III. FORECASTED GROWTH

In order to properly identify potential improvement projects that will be required for the transportation system in Milliken, it is important to first understand the nature and volume of traffic in the planning area in the future. It is also useful to understand existing traffic flow patterns, as presented in the previous chapter. The analysis of future traffic volumes for the Milliken planning area is based on the 2035 regional travel demand model developed by the North Front Range Metropolitan Planning Organization (NFRMPO). This computerized model includes the entire North Front Range region. The model area extends from SH 66 on the south to Larimer County Road 88 on the north, and from west of Fort Collins to east of Greeley. The NFR model was used as the basis for developing forecasts for Milliken because it provides the context of Milliken in relation to the rest of northern Colorado.

Two basic inputs to the computer model are the land use estimates and the transportation network. The amount of traffic which different types of land uses (residential, retail, office, industrial, etc.) generate has been measured for the North Front Range and around the country. The amount of development (number of households, square feet of businesses) can then be used to determine the volume of traffic that will be generated from any specified area. In order to develop these specific allocations of residential and commercial development throughout the North Front Range, the NFRMPO has subdivided its planning area into 981 traffic analysis zones (TAZs). In order to more accurately forecast future traffic volumes in the Milliken planning area, the TAZs were further subdivided to create 18 new TAZs. **Figure 8** shows the 39 TAZs for the Milliken planning area. The area covered by the 39 TAZs is consistent with the Milliken planning area as defined in the Town's Comprehensive Plan.

The current NFR 2035 Fiscally Constrained transportation network has been used as the basis for the modeling effort in Milliken. This network includes those improvement projects which are committed over the next six years plus the projects which are included in the Fiscally Constrained list of the North Front Range 2035 Regional Transportation Plan. In the Milliken planning area, there are no improvement projects included in the Fiscally Constrained Plan.

A. Land Use Forecasts

The *Milliken Comprehensive Plan* (2004) includes a Land Use Plan (shown on **Figure 9**) which depicts anticipated land uses in the Milliken planning area. The primary development pattern will continue to be low density, single family residential use. Commercial and mixed use development is anticipated along the SH 60, CR 54, and Two Rivers Parkway corridors as well as in the southeast section of the planning area.

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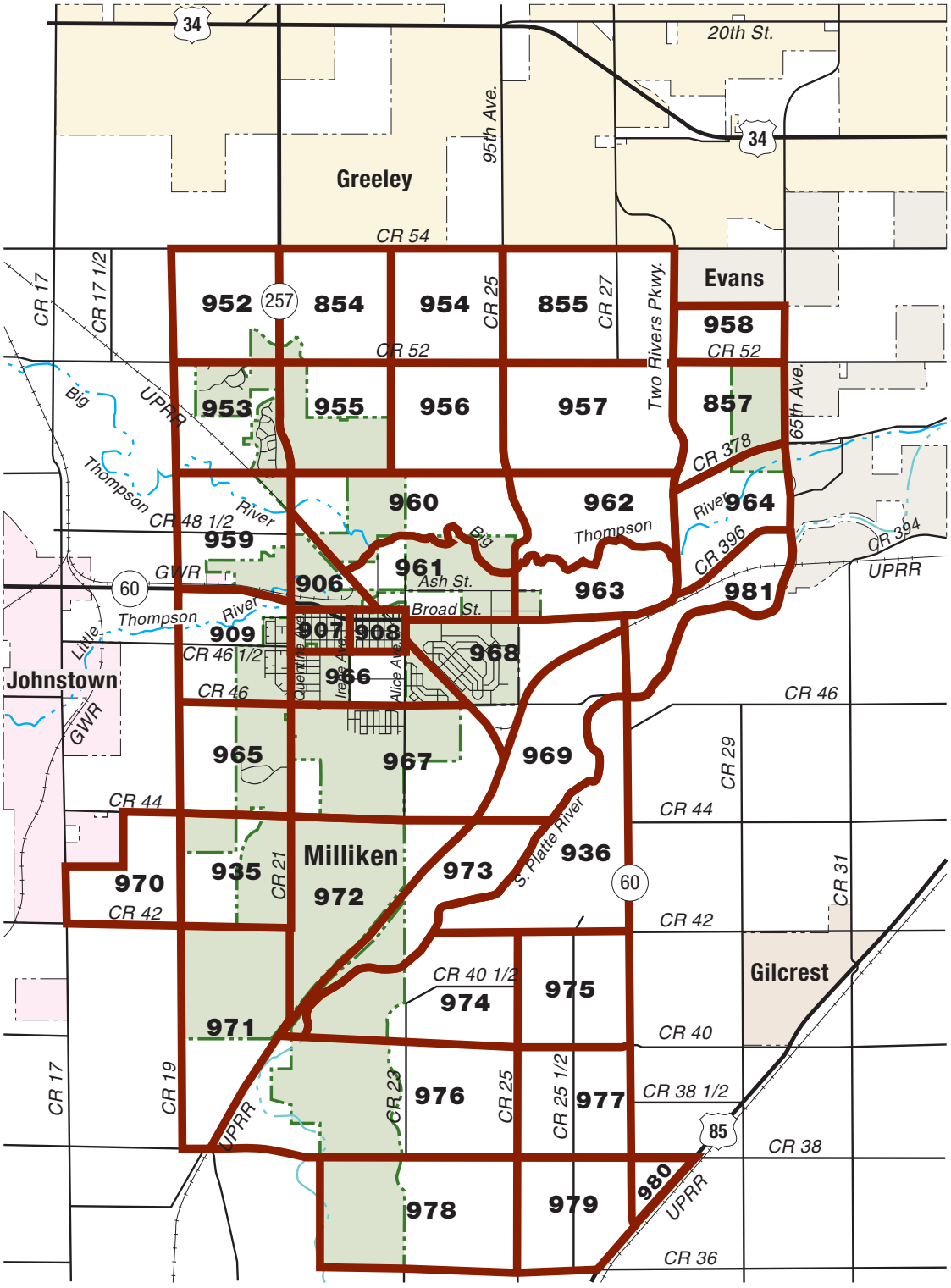

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XXX = Traffic Analysis Zones

