



ALTERNATIVE ANALYSIS UPDATE

MARCH 2014

FINAL REPORT

PREPARED FOR:
THE RED ROCK CORRIDOR COMMISSION



Funding Partners

Counties Transit Improvement Board (CTIB)



Dakota County Regional Railroad Authority



Hennepin County Regional Railroad Authority



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Red Rock Corridor Commission

- Autumn Lehrke, Chair; Washington County Regional Railroad Authority Commissioner
- Jen Peterson, Vice-Chair; City of Cottage Grove Council Member
- Amy Brendmoen, City of St. Paul Council Member
- Keith Franke, City of St. Paul Park Mayor
- Steve Gallagher, City of Newport Council Member
- Cam Gordon, City of Minneapolis Council Member
- Linda Higgins, Hennepin County Regional Railroad Authority Commissioner
- Barb Hollenbeck, City of Hastings Council Member
- Jim Keller, Denmark Township Town Board Supervisor
- Janice Rettman, Ramsey County Regional Railroad Authority Commissioner
- Mike Slavik, Dakota County Regional Railroad Authority Commissioner
- Ex-Officio Members: Goodhue County, Prairie Island Indian Community, City of Red Wing, Canadian Pacific Railway

Project Management Team

- Stephen Baisden, Metro Transit
- Lynne Bly, MnDOT
- John Burbank, City of Cottage Grove
- Chuck Darnell, Hennepin County
- Bill Dermody, City of St. Paul
- Andy Gitzlaff, Washington County
- Jess Greenwood, Goodhue County
- Deb Hill, City of Newport
- John Hinzman, City of Hastings
- Lyssa Leitner, Washington County
- Marc Mogan, Prairie Island Tribal Community
- Joe Morneau, Dakota County
- Josh Olson, Ramsey County Regional Railroad Authority
- Jay Owens, City of Red Wing
- Melissa Taphorn, Washington County HRA
- Scott Thompson, Metro Transit
- Katie Walker, Hennepin County
- Kevin Walsh, City of St. Paul Park
- Katie White, Met Council



Citizens Advisory Committee

- Skip Soleim
- Mary Ann Newman
- Emily White
- Betsy Leach
- Gregory Hanson
- Ronald Toppin
- Jonathan Jordan
- Christy Edman
- David Erickson
- Shauna Klug
- Julie Wickard
- Mark Vaughan
- Joe Chouinard
- Jesse Warden
- Linda Lehrke
- Tom Mohr
- Chris Simonson
- Jerry Dooley
- Commissioner Mike Slavik (liaison to Commission)
- Commissioner Autumn Lehrke (liaison to Commission)

Consulting Team

Stantec Consulting Services Inc.

- Cordelia Crockett
- Jay Demma
- Stuart Krahn
- Marcus Kusuma
- William Lambert
- Graeme Masterton
- David Schellinger
- Tom Wolf

Community Design Group

- Theresa Nelson
- Antonio Rosell
- Benjamin Waldo
- Kevin White



Supporting Documentation (available under separate cover and on the project website)

1. Technical Memorandum #1: Background Review
2. Technical Memorandum #2: Vehicle Technologies
3. Technical Memorandum #3: Operating and Maintenance Cost Evaluation
4. Technical Memorandum #4: Capital Cost Evaluation
 - a. Appendix A: Commuter Rail Cost Estimates for South of Hastings
 - b. Appendix B: Bus Only Shoulder Lane Estimates for Highway 61
 - c. Appendix C: BRT Cost Estimates for Red Rock Corridor
5. Technical Memorandum #5: Ridership Evaluation
6. Technical Memorandum #6: Option Evaluation
7. Public Involvement Documentation



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Executive Summary

Introduction

The results of the Alternatives Analysis Update (AAU) study indicate that extending bus service to Dakota County, promoting more dense development around transit stations, working toward more all-day service options, further evaluation of a Bus Rapid Transit (BRT) alternative, and continued advocacy for mobility investments in rail capacity to support all-day transit service are the needed steps for building a stronger transit base in the Corridor to serve a growing transit market.

This recommendation reflects a staged approach to building transit services in the Red Rock Corridor. The process that led to this conclusion is detailed in this AAU.

Purpose of Report

This Alternative Analysis Update (AAU) project builds upon the previous 2007 Alternatives Analysis (AA) by updating pertinent sections and providing new analysis of BRT as an alternative. The purpose is not to start from scratch, but to carefully review, incorporate, and update in light of more recent census and ridership data in order to create a current and uniform basis for the analysis. Ultimately, the goal of the AAU is to position the Red Rock Corridor for the next steps, including potential funding through the FTA New Starts or Small Starts and identifying the path toward implementation.

Project History

In the 1990s, commuter rail service began being planned for the Minneapolis-St. Paul area, and the Red Rock Corridor was included in this early planning work as a potential commuter rail corridor. Subsequently, high-speed rail was being considered for the region with potential service through the Red Rock Corridor en route to Chicago.

In 2007, the Red Rock Corridor Alternatives Analysis (AA) was developed as an initial phase in attaining federal funding for future commuter rail service. This analysis concluded that commuter rail was appropriate for the long term, especially in the event that high speed rail was introduced into the corridor and provided a potential mechanism for reducing capital costs. The analysis recommended that commuter bus services be developed in the short-term to build transit demand.

The results of the alternatives analysis led to the study of commuter bus services in the Corridor and station area planning work based around a long-term plan for commuter rail service. However, other regional planning work led by the Metropolitan Council, such as the 2008 Transit Master Study and the 2010 Park-and-Ride Study, and ongoing developments in the corridor reopened the door for additional study to reevaluate whether commuter rail is the appropriate investment for the corridor, viewing the potential ridership as low for the potential costs, unless those costs were shared with another capital investment, such as high speed rail. In addition, the East Metro Rail Capacity Study identified existing



capacity constraints within the rail system which would be further strained if commuter rail service was added to the corridor. Finally, the Transportation Policy Plan adopted in November 2010 and amended in May 2013 identifies the Red Rock Corridor as being served by BRT, LRT, or commuter rail. Therefore, in light of the ongoing conversation in the Region as to the future transit services in the Red Rock Corridor, an update to the previously completed Alternatives Analysis was undertaken.

Project Management

Management of the AAU process was overseen by several committees. A project management team consisting of staff from cities and counties along the Corridor, the Metropolitan Council, Metro Transit, MnDOT, and the Prairie Island Indian Community met monthly to review progress and provide technical guidance. A Citizens Advisory Committee made up of representatives of communities along the Corridor met at key milestones during the study and served as liaisons to their respective communities. The Red Rock Corridor Commission, an 11-member committee of elected officials from each city and county along the Corridor, provided oversight and direction of the study.

Study Area Background

The background component of the AAU focused on updated data for travel, population, employment, and transportation services in a Corridor that has been extended south from Hastings to Red Wing, including a potential stop in the Prairie Island Indian Community. In the years since the 2007 AA, there also have been updates to the regional population and employment forecasts, and actual data is available on the performance of commuter rail in the Region via Northstar. BRT planning in the Region has also progressed such that a BRT line began operation in the METRO Red Line BRT (Cedar Avenue) corridor in 2013.

Regional System

While a background review is important for any major transportation study to establish a foundation for analysis, it was particularly important for the Red Rock Alternatives Analysis Update (AAU). This is because several studies with similar purposes have already been completed, including the original Red Rock Corridor Alternatives Analysis that was completed in 2007. To avoid any rework, the information these documents contain and the framework they created for the AAU had to be fully understood. In addition, many complementary studies and transportation initiatives have occurred since the 2007 AA so these were incorporated into the AAU as well.

Key studies include the Station Area Planning Reports which were completed in 2012, the transportation sections of comprehensive plans for communities in the study area including Hastings, Newport, Cottage Grove, Saint Paul Park, Woodbury, St. Paul, and Minneapolis, many of which were completed in 2010, and planning and analysis work related to passenger rail and freight rail in the East Metro Area.

Key projects that have been completed since the 2007 AA that impact the AAU include Northstar Commuter Rail, the METRO Red Line BRT (Cedar Avenue), the Green Line LRT (Central Corridor) that will begin service in 2014, the renovated Union Depot, the new Hastings bridge, and the Newport Transit Station and park and ride facility which will be completed in 2014.



Purpose and Need for Project

The 2007 Red Rock Alternatives Analysis focused heavily on issues related to peak hour mobility to the St. Paul and Minneapolis downtowns. Additional analysis is needed to better understand historical, current and future transit markets in the corridor, including off-peak and reverse commute service demand, local access demand, railroad access, new station locations, connections to new transit services, level of service, and efficient use of transportation infrastructure.

Communities in the Red Rock corridor between St. Paul and Cottage Grove do not currently have all-day fixed route transit service, with service limited to peak period express bus and dial-a-ride services. Community members and the Commission expressed a desire for more off-peak/all day transit service with more access.

Based on the needs of the Corridor that were identified and discussed through the public involvement and overall study process, the Red Rock Corridor Commission's goals for the project are to:

- Provide mode choice and service plan that meets the demonstrated and forecasted needs of Corridor communities
- Cost effectively address transportation needs in the Corridor
- Increase opportunities for community and economic development throughout the Corridor
- Improve quality of natural and built environment

Public Involvement

Public engagement is a critical component of the Red Rock Corridor AAU. Numerous engagement activities were completed as part of this work, with the goal of maximizing the opportunity for members of the general public, for civic organizations, and for current transit riders to offer their opinions and guidance to the Corridor Commission and the project team. Several methods for engagement were used to provide multiple avenues for receiving public guidance. Specific activities included the convening of a Citizens Advisory Committee (CAC), listening sessions with key stakeholder groups, open house meetings with the public, targeted engagement of park and ride users, and online questionnaires. A summary of all the public involvement work done for the AAU is attached to this document.





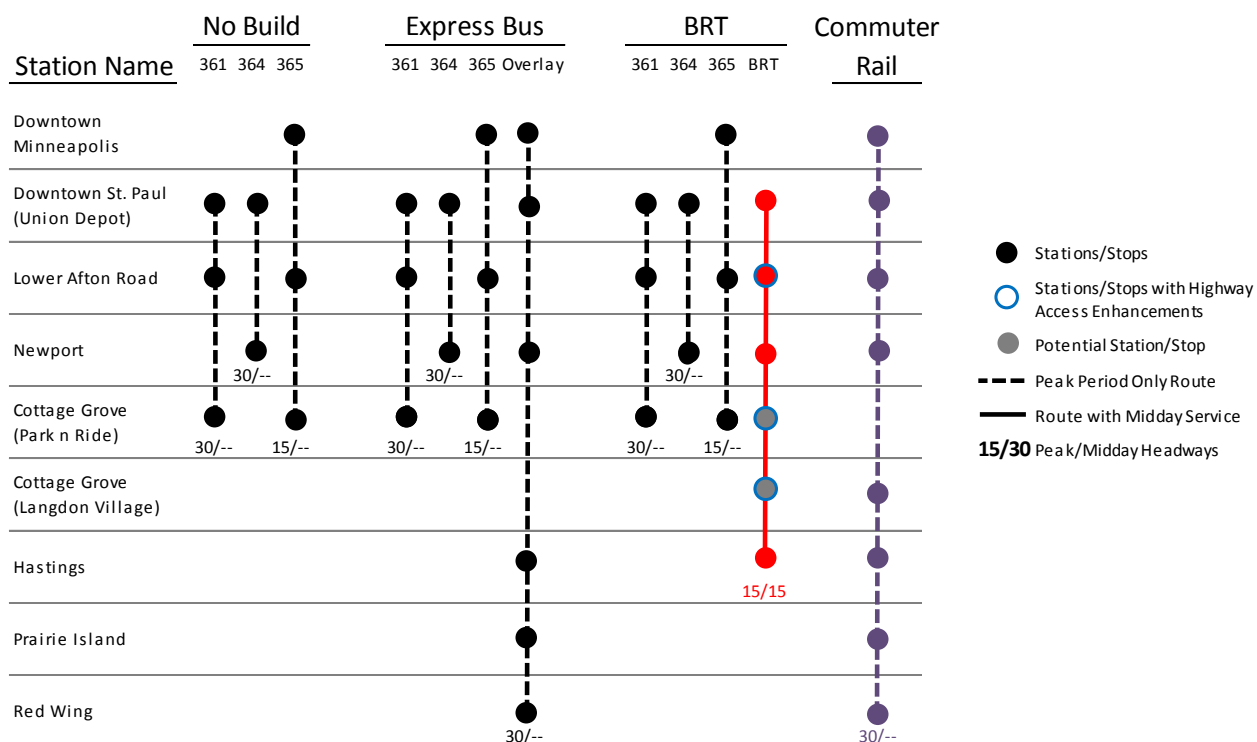
Description of Alternatives Evaluated

Based on an initial screening analysis, the technology and alignment alternatives identified for further evaluation were combined into several build alternatives. These build alternatives were subjected to more detailed quantitative analysis (ridership, capital costs and operational costs) to help identify a preferred alternative. For purposes of comparison, a No-Build Alternative was also developed. Each of the alternatives is described below followed by a graphic that illustrates their station coverage and service level.

