System Management Technical Report

State Highway 82 / Entrance to Aspen Environmental Reevaluation

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Colorado Department of Transportation, Region 3

and

Federal Highway Administration, Colorado Division

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1.0 Introduction

This technical report provides a reevaluation of the transportation system relationships and the system management environment as presented in the 1997 State Highway 82 Entrance to Aspen Final Environmental Impact Statement (FEIS) (CDOT, 1997).

Topics covered include transportation facilities, relationships between transportation modes, system management concepts, the Incremental Transportation Management (TM) Program, parking demand at multimodal centers, and future transit ridership characteristics as they relate to the Preferred Alternative selected in the 1998 Record of Decision (ROD) (CDOT, 1998).

Traffic characteristics and safety, topics closely related to system management, are addressed in a separate report, *Traffic Characteristics and Safety Technical Report, State Highway 82/Entrance to Aspen Environmental Reevaluation* (FHWA and CDOT, 2007a). The reader should consider both this report and the traffic/safety report together to fully understand the transportation issues associated with the Entrance to Aspen project.

1.1 Methodology

This report includes information assembled from many sources, which are listed in the reference section. They include transit ridership data from the Roaring Fork Transportation Authority (RFTA), traffic counts from the City of Aspen and the Colorado Department of Transportation (CDOT), and current plans, policy documents, and data from local government-sponsored studies. Data in the FEIS were analyzed as they relate to the Preferred Alternative selected in the Record of Decision. More recent and/or current data on the same topics, as noted above, were assembled and compared to the FEIS data. Differences in the data and new trends were identified and reported.

1.2 Regulatory Overview

The subjects covered in this technical report are those necessary to meet the requirements of federal regulations pertaining to federally-funded (in whole or in part) transportation projects that minimize and mitigate adverse impacts. Table A-1 in Appendix A shows the federal regulations, executive orders, and state regulations upon which the 1997 FEIS was developed in regard to system management and, if those regulations have changed, how they have changed, as well as any new regulations that bear on system management issues.

The only new regulation related to system management is the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) signed on August 10, 2005, by President Bush. It authorizes the federal surface transportation programs for highways, highway safety, and transit for the 5-year period from 2005 to 2009. This legislation addresses the challenges of the proposed project: improving safety, reducing traffic congestion, improving efficiency in freight movement, increasing intermodal connectivity, and protecting the environment.

2.0 Description of the Existing Condition

The Preferred Alternative selected in the 1998 ROD includes roadway, transit and system management components. Two components of the Preferred Alternative have been constructed since the publication of the FEIS and ROD: (1) Owl Creek Road and West Buttermilk Road have been relocated to create a new, signalized intersection with State Highway 82 near the Buttermilk Ski Area; and (2) the roundabout at the Maroon Creek Road intersection has been completed.

In addition, the Maroon Creek Bridge Replacement Project is currently under construction, scheduled for completion by spring of 2008. This project is being constructed as a bridge replacement without any increase in roadway capacity. The bridge will accommodate the Entrance to Aspen Preferred Alternative in the future by removing the center median and re-striping for two general-purpose lanes and two exclusive bus lanes, although the bridge approaches would still need to be shifted prior to full implementation of the Preferred Alternative (see the Introduction to the Technical Report Volume for more detail).

The intersection of Truscott Drive and State Highway 82 was completed in 2001. While this intersection is not part of the Entrance to Aspen Project, its configuration accommodates the alignment for the east approach to the Maroon Creek Bridge Replacement Project.

A transportation easement across the Marolt-Thomas Open Space was conveyed from the City of Aspen to CDOT in August of 2002, as part of land exchange and mitigation agreements between CDOT and the City of Aspen and Pitkin County. (Refer to Appendix A and B in the 1998 Record of Decision for the details of the open space conveyance agreements and mitigation commitments.)

2.1 System Relationships

Transportation systems must consider all modes of travel, as well as the relationships among various modes of travel. Within the upper Roaring Fork Valley, transportation modes of importance to the Entrance to Aspen State Highway 82 project corridor include: other roadway links; air service; bus service; pedestrian/bicycle facilities; and potential, future exclusive bus lanes and fixed guideway rail service.

The FEIS provided a description of existing transportation system components as context for discussion of issues including system management, as well as traffic characteristics and safety. This technical report provides an updated description of the existing transportation system as a foundation for the reevaluation of the system management components of the Preferred Alternative selected in the 1998 ROD.

2.1.1 Other Roadway Links

State Highway 82 between Glenwood Springs and Aspen is the single-most important surface transportation link in Pitkin County and the Roaring Fork Valley. State Highway 82 is the only through highway route that extends along the length of the valley, carrying most of the valley's highway and

transit traffic while providing access to most of the major roads and facilities in Pitkin County and the City of Aspen. While a number of roadways run parallel to individual segments of State Highway 82, none provide full continuity through the valley. Although parallel roadways are used to bypass congestion on selected segments of State Highway 82, diversion to alternative roadway segments does not significantly reduce demand on State Highway 82.

Since publication of the ROD in 1998, CDOT and the City of Aspen have implemented a number of improvements to the State Highway 82 corridor to correct roadway deficiencies, improve traffic flow, and add needed capacity.

Between 1996 and 1998, CDOT completed widening of State Highway 82 to four lanes between Aspen Village and Brush Creek Road. Improvements at Shale Bluffs were completed between 1997 and 2000, while widening between Gerbazdale and the Holland Hills project, and between Snowmass Creek East and West, was completed in 1999 and 2000, respectively (CDOT, 2000).

