CO/WY TRANSIT FEASIBILITY STUDY

TRANSIT MARKET ANALYSIS

CO-WY TRANSIT FEASIBILITY STUDY

CDOT, WYDOT, & Cheyenne Metropolitan Planning Organization

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Acronyms

CDOT	Colorado Department of Transportation
CSU	Colorado State University
CTP	Cheyenne Transit Program
GET	Greeley-Evans Transit
LBS	Location-Based Services
MPO	Metropolitan Planning Organization
NFR	North Front Range
OTIS	Online Traffic Information System
TAZs	traffic analysis zones
TDMs	travel demand models
UNC	University of Northern Colorado
WYDOT	Wyoming Department of Transportation

1.0 Introduction

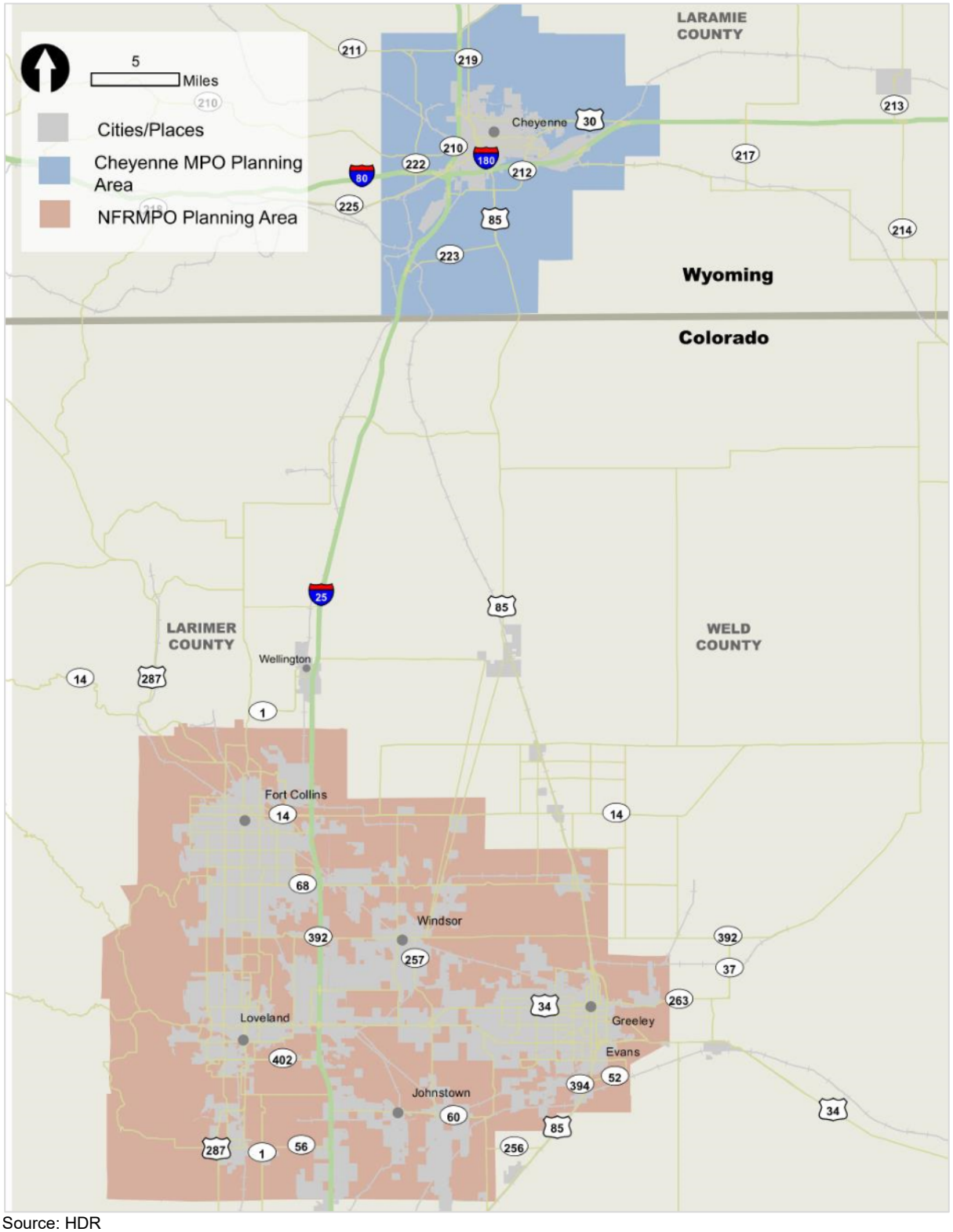
The CO-WY Transit Feasibility Study is a feasibility analysis of transit connection(s) between the north front range communities of Colorado and the Cheyenne, Wyoming, area. The feasibility study is a collaborative effort managed and funded by the Colorado Department of Transportation (CDOT), the Wyoming Department of Transportation (WYDOT), and the Cheyenne Metropolitan Planning Organization (Cheyenne MPO). These groups are collectively referred to as “the partners.”

The feasibility analysis examines the viability of a premium transit connection between the North Front Range (NFR) region of Colorado and the Cheyenne metropolitan area (Cheyenne). The feasibility study includes examination of transit markets/demand, potential routing/termini, evaluation of technology/ amenities, and the overall potential benefits to communities. The study area for the feasibility analysis is illustrated in Figure 1-1.

A transit market analysis is the first step of the feasibility study. The market analysis assesses the current travel market to determine the potential current and future demand for the proposed transit service. The analysis is focused on long travel patterns between the major communities of the NFR region as opposed to shorter, local patterns within the individual communities. The partners will utilize this information and the project team’s recommendations to identify future premium transit routes and determine if demand is deemed sufficient to support new transit service.

This document has been developed to summarize the transit market analysis methodology and present findings that will assist in the corridor evaluation and alternatives development steps of the feasibility study.

Figure 1-1. Study Area



Source: HDR

2.0 Overview

This transit market analysis includes the following:

- Existing transit, traffic, and socioeconomic conditions analysis
- Existing and future travel market activity and trip origin/destination pattern analysis
- Existing transit propensity analysis

For the existing conditions analysis, this travel market analysis reviewed existing and planned transit system information for the Cheyenne area and the NFR region, as well as connections between them. Traffic count data from CDOT were compiled for the major highway connections between Cheyenne and the NFR region. The analysis also reviewed socioeconomic conditions in the area based on data from the travel demand models (TDMs) in the region.

The travel market analysis included an analysis of big data and TDM data. The big data analysis analyzed trip activity and travel origin/destination data provided by StreetLight Data. The TDM analysis summarized trip activity and the existing/future origin-destination patterns from the North Front Range MPO (NFRMPO) travel demand model (NFR Model), the Cheyenne area TDM (Cheyenne Model), and the CDOT Statewide Focus Model (CDOT Model).

The transit propensity analysis considered community and population demographics. Communities and areas within Cheyenne and the North Front Range with high propensity to utilize transit were identified.

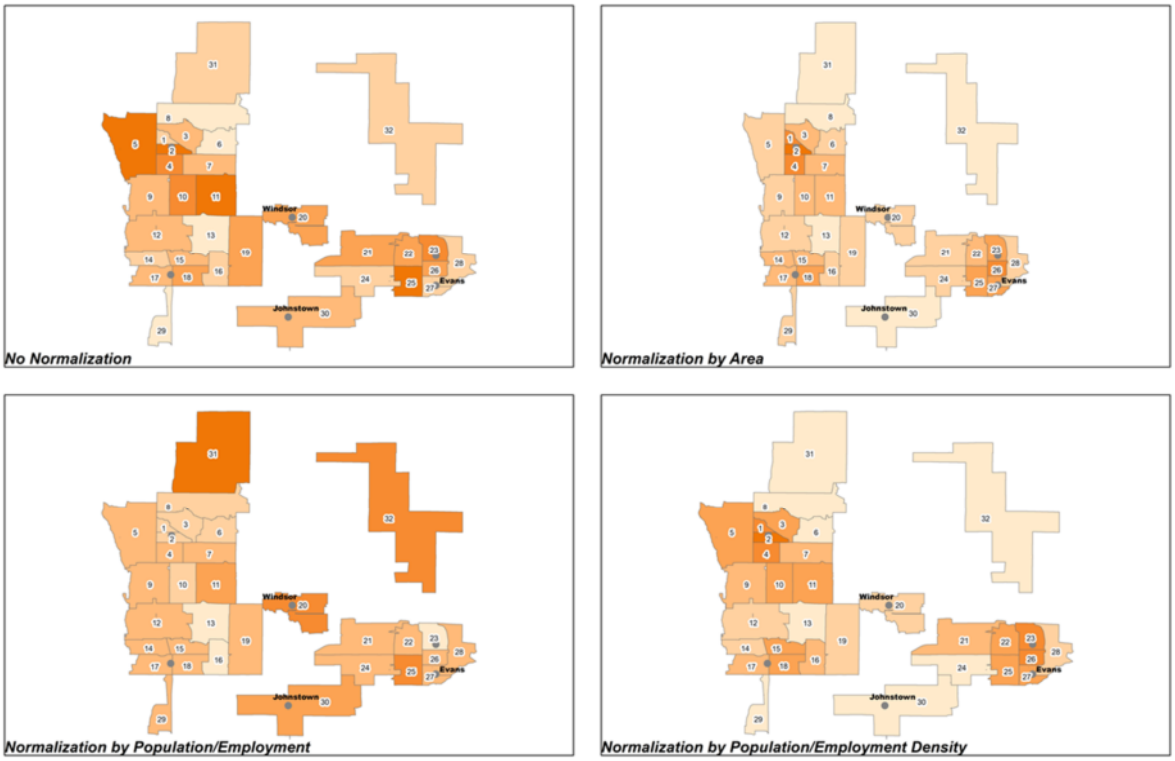
The results from these analyses were compiled and a set of areas identified and recommended for consideration in the alternatives analysis as potential stop locations or areas to be served by future transit.

2.1 Data Normalization

During the data analysis, data elements were analyzed and compared using aggregated data compiled for various “zones” within the study area. These zone types may include traffic analysis zones (TAZs), census blocks and tracts, or zones developed for the big data analysis. To avoid over-emphasizing areas due to differences in zone size, a method of normalizing data was necessary.

Three methods of normalizing the data were tested: by area, by population/employment, and by population/employment density. An example showing the varying results for each method for zone activity (number of vehicle trips originating/destined for a zone) within the NFR region is shown in Figure 2-1. Zone activity is represented by shade—lighter shades indicate lower activity (fewer trips to/from a zone) and darker shades represent higher activity (more trips to/from a zone). Note that the different normalization methods were also reviewed for the Cheyenne area.

Figure 2-1. Data Normalization Methods



Further description of the methods of analysis, in this instance for zone activity, are described below:

- **No-Normalization**—Illustrates total zone activity. This method can be misleading, as larger geographic zones may appear to be busier.
- **Normalization by Area**—Illustrates zone activity per given area, removing bias related to the size of a zone. Smaller zones with high activity are not lost in the analysis.
- **Normalization by Population/Employment**—Illustrates activity per number of residents and jobs, removing bias related to land use (e.g., residential, office). Large rural zones, with low population/employment, tend to be overrepresented.
- **Normalization by Population/Employment Density**—Illustrates activity per resident and job per acre, removing bias related to development density. This method tends to provide results somewhere between normalization by area and no normalization.

A review of each of these methods was performed. This review found that no-normalization, normalization by population and employment, and normalization by population and employment density each have its limitations. No-normalization tends to skew results heavily toward larger zones. When normalized for total population and employment or population and employment density, certain zones exhibit high activity when they have very low overall totals.

Ultimately, normalization by area was used as the primary analysis method. As noted above, this technique essentially removes bias related to the size of a zone allowing smaller zones to be compared on a more even playing field. This methodology was used for much of the analysis.

2.2 Existing Conditions

This section describes the existing conditions within the study area. Included are existing/planned transit systems within the study area, traffic volumes along the major highways connecting the two regions, and socioeconomic data within each area.

2.2.1 Existing Transit Systems

Existing bus service is limited between Colorado and Cheyenne. Two private carriers provide service connecting the regions: Greyhound and Groome. Greyhound currently provides Cheyenne-Fort Collins service and Cheyenne-Greeley service. The Cheyenne-Fort Collins service includes trips in both directions, twice per day. The Cheyenne-Greeley service operates once per day in both directions. Groome is an airport shuttle service that connects Cheyenne with Denver International Airport.

