Mobility Enhancements for Regional Growth & Equity (MERGE) Project

Multimodal Project Discretionary Grant Opportunity (MPDG) Grant Application
May 2024

MERGE Project Highlights:

- To date, the project has received multiple "Highly Recommended" and "Medium-High" ratings from previous RAISE and MPDG pursuits.
- The 35th & 47th Avenue crossings in the project are used heavily by students and families walking, rolling, and biking.
- The 35th & 47th Avenue interchanges would realize immediate safety benefits by reducing approximately 40% of the crashes through the elimination of signals at the at-grade section.
- Given the asset lives of major elements of the project, approximately $6M in discounted residual value benefits will be delivered.
- The 2050 population forecast for the state is 7.48M, with 6.3M along the Front Range (Greeley's region), or 85% of the total population.
- The project will increase travel time reliability for freight movement through the City of Greeley.
- Construction will result in the creation of 1,000 job years.
- A reduction of 40% of air pollutants is expected as a result of the project.
- GHG emission reductions will result in a benefit of $6,957,000 for a 7% discount rate over 20-years.
- School bus service is not provided within 3 miles of high schools or 2 miles of middle schools in the district, making walkability and the public transit heavily used by students.
- The entire micro-transit fleet will be 100% powered through solar arrays located at the mobility hub.
- The project is expected to have an Individual Categorical Exclusion (ICE).

Outcome Criteria

Project Outcome Criteria

Safety

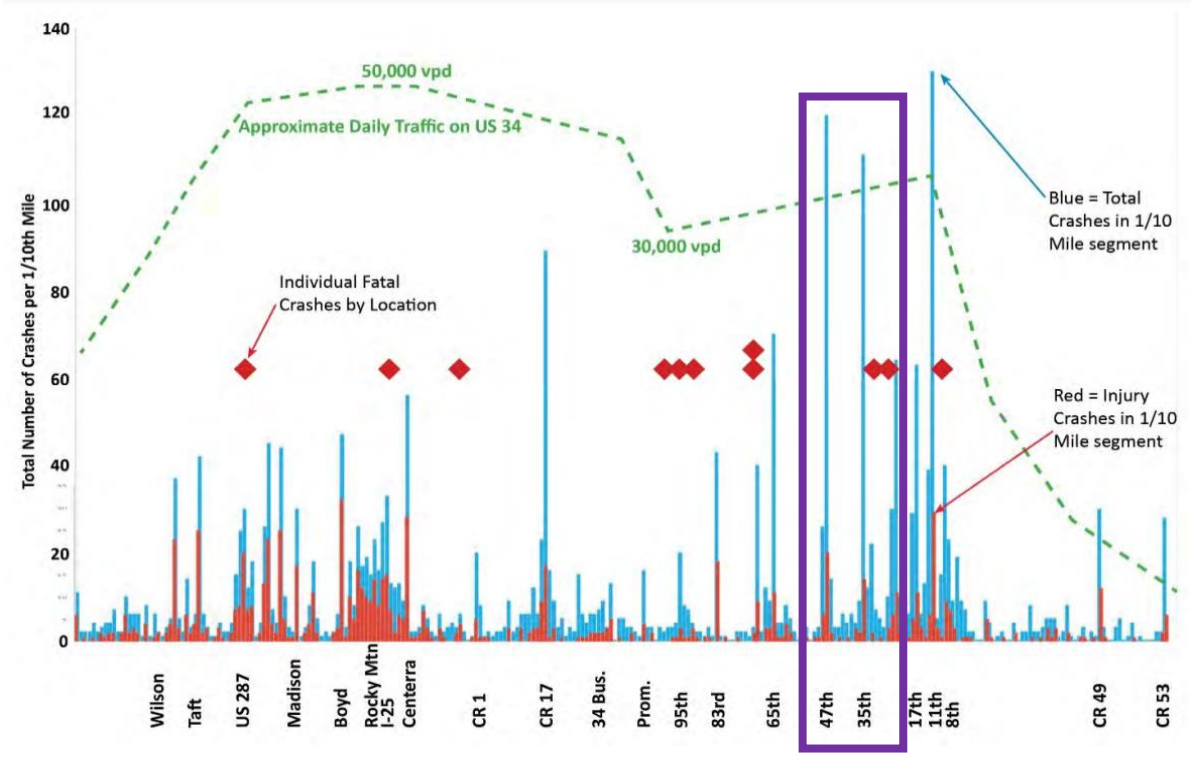
The MERGE interchanges would realize immediate safety benefits by reducing approximately 40% of the crashes through the elimination of signals at the at-grade section.

The US 34 (US 34 Bypass) intersections with 35th and 47th Avenue are large at-grade multi-phased signalized intersections shown below that require long crossings for bicycles and pedestrians. The US 34 PEL Study completed by CDOT and subsequent traffic modeling by CDOT, indicate that there is a need for improvements to the US 34 signalized intersections at both 35th and 47th Avenues.* Currently, these intersections are operating at a Level of Service (LOS) D which approaches the relatively unacceptable level. By 2045, both 35th and 47th Avenues are expected to be operating at an unacceptable Level of Service (LOS) (LOS E or LOS F) and will need to be upgraded to interchanges. Most importantly, the existing at-grade signalized intersections have extensive safety issues. **Image 3** displays an example of a multivehicle crash involving commercial, transit, and personal vehicles. The 35th and 47th Avenue signalized intersections were in the **top three crash locations** for the entire US 34 PEL Study completed by CDOT for 2011-2015 as seen in **Figure 6** and highlighted by the purple outline. In addition, the 35th and 47th Avenue signalized intersections with US 34 were the **#1 and #3 highest crash locations in the City of Greeley** respectively between 2016 and 2020. (City of Greeley 2021 Transportation Safety Report). Using Colorado DOT crash data from 2017-2021, showed that there were 187 and 152 crashes at the US 34 intersections with 35th Avenue and 47th Avenue, respectively.