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Figure 8

Traffic Analysis Zones

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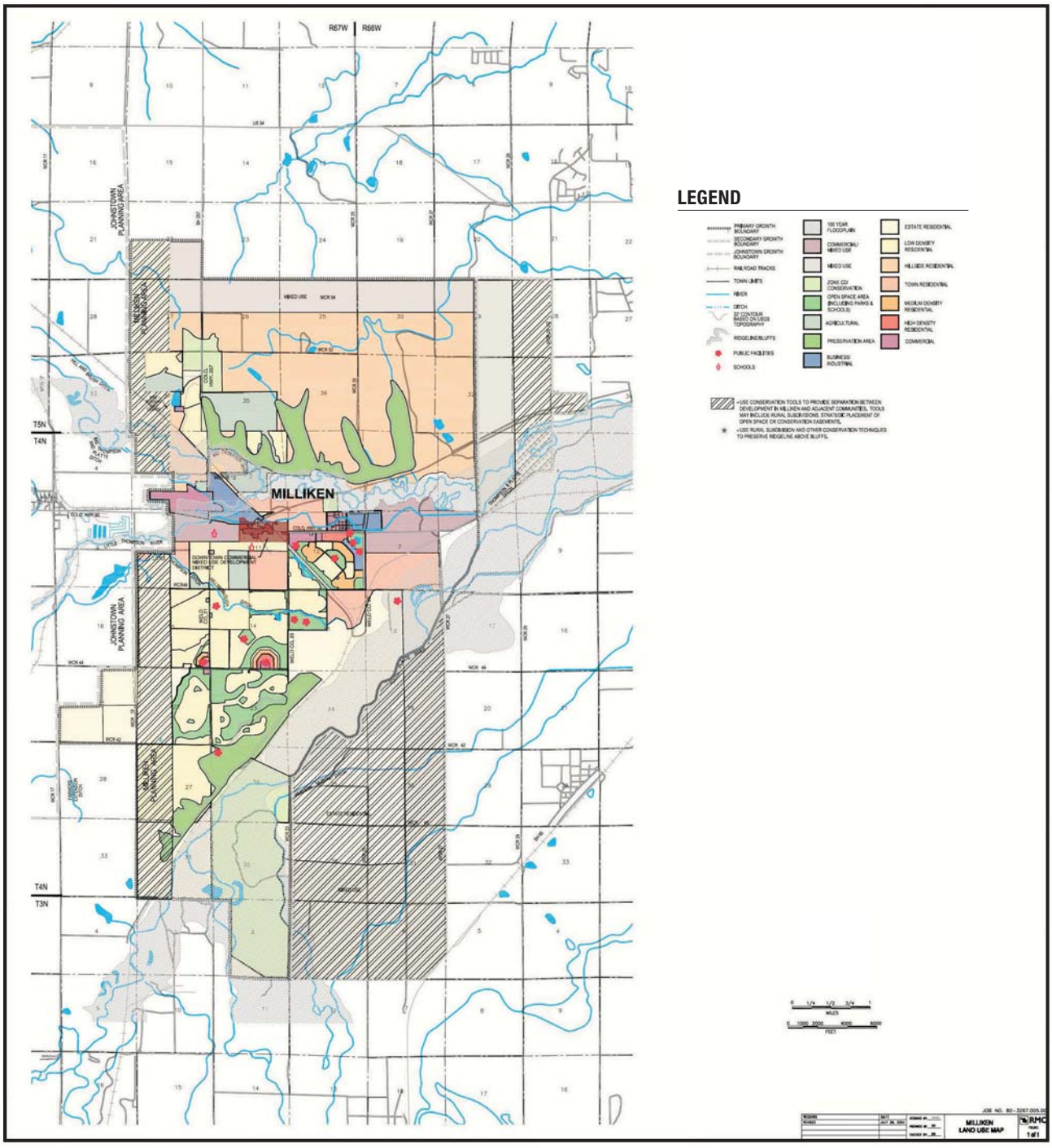

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Figure 9
Milliken Land Use Map
(July 2004)

The Colorado state demographer reports a population within the Milliken town limits of 5,887 in 2006 with an average household size of 3.33 persons per household. The Town's current (2008) population is estimated to be approximately 6,300. It is anticipated that Milliken will continue to experience significant growth over the next 27 years and beyond. Forecasts of future growth in the Milliken planning area have been developed using proposed development plans along with land uses and densities identified in the Town's Comprehensive Plan.

2035 Forecasts

Many new developments have been proposed within the planning area in recent years. **Figure 10** shows the existing developments in the planning area as well as the anticipated developments which have been presented to the Town of Milliken in various phases of the development planning process. For the purpose of this Transportation Plan, it has been assumed that all anticipated development shown on **Figure 10** will be developed by 2035. These anticipated developments were used to estimate the land use projections for 2035, as reflected in **Table 1**. Any development above and beyond the current anticipated development is included only in the buildout forecasts. The household and employment projections shown in **Table 1** correspond to the Traffic Analysis Zones (TAZs) shown on Figure 8. By 2035, over 9,500 households are projected in the planning area, which corresponds to a population of approximately 26,700. An estimated 3,600 jobs are projected in the Milliken planning area by 2035.

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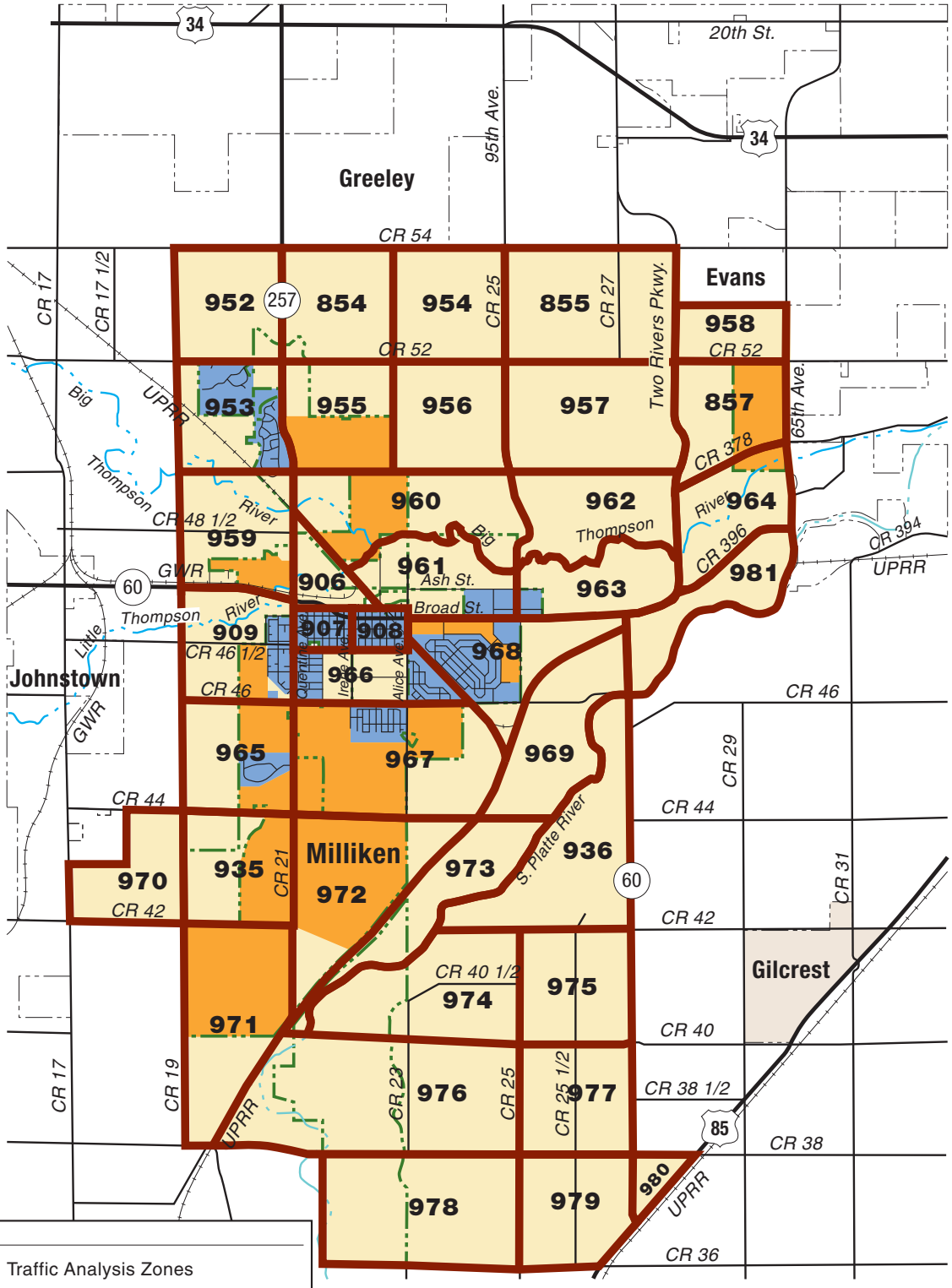

Figure 10

Existing and Planned Development

Table 1. 2035 Land Use Forecasts

TAZ	Households	Retail Employment	Service Employment	Production Employment	Total Employment
854	5	0	0	0	0
855	7	0	0	0	0
857	156	29	49	0	78
906	3	0	0	5	5
907	351	0	75	23	98
908	307	28	166	2	196
909	467	0	0	0	0
935	806	0	0	0	0
936	5	0	0	0	0
952	8	0	0	0	0
953	241	0	20	0	20
954	2	0	0	0	0
955	491	0	0	0	0
956	0	0	0	0	0
957	0	0	0	0	0
958	3	0	0	0	0
959	5	78	395	236	710
960	405	0	0	5	5
961	6	0	20	242	262
962	1	0	0	5	5
963	3	0	40	310	350
964	3	0	0	0	0
965	422	65	109	0	174
966	567	0	0	0	0
967	2128	65	109	0	174
968	1130	199	734	287	1220
969	3	0	0	106	106
970	3	0	0	0	0
971	1005	72	120	7	199
972	960	0	0	0	0
973	1	0	0	0	0
974	8	0	0	1	1
975	7	0	0	0	0
976	8	0	0	0	0
977	7	0	0	0	0
978	10	0	0	0	0
979	11	0	0	0	0
980	2	0	0	0	0
981	4	0	0	0	0
Total	**9,551**	**537**	**1,837**	**1,230**	**3,604**