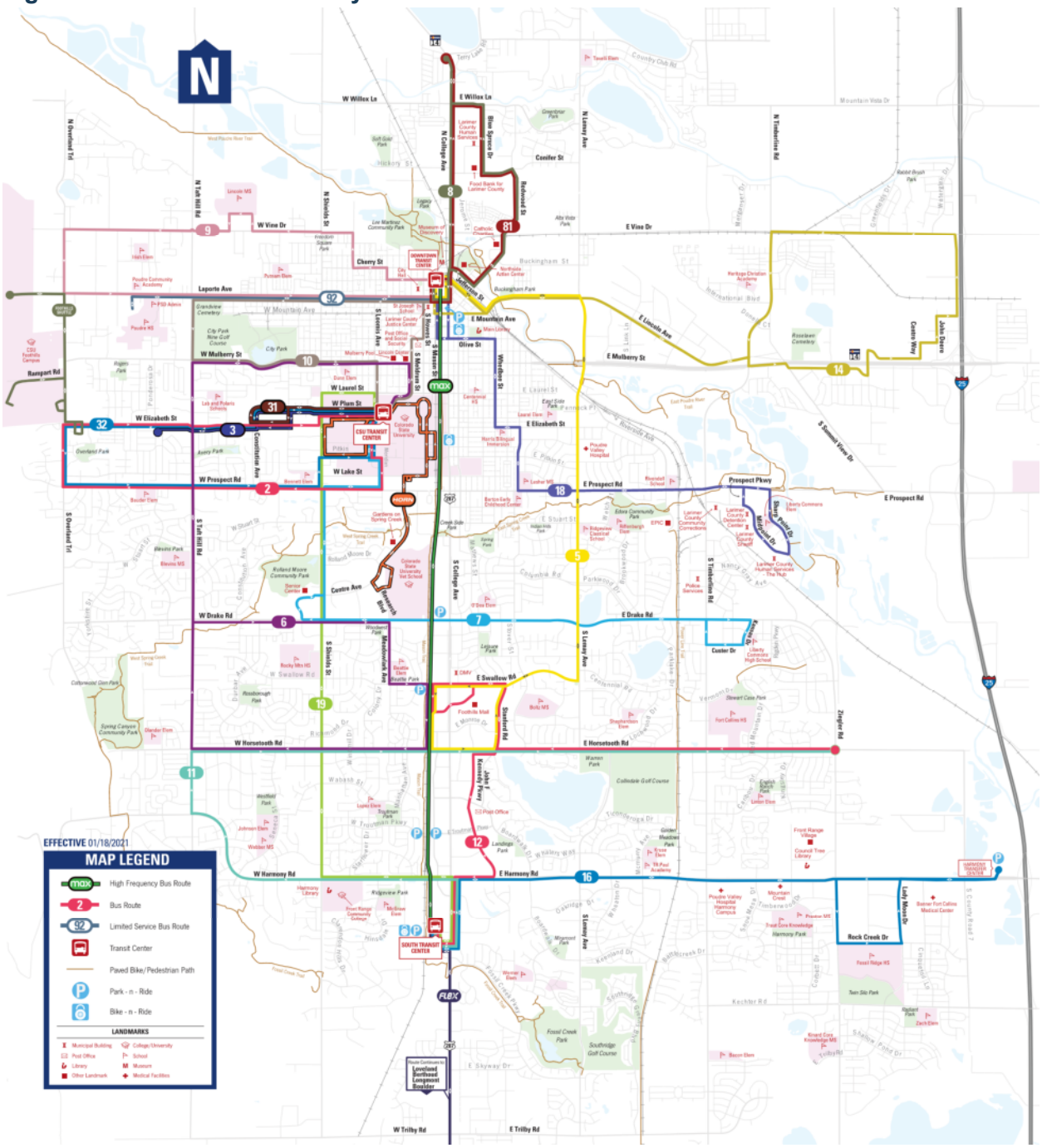
Despite the lack of regional connections between the Cheyenne area and the NFR region, there are several transit systems within the individual communities as well as regional bus service between Fort Collins and Denver. In the NFR region, all three of the major communities are served by their own transit systems: Transfort in Fort Collins, City of Loveland Transit (COLT), and Greeley-Evans Transit (GET) in Greeley. The Cheyenne area is served by the Cheyenne Transit Program (CTP). In addition to the local transit systems, CDOT provides regional bus service from Denver to Fort Collins via Bustang.

2.2.2 NFR Region Transit Services

Transit services in the NFR region include Transfort, COLT, and GET. Transfort, illustrated in Figure 2-2, serves Fort Collins with 23 bus routes. Among these routes are a frequent bus service called MAX between the Fort Collins downtown transit center and the south transit center and regional routes to Boulder, Longmont, and Loveland called FLEX. A transit center also serves the Colorado State University (CSU) campus. The service connects to Transfort's Harmony Transfer Center for airport shuttles and regional transportation connections.

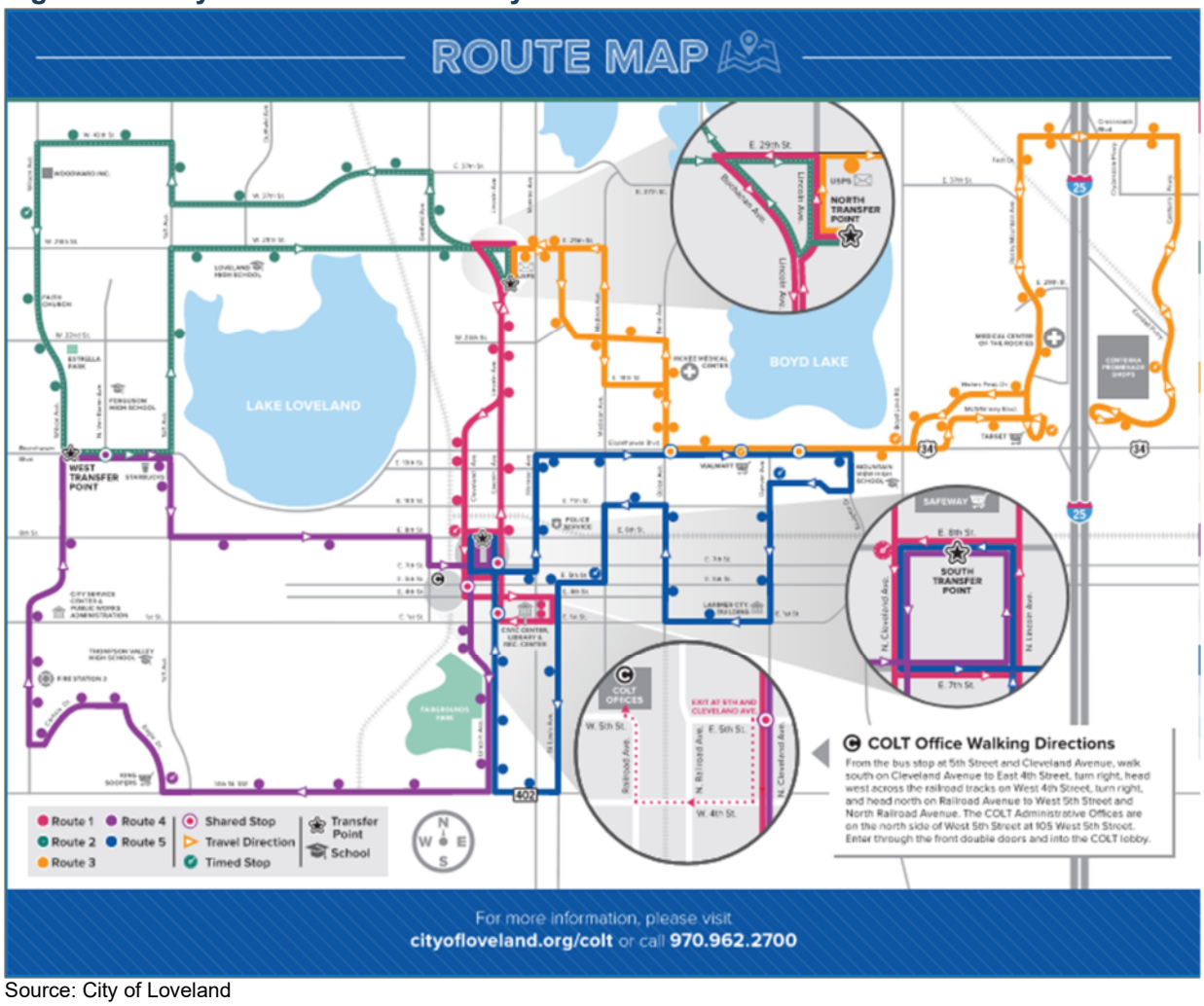
Loveland is served by COLT Transit, which operates five routes within Loveland, illustrated in Figure 2-3. Most routes are hourly frequencies, with two routes having 30-minute frequencies. Major nodes of the system are the South, West, and North transfer points. COLT does not offer any regional routes, however one of the bus routes serves the large Centerra development on the east side of Loveland.

Figure 2-2. Transfort Transit System



Source: City of Fort Collins

Figure 2-3. City of Loveland Transit System



Source: City of Loveland

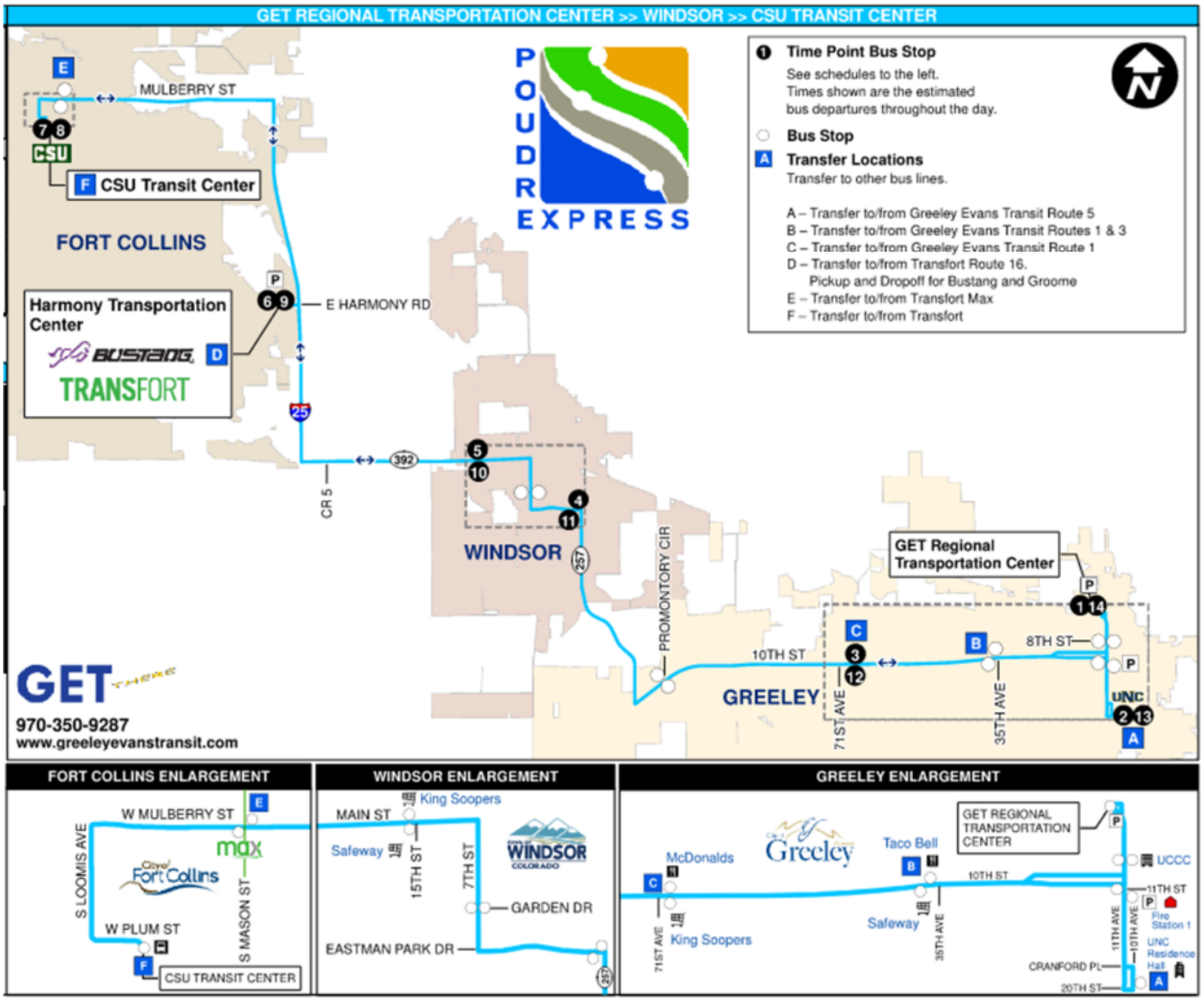
Greeley is served by GET which offers six routes, illustrated in Figure 2-4. Major nodes within the system include the GET Regional Transportation center north of downtown and the Greeley Mall Transit Center.

A regional connection known as the Poudre Express connects Fort Collins and Greeley. The route, illustrated in Figure 2-5, includes stops at the GET Regional Transportation Center, the CSU Transit Center in Fort Collins, and an intermediate stop in Windsor.

Figure 2-4. Greeley Evans Transit System

Source: Greeley Evans Transit

Figure 2-5. Poudre Express

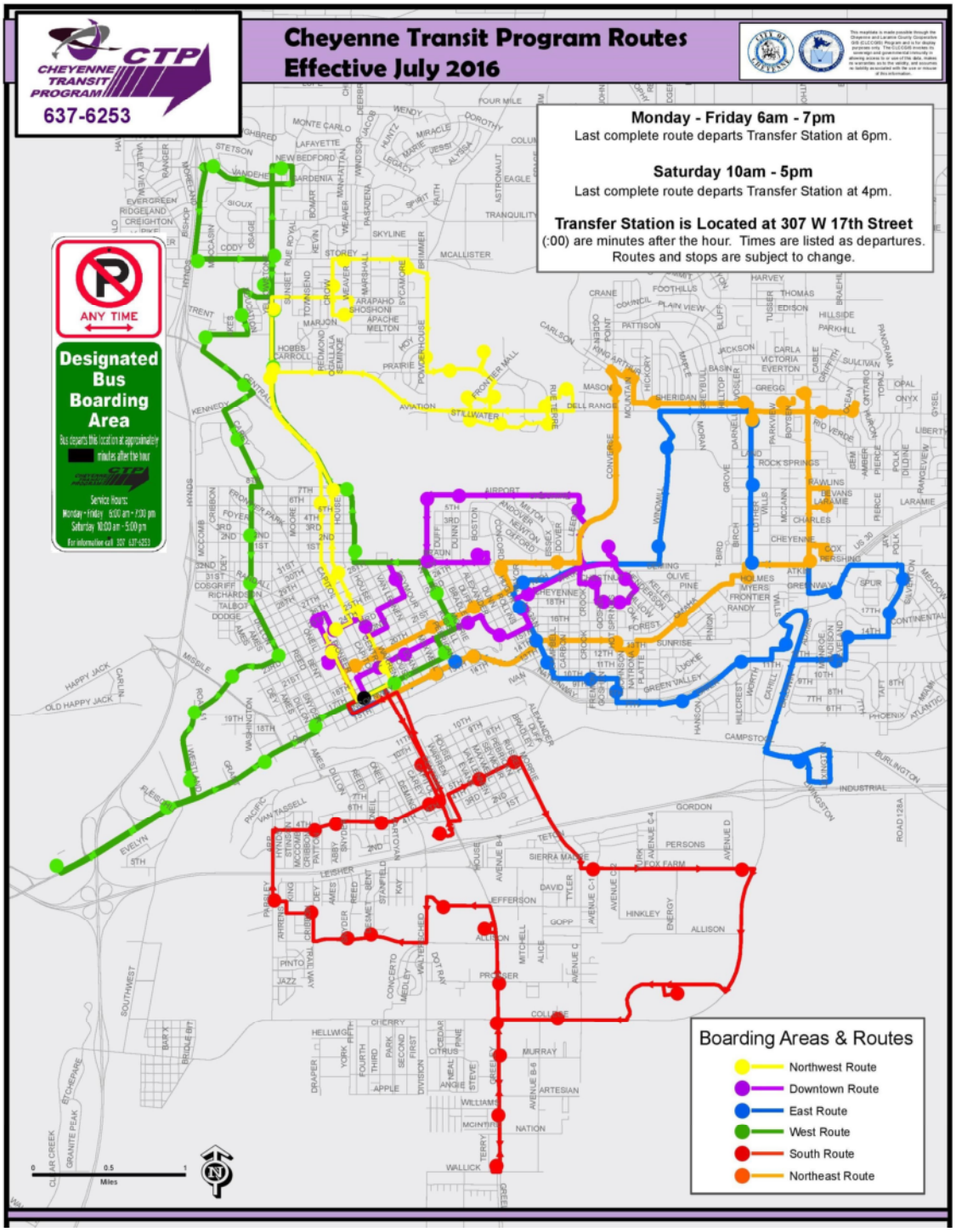


Source: Greeley Evans Transit

2.2.3 Cheyenne Transit Services

The Cheyenne transit system from 2019, pre-pandemic conditions, is illustrated in Figure 2-6. The system today does not include fixed route service, which has been suspended since March 2020. All transit is operated as an on-demand service, providing services much like a call-n-ride. A transit planning study is currently underway that will result in updated routing for the near-term and develop future route and station plans for Cheyenne.

