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THE *Crane Road Bridge* PROJECT

Bronx River Parkway Over the Bronx River – Metro-North Railroad at Crane Bridge – Village of Scarsdale and Town of Greenburgh

Final Design Report

APPENDICES

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February 9, 2010

APPENDIX N

Value Engineering Report & Disposition Forms

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THE Crane Road Bridge PROJECT

RESPONSES to SUMMARY of VE PROPOSALS

New York State Department of Transportation – Region 8
Reconstruction of Crane Road Bridge
Scarsdale and Greenburgh, Westchester County, New York
NYSDOT PIN: 8IF0.13

Proposal No.	DESCRIPTION OF PROPOSAL (JACOBS)	VE Potential Savings (Jacobs)	Disposition	VE Proposal * Savings (Weidlinger)
	Pedestrian Access			
	Install stairs only at Crane Road to MNR platforms	$ 600,000	Conditionally Accept	$ 50,000
3	Add ADA elevator to Metro-North Inbound platform from East Parkway northbound ramp	$ (100,000)	Reject	None
	Highway			
4	Addition of post-mounted signage	$ (39,600)	Accept	None
5	Radar feedback speed display	$ (52,560)	Accept	$ (52,560)
6	Reduce inside shoulder to 1.0 foot and increase southbound lane width from 10 feet to 11 feet	Design Suggestion	Conditionally Accept	$ (88,860)
8	Use 4 percent for shoulder cross-slopes (with 1 percent at the back of curb) and maximum 5 percent and 2 percent for new lane, and 2.5 percent for auxiliary lane	Design Suggestion	Conditionally Accept	None
7	Use Compound Curves on NB EB Scarsdale Ramp to East Parkway South	Design Suggestion	Conditionally Accept	None
8	Eliminate Broken-back Vertical Curves at Station 116 of Alternative C	Design Suggestion	Accept	None
9	Use Spiral Curves for Mainline SBP	Design Suggestion	Reject	None
10	Eliminate Broken-back Vertical Curves at Station 116 of Alternative C	$ 9,420	Accept	$ 9,420
11	Increase profile grades from max. 5 percent to 5 percent	$ 4,101	Reject	None
	Crane Road Exit			
12	Eliminate EXIT SIGN on Crane Road	Design Suggestion	Reject	None
13	Install At-Grade Queue for southbound traffic exiting to East Parkway South	$ (349,370)	Reject	None
14	Install acceleration lane with 870 Feet from East Parkway to allow acceleration maneuvers	Design Suggestion	Reject	None
	Historic Bridge			
15	Preserve stone facing intact for historical purposes (Scarsdale portion)	$ 1,340,660	Reject	None
16	Use existing bridge as scenic overlook	$ 1,237,365	Reject	None
17	Keep historic bridge as vehicular structure, allow bikes only	$ 1,941,720	Reject	None
	Replacement Bridge and Alignment			
18	Eliminate skew, construct new bridge piers and abutments	$ 300,000	Reject	None
19	Multiple voided slab geometry for maximum pier segments	Design Suggestion	Reject	None
21	Construct bridge, deck as single operation in lieu of half deck at a time	Constructability	Reject	None
21	Move bridge further southeast	$ 2,876,171	Reject	None
22	Construct new bridge as multi-span typical structure	$ 4,390,520	Reject	None
23	Crane Road Underpass improves SBP geometry	Design Suggestion	Reject	None
	Maximum Coincident Savings	$ 10,264,647		$ (99,560)

Notes:

* Based on accepting a VE Proposal or a portion of a VE Proposal

NYSDOT VALUE ENGINEERING
REGIONAL DISPOSITION FORM

Project: Replacement of Structures Carrying the Bronx River Parkway Over the Bronx River and the Metro-North Railroad Village of Scarsdale & Town of Greenburgh Westchester County, NY	*PIN 8110.13*
VE Rec Description Install stairs only at Crane Road to MNR platforms	*VE Rec No. 1*
Technical Feasibility: Technical studies were performed to evaluate the feasibility of installing stairs rather than ramps south of the Metro North Bridge to provide VOS residents access to MNR platform without having to walk all the way down to East Parkway.	DISPOSITION: ☐ **Accept**- will incorporate all or part of VE rec. into the design ☑ **Conditionally Accept**- will be studied further to validate the technical feasibility and/or potential cost savings; or, acceptance may be dependent on the EIS or other project decision document – justification required ☐ **Reject**- will not be incorporated into the design – justification required

Accepted Recommendation

Implemented Portions:

ADA access to the MNR Station NB platform will be eliminated as proposed, due to existing ADA access to the NB platform via elevator, south of the project limits on East Parkway. In addition, Metro-North has future plans for a third track along the Harlem line, which could potentially impact the existing NB platform and the proposed adjacent ADA ramp.

ADA accessible ramps connecting to the SB Metro North platform will remain as originally proposed.

Estimated Savings or Added Cost: $50,000

Conditionally Accepted and Rejected Recommendations

Justification:

Enhancing pedestrian access to the BRPR from the Village of Scarsdale is a project objective that will continue to be achieved. Providing stairs in lieu of ramps is dependent upon DOT/FHWA & MNR concurrence that ADA access would not be required.

Approved by: Ralph Butler

Westchester County, Commissioner of Public Works: Ralph L. Butler, PE Date: 2/12/09

NYSDOT VALUE ENGINEERING
REGIONAL DISPOSITION FORM

Project: Replacement of Structures Carrying the Bronx River Parkway Over the Bronx River and the Metro-North Railroad Village of Scarsdale & Town of Greenburgh Westchester County NY	PIN 8119.10
VE Rec Description Add ADA elevator to Metro North Inbound platform from East Parkway overhead walkway.	VE Rec No. 2
Technical Feasibility: No technical studies have been performed with regards to installing an elevator, as this is not part of the project.	DISPOSITION ☐ **Accept**- will incorporate all or part of VE rec. into the design ☐ **Conditionally Accept**- will be studied further to validate the technical feasibility and/or potential cost savings; or, acceptance may be dependent on the EIS or other project decision document – justification required ☒ **Reject**- will not be incorporated into the design – justification required

Accepted Recommendation

Implemented Portions:

Adding an ADA elevator to Metro-North Inbound platform from East Parkway overhead walkway will not be incorporated and is considered beyond the scope of the project.

Estimated Savings or Added Cost: None

Conditionally Accepted and Rejected Recommendations

Justification:

Improvements to Metro North Railroad facilities are not part of this project. ADA access to the BRPR, near the proposed structure was requested by Village of Scarsdale residents at public meetings, therefore ADA ramps were included to the BRPR.

Approved by Ralph L. Butler

Westchester County, Commissioner of Public Works Ralph L. Butler, PE Date 2/10/09

NYSDOT VALUE ENGINEERING
REGIONAL DISPOSITION FORM

Project: Replacement of Structures Carrying the Bronx River Parkway Over the Bronx River and the Metro-North Railroad Village of Scarsdale & Town of Greenburgh Westchester County, NY	PIN 8115.13
VE Rec Description Additional ground level signage	VE Rec No. 5
Technical Feasibility: Adding additional signage is technically feasible. No further investigation necessary.	DISPOSITION ☑ Accept- will incorporate all or part of VE rec. into the design ☐ Conditionally Accept- will be studied further to validate the technical feasibility and/or potential cost savings; or acceptance may be dependant on the EIS or other project decision document justification required ☐ Reject- will not be incorporated into the design – justification required

Accepted Recommendations

Implemented Portions:

Additional ground level signage to improve safety at the BRP will be implemented in this project, as proposed in the design report. Additional signage will be designed in the final design phase of activities.

Estimated Savings or Added Cost: None, the design report already includes $ 200,000 for new signage.

Conditionally Accepted and Rejected Recommendations

Justification:

Approved by _____

Westchester County, Commissioner of Public Works Ralph J. Rutter, PE Date 3/10/09

NYSDOT VALUE ENGINEERING
REGIONAL DISPOSITION FORM

Project: Replacement of Structures Carrying the Bronx River Parkway Over the Bronx River and the Metro North Railroad Village of Scarsdale & Town of Greenburgh Westchester County, NY	PIN: 8110.10
VE Recommendation: Radar feedback speed display.	VE Rec No. 4
Technical Feasibility: Adding radar feedback speed display signs is technically feasible. No further investigation necessary.	DISPOSITION ☑ Accept- will incorporate all or part of VE rec. into the design ☐ Conditionally Accept- will be studied further to validate the technical feasibility and/or potential cost savings; or, acceptance may be dependent on the EIS or other project decision document – justification required. ☐ Reject- will not be incorporated into the design – justification required

Accepted Recommendation

Implemented Portions:

Radar feedback speed display signs should be installed at both the north and south Bridge approaches and implemented during final design.

Estimated Savings or Added Cost: $ (62,560)

Conditionally Accepted and Rejected Recommendations

Justification:

Approved by: Ralph Butler

Westchester County, Commissioner of Public Works: Ralph L. Butler, PE Date: 3/11/09

NYSDOT VALUE ENGINEERING
REGIONAL DISPOSITION FORM

Project: Replacement of Structures Carrying the Bronx River Parkway Over the Bronx River and the Metro-North Railroad Village of Scarsdale & Town of Greenburgh Westchester County, NY	PIN: 8110.13
VE Rev Description Reduce inside shoulders to 1.5 feet and increase deceleration lane width from 10 feet to 11 feet	VE Rec No.: 8
Technical Feasibility: Widening the turning lane shoulder is technically feasible. No further investigation necessary.	DISPOSITION ☐ **Accept**- will incorporate all or part of VE rec. into the design ☑ **Conditionally Accept**- will be studied further to validate the technical feasibility and/or potential cost savings; or, acceptance may be dependent on the EIS or other project decision document – justification required. ☐ **Reject**- will not be incorporated into the design – justification required

Accepted Recommendation

Implementer Portions:

The deceleration lane width will be increased from 10 feet to 11 feet. Reducing inside shoulders to 1.5 feet to achieve the increased deceleration lane was not considered appropriate. 2.5' shoulders will be provided to maintain sight distance.

Estimated Savings in Actual Cost: ($88,000)

Conditionally Accepted and Rejected Recommendations

Justification:

It is proposed that the inside shoulders remain the proposed 2.5'. Reducing the inside shoulder by 1' reduces the critical horizontal sight distance, which is a non-standard feature. Due to the high accident rate along the reverse curve it is recommended that the inside shoulder remain 2.5'.

The deceleration lane will be increased from 10' to 11' by widening the structure. Widening the structure would increase cost by $88,000

Approved by: Ralph L. Butler

Westchester County, Commissioner of Public Works: Ralph L. Butler, PE Date: 2/10/09

NYSDOT VALUE ENGINEERING
REGIONAL DISPOSITION FORM

Project: Replacement of Structures Carrying the Bronx River Parkway Over the Bronx River and the Metro-North Railroad Village of Scarsdale & Town of Greenburgh Westchester County, NY	PIN 8110.19
VE Rec Description Use 4 percent for shoulder cross-slopes, both inside and outside, and make first through lane 1.5 percent and 2 percent for next lane, and 2.5 percent for auxiliary lane.	*VE Rec No. 8*
Technical Feasibility. Where normal crown cross slope can be obtained along at-grade portions of the parkway, varying shoulder cross-slopes would be provided. Varying cross slopes would not be included on superelevated sections or on structures. Further investigation is required to determine limits where normal crown cross slope can be obtained.	DISPOSITION ☐ **Accept**- will incorporate all or part of VE rec. into the design. ☒ **Conditionally Accept**- will be studied further to validate the technical feasibility and/or potential cost savings; or acceptance may be dependent on the EIS or other project decision document – justification required. ☐ **Reject**- will not be incorporated into the design – justification required.

Accepted Recommendation

Implemented Portions.

Shoulder breaks will be provided on at grade portions of the Parkway. Varying cross-slopes will be considered in the design phase for non-superelevated portions of the at grade roadway. Varying superelevations are not proposed on the structures.

Estimated Savings or Added Cost: None

Conditionally Accepted and Rejected Recommendations

Justification:

The project contains two sight reverse curves and will require the use of superelevation along portions of the Parkway. Outside the limits of superelevated sections of the at-grade Parkway where normal crown is provided, varying cross slopes will be implemented.
Further detail regarding superelevation and shoulder breaks will be evaluated during the design process.