- The **No-Build Alternative** is based on the Metropolitan Council's 2030 Plan. It consists of existing bus routes and also contains the following major projects: Northstar Commuter Rail, Green Line LRT (Central Corridor), and Southwest Corridor LRT. In this alternative, Routes 361, 364, and 365 are maintained as the primary transit services in the Red Rock Corridor.
- In the **Express Bus Alternative**, Routes 361, 364, and 365 are maintained and the corridor is served by an additional peak period limited stop express bus route that stops in Red Wing, Prairie Island, Hastings, and Newport before continuing to Union Depot and Minneapolis. This route provides 30-minute headways during the peak periods. Reliability enhancements are offered in the form of bus-only shoulder lanes in congested areas.
- For the **BRT Alternative**, Routes 361, 364, and 365 are maintained and the corridor is served by a BRT route using special BRT buses and stations. The BRT route operates largely on Highway 61 between Hastings and Union Depot. It operates at 15-minute headways throughout the day; from about 6am to 10pm. Passengers wishing to travel to Minneapolis can use existing express bus routes or transfer to the Green Line or other bus routes at Union Depot. Travel time and reliability enhancements are provided in the form of bus-only shoulder lanes and direct access infrastructure to the Cottage Grove and Lower Afton Road Park and Rides.
- In the **Commuter Rail Alternative**, Routes 361, 364, and 365 are discontinued and the corridor is served by commuter rail. This route operates on existing rail rights of way between Red Wing and Downtown Minneapolis. There are 30-minute headways during the peak periods.



Summary of Alternatives by Service Level and Station Coverage



Projected Ridership and Travel Time Analysis

Travel demand is an integral part in analyzing ridership and travel times. An automated method of ridership calculation, using the Twin Cities Regional Travel Demand Model, was used to develop forecasts for an initial set of transit service scenarios, and a manual method of ridership calculation was used to develop forecasts for the four alternatives carried forward in the AAU. These forecasts are inclusive of all services/routes. The 2030 daily weekday ridership results for the four evaluated alternatives are summarized as follows:

Alternative	2030 Daily Weekday Ridership
No Build	1,310
Express Bus	1,560
BRT	2,420
Commuter Rail	1,640



Estimated Capital Costs

Cost information was gathered from recent and relevant studies, such as the Gateway Corridor AA and the 2007 Red Rock Corridor AA. Original opinions of probable cost were developed where there were gaps, and details of these estimates are provided in Technical memorandum #4 and the appendices to that memo. A 3.5% annual escalation rate was used to estimate costs in 2013 dollars. The following table summarizes the capital cost estimates of the four alternatives carried forward in the AAU. The capital costs associated with the No Build alternative include the purchase of additional vehicles to provide more frequent service on two of the three routes serving the corridor and the construction of bus-only shoulder lanes.

Alternative	Total Capital Cost (\$2013)
No Build	\$8,540,000
Express Bus	\$11,690,000
BRT	\$45,810,000
Commuter Rail	\$584,590,000

Estimated Operating Costs

Operating cost information was gathered from recent and relevant studies, such as the Gateway Corridor AA, the most recently completed AA in the Minneapolis-St. Paul region. It should be emphasized that these estimates only reflect weekday service for the sake of comparability among the alternatives. A 3.5% annual escalation rate was used to estimate costs in 2013 dollars. The following table summarizes the OandM cost estimates of the four alternatives evaluated in the AAU.

Alternative	Total Annual Operating Cost (\$2013)
No Build	\$1,340,000
Express Bus	\$1,850,000
BRT	\$3,810,000
Commuter Rail	\$5,700,000

Alternatives Evaluation Process

A set of evaluation criteria were developed to reflect the approved goals and objectives of the AAU. The criteria fall into four categories related to mobility, cost, development, and environment, which are summarized as follows:



- Mobility has five criteria: travel time, reliability, service hours, daily ridership, and coverage. Daily ridership was considered the most important of the criteria and weighted the highest.
- The Cost goal has three criteria: capital costs, operating and maintenance (OandM) costs, and ability to fund. The capital and OandM cost criteria were given equal importance, whereas the ability to fund was weighted the lowest.
- The Development goal has three criteria: service to support transit-oriented development (TOD), create and expand employment opportunities, and increase in access to population centers. Supporting TOD was given the highest weight of the three criteria.
- Environment has four criteria: historic and natural impacts, reduction in emissions, equitable distribution of impacts, and safety. All four criteria were weighted similarly.

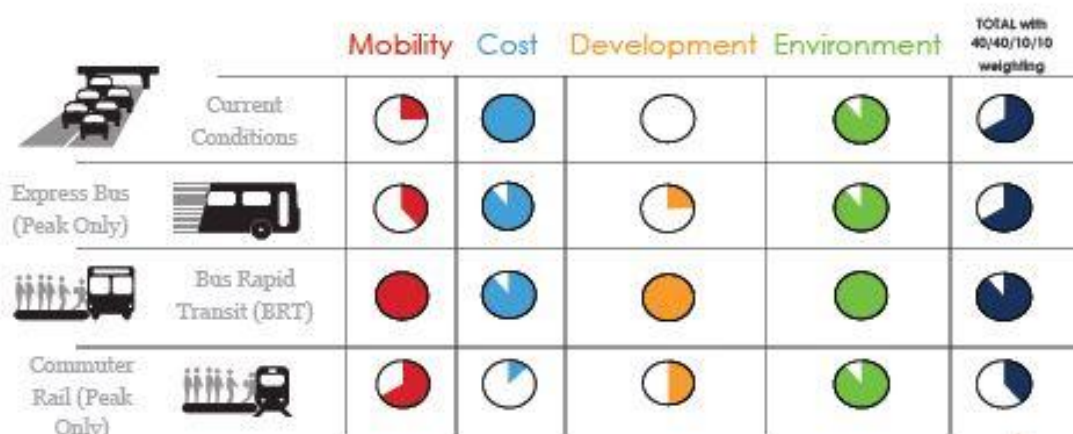
Once the criteria were defined for each goal, then the four alternatives were evaluated against the criteria. The No Build alternative was the highest rated in the Cost category, but fared more poorly in the Mobility and Development categories. The Express Bus rated well in the Cost and Environment categories, but performed more poorly in the Mobility and Development categories. The BRT alternative achieved the highest scores overall based on strong scoring in each of the four categories. The Commuter Rail alternative overall performed the most poorly due to very low scores in the Cost categories.

Below is a summary of the overall score for each alternative and how it performed within each goal category. The more filled in the pie the higher the level of performance.

EVALUATION RESULTS

Through a detailed evaluation, each goal and objective was analyzed.

Here is the summary:



The column on the far right is a weighted composite of the four goals and indicates overall performance.



Implementation Plan and Recommendations

Based on technical information, current land use and growth projections, and the goals and objectives evaluation from the AAU, it has been concluded that BRT is the alternative that is best aligned with the Red Rock Corridor Commission's approved objectives. This conclusion has been made in consultation with representatives on the Citizens Advisory Committee (CAC) and presented to the public in a variety of forums and media.

In moving forward with the development of BRT, the Red Rock Corridor Commission will pursue a staged implementation plan. These stages are such that actions and improvements for Stage 1 will need to be implemented before Stage 2 actions and improvements begin and, likewise, Stage 2 actions and improvements will need to be implemented before Stage 3 actions and improvements begin.

In conjunction with the actions and improvements in each of the three stages, there are other broad and ongoing strategies that will be pursued by the Red Rock Corridor Commission. They are:

1. Advocate for integrated multi-modal investments including pedestrian and bicycle facilities, rail, freight, highway and transit improvements that support mobility throughout the Red Rock Corridor.
2. Advocate for funding for mobility improvements along the corridor. This includes advocating for sustainable local and regional funding sources, as well as supporting and applying for funding at the Federal level.
3. Continue to monitor peak period capacity needs in the corridor to determine the timing for implementation of additional transit services, alternative modes, or capital improvements.



Introduction
December 16, 2013

1.0 Introduction

1.1 PURPOSE OF REPORT

As the Twin Cities Metropolitan Area continues to grow and evolve, so do the transportation needs of its residents. Since the previous Red Rock Corridor Alternatives Analysis (AA) was completed in 2007, this region has had the benefit of additional information via the 2010 Census and a new travel behavior inventory survey. It has also experienced economic and demographic adjustments.

Over the past five years, the Twin Cities Metropolitan Area has begun implementing a variety of transit improvements, including the Northstar Corridor commuter rail and the METRO Red Line BRT (Cedar Avenue) projects. Through these projects, the region has gained valuable insight into how these types of transit services perform.

A review of the 2007 AA and subsequent planning documents suggests that the areas that need to be focused on for the Alternatives Analysis Update include:

- Exploring BRT / Express Bus concepts for the Red Rock Corridor that use bus-only shoulders and other transit “advantages” given work done since 2007 on TH 61 and elsewhere
- Verifying the travel demand that is serving as the basis for the ridership estimates given new census information, a new discussion of the proposed catchment areas, economic data, and the affirming of station locations
- Greater understanding of rail capacity needs in light of the East Metro Rail Study
- Updating forecasts and cost estimates based on Northstar Commuter Rail service and planning work done to date on the METRO Red Line BRT (Cedar Avenue)
- Explore new federal requirements related to funding and safety
- Explore other potential funding sources
- Updated information related to Union Depot
- Updated information from recent Comprehensive Plans



Introduction
December 16, 2013

This Alternative Analysis Update (AAU) project builds upon the previous AA by updating pertinent sections and providing new analysis of BRT as an alternative. The purpose is not to start from scratch, but to carefully review, incorporate, and update in light of more recent census and ridership data in order to create a current and uniform basis for the analysis. Ultimately, the goal of the AAU is to position the Red Rock Corridor for the next steps, including potential funding through the FTA New Starts, Small Starts, or Very Small Starts programs, and identifying the path toward implementation.

1.2 PROJECT HISTORY

In the 1990s, there was a push in the Minneapolis-St. Paul area for commuter rail service, and MnDOT became the lead agency for commuter rail planning efforts. This resulted in early planning for a commuter rail network and led to the eventual creation of the Northstar Commuter Rail service. The Red Rock Corridor was included in this early planning work as another potential commuter rail corridor.

Meanwhile, high-speed rail was being considered for the greater Midwest region. The proposed network of high speed lines included a link between Chicago and St. Paul. An initial study assumed that this link would travel through Rochester, but given the potential synergies between high-speed rail investments and commuter rail investments, the high-speed rail service was soon assumed to be using the Red Rock Corridor.

In 2007, the Red Rock Corridor Alternatives Analysis was developed as an initial phase in attaining federal funding for future commuter rail service. This analysis concluded that commuter rail was appropriate for the long term, especially in the event that high speed rail was introduced into the corridor and provided a mechanism for reducing capital costs. The analysis recommended that commuter bus services be developed in the short-term to build transit demand.

The results of the alternatives analysis led to the study of commuter bus services in the Corridor and station area planning work based around a long-term plan for commuter rail service. However, other regional planning work led by the Metropolitan Council, such as the 2008 Transit Master Study and the 2010 Park-and-Ride Study, and ongoing developments in the corridor reopened the door for additional study to reevaluate whether commuter rail is the appropriate investment for the corridor, viewing the potential ridership as low for the potential costs, unless those costs were shared with another capital investment, such as high speed rail. In addition, the East Metro Rail Capacity Study identified existing capacity constraints within the rail system which would be further strained if commuter rail service was added to the corridor. Finally, the Transportation Policy Plan adopted in November 2010 and amended in May 2013 identifies the Red Rock Corridor as being served by BRT, LRT, or commuter rail. Therefore, in light of the ongoing conversation in the Region as to the future transit services in the Red Rock Corridor, an update to the previously completed Alternatives Analysis was undertaken.



1.3 PROJECT MANAGEMENT

1.3.1 Project Management Team (PMT)

At the outset of the AAU process, a Project Management Team was established to provide an opportunity for input by local and regional staff into the planning process. This group met on a monthly basis. Citizens Advisory Committee (CAC)

The Citizens Advisory Committee (CAC) includes representatives from all of the communities within the corridor. CAC members have worked to transmit information back-and-forth between the project team, the Project Management Team (PMT), the Red Rock Corridor Commission, and their respective communities. Two meetings have already been held with the CAC, with a third and final meeting to be scheduled to discuss final project results and receive CAC guidance.

1.3.2 Red Rock Corridor Commission

The Red Rock Corridor Commission is comprised of 11 members representing the counties and communities within the corridor. In addition to the 11 members, representatives from Goodhue County, the city of Red Wing, Prairie Island Indian Community and the Canadian Pacific Railway serve as ex-officio members.

2.0 Summary of Public Involvement

2.1 INTRODUCTION

Public engagement is an important component of the Red Rock Corridor Alternatives Analysis Update (AAU). Numerous engagement activities have been completed as part of this work, with the goal of maximizing the opportunity for members of the general public, for civic organizations, and for current transit riders to offer their opinions and guidance to the Corridor Commission and the project team. Several methods for engagement, including use of in-person and online engagement, have been used to provide multiple avenues for receiving public guidance.

This following provides an outline of the elements, approach and timeline for partner and community engagement that have been included and implemented as part of the Red Rock Corridor AAU.

2.2 ROLE AND PURPOSE

The purpose of engagement activities included in this project is to:

- Foster community understanding of the transit alternatives being considered,
- Discover the characteristics of transit service that are important to participants,
- Gain information that will help update the vision and direction for the project, and
- Provide a foundation for project recommendations.

2.3 2013 PUBLIC INVOLVEMENT ACTIVITIES

Several tools and forums for community engagement have been set up and implemented for this project. A listing, with a brief description of each, is provided below.

2.3.1 Citizens Advisory Committee (CAC)

The Citizens Advisory Committee (CAC) includes representatives from all of the communities within the corridor. CAC members have worked to transmit information back-and-forth between the project team, the Project Management Team (PMT), the Red Rock Corridor Commission, and their respective communities. Two meetings have already been held with the CAC, with a third and final meeting to be scheduled to discuss final project results and receive CAC guidance.

2.3.2 Listening sessions / Focus group meetings

Listening Sessions are focused meetings that allow the project team to host deeper conversations with a smaller group of participants, and receive detailed information from stakeholders with a common interest or affiliation (for example, members of a cultural or community group, members of a local chamber of commerce or a civic group with an interest in the project).