Image 2: US 34 at 47th Avenue

Image 3: 2019 Crash involving Transit, Commercial, and Personal Vehicles

Figure 6: Crash Data from the *US 34 PEL Corridor* Existing Conditions Report



The MERGE project is surrounded by Historically Disadvantaged Communities that are known to have high percentages of households who rely on walking, biking, and transit options. According to the City of Greeley Bicycle Master Plan, the area just north of the future (new) mobility hub and future interchange (around 20th Street and 35th Avenue) is one of the highest demand locations in the city for active transportation based on demographic and land use characteristics. (For more information, see *Equity, Multimodal Options, and Quality of Life* section). Currently, students who live south of US 34 and attend Greeley West High School, located north of US 34 on 35th Avenue, are forced to cross at the US 34 and 35th Avenue signalized intersection. Several bike and pedestrian safety issues present themselves at this intersection due to the high speed of traffic, heavy vehicle volumes, and long crossing distances. To address these safety issues, District 6 (School District) and the City of Greeley consider a grade-separated bike and pedestrian crossing of US 34 near 35th Avenue a top priority for student safety.

Merge Project Components

Safety is a primary project purpose of the MERGE project. The interchanges at 35th and 47th Avenues would realize immediate safety benefits by reducing approximately 40% of the crashes through the elimination of signals at this at-grade section of US 34 (Crash Modification Factor Clearinghouse ID: 460). The MERGE project will, over its first twenty years of operation, result in nearly 640 fewer vehicular crashes and 278 fewer injuries due to crashes at the US 34 signalized intersections of 35th and 47th Avenue. Concepts for the proposed interchanges at 35th and 47th Avenues, respectively, are shown below along with the mobility hub.

The MERGE project includes the construction of a regional bus station within the center of US 34 between the interchanges. The regional bus station, while being connected to the mobility hub, will encourage and facilitate a higher level of shared commuting options. Currently, there are no GET transit routes south of US 34 and west of 35th Avenue other than demand response service to the Greeley Hospital.

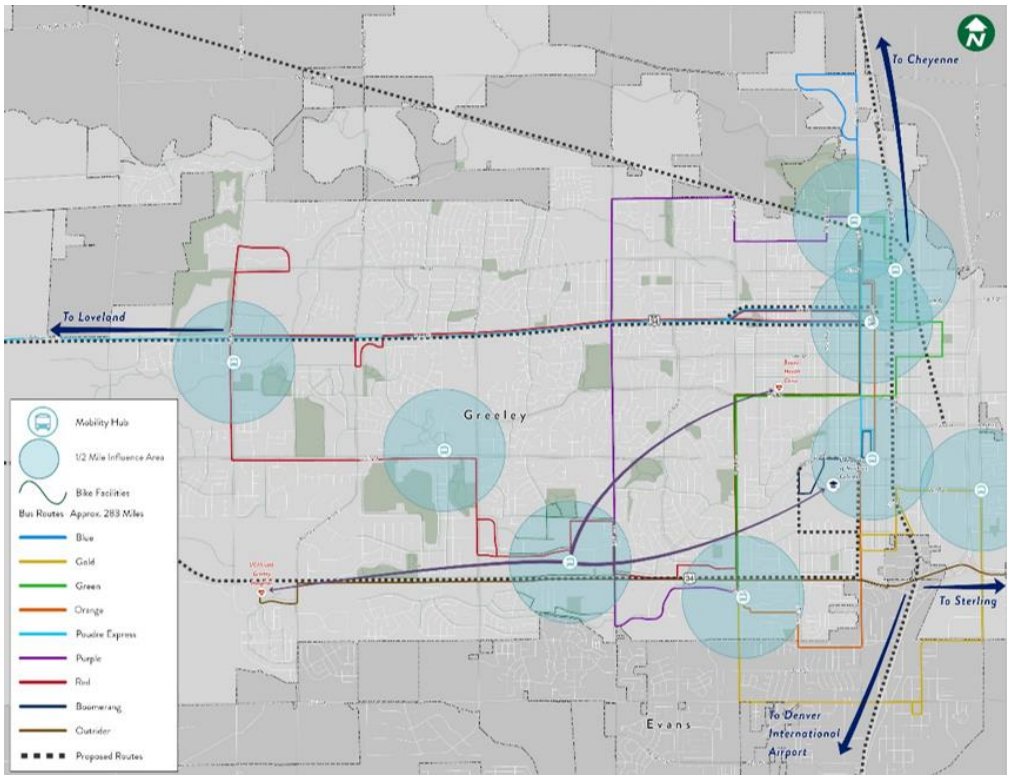
Image 4: US 34 at 35th Avenue Concept - Modified Partial Clover Leaf (Parclo)

Image 5: US 34 at 47th Avenue Concept - Diverging Diamond Interchange (DDI)

Image 6: Mobility Hub on US 34

The City of Greeley has plans to partner with private transportation providers to increase the use of the proposed mobility hub and integrate it into the mobility hub system. The **project website** contains resources on the current bike facilities, bus routes, and mobility hubs in Greeley. **Figure 7** shows the new Greeley Mobility System which integrates micro transit, micromobility, and transit. The new system would total 283 miles as compared to the existing 162 miles; an increase of 74 percent. The combination of new grade-separated interchanges, regional and local transit service, and active transportation infrastructure along both sides of US 34 will reduce the number of cars on the roadways leading to improved safety for both the state and local infrastructure.

Figure 7: New and Expanded Bus Routes with Micromobility Hubs



State of Good Repair

Given the asset lives of major elements of the project MERGE will deliver approximately $6M in discounted residual value benefits.

The MERGE project comprises the delivery of a complex mix of infrastructure components including new auxiliary lanes, improved exits and entrances to the highway, transit elements, and micro mobility options. With the roadway improvements to US 34, 35th and 47th Avenue, the pavement conditions for the MERGE project study area will be in good condition and become safer for users and reduce wear and tear costs for vehicles using the roadways.