Approved by: Ralph Butler

Westchester County, Commissioner of Public Works: Ralph L. Butler, PE Date: 3/10/09

NYSDOT VALUE ENGINEERING

REGIONAL DISPOSITION FORM

Project: Replacement of Structures Carrying the Bronx River Parkway Over the Bronx River and the Metro-North Railroad Village of Scarsdale & Town of Greenburgh Westchester County, NY	*PIN 8110.13*
VE Rec Description Use Compound Curves for NB BRP Scarsdale Ramp to East Parkway South.	*VE Rec No. 7*
Technical Feasibility: A three centered compound curve for a 135 degree angle of turn was evaluated at the NB BRP Scarsdale Ramp to East Parkway South.	DISPOSITION ☐ **Accept** will incorporate all or part of VE rec. into the design ☒ **Conditionally Accept** will be studied further to validate the technical feasibility and/or potential cost savings; or, acceptance may be dependant on the EIS or other project decision document – justification required. ☐ **Reject**- will not be incorporated into the design – justification required

Accepted Recommendation

Implemented Portions:

A two centered compound curve is already being provided on the proposed NB BRP Scarsdale Ramp alignment

Estimated Savings or Added Cost: None

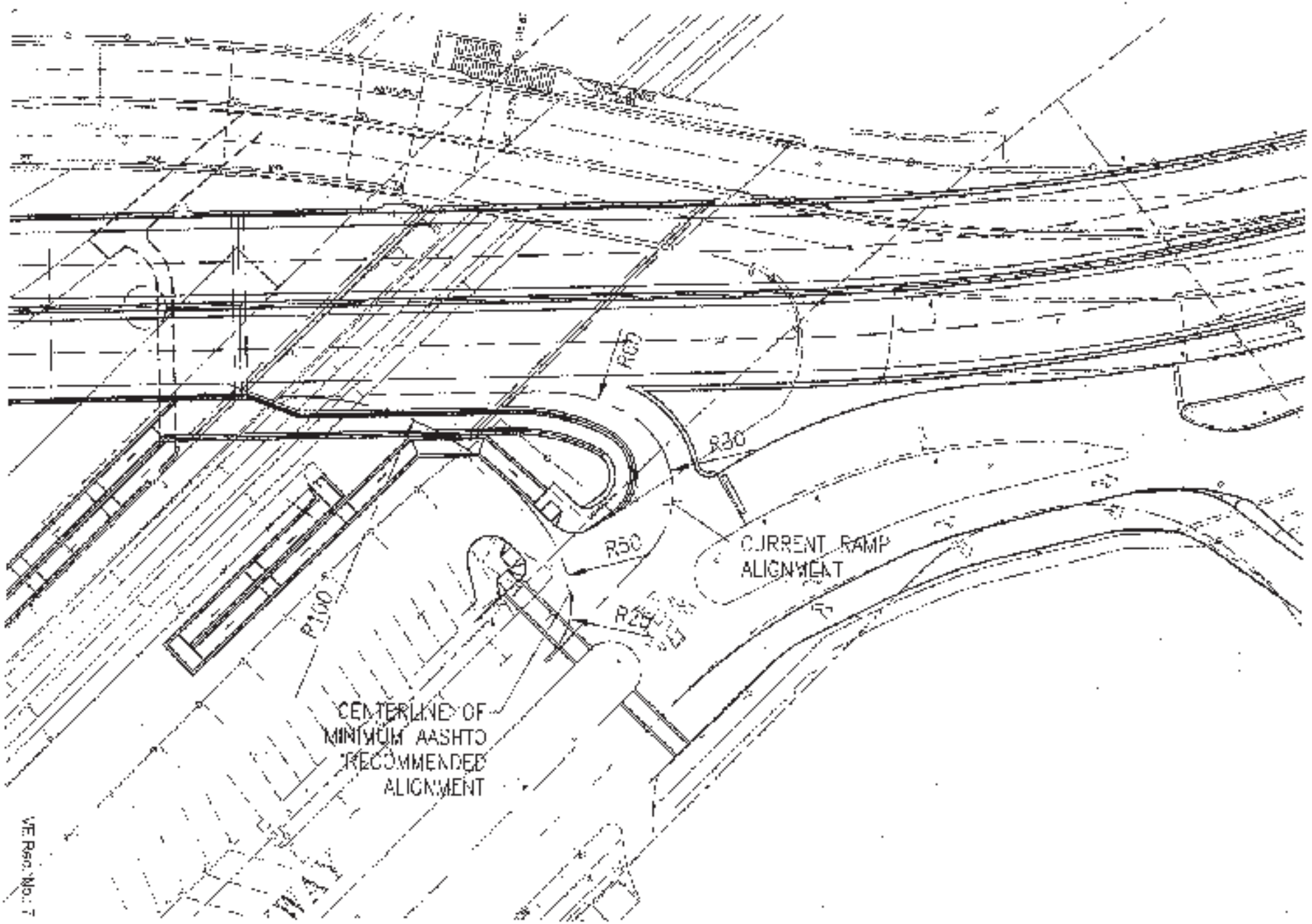
Conditionally Accepted and Rejected Recommendations

Justification:

Introducing a three centered compound curve at the BRP Crane Road Exit Ramp for a 135 degree angle of turn does not provide the advantages suggested in this proposal such as better speed transition, improved safety and matching vehicle wheel path more closely, without increasing the curve radii significantly. Recommended minimum radii, as suggested in AASHTO, are not an option in this case since one of our objectives is to avoid major impacts to the East Parkway / Crane Road intersection (see attached sketch)

Approved by Ralph L. Butler

Westchester County, Commissioner of Public Works Ralph L. Butler, PE Date 2/10/09


R50
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CURRENT RAMP
ALIGNMENT
CENTERLINE OF
MINIMUM AASHTO
RECOMMENDED
ALIGNMENT

NYSDOT VALUE ENGINEERING
REGIONAL DISPOSITION FORM

Project: Replacement of Structures Carrying the Bronx River Parkway Over the Bronx River and the Metro-North Railroad Village of Scarsdale & Town of Greenburgh Westchester County, NY	*PIN:* 8110.13
VE Rec Description: Eliminate broken back horizontal curve between 98 and 99 of Alternative C	*VE Rec No.:* 8
Technical Feasibility: The broken back horizontal curve was eliminated by elongating the tangent alignment on the MNR Bridge to the west. The elongated tangent shifts the PT of the Mushroom Bridge curve approximately 8' to the west, allowing the PC of the existing curve to intersect with the existing tangent section of the Parkway. This modification eliminates both the tangent section and additional curve near Stations 98 and 99	DISPOSITION ☒ **Accept**- will incorporate all or part of VE rec. into the design ☐ **Conditionally Accept**- will be studied further to validate the technical feasibility and/or potential cost savings; or, acceptance may be dependant on the EIS or other project decision document - justification required. ☐ **Reject**- will not be incorporated into the design - justification required

Accepted Recommendation

Implemented Portions:

Eliminating the broken back horizontal curve between Stations 98 and 99 under Alt. C will be incorporated in the design.

Estimated Savings or Added Cost: None.

Conditionally Accepted and Rejected Recommendations

Justification:

Approved by Ralph Butler

Westchester County, Commissioner of Public Works Ralph L. Butler, PE Date 2/10/09

NYSDOT VALUE ENGINEERING
REGIONAL DISPOSITION FORM

Project: Replacement of Structures Carrying the Bronx River Parkway Over the Bronx River and the Metro-North Railroad Village of Scarsdale & Town of Greenburgh Westchester County, NY	PIN 0110.15
VE Rec Description Use Spiral Curves for Mainline BRP	*VE Rec No* 9
Technical Feasibility Based on AASHTO's recommendations a spiral curve alignment was evaluated	DISPOSITION ☐ **Accept** - will incorporate all or part of VE rec. into the design ☐ **Conditionally Accept** - will be studying further to validate the technical feasibility and/or potential cost savings; or, acceptance may be dependant on the EIS or other project decision document - justification required. ☑ **Reject** - will not be incorporated into the design - justification required

Accepted Recommendation

Implemented Portions:

Using spiral curves for mainline BRP will not be incorporated into the design

Estimated Savings or Added Cost: None

Conditionally Accepted and Rejected Recommendations

Justification:

Introducing a spiral curve would not provide continuous geometry for the Mushroom Bridge (recommended in VE #19). A spiral curve alignment along the Mushroom Bridge would increase the complexity of constructing the deck segments, with each deck having a unique geometry.

In addition, according to AASHTO 2004 5th Edition, the safety benefits of spiral curve transitions are negligible when replacing the proposed radius of 503 m (995') (which achieves an approximate design speed of 80 kph (50mph)). AASHTO states that the benefits of spiral curves are negligible when replacing radius greater than 152 m (496') for a speed of 80 kph (50mph).

Approved by Ralph Butler

Westchester County, Commissioner of Public Works Ralph L. Butler, PE Date 2/10/09

NYSDOT VALUE ENGINEERING

REGIONAL DISPOSITION FORM

Project: Replacement of Structures Carrying the Bronx River Parkway Over the Bronx River and the Metro North Railroad Village of Scarsdale & Town of Greenburgh Westchester County, NY	*PIN:* 8110.13
VE Rec Description Increase profile grades from max. 5 percent to 7 percent.	*VE Rec No.* 11
Technical Feasibility: The Highway Design Manual (Chapter 2) was consulted to determine the maximum acceptable roadway grade.	DISPOSITION ☐ **Accept**- will incorporate all or part of VE rec. into the design ☐ **Conditionally Accept**- will be studied further to validate the technical feasibility and/or potential cost savings; or, acceptance may be dependent on the EIS or other project decision document – justification required ☒ **Reject**- will not be incorporated into the design – justification required

Accepted Recommendation

Implemented Portions:

Increasing the profile grade from max. 5 percent to 7 percent will not be incorporated into the design.

Estimated Savings or Added Cost: None

Conditionally Accepted and Rejected Recommendations

Justification:

Increasing the maximum grade to 7% does not meet the Design Criteria requirements established for the project or those for an Urban Arterial Expressway, and creates non standard grades and reduces the vertical stopping sight distance on the Parkway. Reducing vertical sight distance to existing elements to remain such as the Ardsley Road Bridge, Aqueduct Drive Access (southbound) and Crane Road access northbound would not be prudent.

Approved by [signature]

Westchester County Commissioner of Public Works Ralph L. Butler, PE Date 3/14/09

NYSDOT VALUE ENGINEERING

REGIONAL DISPOSITION FORM

Project: Replacement of Structures Carrying the Bronx River Parkway Over the Bronx River and the Metro North Railroad Village of Scarsdale & Town of Greenburgh Westchester County, NY	*PIN 8110.13*
VE Rec Description	*VE Rec No.* 12
Eliminate BRP SB Exit to Crane Road.	
Technical Feasibility: It is not feasible to eliminate movements from the parkway without suitable routing via other access points. Therefore access modifications to the Parkway are not part of the project.	DISPOSITION ☐ **Accept**- will incorporate all or part of VE rec. into the design ☐ **Conditionally Accept**- will be studied further to validate the technical feasibility and/or potential cost savings, or, acceptance may be dependent on the EIS or other project decision document – justification required ☒ **Reject**- will not be incorporated into the design – justification required

Accepted Recommendation

Implemented Portions:

Eliminating the BRP SB Exit to Crane Road will not be incorporated into the design.

Estimated Savings or Added Cost: None

Conditionally Accepted and Rejected Recommendations

Justification:

Eliminating the BRP SB Exit to Crane Road will effectively eliminate access to the Village of Scarsdale for vehicles traveling southbound on the BRP. The VE proposal indicates that vehicles can exit to Scarsdale at the SB Ardsley Road Exit. However, the existing traffic movement configuration at the SB Ardsley Road Exit prohibits left hand turns to Scarsdale.

The left hand turning movement was eliminated by Westchester County from the SB Ardsley Road Exit Ramp approximately 12 years ago for the following reasons:

- High accident rate
- Limited sight distance
- Limited queuing distance. (A traffic signal was investigated as a potential solution to accident and sight distance problems, but rejected due to limited queuing distance.)

Approved by Ralph Butler

Westchester County, Commissioner of Public Works Ralph L. Butler, PE Date 2/11/09

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NYSDOT VALUE ENGINEERING

REGIONAL DISPOSITION FORM

Project: Replacement of Structures Carrying the Bronx River Parkway Over the Bronx River and the Metro-North Railroad Village of Scarsdale & Town of Greenburgh Westchester County, NY	PIN 8110.13
VE Rec Description Install At-Grade Ramp for southbound BRP direct to East Parkway South.	*VE Rec No.* 13
Technical Feasibility Evaluated Figure II-9 provided in the VE Proposal	DISPOSITION ☐ **Accept**- will incorporate all or part of VE rec. into the design ☐ **Conditionally Accept**- will be studied further to validate the technical feasibility and/or potential cost savings; or acceptance may be dependant on the FIS or other project decision document – justification required ☒ **Reject**- will not be incorporated into the design – justification required

Accepted Recommendation

Implemented Portions:

Installing the at-grade ramp for southbound BRP directly to East Parkway South will not be incorporated into the design

Estimated Savings or Added Cost: None

Conditionally Accepted and Rejected Recommendations

Justification:

Installing an at-grade ramp for southbound BRP direct to East Parkway South has significant property and environmental impacts.

- R.O.W. Acquisition would be required from MNR to install the proposed at-grade ramp.
- MNR is proposing a third track that may interfere with proposed ramp layout.
- Additional disturbance to the Reservation, which includes land being utilized by Westchester County's Maintenance Facility.
- The existing topography would require the "at-grade ramp" to be on structure due to the sharp slope down to the railroad tracks.
- Introduction of a new traffic signal along a reverse curve bridge approach, which as proposed has non-standard sight distance, combined with vehicle queuing at the signal results in the potential for increased accidents for northbound motorists, and is considered less desirable than current operations due to the fact that we are crossing the Parkway all sections with less sight distance.
- The SB exit to East Parkway will interfere with the NB exit to East Parkway

Approved by [signature]

Westchester County, Commissioner of Public Works Ralph L. Butler, PE Date 2/10/09

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NYSDOT VALUE ENGINEERING
REGIONAL DISPOSITION FORM

Project: Replacement of Structures Carrying the Bronx River Parkway Over the Bronx River and the Metro-North Railroad Village of Scarsdale & Town of Greenburgh Westchester County, NY	PIN 8110.13
VE Rec Description Install adequate length NB Ramp from East Parkway to allow acceleration and merge	VE Rec No. 14
Technical Feasibility: Technically feasible however there would be environmental impacts on the Reservation.	DISPOSITION ☐ Accept- will be incorporate all or part of VE rec into the design ☐ Conditionally Accept- will be studied further to validate the technical feasibility and/or potential cost savings; or, acceptance may be dependent on the EIS or other project decision document – justification required. ☒ Reject- will not be incorporated into the design – justification required

Accepted Recommendation

Implemented Portions:

Installing adequate length NB Ramp from East Parkway to allow acceleration and merge will not be incorporated into the design.

Estimated Savings or Added Cost: None

Conditionally Accepted and Rejected Recommendations

Justification:

While technically feasible, the increased ramp would result in environmental impacts on the Reservation beyond the project limits. Additional project funding would be required.