In 2000, CDOT built a park-and-ride at Brush Creek (200 paved spaces), and began two projects to complete the widening of State Highway 82 between Basalt and Buttermilk. Widening of the first segment, between Aspen Airport Business Center and Buttermilk was completed in 2001. The Aspen Airport Business Center to Buttermilk segment, within the project corridor, was built as a four-lane segment (including peak hour HOV lanes) with several upgrades including relocation of Owl Creek Road and West Buttermilk Road to create a new, combined intersection with State Highway 82 near the Buttermilk Ski Area. The roundabout at the Maroon Creek Road intersection was constructed, along with a new pedestrian underpass. The underpass improves safety by connecting the Owl Creek Trail to the Aspen Trail system (CDOT, 2007a). The widening of Snowmass Canyon followed immediately, and was opened to traffic in the fall of 2004. Additional down valley park-and-ride facilities have since been developed at Buttermilk, Basalt, Snowmass Creek, and Aspen Village. All of the park-and-ride facilities experience heavy use.

The CDOT projects are included in the No Action/Committed Projects Alternative of the West Glenwood Springs to Aspen Corridor Investment Study (CIS) (RFTA, 2003). Travel demand forecasts for both the CIS and the State Highway 82 Basalt to Buttermilk EIS (CDOT, 1993) concluded that, without an improved transit system, such as that included in the Preferred Alternative, the new four-lane highway will experience peak-hour congestion as early as the year 2009. Traffic analysis for the current reevaluation validates this conclusion.

Most recently, the City of Aspen undertook a phased project to improve traffic flow and safety of the S-curves at the signalized intersection of 7th Street and Main Street, known as the "S-Curves Feasibility Study." As the first project phase, an off-season demonstration of selected S-curve improvements (City of Aspen, 2005a) was conducted during a two-week period from May 23 through June 3, 2005. The improvements tested included implementing the following actions simultaneously:

- Left-turn restriction from Cemetery Lane to SH 82 (7-10 a.m., 3-6 p.m.)
- Eight Street closure, north of SH 82/Hallam Street

- Hallam Street closure, east of SH 82/Seventh Street
- Bleeker Street closure, east of SH 82/Seventh Street
- Bleeker north alley closure, east of SH 82/Seventh Street
- Bleeker south alley closure, east of SH 82/Seventh Street

Off-season testing of the improvements resulted in "… overall improved traffic flow for traffic entering Aspen from the roundabout", as well as a "…significant reduction in the delay at the signalized Cemetery Lane intersection (12.8 to 25. 9 seconds for the morning and evening peaks, respectively)." (City of Aspen, 2005a.) Other observations/ impacts of the tested improvements included a slight increase in queue lengths at the roundabout, increases in traffic volumes on Power Plant Road and Smuggler Road, modest impacts to the intersections of Seventh and Hallam/State Highway 82 and Sixth and Main as a result of turn restrictions and street closures.

Summer "peak season" demonstration of the improvements was conducted in August 2005 (City of Aspen, 2005b). The "peak season testing of the improvements resulted in only modest improvements to traffic flow into Aspen". With summer traffic volumes on State Highway 82 at capacity for most of the day, there is little opportunity for improvement with existing roadway capacity; however, "…closures and turn restrictions at Cemetery Lane do keep the flow constrained through the corridor, minimizing turn movements to and from the mainline, improving the flow of traffic." (City of Aspen, 2005b.) Further implementation testing was recommended in connection with traffic control for CDOT resurfacing activity during the summer of 2006.

To test possible transit operations benefits from exclusive lane operations, the City of Aspen also conducted a demonstration involving peak period removal of parking from the north side of State Highway 82, between 7th Street and Garmisch Street. Parking was allowed to continue during the day until 2:30 p.m. After that, the south side of the roadway was used as an exclusive bus lane for westbound buses exiting Aspen (right turn in front of Hickory House). As expected, this scheme resulted in improved peak period bus travel time, decreasing the time for buses to get out of town. However, transit capacity is currently limited and buses still must merge back into general traffic at the S curves and other places that offset the travel time advantages gained from the bus lane on Main Street. Therefore, implementation of the exclusive bus lanes/light-rail transit (LRT) elements of the Preferred Alternative is believed to be necessary to increase transit ridership, address the community goal of zero traffic growth in the City of Aspen, and provide needed transportation system capacity for future corridor person-trip demand.

It was concluded that S-curve improvements will work best as a package and, if paired with an outbound transit lane as part of transit improvements, significant improvement in transit travel times and increases in transit ridership would result. The bus lane on Main Street in Aspen has now been implemented on a permanent basis, and operates daily from 3:00 p.m. to 6:00 p.m. year-round, resulting in a decrease in transit times. The final bus-lane striping was done as part of the State Highway 82 Overlay Project.

Capacity and safety improvements completed within the project corridor since 1998 have not produced adequate additional capacity to satisfy current and future project corridor transportation demand. (See also Traffic Characteristics and Safety Technical Report, FHWA and CDOT, 2007a).

2.1.2 Air Travel

Aspen/Pitkin County Airport was the third busiest commercial airport in Colorado during 1993, with only Colorado Springs and Denver reporting higher numbers of enplanements (CDOT, 1997). One of the two scheduled commercial airlines, Continental Express, discontinued service in 1994. In spite of increased numbers of flights by the remaining carrier, United Express, the number of enplanements at the airport dropped significantly in 1995. As shown in Table 1-1, however, a significant rebound occurred almost immediately, bringing activity at the Aspen/Pitkin County Airport back to 1993 levels in 1998. Enplanements have remained stable at this level, and the airport is now served by three commercial carriers, United, America West and Delta Airlines. Because all ground traffic to and from the airport must use State Highway 82 to access Aspen, future increases in the level of activity at the airport will produce continuing growth in project corridor transportation demand (CDOT, 1997).

Table 1-1
Historic Commercial Enplanements at Aspen/Pitkin County Airport

Airport	1994	1995	1996	1997	1998	2005	Avg Annual Growth Rate %
Pitkin County Airport	251,533	204,907	206,672	217,343	251,448	249,000	0%
Eagle County Airport	62,347	77,167	109,118	164,415	173,041	215,464	22.7%
Regional Total	313,880	282,074	315,790	381,758	424,489	464,464	6.2%
Sources: Intermountain Transportation Planning Region, 2003; www.aspenairport.com/geninfo_overview, 2006; www.eaglecounty.us/airport, 2006.							