Four listening sessions were held during April 2013. These sessions were set up to engage civic groups and organizations working along the Corridor. Session hosts were:

- Red Wing 20/20 (held April 3, 2013)
- Prairie Island Tribal Council (held April 10, 2013)
- Newport Planning Commission (held April 11, 2013)
- Hastings Chamber of Commerce (held April 16, 2013)



2.3.3 Open house meetings

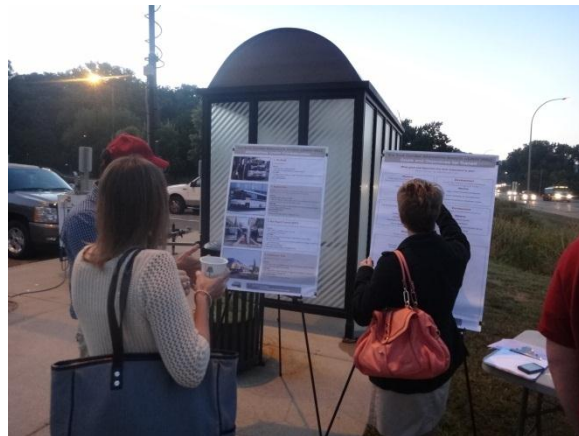
Open house meetings provide an opportunity for members of the public to receive project information, express preferences, and ask questions from the project team. One public open house meeting was held on March 19, 2013 at the St. Paul Park City Hall. The meeting was open to the general public, and was also attended by project staff, elected officials, a member of the Red Rock Corridor Commission, and several members of the local media.

One additional public open house meeting, to serve as a public hearing for the project's results, is envisioned at the conclusion of the AAU.

2.3.4 Park and Ride Engagement

One of the best ways to solicit ideas and opinions for improving a system is to ask current users of that system. To provide additional opportunity to gather comments from members of the public, and to receive guidance from current system users on the issue of enhanced transit service in the Red Rock Corridor, a total of four “tabling” sessions were held at the two Metro Transit Park and Ride locations along the U.S. Highway 61/Red Rock Corridor between Cottage Grove and Saint Paul.

The sessions were held during weekday morning and evening hours when transit riders were using the facilities. Activities included surveys and brief conversations at a pop-up information station during times of Express Bus service. Approximately 200 persons were reached with this engagement. Metro Transit Express Bus routes 361 / 361B (Cottage Grove to Downtown St. Paul), and 365 (Cottage Grove to Downtown Minneapolis), provide service to these locations.



2.3.5 Online Questionnaires

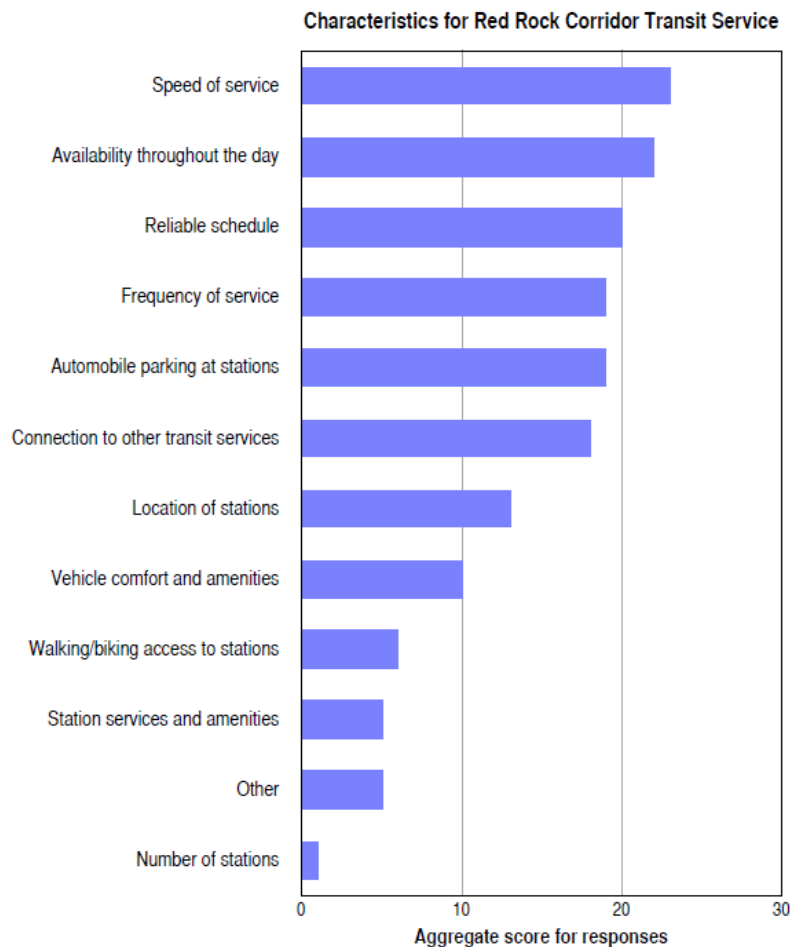
Overall, two sets of questionnaire types were developed for specific audiences. The first set, deployed near the beginning of the project, sought to receive public guidance on the characteristics of transit that were most important to respondents and that would attract them to become users of the system. The second set of questionnaires sought to receive public guidance on service characteristics and different tradeoffs associated with the alternatives that had moved forward in the Technical Analysis portion of this work.

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A complete set of results from the questionnaires are included as an appendix. The first online survey asked participants to rank their top 5 most important transit service characteristics for the Red Rock Corridor. A summary of responses is below.



Two key findings from second set of questionnaires are summarized in the following graphs (note that the sample sizes were not large enough for these to be considered statistically significant surveys). When asked about current travel needs, a majority of Park and Ride respondents indicated “peak/direct” service, which is not surprising given that is the only type of transit service currently available in the corridor. Nonetheless, a significant percentage also indicated a need for more frequent service throughout the day. The on-line respondents were more in-line in terms of their need for “All-Day” service whether it was direct to the downtowns or connected each city in the corridor.



Figure 1: Questionnaire Result: Current Travel Needs

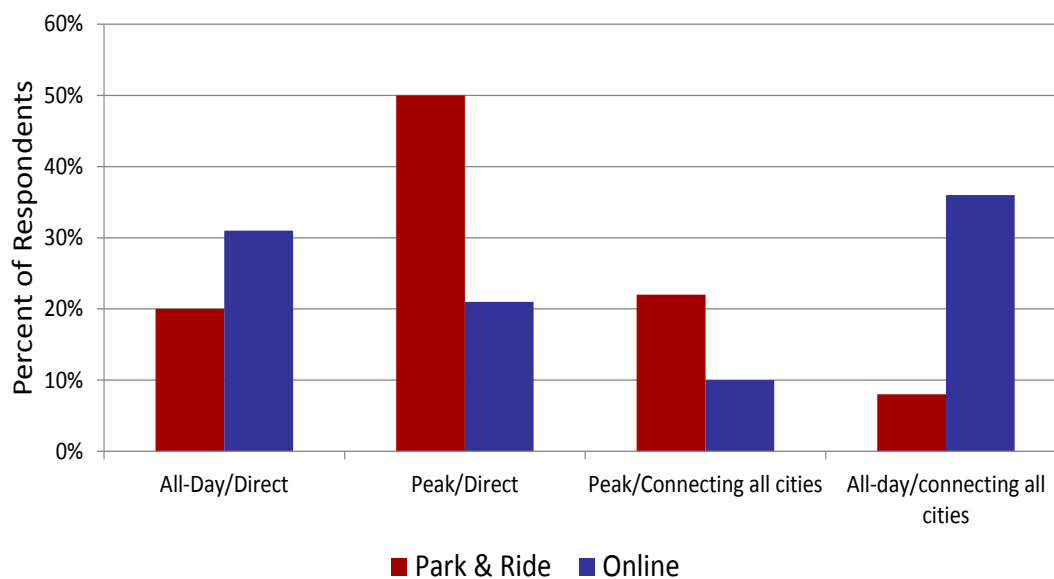
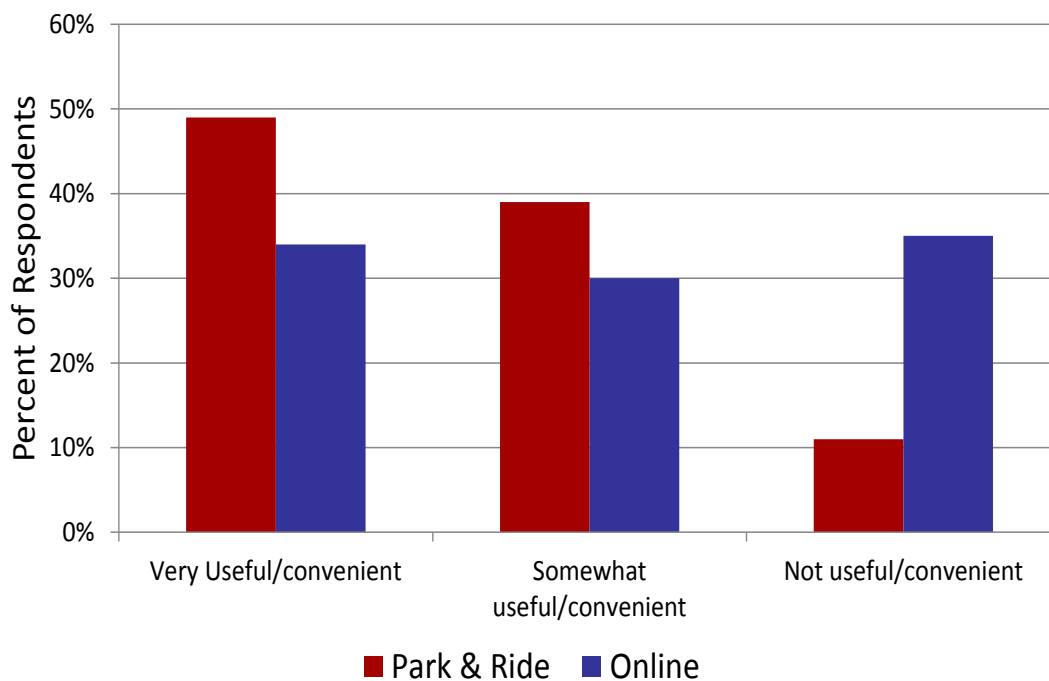


Figure 2: Questionnaire Result: Usefulness of All-Day Service



2.3.6 Other web and online engagement

A project website, e-newsletter, and Facebook account were actively maintained by Washington County staff to disseminate news, information and project materials to the wider public.



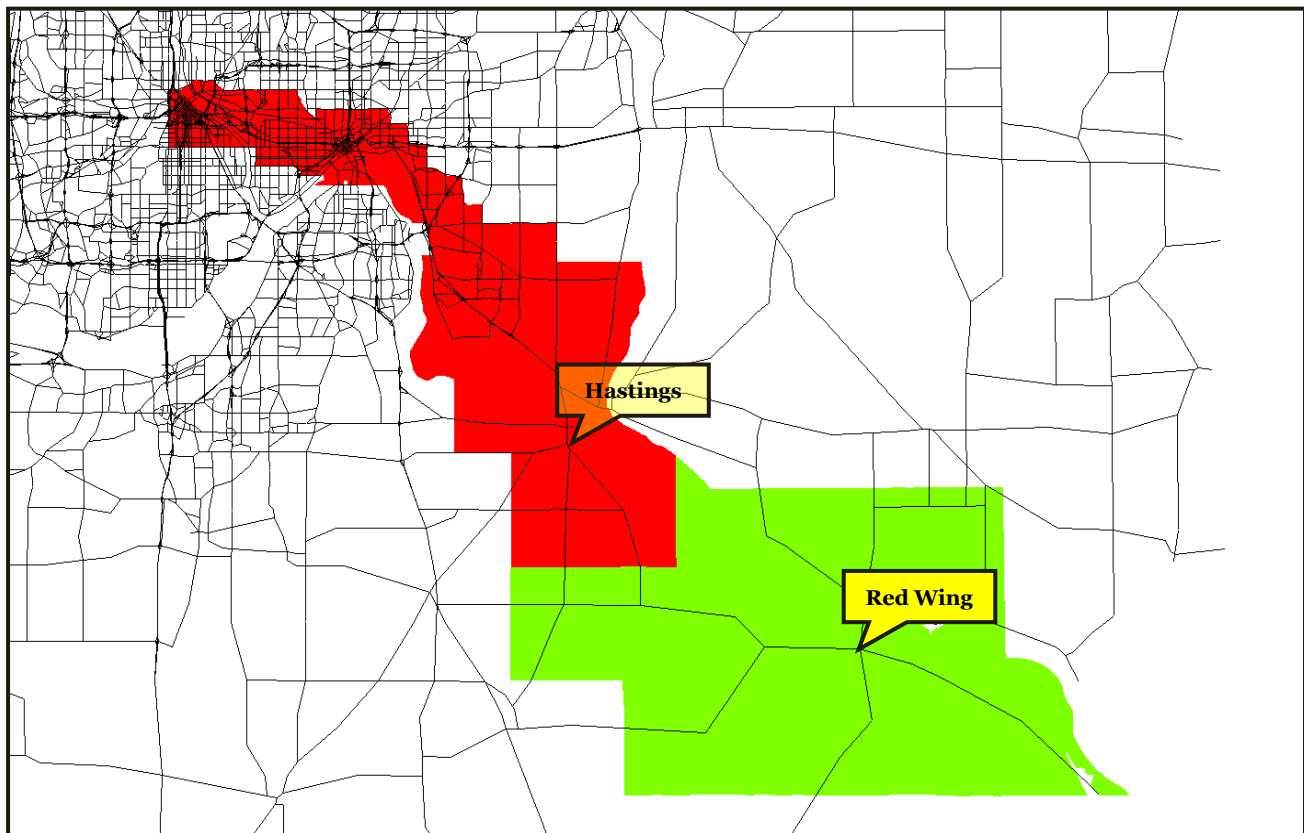
3.0 Study Area Background

3.1 OVERALL

The data review component of this background review was aimed at data for travel, population, employment, and transportation services. In the years since the 2007 Alternatives Analysis, there have been updates to the population and employment forecasts, and actual data is available on the performance of commuter rail in the Region. BRT planning in the Region has also progressed such that the METRO Red Line BRT line began operation in the Cedar Avenue corridor in 2013.

