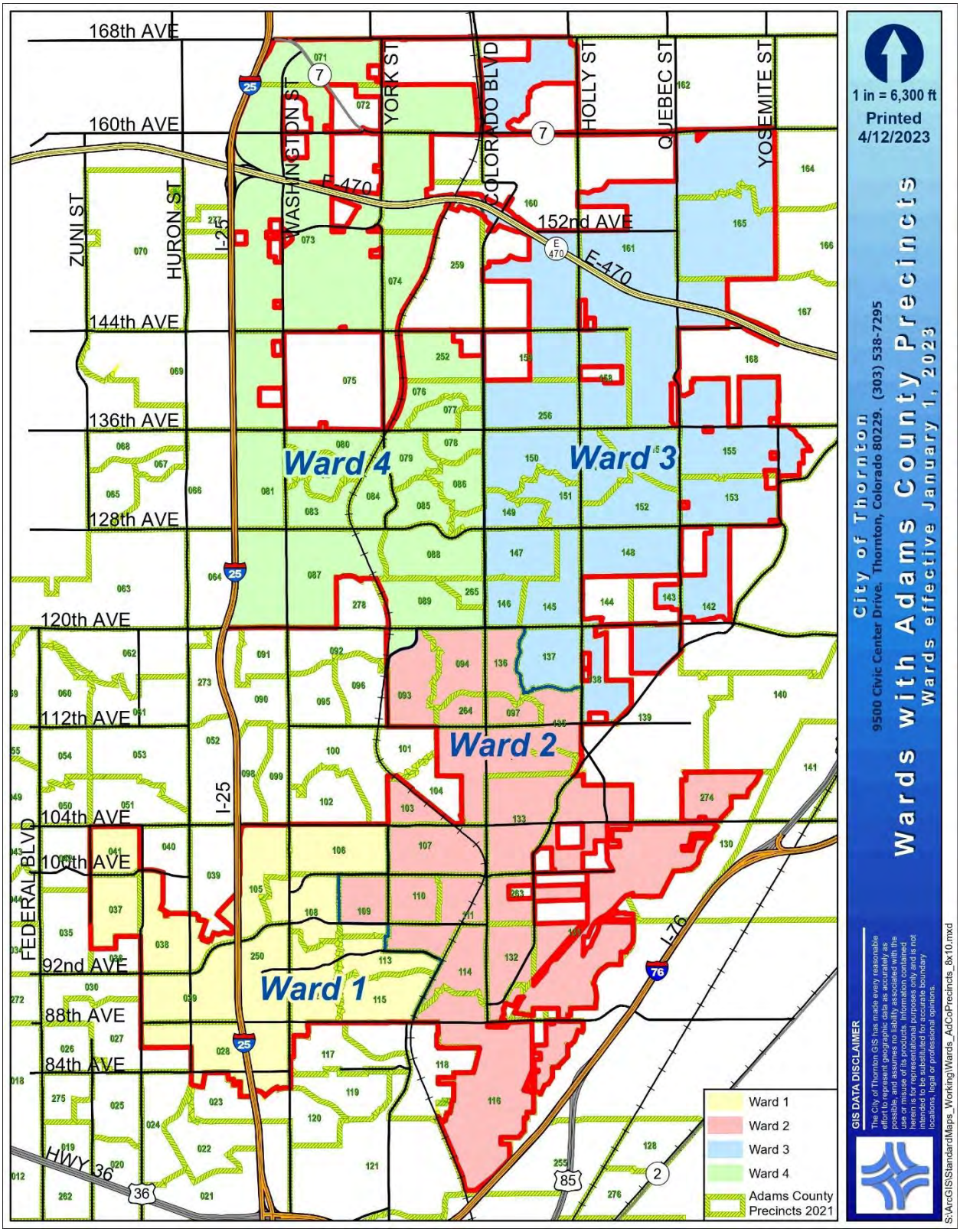


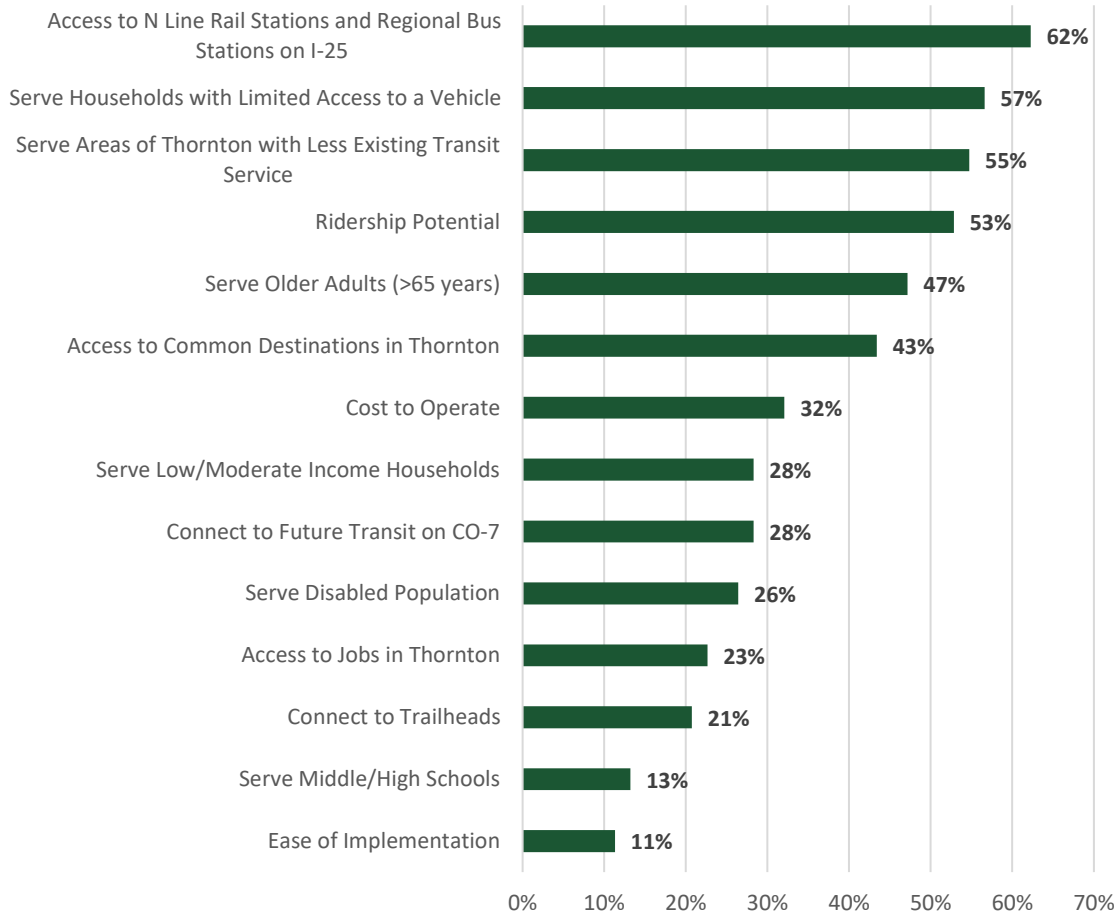
Figure 13: City of Thornton Ward Map, January 2023



Alternatives Survey Results

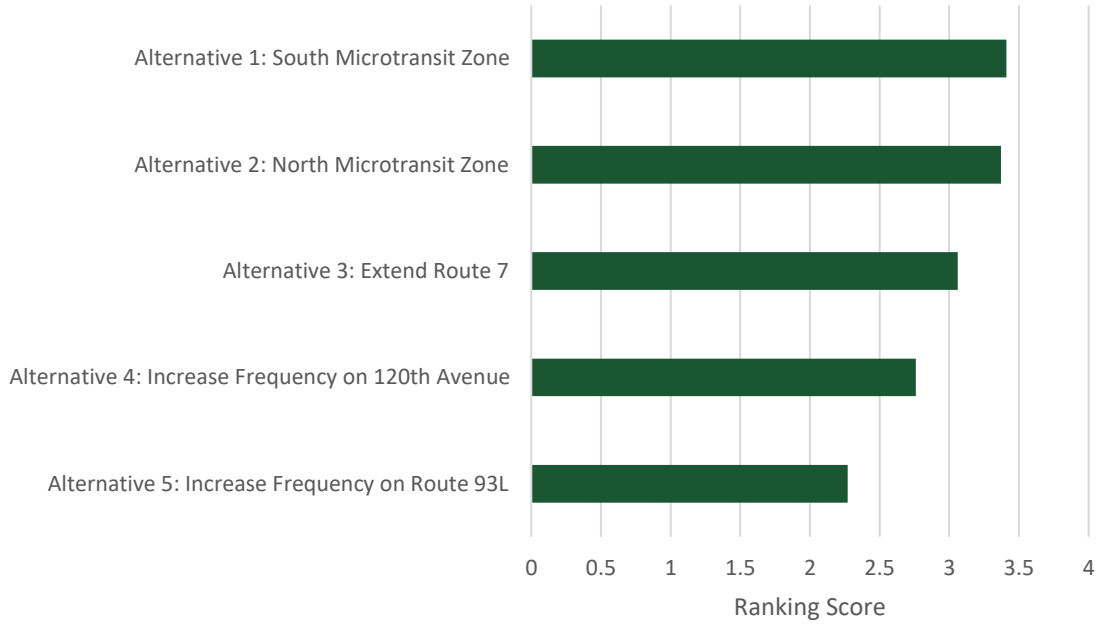
The community was asked to pick the five most important evaluation criteria when it comes to evaluating each alternative. **Figure 14** displays which criteria were the most important to survey respondents. The top factors were access to N Line rail stations and regional bus stations, serving households with limited access to a vehicle, serving areas of Thornton with less existing transit service, ridership potential, serving older adults, and access to common destinations in Thornton.

Figure 14: Of the Evaluation Criteria used to compare the improvement alternatives, please indicate the five most important to you.



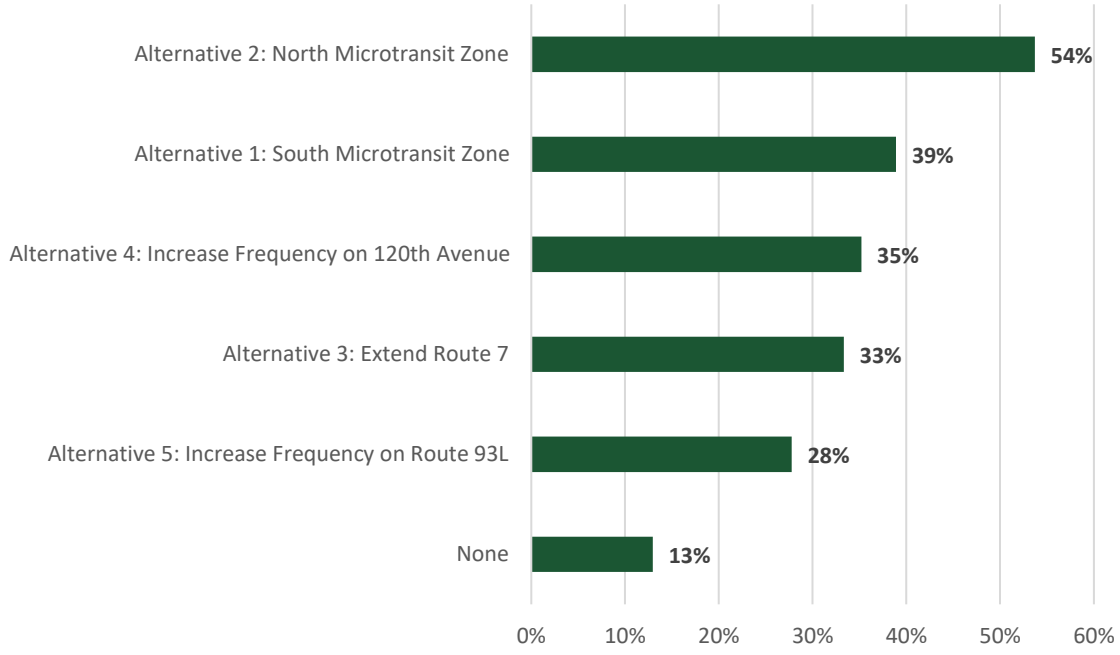
Survey respondents were asked to provide input on the draft alternatives in two ways. The first way was by ranking the alternatives from most preferred to least preferred. For this question the two microtransit zones were ranked highest, followed by Alternative 3 - to extend Route 7 **(Figure 15)**.

Figure 15: Based on the comparison between all five alternatives for improving public transit in Thornton, please rank the alternatives from most preferred to least preferred.



The second way in which respondents were asked to provide input on the draft alternatives was by selecting which alternative(s) they would use. **Figure 16** displays that the North Microtransit Zone would be used most, followed by the South Microtransit Zone. It is notable that although the survey respondents ranked the microtransit zones similarly, there is a larger portion of people who said they would use the North one. Further, although the Route 7 extension alternative ranked third, the public input shows that people would more likely use the increased frequency on 120th Avenue. It is important to consider that there were more Ward 2 and Ward 4 residents who responded to the survey than Ward 1 or 3 residents, which corresponds to the transit alternatives that rose to the top by likelihood to use.

Figure 16: If all of these alternatives were implemented, which would you use? (select all that apply)



Input on Service Characteristics

The online survey also asked respondents to rank the days of the week and times of day that they would most likely use transit services in Thornton. **Figure 17** displays the preference of days, with weekdays (Monday through Friday) ranking at the top, followed by Saturday and then Sunday.

Figure 17: Please rank the days of the week you would likely use transit service in Thornton from most likely to least likely. Do not select days you would not use the service.

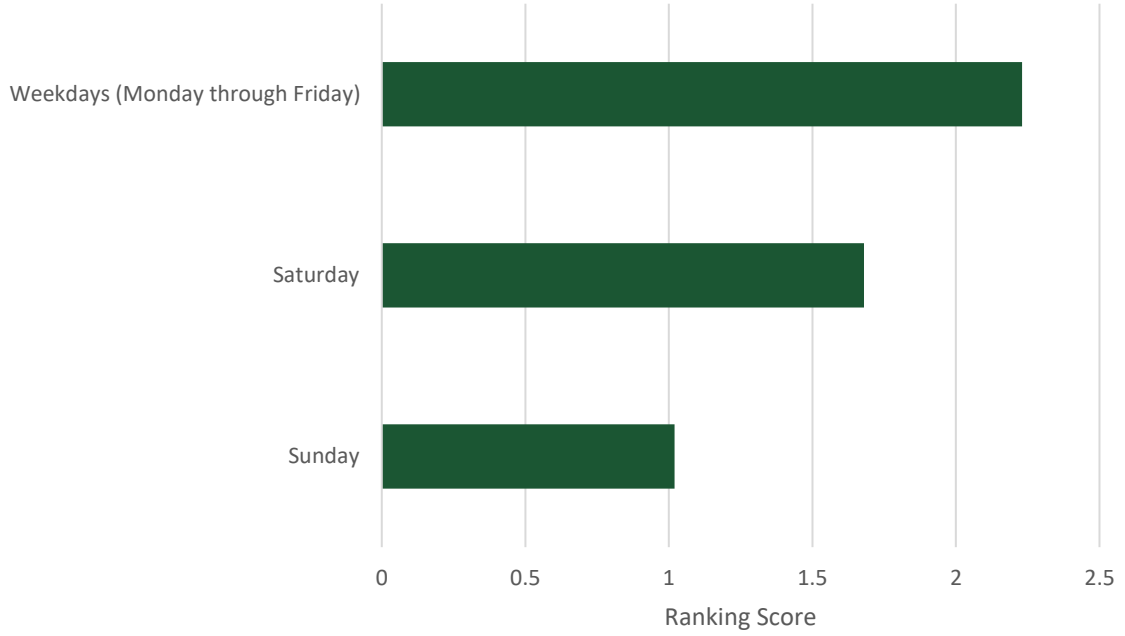
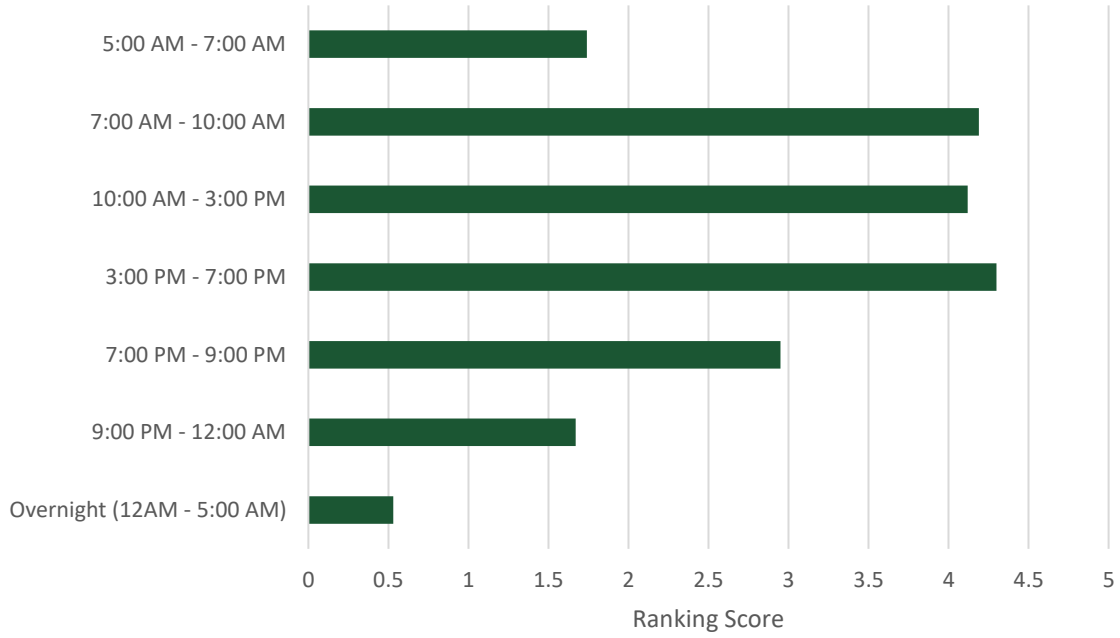


Figure 18 displays the preference for times of the day, with the top desired times of day being 7:00 AM to 7:00 PM. There is also a larger preference for service going toward 9:00 PM than service going earlier from 5:00 AM.

Figure 18: Please rank the times of the day you would likely use transit service in Thornton from most likely to least likely. Do not select times of day you would not use the service.



Other Comments

During the open house and through the survey, the public had opportunities to provide open-ended responses related to changes to the presented alternatives, additional improvements to public transit, and other comments. In general, the open-ended responses were more focused on similar themes seen in the first phase of public outreach, where the public expressed a desire for increased frequency of existing transit services and easier connections to regional transit at the N Line stations and the regional bus stations. The comments directly related to the presented alternatives expressed a desire to connect to nearby areas outside of the Thornton city boundary, and a desire for the microtransit zones to overlap more to provide north-south connections throughout the city. There were also numerous comments about improvements to the existing RTD FlexRide service and improvements to the RTD website.

Selection of a Preferred Alternative

Based on the evaluation criteria, input from the public, and guidance from the project's stakeholder group, the project team determined that implementation of all alternatives over time would advance the city toward its transit mobility goals. Based on feedback from the public and stakeholders some modifications were made to the microtransit zone boundaries to cover more area. Community and stakeholder input along with anticipated performance metrics also informed a phasing plan to prioritize implementation of certain improvements first. Several additional future transit projects emerged from the evaluation process that were also included as medium and long-term improvements in the plan. The preferred alternative and phasing of each action is described in Chapter 4.

Chapter 4 – Preferred Alternative and Implementation Phases

This chapter describes the preferred alternative and provides guidance on how to phase the transit improvements over a ten-year period between 2025 and 2034. The operating plan is split into three implementation phases:

4. Short-term: 2025 to 2027
5. Mid-term: 2028 to 2031, and
6. Long-term: 2032 to 2034.

Note: All cost estimates are in 2023 dollars and will need to be adjusted for inflation according to year they are implemented. Additionally, the proposed responsible party was identified for each improvement in **Table 2**, **Table 3**, and **Table 4**. The responsible party includes City of Thornton, RTD, or RTD and City of Thornton and potentially other jurisdictions. For improvements where City of Thornton is listed, Thornton will need to initiate this improvement, but funding could come from multiple sources, including both internal and external. For improvements where only RTD is identified as the responsible party, RTD has expressed their intent to make that improvement. For improvements to the RTD fixed-route network where both City of Thornton and RTD are listed, it is assumed that either RTD will need to make this improvement or Thornton (and potentially other jurisdictions) will need to "buy up" service from RTD. However, it should be noted that RTD is not currently allowing buy-ups largely because of the driver shortage, but RTD has indicated a desire to allow buy-ups again in the future. More is described on this risk at the end of Chapter 6 – Implementation Plan.

Short-Term Implementation (2025-2027)

The short-term transit improvements are displayed in **Table 2**, along with service characteristics, cost estimates, and implementation timeline. In the first three years the city will focus on implementing the two microtransit zones and extending the Route 7 north to Larkridge in two phases.

Figure 19 illustrates these short-term improvements in a map. Descriptions of each transit improvement are also provided below.

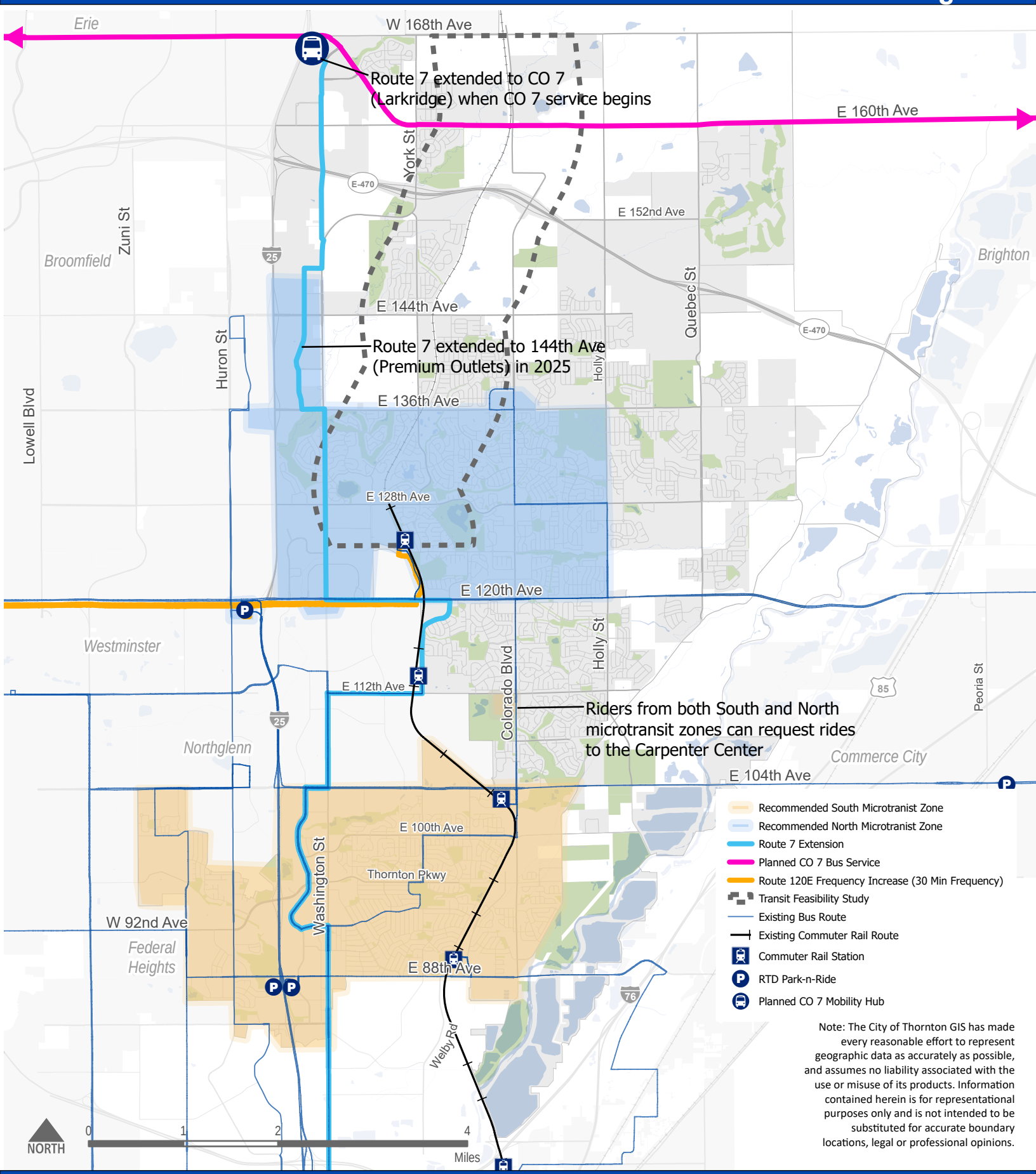
Table 2: Short-Term Implementation Details

Transit Improvement	General Extent Description	Service Hours	Response Time or Frequency	Estimated Annual Operating Cost*	Implementation Year	Responsible Party
South Microtransit Zone	Between southern city limits and 104th Ave, and from Zuni St to Riverdale Rd. Rides can also be requested to/from the Carpenter/Active Adult Center.	Monday – Saturday 7:00 AM to 9:00 PM	30 minutes	$1M - $1.5M	2025	City of Thornton
Route 7 Extension (Northglenn/112th to 144th Avenue)	RTD SOP indicates an extension to 144th Avenue (Denver Premium Outlets).	Daily 5:00 AM to 12:00 AM	60 minutes	$600K - $1.2M	2025	RTD
Route 7 Extension to CO 7 (144th Ave to CO 7)	Extension to the future CO 7 mobility hub (Larkridge Shopping Center).	Daily 5:00 AM to 12:00 AM	60 minutes	$350K - $450K	When CO 7 Bus Service Begins (2025/2026)	City of Thornton and RTD
North Microtransit Zone	Between 120th Ave and 136th Ave, and from I-25 to Holly St. Rides can also be requested to/from the Carpenter/Active Adult Center and the Wagon Rd Park-n-Ride.	Monday – Saturday 7:00 AM to 9:00 PM	30 minutes	$800K - $1.2M	2026-2027	City of Thornton
Transit Feasibility Study for Interim Connections to CO 7	Study for bus service and supporting infrastructure to connect Eastlake & 124th Station to CO 7 through planned station areas.	TBD	TBD	$200K - $300K	2026-2027	City of Thornton
Route 120E Frequency Increase	Routing stays the same as existing between US 36 & Broomfield Station and Eastlake & 124th Station.	Daily 6:00 AM to 11:30 PM	30 minutes	$300K - $500K	2026-2027	RTD

*Cost estimates are in 2023 dollars and will need to be adjusted for inflation.

Short-Term Implementation (2025-2027)

Figure 19



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South Microtransit Zone

The area of the south microtransit zone should generally extend from the southern city limits to 104th Avenue and from Zuni Street to Riverdale Road and include a connection point to/from the Carpenter Recreation Center and Thornton Active Adult Center. Riders may request rides from any origin to any destination within the zone boundary. In addition, riders may request rides from the south zone to and from the Carpenter Recreation Center and Thornton Active Adult Center. This zone boundary will allow transfers at three regional transit hubs to the N Line and regional service along I-25: Thornton Crossroads & 104th, Original Thornton & 88th, and Thornton Park-n-Ride. The annual operating cost estimate of $1M to $1.5M assumes 14 hours of service six days per week, three vehicles operating throughout the day, and any necessary start-up, administrative, and marketing costs. The alternatives analysis public survey results indicate the highest demand for the service to be between 7:00 AM and 9:00 PM. As will be described in the implementation plan in Chapter 6, the City of Thornton should work with the selected microtransit operator to refine the service area, service days and hours, and required vehicles to best support the community needs over time.

Route 7 Extension to 144th Avenue

RTD's Strategic Operating Plan (SOP) indicates that Route 7 (which currently terminates at the Northglenn & 112th Station) will be extended to the Denver Premium Outlets at 144th Avenue by 2028. The alignment of the route may change over time to best accommodate the travel demand, but the SOP would have every other trip travel to the Denver Premium Outlets, meaning that there would be 30-minute frequency to the Northglenn & 112th Station, and 60-minute frequency between the current terminus and the Denver Premium Outlets. It is recommended that this be completed in 2025 since the demand for this extension already exists. Due to RTD planning to implement this extension, the assumption is that the City of Thornton would not need to fund it. To still understand the rough magnitude of cost, the project team estimates that this route extension with 60-minute frequencies would cost an additional $600K to $1.2M to the existing annual operating cost. This cost assumes a standard operating rate provided by RTD, with proportional route distance added.

Route 7 Extension to CO 7

Between the anticipated commercial and mixed-use development north of 144th Avenue, the mobility hub to be constructed at I-25 and CO 7, and new transit service to run between Brighton and Boulder on CO 7, it is recommended to extend Route 7 to this mobility hub along a Grant Street/Washington Street alignment. It is currently uncertain who would fund this extension. It may be RTD, the city, or a combination. The annual operating cost estimate of this extension from 144th Avenue to CO 7 is $350K - $450K at 60-minute frequencies. The cost assumes a standard RTD operating rate proportionally applied to route distance.

North Microtransit Zone

The general area of the north microtransit zone is recommended to initially extend from 120th Avenue to 136th Avenue, and from I-25 to Holly Street. The zone also extends to 148th Avenue between I-25 and

Washington Street. Riders may request rides from any origin to any destination within the zone boundary. In addition, riders may request rides from the north zone to and from the Carpenter Recreation/Active Adult Center and/or the Wagon Road Park-and-Ride. The annual operating cost estimate of $800K to $1.2M assumes 14 hours of service six days per week and three full-time vehicles and one part-time vehicle (three vehicles during peak hours). Like the south microtransit zone, the City of Thornton should work with the selected microtransit operator to modify the service area, service days and hours, and required vehicles to best support the community needs over time.

Transit Feasibility Study for Interim Connections to CO 7

According to the RTD FasTracks program, the N Line (which currently has a temporary end of line station at the Eastlake & 124th Station) is to be completed to CO 7 with stops at York & 144th and CO 7. As of 2023, funding the completion to CO 7 is not available, and RTD states the completion of the final 5.5 miles will be complete when funds become available, which may not happen for another 20 or 30 years – or more. As this area of Thornton is expected to grow significantly in the next decade, the City of Thornton should study the feasibility of providing an interim bus service between the Eastlake & 124th Station and CO 7, including to the planned N Line station that would be at 144th Avenue. This study should consider the transit service type (fixed-route, deviated, vehicle type, etc.), the alignment, stations, land acquisition, ridership demand, and implementation timing given development and other bus connections along CO 7; the initial CO 7 service plan includes stations in Thornton at the CO 7/I-25 Mobility Hub, Holly Street, and Quebec Street. Furthermore, the study should consider locations for the future N Line station areas and other infrastructure needed to support both the interim service and the N Line extension (such as park-n-rides and bicycle/pedestrian connections).

Route 120E Frequency Increase

To increase frequency of service on 120th Avenue within Thornton, modifications to frequency will need to occur to both the Route 120E and Route 120L. Route 120E, which runs between the US 36 & Broomfield Station and the Eastlake & 124th Station, currently operates at 60-minute frequencies east of Wagon Road Park-n-Ride. RTD has indicated they are likely to increase frequencies of the Route 120E to operate at 30-minute frequencies during the peak periods at some point in the next year or two. The recommendation in this plan is to increase to 30-minute frequencies in the midday as well. The estimated additional annual operating cost for increasing frequency on the segment between Wagon Road Park-n-Ride and the Eastlake & 124th Station all day is $300K to $500K, assuming a standard RTD operating rate.

Mid-Term Implementation (2028-2031)

The mid-term implementation transit improvements are displayed in **Table 3**, along with service characteristics, cost estimates, and implementation timeline. Mid-term recommendations include making adjustments to the existing microtransit services and providing enhancements to fixed-route transit through frequency increases, new routes, and route extensions. Recommended mid-term improvements are illustrated in a map **(Figure 20)** and descriptions of each transit improvement are provided below.

Table 3: Mid-Term Implementation Details

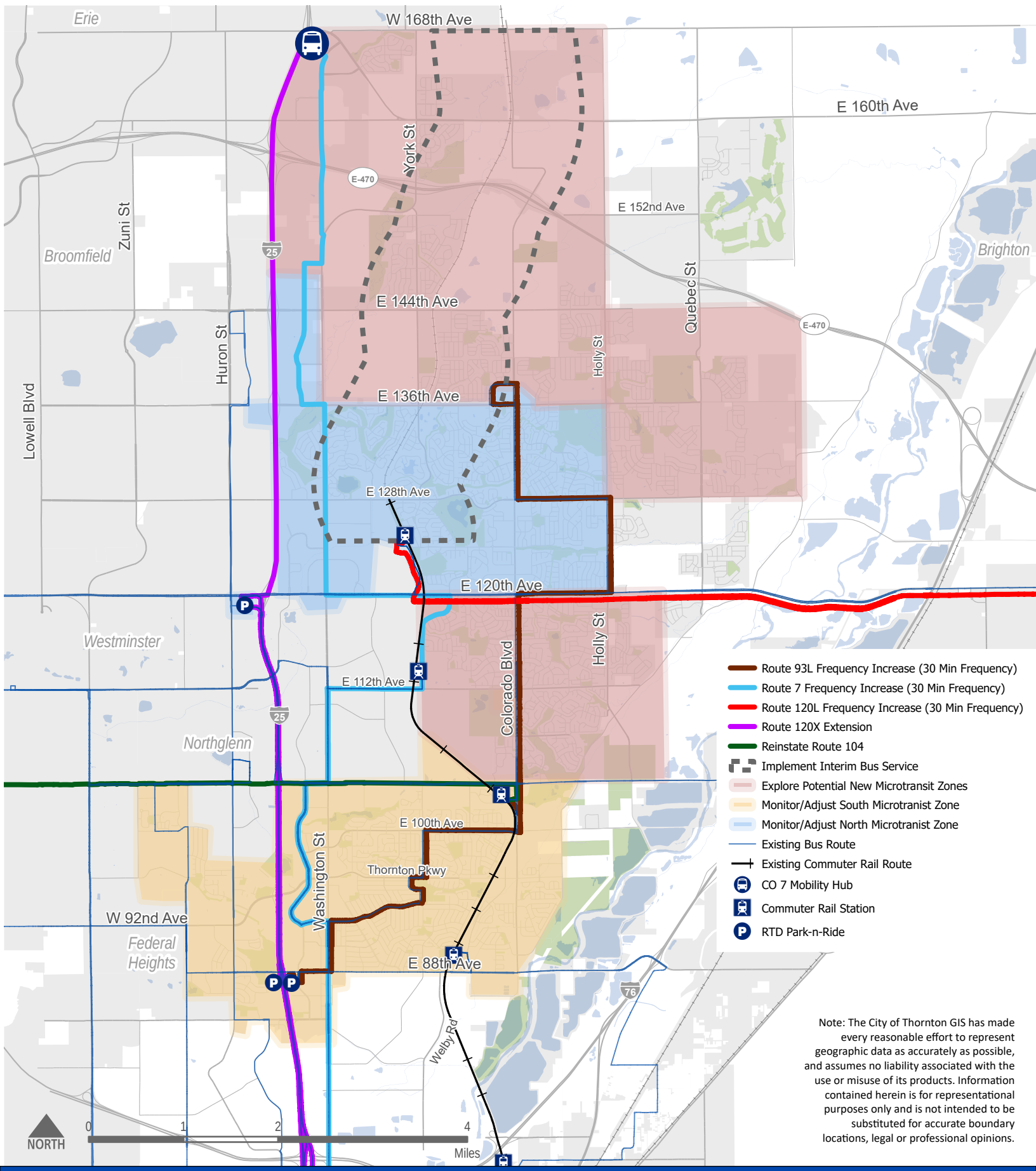
Transit Improvement	General Extent Description	Service Hours	Response Time or Frequency	Estimated Annual Operating Cost*	Implementation Year	Responsible Party
Adjustments to South and North Microtransit Zones and Potential New Zone(s)	Consider adjusting service areas or creating new service areas to accommodate any travel gaps identified in initial implementation.	TBD	30 minutes	Approx. $200K - $300K for improvements, and $800K - $1.2M per new zone	2028-2031	City of Thornton
Route 93L Frequency Increase	Routing stays the same as existing between Thornton Park-and-Ride and 138th & Cherrywood Pk Rd.	Daily 7:00 AM to 9:00 PM	30 minutes	$1.2M - $1.9M	2028-2029	City of Thornton and RTD
Route 7 Frequency Increase	Along entire route, including extension; from Northglenn & 112th Station to CO 7.	Daily 5:00 AM to 12:00 AM	30 minutes	$1M - $1.6M	2028-2029	City of Thornton and RTD
Route 120L Frequency Increase	Routing stays the same between Eastlake & 124th Station and US 85 & Bridge St Park-and-Ride.	Monday – Saturday 5:30 AM to 12:00 AM	30 minutes	$400K - $600K	2028-2029	City of Thornton, RTD, Westminster, Broomfield
Extend 120X to CO 7	Extension to the future CO 7 mobility hub (Larkridge Shopping Center).	Monday – Saturday 5:00 AM to 12:00 AM	15 minutes during peak times; 30 minutes during off-peak times	$800K - $1.5M	2029-2031	City of Thornton, RTD, Adams County, Brighton
Reinstate Route 104	Per RTD North Metro Corridor Bus Operations Service Plan, reinstate a route along 104th Ave between US 36 & Church Ranch Station and Thornton Crossroads & 104th Station.	Daily 5:00 AM to 12:00 AM	30 minutes	$1.1M - $1.4M	2029-2031	City of Thornton, RTD, Northglenn, Westminster
Implement Interim Bus Service per Transit Feasibility Study	Bus service and infrastructure to connect Eastlake & 124th Station to CO 7 through planned stations areas.	TBD	TBD	TBD	2029-2031	City of Thornton and RTD

*Cost estimates are in 2023 dollars and will need to be adjusted for inflation.

Mid-Term Implementation (2028-2031)

*These improvements are in addition to the short-term improvements

Figure 20



Note: The City of Thornton GIS has made every reasonable effort to represent geographic data as accurately as possible, and assumes no liability associated with the use or misuse of its products. Information contained herein is for representational purposes only and is not intended to be substituted for accurate boundary locations, legal or professional opinions.

Adjustments to South and North Microtransit Zones and Potential New Zone(s)

The city should evaluate the performance of the microtransit systems on at least a monthly basis, including tracking ridership per service hour, response times, top destinations, unfulfilled ride requests, customer service, demand by time of day, and feedback from the public. Based on the performance the city may need to make periodic adjustments within the first few years to improve the service and match available funding. Adjustments may be needed to the service boundaries, times of day, days of week, number of vehicles, types of vehicles, minimum trip distances, etc. to maintain the utility of the service to the community.

Based on performance, community feedback, and available resources it may also be appropriate to explore additional areas within the city to add new service, such as filling the gap between the North and South microtransit zones between 104th Avenue and 120th Avenue and north of 136th Avenue. The city should also periodically engage with other jurisdictions (such as Northglenn, Westminster, Federal Heights, and Adams County) to see if there are opportunities to jointly provide service to meet the travel demand to destinations in adjacent communities. Given the uncertainty of future modifications and expansions, mid-term cost estimates for these adjustments cannot be determined, but would be directly linked to service area size, population density, population demographics, and number of service hours.

Route 93L Frequency Increase

The 93L currently provides service between the Thornton Park-n-Ride and 138th & Cherrywood Pk Rd at 60-minute frequencies during peak times. It is recommended to increase the frequency on this route to 30 minutes. The estimated annual operating cost of increasing service is $1.2M to $1.9M. Like the other route extensions or frequency increases of existing RTD routes, the City of Thornton will need to work with RTD to make this improvement. If RTD does not consider this service change to be justified by its own metrics, the City of Thornton may need to finance the "buy-up" of the service to provide the desired frequency.

Route 7 Frequency Increase

In the mid-term, it is recommended to increase the frequency of Route 7 between the Northglenn & 112th Station and CO 7 to 30 minutes. This will cost an estimated $1M - $1.6M in annual operations in addition to the operating cost of the Route 7 extension at 60-minute frequencies recommended as part of the short-term implementation. The City of Thornton will need to collaborate with RTD to determine financing and service delivery for this transit improvement.