Figure 2-6. Cheyenne Transit Program

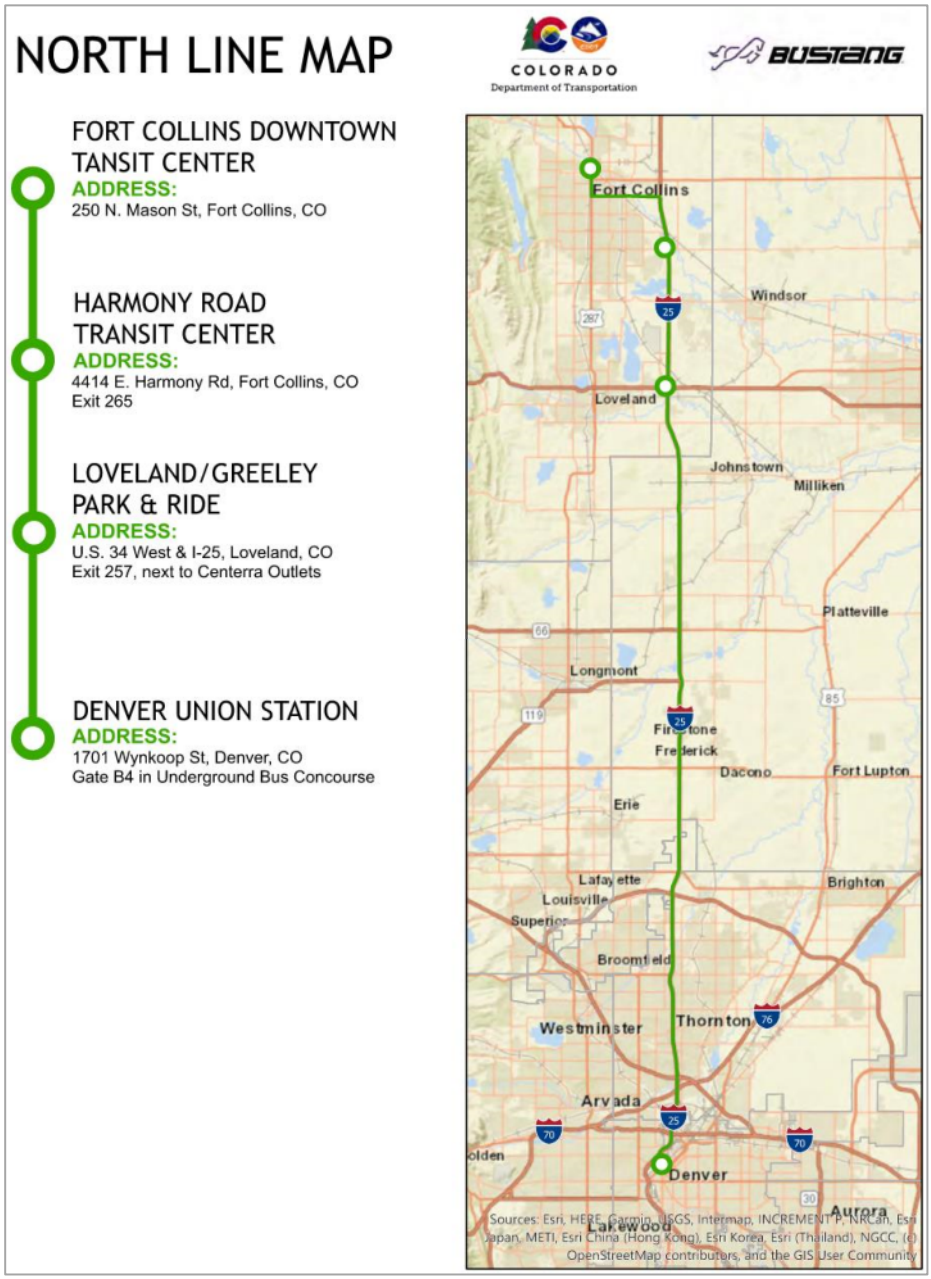


Source: Cheyenne Transit Program (City of Cheyenne)

2.2.4 CDOT Regional Transit Services

CDOT's regional bus system, Bustang, includes routes that serve the NFR region via the I-25 corridor. The current North Line Bustang route is illustrated in Figure 2-7. The system stops at Loveland, providing connections to COLT routes. It goes on to stop at the Harmony Transit Center before terminating at the Fort Collins Downtown Transit Center. Both Fort Collins stations connect to Transfort routes. CDOT is currently reviewing the Bustang system and there is the potential to add buses along routes within the existing network.

Figure 2-7. Existing CDOT Bustang Routes



Source: CDOT

2.2.5 Existing Traffic Volumes/Travel Times

Existing traffic count data were compiled from CDOT's Online Traffic Information System (OTIS). Traffic counts along I-25 and US 85, the major connections between the regions, are illustrated in Table 2-1.

Using existing counter data at two counter locations, counts at the CO-WY border were estimated for year 2019 at a daily two-way volume of 24,800 vehicles. The counter on US 85, north of CR 108, is a continuous counter that shows a two-way daily average of 3100 vehicles along the highway in 2019. Combined, these two facilities are estimated to have carried about 28,000 two-way daily vehicles in 2019 at the CO-WY border.

Table 2-1. Daily Traffic Counts

Counter ID	Highway	Location	2019 Average Annual Daily Traffic
101039	I-25	North of SH 1 (Wellington)	31,100
000153	I-25	CO-WY Border	24,800*
000215	US 85	North of CR 108	3,100
Estimated Combined Volume at I-25 & US 85 at CO-WY Border			28,000

Note: * Counts at Station 000153 were estimated for 2019 based on counts during 2020 and counts from the 000215 counter.
Source: CDOT, HDR

Existing travel times under free-flow conditions were compiled for locations within the NFR region to/from downtown Cheyenne. The travel times, illustrated in Table 2-2, allow for an understanding of how trip length may affect trip activity between the regions. along I-25 and US 85, the major connections between the regions, are illustrated in Table 2-1.

Table 2-2. Free-Flow Travel Times to/from Downtown Cheyenne

Origin/ Destination	Shortest Route	Approximate Free-Flow Travel Time
Fort Collins - Downtown	Via I-25	45 minutes
Loveland – Centerra	Via I-25	50 minutes
Loveland - Downtown	Via I-25	60 minutes
Greeley – Downtown	Via US 85	60 minutes
Wellington	Via I-25	30 minutes

Source: Google Maps

2.2.6 Existing Socioeconomic Status

An assessment of the existing socioeconomic profile of the analysis area provides a baseline picture of the conditions in which transit is operating today. For the NFR region, total household and employment data were drawn from the "baseline" year 2015 and horizon year 2045 NFR models, as illustrated in Figure 2-8 and Figure 2-9, respectively. For the Cheyenne area, household and employment data were drawn from the baseline year 2019 and the horizon year 2045 Cheyenne models, as illustrated in Figure 2-10 and Figure 2-11, respectively.

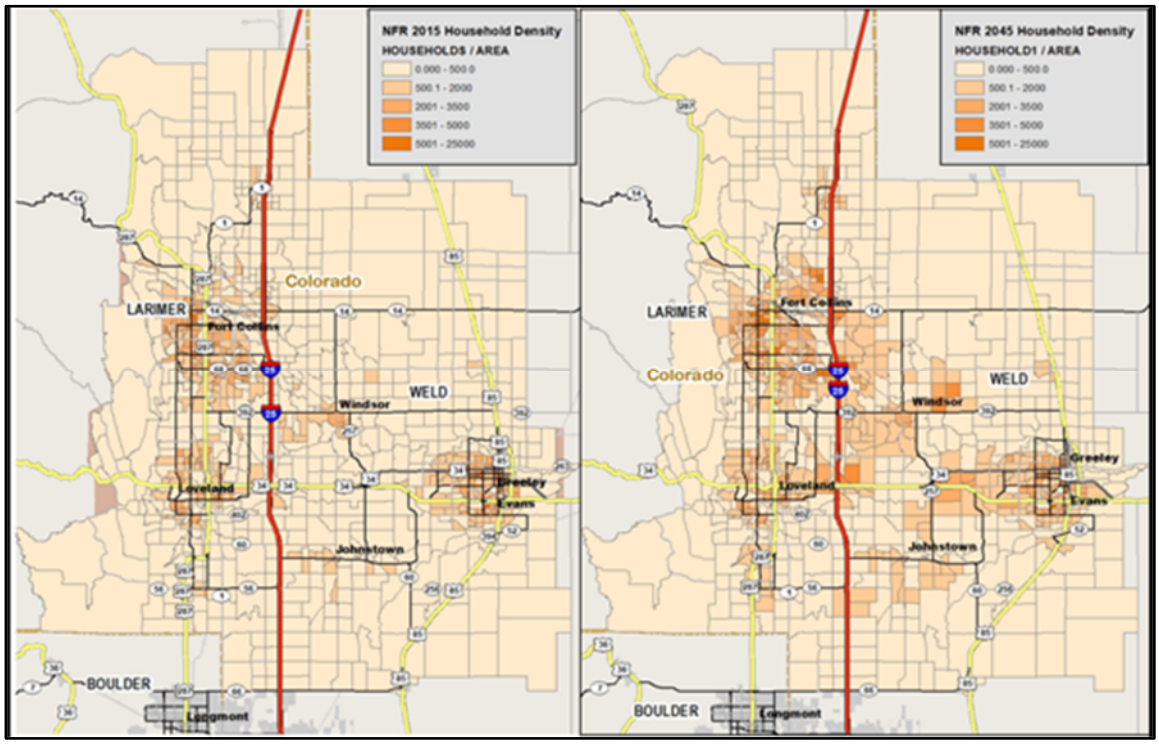
The NFR region of the study area includes approximately 195,000 households and 282,500 jobs in 2015. The areas with greater population are concentrated in the region's three largest cities of Fort Collins, Greeley, and Loveland, with some considerable population in smaller cities such as Windsor and Johnstown. Population density is greatest in Fort Collins, particularly near CSU and downtown areas. Other areas with relatively high population density include limited areas of downtown Loveland and areas of Greeley near downtown and the University of Northern Colorado. Future growth is expected throughout the region, especially along the I-25 corridor, US 34 corridor, and in the Windsor area.

Major employment centers in the region are in eastern Fort Collins, in Loveland near the junction of US 34 and I-25, and in downtown and western Greeley. As with household growth, future employment growth is expected throughout the region with high growth along the I-25 corridor in eastern Loveland, in western Greeley, and in the Windsor area.

The Cheyenne region includes approximately 39,200 households and 43,400 jobs in the year 2015. Population in the Cheyenne study area is greatest in the areas east of US 85 downtown, south of US 30 in the eastern part of town, northeast of the airport, and west of I-180. Eastern downtown has the greatest population density in the study area. Increases in household density are projected north of the airport and to the south of I-80 within and east of South Greeley.

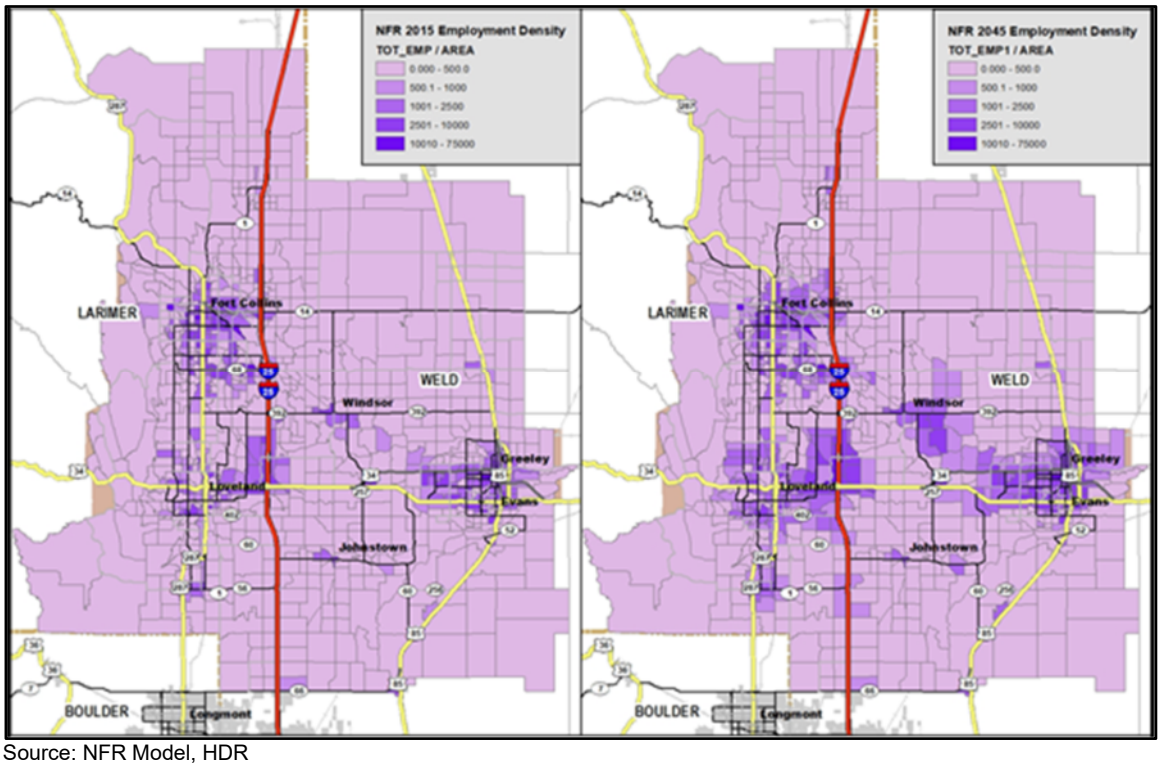
Areas of Cheyenne with high employment include portions of downtown west of US 85, the eastern portion of the city north of I-80, and in areas north of the airport. Downtown Cheyenne has the greatest job density. Future employment projections show growth throughout the area, with areas south of I-80 near Laramie County Community College and west of I-25 south of College Drive exhibiting some of the highest growth.

