

## CHAPTER 5: SERVICE & CORRIDOR ALTERNATIVES

This chapter identifies four transit service alternatives for the 2035 planning horizon. These alternative visions focus on developing services on regional transit routes.

This is a long-range plan with a 25-year planning horizon. With the anticipated population growth in the region, regional transit services are anticipated to be part of the transportation network. The vision in the current Regional Transportation Plan states that “Passenger rail connects the North Front Range and the Denver metro area”, The region’s desire for rail service is also reflected in the North I-25 EIS with a preferred plan that includes bus and rail services in the region, with a comprehensive set of regional routes connecting the cities in the region with each other and with the Denver-Boulder metropolitan area.

Three key challenges in this planning effort are:

- Refining the vision for regional transit services.
- Identifying how that vision affects near-term choices for service development, finance and governance.
- Setting practical near-term objectives and strategies that will move the region towards attaining this vision.

The North I-25 EIS identifies a multi-modal solution to address the anticipated north-south transportation needs for the corridor with a State perspective. This Regional Transportation Element examines many of the same corridors but adds a focus on the east-west connections needed for regional mobility. The focus is also on the practical steps necessary to develop these regional services.

NFR communities support local transit through the Transfort, COLT, BATS, and GET systems. Fort Collins, Loveland, Berthoud and Larimer County have developed the FLEX regional service in the US 287 corridor. Nevertheless, the region lacks the foundation necessary to move forward on developing such regional services. A plan that includes a vision for developing regional transit services, a conceptual network plan, and goals and strategies to guide the region in implementing a cohesive regional transit service network will help provide that foundation.

This chapter begins with a discussion of service level alternatives for regional transit. Then it looks in more detail at the corridors included within each alternative.

## SERVICE LEVEL ALTERNATIVES

Four service level alternatives have been identified for the regional transit network. Each reflects a different vision of what regional transit services will be provided in 2035 and the speed with which services will be developed. The alternatives are:

1. **Status Quo.** Regional services are available in the US 287 corridor, between Fort Collins and Longmont. This service would operate at a higher level than FLEX operates today, allowing for anticipated growth in ridership. Service is provided every 30-minutes in peak hours and hourly the rest of the day and on Saturday. No other regional services are provided except for vanpools/carpools.
2. **Basic.** A basic level of regional transit service is available between communities in the NFRMPO and to Longmont and Downtown Denver, traveling on primary corridors. These services provide an alternative to people who wish to use transit or do not have access to automobile transportation.
3. **Moderate.** Regional services provide an alternative to automobile transportation, with express trips available on the busiest corridors. Residents can use transit for many trips, with frequent service and Saturday operation in busy corridors.
4. **High.** Regional transit services will be available in most corridors, connecting to local services in the communities in the North Front Range. Transit options will be available for a full range of trips, operating through the evening hours and on Saturdays and Sundays. Park-and-ride lots provide auto access for regional services.

The alternatives reflect different levels of service in each of the corridors identified in Chapter 4. More information on the individual corridors is provided later in this chapter. Each successive alternative builds upon the previous one. *If the selected alternative is a high level of service, the region still needs to begin with a basic level of service and build up to the high level.*

Both the moderate and high alternatives are supportive of the larger vision of a region connected with rail services. Both of these would develop bus services in the key rail corridors prior to the programmed development of rail services. The status quo and moderate alternatives recognize the financial constraints on government organizations. While the basic alternative takes some steps towards developing regional services, it would not result in the level of service and ridership that is a desirable precursor to rail services. However, nothing in these alternatives precludes the development of rail services.

## A Fifth Alternative

A fifth alternative was also identified to reflect a very high level of services. This can be described as minimizing growth in Vehicle Miles Traveled (VMT) and meeting mobility needs through building a robust transit system. With the anticipated population growth, this would require a comprehensive set of strategies that include changing land use policy and shifting significant resources from roadways to transit. This alternative would result in rail transit services in the busiest corridors, providing reliable and competitive services between communities on the rail line and to Longmont, Boulder, and Denver. Park-and-ride lots would be located near most stations. It would also require extensive local transit services within individual communities to connect to regional corridors.

This fifth alternative reflects the current vision of passenger rail services connecting the North Front Range and the Denver metro area. It also reflects the North I-25 EIS, where commuter rail service is included, and the Rocky Mountain Rail Authority High Speed Rail Feasibility Study, where high-speed rail is provided in the I-25 corridor. To provide perspective on this vision, it is useful to note that the commuter rail service included in the North I-25 EIS is likely more than 25 years out, beyond the planning horizon of this current effort. However, rail service in major corridors in the future is a very real option.

While a rail vision is viable (perhaps more so than is commonly realized), it is not included in this analysis for three reasons:

1. Adequate analysis is beyond the scope of this study so accurate comparisons are not possible.
2. All of the stakeholders who would need to participate and the format for public participation are not adequate to address such a major policy discussion.
3. The focus of this plan is building a foundation for regional transit services with the understanding that achieving a vision that is beyond the fourth alternative is very possible; however it is dependent upon the development of a solid foundation for services.

The land-use and transportation connection is being explored in the region, Supportive land use policies would be necessary to pursue this fifth alternative.

