1.0 EVALUATION OF COMMUTER RAIL CORRIDOR ALTERNATIVES

1.1 DEVELOPMENT OF EVALUATION CRITERIA

The process for evaluating commuter rail system corridors builds on previous work in the MAG *Commuter Rail Strategic Plan* that established the goals for commuter rail in the region and the MAG *Regional Transit Framework Study* that identified a method of evaluating and prioritizing transit corridors.

The *Commuter Rail Strategic Plan* outlined a series of five goals to serve as a guiding framework for future commuter rail planning and implementation in the region:

Goal 1 - Employ Commuter Rail to Shape Regional Growth

Goal 2 - Improve Transportation Mobility Opportunities by Implementing Commuter Rail

Goal 3 - Provide a Seamless and Cost Effective Commuter Rail Option

Goal 4 - Promote Sustainability through the Implementation of Commuter Rail

Goal 5 - Increase Public/Private Cooperation to Implement Commuter Rail

Following the results of the *Strategic Plan*, the *Regional Transit Framework Study* is now seeking to identify transit improvements with an overall potential to increase transit mobility. To this end, transit corridors have been evaluated and prioritized using performance standards and indicators that were categorized into the following three categories: Primary Mode Choice, Rider Perception Characteristics and System/Policy Compatibility.

Using the *Strategic Plan* goals as a framework and the *Transit Framework Study* categories of performance standards and indicators, the System Study Project Team established a set of evaluation criteria by which to evaluate potential rail corridor alternatives. Each category of criteria was related to a specific *Strategic Plan* goal; and in several cases the evaluation criteria used in the *Transit Framework Study* was expanded on to evaluate the commuter rail corridors in a greater level of detail. In addition to the three categories of Primary Mode Choice, Rider Perception Characteristics, and System/Policy Compatibility, the Project Team added two additional evaluation categories of Cost-Effectiveness and Implementation/Constructability.

1.2 CATEGORIES OF EVALUATION CRITERIA

Each set of evaluation criteria seeks to answer the following questions:

- Primary Mode Choice: Will travelers choose to ride commuter rail transit based on ***travel time savings***? Will there be sufficient ***number of transit patrons*** to support high levels of peak and off-peak service?

- Rider Perception Characteristics: Is the degree of ***regional connectivity*** and activity center connections provided by the commuter rail corridor enough to be deemed a ***convenient*** transit service?

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- System/Policy Compatibility: Does the commuter rail corridor serve a concentration of ***population and employment*** centers such that ***reductions in auto travel*** and ***improvements in air quality*** are achieved?

- Cost-effectiveness: Does the investment in the rail corridor prove economical in terms of a number of ***cost-effectiveness*** and ***user benefit*** measures?

- Implementation/Constructability: What is the degree of ease of difficultly that might be expected to ***construct and implement*** the commuter rail corridor?

1.3 DESCRIPTION OF EVALUATION CRITERIA AND MEASURES

The following section describes each of the corridor and system evaluation criteria and measures. Table 1 also summarizes each of the criteria and ratings.

Primary Mode Choice

Speed/Travel Time

Estimated corridor end-to-end (or selected zones) travel time savings. The total travel time from one end of a commuter rail route to the terminal station, or between specific zones, should provide a time advantage over travel along parallel roadway corridor(s). The greater the time savings, the greater the passenger benefit and the more riders the system is likely to attract.

Measures

High:	Greater than _ % travel time savings over comparable roadway travel corridor(s) in 2030
Medium:	Between _ and _ % travel time savings over comparable roadway travel corridor(s) in 2030
Low:	Less than _ % travel time savings over comparable roadway travel corridor(s) in 2030

Total Daily Ridership Forecast

The total daily riders per mile of corridor or system length. This measure reflects the usefulness and attractiveness of the commuter rail corridor as a primary mode choice on a daily basis.

Measures

High:	Daily 2030 ridership per system mile is above peer city average
Medium:	Daily 2030 ridership per system mile is 75 – 100% of peer city average
Low:	Daily 2030 ridership per system mile is less than 75% of peer city average

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Rider Perception

Direct Connections to Activity Centers

The direct connections made by the rail corridor between activity centers. The commuter rail corridor should provide a degree of regional connectivity between activity center to be perceived as a convenient transit service.

Measures

High:	Commuter rail corridor connects at least two regional activity centers
Medium:	Commuter rail corridor connects at least one regional activity center and one subarea activity center
Low:	Commuter rail corridor does not connect any regional or subarea activity centers

System/Policy Compatibility

Land Use Compatibility

Population and employment density within ½ mile of the rail alignment. The ability of commuter rail service to help shape population and employment growth by reinforcing and/or stimulating development in a multi-centered growth pattern was identified as the single most important benefit of commuter rail among Commuter Rail Strategic Plan stakeholders.