Figure 2-8. NFR TDM Household Density



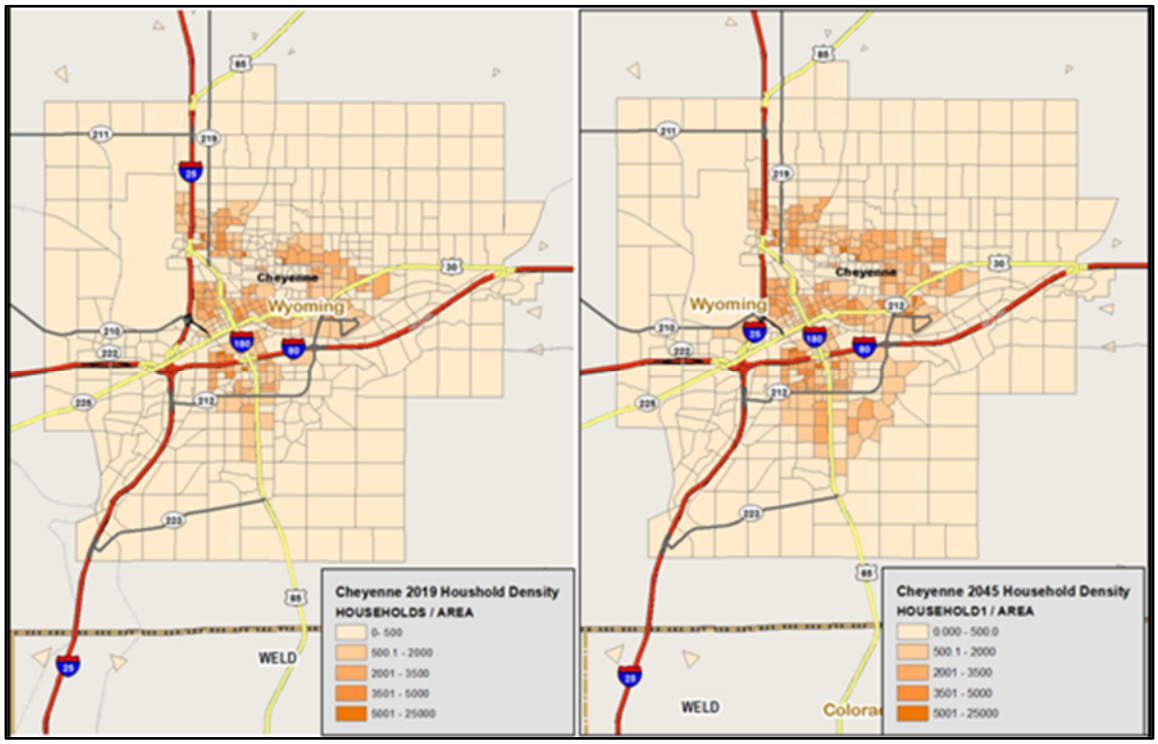
Source: NFR Model, HDR

Figure 2-9. NFR TDM Employment Density



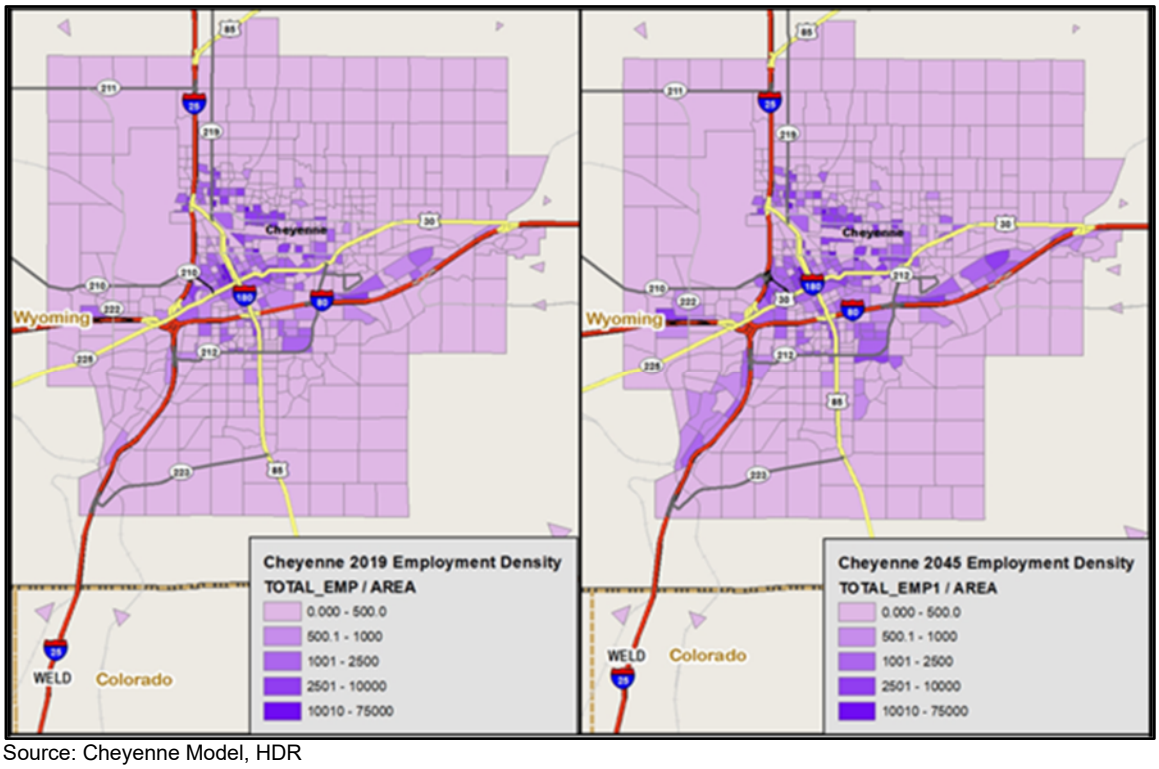
Source: NFR Model, HDR

Figure 2-10. Cheyenne Model Household Density



Source: Cheyenne Model, HDR

Figure 2-11. Cheyenne Model Employment Density



Source: Cheyenne Model, HDR

3.0 Travel Market Analysis

This section describes the travel market analysis performed for this study. A travel market analysis of this type examines trip patterns within a given area, considering travel activity, trip origins/destinations, and travel mode, and how the transportation system serves these trips.

Real-world travel pattern data provided by StreetLight Data, a big data provider, were compiled and analyzed for this study. Additionally, travel demand model demographic inputs and travel outputs from the NFR Model and Cheyenne Model were reviewed, both existing and horizon year models.

3.1 Big Data Analysis

Existing traffic condition data were collected using StreetLight Data. This section describes StreetLight Data, the methodology for analyzing the data, and the resulting trip activity and origin-destination patterns.

3.1.1 StreetLight Data Background

StreetLight Data is a data analytics provider that allows users to access an online platform, StreetLight Insight, for analyzing mobility patterns. StreetLight Insight users can analyze “big data” resources using StreetLight Data’s processing software and provides comprehensive metrics to identify typical mobility behaviors. Big data in this instance includes extremely large data sets that may be gathered and analyzed to reveal human behavior as it relates to travel patterns and trends. StreetLight Data processes a large representative sample of geospatial records from two main sources: Location-Based Services (LBS) data, which is generally available via cell phone applications, and Navigation-GPS data, which is generally available from devices that help navigation like those found in commercial fleet management systems.

StreetLight Data develops trips by processing the “pings” from a given device. As a device’s location begins to change and crosses a certain distance threshold, a trip is initiated. A trip is considered at its end when the device stands still for a certain amount of time, generally several minutes or more. Trips that are observed to begin or end at locations that do not make sense, such as in the middle of a roadway, are removed from the dataset. Different modes of travel generally exhibit different characteristics of speed, acceleration, route, etc. If a device appears to switch modes during a trip (e.g., automobile to walking), the initial trip is considered complete and a new trip is initiated.

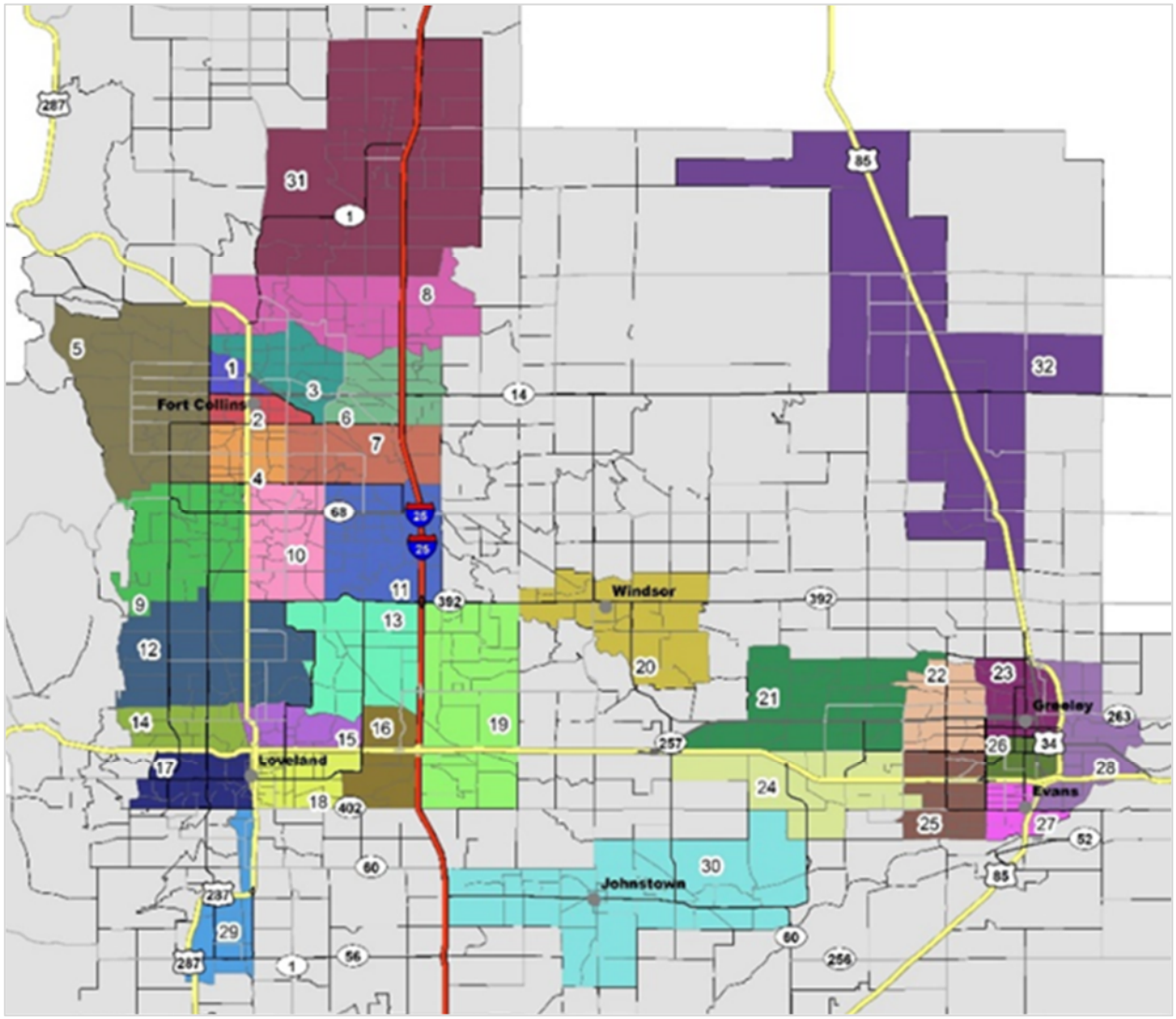
The resulting outputs from the analysis are obtained as anonymized, aggregated vehicle trip totals. The data includes vehicle trip activity and origin/destination patterns. Vehicular trips may occur via personal vehicles, trucks, or transit.

3.1.2 Methodology

Data inputs for this analysis included a set of origin and destination zones and date and time period sets. This analysis focused on data from the spring (April-May) and fall (September-October) of 2019 (pre-Covid). Daily trip patterns for a typical weekday (Tuesdays, Wednesdays, and Thursdays) were the focus of the analysis. Peak period patterns did not differ significantly from daily patterns.