Route 120L Frequency Increase

It is recommended to increase the frequency of the 120L in the mid-term between the Eastlake & 124th Station and the US 85 & Bridge St Park-n-Ride in Brighton from 60 minutes to 30 minutes. The annual operating cost to do so within the portion of the route that is within Thornton is $400K to $600K. Additional funding from RTD or other jurisdictions this route passes through, including Adams County and Brighton, will be needed to increase frequency in the portion of the route outside Thornton.

Extend 120X to CO 7

Input from the public and the study's stakeholder group recommended the extension of Route 120X to the future mobility hub at I-25 and CO 7. The route currently runs between Denver's Union Station and the Wagon Road Park-n-Ride at 15-minute peak-direction frequencies and 30-minute off-peak frequencies. The estimated annual operating cost to extend the route to CO 7 assuming the same frequency is $800K to $1.5M in addition to the current cost of operating the route. However, as this route extension moves toward implementation, the specific routing, frequency, and scheduling will need to be determined and may impact operating cost. Because this route travels along I-25 there are multiple jurisdictions on the west side of I-25 (Westminster and Broomfield) in addition to Thornton on the east side that would benefit from this service. Therefore, funding should be coordinated with RTD in conjunction with the surrounding jurisdictions.

Reinstate Route 104

Prior to the COVID-19 pandemic, RTD operated Route 104 at 60-minute frequencies, connecting Thornton communities to the US 36 & Sheridan Station along 104th Avenue. In preparation for the opening of the N Line in 2020, RTD prepared the North Metro Corridor Bus Operations Service Plan, which detailed the bus routes that would support the operation of the N Line. One of the proposed routes was to modify Route 104 to connect the US 36 & Church Ranch Station and the Thornton Crossroads & 104th Station along 104th Avenue. Route 104 was discontinued starting in April 2020. A key concern expressed throughout the Thornton Transit Study is the lack of transit connections across I-25, so reinstating Route 104 was raised repeatedly by the community. It is recommended that RTD reinstate this route to provide this critical connection with 30-minute frequencies. The estimated annual operating cost for the portion of the route within Thornton is $1.1M to $1.4M. Given this route crosses multiple jurisdictions (including Northglenn and Westminster) funding should be a collaborative effort between RTD, the City of Thornton, and surrounding jurisdictions.

Implement Interim Bus Service per Transit Feasibility Study

Pending the completion of the **Transit Feasibility Study for Interim Connections to CO 7** that will be completed in the near-term phase, the city should consider implementing recommendations that come out of the study in the mid-term. Bus service would provide an interim transit connection between the Eastlake & 124th Station and CO 7, including service to 144th Avenue, until RTD is able to extend the N-Line north to CO 7 as planned as part of FasTracks.

Long-Term Implementation (2032-2034)

The long-term implementation transit improvements are displayed in **Table 4**. These improvements are less detailed due to the uncertainty of the transit landscape in 2032 through 2034. Most of the improvements are targeted toward adjusting and improving the services that would have been implemented in the previous phases.

Table 4: Long-Term Implementation Details

Transit Improvement	General Extent Description	Service Hours	Response Time or Frequency	Estimated Annual Operating Cost	Implementation Year	Responsible Party
Adjustments to South and North Microtransit Zones and Potential New Zone(s)	Consider adjusting service areas, creating new service areas where gaps exist, or scaling back where new fixed-route service may be sufficient.	TBD	30 minutes	TBD	2032-2034	City of Thornton
Frequency Increases Across Fixed Routes	Consider increasing frequencies of fixed-route buses across Thornton in demand areas.	TBD	15-minute peak hours, 30-minute off-peak hours	TBD	2032-2034	City of Thornton and RTD
Route Extensions Across Fixed Routes	Consider extending other routes to connect to growing areas, such as along York St, Colorado Blvd, Holly St, and Quebec St.	TBD	30 minutes	TBD	2032-2034	City of Thornton and RTD

Adjustments to South and North Microtransit Zones and Potential New Zone(s)

The city will continue to monitor and adjust microtransit service zones and operations as needed to maintain efficient service within available funding, in particular riders per hour and adequate response times. In addition to expanding to new areas to fill gaps in the network, adjustments may also include scaling back service in locations that may be getting more robust and complete fixed-route service that would more efficiently fill the transit service demand for a particular area.

Frequency Increases Across Fixed Routes

The city will monitor ridership and potential demand along existing transit corridors in the community and work with RTD to explore increasing the frequency of fixed routes with the highest demand. Assuming that all recommendations to short-term and mid-term implementation on fixed-route service will be successful, all transit services in Thornton will have a frequency of 30-minutes or better. During the long-term phase of implementation, the City of Thornton should work with the public and RTD to identify any routes where improving frequency to 15 minutes during peak hours can provide a beneficial impact to riders and community members. These will typically be routes with relatively high existing ridership, that connect into key destinations, and provide key connections throughout the city and region. Core routes identified for higher frequency service in the future by the TMMP are those that operate along Washington/Grant Street (currently Route 7), 88th Avenue (Route 92), and 120th Avenue (120/120L).

Route Extensions Across Fixed Routes

In the long-term implementation phase, the city will evaluate the need and feasibility of extending fixed route service to increase transit coverage to areas that are continuing to grow. Over the next decade additional development is expected across Thornton, particularly north of 144th Avenue. Providing transit coverage to these areas will become increasingly important as more and more people begin living and working in the area. Potential extensions or new routes to explore include along York Street (in conjunction with the interim bus service connections to CO 7), Colorado Boulevard, Holly Street, and Quebec Street. These route extensions would connect with other transit services, with the aim being to increase transit access and overall connectivity.

Chapter 5 – Financial Plan

Short/Mid-Term Financial Plan

The financial plan detailed in **Table 5** describes the estimated financial commitment (in 2023 dollars) to deliver each transit improvement identified in the Transit Operating Plan described in Chapter 4 in the short-term and mid-term implementation phases from 2025 to 2031. Costs are summarized by year and organized by the assumed agency that would be responsible for the given improvement, including Thornton, RTD, or undetermined as RTD, Thornton, and/or other jurisdictions.

City of Thornton Financial Responsibility

It is assumed that Thornton would be responsible for assembling funding for:

1. Microtransit service, including start-up and adjustments over time, and
2. Infrastructure costs (e.g., bus stop improvements) to extend RTD Route 7 to CO 7/Larkridge
3. Conducting a transit feasibility study for interim connections to CO 7.

It is assumed that the microtransit services would be turn-key operated through a third-party vendor, as detailed in Chapter 6.

RTD Financial Responsibility

Operations costs for the following transit improvements are assumed to be fully financed by RTD as they are either slated as action items in the RTD System Optimization Plan or RTD has verbally communicated an intent to improve service:

4. Extend RTD Route 7 to 144th Avenue at 60-minute frequency
5. Increase peak period frequencies of RTD Route 120E to 30-minute

RTD, City of Thornton, and/or other Jurisdiction Financial Responsibility

Finally, the responsible party for the following transit improvements is unknown at the moment. These improvements will require coordination between the City of Thornton, RTD, and/or other jurisdictions, and may be funded by any or all of these agencies through internal and/or external sources:

6. Operations cost to extend RTD Route 7 from 144th Avenue to CO 7/Larkridge
7. Increase midday frequency of RTD Route 120E to 30-minutes
8. Increase midday and peak period frequency of RTD Route 93L to 30-minutes
9. Increase midday and peak period frequency of RTD Route 7 extension to 30-minutes
10. Increase midday and peak period frequency of RTD Route 120L to 30-minutes
11. Extend RTD Route 120X to CO 7/Larkridge

12. Reinstate RTD Route 104 along 104th Avenue between US 36 & Church Ranch Station and the Thornton Crossroads & 104th Station

It should be noted that all operations costs shown in the plan are service costs for the portion of routes operating only within Thornton. For example, the costs shown to increase the frequency of Route 120L are just the cost of the small portion within Thornton, based on the proportional route distance within Thornton, and do not include the cost of operations for the portion that operates in unincorporated Adams County or Brighton. Given the regional nature of the transit system there are some transit improvements that are dependent on the cooperation of RTD and other jurisdictions to bear the cost of improvements outside of the city boundaries.

Furthermore, for the improvements to RTD routes (which include the majority of recommendations) if RTD is unwilling or unable to finance the improvements on their own, a potential financing strategy would be for Thornton to explore "buying-up" service to fund the frequency increase or route extension. If after a period of time the service buy-up results in ridership performance metrics that meet RTD's minimum standards, RTD may take over cost of financing the route. This model has been implemented historically in places like Boulder and Commerce City (Route 104L). It should be noted that RTD has temporarily suspended service buy-ups largely due to an ongoing driver shortage but hopes to allow them again in the future.

Table 5: Short/Mid-Term Financial Plan

	Short-Term			Mid-Term			
Transit Improvement	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**
Thornton Costs*							
South Microtransit Zone (including start-up costs and future adjustments)	$1M - $1.5M	$1M - $1.5M	$1M - $1.5M	$1.2M - $1.7M	$1.2M - $1.7M	$1.4M - $1.8M	$1.4M - $1.8M
North Microtransit Zone (including start-up costs and future adjustments)	-	$800K - $1.2M	$800K - $1.2M	$1M - $1.4M	$1M - $1.4M	$1.2M - $1.6M	$1.2M - $1.6M
Potential New Microtransit Zone	-	-	-	-	-	$800K - $1.2M	$800K - $1.2M
Transit Feasibility Study	-	-	$200K - $300K	-	-	-	-
Thornton Costs Subtotals	$1M - $1.5M	$1.8M - $2.7M	$2M - $3M	$2.2M - $3.1M	$2.2M - $3.1M	$3.4M - $4.6M	$3.4M - $4.6M
RTD Costs							
Route 7 Extension (Northglenn/112th to 144th Ave at 60-minutes)	$600K - $1.2M	$600K - $1.2M	$600K - $1.2M	$600K - $1.2M	$600K - $1.2M	$600K - $1.2M	$600K - $1.2M
Route 120E Frequency Increase	-	-	$300K - $500K	$300K - $500K	$300K - $500K	$300K - $500K	$300K - $500K
RTD Costs Subtotals	$600K - $1.2M	$600K - $1.2M	$900K - $1.7M	$900K - $1.7M	$900K - $1.7M	$900K - $1.7M	$900K - $1.7M
Thornton, RTD, and/or other Jurisdictions							
Route 7 Extension (144th Ave to CO 7 at 60-minutes)	-	$350K - $450K	$350K - $450K	$350K - $450K	$350K - $450K	$350K - $450K	$350K - $450K
Bus Stop Improvements/ New Bus Stops for Route 7	$600K - $1.2M	$600K - $1.2M	-	-	-	-	-
Route 93L Frequency Increase	-	-	-	-	$1.2M - $1.9M	$1.2M - $1.9M	$1.2M - $1.9M
Route 7 Frequency Increase (Northglenn/112th to CO 7 at 30-minutes)	-	-	-	$1M - $1.6M	$1M - $1.6M	$1M - $1.6M	$1M - $1.6M

Route 120L Frequency Increase	-	-	-	-	$400K - $600K	$400K - $600K	$400K - $600K
Route 120X Extension to CO 7	-	-	-	-	-	$800K - $1.5M	$800K - $1.5M
Reinstate Route 104	-	-	-	-	-	$1.1M - $1.4M	$1.1M - $1.4M
Thornton, RTD, and/or other Jurisdictions Costs Subtotals	$600K - $1.2M	$1M - $1.7M	$350K - $450K	$1.4M - $2M	$3M - $4.6M	$4.9M - $7.5M	$4.9M - $7.5M

*Cost estimates are in 2023 dollars and will need to be adjusted for inflation.

Long-Term Financial Plan

The actions that are currently undetermined in terms of cost and responsibility include the following three improvements:

1. Implement interim bus service along future N-Line extension between 124th & Eastlake Station and CO 7
2. Increase frequency of high-ridership RTD routes in Thornton to 15-minutes (e.g., Route 7, Route 120, and/or Route 92)
3. Add or extend additional RTD routes along future north-south corridors to CO 7 (e.g., along York Street, Colorado Boulevard, and/or Quebec Street)

These three improvements would be implemented either toward the end of the mid-term phase or throughout the long-term phase and would depend on a variety of factors. The interim bus service and associated cost is dependent on the recommendations of the Transit Feasibility Study completed during the short-term implementation phase. Similarly, costs for the frequency increases on high-ridership RTD routes and additional routes or extensions of routes to CO 7 will be directly related to the number of service hours the bus routes will provide, and the human and infrastructure support the routes will require.

Furthermore, it is assumed that all of the improvements mentioned throughout Chapter 4 will continue into the long-term phase, meaning that the financial commitments will remain constant, only changing due to service enhancements, changes to the responsible party, and/or inflation.

Potential Funding Mechanism

The following is a list of potential funding mechanisms Thornton can explore to finance Thornton's share of microtransit or fixed-route transit improvements identified in this plan. This list is not exhaustive and should be considered a starting point.

DRCOG TIP Funding

DRCOG has provided matching funding through the Transportation Improvement Program (TIP) for microtransit services that fill a local transportation need in other areas of the Denver Region. Thornton could explore this option and submit a TIP application to partially fund transit improvements in Thornton.

RTD Partnership Program

RTD launched their Partnership Program in 2023, which made available $2 million dollars per year for up to three years to transit and mobility projects operated by local governments or Transportation Management Associations/Organizations (TMAs/TMOs) within the district. Thornton could consider applying for funds during a future Call for Projects through this program to support funding for local transit improvement projects.

Federal Funds

Federal funds for transit service improvements are likely to flow through RTD, DRCOG, or CDOT. In general, Thornton should work with these regional agencies to secure federal funding. Federal funds for transit projects typically come in the form of formula funding, competitive grants, or earmarks. There are occasionally one-time federal funding programs that could potentially fund microtransit services. Federal funding opportunities for microtransit and fixed-route transit can change from year to year and Thornton should keep updated on those potential options over time.

Local Funds

It is recommended that the local contribution for start-up pilot microtransit service be funded through the general fund initially to build public awareness and make sure the service is performing well and meeting mobility goals. Long-term local transit funding options may include funding through the general fund, or establishing a dedicated transportation/transit funding stream, such as through sales tax, property tax, transportation utility fees, or other fee programs.

Chapter 6 – Implementation Plan

On-Demand Transit

Service Delivery

The South and North microtransit zones are recommended for implementation in the first three years. Microtransit can be operated either through a turn-key contract (third-party service provider) or agency-operated, whereby the City of Thornton would fully manage and operate the service. Turn-key contracts involve delivering a service plan directly to a service provider and relying on that provider to implement the service. The vendor is typically experienced in delivering fixed-route, flex-route, and on-demand transit service and would manage all aspects of the service. Based on the logistical advantages and disadvantages displayed in **Table 6**, it is recommended that the two microtransit zones be operated through a turn-key contract.

Table 6: Advantages and Disadvantages to Turn-Key Contracts for Microtransit Services

Advantages	Disadvantages
Quick deployment	Requires oversight by City of Thornton
Does not require City of Thornton to have experience operating a transit service	Flexibility, responsiveness, and adaptability are constrained to the terms of the contract and to the capacity of the vendor
Does not require hiring of additional City of Thornton personnel (e.g. vehicle operators, administrative staff, maintenance teams)	Less control of service quality, customer experience, and operational procedures
Vendor is responsible for service quality and compliance	
Vehicle capital costs are included in the contract – minimizes the capital assets that City of Thornton must acquire	
Allows City of Thornton to take advantage of the vendor's existing scale	

Potential Vendors

There are several national vendors providing turn-key microtransit service today. These include Downtowner, RideCo, Spare Labs, Transloc, and Via, among others. These vendors provide service in a variety of Colorado communities, such as Denver, Lafayette, Lone Tree, Golden, Steamboat Springs, and Aspen. There are also many local, regional, and national contract transit service providers who may be interested in participating in an RFP for microtransit service provision within Thornton. The turn-key contractor should be selected based on experience, project/area understanding, project approach, capabilities, ability to deliver, qualifications of the team, references, and overall value.

Hybrid and Electric Vehicle Infrastructure

If the City of Thornton determines that it is in its best interest to pursue hybrid and/or electric vehicles for its preferred vehicle fleet for the microtransit service, it will need to work with the selected vendor to do so. In general, many vendors are experienced with providing microtransit services with a variety of vehicle types. Although these details will be determined through the turn-key contracting process, the more that the city is able to offer in terms of vehicle storage, charging, maintenance, washing, etc., the less costly the turn-key contract with the operator will be. It should also be noted that opting for a fully electric microtransit fleet will require a feasibility analysis on daily vehicle miles. This analysis will help determine the necessary vehicle range and the number of vehicles needed to meet the service's daily demand.

Service Adjustments and Monitoring Plan

Throughout the implementation of the new microtransit services, the service may need to be adjusted periodically to better serve local needs. This section describes elements of a monitoring plan that should be implemented early in the life of the on-demand transit services and used to determine whether and when service changes are needed. In essence, this monitoring plan sets the expectations for when changes should be made.

Tracking Ridership

The number of daily riders using the new transit service is a basic metric that the contract vendor will be able to provide to Thornton on a regular basis. Ridership can be reported both as the total number of passenger trips per day and the average number of passengers per vehicle service hour. As discussed in the alternatives analysis of Chapter 3, the South microtransit service is projected to have 200-300 passenger trips per day and the North microtransit service is projected to have 125-225 passenger trips per day. These estimates are based on five to seven passengers per vehicle service hour on the South microtransit service, and four to six passengers per vehicle service hour on the North microtransit service. Over the first one to two years, the ridership may be lower while the city and its partners build awareness about the service and community understanding of this new transportation resource grows. As seen in

Table 7, the goal for the first year of service should be an average of 150-200 passenger trips per day on the South microtransit service and 75-125 passenger trips per day on the North microtransit service, growing over the course of the following two years.

Table 7: Average Daily Passenger Expectations by Year of Service Implementation

Service Area	Year 1 of Implementation	Year 2 of Implementation	Year 3 of Implementation
South Microtransit Zone	150-200 Daily Passengers	200-250 Daily Passengers	200-300 Daily Passengers
North Microtransit Zone	75-125 Daily Passengers	125-175 Daily Passengers	125-225 Daily Passengers

If the service is not meeting the ridership targets, then some additional analysis may be needed to pinpoint whether there are times of day when the service is utilized at a higher rate. If so, a determination can be made on whether a service span adjustment is needed. While ridership is a key metric, it should not be the single metric for measuring whether the initial service is performing successfully. When Thornton is determining whether to extend the service, metrics like response time, rider satisfaction, and the rate at which the service completes the intended trip types should be among the factors considered.

Tracking Ride Times

The number of passengers that can be served within a daily service span is dictated, in part, by the amount of time vehicles spend completing trips and the amount of time vehicles spend traveling between trips, also known as deadhead. It is assumed that single passenger trips will take, on average, 10 minutes from origin to destination. It is also assumed that a 50% buffer should be added into trip time estimates for deadhead or for passengers sharing their trip with others making an unrelated trip, which will likely extend the ride time for both individuals. Factoring in the buffer time, it is assumed each passenger will experience a 15-minute average trip fulfillment time (time between when a passenger requests the trip using the app or calling and when they are picked up). If, after the first three months, the actual per passenger trip time exceeds 15 to 20 minutes, the service plan should be adjusted to better reflect local travel conditions.

It is also projected that the average trip fulfillment time should be 15 to 20 minutes and ideally no longer than 30 minutes. The selected vendor will be able to provide a response time by passenger trip. If it is found that the average response time is longer than 15 to 20 minutes, then changes may be needed in order to provide riders with a more accurate sense of potential response time.

Tracking User Experience

While metrics like ridership can convey system productivity, more qualitative indicators are also important. The experiences of early riders should be captured to learn of any unanticipated issues with service provision. Rider feedback can be captured through post-trip surveys distributed either electronically via the smartphone app or using paper copies that are distributed by the vehicle operator. In order to ensure the highest response rate possible, it is recommended the survey be brief with two to three key questions. Paper surveys should also include a pre-paid postage envelope, so respondents face minimal barriers to returning their surveys.

Since the contract vendor will track the quantitative aspects of each trip, like response time and time in vehicle, the survey can be used to assess ease of use of the reservation system, whether riders find the vehicles comfortable, whether riders have positive interactions with vehicle operators, and whether the rider overall travel experience has improved because of the new service.

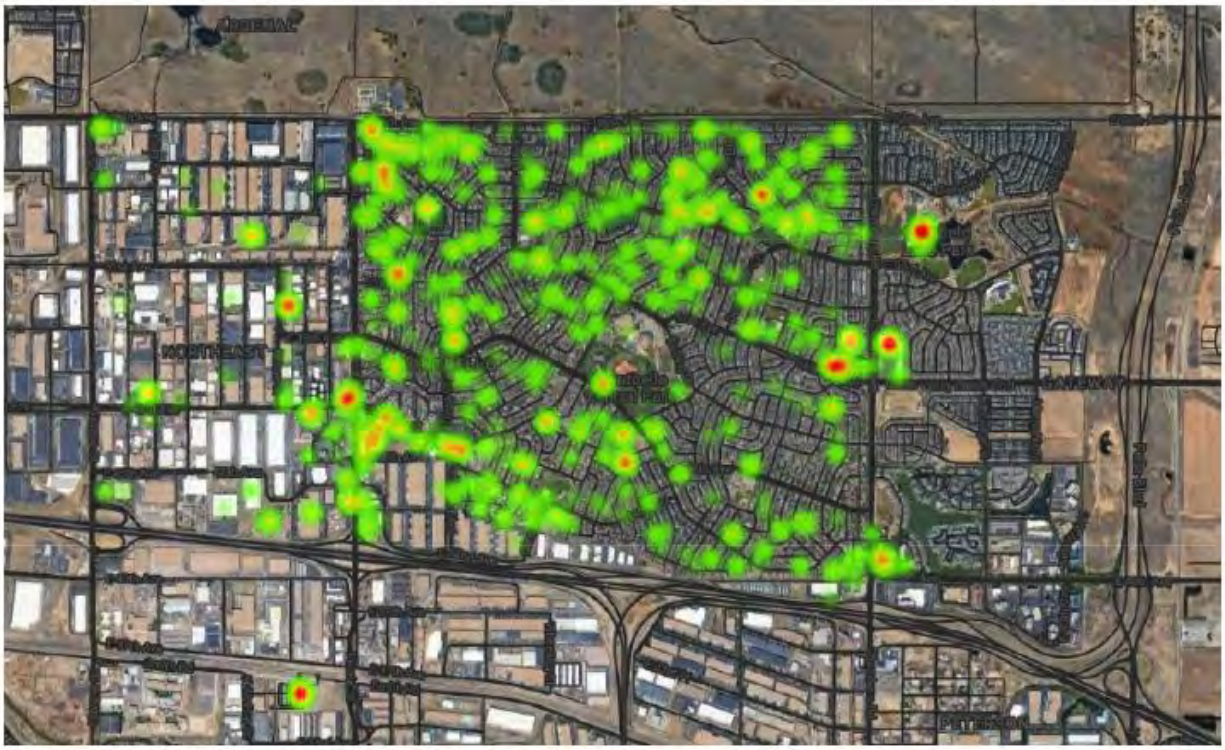
The surveys should be offered to each rider during the first six months of service in English and Spanish. Following a survey response evaluation period, surveying should then be conducted at regular intervals to be determined by the City of Thornton and for passenger samples instead of all riders.

Beyond the qualitative factors that the survey will provide, the city can track overall rider satisfaction, aiming for a 90% or more satisfaction rate. Furthermore, the city should aim for a 1% complaint rate based on customer complaints that are registered and regularly reviewed.

Evaluating Service Area Scope

The initial service zone has been drawn based on the travel market assessment and stakeholder input. It is possible that some portions of the service area may be disproportionately heavy trip generators or popular destinations. Monitoring the origin and destinations patterns by trip will allow Thornton to understand whether the service area needs to be modified or if there are particular origin-destination pairs and routes that are utilized at a high rate. The selected vendor will likely be able to provide visualizations of trip patterns like the example shown in **Figure 21** to help Thornton evaluate service utilization and potentially make adjustments such as narrowing the service area or establishing fixed pick-up/drop-off locations that serve popular destinations. This data will also inform the envisioned mid-term and long-term adjustments and potential new microtransit zones after 2027.

Figure 21: Example of pickup heat map (courtesy of City & County of Denver and Downtowner)



Determining Service Changes

While this service plan seeks to meet the needs of the Thornton travel market, it is possible that in practice the performance outcomes may differ from the service goals outlined here. Thornton should be prepared to collaborate with the selected vendor on making service adjustments on an as-needed basis to ensure the microtransit service is providing efficient service and filling the desired mobility needs. It is recommended that Thornton complete a thorough review of the performance metrics described in this service monitoring plan along with initial responses to the rider surveys after the first year of service. If any goals are unmet or if initial rider satisfaction is low, then targeted service adjustments may be required.

Regular Updates to Elected Officials

As microtransit will be a significant investment in Thornton's intracommunity mobility, it is recommended that staff schedule monthly updates to elected officials through the City Manager's notes to the Thornton City Council for the first year of service. After the first year of service, these updates can be made quarterly. These updates should include summaries of the above metrics to best inform City Council of the progress that the microtransit service is making and if any changes or adjustments are expected. These updates should also include the status of community marketing and outreach efforts. Staff can also encourage the elected officials to ride the new service, leverage their networks to spread the word, and educate constituents about the new service.

Long-Term Goals and Priorities

The service model for microtransit services described in the preferred alternative and the implementation plan is a step towards enhanced mobility within Thornton, and it should be considered as the start to longer-term improvements. The operating and implementation plans detail the initial services. In conjunction with the service adjustment metrics detailed previously, Thornton should strive for having long-term microtransit services that might include:

- Service seven days per week with weekday hours of 5:00 AM to 10:00 PM and weekend hours of 7:00 AM to 9:00 PM.
- Service that can connect Thornton residents, employees, and visitors with destinations that may be outside of the Thornton boundaries (such as in Northglenn, Westminster, and Broomfield).
- Average trip fulfillment time of 15 minutes or less with a mixed fleet of low- or zero-emission vehicles.

To work toward accomplishing the above goals, future improvements to individual zones should be prioritized in the following manner:

1. Expand weekday hours of service to 5:00 AM to 10:00 PM.
2. Add weekend service.
3. Expand service area.

Roles and Responsibilities

It is important to establish and understand the roles and responsibilities of implementing microtransit service in Thornton. **Table 8** displays the different responsibilities of the City of Thornton staff and the microtransit vendor when operating the on-demand service. In general, a turn-key contract allows the City of Thornton to have minimal staff managing the microtransit service as discussed previously. Especially with the initial South microtransit zone, the staff resource need will be approximately 0.25 FTE (full-time equivalent) and can be incorporated into an existing role. As the service grows and as Thornton adds the North microtransit zone, the staff commitment will rise. In its full development stage, overseeing transit services that are funded directly by the City can potentially be a role for one full time employee.

Table 8: Microtransit Roles and Responsibilities

City of Thornton Staff	Microtransit Vendor
Oversee vendor contract	Operate the service day-to-day according to the service plan and per the contract
Manage marketing, branding, and community outreach	Ensure quality of service and compliance with contract
Interpret performance metrics	Be accountable to specific performance metrics and provide excellent customer service; Report on performance metrics
Update City Council on service performance and anticipated service adjustments	Resolve minor customer complaints

Coordinate with surrounding jurisdictions for partnerships on potential cross-jurisdictional services	Provide necessary vehicles, drivers, insurance, dispatch, supervisors, vehicle storage, fuel, maintenance, and microtransit ride-matching technology
Develop community partnerships to support awareness and build ridership	Make suggestions on service improvements, based on operations knowledge
Develop local funding for long-term sustainability	
Review and resolve serious customer complaints	

Strategies for Managing Implementation Hurdles

The implementation plan described in this chapter is an ideal situation for new microtransit services in Thornton. However, the city should be prepared for implementation hurdles to arise (in the case of political, economic, or other unknowns). This section describes a couple of ways in which Thornton can be flexible and adaptable in implementing the new microtransit services.

Delaying Implementation

Although it is anticipated that the two microtransit services will be implemented within the designated timeline, this timeline may change. Delaying implementation, specifically for the second microtransit zone (North microtransit zone), might prove to be an effective measure if Thornton feels like it would be beneficial to continue to improve and garner support for the South microtransit zone. In deciding to delay implementation, it is critical to be ahead on any public marketing and outreach. It is recommended that the City of Thornton announce the upcoming plans for microtransit service to begin the educational component, but to delay announcing service launch dates until they are solidified. This is especially applicable when the South microtransit service will already be operational and the North microtransit zone will still be anticipated.

Adjusting Service Levels

Another option in the case that implementation of the service(s) is deemed difficult is to scale service appropriately to meet capacity. The city can work with the service vendor to reduce service hours or reduce the number of vehicles being deployed to maximize the given resources. It is important to note that these adjustments that result in less convenience for the user may be difficult to communicate to the public. For this reason, the initial service levels should be closely coordinated between the city and the vendor to ensure that any adjustments are made to improve user convenience.

Marketing, Branding, Outreach

A critical aspect of program success is robust marketing and outreach effort. An awareness building campaign should be paired with the service rollout to ensure community members and visitors learn of the new service, understand how to request trips, and are aware of the service area. While traditional avenues, like visually compelling advertisements, will be important, additional community-specific outreach strategies should also be pursued. These can include engaging local stakeholders who have existing community ties to serve as ambassadors for the new service and establishing educational messaging that the new Thornton microtransit service is a public service that is open to all and

highlighting the benefits of using the service (e.g., low cost and shorter travel times relative to existing fixed route bus service).

Overall Marketing Strategy

In order for the microtransit service to be successful, Thornton should place an emphasis on maintaining as broad an outreach approach as possible in order to reach existing and potential transit riders. The city can partner with local businesses, schools, community centers, and other key destinations to post information about the new service. Beyond physical advertisements, the social media networks of these community partners can also be leveraged to broaden awareness. All marketing efforts should focus on educating community members about the service itself and conveying three key messages:

1. Thornton microtransit is a new service that has been designed to help address the mobility challenges residents are facing today.
2. The microtransit service will be both free and offer a comparable travel time to driving for certain trips.
3. The city will continuously seek rider feedback to learn how the new service can be optimized to best meet local travel needs.

In order to effectively disseminate these messages, Thornton should work with the selected vendor to develop a robust brand identity for the service and pursue a broad advertising and outreach campaign, as described below. To ensure the marketing campaign has an effective reach, Thornton can monitor who is utilizing the service through the rider surveys and then target marketing efforts to any groups within the community who have not yet tried the new service. Having a dynamic marketing campaign that tailors messaging to the various audiences within Thornton will help ensure that all efforts to raise awareness target both people who are likely to ride, like existing transit users, and those who are not currently transit users but may benefit from the new service.

Branding

Applying a logo and uniform color scheme on vehicles and on all collateral related to the service will help establish a uniform brand. Brand awareness is critical to developing an understanding that the new Thornton microtransit service is distinctive from existing RTD service that is a new mobility resource. The selected vendor will likely have prior experience with service branding and will be able to advise the city on the parameters for applying new logos and paint to their fleet. **Figure 22** shows examples of branding from various microtransit systems. Developing a distinctive visual style for the system will help community members readily identify the microtransit vehicles.

Figure 22: Microtransit Vehicle Branding Examples

Signage

Signage describing the new service and featuring the branding should be posted in all locations where it is likely community members will start or end rides. Although the current microtransit operations would be zonal, where riders could make trips between any two points within the zone boundaries, these signs can serve to designate pick-up and drop-off locations, which would make the system easier to use. Furthermore, having a signed, dedicated curb space at the N Line stations and Thornton Park-n-Ride could also help identify the new service and educate potential riders on how to use it. High quality, visually compelling signs can be targeted to key market groups such as active adults, youth, and commuters.

Advertising

Signage can also be adapted into flyers that are posted in popular locations – having system information at local community centers, medical centers, social services locations, and businesses will be important and could take the form of a tabletop rack card with information on how to use the system and where it serves. In addition, the city can partner with local print media along with radio and tv stations to promote the service, such as through the Thornton City Voice paper. While traditional media platforms have a wide reach, social media promotion is also a useful avenue to explore. Social media is particularly effective at reaching younger and commuter audiences, which should be a key consideration in Thornton. The city can use its existing social media presence and also partner with RTD and other community partners who may be willing to promote the service.

Outreach

The city should leverage the existing network of community groups to raise awareness and promote the new service. Key stakeholders, such as the Active Adults Center and Smart Commute, should be invited to serve as ambassadors for the new service. This role can be as simple as committing to including the microtransit service as a discussion topic in community events or promoting the service on an organization's website, social media pages and community boards. The city can also collaborate with ambassadors to periodically visit popular destinations throughout the community and informally discuss the new service with residents.

Employer Partnerships

Partnerships with local employers are another tool the city can utilize. Local businesses with employees who may not have reliable transportation should see the benefit of the new public transit service. Employees who need to travel to Amazon, the medical centers, or the retail centers will find it easy to use the new service to get to employment destinations.

Active Adults Partnerships

As part of this transit study, a distinct group that has voiced their desire for dedicated outreach on transit in general is Thornton's active adult population. In partnership with the Active Adult's Center, the City of Thornton can ensure that this population is engaged and understands how the new service works,

emphasizing that technology is not a limitation to this service. This outreach could include flyers and dedicated learning sessions at the Active Adult's center.

School Partnerships

Local schools can also advertise the new service. While some parents may not be comfortable allowing their child to walk or bike to school, microtransit could be perceived as a safe and efficient travel option, especially when the school supports and advertises the service as a mode for getting to school.

Business Partnerships

The city should work with Thornton's businesses to promote the new transit service. Having printed flyers in local retail establishments and restaurants that announce the new service and how to use it could be an effective way to gain awareness of the service. Businesses could also distribute information to employees and allow local ambassadors to present at staff meetings.

Special Events

The city should consider having a presence at all local events such as markets, visitor events, expos, kids' events, and neighborhood parties. Setting a table with brochures and a friendly community ambassador is a relatively low-cost way to build awareness of the new service.

Microtransit Implementation Timeline

Although it is typical for a pilot microtransit project to take 12 to 18 months to launch once a final service plan is complete, the City of Thornton has been thoroughly and strategically working on this transit study since November 2022. As such, it is possible to accelerate implementation and condense into six to nine months, assuming that contracting with a microtransit vendor could be done efficiently and that Thornton and its community partners can move effectively through the various service preparation steps, shown in **Figure 23**. According to this timeline, it may be possible to have this new service operating by late 2024 or early 2025.

Figure 23: Microtransit Implementation Timeline

6 months before launch	Finalize program management and oversight Select turn-key service operator and associated vehicle fleet Finalize budget and associated operating hours Select program name, logo, and brand
3 months before launch	Develop marketing materials and advertising plan Formalize promotional partnerships with community groups Work with microtransit vendor on service plan adjustments Install any permanent infrastructure such as signage
1 month before launch	Install vehicle brand graphics (vinyl wraps) Begin intensive advertising and promotion of program launch Coordinate with program partners and electeds about launch Test microtransit technology and dry-run service
Launch of operations	Final planning, promotion, and coordination for launch event Determine performance monitoring program Launch event Intensive advertising and promotion of service
Month 1	Daily service quality monitoring Responsiveness to passenger complaints or input Weekly evaulation of performance metrics Intensive advertising and promotion of service
Month 2	Review lessons learned in first month with vendor Intensive advertising and promotion of service Ongoing evaluation/monitoring/customer responsiveness
Months 3-6	Implementation of possible service adjustments Ongoing advertising and promotion of service Ongoing evaluation/monitoring/customer responsiveness Report to electeds and community partners on early results
Months 7+	Plan for Year 2 of service and added fixed route phase Ongoing advertising and promotion of service Ongoing evaluation/monitoring/customer responsiveness Review and report on first year results

Fixed Route Transit

Provide Supporting Bus Infrastructure

Bus service extensions require appropriate infrastructure to support service, including ADA accessible locations for bus stops, layover locations at the end of the route with bathroom facilities available to drivers, and direct convenient route alignments that can accommodate a 40-foot transit bus. The city should work to provide this infrastructure supportive of bus service along planned future bus route extensions.

Of particular importance in supporting bus service are planning new streets and developments with bus stops, which allow bus circulation, and with convenient pedestrian infrastructure in place. Bus stops should be anticipated in locations along arterial and collector streets to meet RTD design standards (near-side, far-side, etc.), adjacent to pedestrian crossings, where they allow for convenient transfers to crossing transit routes, and as close to high trip generating destinations as reasonably possible. Bus stops and pedestrian access to bus stops should be incorporated into the design of future development. Bus stop location should be considered when designing auxiliary lanes, utility infrastructure, landscaping, drainages, pedestrian crossings, and bikeways. Arterial and collector streets where future bus routes are planned should be designed to accommodate bus circulation and pedestrian access to stops and avoid an overly circuitous design. Lastly, new development along planned bus routes should be designed to be pedestrian oriented, with direct pedestrian connections to land uses and adjacent streets and trails that avoids large parking lots and other setbacks from the street that pedestrians would need to traverse to connect between a building and the street.

Mitigating Unknown Factors (Specific to RTD)

To implement many of the fixed-route transit improvements recommended in the preferred alternative, the City of Thornton will need to strategically partner with RTD and other surrounding jurisdictions. Due to this required relationship, there are number of factors that may pose challenges to the implementation timeline for these fixed-route recommendations. Some factors are routine and can surface at any time while others, like a global pandemic, are unpredictable. When assessing the factors that may pose a challenge to the City of Thornton as it seeks to implement transit improvements to the existing fixed-route network, the following issues are most likely to impede the process:

Inflation

Throughout the COVID-19 pandemic and in the post-pandemic era, inflation has increased and remained high. As noted in the operating and financial plans, the displayed estimated costs are based on 2023 prices. Should inflation rates continue to increase, the cost estimates may soon be too low.

Driver Shortages

RTD, along with other transit providers across the nation, has struggled to hire and retain transit operators for existing service. This challenge is typically more difficult to overcome with fixed-route transit due to a

variety of factors, including federal employment requirements, commercial vehicle training requirements, and workload. Enhancing the existing services to run more frequently or cover more distance requires a larger workforce. The ongoing driver shortage is likely to be a significant barrier to increasing RTD fixed-route service levels in Thornton near-term. It is the primary reason that RTD is not currently allowing service buy-ups.

One strategy some agencies are experimenting with to overcome this barrier is operating transit service at time intervals that are more attractive to drivers, such as eliminating split shifts during daytime hours. The city should continue to maintain close relationships and regular communication with RTD to advocate for improvements and collaborate on strategies to make improvements to the fixed-route network identified in this plan acknowledging that driver shortages are likely to be a near-term barrier.

Strategies for Managing Implementation Hurdles

There are a few strategies to manage potential implementation hurdles related to fixed-route transit. For example, delaying implementation and adjusting service levels to ease the stress on human and capital resources may be a strategy that RTD employs. Some other strategies that the City of Thornton can employ include:

Contract Fixed-Route Service Through a Third-Party Vendor

Although the ideal scenario includes RTD funding and operating fixed-route transit services in Thornton, the city may determine that it is a worthy investment to contract supplemental fixed-route service using a third-party vendor. New fixed-route services that operate fully within the city boundaries (such as the Route 93L) could be contracted through a turn-key contract, similar to microtransit. This may require careful conversations and coordination with RTD, but it could ensure that the city is responsible for meeting its mobility needs and goals, rather than relying on the regional provider.

Organize Regular Meetings between Thornton's Elected Officials and RTD's Elected/Appointed Officials

To keep Thornton and its unique mobility needs part of RTD's priorities, it is important that Thornton's elected officials hold quarterly conversations with RTD's elected officials. Parts of Thornton fall into the I, J, and K RTD districts, so engaging in conversations with those elected district directors can ensure that RTD is making changes that align with Thornton's transit plans.

Conclusion

The 2022 Transportation and Mobility Master Plan (TMMP) established a long-term vision for Transit within Thornton. This Transit Study further analyzed the viability of enhancing public transit in different parts of the city and provides guidance on how to implement transit service improvements in Thornton over the next ten years (through 2034). This study demonstrates that transit, and the expansion of public transit service, is a viable transportation solution within the City of Thornton. Many areas of Thornton are well suited for short-term implementation of on-demand transit service, and some corridors can support expansion of fixed-route transit service. As the city continues to grow, additional areas of the city, particularly in north Thornton, will become more viable for additional transit expansion. This Study provides a phased-approach for gradually expanding transit service in Thornton as the city grows and more resources become available to fund service, prioritizing expansion of service to the locations were transit is likely to be most successful first.

