



CHAPTER 3

POPULATION

CHARACTERISTICS

AND NEED FOR SERVICE

This chapter examines the extent to which Colorado’s current bus network meets public need for intercity and regional connections. Intercity demand is calculated separately from regional demand, although there is overlap in the markets served by intercity and regional bus services.

The analysis of demographic and economic characteristics of the population provides a foundation for both intercity and regional service demand. Areas of high relative need for transportation services are determined based on the density and percentage of potentially transit-dependent populations.

The chapter then identifies places or facilities that are likely to be intercity or regional bus destinations: educational institutions, major hospitals, correctional facilities, commercial airports, ski resorts, and military bases. By overlaying the existing bus network with origin areas of higher relative need and potential destination points, the analysis reveals key intercity connections and gaps.

The last section of this chapter addresses the demand for regional transit services. It contains a general description of overall needs for regional services and a detailed examination of demand in the corridors where CDOT has proposed operating regional commuter bus services.

POPULATION PROFILE

The need for any type of transit service, including intercity and regional bus service, depends upon the size and distribution of an area’s population and on the demographic and economic characteristics of that population. Using data from the 2010 Census and the 2007-2011 American Community Survey (ACS), the following potentially transit-dependent population segments of the Colorado population were selected:

1. Young Adults (persons 18 to 34): enlisted military personnel, college students, and other young adults often do not have access to an automobile. Research also suggests that individuals in this age range make up the bulk of intercity bus ridership.



2. Elderly (persons 65 and above): advancing age can mean diminished ability or desire to drive (particularly on a long trip) and a need for access to medical facilities on a regular basis.
3. Persons living below poverty: persons that typically lack the economic means to own or operate a vehicle, or a vehicle perceived as capable of a long trip.
4. Auto-less households: persons without access to a car must rely on alternative transportation services.

These factors were chosen in part because of national and statewide data regarding intercity bus passenger characteristics.^{1, 2, 3} Passengers are most likely to be traveling for pleasure or personal business, have relatively low annual household incomes, and fall within the 18 to 35 age bracket. These characteristics are also supported by Greyhound’s 2004 10K report to the Securities and Exchange Commission. The average customer travels to visit friends or relatives and has an annual income below \$35,000. These individuals may own automobiles that they think are reliable enough for a trip, but they travel by bus because the costs of a bus trip are lower than driving alone.

In addition, data from the American Community Survey is presented on mode of transportation to work for counties along the I-70 and I-25 corridors where regional services geared towards employees are either provided or being considered. This provides perspective on the numbers of employees presently using transit and other modes to access jobs.

This plan update differs from the previous 2008 Study in that it increases the youth/young adult category from 18-24 to 18-34. The change reflects findings by Fischer and Schwieterman (2011) that almost three quarters of intercity passengers fall within the latter range. In addition, this update does not include those persons with a disability (age 16 and above) as a transit-dependent population segment. Due to Census reporting, the most current disability information at the block group level is from Census 2000. This information is both dated and incompatible with 2010 block group geographies.

It should be noted that the intercity bus analysis focuses mainly on the likely ridership for “traditional” intercity bus services, i.e., persons with higher transportation need characteristics. It does not fully address potential markets of “choice” riders—those who have a vehicle available, could drive or fly, and could choose to take transit or not for intercity trips.

¹ U.S. Department of Transportation. Bureau of Transportation Statistics. 2001 National Household Travel Survey,

² Fischer, Lauren and Joseph Schwieterman. *Who Rides Curbside Buses? A Passengers Survey of Discount Curbside Bus Services in Six Eastern and Midwestern Cities*. DePaul University. August 2011.

http://las.depaul.edu/chaddick/docs/2011-2012_Reports/Who_Rides_Curbside_Buses_-_A_Passenger_.pdf

³ Sperry, Benjamin and Curtis Morgan. *Analysis of the 2011 Michigan DOT Intercity Rail and Bus Passenger Surveys*. Texas Transportation Institute. March 2012.

http://www.michigan.gov/documents/mdot/MDOT_2011_Analysis_Intercity_Rail_Bus_Surveys_407633_7.pdf



Quantifying potential demand from such markets is difficult, and must be supplemented with qualitative knowledge collected through stakeholder outreach.