3.2 DEMOGRAPHICS

The study area coverage for the Red Rock Alternatives Analysis Update is shown in the figure below. It is made up of the designated Red Rock Corridor and points to the southeast of Hastings to Red Wing.





Study Area Background
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Socioeconomic data for the Red Rock Corridor is summarized in the table below, including the 2030 projections and the compounded annual growth rate (CAGR).

	2010	2030	CAGR
Population	398,991	509,098	1.2%
Households	160,154	211,667	1.4%
Employment	373,367	515,789	1.6%

The 2011 - Market Assessment Report: Red Rock Corridor Station Area and Site Master Planning Study provided employment, population, and household estimates for 1/2 mile, 1-mile and 3-mile catchment areas. These estimates are shown in the table below.

Table 3
Population, Household, and Employment Forecasts
within Station Areas
(1/2-mile, 1-mile, 3-mile radii)

	Population			Households			Employment		
	1/2-Mile	1-Mile	3-Mile	1/2-Mile	1-Mile	3-Mile	1/2-Mile	1-Mile	3-Mile
2010									
Lower Afton	575	5,319	64,583	202	1,979	24,632	149	547	27,949
Newport	485	2,564	52,704	199	1,055	21,063	1,488	4,583	20,008
Hamlet Park	1,837	8,979	32,911	697	3,369	12,169	601	3,605	7,404
Langdon Village	1,246	3,473	22,367	424	1,196	8,078	1,293	2,668	6,401
Hastings	1,580	6,665	25,234	690	2,640	9,592	1,809	4,729	9,392
2020									
Lower Afton	580	5,733	67,064	204	2,160	25,887	180	370	31,961
Newport	544	2,925	56,573	225	1,220	23,075	1,883	5,762	22,474
Hamlet Park	1,926	9,632	43,196	719	3,633	16,181	690	4,097	8,894
Langdon Village	1,460	3,766	28,785	499	1,277	10,459	1,447	3,298	7,716
Hastings	1,652	8,500	30,634	751	3,503	12,190	1,872	5,353	9,890
2030									
Lower Afton	597	5,900	69,972	213	2,256	27,240	190	391	33,901
Newport	591	3,289	60,046	253	1,421	24,501	2,350	6,732	24,057
Hamlet Park	1,876	9,580	49,556	720	3,654	19,157	720	4,337	9,784
Langdon Village	1,675	3,875	34,838	600	1,378	13,108	1,613	3,706	8,788
Hastings	1,730	10,563	34,421	830	4,405	14,181	1,953	5,766	10,551
2010-2030 Change									
Lower Afton	22	581	5,389	11	277	2,608	41	-156	5,952
Newport	106	725	7,342	54	366	3,438	862	2,149	4,049
Hamlet Park	39	601	16,645	23	285	6,988	119	732	2,380
Langdon Village	429	402	12,471	176	182	5,030	320	1,038	2,387
Hastings	150	3,898	9,187	140	1,765	4,589	144	1,037	1,159

Source: Metropolitan Council



3.3 TRANSPORTATION

In 2010, a Travel Behavior Inventory (TBI) Household Survey was completed. The “*draft version*” of the TBI survey data consists of three sets of information including:

- Person Records,
- Household Records, and
- Trip Records

The data was gathered by the Metropolitan Council via two different survey types, GPS Survey and Home Interview Survey. This information was used in calibrating the Twin Cities Regional Travel Demand Model.

3.4 TRANSIT

Three bus routes, Routes 361, 364, and 365 currently provide express bus service to Minneapolis and/or St. Paul. These routes are shown in Figure 5.1: No-Build Alternative.

A transit on-board survey was conducted by the Metropolitan Council and the results are trip data from 2005 and 2010 that have been combined. Each trip record was geocoded with the traveler’s origin zone, destination zone, and boarding and alighting zones. The survey also included some other pertinent trip information such as access and egress modes, number of transfers, and time-of-day. The 2010 survey was conducted in four separate time-of-day periods, including AM Early, AM Peak, Midday, and PM Peak, while the 2005 survey was conducted only for two time periods, peak and off-peak. A summary of observed ridership from the 2012 survey is shown in the table below.

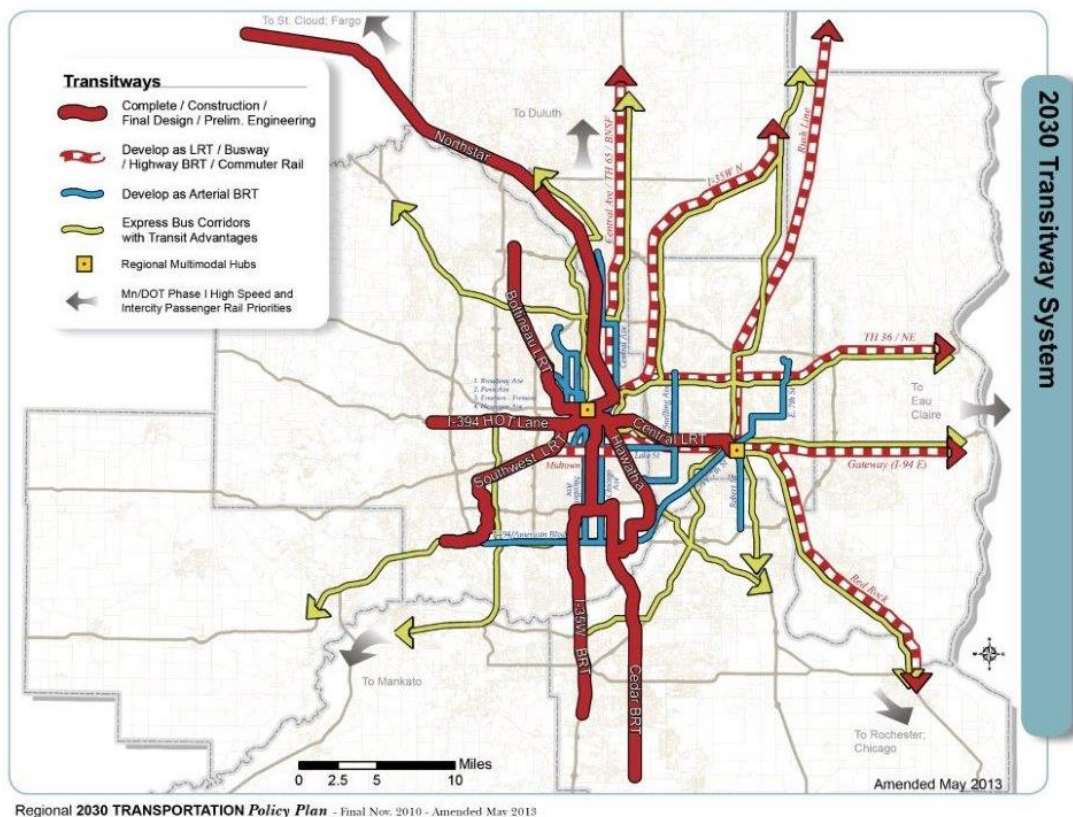
	Route 361	Route 364	Route 365
Weekday Ridership	280	40	540

Regional System
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4.0 Regional System

4.1 REGIONAL PLANNING CONTEXT

The Red Rock Corridor is one of a number of corridors within an overall system of regional transitways identified in the 2030 Transportation Policy Plan (see image below from the 2030 Metropolitan Council Transportation Policy Plan). While a background review is important for any major transportation study to establish a foundation for analysis, it was particularly important for the Red Rock Alternatives Analysis Update (AAU). This is because several studies with similar purposes have already been completed, including the original Red Rock Corridor Alternatives Analysis that was completed in 2007. To avoid any rework, the information these documents contain and the framework they created for the alternatives analysis update had to be fully understood. In addition, many complementary studies and transportation initiatives have occurred since the last formal study of transit alternatives for the Red Rock Corridor, so these will have to be incorporated into the AAU. Key studies include the Station Area Planning Reports which were completed in 2012, the transportation sections of comprehensive plans for communities in the study area including Hastings, Newport, Cottage Grove, Saint Paul Park, Woodbury, St. Paul, and Minneapolis, many of which were completed in 2010, and planning and analysis work related to passenger rail and freight rail in the East Metro Area.





4.1.1 Technical Memorandum #1 Background Review

Technical Memorandum #1 Background Review contains a synopsis of local transportation studies prepared prior to this update. It should be noted that the content of many of the reports is now outdated. In many cases, the conclusions have been superseded by the results of other studies, and in some cases, what was once a plan has now been implemented. The relevant content of these plans are described as they were written, although in some cases, updated information is provided where applicable. For example, in some of the earlier plans, it was not yet known what mode of transit would serve the Central Corridor (the corridor between St. Paul and Minneapolis), and now it is known that LRT will serve this corridor.

In addition to noting information that was relevant to the planning of transit services in the Red Rock Corridor, the background review made note of any vision or public involvement elements to provide a foundation for the visioning and outreach elements of this AAU.

4.1.2 2012 - East Metro Rail Capacity Study

The East Metro Rail Capacity Study (2012) stated that the capacities of existing freight lines in the Red Rock Corridor were already constrained. Adding projected freight rail growth, commuter rail, higher speed passenger rail, and additional intercity passenger rail will further strain capacity. The Ramsey County Regional Railroad Authority (RCRRA) and Red Rock Corridor Commission (RRCC) commissioned this study to investigate the existing capacity constraints around Union Depot and the Red Rock Corridor and to identify solutions for increasing capacity.

The recommendations were to pursue the package of minor improvements around St. Paul, except for the Union Depot flyover, to address freight volume growth, then to pursue improvements such as the new third mainline track along the TH 61 corridor all the way south to Hastings. This report proposed packages that can be constructed as funding becomes available. The report indicated that there were not many opportunities for increasing capacity through operational changes, except in the instances where train crew are changed while through trains are on the mainline. Implementation of commuter rail on the corridor would trigger the majority of the capital costs related to capacity, and there would be limited ability to offer mid-day service due to capacity constraints on the corridor. The report suggested that another evaluation may be needed in five to ten years, or whenever passenger rail is introduced, because conditions might have changed.

4.1.3 2012 - Regional Transitway Guidelines

This document develops guidelines for four transitway modes: (1) commuter rail, (2) LRT, (3) Highway BRT, and (4) Arterial BRT. It does not directly address Express Bus or BRT within an exclusive guideway. Highway BRT service types include station-to-station service (all-day frequent service) and express service (commuter express service coordinated with Highway BRT station-to-station service). Highway BRT station-to-station service is a coordinated set of routes that stop at most stations in a BRT corridor, which is defined by stations and a runningway. It provides service 7 days a week, 16 hours a day, and at least every 10 minutes during peak periods with lower frequencies during the mid-day and evenings. Weekend frequency is based on demand. Highway BRT is coordinated with station-to-station service,



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using the same BRT runningway and park-and-ride facilities as the station-to-station service. It provides at least 30-minute service in the peak periods in Transit Market Areas I and II with at least three peak period trips in Transit Market Areas III and IV.

These guidelines require coordination of transit services, the elimination of competing routes, appropriate route structure, minimum frequencies, minimum span of service, travel times, productivity, and acceptable loading. They also address station siting and spacing, vehicle design, and fare collection system design.

4.1.4 2012 - Gateway Corridor Alternatives Analysis

Another significant corridor in the eastern metropolitan area, the Gateway Corridor, completed the AA process in 2012 and entered into the DEIS process in 2013. The AA results recommended a Draft EIS be completed by analyzing both LRT and a dedicated guideway BRT.

4.1.5 Transportation Policy Plan

The Regional Transportation Policy Plan is currently being updated, with a draft scheduled for release in Spring 2014 and final approved document expected in December 2014.

4.2 STATUS OF AREA PROJECTS

The following area projects have been completed since the 2007 Alternatives Analysis:

- Northstar Commuter Rail began service in 2009.
- The Union Depot was completed in December 2012
- The METRO Red Line BRT (Cedar Avenue) began service in 2013.
- The Green Line LRT (Central Corridor) is scheduled to begin service in 2014.
- The new Hastings bridge opened in 2013, with construction to be completed in 2014.
- The Newport Transit Station and park and ride is scheduled for completion in late fall 2014.

4.3 SYSTEM CONNECTIVITY

The Red Rock Corridor will seamlessly connect to other transit lines and services at the stations along the corridor. At the Union Depot in downtown St. Paul, Red Rock will connect with Metro Transit buses, taxis, intercity buses (Jefferson Lines), the Green Line LRT (Central Corridor) via the Union Depot, high-speed passenger rail from Chicago, Amtrak's Empire Builder, and future connections to both the Gateway and Rush Line Corridors. At the stations along 5th Street in downtown Minneapolis and at the Target Field Station, Red Rock (via the Green Line or other modes) will connect to buses, taxis, the Blue Line LRT (Hiawatha) and the eventual Bottineau extension, Northstar commuter rail, and the planned Green Line extension into the Southwest Corridor and Bottineau Corridor transitways. At the other stations, Red Rock will provide convenient connections with local bus service.



5.0 Purpose and Need for Project

5.1 NEED FOR TRANSPORTATION IMPROVEMENTS

The Red Rock Corridor has regional, statewide, and national significance as a primary transportation route for automobile, truck, and rail travel. Highway 61 is a principal arterial and part of the National Highway and National Scenic Byway systems. The Metropolitan Council has projected that the Southeast quadrant of the Metro Area will grow by another 100,000 people over the next 20 years. Despite the growth in some of the outlying areas, 94 percent of the jobs in the study area are within Minneapolis and St. Paul, and the primary commute pattern is to these two downtowns. This pattern is expected to continue into 2030. The Metropolitan Council projects that by 2030, nearly the entire length of Highway 61 in the Red Rock Corridor will be congested and operating at a Level of Service (LOS) F during the morning and evening commute periods. As population and employment increase, demand for transportation increases and congestion will only get worse unless a transit solution is pursued.

