

Appendix C

Initial Strategy Packages Summary Memorandum



Memorandum



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To: I-70 FTEIS Resource Agencies
From: I-70 FTEIS Project Team
Subject: I-70 First Tier Environmental Impact Statement, Kansas City Metro
Job No. J4I1486B
I-70 FTEIS Initial Strategy Packages Summary

The following is an initial strategy packages summary and evaluation for the I-70 First Tier Environmental Impact Statement (FTEIS). Fifteen initial strategy packages were developed and evaluated. The first seven strategy packages evolved from the I-70 Major Investment Study (MIS) with the elements outside of the I-70 FTEIS study area removed. Eight other packages are focused goal oriented strategy packages based on the purpose and need of the I-70 FTEIS and/or particular issues in the corridor. The initial strategy packages were revised based on public and stakeholder input.

These strategy packages have been screened against purpose and need goals of improve safety, reduce congestion, restore and maintain existing infrastructure, improve accessibility across the corridor, and improve goods movement. Natural and human impacts, as well as engineering issues and anticipated relative costs, also were evaluated. A Summary Matrix is located **Appendix B**. A section on public comments also follows the initial screening and summarizes public input into the initial concepts evaluation.

The overall purpose of the I-70 FTEIS is to determine an improvement strategy for the corridor, including future capacity and mode choices, which addresses the following items.

- Improve Safety: Reduce crash rates and crash severity on I-70 and the downtown loop.
- Reduce Congestion: Remove key bottlenecks, reduce the potential for ramp back-up onto the freeway, and improve multi-modal travel times in coordination with plans put forward by local and regional agencies.

- Restore and Maintain Existing Infrastructure: Improve the long-term bridge and pavement conditions on I-70 and the downtown loop and implement cost-effective investment strategies.
- Improve Accessibility: Provide travel options for all residents, increase safe access across I-70 and the downtown loop for non-motorized travel, and support local and regional land use plans.
- Improve Goods Movement: Improve the efficiency of freight movement on I-70 and the downtown loop.

The strategy packages were evaluated on a three level criteria with regards to Purpose and Need. There were assigned one of the following for each goal of the Purpose and Need:

- Meets Purpose and Need goal
- Does not meet the Purpose and Need goal
- Worse than existing conditions

The criteria to meet the Purpose and Need goals are defined as:

- Improve safety – The strategy includes improvements to address all or most of the locations with crash rates above the statewide average. The strategy allows for the implementation of standard safety improvements MoDOT is making on freeway corridors statewide.
- Reduce congestion – The strategy includes measures that increase the capacity of the I-70 corridor and/or increase transit service and use that would be sufficient to anticipate a reduction in congestion to acceptable levels per the Engineering Policy Guide.
- Restore/maintain the existing infrastructure – The strategy includes corridor wide rehabilitation and/or rebuilding of the existing highway either in place or as part of a capacity expansion and thus would renew the long-term condition of the pavement and base in the I-70 corridor.
- Improve accessibility – The strategy includes reasonable measures to enhance crossing of the corridor for non-motorized travel and increases the effectiveness of transit options in the corridor.
- Improve goods movement – The strategy provides safety and congestion improvements (as defined above) that would effectively serve freight movements in the corridor in addition to passenger vehicles and/or the strategy includes specific features to effectively improve freight movement in the corridor.

The Study Team also performed a cursory evaluation of the natural environment, human environment, and engineering issues facing each package. The natural environmental impacts relate to the anticipated affect on air quality, floodplains, streams, wetlands, or natural sites. The human environmental impacts include any community, neighborhood, or business resources that may be affected by the strategy packages. The rating of each included:

- Fatal Flaw - illegal or unusually devastating impacts for a project of this type and location
- High - impacts substantially higher than most of the other strategies
- Medium - impacts similar to most other packages
- Low - impacts substantially lower than most of the other packages

The Study Team did not identify any fatal flaws for any strategy package.

In addition, the final evaluation was relative costs of each strategy package. The strategy packages were given one of the ratings below:

- \$ Strategy packages would have minimal additional cost beyond what is anticipated for long-term maintenance.
- \$\$ Strategy packages anticipated to have substantially lower costs than most packages proposed.
- \$\$\$ Strategy packages that add capacity/lanes to urban freeway corridors would cost in the hundreds of millions or billions of dollars are considered high cost.
- \$\$\$\$ Strategy packages anticipated to have a cost that is orders of magnitude higher than other strategies.

The complete screening criteria definitions are located in **Appendix A**. A summary table of the evaluation can be found in the **Appendix B**.

Initial Strategy Package 1: No-Build

This package contains the base or No-Build condition. The No-Build Package originates from the I-70 MIS and includes maintenance activities as needed and projects already committed to in MoDOT's Statewide Transportation Improvement Program. As such, the No-Build approach is a needed level of effort required to address the major safety and maintenance problems. This includes activities such as maintaining the existing bus service, committed upgrades to the I-435 interchange, committed upgrades to the Central Business District Loop's northeast corner, repave I-70 through regular

maintenance, Transportation System Management (TSM) and Transportation Demand Management (TDM) activities; and upgrade the I-70 interchanges and bridges (as identified on MoDOT Bridge List). Over time, maintenance would occur as needed.

The No-Build Strategy would lead to further implementation of Transportation System Management (TSM) and Travel Demand Management (TDM) initiatives. TSM programs identified in MARC’s Congestion Management System toolbox includes traffic signal coordination, enhanced freeway incident detection and management, ramp metering, advance traveler information systems, and highway information systems. Two elements – enhanced freeway incident detection and management and advance traveler information systems are already in place along I-70. TDM concepts in MARC’s toolbox include alternate work hours, telecommuting, ridesharing, and preferential carpool parking. These measures could be implemented as a part of the No-Build or any of the Build Strategies.

The No-Build strategy package will address the purpose and need goals as follows:

- Improve safety – There is no improvement to safety expected as the traffic flow is expected to become more intermittent with stop/slow and go traffic patterns during peak commuter times which tend to result in more crashes. The No-Build also does nothing to address the substantially higher than average crash rates occurring at various points in the corridor as discussed in the purpose and need, including the speed reduced curves at Benton Boulevard and Jackson Avenue.
- Reduce congestion – There is no improvement expected as the forecasted traffic volumes continue to grow at a slow rate between 2008 and 2030.
- Restore/maintain the existing infrastructure – There is minimal improvement expected as routine maintenance may be required to reconstruct I-70 over time, the work will be spot specific and not through the entire corridor.
- Improve accessibility – There is little or no improvement expected to improve accessibility across I-70 or the downtown loop freeway.
- Improve goods movement – There is no improvement expected for goods movement. Congestion would continue to rise.

	Improve Safety	Reduce Congestion	Restore/Maintain Existing Infrastructure	Improve Accessibility	Improve Goods Movement
Strategy Package 1 No-Build	Does Not Meet	Does Not Meet	Does Not Meet	Does Not Meet	Does Not Meet

Potential natural impacts include worsening air quality due to higher congestion. There would be no major impacts to the social or cultural environment from the No-Build. The No-Build baseline package does not raise any red flags from the engineering aspect. The No-Build baseline package is required to be carried forward for more detailed evaluation as a comparison to the other strategy packages carried forward.

Initial Strategy Package 2: Fix Key Bottlenecks

Package 2 originates from the I-70 MIS and includes everything listed under Package 1 in addition to activities such as:

- Rehabilitation and/or rebuilding I-70 to its existing six-lane configuration from the Central Business District Loop to I-470 including obsolete or deficient bridges
- Improving lane balance in the downtown loop and consolidate downtown loop interchanges to one access point on the north and east sides to improve traffic flow and safety.
- Consolidating loop access on the north and east legs
- Building some low-cost interchange improvements
- Using collector distributor roads at key locations
- Improving the I-70 curves at Benton Boulevard and Jackson Avenue
- Upgrading the Truman Road Interchange
- Upgrading the I-435 interchange as noted in the I-435 MIS
- Advancing Operation Green Light and integrating advance public transportation systems (parallel arterial management systems)
- Expanding express bus service, including park and ride facilities
- Providing for bus on shoulder operation
- Expanding incident management and motorist assist service patrols

Completing this package would rebuild I-70 with its existing lane configuration and would renew the long-term pavement and road base conditions with an infrastructure design life to last 30-50 years to eliminate the need for costly investments in more frequent rehabilitation and reconstruction. Routine pavement maintenance will continually occur.

Package 2 will address the purpose and need goals as follows:

- Improve safety – There are safety improvements expected as the traffic flow is improved through the existing key bottlenecks reducing the speed reductions at these locations. Fixing the bottlenecks would address several of the locations in the corridor where crash rates are substantially above the state average.

- Reduce congestion – Congestion would be reduced as the traffic flow is improved through the existing bottleneck areas. As traffic flow is improved through the existing bottlenecks, new bottlenecks could emerge downstream over time.
- Restore/maintain the existing infrastructure – There are improvements expected in this package that will rehabilitate and/or rebuild the entire roadway in the existing corridor to renew the long-term condition of the pavement and road base conditions.
- Improve accessibility – There are improvements expected to accessibility across I-70 or the downtown loop freeway through pedestrian and non-motorized improvements made during interchange replacements, as well as bus on shoulder provisions.
- Improve goods movement – There are expected improvements for goods movement through improved traffic flow at bottleneck locations. However, the package includes no specific improvement for freight movement.