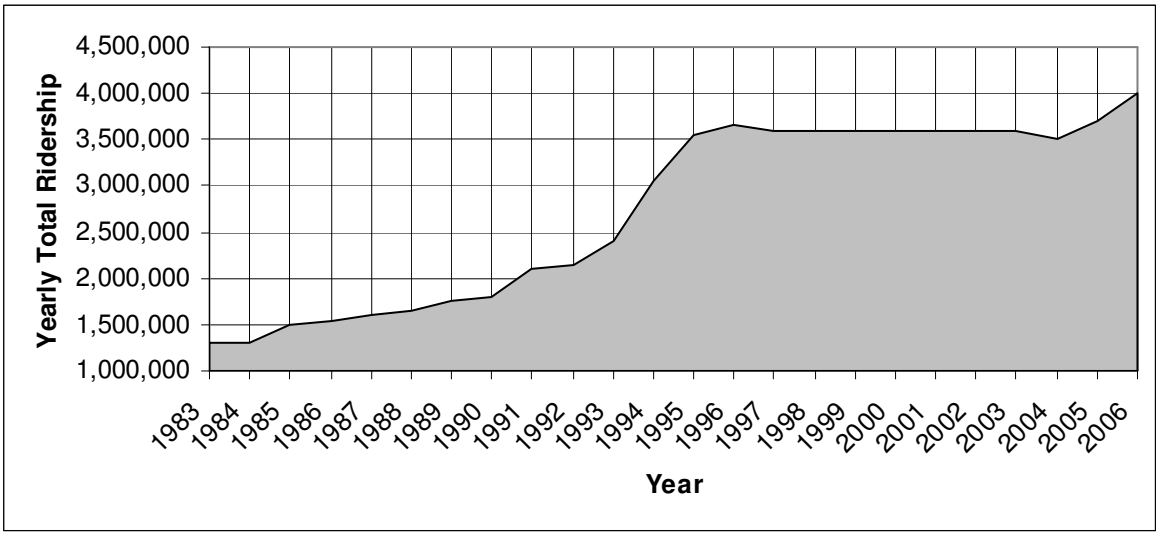
2.1.3 Bus Travel

In 1997, during the peak period, Roaring Fork Transportation Authority (RFTA) operated 60 buses on eight routes that were within or connecting to the Entrance to Aspen corridor. Figure 1-1 shows that RFTA ridership more than doubled between 1987 and 1996. By 1994 RFTA was carrying more than three million passengers, with much of the increase occurring between 1993 and 1996 (a 34% increase on valley routes, and a 19 % increase on skier shuttles) due to the additional provisions in new locations, such as a doubling of service between Aspen and El Jebel and increased frequencies in other places. Significantly, CDOT 1993 and 1994 origin and destination (O & D) surveys also showed that 6 % of summer trips and 17 % of winter trips using the State Highway 82 corridor were made on RFTA buses (CDOT, 1997). For peak hour operations affected by congestion, the RFTA person trip share was even higher, with RFTA buses carrying about 37 % of the winter person trips across the Castle Creek Bridge during the a.m. peak hour and 26% in the p.m. peak hour. During the summer of the same year, the RFTA share of person trips crossing the bridge was about 7% during the peak hours. More recent O&D data has not been collected; however, given that a major RFTA service expansion occurred in 1994 and

1995, the RFTA person trip share on the State Highway 82 corridor would be expected to be higher today. Per the Local and Regional Travel Patterns Study, the transit mode share for 2004 in the Roaring Fork Valley is very high, similar to 1998, at approximately 10 to 13% of all commute trips in the broader region using transit. This compares favorably to cities that rank high nationally in transit usage, including Portland, Oregon, where transit enjoys only a 5.7 % transit mode share. The study observes that Roaring Fork Valley transit mode share varies by community and by work destination, with Aspen and trips to and from Aspen on the high end. The study concludes that transit mode share would increase even more if regional transit frequencies and time savings were increased, making a strong case for implementing enhanced transit service components of the Preferred Alternative in order to meet current and future corridor transportation demand.

Today, transit service to/from and within Aspen is provided on 14 routes, including: 7 city routes, 3 skier shuttle routes, 3 valley routes, and a direct route between Aspen and Brush Creek/State Highway 82 or the Snowmass Mall. RFTA continues to enjoy very high bus patronage, particularly during peak tourist seasons. As shown by Figure 1-1, the rate of growth slowed and was generally stagnant between 1996 and 2004, attributed to such factors as limited existing transit system capacity, delayed improvements in transit, major fare increases, and the overall downturn in the economy. However, transit ridership has been on the incline since 2004. The total number of rides provided on all RFTA services was 3.7 million in 2005, with 1.7 million of these being provided by the commuter services. Ridership numbers as of September 2006 are up 10 % over 2005 levels and, therefore, total annual ridership for 2006 is anticipated to exceed 4.0 million, attributed to improvements in the economy, increasing employment levels, and rising fuel prices. Since 1995, the implementation of paid parking and other TDM measures in Aspen have also provided incentives to use transit. While slight ridership increases have been occurring, jumping to the next level of ridership (such as that shown in Figure 1-1 between 1994 and 1996) will require major improvements to the transit system to accommodate additional capacity.

Figure 1-1
Roaring Fork Transportation Authority Ridership



Note: 2006 total is estimated based on September 2006 actual ridership data showing 10% increase over 2005

2.1.4 Pedestrian/Bicycle Routes

The project corridor includes the Aspen Airport Business Center Trail, a pedestrian/bicycle trail that parallels State Highway 82 on the north side between the Buttermilk Ski Area and Aspen, and the High School Bike Path, located on the south side of the corridor between Maroon Creek Road and Aspen. There are protected crossings of State Highway 82 at the roundabout, Truscott and Buttermilk.