Furthermore, rail will be thoroughly addressed outside of this planning effort. A statewide rail plan is anticipated as a top priority for the recently formed CDOT Division of Transit and Rail. Rail planning is necessary to build upon the North I-25 EIS and the Rocky Mountain Rail Authority's High Speed Rail Feasibility study.

## COMPARING SELECTED SERVICE ALTERNATIVES

To function effectively in the transportation network, regional transit services must be integrated with local service, park-and-ride facilities, and with other modes. In the Status Quo, Basic, and Moderate levels of service, vanpools and carpools will serve an important role in offering services where transit services are limited, especially for areas without direct transit connections on one or both ends of the trip. Even at the High service levels, vanpools and carpools will continue to be important in providing a diverse range of transportation options. Active promotion of the linkages between modes, Transportation Demand Management (TDM) techniques, and support for pedestrians and bicyclists are essential at all service levels.

Specialized transportation will continue to be provided at the local level, with local providers connecting individuals who require assistance to regional trips. Volunteer driver programs will continue to be an important part of the system. At the basic level of service, only local connections will be available for the general public. For the moderate and high levels of service, scheduled trips are included between the most common destinations within the NFRMPO region. The moderate level of service includes three specialized trips daily in the busiest corridors within the region – one in the morning, mid-day, and late afternoon. The high level of service expands this to five trips daily in the busiest corridors, with two in the morning and evening peaks and one trip mid-day.

The demand estimation numbers developed in the previous chapter informed the development of the appropriate level of service in each corridor and are listed in Table 5-1. These illustrate the potential ridership in each corridor for three different levels of transit mode share: .5%, 1%, and 2% of total trips. These are relatively small capture rates of trips for transit, but a realistic starting point. They serve as a basis for determining appropriate service levels in each corridor under the various alternatives.

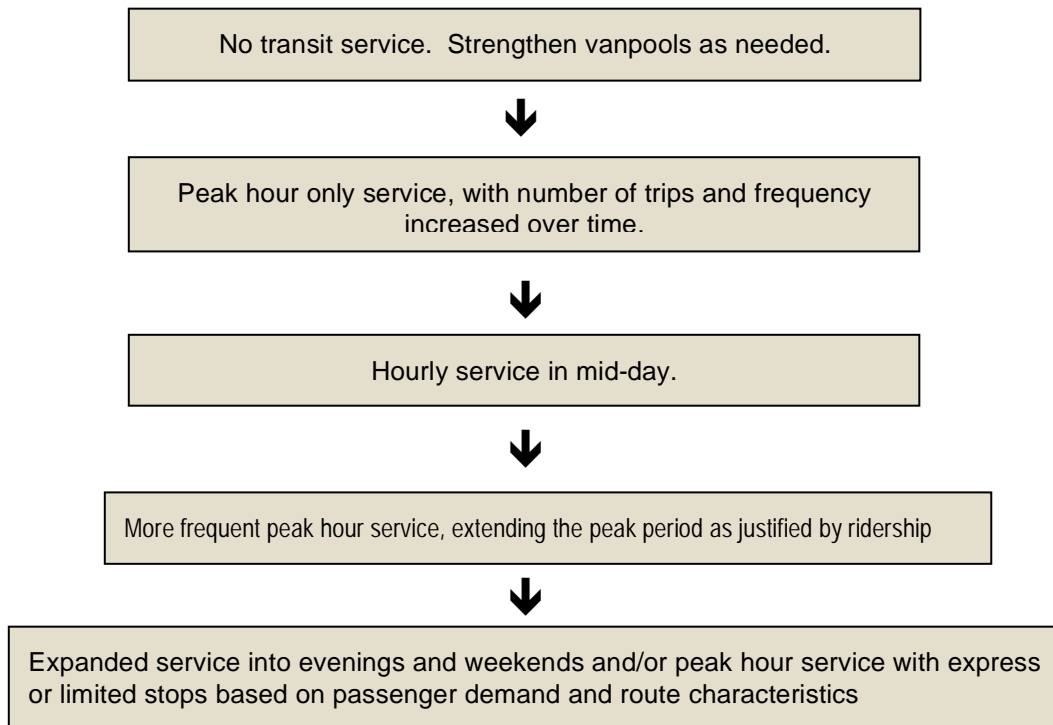
**Table 5-1: Mode Share and Daily Ridership by Corridor**

Corridor	2035		
	0.5% of Trips	1% of Trips	2% of Trips
A: US 287, Ft. Collins - Longmont	542	1,085	2,170
B: I-25, Fort. Collins - Denver	663	1,326	2,653
C: US 85, Greeley - Denver	58	115	230
D: SH 119, Greeley - Longmont )	26	52	104
E: SH 56 & 60, Greeley-Berthoud (Evans/Milliken /Johnstown)	44	87	175
F: US 34, Greeley - Loveland	207	415	830
G: SH 257 & 392, Fort Collins - Windsor - Greeley	130	260	519

These service alternatives *are intended to provide the highest justifiable service in each corridor* based on the level of ridership identified for each level of mode share.

The development of transit service is illustrated in Figure 5-1. Evolution of transit service in each corridor follows the same pattern. The major corridors could each evolve to bus rapid transit or rail service. The application of this evolution for each alternative vision is illustrated in Table 5-2.