INTERCITY AND REGIONAL TRANSPORTATION NEED

METHODOLOGY

The purpose of this task is to compare the locations served by the current network with the locations in Colorado that have concentrations of persons more likely to need public transportation. The first step involved extracting block group level ACS and Census 2010 data for the overall population and for each of the four needs categories (young adults, older adults, persons living below poverty, and auto-less households). For each category, block groups were ranked relative to the rest of the block groups in the state. Such rankings were performed twice, once based on the density of the population within each category, and a second time based on the percentage of the population in that category. Individual variable rankings were then summed by block group, resulting in two rankings that represent relative transportation need based on:

1. The density of potentially transit-dependent persons, and
2. The percentage of potentially transit-dependent persons.

While fixed-route transit service is often prioritized for areas that contain block groups with higher densities of potentially transit-dependent persons (ranking 1), it is also important to look at the percentage of the population with transit-dependent characteristics (ranking 2). Substantial percentages of transit-dependent populations indicate a high proportion of people who may need transit, though spread out over large areas.

The rankings for density and percentage of transit-dependent persons were mapped by natural breaks (with some manual adjustment), representing ranges of low, moderate, and high relative need. To depict the density of transit-dependent persons, the urbanized areas of Denver and Colorado Springs were not highlighted. These metro areas generally already have significant intercity bus service, and may mask other places of potential need. Overall population density was also mapped to compare with the ranked density of transit-dependent persons. For the most part, the general population density map confirms that the towns with high ranked densities of transit-dependent persons also have relatively high overall densities.

RESULTS

It is important to recognize that this methodology produces relative rankings that may not translate directly into demand (ridership). The map of transit need by ranked density of transit-dependent persons is typically most useful in identifying locations with high concentrations of potential riders, indicating potential demand. The map of transit need by ranked percentage is most useful in identifying areas with a high degree of need. However, rural areas with a high



degree of need may not have the density of demand to support intercity bus service without subsidy, or even with subsidy. Such areas may be candidates for rural feeder services, particularly as part of local rural transit options. Examining these rankings independently and then comparing them to one another results in a better understanding of the relative potential need for transit services in each block group.

Density Ranking of Transit-Dependent Populations

Figure 3.1 displays relative levels of need for public transportation based on the density of transit-dependent populations, overlaid with the intercity and regional bus network. Similar to the 2008 results, the block groups with high relative need that are outside the major metro areas tend to occur along major highways. With some exceptions, the existing bus network currently serves almost all of these areas. The block groups with high to moderate relative need based on ranked density that are not currently served by intercity or regional bus include places like Hotchkiss, Meeker, and Rangley to the west, Pagosa Springs and Manassa to the south, and Holyoke to the northeast. Akron, Yuma, and Wray are also pockets of need that could be served by regional bus service; Amtrak currently passes through these locations but does not stop.