5.2 PROBLEM STATEMENT, GOALS, AND OBJECTIVES

5.2.1 2013 Alternative Analysis Update Problem Statement

The 2007 Red Rock Alternatives Analysis focused heavily on issues related to peak hour mobility to the St. Paul and Minneapolis downtowns. Additional analysis is needed to better understand historical, current and future transit markets in the corridor, including off-peak and reverse commute service demand, local access demand, railroad access, new station locations, connections to new transit services, level of service, and efficient use of transit infrastructure.

Communities in the Red Rock corridor between St. Paul and Cottage Grove do not currently have all-day fixed route transit service, with service limited to peak period express bus and dial-a-ride services. Community members and the Commission have expressed a desire for more off-peak/all day transit service with more access.

5.2.2 2013 Alternatives Analysis Update Goals and Objectives

The goals and objectives lay the framework for how each alternative is evaluated in the AAU with measureable data points being analyzed for each objective. The following goals and objectives were adopted by the Red Rock Corridor Commission on May 22, 2013.

1. Goal: Provide Mode Choice and Service Plan that Meets the Demonstrated and Forecasted Needs of Corridor Communities

Objectives

- a. A transit option which is time competitive to the private automobile
- b. Reliable service
- c. Improve mobility throughout the day for both work and non-work trips by providing flexible duration of service



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- d. A transit option that maximizes the number of riders and the transit modal share, among both transit-dependent and non-transit-dependent populations
- e. Provide connectivity among existing and planned transit/bike/pedestrian services and infrastructure throughout the region, expanding the destinations corridor transit users can access

2. Goal: Cost Effectively Address Transportation Problems in the Corridor

Objectives

- a. Implement a service with operating costs per rider that are consistent with other cost effective transit systems in the region
- b. Create a transit service with capital costs that are consistent with other transit systems in the region.
- c. Implement a transit investment that is coordinated with other transportation projects in the corridor and region but not dependent on them to be cost-effective.

3. Goal: Increase Opportunities for Community and Economic Development Throughout the Corridor

Objectives

- a. Support local initiatives to create transit oriented development (TOD) including, higher density housing and mixed-use commercial/retail areas within walking distance of the station areas and throughout the Corridor
- b. Support a vibrant business community by increasing access for workers and customers to businesses in the corridor.
- c. Increase connectivity and access from population centers to employment concentrations along the Corridor

4. Goal: Improve Quality of Natural and Built Environment

Objectives

- a. Limit adverse impacts to natural, cultural, and other resources in the study area
- b. Reduce emissions
- c. Provide a fair and equitable distribution of impacts and benefits across the various population groups in the study area
- d. Address existing and future safety issues along corridor



6.0 Description of Alternatives Evaluated

Based on an initial screening analysis, the technology and alignment alternatives identified for further evaluation were combined into several build alternatives. These build alternatives were subjected to more detailed quantitative analysis (ridership, capital costs and operational costs) to help identify a preferred alternative. For purposes of comparison, a No-Build Alternative was also developed. Each of the alternatives is described below.

6.1 NO-BUILD ALTERNATIVE

The No-Build Alternative is based on the Metropolitan Council's 2030 Plan. It consists of existing bus routes and also contains the following major projects: Northstar Commuter Rail, Green Line LRT (Central Corridor), and Southwest Corridor LRT.

In this alternative, Routes 361, 364, and 365 are maintained as the primary transit services in the Red Rock Corridor. An additional bus stop is added to Route 364 to serve the new Newport Park and Ride, but the route structures will generally remain the same. To accommodate modeled increases in demand in the corridor, the level of service is increased on both Routes 361 and 365. Reliability enhancements are offered in the form of bus-only shoulder lanes in congested areas. The No-Build Alternative is depicted in Figure 5.1.

6.2 BUILD ALTERNATIVES

6.2.1 Express Bus Alternative

In this alternative, Routes 361, 364, and 365 are maintained and the corridor is served by an additional peak period limited stop express bus route that stops in Red Wing, Prairie Island, Hastings, and Newport before continuing to Union Depot and Minneapolis. This route provides 30-minute headways during the peak periods. Reliability enhancements are offered in the form of bus-only shoulder lanes in congested areas. The Express Bus Alternative is depicted in Figure 5.2.

6.2.2 Bus Rapid Transit (BRT) Alternative

In this alternative, Routes 361, 364, and 365 are maintained and the corridor is served by a BRT route using special BRT buses and stations. The BRT route operates largely on Highway 61 between Hastings and Union Depot. It operates at 15-minute headways throughout the day; from about 6am to 10pm. Passengers wishing to travel to Minneapolis can use existing express bus routes or transfer to the Green Line at Union Depot. Travel time and reliability enhancements are provided in the form of bus-only shoulder lanes and direct access infrastructure to the Cottage Grove and Lower Afton Road Park and Rides. The BRT Alternative is depicted in Figure 5.3.

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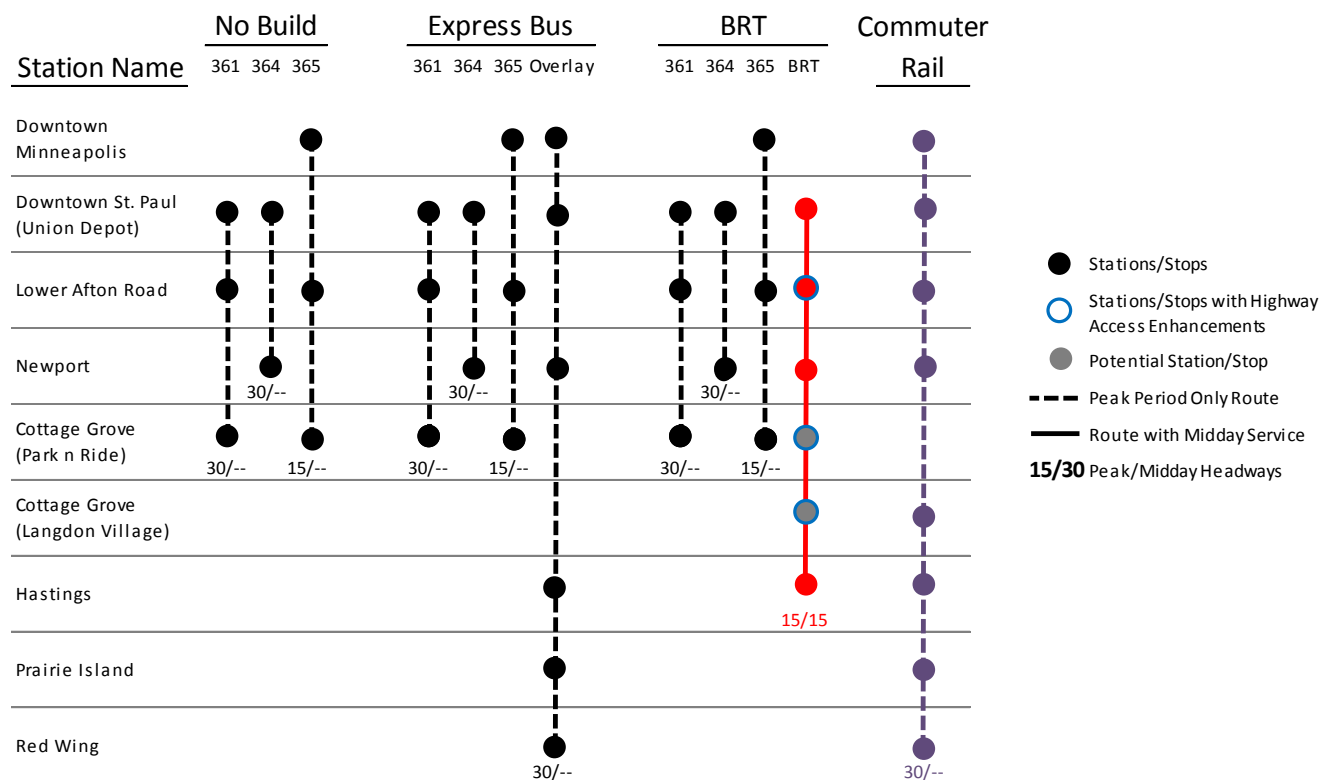
Description of Alternatives Evaluated
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6.2.3 Commuter Rail Alternative

In this alternative, Routes 361, 364, and 365 are discontinued and the corridor is served by commuter rail. This route operates on existing rail rights of way between Red Wing and Downtown Minneapolis. There are 30-minute headways during the peak periods. The Commuter Rail Alternative is depicted in Figure 5.4.

6.3 SUMMARY OF ALTERNATIVES BY SERVICE LEVEL AND STATION COVERAGE

Below is a graphic depiction of the service level and station coverage of each alternative.