Through a robust transit market analysis, including input from the community, five alternatives were initially developed and refined into a preferred alternative to be implemented over a course of short, mid, and long-term phases between 2025 and 2034. The preferred alternative includes introducing two new on-demand (microtransit) service zones within the city, increasing the frequency of several existing local bus routes, and the extension or creation of other routes. The study also includes a financial plan (with potential funding mechanisms) along with an implementation plan for both the on-demand transit services and the fixed-route transit services. It is emphasized that in order to accomplish the entirety of the preferred alternative, close collaboration between the City of Thornton, RTD, neighboring jurisdictions, and other regional agencies will be crucial.

Expanding public transit will help meet the mobility needs of the community, particularly for the most vulnerable community members that have limited mobility options, and will be a crucial element of achieving the vision identified in the TMMP to enable residents to access all areas of Thornton in a timely manner without using a private vehicle. This study provides an implementation framework to achieve core goals identified early on in the project, including bringing Thornton closer to implementing the TMMP's vision, making transit a more viable choice for residents that do not currently have access to transit, and better serving those who are mobility challenged, but not served by RTD's Access-A-Ride.

Appendix A: Transit Market Analysis

Thornton Transit Study: Travel Market Analysis

Prepared for:
City of Thornton, CO

June 12, 2023

DN23-0752

FEHR PEERS

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Background

Purpose of the project

The Thornton Transit Study builds off the vision set by the Transportation and Mobility Master Plan (TMMP) with the following goals:

- Bring Thornton closer to implementing the TMMP's vision.
- Provide clear direction on how to implement transit improvements throughout Thornton over the next 10 years.
- Make transit a more viable mode choice for residents that do not currently have access to transit.
- Better serve those who are mobility challenged, but not served by RTD's Access-A-Ride.

Ultimately, the study will evaluate how to serve more of Thornton with transit, and it will determine the best type of service. This evaluation will include the following criteria:

- Integrating with Thornton's active transportation system
- Ridership projections
- Impact of trip frequency
- Cost magnitudes
- Environmental justice and geographical equity

As a result of the study, the outcomes will be the following:

- A transit operating plan
- A financial plan for implementing transit
- A 10-year phasing plan
- Service delivery strategies
- Supporting infrastructure
- Performance measures

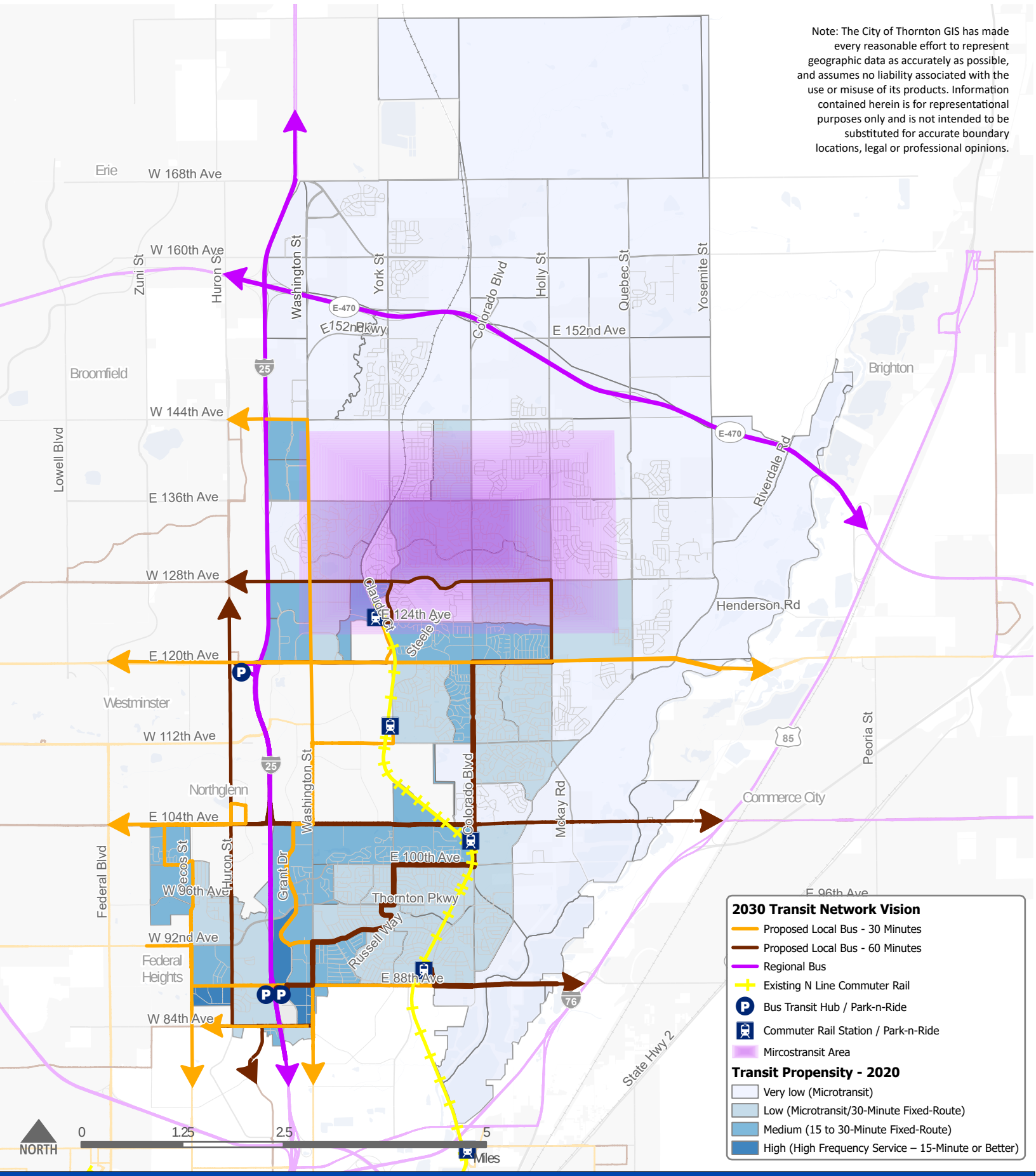
TMMP vision

Thornton's 2022 TMMP envisioned the overall transportation network that expands transportation options to enable a resident to access all areas of Thornton in a timely manner without the use of a private vehicle. The plan developed transit visions for 2030 and 2050 based

on a transit propensity analysis, as shown in **Figure 1** and **Figure 2**, respectively. The vision includes proposed fixed routes, regional routes, transit hubs, and potential microtransit areas.

Thornton Transit Vision - 2030

Figure 1

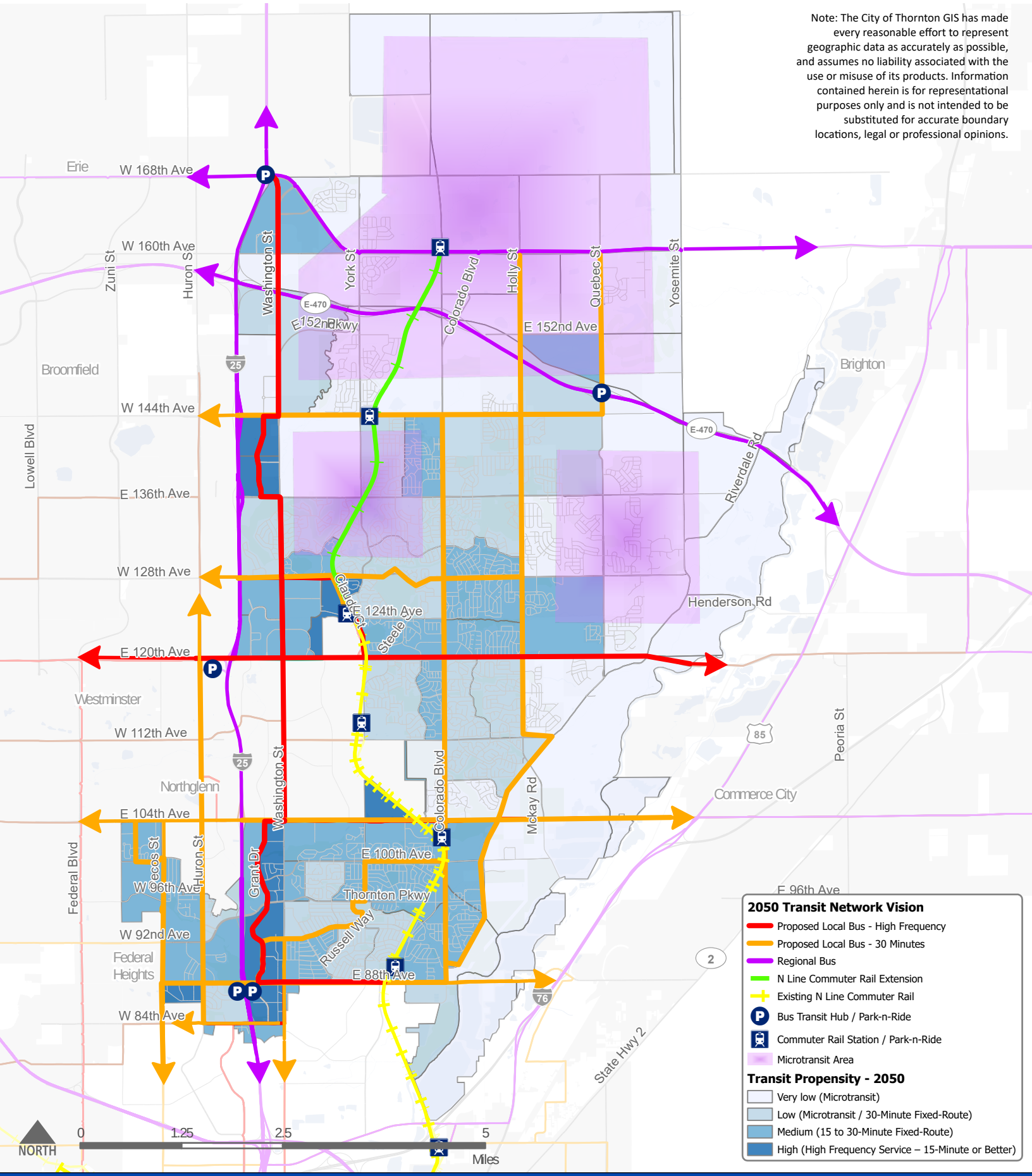


City of Thornton

Source: Thornton TMMP 2022

Thornton Transit Vision - 2050

Figure 2



City of Thornton

Source: Thornton TMMP 2022

Other Relevant Plans

This study is also considering how other municipalities and agencies are planning transit in this area.

RTD System Optimization Plan (July 2022)

The *Reimagine RTD System Optimization Plan* (SOP) includes the following route improvements relevant to Thornton:

- Route 7 extended north of 112th Ave to Denver Premium Outlets at 60-minute frequencies.
- Reinstate Route 80 at 60-minute frequencies (Olde Town Arvada to Original Thornton/88th).
- Reinstate Route 104 at 60-minute frequencies (Church Ranch Blvd/Westcliff Pkwy to Thornton Crossroads/104th).
- Reinstate Route 122X at 30-minute peak direction frequencies (Wagon Rd to Civic Center).

The SOP also mentions that RTD is exploring the integration of the following opportunities:

- Demand-response expansion
- Micro-mobility
- Rideshare
- Active transportation

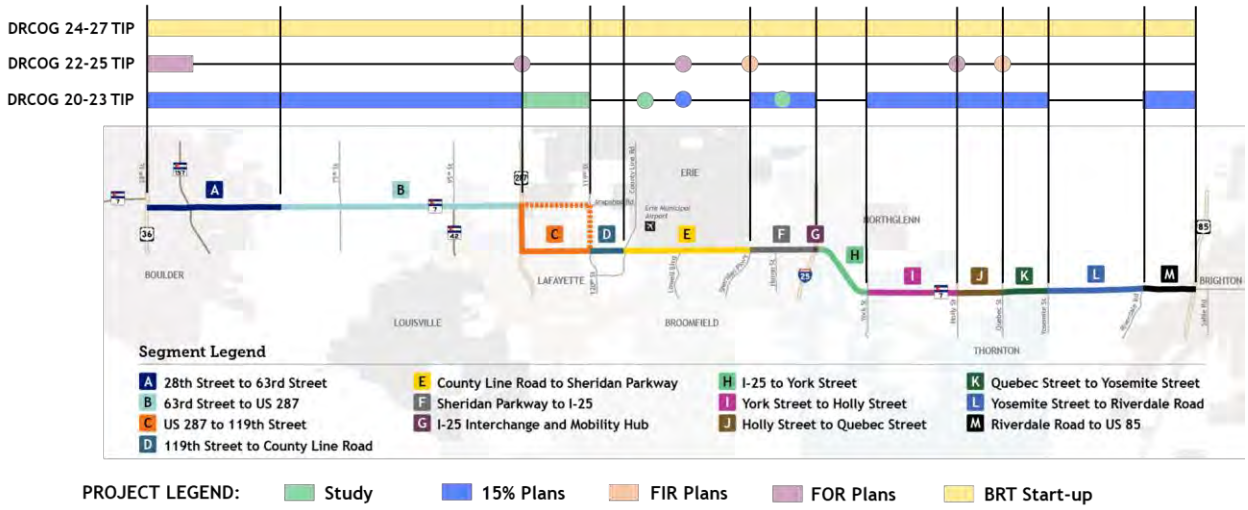
DRCOG 2050 Metro Vision Regional Transportation Plan DRAFT (September 2022)

This plan identifies specific projects and programs that the Denver Regional Council of Governments can help implement to improve mobility across the Denver region. The plan's priorities are multimodal mobility, safety, air quality, regional transit, active transportation, and freight. There are minimal mentions of transit improvements related to Thornton, but there is acknowledgement of the coordinated efforts to develop the CO 7 corridor between Brighton and Boulder as well as mobility along I-25 North and the CO 7 interchange.

CDOT CO 7 Corridor Development Plan (February 2021)

The CO 7 corridor is being developed for mobility improvements between Brighton and Boulder, including the northern portions of Thornton (**Figure 3**). Tentatively, a bus rapid transit (BRT) system will operate on the corridor beginning in 2025, Monday through Friday with 30-minute frequencies. The plan is to increase this to daily operations in 2026.

Figure 3: CO 7 Corridor Development and Funding



An aspect of the project is the mobility hub at the CO 7 and I-25 interchange. An interim interchange design is in progress with construction set for 2024-2025 with hopes to start the operation of CDOT's Bustang service in 2025 or 2026. The ultimate mobility hub, currently at 30% design, will serve the CO 7 BRT, Bustang, and future RTD service, and the hub would be a key transit hub for regional trips. This includes residents of Thornton who would need to travel north toward Fort Collins, south toward Denver, and west toward Boulder.

Advancing Adams: Adams County Transportation Master Plan (April 2022)

Advancing Adams guides Adams County through changes to the mobility network through 2040. A key factor of the plan is ensuring first/last mile connections, including on-demand, door-to-door services that connect users to key destinations or RTD transit stations within the denser parts of the county. Further, the plan emphasizes the ideas of mobility as a service and other transportation services that make it easier to live, work, play, and age in place in Adams County.

Active Adults Center Transportation Services

Thornton's Active Adult Advisory Board promotes and facilitates communications with Thornton City Council, specifically on issues relating to 55+ citizens. A current effort the Board is working on is the investigation of existing transportation services. The Board is collecting an inventory of transportation vendors and services, and how Thornton residents can access these services. This research also includes how the existing city transportation resources can be leveraged for increased transportation access. Further, an important characteristic of the Board's efforts is the understanding of the intersection of access to affordable housing with transportation.

Demographic Analysis

Key aspects of this study include making transit a more viable mode choice for residents that do not currently have access to transit and better serving those who are mobility challenged. A demographic analysis helps identify the communities that are more likely to benefit from improved transit service in Thornton.

Transit Propensity from TMMP

The TMMP included a transit propensity analysis based on the density of residents and jobs weighted by demographic factors that are proven to increase the likelihood of people using transit (such as zero car households) to identify areas with the highest need for transit. The results of this transit propensity analysis identified areas that are most likely to support transit in Thornton and at what frequency. **Table 1** shows the service type and frequency of transit that would be supported by different land use densities as measured by the weighted number of residents plus jobs per acre. In general, locations with medium and high transit propensity (generally with at least 15 residents per acre or at least eight jobs per acre) are best suited for fixed-route transit. As seen in

Figure 4, the area south of 128th Avenue and west of Colorado Boulevard is the area generally with the highest transit propensity.

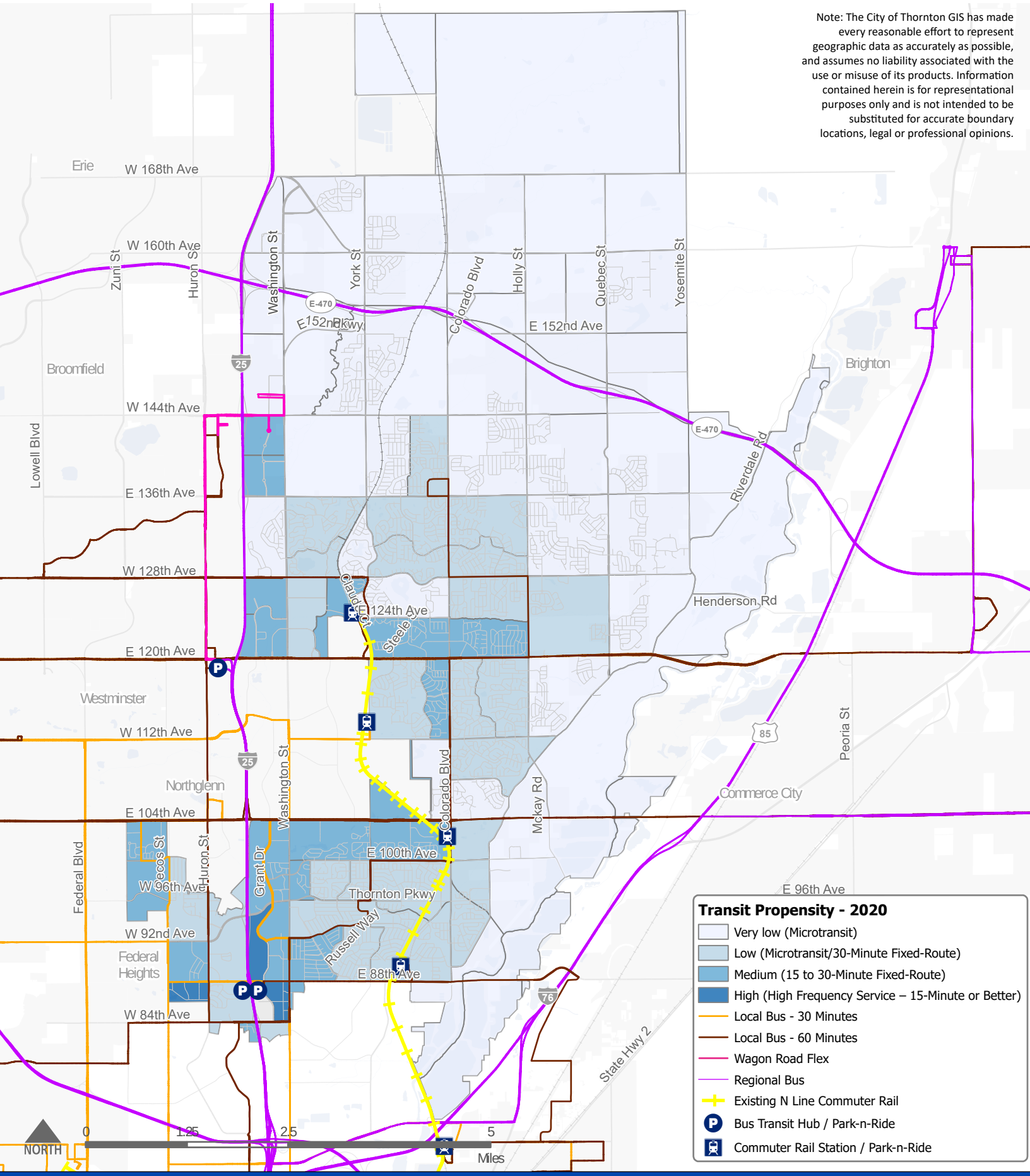
Table 1: Transit Propensity for Different Transit Service Types

Transit Propensity	Typical Corresponding Land Use	Types of Transit	Frequency of Service
High	Urban or mixed-use corridors	• Bus Rapid Transit (BRT) • High frequency bus • Local bus	10-15 minutes
Medium	Suburban or mixed-use nodes	• Local bus	15-30 minutes
Low	Suburban	• Local Bus • Demand response	30 minutes or microtransit
Very Low	Single family residential or rural	• Demand response	Microtransit (i.e., on-demand)

Source: Thornton TMMP, 2022

Thornton Transit Propensity - 2020

Figure 4



City of Thornton

Source: Thornton TMMP 2022

Geographic Patterns

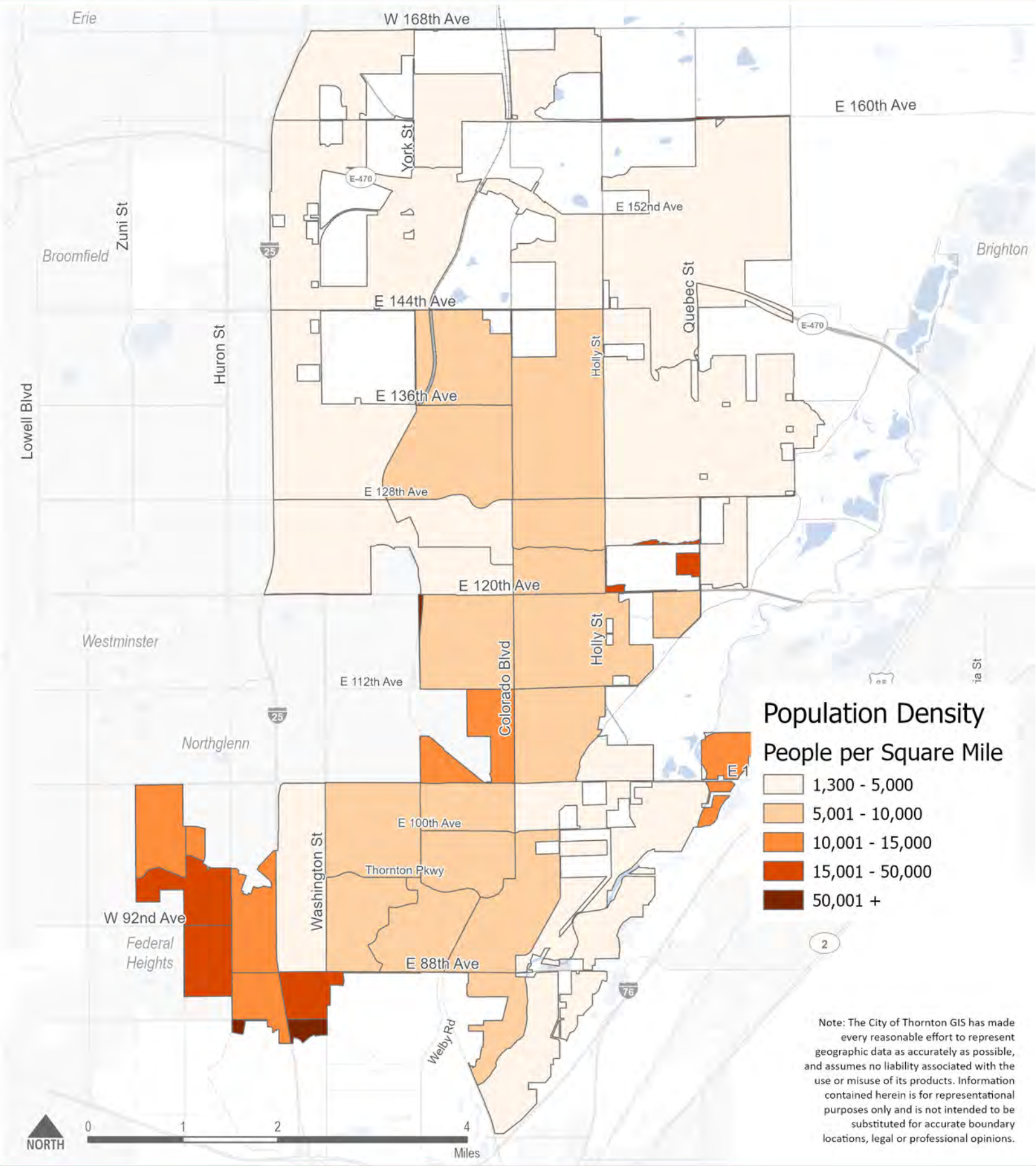
The TMMP's transit propensity analysis provided insightful focus for areas in Thornton that could have a higher demand for transit. Building off the TMMP and to get a better understanding of the potential transit markets in Thornton, a demographic analysis was performed by geography within Thornton.

Population Density

Figure 5 displays population density within each census tract in Thornton. The densest areas are in the southwestern part of Thornton and along Colorado Boulevard. Areas with higher densities are more likely to be areas where frequent transit services can be the most successful.

Population Density

Figure 5



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City of Thornton

Sources: Thornton TMMP 2022
Basemap Data: June 2023

Age

Age is a notable factor in the likelihood of transit usage. Younger people, including teenagers and college-aged residents tend to rely more heavily on transit as they are less likely to have access to a car. For a similar reason older adults also tend to rely on transit more than other age groups.

Youth Population

There are many census tracts where a large portion of residents are between the ages of 10 and 17, and these are fairly dispersed across the city (**Figure 6**). Some locations in Thornton with the highest concentration of teenagers are not in areas that the TMMP identified as having high transit propensity, but youth populations tend to use transit service at higher rates due to either not yet having a driver's license or not having access to a personal vehicle. Further, with multiple schools, recreation centers, and other key destinations for youth, improving transit in Thornton can positively impact the city's youth populations.

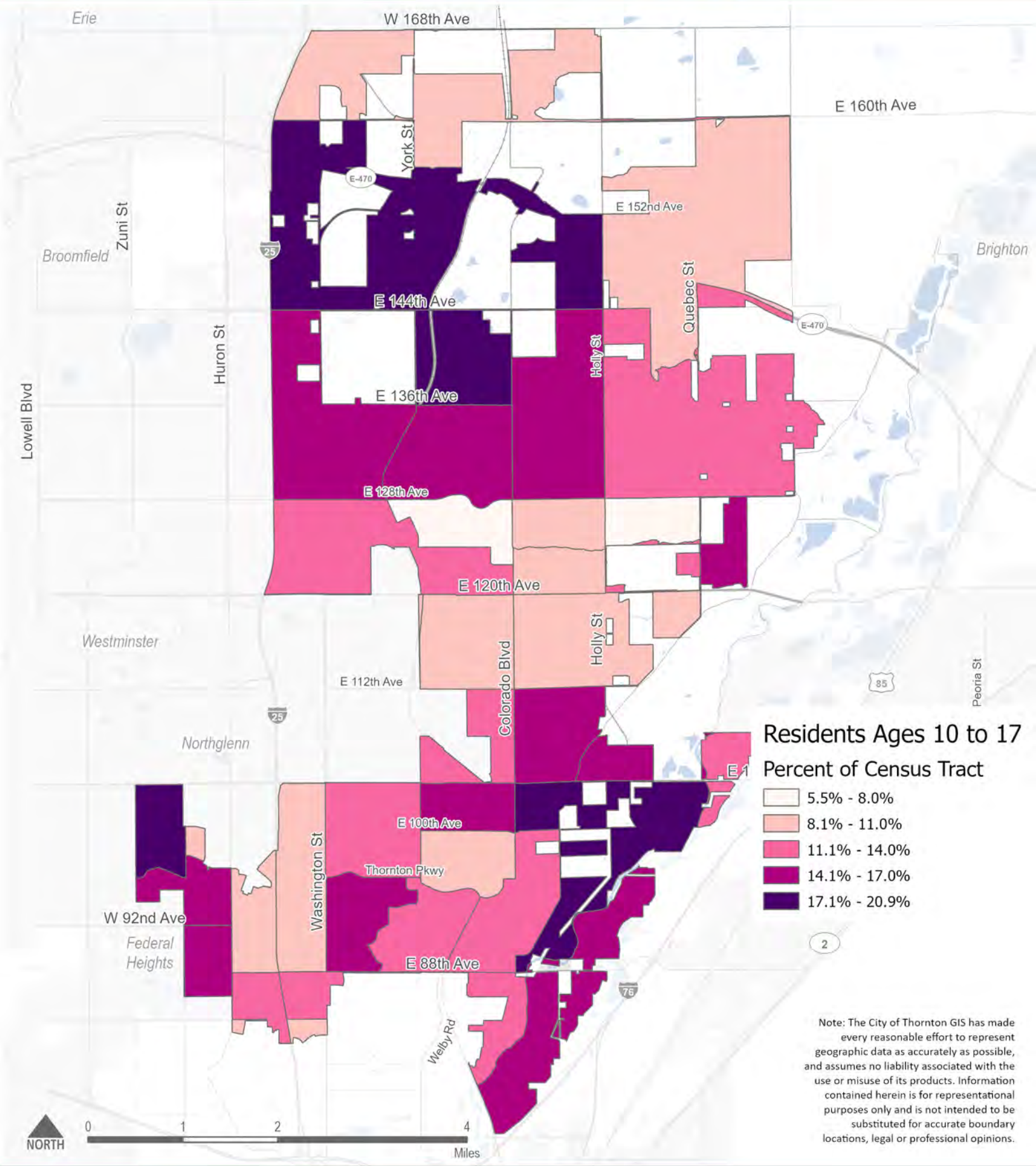
Older Adult Population

Like youth, older adults use transit 10% more than the average rate of ridership.[1] This can be for several reasons, including increased prevalence of health issues that may limit the ability to drive or a desire to limit the risk of experience traffic safety issues. In Thornton, unlike the youth population, there are distinct census tracts with high portions of resident 65 years of age and older (**Figure 7**). One of these areas is between 112th Avenue and 144th Avenue, west of Colorado Boulevard. The other area with a high portion of residents 65 years of age and older is in the most northeastern part of the city, which is the location of a large 55+ living community called Todd Creek. Like the areas with high populations of youth residents, the Todd Creek area was not identified as having high transit propensity in the TMMP, but having transit in this area can connect the senior population to key destinations such as grocery stores, medical appointments, and the active adults center.

[1] TCRP Report 28: Transit Markets of the Future

Youth Residents (Ages 10 to 17)

Figure 6



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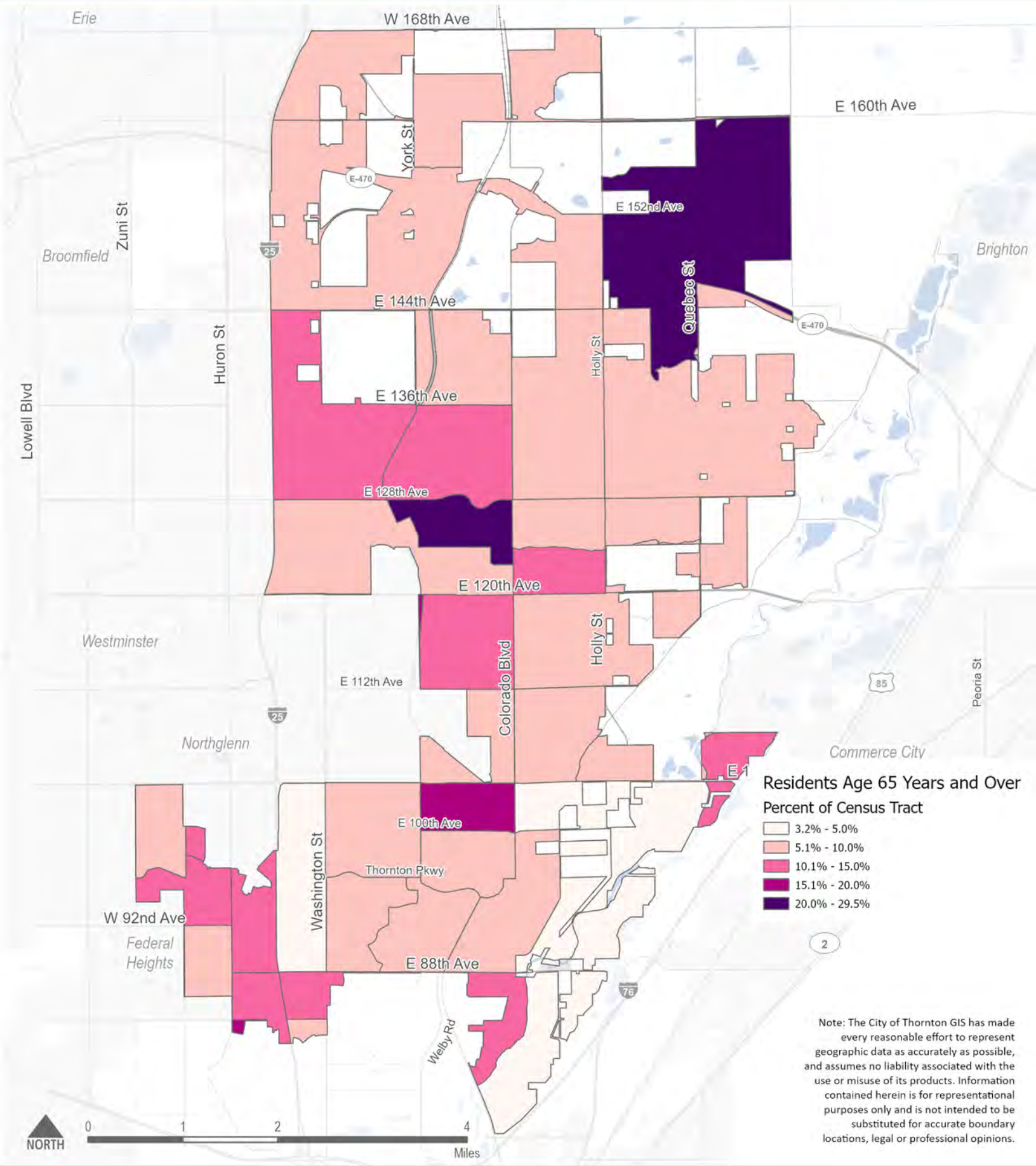
Sources: American Community Survey, 2020
Basemap Data: June 2023

Residents 65 Years of Age and Older

Figure 7



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Sources: American Community Survey 2020
Basemap Data: June 2023

Income

Transportation and housing are the two main expenses of each household, so income plays a critical role in impacting the use of transit.[2] Further, access to transit can be a large motivator for low-income individuals when choosing where to live.

Residents Living in Poverty

To determine poverty, the U.S. Census Bureau uses income thresholds based on family size. If the family's total income is less than the threshold determined for that size of a family, the family and every individual in it is considered to be in poverty. **Figure 8** displays the percent of residents in each census tract who live under the poverty line. South of 104th Avenue is an area where up to 20% of residents living within a census tract are living under the poverty line. Further, between 136th Avenue and 160th Avenue, west of Holly Street is another area where a significant portion of residents experience poverty.

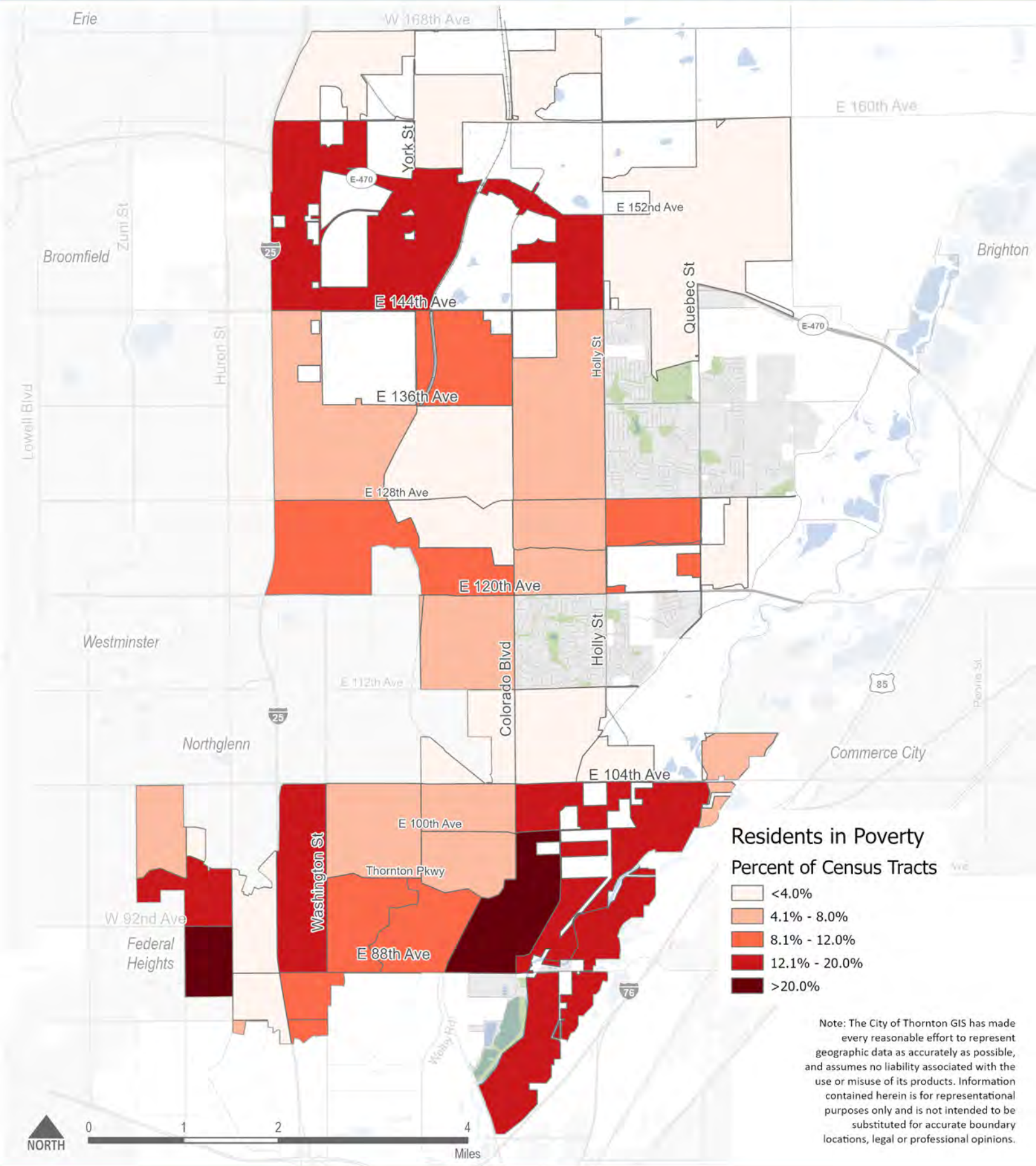
Residents of Low and Moderate Income

The U.S. Department of Housing and Urban Development defines low-income populations as those earning 50 percent or less of the Area Median Income (AMI), and moderate-income populations as those earning between 50 percent and 80 percent of the AMI. Although some people with low and moderate income earn more than those living under the poverty line, they are still vulnerable to the burden of transportation costs. Census tracts located south of 104th Avenue have up to 82% of residents who earn low and moderate income, as displayed in **Figure 9**. The data shows a clear segmentation of the population by income in Thornton, with lower incomes to the south, gradually increasing to higher incomes to the north. Whether people are living with low and moderate income, or they are living under the poverty line, transportation is a burdensome cost; focusing transit access in these areas can meet the demand for transportation options and significantly improve the quality of life for these residents.