Percentage Ranking of Transit-Dependent Populations

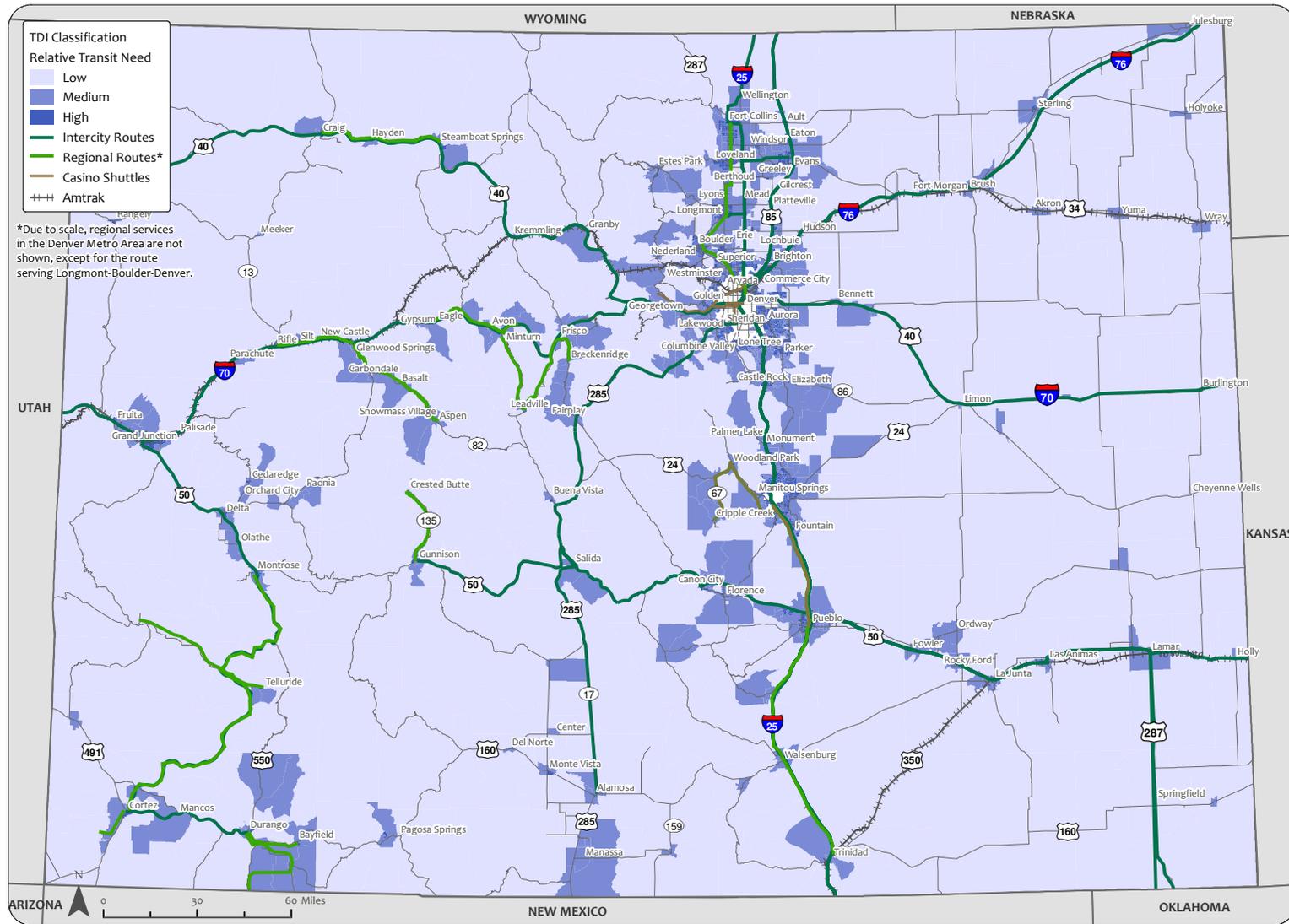
The next summary ranking is based on the percentage of potentially transit-dependent persons, by block group. As with the density ranking, the variables were ranked separately and then summed to create an overall percentage ranking. **Figure 3.2** shows the relative level of need among the block groups with the intercity and regional bus network superimposed. Block groups with a low percentage-based need are concentrated in the center and northwestern quadrant of the state. High need areas are scattered throughout the rural areas. Though this distribution is not radically different from the 2008 results, the high needs to the east of I-25 in particular are no longer as prominent.

Overall Population Density

The final component of the population profile analysis is the overall distribution of population in the state. **Figure 3.3** illustrates the overall population density of each block group in relationship to the existing intercity and regional network. Areas over 500 persons per square mile are shaded in white to avoid highlighting areas of obvious density and allow some look at places with moderate density. As in 2008, the majority of the population in the state is located in



Figure 3.1: Transit Dependence Ranked by Density



Data sources: ESRI Census 2010 base map files, ACS 2007-2011, Census 2010, and provider bus schedules as of Jan. 2013.