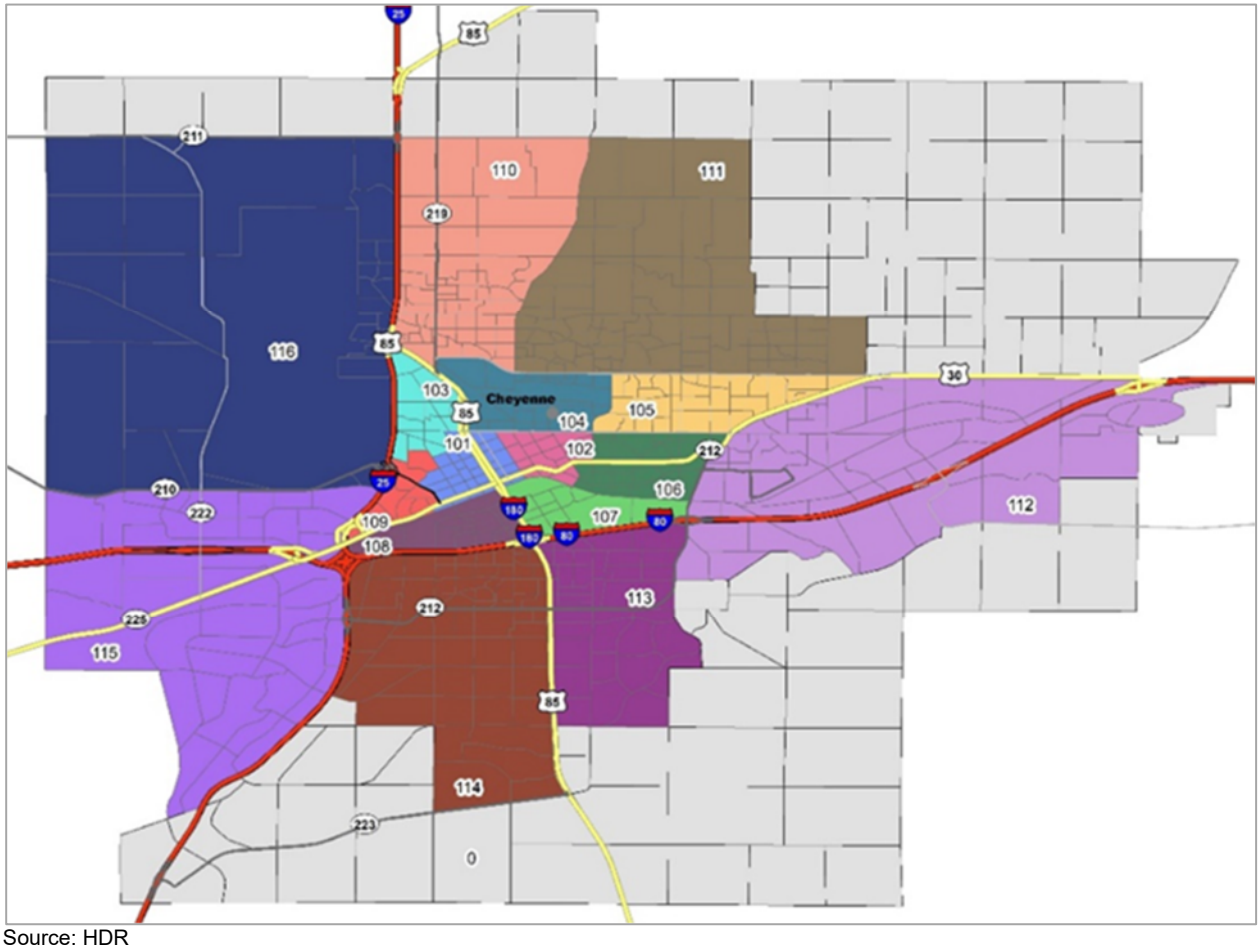
For this analysis, the NFRMPO region was divided into 32 origin/destination zones to analyze trip patterns. The zones are shown in Figure 3-1. The Cheyenne area was divided into 16 zones, illustrated in Figure 3-2.

Figure 3-1. NFR StreetLight Analysis Zones



Source: HDR

Figure 3-2. Cheyenne StreetLight Analysis Zones



Source: HDR

3.1.3 Traffic Count Comparison

Results from the big data analysis were compiled and compared to CDOT OTIS traffic count data. This comparison was performed in order to confirm that the StreetLight Data results and the overall trip totals between the two regions appear to be reasonable.

25%

Estimated portion of I-25/US 85 vehicle trips at the CO-WY border that begin **AND** end within the NFR region zones and the Cheyenne area zones.

The daily vehicle trip volumes between the NFR region zones and the Cheyenne area zones were compiled to estimate an overall daily volume between the regions according to StreetLight Data. An average of about 6,800 daily vehicle trips travelled between the region zones. Because I-25 and US 85 are the only major highways connecting these regions, and any other route would result in a significantly longer travel time, it is assumed that nearly all of these trips utilized these two highways.

Based on the CDOT OTIS traffic count data (discussed earlier in the Existing Traffic section), there are an estimated 28,000 daily two-way vehicle trips that travel across the CO-WY border between these two regions via I-25 and US 85 combined. The big data trip total of about 6,800

daily vehicle trips suggests that approximately 25 percent of trips along I-25/US 85 have both origin and destination within the zones representing these regions. The other 75 percent of trips along I-25/US 85 at the CO-WY border would have only one trip end within NFR region zones or the Cheyenne area zones or would be “external” trips that generally travel through both regions.

These findings seem reasonable and meet the expectations of the project team.

3.1.4 Trip Activity

Trip activity was evaluated with StreetLight for trips traveling between the NFR region and Cheyenne area. The activity analyzed includes all vehicle types (passenger cars, trucks, buses, etc.) and only considers trips destined for or originating in the other region. For example, trip activity in the Cheyenne area zones only considers trips with a starting or end point in the NFR zones. For NFR zones, only trips with a starting or end point in the Cheyenne zones were compiled.

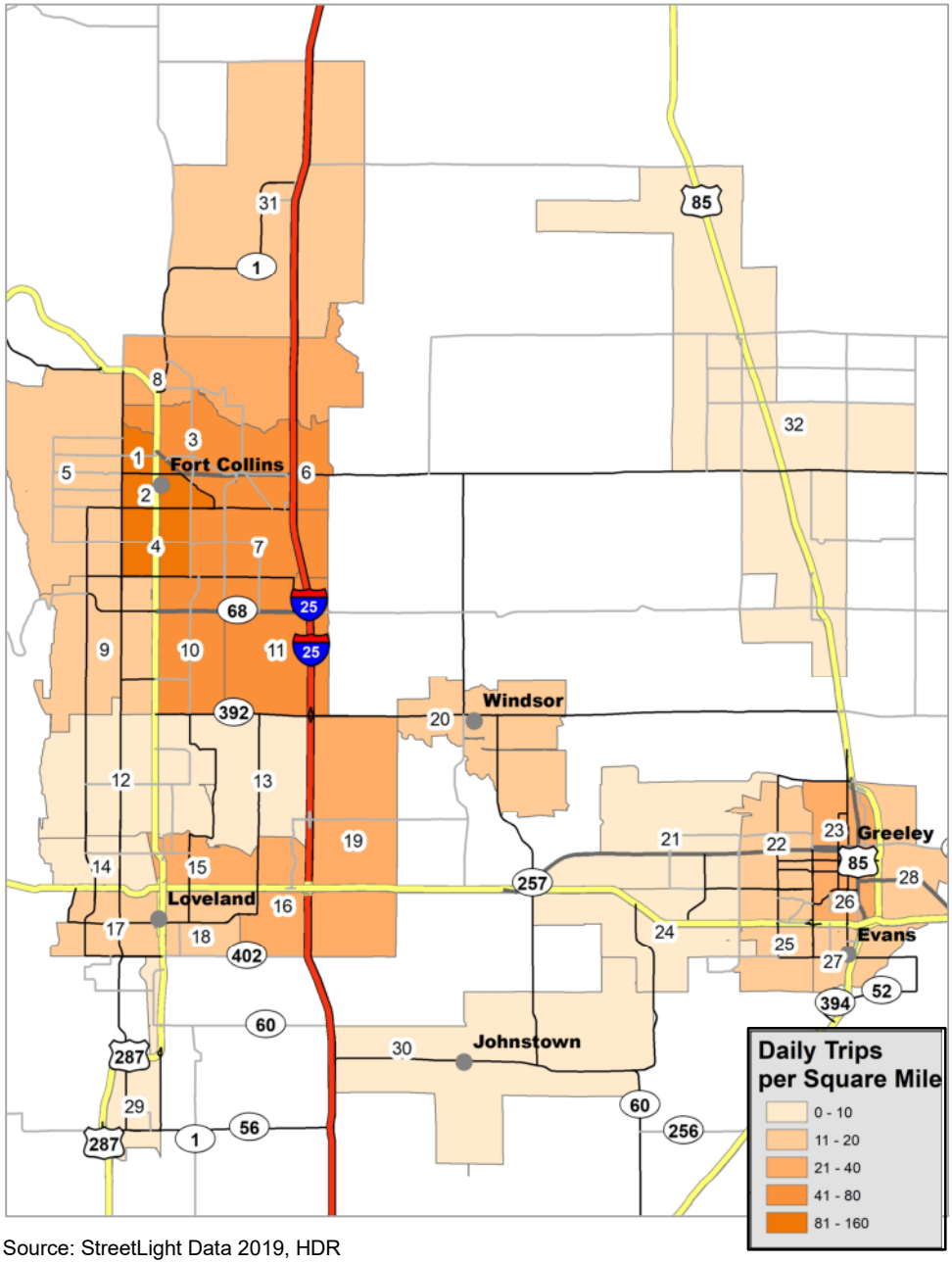
The trip activity results for the NFR region and the Cheyenne area, normalized by area, are illustrated in Figure 3-3 and Figure 3-4, respectively. Included in the figures are zone rankings based on overall trip activity normalized by area.

As shown in Figure 3-3 and Figure 3-4, trip activity to/from the neighboring region is generally lowest in more rural, lower-density zones. Trip activity generally increases as one moves closer to the more dense, urban areas of these regions including the community downtowns, indicating that they are major trip attractors/ generators.

For the NFR region, zones representing the downtown and core Fort Collins area (e.g., zones 1, 2, and 4), have the highest activity levels for trips to/from Cheyenne normalized by area. These zones include downtown Fort Collins, the main CSU campus, and major commercial centers along the US 287 corridor from Riverside Ave to Harmony Rd. The top eight zones within the NFR region for trips to/from Cheyenne are all in the Fort Collins core or in south and eastern Fort Collins, between US 287 and I-25.

Other NFR zones with high trip activity to/from Cheyenne include eastern Loveland/Centerra (zones 15, 16, and 19) and downtown/eastern Greeley (zones 23 and 26). In Loveland, this includes commercial centers along the US 34 corridor, McKee Medical Center, UC Health Medical Center of the Rockies, the Centerra development, and the Budweiser Events Center. In Greeley, the zones with high activity include the downtown core, the North Colorado Medical Center, and the University of Northern Colorado (UNC) campus.

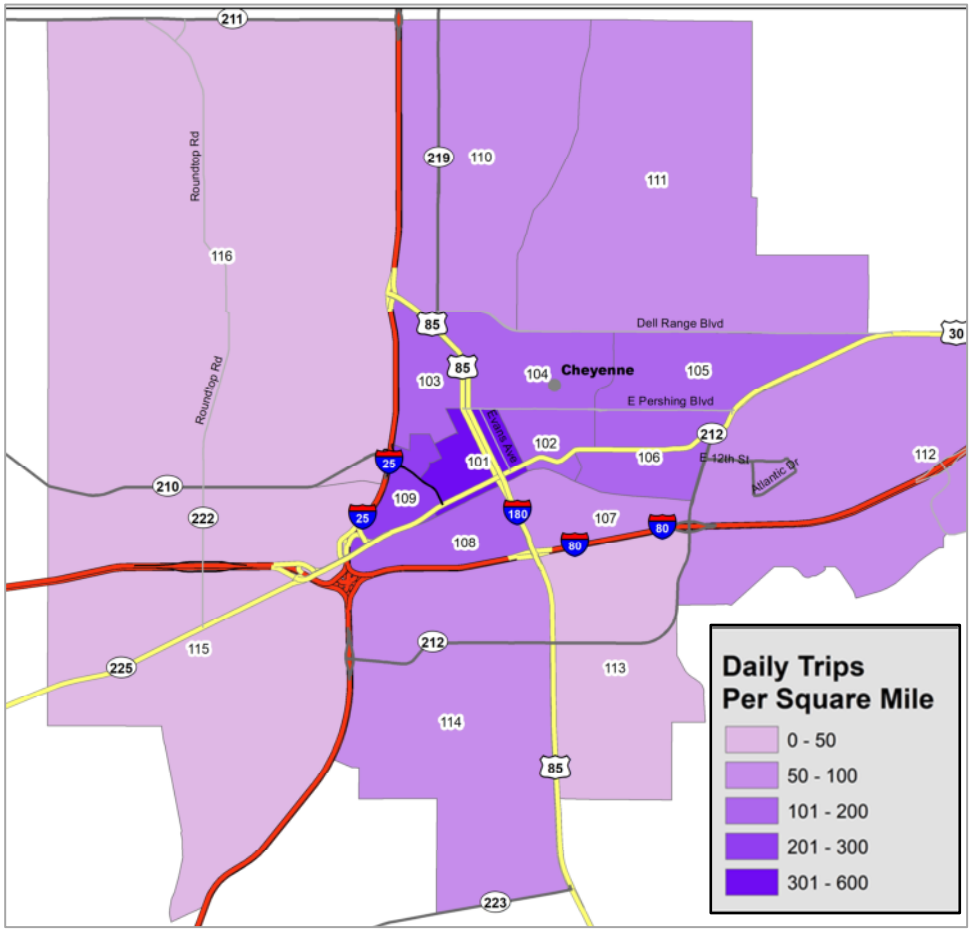
Figure 3-3. NFR Trip Activity to/from Cheyenne – Normalized by Area



Source: StreetLight Data 2019, HDR

Rank	Zone (Normalized by Area)
1	1
2	4
3	2
4	11
5	3
6	10
7	6
8	7
9	16
10	15
11	26
12	23
13	19
14	8
15	25
16	18
17	31
18	9
19	22
20	17
21	5
22	27
23	28
24	20
25	12
26	13
27	32
28	24
29	21
30	14
31	30
32	29

Figure 3-4. Cheyenne Trip Activity to/from NFR – Normalized by Area



Rank	Zone (Normalized by Area)
1	101
2	109
3	106
4	105
5	102
6	108
7	104
8	103
9	110
10	114
11	107
12	111
13	112
14	115
15	113
16	116

Source: StreetLight Data 2019, HDR

For the Cheyenne area, the downtown (zone 101) has the highest activity level for trips, normalized by area, to/from the NFR region, followed by the surrounding core to the west (zone 109) and east (zones 106, 105 and 102). These zones include the commercial core of downtown, the Cheyenne Regional Medical Center, the Cheyenne Veterans Affairs Medical Center, and residential and commercial neighborhoods east of downtown.