Additional hiking and bicycling trails that parallel or cross State Highway 82 include:

- Owl Creek Trail, a major trail between Snowmass Village and Aspen, descends through the Owl Creek Valley to a crossing (underpass) of State Highway 82 (4.4 miles long). The trail then joins the Aspen Airport Business Center (ABC) Trail (Aspen Ranger District, 2006). The portion of the trail that crosses State Highway 82 is in the City of Aspen. It was built as an underpass in 2001 as part of the widening of State Highway 82 (Weiss 2006, CDOT 2007b, D'Autrechy 2006a and 2006b, Pitkin County Open Space and Trails 2006).
- James E Moore Trail (2 miles long) is used to reach the High School Trail from the ABC Trail and the Aspen Golf Course & Cross Country Center with an underpass at the roundabout (Aspen Parks & Recreation 2006b).
- Marolt Trail is used as an access route between the ABC Trail and the High School Trail (1.5 miles long). It also connects the West Hopkins Bikeway with Castle Creek Road with overpasses over Maroon and Castle Creek Roads (Aspen Parks & Recreation 2006b).
- Maroon Creek Trail (1.3 miles long) runs along Maroon Creek connecting the eastern end of the Government Trail to the ABC Trail (Aspen Parks & Recreation 2006b).
- The ABC Trail extends from Aspen to the Aspen Airport Business Center along the north side of State Highway 82 (2.5 miles long), with underpasses at Harmony Road and at Truscott, and is connected across State Highway 82 by the Owl Creek Trail, the Maroon Creek Trail, the James E. Moore Trail, and the Marolt Trail (Aspen Parks & Recreation 2006b, D'Autrechy 2006b).

The trails network has changed since the 1997 FEIS was published. Some trails have been modified due to planned construction along the State Highway 82 corridor. New trails have also been created as part of the trails network expansion. For details and maps of the Aspen area trail system, see the *Social Environment and Community Character Technical Report, State Highway 82/Entrance to Aspen Environmental Reevaluation* (FHWA and CDOT, 2007b).

Although the area trails are heavily used, the FEIS concluded that their use does not significantly reduce transportation demand on State Highway 82 (CDOT, 1997). This conclusion remains valid based on 2005 traffic data.

2.1.5 Potential Future Transit Travel

A number of studies have explored the feasibility of providing rail service between Glenwood Springs and Aspen. A 1995 CDOT feasibility study (CDOT, 1995) concluded that, even with transit incentives, rail ridership could reduce travel on State Highway 82 by only 11 percent, not enough to reduce traffic volumes on the existing, two-lane highway below capacity. In June, 1997, the rail corridor from Glenwood Springs to Woody Creek was acquired by local communities in the Roaring Fork Valley with support from Great Outdoor Colorado (GOCO) and Federal Enhancement Funds. A comprehensive alternatives analysis of potential transportation, trails and open space uses within the corridor was undertaken in 1998 in connection with the West Glenwood Springs to Aspen Corridor Investment Study (CIS) (RFTA, 2003). The study evaluated a broad range of alternatives for the CIS study area from Glenwood Springs to Buttermilk, in order to tie into the Entrance to Aspen Preferred Alternative. (The CIS assumed the Entrance to Aspen Preferred Alternative would already be in place as a separate effort.) Through tiered screening using reality checks and fatal flaw testing, three alternatives were developed in the CIS for comparative analysis and selection of a preferred alternative. The final alternatives selected for detailed evaluation were:

- No Action/Committed Projects Alternative
- Bus Rapid Transit (BRT) Alternatives + Trail
  - BRT – Bus sub-alternative use dedicated busway from Buttermilk to Aspen
  - BRT-Light-Rail Transit (LRT) sub-alternative uses light rail transit (LRT) from Buttermilk to Aspen
- Rail + Trail

During the CIS study, it was concluded that an alternative based on rail technology for the entire project corridor ("Rail + Trail"), from Glenwood Springs to Aspen, would not be realistically feasible within the planning horizon due to funding constraints. A decision was made to continue with the study, using NEPA-like evaluation to compare bus and rail technologies, as well as the No Action Alternative. The modified study was used to gauge public support for transit within the corridor, and to seek public input for refinement of the project. The Preferred Alternative selected in the CIS process is bus rapid transit to be implemented by year 2017 (as requested by the RFTA Board of Directors). The BRT project, which will connect to the Entrance to Aspen Preferred Alternative (exclusive bus lanes), includes the following elements: a new fleet of low-floor vehicles that are different in appearance from standard buses; a comprehensive family of ITS elements including real time information, automatic fare collection, and automatic vehicle location technology; enhancements made to bus stops and park and rides to provide stations and other amenities where possible to improve the passenger's experience and convenience; and queue bypass lanes or shoulders at key intersections to allow buses to avoid general traffic congestion.

While BRT has been selected as the regional alternative to be implemented in the near term (next ten years), implementation of a regional passenger rail system is still identified by the RFTA Board of Directors as the longer-term goal.

The BRT project has garnered regional, state and federal support as demonstrated by its endorsement in the Regional and State Transportation Plans – BRT is currently designated as Priority #3, after the Eagle Spur Road and the State Highway 133 Reconstruction Project. BRT is also authorized for preliminary engineering in the national SAFETEA-LU transportation bill. Additionally, several federal and state grants have been awarded and utilized in furthering the regional BRT project development (for ITS planning, purchase of BRT hybrid vehicles, etc.).