State of Good Repair is a **primary project purpose** of the MERGE project. By far, the main elements of the project are the construction of the bridges that grade-separate US 34 with 35th and 47th Avenue as part of the new interchanges, the center loading regional transit center, and underpass with US 34. These elements will be designed with a minimum of 75-year asset life and will be ranked as "good" (indicating no design or structural issues). Maintenance activities for the new infrastructure will be limited to preventative maintenance for at least the first ten years of operation, leading to less vehicle delays during these activities. Given the asset lives of major elements of the project (bridges, ramps, concrete lanes, retaining walls), the project will also deliver approximately $6M in discounted residual value benefits at the end of the assessment period. Coupled with the provision of the other infrastructure elements of the MERGE project (retaining walls, noise barriers, culverts, pavement, drainage improvements, signals, ITS, and utilities), this key corridor to regional and local mobility will be in a good state of repair. The City staff in coordination with the CDOT will be responsible for proper maintenance.

Economic Impacts, Freight Movement, and Job Creation

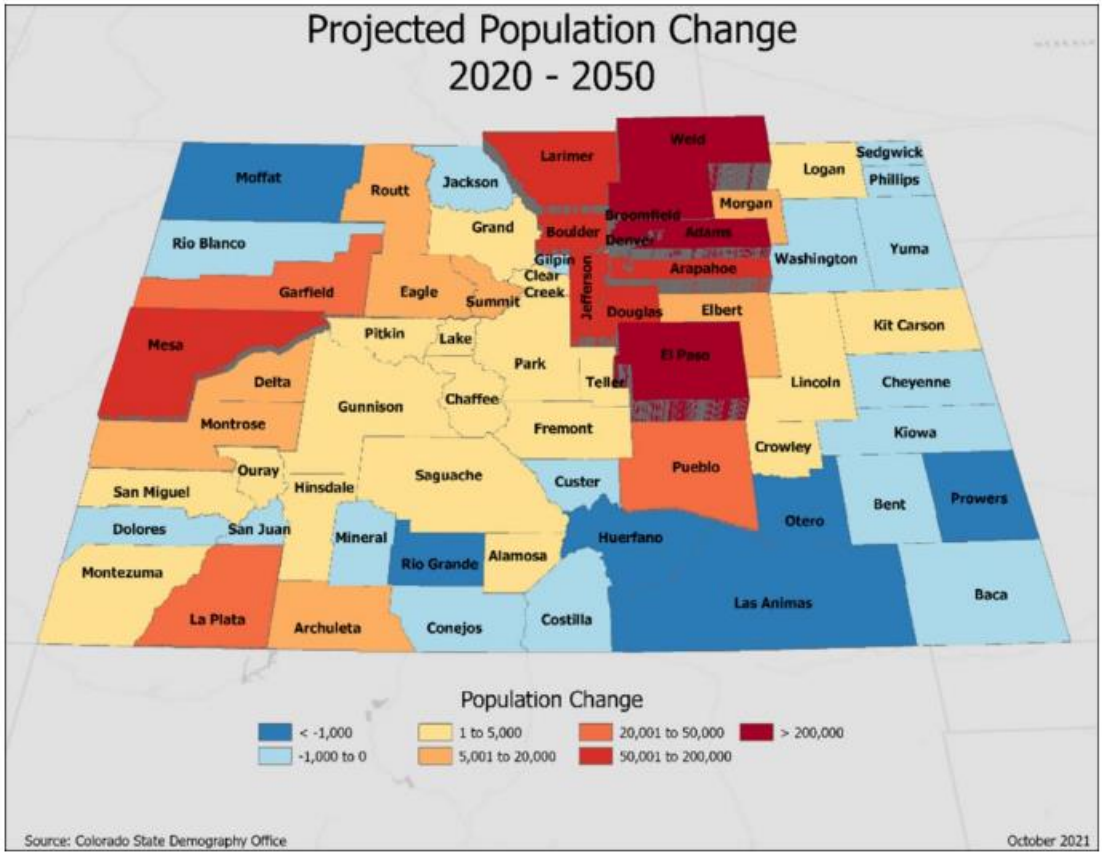
Economic Impacts

The 2050 forecast for the state is 7.48 million, with 6.3 million along the Front Range, or 85% of the total population.

Transportation is the backbone for commerce, and the extent and quality of transportation infrastructure is one of the most important factors to determine long-term economic prosperity at the local, regional, and national levels. As a result, the City of Greeley's position as both a regional economic center and a multimodal transportation hub drives the MERGE project initiative.

The Population Summary January 2023 prepared by the Colorado State Demography Office projects **"The largest population growth is forecast to be along the Front Range. Between 2020 and 2030, the state's population is projected to increase by 630,000, with 88% of this increase projected for the Front Range and of that, 300,000 for the Denver Metro area. The North Front Range is expected to observe the fastest growth, at an annual average growth rate of 2%, or 140,000 people. The 2050 forecast for the state is 7.48 million, with 6.3 million along the Front Range, or 85% of the total population."**

Figure 7: Project Population Change Map



The MERGE project is expected to have significant positive impacts on the local and regional economies and has been identified as a **primary project purpose**. Increased mobility (and more affordable mobility options), improved regional transit service to areas such as Fort Collins and Denver, and improved system-wide traffic operations (reduced travel times for all modes) are key benefits of this initiative and will help the City of Greeley and Weld County to continue to develop as a regional economic hub for decades to come. Weld County is top ranked in agriculture, the number 1 meat processing company (JBS) is headquartered and has a facility in Greeley, and the world's largest manufacturer of cheese (Leprino) has a facility in Greeley. This workforce lives mostly in the City of Greeley. Improved traffic and safety operations will remove supply chain bottlenecks that reduce the cost of doing business and improves local and regional connectivity to the ever-more global economy. The potential of additional long-term parking for commercial vehicles adjacent to the project is also a key economic benefit.