	Improve Safety	Reduce Congestion	Restore/Maintain Existing Infrastructure	Improve Accessibility	Improve Goods Movement
Strategy Package 2 Fix Key Bottlenecks	Meets	Meets	Meets	Meets	Meets

No significant adverse impacts are expected to the natural environment. Noise is a continued human environmental impact. The study area is also scattered with churches, parks, and other community facilities near the existing corridor. Another human environmental concern is the low income and/or minority neighborhood impacts that are located adjacent to the corridor. Cultural resource impacts may occur in the downtown loop with a high concentration of historic districts and buildings on, or eligible for, the National Register of Historic Places.

There are engineering issues associated with Package 2 related to narrow right of way and steep side slopes at key points. Construction activities to rehabilitate and/or rebuild I-70 will create traffic delays due to reduced lanes. Fixing the key bottlenecks would provide an improved traffic flow through the previous choke points; however, the downstream impact will be evaluated to determine if other issues or bottlenecks result. Package 2 can be a stand alone strategy for the I-70 FTEIS. Elements of Package 2 can also be used in combination with other concepts. Concepts from Package 12 - Collector Distributor Roads Alternative could be implemented as a spot improvement at key locations as part of an enhanced Package 2 carried forward.

Initial Strategy Package 3: Fix Key Bottlenecks plus HOV Lanes

This package provides the infrastructure to better support choices between travel options. Package 3 includes everything from Package 2 in addition to adding managed/High-Occupancy Vehicle (HOV) Lanes (toll optional) from the downtown loop to U.S. 40/Blue Ridge Boulevard. Package 3 originates from the I-70 MIS.

HOV lanes are physically separated lanes by a barrier, striping, or signing from the adjacent general purpose lanes. Adding two HOV lanes is proposed between I-470 and the downtown loop for this concept and could be reversible with the flow of peak congested traffic. HOV lanes are exclusive lanes for vehicles with high passenger occupancy (two or more people). HOV lanes can move more people during congested periods with fewer vehicles because of the higher number of occupants. The toll option for this package includes High Occupancy Toll (HOT) Lanes, which are lanes for vehicles with high passenger occupancy, but may also be used by single occupancy vehicles for a toll.

Package 3 includes activities such as adding HOV and/or reversible flow express lanes on I-70, upgrading interchanges along I-70 to accommodate additional mainline lanes, improving the Benton and Jackson curves, considering toll options (i.e., HOT Lanes), integrating the Smart Moves Regional Transit Vision, and supporting transit centers.

Package 3 will address the purpose and need goals as follows:

- Improve safety – There are safety improvements expected as the general purpose lane traffic flow is improved through some traffic using the HOV lanes resulting in more efficient traffic flow. Fixing the key bottlenecks would address several locations with crash rates higher than the statewide average including improvements to the Benton and Jackson curves.
- Reduce congestion – There are expected congestion reductions as some existing traffic will divert from the general purpose lanes to the HOV lanes. The fixed bottlenecks would also result in reduction of congestion at key points.
- Restore/maintain the existing infrastructure – There are improvements expected as this package will rehabilitate and/or rebuild the entire roadway in the existing corridor to renew the long-term condition of the pavement and road base conditions. This package also provides for bus on shoulders within the corridor.
- Improve accessibility – There are improvements expected to improve accessibility across I-70 or the downtown loop freeway through pedestrian and non-motorized improvements made during interchange replacements. Bus

transit could operate in the HOV lanes dependent on the needs of the particular transit route.

- Improve goods movement – There are expected improvements for goods movement through improved traffic flow and reduced congestion. More vehicles in HOV or HOT lanes will improve traffic flow for trucks.

	Improve Safety	Reduce Congestion	Restore/Maintain Existing Infrastructure	Improve Accessibility	Improve Goods Movement
Strategy Package 3 Fix Key Bottlenecks plus HOV Lanes	Meets	Meets	Meets	Meets	Meets

Potential natural impacts include expanded crossings at multiple stream tributaries and at the Blue River. Potential noise impacts may exist. The potential for human environmental impacts exist since the study area is scattered with churches, parks, other community facilities, and low income and/or minority populations near the existing corridor. The improvements to the Benton and Jackson curves would be a key location for right of way concerns. Cultural resource impacts may occur in the downtown loop with a high concentration of historic districts and buildings on, or eligible for, the National Register of Historic Places.

There are engineering issues associated with Package 3 related to narrow right of way, steep side slopes, and stormwater drainage at key points. Construction activities to rebuild I-70 will create traffic delays which could be completed by reducing lanes. Fixing the bottlenecks would provide an improved traffic flow through the previous choke points; however, the downstream impact will be evaluated to determine if other issues or bottlenecks result.

Package 3 could be carried forward as a stand alone strategy or elements of Package 3 could be included in an overall strategy.

Initial Strategy Package 4: Fix Key Bottlenecks, HOV Lanes, Unique Design Features (Tunnel)

This package includes everything from Package 3 in addition to incorporating a new alignment of I-70 and unique features. The “unique features” refer to use of a tunnel, the construction of wider bridges in at least three locations to implement the community bridges concept, support for the implementation of commuter rail on one or both of the two existing rail corridors that operate in the I-70 corridor, and supporting

the operation of bus rapid transit on U.S. 40 and other parallel roadways. Package 4 originates from the I-70 MIS.

Package 4 includes activities such as rebuilding I-70 on a new alignment in a tunnel from the Central Business District Loop north leg to the upgraded 22nd/23rd Street interchange at the Benton curve (express lanes in a tunnel), adding I-70 community bridges, integrating the Smart Moves Regional Transit Vision, and adding bus rapid transit on U.S. 40 and other east/west arterial routes.

Package 4 will address the purpose and need goals as follows:

- Improve safety – There are safety improvements expected as the general purpose lane traffic flow is improved through some traffic using the HOV lane and the proposed tunnel resulting in more efficient traffic flow. Fixing the key bottlenecks would address several locations with crash rates higher than the statewide average including improvements to the Benton and Jackson curves. Potential safety issues related to a tunnel (emergency response, limited access) would need to be addressed.
- Reduce congestion – There are expected congestion reductions as some existing traffic will divert from the general purpose lanes to the HOV lanes. The tunnel would also provide additional capacity from the downtown loop to 22nd/23rd Street.
- Restore/maintain the existing infrastructure – There are improvements expected as this package will rehabilitate and/or rebuild the entire roadway in the existing corridor to renew the long-term pavement and road base conditions.
- Improve accessibility – There are expected improvements to accessibility across I-70 or the downtown loop freeway through the provision of community bridges. Bus transit could operate in the HOV lanes dependent on the needs of the particular transit route.
- Improve goods movement – There are expected improvements for goods movement through improved traffic flow and reduced congestion. Moving vehicles to HOV or HOT lanes or to an additional tunnel would improve traffic flow for trucks.

	Improve Safety	Reduce Congestion	Restore/Maintain Existing Infrastructure	Improve Accessibility	Improve Goods Movement
Strategy Package 4 Fix Key Bottlenecks, HOV Lanes, Unique Design Features (Tunnel)	Meets	Meets	Meets	Meets	Meets

Potential natural impacts include expanded crossings at multiple stream tributaries and at the Blue River. The potential for human environmental impacts exist since the study area is scattered with churches, parks, other community facilities, and low income and/or minority populations near the existing corridor. In addition, noise impacts may be a concern. Cultural resource impacts may occur in the downtown loop with a high concentration of historic districts and buildings on, or eligible for, the National Register of Historic Places. The improvements through the Benton and Jackson curves and the proposed tunnel location would be key locations for right of way concerns.

There are engineering issues associated with Package 4 related to narrow right of way, steep side slopes, and storm water drainage at key points. Construction activities to rebuild I-70 will create traffic delays which could be completed by reducing lanes. Fixing the bottlenecks would provide an improved traffic flow through the previous choke points; however, the downstream impact will be evaluated to determine if other issues or bottlenecks result.

The tunnel concept in this strategy has some engineering issues of its own. The issues related to the tunnel include air ventilation, vibration during construction, emergency response in the tunnel, the proximity of the tunnel to the water table, and the required interchange improvements in the northeast corner of the downtown loop.

The I-70 MIS estimated the cost of the tunnel at \$375 million. Due to sharp increases in construction costs and inflation, recent estimates by the Study Team are in the area of \$960 million for the tunnel.

The community bridges, implementing the Smart Moves Regional Transit Vision, and bus rapid transit on parallel routes are elements which could be carried forward in combination with other concepts. The commuter rail on existing rail lines portion of this strategy package is out of the existing study area, its affects on the corridor should be considered.

The community bridges and improved transit options are elements that could be included in other packages. The tunnel element introduces a number of engineering issues at a relatively expensive cost. The tunnel concept will not be carried forward.