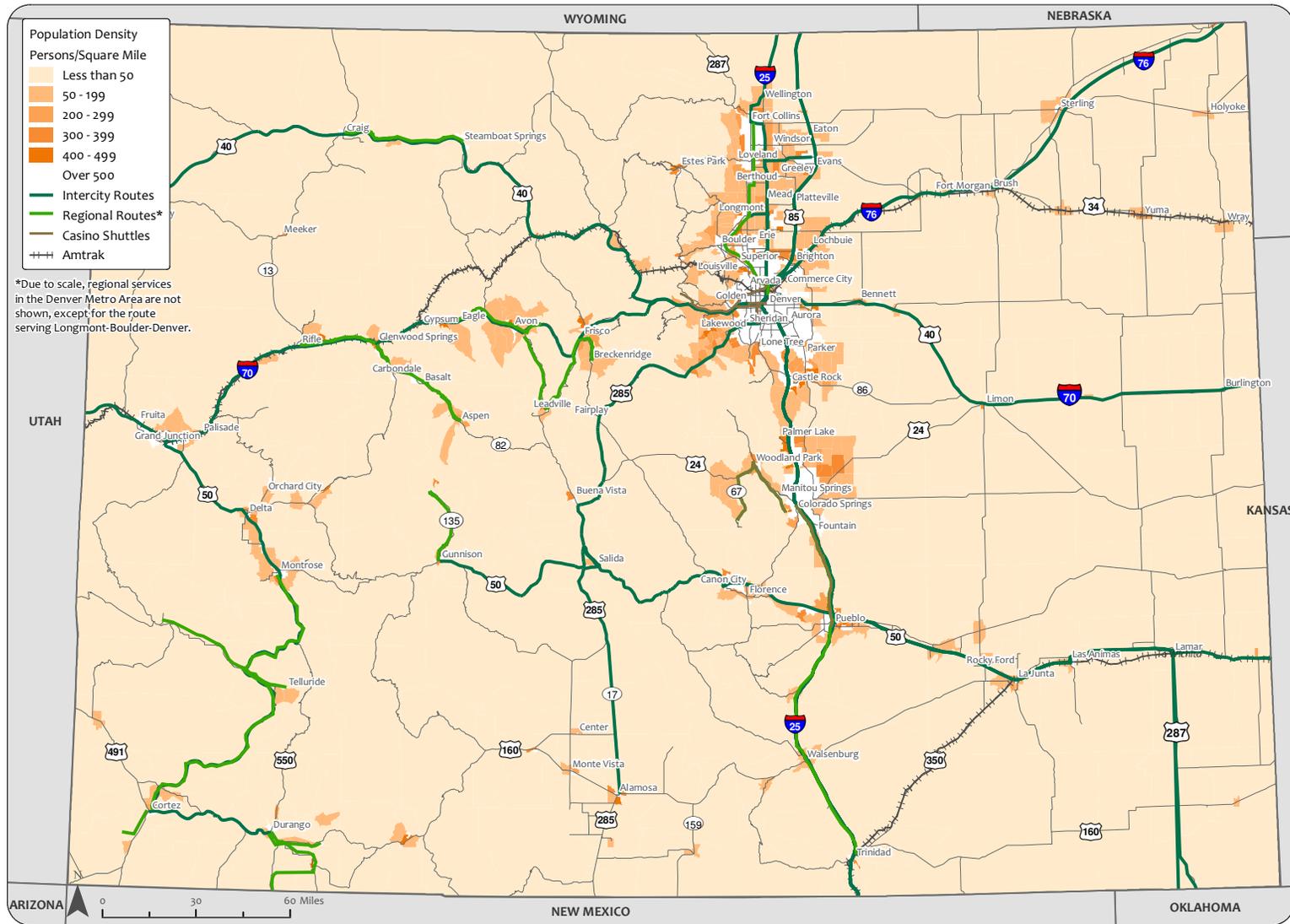








Figure 3.3: 2010 Population Density



Data sources: ESRI Census 2010 base map files, ACS 2007-2011, Census 2010, and provider bus schedules as of Jan. 2013.







the Front Range area, along major interstates. Places with the highest population densities correspond closely to those areas described above as having the highest relative transit dependence by ranked density.

DESTINATIONS/FACILITIES

The analysis of needs and population density addresses the potential origin areas for intercity trips, but another consideration is whether or not current routes serve the places that are likely to be attractors of intercity bus ridership. These include colleges and universities, military bases, hospitals, correctional facilities, airports, and tourist/ski resorts.