**Figure 5-1: Growth of Transit Service**



**Table 5-2: Corridor Characteristics for Alternatives**

Corridor	Status Quo	Basic	Moderate	High
<b>A: US 287</b>	Hourly service mid-day with ½ hour peak service, approximately 6 AM to 7 PM	Hourly service mid- day with ½ hour peak service, approximately 6 AM to 7 PM	15-minute peak hour service and 30-minute base service. Evening service to 10 PM on most evenings, 2 AM on Friday and Saturday night. Hourly headways on Sunday and holidays.	Expand with additional limited and express services, based on demand.
<b>B: I-25</b>	Vanpool only	Hourly service throughout the day with ½ hour peak service, approximately 6 AM to 7 PM	15-minute peak hour service and 30-minute base service. Evening service to 10 PM on most evenings. 2 AM on Friday and Saturday night. Hourly headways on Sunday and holidays.	Expand with additional limited and express services, based on demand.
<b>C: US 85</b>	Vanpool only.	Vanpool only	Peak hour service. 4-5 trips in AM and in PM. Weekdays only	Extend peak; add 1-2 mid-day trips.
<b>D: Greeley / Longmont (SH 119)</b>	Vanpool only	Vanpool only	Vanpool only	Peak hour service. 4-5 trips in AM and in PM. Weekdays only.
<b>E: Evans/Milliken /Johnstown</b>	Vanpool only	Vanpool only.	Peak hour service. 4-5 trips in AM and in PM. Weekdays only.	Extend peak; add 1-2 mid-day trips.
<b>F: US 34</b>	Vanpool only	Peak hour service. 4 to 5 trips in AM and in PM. Weekdays only	Hourly headways mid-day with ½ - hour peak service. Weekdays. 6 AM – 7 PM	15-min peak hour and 30-minute mid-day service.
<b>G: Fort Collins/ Windsor/Greeley</b>	Vanpool only.	Peak hour service. 4-5 trips in AM and in PM. Weekdays only	Extend peak; add 1-2 mid-day trips.	Hourly headways mid day with ½ hour peak service, approximately 6 AM to 7 PM

For those corridors with less than 80 daily passengers, no transit service is recommended. Rather, it is recommended that vanpools be emphasized and strengthened.

Figures 5-1 through 5-4 illustrate each of the four service alternatives, illustrating the level of service that one might expect in 2035 under each.

Based on these projected service levels<sup>6</sup>, Table 5-3 provides information on the routes and service levels contained in each alternative, along with the general costs. Table 5-3 is intended to provide an order-of-magnitude understanding of the level of service proposed in each alternative and associated costs to help frame the discussion for governance and financing.

**Table 5-3: Characteristics of Alternatives**

<b>Characteristic</b>	<b>Status Quo</b>	<b>Basic</b>	<b>Moderate</b>	<b>High</b>
Annual Service Hours	17,000	48,000	128,000	194,000
Annual Miles	394,000	1,523,000	3,507,000	5,552,000
Peak Vehicles	4	15	33	46
<b>Operating Costs at \$75/hour</b>				
	\$1.3 M	\$3.6 M	\$9.6 M	\$14.5 M
<b>Annualized Vehicle Costs</b>				
	\$0.1 M	\$0.5 M	\$1.0 M	\$1.4 M
<b>Annualized Op. Facility Costs<sup>7</sup></b>				
	\$0 M	\$0.1 M	\$0.2 M	\$0.2 M
<b>TOTAL ANNUAL COSTS</b>	<b>\$1.4 M</b>	<b>\$4.2 M</b>	<b>\$10.8 M</b>	<b>\$16.1 M</b>