Initial Strategy Package 5: Add General Lane Capacity

Package 5 originates from the I-70 MIS and is focused on improvements to the automobile/truck travel modes by adding general-purpose lanes and eliminating deficient horizontal and vertical curves. This package includes everything from Package 1 in addition to widening I-70 to eight lanes from the Central Business District Loop to I-470 and integrating the Smart Moves Regional Transit Vision. Package 5 includes activities such as:

- Rebuilding some interchanges along I-70 to accommodate additional lanes
- Using collector distributor roads at key locations
- Providing for bus on shoulders
- Upgrading the I-435 interchange as noted in the I-435 MIS
- Consolidating downtown loop access on north and east legs and improve lane balance in the downtown loop
- Building major downtown loop operational improvements and upgrading the downtown loop's southwest corner (I-35/I-670 interchange ramps)
- Adding I-70 to Bruce R. Watkins (U.S. 71) directional ramps
- Improving the Benton and Jackson curves

Package 5 will address the purpose and need goals as follows:

- Improve safety – There are safety improvements expected as the general purpose lane traffic flow is improved through the addition of general purpose lanes. Improving the Benton and Jackson curves and addressing other key locations with crash rates substantially above the statewide average will also address safety concerns.
- Reduce congestion – There are expected congestion reductions with the addition of general purpose lanes.
- Restore/maintain the existing infrastructure – There are improvements expected as this package will rehabilitate and/or rebuild the entire roadway in the existing corridor to renew the long-term pavement and road base conditions.
- Improve accessibility – There are improvements expected to improve accessibility across I-70 or the downtown loop freeway through pedestrian and non-motorized improvements made during interchange replacements. Bus on shoulder is included to improve transit accessibility and mobility.

- Improve goods movement – There are expected improvements for goods movement through improved traffic flow and reduced congestion.

	Improve Safety	Reduce Congestion	Restore/Maintain Existing Infrastructure	Improve Accessibility	Improve Goods Movement
Strategy Package 5 Add General Lane Capacity	Meets	Meets	Meets	Meets	Meets

Potential natural impacts include expanded crossings at multiple stream tributaries and at the Blue River. The study area is scattered with churches, parks, and other community facilities near the existing corridor. Another human environment concern is the low income and/or minority neighborhood impacts that are located adjacent to the corridor. The improving of the Benton and Jackson curves would be a key location for right of way concerns. Additional social impacts include the potential of noise impacts. Cultural resource impacts may occur in the downtown loop with a high concentration of historic districts and buildings on, or eligible for, the National Register of Historic Places.

There are engineering issues associated with Package 5 related to narrow right of way, steep side slopes, and stormwater drainage at key points. Construction activities could create some temporary traffic delays. The widening of I-70 to eight lanes could occur for all or part of the study area corridor. This package could be carried forward as a stand alone package.

Initial Strategy Package 6: Capacity Increases (HOV Lanes) plus Transit Improvements

Package 6 originates from the I-70 MIS. This package is focused on increasing the number of persons served by the highway facility. This package includes everything from Package 5 in addition to applying HOV Lanes (toll optional) to the new lanes. Package 6 also includes activities such as adding I-70 community bridges, integrating the Smart Moves Regional Transit Vision, adding bus rapid transit on parallel arterial routes, supporting transit centers, and supporting commuter rail. Package 3 and Package 6 are similar in their major elements (as were Package 2B and Package 3B of the MIS), but includes more transit and accessibility options.

Package 6 will address the purpose and need goals as follows:

- Improve safety – There are safety improvements expected as the general purpose lane traffic flow is improved through some traffic using the HOV lanes resulting in more efficient traffic flow. The Package would address several locations with crash rates higher than the statewide average including improvements to the Benton and Jackson curves.
- Reduce congestion – There are expected congestion reductions as some existing traffic will divert from the general purpose lanes to the HOV lanes.
- Restore/maintain the existing infrastructure – There are improvements expected as this package will reconstruct the entire roadway in the existing corridor to renew the long-term pavement and road base condition.
- Improve accessibility – There are expected accessibility improvements across I-70 or the downtown loop freeway through the provision of community bridges.
- Improve goods movement – There are expected improvements for goods movement through improved traffic flow and reduced congestion. More vehicles in HOV or HOT lanes will improve traffic flow for trucks.

	Improve Safety	Reduce Congestion	Restore/Maintain in Existing Infrastructure	Improve Accessibility	Improve Goods Movement
Strategy Package 6 Add HOV and Transit	Meets	Meets	Meets	Meets	Meets

Potential natural impacts include expanded crossings at multiple stream tributaries and at the Blue River. The potential for human environmental impacts exist since the study area is scattered with churches, parks, other community facilities, and low income and/or minority populations near the existing corridor. Cultural resource impacts may occur in the downtown loop with a high concentration of historic districts and buildings on, or eligible for, the National Register of Historic Places. Improving the Benton and Jackson curves would be a key location for right of way concerns.

There are engineering issues associated with Package 6 related to narrow right of way, steep side slopes, and stormwater drainage at key points. Construction activities could create some temporary traffic delays.

Package 6 could be carried forward as a stand alone strategy. The community bridges and integrating Smart Moves Regional Transit Vision are concept elements which could be carried forward in combination with other concepts. These concepts have positive impacts which can be used in combination with other concepts. Increasing bus transit

concepts could be included in all strategies throughout the corridor. The commuter rail element of Package 6 uses existing rail lines outside the study area, its affects on the corridor should be considered separately.

Initial Strategy Package 7: Fix Key Bottlenecks plus Transportation Improvement Corridor

Package 7, the recommended strategy of the I-70 MIS, consists of a combination certain parts of Packages 1 through 6.

The MIS recommended reconstructing I-70 to six lanes with provisions for a 48-foot future “transportation improvement corridor” from the Central Business District Loop to the U.S. 40/Blue Ridge Boulevard interchange. Typical applications could include HOV lanes, HOT lanes, reversible lanes, bus only lanes, or truck only lanes. Between I-435 and I-470, the MIS recommended total rebuild of I-70 to eight lanes.

Package 7 also includes activities such as:

- Pavement reconstruction for the entire length of the I-70 corridor
- Improvements to the Benton and Jackson curves
- Improving lane balance in the downtown loop and consolidate downtown loop interchanges to one access point on the north and east sides to improve traffic flow and safety
- Reconstructing all interchanges throughout the corridor to include the transportation improvement corridor
- Upgrading the I-435 and I-470 interchanges
- The addition of park and ride facilities
- Bus on shoulder provisions
- Support for Operation Green Light
- Expanded freeway patrols
- Integrating the Smart Moves Regional Transit Vision

Package 7 will address the purpose and need goals as follows:

- Improve safety – There are safety improvements expected as the general purpose lane traffic flow is improved with some traffic diverting to the Transportation Improvement Corridor. Fixing the key bottlenecks would address several locations with crash rates higher than the statewide average including improvements to the Benton and Jackson curves.

- Reduce congestion – There are expected congestion reductions with the addition of Transportation Improvement Corridor. The fixed bottlenecks would also result in a reduction of congestion at key points.
- Restore/maintain the existing infrastructure – There are improvements expected as this package will reconstruct the entire roadway in the existing corridor to renew the long-term pavement and road base conditions.
- Improve accessibility – There are expected improvements to accessibility across I-70 or the downtown loop freeway through the provision of community bridges. Bus transit could operate in the Transportation Improvement Corridor to improve transit accessibility and mobility.
- Improve goods movement – There are expected improvements for goods movement through improved traffic flow and reduced congestion. If the Transportation Improvement Corridor successfully reduces congestion in the general purpose lanes, flow for trucks will improve.

	Improve Safety	Reduce Congestion	Restore/Maintain Existing Infrastructure	Improve Accessibility	Improve Goods Movement
Strategy Package 7 Fix Key Bottlenecks plus a Specialty Corridor	Meets	Meets	Meets	Meets	Meets

Potential natural impacts include expanded crossings at multiple stream tributaries and at the Blue River. Noise is also a potential impact with this strategy. The potential for human environmental impacts exist since the study area is scattered with churches, parks, other community facilities, and low income and/or minority populations near the existing corridor. Cultural resource impacts may occur in the downtown loop with a high concentration of historic districts and buildings on, or eligible for, the National Register of Historic Places. The improvements to of the Benton and Jackson curves would be a key location for right of way concerns.

There are engineering issues associated with Package 7 related to narrow right of way, steep side slopes, and stormwater drainage at key points. Construction activities could create some temporary traffic delays.

Package 7 can be carried forward with considerations of HOV/HOT/BRT lanes, reversible lanes, or commuter express lanes within the proposed improvement corridor.

Initial Strategy Package 8 – TSM/TDM plus BRT Solutions Alternative

Package 8 is focused on a combination of improvement concepts specifically aimed at reducing vehicle emissions and automobile use in the I-70 corridor. This package includes Bus Rapid Transit (BRT) and HOV in a converted general traffic lane, emphasizing bicycle and pedestrian improvements, community bridges, and encouraging TSM and TDM activities.