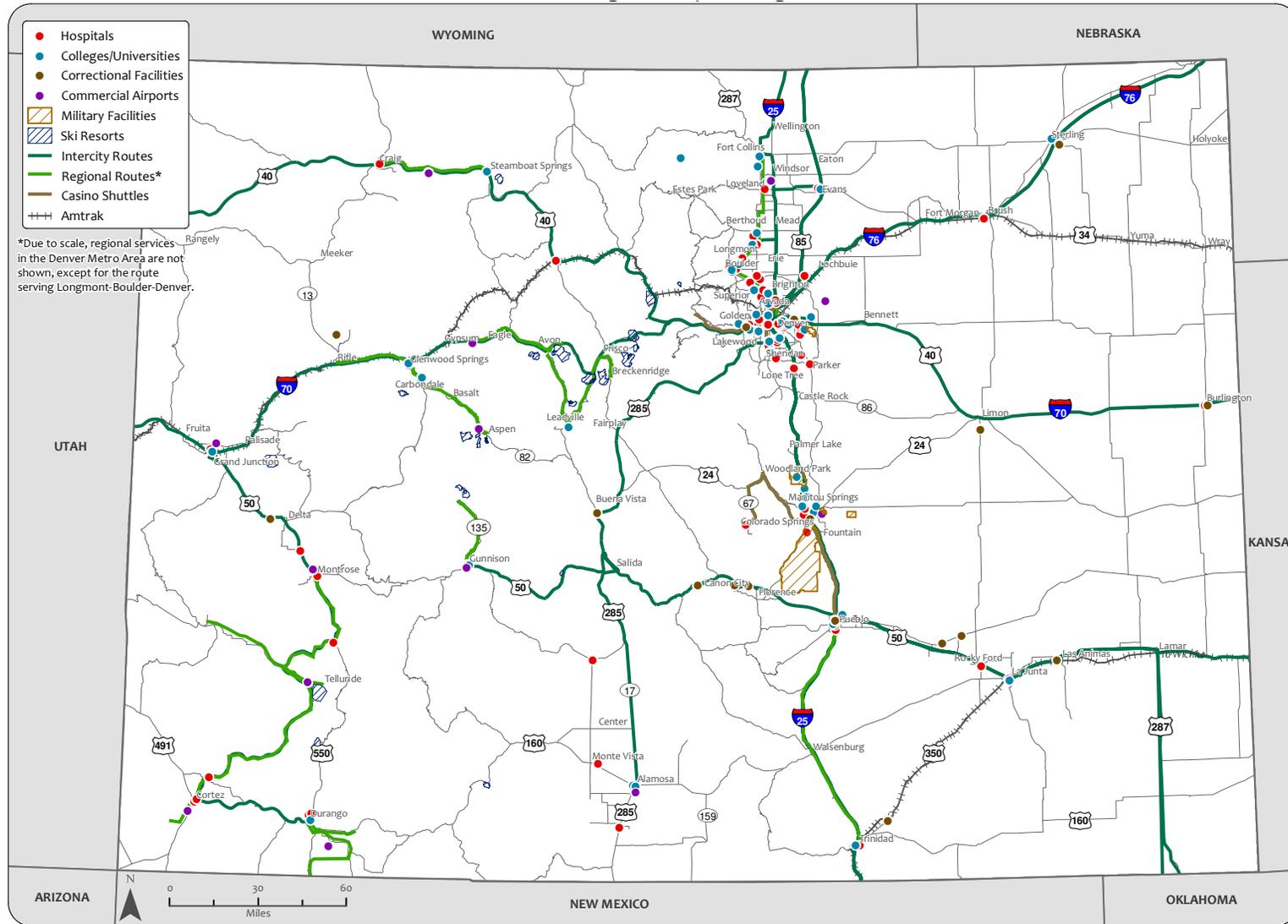
Major Colorado destinations/facilities are mapped in **Figure 3.4** and listed along with their locations in Appendix E. As expected, the vast majority of destinations are clustered around the Front Range or in towns and cities along major interstates. In addition to the categories of destinations identified in the 2008 study, this analysis includes ski resorts and airports, as both are hubs for potential riders.