The Preferred Alternative selected in the 1998 Entrance to Aspen ROD incorporates enhanced, high capacity transit service as one of three critical system management components that are needed to produce adequate additional capacity within the project corridor to satisfy current and future transportation demand. With the exception of the Main Street bus lane, the Maroon Creek kiss & ride, and new bus stops, significant transit improvements within the project corridor have not been implemented since issuance of the ROD in 1998. However, RFTA has begun to take steps to implement elements of the BRT project in the last three years, including: replacing 30% of its entire fleet with low-floor, BRT-compliant vehicles, acquiring land in West Glenwood and Carbondale for development of new park and rides/stations; completing a detailed ITS plan that outlines costs and priorities for implementation of ITS technologies, and actively pursuing state, local and federal funding opportunities. While progress on portions of the regional BRT project has been and can continue to be made, the biggest time-savings advantages to regional transit travel will be realized once the Entrance to Aspen Preferred Alternative is in place. Including the Buttermilk/Airport to Aspen segment in the overall regional BRT project may additionally serve to make the regional BRT project more competitive in garnering federal funds. Enhanced project corridor transit service (express bus, LRT) is critically needed to serve current demand within the project corridor, and interim improvements (i.e., construction of exclusive bus lanes and provision of express bus service) will position the corridor for implementation of incremental transit improvements, perhaps evolving from express bus to BRT to LRT, that will ultimately be needed to serve future project corridor transportation demand.

2.1.6 Multimodal Facilities

The Preferred Alternative selected in the 1998 Record of Decision includes development of multimodal facilities at the Aspen/Pitkin County Airport and at the Buttermilk LRT station. Although down valley park-and-rides have been developed at Brush Creek, Buttermilk, Basalt, Old Snowmass, and Aspen Village, full-blown upper valley multimodal centers have not yet been implemented. These multimodal facilities will take a step beyond park-and-rides in that they provide not only parking, but also direct connections to transit and land use activity centers such as the airport or ski resorts, and are essential elements to a multimodal approach to transportation. Use of the down valley facilities, as well as success of the Transportation Management (TM) program, underscore the importance of these system management components of the Preferred Alternative, as well as the need to implement the Preferred Alternative's third, complimentary system management component – enhanced transit service – in order to meet current and future corridor transportation demand.

2.1.7 Long-Term Transportation Planning Options

Long-term transportation options within the State Highway 82 corridor include options for future phasing of new technologies, such as light rail transit and Intelligent Transportation Systems. The Preferred Alternative selected in the 1998 ROD includes enhanced transit service within the corridor, as well as multimodal facilities development and implementation of comprehensive demand management strategies. Long-term options to create an integrated, multimodal approach to transportation in the Roaring Fork Valley include implementation of new transit technologies and transportation management strategies.

The FEIS found that serving existing and future person-trip demand on the State Highway 82 project corridor will require a combination of general purpose lanes and transit facilities. Provision of dedicated rights-of-way included in the Preferred Alternative (for LRT, buses, or other high-capacity transit modes) will be critical to providing the transportation capacity needed to accommodate forecasted person trips in the years 2015 and 2030, and will support achieving the stated community goal of limiting the number of vehicles in 2015 to levels at or below those in 1994 (CDOT, 1997). Transit modes, particularly exclusive bus lanes and high-capacity LRT, provide significantly more person-trip carrying capacity within less right-of-way width than can be provided by the addition of general purpose lanes within the corridor. Supporting multimodal parking facilities, also included in the Preferred Alternative, will encourage transit use, limit travel by personal vehicle within the City of Aspen, and reduce traffic congestion within the core downtown area.

2.1.2 System Management

System management is the coordination of transportation system elements, including transportation management programs, parking demand, and transit ridership. The overarching goals of transportation management are to reduce travel demand and to improve utilization of the transportation system using lower costing actions when compared to more costly investments of adding highway lanes.

Three system management components are included in the Preferred Alternative. This technical report provides an overview and update on implementation of each of the systems management strategies included in the Preferred Alternative: (1) Incremental Transportation Management (TM) Program, (2) multimodal center-based Parking Demand Management, and (3) provision of enhanced transit service/capacity (exclusive bus lanes/LRT on State Highway 82 between the airport and Aspen.

2.2.1 Transportation Management Program

In 1997, when the FEIS was completed, then-recent (1995) CDOT traffic counts indicated that traffic was then already at least 2.4 percent over the winter target level, and 2.7 percent over the summer target level. To avoid reaching predicted traffic levels that would exceed the zero-growth target by 12 percent by the

year 2000, the City of Aspen implemented the Incremental TM Program in 1995, with the goal of maintaining future traffic volumes at or below the 1994[1] traffic levels in the project corridor.

The TM Program, the first of three system management elements of the Preferred Alternative, is designed to maintain traffic levels at the Castle Creek Bridge at or below 24,800 vehicles per day during the winter, and 28,600 vehicles per day during the summer (CDOT, 1997). The program relies on monitoring and marketing components to direct and support incremental implementation of three levels of TM measures and supporting actions.

The TM Measure Levels are defined as follows:

- Level 1 – Starter level actions that are implemented when zero growth is first exceeded. These actions/programs include: putting the program administration in place (TM Authority, staff, permanent counter) and initiation of informational programs (kiosks, ride-matching, trip planning, transit brochures, targeted marketing, etc.).
- Level 2 – Programs designed to reduce traffic by 0-5 percent. These programs include: provision of enhanced transit services (shorter headways, larger service area, increased subsidies, new capacity), minor increase in internal parking rates, multimodal stations, commute ordinance, etc.
- Level 3 – Programs designed to reduce traffic by 7-10 percent. These programs include: parking caps, auto free zones, major increases in internal parking rates, HOV subsidies, parking space taxes/congestion pricing, etc.

Supporting actions are associated with all three levels, and are intended to help ensure the success of Level 1-3 programs. Supporting actions include: a guaranteed ride home program, provision of park-and-ride lots, employer programs, bus stop shelters, and bicycle/ pedestrian facilities.

The Incremental TM Program works as follows:

- If vehicle levels are at or below 1994 levels, no new TM measures are implemented.
- The first time vehicle counts exceed the zero-growth goal, the Level 1 program is introduced as a full package.
- If vehicle counts again exceed the zero-growth goal, incremental TM measures are implemented as shown in Table 1-2.

[1] The project objective is stated in the 1998 ROD (page 7) as, "…the stated community goal of limiting the number of vehicles in 2015 to levels at or below those in 1994." Throughout the FEIS, traffic volumes are referred to as levels at or below those in 1993, because the traffic model used for the FEIS was based on 1993 traffic volumes. The FEIS states that difference between 1993 and 1994 traffic volumes is minimal (page I-3, FEIS).