Measures

High:	Projected 2030 population and employment density in the corridor or system within ½ mile of alignment (ranges to be determined)
Medium:	Projected 2030 population and employment density in the corridor or system within ½ mile of alignment (ranges to be determined)
Low:	Projected 2030 population and employment density in the corridor or system within ½ mile of alignment (ranges to be determined)

Impact on Regional Travel and Air Quality

Projected change in regional vehicle miles traveled (VMT) or vehicle hours traveled (VHT) with the implementation of the commuter rail corridor. The ability of transit service to reduce regional miles and hours of auto travel is a strong indicator of how commuter rail can influence auto travel. The greater the reduction in regional VMT/VHT, the greater the benefit the transit system will have on highway congestion and air quality.

Measures

High:	Corridor or system results in VMT/VHT reduction
Medium:	Corridor or system results in no or negligible VMT/VHT change
Low:	Corridor or system results in VMT/VHT increase

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Cost-Effectiveness

Total Capital Cost per Corridor or System Mile

The estimated capital cost to construct the commuter rail corridor as compared to peer cities. Systems with lower capital cost are preferred over those with higher capital cost.

Measures

High:	Absolute cost; and/or more than 10% below peer city average cost per mile
Medium:	Absolute cost; and/or 10% above or below peer city average cost per mile
Low:	Absolute cost; and/or more than 10% above peer city average cost per mile

Total Annualized Capital and O&M Cost per Corridor or System Mile

The estimated cost to build, operate and maintain the system on an annual basis as compared to peer cities. Commuter rail systems with lower capital and O&M cost are preferred over those with higher capital and O&M cost.

Measures

High:	More than 10% below peer city average annualized capital and O&M cost per mile
Medium:	10% above or below peer city average annualized capital and O&M cost per mile
Low:	Greater than 10% above peer city average annualized capital and O&M cost per mile

Annual O&M Cost per Annual Rider

Reflects the subsidy required per rider. This criterion measures how much of the annual O&M cost would be covered by passenger farebox revenues. By calculating the operating cost per user, a comparison to typical bus farebox revenues can be made to determine the additional cost by corridor.

Measures

High:	Range to be determined.
Medium:	Range to be determined.
Low:	Range to be determined.

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Total Annual Cost (Capital and O&M) per Annual Rider

Reflects the relative benefit per rider by calculating the annualized cost per annual rider. This measure uses the annualized capital cost, annualized operating cost, and annualized ridership to produce a resulting calculation of annual cost per annual rider. A lower cost per rider indicates more effective performance.

Measures

High:	Range to be determined
Medium:	Range to be determined
Low:	Range to be determined

Annual Cost per Travel Time Savings

Measures annualized cost per user benefit. The annualized cost is divided by the estimated annual travel time saving to produce a measure of cost per hour of travel saved.

Measures

High:	Range to be determined
Medium:	Range to be determined
Low:	Range to be determined

Implementation/Constructability

Ease of Implementation/Constructability

The degree of ease of difficulty that might be expected to construct and implement a proposed system. A system that is easy to implement because of minimal right-of-way acquisition, environmental issues, physical barriers, station site locations, and other factors is more easily accommodated and more likely to be completed on schedule and within budget.

Measures

High:	Implementation of the commuter rail corridor would have a low degree of difficulty (quantitative and qualitative assessment to be determined)
Medium:	Implementation of the commuter rail corridor would have a moderate degree of difficulty (quantitative and qualitative assessment to be determined)
Low:	Implementation of the commuter rail corridor would have a high degree of difficulty (quantitative and qualitative assessment to be determined)

Compatibility with Freight Railroad

Number and type of potential conflicts with freight operations. Commuter rail corridors with limited freight volume, passenger rail expansion capabilities and potential railroad cooperation are more likely to be implemented.

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Measures

High: Commuter rail corridor would have a minimal number of conflicts with existing and planned freight operations (quantitative and qualitative assessment to be determined)

Medium: Commuter rail corridor would have moderate number of conflicts with existing and planned freight operations (quantitative and qualitative assessment to be determined)

Low: Commuter rail corridor would have substantial number of conflicts with existing and planned freight operations (quantitative and qualitative assessment to be determined)

Benefit to Adjacent or Crossing Highway Infrastructure

Construction of any of the commuter rail corridors under consideration would require modifications to a number of adjacent roadways and/or roadway crossings. This criteria measures the relative benefit that may be achieved by these modifications.