With the exception of the closings of several correctional facilities, Colorado's major destinations have remained relatively consistent over the past five years. As in 2008, most are currently served by the intercity and regional bus network. Though several ski resorts (Powderhorn, Durango, Wolf Creek) are not accessible by existing services, these locations advertise private seasonal shuttles for their patrons. The only college/university outside of the intercity bus network range is a field site for Colorado State University natural resources students, and thus is not a traditional campus. Note that several colleges have identified needs for transit services that meet daily travel needs of students. Being within the range of the intercity bus network only means that service if available for students traveling to and from the school for school breaks, when the time schedule is not critical. More significantly, three medical facilities just to the west of Route 17 (Saguache County Health Clinic, Conejos County Hospital, Colorado State Veterans Center at Homelake) are all about 15 miles from an existing intercity route. In addition, Greyhound Route 360 along I-70 no longer stops in Limon to serve the Limon Correctional Facility.





Figure 3.4: Destinations and the Existing Intercity and Regional Bus Network



Data sources: ESRI Census 2010 base map files, ACS 2007-2011, Census 2010, and provider bus schedules as of Jan. 2013.







HISTORICAL SERVICE COVERAGE

In addition to analyzing demographics and potential destinations, another way to determine possible network improvements is to review what cities and routes had service when ridership was higher and operating costs were lower. Places that formerly received service might be candidates for some type of reinstated service, either as an intercity route or some type of feeder or regional service.

Figure 3.5 depicts Colorado's intercity bus network as presented in the timetables of *Russell's Official National Motorcoach Guide* from the summer of 1980, two years prior to the passage of the Bus Regulatory Reform Act of 1982. Compared to the current network, the southern portion of the state in particular has lost service. For example, routes no longer run on US 550 south of Ridgway, on US 50 between Montrose and Gunnison, or on US 160 between Durango and Walsenburg. To the east, US 24 and 287/40 between Colorado Springs and the Kansas border also lost service.

Changes have also occurred since the 2008 study. Greyhound absorbed its previously independent subsidiary TNM&O; the restructuring resulted in a loss of service between Walsenburg south to New Mexico via Alamosa. Greyhound also discontinued its route from Grand Junction to Durango in September 2011. SUCAP plans to restore this service in Spring 2014, along a parallel route through Cortez. In addition, Chaffee Shuttle and Black Hills Stage Lines have implemented service in the center of the state along US 50 and US 285. Greyhound also now serves the entire I-40 corridor from Denver west to Utah.

This comparison of service over time suggests some possibilities for the development of service options in areas that either have lost significant coverage or that are now bypassed by express service. However, further analysis of potential demand and appropriate service type/provider is needed before simply reinstating any now-defunct route segments.