Table 1-2
Incremental TM Program Implementation Process

Monthly Average Daily Traffic vs. Zero-Growth Target	TM Measure Implementation
Less than 5 percent above the zero-growth target	Implement one item from the second level list at each additional occurrence.
Between 5 and 10 percent over the zero-growth target	Implement two items from the second level list and at least one supporting action.
10 percent or more over the zero-growth target	Implement one item from the third level list and at least one supporting action.
Source: FEIS (CDOT, 1997).	

Because the amount of TM needed depends on growth in travel demand, the FEIS (CDOT, 1997) included a comparison of traffic levels, based on historic traffic growth rates to alternative forecasts and the zero growth targets, for the period between 1993 and 2000. From that analysis, presented in Figures 2-1 and 2-2, it was concluded that, in order to meet the zero growth targets, TM measures would need to reduce winter traffic by 5 to 12 percent in the year 2000, while year 2000 summer reductions from TDM would need to be in the range from 9 to 12 percent. The gap has increased since 2006, and will continue to widen in the future. While RFTA summer ridership increased by 3,900 new peak riders between 1993 and 1995, traffic levels still increased by 2,500 vehicle trips. If transit is to attract enough riders to achieve the needed traffic reductions, high-capacity transit service improvements, as included in the Preferred Alternative, will be needed.

Since its inception, the Incremental TM Program has been successful in meeting zero-growth goals, primarily through Level 1 and Level 2 measures, together with associated supporting measures. The implementation of paid parking in 1995, with pricing increases in 2001, was critical to success of the program.

Figure 2-1
Growth Rate Comparison, Winter Year 2000

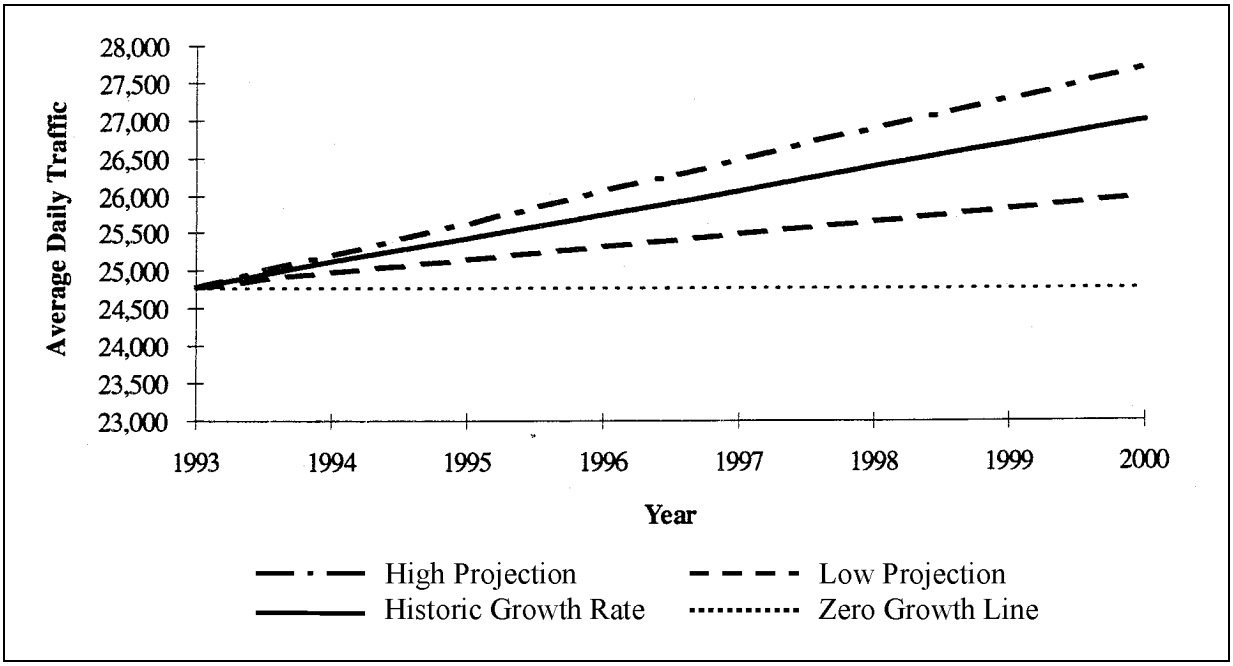
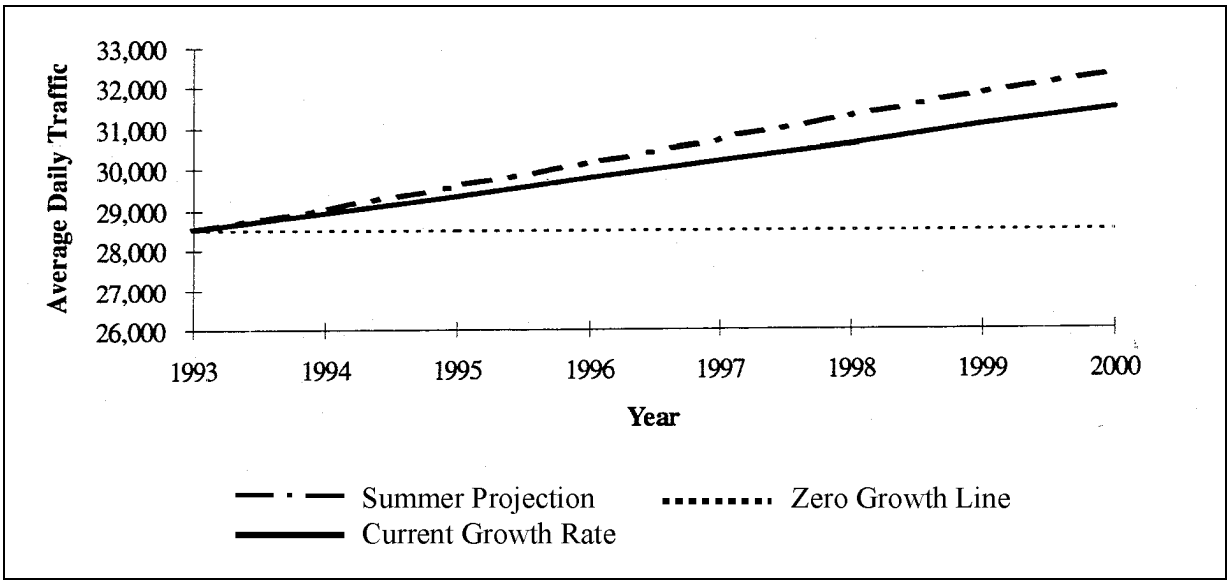