[2] Housing and Transportation Affordability Index

Residents Living Under the Poverty Line

Figure 8



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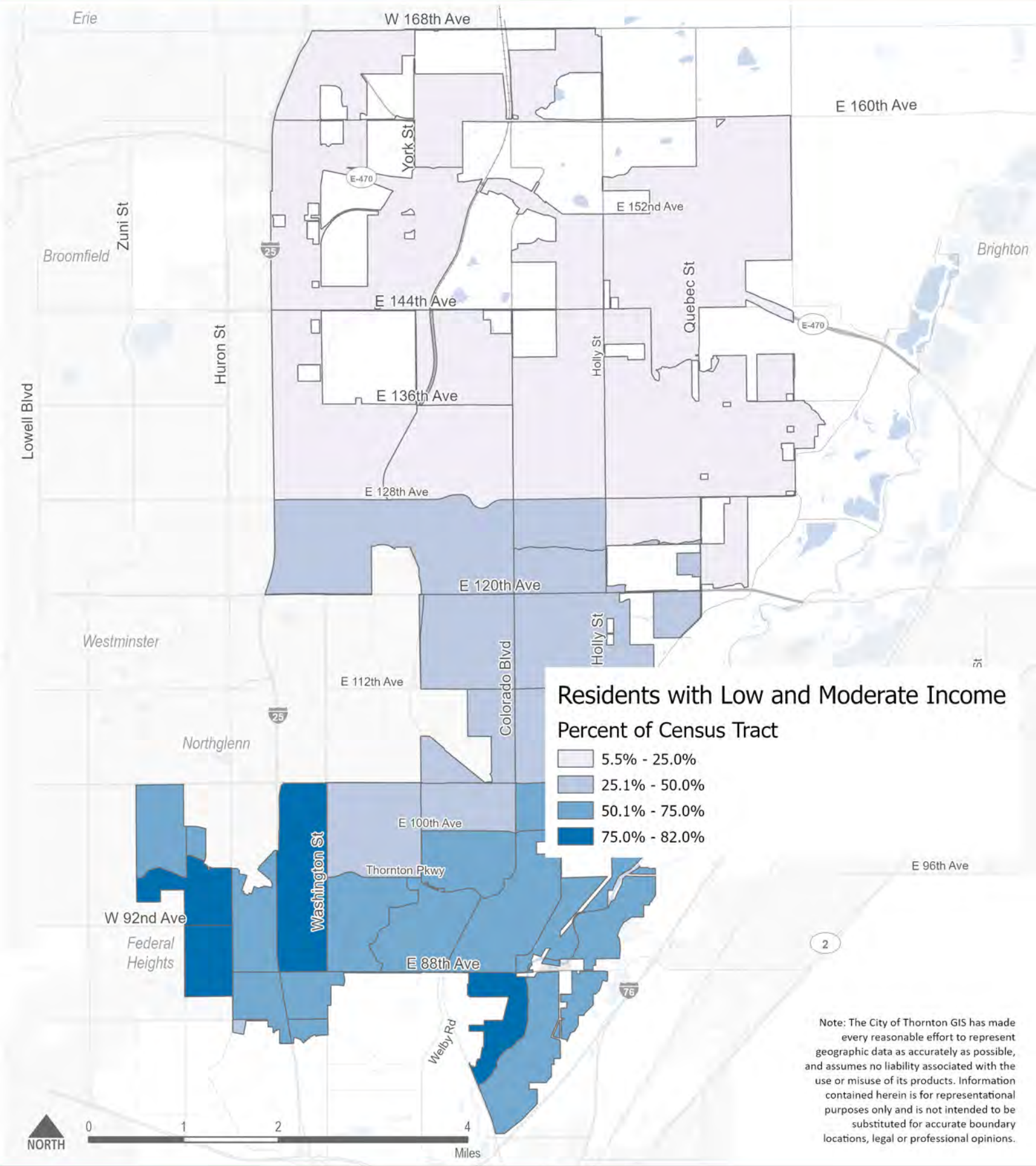
Sources: American Community Survey 2020
Basemap Data: June 2023

Low and Moderate Income

Figure 9



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City of Thornton

Sources: CO DOLA, Department od Housing, 2020
Basemap Data: June 2023

Travel Characteristics

Vehicle availability and commute mode are insightful factors to understand existing demand for public transportation.

Zero Vehicle Households

Residents without access to vehicles are much more likely to use transit than those with a vehicle, particularly in areas where land uses are more dispersed and parking is free, such as in Thornton. **Figure 10** displays the percent of households in each census tract that do not own a vehicle. The highest concentration of residents without a vehicle live south of 128th Avenue, which reflects the income trends shown in **Figure 9**. This data reinforces the notion that these areas are likely to have the highest demand for transit. Interestingly, there is also a large census tract in northeast Thornton where up to 13% of residents have no vehicle available despite this being in an area of Thornton with higher average incomes. This location coincides with the same census tract with a large portion of residents 65 years and older, which is located in the 55+ community of Todd Creek. Given these demographic characteristics, this area of Thornton may also have a higher demand for public transportation.

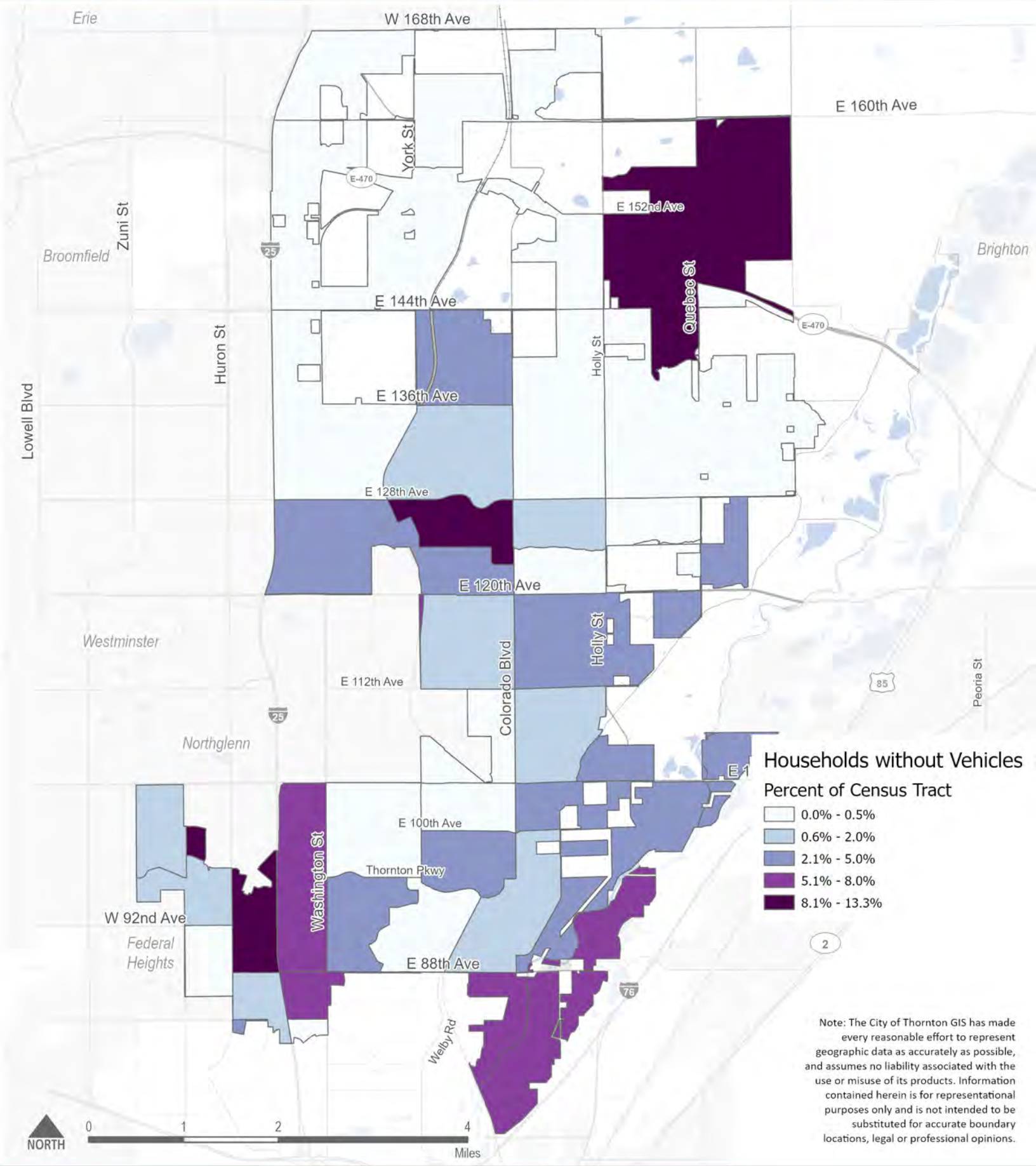
Transit Commute Mode Share

Beyond vehicle availability, understanding where in Thornton people are currently using transit can help reveal areas with high transit demand. As seen in **Figure 11**, most residents who use public transportation live south of 104th Avenue. There is also a concentration of residents commuting using public transportation between 120th Avenue and 144th Avenue west of Colorado Boulevard. This pattern generally correlates with the areas of the city where higher transit use would be expected given these areas generally have higher densities, lower incomes, and lower levels of car ownership. However, to some extent this data also reflects where public transit operates today within Thornton and this data also only reflects transit use for people commuting, which is less than half of transit trips.[3] Older adults tend to use transit for non-commuting purposes and this data would not reflect those trip types. Thus, demand for transit for non-commute trips and in areas of the city with little or no transit service would not be reflected.

[3] According to the 2017 National Household Travel Survey, approximately 37% of transit trips are by people commuting to work.

Households with No Vehicles Available

Figure 10



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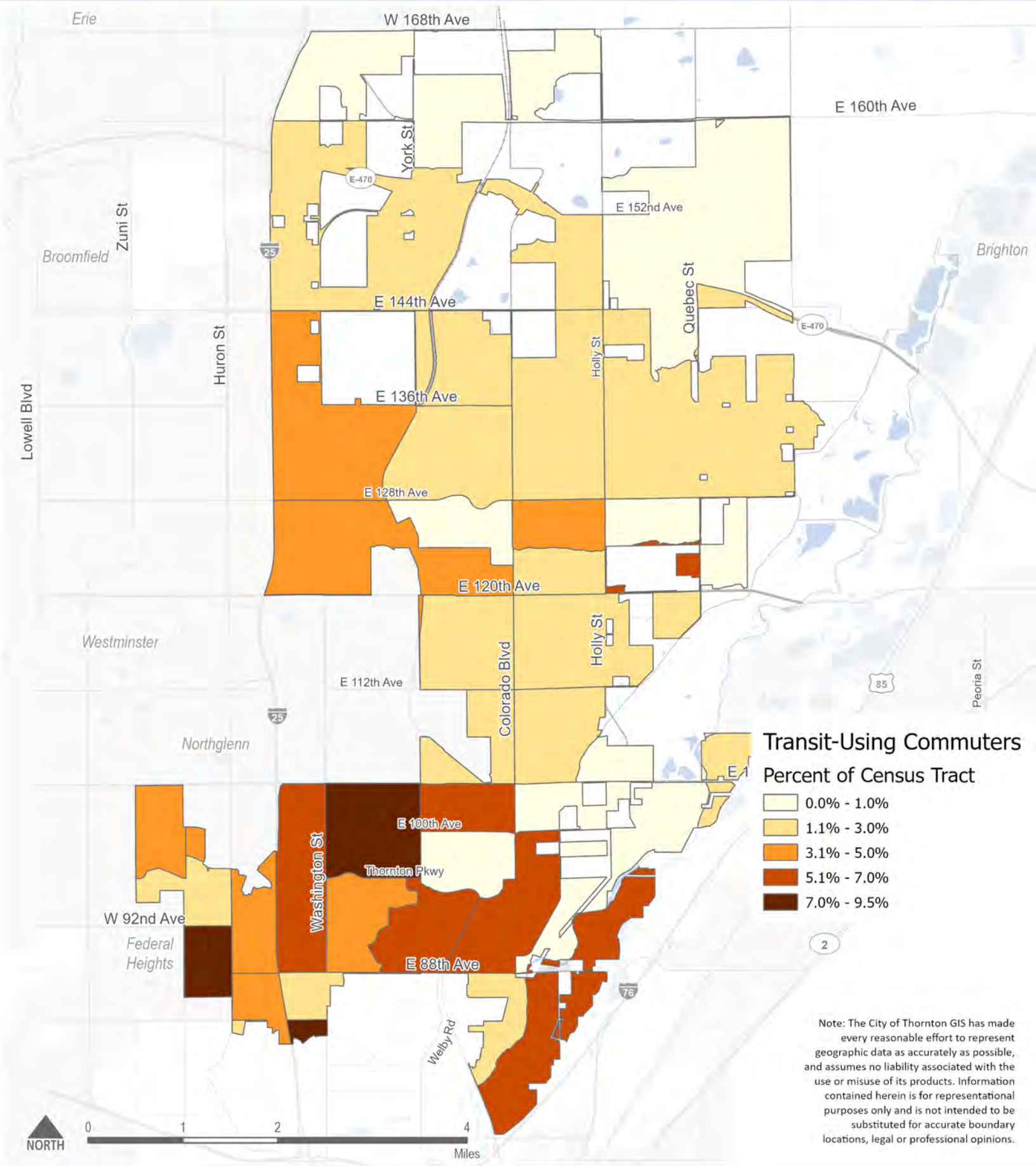
City of Thornton

Sources: American Community Survey 2020
Basemap Data: June 2023

Residents Commuting Using Public Transportation

Figure 11



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City of Thornton

Sources: American Community Survey 2020
Basemap Data: June 2023

Smart Commute

Smart Commute Metro North is the transportation management organization serving northern Colorado. The organization annually surveys residents across the north area of the Denver metropolitan area on their commute patterns. The organization also focuses on connecting with and educating different municipalities on how to interpret the results and apply them to actionable recommendations. The takeaways from the 2022 survey are described in **Table 2**.

Table 2: Smart Commute Metro North Survey Highlights

	North Denver Metro Area	City of Thornton
Single-Occupancy Vehicle Commuters (Considering days off)	54.2%	61.5%
Transit Commuters	0.9%	0.9%
Bike Commuters	1.5%	1.0%
Average Commute Distance	12.4 miles	9.9 miles
Average Commute Distance using Transit	15 miles	15 miles
Percent of people who do not know who to ask about different commuting options	64%	72%
Percent of people who are responsible for a child during their commute	27%	31%

Source: 2022 Smart Commute Metro North Commuter Survey

Thornton is similar to the rest of the region in its commute patterns, especially when comparing regional and local transit use for commuting purposes. When measuring mode split, Smart Commute calculates the contribution of peoples off days to represent an average day more accurately. This means that although 87% of Thornton commuters use a single-occupancy vehicle as their commute mode, only about 62% of commuters use a single-occupancy vehicle on any given day due to the consideration for a day off. In other words, because people work varying schedules with differing days off, a more accurate percentage of people commuting in single-occupancy vehicles is closer to 62% on any given day.

The average commute distance is smaller in Thornton (9.9 miles) than across the region (12.4 miles), which also aligns with the fact that 21% of survey respondents indicated they work and live within Thornton. Although the average commute distance using transit is the same as the regional average, the larger difference between the average commute distance for all modes and for transit indicates a mismatch in the desired destinations and the transit service provided.

Beyond the average commute distance using transit, the sentiment of the mismatch in desired destinations and the transit service provided is reiterated in responses to desired transit improvements for errands outside of commuting. Smart Commute asks what type of transit improvements would make people more likely to ride transit instead of driving for an errand; 65% of respondents indicated a desire for service-related improvements, 16% safety improvements, 13% equity improvements, and 6% educational improvements. More specifically, people indicated a desire for service near homes and destinations, a better transit network, and more direct transit services between origins and destinations, improved safety in and around the train/bus, lower fares, and education about how to use transit.

For the City of Thornton, Smart Commute Metro North recommends exploring the following next steps in 2023:

- Coordinating more with residents and employers to increase educational opportunity for commuting and travel options.
- Working with community members and stakeholders to identify gaps in the non-motorized transportation system, starting with areas with lower access to opportunity.

Existing Transit Service

RTD provides public transportation in Thornton through three main services: fixed-route bus, commuter rail, and FlexRide.

Fixed-Route Bus Service

Eleven fixed-route bus routes currently serve Thornton in some capacity, listed in **Table 3** and illustrated in **Figure 12**. Most routes have 30-to-60-minute frequencies throughout the day and predominantly connect to the southern portion of Thornton. With the limited frequencies and limited geographic reach, fixed-route transit is hard to rely on as a mode of transportation. The majority of bus routes in Thornton operate at hourly frequencies, which are impractical for most people, particularly if a transfer is required. Further, this limits the transit-dependent population on how many travel choices they can make, negatively impacting their quality of life.

Only three local bus routes in Thornton operate at 30-minute frequencies during the day, all of which operate in the very south and western parts of the city:

- Route 7 – Along Washington Street south of 112th Avenue
- Route 19 – Along Pecos Street and Ura Lane south of 104th Avenue
- Route 92 – Along 88th Avenue from Pecos Street to the Original Thornton N Line Station

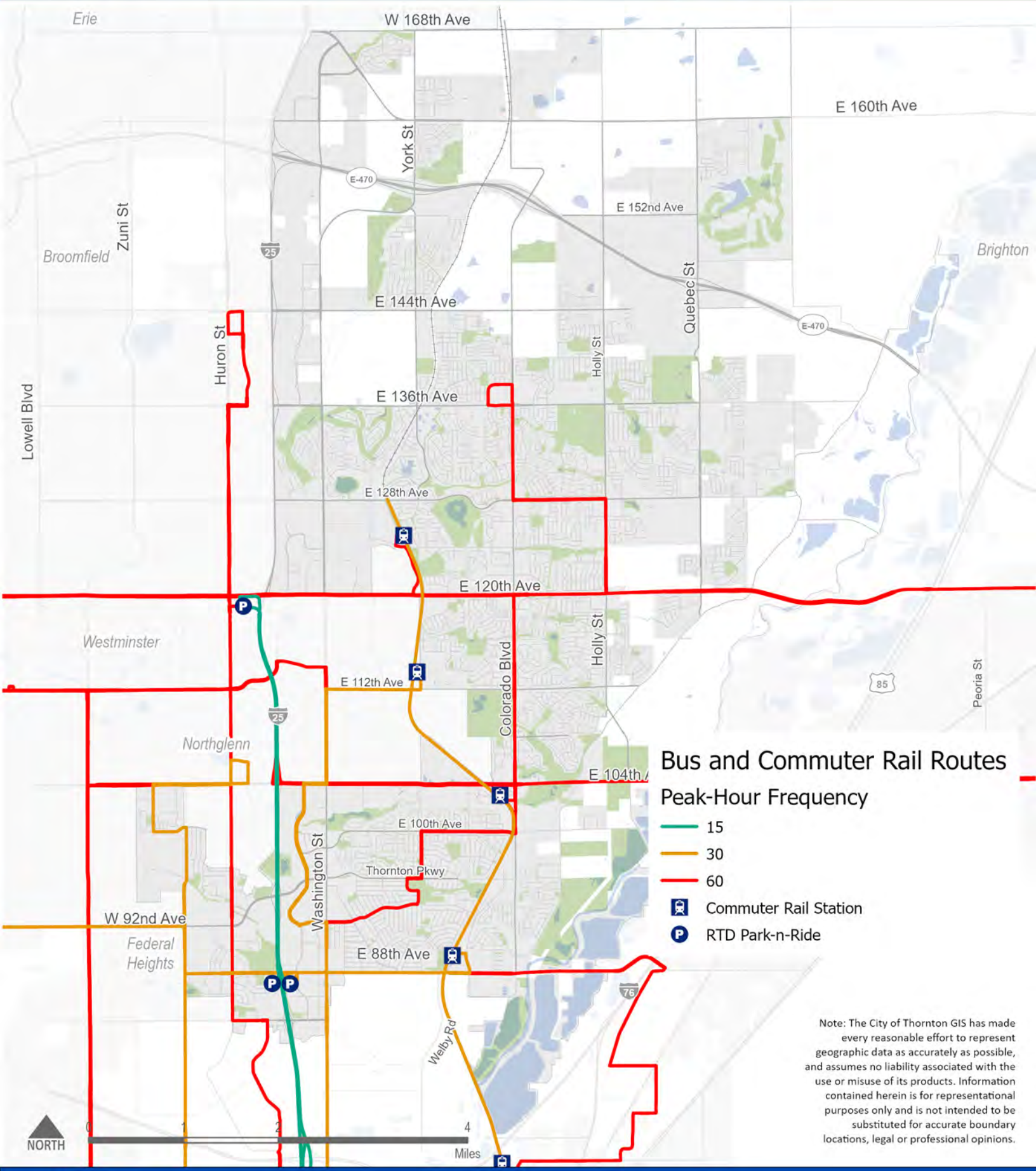
Table 3: Existing Bus Routes and Frequency (in minutes) in Thornton

Route #	Route Name	Weekday Day (Eve)	Weekend Day (Eve)
7	North Washington	30 (30)	60 (60)
8	North Broadway / Huron	60 (60)	60 (60)
19	North Pecos	30 (60)	60 (60)
31	Federal Blvd	- (60)	- (60)
88L	Thornton / Commerce City Limited	60 (60)	60 (60)
92	92nd Avenue	30 (60)	30 (60)
93L	N Colorado Blvd Limited	60 (60)	60 (60)
104L	Wagon Road / Denver Airport Limited	60 (60)	60 (60)
120E	120th Avenue	60 (60)	60 (60)
120L	120th Avenue Limited	60 (60)	60 (60)
120X	Wagon Road / Thornton Express	15 (30)	30 (30)

Source: RTD, 2023

Frequency by Route (January 2023)

Figure 12



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City of Thornton

Sources: RTD 2023
Basemap Data: June 2023

Rail Service

The N Line is a commuter rail running between Denver's Union Station and the Eastlake & 124th Station in Thornton. It runs at 30-minute frequencies all day, daily, making four stops in Thornton:

- Eastlake & 124th
- Northglenn & 112th
- Thornton Crossroads & 104th
- Original Thornton & 88th

In a similar pattern to the fixed-route buses, the most northern station is geographically only halfway into Thornton. With the intense growth expected in northern Thornton, a rail extension will positively impact transit availability. Eventually, the N Line is planned to go up to Colorado Boulevard & CO 7 once funding becomes available.

FlexRide

FlexRide is RTD's extended bus service intended to help with first- and last-mile connections. In general, riders can reserve a ride anywhere within the FlexRide service area, and RTD offers a subscription service for people that regularly need a ride at a set time on certain days. Thornton has four FlexRide service areas: Thornton, Federal Heights, Wagon Road/144th, and Broomfield North with some overlap between the service areas in the case of a needed transfer.

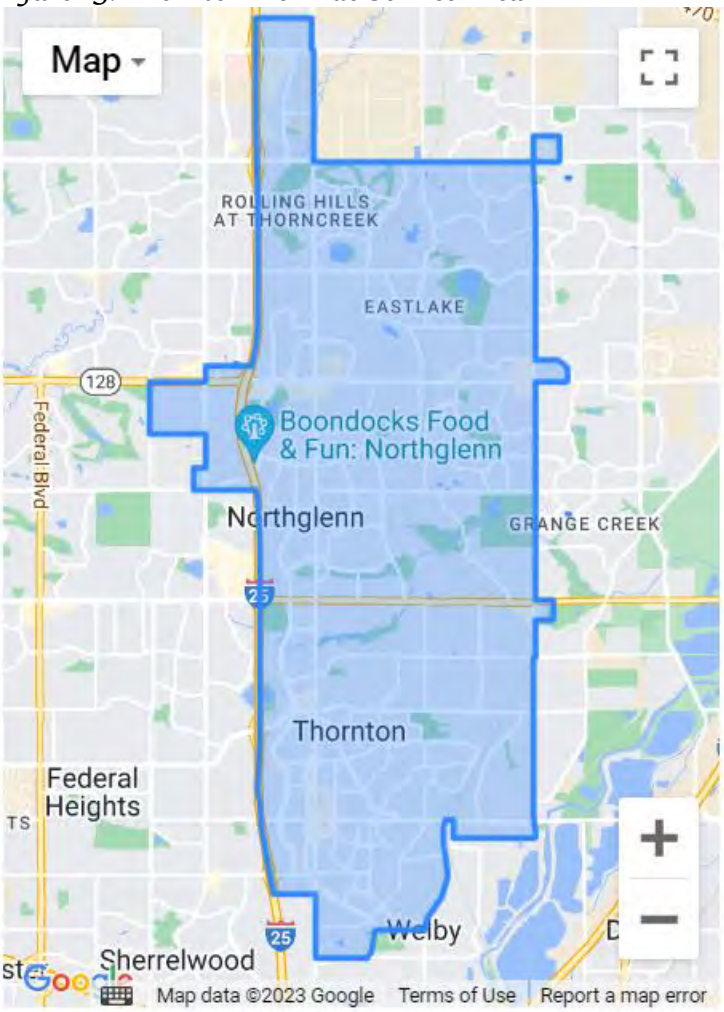
Per conversations with RTD, the Thornton FlexRides generally serve a community-based need; this means that the FlexRide is used more by residents who need to get to shopping opportunities, appointments, and recreational services, and is less used by commuters. Service for the Thornton and Federal Heights FlexRide are each provided by two buses. Because they each serve a large geographic area, it can sometimes be impossible to reserve a ride when needed. Additionally, while transfers are technically feasible at the Thornton Park-n-Ride, Wagon Road Park-n-Ride or the area around St. Anthony's Hospital, they are often challenging to coordinate may require significant out-of-direction travel making connections from either side of I-25 via FlexRide impractical.

Thornton FlexRide

The Thornton FlexRide mostly covers a large area generally from 70th Avenue to 144th Avenue east of I-25 and west of Colorado Boulevard, as depicted in **Figure 13**. It operates Monday through Friday between 5:30 AM and 7:00 PM, and the service is mostly available by reservation,

but it will also depart from the Wagon Road Park-n-Ride every 60 minutes between 6:00 AM and 6:00 PM without a required reservation.

Figure 13: Thornton FlexRide Service Area

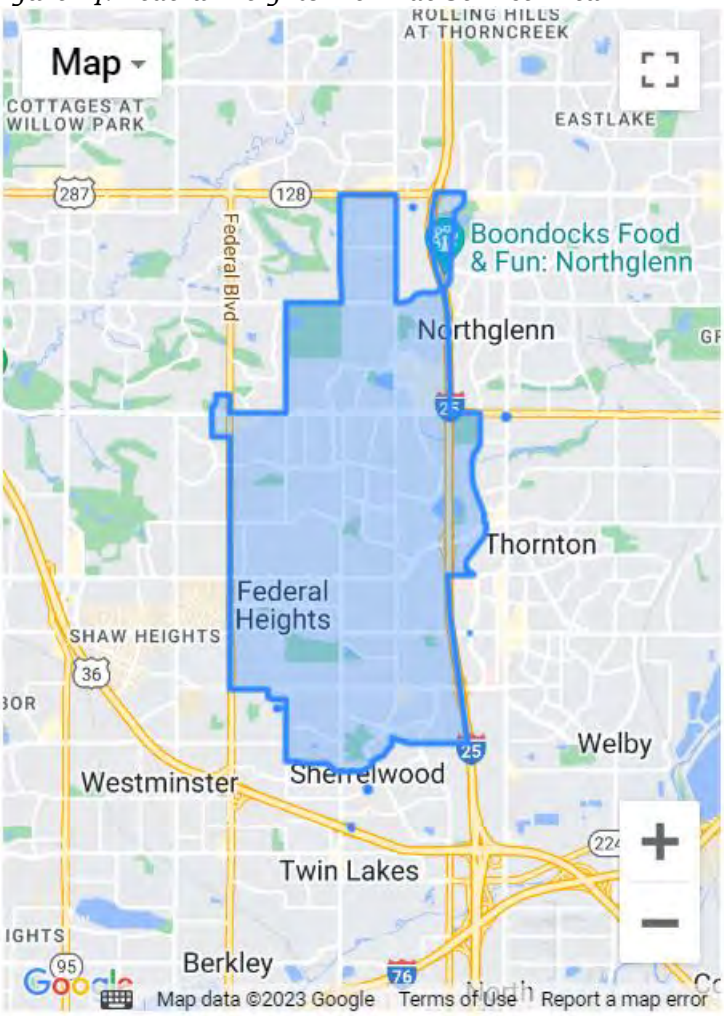


Source: RTD, 2023

Federal Heights FlexRide

The Federal Heights FlexRide mostly covers an area from 76th Avenue to 120th Avenue east of Federal Boulevard and west of I-25, as depicted in **Figure 14**. It operates Monday through Friday between 5:30 AM and 7:00 PM, and the service is available by reservation only.

Figure 14: Federal Heights FlexRide Service Area

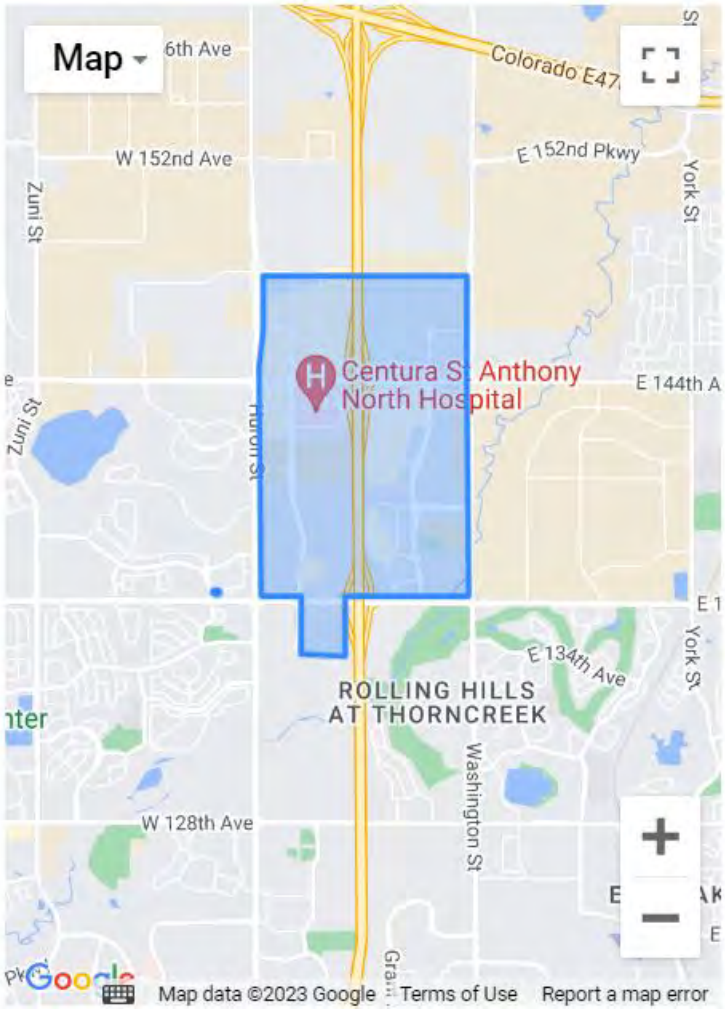


Source: RTD, 2023

Wagon Road FlexRide

The Wagon Road FlexRide covers a small area between 136th Avenue and 148th Avenue east of Huron Street and west of Washington Street, as depicted in **Figure 15**. It operates Monday through Sunday between 4:50 AM and 9:45 PM; between 8:45 AM and 5:30 PM, it is an on-demand service requiring reservations, and in the other times it is a fixed-route departing every 20 minutes from the Wagon Road Park-n-Ride and making stops at the St. Anthony's employee entrance, the Dollar Tree at The Orchard, the Amazon main door, the Grove at Burlington, Grant at 141st Street, and the Premium Outlet Group Check. The fixed-route service portion of service is oriented primarily during shift changes at the St. Anthony's hospital and Amazon distribution center. The service is funded by a grant that is set to expire in September 2023 and the city, Smart Commute, and RTD are working on solutions to keep the service operating in the future.

Figure 15: Wagon Road FlexRide Service Area

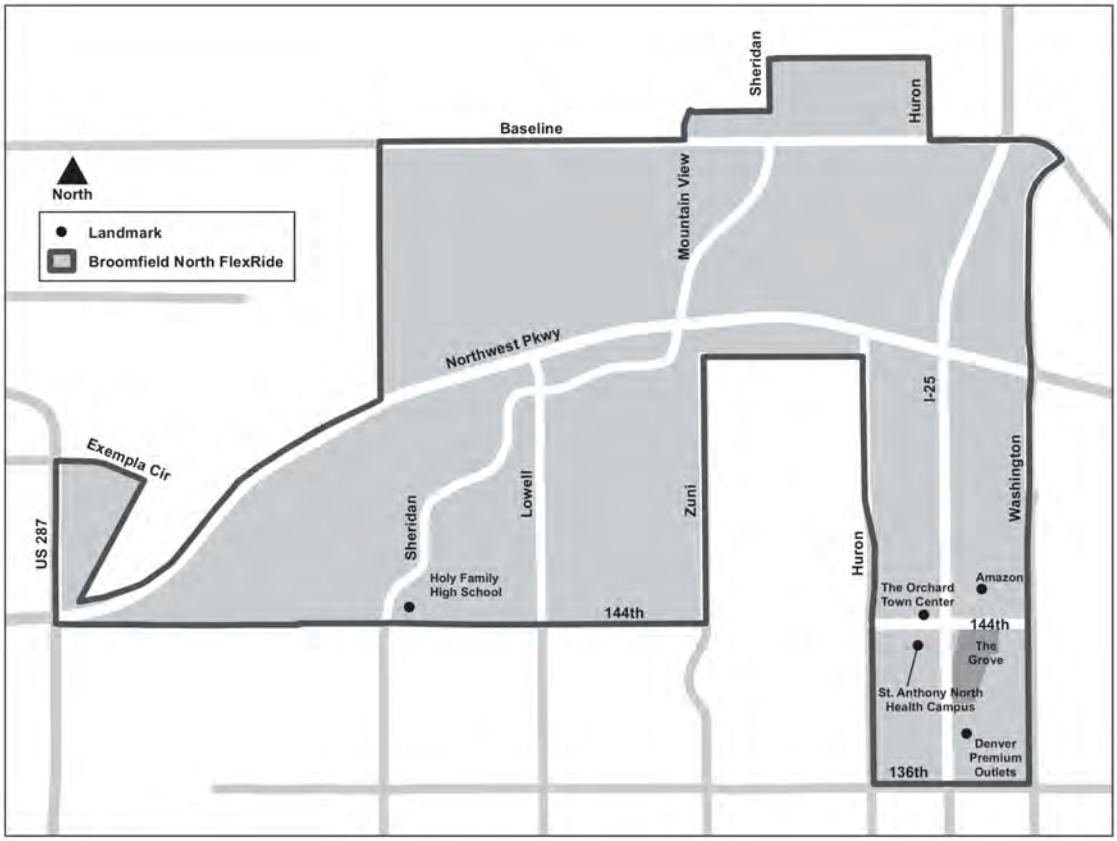


Source: RTD, 2023

Broomfield North FlexRide

The Broomfield North FlexRide service started on May 29, 2023 and Broomfield serves an area between 136th Avenue and CO 7 east of US 287 and west of Washington Street, as seen in **Figure 16**. The service operates Monday through Friday between 9:00 AM and 4:00 PM. Unlike the other FlexRide services in Thornton, the Broomfield North FlexRide has very little overlap with RTD's existing fixed-route service. The only connections points into the rest of RTD's transit network are with the LD regional bus (which operates hourly between Broomfield and Longmont) along US 287 and the Wagon Road FlexRide around 144th Street & I-25.

Figure 16: Broomfield North FlexRide Service Area



Source: City and County of Broomfield, 2023

Access-a-Ride

RTD also provides an ADA paratransit service, Access-a-Ride, which serves people who cannot use regular fixed-route services due to a disability. To qualify, a rider must be unable to independently get to and from a bus stop or on and off a lift-equipped fixed-route bus; and the rider must have a disability that prohibits them from independently riding fixed-route bus services. The service has a fare and is available anywhere throughout the RTD service area, as long as the origin and destination are within ¾ mile of the local fixed-route transit system. **Figure 17** shows that because of the lack of fixed-route service to most of north Thornton, there are gaps in that part of the city where Access-a-Ride does not serve.

Transit Hubs

There are six transit hubs in or near Thornton that provide access to the N Line or regional express bus service on I-25. These hubs are park-n-rides and major transfer points in the

regional transit system. The locations of transit hubs are mapped in **Figure 17** (see Commuter Rail Stations and Park-n-Rides) and summarized in **Table 4**.

Table 4 Transit Hubs in/near Thornton

Station	Regional Bus/Rail Routes	Local/Limited Bus Routes	FlexRide
Eastlake & 124th	N Line	120E, 120L	Thornton
Northglenn & 112th	N Line	7, 112	Thornton
Thornton Crossroads & 104th	N Line	93L, 104L	Thornton
Original Thornton & 88th	N Line	92, 88L	Thornton
Wagon Road Park-n-Ride	120X	8, 104L, 120W	Federal Heights, Thornton, Wagon Road
Thornton Park-n-Ride	120X	92, 93L	Federal Heights, Thornton

System Coverage & Gaps

RTD provides fixed-route bus service, commuter rail service, and FlexRide service to the Thornton area. **Figure 17** displays this coverage. In terms of coverage, the services cover a significant land area of Thornton, especially in the western and southern parts of the City. However, there are notable gaps in this coverage especially when combined with frequency as explained below.

Geographic Coverage Gaps

As seen in **Figure 17**, there is minimal to no transit east of Colorado Boulevard and north of 120th Avenue, leaving no practical option for transit access within most of these neighborhoods. Some of these areas are also more than three quarters of a mile from the nearest fixed-route transit, meaning Access-a-Ride is not available for people who would otherwise qualify for the service.

Further, **Figure 18** displays the areas of Thornton within a quarter-mile to nearest bus stops and a half-mile distance to the nearest regional transit hubs via the roadway network. These are the distances most people are willing to walk to access local bus (a quarter mile) and regional express service (a half a mile). This map shows many areas of the city that are not within a convenient walk to transit, even in the areas south of 104th Avenue where transit coverage is higher. Additionally, the analysis does not account for the existence (or condition) of the sidewalk network, which is generally poorer in the southern part of Thornton as expressed by stakeholders and members of the public. Narrow or missing sidewalks can make it more difficult to access transit stops, even when one's origin or destination is within walking distance to a stop.

While the areas with existing service roughly align with the areas of Thornton with the highest population density (**Figure 5**) and highest transit propensity, much of the service in this area is too infrequent to be practical, especially when making connections, as described below.

Frequency Gaps

Frequency is another gap that limits residents from being able to access transit in a flexible and accommodating way. As discussed with **Table 3**, none of the local fixed-route transit services run more frequently than every 30 minutes in Thornton. The only services that run more frequently than 30 minutes are the 120X along I-25 that operates at 15-minute headways in the peak direction and the Wagon Road Flexride that operates at 20-minute frequencies during peak commuting times. The TMMP emphasizes being able to access all areas of Thornton in a timely manner without using a private vehicle, which would be difficult with the current frequency of service provided.

Service Span Gaps

How early or late in the evening transit service operates impacts its utility, particularly for service workers who often have non-traditional schedules. While most fixed-route transit in Thornton operates in the evening, the Thornton FlexRide stops running at 6 PM which limits the ability of many evening commuters and service workers to use the service.