Buildout Forecasts

There is a significant portion of land within the Milliken planning area for which no specific development plans are available. For these areas, which are shaded yellow on **Figure 10**, the land uses identified in the Milliken Land Use Map (**Figure 9**) from the Comprehensive Plan have been used to estimate the number of households and employment at buildout of the planning area. The Comprehensive Plan provides some guidelines on the densities allowed for the various land uses; the Town Planner provided input on appropriate densities to use where specifics are not provided in the Comprehensive Plan. The buildout land use forecasts are shown in **Table 2**. The buildout land use projections represent a significant increase over the 2035 projections, with approximately 29,000 households and 22,000 jobs. Using the current Weld County average household population of 2.8, this equates to a buildout population of approximately 81,000. Documentation of the assumptions used to calculate the buildout land use forecasts is provided in **Appendix B**.

Table 2. Buildout Land Use Forecasts

TAZ	Households	Retail Employment	Service Employment	Production Employment	Total Employment
854	1088	186	310	0	497
855	1717	294	490	0	784
857	699	790	1317	0	2107
906	3	131	653	397	1181
907	351	0	75	23	98
908	307	28	166	2	196
909	592	55	183	55	293
935	976	0	0	0	0
936	245	70	232	592	894
952	1742	85	142	0	227
953	881	0	20	0	20
954	1161	199	332	0	531
955	891	0	0	0	0
956	1040	0	0	0	0
957	1600	0	0	0	0
958	299	302	503	0	805
959	755	78	395	236	710
960	1045	0	0	5	5
961	1106	0	20	242	262
962	761	0	0	5	5
963	213	256	894	566	1716
964	155	157	261	0	418
965	582	65	109	0	174
966	1267	0	0	0	0
967	2548	65	109	0	174
968	2015	455	1588	544	2586
969	1193	37	122	143	301
970	238	0	0	0	0
971	1115	72	120	7	199
972	960	0	0	0	0

TAZ	Households	Retail Employment	Service Employment	Production Employment	Total Employment
973	246	0	0	0	0
974	288	0	0	1	1
975	237	61	203	518	783
976	248	70	232	592	894
977	197	96	319	815	1230
978	130	105	348	889	1342
979	144	115	385	981	1481
980	2	235	784	235	1255
981	4	261	436	0	697
Total	**29,040**	**4,268**	**10,749**	**6,848**	**21,866**

B. Future Traffic Forecasts

The future travel demand patterns in the Milliken area and the North Front Range region are primarily a function of the population and employment opportunities in the area. The household and employment data outlined in the previous sections were used as input to the NFR travel demand model. The model provided traffic forecasts on the various street networks that were used to assess improvement needs. These forecasted volumes could then be used to identify deficiencies in the roadway network and to evaluate the effectiveness of alternatives.

The initial traffic forecasts were developed using the NFR Fiscally Constrained model which includes the existing roadway network plus projects that have committed funding and those included in the NFR 2035 Fiscally Constrained Plan. No improvement projects are included within the Milliken planning area. The roadway network within the planning area has been expanded in the model to represent all existing section line roads.

C. Travel Patterns

The future travel demand patterns in the Milliken area and the other communities in the North Front Range are shown on **Figure 11**. Of the trips generated by the Milliken planning area (as shown in **Figures 8** and **9**), 23 percent are expected to remain internal to the planning area in 2035. Seventeen percent of the total daily trips with either an origin or a destination in the Milliken planning area are projected to be made between Milliken and Johnstown. The remaining trips generated by Milliken are expected to have either an origin or destination in the Denver metropolitan area (16 percent), the Greeley/Evans area (14 percent), Loveland (12 percent), or the remainder of the North Front Range region (18 percent).

D. Screenline Analysis

A simple method of creating “screenlines” was used to compare the projected traffic volumes with the existing traffic volumes and to compare those volumes with the capacities of the roadways. A screenline is a straight line drawn across a number of streets providing travel in the same direction. All traffic volumes traveling across that particular screenline added together provide an understanding of the travel patterns and deficiencies in the network along a specific orientation (i.e. north-south or east-west).

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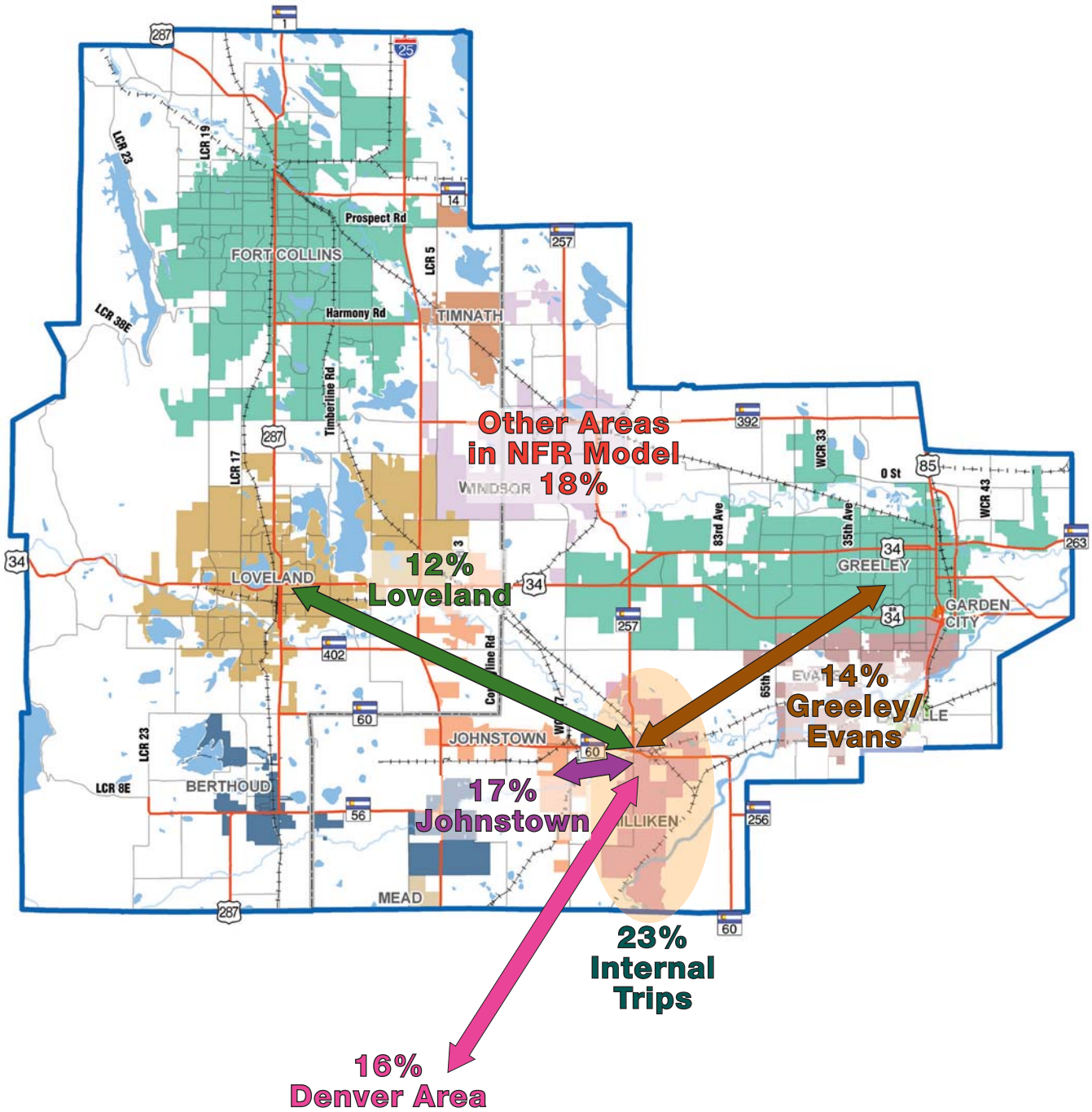

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Figure 11

2035 Daily Trip Distribution

The results of the three screenline analyses in the Milliken area are shown on **Figure 12**. Bar graphs of the existing volumes and the projected 2035 and buildout volumes are shown next to each screenline. The summation of the capacity of the roads that cross the screenline is also shown on each graph. Both the traffic forecasts and the capacities are based on the model results using the existing/committed roadway network.

