



COLORADO
Department of Transportation
Office of Major Project Development

4201 E. Arkansas Ave., Room 158
Denver, CO 80222

MEMORANDUM

TO: TRANSPORTATION COMMISSION
FROM: PETER KOZINSKI, OFFICE OF MAJOR PROJECT DEVELOPMENT
CC: DON HUNT, CDOT EXECUTIVE DIRECTOR & DIRECTOR OF THE COLORADO BRIDGE ENTERPRISE
DATE: DECEMBER 10, 2014
SUBJECT: SCOPE OPTIONS FOR I-70 EAST PROJECT

Purpose

In light of the substantial changes to initial revenue projections, including the potential reduction of available Senate Bill 09-228 (SB-228) funds, staff has prepared a three month approach to move the I-70 East Project forward.

This month, staff will update the Transportation Commission (TC) on the three fundamental Scope options available to the Department for the first phase of the I-70 East Project, and ask for a sense from the Commission on the appropriate Scope for the first phase of the project.

In January, staff hopes to obtain direction from the Commission on how to fund the preferred Scope.

In February, staff will seek direction from the Commission on how to deliver the project (through a public-private partnership or traditional delivery).

Action

Direction on the appropriate Scope for the first phase of the I-70 East Project and brief review of funding options for each Scope option in preparation of a more detailed funding discussion in January.

The three Scope options are:

- Repair and Maintain the Existing Viaduct
- Remove the Viaduct and Construct the Partially Covered Lowered (PCL) Section
- Remove the Viaduct, Build the PCL Section and Extend Express Toll Lanes to I-225

Background

The November 2014 Transportation Commission workshop focused on the implications of the loss of SB-228 funds to the I-70 East Project. Prior to this loss, the I-70 East Team was structuring the first phase (or Scope), of the \$1.8 billion overall project, as a \$1.17 billion effort that would have removed the viaduct, built the PCL section and made the needed improvement to get, at a minimum, one Express Toll lane in each direction between I-25 and I-225.



Three funding sources for the \$1.17 billion first phase were assumed:

- \$850 million Bridge Enterprise funding
- \$50 million DRCOG commitment
- \$271 million SB-228 funds

With the reduction of available SB-228 funds, from the anticipated \$271 million, down to \$90 million (or potentially even zero) the Scope of this first phase needs to be redefined or reconfirmed.

Options to Consider

The options presented below including the pros and cons of each and are not all-inclusive, but rather provide a framework from which to redefine or reconfirm the Scope of the first phase of the I-70 East Project. It is important to note that the No Action alternative in the I-70 East NEPA document calls for replacing the existing viaduct between Brighton Blvd. and Colorado Blvd with a viaduct built to modern construction standards (e.g. shoulders and lane widths) but adding no additional capacity. This No Action alternative is different from any of the three options listed below, none of which proposes to replace the existing viaduct with a new viaduct.

1. Repair and Maintain the Existing Viaduct

It is technically feasible to repair and maintain the existing viaduct for an estimated period of 10 to 30 years under the assumption that regular and ongoing maintenance efforts are enhanced. It is estimated that it would cost \$30m or more to maintain the existing viaduct for the next 10-years, absent the need for unanticipated emergency repairs (Attachment A).

The pros and cons of sustaining the existing viaduct include:

	Pros	Cons
Cost	<ul style="list-style-type: none"> • Initially lowest cost option 	<ul style="list-style-type: none"> • Potential for a substantially higher cost project when improvements are ultimately achieved
Capacity/Reliability		<ul style="list-style-type: none"> • Delays capacity and operational improvements in the viaduct area
Safety	<ul style="list-style-type: none"> • Provides a temporary, cost effective solution to keeping the viaduct safe 	<ul style="list-style-type: none"> • Delays permanent safety improvements until the viaduct is replaced • Potential remains for large repair (holes in bridge deck or piers)
Policy & Perception	<ul style="list-style-type: none"> • Maintains full CBE funding in the short term for other eligible bridge projects around the state 	<ul style="list-style-type: none"> • Significant local political and community backlash; will be difficult to rebuild project support when viaduct is ultimately replaced.

Financial Note – Lowest cost option and could be funded with little to no impact to asset management efforts.



2. Remove the Viaduct and Limit Construction to the Partially Covered Lowered (PCL) Section

The I-70 East viaduct between Brighton Blvd. and Colorado Blvd. was one of the original 128 “poor” bridges identified at the passage of the FASTER legislation. Moreover, at the time of the passage of the FASTER legislation the I-70 viaduct was identified as one of the 30 worst bridges in the State and is one of the last two structures remaining to be addressed.

Removing this 50-year old structure and replacing it with the PCL will substantially reduce the square footage of currently “poor” CBE eligible bridge deck area. The viaduct is approximately 569,540 square feet and represents 61 percent of the State’s overall CBE eligible deck area.

The replacement of the viaduct with the PCL is estimated to cost \$950m (depending upon delivery method) and is feasible within funding available - assuming the Project gets \$90m of the original anticipated \$271m from SB-228 funding.

The pros and cons of Removing the Viaduct and Limiting Construction to the PCL Section include:

Pros	Cons
Cost	
<ul style="list-style-type: none"> Further segments the projects into affordable phases given funding limitations Unlike repairing the existing viaduct, expenditures on the PCL are not “throw-away” and build toward the vision for the corridor 	<ul style="list-style-type: none"> Utilizes approximately half of the statewide CBE funds for 30-years Would require additional funding commitment in near future
Capacity/Reliability	
<ul style="list-style-type: none"> Because lowered section would be built to full width there is opportunity for capacity expansion in the future 	<ul style="list-style-type: none"> No capacity improvements on opening day Express Toll Lanes not practicable in just PCL segment
Safety	
<ul style="list-style-type: none"> Remove 50-year old structure and address safety and operational concerns (shoulders, drainage lane widths...) 	
Policy & Perception	
<ul style="list-style-type: none"> Addresses most politically sensitive segment of the project. 	<ul style="list-style-type: none"> Public perception of very wide shoulders in politically sensitive neighborhood until additional capacity could be added east of PCL Segment of greatest current and future congestion not addressed.