TSM programs identified in MARC’s Congestion Management System toolbox includes traffic signal coordination, enhanced freeway incident detection and management, ramp metering, advance traveler information systems, and highway information systems. Two elements – enhanced freeway incident detection and management and advance traveler information systems are already in place along I-70. TDM concepts in MARC’s toolbox include alternate work hours, telecommuting, ridesharing, and preferential carpool parking. These types of measures could also be implemented as part of the No-Build Strategy or other Build Strategies.

Package 8 will address the purpose and need goals as follows:

- Improve safety – There are few safety improvements with the TSM/TDM plus BRT solution strategy as it does not address key locations where crash rates exceed statewide averages or locations with geometric issues such as the speed reduced curves at Jackson Avenue and Benton Boulevard.
- Reduce congestion – There are little to no congestion reductions with the TSM/TDM plus BRT solution strategy with the conversion of general purpose lanes to a BRT/HOV lane.
- Restore/maintain the existing infrastructure – There are no improvements expected in this package that will renew the long-term pavement and road base conditions.
- Improve accessibility – There are expected improvements to accessibility across I-70 or the downtown loop freeway through the provision of community bridges and better transit options.
- Improve goods movement – There are no expected improvements for goods movement.

	Improve Safety	Reduce Congestion	Restore/Maintain Existing Infrastructure	Improve Accessibility	Improve Goods Movement
Strategy Package TSM/TDM plus BRT Solutions Strategy	Does Not Meet	Does Not Meet	Does Not Meet	Meets	Does Not Meet

There are no major adverse impacts to the natural, human, or cultural environments. Air quality at point locations along the corridor could be a concern due to emissions from heavily congested traffic.

Package 8 by itself will not do enough to address the purpose and need to be a stand alone strategy for the I-70 FTEIS. These concepts have positive impacts which can be used in combination with other concepts. Bicycle and pedestrian improvements (community bridges), TSM, and TDM concepts could be included in all strategy packages in the corridor.

Initial Strategy Package 9 – Unique Capacity Designs Alternative

Package 9 is focused on unique design alternatives to expand I-70 with either general purpose lanes or specialty lanes, such as HOV, HOT, Reversible, Bus Rapid Transit, or Truck Only Lanes, while minimizing new right of way needs. Effectively the package expands the roadway vertically instead of horizontally. This package includes the elevated/stacked highway lanes design option and the one-way downtown loop. Elevated and stacked lanes may be included on the existing alignment or in sections with limited right of way. Stacked lanes may be suited in the urban section of the corridor, especially through the Benton and Jackson curves where right of way may be an issue.

The one-way loop option is a one directional loop around downtown using the existing downtown loop. Downtown access and an exact plan for the conversion from two-way traffic flow to one-way traffic flow would need to be developed. The entire downtown loop traffic flow would travel in a counter clockwise direction with the north side of the downtown loop traveling west; west side traffic would travel south; south side traffic would travel east; and east side traffic would travel north. The Northland Downtown MIS recommendation included that the existing two-way traffic operation of the downtown freeway loop is the most efficient configuration.

Package 9 will address the purpose and need goals as follows:

- Improve safety – There are safety improvements expected with the addition of specialty lanes or general purpose lanes in a stacked manner resulting in more efficient traffic flow. However, the improvements would not fix some of the key horizontal curves in the corridor and the stacked lanes would introduce many new transition and possible weave points between ramps to upper and lower lanes.

- Reduce congestion – There are expected congestion reductions from additional capacity in the form of stacked special use lanes or general purpose lanes.
- Restore/maintain the existing infrastructure – There are improvements expected as this package will rehabilitate and/or rebuild the entire roadway in the existing corridor to renew the long-term pavement and road base condition.
- Improve accessibility – There is little or no improvement expected to improve accessibility across I-70 or the downtown loop freeway. Stacked lanes would make it more difficult to provide enhanced crossings of the corridor.
- Improve goods movement – There are expected improvements for goods movement through improved traffic flow and reduced congestion.

	Improve Safety	Reduce Congestion	Restore/Maintain Existing Infrastructure	Improve Accessibility	Improve Goods Movement
Strategy Package 9 Unique Capacity Designs	Meets	Meets	Meets	Worse than Existing	Meets

Potential natural impacts include expanded crossings at multiple stream tributaries and at the Blue River. With stacked lanes, expansion at these crossings could be minimized. The study area is scattered with potential social impacts to churches, parks, other community facilities, and low income and/or minority populations near the existing corridor. Additional human environmental impacts may include increased noise and visual impacts. Cultural resource impacts may occur in the downtown loop with a high concentration of historic districts and buildings on, or eligible for, the National Register of Historic Places. Stacked lanes may have right of way impacts at major interchanges where right of way is needed to provide higher bridge crossings over the stacked freeway or crossings under the stacked freeway.

There are engineering issues associated with the elevated or stacked lanes concept. Elevated or stacked lanes would require bridge and interchange configuration revisions. Current overpasses would need modifications. The number of access points along the corridor could be reduced.

The unique capacity designs will not be carried forward as they do not meet all the goals of the Purpose and Need. The one-way loop would require all bridges to be rebuilt without center supports to allow lane changes. The one-way loop also did not receive support when analyzed as part of the downtown loop study. The elevated or

stacked lanes would require extensive interchange revisions. Elevated or stacked lanes would also be expected to cost substantially more than other potential solutions.

Initial Strategy Package 10 – Rail Transit Alternative

Package 10 is focused on rail transit alternatives within the I-70 corridor right of way. This package includes an exclusive rail corridor which may be commuter rail or light rail and enhanced park and ride facilities. Rail within the corridor could either run the length of the corridor from I-470 to the downtown loop or connect with key rail lines that run near to or cross I-70 and only run along I-70 for part of the corridor. There would be no expansion of general purpose lanes or major bottleneck fixes as part of this alternative although the speed reduced curves at Jackson Avenue and Benton Boulevard would need improvement to allow for rail lines. The existing I-70 would be rebuilt.

Light Rail Transit could operate in the I-70 right of way in a dedicated corridor on one side of the roadway or in the median. Light rail would have a limited number of stops and provide travel time savings during peak congestion periods. Light rail would need to be coordinated with other regional light rail initiatives.

Commuter rail transit generally uses existing rail lines to provide morning and afternoon service during the heaviest congestion periods and carries both freight and passenger cars on a daily basis. Because of the shared nature of the rail line between freight and commuter service, commuter rail would only run during the morning and afternoon peak commuter periods. There is an opportunity to use a combination of existing and new rail lines. A new commuter rail connection between the existing Rock Island line at Blue River and the KCT line near 18th Street is a possible combination. This alignment could use Union Station as a terminus point. However, the growing demand for freight rail (projected to increase 40 to 60 percent nationally in the next 20 years) could lead to rail congestion locally without investment in additional tracks. This may limit the opportunity for commuter rail to share the freight rail tracks.

Package 10 will address the purpose and need goals as follows:

- Improve safety – There would be minor safety improvements to the extent that traffic flow is improved by shifting trips to rail. However, all of the areas with crash rates that are higher than the statewide average would not be addressed with improvements.
- Reduce congestion – There are improvements expected as the traffic flow is improved by travelers changing their mode choice to transit. However, Mid-

America Regional Council’s I-70 Transit Alternatives Analysis Study did not show ridership that would lead to a substantial reduction in automobile use in the corridor.

- Restore/maintain the existing infrastructure – There are no improvements expected as this package will rehabilitate and/or rebuild the entire roadway in the existing corridor to renew the long-term pavement and road base condition.
- Improve accessibility – There is little or no improvement expected to improve accessibility across I-70 or the downtown loop freeway. However, neighborhoods near the freeway would have new transit options.
- Improve goods movement – There are minimal improvements expected for goods movement through improved traffic flow.

	Improve Safety	Reduce Congestion	Restore/Maintain Existing Infrastructure	Improve Accessibility	Improve Goods Movement
Strategy Package 10 Rail Transit	Does Not Meet	Does Not Meet	Does Not Meet	Meets	Does Not Meet

With an increase in the right of way for rail, the potential natural impacts include expanded crossings at multiple stream tributaries and at the Blue River. The potential for human environmental impacts exist since the study area is scattered with churches, parks, other community facilities, and low income and/or minority populations near the existing corridor. Cultural resource impacts may occur in the downtown loop with a higher concentration of historic districts and buildings on, or eligible for, the National Register of Historic Places. Additional park and ride lots to support rail alternatives would also have right of way impacts in eastern parts of the study area.

The Jackson and Benton curves limit the practicality of light rail in the I-70 right of way. Light rail between the vehicle lanes would also create station access challenges for local residents as they would need to walk halfway across freeway bridge and take stairs or some other means of getting up to or down from a station stop in the middle of the right of way. A light rail route that serves eastern Jackson County may be more practical on an alignment off of the I-70 right of way. The Smart Moves Regional Transit Vision, as well as the current Kansas City, Missouri Mayor’s regional transit plan, identifies commuter rail as the preferred option for eastern Jackson County.