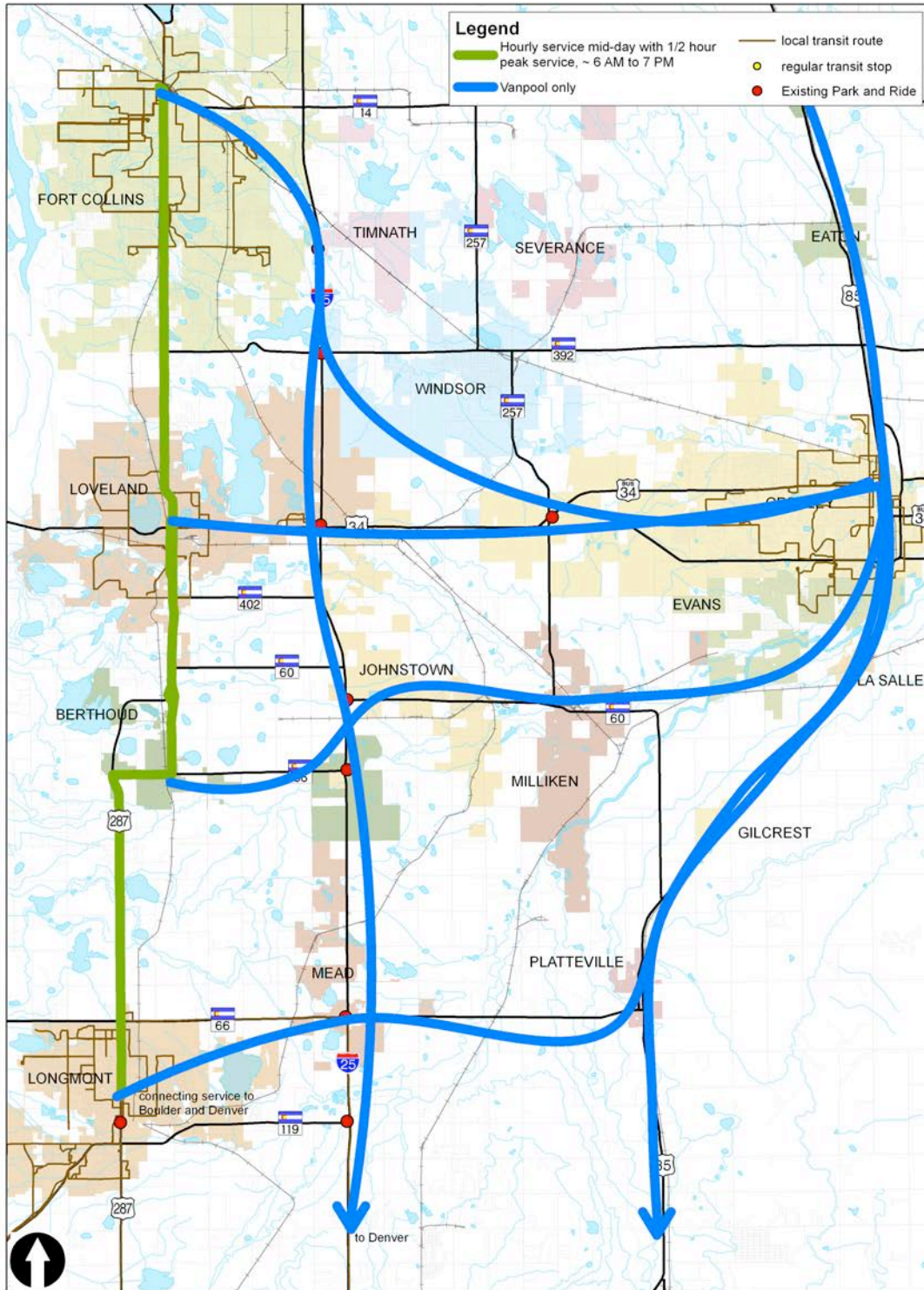
There is a general level of service, fleet size, and expenditure associated with each alternative. It is recognized that actual development and demand may occur at a different pace in some corridors than presently envisioned, but this would likely result in resources shifting between corridors rather than increasing the overall level of service.

Regional services cannot exist apart from local and feeder services. Continued evolution of local transit services, as currently anticipated in the planning documents for each community is anticipated. While residents will access regional services by bus, driving, biking, and walking, it is important to provide effective transit access for residents who do not have automobiles.

<sup>6</sup> Hours for each route have been calculated using current drive times plus an allocation of time for stops along the route. The number of stops and dwell time within each stop significantly affects overall route travel time. Increasing congestion has been assumed over time.

<sup>7</sup> Maintenance facility costs are based on the number of vehicles operated, with no additional costs for the Status Quo alternative. Using a cost of \$150,000 per vehicle space, the total cost was calculated. This was then amortized over 25 years for an annual expense. See Appendix E for more detailed information.