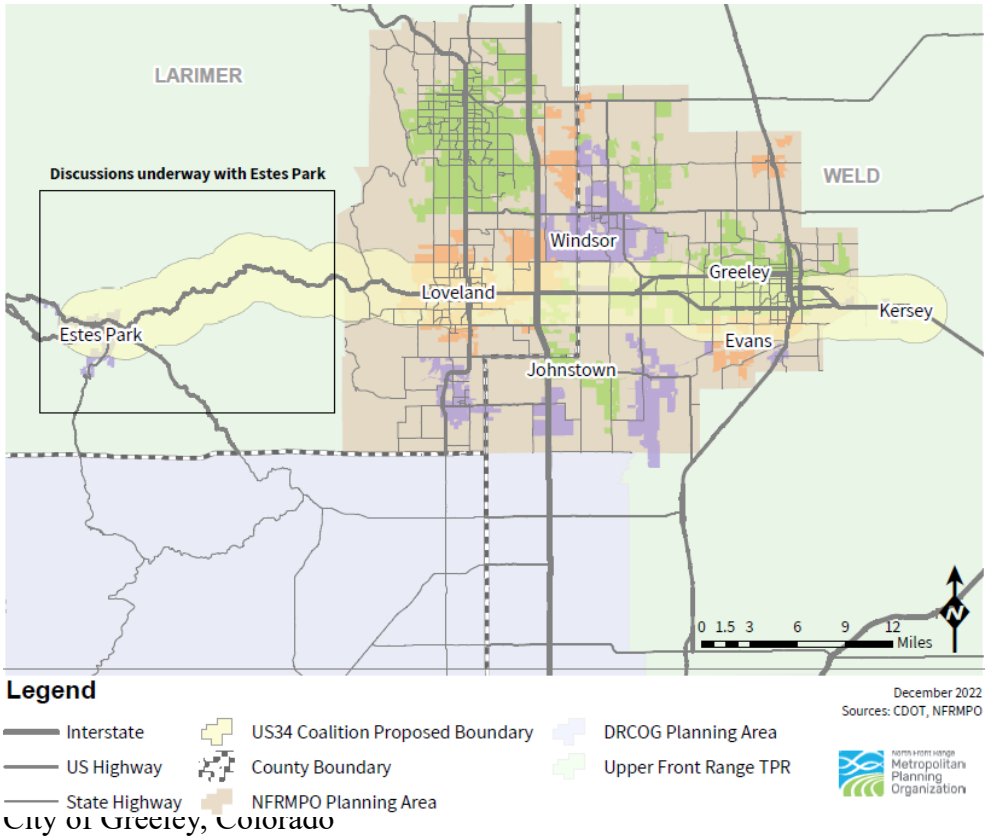
In addition to the operational benefits that enable economic growth, research has shown that corridors with grade-separated do not suffer negative impacts to local businesses. In fact, they often flourish as adjacent and local land uses move toward the highest land-use productivity. This is a key benefit that will benefit local businesses as well as the success of the mobility hub.

US 34 is the primary east-west corridor through the northern Colorado region and the North Front Range MPO (NFRMPO) area of Weld and Larimer counties. The components of the proposed project (two proposed interchanges at 35th and 47th Avenues and the mobility hub) have been identified as priority projects in state and regional long-term planning as the area supports growing housing, employment centers, and tourism nodes. See *Project Readiness* for additional information.

The proposed interchanges for MERGE will improve the overall operations of not just US 34, but the larger local network. This project will take pressure off the local roadways as well as increase throughput on US 34 along this key mobility corridor within the NFRMPO planning area (**Figure 8)**. Sustained growth and regional economic development along the US 34 corridor from Greeley to I-25, Loveland, Estes Park and Rocky Mountain National Park have increased the need to eliminate transportation barriers to jobs, reduce recurring traffic congestion, enhance multimodal safety, and improve regional mobility.

On August 8, 2023, the USDOT approved a $501 million TIFIA loan to improve a 61-mile north-south corridor of I-25, including adding 52 miles of express toll lanes between Denver and Fort Collins, Colorado which provides direct access to US 34. The benefits of the $1.6 billion project include improved travel times; construction of new mobility hubs that encourage a modal shift to transit, carpooling, and bicycle/pedestrian travel; capacity for future travel demand; rehabilitation of older critical rail crossings and structures; and connecting users to a 100-mile regional trail network, while also maintaining safe crossings for wildlife throughout the corridor. This connectivity makes the need for the MERGE project even more critical to address the challenges that will be presented due to the ease of connectivity.

Figure 8: NFRMPO Planning Area



Furthermore, construction and operation of the MERGE project will improve active transportation mobility and safety for students and those seeking recreation while also enabling the future expansion of regional and local transit services. In addition to safer transportation for the students, this project will provide better opportunities for lower income residents through greater accessibility to employment, health services, essential services, and recreational activities. The Long-Term Mobility Vision for the City of Greeley is shown in **Figure 9**.