The MIS did not recommend light rail for further consideration for a number of reasons. Large up-front capital investment makes this concept difficult to phase over time. Residents in the MARC region have not a shown willingness to provide local funding

commitments for capital and operating costs of light rail, most recently with the November 4, 2008 light rail ballot initiative defeat. In light rail plans proposed previously, other corridors in the MARC region have been identified as higher priority for light rail, not I-70. This concept shows the highest potential of all transit concepts for negative effects, primarily due to the need for stations and parking areas in currently developed areas. Existing and anticipated development densities throughout the corridor are not consistent with patterns needed to support the rail concept and most jurisdictions do not have land use plans in place to promote dense transit oriented development.

Initial Strategy Package 11 – Freight Movement Alternative

Package 11 is focused on freight movement alternatives to improve I-70 as a freight corridor. This package includes exclusive truck only lanes on the inside of the general purpose lanes. The existing freeway would need to be rebuilt and widened to accommodate truck only lanes. If implemented, truck only lanes would be best suited for the suburban section of the I-70 corridor (I-470 to I-435). They could provide access to the I-435 beltway without directing through trucks into the core of the city. The separation of truck only lanes from the general purpose lanes could be accomplished with a physical barrier or a buffer area delineated with pavement markings. The footprint of a truck only lane would limit the practicality through the downtown loop, although a designated truck route and signage would enhance the truck flows through the downtown loop.

Package 11 will address the purpose and need goals as follows:

- Improve safety – There are safety improvements expected as the interaction between trucks and passenger vehicles are separated and improve traffic flow.
- Reduce congestion – Truck only lanes do not address peak hour commuter congestion well. There are some improvements expected as the traffic flow is improved through the separation of generally slower moving and accelerating trucks from the general traffic flow. However, designating the I-70 corridor as a major truck route with truck only lanes could draw more through truck trips to the corridor, potentially causing additional congestion if truck only lanes are not barrier separated.
- Restore/maintain the existing infrastructure – There are improvements expected as this package will rehabilitate and/or rebuild the entire roadway in the existing corridor to renew the long-term pavement and road base condition.
- Improve accessibility – Truck only lanes would not be expected to improve accessibility across I-70 or the downtown loop freeway.

- Improve goods movement – Dedicated lanes for trucks could substantially enhance the movement of goods on the corridor.

	Improve Safety	Reduce Congestion	Restore/Maintain Existing Infrastructure	Improve Accessibility	Improve Goods Movement
Strategy Package 11 Freight Movement	Meets	Does Not Meet	Meets	Does Not Meet	Meets

Potential natural impacts include expanded crossings at multiple stream tributaries and at the Blue River. The potential for human environmental impacts exist since the study area is scattered with churches, parks, other community facilities, and low income and/or minority populations near the existing corridor. Cultural resource impacts may occur in the downtown loop with a high concentration of historic districts and buildings on or eligible for the National Register of Historic Places. Adding one truck only lane in each direction may be ineffective; as a result truck only lanes may necessitate a wider footprint than other alternatives. Unlike I-70 across the state, there are few parts of the corridor with a wide median section to accommodate truck only lanes.

There are engineering issues associated with the truck only lanes concept related to narrow right of way, steep side slopes, and stormwater drainage at key points. Construction activities could create some temporary traffic delays.

Truck origins and destinations are scattered throughout the region which limits the practicality of a truck only lane on I-70 in the Kansas City metropolitan area. Directing through trucks into the heart of the city is not consistent with multiple, scattered origin and destination points. The statewide truck only lanes corridor will transition into auto and truck shared use lanes east of I-470 as proposed in the statewide study. Trucks passing through the region also have a variety of routes available to them. The I-70 Statewide Supplemental Environmental Impact Statement (SEIS) is currently recommending that truck only lanes be phased out east of I-470, which is the eastern limit of this study. As a result, the truck only lane concept will not be carried forward for this FTEIS.

Initial Strategy Package 12 – Collector Distributor Roads Alternative

Package 12 is focused on collector distributor (C/D) roads to improve the I-70 corridor. This package includes constructing new capacity in the form of a parallel collector distributor roadway system which will provide local access to cross streets and reduce the number of access points on I-70. This package extends from the downtown loop to

I-470. The full CD system would require two additional lanes in each direction at most locations.

With a collector distributor system, there would be designated express lanes. The express lanes would not have direct access to the cross streets that I-70 currently does, rather cross street access would be to/from the collector distributor roads. The access between the express lanes and the collector distributor lanes would be fewer than existing I-70, likely once every two to four interchanges. The collector distributor roads would provide the access to the cross streets. The cross street access with the collector distributor road may be as an intersection or an interchange.

Package 12 will address the purpose and need goals as follows:

- Improve safety – There are safety improvements expected as the interaction between entering and exiting vehicles on the express lanes will be reduced. As part of implementing the collector-distributor system, many areas along I-70 with above statewide average crash rates would be addressed. Much of the merging, diverging and weaving movements would take place on the lower speed collector distributor roadways.
- Reduce congestion – There are improvements expected to the traffic flow on the express lanes due to the reduced number of merge points. Additional lanes as part of the collector-distributor system will also improve flow.
- Restore/maintain the existing infrastructure – There are improvements expected as this package will rehabilitate and/or rebuild the entire roadway in the existing corridor to renew the long-term pavement and road base condition.
- Improve accessibility – Collector-distributor roads would widen the crossing of the freeway while offering few opportunities to improve flexibility.
- Improve goods movement – There are improvements expected for goods movement through the improved traffic flow in the express lanes.

	Improve Safety	Reduce Congestion	Restore/Maintain Existing Infrastructure	Improve Accessibility	Improve Goods Movement
Strategy Package 12 Collector Distributor Roads	Meets	Meets	Meets	Meets	Meets

Potential natural impacts include expanded crossings at multiple stream tributaries and at the Blue River. The potential for human environmental impacts exist since the study area is scattered with churches, parks, other community facilities, and low income

and/or minority populations near the existing corridor as well as noise concerns. Cultural resource impacts may occur in the downtown loop with a high concentration of historic districts and buildings on or eligible for the National Register of Historic Places. A collector-distributor system, while efficient at moving traffic would likely have one of the widest footprints of any strategy due to the separation and transitions between express and collector lanes.

There are engineering issues associated with the collector distributor roads concept related to narrow right of way, steep side slopes, retaining walls, and stormwater drainage at key points. Construction activities could create some temporary traffic delays.

Package 12 will not be carried forward. Two other packages are being carried forward which can incorporate the CD road concept at key locations. (Package 2 and Package 5) Package 2 can incorporate a CD system at specific locations to improve a bottleneck or address a safety issue. Package 5 can incorporate the CD system at key locations if traffic modeling indicates that more than one lane of capacity in each direction is not adequate.

Initial Strategy Package 13 – Privatization Alternative

Package 13 is focused on involving the private sector in developing and funding alternatives to improve the I-70 corridor. This package includes selling or leasing I-70 to a third party which will convert I-70 into a toll road and use the collected toll revenue to build, operate, and maintain the roadway. In order for this alternative to be feasible, the private sector needs a revenue stream from the project. This could include HOT lanes or some form of a “shadow” toll paid by the public sector based on usage of the facility. Congestion pricing is also a tolling method to finance and build the additional lanes where the toll price would increase based on the demand to use the HOT lane or even time of day toll increases. Either the public or private sector could implement some form of congestion pricing.

It is difficult to evaluate privatization against the purpose and need without defining the types of improvements the private sector would be involved in. Assuming the private sector will be involved in a capacity expansion in some form, along with reconstruction of the existing roadway, in exchange for some form of revenue stream; the privatization strategy package will address the purpose and need goals as follows:

- Improve safety – There are safety improvements expected with the addition of specialty lanes, most likely HOT lanes, resulting in more efficient traffic flow.

However, safety will only be enhanced to the extent that the program of improvements funded by the private sector addresses key locations with higher than statewide average crash rates.

- Reduce congestion – There are expected congestion reductions from additional capacity in the form of special use lanes or general purpose lanes provided through the private sector.
- Restore/maintain the existing infrastructure – There are some improvements expected as this package would only be applicable for new lanes under current Missouri/federal law unless this is changed to allow tolling on existing lanes. As a result, reconstructing the existing roadway to renew the long-term pavement and road base condition would still be a public expense.
- Improve accessibility – There is little or no improvement expected to improve accessibility across I-70 or the downtown loop freeway as the private sector is less likely to pay for amenities that could not be captured by the roadway toll or other financial return on their investment.
- Improve goods movement – There are expected improvements for goods movement through improved traffic flow and reduced congestion.

	Improve Safety	Reduce Congestion	Restore/Maintain Existing Infrastructure	Improve Accessibility	Improve Goods Movement
Strategy Package 13 Privatization	Does Not Meet	Meets	Meets	Does Not Meet	Meets

Potential natural impacts include expanded crossings at multiple stream tributaries and at the Blue River. The potential for human environmental impacts exist since the study area is scattered with churches, parks, other community facilities, and low income and/or minority populations near the existing corridor as well as noise concerns. Cultural resource impacts may occur in the downtown loop with a high concentration of historic districts and buildings on or eligible for the National Register of Historic Places. Overall impacts would likely be similar to other strategy packages that expand capacity.