Screenline 1 represents the demand for travel in the north-south direction, north of downtown Milliken. This screenline includes SH 257, CR 25, and Two Rivers Parkway. The existing volume along the screenline is well below the existing capacity of 40,000 vehicles per day (vpd). The 2035 forecasts are also below the existing capacity, but the buildout forecasts exceed the capacity, indicating the need for additional capacity in the north-south direction. It should be noted that, although the 2035 forecasts are below the existing capacity of the screenline, individual roadway facilities exceed the capacity, as described in Section III.F.

Screenline 2 represents the demand for east-west travel on the west side of Milliken. This screenline includes CR 42, CR 44, CR 46 ½, SH 60, CR 48 ½, CR 52, and CR 54. Similar to the results shown in Screenline 1, the travel demand along the screenline are not expected to exceed the screenline capacity until buildout of the Milliken planning area. This indicates a need for additional capacity in the east-west direction as growth continues in the area. Traffic is not evenly distributed along the seven roadways included in the screenline; individual roadways will likely require additional capacity prior to 2035.

Screenline 3 includes CR 19, CR 21, and SH 60 and represents the demand for north-south travel south of the currently developed area of Milliken. In this case, the existing, 2035 forecasts, and buildout forecasts along the screenline are projected to remain below the capacity of the screenline.

E. Projected Traffic Demand on Existing/Committed Network

With the general trends observed in the screenline analyses in mind, the initial model runs involved assigning 2035 and buildout volumes to the existing/committed roadway network. The forecasted 2035 traffic volumes on the existing/committed network are shown on **Figure 13**, and the buildout traffic forecasts on the existing/committed network are shown on **Figure 14**.

F. Identifications of Deficiencies

The purpose of modeling the future land use on the existing/committed network is to identify future deficiencies in the existing roadway network. **Table 3** provides design and maximum planning level capacities in vehicles per day (vpd) for various roadway types and laneages. The design standard capacities generally conform to level of service (LOS) D, which is typically the design goal for urban areas. The maximum capacity corresponds to the breakpoint between level of service E and F where roadway failure and resulting congestion can be expected a significant amount of the time.

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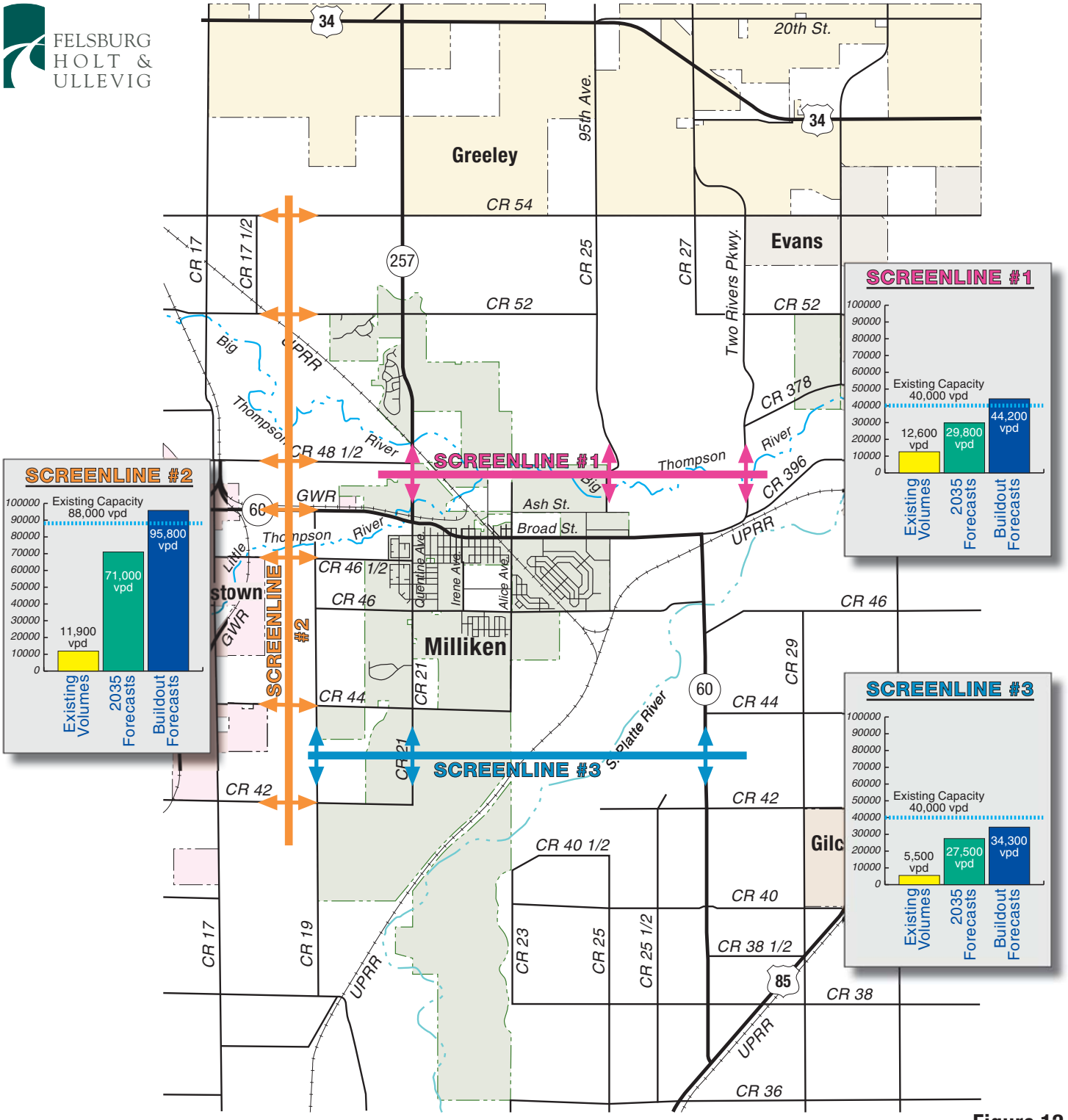