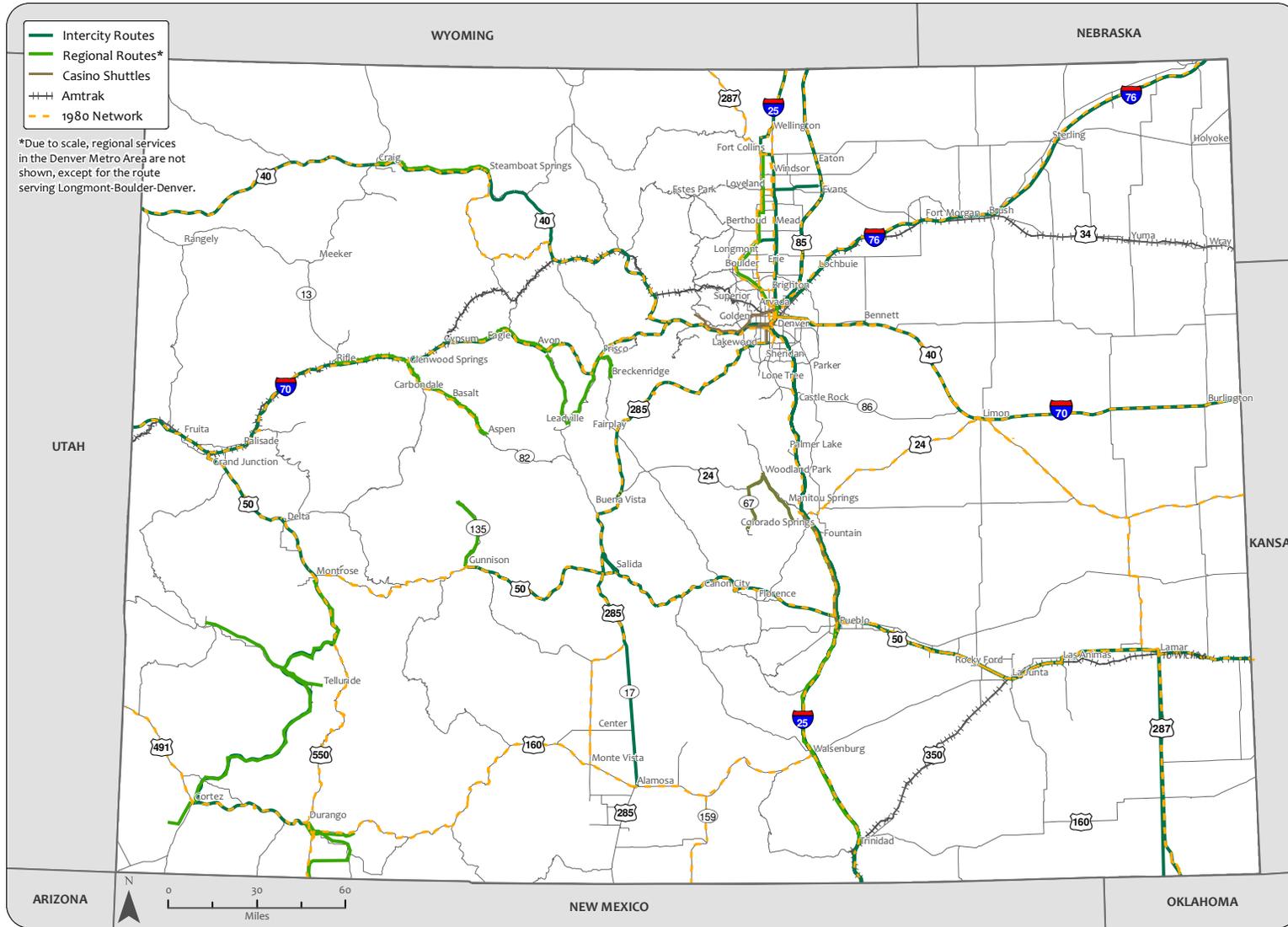
SUMMARY OF INTERCITY DEMAND

This analysis has compared the current intercity bus network with locations that are potentially in need of service, based on population characteristics and potential destinations. Some cities and towns in the state that were served in 1980 no longer have service. In the more recent past, however, service has both been lost and gained. Much of the current network service appears to be responsive to identified need. Further investigation and additional input regarding the proposed plan for regional commuter service are necessary to fully evaluate intercity connectivity and possible service changes.





Figure 3.5: Current and Historic (1980) Intercity and Regional Bus Network



Data sources: ESRI Census 2010 base map files, ACS 2007-2011, Census 2010, and provider bus schedules as of Jan. 2013.







REGIONAL BUS DEMAND

Colorado has a variety of regional services in both urban and rural areas. In the Denver Metro areas, regional services are an important part of RTD's network. In the rural areas, many regional transit services developed around resort economies. Generally, such services were originally designed to meet the needs of employees traveling to and from work. People traveling to ski resorts for recreation are also an important part of the ridership in many corridors. While these systems may have begun catering to just the primary work trip, as they develop they tend to serve as the primary mode of transportation for employees, many of whom do not own autos. Both the ECO and RFTA systems are good examples of this trend.