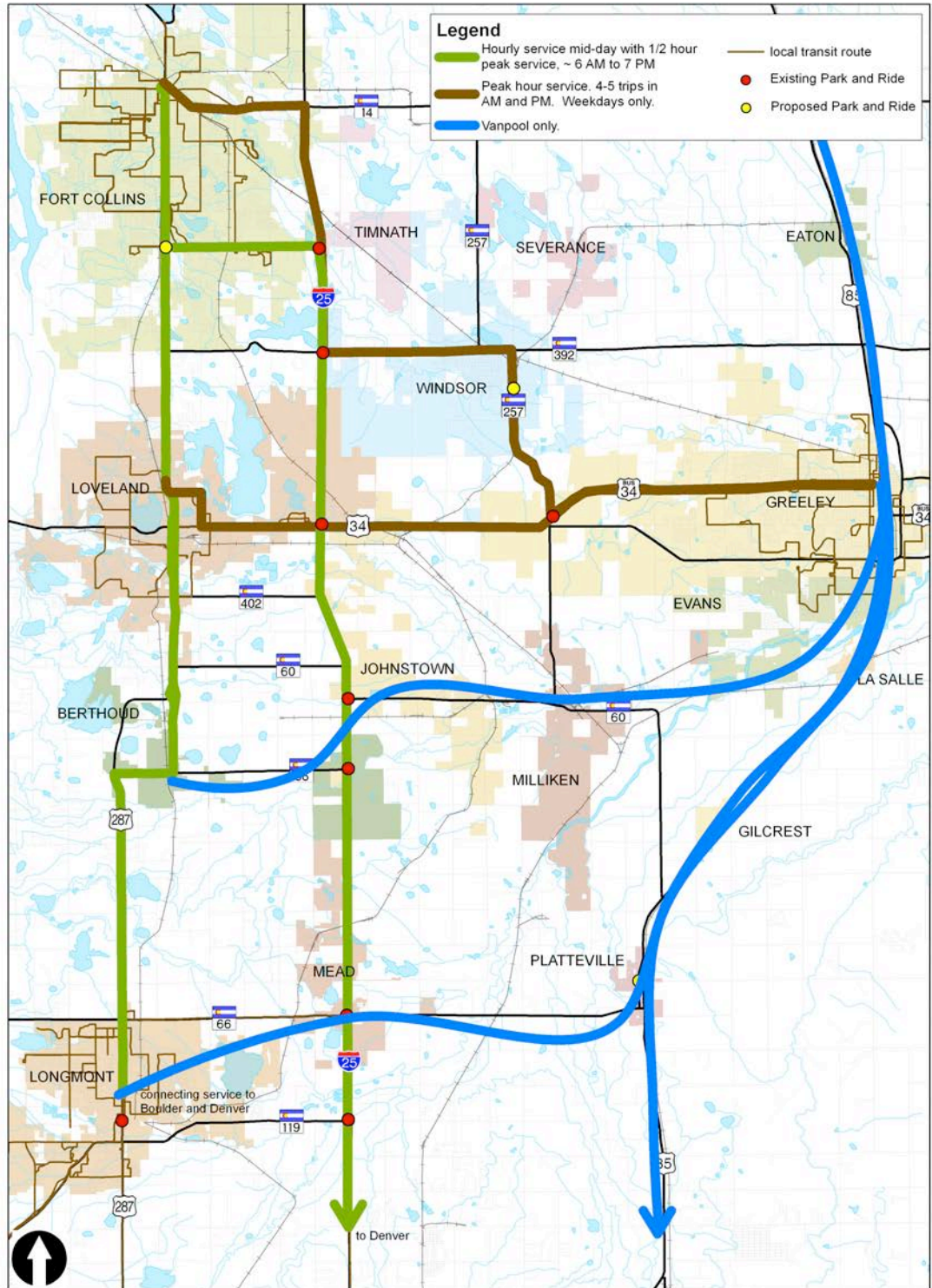
Figure 5-1: Status Quo Alternative



North Front Range MPO Regional Transit Element

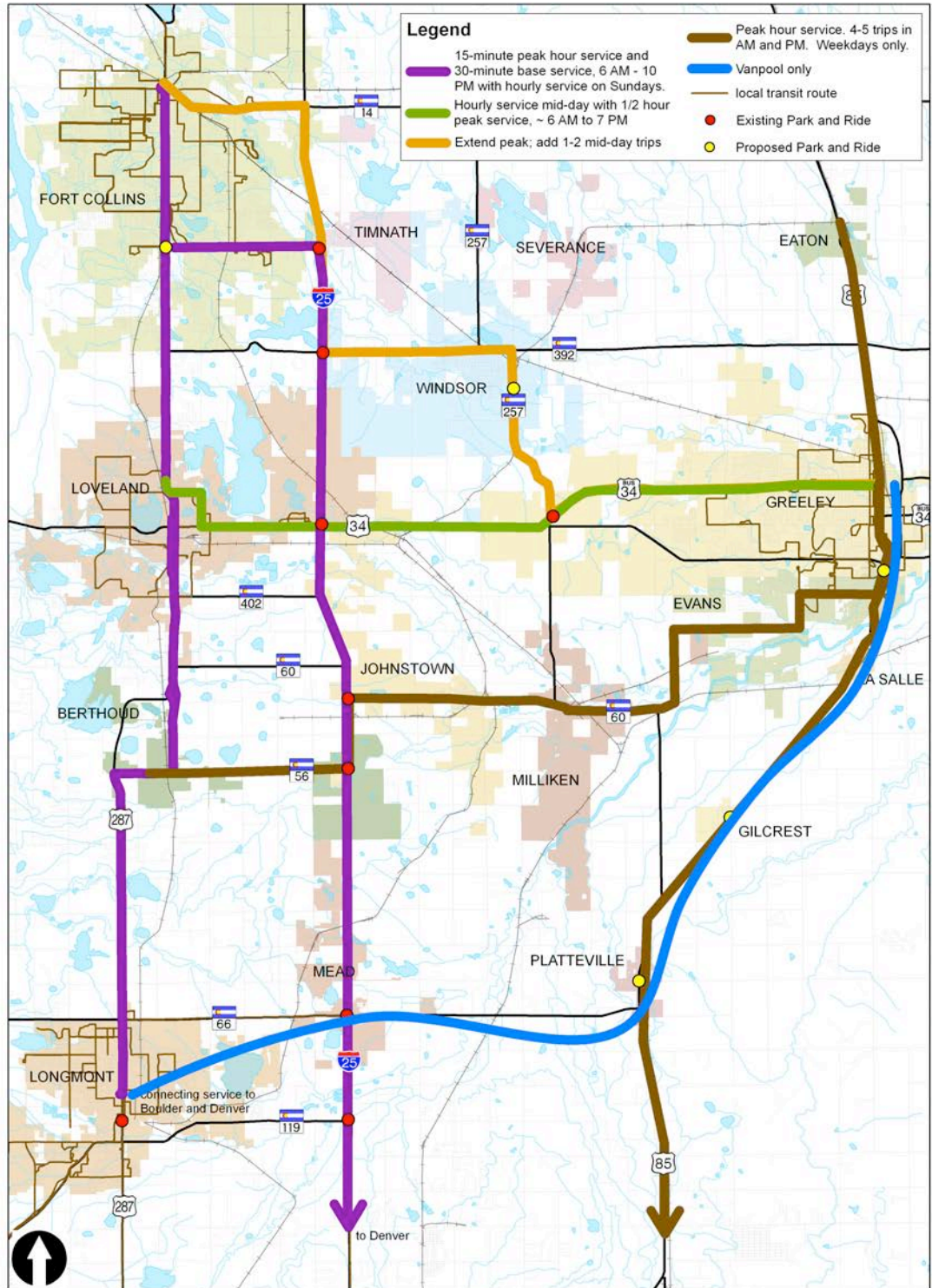


**Figure 5-2: Basic Alternative**



*North Front Range MPO Regional Transit Element*

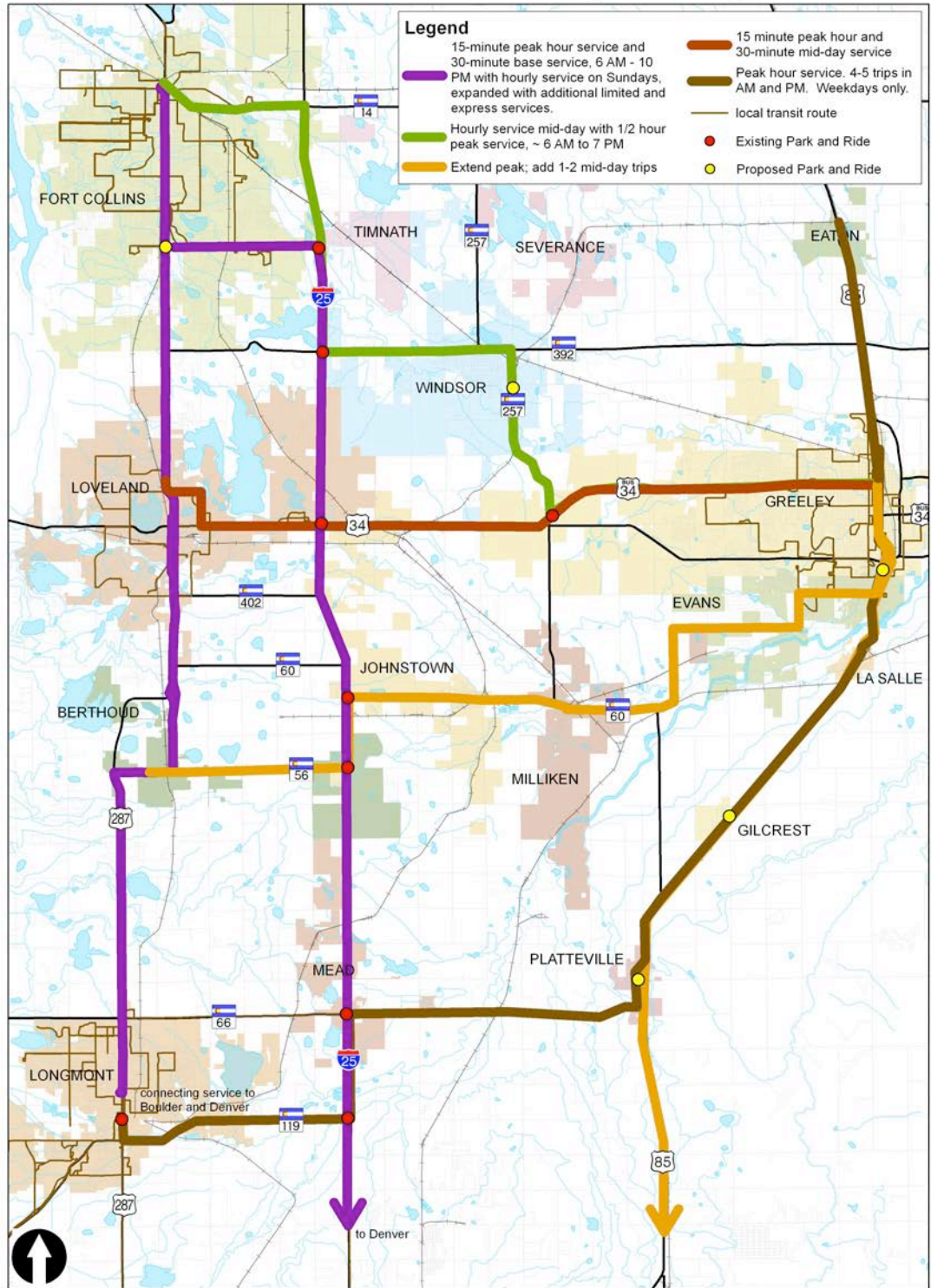
Figure 5-3: Moderate Alternative



North Front Range MPO Regional Transit Element



Figure 5-4: High Alternative



North Front Range MPO Regional Transit Element

The region is diverse and communities have different levels of local services. Some areas do not provide local transit at all. Selecting a uniform vision for regional transit services is not required. When service is developed in a corridor the emphasis will be on agreeing to the specific level of regional services that will connect the communities and assuring that adequate access is provided so the service will be successful.