Figure 12

Screenline Daily Traffic Volumes on Existing/Committed Network

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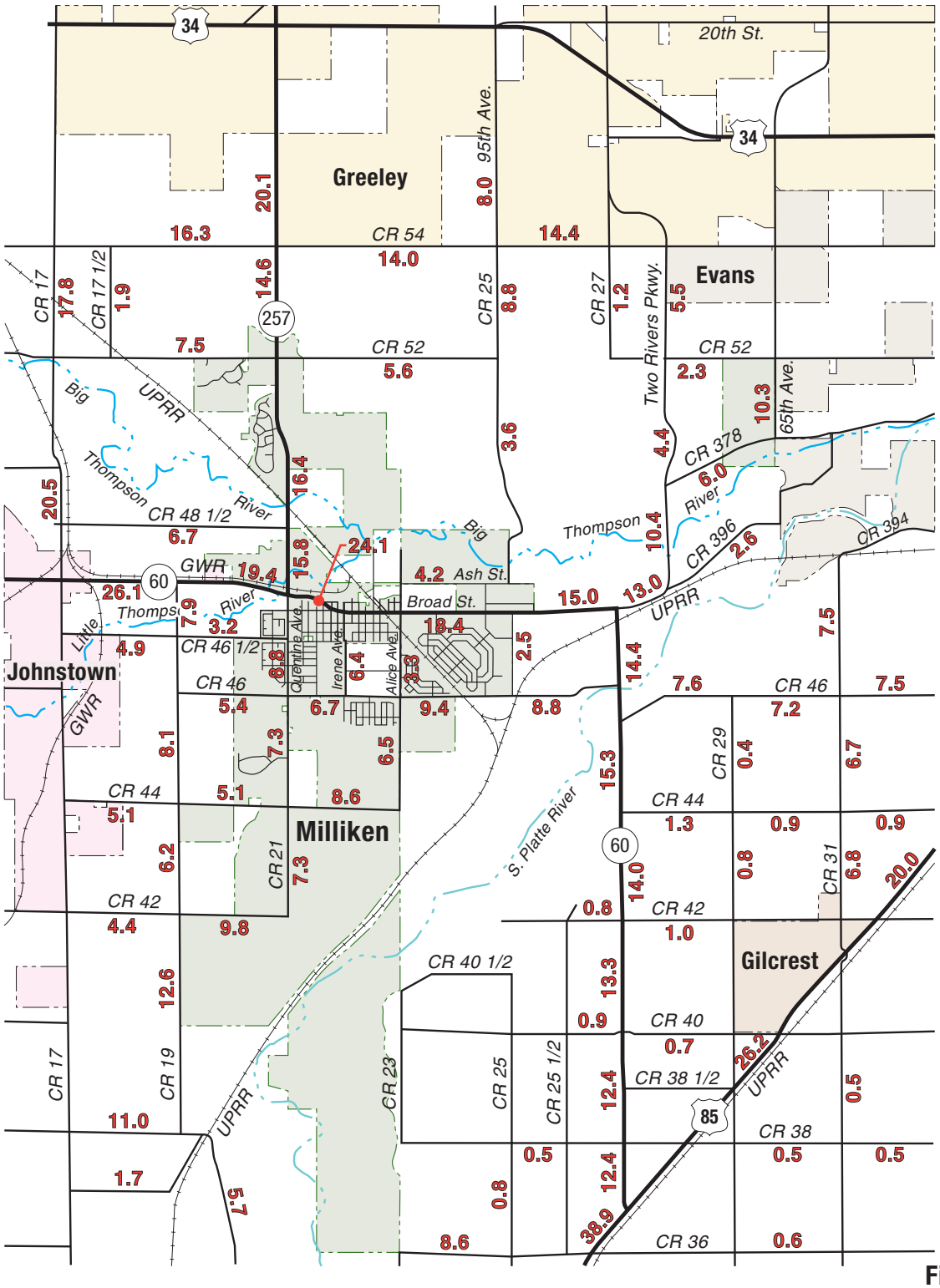

Figure 13

2035 Traffic Forecasts on Existing/Committed Network

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Legend

XX.X = 2035 Daily Traffic Forecasts (in thousands)

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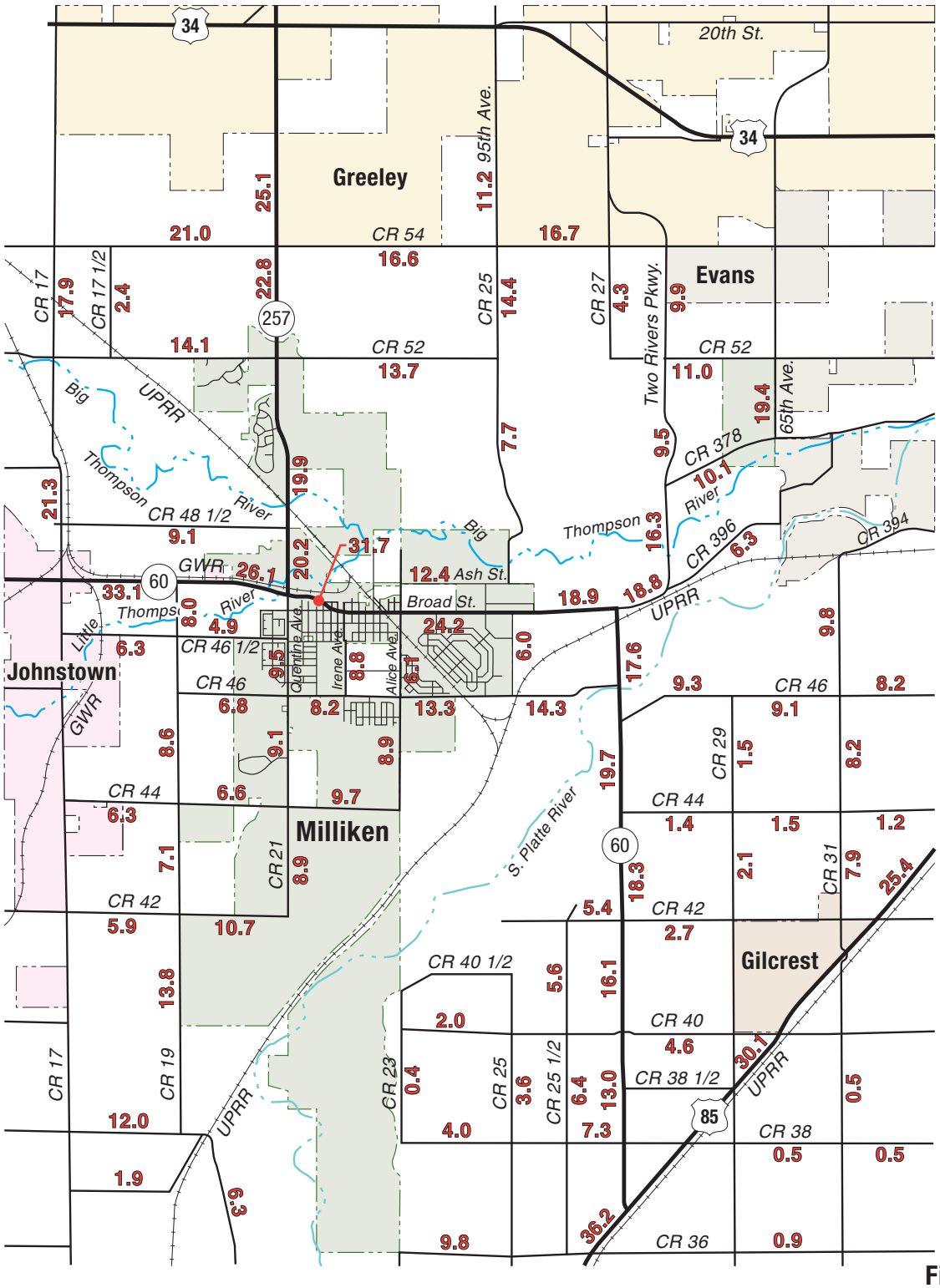

Figure 14

Buildout Traffic Forecasts on Existing/Committed Network

Legend

XX.X = Buildout Daily Traffic Forecasts (in thousands)

North

Table 3. Planning Level Roadway Capacities

Functional Classification	Number of Lanes	Design Standard	Maximum Capacity
Expressway	4-Lane	48,000 vpd	60,000 vpd
	6-Lane	72,000 vpd	90,000 vpd
Major Arterial	2-Lane	13,000 vpd	16,000 vpd
	4-Lane	26,000 vpd	32,000 vpd
	6-Lane	39,000 vpd	48,000 vpd
Minor Arterial	2-Lane	10,000 vpd	12,000 vpd
	4-Lane	20,000 vpd	24,000 vpd
Collector	2-Lane	8,000 vpd	10,000 vpd
	4-Lane	16,000 vpd	20,000 vpd

One measure that is used to define operational characteristics is volume to capacity ratio (v/c). This analysis compares the capacity of the street as it is designed and constructed to the volume of traffic it carries, or is projected to carry in the future. The planning level daily capacity thresholds shown in **Table 3** are the basis for the v/c ratios developed in this transportation plan. Roads with lower functional classifications and fewer lanes would be expected to accommodate fewer vehicles per day, while roads with higher functional classifications would be expected to accommodate more vehicles. For the purpose of this v/c analysis, the Major Arterial maximum capacity was used for SH 60, SH 257, and CR 54, and the Minor Arterial maximum capacity was used for all other county roads. These capacities assume that all county roads will be paved by 2035.