Connectivity Gaps

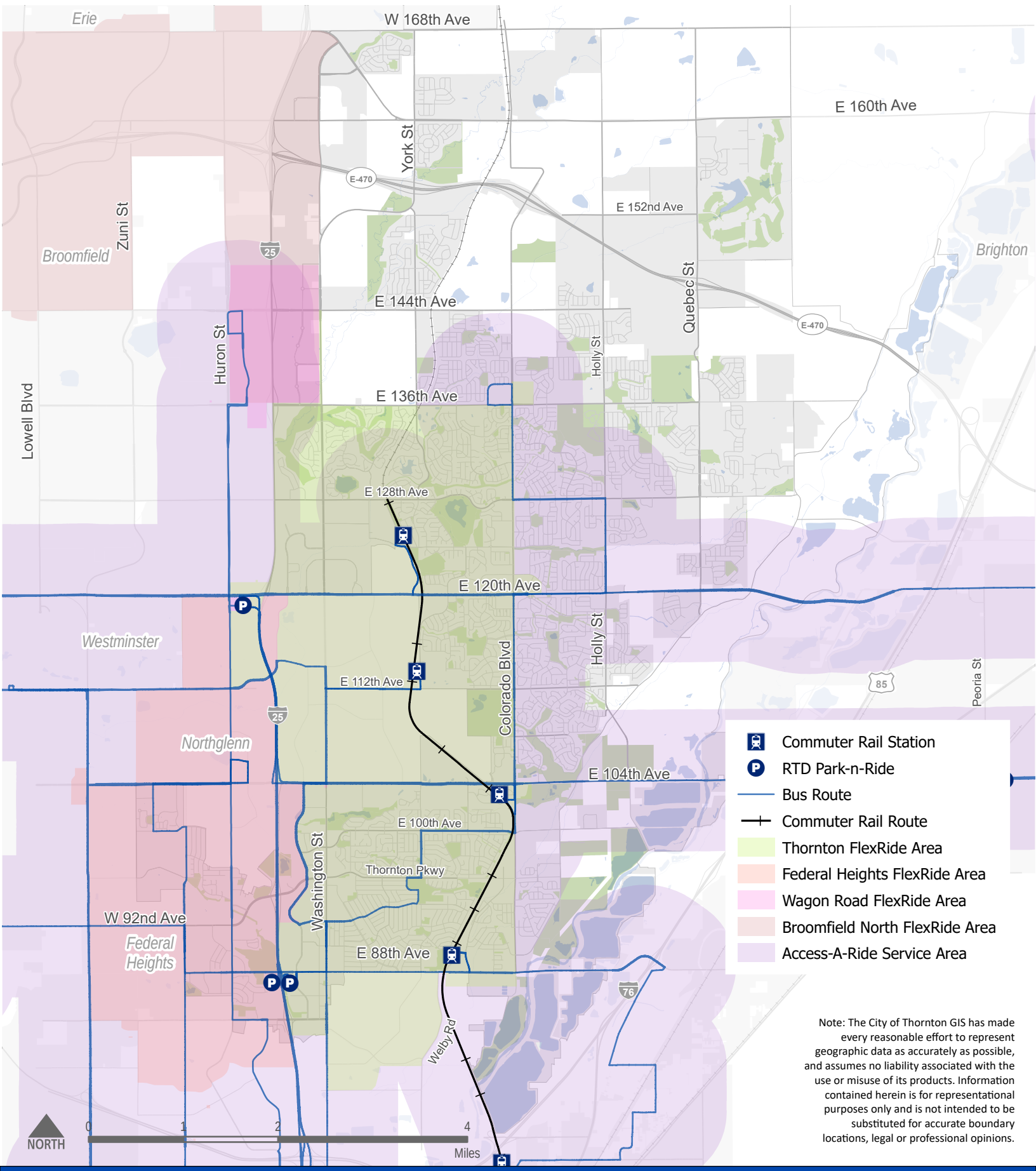
In much of Thornton there is good connectivity of services to the N Line and I-25 transit hubs. However, there are noticeable gaps. In addition to the challenges of transferring between routes that is caused by the low frequency of most routes, there is also a lack of transit connectivity across I-25 in some areas. This includes 104th Avenue (despite fixed-route service on both sides of I-25), and the FlexRide boundaries are split generally along I-25 making this FlexRide extremely inconvenient to use for trips that cross I-25.

Trip Purpose Gaps

Another gap in transit service in Thornton is the mismatch between the services offered and the desired trip purposes. The routes in Thornton are mostly oriented to serve regional trips, particularly to downtown Denver, which is helpful to commuters who work outside Thornton or are traveling longer distance in the region. However, the existing transit service is not well set up for shorter community-based trips, other than the FlexRide is not always an option due to capacity constraints. Thus, this market is largely unserved by transit in Thornton. Additionally, the travel market for east-west regional trips is not well served by transit today.

Thornton Transit Coverage

Figure 17



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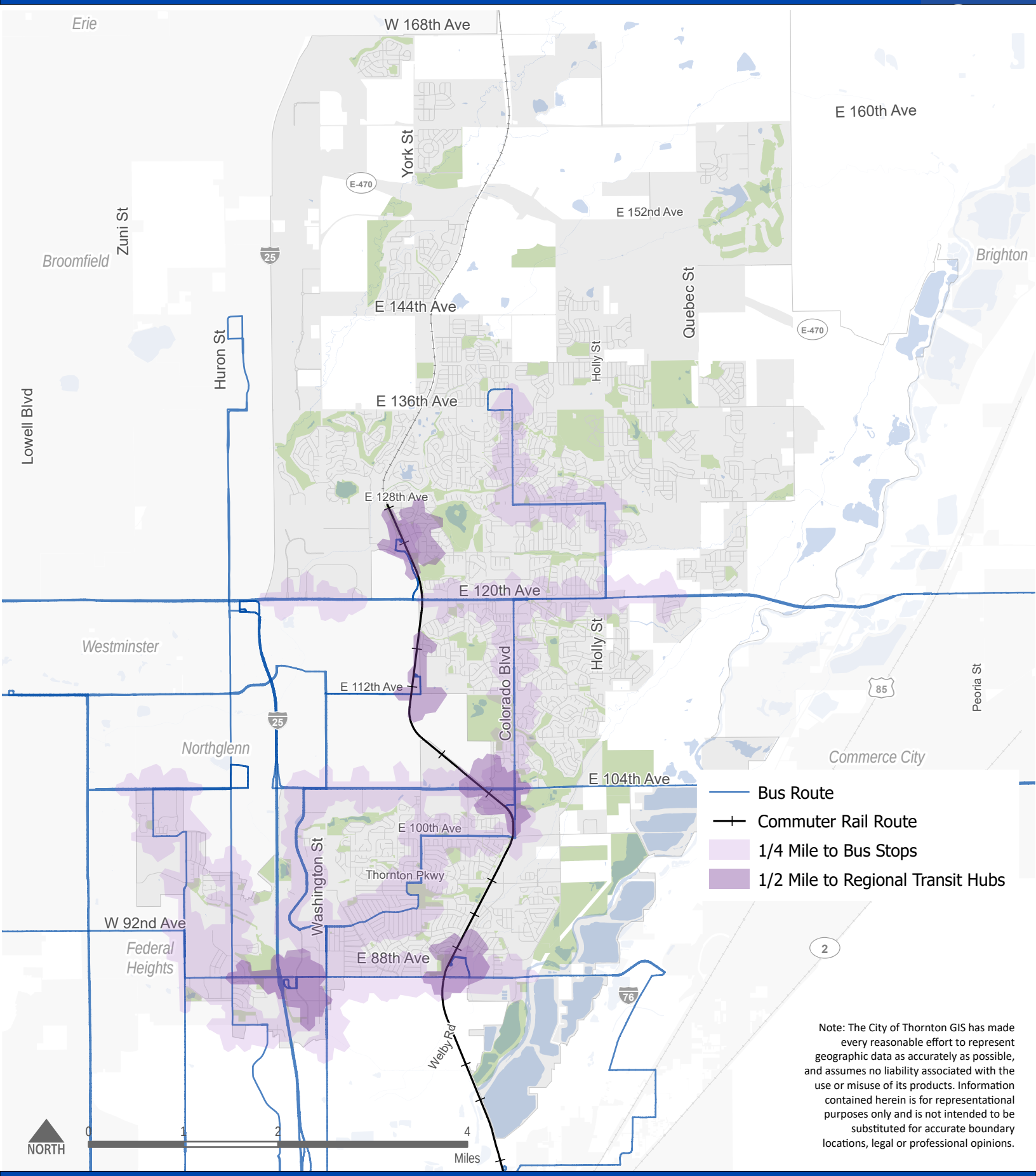
City of Thornton

Sources: RTD 2023

Thornton Transit Access

Figure 18



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City of Thornton

Sources: RTD 2023
Basemap Data: June 2023

Ridership by Stop

The success of existing transit is heavily based in ridership, and the ridership for the bus stops in Thornton is displayed in **Figure 19**. In the map, ridership is calculated as the average daily boardings and alightings throughout the May to August 2022 runboard. This runboard was used since previous runboards were still disrupted by the COVID-19 pandemic.

The stops with the highest daily ridership align with the rail stops and park-n-rides and major transfer points in the system, as seen in **Table 5**. The Thornton Park-n-Ride and the stops at 88th Avenue & Washington Street also have substantial ridership. This pattern may be indicative of how the existing transit services are used for more regional connections rather than local connections.

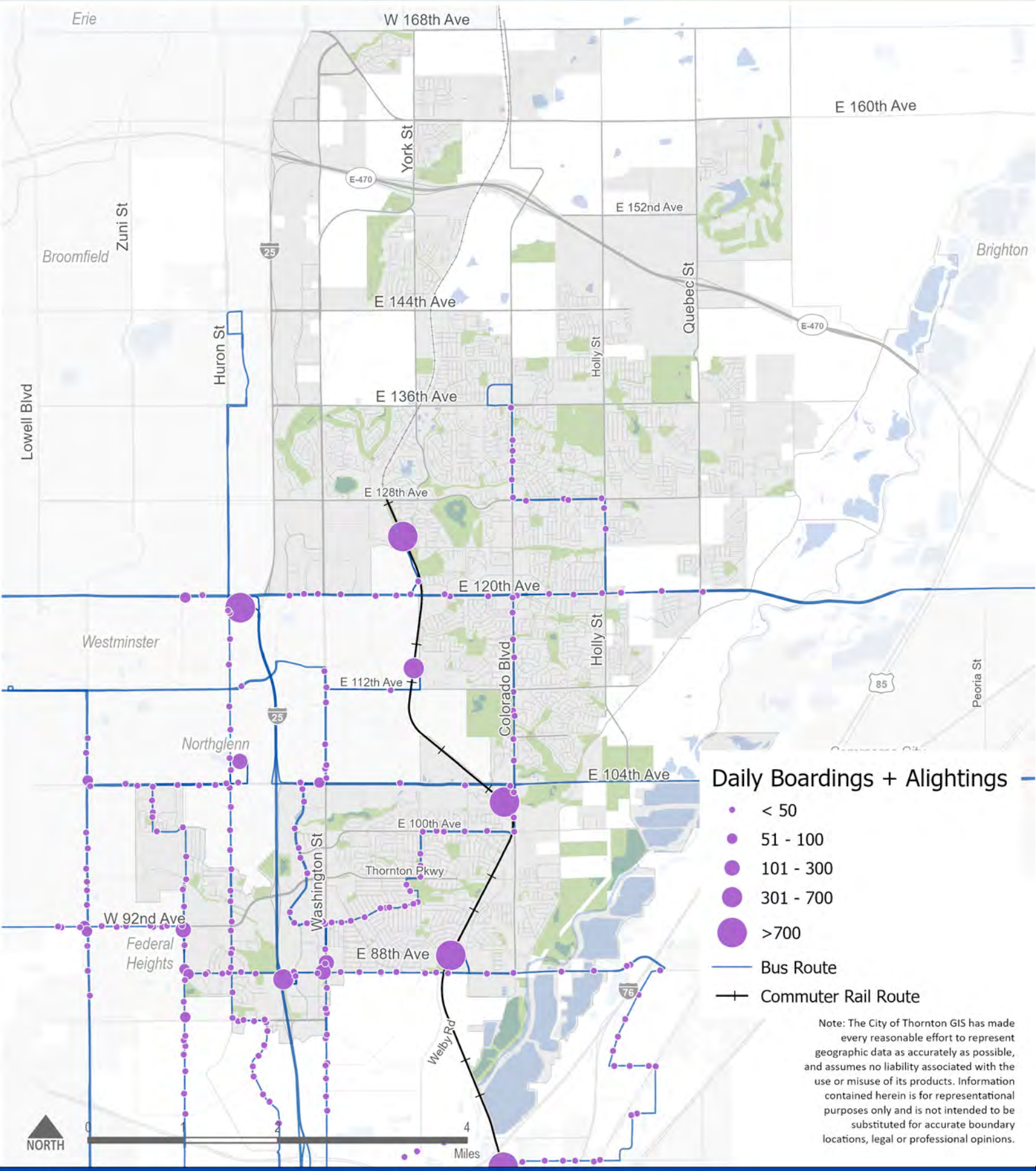
Table 5: Highest Ridership Stops

Transit Stop	Average Daily Boardings	Transit Routes Available
Eastlake & 124th	1,665	N Line, 120E, 120L, Thornton FlexRide
Thornton Crossroads & 104th	940	N Line, 93L, 104L, Thornton FlexRide
Wagon Road Park-n-Ride	905	8, 104L, 120W, 120X, Federal Heights, Thornton, & Wagon Road FlexRides
Original Thornton & 88th	746	N Line, 88L, 92, Thornton FlexRide
Northglenn & 112th Ave	700	N Line, 7, 112, Thornton FlexRide

Source: RTD, 2022

Ridership by Stop (May 2022)

Figure 19



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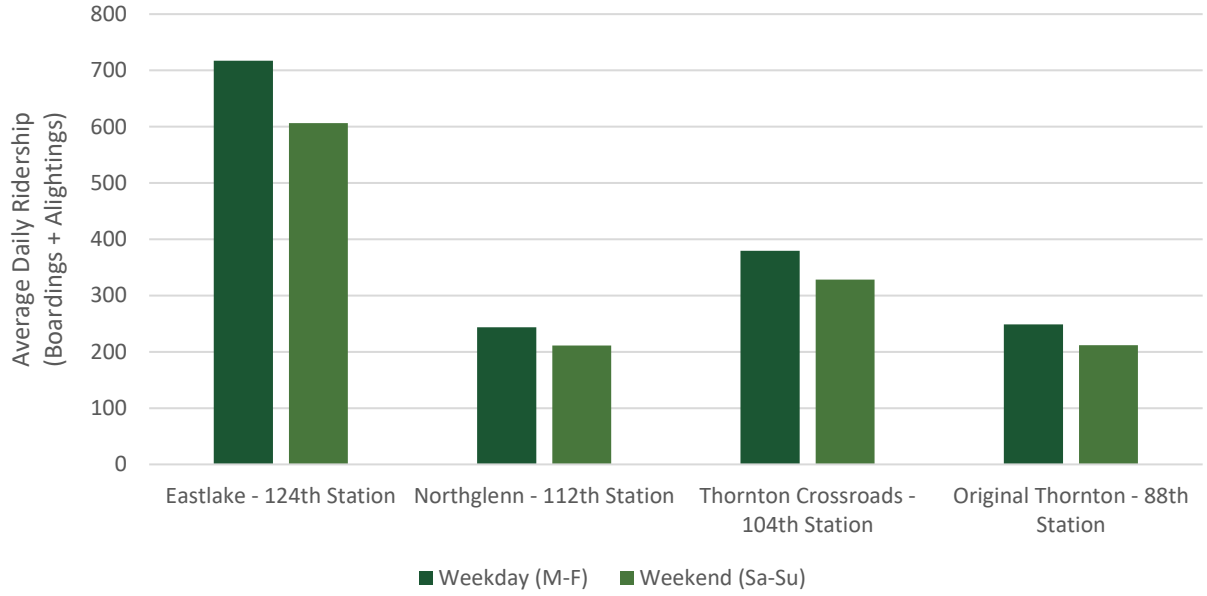
City of Thornton

Sources: RTD 2023
Basemap Data: June 2023

Further, with the N Line stops being significant origins and destinations for transit trips, **Figure 20** displays the difference in ridership on the weekdays and the weekends. There are about 16% more trips on the weekdays than on the weekends, indicating a relatively consistent demand for the N Line throughout the week.

Figure 20. Average N Line Ridership, May 2022 (Weekdays vs Weekends)

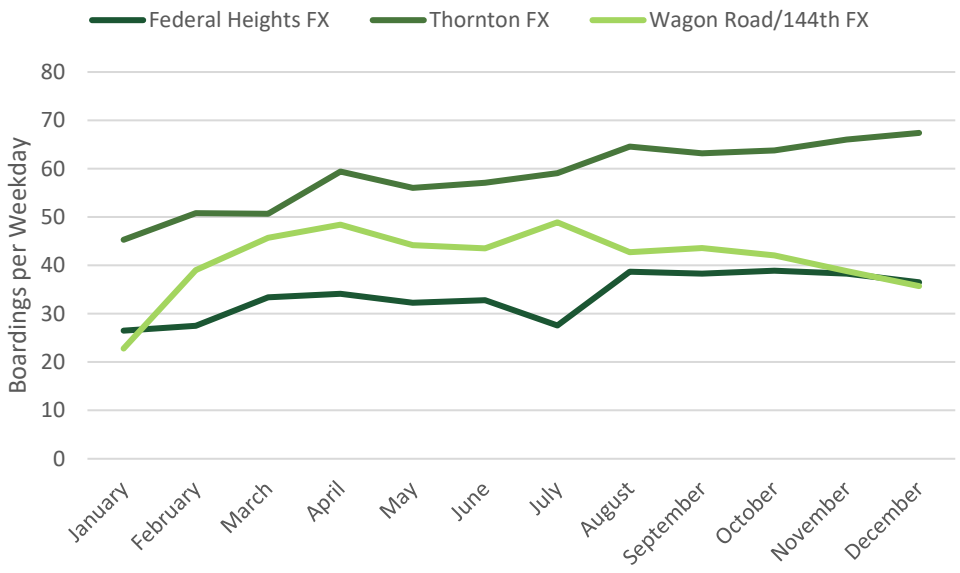


Source: RTD, 2022

FlexRide Ridership Patterns

RTD also tracks ridership patterns for the FlexRide services. **Figure 21** displays the average boardings per weekday on all three FlexRide services in 2022. It should be noted that the new Broomfield North FlexRide is not displayed due to starting service in May 2023. Overall, the Thornton FlexRide had the largest ridership, and it grew over the course of the year, from 45 riders per day in January to almost 70 riders per day in December. It is also noteworthy that this FlexRide has the largest service area. The other two FlexRide services grew more modestly in 2022 and were averaging about half as many riders per day (just under 40) by December, 2022, with ridership on the Wagon Road FlexRide declining since its peak in the summer.

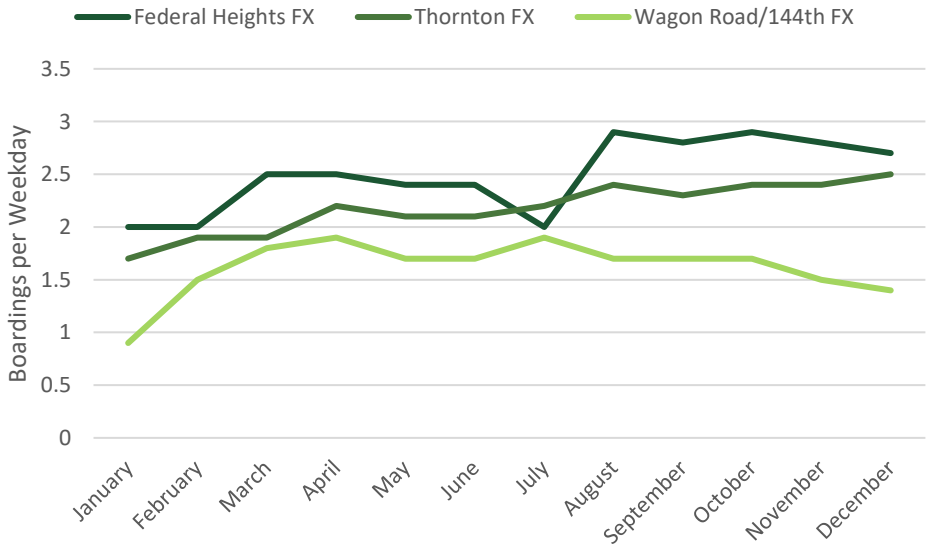
Figure 21: 2022 Boardings per Weekday on Thornton Flex Rides



Source: RTD, 2022

Figure 22 and **Table 6** display the boardings per hour for each FlexRide service, which in 2022 ranged from an average of 1.6 boardings per hour on the Wagon Road FlexRide to 2.5 boardings per hour on the Federal Heights FlexRide. RTD aims to have an average of three boardings per hour, and the closest one to that level of service is the Federal Heights FlexRide.

Figure 22: 2022 Boardings per Hour on Thornton Flex Rides



Source: RTD, 2022

Further, it is important to compare the FlexRide ridership patterns over time. **Table 6** also displays how ridership on the Thornton area FlexRide services has changed between 2021 and 2022, and both the Federal Heights FlexRide and the Thornton FlexRide increased in overall ridership. Despite the growth in ridership, the relatively low numbers reflect the inefficiency of operating an on-demand service over a large area and challenges in meeting demand. The Wagon Road FlexRide had a decrease in ridership between 2021 and 2022. The latter service is largely dependent on patterns at Amazon and may be reflective of changes in shift schedule and number of employees.

Table 6: FlexRide Ridership Over Time

Service	2021	2022	Percent Change
	Average Boardings per Weekday		
Federal Heights FlexRide	30.2	33.7	+11.7%
Thornton FlexRide	45.4	58.6	+29.1%
Wagon Road FlexRide	47.7	41.3	-13.5%
	Average Boardings per Hour (Weekdays)		
Federal Heights FlexRide	2.5	2.5	0%
Thornton FlexRide	1.9	2.2	+14.5%
Wagon Road FlexRide	1.9	1.6	-14.9%

Source: RTD, 2022

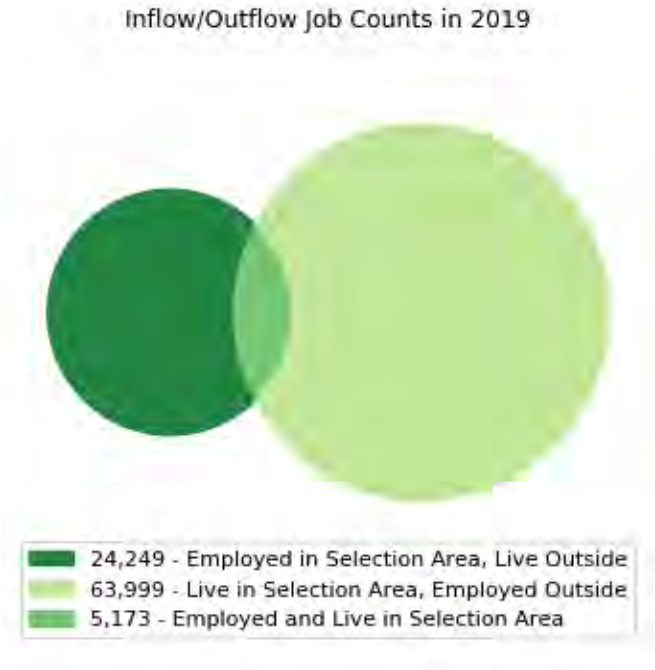
Travel Patterns & Demand

Existing travel patterns and demand are insightful to how people currently move around and in relation to Thornton. Studying where people are currently making trips by all modes can help reveal potential markets for transit service.

LEHD Commute Patterns

The Longitudinal Employer-Household Dynamics (LEHD) from the U.S Census collect survey data on travel and commute patterns. As seen in **Figure 23**, the majority of Thornton residents work outside of Thornton, although there is also a good amount of people who work in Thornton but live elsewhere. A small portion of Thornton's residents work and live within Thornton. It should be noted that the LEHD data is from 2019 and patterns may have shifted significantly following the COVID-19 pandemic and a higher prevalence of working from home.

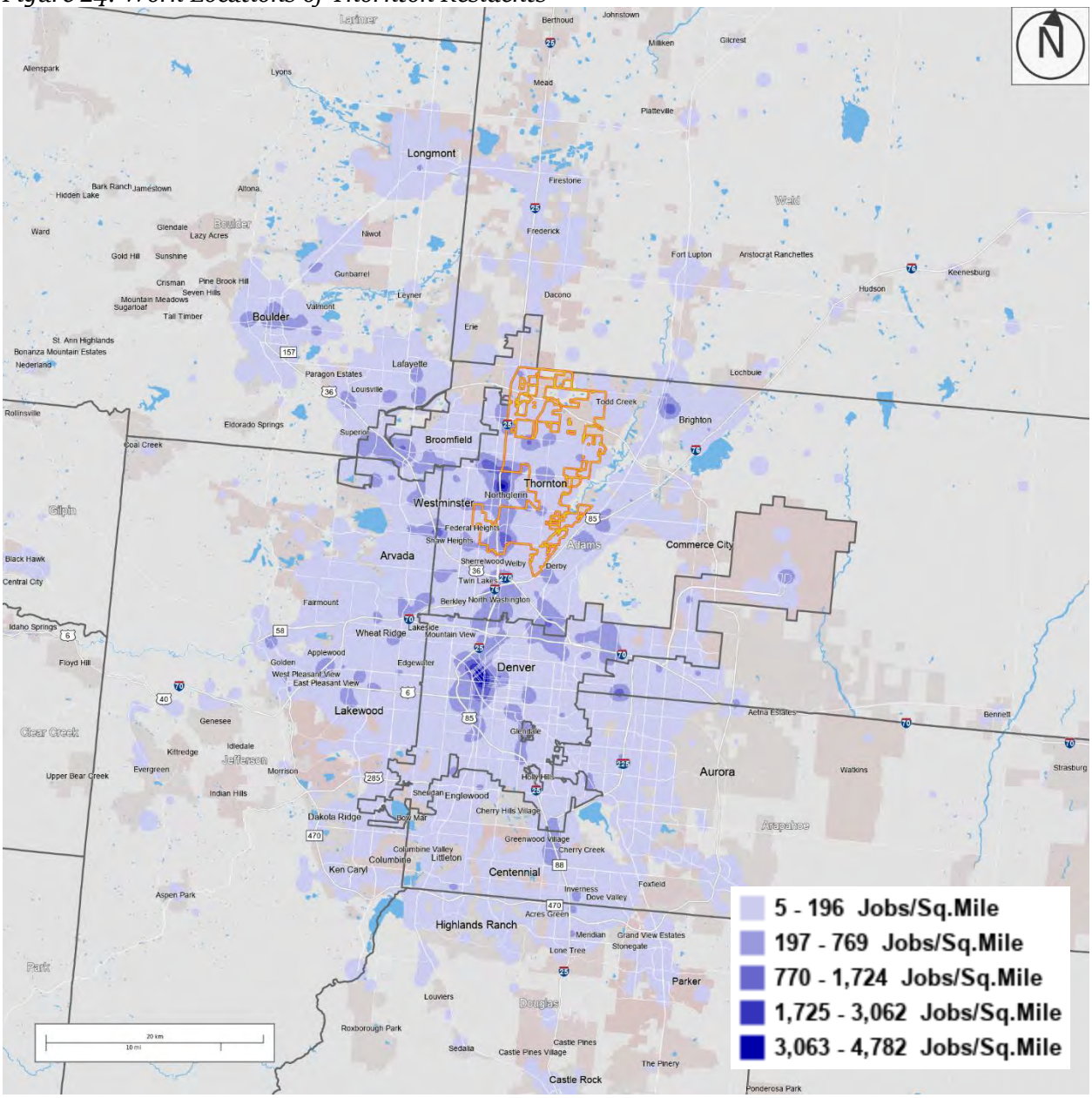
Figure 23: Inflow/Outflow of Commuters



Source: LEHD, 2019

Figure 24 shows where people who live in Thornton were working in 2019. Geographically, two primary areas are evident as work locations for Thornton residents: Northglenn and Downtown Denver. However, the data also shows that commute trips from Thornton are highly dispersed throughout the region, spreading from Boulder to Brighton to Greenwood Village.

Figure 24: Work Locations of Thornton Residents



Source: LEHD, 2019

StreetLight Data Analysis

Origin-destination trip data for Thornton and the surrounding area were collected using StreetLight Data. StreetLight Data is an on-demand mobility analytics platform and a "Big Data" provider that compiles origin-destination trip data from global positioning system (GPS) tracking technology provided through location-based services (LBS) data or connected vehicle data (CVD). LBS data is collected through mobile devices when a user enables a location-based

services application on their smartphone, and CVD is collected from vehicles equipped with advanced communication technology.

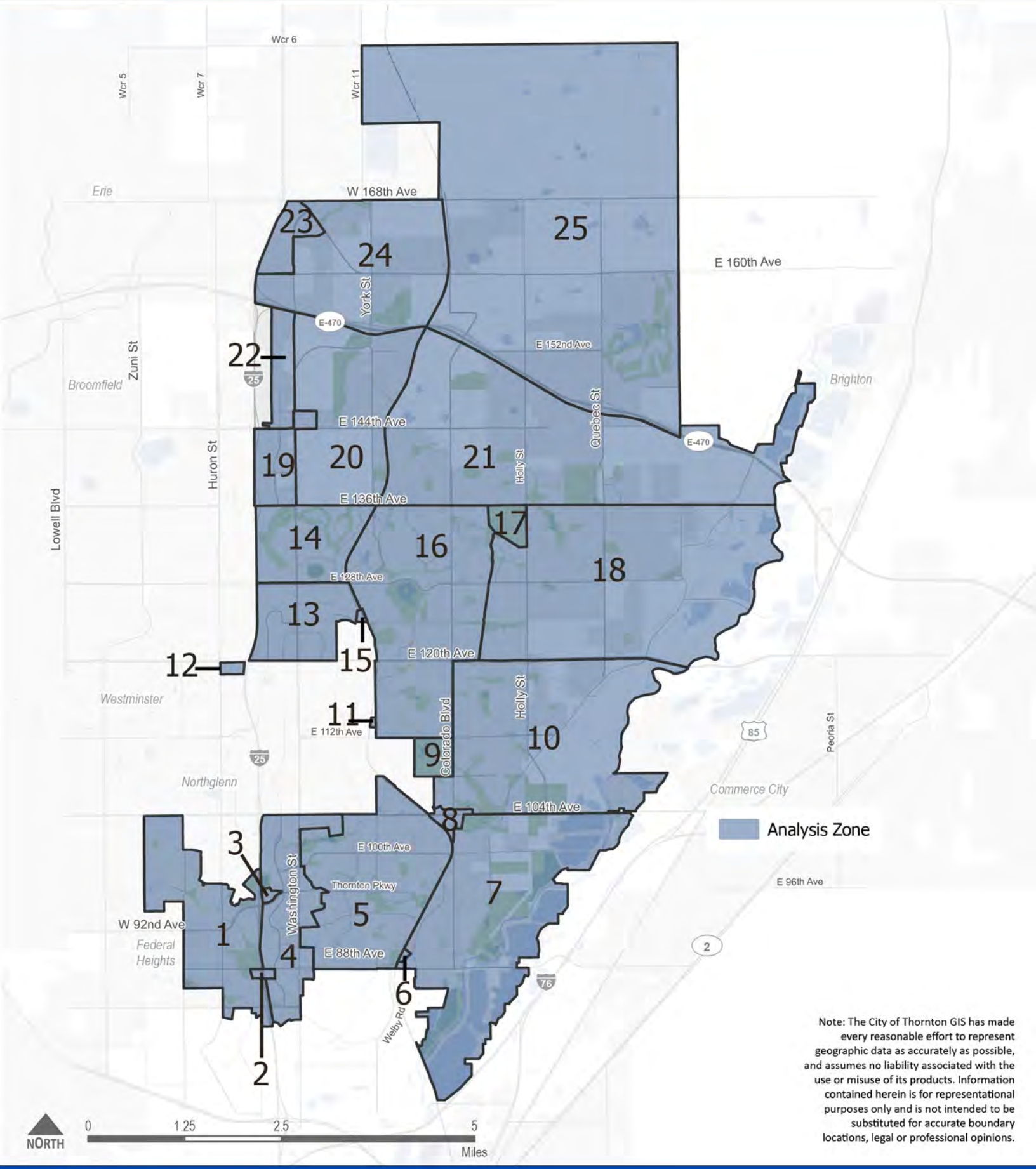
The primary output used in this analysis is the StreetLight Index, which is a relative estimate of device trips (including trips taken by automobile, truck, motorcycle, and bus). StreetLight allows for analysis over different time periods depending on the type of data collected; LBS is available for analysis dates between January 2016 and April 2022, and CVD is only available between May 2022 and December 2022. For this analysis, LBS data was collected for March – April 2022 and CVD data was collected for September – October 2022. To capture peak flows and analysis at various times of the day and days of the week, data was collected for a typical weekday (Tuesday – Thursday), a typical weekend (Saturday – Sunday) on an hourly basis.

Zones

Transportation zones are the building blocks for running analyses on the StreetLight platform. Zones can be used to analyze traffic that stops and starts within an area. To capture all the critical origin and destination spots in and around Thornton, 25 zones were developed for this analysis. The zones developed for this analysis were based on the land use patterns, including separate zones for major commercial areas and recreational facilities, separate zones for the major transit stations and Park-n-Rides, and separate zones for residential zones separated by highways, railroads, or other built-environment features. **Figure 25** shows a map of the zones analyzed and **Table 7** shows the zone descriptions, with numbers corresponding to the map. To understand certain questions of the analysis, specifically regional trips to or from Thornton, an additional analysis with pre-set ZIP code geographies was run.

Analysis Zones

Figure 25



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City of Thornton

Sources: RTD 2023
Basemap Data: June 2023

Table 7. StreetLight Analysis Zone Descriptions

Zone Name	Zone Number
Huron Street Area	1
Thornton Park-n-Ride	2
Thornton Civic Center/City Hall	3
Washington Street Commercial Corridor, South of 104th	4
Residential Zone East of Washington Street, West of Railroad	5
Original Thornton/88th Station	6
Eastern Residential Zone South of 104th	7
Thornton Crossroad104th Station	8
Carpenter Recreation Complex	9
Residential Zone between 104th Avenue and 120th Avenue, East of Colorado	10
Northglenn/112th Station	11
Wagon Road Park-n-Ride	12
Western Commercial Zone between 120th Avenue and 128th Avenue	13
Western Residential Zone between 128th and 136th Avenue	14
Eastlake/124th Station	15
Residential Area surrounding Eastlake	16
Trail Winds Recreation Complex	17
Eastern Residential Zone between 120th Avenue and 136th Avenue	18
Denver Premium Outlets	19
Residential Zone between 136th Avenue and E470, West of Railroad	20
Residential Zone between 136th Avenue and E470, East of Railroad	21
Amazon Employee Parking	22
Larkridge Employee Center	23
Residential Zone between E470 and 168th Avenue, West of Railroad	24
Northern Zone North of E470, East of Railroad	25

Analysis Results

To best inform the study of the existing travel patterns, and how transit can assist in these patterns, the Streetlight analysis aimed to answer the following questions:

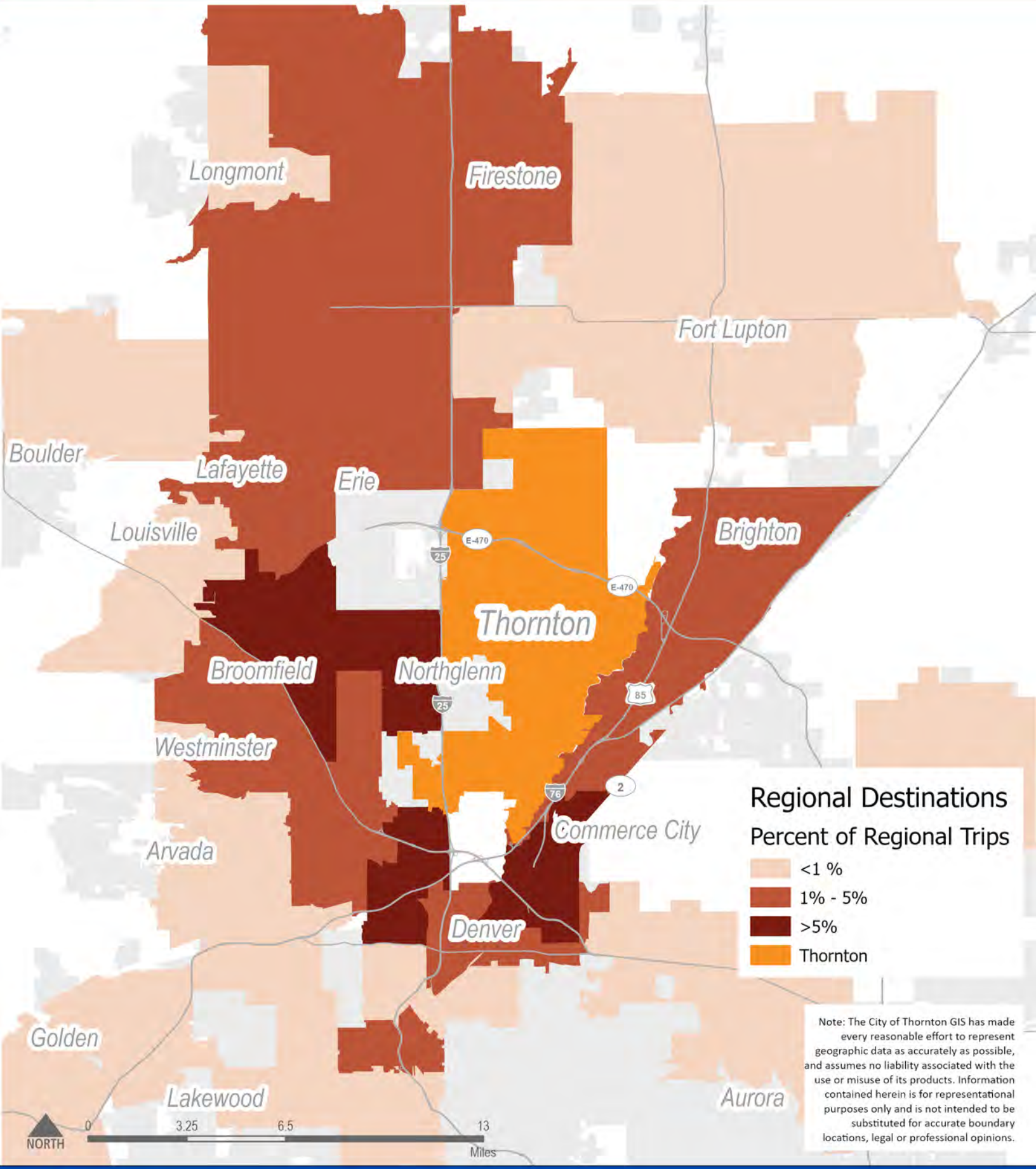
- What regional destinations are people from Thornton going to?
- Where are people in the high transit propensity zones (from TMMP) going in Thornton?
- What are the origins of trips to the transit hubs?
- What are the origins of trips to some key destinations in Thornton?
- What are the general travel patterns within Thornton?

Top Regional Destinations

To understand where people are travelling to outside of Thornton, an origin-destination analysis with pre-set geographies was run. This is an analysis type where the origins are set as the 25 custom zones in Thornton, and the destinations are set as ZIP code boundaries. **Figure 26** displays the distribution of destinations from Thornton on weekdays between March and April 2022. Out of all trips destined to areas outside of Thornton, a large portion of trips are travelling to Commerce City and Broomfield. There are also a significant portion of trips travelling to Brighton, Westminster, and to communities along the Northern I-25 corridor (Erie, Lafayette, Firestone). In general, this pattern shows that trips destined outside of Thornton do not travel far; most trips are within a radius of 15 miles. This is consistent with the Smart Commute survey, which showed that the average commute distance of Thornton residents in 2022 was 9.9 miles.

Regional Destinations

Figure 26



City of Thornton

Sources: StreetLight Data, March to April 2022, Fehr & Peers
Basemap Data: June 2023

Where are Trips from High Transit Propensity Zones Going within Thornton?