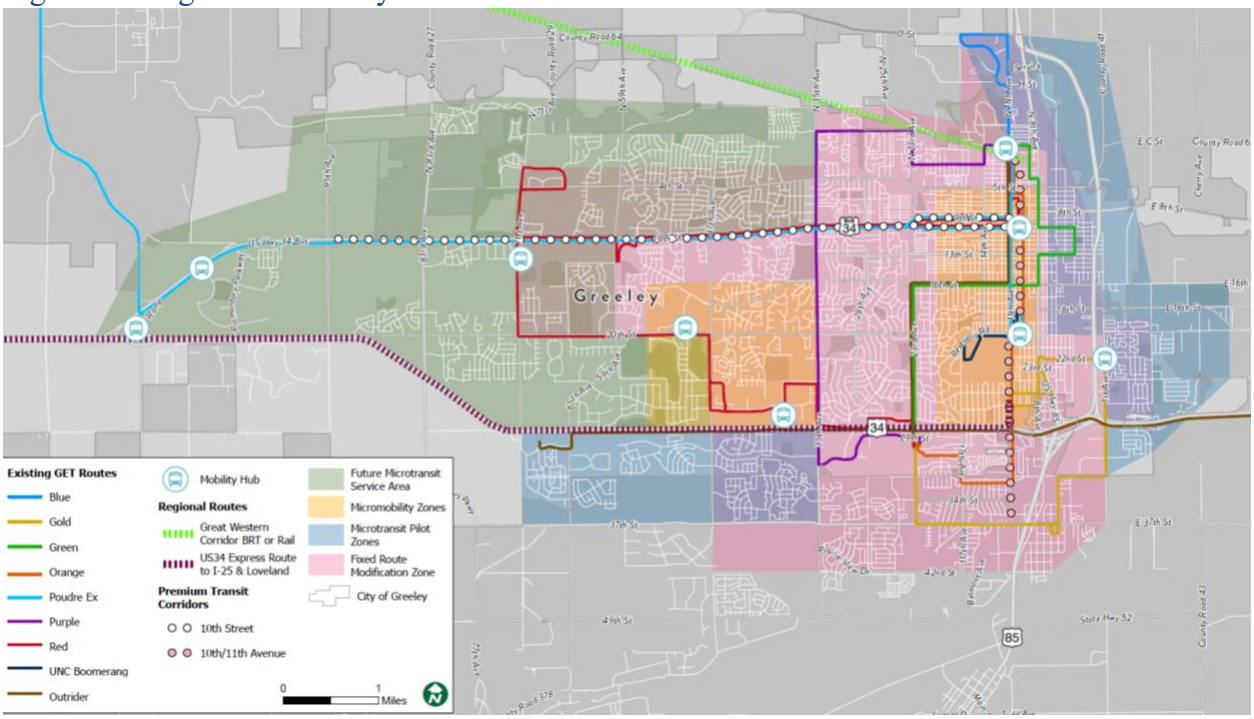
By incorporating multiple transportation components, the MERGE project will generate economic development, enable the future expansion of regional and local transit services, and dramatically improve transit accessibility, efficiency, and safety. The new mobility hub serves the region with the local connection that will allow the City of Greeley to reconfigure its current local transit systems to be more responsive and provide flexible schedules and routes including new micro-transit options to support the needs of the traveling residents.

The following are public and private sector regional partners for the MERGE project:

Public Sector: City of Greeley, NFRMPO, Colorado DOT, University of Northern Colorado, Weld County, City of Loveland, City of Windsor, City of Fort Collins, Greeley Area Chamber of Commerce, Greeley Downtown Development Authority

Private Sector: Leprino Food, JBS Foods, Alquist 3D

Figure 9: Long-Term Mobility Vision



Freight Movement

The MERGE project will increase travel time reliability for freight movement through the City of Greeley.

The MERGE project will be critical infrastructure to support the need of a resilient freight transportation network. One of the key aspects of our local economy is how freight moves through and within the City of Greeley and the greater region. The MERGE project will be transformative to improve traffic operations and safety on US 34, 35th and 47th Avenue and throughout the area which will naturally extend to freight operations as well. This will increase travel time reliability and manage travel demand for freight, especially for supply chain bottlenecks and is identified as a **primary project purpose**. With Greeley as a regional economic hub, the increase in reliable mobility reduces the cost of doing business in and around Greeley and improves the local and regional freight connectivity. Large private sector regional partners with heavy freight traffic, JBS and Leprino Foods, would benefit from the improved east-west mobility along US 34.

Job Creation

MERGE construction will result in the creation of 1,000 job years.

A healthy economic business environment is a main element for sustainable and well-paying jobs. This MERGE project will support hundreds of construction jobs that will spur spending locally, identifying job creation as a **primary project purpose**. The new mobility hub will also provide premium transit services directly to the City of Loveland via US 34, which is finalizing a new Amazon warehouse projected to create 1,000 jobs. The City of Greeley in partnership with the University of Northern Colorado (UNC) will provide important mobility hub micro transit connections to the campus and planned new Osteopathic Medical College. Recently, Alquist 3D, a three-dimensional (3D) concrete printing company has relocated their headquarters and operations to Greeley with City and State incentives. The company's expertise is in printing houses and other infrastructure elements using robots and artificial intelligence. The company has expressed interest to the City of Greeley in 3D printing the new mobility hub. The improved business environment created by the MERGE initiative will enable more local job creation as the commercial hub grows. The mobility hub also expands the potential job pool for these new jobs, as improved regional mobility broadens the area of available labor.

The construction of the MERGE project will result in the creation of 1,000 job years according to the Rulemaking Information Management System (RIMS) II. The interpretation of the RIMS II employment multipliers used in the analysis is as follows. The final demand employment multiplier represents the total change in number of jobs that occurs in all industries for each $1 million of output (in 2020$) delivered to final demand by the industry in question. In this case, costs are allocated between Professional Services (for Design) and Construction, based on the capital cost allocation. The employment effects are expressed in job-years, which are defined as one job for one person for one year. For example, three job-years are equal to three people doing a job for one year, or one person doing a job for three years.

Climate Change, Resiliency, and the Environment

A reduction of 40% of air pollutants is expected as a result of the MERGE project.

The improvements to the US 34 corridor of two new grade-separated interchanges at 35th and 47th Avenues, improved transit service along US 34, and the new mobility hub would lower vehicle emissions by providing improved traffic flow and non-motorized flow in the north-south direction across US 34. By converting the existing at-grade US 34 intersections at 35th and 47th Avenue to grade-separated interchanges, traffic congestion would be reduced, transit efficiency is estimated to improve by 20%, and the amount of fossil fuels consumed would be reduced. An estimated air pollutant decrease of 40% is expected to result with the implementation of the project. Air pollutants include carbon, ozone, particulate matter 2.5 (autos) and diesel particulate matter (trucks) (CMF ID:460).

With respect to environmental justice (EJ), EPA's EJ SCREEN Report (Version 2.2) for the two major Block Groups bisected by US 34 between 35th and 47th Avenues, reveals EJ areas impacted by limited transportation mobility. The two major Block Groups have 40% and 36% averages for "people of color" and "low income", respectively, which are higher than the Statewide and National averages. With respect to Climate Change, on the north side of US 34, Census Tract 08123001409 is ranked a relatively high risk for Climate and Disaster burdens. This tract falls into the 72nd percentile rank for Anticipated Changes in Extreme Weather and the 67th percentile for the prevalence of Impervious Surfaces (from Land Cover).