The v/c ratios calculated for streets within the planning area in 2035 and at buildout are graphically depicted on **Figures 15** and **16**, respectively. These ratios have been calculated using the forecasted daily traffic volumes shown on **Figures 13** and **14** and the maximum roadway capacities provided in **Table 3**. The red segments represent roadways which are projected to carry traffic volumes in excess of the planning-level roadway capacity (v/c $\geq$ 1.0), representing level of service (LOS) F. The yellow segments represent roadways that are projected to operate near capacity conditions (v/c between 0.8 and 1.0), generally corresponding to LOS E. The remaining segments represent roadways which operate below capacity (v/c < 0.8), representing LOS D or better. Volume to capacity ratios are not shown on those roadway segments which are within another community's jurisdiction.

The v/c ratios shown on **Figure 15** indicate that several roadways in the planning area are projected to carry volumes exceeding their capacity in 2035 if no improvements (other than paving) were made. Sections of SH 60, SH 257, Two Rivers Parkway, CR 54, and CR 19 are projected to operate at above capacity conditions. Based on the buildout land use forecasts, a significant portion of the roadway system is expected to be over capacity if no improvements were made, as shown on **Figure 16**. These roadway deficiencies help to identify potential roadway improvements.

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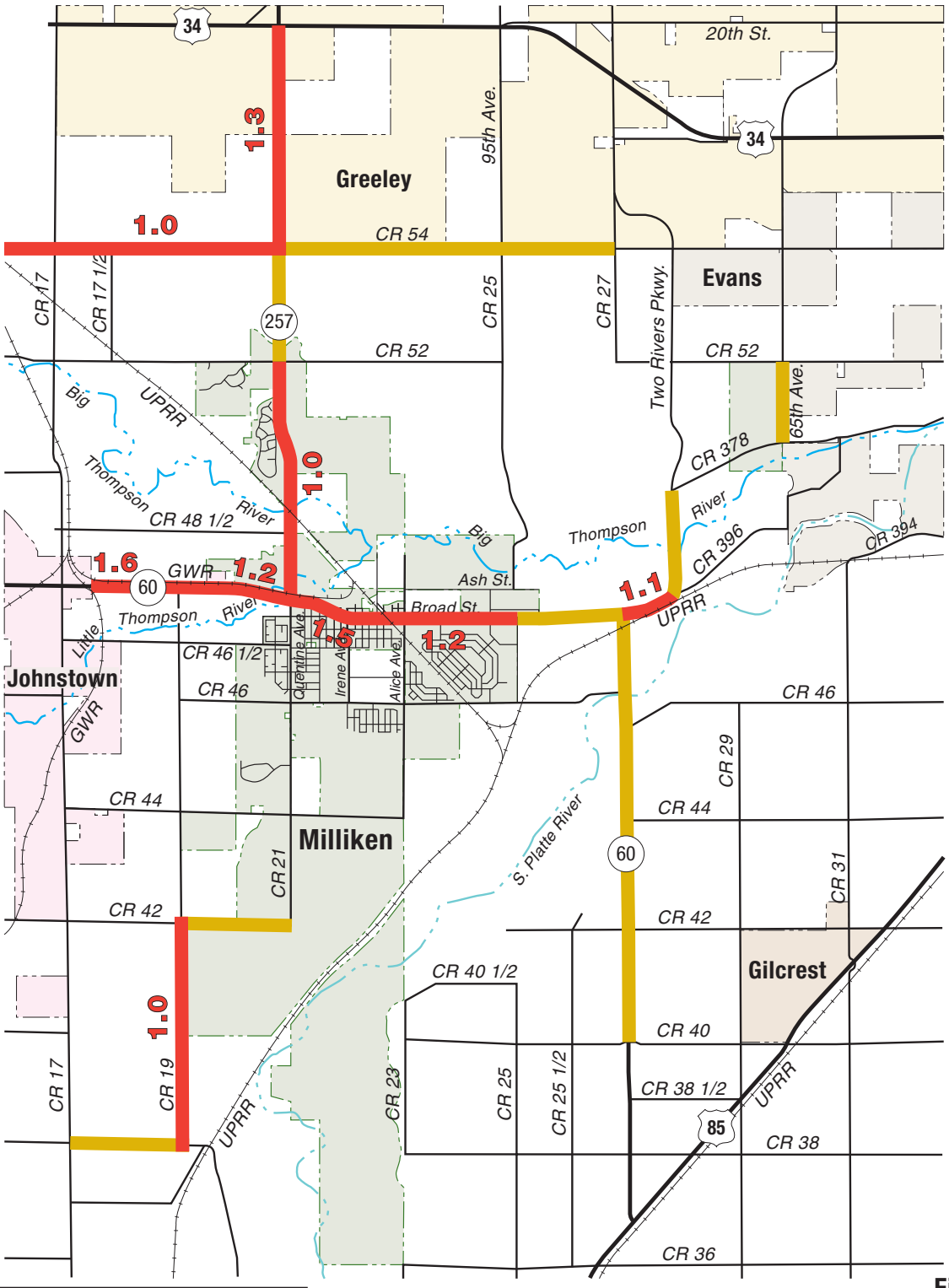

Legend

XX.0 = Volume to Capacity (V/C) Ratio

= Over Capacity (V/C≥1.0)

= Near Capacity (0.8≤V/C < 1.0)

North

Figure 15

2035 Volume to Capacity Ratios on Existing/Committed Network

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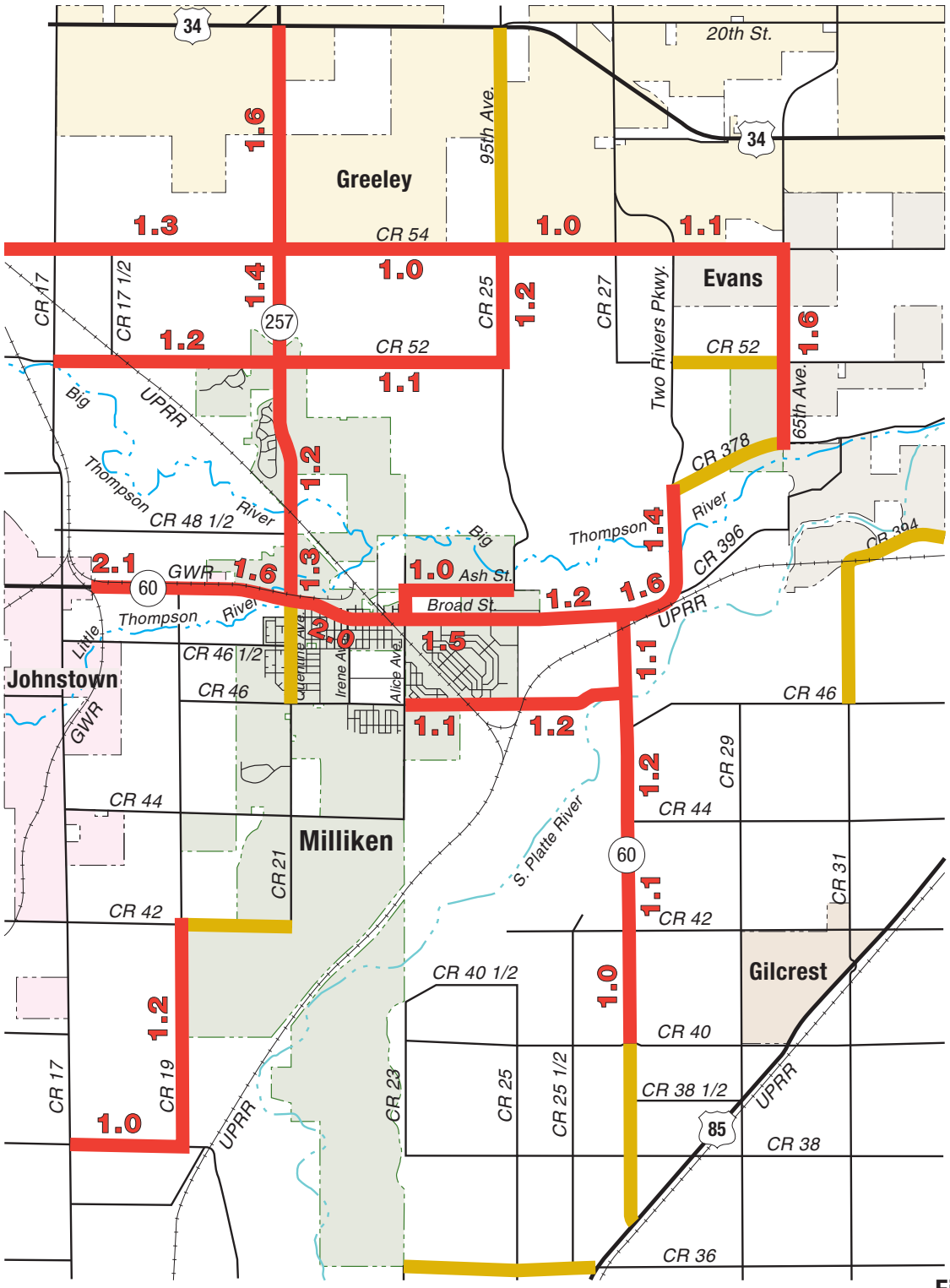