As described in **Figure 4**, the TMMP identified transit propensity zones where residents are more likely to rely on and use transit. These transit propensity zones were given special attention in the StreetLight analysis to understand the specific travel patterns to and from these areas of Thornton. The zones with high transit propensity include the following:

- Huron Street Area
- Washington Street Commercial Corridor
- Residential Zone East of Washington Street
- Western Commercial Zone (North of Northglenn)
- Eastlake Area

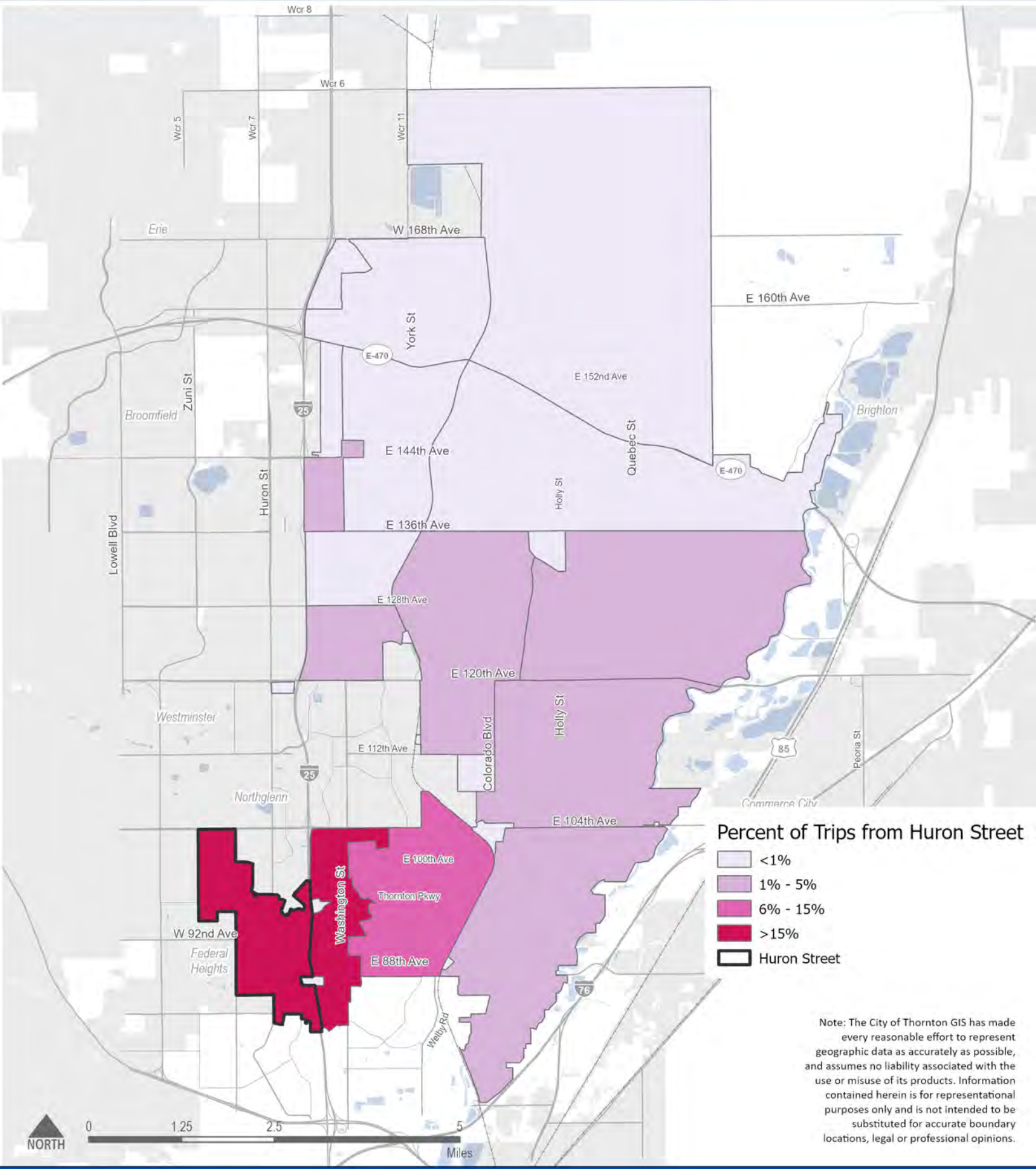
An analysis of top destinations within Thornton from these high transit propensity zones was conducted to understand potential transit market demand from these areas of Thornton.

Huron Street Area

Compared to other areas of Thornton, the Huron Street area has a higher portion of its population living under the poverty line, under the age of 18 and over the age of 64, with limited access to vehicles, and commuting using public transportation. The StreetLight analysis showed that most destinations of trips originating in this area and going to other areas of Thornton are to the surrounding zones directly east, but there are still some trips heading northeast towards 136th Avenue (**Figure 27**).

Destinations from Huron Street

Figure 27



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City of Thornton

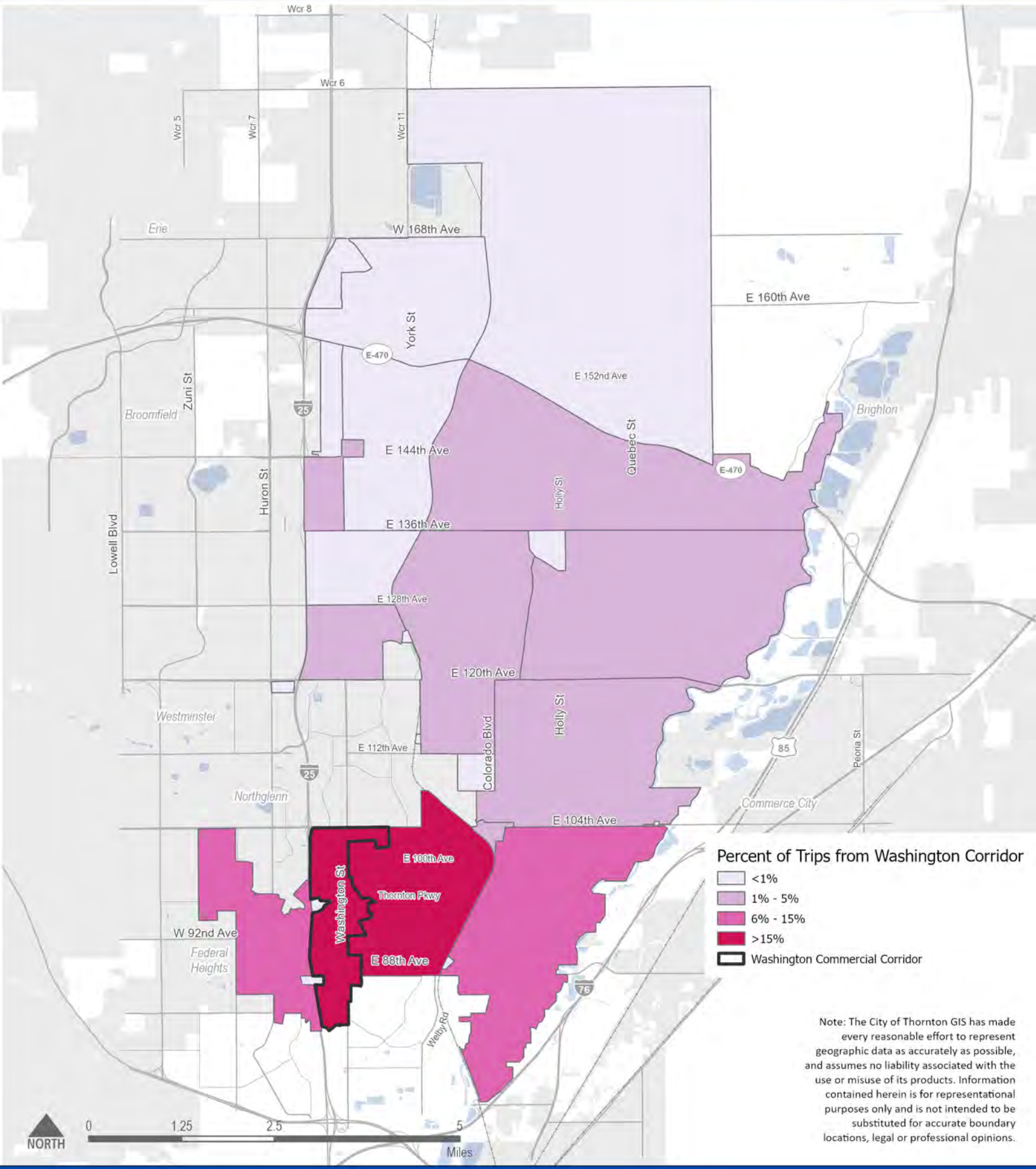
Sources: StreetLight Data, March to April 2022, Fehr & Peers
Basemap Data: June 2023

Washington Street Commercial Corridor

The commercial corridor located along Washington Street is bounded by 84th Street to the south and 104th Avenue to the north. The zone's demographic characteristics are similar to the Huron Street area, except there are not as many people under 18 years of age or older than 64 years of age. Destinations from this zone are also similar to the Huron Street area with most people going to areas directly east and west of the zone (**Figure 28**). However, there are people travelling to more northern areas of Thornton. This suggests that besides residents travelling to and from this zone, the commercial corridor is a destination for many people in Thornton. In fact, as seen in later maps (**Figure 29, Figure 30, Figure 31**), the data shows that the Washington Street Commercial Corridor is a consistent destination of trips from other areas of Thornton as well, especially other transit propensity zones.

Destinations from Washington Corridor

Figure 28



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City of Thornton

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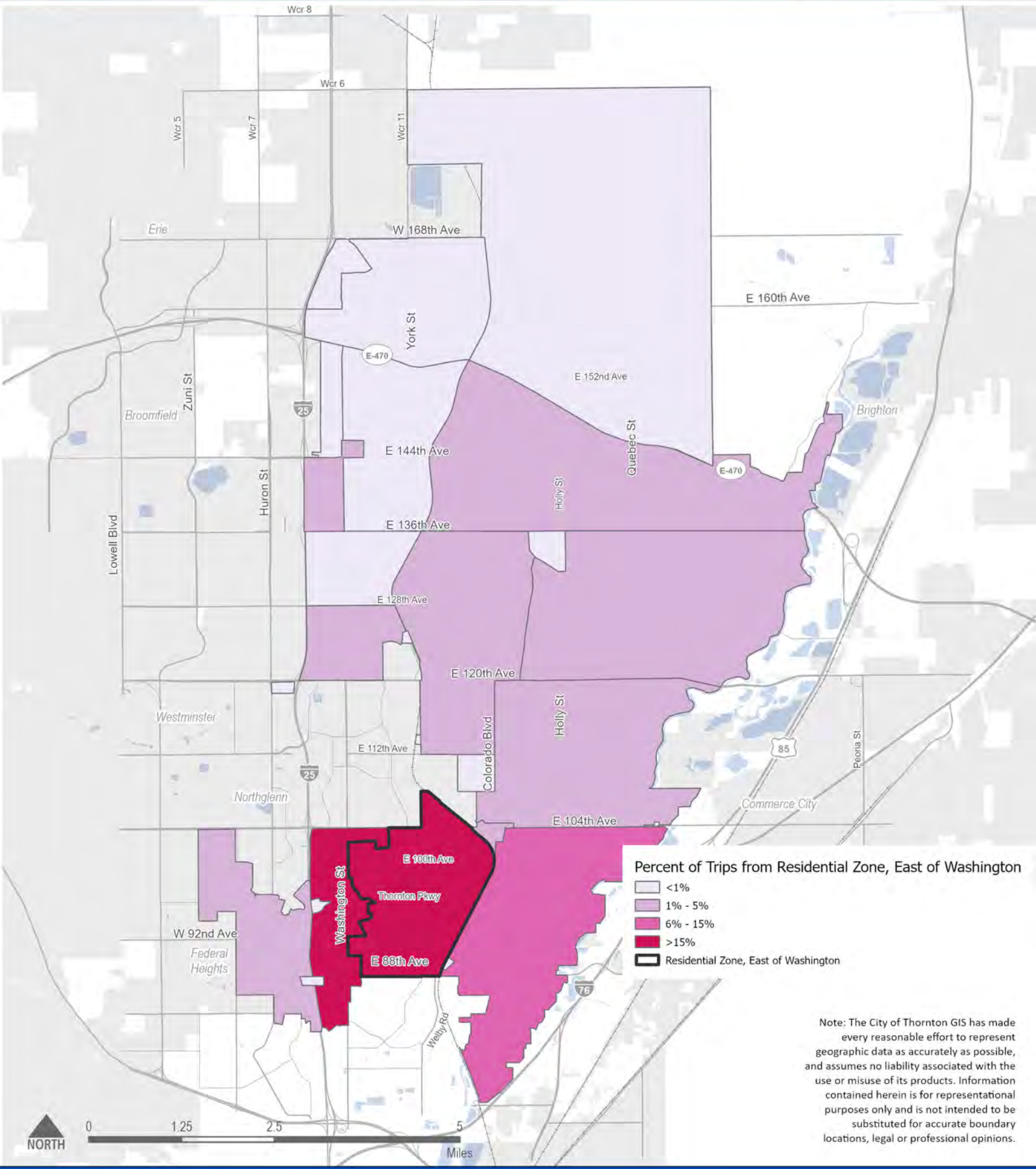
Basemap Data: June 2023

Residential Zone East of Washington Street

The residential zone east of Washington Street and west of the railroad is bounded by 88th Avenue to the south and 104th Avenue to the north. Not as many residents in this area experience poverty or limited access to a vehicle as in the Huron Street area or the Washington Street Corridor, there is still a relatively higher portion of residents living with low and moderate income and using public transportation as their commute mode as compared to the rest of the city. There is also a significant portion of the population who is under 18 years of age. The travel patterns for this area are almost identical to those of the commercial corridor on Washington Street (**Figure 29**). The slight difference is that there are less people travelling between the Huron Street area and this area than from the Washington Street Corridor.

Destinations from East of Washington

Figure 29



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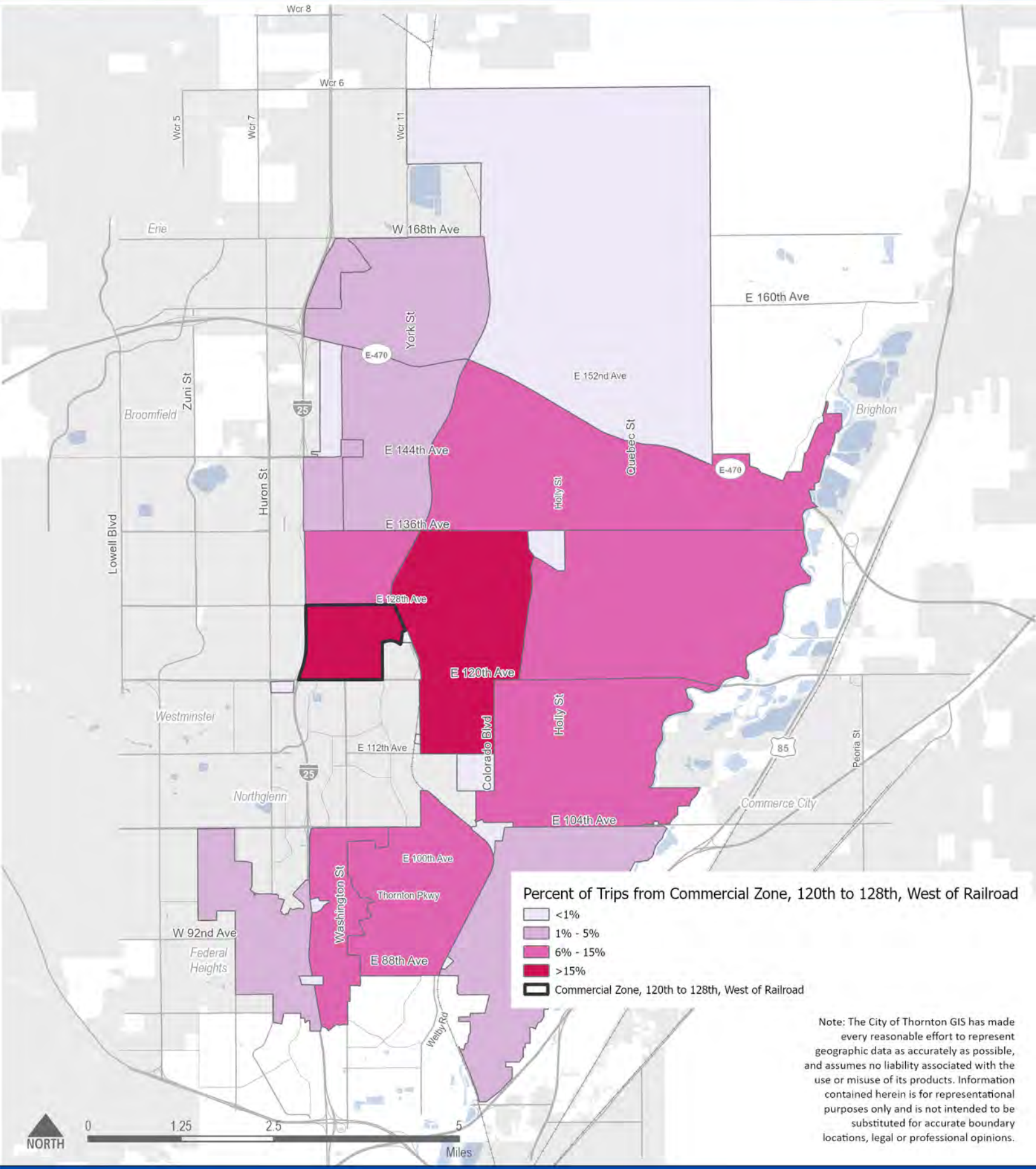
Western Commercial Zone (North of Northglenn)

The commercial area directly north of Northglenn between I-25 and the railroad is bounded by 120th Avenue and 128th Avenue. Like the other transit propensity areas, most people travel to and from the nearby zones (**Figure 30**). However, there is an equal distribution of trips coming from all over Thornton, potentially due to the commercial nature of this zone.

Destinations from Western Commercial Zone

Figure 30



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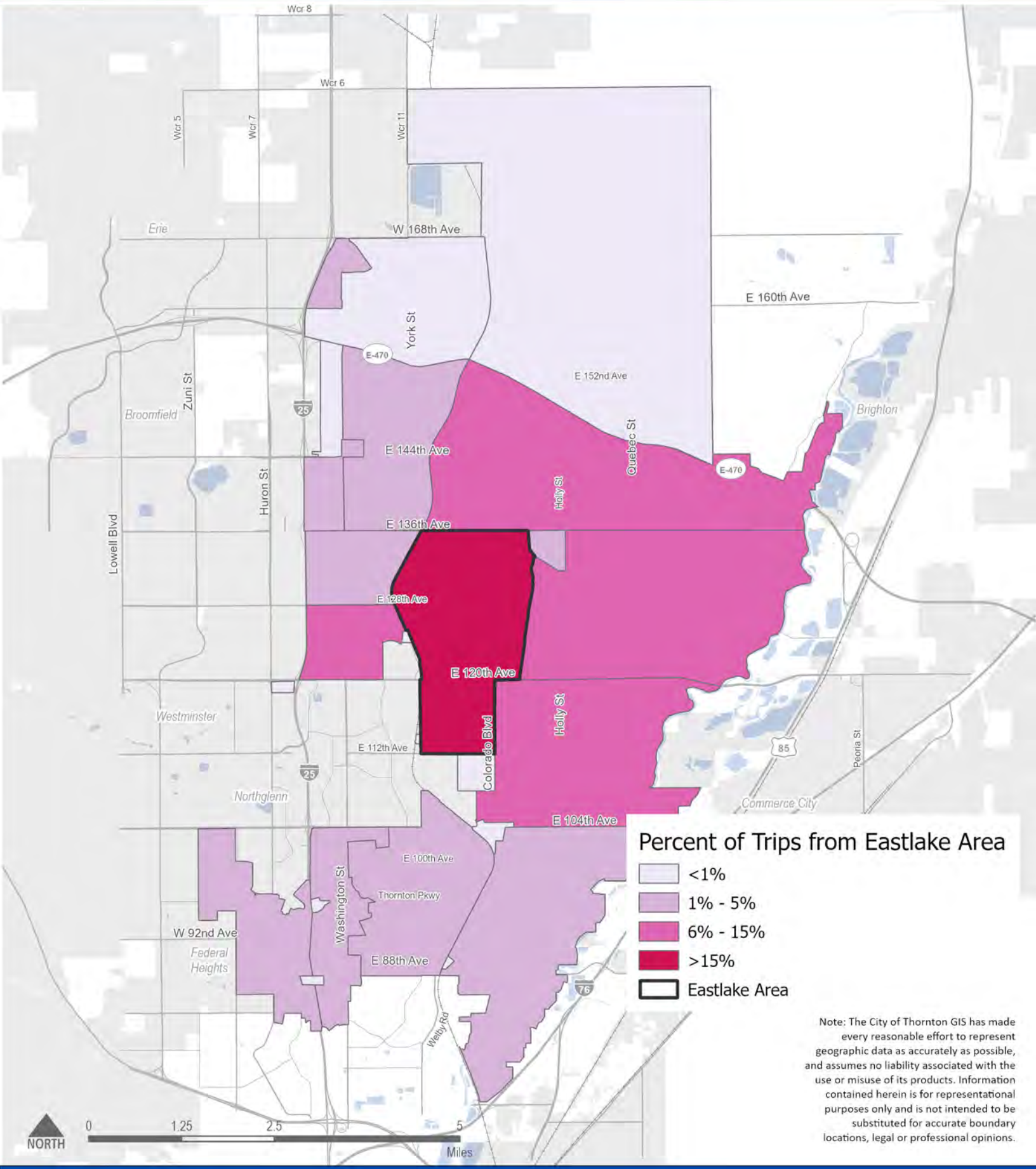
Basemap Data: June 2023

Eastlake Area

The TMMP also identified the area surrounding Eastlake/124th Station as a transit propense area, so the analysis zone is bounded by the railroad to the west and a trail leading to the Trail Winds complex to the east. The area stretches from 112th Avenue to the south to 136th Avenue to the north. Most of the travel is internal within the zone, although there is also significant travel to the areas between 104th Avenue and E-470 (**Figure 31**).

Destinations from Eastlake Area

Figure 31



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City of Thornton

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Basemap Data: June 2023

Origins of Trips to Transit Hubs

There are six transit hubs in or near Thornton that provide access to the N Line or regional express bus service on I-25 and are major transfer points in the regional transit system:

1. Original Thornton & 88th Station
2. Thornton Crossroads & 104th
3. Northglenn & 112th
4. Eastlake & 124th
5. Thornton Park-n-Ride
6. Wagon Road Park-n-Ride

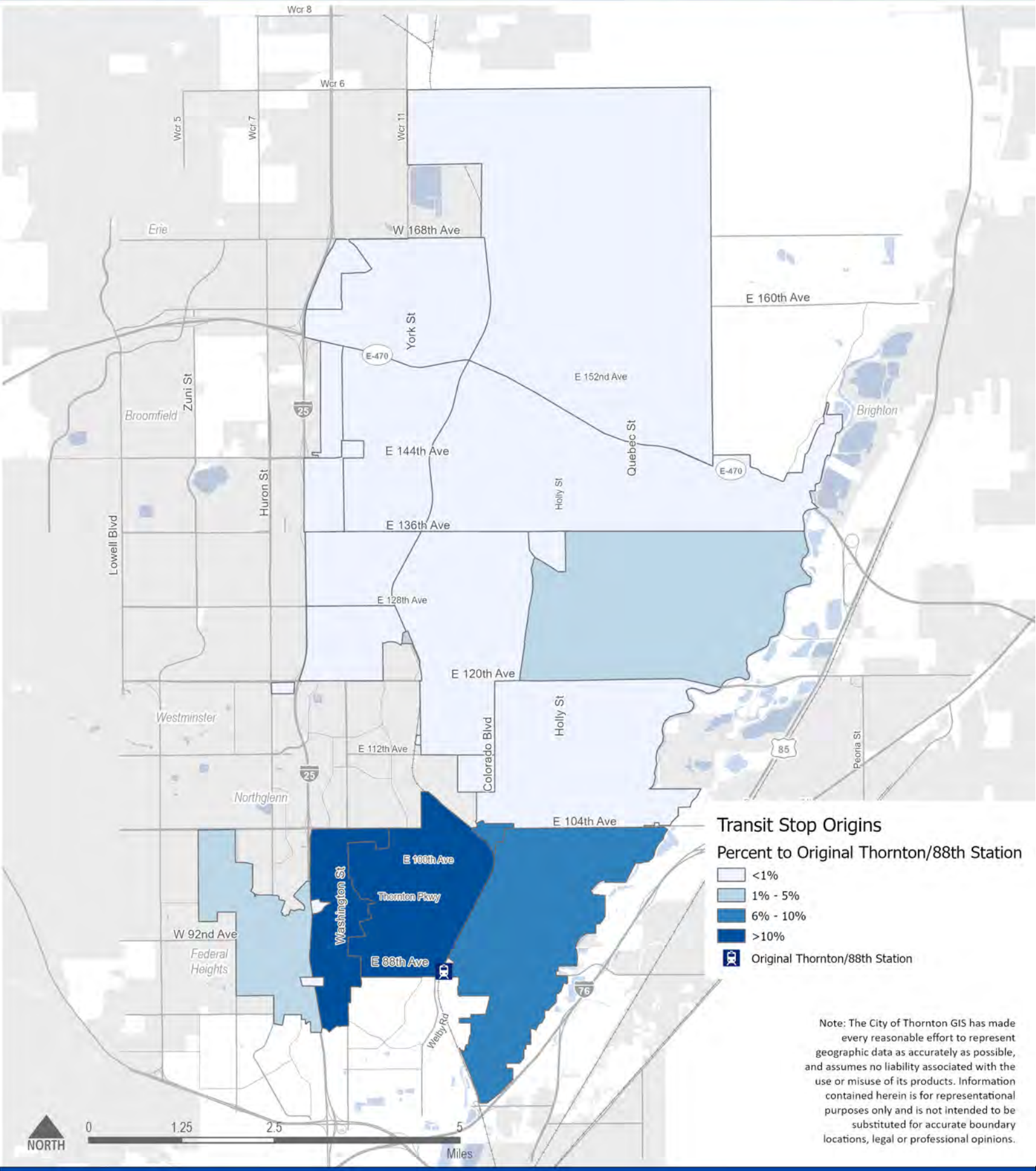
An analysis was performed to understand where people come from in Thornton who travel to these transit hubs. Improving access to these transit hubs is a potential transit market for people making longer regional trips on the transit network.

Original Thornton & 88th Station

The Original Thornton & 88th Station is located at 88th Avenue and Welby Road, and most of the origins to this transit station from Thornton are from the areas directly adjacent to the station (**Figure 32**). There is also a slightly higher travel pattern between the eastern residential area between 120th Avenue and 136th Avenue, which is interesting considering there are other transit stops closer to the area. This potentially indicates a travel time preference where residents see a benefit to getting to this station before getting on transit.

Origins to Original Thornton/88th Station

Figure 32



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City of Thornton

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Basemap Data: June 2023

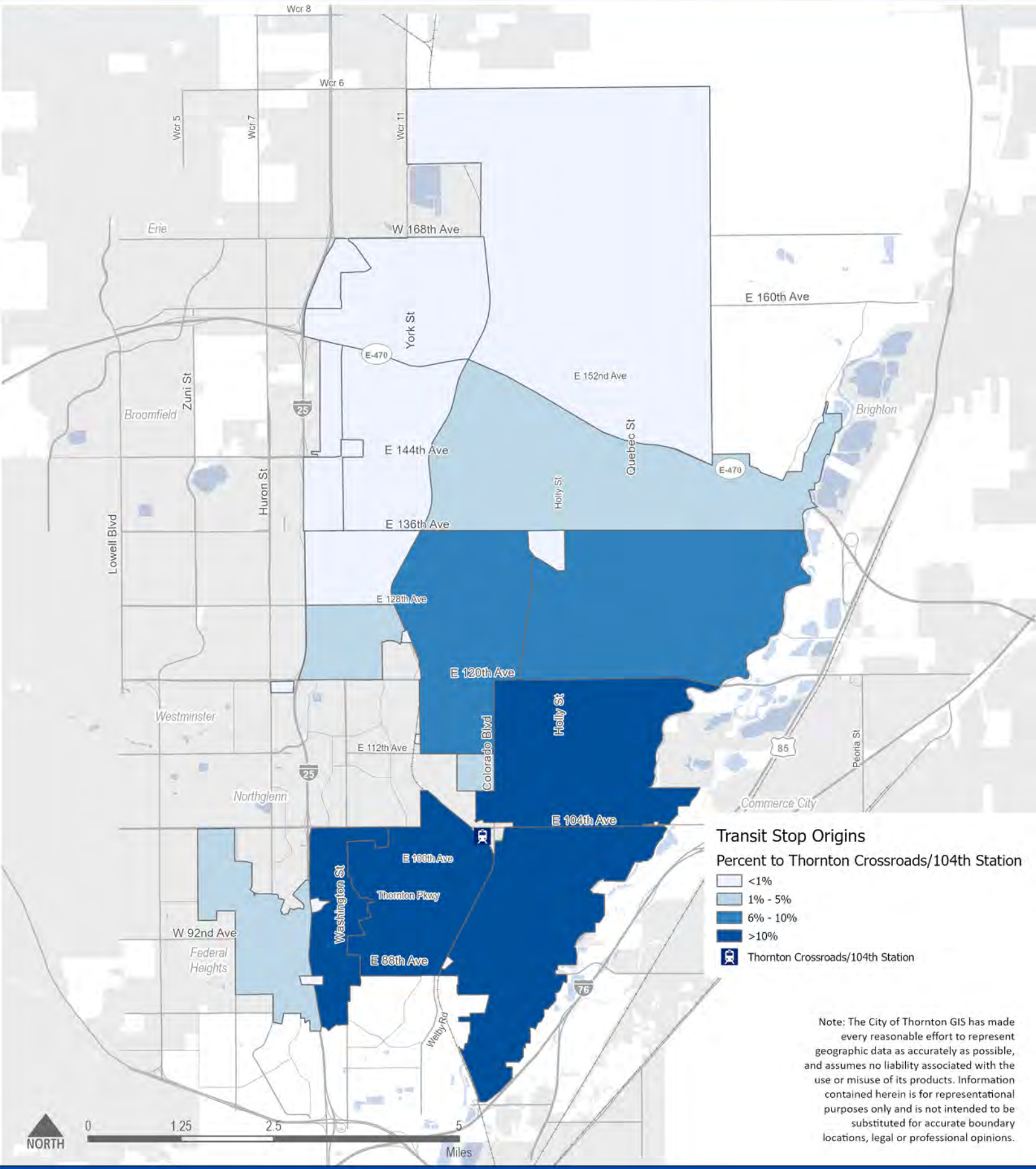
Thornton Crossroads/ 104th Station

The Thornton Crossroads/104th Station is located near the shopping center at Colorado Boulevard and 104th Avenue, and the 93L, 104L and N Line transit routes serve the station. The analysis zone includes the commercial properties nearby as these would be just as much of a destination as the rail station from a transit market perspective. Data shows that trips to this zone are coming from many areas of Thornton well beyond the immediate station area travel shed and from a larger area than most of the other transit hubs (**Figure 33**). There are several potential reasons for this:

- This station is the only station on the N Line in Thornton with a parking garage, which provides shelter for one's vehicle.
- This is the furthest north N Line station where a local fare can be used to ride the train into Union Station.
- Unlike the other stations, this station is surrounded by a commercial area that may attract trips from farther away.
- The geographic location of the station, being the furthest east station and along Colorado Boulevard, may make it a more convenient location for people coming from the north as it would avoid out of direction travel to the west.

Origins to Thornton Crossroads/104th Station

Figure 33



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City of Thornton

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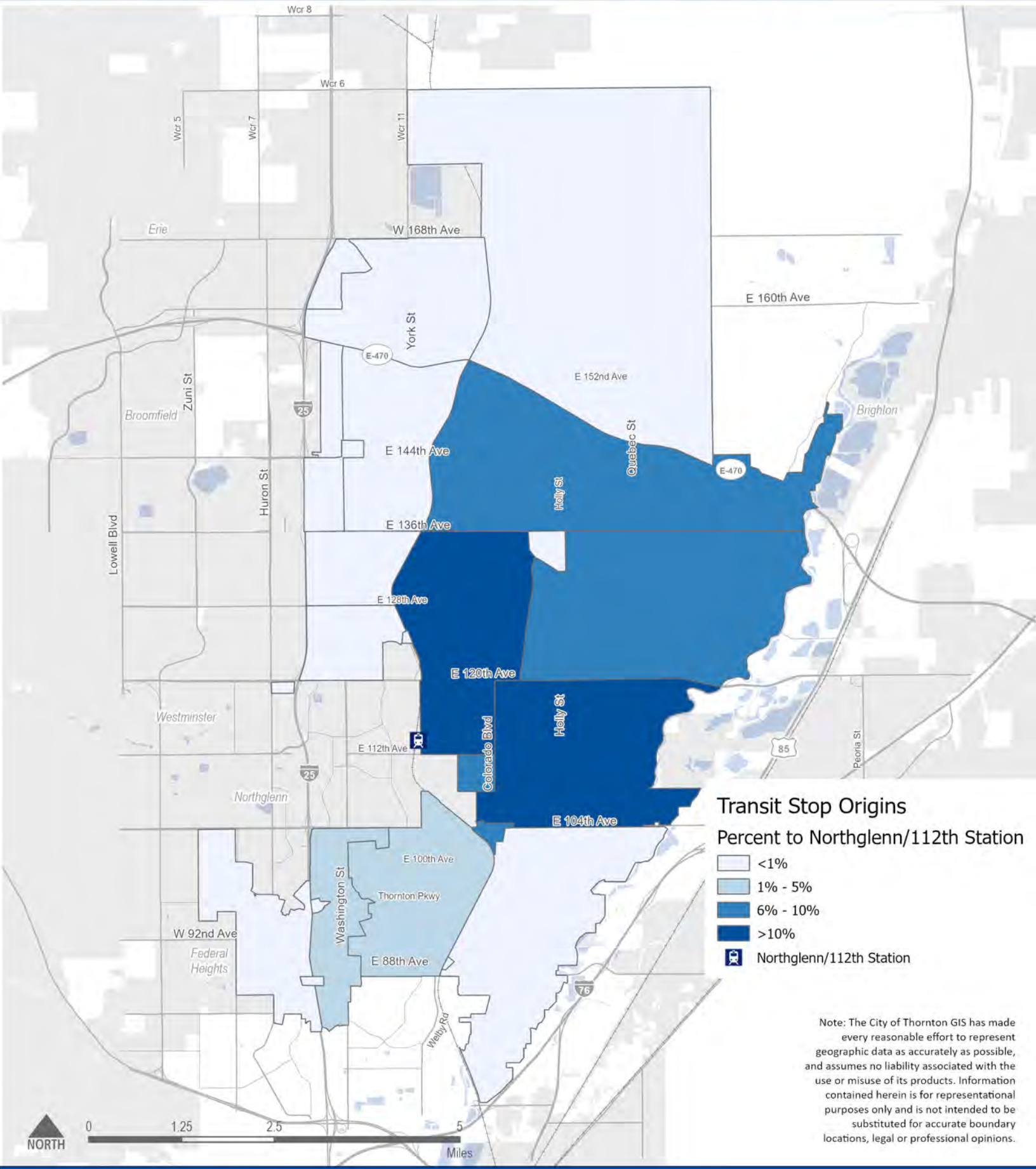
Basemap Data: June 2023

Northglenn/112th Station

The Northglenn/112th Station is located at 112th Avenue and York St, and it is served by the 12, 112, and N Line transit routes. Many people travel from the residential areas directly east of the station, although there are some people coming from the southern zones too (**Figure 34**).

Origins to Northglenn/112th Station

Figure 34



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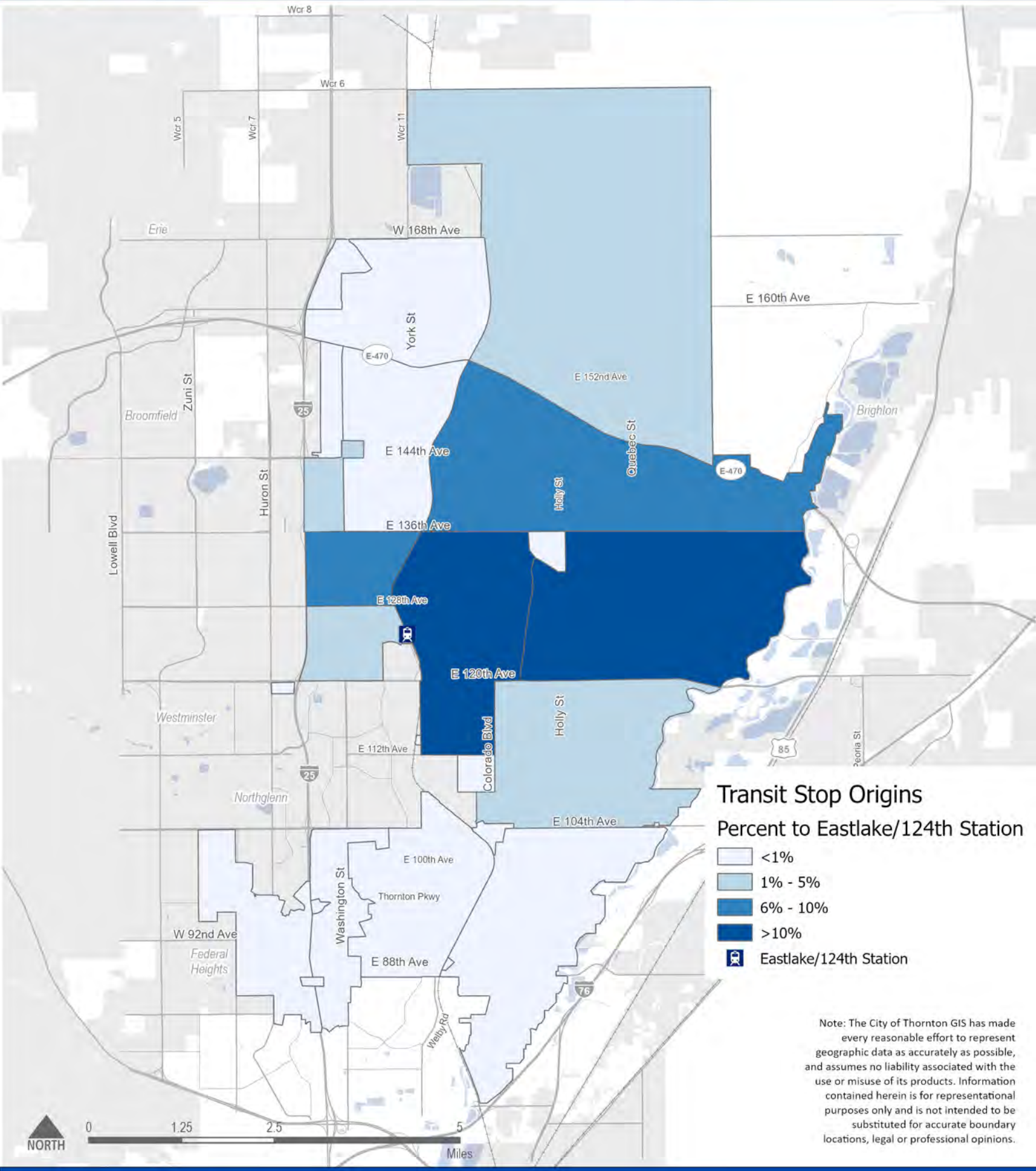
Basemap Data: June 2023

Eastlake/124th Station

The Eastlake/124th Station is located at Eastlake Avenue and Claude Court, and it is served by the 120E, 120L and the N Line transit routes. Most trips to the station originate in the zone directly to the east of the station, with less people traveling from other areas (**Figure 35**).

Origins to Eastlake/124th Station

Figure 35



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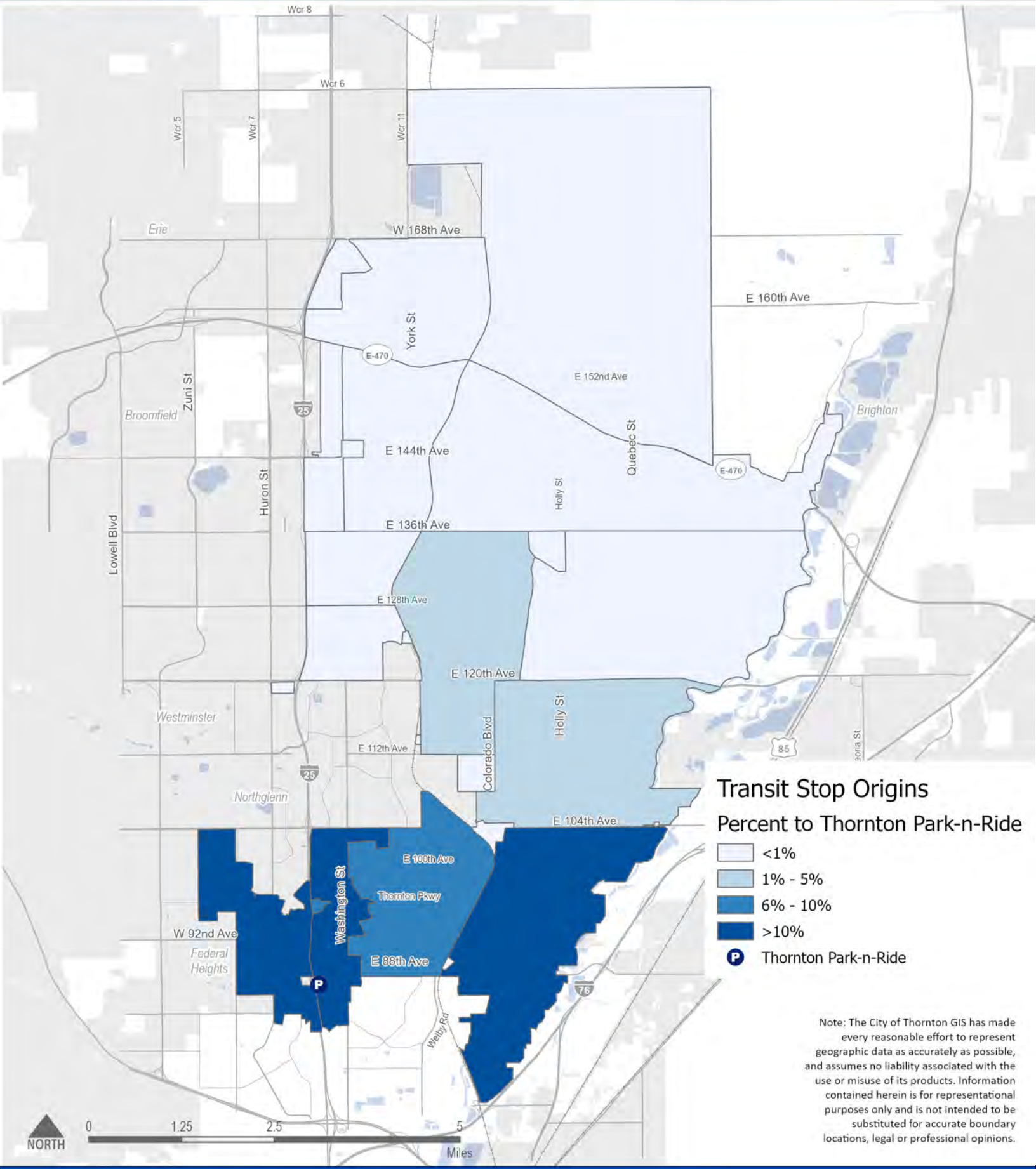
Thornton Park-n-Ride

The Thornton Park-n-Ride has two large parking lots on both sides of I-25 at 88th Avenue. The east side serves the 92, 93L, and 120X bus routes, while the west side just serves the 120X bus route. People who travel to this park-n-ride mostly come from areas south of 104th Avenue (**Figure 36**). Like the Eastlake/124th Station, this concentration of origins for this park-n-ride might be due to the convenience of the transit stop for people directly surrounding it, and other transit stops or modes of transportation might be more convenient for others across Thornton.