Approved by: Ralph L. Butler

Westchester County, Commissioner of Public Works Ralph L. Butler PE Date 2/12/09

NYSDOT VALUE ENGINEERING

REGIONAL DISPOSITION FORM

Project: Reassessment of Structures Carrying the Bronx River Parkway Over the Bronx River and the Metro North Railroad Village of Scarsdale & Town of Greenburgh Westchester County, NY	PIN 9110.13
VE Rec Description: Leave existing bridge intact for historical purposes (not adopted)	VE Rec No. 15
Technical Feasibility: Due to the condition of the bridge, leaving the structure without performing rehabilitation and continued maintenance is not considered prudent or feasible.	DISPOSITION ☐ Accept- will incorporate all or part of VE rec. into the design ☐ Conditionally Accept- will be studied further to validate the technical feasibility and/or potential cost savings; or, acceptance may be dependent on the EIS or other project decision documents; justification required. ☑ Reject- will not be incorporated into the design; justification required

Accepted Recommendation

Implemented Portions:

Leaving the existing bridge intact for historical purposes will not be incorporated into the design.

Estimated Savings or Added Cost: None

Conditionally Accepted and Rejected Recommendations

Justification:

It is desirable to minimize the environmental impacts in the Reservation. Eliminating the existing bridge reduces the structure cover over the Reservation, and allows for native species to be re-introduced in its footprint, to offset the loss of vegetation from the new bridge footprint.

The existing bridge would require rehabilitation and continued maintenance to maintain safe access for pedestrians & cyclists traveling under the structure in the Reservation.

Also, leaving the existing bridge piers in the Bronx River along with the introduction of new bridge piers could impact the flood plain by increasing the number of piers located within the Bronx River and within the mapped floodplain.

Westchester County Dept. of Planning and SHPO have indicated in correspondence that the existing masonry bridge is not individually eligible to be listed on the National Register. An option of replicating existing arches of the existing structure on a new parallel bridge and documenting the existing bridge prior to demolition would be an acceptable alternative for historic purposes.

Approved by _____

Westchester County Commissioner of Public Works Ralph L. Butler, PE Date 2/11/09

NYSDOT VALUE ENGINEERING
REGIONAL DISPOSITION FORM

Project: Replacement of Structures Carrying the Bronx River Parkway Over the Bronx River and the Metro-North Railroad Village of Scarsdale & Town of Greenburgh Westchester County, NY	PIN 2110.10
VE Rec Description Use existing bridge as scenic overlook.	*VE Rec No.* 16
Technical Feasibility: Due to the condition of the bridge, leaving the structure without performing rehabilitation and continued maintenance is not considered prudent or feasible.	DISPOSITION ☐ **Accept**- will incorporate all or part of VE rec. into the design ☐ **Conditionally Accept**- will be studied further to validate the technical feasibility and/or potential cost savings; or, acceptance may be dependant on the E.S or other project decision document – justification required. ☑ **Reject**- will not be incorporated into the design – justification required

Accepted Recommendation

Implemented Portions:

Using the existing bridge as a scenic overlook will not be incorporated into the design

Estimated Savings or Added Cost: None

Conditionally Accepted and Rejected Recommendations

Justification:

It is desirable to minimize the environmental impact in the Reservation. Eliminating the existing bridge reduces the structural cover over the Reservation, and allows for native species to be reintroduced in its footprint, to offset the loss of vegetation from the new bridge footprint.

The existing bridge would require rehabilitation and continued maintenance to maintain safe access for pedestrians & cyclists travelling under the structure in the Reservation.

Also, leaving the existing bridge piers in the Bronx River along with the introduction of new bridge piers could impact the flood plain by increasing the number of piers located within the Bronx River and within the mapped floodplain.

Westchester County Dept. of Planning and SHPO have indicated in correspondence that the existing mushroom bridge is not individually eligible to be listed on the National Register. An option of replicating existing elements of the existing structure on a new parallel bridge and documenting the existing bridge prior to demolition would be an acceptable alternative for historic purposes.

Approved by Ralph Butler

Westchester County, Commissioner of Public Works Ralph L. Butler, PE Date 2/16/09

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NYSDOT VALUE ENGINEERING
REGIONAL DISPOSITION FORM

Project: Replacement of Structures Carrying the Bronx River Parkway Over the Bronx River and the Metro-North Railroad Village of Scarsdale & Town of Greenburgh Westchester County, NY	*PIN:* 8116.13
VE Rec Description Keep Historic Bridge as visual element allow to deteriorate.	*VE Rec No.:* 17
Technical Feasibility: Due to the condition of the bridge, leaving the structure without performing rehabilitation and continued maintenance is not considered prudent or feasible.	DISPOSITION ☐ Accept- will incorporate all or part of VE rec. into the design ☐ **Conditionally Accept**- will be studied further to validate the technical feasibility and/or potential cost savings; or, acceptance may be dependent on the EIS or other project decision document – justification required. ☑ **Reject**- will not be incorporated into the design – justification required

Accepted Recommendation

Implemented Portions:

Using the existing bridge as a visual element will not be incorporated into the design.

Estimated Savings or Added Cost: None

Conditionally Accepted and Rejected Recommendations

Justification:

It is desirable to minimize the environmental impact in the Reservation. Eliminating the existing bridge reduces the structural cover over the Reservation, and allows for native species to be maintained in its footprint to offset the loss of vegetation from the new bridge footprint.

The existing bridge would require rehabilitation and continued maintenance to maintain safe access for pedestrians & cyclists traveling under the structure in the Reservation.

Also, leaving the existing bridge piers in the Bronx River along with the introduction of new bridge piers could impact the flood plain by increasing the number of piers located within the Bronx River and within the mapped floodplain.

Westchester County Dept. of Planning and SHPO have indicated in correspondence that the existing mushroom bridge is not individually eligible to be listed on the National Register. An option of replicating existing elements of the existing structure on a new parallel bridge and documenting the existing bridge prior to demolition would be an acceptable alternative for historic purposes.

Approved by _____

Westchester County, Commissioner of Public Works: Ralph L. Butler, P.E. Date: 2/11/09

NYSDOT VALUE ENGINEERING
REGIONAL DISPOSITION FORM

Project: Replacement of Structures Carrying the Bronx River Parkway Over the Bronx River and the Metro North Railroad Village of Scarsdale & Town of Greenburgh Westchester County, NY	PIN: 9110.19
VE Rec Description Use new stone veneer on new bridge piers and abutments.	*VE Rec No.* 15
Technical Feasibility The use of new stone veneer is technically feasible, however re-use of the existing stone is more desirable for maintaining the size, shape, contour and reveal of the stone that contributes to the aesthetics of the bridge in relation with other structures within the BRPR	DISPOSITION ☐ **Accept**- will incorporate all or part of VE rec into the design ☐ **Conditionally Accept**- will be studied further to validate the technical feasibility and/or potential cost savings, or, acceptance may be dependant on the EIS or other project decision document – justification required. ☒ **Reject**- will not be incorporated into the design – justification required

Accepted Recommendation

Implemented Portions:

Re-use of the existing stone on the new bridge piers and abutments would be incorporated into the design. And where additional material is required, stone veneer would be incorporated.

Estimated Savings or Added Cost: None

Conditionally Accepted and Rejected Recommendations:

Justification:

Replicating the visual character of the existing bridge can not be achieved through the use of a stone veneer architectural treatment. The proposed stone veneer will not achieve the same texture, coloring, and reveals intended by re-using the existing stone from the piers and abutments of the Crane Road Bridge. nor would it be consistent with other stone structures within the BRPR. In addition, there are environmental advantages and cost savings associated with re-using the existing bridge stone. Re-using the existing bridge stone provides the following advantages when compared to using the new stone veneer:

- Eliminates additional environmental impacts resulting from quarrying the stone for the new stone veneer product.
- Saves fuel expended to transport new stone from the quarry to the factory, from the factory to the job site, and the fuel required to dispose of the existing bridge stone.
- Reduces labor required to quarry and manufacture stone veneer panels, and the labor for disposing of the existing bridge stone.
- The replacement bridge would retain the existing bridge's visual character in context with the Reservation (listed on the National Register of Historic Places where all bridges are contributing elements).

Approved by Ralph Butler

Westchester County, Commissioner of Public Works Ralph Butler, PE Date 2/10/09

NYSDOT VALUE ENGINEERING

REGIONAL DISPOSITION FORM

Project: Replacement of Structures Carrying the Bronx River Parkway Over the Bronx River and the Metro-North Railroad Village of Scarsdale & Town of Greenburgh Westchester County, NY	PIN: 8110.13
VE Recommendation: Maintain continuous geometry for mushroom pier segments.	VE Rec No.: 19
Technical Feasibility: While technically feasible, maintaining a continuous geometry through all mushroom sections is less desirable than the preferred alignment that minimizes the need for a temporary MPT bridge, minimizes construction staging, provides a geometry that is aesthetically similar to the existing bridge and minimizes the impact on the BRPR.	DISPOSITION: ☐ **Accept**- will incorporate all or part of VE rec. into the design ☐ **Conditionally Accept**- will be studied further to validate the technical feasibility and/or potential cost savings; or, acceptance may be dependant on the EIS or other project decision document - justification required. ☒ **Reject**- will not be incorporated into the design - justification required

Accepted Recommendations:

Implementation Portions:

The proposed alignment is based on maintaining a continuous geometry (4 out of 6 bays). Two of the remaining bays could not be continuous due to geometry restrictions.

Estimated Savings or Added Cost: None

Conditionally Accepted and Rejected Recommendations:

Justification:

The preferred alternative maintains a constant geometry for four out of six mushroom segments, maximizes the horizontal stopping sight distance, provides an alignment that minimizes the impacts on the BRPR, maximizes the distance between the Aqueduct Drive entrance and Ardsley Road exit, and provides geometry similar to the existing structure above the Bronx River and Scarsdale Lake. The alignment changes necessary for maintaining constant mushroom sections were evaluated and discarded for engineering and environmental reasons.

Approved by: _____

Westchester County, Commissioner of Public Works: Ralph J. Ruda, PE Date: 6/15/09

NYSDOT VALUE ENGINEERING
REGIONAL DISPOSITION FORM

Project: Rehabilitation of Structures Carrying the Bronx River Parkway Over the Bronx River and the Metro-North Railroad Village of Scarsdale & Town of Greenburgh Westchester County, NY	PIN 9110.12
VE Rec Description: Construct bridge deck as single operation in lieu of half deck at a time.	VE Rec No. 20
Technical Feasibility: Alignments that did not require construction staging of the deck were considered, (i.e. constructing an MPT bridge, constructing a new bridge outside of the footprint of the existing bridge, etc.) evaluated, and discarded for cost engineering and environmental reasons during the alternative evaluation phase.	DISPOSITION ☐ Accept- will incorporate all or part of VE rec. into the design ☐ Conditionally Accept- will be studied further to validate the technical feasibility and/or potential cost savings; or, acceptance may be dependent on the EIS or other project decision document – justification required ☒ Reject- will not be incorporated into the design justification required

Accepted Recommendation

Implemented Portions:

Most of the mushroom bridge can be built 4-lanes at a time to maximize radii and sight distance, except for the southwest portion of the bridge. Eliminating staged construction of the southwest bridge portions requires a temporary bridge. Additionally, the Metro North Bridge will be constructed half at a time to allow for the proposed structure to be further north to achieve improved sight distance and a new deceleration lane for the Crane Road NB exit ramp.

Estimated Savings or Added Cost: None

Conditionally Accepted and Rejected Recommendations

Justification:

Moving the BRP alignment southeast to allow for the mushroom bridge deck to be constructed as a single operation creates the following conflicts/undesirable features:

- SB Ardsley Road exit Ramp needs to be modified for new BRP alignment.
- Aqueduct Drive entrance Ramp needs to be extended to revised Parkway locations (this includes additional structure to support the Ramp).
- The extension of Aqueduct Drive will place the SB Ardsley Road exit Ramp in conflict (insufficient weave distance).
- Additional roadway widening required in the Reservation at the approach to the south.
- Additional impacts to Scarsdale Parking Lot.
- Impacts new pedestrian path & bridge @ Scarsdale Lake.
- The alignment would require additional construction of piers within the Bronx River and within the adjacent flood plain.
- The geometry of the Crane Road northbound exit ramp would be less desirable and contain non-standard elements beyond those proposed in the preferred alternative.

Approved by: Ralph Butler

Westchester County, Commissioner of Public Works: Ralph J. Butler, PE. Date: 2/13/09

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NYSDOT VALUE ENGINEERING
REGIONAL DISPOSITION FORM

Project: Replacement of Structures Carrying the Bronx River Parkway Over the Bronx River and the Metro-North Railroad Village of Scarsdale & Town of Greenburgh Westchester County, NY	*PIN: 8110.13*
VE Rec Description: Move bridge further toward southeast.	*VE Rec No.:* 21
Technical Feasibility: Alignments that did not require construction staging of the deck were considered. (i.e. constructing an MPT bridge, constructing a new bridge outside of the footprint of the existing bridge, etc.) evaluated, and discarded for cost engineering and environmental reasons during the alternative evaluation phase.	DISPOSITION ☐ **Accept**- will incorporate all or part of VE rec. into the design ☐ **Conditionally Accept**- will be studied further to validate the technical feasibility and/or potential cost savings; or, acceptance may be dependent on the FIS or other project decision document – justification required ☒ **Reject**- will not be incorporated into the design justification required

Accepted Recommendation

Implemented Portions:

Moving the bridge further toward the southeast will not be incorporated into the design.

Estimated Savings or Added Cost: None

Conditionally Accepted and Rejected Recommendations

Justification:

During agency review process and public participation periods, comments were made on maintaining the curvilinear alignment that is a contributing characteristic to the Bronx River Parkway's National Register listing. Moving the bridge further south creates smaller radii either on the north or south side of the proposed bridges which translates to less sight distance.