Information on existing services (Chapter 2) includes ridership for the existing regional services, providing a measure of demand in various corridors. The ridership levels are both a measure of demand and a reflection of the level of service that is provided in the corridor. Rural destinations with strong transit ridership are:

- Glenwood-Aspen, Highway 82
- Vail-Gypsum, US 6 / I-70
- Black Hawk/Central City- Metro Denver
- Glenwood-Rifle, I-70
- Crested Butte-Gunnison, Hwy 135
- Cripple Creek-Metro Colorado Springs, US 24

Given the financing structure in Colorado, local areas have worked together to serve primary markets (generally employees) while leaving gaps between systems. Examples of such regional gaps are on US 34 from Greeley to Loveland and in the I-70 corridor from Glenwood Springs to Gypsum and from Vail to Frisco.

Appendix C examines regional demand in the I-70 and I-25 corridors, where CDOT is implementing interregional express bus services. It also provides information on the role of transit in employment transportation across the State, an important driver of regional transit services. Some key findings regarding employment transportation are:

- In Gilpin County over 26% of workers arrive by transit, riding the many casino shuttles that serve Black Hawk and Central City. Four percent of residents in the County use transit for their work trip.
- The strength of the transit networks in Summit, Eagle, and Pitkin counties are reflected in the high use of transit for commute trips. Parking costs in the Vail and Aspen area also are an important factor. For commute trips, Summit County has a 7.5% transit mode share; Eagle County has a 6.9% transit mode share among residents and 4.8% among workers; Pitkin County has a 10.9% transit mode share among residents and 13.6% transit mode share among workers. In Pitkin and Garfield counties the carpool



mode share is extraordinarily high as well, with approximately 18.3% of Garfield County's workers and Pitkin County's workers commuting in carpools.

SUMMARY OF REGIONAL DEMAND

The analysis of regional transit demand has been presented only in general terms, because regional demand, by its nature, must be carried out on a corridor basis. There are two exceptions: detailed analysis was completed for the I-70 corridor and for Interregional Express services. This detail is contained in Appendices A, B, and C. Across the State, the Census Transportation Data clearly shows that commuters are using transit for employment trips when it is available.

MARKETS SERVED BY REGIONAL AND INTERCITY TRANSIT

Based on the analysis of demand, information provided by the various state agencies, and the assessment of the routes and schedules, it is apparent that there are three distinct markets served by regional or intercity transit providers in Colorado. These are Regular-Route Intercity Bus Service, Commuters, and Airport Service.

Regular-Route Intercity Bus Service

This market desires conventional regular-route scheduled intercity bus service, which provides the more typical intercity passenger trip (non-peak, longer distance, for social or recreational trip purposes). Interline connections with the national intercity bus network are a significant factor, as passengers may need to travel with more than one carrier to reach their destination. This market is served primarily by the private intercity carriers described in Chapter 2.

Commuters

Another market is the commuter market, which is characterized by weekday, daily services with a peak-hour schedule orientation in several regions in Colorado. The Colorado services primarily addressing this market are located in the regions that contain relatively large population centers or produce enough demand for a population center to serve as a destination. The Denver RTD operates a number of commuter bus services (the Boulder and Longmont routes in particular) that augment or replace intercity services. The lack of affordable housing in a number of the resort communities has also led to the creation of long-distance commuter services that permit resort-area workers to live in other towns that have more affordable housing opportunities, as can be seen in the RFTA and ECO services.



Airport Service

Another market in Colorado, which has the potential to grow, is the airport ground transportation/shuttle market, much of which is currently provided by van or shuttle services that operate in a more demand-responsive mode. These providers typically do not connect with either the commuter operators or the traditional intercity bus network, but operate directly between the airport and either downtown Denver, Boulder, or major resort destinations.

It is important to recognize the distinctive types of service because of the need to provide the appropriate service in different markets (in terms of frequency, stops, and fares), and the differences in the facility and assistance needs of each service (park and ride lots versus stations, etc.). In addition, services that are primarily oriented to different markets may be able to utilize different fare structures. In general, airport passengers have a higher value of travel time, and services intended to serve this market should have limited stops and no transfers. Fares per mile can be higher for airport connecting passengers than for regular intercity bus passengers. Terminal facilities for airport-bound passengers need to include secure parking, as well as offer typical amenities.