There are engineering issues associated with any widening of the existing corridor related to narrow right of way, steep side slopes, retaining walls, and stormwater drainage at key points. Construction activities could create some temporary traffic delays.

Current transportation funding sources such as the fuel tax, may not be sufficient to completely fund large scale transportation infrastructure investments such as improving I-70. Federal law currently dictates tolls can only be placed on new lanes. An alternative financing approach involving the private sector may be an important part of the funding package for the recommended solution, but a purely private solution is unlikely for I-70 and would struggle to address all elements of the purpose and need.

Initial Strategy Package 14 – Bus Transit Focus Alternative

Package 14 is focused on bus transit alternatives in the I-70 corridor. This package includes an exclusive corridor for bus rapid transit service, enhancing park and ride facilities, integrating the Smart Moves Regional Transit Regional Vision, and enhancing transit applications such as advance traveler information systems. Bus only lanes for bus rapid transit would be best suited between I-435 and the downtown loop, but certainly capable of extending through the entire length of the study area.

Bus rapid transit would operate in an exclusive corridor with limited stops. The special corridor would remove the buses from the congestion and slow downs in the general purpose lanes and have a travel time advantage over personal automobiles. In lieu of a dedicated corridor, some metropolitan areas are allowing buses to drive on shoulder during congested periods of the day. This accomplishes travel time benefits for bus transit which may attract more riders. The Smart Moves Regional Transit Vision calls for a fixed route bus service along I-70; however, does not identify if that is in an exclusive BRT lane or in the general traffic flow.

Package 14 will address the purpose and need goals as follows:

- Improve safety – There are safety improvements expected as the traffic flow is improved through the corridor. However, unless coupled with other improvements, this package would not address key safety enhancements in the corridor including speed reduced curves at Jackson Avenue and Benton Boulevard and above average crash locations.
- Reduce congestion – Some improvement would be expected as the traffic flow is improved by travelers changing their mode choice to transit. In an atmosphere of higher fuel prices, commuters may seek high quality consistent transit service as an alternative to their cars. However, there would need to be a widespread shift to have a substantial effect on congestion, e.g. full busses with five minute headways.

- Restore/maintain the existing infrastructure – There are no improvements expected, as this package will not rehabilitate and/or rebuild the entire roadway in the existing corridor to renew the long-term pavement and road base condition.
- Improve accessibility – There are expected improvements to accessibility across I-70 or the downtown loop freeway through the provision of community bridges. This option would also increase transit accessibility.
- Improve goods movement – There are few improvements expected for goods movement through improved traffic flow.

	Improve Safety	Reduce Congestion	Restore/Maintain Existing Infrastructure	Improve Accessibility	Improve Goods Movement
Strategy Package 14 Bus Transit	Does Not Meet	Does Not Meet	Does Not Meet	Meets	Does Not Meet

Potential natural impacts include expanded crossings at multiple stream tributaries and at the Blue River. The potential for human environmental impacts exist since the study area is scattered with churches, parks, other community facilities, and low income and/or minority populations near the existing corridor. Cultural resource impacts may occur in the downtown loop with a high concentration of historic districts and buildings on or eligible for the National Register of Historic Places.

There are engineering issues related to narrow right of way, steep side slopes, retaining walls, and storm water drainage at key points. Construction activities could create some temporary traffic delays.

The funding for bus transit service beyond the Kansas City, Missouri city limits is provided by the local community receiving the service. In late 2008, Independence chose to cut some bus transit service and Blue Springs has maintained current service levels despite buses running at capacity.

Increased bus transit service alone will not have a large enough impact to be a stand alone strategy for the I-70 FTEIS. These concepts have positive impacts which can be used in combination with other concepts. Bus transit concepts, such as bus on shoulder during periods of congestion, could be included in all strategies throughout the corridor. The MIS indentified dedicated lanes solely for bus operations as not economically justified based on low cost effectiveness.

Initial Strategy Package 15 – Reduce Capacity Alternative

Package 15 is focused on reducing the number of general purpose lanes and converting the interchanges to intersections. Effectively I-70, as it is currently known, would be reduced to a parkway and commuters would need to spread out to other roads or other modes of transportation. I-70 would require re-designation along other interstate facilities to maintain a connection with I-70 in Kansas. The reduce capacity concept is designed to provide parkway elements to the roadway including a green median with trees. This package includes bus service improvements, TSM, and TDM elements. This package would be considered from I-435 to the downtown loop and potentially for the north side of the loop. Consideration must be given to traffic diversion and the associated impacts on alternative routes with this package.

Package 15 will address the purpose and need goals as follows:

- Improve safety – There are no overall safety improvements expected. Intersections typically have higher crash rates than grade separated interchanges although speed is lower.
- Reduce congestion – There is an expected increase in congestion with the lane reductions and lower speed limits. This would occur both on the I-70 parkway and on parallel routes.
- Restore/maintain the existing infrastructure – There is no improvement expected as this package would not reconstruct the existing roadway to renew the long-term condition.
- Improve accessibility – There are expected improvements to accessibility across I-70 or the downtown loop freeway from a shorter distance to cross the new parkway and pedestrian signals at most cross streets.
- Improve goods movement – There are expected decreases in goods movement through the increased congestion and crash rates.

	Improve Safety	Reduce Congestion	Restore/Maintain Existing Infrastructure	Improve Accessibility	Improve Goods Movement
Strategy Package 15 Reduce Capacity	Worse than Existing	Worse than Existing	Does Not Meet	Meets	Worse than Existing

No adverse impacts are expected to cultural resources or the natural or human environments so long as the parkway fits in the existing I-70 right of way. Air quality would be potentially worsened through more idling and stop and go traffic through

intersections. There are engineering issues associated with converting the interchanges to signalized intersections in the parkway concept.

The parkway concept would be most effective in conjunction with wide spread regional transit or alternative transportation development strategy. These strategies are not currently occurring in the Kansas City metropolitan area. The parkway does not address the purpose and need as a stand alone strategy.

Other Alternative Considerations

The Study Team did not put together a complete package of alternative upgrades to regional/parallel roads other than I-70. Upgrades to other key roads such as U.S. 24, U.S. 40, MO-78, and MO-350 could help alleviate congestion along I-70. Operation Green Light is one potential upgrade to parallel routes that is included and discussed for several of the strategy packages evaluated. It would be advantageous for all packages moved forward for further evaluation to incorporate the concept of upgrades to parallel routes, particularly low cost upgrades. However, focusing on a full package of improvements to parallel routes, including those requiring new right of way, is beyond the scope of this project and fails to address many of the safety, infrastructure restoration, and accessibility needs.

Input Into Alternative Concept Evaluation from Public Open Houses and Community Coffees

This section discusses the key ideas the Study Team heard with regards to evaluating alternative concepts at a series of two open house meetings and two community coffees held in September 2008. At the open houses and community coffees, members of the public were invited to comment on improvement concepts and the individual elements that make up strategy packages. Strategy packages had not been defined at the time. The open houses were held on weekday evenings while the community coffees were held on Saturday mornings. The Study Team held the meetings/coffees at four different locations spread along the corridor. The meetings and community coffees were formatted as open houses, so participants were welcome to come and go as desired.

The purpose of the open houses and community coffees were to gather stakeholders' input that included four questions (which were included on comment forms):

- What are the problems in the corridor?
- What needs to be fixed and how would you fix it?
- How does the corridor affect your everyday life?
- Other comments?

Over 11,000 newsletters were mailed to I-70 property owners and 308 fliers were mailed to umbrella organizations, agencies, businesses, and public officials inviting them to attend the meetings. Sixty-five residents, business owners, and other area citizens attended the open houses and community coffees.

Summary of Comments

The following points provide a summary of comments received at the open house meetings and community coffees.

What are the problems in the corridor?

- Traffic congestion
- On/off ramps too short
- Access across the north and south leg of the downtown loop
- Benton curve
- One mode available, car. Provide alternative modes (rail, bus , bicycle)
- I-435 Interchange
- Noise and drainage

What needs to be fixed and how would you fix it?

- On/off ramps – lengthen and/or reduce the number
- Light rail
- Reversible lanes
- Cap the south leg of loop
- Get rid of north leg of loop
- Interchange improvements
- Transportation Demand Management (TDM)
- Noise walls
- Benton Curve
- No new lanes.
- No ramp metering
- Provide alternative modes
- Bicycle/pedestrian accessibility

Other Comments

- Toll road support
- Light rail support

- Reversible lanes support
- Likes one-way loop
- Support truck only lanes
- Cap the north and south leg of the loop
- No to exclusive bus lanes, tunnel, elevated lanes, reversible lanes
- Noise – need noise walls
- HOV lanes or HOT lanes
- Tunnels
- Benton/Jackson curves
- Concern about air quality
- No to tolls
- Transit options
- HOV lanes or HOT lanes
- On/off ramps too short
- Cover north and south leg of loop/better bicycle and pedestrian access
- No to general purpose lanes

A synopsis of the comments show support for fixing bottlenecks (Package 2, parts of Packages 3, 4, and 7), light rail (Package 10), reversible lanes (Packages 6 and 7), cap the north and south legs of the loop (Package 6 and a part of Packages 4, 8, and 14), truck only lanes (Package 11), one-way loop (Package 9), TDM activities (parts of Packages 1, 2, 3, 4, 7, 8, and 15), provide alternative modes (Packages 10, 14, and potentially others), and HOV/HOT lanes (Packages 3, 4, 6, 7, and 13).