A grade-separated non-motorized connection across existing US 34 between 35th and 47th Avenues, improved pedestrian sidewalks, ADA accessibility, and added bicycle connections to transit routes would likely create a shift in modes of transportation as people could walk, roll, bike, and use micro mobility (e-bikes and e-scooters) along the corridor. These mode shifts factor into reducing EJ impacts as well as climate change reducing greenhouse gases and improving sustainability/resiliency, and ultimately improving air quality. MERGE clearly benefits the environment over the existing conditions of at-grade intersections at 35th and 47th Avenues and no grade-separated non-motorized crossing of US 34.

Greeley's Energy Action Plan

The City of Greeley, with support from Xcel Energy, adopted an Energy Action Plan in 2019 as a part of Greeley's comprehensive plan - Imagine Greeley. City of Greeley staff worked through Xcel Energy's Partners in Energy. The Energy Action Plan identifies four focus areas: residential, business, educational institution, and municipal. Each focus area has identified goals and specific strategies to help Greeley reach their goals. Three priorities for the community were identified:

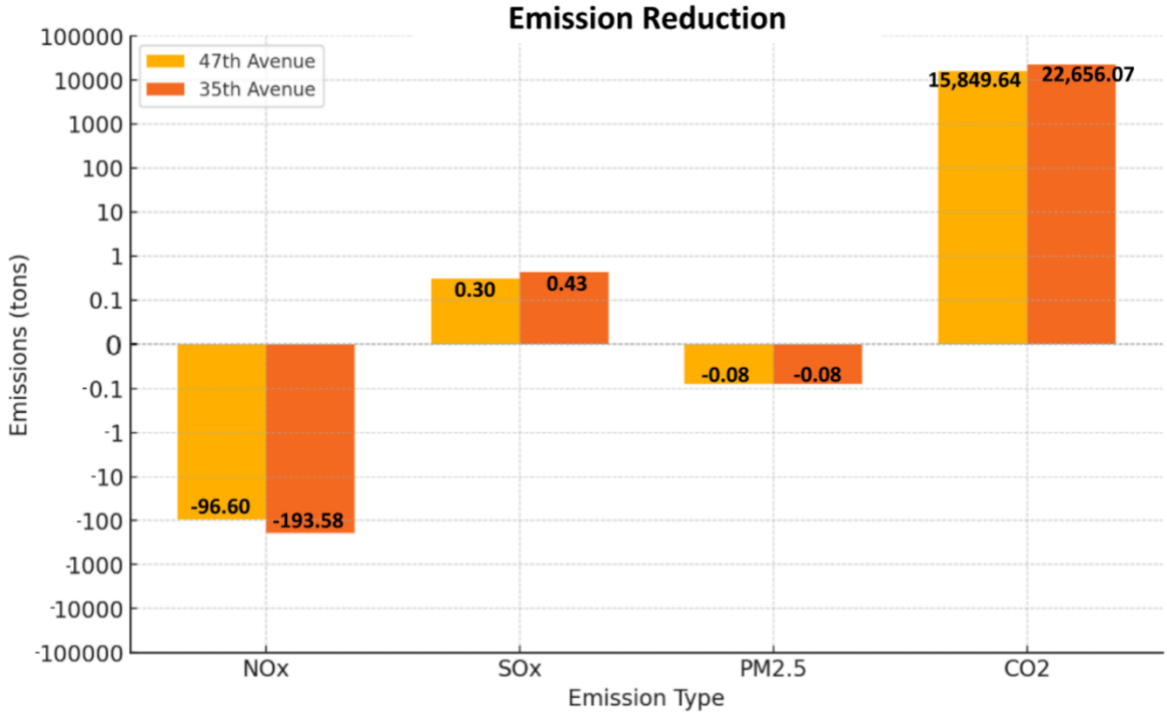
- Create an affordable and reliable energy future.
- Increase residential, commercial, and industrial energy efficiency and alternative energy opportunities.
- Improve economic health and stimulate growth.

Greenhouse Gases

GHG emission reductions will result in a benefit of $6,957,000 for a 7% discount rate over 20-years.

The MERGE project holistically addresses climate change through various resilient infrastructure improvements. This project is inclusive of interchanges instead of signalized intersections, multimodal transportation to and from the new mobility hub, and increased transit ridership will not only decrease local and regional travel times through Greeley but will also decrease greenhouse gas emissions due to less idling time for vehicles. Using the reported NOx and CO2 emissions in SimTraffic and the USDOT recommended emission reduction monetized value, an environmental benefit result is **$6,957,000** for a 7 percent discount rate over the 20-year analysis period (2028-2047). Additionally, there would be an **estimated 3,850-ton reduction of NOx** from the implementation. With these benefits, emissions reduction has been identified as a **primary project purpose**.

Figure 10: Emission Reductions and Increases



In January 2021, Colorado released its Greenhouse Gas Pollution Reduction Roadmap. The Roadmap represents the most action-oriented, ambitious, and substantive planning process Colorado has ever undertaken on climate leadership, pollution reduction and clean energy transition. It lays out an achievable pathway to meet the state's science-based climate targets of 26% by 2025, 50% by 2030 and 90% by 2050 from 2005 levels. The development of the Roadmap was an open, transparent process. State agencies sought input from a wide variety of stakeholders including those most impacted by the effects of climate change.