Moving the BRP alignment southeast to allow for the mushroom bridge deck to be constructed as a single operation creates the following conflicts/undesirable features:

- SB Ardsley Road exit Ramp needs to be modified for new BRP alignment
- Aqueduct Drive entrance Ramp needs to be extended to revised Parkway locations (this includes additional structure to support the Ramp).
- The extension of Aqueduct Drive will place the SB Ardsley Road exit Ramp in conflict (insufficient weave distance).
- Additional construction required in the Reservation at the approach to the south.
- Additional impacts to Scarsdale Parking Lot
- Impacts new pedestrian path & bridge @ Scarsdale Lake.
- The alignment would require additional construction of piers within the Bronx River and within the adjacent flood plain.
- The geometry of the Crane Road northbound exit ramp would be less desirable and contain non-standard elements beyond those proposed in the preferred alternative

Approved by Ralph Butler

Westchester County, Commissioner of Public Works Ralph L. Butler, PE Date 2/10/09

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NYSDOT VALUE ENGINEERING

REGIONAL DISPOSITION FORM

Project: Replacement of Structures Carrying the Bronx River Parkway Over the Bronx River and the Metro North Railroad Village of Scarsdale & Town of Greenburgh Westchester County, NY	*PIN:* 8110.10
VE Rec Description Construct new bridge as modern economical structure.	*VE Rec No.:* 22
Technical Feasibility: While technically feasible, a modern bridge would not be consistent with the construction type and materials used throughout the BRPR. The alignment, construction materials and structure type that replicates the existing structure was selected in consultation with WCDPR, Bronx River Parkway Conservancy, and SHPO to minimize the potential of impacts of the project on the BRPR and other elements that contribute to the BRPR listing on the National Register.	DISPOSITION ☐ **Accept**- will incorporate all or part of VE rec. into the design ☐ **Conditionally Accept**- will be studied further to validate the technical feasibility and/or potential cost savings, or, acceptance may be dependent on the EIS or other project decision document – justification required. ☒ **Reject**- will not be incorporated into the design – justification required

Accepted Recommendations

Implemented Portions:

Constructing the new bridge as modern economical structure will not be incorporated into the design.

Estimated Savings or Added Cost: None

Conditionally Accepted and Rejected Recommendations

Justification:

Through ongoing consultation with SHPO, WCDPR, and WCDP the replacement structure over the Bronx River would replicate the existing bridge's mushroom piers, rainlinear alignment, profile, elevation and material so that impacts of the project on the BRPR is minimized. Providing a modern structure would not be consistent with planning objectives that were established for the BRPR and the structures that contribute to the BRPR listing on the National Register of Historic Places.

Approved by Ralph Butler

Westchester County, Commissioner of Public Works Ralph L. Butler, PE Date 2/10/09

NYSDOT VALUE ENGINEERING
REGIONAL DISPOSITION FORM

Project: Replacement of Structures Carrying the Bronx River Parkway Over the Bronx River and the Metro-North Railroad Village of Scarsdale & Town of Greenburgh Westchester County, NY	*PIN:* 8110.15
VE Rec Description: Crane Road Underpass improves BRP geometry.	*VE Rec No.:* 23
Technical Feasibility: An Underpass option was reviewed under the alternative screening process and was eliminated. See attached sketch.	DISPOSITION ☐ **Accept**- will incorporate all or part of VE rec. into the design ☐ **Conditionally Accept**- will be studied further to validate the technical feasibility and/or potential cost savings, or, acceptance may be dependent on the E.S. or other project decision document – justification required. ☒ **Reject**- will not be incorporated into the design – justification required
Accepted Recommendation	
Implemented Portions: A SB Crane Road Underpass Exit will not be incorporated into the design	
Estimated Savings or Added Cost:	
Conditionally Accepted and Rejected Recommendations	
Justification: The following SB Crane Road Underpass was previously considered. The following are impacts associated with this proposal: • Significant environmental impacts to the Reservation. • New retaining walls & bridge structure for the BRP will be required adding a significant cost to the project. • Drainage concerns with the underpass • More costly • Visual impacts.	

Approved by _____

Westchester County Commissioner of Public Works Ralph L. Boehner Date 2/10/09

NYSDOT VALUE ENGINEERING

REGIONAL DISPOSITION FORM

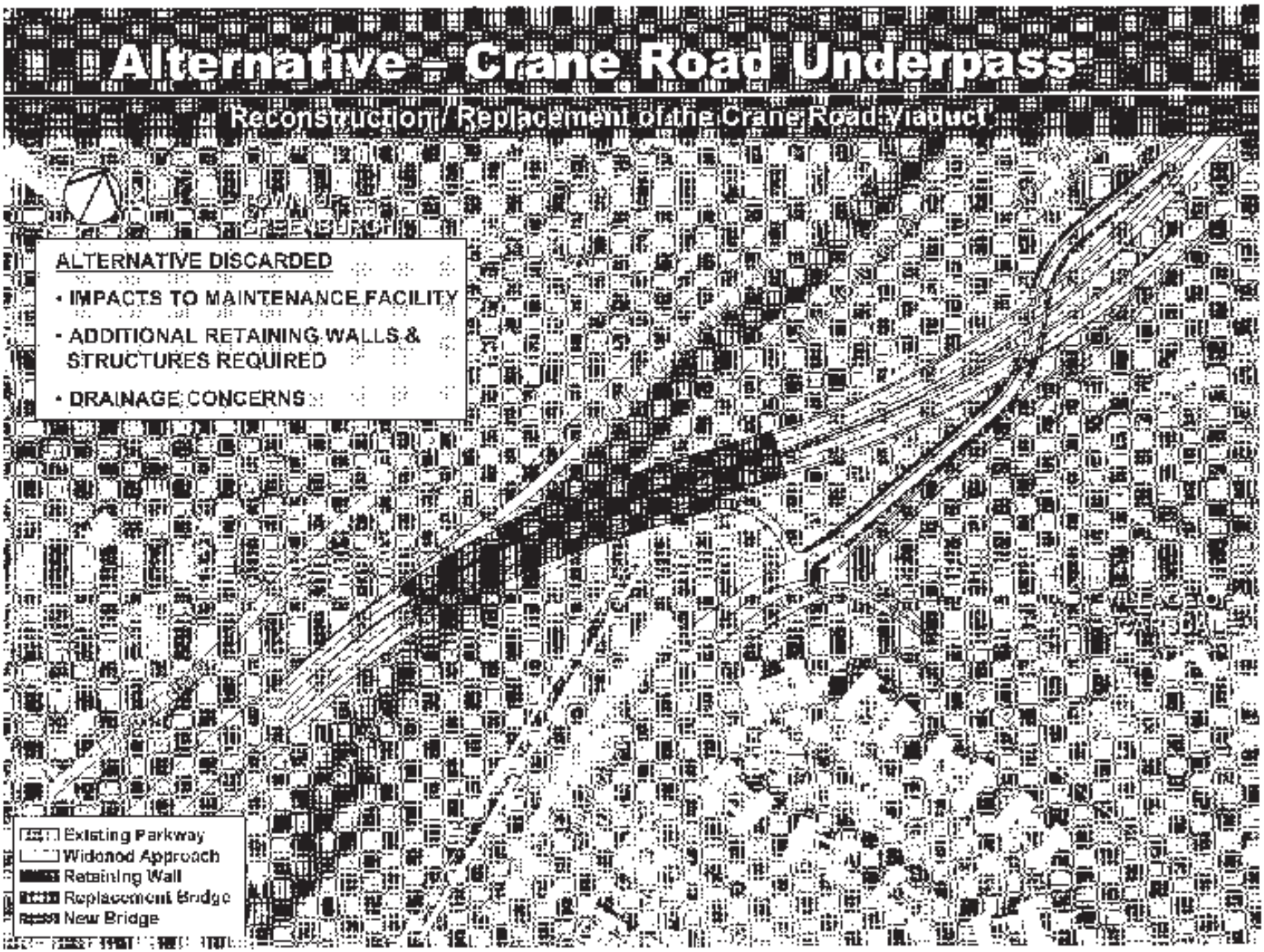
Project: Replacement of Structures Carrying the Bronx River Parkway Over the Bronx River and the Metro North Railroad Village of Scarsdale & Town of Greenburgh Westchester County, NY	*PIN:* 8110.10
VE Rec Description Eliminate Broken Back Vertical Curve at Station 108 of Alternative C.	*VE Rec No.* 10
Technical Feasibility: A new vertical curve was evaluated that eliminates the broken back vertical curve.	DISPOSITION ☑ **Accept**- will incorporate all or part of VE rec. into the design ☐ **Conditionally Accept**- will be studied further to validate the technical feasibility and/or potential cost savings; or, acceptance may be dependent on the EIS or other project decision document – justification required. ☐ **Reject**- will not be incorporated into the design – justification required
Accepted Recommendation	
Implemented Portions: Eliminate the broken back vertical curve at Station 108 under A.. C.	
Estimated Savings or Added Cost $9,320	
Conditionally Accepted and Rejected Recommendations	
Justification:	

Approved by [signature]

Westchester County, Commissioner of Public Works Ralph L. Butler, PE Date 2/10/09

Alternative – Crane Road Underpass

Reconstruction / Replacement of the Crane Road Viaduct



VE Rec No. 22

Value Engineering Report

December 2008

JACOBS
Edwards and Kelcey

New York State
Department of Transportation
Region 8

Bronx River Parkway
Crane Road Bridge Replacement
Village of Scarsdale and
Town of Greenburgh

Westchester County, NY
NYSDOT PIN 8110.13

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D. Design presentation Meeting
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I. Executive Summary

JACOBS

I. EXECUTIVE SUMMARY

A. Project Description

Jacobs Edwards and Kelcey was commissioned by the New York State Department of Transportation to perform a 5-day Value Engineering Study for the proposed reconstruction of the Bronx River Parkway bridges over the Bronx River and Metro-North Railroad tracks located in the vicinity of Crane Road in the Village of Scarsdale, Westchester County, New York. The Draft Design Report was prepared by Stantec Consulting for Westchester County Department of Public Works, dated November 5, 2008. The Federal funding for this project administered by the New York State Department of Transportation necessitated a Value Engineering (VE) Study.

The Crane Road Bridge, constructed in 1925, is a unique design made up of six 'mushroom bridge' single center pier supported segments. The bridge has increasingly deteriorated, with two separate incidents where holes developed in the concrete deck, which resulted in travel lane closures until repairs could be completed. The need is to replace the bridge in its entirety, which includes the bridge over Metro-North Railroad. The intent is to replace the 'mushroom bridge' with a new bridge having the same design. The Bronx River Parkway Restoration area and the 'mushroom' bridge are seeking to have the area declared historic.

The highway alignment before and after the bridge has sharp curves, plus this section of highway has several non-standard features. In turn the accident rate in for the section of highway is 4 to 5 time the state average.

Based upon the Draft Design Report several design alternates have been proposed to the public. The current preferred design option is Alternate C.

This report documents the results of the study effort, and the processes and procedures used. Value Engineering methods and procedures are described in Appendix A of the report and includes the names and disciplines of the team members. A list of documents furnished to the study team, site visit observations, and project function identification are included in Appendix B. Appendix C includes a listing of all the ideas generated during Brainstorming and the results of the Idea Evaluation process. Appendices D and E contain minutes of the Presentation Meeting by the Design Team and the Presentation Meeting by the VE Team at the end of the VE Study.

B. Cost Estimate

The Preliminary project estimate of $37,084,400 (including 31.4% contingency) was prepared by Stantec, and is dated November 5, 2008. The project cost estimate was used as the primary basis of costing for this VE study. A more complete discussion of the estimated project cost and the cost models is included in Section III.

C. Summary of VE Proposals

1. Twenty-seven (27) Ideas were generated by the VE Team for this project. A complete list is contained in Appendix C, along with the evaluation of the ideas.

2. Twenty-three (23) Proposals that included ten (10) Design Suggestions were presented as a result of ideas generated by the VE Team. A summary tabulation of the Value Engineering Proposals is included at the end of this section, and copies of all proposals and Design Suggestions (DS), with backup, are included in Section II. All proposals and design suggestions generated by the VE Team were reviewed for their respective value, cost, or merit.

3. The proposals address several themes which include improving highway alignment, intersection alignments, bridge constructability, project schedule, keeping portions of the historic structure and pedestrian access.

4. A suggested alignment is proposed which would relocate the Alternate C alignment toward the south east. The alternate alignment, or one that is similar, offers the above desired advantages to the project plus the improved alignment should reduce the accident rate this section of highway has experienced.

5. Several proposals are offered to improve highway safety and reduce the accident rate.

6. It is recognized that the project is a design in progress. Some ideas were generated to assist that process.

7. All potential savings are based upon the above-defined criteria and/or criteria defined in the content of the respective proposals, as tabulated below.

Based on the developed proposals only, the maximum coincident initial savings addressed in this report is approximately

$ 10,854,661,
or
29.2 %

of the current $37,084,400 project cost estimate (including contingency). The maximum coincident savings is the combination of proposals that can be simultaneously exercised and represent the maximum combined savings to this project.

II. VE PROPOSALS AND DESIGN SUGGESTIONS

The table below presents a summary of the VE Proposals and Design Suggestions developed during the course of this VE Study. See Appendix C for detailed write-ups of the proposals summarized below.