3.2 Travel Demand Model Analysis

Regional travel demand model data were compiled and analyzed for this study from available models in the study area. The following section discusses the travel demand models, the methodology of analysis, and the results including trip activity and trip origin/destination patterns.

3.2.1 Travel Demand Model Background

Travel demand forecasting is the process of estimating the amount of travel along the transportation facilities within a system, be it roadways, transit lines, or multimodal facilities. A travel demand model (TDM) is a planning tool used to estimate travel within the transportation system and to assess alternative improvements to a transportation system. Its primary inputs are the region's transportation network and socioeconomic data consisting of population, household, and employment data. The model produces various outputs including estimated future traffic volumes along roadways

Three travel demand models cover various portions of the project study area:

- Cheyenne MPO Regional Travel Demand Model (Cheyenne Model)
- North Front Range MPO Regional Travel Demand Model (NFR Model)
- CDOT Statewide Focus Travel Demand Model (CDOT Model)

The Cheyenne Model was used to analyze trip patterns within the Cheyenne area. It is the only model covering the study area within Wyoming. The Cheyenne Model has a base year 2019 and a horizon year 2045. There are multiple 2045 horizon year model scenarios. For this analysis, the project team utilized the "2045 RTP + Dev" horizon year model.

The NFR Model and CDOT Model both cover the project study area within Colorado. The NFR Model, version 5.11, includes a 2015 base year and 2045 horizon year. This version of the NFR Model was developed as a part of the regular update to a new base year of 2015, from the NFR 2012 model, and includes numerous updates. The CDOT Model, version 1.61, also includes a 2015 base year and 2045 horizon year. The CDOT Model was released in 2018 and was developed by "stitching together" travel demand model inputs from multiple MPO models across Colorado. In the NFR Model region, the CDOT Model was developed using inputs from an older version of the NFR Model; the CDOT Model does not include some of the updates included in the latest NFR Model. Additionally, the NFR Model was designed specifically for travel forecasting in the NFR region. For these reasons, the NFR Model was utilized for the NFR region forecasting for this study, as opposed to the CDOT Model.

3.2.2 Methodology

The NFR Model and Cheyenne Model zone activity and origin-destination patterns were compiled and reviewed. Because the study area straddles multiple model areas, analysis of trips between the two regions is focused on the external stations entering/exiting the model regions representing I-25 and US 85. **Thus, it is important to note, that trips along I-25 and US 85 that cross the border are NOT necessarily destined for or originating from the neighboring region.** In fact, it is assumed that most trips have one or more trip ends that are outside the Cheyenne and NFR regions.

Existing and horizon year travel demand model data were analyzed. This includes zonal trip activity and trip patterns to/from the CO-WY border according to the models. As with the big data analysis, the TDM analysis includes all vehicle types and is focused on daily vehicle trips normalized by area.

The big data analysis results were compared to outputs from the TDMs. This comparison provides insight into the models' ability to accurately replicate real-world conditions and, thus, the reliability of horizon year trip forecasts.

3.2.3 Trip Activity

Trip activity for the NFR region and the Cheyenne area, normalized by area, were compiled and reviewed for existing and horizon years. For the NFR Model, only trip activity in the area destined for or originating from I-25 and US 85 at the northern edge of the model (i.e. the border to Wyoming) were included. It is important to note that of the trips along I-25 and US 85, the travel demand models estimate that about 70 percent have a trip end within the Cheyenne area while the other 30 percent have a trip end beyond Cheyenne. The NFR Model trip activity results for the NFR region in year 2015 and year 2045 are illustrated in Figure 3-5 and Figure 3-6, respectively.

As shown in Figure 3-5, trip activity to/from I-25/US 85 at the Wyoming border is generally greatest in the northwestern NFR region, including the downtown and core of Fort Collins. Wellington shows a high trip density as well. In the southern half of the NFR region, only the Centerra development around I-25/US 34 and a couple of zones in Greeley stand out. The pattern of trips in the NFR Model appears to align well with observations from the big data analysis. The Fort Collins downtown and core areas between US 287 and I-25 were the greatest trip generators according to the big data analysis.

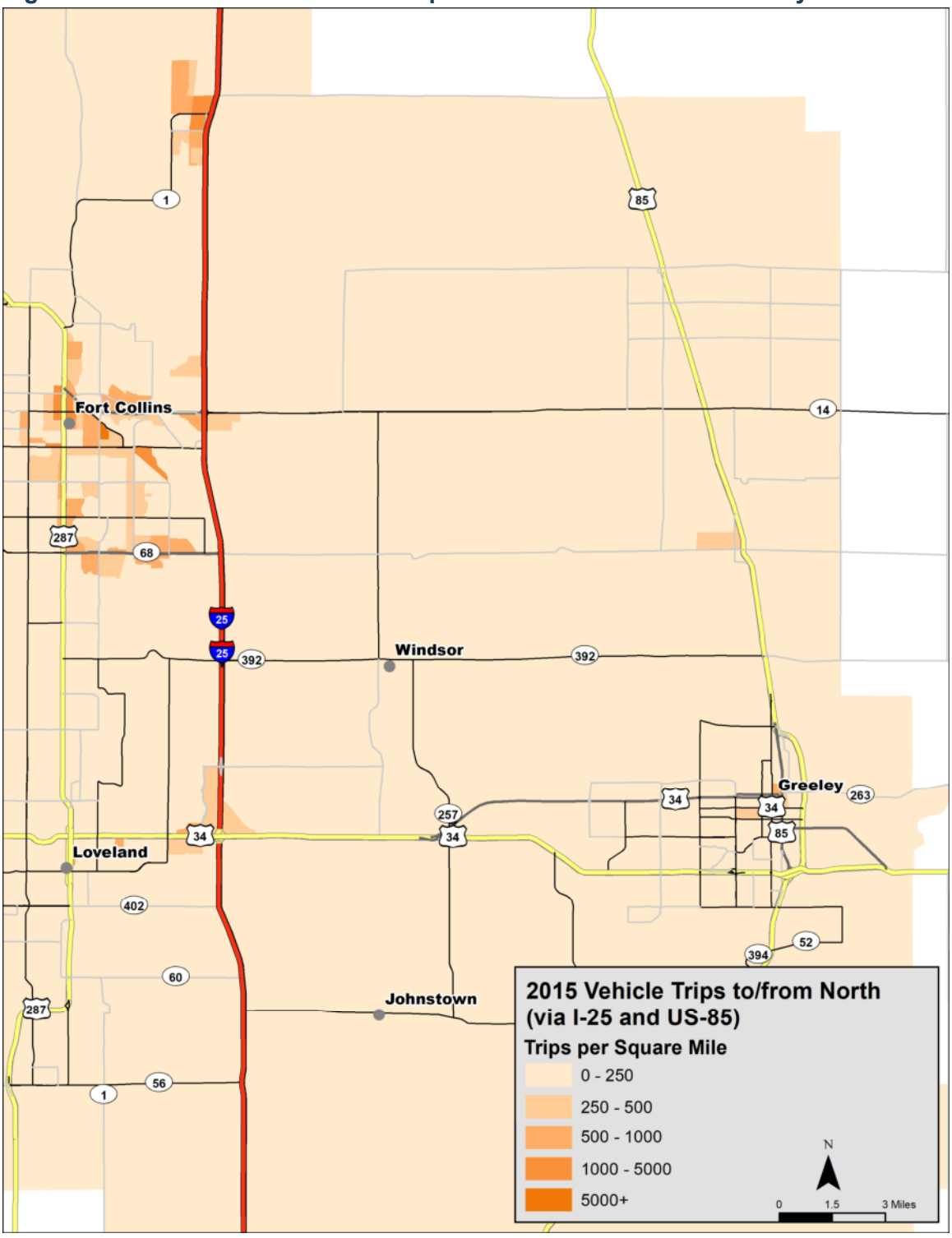
Comparing the 2045 trip activity in Figure 3-6 to the 2015 data highlights growth patterns in the region. Growth is observed along much of the I-25 corridor in Fort Collins, east Loveland (Centerra), and in Wellington. Some growth is observed in eastern/northern Greeley as well.

For the Cheyenne Model, only trip activity in the area destined to or originating from I-25 and US 85 at the southern edge of the model (i.e. the CO-WY border) were included. According to the travel demand models, about 70 percent of trips along I-25 and US 85 at the border have a trip end within the NFR region while the other 30 percent have a trip end beyond the NFR region.

Using the trip information from the two travel demand models combined, the following trip pattern was estimated for trips crossing the CO-WY border via I-25/US 85:

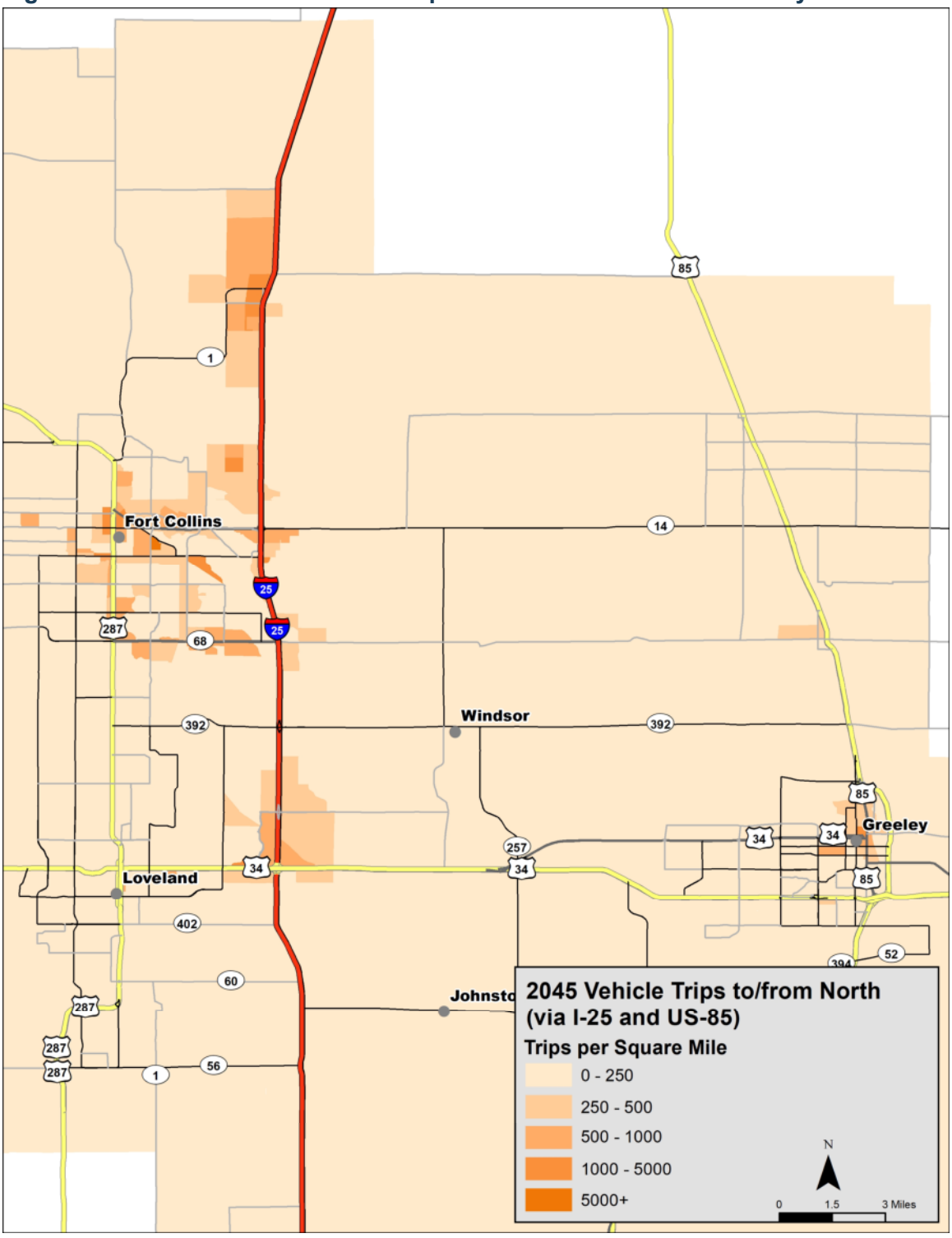
- NFR model region to/from Cheyenne model area = 45%
- Outside of NFR model region to/from Cheyenne model area = 20%
- NFR model region to/from outside of Cheyenne model area = 20%
- Through trips (no stops in either model region) = 15%