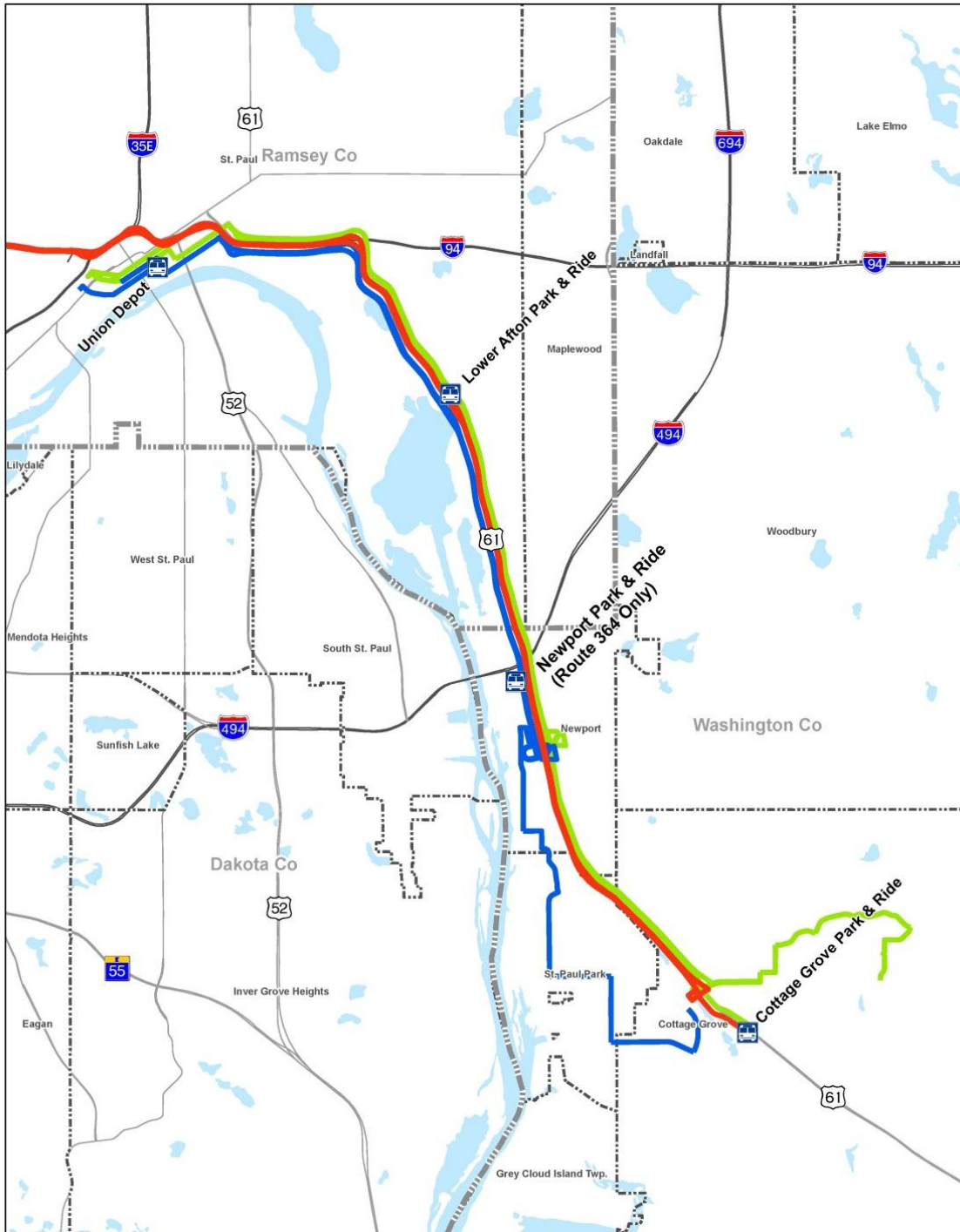


RED ROCK CORRIDOR ALTERNATIVES ANALYSIS UPDATE



Description of Alternatives Evaluated
December 16, 2013

Map 1: No-Build Alternative



No Build (Current Conditions) Alternative

Red Rock Corridor



- Bus Route 361
- Bus Route 364
- Bus Route 365



August 13, 2013

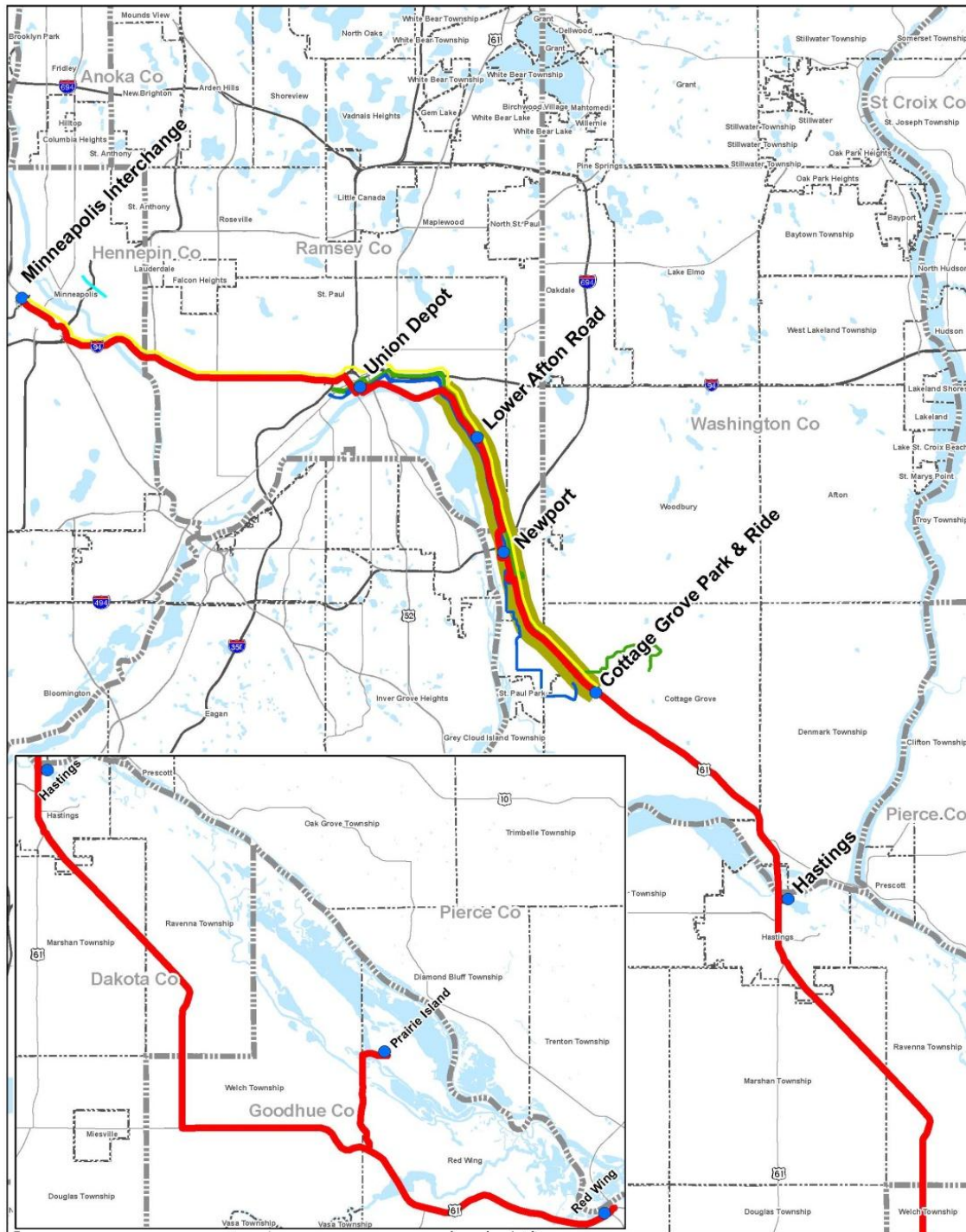


RED ROCK CORRIDOR ALTERNATIVES ANALYSIS UPDATE



Description of Alternatives Evaluated
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Map 2: Express Bus Alternative



Express Bus Alternative

Red Rock Corridor

- Limited Stop Overlay (does not serve Cottage Grove and Lower Afton stations)
- Bus Route 361
- Bus Route 364
- Bus Route 365
- Bus-Only Shoulder Lanes



August 22, 2013



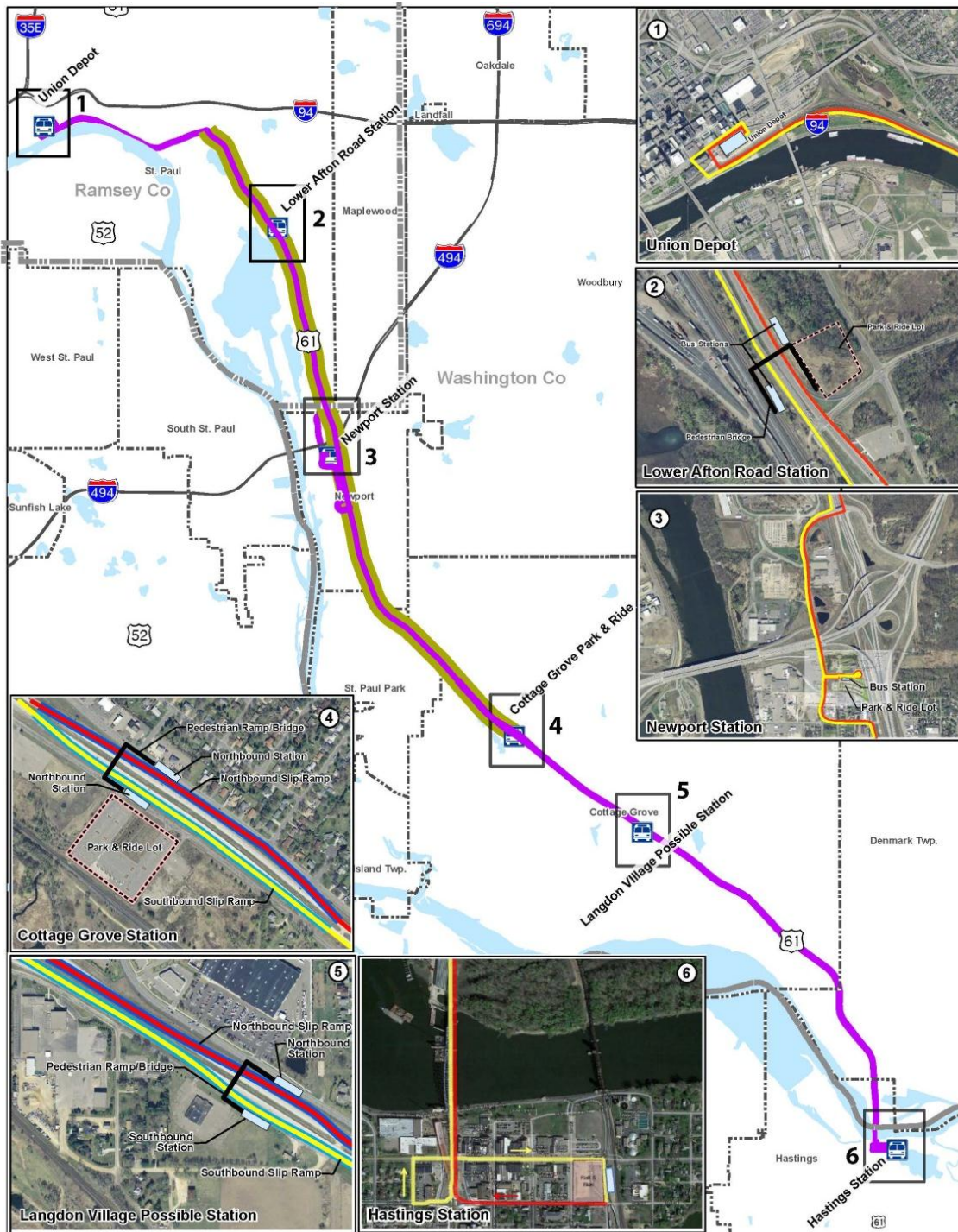
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RED ROCK CORRIDOR ALTERNATIVES ANALYSIS UPDATE

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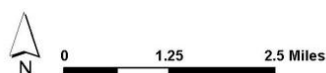


Map 3: Bus Rapid Transit (BRT) Alternative



Bus Rapid Transit (BRT) Alternative

Red Rock Corridor



- BRT Alignment
- Bus Only Shoulder Lanes
- Southbound BRT Alignment
- Northbound BRT Alignment

August 22, 2013

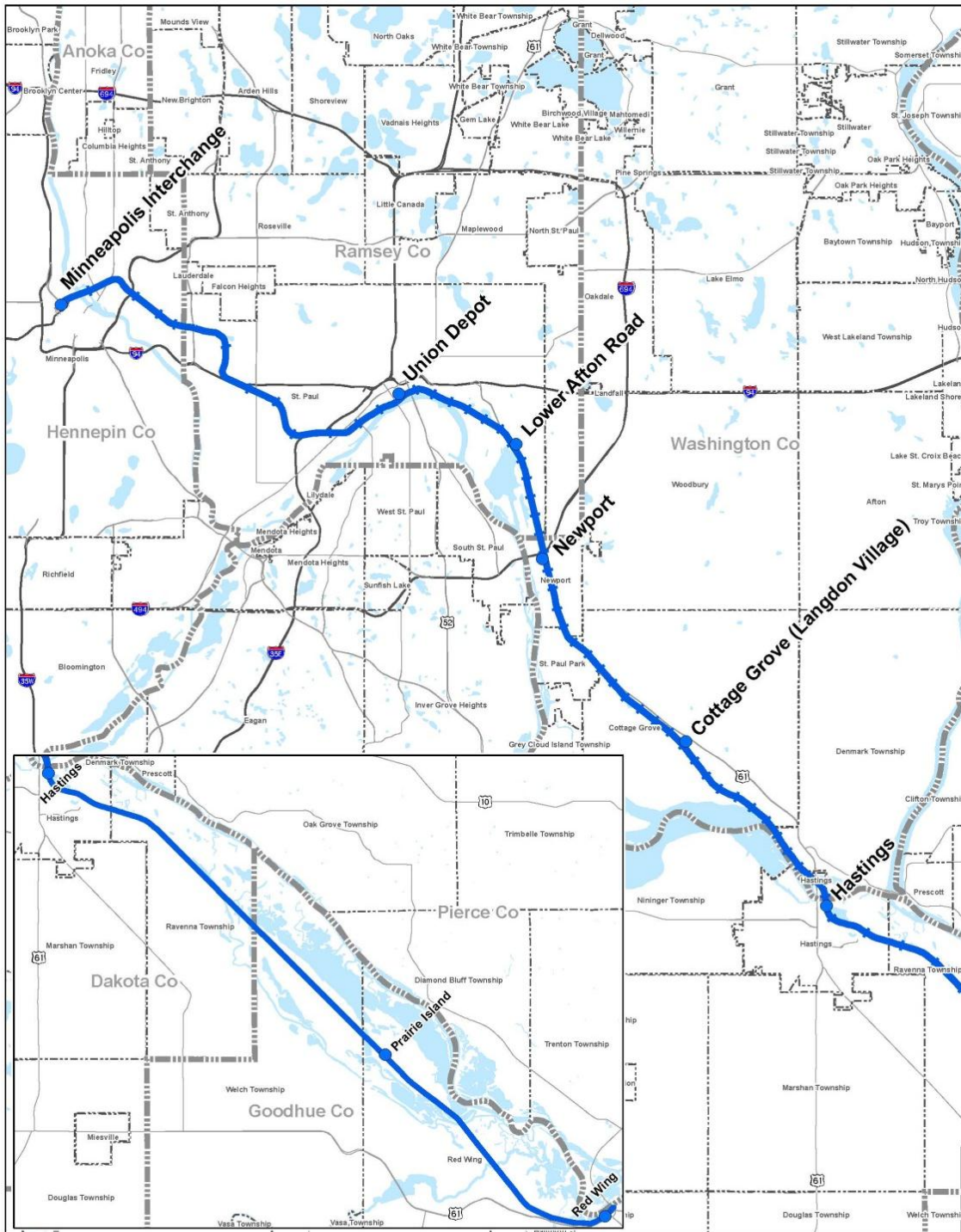


RED ROCK CORRIDOR ALTERNATIVES ANALYSIS UPDATE



Description of Alternatives Evaluated
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Map 4: Commuter Rail Alternative



Commuter Rail Alternative

Red Rock Corridor

Minneapolis to Red Wing



August 22, 2013





7.0 Project Ridership and Travel Time Analysis

7.1.1 Corridor Districts, Characteristics, and Data Sets

The study corridor was developed to mimic the 2007 Red Rock Corridor Alternatives Analysis with an extension southward to include Prairie Island and Red Wing, while honoring the regional model's Traffic Analysis Zones (TAZ) boundaries. For model calibration purposes, the study corridor was divided into eight districts / areas:

1. Red Wing
2. Prairie Island
3. Hastings
4. Cottage Grove / St. Paul Park
5. Woodbury / Newport
6. St. Paul / Lower Afton
7. St. Paul Downtown
8. Minneapolis CBD

The transit market along this corridor is primarily served by three express bus routes, Routes 361, 364, and 365, which only operate during peak periods. These three bus routes provide services for transit patrons from the first six districts listed above to downtown St. Paul and Minneapolis, and vice versa (note that transit patrons from the first three districts listed above must drive to the Cottage Grove Park and Ride to access the express bus services or other regional facilities). These also provide local trips to some extent. Considering that downtown St. Paul and downtown Minneapolis are the two main destinations of the transit commuters, the transit markets for these two destinations were calibrated to replicate the surveyed data. The calibration effort was performed for the 2010 model year using the Twin Cities Regional Travel Demand Model, and the observed data was developed using several available survey datasets:

- 2010 Travel Behavior Inventory (Household Survey)
- 2010 Metro Transit On-Board Survey Data
- 2000 Census Journey to Work (JTW) data (2010 JTW data was not available at the time of the calibration), and
- 2010 traffic counts.

7.1.2 Modeled Scenarios

Six scenarios were analyzed as part of the ridership forecasting effort, three of which were BRT variants. Those scenarios are:



1. No-Build Scenario, in which the service frequencies for Routes 361 and 365 were increased, while service levels for Route 364 were maintained.
2. Express Bus Scenario, in which a new express bus route had all-day service and served the corridor between Red Wing and Minneapolis, although during the off-peak period the service coverage was limited to the corridor between Hastings and St. Paul.
3. BRT Scenarios, described as follows:
 - a. The Partial Investment, in which only minor investments were made in the corridor and headways were 15 minutes throughout the day.
 - b. Full Investment, in which major investments were made in the corridor to enhance travel time and headways were 15 minutes throughout the day.
 - c. Full Investment, in which major investments were made in the corridor to enhance travel time and headways were 15 minutes in the peak periods but only 30 minutes in the off-peak periods.