## EVALUATION OF ALTERNATIVES

Perspectives on the preferred alternative vision for the region have been solicited through meetings with the jurisdictions in the region and an open house for the general public. Considerations in evaluating the alternatives include:

- **Transportation Network Diversity.** What is the relative importance of providing a diverse set of transportation options, and providing alternative transportation for various trip markets? Of serving peak commuter needs? Of building a foundation for more extensive service?
- **Corridors.** Are the corridors included in each alternative for transit service appropriate? (In the next section more information is provided about each of the corridors and how they compare. Comments might regard the inclusion of a corridor (or exclusion of another corridor) in a specific alternative.
- **Regional Services Parallel to Local Service Levels.** How well do the proposed regional services match with planned local transit service levels? Unless it is anticipated that most riders will walk or drive to the regional stops, lack of adequate feeder service will diminish ridership on regional routes. Similarly, residents and social service programs will likely want services that are balanced, with local services parallel in quality to regional options.
- **Financing.** What is the capacity to finance the various levels of service? (Financing is addressed in Chapter 6.) Financing of services in regional corridors will require partnerships with entities outside the NFRMPO boundaries and the State, however a significant portion of the costs will be borne by local entities.
- **Quantitative Performance Measures.** These may include riders per trip or service mile, passenger miles provided or reduced vehicle miles traveled, cost or subsidy per trip.
- **Congestion Mitigation.** Even though the “high” end of mode share is at 2% of total trips, this will result in a much higher level of peak commute trips. How important is this? To what extent should regional services focus on meeting the needs of the transit dependent population and to what extent should it provide congestion relief?

- **Reduce Carbon Footprint.** What impact does the route have on the environment, and in particular climate change?

Ultimately the choices made on the appropriate level of regional transit services will reflect the values of the region. It is likely that different jurisdictions will select different alternatives, reflecting the diversity in the region.

## **CORRIDOR DEVELOPMENT**

The basic service alternatives are built from the individual corridors identified in Chapter 4. The service alternatives used mode share calculations to identify the approximate level of ridership anticipated in each corridor, appropriate for the conceptual level of planning undertaken in this current effort. It is useful to compare the corridors on other factors as well in order to identify potential and priorities for developing corridor services. This section identifies a variety of tools for evaluating the corridors and provides a summary comparison between the corridors.

Designing service for each of the potential corridors will require additional analysis for exact routes, level of service, and phasing. The consultant team recommends the development of corridor service plans for each corridor. These corridor plans would address detailed transit service planning issues as well as evaluate the potential for Transportation Demand Management activities in the corridor.

In this section draft routes and potential bus stop locations have been selected based on the proximity of existing and planned housing and employment locations. However, this cannot substitute for local input regarding stops and routes. The actual distribution of housing and employment along the route and the residential location of employees working in the corridor must be assessed concurrently with designing actual routes and stops as corridor plans are defined.

Each route also has logistical and access issues and other factors that must be considered. For example, is there good pedestrian access between potential bus stops and residences and activity centers?

This technical analysis should, and will necessarily, be supplemented by social and political considerations. If the people in a corridor demonstrate their desire for transit service by supporting it financially or demanding it politically, then transit service may be appropriate in that corridor despite receiving a lower ranking based on passenger predictions.

Ultimately, the best transit service plan will balance all of these factors – technical feasibility, social need, and political support.

## EVALUATION OF POTENTIAL CORRIDORS

A variety of tools can be used to help decision-makers determine how to allocate resources between corridors. Criteria are identified for initiating services in a corridor and for maintaining and expanding services. They can assist the MPO in building and supporting a comprehensive and cohesive network of regional services. These criteria can also be used to identify priorities for services among various corridors.

### Service Development Criteria

- Number of housing units and jobs within walking distance (½-mile) of bus stops.
- Number of housing units within driving distance, extending from ½ to 5 miles of park-and-rides or bus stops with parking
- Level of connecting transit services: high / medium / low / none, where:
  - High is access to a full transit network;
  - Medium is access to a solid transit network serving the majority of jobs and residents; and,
  - Low is some transit access – perhaps to less 60% of residents and jobs with one direct transfer.
- Number of vanpool riders traveling in corridor. While the unique characteristics of vanpools, which provide door-to-door rides with a pre-determined group, make them an imperfect predictor of future transit systems, high numbers of vanpool customers in a corridor provide a ready target for a new transit system which can offer lower cost to the passenger, independence, and more options in travel time.
- Directness of service: As measured in travel time for bus portion of route. If travel time is less than 1.5 times auto travel time the corridor can be considered to have high potential; between 1.5 and 2 times auto travel time – medium potential; or more than 2 times auto travel time – low potential.<sup>8</sup>
- Land use: is development in corridor conducive to transit service with good pedestrian and bus access? Serving developments by diverting regional buses from their main route is typically unproductive. The gain in passengers to the specific development is offset by the loss of passengers frustrated by the additional time on route.

Service development criteria can provide a general idea of how the various corridors compare to each other. Table 5-4 identifies how the various corridors

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<sup>8</sup> Ibid, page 3-51 identifies travel time differences for level of service A-F.

compare, using draft routes and stops, at the 2035 planning horizon, based on 2035 projected development.

It is also useful to consider when development is anticipated to occur and the services that might be appropriate over time. The corridors were assessed for housing and employment proximity under current conditions and predicted conditions in 2015, 2025, and 2035. This analysis was limited to the geographic area of the NFRMPO, due to limitations of available data. If information on the areas in the DRCOG planning boundary is available at a later date, it can be considered as more detailed corridor studies are undertaken.

One corridor that stands out is the Fort Collins – Windsor – Greeley Windsor corridor. Projected development in this corridor is stronger and projected to come on sooner than some of the other rural corridors, so it may be a corridor that is considered for an early corridor implementation plan.