Legend

XX.0 = Volume to Capacity (V/C) Ratio

= Over Capacity (V/C ≥ 1.0)

= Near Capacity (0.8 ≤ V/C < 1.0)

North

Figure 16

Buildout Volume to Capacity Ratios on Existing/Committed Network

G. Potential Roadway Constraints

The Milliken planning area has a number of constraints that create potential obstacles for future roadway improvements. In some cases, the constraints may prevent certain improvements. The potential constraints in the planning area are shown on **Figure 17**. The residences and businesses along Broad Street (SH 60) through downtown Milliken are located close to the road, eliminating the possibility of widening this section of SH 60 to four lanes. This constraint is recognized in the *SH 60 EOS*, and no widening is anticipated by CDOT. Three rivers (the South Platte River, the Big Thompson River, and the Little Thompson River) flow through the Milliken planning area. These rivers and the adjacent flood plains, create obstacles for roadway connectivity in the area. Likewise, the Union Pacific Railroad and Great Western Railway lines that extend through the study area act as barriers between various sections of the planning area. Any new railroad crossings would likely require grade separation; grade separations with the railroad and bridges over the rivers result in significant cost for roadway improvements. Gravel pits are currently being mined in the southern portion of Milliken; ultimately these gravel pits will be reclaimed as parks with reservoirs, which could present obstacles for future roadway improvements.

H. Alternatives Considered

The results of the screenline and volume to capacity ratio analyses were used to identify potential roadway improvement corridors. In addition to the analysis results, transportation needs were identified through input from the public, the Town Board, Planning Commission, and previous transportation studies conducted in the region. The following roadway improvements have been included in other transportation studies or plans and are assumed to be completed by 2035:

- Widen US 34 from I-25 to US 85 to six lanes
- Widen SH 257 from SH 60 to US 34 to four lanes
- Widen CR 54 from I-25 to US 85 to four lanes
- New Two Rivers Parkway alignment (two lanes) from SH 60 to CR 378
- Widen Two Rivers Parkway from CR 54 to US 34 to four lanes

The improvements listed above serve as the baseline network for evaluating additional roadway improvement alternatives. Six corridors have been identified as potential future roadway connections, as shown on **Figure 18**. Based on public input and the initial travel demand modeling results, the primary goal in evaluating these corridor alternatives is to find a combination of improvements that:

- Provides relief to the demand along Broad Street (SH 60) through downtown
- Provides an alternative truck route to minimize truck traffic through downtown
- Provides connectivity of the roadway system across the South Platte, Big Thompson, and Little Thompson Rivers as well as the UPRR and Great Western Railroad
- Provides an alternative entrance into Milliken for future growth areas to the north and southeast of the existing community

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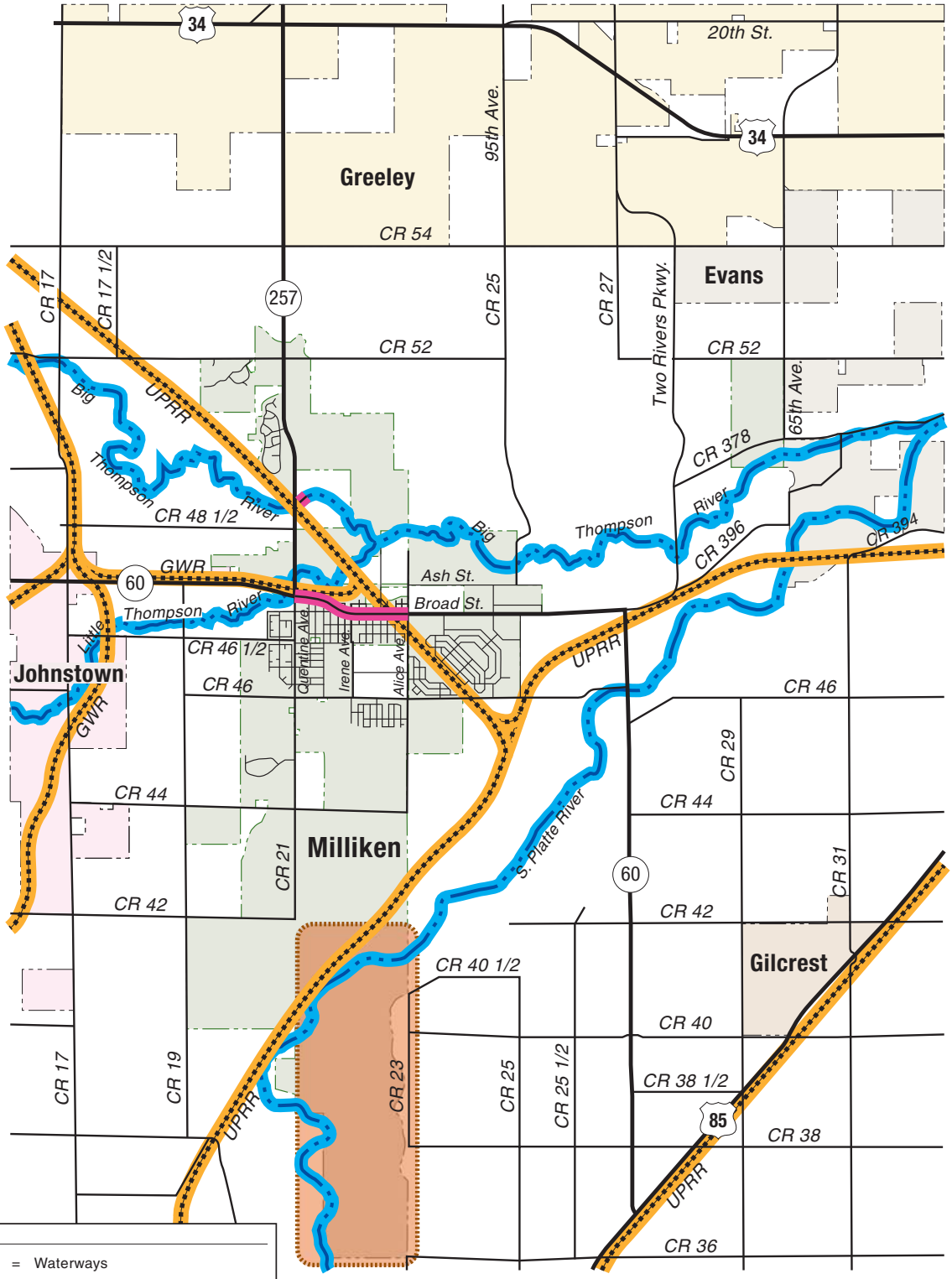