Electric Vehicle Infrastructure

Numerous electric vehicle (EV) charging stations currently exist in Census Tracts 08123001409 and 08123001406 that cover both sides of US 34 between 35th and 47th Avenues. The proposed

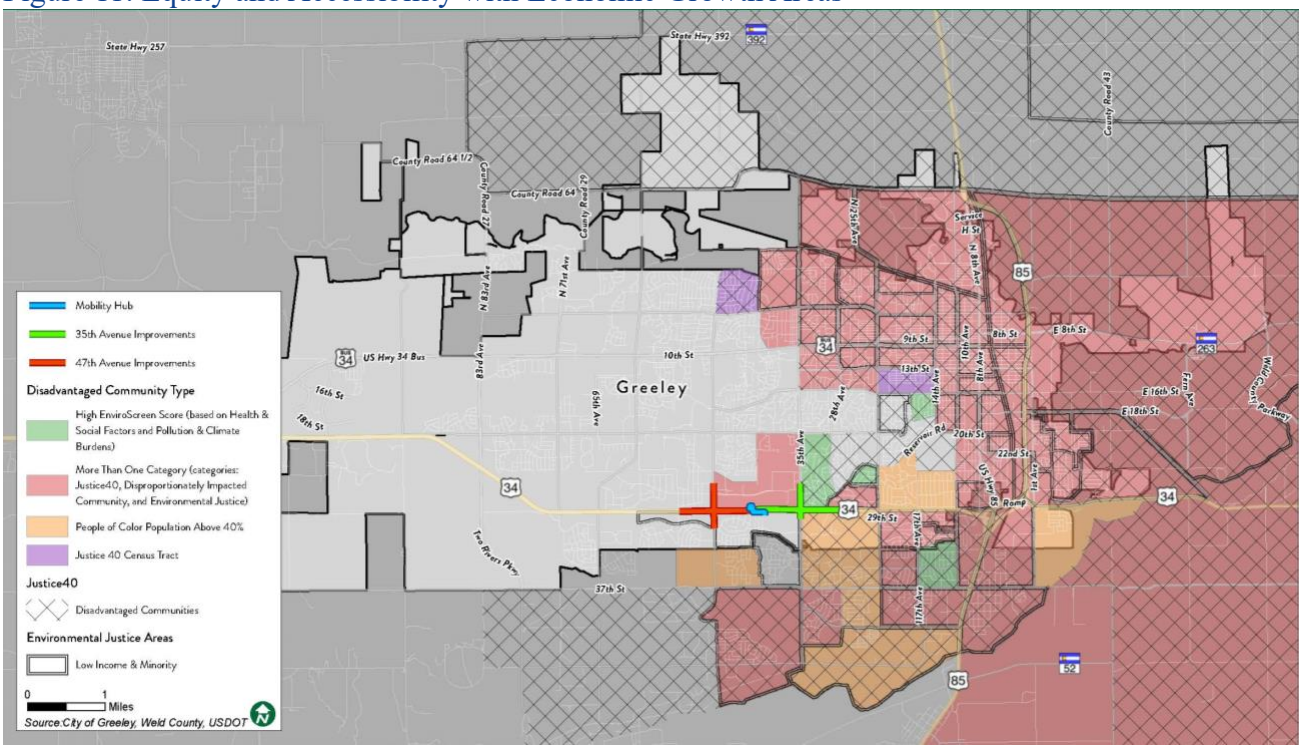
new mobility hub will bring even more stations to this area. Two types of chargers are provided in the area, DC Fast Chargers and Level 2 Chargers. Within Census Tract 08123001409, a mix of the two types of chargers exists. Within Census Tract 08123001406, only Level 2 Chargers exist.

Equity Multimodal Options and Quality of Life

School bus service is not provided within 3 miles of high schools or 2 miles of middle schools in the district, making walkability and the public transit heavily used by students.

The MERGE project will proactively address equity and barriers to opportunity, improve quality of life in the urbanized area of Greeley and the region, and benefit choice neighborhoods, Historically Disadvantaged Communities, and populations in the area by increasing affordable transportation choices and by effectively engaging communities and stakeholders affected by the project.

Figure 11: Equity and Accessibility with Economic Growth Areas



The poverty level around the US 34 corridor ranges from zero to 10 percent in the south and west, 10 to 20 percent in the north and 20 to 30 percent in the east. Poverty level is defined as "families whose incomes do not exceed the greater of 30 percent of the median family income for the area". The project will benefit residents, workers, and students from the adjacent Historically Disadvantaged Communities on the east side of 35th Street (Census Tract 08123001005), north of US 34 (Census Tract 08123001201) and other areas near downtown Greeley as shown in **Figure 11**. Historically Disadvantages Communities is characterized by deficits in the areas of environmental, equity, economy, and health factors by providing the following improvements:

a. On average Greeley residents spend 20% of their income on transportation and spend 20% of their income on housing with the transportation costs averaging $14,808 annually (Source).
b. Existing and future improved bus routes along 35th Avenue and the project corridor are designed to provide access to services and jobs to address limited transportation options.
c. The new mobility hub will provide increased access to jobs via connections to additional and reconfigured local and regional transit routes, new demand-responsive transit, and express bus services to and from Denver.
d. New pedestrian and bicycle connection under US 34 at the mobility hub and improved pedestrian and bicycle facilities on the 35th and 47th Avenue bridges will provide increased walkability and accessibility for people using active transport and micro mobility modes.
e. The mobility hub and multimodal tunnel will be located adjacent to an existing multi-use path on the north side of existing US 34, which will connect to new pedestrian and bicycle infrastructure at the new interchanges and the City of Greeley's active transportation network. All project infrastructure will be constructed with universal design and improved accessibility standards to help encourage modal shifts and increase equity in transportation.
f. Shared micro mobility, car share, transportation network companies (TNC) and other passenger drop-off/pick-up, and EV-charging infrastructure at the new mobility hub will provide additional transportation options for adjacent workers, transit users, and residents.
g. The new mobility hub will be in a central area of existing commercial services and employment for the City of Greeley and adjacent to multi-family housing developments, which will provide new housing options for a greater range of people and households at various income levels.
h. Placemaking and other mobility-related improvements (e.g., seating, art, landscaping, WiFi/charging, retail-access)

The City of Greeley has already conducted the following equitable and inclusive planning and public participation efforts surrounding this project and will continue to engage residents, business owners, school district, and other partners as the project progresses.

a) In 2018, voters passed the Quality of Life tax renewal to raise $30 million dollars to fund improvements at the 35th Avenue and 47th Avenue and US 34 intersections.
b) A pedestrian connection across US 34 near 35th Avenue was stated as the highest priority project for School District 6.
c) Students are known to utilize the 35th Avenue bridge on foot today to cross US 34 to get to and from the high school.
d) Students from local schools and the University are heavy users of the City's transit system as school bus service is not provided within 3 miles of high schools or 2 miles of middle schools in the district.
e) Inclusive and equitable engagement of surrounding neighborhoods and stakeholders will be programmed into each stage of future design and construction of the project.