The Study Team also heard what not to do including bus only lanes (part of Package 14), tunnel (Package 4), elevated lanes (Package 9), and reversible lanes (Packages 6 and 7). The Study Team also heard that they should not implement capacity improvements (all packages other than 1, 2, 8, 10, 14, and 15), and that the improvements should not include tolls (Package 13 and potentially others).

Summary

The initial strategy packages were screened against purpose and need, high level natural and human environmental impacts, and high level engineering factors and costs to determine which packages would be carried forward for more detailed evaluation. The packages that best met purpose and need goals while not creating any standout environmental or engineering issues were carried forward. The recommend packages to be carried forward include:

- **Package 1 No-Build** – This is a requirement of the NEPA process

- **Package 2 Fix Key Bottlenecks**
- **Package 5 Add General Lane Capacity**
- **Package 7 Fix Key Bottlenecks plus Transportation Improvement Corridor**

These packages carried forward will likely be refined through the First Tier Reasonable Strategy evaluation process prior to the selection of a Preferred Strategy.

The following paragraphs briefly summarize why other packages were not carried forward. **Appendix B** also contains a table that summarizes the screening.

Package 3 Fix Key Bottlenecks plus HOV Lanes and Package 6 Add Capacity (HOV) and Transit Improvements were not carried forward because the elements within these packages were very similar to Package 7 which was carried forward.

Package 4 Fix Key Bottlenecks, HOV Lanes, Unique Design Features (Tunnel) was not carried forward because of the cost and other issues related to the tunnel. It is not an efficient or practical way to meet purpose and need.

Package 8 TSM/TDM plus BRT Solutions was not carried forward because it did not meet several purpose and need goals.

Package 9 Unique Capacity Designs (Stacked Lanes) was not carried forward primarily due to additional costs factors and interchange/overpass issues. It also would create purpose and need difficulties related to safety and access.

Package 10 Rail Transit was not carried forward due to not meeting purpose and need goals, potentially higher human environmental and cultural impacts, rail lines negotiating the upgraded curves, and light rail (specifically is not identified in local and regional plans.

Package 11 Freight Movement was not carried forward due to not meeting purpose and need goals. The diverse origin and destinations of truck movements around and through the area does not lend well to a dedicated truck only lane through the center of Kansas City.

Package 12 Collector Distributor Roads was not carried forward due to being included into Package 2 Fix Key Bottlenecks at select locations or incorporated into Package 5 Add General Purpose Capacity if traffic model results conclude that more than one lane in each direction is required along portions of the corridor.

Package 13 Privatization was not carried forward as a stand alone option due to being similar to Package 7 improvements. Privatization options are more a method to finance improvements and may be considered within future funding discussions for packages carried forward.

Package 14 Bus Transit Focus was not carried forward due to not meeting purpose and need goals as well as other packages and providing only limited improvement. Bus transit on the highway shoulder was added to Package 2 and Package 5 which were carried forward. Bus transit could also be a part of the specialized corridor in Package 7.

Package 15 Reduce Capacity was not carried forward due to not meeting purpose and need goals.

Appendix A - I-70 FTEIS Initial Screening Criteria Definitions

By the nature and level of analysis at this stage of the project all screening criteria are high level and will include some level of subjectivity.

Purpose and Need Criteria	Criteria for Meets Purpose and Need Rating	Criteria for Does Not Meet Purpose and Need Rating	Criteria for Worse Than Existing Rating
<i>Improves Safety:</i> Reduce crash rates and crash severity on I-70 and the downtown loop.	The strategy includes improvements to address all or most of the locations with crash rates above the statewide average. The strategy allows for the implementation of typical safety improvements MoDOT is making on freeway corridors statewide.	The strategy does not include improvements to address all or most locations with crash rates above the statewide average and/or does not allow for the implementation of standard safety improvements MoDOT is making on freeway corridors statewide.	The strategy includes features such as new at-grade intersections instead of grade separations that would potentially lead to higher crash rates.
<i>Reduces Congestion:</i> Remove key bottlenecks, reduce the potential for ramp back-up onto the freeway, and improve multi-modal travel times.	The strategy includes measures that increase the capacity of the I-70 corridor and/or increase transit service and use that would be sufficient to anticipate a reduction in congestion to acceptable levels per the Practical Design Manual.	The strategy does not include measures that increase the capacity of the I-70 corridor and/or increase transit service and use that would be sufficient to anticipate a reduction in congestion to acceptable levels per the Practical Design Manual.	The strategy reduces overall capacity within the corridor without providing alternatives that could reasonably be anticipated to provide substitute capacity on other routes.
<i>Restores and Maintains Existing Infrastructure:</i> Improve bridge and pavement conditions on I-70 and the downtown loop and implement cost-effective investment strategies.	The strategy includes corridor wide reconstruction of the existing highway either in place or as part of a capacity expansion and thus would renew the long-term condition of the I-70 corridor.	The strategy does not include corridor wide reconstruction of the existing highway either in place or as part of a capacity expansion and thus would not renew the long-term condition of the I-70 corridor.	Federal law requires MoDOT to maintain the existing I-70 corridor and the downtown loop (I-70, I-35, I-29, and I-670). As a result, this rating does not apply for this purpose and need goal.

Appendix A - I-70 FTEIS Initial Screening Criteria Definitions

<p><i>Improves Accessibility:</i> Provide travel options for all residents, increase safe access across I-70, and the downtown loop for non-motorized travel.</p>	<p>The strategy includes reasonable measures to enhance crossing of the corridor for non-motorized travel and increases the effectiveness of transit options in the corridor.</p>	<p>The strategy does not include reasonable measures to enhance crossing of the corridor for non-motorized travel and increases the effectiveness of transit options.</p>	<p>The strategy creates new barriers to crossing I-70 and/or would likely close crossing of I-70 at multiple points. The strategy reduces or eliminates transit options in the corridor.</p>
<p><i>Improves Goods Movement:</i> Improve the efficiency of freight movement.</p>	<p>The strategy provides safety and congestion improvements (as defined above) that would effectively serve freight movements in the corridor in addition to passenger vehicles and/or the strategy includes specific features to effectively improve freight movement in the corridor.</p>	<p>The strategy does not provide safety and congestion improvements (as defined above) that would effectively serve freight movements in the corridor in addition to passenger vehicles and the strategy does not include specific features to effectively improve freight movement in the corridor.</p>	<p>The strategy converts the corridor to a facility that will not effectively serve freight movements as well as the existing facility by introducing additional congestion or features such as new at-grade intersections that would slow the flow of goods.</p>

Appendix A - I-70 FTEIS Initial Screening Criteria Definitions

Impact Criteria	Criteria for Fatal Flaw Rating	Criteria for High Rating	Criteria for Medium Rating	Criteria for Low Rating
Human Environmental Impacts	Strategy footprint would be anticipated to affect community, neighborhood, or business resources in a manner that is either illegal or unusually devastating for a MoDOT project in an urban area.	Strategy would be anticipated to affect community, neighborhood, or business resources in a manner that is substantially higher than most of the strategies under consideration.	Strategy would be anticipated to affect community, neighborhood, or business resources in a similar manner to most of the strategies under consideration.	Strategy would be anticipated to affect community, neighborhood, or business resources in a manner that is substantially lower than most of the strategies under consideration.
Natural Environmental Impacts	Strategy footprint would be anticipated to affect air quality, floodplains, streams, wetlands, or natural sites in a manner that is either illegal or unusually devastating for a roadway project in an urban area.	Strategy footprint would be anticipated to affect air quality, floodplains, streams, wetlands, or natural sites in a manner that is substantially higher than most of the strategies under consideration.	Strategy footprint would be anticipated to affect air quality, floodplains, streams, wetlands, or natural sites in a similar manner to most of the strategies under consideration.	Strategy footprint would be anticipated to affect air quality, floodplains, streams, wetlands, or natural sites in a manner that is substantially lower than most of the strategies under consideration.
Engineering Issues	Strategy includes features that would render it essentially unbuildable or completely impractical to build as proposed.	Strategy includes features that would be anticipated to make design, construction, and/or maintenance of traffic substantially more difficult than most of the strategies under consideration.	Strategy is similar to most strategies under consideration in terms of anticipated design, construction, and maintenance of traffic issues.	Strategy includes features that would be anticipated to make design, construction, and/or maintenance of traffic substantially easier than most of the strategies under consideration.