Figure 17

Potential Contraints

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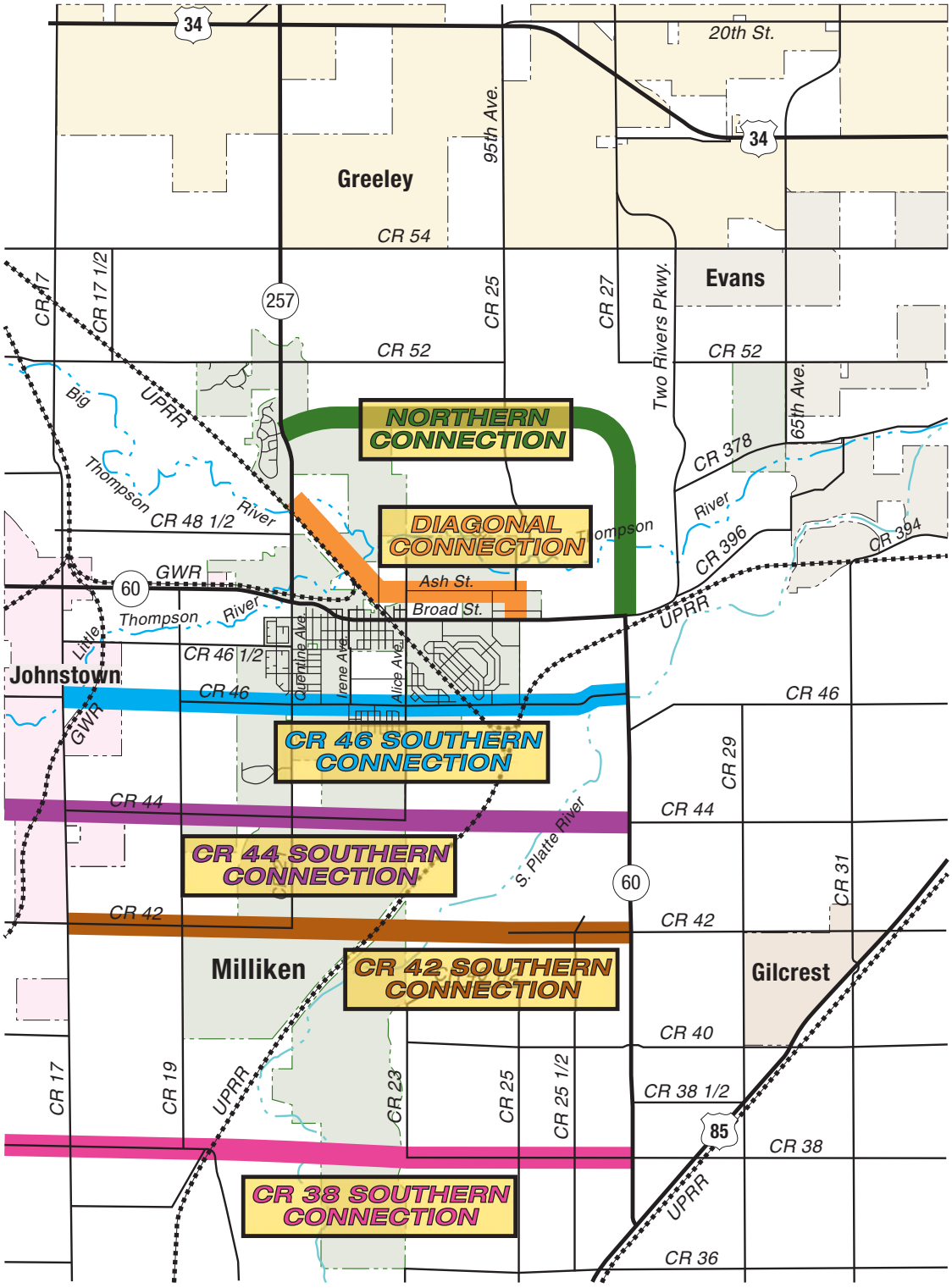

North

Figure 18

Corridor Alternatives Considered

The corridor alternatives shown on **Figure 18** were each incorporated into the travel demand model, and separate model runs were conducted to evaluate the exclusive effects of each improvement. A summary of the modeling results and other considerations for each of the six corridor alternatives is provided below.

Northern Connection

Advantages:

- Provides east-west connectivity for future development north of the Big Thompson River
- Provides a direct connection between SH 257 to Two Rivers Parkway/SH 60
- May be a viable "swap" with CDOT
- Potential truck route to minimize truck traffic through downtown
- Some reduction in traffic through downtown (2,000 vpd in 2035)

Disadvantages:

- Divides up agricultural fields/developable land
- Numerous drainageway crossings at tributaries to Big Thompson River and Kammerzell Lake
- Potential impacts to oil/gas well sites

Ash Street / Diagonal Connection

Advantages:

- Provides a semi-direct route from SH 60 to SH 257
- May be a viable "swap" with CDOT
- Potential truck route to minimize truck traffic through downtown
- Reduction in traffic through downtown (5,000 vpd in 2035)
- Would be adjacent to existing transportation corridor (UPRR tracks)

Disadvantages:

- Could require acquisition of up to three residential parcels
- Additional right-of-way takes at nearby residential parcels

CR 46 Southern Connection

Advantages:

- Provides an alternate entrance into Milliken from I-25 (via CR 44 interchange)
- Some reduction in traffic through downtown (2,000 vpd in 2035)
- Potential truck route to reduce truck traffic through downtown

Disadvantages:

- Connection between CR 17 and CR 19 not feasible because of approved development in Johnstown, Hillsboro Reservoir, and proximity of railroad to CR 17
- Increased traffic adjacent to existing residences along CR 46

CR 44 Southern Connection

Advantages:

- Provides an alternate entrance into Milliken from I-25 (via CR 44 interchange)
- Provides additional crossing of South Platte River and UPRR to improve roadway connectivity
- Some reduction in traffic through downtown (1,500 vpd in 2035)
- Potential truck route to reduce truck traffic through downtown

Disadvantages:

- Connection between CR 15 and CR 17 not feasible because of approved development in Johnstown
- Potential environmental impacts at reclaimed gravel pits
- Large expense for bridge over S. Platte River and UPRR

CR 42 Southern Connection

Advantages:

- Minor reduction in traffic through downtown (600 vpd in 2035)
- Potential truck route to reduce truck traffic through downtown
- Provides additional crossing of South Platte River and UPRR to improve roadway connectivity
- Provides an alternative entrance into Milliken from I-25 (via CR 44 interchange)

Disadvantages:

- Potential environmental impacts at reclaimed gravel pits
- Large expense for bridge over S. Platte River and UPRR

CR 38 Southern Connection

Advantages:

- Potential truck route to reduce truck traffic through downtown
- Provides additional crossing of South Platte River and UPRR to improve roadway connectivity
- Provides an alternative entrance into Milliken from I-25 (via CR 34 interchange)

Disadvantages:

- No reduction in traffic through downtown; more of a relief for roadways south of Milliken (CR 46 and SH 66)
- Potential environmental impacts at reclaimed gravel pits
- Large expense for bridge over S. Platte River and UPRR

Based on the evaluation of these six corridor improvement alternatives, three have been deemed appropriate for inclusion in the long range roadway plan: the northern connection, the diagonal connection, and the CR 42 southern connection. The combination of these three alternatives best achieves the goals of relieving Broad Street, providing an alternative truck route, providing roadway connectivity and providing an alternative entrance into Milliken. The CR 44 and CR 46 alternatives have been eliminated from further consideration primarily because of the approved development plans in Johnstown that prevent completing the missing sections of these corridors. The CR 38 alternative has been eliminated because it primarily benefits areas south of Milliken rather than relieving the roadways within Milliken.