Figure 3-5. 2015 NFR TDM Vehicle Trips to/from North – Normalized by Area



Source: NFRMPO, HDR

Figure 3-6. 2045 NFR TDM Vehicle Trips to/from North – Normalized by Area

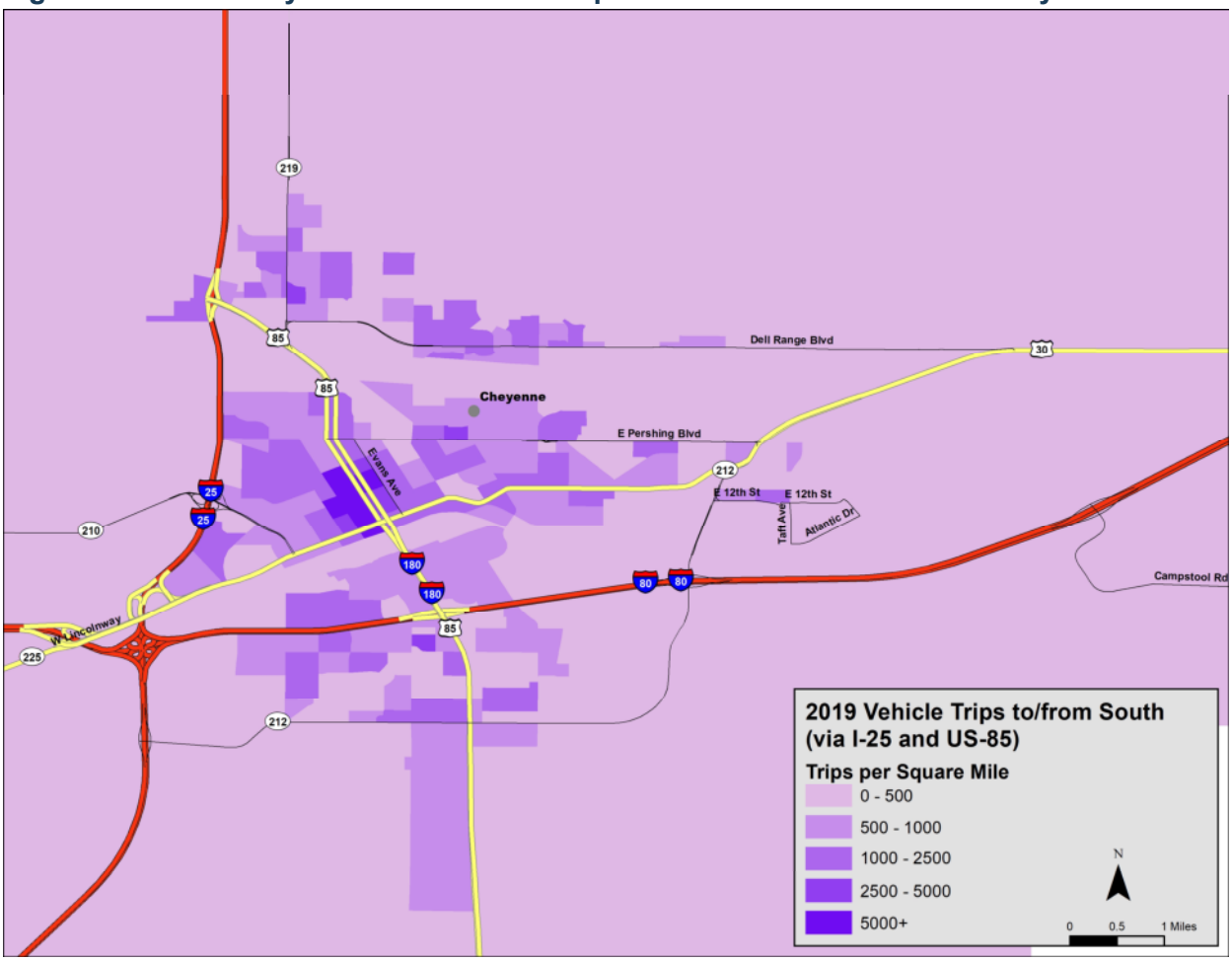


Source: NFRMPO, HDR

For comparison, the StreetLight Data analysis suggested that an estimated 25% of I-25/US 85 vehicle trips at the CO-WY border begin within the NFR region zones and end in the Cheyenne area zones, or vice versa, compared to the 45% estimated from the travel demand models. Though these percentages may appear out of alignment with one another, it is important to note that the estimates are from different sources, one from real-world data (big data and traffic counts) and one from the regional travel demand models. Some variability is expected. Additionally, the StreetLight Data analysis zones encompass smaller areas that do not encompass the entire travel demand model regions. The result is region-to-region trips accounting for a smaller percentage of the total trips crossing the CO-WY border according to the real-world data.

The Cheyenne Model trip activity results in year 2019 and year 2045 are illustrated in Figure 3-7 and Figure 3-8, respectively.

Figure 3-7. 2019 Cheyenne TDM Vehicle Trips to/from South – Normalized by Area



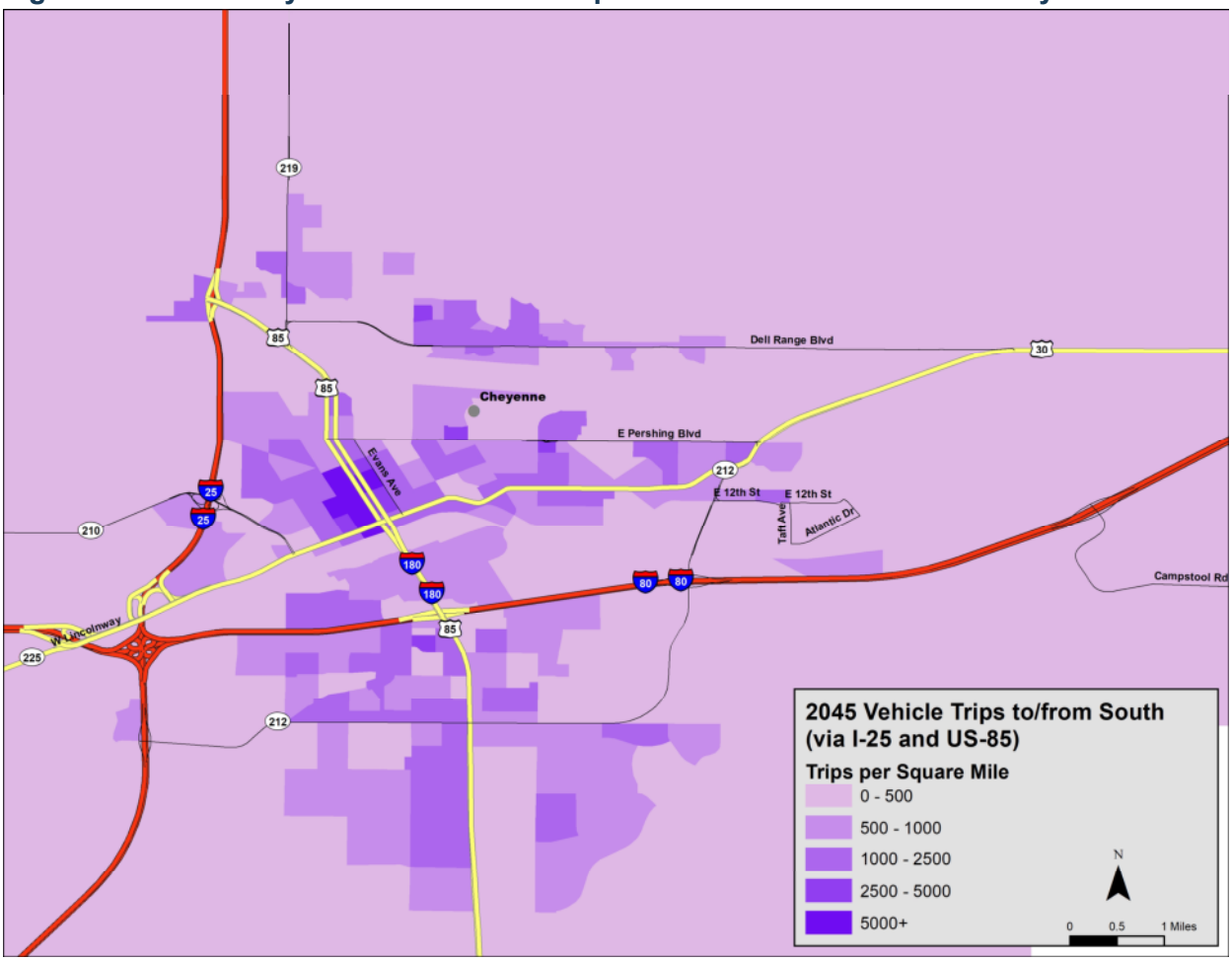
Source: Cheyenne MPO, HDR

As shown in Figure 3-7, trip activity to/from I-25/US 85 at the Wyoming border is greatest in the downtown Cheyenne area along the Warren Ave and Central Ave corridors. Other areas of high trip activity normalized by area include neighborhoods directly east and west of downtown along

Lincolnway, developments along Dell Range Blvd and Yellowstone Rd in northern Cheyenne, and southern Cheyenne/South Greeley.

Comparing the 2045 trip activity in Figure 3-8 to the 2015 data highlights growth patterns in the area. Trip activity tends to show limited growth north of the I-80 corridor with some areas showing a decrease in trip activity to/from I-25 and US 85 to the south. However, growth in trip activity is clearly seen in the areas south of I-80, including South Greeley, the Fox-Farm College neighborhood, and areas south of Laramie County Community College.

Figure 3-8. 2045 Cheyenne TDM Vehicle Trips to/from South – Normalized by Area



Source: Cheyenne MPO, HDR

4.0 Transit Propensity

This section describes the transit propensity analysis performed for this study. Community and population demographics were analyzed to indicate which communities in Cheyenne and the North Front Range would have the highest propensity for transit trips.

4.1 Transit Propensity Methodology

Nine demographic characteristics were chosen for the analysis based on transit propensity analyses completed in the past by CDOT, NFRMPO, and City of Cheyenne. The project management team also provided input on the demographic characteristics to use for the analysis. The preferred geographic unit for the analysis was Census block group level data and was used whenever available; if a demographic data set was not available at the block group level, census tract data was used.[1] Similarly, the 2020 Decennial Census was used when available and supplemented by American Community Survey 2016-2020 data when necessary.

Points were assigned to each block group based on the percentage of the population included within a demographic group. The percentage was compared to the median percentage for the three counties. If the block group was found to have a percentage above the median for the three counties, it was assigned one point. If the percentage was at or below the median for the three counties, it was assigned 0 points. The highest number of points a block group could receive is 9.

The score was weighted by the total population. The weights ranged from 1 to 5 and were assigned to the block groups based on their total population, with the highest weight assigned to the block groups with the highest population. This score was then normalized by the land area of the block group, to account for density.

The demographic attributes used for this analysis are listed below. The following attributes have data sourced from the U.S. Census Bureau's 2016-2020 American Community Survey 5-Year Estimates:

- Zero vehicle households (tract only)
- Youth/College-aged (10-24) (block group)
- Senior (60+) (block group)
- People with a disability (tract): This includes people with an ambulatory disability.
- Low-income (below federal poverty line) (block group): This data set included the poverty status in the past 12 months of households.
- People with limited English proficiency (tract)

[1] Analysis completed at Census Tract level. Block groups were assigned their corresponding Census Tract score.

- Veterans (block group)[2]: Veteran status for the population 18 years and over.

The attributes listed below have data sourced from the 2020 Decennial Census:

- People of color (block group): Includes all people except those who are white and non-Hispanic or Latino. Source: 2020 Decennial Census
- Military Quarters (block group): Includes the number of people living in military quarters.
- Population (block group)

4.2 Transit Propensity Results

The results indicated which communities in Cheyenne and the NFR region have the highest propensity for transit trips. In Cheyenne, the highest transit propensity census block groups were concentrated in the city center with a few high propensity census block groups on the periphery:

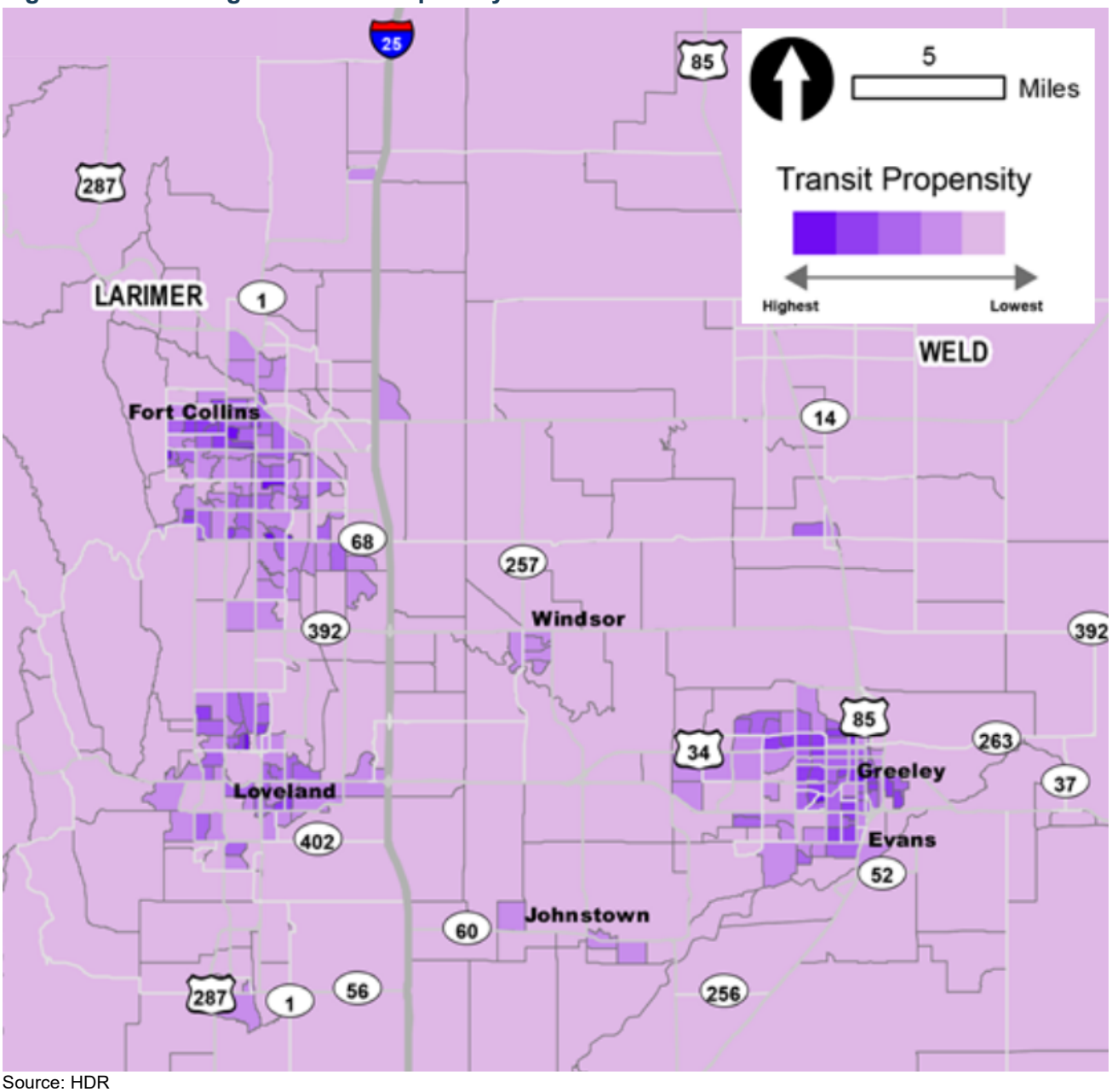
- East of Cheyenne Shopping Mall
- South of I-80, North of South High School
- Near Pioneer Park in City Center
- West of Airport

In Northern Colorado, Fort Collins, Greeley, and North Loveland had the highest propensity. Some smaller communities in Northern Colorado showed some propensity, including Windsor, Johnstown, Berthoud, Milliken, Windsor, and Eaton.