The new mobility hub as part of the MERGE project is shown in **Image 6**. The new mobility hub is directly between the proposed 35th and 47th Avenue interchanges with a local bus station (north side of existing US 34). In connection with transit services and other mobility hubs in Greeley shown in **Figure 7**, the new mobility hub would support active and sustainable transportation with modal flexibility, including direct regional-local bus transfers, bike and scooter sharing, ADA parking, and electric vehicle charging stations. The new mobility hub directly connects to the regional bus station within the center of US 34 between the interchanges via a pedestrian underpass of US 34. **The new mobility hub and the other eight mobility hubs create nine new half-mile areas of influence, dramatically improving accessibility for residents in Justice40, Disproportionately Impacted Communities, Environmental Justice and Transportation Insecure areas**.

In addition to improving north-south traffic safety and efficiency along US 34 and along 35th and 47th Avenues as described in the *Safety* section; the MERGE project will eliminate a significant north-south mobility barrier and safety concerns for active transportation users. The existing at-grade crossings are heavily used by students walking or biking to schools which, when coupled with other multi-modal improvements, will further enhance overall US 34 corridor mobility, address equity, and improve the quality of life. All of which demonstrates that Equity, Multimodal Options, and Quality of Life are **primary project purposes** of the MERGE project.

In summary, the project will improve connectivity for residents, workers, and students from the adjacent communities on the east side of 35th Street, north of US 34 and other areas near downtown Greeley through:

a. Improved pedestrian sidewalks and ADA accessibility.
b. Current and upcoming enhanced bus routes along 35th Avenue and the project corridor aim to offer residents in this area, who have limited transportation options, improved access to services and job opportunities.
c. The proposed mobility hub is set to enhance job accessibility by connecting to revamped local and regional transit routes, introducing demand-responsive transit, and facilitating express bus services to and from Denver.
d. Enhanced walkability and accessibility for individuals utilizing active transportation and electric micro-mobility modes will be achieved through the introduction of a new pedestrian and bicycle connection beneath US 34 at the mobility hub, along with improved pedestrian and bicycle facilities on the 35th and 47th Avenue bridges.
e. The new mobility hub will offer supplementary transportation choices for nearby workers, transit users, and residents, including shared micro-mobility, car-sharing, transportation network companies (TNC), passenger drop-off/pick-up services, and EV-charging infrastructure.
f. The mobility hub and multimodal tunnel will be positioned alongside an existing multiuse path on the north side of the current US 34. This path will link up with the new pedestrian and bicycle infrastructure at the upcoming interchanges and integrate with the City of Greeley's active transportation network.

Innovation

The entire micro-transit fleet will be 100% powered through solar arrays located at the mobility hub.

Innovative Technology

The MERGE project has tremendous capability for utilizing/integrating innovative technologies. Intelligent Transportation Systems (ITS) technologies have a long-established absence in smaller metropolitan areas due to lack of funding. Development of Vehicle-to-everything (V2X) infrastructure in cities like the City of Greeley and in facilities like the new mobility hub. Connected vehicle infrastructure has been deployed to improve the overall efficiency of transit operations and in similar corridors in and around this area. V2X can also provide and enhance the reliability of connected and autonomous vehicles (CAV) deployments as they mature and expand into smaller cities. This suite of advancements includes both active measures such as controlling the vehicle's steering and braking as well as passive measures such as notifying drivers about the environment such as stopped emergency vehicles or pedestrian/bicyclists on the roadway ahead.

In addition, the mobility hub facility itself will be a stage for innovative technology. With a goal to be a true net-zero facility, the hub will utilize EV charging technology for both passenger vehicles and the micro-transit units. The entire micro-transit fleet will be 100% powered/charged through solar arrays located at/on the hub facility. Alquist 3D has relocated their headquarters and operations to the City of Greeley. The company uses robotics and artificial intelligence to 3D print concrete houses and other infrastructure elements. The company has expressed interest in collaborating on the MERGE project to use their technology in construction of the mobility hub and the underpass, making the structures carbon negative. Additionally, Driven Plastics headquarters is in Colorado, which recycles landfill-bound plastics into an asphalt additive. Through this innovative process, up to 10 tons of plastic can be used in one mile of roadway. The City will work to incorporate Drive Plastics innovation as well in the MERGE project.

Innovative Project Delivery

The MERGE initiative will be utilizing a CDOT approved alternative project delivery processes. The City of Greeley and CDOT proposed to use the Construction Manager General Contractor (CMGC) as the best method of delivery for the MERGE project. CMGC ranked highest in the areas of project complexity and innovation, project cost considerations, and risk assessment. This alternative project delivery method allows for continuous value engineering and real-time feedback on design costs and provides critical input on constructability, real-time industry costs and phasing. The Draft Project Delivery Selection Matrix is presented in the **Appendix C**.

Financing

In terms of innovative financing options, the City of Greeley is and will continue to evaluate availability of Federal and State grant programs and intergovernmental agreements with surrounding cities and Weld County to help offset the City's match on this project. The City of Greeley has independently applied for TIFIA federal funding for the 35th Avenue interchange, 47th Avenue interchange, and new mobility hub as independent utility projects instead of as one MERGE project. As part of the TIFIA application, the City of Greeley has scheduled regular check-in meetings with FHWA as the MERGE project goes through the NEPA process and will coordinate financing opportunities going forward. The draft LOIs submitted to TIFIA are presented on the **project website**.