Figure 2-2
Growth Rate Comparison, Summer Year 2000



Note: Figures 2-1 and 2-2 are reproduced here from the FEIS. Figure 2-2 did not include a "Low Projection" in the FEIS, and traffic modeling information from the time of the FEIS (1995) cannot be verified so no "Low Projection" is estimated here.

Although winter and summer months were used to guide TM measure implementation, the TM Program was designed to monitor performance relative to monthly targets, recognizing that these monthly volumes would need to be adjusted periodically, in accordance with changes in the annual profile such as peak increases in off-season traffic. Table 1-3 provides a summary of Incremental TM Program performance monitoring and implementation.

Table 1-3
Performance Monitoring of the Aspen Incremental TM Program

Month	Monitoring Year [a, b]								2005 vs. 1993	
	1993 ADT[c]	1999 ADT	2000 ADT	2001 ADT	2002 ADT	2003 ADT	2004 ADT	2005 ADT	Diff	% Diff
January	23800	22701	22504	22827	22945	22837	**23816**	**24398**	598	2.51
February	24300	23638	23910	23932	23207	23694	23400	24164	(138)	-0.57
March	24800	**25574**	24590	24752	23822	23812	**25417**	**25892**	1092	4.40
April	18800	**19734**	**20270**	**19443**	**19900**	**19789**	**18921**	**19420**	620	3.30
May	19300	18538	**19944**	18929	**19310**	18837	18924	19021	(279)	-1.45
June	26200	25408	25126	23719	23618	25003	25650	25097	1103	-4.21
July	28600	26579	27873	27325	**28777**	**29285**	**29278**	**29544**	944	3.30
August	28600	25142	27375	26237	27497	27391	27952	27998	(602)	-2.10
September	24000	23294	21964	21763	22396	22231	23879	23796	(204)	-0.85
October	20500	20038	**20511**	19921	19969	19866	**20521**	20371	(129)	-0.63
November	20000	--	18643	18430	--	18220	19652	18892	(1108)	-5.54
December	25200	24743	22847	22394	--	22880	24882	22449	(2751)	-10.92
Avg AADT/ Month	23675	23217	22963	22473	23144	22820	23524	23420	(255)	-1.08

[a] Monthly traffic volumes that exceed the 1993 winter or summer target threshold are shaded in grey. The TM Program, the first of three system management elements of the Preferred Alternative, is designed to maintain traffic levels at the Castle Creek Bridge at or below 24,800 vehicles per day during the winter, and 28,600 vehicles per day during the summer (CDOT, 1997).

[b] Monthly traffic volumes that exceed the 1993 total for that month are shown in **bold**. These monitored exceedances triggered implementation of appropriate TM program elements to reduce traffic volumes.

[c] ADT = Average Daily Traffic

Source: Incremental TM Program monitoring data from the City of Aspen

2.2.2 Parking Demand

The second systems management element of the Preferred Alternative includes development of parking facilities at multimodal centers within the project corridor. Because parking demand is highly dependent on capturing transit ridership, parking facilities will be scattered at transit-served locations along the corridor as a partner, supporting strategy for the transit component of the Preferred Alternative. Since 1997, down valley park-and-rides have been developed at Brush Creek, Buttermilk, Basalt, Snowmass Creek, and Aspen Village. However, full-blown upper valley multimodal centers have not yet been implemented. (The Brush Creek park-and-ride is currently being expanded; in addition to its 200 paved

spaces, it will have another 200 recycled asphalt spaces and an area planted in native grasses that can accommodate another 1,000 vehicles during special events.)

As noted by the FEIS, future exclusive bus lanes/LRT operations to the Buttermilk Ski Area and the Airport could make these locations attractive as multimodal centers. Airport parking facilities would be sized to meet projected demand, assuming that no parking fee is charged, bus riders receive free transfers to rail, Aspen home-based trips do not park at the multimodal lot, and sufficient TM measures are in place to meet the zero-growth target (CDOT, 1997).

At the proposed Buttermilk Multimodal Center, the FEIS indicates that parking lot is constrained to 750 spaces, and that unrestricted parking demand would likely exceed the available 750 spaces by 50 percent in 2015. The TM program could focus on reducing Aspen-origin and Aspen-destination drive trips and increasing express bus/LRT usage to manage the potential parking shortfall. TM measures suggested in the FEIS (CDOT, 1997) to restrict Aspen-based demand for Buttermilk parking include:

- Issuing a transportation access pass to all arriving Aspen visitors.
- Restricting westbound left turns into Buttermilk during the morning peak hours. (Since publication of the 1997 FEIS, intersection improvements have improved traffic flow in this portion of the corridor such that restricting westbound left turns may no longer be an effective disincentive for reducing Aspen-origin drive trips.)
- Providing reserved parking spaces in the Buttermilk lot for down valley travelers with a Buttermilk destination using a Medallion/Pass program available to down valley residents and hotel patrons.