Proposal No.	DESCRIPTION	Potential Savings
	Pedestrian Access	
1	Install stairs only at Crane Road to MNR platforms	**$ 100,000**
2	Add ADA elevator to Metro-North Inbound platform from East Parkway overhead walkway	$ (100,000)
	Highway	
3	Additional ground-level signage	$ (39,369)
4	Radar feedback speed display	$ (52,560)
5	Reduce inside shoulders to 1.5 feet and increase deceleration lane width from 10 feet to 11 feet	Design Suggestion
6	Use 4 percent for shoulder cross-slopes, both inside and outside, and make first through lane 1.5 percent and 2 percent for next lane, and 2.5 percent for auxiliary lane	Design Suggestion
7	Use Compound Curves for NB BRP Scarsdale Ramp to East Parkway South	Design Suggestion
8	Eliminate broken back horizontal curve between. 98 and 99 of Alternative C	Design Suggestion
9	Use Spiral Curves for Mainline BRP	Design Suggestion
10	Eliminate Broken Back Vertical Curve at Station 106 of Alternative C	**$ 9,320**
11	Increase profile grades from max. 5 percent to 7 percent	**$ 4,101**

Proposal No.	DESCRIPTION (Continued)	Potential Savings
	Crane Road Exit	
12	Eliminate BRP SB Exit to Crane Road	Design Suggestion
13	Install At-Grade Ramp for southbound BRP direct to East Parkway South	$ (349,370)
14	Install adequate length NB Ramp from East Parkway to allow acceleration and merge	Design Suggestion
	Historic Bridge	
15	Leave existing bridge intact for historical purposes (rehab/protect)	$ 1,540,665
16	Use existing bridge as scenic overlook	$ 1,227,865
17	Keep Historic Bridge as visual element; allow to deteriorate	**$ 1,944,720**
	Replacement Bridge and Alignment	
18	Use new stone veneer on new bridge piers and abutments	**$ 500,000**
19	Maintain continuous geometry for mushroom pier segments	Design Suggestion
20	Construct bridge deck as single operation in lieu of half deck at a time	Constructability
21	Move bridge further toward southeast	$ 2,836,414
22	Construct new bridge as modern economical structure	**$ 8,296,520**
23	Crane Road Underpass improves BRP geometry	Concept Suggestion
	Maximum Coincident Savings[1]	**$ 10,854,661**

[1] **Maximum Coincident Savings is the sum of proposals that could be simultaneously implemented and generate the maximum project cost savings. Proposal costs highlighted in black are summed up to be maximum coincident savings.**

II. VE Proposals

VE RECOMMENDATION	Proposal No. 1
JACOBS	Project: Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Current Design:

ADA-compliant ramps are proposed at the north end of both inbound and outbound platforms of MNR Scarsdale station, leading up to the vicinity of East Parkway and Crane Road. A sidewalk on the Bronx River Parkway Bridge over the MNR tracks would provide access to the inbound platform ramp west of the tracks. The outbound platform ramp would be built into the steep slope immediately east of the outbound platform.

Description of VE Alternative - Idea No. 26:

The VE Team suggests installing stairs only at the north end of the Scarsdale station platforms up to the East Parkway and Crane Road vicinity, with the sidewalk on the BRP railroad bridge providing access to the inbound platform stairs.

Advantages:

- Lower cost
- Visually less intrusive
- Outbound platform is already ADA accessible via elevator from East Parkway
- Savings can be applied to Proposal No. 2

Disadvantages:

- Persons in the vicinity of Crane Road needing barrier-free access will need to travel to the elevator in the Scarsdale station building
- A second elevator would be needed at Scarsdale station (see Proposal No. 2) to provide barrier-free access to the inbound ramp from East Parkway

Cost Summary			
	Capital Cost	O&M Cost	Total
Original	$200,000		$200,000
Proposed	$100,000		$100,000
Savings	**$100,000**		**$100,000**

Discussion - Idea No. 26:

The VE Team views the proposed ADA ramps at the north end of the MNR Scarsdale station platforms as a costly and visually intrusive solution to the need to provide station and park accessibility. The length required in order for the ramps to negotiate the ±15-foot change in grade (1:12 maximum ramp slope, plus 36-inch level landings every 30 feet, plus level turnarounds) almost nullifies any advantage gained by not traveling to the existing elevator (on level ground).

The Scarsdale MNR station currently contains one elevator, which provides ADA access from East Parkway down to the outbound platform (east side of the tracks), in the vicinity of the overhead walkway. The existing elevator on the outbound side of the station obviates the need for a ramp on this side.

On the other hand, the inbound platform (west side of the tracks) is not ADA accessible from East Parkway, although the inbound platform is ADA accessible from Depot Place. Therefore, persons requiring barrier-free access to the inbound platform currently are required to approach the station from the west entrance, with vehicular access from Popham Road. An elevator at the station building, as recommended in VE Proposal 2, would better serve the public than the proposed ramp between the inbound (west) platform and the BRP Bridge over the railroad.

VE RECOMMENDATION	Proposal No. 2
JACOBS	Project: Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Current Design:

No modifications are proposed to the Metro-North Scarsdale Station.

Description of VE Alternative - Idea No. 27:

The VE Team proposes the addition of an ADA-compliant elevator to/from the Metro-North Inbound platform at the overhead walkway at Scarsdale Station.

Advantages:

- Provides more ADA functionality
- Completes ADA access to and across both sides of station
- Provides ADA access to the Park

Disadvantages:

- Additional cost
- Metro-North Railroad may be required to install the elevator
- May required special consideration to be covered by the project federal funding

Cost Summary			
	Capital Cost	O&M Cost	Total
Original	0	0	0
Proposed	$100,000[1]	0	($100,000)
Additional cost	($100,000)	**0**	**($100,000)**

[1] Elevator pricing is based upon other hydraulic elevator installations at similar NYCT stations.

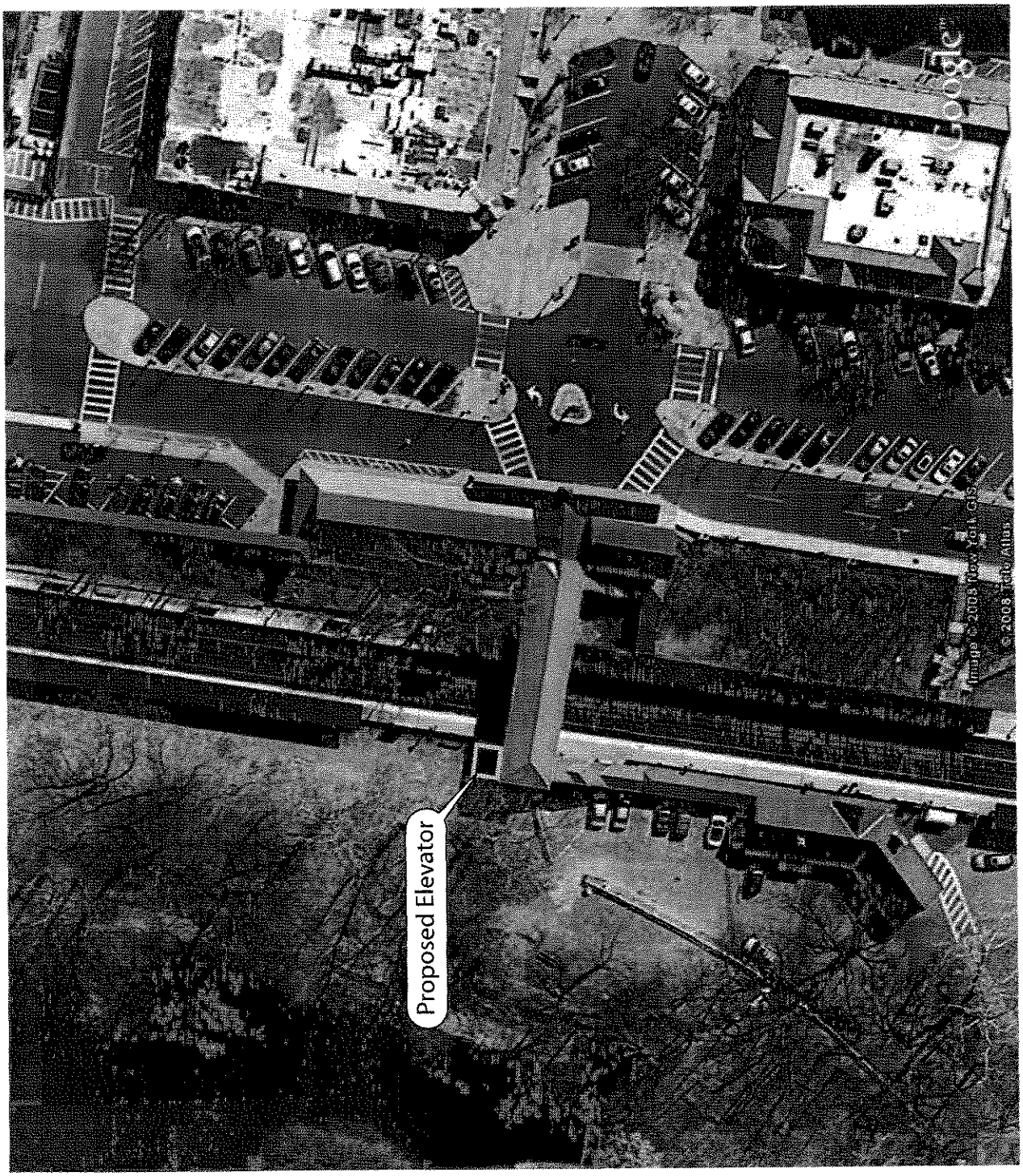
Discussion – Idea No. 27:

The ADA access to the Metro-North Scarsdale station from East Parkway to the platform level currently contains of one elevator, which allows outbound platform service only (east side of the tracks). The elevator is accesses at the east side of the overhead walkway. Currently, the inbound platform (west of the tracks) is not ADA accessible from East Parkway.

Persons requiring barrier-free access to the inbound platform currently are required to approach the station from the west entrance, with vehicular access from Depot Place, via Popham Road. Upon making the round trip return to Scarsdale that person, if parked at the station, thus have no means of crossing the tracks, to get back to their car, other than taking a circuitous route uphill or downhill via Popham Road.

The VE Team views the existing condition as incomplete from an accessibility standpoint. The addition of an elevator west of the tracks would conveniently complete ADA accessibility with minimal visual impact. A suggested layout is attached. The intent of the proposed layout would allow ADA elevator access to the overhead bridge, at the outbound platform and a walkway to be installed at the Depot Place parking lot level.

VE RECOMMENDATION	Proposal No. 2
JACOBS	Project: Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**



VE RECOMMENDATION	Proposal No. 3
JACOBS	Project: Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Current Design:

The current preliminary design does not yet show signage. For example, there is not yet signage on the ramp and there are no speed reduction devices.

Description of VE Alternative - Idea No. 2:

Add additional ground level signage. The highway has an accident rate four to five times that state average, sharp curves and less than desirable access/egress conditions at Crane Road. Suggested signage includes highway ramp signage (W1-13, W13-2, and W13-3) and Chevron alignment signs (W1-8). Also consider raised reflectorized snowplowable pavement markers.

Installation of various signs and pavement features to heighten driver awareness of upcoming conditions should reduce the number of errant vehicles and rollover incidents.

Advantages:

- Improves safety
- Delineates roadway
- Increases driver awareness
- Reduces speed

Disadvantages:

- Adds cost
- Adds maintenance

Add estimate sheet

Cost Summary			
	Capital Cost	O&M Cost	Total
Original	0		0
Proposed	$38,369		$38,369
Savings (Add Cost)	($38,369)		**($38,369)**

COST WORKSHEET

Proposal No: 3
Idea No: 2

Item	Qty	Unit	Original Estimate Cost	Original Estimate Total	New Estimate Cost	New Estimate Total
Current Design						
Proposed Design						
item # 645.7113	80	sm			260	$ 20,800
item # 685.0310	70	ea			40	$ 2,800
item # 685.0311	140	ea			40	$ 5,600
Subtotals:				$ -		$ 29,200
Mark-up :	31%			$ -		$ 9,169
Total:				$ -		$ 38,369
				$ (38,369)		
Difference :				**$ (38,369)** (add cost)		

JACOBS	Project:	**Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County New York State DOT - Region 8**	
	By: GIG	Date: 11/19/2008	Page: 2 of 2

VE RECOMMENDATION	Proposal No. 4
JACOBS	Project: Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Current Design:

The existing highway has speed detection signage going northbound from Crane Road.

Description of VE Alternative - Idea No. 3:

Add radar measured speed display sign(s). The addition of radar type speed detection unit(s) with flashing speed display will assist drivers in adjusting speed prior to the bridge and associated highway geometry. This may result in fewer errant vehicles, collisions and rollover incidents.

Advantages:

- Increases safety
- Improves driver awareness
- Reduces speed

Disadvantages:

- Increases cost
- Increases maintenance

Cost Summary			
	Capital Cost	O&M Cost	Total
Original	0		0
Proposed	$ 52,560		$ 52,560
Savings (Add Cost)	($ 52,560)		**($ 52,560)**

COST WORKSHEET

Proposal No: 4
Idea No: 3

Item	Qty	Unit	Original Estimate Cost	Original Estimate Total	New Estimate Cost	New Estimate Total
Current Design				$ 0		
no provision for speed detection						
Proposed Design						
item# 645.79	1	ls			40,000	$ 40,000
Subtotals:				$ 0		$ 40,000
Mark-up :	31.4%			$ 0		$ 12,560
Total:				$ 0		$ 52,560
				$ (52,560)		
Difference :				**$ (52,560)**		
				(add cost)		

JACOBS

Project: **Bronx River Parkway**
Replacement of Crane Road Bridge
Village of Scarsdale and Town of Greenburgh, Westchester County
New York State DOT - Region 8

By: GIG | Date: 11/19/2008 |

VE RECOMMENDATION		Proposal No. 5
JACOBS	Project:	Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Current Design:

The typical section for Alternative "C" indicates 2.5-foot inside shoulders, 11-foot through lanes, and a 10-foot wide deceleration lane.

Description of VE Alternative - Idea No. 17:

It is suggested to reduce the inside shoulder from 2.5 feet to 1.5 feet, and transfer this one foot to the 10-foot wide deceleration lane.

Advantages:

- Improves exit safety for deceleration lane
- Improves drivability
- Improves capacity for exiting vehicles

Disadvantages:

- Reduces horizontal sight distance on inside lane adjacent to barrier

Cost Summary			
	Capital Cost	O&M Cost	Total
Original			
Proposed			Design Suggestion
Additional cost			

VE RECOMMENDATION	Proposal No. 6
JACOBS	Project: Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Current Design:

The typical section for Alternative "C" indicates a normal crown roadway cross slope of 2 percent for each direction.

Description of VE Alternative - Idea No. 18

It is suggested that where possible, the normal crown cross slope have 4 percent for the outside shoulder, 1.5 percent for the inside through lane, 2 percent for the outside through lane, and 2.5 percent for the outside deceleration lane.

Advantages:

- Improves drainage of stormwater runoff
- Improves safety
- May reduce fill
- More consistent and balanced cross section

Disadvantages:

- None

Cost Summary			
	Capital Cost	O&M Cost	Total
Original			
Proposed			Design Suggestion
Additional cost			

VE RECOMMENDATION		Proposal No. 7
JACOBS	Project:	Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Current Design:

Alternative "C" includes a sharp exit turning movement at Scarsdale from the Bronx River Parkway Northbound to East Parkway, with a deceleration lane length of

Description of VE Alternative - Idea No. 11:

It is suggested that the final design of this turning movement incorporate a three-centered compound curve for a 135° angle of turn.