Based on the overall characteristics of the corridors, North I-25 matches or exceeds service potential in the US 287 corridor. It is recommended that this be high on the list of corridors where detailed service planning is carried out with implementation as soon as feasible. This corridor has the advantages of being recommended in the North I-25 EIS and providing an opportunity to sort through fiscal and operating responsibility issues with CDOT.

Two corridors where early development of corridor plans may also be useful are US 34 and US 85. These corridors are ones with logistical complexities in terms of the roadway access for pedestrians, park-n-ride access, set-backs for buildings, and local transit connections. It may be useful to identify how to connect riders for the last mile of their trips, particularly to employment parks off US 34. Working through these issues relatively early may provide more opportunities to overcome the difficulties and establish successful services.

**Table 5-4: Evaluation of Corridors**

	<b>A: SH 287 Fort Collins - Longmont</b>	<b>B: I-25 Fort Collins - Denver</b>	<b>C: US 85 Greeley- Denver</b>	<b>D: SH 119 Greeley/ Longmont</b>	<b>E: SH 60/56 Greeley Evans/ Mill./J'town Berthoud</b>	<b>F: US 34 Greeley/ Loveland/</b>	<b>G: SH 257/392 Fort Collins/ Windsor/ Greeley</b>
Housing units within ½-mile of bus stops <sup>(1)</sup>	High 16,014	Low 3,375	Low 3,073	Low 2,971	Medium 11,560	High 14,669	High 15,984
Housing units within 5 miles of park-and-ride locations <sup>(1)</sup>	n/a	High 130,449	Medium 36,492	Low 12,302	Low 18,642	Medium 39,878	Medium to High 88,084
Jobs within ½-mile of bus stops <sup>(1)</sup>	Medium 36,550	High (14,645 within MPO but consider Denver)	High (13,962 within MPO but consider Denver)	Low 17,124	Low 16,134	Medium 40,025	Medium 41,847
Number of vanpool riders in corridor <sup>(2)</sup>	213 Fort Collins to Denver with 49 counter flow; 76 to Boulder County.		36	12 To Boulder	0	15	
Directness of service (ratio of transit to auto travel time).	2	1.4	1.3	1.5	1.8	2.6	1.7
Connecting transit services at origin	Low-Medium, varies along route	Low, on average.	Low to none	Low to none	Low to none	Low	Low, on average. Service in Fort Collins and Greeley, none in Windsor
Connecting transit services at destination	High	High	High to downtown Moderate to Commerce City, DIA, Aurora	Medium	Low to none	Low	
Land use is supportive of transit services	Low to Moderate	Low to Moderate	Low	Low	Low	Low	Low

Notes:

- (1) Vanpool riders have been grouped by the corridors in which most of the vehicles travel. Cells are combined where more than one route is taken.
- (2) Data is limited to MPO boundaries. The North I-25 and US 85 corridors have been rated “High” with respect to jobs because of the connection to Denver despite low numbers within the MPO.



## Criteria for Maintaining or Expanding Services

It will be important to establish criteria for maintaining and expanding services, similar to the criteria for initial development. Categories for maintaining or expanding services may be quantitative or qualitative. Quantitative measures may include:

- Passengers per trip or per hour
- Total cost and subsidy per trip
- Passenger miles traveled or vehicle miles reduced.

These quantitative measures will need to show that the investment in these services generally rates fairly with other transit service investments. The scales may be somewhat different because of distance traveled, so passengers per trip may be a better measure than passengers per hour.

The qualitative measures are more difficult to capture, and will be guided by the network plan and goals and objectives. Important categories include:

- Providing stable and continuous services
- Building on success
- Providing a comprehensive network with services to all major population centers

The quantitative measures are supportive of each other so a route with high ridership will rank well in each category. On the other hand, the qualitative measures require finding balance. Where resources are limited, choices to build on success and put additional resources into an existing route will pull resources away from establishing services in corridors that do not already have services. This requirement for balance can be addressed in the development of the network plan and goals and also in evaluating governance and financing options.

## CONCLUSION

This chapter has provided the big picture of four basic service alternatives:

- Status Quo
- Basic
- Moderate
- High

In addition, a Very High alternative was described early in the chapter but detailed planning was not done on this as it would only be considered after the High alternative is in place. The alternatives are described by the level and type of regional services that would be provided in each corridor.

In addition, information has been provided on how the individual corridors compare to each other and tools for developing services. These include:

- Criteria for developing regional transit services;
- Criteria for maintaining or expanding regional services; and,
- The recommendation that detailed service planning occur in each corridor prior to implementing transit services.

In considering the basic service alternatives, it will also be useful to explore the detailed financial analysis presented in Chapter 6. This provides a break-out of how costs might be split between federal, state, and local sources.

## SUMMARY OF RECOMMENDATIONS FROM CHAPTER 5

- Select an overall level of service (Status Quo, Basic, Moderate or High) to use as a foundation, after considering financial impacts of each alternative.
- Prepare more detailed corridor service plans for the top ranked corridors. The initial analysis suggests that North I-25 is the top ranked corridor. The Fort Collins-Windsor-Greeley, US 34, and US 85 corridors also show significant potential. Final decisions on the ranking of the corridors will consider public and jurisdictional comments.
- While a corridor service plan is not needed for service in the US 287 corridor, a financial plan to assure stable long-term funding is another recommended priority.
- Criteria for developing and maintaining services in each corridor will be important to developing a successful regional transit network.