Origins to Thornton Park-n-Ride

Figure 36



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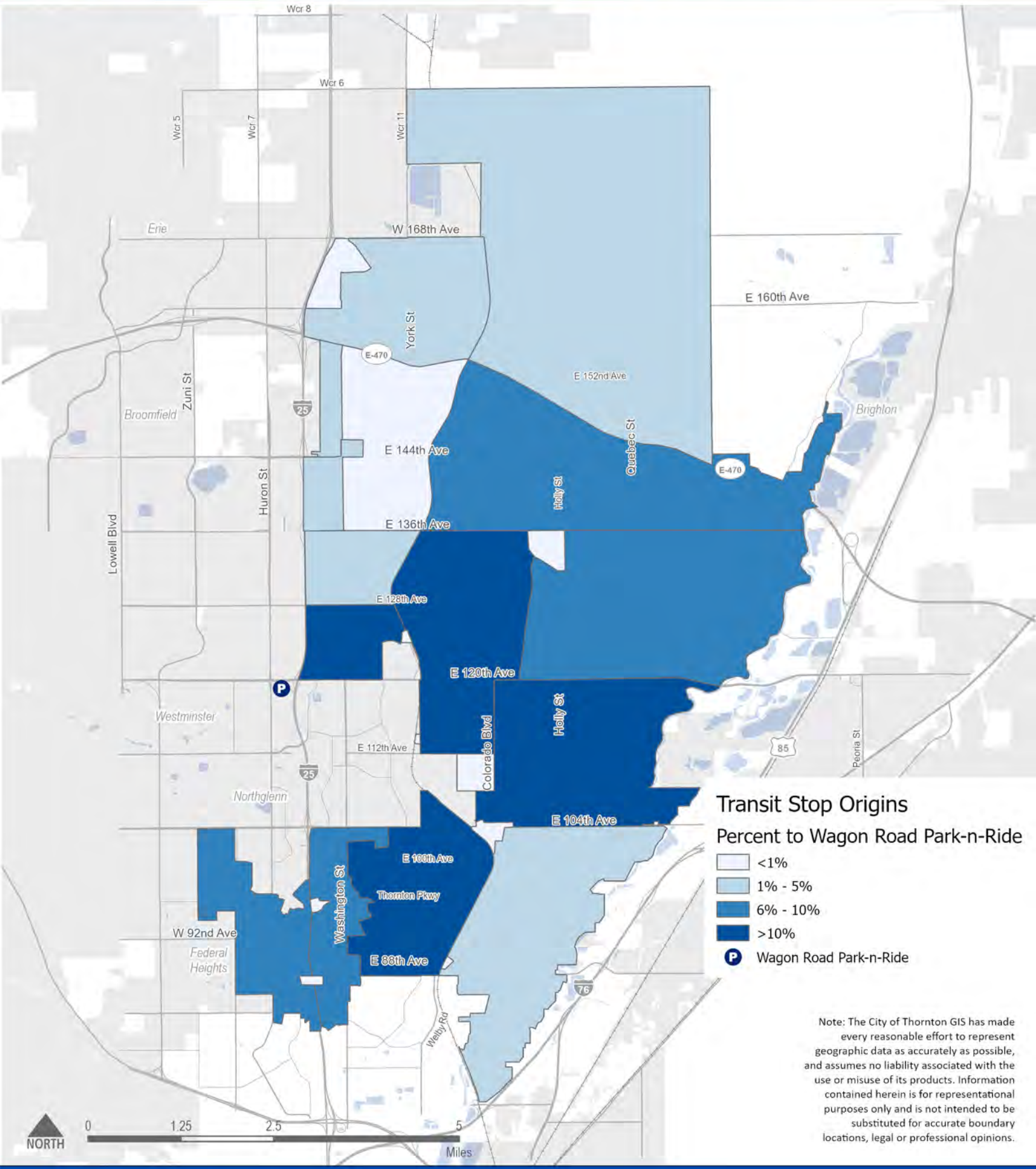
Wagon Road Park-n-Ride

The Wagon Road Park-n-Ride is located west of I-25 on 120th Avenue, and it is served by the 8, 104L, 120W, 120X bus routes as well as all three Flex Ride services. Although the transit stop is not directly within Thornton, the variety of routes and destinations from the stop is a large motivator for using transit. As seen in **Figure 37**, people travel to the Wagon Road Park-n-Ride from nearly all areas of Thornton. Thus, similar to the Crossroads & 104th Station, the Wagon Road Park-n-Ride serves a larger travel shed than most of the other transit hubs in the area.

Origins to Wagon Road Park-n-Ride

Figure 37



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City of Thornton

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Basemap Data: June 2023

Origins of Trips to Key Destinations

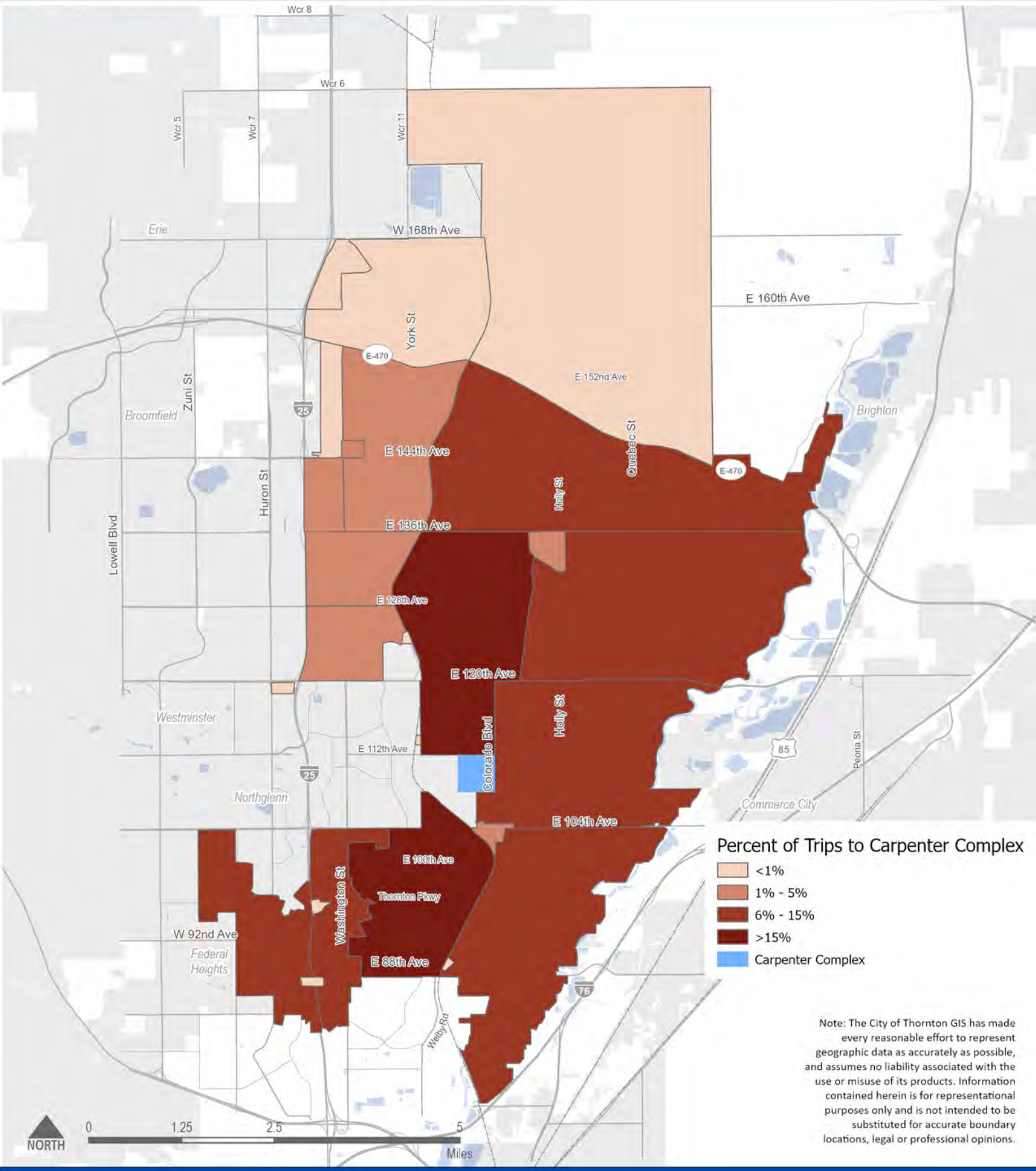
The Trail Winds recreational complex, the Margaret Carpenter recreational complex, and the Amazon facility are three key destinations in Thornton identified as part of the outreach process. Understanding where people come from when travelling to these locations may be helpful in assessment transit markets and potential for improved transit service.

Carpenter Complex

The Margaret Carpenter Recreation Center opened in 1994 and was Thornton's main recreation center until 2019 when the Trail Winds Recreation Center was built. The Carpenter Complex is located at 112th Avenue and Colorado Boulevard, and includes the recreation center, an amphitheater, boathouse, sports courts and fields, pavilion, playground, skatepark, active adults center and other amenities. **Figure 38** shows that people are traveling to the Carpenter Complex from all areas of Thornton, and the distribution of those trips is fairly evenly spread across the city.

Origins to Carpenter Complex

Figure 38



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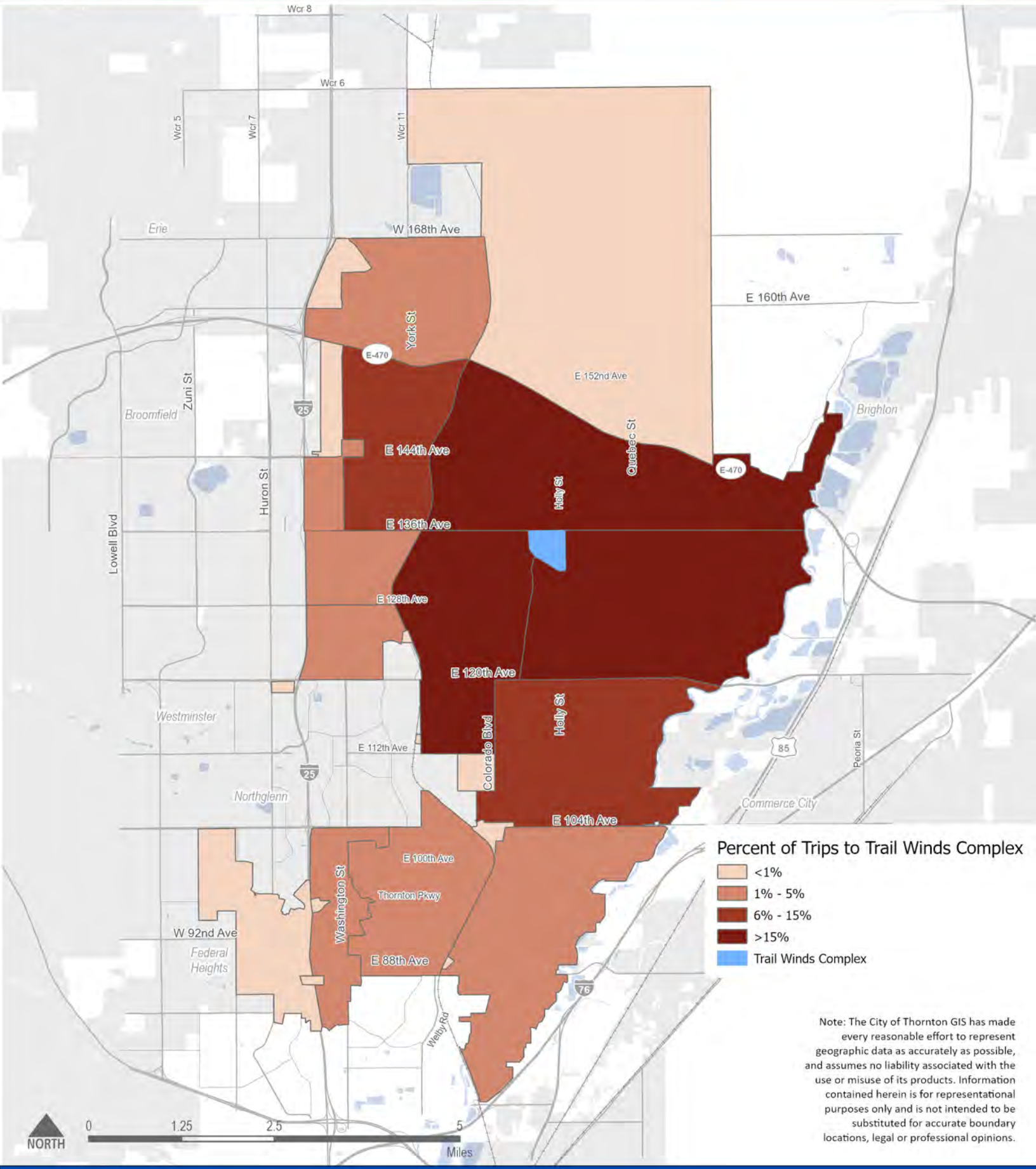
Basemap Data: June 2023

Trail Winds Complex

The Trail Winds Recreation Center was opened in 2019 in Trail Winds Park at 136th Avenue and Holly Street, which also includes sports fields, a water park, dog park, skate park, community lawn, trails and open space, and other amenities. **Figure 39** shows that most people who visit the complex come from the immediate surrounding areas, and there are fewer trips from southern Thornton. Unlike the Carpenter Complex, there is no existing transit service to the Trail Winds Complex which may impact who is able to get to the Carpenter Complex.

Origins to Trail Winds Complex

Figure 39



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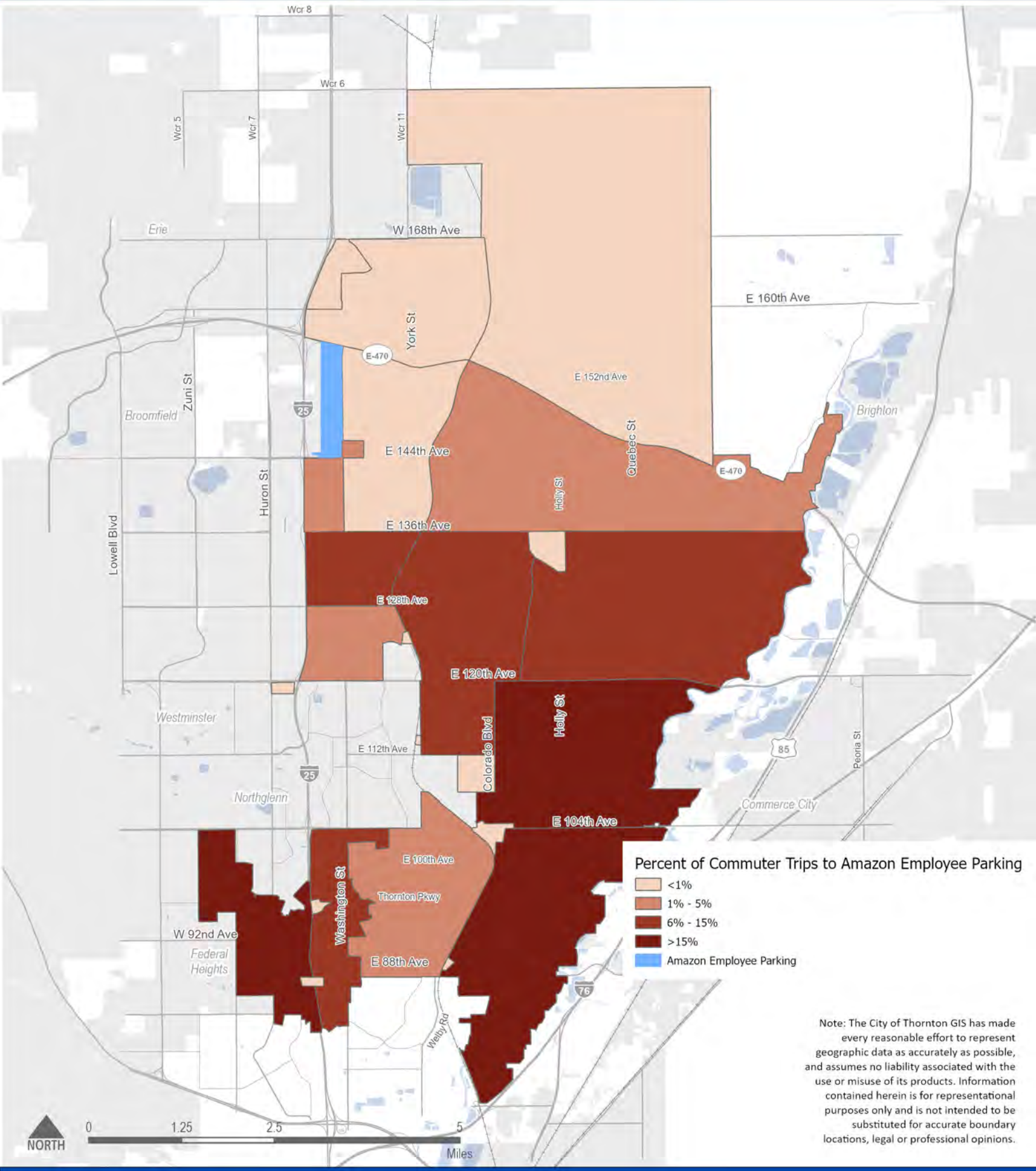
Amazon Distribution Center

The Amazon Distribution Center is located at 144th Avenue and Washington Street, and it is a major employer for Thornton residents and the surrounding community. The StreetLight analysis zone for Amazon included the employee parking and entrance area and excluded the freight and delivery areas to isolate travel patterns of employees. Further, the analysis specifically looked at commuter trips. **Figure 40** shows that a high percentage of commute trips to the Amazon facility travel from southwestern Thornton (around Huron and Washington Street) and from southeastern Thornton (east of Colorado Boulevard). These areas correlate with areas with the areas of the city with the highest portion of residents are living with low and moderate incomes (see **Figure 9**).

Commuter Origins to Amazon

Figure 40



City of Thornton

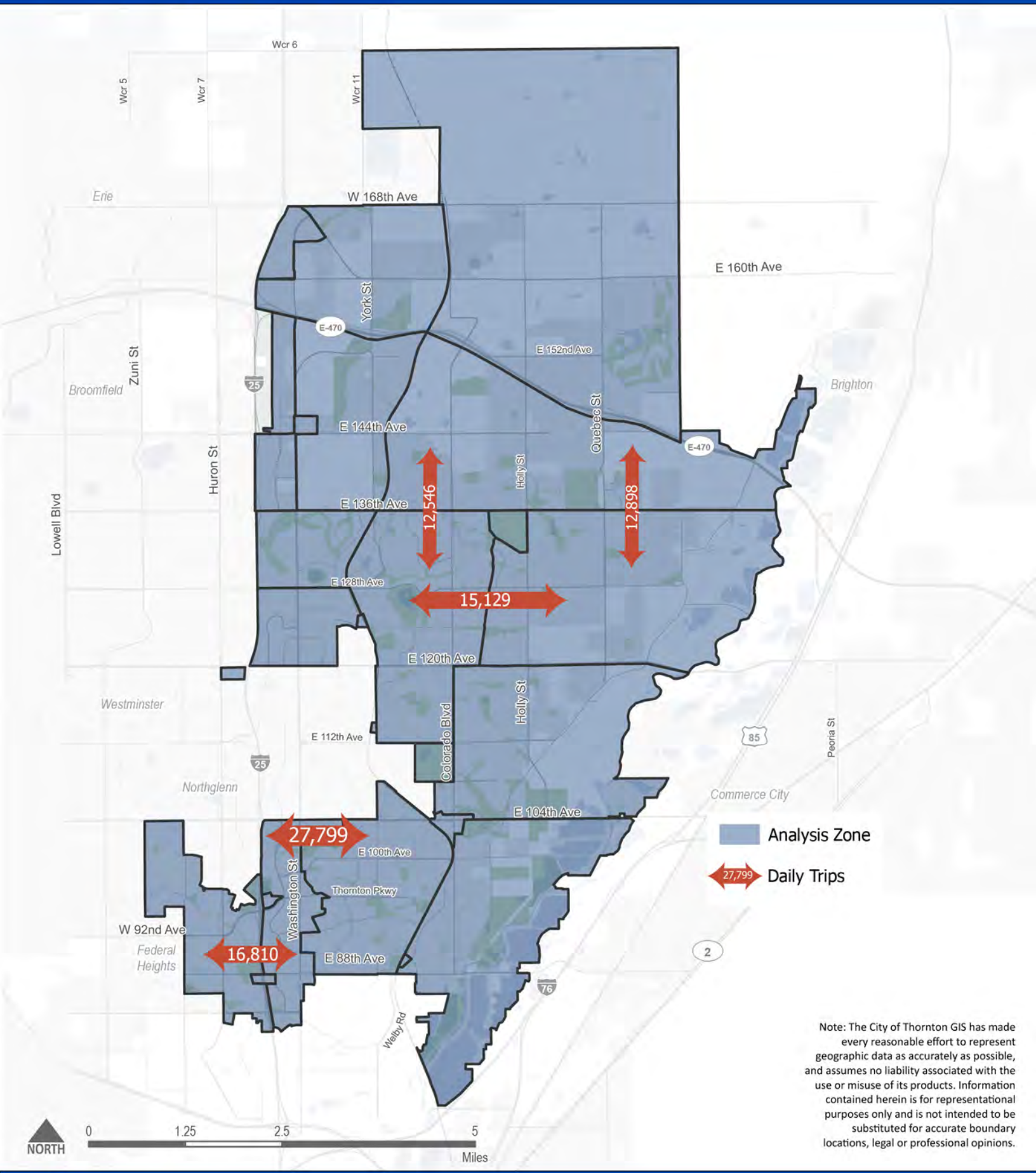
Sources: StreetLight Data, March to April 2022, Fehr & Peers
Basemap Data: June 2023

General Travel Patterns

An analysis of the highest volume trip pairs in Thornton shows that most trips are relatively short. **Figure 41** shows the top five highest trip pairs of the zones analyzed in the city, with the two highest between the Washington Street Corridor south of 104th Avenue and the two adjacent zones east and west. Given the geography of the area it's also likely that there are high trip pairings between this area of the city and the adjacent communities in Federal Heights and Northglenn. However, those trips were not analyzed in this part of the study given the focus of this Transit Study is on transit market potential within Thornton.

Top Trip Pairs Within Thornton

Figure 41



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Other notable general trip patterns are shown in **Table 8**:

- Only 18% of trips on weekdays are people travelling between home and work.
- The largest share of trips is between ten and twenty minutes and two and five miles.
- Almost half of all trips have an average speed of between 10 and 20 miles per hour,

These existing travel patterns show that for transit to competitively serve this market, service will need to provide fairly direct connections over short-to-medium distances to key destinations within the city, including non-employment destinations such as groceries, medical providers, commercial centers, recreation/community centers, schools, etc.

Table 8: General Trip Characteristics

Trip Characteristics	All Days	Weekdays	Weekends
Percent Commuters	14%	18%	6%
Largest Share of Travel Time (Percent of All Trips)	10-20 minutes (38%)	10-20 minutes (38%)	10-20 minutes (38%)
Largest Share of Trip Length (Percent of All Trips)	2-5 miles (50%)	2-5 miles (51%)	2-5 miles (49%)
Largest Share of Trip Speed (Percent of All Trips)	10-20 miles per hour (44%)	10-20 miles per hour (45%)	10-20 miles per hour (43%)

Source: StreetLight Data March-April 2022

Travel Pattern & Demand Summary

The existing transit system is designed to serve regional, long-distance travel, particularly for commuters, and is not well-designed for short, community-focused trips, which is the predominant trip type in Thornton. Thus, there may be an untapped market potential for transit to better serve these types of trips in the future.

To be competitive with existing travel speeds of 10-20 mph transit would need to provide more frequent and direct connections than exist today. While most local transit services operate at an average speed of 10 – 20 mph, when wait times and walking distances are long, overall travel speeds for short trips significantly decrease, decreasing the utility of transit. Thus, to best serve this market pattern via transit, transit should be design in one of two ways:

- In the form of frequent fixed-route service along high demand corridors (such as Washington Street), or

- In situations where origins and destination are more dispersed (as in much of Thornton), microtransit that is designed to provide door-to-door on-demand service with relatively short response times.

Although the regional trips serve a critical need, data shows there is also a need to provide local and frequent transit service that can connect people with local destinations in addition to local and regional workplaces. Especially because half of the trips in Thornton are within five miles, additional transit services may help diversify the mode share and the available mobility options.

Community Input

Community input is a key aspect of understanding the gaps in the existing transit system and transit market potential in Thornton. Initial community input to inform this market analysis was gathered through several means, including:

- A public online survey;
- An in-person and virtual community open house;
- An online mapping exercise;
- A stakeholder group of local and regional partners;
- A project website; and
- Several focus groups.

Online Survey and Community Open House

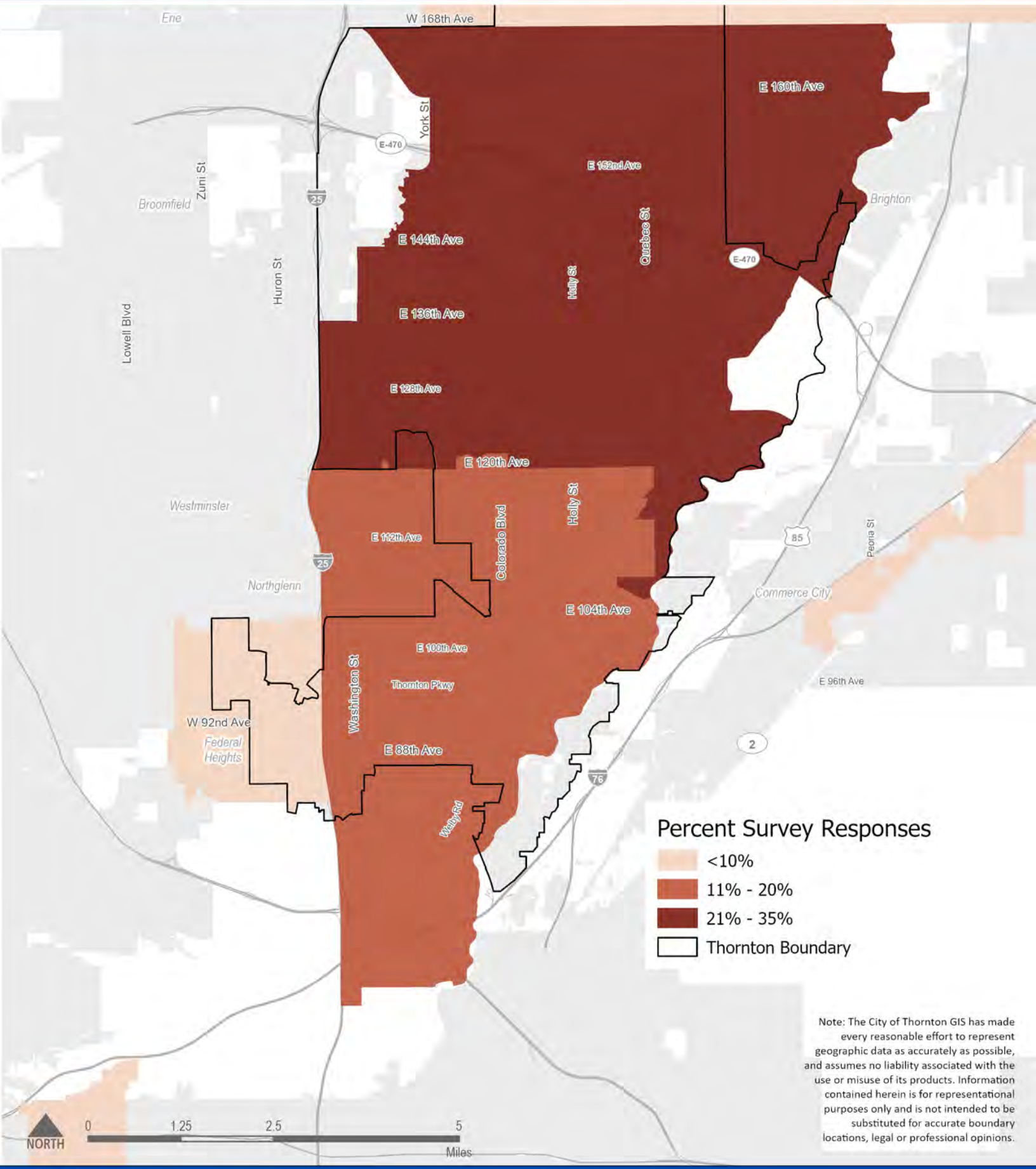
One online survey and one community open house were conducted throughout the Transit Market Analysis period, in conjunction with other engagement mediums. The survey accepted responses in English and Spanish between February 10th, 2023, and April 17th, 2023, and the community open house was held in an in-person and hybrid manner in early March 2023. The survey received 93 total responses and 10 people in total attended the open houses. Both the survey and the open house offered participants an opportunity to learn more about the goals of the study and to voice their current transit and travel patterns, as well as aspirations for transit in Thornton. The combined input from the survey and open house are described below.

Respondent Demographics

Respondents to the online survey were presented with optional questions to describe their residence location, age, vehicle availability, and personal mobility. These questions were asked to ensure that the survey reached a representative population. 91% of the respondents identified as Thornton residents, and most respondents reside in ZIP codes 80602 (Northern Thornton) and 80241 (Eastlake Area), as seen in **Figure 42**. Knowing that the location of survey respondents is skewed to the north, where there are higher average incomes, and less dependency on the transit system, and less overall existing transit service, as compared to south Thornton is important to interpreting the survey results.

Survey Respondent Home Locations

Figure 42

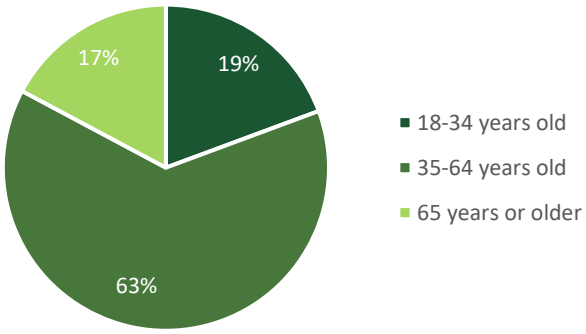


City of Thornton

Sources: Fehr & Peers
Basemap Data: June 2023

Most respondents were between the ages of 35 and 64, and 17% of respondents were 65 years or older (**Figure 43**). The survey did not receive a single response from anyone under the age of 18.

Figure 43: Survey Respondent Age



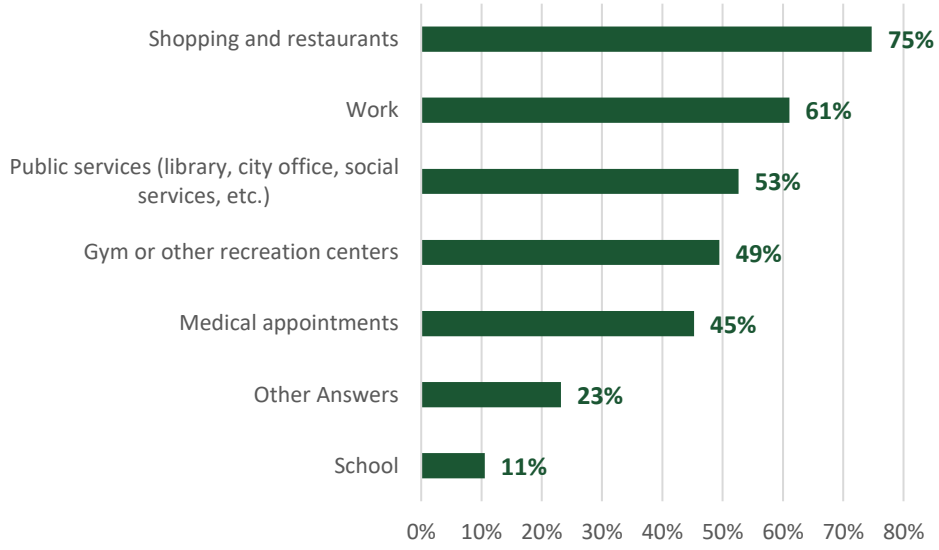
Further, 12% of respondents indicated that they do not have regular, dependable access to a car either as a driver or passenger. Lastly, 4% of respondents indicated they have personal mobility challenges that impact their ability to get around.

Understanding the needs of older adults, people with limited vehicle availability, and people with personal mobility challenges are critical to considered in this study.

Trip Type

When asked what destinations people would like to take public transit to, more than half of the respondents indicated that shopping and restaurants, work, and public services as desirable destinations (see **Figure 44**).

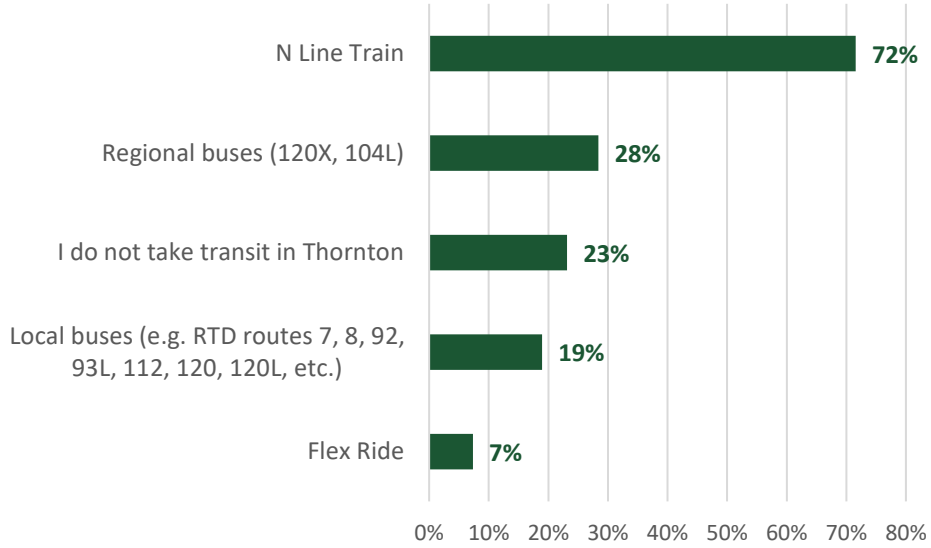
Figure 44: Desired Destinations Using Public Transit



Transit Use

When asked which public transit services people currently use in Thornton, over 70% of survey and open house respondents said they use the N Line train, followed by 28% who use regional buses, and 19% who use local bus (**Figure 45**). Only 7% of respondents also said they utilize FlexRide, almost a quarter of respondents indicated they do currently take transit in Thornton.

Figure 45: Current Public Transit Use



Desired Improvements

Survey respondents were also asked about their desire for more frequent public transit routes and more extended hours of public transit routes. For both types of improvement, overwhelmingly the respondents believe that the N Line train should run more frequently and at earlier/later hours of the day (**Figure 46** and **Figure 47**). The other top transit routes to which frequency improvements would be desired are Route 104L, Route 93L, and Route 120. The other transit routes to which more extended hours of service would be desired are Route 104L, Route 120X, and Route 93L. Some comments related to frequency improvements related to providing more frequent access to shopping centers and to the major transit stations and stops. The strong desire for increased frequency on the N Line as compared to other routes in the city may, in part, be attributable to the home location of many of the respondents, which was skewed to the north where there are few (if any) bus routes and less dependency on transit as compared to areas to the south.