Measures

High: Provides some adjacent or crossing highway infrastructure improvements that improves operations or performance

Medium: Does not affect adjacent or crossing highway infrastructure

Low: Results in need for additional highway improvements that do not improve highway/railroad performance or operations

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Table 1: Summary of Corridor and System Evaluation Criteria and Ratings

Evaluation Criteria	Corridor or System Rating		
	High	**Medium**	**Low**
Primary Mode Choice			
Estimated corridor end-to-end (or selected zones) travel time savings	Greater than _ % travel time savings over comparable roadway travel corridor(s) in 2030	Between _ and _ % travel time savings over comparable roadway travel corridor(s) in 2030	Less than _ % travel time savings over comparable roadway travel corridor(s) in 2030
Total daily ridership forecast (measured in total daily riders per mile of corridor or system length)	Daily 2030 ridership per system mile is above peer city average	Daily 2030 ridership per system mile is 75 – 100% of peer city average	Daily 2030 ridership per system mile is less than 75% of peer city average
Rider Perception			
Direct connections to activity centers	Commuter rail corridor connects at least one regional activity center	Commuter rail corridor connects at least one subarea activity center	Commuter rail corridor does not connect any regional or subarea activity centers
System/Policy Compatibility			
Land use compatibility (population and employment density within ½ mile of alignment – could also use ratio of jobs to population)	Projected 2030 population and employment density in the corridor or system within ½ mile of alignment (Ranges to be determined)	Projected 2030 population and employment density in the corridor or system within ½ mile of alignment (Ranges to be determined)	Projected 2030 population and employment density in the corridor or system within ½ mile of alignment (Ranges to be determined)
Impact on regional travel and air quality	Corridor or system results in VMT/VHT reduction	Corridor or system results in no or negligible VMT/VHT change	Corridor or system results in VMT/VHT increase
Cost Effectiveness			
Total capital cost per corridor or system mile (including comparison with peer cities)	Absolute cost; and/or more than 10% below peer city average cost per mile	Absolute cost; and/or 10% above or below peer city average cost per mile	Absolute cost; and/or more than 10% above peer city average cost per mile
Total annualized capital and O&M cost per corridor or system mile (compared with peer cities)	More than 10% below peer city average annualized capital and O&M cost per mile	10% above or below peer city average annualized capital and O&M cost per mile	Greater than 10% above peer city average annualized capital and O&M cost per mile
Annual O&M cost per annual rider	Ranges to be determined	Ranges to be determined	Ranges to be determined
Total annual cost (capital and O&M) per annual rider	Ranges to be determined	Ranges to be determined	Ranges to be determined
Annual cost per travel time savings	Ranges to be determined	Ranges to be determined	Ranges to be determined

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Evaluation Criteria	Corridor or System Rating		
	High	**Medium**	**Low**
Implementation/Constructability			
Ease of implementation/constructability (issues related to right-of-way acquisition, environmental factors, station locations, physical barriers, and other factors)	Implementation would have low degree of difficulty (Quantitative and qualitative assessment factors to be determined)	Implementation would have moderate degree of difficulty (Quantitative and qualitative assessment factors to be determined)	Implementation would have high degree of difficulty (Quantitative and qualitative assessment factors to be determined)
Compatibility with freight railroad (issues such as conflicts with freight volume, passenger rail facilities and track construction capabilities, potential railroad cooperation)	Minimal number of conflicts with existing and planned freight operations (Quantitative and qualitative assessment factors to be determined)	Moderate number of conflicts with existing and planned freight operations (Quantitative and qualitative assessment factors to be determined)	Substantial number of conflicts with existing and planned freight operations (Quantitative and qualitative assessment factors to be determined)
Benefit to adjacent or crossing highway infrastructure	Provides some adjacent or crossing highway infrastructure improvements that improves operations or performance (Qualitative assessment factors to be determined)	Does not affect adjacent or crossing highway infrastructure (Qualitative assessment factors to be determined)	Results in need for additional highway improvements that do not improve highway/railroad performance or operations (Qualitative assessment factors to be determined)

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1.4 RELATIONSHIP OF EVALUATION CRITERIA TO STRATEGIC PLAN GOALS

The comparison of the *Commuter Rail Strategic Plan* goals to the MAG *Commuter Rail System Study* evaluation criteria in Table 1 demonstrates how *Strategic Plan* goals informed the development of evaluation criteria for this study. Table 2 identifies the relationships between the goals and resulting criteria.

Table 2: Comparison of Strategic Plan Goals and System Study Evaluation Criteria

MAG Commuter Rail Strategic Plan Goals	MAG Commuter Rail System Study Evaluation Criteria
Goal 1 - Employ Commuter Rail to Shape Regional Growth	• Direct Connections to Activity Centers • Land Use Compatibility
Goal 2 - Improve Transportation Mobility Opportunities by Implementing Commuter Rail	• Speed/Travel Time • Total Daily and Peak Ridership Forecast
Goal 3 - Provide a Seamless and Cost Effective Commuter Rail Option	• Total Capital Cost per Corridor or System Mile • Total Annualized Capital and O&M Cost per Corridor or System Mile • Annual O&M Cost per Annual Rider • Total Annual Cost (Capital and O&M) per Annual Rider • Annual Cost per Travel Time Savings
Goal 4 - Promote Sustainability through the Implementation of Commuter Rail	• Impact on Regional Travel and Air Quality
Goal 5 - Increase Public/Private Cooperation to Implement Commuter Rail	• Ease of Implementation/Constructability • Compatibility with Freight Railroad • Benefit to Adjacent or Crossing Highway Infrastructure

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