All BRT scenarios provide service between Hastings and Union Depot only.
4. Commuter Rail Scenario, in which commuter rail operated during the peak periods, while demand during the off-peak period was provided by supplemental bus service. As part of this alternative, a modified Route 364 operated between Cottage Grove and Newport Stations during the peak periods as a feeder bus to the commuter rail stations and to serve the local transit market.

7.1.3 2030 Estimated Weekday Ridership

The 2030 estimated total ridership for each modeled scenario is shown in the table below. The average weekday boarding summary by station for each alternative is presented in the following subsections. Note that these are not the alternatives carried forward in the study; they were a set of scenarios developed at the mid-point of the study for discussion. For the most part, they were scenarios that incorporated generous features (i.e., all-day service, more stations) so that if the decision was made to cut back on the services, corresponding boardings could be removed. These forecasts were generated by an automated method that used the Regional Travel Demand Model. Additional detail on boardings by station or park and ride location is provided in Technical Memo #5. A summary of the ridership forecasts of the four alternatives is shown in the following table.

Table 2: 2030 Estimated Ridership Summary

	No Build (Current Conditions)	Express Bus	BRT	Commuter Rail
Weekday Ridership	1,310	1,560	2,420	1,640



Estimated Capital Costs
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8.0 Estimated Capital Costs

Technical Memorandum #4 describes the assumptions made and the outcomes of the cost estimation exercise carried out for the Red Rock Corridor AAU. Capital cost estimates were prepared for vehicles, infrastructure, and right of way. Where possible, cost information was gathered from recent and relevant studies, such as the Gateway Corridor AA and the 2007 Red Rock Corridor AA. Original opinions of probable cost were developed where there were gaps, and details of these estimates are provided in Technical memorandum #4 and the appendices to that memo.

A 3.5% annual escalation rate was used to estimate costs in 2013 dollars.

The following table summarizes the capital cost estimates of the four alternatives carried forward in the AAU.

Table 3: Capital Cost Summary (\$2013)

	No Build	Express Bus	BRT	Commuter Rail
Total Capital Cost	\$8,540,000	\$11,690,000	\$45,810,000	\$584,590,000



9.0 Estimated Operating Costs

This section describes the assumptions made and the outcomes of the OandM cost estimation exercise carried out for the Red Rock Corridor AAU. Where possible, cost information was gathered from recent and relevant studies, such as the Gateway Corridor AA, the most recently completed AA in the Minneapolis-St. Paul region. Cost estimates were developed for weekday services only in order to provide consistency among the different alternatives. This does not preclude the possibility of some of the alternatives having weekend service. It should also be noted that the aim of estimating OandM costs at this stage of planning is to compare alternatives. Due to the fact that the actual implementation of an alternative is still likely years away, the cost estimates, as well as the schedules they are based on, should be viewed as conceptual only and developed only to the extent needed to compare the alternatives. It is unlikely that any of the schedules would be implemented as is.

A 3.5% annual escalation rate was used to estimate costs in 2013 dollars.

The following table summarizes the OandM cost estimates of the four alternatives carried forward in the AAU. It should be emphasized that these estimates only reflect weekday service for the sake of comparability among the alternatives.

Table 4: Operations and Maintenance Cost Summary (\$2013)

	No Build (Current Conditions)	Express Bus	BRT	Commuter Rail
Annual Revenue Hours	10,021	13,854	32,379	3,583
Total Annual Cost	\$1,340,000	\$1,850,000	\$3,810,000	\$5,700,000



10.0 Alternatives Evaluation Process

Evaluation criteria were developed to reflect the Red Rock Corridor 2013 Alternatives Analysis Update Problem Statement, Goals and Objectives approved by the Red Rock Commission. The criteria fall into four categories related to mobility, cost, development, and the environment. This chapter describes the framework for applying the criteria to each alternative in order to score and rank them.

The chapter begins with a summary comparison of each alternative, which is then followed by a description of how each objective is evaluated and scored. To help rank the alternatives, the scores for each alternative by goal are then summarized into an overall composite score.



10.1 SUMMARY COMPARISON OF ALTERNATIVES

Table 5 presents a summary comparison of the key service attributes of each alternative evaluated.

Table 5: Summary Comparison of Alternatives

Key Service Attributes	Alternative 1: No Build	Alternative 2: Express Bus	Alternative 3: Bus Rapid Transit (BRT)	Alternative 4: Commuter Rail
Service in the midday	No	No	Yes	No
Service to Hastings	No	Yes	Yes	Yes
Service to Red Wing / Prairie Island	No	Yes	No	Yes
One-seat ride to Minneapolis	Yes (only in the peak periods and from Cottage Grove and Lower Afton)	Yes (only in the peak period)	Yes (only in the peak periods and from Cottage Grove and Lower Afton)	Yes (only in the peak period)
Travel time / reliability enhancements	Yes (bus-only shoulder lanes)	Yes (bus-only shoulder lanes)	Yes (bus-only shoulder lanes and bus-only ramps)	Yes (no auto congestion)
Key Stations served	Downtown Minneapolis (3 locations), Downtown St. Paul (1 location), Lower Afton Road Park-and-Ride, Newport Park-and-Ride, and Cottage Grove Park-and-Ride	Downtown Minneapolis (3 locations), Downtown St. Paul (2 locations, inc. Union Depot), Lower Afton Road Park-and-Ride, Newport Park-and-Ride, Cottage Grove Park-and-Ride (at Langdon Village site), Hastings Park-and-Ride, Prairie Island, and Red Wing	Downtown Minneapolis (3 locations), Downtown St. Paul (2 locations, inc. Union Depot), Lower Afton Road Park-and-Ride, Newport Park-and-Ride, Cottage Grove Park-and-Ride (at Langdon Village site), and Hastings Park-and-Ride	Target Field Station, Union Depot, Lower Afton Road Park-and-Ride, Newport Park-and-Ride, Cottage Grove Park-and-Ride (at Langdon Village site), Hastings Park-and-Ride, Prairie Island, and Red Wing
Trips per weekday	56	66	170	10
Annual weekday revenue hours	10,100	14,000	28,600	3,600
Weekday boardings	1,300	1,560	2,420	1,640
Boardings per revenue hour	32	28	21	114
Cost per mile (excluding vehicles)	\$70,000	\$30,000	\$1,500,000	\$9,570,000
O and M Costs per Boarding	\$4.11	\$4.75	\$6.28	\$13.98
Capital Costs (including vehicles)	\$8,540,000	\$11,700,000	\$45,810,000	\$584,590,000
Annual OandM Costs	\$1,340,000	\$1,850,000	\$3,805,000	\$5,720,000
Fare structure	Express / local fares	Express / local fares	Local fares	Distance-based



10.2 MOBILITY EVALUATION

Goal 1: Provide Mode Choice and Service Plan that Meets the Demonstrated and Forecasted Needs of Corridor Communities

Table 6: Criteria for Mobility Goal

Objective	Criteria	Evaluation	Points Available
Time competitive with auto	Travel Time	The scoring for this item is based on the estimated travel time between Hastings and Union Depot in the morning peak. With commuter rail travel time being the shortest, at 27 minutes, it is given the maximum point value, while the BRT Alternative, which provides some travel time enhancements for bus service, is given 0.5 points. Alternatives that offer no travel time advantages compared to existing express bus service are given a score of 0.	1.0
Reliable service	Reliability	The scoring for this item is based on the provision of elements that aim to improve transit service reliability. Alternatives are given the maximum point value if they have infrastructure investments beyond bus-only shoulder lanes that improve reliability or are able to avoid auto congestion.	1.0
Improve mobility throughout the day	Service hours	The scoring for this item is determined by whether the alternative provides service throughout the day or just the peak periods. Full points are awarded to an alternative that provides all-day service.	1.0
Number of riders	Daily ridership	The scoring for this item is based on an estimate of daily weekday boardings at stations along the route. The alternative with the highest ridership is given a score of 6, while other alternatives are given scores equal to their ridership values relative to the ridership value of the highest ranking alternative, multiplied by six and rounded to the nearest half point.	6.0
Expands destination options	Coverage	The scoring for this item is based on an alternative's ability to serve new destinations that are not currently accessible today. Points are awarded for: <ul style="list-style-type: none"> • Access to Hastings, Prairie Island, and Red Wing: 0.5 • Station to station access: 0.5 	1.0
<u>Total Score</u>			<u>10.0</u>



10.2.1 Travel Time

Full points were given to the Commuter Rail Alternative because it has the shortest expected travel time between Hastings and Union Depot. The BRT Alternative was given a half point because the ramps that would be built at the Lower Afton Road and Cottage Grove Stations will provide travel time advantages to buses compared to what is available today. No points were given to the Express Bus Alternative or No Build (Current Conditions) Alternative due to the fact that there are no travel time enhancements incorporated into either alternative for service between Hastings and Union Depot.

10.2.2 Reliability

No points for reliability were given to the No Build (Current Conditions) Alternative or the Express Bus Alternative. Full points were given to the BRT Alternative due to the inclusion of bus-only access ramps that will allow buses to bypass congestion getting to or from park and ride facilities. Full points were also given to the commuter rail alternative because it will be able to avoid auto congestion.

10.2.3 Service Hours

Full points were given to the BRT Alternative because it operates throughout the day. No points were given to the remaining alternatives which are peak-period only.

10.2.4 Daily Ridership

The daily ridership scores are based on the 2030 ridership forecasts described in more detail in Technical Memorandum #5. The BRT Alternative provided the highest ridership forecasts, and so it was allotted full points. Points were given to other alternatives based on the ratio of their ridership forecasts to the BRT ridership forecast, multiplied by six and rounded to the nearest half point.

10.2.5 Coverage

No points were given to the No Build (Current Conditions) Alternative because it does not expand transit coverage in the corridor. However, the Express Bus Alternative and the Commuter Rail Alternative are allocated half points because they extend coverage to Hastings, Prairie Island, and Red Wing. The BRT Alternative does not extend serve to Prairie Island and Red Wing, but it is allocated a half point because it provides station-to-station coverage throughout the day between Hastings and Union Depot that does not exist today.

Table 7 shows a summary of the mobility scores.

**Table 7: Mobility Criteria Scores**

Criteria	Maximum Score	Alternative 1: No Build	Alternative 2: Express Bus	Alternative 3: Bus Rapid Transit (BRT)	Alternative 4: Commuter Rail
Travel Time	1	0.0	0.0	0.5	1.0
Reliability	1	0.0	0.0	1.0	1.0
Service Hours	1	0.0	0.0	1.0	0.0
Daily Ridership	6	3.0	4.0	6.0	4.0
Coverage	1	0.0	0.5	0.5	0.5
TOTAL SCORE	10	3.0	4.5	9.0	6.5

10.3 COST EVALUATION

Goal 2: Cost Effectively Address Transportation Problems in the Corridor

Table 8: Criteria for Cost Goal

Objective	Criteria	Evaluation	Points Available
Capital costs per rider are consistent with others in the region	Capital Cost	<p>The scoring for this item is based on a planning level estimate of the capital cost (in 2013 dollars) for implementing the alternative. Points are allocated as follows:</p> <ul style="list-style-type: none"> • Under \$15 million: 4 • Between \$15 million and \$75 million: 3 • Between \$75 million and \$400 million: 2 • More than \$400 million: 1 	4
Operating costs that are consistent with other projects in the region	Annual OandM Cost	<p>The scoring for this item is based on a planning level estimate (in 2013 dollars) of the annual operating and maintenance cost per rider of the alternative. Points are allocated as follows:</p> <ul style="list-style-type: none"> • Under \$5: 4 • Between \$5 and \$8: 3 • Between \$8 and \$11: 2 • Over \$11: 1 	4
Implement a transit service that is not dependent on other investments in the region	Ability to Fund	The scoring for this item is determined by the ability for the alternative to be constructed independently from other investments and if there is a funding model. Alternatives that have a funding model are given two points and alternatives that do not have a funding model are given zero points.	2
<u>Total Score</u>			<u>10</u>



10.3.1 Capital Cost

The capital cost scores are based on the capital cost estimates described in more detail in Technical Memorandum #4. The No Build (Current Conditions) Alternative and the Express Bus Alternative were allocated four points because they both are estimated to cost less than \$15 million. The BRT Alternative was allocated three points because its cost is estimated to be between \$15 million and \$75 million. The Commuter Rail Alternative was allocated one point because its cost is estimated to be more than \$400 million.

10.3.2 Annual OandM Cost

The OandM cost scores are based on the OandM cost estimates described in more detail in Technical Memorandum #3. The No Build (Current Conditions) and Express Bus Alternatives were give scores of 4 because their cost per trip was under \$5. The BRT Alternative was given a score of 3 because its cost per trip was between \$5 and \$8. The Commuter Rail Alternative was given a score of 1 because its cost per trip was above \$11.

10.3.3 Ability to Fund

Full points were given to those alternatives that had a cost model in place for funding. Therefore, the no build alternative was given full points. Two points were also given to the BRT Alternative given that there is a potential funding model in place through the Small Starts program (although the alternative's competitiveness in this program has yet to be determined). Express bus was not given any points because there is no funding model to implement service south of Cottage Grove. The Commuter Rail Alternative was also given zero points because the project would not qualify for New Starts funding.

Table 9 shows a summary of the cost scores.