Advantages:

- Better speed transition
- Improves safety
- Matches vehicle wheel path more closely

Disadvantages:

- May require shift of parking lot entrance/exit further east of its present location

Design suggestion—no cost estimate

Cost Summary			
	Capital Cost	O&M Cost	Total
Original			
Proposed			Design Suggestion
Additional cost			

VE RECOMMENDATION	Proposal No. 8
JACOBS	Project: Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Current Design:

The plan for Alternative 'C' indicates a 'broken back' horizontal alignment between Stations 98+32.23 and 98+74.40. This 42.17-foot tangent length separates same-direction horizontal curves having radii of 788 feet and 1087 feet, respectively.

Description of VE Alternative - Idea No. 16:

It is proposed to eliminate the short length of tangent separating these same-direction curves by using an alignment with one simple curve having a radius of approximately 900 feet, or by continuing the two curves somewhere between the PT of the R=788 ft. curve and PC of the R=1087 ft. curve.

Advantages:

- Better drivability
- Better superelevation transition design

Disadvantages:

- None

Design suggestion—no cost estimate

Cost Summary			
	Capital Cost	O&M Cost	Total
Original			
Proposed			Design Suggestion
Additional cost			

VE RECOMMENDATION	Proposal No. 9
JACOBS	Project: Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Current Design:

The alignment plan for Alternative "C" indicates simple curve radii ranging from 722 feet to 1087 feet.

Description of VE Alternative - Idea No. 10:

It is recommended that spiral curves be introduced at the beginning and end of the simple curves to transition speed and superelevation gradually and comfortably.

Advantages:

- Safer transition of speeds
- Improves safety
- Transitions superelevation

Disadvantages:

- Could complicate bridge geometry

Design suggestion—no cost estimate

Cost Summary			
	Capital Cost	O&M Cost	Total
Original			
Proposed			Design Suggestion
Additional cost			

VE RECOMMENDATION	Proposal No. 10
JACOBS	Project: Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Current Design:

The profile for Alternative "C" indicates a tangent grade of +1.5 percent between two vertical curves having a length of 154 feet and 155.96 feet at Stations 105+40.83 and 106+22.02, respectively.

Description of VE Alternative - Idea No. 14:

It is suggested to utilize one continuous vertical curve with the PVI at Station 105+75±. This vertical curve would have a length of approximately 400 feet, with a 3.5 foot middle ordinate, a K value of 57 (44 mph), and algebraic difference in grades of 7 percent.

Advantages:

- Could reduce fill
- Saves cost
- Will achieve higher design speed and greater stopping sight distance on the crest vertical curve

Disadvantages:

- None apparent

Savings based upon reduced borrow excavation 63' x 100' x 1' = 6300 cf = 233 cy
233 cy x $40/cy = $9,320

Cost Summary			
	Capital Cost	O&M Cost	Total
Original			$9,320
Proposed			0
Savings			**$9,320**

VE RECOMMENDATION	Proposal No. 11
JACOBS	Project: Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Current Design:

Maximum grade is 5 percent. Proposed High Point is at Station 106+88.02.

Description of VE Alternative - Idea No. 19:

Increase maximum grade to 7 percent. Locate the High Point at Station 106+37.45.

Advantages:

- Saves construction time
- Reduces northbound speed
- Improves viewsheds
- Supports VE Proposal 21 (Idea No. 1)

Disadvantages:

- Increases southbound speed

Cost Summary			
	Capital Cost	O&M Cost	Total
Original	$ 4,101		$ 4,101
Proposed	0		0
Savings	$ 4,101		**$ 4,101**

Discussion - Idea No. 19:

Adjusting the grade to the maximum allowable of 7 percent for a 50-mph design speed, while maintaining the minimum clearance point between Metro-North Bridge and the southbound Metro-North track, minimizes the overall height of the bridge structure. Reducing the height of the bridge structure has a general positive effect on the cost of the bridge.

This alignment appears to save fill on the southern approach.

Depth: 147.01 @ Station 99+49 – 141.56 @ Station 97+51 = 5.45 feet
Potential length: Station 99+49 – Station 97+51 = 198 feet
Width of roadway: 38.5 feet

5.45 / 2 x 198 x 38.5 = 20,775 cubic feet = 590 cubic meters

In addition, abutment and structural column height will be reduced.

COST WORKSHEET

Proposal No: 11
Idea No: 19

Item	Qty	Unit	Original Estimate Cost	Original Estimate Total	New Estimate Cost	New Estimate Total
Current Design				$ 0		
item 203.03	590	cm	5.29	$ 3,121		
refer to discusssion narritive, page 2 of 4						
Proposed Design						
Shift vertical alignment						
Subtotals:				$ 3,121		$ -
Mark-up :	31.4%			$ 980		
Total:				$ 4,101		$ -
				$ -		
Difference :				**$ 4,101**		

JACOBS

Project: **Bronx River Parkway**
Replacement of Crane Road Bridge
Village of Scarsdale and Town of Greenburgh, Westchester County
New York State DOT - Region 8

By: GIG | Date: 11/19/2008 |

VE RECOMMENDATION		Proposal No. 12
JACOBS	Project:	Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Current Design:

The Bronx River Parkway Southbound exit at Crane Road is retained in its current configuration.

Description of VE Alternative - Idea No. 7:

Eliminate the Bronx River Parkway Southbound exit at Crane Road. Vehicles can exit to Scarsdale at Popham Road.

Peak-hour southbound traffic exiting at Popham Road and Crane Road is about 100 and 220 vehicles, respectively. The impact to Popham Road should be addressed by a traffic study. Upgrades to the Popham Road might be required to make this proposal more viable.

Advantages:

- Improve traffic flow on Bronx River Parkway
- Eliminate existing signal at SB exit to East Parkway at Crane Road
- Eliminates a very confusing highway driving pattern for exiting vehicles
- Eliminates a source of driver confusion from East Parkway to BRP northbound
- Eliminates assumed cause of head-on accidents in northbound lanes
- Improves safety

Disadvantages:

- Increases traffic on Popham Road
- Traffic study is needed

Cost Summary			
	Capital Cost	O&M Cost	Total
Original			
Proposed			Design Suggestion
Additional cost			

VE RECOMMENDATION	Proposal No. 13
JACOBS	Project: Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Current Design:

The Bronx River Parkway Southbound exit at Crane Road is retained in its current configuration.

Description of VE Alternative - Idea No. 9:

Install an at-grade ramp to exit Bronx River Parkway southbound onto East Parkway.

Advantages:

- Improves traffic flow on Bronx River Parkway
- Eliminates source of traffic pattern weave as through traffic approaches Crane Road Bridge
- Eliminate a very confusing highway driving pattern for exiting vehicles
- Eliminates source of driver confusion from East Parkway to BRP northbound
- Eliminates assumed cause of head-on accidents in northbound lanes
- Allows an East Parkway to BRP northbound acceleration lane without the need for land acquisition
- Improves safety

Disadvantages:

- Adds cost for pavement and deceleration lane
- Requires some land swap between Village and County

Cost Summary			
	Capital Cost	O&M Cost	Total
Original			
Proposed	$349,370		$349,370
Savings (added cost)	($349,370)		(349,370)

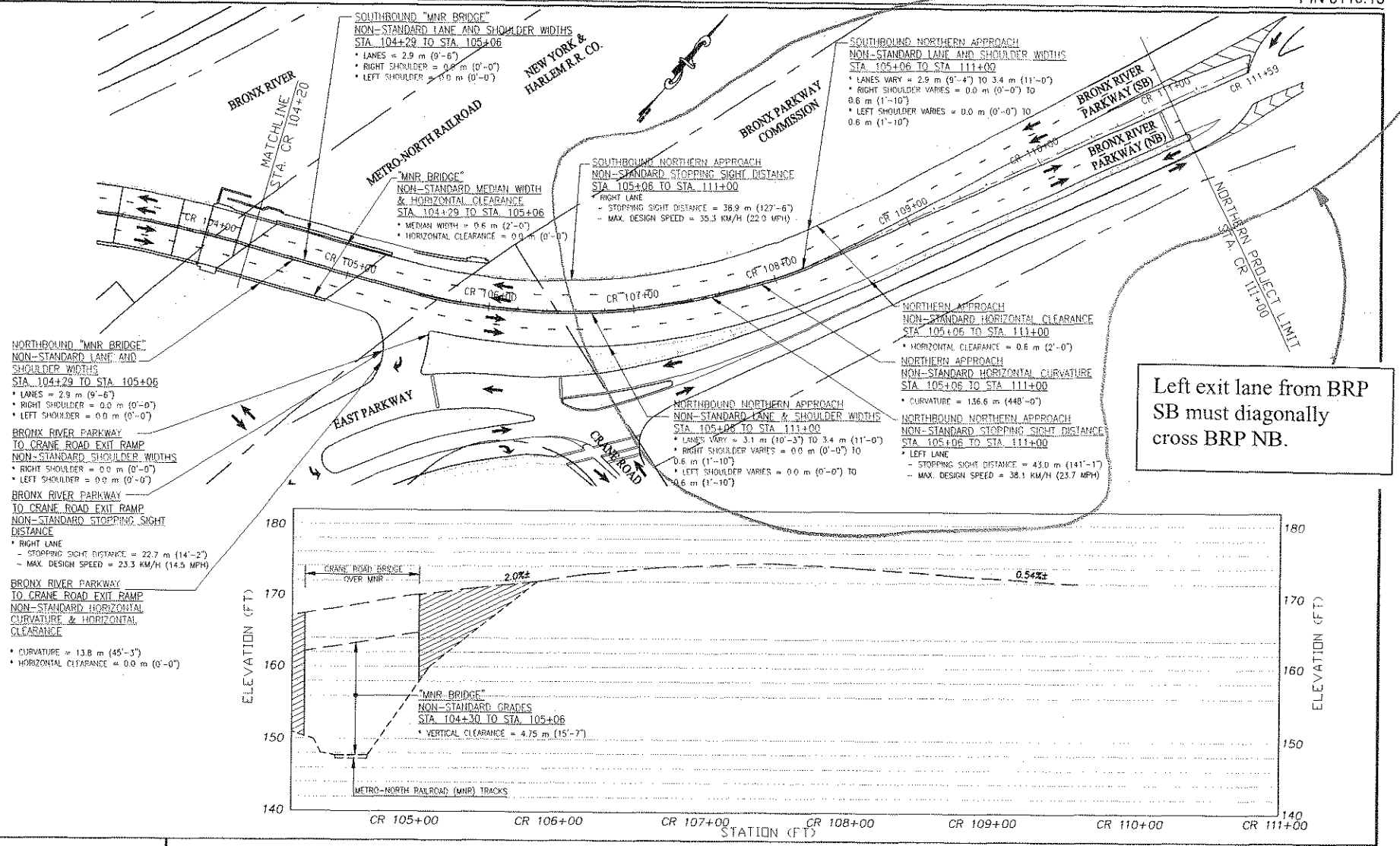
VE RECOMMENDATION		Proposal No. 13
JACOBS	Project:	Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Discussion:

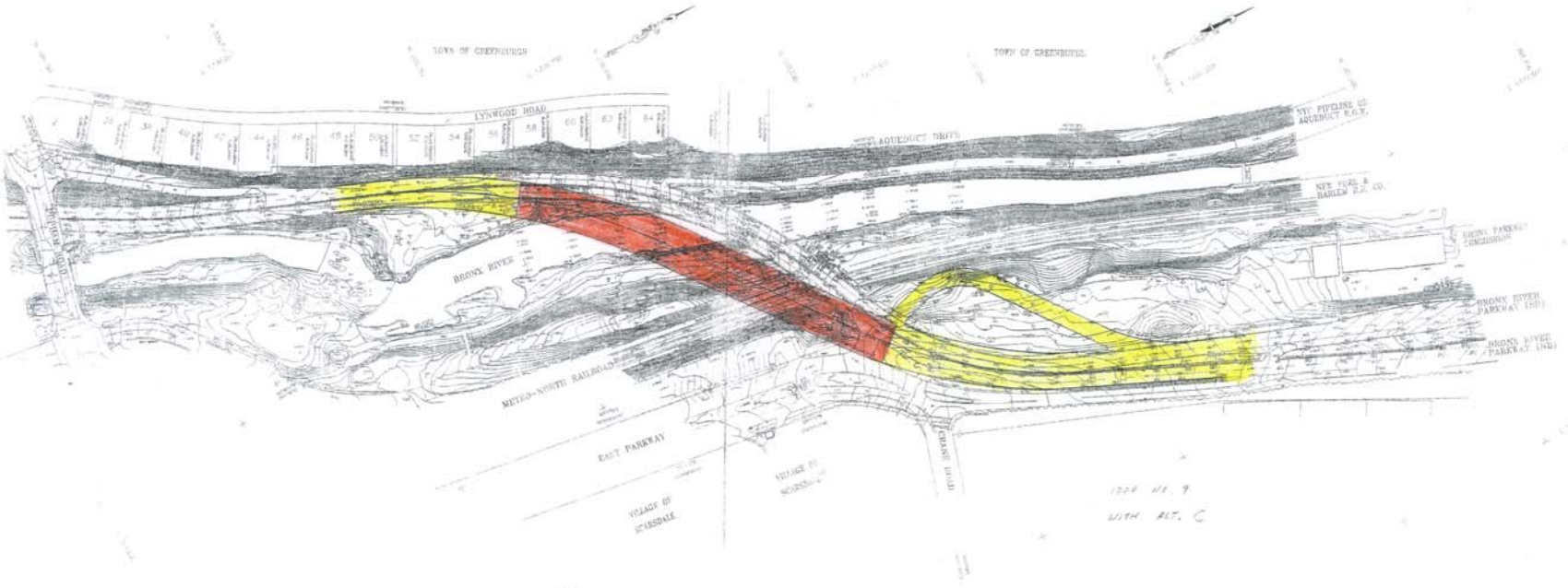
The existing southbound exit ramp from Bronx River Parkway to East Parkway has several undesirable features that are corrected by this proposal. Those undesirable features (see attached Figure II-9 from Draft Design Report and notes) include:

1. Left lane exit from BRP.
2. Left lane exit before sharp curve, increasing weave and change of speed conditions on BRP.
3. Confusing exit lane pattern for exiting vehicles where vehicles can inadvertently proceed into oncoming traffic on the BRP northbound lanes or oncoming BRP northbound accessing traffic.
4. Confusing traffic pattern for East Parkway vehicles going northbound at Crane Road intersection.
5. Other Non-Standard features of the intersection area.