Appendix A - I-70 FTEIS Initial Screening Criteria Definitions

<p>Anticipated Cost (\$ to \$\$\$\$)</p>	<p>\$\$\$\$ - Strategy is anticipated to have a cost that is orders of magnitude higher than other strategies.</p>	<p>\$\$\$ - All strategies that add capacity/lanes to urban freeway corridors would be cost in the hundreds of millions or billions of dollars and would be considered high cost.</p>	<p>\$\$ - Strategy would be anticipated to have substantially lower costs than most of the strategies proposed for the project.</p>	<p>\$ - Strategy would have minimal additional cost beyond what is anticipated for long-term maintenance. By this definition only the No-Build strategy is given a single \$ rating.</p>
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Appendix B - Initial Strategy Package Evaluation

Strategy Packages	Preliminary Purpose and Need Evaluation					Environmental Issues Relative to other Packages		Engineering Issues Relative to other Packages		Carry Forward	Reasons
	Improve Safety	Reduce Congestion	Restore and Maintain Existing Infrastructure	Improve Accessibility Across/ Neighborhood	Improve Goods Movement	Human	Natural	Engineering Issues	Relative Costs		
Strategy Package 1 - No-Build	Does Not Meet	Does Not Meet	Does Not Meet	Does Not Meet	Does Not Meet	Low	Medium	Low	\$	Yes	Required
Strategy Package 2 - Fix Key Bottlenecks	Meets	Meets	Meets	Meets	Meets	Low	Low	Medium	\$\$	Yes	Meets Purpose and Need - with BRT on shoulder and upgrade Benton and Jackson Curves, may include CD roads at key locations
Strategy Package 3 - Fix Key Bottlenecks plus HOV Lanes	Meets	Meets	Meets	Meets	Meets	Medium	Medium	Medium	\$\$\$	No	Similar to Packages 6 and 7
Strategy Package 4 - Fix Key Bottlenecks, HOV Lanes, Unique Designs	Meets	Meets	Meets	Meets	Meets	Medium	Medium	High	\$\$\$\$	No	Cost, other elements similar to other Packages
Strategy Package 5 - Add General Lane Capacity	Meets	Meets	Meets	Meets	Meets	Medium	Medium	Medium	\$\$\$	Yes	Meets Purpose and Need - include bus on shoulder provisions and possibly CD roads at key locations
Strategy Package 6 - Add Capacity (HOV Lanes) and Transit Improvements	Meets	Meets	Meets	Meets	Meets	Medium	Medium	Medium	\$\$\$	No	Similar to Packages 3 and 7
Strategy Package 7 - Fix Key Bottlenecks plus Transportation Improvement Corridor	Meets	Meets	Meets	Meets	Meets	Medium	Medium	Medium	\$\$\$	Yes	Meets Purpose and Need
Strategy Package 8 - TSM/TDM Solutions Alternative (Lane Conversion to BRT)	Does Not Meet	Does Not Meet	Does Not Meet	Meets	Does Not Meet	Low	Medium	Low	\$\$	No	Does not meet Purpose and Need
Strategy Package 9 - Unique Capacity Designs Alternative (Stacked Lanes)	Meets	Meets	Meets	Worse than Existing	Meets	Low	Medium	High	\$\$\$\$	No	Does not meet Purpose and Need
Strategy Package 10 - Rail Transit Alternative	Does Not Meet	Does Not Meet	Does Not Meet	Meets	Does Not Meet	Medium	Medium	High	\$\$\$	No	Does not meet Purpose and Need
Strategy Package 11 - Freight Movement Alternative	Meets	Does Not Meet	Meets	Does Not Meet	Meets	Medium	Medium	Medium	\$\$\$	No	Does not meet Purpose and Need
Strategy Package 12 - Collector Distributor Roads Alternative	Meets	Meets	Meets	Meets	Meets	High	Medium	Medium	\$\$\$	No	Elements can be included in Package 2 (spot improvements) and Package 5 based on traffic analysis and high social impacts
Strategy Package 13 - Privatization Alternative	Does Not Meet	Meets	Meets	Does Not Meet	Meets	Medium	Medium	Medium	\$\$ / \$\$\$	No	Does not meet Purpose and Need by itself. Private sector could be involved in funding parts of other packages carried forward.
Strategy Package 14 - Bus Transit Focus Alternative	Does Not Meet	Does Not Meet	Does Not Meet	Meets	Does Not Meet	Low	Medium	Low	\$\$	No	Does not meet Purpose and Need
Strategy Package 15 - Reduce Capacity Alternative	Worse than Existing	Worse than Existing	Does Not Meet	Meets	Worse than Existing	Low	Low	Medium	\$\$\$	No	Does not meet Purpose and Need

Purpose and Need Legend	Environmental and Engineering Legend
Meets Purpose and Need	Fatal Flaw - Illegal or unusually devastating
Does Not Meet Purpose and Need	High - Substantially higher impacts than most packages
Worse than Existing	Medium - Similar impacts as most other packages
	Low - Substantially lower impacts than most other packages

Strategy Package 1 - No-Build (MIS)
 I-435 MIS preferred strategy components
 Northland / Downtown MIS preferred strategy components
 I-70 pavement restoration and maintenance (programmed)
 Bridge replacement projects (programmed)
 Interchange improvements (programmed)
 Maintain existing bus service

Strategy Package 2 - Fix Key Bottlenecks (MIS)
 Package 1 plus the following additional elements:
 - Rehabilitation or rebuilding of I-70 as 6-lanes
 - Rehabilitation of all functionally obsolete or structurally deficient bridges
 - Downtown loop operational improvements
 - Consolidate loop access on north and east legs
 - Low-cost operational interchange improvements (I-470, US 40 Blue Ridge Boulevard, Paseo Boulevard, 22nd/23rd Street, 31st & Van Brunt Boulevard, and Manchester I-70 Viaduct)
 - Geometric improvements at Benton Boulevard and Jackson Avenue curves
 - Upgrade Truman Road interchange
 - Operation Green Light / Advance Public Transportation Systems (on parallel routes)
 - Expand I-70 community express service and park and ride facilities
 - Expand emergency management

Strategy Package 3 - Fix Key Bottlenecks plus HOV Lanes (MIS)
 Package 2 plus the following additional elements:
 - HOV lanes from the Loop to US 40 / Blue Ridge Boulevard
 - Rehabilitation or rebuilding of interchanges and bridges to accommodate the additional mainline lanes
 - Geometric improvements at Benton Boulevard and Jackson Avenue curves
 - Implement Smart Moves Transit Plan
 - Transit centers

Strategy Package 4 - Fix Key Bottlenecks, HOV Lanes, Unique Features (MIS)
 Package 3 plus the following additional elements:
 - Tunnel from 22nd/23rd Street to the northeast corner of the loop
 - Community bridges (northside of loop, east of Van Brunt Boulevard, Noland Road, and potentially south side of loop)
 - Support commuter rail along I-70

Strategy Package 5 - Add General Lane Capacity (MIS)
 Package 1 plus the following additional elements:
 - Rehabilitation or rebuilding of I-70 as 8-lanes
 - Rehabilitation or rebuilding of interchanges and bridges to accommodate 8 lanes to meet current design standards
 - New design/rebuild north and east legs of loop and consolidate loop access
 - Interchange improvement at southwest corner of loop
 - Enhance southeast loop interchange

Strategy Package 6 - Add Capacity (HOV Lanes) and Transit Improvements (MIS)
 Package 5 plus the following additional elements:
 - HOV lanes (potential toll)
 - Bus Rapid Transit on parallel routes
 - Implement Smart Moves Transit Plan and Transit Centers
 - Community bridges
 - Implement commuter rail

Strategy Package 7 - Fix Key Bottlenecks plus Transportation Improvement Corridor (MIS Recommended)
 - Rehabilitation or rebuilding of I-70 from the Loop to US 40 / Blue Ridge Boulevard as 6-lanes with provisions of a transportation improvement corridor (HOV lanes, HOT lanes, reversible lanes, BRT lanes, or TOL).
 - Rehabilitation or rebuilding of I-70 from US 40 / Blue Ridge Boulevard to I-470 as 8-lanes
 - Downtown loop operational improvements
 - Rehabilitation or rebuilding of interchanges and bridges to accommodate the additional lanes
 - Geometric improvements at Benton Boulevard and Jackson Avenue curves
 - Transit and other improvements (community bridges, Operation Green Light, Smart Moves Plan, Commuter Rail, transit centers, park and ride facilities, expand emergency management)

Strategy Package 8 - TSM/TDM Solutions Alternative
 Convert general purpose lane to Bus Rapid Transit
 TDM and TSM
 Bicycle/pedestrian access
 Community bridges

Strategy Package 9 - Unique Capacity Designs Alternative
 Stacked or elevated lanes
 One-way loop
 Community bridges

Strategy Package 10 - Rail Transit Alternative
 Rebuild I-70
 Light rail in the I-70 Corridor

Strategy Package 11 - Freight Movement Alternative
 Rebuild I-70
 Truck only lanes

Strategy Package 12 - Collector Distributor Roads Alternative
 Collector distributor roads along entire corridor

Strategy Package 13 - Privatization Alternative
 Assumes some additional lanes with a toll

Strategy Package 14 - Bus Transit Focus Alternative
 Advance public transportation systems
 Exclusive Bus Rapid Transit lane

Strategy Package 15 - Reduce Capacity Alternative
 Convert to an at-grade parkway