Figure 46: Desired Frequency Improvements

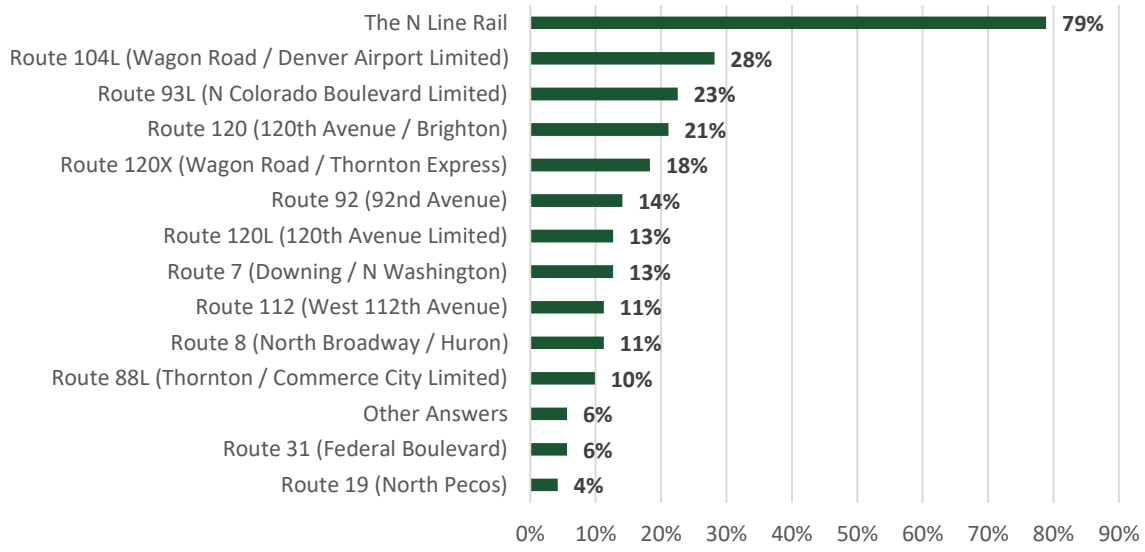
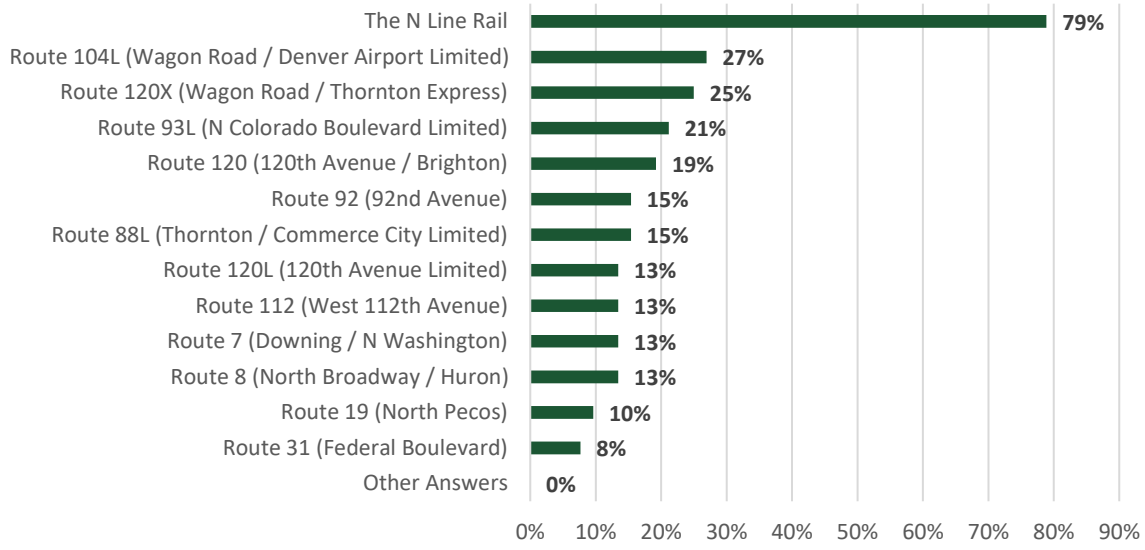


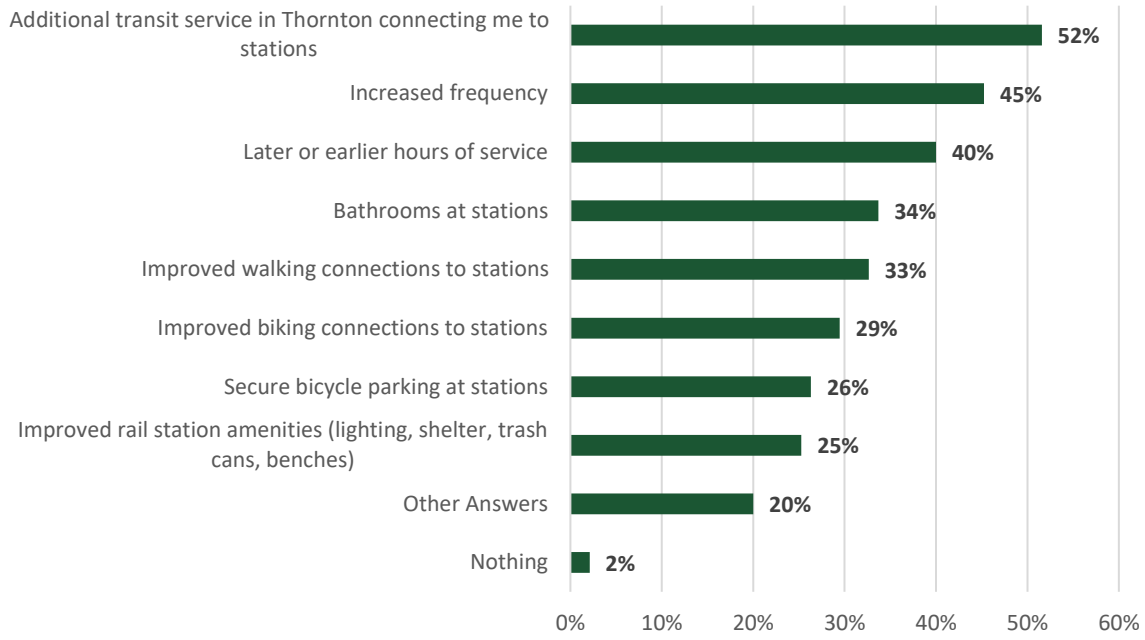
Figure 47: Desired Hour Extensions (Earlier or Later Transit Operations)



N Line Improvements

When specifically asked which improvements to the existing N Line service would make it more useful, people expressed that additional transit service within Thornton to connect to the stations in addition to frequency and service hour expansion (**Figure 48**). Many of the comments specifically related to N Line improvements included the extension of the route further north and connections to transit that would connect to other communities like Boulder and Erie. Further, people commented on the lack of safety they feel at the stations and on the trains.

Figure 48: Desired N Line Improvements



Bus Service Improvements

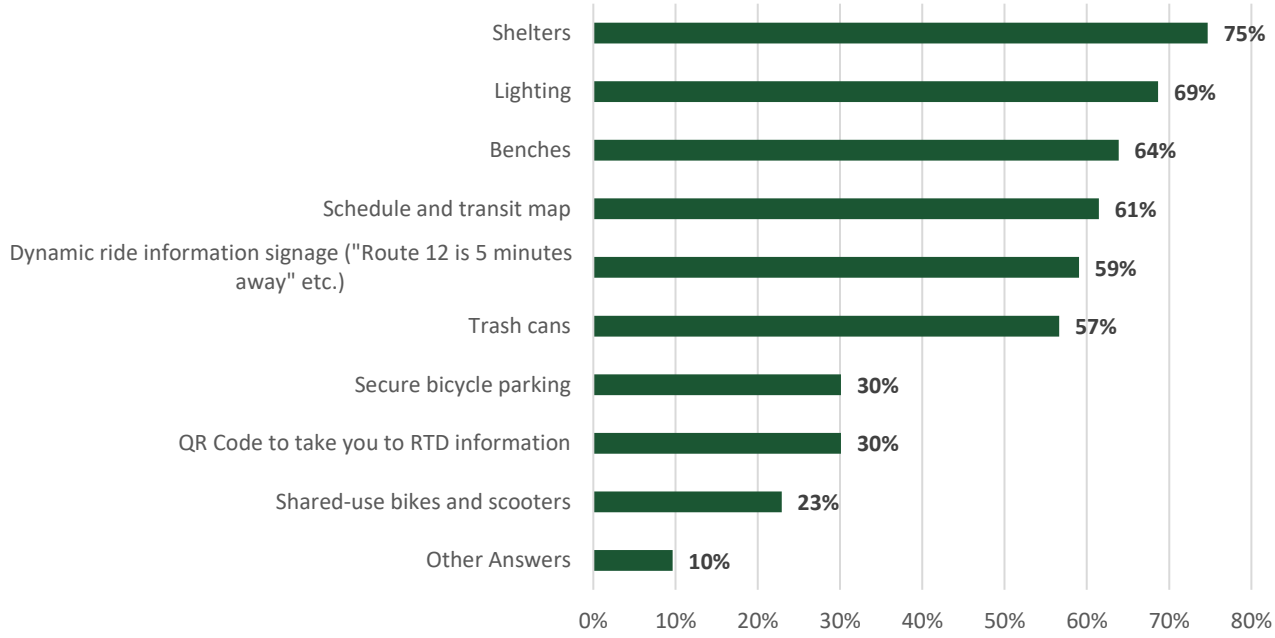
When specifically asked which improvements to the existing N Line service would make it more useful, people expressed that new bus routes connecting to desired destinations and improved bus stop amenities were top priorities in addition to increased frequency (**Figure 49**). The comments expressed for this question were like the responses, indicating that there are not enough local routes to connect from desired origins to desired destinations. Multiple comments stated that FlexRide also does not help solve this issue due to its limited service area.

Figure 49: Desired Bus Service Improvements

Transit Stop Amenity Improvements

Respondents were asked for input on the amenities they would like to see at bus stops and rail stations. Many respondents indicated that shelters, lighting, benches, schedules and transit maps, dynamic signage, and trash cans are all desired amenities (**Figure 50**). The comments on this question mostly focused on safety and concerns that both the stops and park-n-rides do not feel secure.

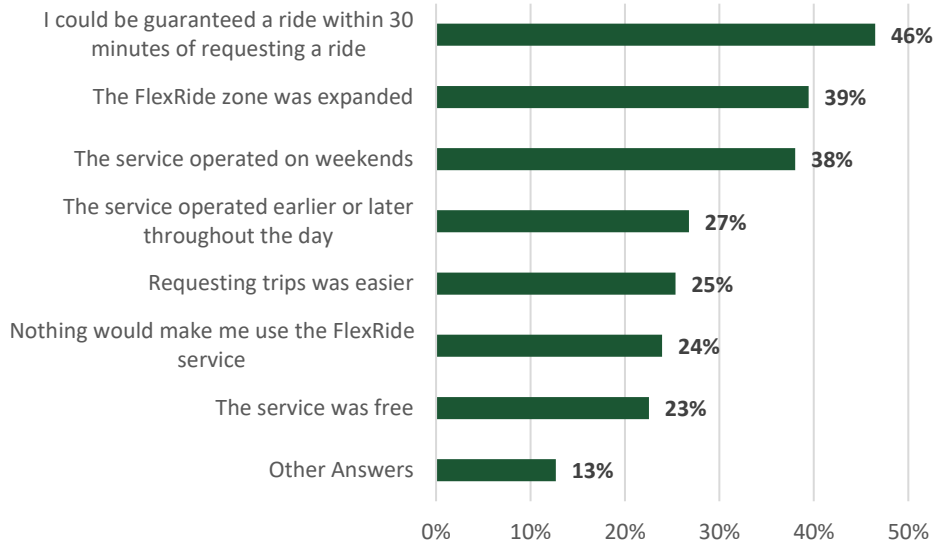
Figure 50: Desired Transit Stop Amenities



FlexRide Improvements

Although there are three FlexRide services in Thornton, residents had previously expressed a lack of understanding of the service. The survey informed the respondents of FlexRide characteristics, and it asked what would encourage them to use the service more. The most popular response was the guarantee of a ride within 30 minutes of requesting a ride, and the other top responses included service zone expansion and operation on weekends (**Figure 51**). The comments related to this question included a desire for more information about FlexRide, and concerns about the current lack of reliability and service area coverage.

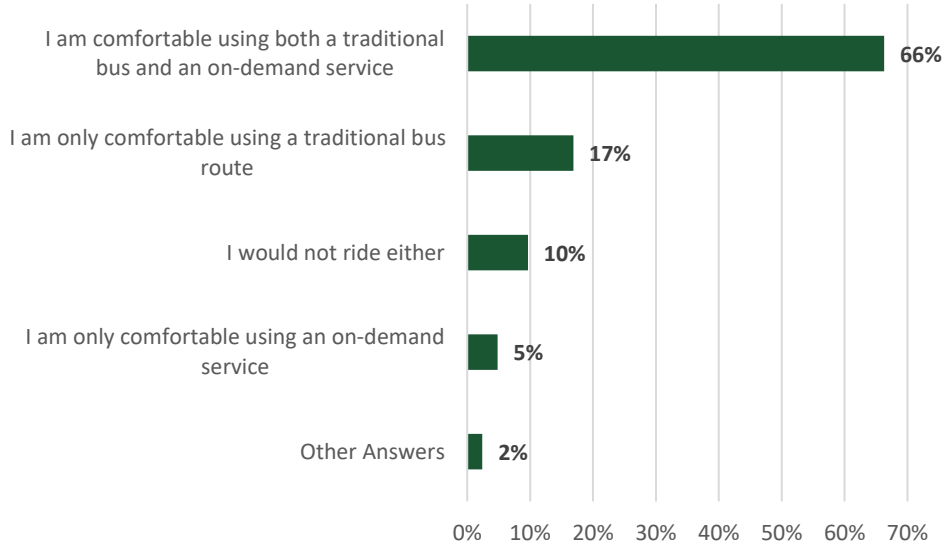
Figure 51: Desired FlexRide Improvements



New Transit Services

When asked about which types of transit service people would be most supportive of, most people are comfortable using both traditional buses and on-demand services (**Figure 52**). A few people said they would only be comfortable using a traditional bus route, while some people said they would not ride either type of transit service.

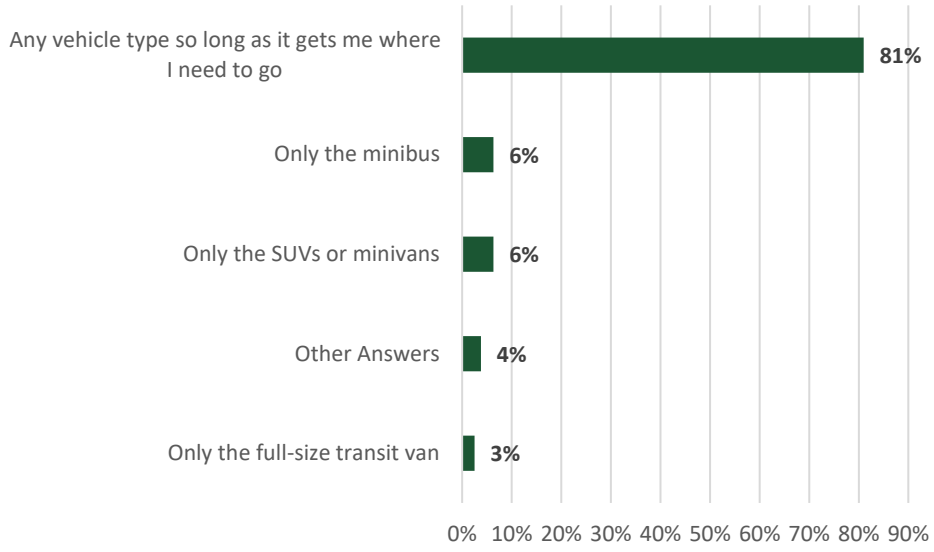
Figure 52: Transit Service Type Preferences



On-Demand Service

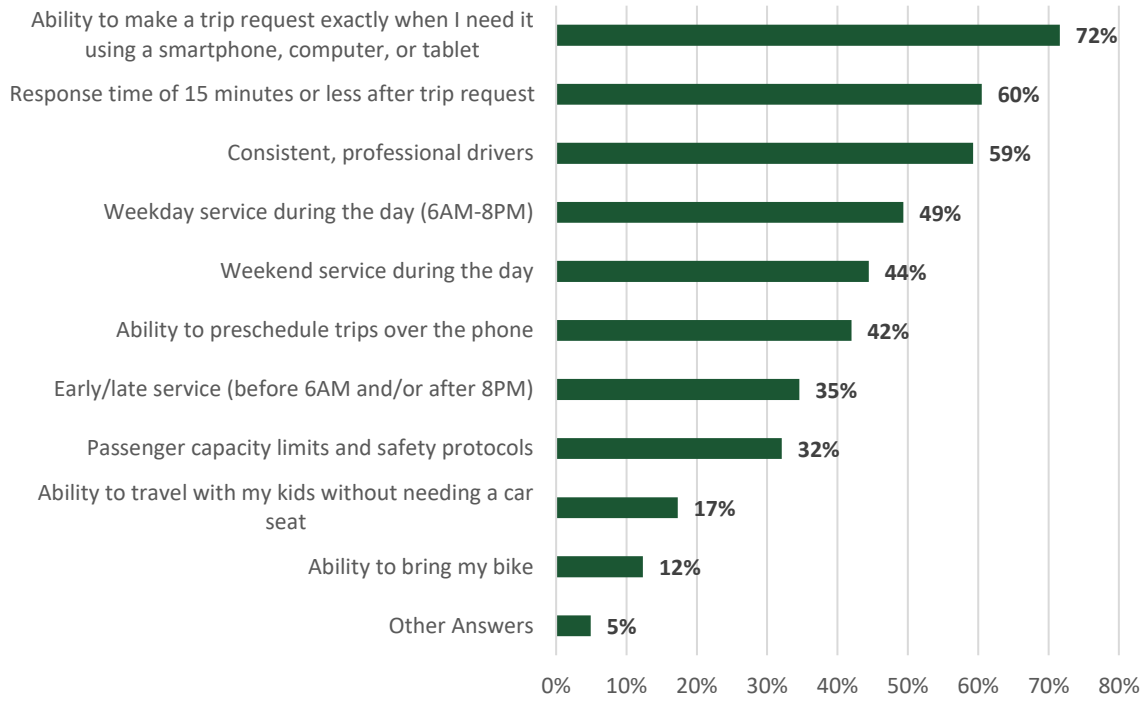
Survey and open house participants were introduced to the idea of on-demand public transit service. They were then asked about the type of vehicle they would be most comfortable using for on-demand service, and overwhelmingly people responded that the type of vehicle is not as important as being able to connect to the desired destination. Comments to this question also indicated a desire for a marketed vehicle that is easy to spot and recognize.

Figure 53: On-Demand Vehicle Type Preference



When asked about the specific characteristics of a potential on-demand service, the top answer was the ability to make a trip request when needed using a smartphone, computer, or tablet (**Figure 54**). The other top answers included a response time of 15 minutes or less after the trip request and consistent/professional drivers. Nearly 60% of respondents also preferred a consistent, professional driver.

Figure 54: Important Characteristics of an On-Demand Service



Based on how respondents were supportive of new services and vehicles if the service can be requested easily, efficiently, with consistent drivers, and it will connect them with desired destinations, the community would support a new on-demand service.

Anticipated CO 7 Park-n-Ride

This outreach process also informed the public about the new park-n-ride bus station that is planned to open at the intersection of CO 7 and I-25 in 2025 or 2026. People were asked if the park-n-ride will be beneficial to them, and how they anticipate using the park-n-ride. 43% of respondents said the park-n-ride would be beneficial to them and 22% were uncertain (**Figure 55**). Those who said they would find it beneficial would use it to either get to Denver's Union Station or destinations from the new CO 7 regional bus (**Figure 56).** Additional comments about this park-n-ride indicated a desire for expanded service to Boulder and the extension of the N-Line train.

Figure 55: CO 7 Park-n-Ride Benefit

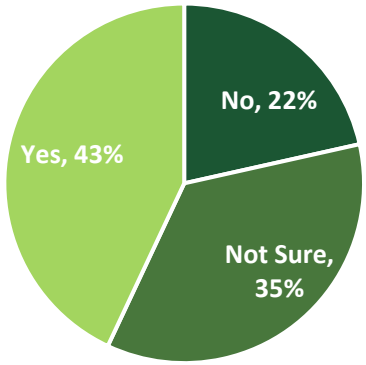
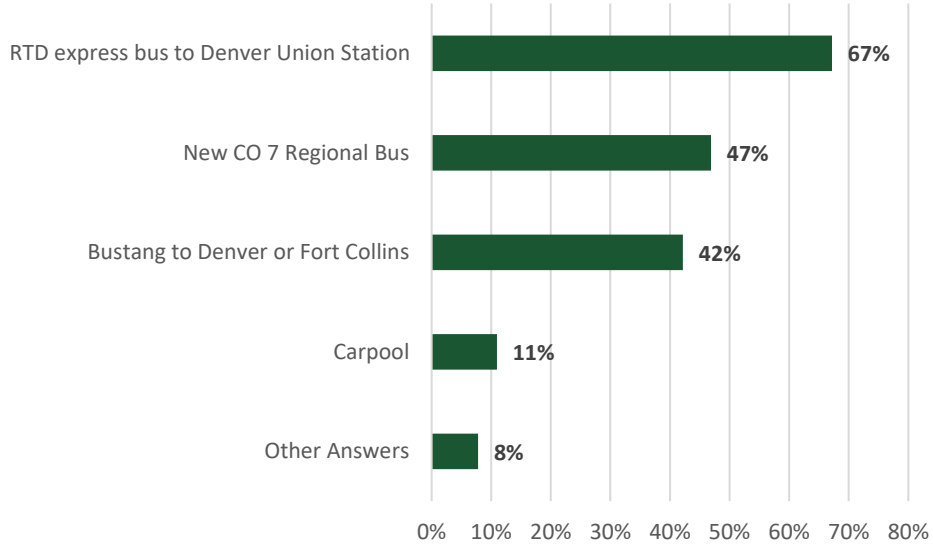


Figure 56: Anticipated Use of CO 7 Park-n-Ride



Other Comments

Both survey respondents and open house participants also had an opportunity to express other comments that were not addressed. Overall, there were 54 comments on a variety of topics. The top three categories of comments were related to a desire for route expansion, increased bicycle facilities, and a concern for inconvenient connections to desired destinations.

The comments related to route expansion expressed interest in and support for the N Line expansion. Other similar comments emphasized the need for the bus route 104, more service in Ward 1, and more service in the 136th Avenue and Quebec Street area.

Comments relating to increased bicycle facilities expressed the concern that without adequate bicycle connections, using transit is not as supportive of the suburban nature of Thornton. Respondents want to be able to connect to transit on bike, but the lack of facilities does not allow them to do so. A few comments also mentioned the need for more bike racks at stops and stations.

The third most popular comment theme was about inconvenient transit connections to desired destinations. People specifically mentioned that traveling from one side of I-25 to the other is difficult to do on the existing transit services, and that the mismatch in scheduling and frequency does not make the existing transit conducive to productive use. One person said to go a couple of miles in Thornton on the existing transit system would take them over two hours because of the 60-minute frequency and need for transfers.

Other comments included a desire for later/earlier service on the N Line, connections that are focused on the mobility of older adults, and safety improvements at transit stops and along pedestrian facilities. There were also a few people between the overall comment section and comments throughout the survey that indicated an interest in bringing back the Broncos Ride.

Some key comments representative of common themes are displayed here:

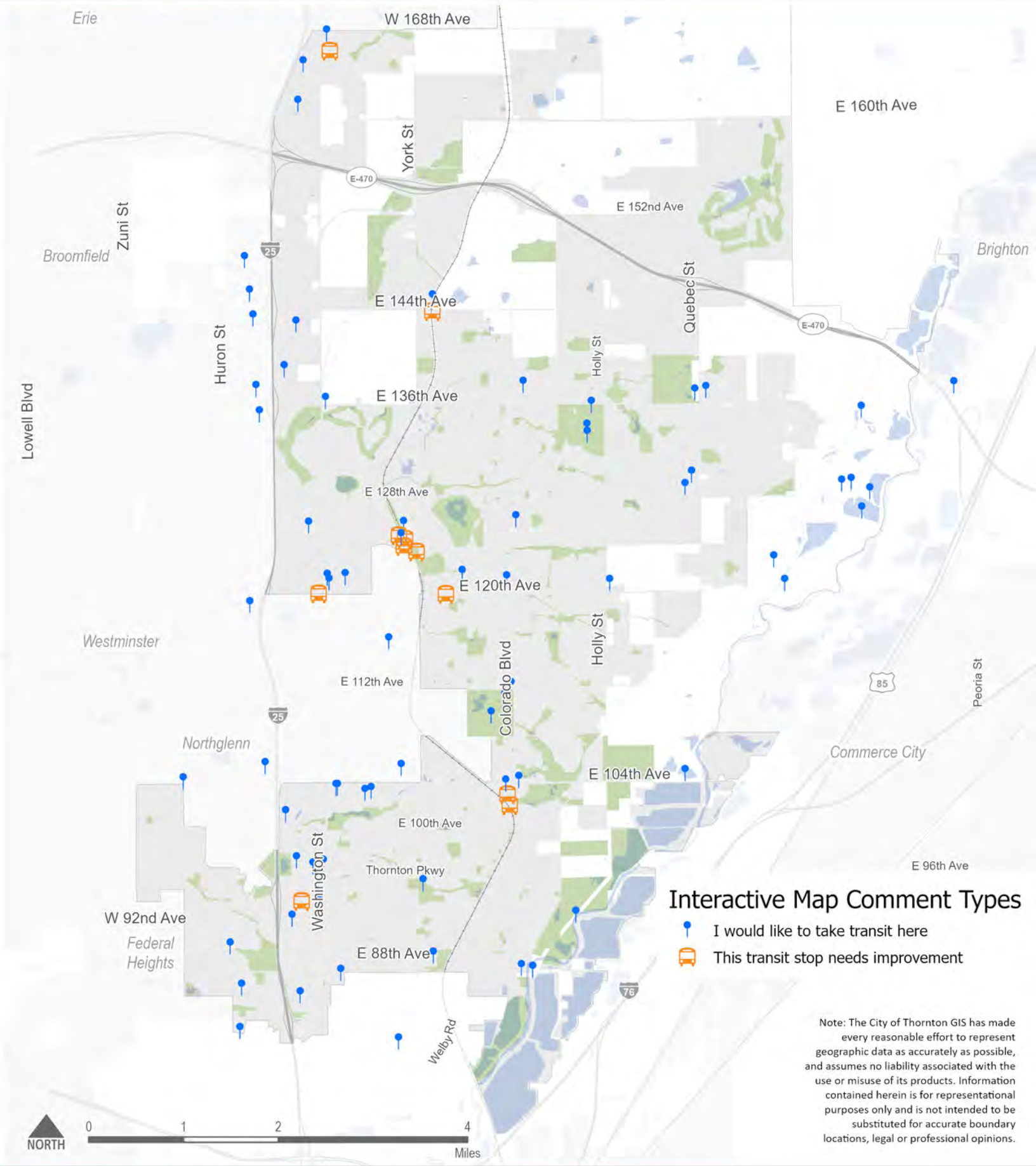
- "Bike lane are only available directly around the stations, but getting to those bike lanes are not always easy."
- "I would like to see flexride have weekend service. I use flexride multiple times a week and weekends would be very beneficial."
- "I use the bus every day and I have to walk 30 minutes to the Eastlake and 124th station to get the train to Union Station. It is very inconvenient for me."
- "There seems to be a lot of transit routes that take you from parking lot to parking lot. Instead they should pick up and drop off closer to where people are. The transit should be closer to where people live. Have stops closer to neighborhoods so people can get there without using a car which would induce people to use them."

Destinations Mapping

As part of the survey and open house process, community members had an opportunity to interact with a map of Thornton to give input on where people live, where they would like to take transit, where they believe a transit stop needs improvement, and any other comments they have. Thirteen respondents shared their home location, and **Figure 57** shows the combined responses from the survey and the open house, representing locations where people would like to take transit to, and which transit stops need improvements.

Interactive Map Comments

Figure 57



Note: The City of Thornton GIS has made every reasonable effort to represent geographic data as accurately as possible, and assumes no liability associated with the use or misuse of its products. Information contained herein is for representational purposes only and is not intended to be substituted for accurate boundary locations, legal or professional opinions.

City of Thornton

Sources: Fehr & Peers
Basemap Data: June 2023

The residents who shared their home location all live south of 128th Avenue, which is representative of the population density, but it does not necessarily display all desired origins for trips.

Comments relating to improvements needed at transit stops included concerns of the unnecessarily large size of the Eastlake/124th Station parking lot and the lack of transit connections to the station. The Thornton Crossroads/104th Station, among others, was also identified as a transit stop where people desire more destinations to which transit could be taken. There were multiple comments like this that mentioned the need for more transit-oriented development across the city.

As for the desired destinations, they are spread out throughout Thornton, ranging from grocery stores to restaurants to recreational facilities to doctor's offices. A few of these pins were dropped outside of the Thornton city boundary, which indicates a need for Thornton residents to travel outside of the city for certain reasons, mostly for recreation. Many comments on desired destinations discussed how large commercial areas, specifically the Larkridge Shopping Center and the Denver Premium Outlets, do not have any transit access. In fact, many other comments expressed a desire for more transit service in the areas where it does not exist at all right now, specifically in the northern parts of the City.

Focus Groups

Like the community open house and the online survey, focus groups were formed to provide input on how people currently use transit, advantages and disadvantages of the current system, where people would like to go, and what improvements they would like to see. The purpose of these focus groups, however, was to ensure the perspective of particular groups was captured in the planning process.

Active Adults Focus Group

The Active Adults focus group was held on April 4th, 2023, at the Active Adults Center in the Carpenter Recreation Complex. There were nine community members in attendance, two of which do not have regular access to a vehicle. The discussion with this group was focused on desired destinations, challenges with transit, and thoughts on a new on-demand service.

In general, this group expressed a need to travel to grocery stores, medical centers, and public services (libraries, recreation centers, and community centers). They also expressed that there are certain destinations just outside of Thornton (particularly west of I-25) to which they consistently travel.

There were multiple challenges the group expressed with the current state of transit. Active adults are most interested in door-to-door services like FlexRide, but they believe that FlexRide is not meeting their needs. Specifically, the service areas do not cover the desired origins and destinations, and although transfers are possible between one FlexRide service area and another, these are inconvenient and difficult to make. Further, they expressed frustration with the difficulty of booking the service, especially with a technological gap for some residents.

Beyond FlexRide, the active adults suggested that more information on existing and new transit services be widely publicized and easily conveyed. They feel as though there are plenty of existing services, specifically those which serve senior or disabled citizens, but not many fully understand how the services operate.

When asked about where a potential on-demand or microtransit service should be prioritized, the group had a few key points. Whatever the on-demand service looks like, the active adults believe that it should connect to:

- Existing food deserts in southeastern Thornton
- 104th and 120th Avenues due to the presence of key destinations
- Community centers like the Carpenter recreation complex to ensure a community purpose beyond just access to basic necessities.

Latinx Focus Group (From TMMP)

During the TMMP process in 2020, there was a successful focus group made up of Spanish-speaking individuals. Although the TMMP was a holistic process evaluating and planning all elements of transportation, this focus group mostly provided input on the topic of transit. For this reason, this study incorporates this feedback from the TMMP to ensure the feedback for transit is heard and considered.

In particular, this focus group indicated that increased public transportation options across the city would help mitigate vehicular traffic, and they believe that investment in public transit should be significantly increased. Further, an important piece of feedback received through this group is the lack of translated materials available about transit; schedules, fare payment methods, using the park-and-ride lots, etc. are not displayed in Spanish or other languages. This discourages and makes it much more difficult to use public transit when English is not the primary language.

A final point of concern expressed across the entire focus group is the lack of first and last mile connections to transit and other destinations due to poor pedestrian and bicycle infrastructure.

There are either no sidewalks or too narrow sidewalks, especially in the southern part of Thornton, which discourage safely getting to and from transit stops.

Peer Community Analysis

As Thornton looks ahead to transit improvements, it is important to understand what peer communities have done to address transit gaps.

Lafayette, Colorado

Lafayette, CO is located within ten miles of Thornton to the northwest, between Thornton and Boulder. Although Lafayette's population is significantly smaller than Thornton's, its distribution of age is like Thornton. Lafayette also has a larger portion of its population who commute using public transportation than in Thornton.

RTD provides a regional route between Denver and Longmont which goes through Lafayette. There is also an on-demand, door-to-door bus service that connects people throughout the city and to the Kestrel community in Louisville. The service is called Ride Free Lafayette, operating seven days a week from 7:00 AM to 8:00 PM for free, and it is operated by Boulder County.

Kent, Washington

Kent, WA is located twenty miles southeast of Seattle and it also has about 140,000 residents. Kent has a similar share of its population as Thornton who are either under 18 years of age or 65 years of age and older. Also, Kent has a larger portion of its population who is racially and ethnically diverse, and the household income is smaller than in Thornton. Further, Kent has a larger population than Thornton who commute using public transportation.

Kent is served by King County Metro Transit and Sound Transit buses and trains. In addition, King County Metro Transit operates the DART shuttle, which is a free shuttle travelling in multiple loops to shopping areas, banks, medical facilities, and senior housing. The shuttle arrives each half-hour in the downtown Kent area and each hour in the East Hill area from 9AM to 5PM Monday through Saturday. Every bus is equipped to serve wheelchairs and bikes. The DART shuttle is a joint effort between King County Metro Transit, the City of Kent, and Hopelink (which prioritizes serving homeless, low-income, children, seniors, and people with disability).

Tracy, California

Tracy, CA is located east of the intersection of I-205 and I-580 in California, between San Jose and Sacramento. It is a bit smaller than Thornton with 93,000 residents. Although Tracy has a smaller portion of its population who are 65 years of age and older, they have a large portion of their residents who are under 18 years of age. Tracy has a similar portion of its population who

are Hispanic or Latino, but compared to Thornton, the portion of the racially diverse population is much higher in Tracy. Although the median household income is higher in Tracy, the portion of the population living in poverty is almost identical to that of Thornton. Further, a similar but larger portion of residents commute using public transportation in Thornton than Tracy.

Tracy, unlike Thornton, is served almost solely by a local transit system. In fact, the regional transit system in San Joaquin County, where Tracy is, operates one route to Stockton, CA and one to the Dublin BART station in Pleasanton, CA. The local transit system in Tracy includes local routes across the city operating all week long, commuter routes across the city operating on weekdays, on-demand bus service operating when the other services are not, and paratransit door-to-door service for ADA/Medicare passengers.

Conclusion

This transit market analysis report includes the project's background, a comprehensive demographic analysis, an evaluation of the existing transit service, an analysis of travel patterns, community input, and a review of peer communities.

Key Findings

Key findings from the analyses within this report are summarized as follows:

Demographic Analysis

Thornton's residents are diverse in age, income, and travel characteristics, and those who are most likely to rely on transit service are youth, older adults, people with low and moderate income, people with disabilities, and households with limited access to vehicles. While there are higher concentrations of many of these key demographic groups in the southern portion of Thornton as well as high population densities, there are other areas of the city with higher concentrations of these demographics as well, including:

- A high youth and older adult population north of 136th Avenue
- Residents living under the poverty line north of 136th Avenue
- Residents with no or limited access to vehicles in communities between 112th Avenue and 128th Avenue, and in the Todd Creek Area

Existing Transit Service

Overall, existing transit service in Thornton exhibits the following key themes:

- **Regionally Focused** – The system is predominantly designed for regional travel, particularly to downtown, and less useful for local travel within Thornton and east-west regional travel.
- **Limited in Geographic Coverage** – While the southwest part of Thornton (generally south of 120th Avenue and east of Colorado Boulevard) which has the highest transit propensity is generally covered by transit there are large sections of north and eastern Thornton without any transit, which also leaves parts of these areas in north Thornton devoid of Access-a-Ride service. Additionally, many areas of southern Thornton are more than a quarter-mile walk from transit and/or have areas with missing or narrow sidewalks that add additional barriers to accessing transit.

- **Low Frequencies** – Most bus service in Thornton operates at 60-minute frequencies, with just three routes plus the N-Line and 120X providing 30-minute all day frequencies. The low frequency is one of the biggest barriers to using transit in Thornton, making it an impractical option for many trips (even where transit exists), especially for short trips and trips that require a transfer.
- **Limited Demand Response Service** – The three FlexRide services that operate in Thornton are designed to fill those gaps in local travel demand, but can be unreliable, difficult to coordinate transfers, and exclude many areas of Thornton. The service also suffers from lack of efficiency typically averaging less than 3 riders per hour. Additionally, because the Thornton FlexRide does not operate after 6 PM, it does not serve evening commuters/service workers.
- **Limited Connectivity Across I-25** – While service is provided on both sides of I-25, service on 104th Avenue does not connect across, and the FlexRide boundaries generally fall along I-25 making connections across I-25 via FlexRide generally impractical.

Existing Travel Patterns

Both LEHD and StreetLight analyses show that desired destinations for Thornton residents are mostly local, most commonly within five miles. More specific takeaways include:

- Non-commute trips make up only 82% of trips on weekdays.
- Nearly half of all trips in Thornton have an average speed of 10 to 20 mph from origin to destination.
- The most common trip length is two to five miles.
- The top local trip pairings occur in the southwestern part of the city going to/from the Washington Street corridor from zones directly east or west.
- Most regional trips are destined for Commerce City and Broomfield, but there are also many trips headed to Brighton, Westminster, and to communities along the Northern I-25 corridor.
- In 2019, the highest concentration of work locations for Thornton residents was along the north I-25 corridor and Downtown Denver. There were also notable nodes in Boulder, Brighton, Broomfield, and the Anschutz Medical Campus in Aurora.
- Of trips that originate in Thornton's top transit propensity zones most are destined to areas directly surrounding the zones, so trips are predominantly short and close.
- Most people traveling from Thornton to one of the six regional transit hubs in (or near) Thornton originate in the zones immediately around the station. The two exceptions are the Wagon Road park-n-ride and Crossroads & 104th Station which have much larger travel sheds than the other transit hubs.

- The Carpenter Recreation Center draws people from all areas of Thornton in a fairly evenly distributed manner, while the Trail Winds Recreation Center has a much higher share of trips originating around the recreation center in north Thornton, with fewer people coming from south Thornton.
- While the Amazon facility (specifically the employ lot) draws trips from across Thornton, there are particularly higher concentrations of trips originating in south Thornton.

Community Input

The following are key takeaways from the community input process:

- A disproportionately high percentage of survey respondents live in north Thornton (as compared to the actual population distribution) meaning respondents from south Thornton which has a higher percentage of transit-reliant population may be underrepresented in the survey.
- The top desired destinations for transit include shopping and restaurants, work, and public services.
- The top desired transit improvements include increased frequency (particularly along the N-line), earlier and later hours of service, and additional first/last mile transit service within Thornton to connect to the rail stations.
- For both existing FlexRide and with any new on-demand service, residents' top priority is being able to be guaranteed a ride within 15 to 30 minutes of a request, followed by a convenient booking platform and consistent, professional drivers.
- Other characteristics that impact first/last mile connections like bicycle and pedestrian facilities are important to consider when planning new services.
- Desired destinations are dispersed throughout the community.
- The FlexRide can be challenging to use as it's not always available and difficult to make transfers.
- Traveling from one side of I-25 to the other and making most local trips in general in Thornton is very difficult due to the low frequency of existing transit service, lack of transit service in some areas, and need to transfer.

Peer Community Analysis

When looking at communities that are similar to Thornton, such as Lafayette, Kent, and Tracy, local transit service is supplemental and complimentary to regional service. Further, the local services in these communities focus on ensuring access to a wide variety of areas throughout the community by providing a mix of fixed-route services and on-demand services.

Potential Transit Travel Markets

Primary transit travel markets (groups with common demographic characteristics) are important to identify to inform the service alternatives, final service plan, and associated marketing strategies. Through the transit market analysis, including analysis of demographics, existing transit service, community input, and existing travel patterns, the following potential transit travel markets have been identified.

Young Users and School Trips

Youth between the ages of ten and seventeen make up 13% of Thornton's population. These riders may not have a driver's license or access to a vehicle and may be a market for increased ridership. These young users may be more open to app-based on-demand services than other user groups. Typically, the largest demand of trips for this travel market is to get to and from school and to after school activity centers and jobs. This population group is distributed across most of Thornton.

Older Adults

People aged 65 and over make up 10% of Thornton's population. Older adults may be more interested in a new service that picks up and drops them off closer to where they need to go, and areas with missing or uncomfortable sidewalks are going to be a significant barrier to using fixed-route transit. The most desired trip types by this group are to grocery stores, medical facilities and services, and community centers (including the Active Adults Center). Through the active adults focus group, it was made clear that transit improvements are highly supported among this group. While there are several areas of Thornton with higher concentrations of older adults, these areas are distributed across the city, with a notable population in the 55+ community of Todd creek that is far from any existing transit service.

Individuals and Families with Lower Incomes

Census data showed that people with low and moderate income are mostly in the southern portion of Thornton, but there are other areas to the north where a large portion of the population is living under the poverty line. A low cost, reliable transit service that connects low-income families and individuals with shopping options, local services, and jobs could be an important mobility option for these riders.

People with Limited Access to a Vehicle

About 3% of Thornton households do not own a vehicle, and 14% only have one vehicle. Even in households with one vehicle there may be people who need to get around but don't have the option to drive, particularly youth and older adults, either because they cannot drive or

someone else in the house is using the vehicle. Transportation for these populations is often challenging, due to the limitations in driving a personal automobile or consistent access to a personal automobile. In some census tracts in Thornton over 5% of households do not have a vehicle, particularly in the southwest, southeast, and in the Todd Creek 55+ neighborhood. By expanding transit options and connections, a new transit service could improve mobility for those who would otherwise have a difficult time accessing the places that they need to go.

People with Limited Mobility or Mobility Assistance Devices

Given that 9% of Thornton residents households have a disability, and those community members may have mobility needs, there is an opportunity to provide a more convenient option using an on-demand solution, especially for those residents that do not meet eligibility requirements for paratransit but may not be able to easily use existing bus services.

Commuters and Service Workers

While RTD does provide some service to regional destinations, particularly to Downton Denver, there are many service-oriented jobs within and near Thornton with varying schedules that are not well served by existing transit service. People working service jobs often do not have access to a vehicle and depend on transit or a friend or family member to get to work.

First/Last Mile Access

There are six regional transit hubs in or adjacent to Thornton that provide bus and/or rail service to destinations throughout the Denver region. While many people use these regional services (or would like to), these hubs are difficult to access without a vehicle from most of Thornton. Improving access via transit to these regional hubs was one of the top desired transit improvements identified by the community and a potential travel market that is not well served today.

Short, Community-Based Trips

The most common trip type in Thornton are short community-based trips of two to five miles. This market is not currently well-served by RTD and there may be an opportunity for Thornton to fill this gap as the existing transit service is designed largely to serve longer regional and commuter trips. While these trips occur across the city there are particularly high concentrations in south Thornton where densities are higher and there are numerous commercial destinations (particularly around the Washington Street corridor).

Next Steps

Based on findings from this Transit Market Analysis, the project team will work with the project Stakeholder group to compile a list of potential transit alternatives to serve the potential transit travel markets in Thornton. This process will include identifying evaluation criteria to assess the performance of different alternatives within these travel market opportunities. Following the alternatives analysis, the public will get an opportunity to provide input in selecting a preferred alternative to advance forward and develop into a final transit service plan.