The proposed at-grade right existing ramp mitigates all of the above deficiencies (sketch attached) by eliminating the intermingling of BRP exiting lanes with right exiting from BRP and elimination of the confusing entrance arrangement between East Parkway, Crane Street, and BRP entrance/exit. The recommended arrangement would have exiting and crossing the BRP a perpendicular rather than a parallel movement, making driver use of the wrong lanes unlikely. Similarly, parallel and potential cross-over movement with BRP northbound accessing traffic is totally eliminated by a complete separation of access/egress routes.



THE CRANE ROAD BRIDGE PROJECT
Existing Non-Standard Features Plan & Profile - Sheet 2
Figure II-9



NOTES:

1. TOPOGRAPHIC MAP PREPARED FROM AERIAL PHOTOGRAPHY DATED 1/11/07 AND UPDATED BY GROUND SURVEY METHODS DATED 1/31/07.
2. HORIZONTAL COORDINATE SYSTEM IS NEW YORK STATE PLANE, NAD83, LONG ISLAND ZONE, ENGLISH.
3. VERTICAL DATUM IS NAVD 1988.

REFERENCE DRAWINGS:

1. "MAP OF ROADS & PARKWAYS" MAP# 2118 FIELD ZONE 1914
2. "MAP OF NY CENTRAL RAILROAD PROPERTIES TO BE ACQUIRED" MAP # 13000 FILED JULY 18, 1980 & REVISED SEPT. 13 1980
3. "MAP OF PROPERTY STATE OF SCARSDALE DEPOT" MAP 2030 FILED JUNE 1912
4. "MAP SUBDIVISION OF SECTION 4 EDGEMONT ESTATE" MAP # 1934 FILED JULY 15, 1910

LEGEND

REFERENCE DRAWINGS:

1. "MAP OF ROADS & PARKWAYS" MAP# 2118 FIELD ZONE 1914
2. "MAP OF NY CENTRAL RAILROAD PROPERTIES TO BE ACQUIRED" MAP # 13000 FILED JULY 18, 1980 & REVISED SEPT. 13 1980
3. "MAP OF PROPERTY STATE OF SCARSDALE DEPOT" MAP 2030 FILED JUNE 1912
4. "MAP SUBDIVISION OF SECTION 4 EDGEMONT ESTATE" MAP # 1934 FILED JULY 15, 1910

LEGEND

RECORD DRAWING CERTIFICATION

☐ AS BUILT - CHANGES AS NOTED
☐ AS BUILT - NO CHANGES

CONTRACTOR | PROJECT COORDINATOR

WESTCHESTER COUNTY
DEPARTMENT OF PUB
DIVISION OF ENGINEER

Stantec

RECORD DRAWING CERTIFICATION

☐ AS BUILT - CHANGES AS NOTED
☐ AS BUILT - NO CHANGES

CONTRACTOR | PROJECT COORDINATOR

WESTCHESTER COUNTY, NEW YORK
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ENGINEERING

Stantec

COST WORKSHEET

Proposal No: 13
Idea No: 9

Item	Qty	Unit	Original Estimate Cost	Original Estimate Total	New Estimate Cost	New Estimate Total
Pavement Area Ramp						
(400 x 25) + ((75 X 20)/2) =	10,750	sf				
Deceleration Lane						
450 x 10 =	4500	sf				
Total Area (sy)	15,250	sf				
Total Area (sf)	1694	sy				
BCSC						
1694sy x 115#/in x 1/in x 3 in x ton/20000#	292	ton				
BCSC						
1694sy x 115#/in x 1/in x 5 in x ton/20000#	585	ton				
Sub						
15250sf x 1ft / 27sf/cf	565	cy				
Curb 450 +850 =	1300	lf				
Proposed Design						
BCSC	292	ton			$ 75	$ 21,900
BSBC	584	ton			$ 80	$ 46,720
Sub	565	cy			$ 50	$ 28,250
Curb	1300	lf			$ 25	$ 32,500
Traffic Signal	1	ls			$ 220,000	$ 220,000
						$ -
Subtotals:				$ -		$ 349,370
Mark-up :	0.0%			$ -		$ -
Total:				$ -		$ 349,370
				$ (349,370)		
Difference :				**$ (349,370)**		

Note: Unit prices based upon recent NJDOT contracted pay items. Pay items would include contractor mark-ups.

JACOBS

Project: **Bronx River Parkway**
Replacement of Crane Road Bridge
Village of Scarsdale and Town of Greenburgh Westchester County
P.I.N. 8110.13

By: RKS/DS | Date: 11/21/2008 |

VE RECOMMENDATION	Proposal No. 14
JACOBS	Project: Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Current Design:

Acceleration lane from East Parkway to BRP northbound is unchanged.

Description of VE Alternative - Idea No. 13:

Add adequate length to the East Parkway to BRP northbound ramp to allow for acceleration and merge.

When driving during the project site visit, it was apparent the acceleration lane entering northbound BRP from East Parkway is short, based upon current standards. The ramp could be lengthened by:

1. extending the ramp, which might require land acquisition or swap, or
2. converting the existing southbound exit ramp to an acceleration lane, assuming Proposal 13 (Idea #9) is exercised.

Advantages:

- Improves traffic merge
- Supported by VE Proposal 13

Disadvantages:

- May require acquisition

Cost Summary			
	Capital Cost	O&M Cost	Total
Original			
Proposed			Design Suggestion
Additional cost			

VE RECOMMENDATION	Proposal No. 15
JACOBS	Project: Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Current Design:

The preferred alternative proposes demolition of the historic mushroom bridge.

Description of VE Alternative - Idea No. 04:

Leave the existing bridge intact for historical purposes. This requires a modified alignment of the new Bronx River Parkway Bridge from the current Alternate C alignment. For example see VE Proposal 21.

Advantages:

- Preserves the historic resource
- Saves demolition costs

Disadvantages:

- Will require some preservation/stabilization effort

Cost Summary			
	Capital Cost	O&M Cost	Total
Original	$2,430,900		$2,430,900
Proposed	$890,235		$890,235
Savings	$1,540,665		**$1,540,665**

VE RECOMMENDATION		Proposal No. 15
JACOBS	Project:	Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Discussion - Idea No. 04:

Proposals considered have either required complete rehabilitation and restoration of the existing bridge, or demolition of the existing bridge in conjunction with replacement-in-kind, using the stone from the original piers and abutments in the cladding of the new bridge.

The VE Team is proposing to leave the existing bridge in place, rerouting the Bronx River Parkway onto new structures over the Bronx River and Metro-North Railroad (for example VE Proposal 21). The original mushroom bridge would need to undergo sufficient rehabilitation to avert further deterioration, but would not require a full structural stabilization.

This option would eliminate the cost of demolishing the existing bridge, and preserve the National Register-eligible cultural resource. This proposal keeps the historic structure as a landmark structure.

COST WORKSHEET

Proposal No: 15
Idea No: 4

Item	Qty	Unit	Original Estimate Cost	Original Estimate Total	New Estimate Cost	New Estimate Total
Current Design						
MNR Bridge and Mushroom Bridge Demolition	1	ls	1,850,000.00	$ 1,850,000		
Proposed Design						
MNR Bridge Demolition	15%					$ 277,500
Stabilize Bridge remove non-aesthatic	allow					$ 400,000
						$ -
Subtotals:				$ 1,850,000		$ 677,500
Mark-up :	31.4%			$ 580,900		$ 212,735
Total:				$ 2,430,900		$ 890,235
				$ (890,235)		
Difference :				**$ 1,540,665**		

JACOBS

Project: **Bronx River Parkway**
Replacement of Crane Road Bridge
Village of Scarsdale and Town of Greenburgh Westchester County
P.I.N. 8110.13

By: | Date: 11/21/2008 | Page: 3 of 3

VE RECOMMENDATION	Proposal No. 16
JACOBS	Project: Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Current Design:

The preferred alternative proposes demolition of the historic mushroom bridge.

Description of VE Alternative - Idea No. 25:

Leave the existing mushroom bridge intact for historical purposes, in conjunction with the provision of a new Bronx River Parkway bridge on a new alignment adjacent to the existing structure. Suggest resurfacing and installing guardrails on the deck of the former BRP bridge to provide a scenic overlook of the Bronx River Park Reservation and adjacent areas.

Advantages:

- Adds a recreational use within the Bronx River Parkway Reservation
- Preserves the historic resource
- Saves cost of demolition

Disadvantages:

- Adds some costs for preservation and stabilization of the structure
- Adds costs for the safety and protection of pedestrians on and beneath the structure

Cost Summary			
	Capital Cost	O&M Cost	Total
Original	$1,850,000		$1,850,000
Proposed	$1,153,035		$1,153,035
Savings	$1,277,865		**$1,277,865**

Discussion - Idea No. 25:

Proposals considered have either required complete rehabilitation and restoration of the existing bridge, or demolition of the existing bridge in conjunction with replacement-in-kind, using the stone from the original piers and abutments in the cladding of the new bridge.

The VE Team proposes leaving the existing mushroom bridge in place, rerouting the Bronx River Parkway onto new structures over the river and railroad. The original bridge would need to undergo sufficient rehabilitation to forestall further deterioration, but would only require sufficient structural stabilization to carry pedestrians. It is assumed recent non-aesthetic looking repair work to the bridge would be removed.

This option would eliminate the cost of demolishing the existing bridge, and preserve the National Register-eligible cultural resource.

COST WORKSHEET

Proposal No: 16
Idea No: 25

Item	Qty	Unit	Original Estimate Cost	Original Estimate Total	New Estimate Cost	New Estimate Total
Current Design						
MNR Bridge and Mushroom Bridge Demolition	1	ls	1,850,000.00	$ 1,850,000		
Proposed Design						
MNR Bridge Demolition	15%					$ 277,500
Stabilize Bridge remove non-aesthatic	allow					$ 400,000
Deck stabilization and hails	allow					$ 200,000
Subtotals:				$ 1,850,000		$ 877,500
Mark-up :	31.4%			$ 580,900		$ 275,535
Total:				$ 2,430,900		$ 1,153,035
				$ (1,153,035)		
Difference :				**$ 1,277,865**		

JACOBS

Project: **Bronx River Parkway**
Replacement of Crane Road Bridge
Village of Scarsdale and Town of Greenburgh Westchester County
P.I.N. 8110.13

By: RKS | Date: 11/21/2008 |

VE RECOMMENDATION		Proposal No. 17
JACOBS	Project:	Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Current Design:

The preferred alternative proposes demolition of the historic mushroom bridge.

Description of VE Alternative - Idea No. 15:

The VE Team proposes abandoning the existing mushroom bridge and leaving it in place for historical purposes, while providing a new bridge on a new alignment adjacent to the existing structure.

Advantages:

- Retention of the historic structure
- Saves demolition costs

Disadvantages:

- Will need to provide safety measures for areas under the bridge
- Abandoned bridge will eventually deteriorate, requiring periodic clean-up

Cost Summary			
	Capital Cost	O&M Cost	Total
Original	$2,430,900		$2,430,900
Proposed	$486,180		$486,180
Savings	$1,944,720		**$1,944,720**

Discussion - Idea No. 15:

Proposals considered have either required complete rehabilitation and restoration of the existing bridge, or demolition of the existing bridge in conjunction with replacement-in-kind, using the stone from the original piers and abutments in the cladding of the new bridge.

The VE Team proposes leaving the existing bridge in place, and rerouting the Bronx River Parkway onto new structures over the Bronx River and Metro-North Railroad. Pedestrians and users of the Bronx River Park Reservation trail would need to be protected from overhead hazards associated with ongoing deterioration of the original bridge structure.

This option would eliminate the cost of demolishing the existing bridge, and leave standing a National Register-eligible cultural resource. In considering structural solutions for the new BRP bridge, consideration should be given to preserving views of the existing original bridge, particularly from the BRPR trail and the MNR Scarsdale station.

COST WORKSHEET

Proposal No: 17
Idea No: 15

Item	Qty	Unit	Original Estimate Cost	Original Estimate Total	New Estimate Cost	New Estimate Total
Current Design						
MNR Bridge and Mushroom Demolition	1	ls		$ 1,850,000		
Proposed Design						
Demolition of MNR Bridge only	15%	ls				$ 370,000
Subtotals:				$ 1,850,000		$ 370,000
Mark-up :	31.4%			$ 580,900		$ 116,180
Total:				$ 2,430,900		$ 486,180
				$ (486,180)		
Difference :				**$ 1,944,720**		

JACOBS

Project: **Bronx River Parkway**
Replacement of Crane Road Bridge
Village of Scarsdale and Town of Greenburgh Westchester County
P.I.N. 8110.13

By: RKS | Date: 11/21/2008 | Page: 3 of 3

VE RECOMMENDATION		Proposal No. 18
JACOBS	Project:	Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Current Design:

Re-use existing stone on new bridges.

Description of VE Alternative - Idea No. 21:

Use new stone veneer on the new bridges.

Advantages:

- Quicker, less labor-intensive construction.
- Less care required for demolition with respect to removal and storage of stone
- Saves cost, in terms of time.
- Replicates desired aesthetics/ consistent with SHPO's desire to provide appropriate appearance to help "mitigate the loss of the historic element."

Disadvantages:

- None

Cost Summary			
	Capital Cost	O&M Cost	Total
Original			
Proposed			
Savings			**$500,000[1]**

[1] There is savings compared to removing stone façade from existing mushroom bridge and installation on now bridge. Detail of estimate does not allow quantification of cost saving. Savings suggested below is assumed.