Table 9: Cost Criteria Scores

Criteria	Maximum Score	Alternative 1: No Build	Alternative 2: Express Bus	Alternative 3: Bus Rapid Transit (BRT)	Alternative 4: Commuter Rail
Capital Costs	4	4.0	4.0	3.0	1.0
Annual OandM Cost	4	4.0	4.0	3.0	1.0
Ability to Fund	2	2.0	0.0	2.0	0.0
TOTAL SCORE	10	10.0	8.0	8.0	2.0



10.4 DEVELOPMENT EVALUATION

Goal 3: Increase Opportunities for Community and Economic Development Throughout the Corridor

Table 10: Criteria for Development Goal

Objective	Criteria	Evaluation	Points Available
Support TOD efforts within walking distance of stations	Service to Supports TOD	Because TOD development is tied to the level of investment at transit stations and level of service, points for this category have been assigned in the following way; two points are given for all day transit service at the corridor stations listed below and one point is given if there is not all-day service but significant investments are made at stations. <ul style="list-style-type: none"> • Hastings • Cottage Grove (Langdon Village or existing site) • Newport 	6.0
Increase access for workers and customers in the corridor	Increase in Access to Businesses	The scoring for this goal is based on increasing access that is not available today. Three points are given to an alternative that provides all-day access to stations and one point is given to an alternative that provide just peak-period service to stations.	3.0
Increase access to population centers	Increase in Access to Population Centers	The population centers in the Corridor are St. Paul and Minneapolis. An alternative that provides peak period service to both is given 1 point.	1.0
<u>Total Score</u>			<u>10.0</u>

10.4.1 Service to Support TOD

Full points were given to the BRT Alternative given the fact that it provides frequent service to the stations throughout the day. While the commuter rail service only operated in the peak period, it was felt that the investment levels in the stations could effectively stimulate TOD, so it was given three points. The No Build (Current Conditions) and Express Bus Alternatives were given no points.



10.4.2 Increase in Access to Businesses

The BRT Alternative was given full points because it provides all-day service. The Express Bus and Commuter Rail Alternatives were given one point due to the fact that they increase service in the peak period.

10.4.3 Increase in Access to Population Centers

Full points were given to the No Build (Current Conditions), Express Bus, and Commuter Rail Alternatives because they offered one-seat rides to both downtown St. Paul and Minneapolis. No points were given to the BRT Alternative.

Table 11 shows a summary of the development scores.

Table 11: Development Criteria Scores

Criteria	Maximum Score	Alternative 1: No Build	Alternative 2: Express Bus	Alternative 3: Bus Rapid Transit (BRT)	Alternative 4: Commuter Rail
Service to support TOD	6	0	0	6	3
Increase in access for businesses	3	0	1	3	1
Increase in access to population centers	1	1	1	1	1
TOTAL SCORE	10	1.0	2.0	10.0	5.0



10.5 ENVIRONMENT EVALUATION

Goal 4: Improve Quality of Natural and Built Environment

Table 2: Criteria for Environment Goal

Objective	Criteria	Evaluation	Points Available
Limit adverse effects on natural and cultural resources	Historic and Natural Environment Impacts	Points are provided based on the: <ul style="list-style-type: none"> • Likelihood to not have impacts to historic properties – 1 • Likelihood to not require significant infrastructure in undeveloped areas – 1 • Likelihood to not have significant impact to floodplains – 1 	3.0
Reduce emissions	Reduction in Emissions	Provides a low-emission transportation alternative to driving for many trips. Note: full points given for all alternatives.	3.0
Provide an equitable distribution of impacts	Equitable Distribution of Impacts	Points are provided based on the equitable distribution of impacts. Note: full points were given to every alternative	2.0
Address existing safety issues	Infrastructure that will address safety	The largest known safety issue in the Corridor is the at-grade pedestrian crossing at the Lower Afton station. Two points were given to alternatives that address this issue. Zero points were given to the alternatives that don't address this issue.	2.0
<u>Total Score</u>			<u>10.0</u>

10.5.1 Historic and Natural Environment Impacts

The No Build (Current Conditions) Alternative received full points because it is not expected to have any historic or natural environment impacts. The Express Bus and BRT Alternatives also received full points because it was expected that the bus-only shoulder lanes and bus-only ramps and stations would be creating impacts in an area that was already developed. The Commuter Rail Alternative was only given one point because it is expected that its stations and corridor investments will have some impacts on historic properties and in floodplains. .

10.5.2 Reduction in Emission

All of the alternatives received a full score due to their ability to attract customers to transit and encourage a mode shift away from single occupant driving. While there are methods for calculating the emissions impacts of the alternatives, they rely on information about the vehicle-miles of travel by automobile



averted by an alternative, as well as the direct emissions from the operation of an alternative. It is felt that there is not enough information available at this stage of analysis to produce results that would be meaningful for this AAU. For one, the emissions profiles of vehicles in 2030 are unknown. Secondly, changes in vehicle-miles traveled were not directly measured in this analysis.

10.5.3 Equitable Distribution of Impacts

All of the alternatives received a full score because it is felt that the distribution of impacts is fairly distributed.

10.5.4 Infrastructure Impacts to Address Safety

The BRT and Commuter Rail Alternatives were given full points because they included new pedestrian crossings at Lower Afton Road.

Table 13 shows a summary of the environment scores.

Table 3: Environment Criteria Scores

Criteria	Maximum Score	Alternative 1: No Build	Alternative 2: Express Bus	Alternative 3: Bus Rapid Transit (BRT)	Alternative 4: Commuter Rail
Historic and natural environment impacts	3	3	3	3	1
Reduction in emissions	3	3	3	3	3
Equitable distribution of impacts	2	2	2	2	2
Infrastructure investments to address safety	2	0	0	2	2
TOTAL SCORE	10	8	8	10	8

10.6 SUMMARY SCORES

A composite of summary scores are shown in Table 14. The summary evaluation is also depicted in Figure 3. Based on the scoring methodology, the BRT alternative rates the highest with an overall composite score of 8.8 out of 10. It followed by the No Build and Express Bus alternatives with overall composite scores of 6.1 and 6.0, respectively. The commuter rail alternative had an overall composite score of 4.7 out of 10.

Table 44: Summary Scores

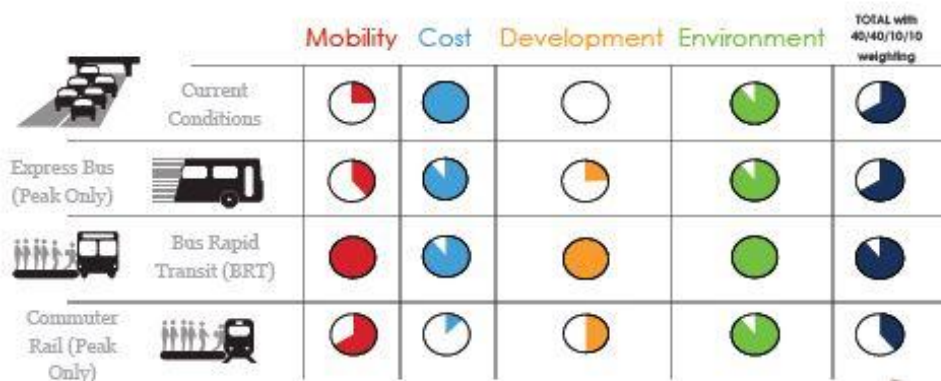
Alternative	Mobility	Cost	Development	Environment	40/40/10/10 Weighting
No Build (Current Conditions)	3.0	10.0	1.0	8.0	6.1
Express Bus	4.5	8.0	2.0	8.0	6.0
BRT	9.0	8.0	10.0	10.0	8.8
Commuter Rail	6.5	2.0	5.0	8.0	4.7

Figure 3: Evaluation Summary of Red Rock Corridor Alternatives

EVALUATION RESULTS

Through a detailed evaluation, each goal and objective was analyzed.

Here is the summary:

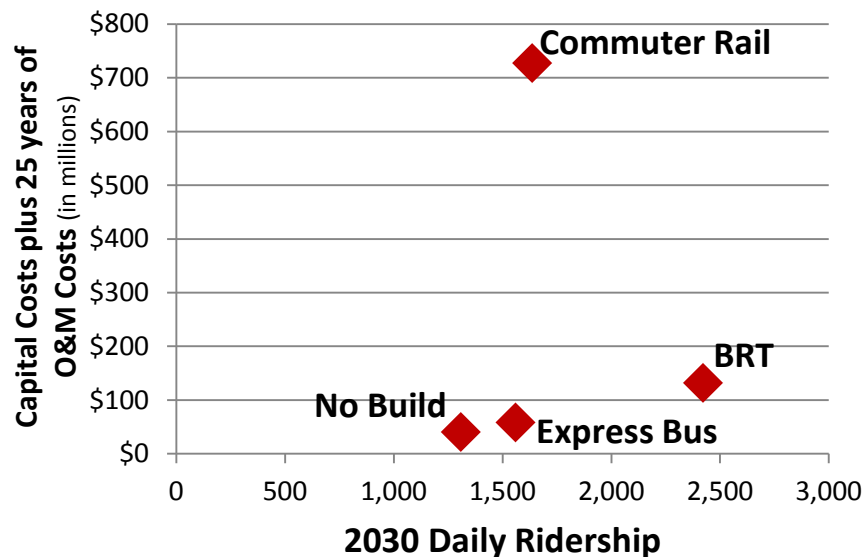


The column on the far right is a weighted composite of the four goals and indicates overall performance.

Figure 4 plots ridership against costs, as defined by capital costs plus 25 years of operating and maintenance costs. According to the figure, the BRT alternative has the highest projected 2030 ridership and the second highest cost. The No Build alternative has the lowest cost and the lowest level of projected ridership. The Express Bus alternative has the second lowest cost and second lowest level of ridership. The commuter rail alternative has the highest cost and the second highest level of ridership.



Figure 4: Cost versus Ridership of Red Rock Corridor Alternatives



11.0 Implementation Plan

Based on technical information, current land use and growth projections, and the goals and objectives evaluation from the AAU, it has been concluded that BRT is the alternative that is best aligned with the Red Rock Corridor Commission's approved objectives. This conclusion has been made in consultation with representatives on the Citizens Advisory Committee (CAC) and presented to the public in a variety of forums and media.

Central to this conclusion was public input regarding the need for all-day transit service in the Corridor to key regional destinations as well as between station areas throughout the Corridor. Nonetheless, this conclusion also takes into consideration the potential need for additional peak-period transit capacity improvements as the population base continues to grow throughout the Corridor.

In moving forward with the development of BRT, the Red Rock Corridor Commission will pursue a staged implementation plan. These stages are such that actions and improvements for Stage 1 will need to be implemented before Stage 2 actions and improvements begin and, likewise, Stage 2 actions and improvements will need to be implemented before Stage 3 actions and improvements begin.

In conjunction with the actions and improvements in each of the three stages, there are other broad and ongoing strategies that will be pursued by the Red Rock Corridor Commission. They are:

1. Advocate for integrated multi-modal investments including pedestrian and bicycle facilities, rail, freight, highway and transit improvements that support mobility throughout the Red Rock Corridor.



2. Advocate for funding for mobility improvements along the corridor. This includes advocating for sustainable local and regional funding sources, as well as supporting and applying for funding at the Federal level.
3. Continue to monitor peak period capacity needs in the corridor to determine the timing for implementation of additional transit services, alternative modes, or capital improvements.

The three stages include the following:

11.1 STAGE ONE

1 Work with Metro Transit to increase express bus service to St. Paul/Minneapolis as demand increases within the existing Corridor.

- 1.1.1 Complete the Newport Transit Station and Park and Ride
- 1.1.2 Evaluate the feasibility of providing peak period express service from Newport Transit Station to downtown Minneapolis.
- 1.1.3 Evaluate the feasibility of providing limited mid-day and evening service along the corridor.
- 1.1.4 Work with the Metropolitan Council to monitor parking capacity and safety issues at the Lower Afton Road Park and Ride and make improvements if warranted.
- 1.1.5 Monitor congestion on Highway 61 to determine whether bus shoulder lanes are warranted.
- 1.1.6 Prepare Feasibility Study and Environmental Documentation for BRT, including bus-only shoulder lanes, station improvements and other supporting infrastructure.
- 1.1.7 Coordinate the outcomes of this study with the Metropolitan Council Highway BRT study and the update to the regional Transportation Policy Plan
- 1.1.8 Work with Metro Transit to implement all-day bus service as part of a phased BRT investment.

1.2 Promote land use changes and development around station areas to increase density to support all-day transit market.

- 1.2.1 Work with the City of Newport and the Washington County HRA to develop transit-supportive uses on the Newport Transit Station Site and surrounding area.
- 1.2.2 Work with the Cities of Cottage Grove and Hastings to develop transit-supportive uses around the station/park and ride locations.
- 1.2.3 Evaluate the need to prepare a Corridor Investment Framework Plan to prioritize investments, similar to the plan prepared for the Central Corridor.



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1.3 Encourage service extensions to Hastings, which would require the City to join the transit taxing district.

- 1.3.1 Evaluate the feasibility of extending initial peak period limited stop express service from Cottage Grove to Hastings.

11.2 STAGE TWO

- 2.1 Further evaluate a BRT alternative.
- 2.2 If warranted, begin phased implementation of BRT improvements.
- 2.3 Add BRT/ticket vending machines/next bus technology improvements at all stations/park and rides.
- 2.4 Perform Preliminary Engineering for bus-only shoulder lanes.
- 2.5 Perform Preliminary Engineering for direct access infrastructure to the Cottage Grove and Lower Afton Road Park and Rides.
- 2.6 Perform Final Design and Construct Bus Only Shoulder Lanes.

11.3 STAGE THREE

- 3.1 Design and Construct Infrastructure Improvements at Lower Afton, Cottage Grove, and Hastings and retrofit Newport Station to accommodate BRT.
- 3.2 Procure BRT Vehicles.
- 3.3 Begin operation of BRT service.
- 3.4 Consider additional transit services, alternative modes, or capital improvements to meet peak period capacity needs in the corridor as warranted.