Financial Note – Some elements of PCL section that are not eligible for CBE funds and will likely need additional funds from asset management or other categories (Est. \$30 million).

3. Remove the Viaduct, Build the PCL Section and Extend Express Toll Lanes to I-225

When the first phase of the I-70 East Project was slated to receive \$271m of SB-228 funds, the budget available for the project Scope was approximately \$1.17 billion (\$850m CBE, \$50m DRCOG and \$271m SB-228). Based upon the original Value for Money (VfM), the budgeted amount would have been sufficient to construct the entire Scope of Option 3 - removing the viaduct, building the PCL and extending one Express Toll lane in each direction between I-25 and I-225.



Now with the reduction in SB-228 from \$271m to \$90m, (and maybe even zero dollars) - the validity of this original Scope must be re-confirmed and additional funding for the project identified. In all likelihood, asset management funds would be reduced for several years in order to fill the funding gap.

The pros and cons of Removing the Viaduct, Building the PCL Section and Extending Express Toll Lanes to I-225 include:

	Pros	Cons
Cost	<ul style="list-style-type: none"> higher cost also yields substantial economic benefits to the region and state 	<ul style="list-style-type: none"> Requires backfilling lost SB-228 funds, likely by utilizing asset management or other funds for several years to fill the funding gap
Capacity/Reliability	<ul style="list-style-type: none"> Trip reliability through the corridor is established, as Express Toll lanes run the full length of the Project Travel Time for all (GP & Toll Lanes) is improved 	
Safety	<ul style="list-style-type: none"> Remove 50-year old structure and address safety and operational concerns 	
Policy & Perception	<ul style="list-style-type: none"> Addresses highest congestion area 	<ul style="list-style-type: none"> Utilizes approximately half of the statewide CBE funds for 30-years

If Option 3 is identified as the appropriate Scope for the first phase of the I-70 East Project, the most notable Con is the need to backfill the lost SB-228 funds. As noted in the *Purpose* section of this memo, more detailed discussions on available funding sources will be held in January 2015.

Financial Note - Would require approximately \$180m of asset management or other funds to make whole.



Attachment A - Repair and Maintain the Viaduct Costs

In addition to the approximately \$1M per year of minor and cyclical maintenance, it is estimated that a recurring 5-year time cycle investment of \$20M in repairs and rehabilitation will be needed. A maximum term of 30 years should be considered for this approach.

This plan should maintain safety and structural capacity which were the main concerns and 2 of the 4 purpose and need statements in the EIS. The maintenance operations on the 5-year cycle would require night work and would impact the community via noise, lights, dust, etc.

Project Code: 13599
R.E.: Keith Stefanik
P.M./P.E.: [Redacted]
Project No.: [Redacted]
Designer: MCY
Date: 12/4/2014
 By MCY

E-17-FX built in 1964
 I-70 East Corridor
 Out-to-Out Width: 90.8'
 Structure Length: 6,267 ft

Quantities		Unit	Quantity	Unit cost	Total
Item	Description				
202-00240	Removal of Asphalt Mat (Planing)	SQYD	63227	\$2.0	\$126,454
403-34731	Hot Mix Asphalt	Ton	6971	\$100	\$697,100
509-08010	Alter and Erect Structural Steel	Lump Sum	1	\$100,000	\$100,000
518-01004	Bridge Expansion Device (0-4 Inch)	LF	1315	\$467.00	\$614,105
618-00002	Prestressing Steel Strand	MKFT	1001	\$100.00	\$100,100
sum					\$1,637,759

Thickness of Asphalt existing 4"
 removal 2"
 Placing 2"

Colorado Cost Factor: 4.1825
 Design Engineering Cost Factor: 15.00%
 construction engineering Cost Factor: 22.10%
 Repair Total: \$9,618,326

deck area, ft²: 569,044
 repair cost per ft² \$16.90

Notes:
 Colorado Cost Factor adjusts for Traffic Control costs
 Above repair costs are for assumed maintenance and repair for next 10 years
 Bridge Expansion device (0-4 Inch) includes removal of existing device, concrete class D (Special), reinforcing steel.

Additional Inspection Costs

Description	Unit	Quantity	Unit Cost	Total
Routine Bridge Inspection	Hours	80	\$ 100.00	\$ 8,000.00
Paperwork/Inspection Report	Hours	8	\$ 100.00	\$ 800.00
Total =				\$ 8,800.00 /2 year
@ 10 Years Additional Cost =				\$ 44,000.00

Description	Unit	Quantity	Unit Cost	Total
Poor Bridge Inspection	Hours	120	\$ 100.00	\$ 12,000.00
Paperwork/Inspection Report	Hours	16	\$ 100.00	\$ 1,600.00
Steel Span Inspection				
Hi Ranger	Days	4	\$ 1,500.00	\$ 6,000.00
Traffic Control	Days	4	\$ 1,500.00	\$ 6,000.00
Railroad Flagger	Hours	32	\$ 300.00	\$ 9,600.00
Total =				\$ 35,200.00 /year
@ 10 Years Additional Cost =				\$ 352,000.00

Grand Total Next 10 Years = ~ \$10,014,326.33