The results for the NFR region and the Cheyenne area are depicted in Figure 4-1 and Figure 4-2, respectively.

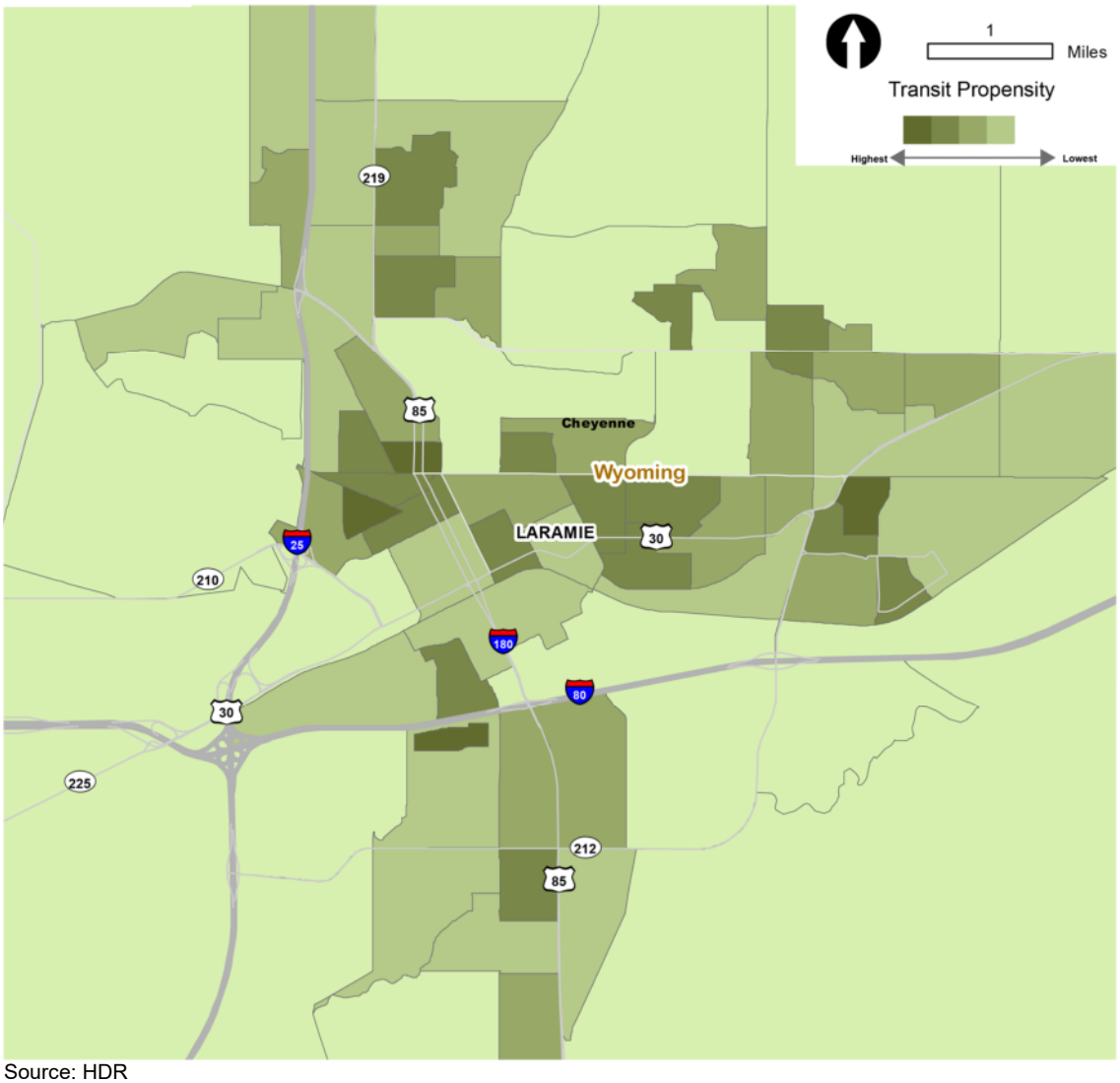
[2] Military data identifies the population in the block group living in military quarters. Only one block group in the study area has a population living in military quarters; it received a "1" and the rest of the block groups received a "0."

Figure 4-1. NFR Region Transit Propensity Scores



Source: HDR

Figure 4-2. Cheyenne Area Transit Propensity Scores



Source: HDR

5.0 Transit Market Analysis Results

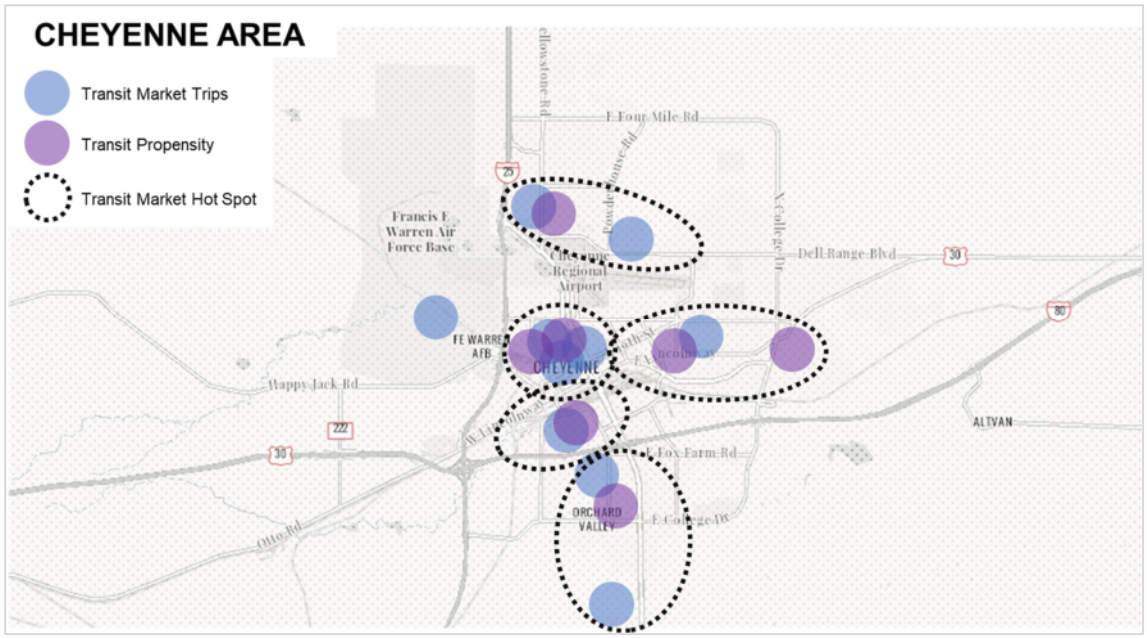
5.1 Methodology

After completing the big data, travel demand model, transit propensity, and socioeconomic analyses, the project team completed a geospatial analysis by layering the results of these four analyses to identify transit market hot spots. The goal of this effort was to determine where the results of these analyses aligned, as these locations are more likely to show demand for transit. Transit market hot spots were identified where these elements indicate areas where trip origins/destinations and the people who make those trips are likely to utilize transit to connect between the NFR region and the Cheyenne area. The transit market hot spots, identified in both the NFR region and the Cheyenne area, will be used in future phases of this study to identify transit routes and station locations.

5.2 Cheyenne Area

Cheyenne's transit market hot spots are illustrated in Figure 5-1. As Figure 5-1 shows, transit market hot spots are dispersed throughout much of the city. The area with the strongest transit market is concentrated in the city center which includes the downtown, Cheyenne Civic Center, the Cheyenne Regional Medical Center, and commercial developments along Warren Ave/Central Ave (US 85) and Lincolnway (US 30). Another area with a concentrated transit market hot spot is the primarily residential area directly south of the city center between the Union Pacific railyard and I-80. Other areas that were revealed as potential transit markets in the analyses were the South Greeley area, east of the city center along the commercial street East Lincolnway, and north of the Cheyenne Regional Airport along Dell Range Blvd and Yellowstone Rd. While not as strong as the other areas detailed above, the analyses did indicate Francis E Warren Air Force Base has a market for transit.

Figure 5-1. Cheyenne Area Transit Market Hot Spots

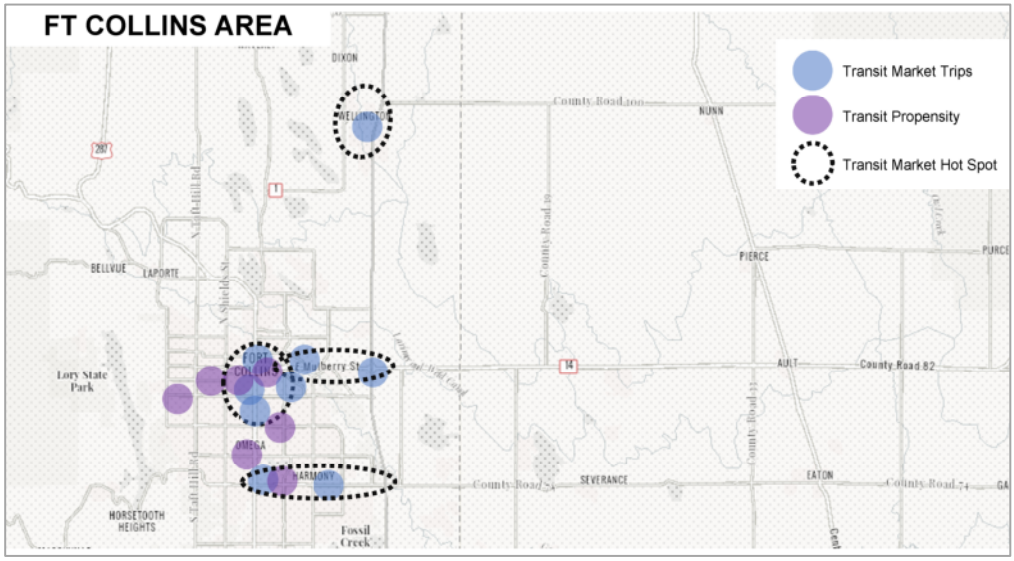


Source: HDR

5.3 North Front Range Region

In the northern portion of the NFR region, transit market hot spots were identified in both Wellington and throughout Fort Collins, as shown in Figure 5-2. The strongest transit market hot spots in the Fort Collins area are located around CSU and the downtown area. In addition, the areas along Mulberry Street east of downtown and along Harmony Road were also transit market hot spot areas. Mulberry Street is a commercial street surrounded by dense single-family homes. Harmony Road is a large commercial arterial which provides access to some residential developments in southern Fort Collins. Wellington is also identified as a hot spot as its close proximity to Cheyenne and the I-25 corridor result in a high trip pattern between the regions.

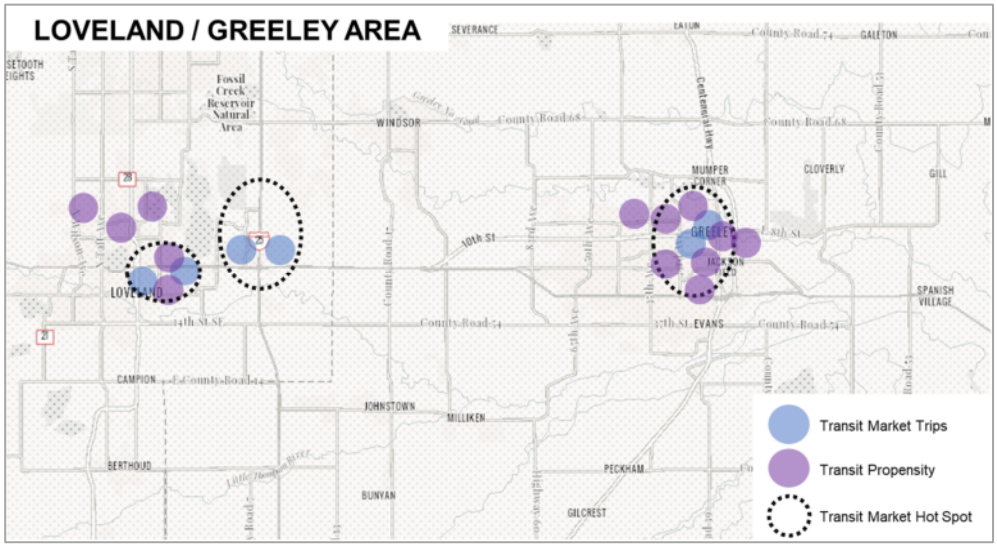
Figure 5-2. Fort Collins Area Transit Market Hot Spots



Source: HDR

In addition to the Fort Collins/Wellington area to the north, the analysis considered communities to the south including Loveland, Greeley, Windsor, and Johnstown. The analyses indicates additional transit market hot spots in both Greeley and Loveland, as shown in Figure 5-3, though the transit markets in these areas are generally not as strong as those of the Fort Collins area. Loveland's city center and the area around the Centerra Development at US 34 and I-25 were the strongest transit market areas. The Greeley community had many areas throughout the city that scored high in transit propensity. However, the travel market analysis found that there are fewer trips connecting Greeley and the Cheyenne area compared to other areas of the NFR region.

Figure 5-3. Loveland/Greeley Area Transit Market Hot Spots



Source: HDR

6.0 Next Steps

Transit alternatives development is the next phase of work for the CO-WY Transit Feasibility Study. Results from this transit market analysis will directly feed the transit alternatives development process. The project team will examine a range of transit service models appropriate to providing regional connectivity that meet the findings identified in the transit market analysis, including fixed route, on demand, deviated services, etc., to determine the most effective provision of transit service. The team will pair the appropriate examination of route termini with routing, service plan assumptions (frequencies), and conceptual stop locations (as appropriate to the service model). Bus technologies and fleet requirements will be examined, and a recommended vehicle type proposed as the assumption for modelling and travel time purposes.