2.2.3 Future Transit Ridership Characteristics

The final systems management element of the Preferred Alternative consists of an LRT system extending from a new LRT Maintenance Facility to be located west of Service Center Road (north side of State Highway 82 near the Aspen/Pitkin County Airport) to Rubey Park in downtown Aspen. The Preferred Alternative LRT envelope runs parallel to and on the south side of the highway component of the Preferred Alternative. The LRT system would be developed initially as exclusive bus lanes if local support and/or funding are not available for LRT, and the platform would be built at an adequate width to allow interim exclusive bus lanes to continue in operation during later construction of the LRT.

Implementation of light rail service (or an interim high-capacity transit alternative, such as exclusive bus lanes) between Rubey Park and the airport will change how people get to and from Aspen, and is essential to achieving the community's overarching goal of zero-growth in traffic volumes. If zero-growth targets are met in the future, one in three persons traveling through the State Highway 82 corridor will do so on buses/LRT.

As stated in Section 2.1.3, major capacity increases are needed to accommodate the next level of increased ridership numbers. Implementation of the bus lanes/LRT is a critical step in providing additional transit system capacity. For example, with the addition of the exclusive bus lanes, 5-minute headways could be provided on a consistent basis for buses operating between Rubey Park and the Brush Creek park-and-ride. For the three hours in the evening peak between 3:00 and 6:30 p.m., a total of 37

bus trips using the dedicated bus lanes would carry an estimated 1,665 passengers in the peak direction. It is estimated that 5-minute headways could be maintained using 8 to 9 vehicles.

2.2.4 Conclusions

The FEIS characterizes the State Highway 82 corridor as constrained and of inadequate capacity to meet even current (1997) transportation demand. This remains true today. While the Incremental TM Program has been effective in stemming traffic growth within Aspen, traffic congestion throughout the project corridor remains a problem that can be expected to worsen in the future.

Capacity and safety improvements completed within the project area since 1998 have not produced adequate additional capacity to satisfy current and future project corridor transportation demand. Travel into the valley will increase, as evidenced by increases in State Highway 82 up-valley traffic volumes, as well as levels of activity at regional airports. Because all ground traffic to and from the Aspen/Pitkin County Airport must use State Highway 82 to access Aspen, any increases in the level of activity at the airport will produce continued growth in project corridor transportation demand. RFTA continues to enjoy very high bus patronage, particularly during peak seasons, but the rate of growth has slowed and been generally stagnant since 1996 due to fare increases, limited financial capacity to implement improvements, inability to operate in extended dedicated bus lanes, and the downturn in the economy following September 11, 2001. Since 2004, transit ridership is on the rise, largely attributed to a stronger local economy resulting in an increase in jobs and employees. As described and illustrated in Section 2.1.3, 2006 transit ridership is expected to exceed 4 million passengers, and has risen 10% over 2005 levels as of September, 2006.

Incremental implementation of some system management components of the Preferred Alternative has occurred since 1998. Continued success of Aspen's Incremental Transportation Management (TM) program underscores the proven effectiveness of these system management components of the Preferred Alternative, as well as the need to implement the Preferred Alternative's third system management component – enhanced transit services – in order to meet current and future corridor transportation demand.

3.0 Agency Contacts and Coordination

Data was collected from CDOT, City of Aspen, Pitkin County, and RFTA for this system management analysis. All data and personal communications are listed in Section 4.0, References.

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Appendix A: Federal and state regulations

Table A–1. Federal and state regulations followed in development of the 1997 FEIS System Management section, changes in the regulations, and new regulations.

Applicable regulation to system management assessment	Description	Changes if any	Relationship to project
The National Environmental Policy Act of 1969, as amended (NEPA) (Pub. L. 91-190, 42 U.S.C. 4321-4347, January 1, 1970, as amended by Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, and Pub. L. 97-258, § 4(b), Sept. 13, 1982)	The purposes of this Act are to prevent or eliminate damage to the environment, protect the health and welfare of people, to enrich the understanding of the ecological systems and natural resources important to the region.		All projects involving the Federal Highway Administration (FHWA) must follow NEPA regulations. Procedures and guidance are set by the Council on Environmental Quality (CEQ).
1991 Intermodal Surface Transportation Efficiency Act (ISTEA)	This landmark provided policy guidance and funding for highway, transit, and safety programs, and authorizes Federal transportation programs in these areas for fiscal years 1992–1997. Through ISTEA, FHWA provided a strategic investment framework, created programs, such as the Surface Transportation Program, that provided flexibility to state and local officials, and helped assure that transportation investments would meet the unique needs of their communities. ISTEA's authority expired in October 1997.	This program was reauthorized as Transportation Equity Act for the 21st Century (TEA-21) (see below).	An important step in coordinating and funding local multimodal projects, and funds for Transportation Enhancement activities, such as landscaping and beautification, rehabilitation—important to this project.
Transportation Equity Act for the 21st Century (TEA-21)	The Transportation Equity Act for the 21st Century was enacted June 9, 1998. TEA-21 authorized the federal surface transportation programs for highways, highway safety, and transit for the period 1998-2003. The TEA-21 Restoration Act, enacted July 22, 1998, provided	This program continued ISTEA in 1998 and was reauthorized as Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) in 2005 (see below).	Continued ISTEA's innovative policies.

Applicable regulation to system management assessment	Description	Changes if any	Relationship to project
	technical corrections to the original law.		
Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)	SAFETEA-LU, signed on August 10, 2005, by President Bush, authorizes the federal surface transportation programs for highways, highway safety, and transit for the 5-year period from 2005 to 2009.	New in 2005.	This legislation addresses the challenges of the proposed project: improving safety, reducing traffic congestion, improving efficiency in freight movement, increasing intermodal connectivity, and protecting the environment.
Title 23 - Highways Section 109 – Standards (h)	The purpose of this regulation is to assure that possible adverse economic, social, and environmental effects relating to any proposed project have been fully considered and that the final decisions are made in the best overall public interest.		This covers the important topics of air, noise, water pollution; man-made and natural resources, aesthetic values, community cohesion, public facilities and services; adverse employment effects, and tax and property values losses; displacement of people, businesses and farms; and disruption of desirable community and regional growth.