VE RECOMMENDATION	Proposal No. 19
JACOBS	Project: Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Current Design:

The proposed horizontal alignment of the mushroom bridge in Alternative "C" is comprised of a curve and a tangent section.

Description of VE Alternative - Idea No. 22:

Keep the horizontal alignment geometry constant along the bridge.

Advantages:

- Allows for the re-use of forms from one mushroom pier section to the next.
- Uniformity in details simplifies plans and construction.
- Saves construction time.

Disadvantages:

- None

Cost Summary			
	Capital Cost	O&M Cost	Total
Original			
Proposed			Design Suggestion
Savings			

VE RECOMMENDATION		Proposal No. 20
JACOBS	Project:	Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Current Design:

Build the south portion of the new mushroom bridge in 2 stages due to overlap in location of the new bridge relative to the existing bridge.

Description of VE Alternative - Idea No. 23:

Construct the mushroom bridge in one stage. This would also require elimination of the conflict between the locations of the existing vs. the proposed bridge (e.g., move the alignment southeast). This concept is incorporated into and supports Proposal 21.

Advantages:

- Eliminates unbalanced dead loads on the in-service portions of existing and the new structures
- Simplifies construction
- Saves construction time
- Simplifies design and detailing. No analysis needed for a temporary construction condition.
- Less disruption to the traveling public since there would be no construction zone to drive through while the new bridge is constructed until the tie-in to the existing roadway is made.
- Simplifies/reduces MPT since staging of the bridge construction is eliminated

Disadvantages:

- Might result in removal of additional trees, requiring additional tree planting.

Cost Summary			
	Capital Cost	O&M Cost	Total
Original			
Proposed			
Additional cost			**Constructability**[1]

[1] Savings associated with this proposal is quantified in Proposal 21 and 22.

VE RECOMMENDATION	Proposal No. 21
JACOBS	Project: Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Current Design:

Realign the roadway south of the existing location.

Description of VE Alternative - Idea No. 1:

Move the proposed alignment further south. The proposed realignment is intended to improve constructability, reduce construction duration, improve highway alignment and reduce motor vehicle accidents. These objectives are achieved by physical separating the overlap of the new and existing bridges at the west abutment and vicinity, allowing construction of the new bridge in its entirety versus one-half at a time, and reducing the severity of highway curvature.

This proposal is further enhanced by Proposal 22 (Construction of a new modern bridge leaving existing mushroom bridge in place).

Advantages:

- Entire bridge is on a tangent, which simplifies details.
- Accommodates leaving the existing mushroom bridge in place, so that the historic element is retained.
- Minimizes the amount and complexity of MPT required.
- Bridge construction would be accomplished in one stage.
- Improved highway alignment
- Probable reduction in motor vehicle accidents

Disadvantages:

- Increases the length of the mushroom bridge.
- 7 piers would be required for the mushroom bridge, compared to 6 for alternative C.
- Increases length of span over the MNR leading to a probable increase in structure depth with respect to the existing (approximately 6" to 23", depending on structure type).

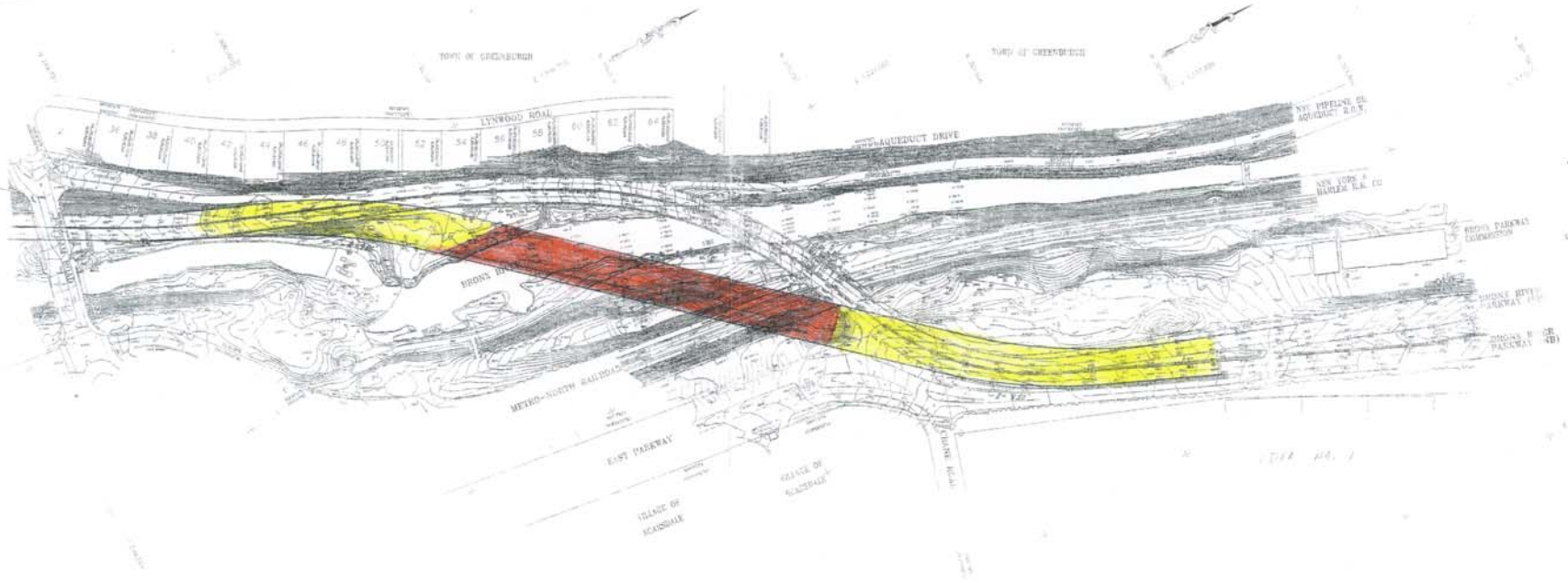
Cost Summary			
	Capital Cost	O&M Cost	Total
Original	$11,838,982		$11,838,982
Proposed	$9,007,569		$9,007,569
Savings	$2,836,414		**$2,836,414**[1]

[1] Savings is based upon an alignment between the alignment in the attached layout and Alternate C, whereby the span is the same and six mushroom bridge piers are required.

Discussion:

Realigning Alternate C toward the south east eliminates several constructability issues while providing an alignment that is would address the highway alignment issues. From a constructability standpoint relining toward the south east eliminates the need to construct the bridge one-half at a time; which reduces construction duration by several months, reduces MPT requirements and eliminates temporary sheeting for the west abutment.

The attached suggested alignment produces a highway alignment with straight bridge segments (See Proposal 19) and maximum reduction of highway curvature. However this alignment produces a longer bridge span which would require one more mushroom pier. On the other hand, an alignment could be adopted that is between the attached alignment and Alternate C, whereby an additional mushroom pier is not needed. If so, there is a cost benefit to this proposal as demonstrated in the accompanying estimate.



LEGEND

NOTES:

1. SUBSURFACE MAP PREPARED FROM AERIAL PHOTOGRAPHY DATED 1/11/07 AND UPDATED BY GROUND SURVEY METHODS DATED 1/21/07
2. HORIZONTAL COORDINATE SYSTEM IS NEW YORK STATE PLANE, NORTH LONG ISLAND ZONE, ENGLISH
3. VERTICAL DATUM IS NAVD 1988

REFERENCE DRAWINGS

1. "MAP OF ROADS & PARKWAYS" MAP# 2116 FILED JUNE 1914
2. "MAP OF NY CENTRAL RAILROAD PROPERTIES TO BE ACQUIRED" "MAP # 13030 FILED JULY 16, 1900 & REVISED SEPT. 13 1900
3. "MAP OF PROPERTY SITUATE AT SCARSDALE DEPOT" MAP 2030 FILED JUNE 1913
4. "MAP SUBDIVISION OF SECTION 1 EDGEMONT ESTATE" MAP # 1934 FILED JULY 15, 1910

LEGEND

REFERENCE DRAWINGS

1. "MAP OF ROADS & PARKWAYS" MAP# 2116 FILED JUNE 1914
2. "MAP OF NY CENTRAL RAILROAD PROPERTIES TO BE ACQUIRED" "MAP # 13030 FILED JULY 16, 1900 & REVISED SEPT. 13 1900
3. "MAP OF PROPERTY SITUATE AT SCARSDALE DEPOT" MAP 2030 FILED JUNE 1913
4. "MAP SUBDIVISION OF SECTION 1 EDGEMONT ESTATE" MAP # 1934 FILED JULY 15, 1910

RECORD DRAWING CERTIFICATION

AS BUILT - CHANGES AS NOTED
AS BUILT - NO CHANGES

CONTRACTOR | PROJECT COORDINATOR

WESTCHESTER COUNT
DEPARTMENT OF PU
DIVISION OF ENGINE

Stantec

RECORD DRAWING CERTIFICATION

AS BUILT - CHANGES AS NOTED
AS BUILT - NO CHANGES

CONTRACTOR | PROJECT COORDINATOR

WESTCHESTER COUNTY, NEW YORK
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ENGINEERING

Stantec

COST WORKSHEET

Proposal No: 21
Idea No: 1

Item	Qty	Unit	Original Estimate Cost	Original Estimate Total	New Estimate Cost	New Estimate Total
Current Design						
Sheeting		ls		$ -		
Scaffolding to construct bridge 1/2 at a time		ls		$ -		
Pour deck as dual operation		ls		$ -		
24 month schedule duration (a) (b)	24	mos		$ 7,056,880		
MPT	1	LS	1,953,000	$ 1,953,000		
Proposed Design						
Eliminate sheeting (deduct allowance)		allow				$ (100,000)
Eliminate second set-up of scaffolding (deduct allowance)		allow				$ (100,000)
Pour deck as single operation		allow				$ (100,000)
21 month schedule duration	21	mos				$ 6,174,770
MPT (assume 50% reduction)	50%	ls				$ 976,500
Subtotals:				$ 9,009,880		$ 6,851,270
Mark-up :	31.4%			$ 2,829,102		$ 2,151,299
Total:				$ 11,838,982		$ 9,002,569
				$ (9,002,569)		
Difference :				**$ 2,836,414**		

Notes:
(a) Schedule is 24 months per Draft Design Report; Ch III pg 49.
(b) Unit prices are assumed to iclude 15% overhead and 10% profit ($28,227,520*(15%+10%) = $7,056,880)
(c) Allowances are made for deletion of certain deleted work where there is no method of calculation a project specific cost.

JACOBS

Project: **Bronx River Parkway**
Replacement of Crane Road Bridge
Village of Scarsdale and Town of Greenburgh Westchester County
P.I.N. 8110.13

By: Date: 11/21/2008 Page: 4 of 4

VE RECOMMENDATION	Proposal No. 22
JACOBS	Project: Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Current Design:

Replacement bridge is the same style as the existing "mushroom" bridge.

Description of VE Alternative - Idea No. 6:

Construct a new modern structure to replace the "mushroom" bridge, incorporating aesthetic treatments to fit the historic resource (Bronx River Parkway).

Advantages:

- Lower construction costs than is true for the more labor-intensive mushroom structure.
- Quicker to construct than a mushroom structure.
- Significantly less formwork
- More bidders for the construction – competitive pricing
- Less impact on the traveling public and trail users due to decrease in construction time
- Can eliminate deck joints, which ultimately leak
- Can leave the existing structure in place if new bridge is constructed on a new alignment, thus the historic element is not lost.
- Less demolition

Disadvantages:

- Will affect the view shed (from train station) by obstructing/partially obstructing the view of the existing "mushroom" bridge for views looking north. This would be minimized/mitigated by raising the vertical profile, to move the obstruction away from the view shed.
- The form of the historic pier configuration is not replicated in the replacement bridge.

Cost Summary			
	Capital Cost	O&M Cost	Total
Original	$19,946,520		$19,946,520
Proposed	$11,550,000		$11,550,000
Additional cost	$8,396,520		**$8,396,520**[1]

[1] See pages 3 and 4 for two separate pricing approaches to this proposal.

VE RECOMMENDATION		Proposal No. 22
JACOBS	Project:	Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Discussion:

Construction of a conventional bridge is less expensive than the mushroom type bridge. This proposal is to use conventional steel span construction, which would require one or two center support structures. Construction would be much faster as the formwork as required for the mushroom bridge is eliminated. The bridge can be faced with stone veneer as per Proposal 18.

A conventional bridge can be installed as per Proposal 21, Alternate C, or an alignment incorporating Proposal 21 and Alternate C. For comparison purposes Proposal 21 alignment or an alignment incorporating Proposal 21 and Alternate C is assumed.

The project estimate quantifies the cost for the mushroom bridge based upon as a single unit price. Cost comparison estimates for the mushroom bridge versus conventional bridge construction were prepared using two different approaches, which are as follows:

1. Compare mushroom bridge with payment unit prices for recent conventional bridge payment prices in the New York New Jersey area (page 3 of 4).
2. Quantify work items know to change by use of conventional construction. Price those work items by order of magnitude (page 4 of 4).

Both methods of pricing generate of the same order or magnitude cost savings.

If Alternate C is used, conventional bridge construction should also be considered. However, use of this proposal with Alternate C will retain the west bridge abutments overlap, the bridge will need to be constructed one-half at a time and the project schedule time savings will not be less. As a result, the project will not realize the full cost savings.

COST WORKSHEET

Proposal No: 22
Idea No: 6

Item	Qty	Unit	Original Estimate Cost	Original Estimate Total	New Estimate Cost	New Estimate Total
Current Design						
BRP - Structure and Approach Walls	33,000	sf	$ 460	$ 15,180,000		
Proposed Design						
Conventional Bridge Structure (a)	33,000	sf			$ 350	$ 11,550,000
Subtotals:				$ 15,180,000		$ 11,550,000
Mark-up :	31.4%			$ 4,766,520		$ -
Total:				$ 19,946,520		$ 11,550,000
				$ (11,550,000)		
Difference :				**$ 8,396,520**		

(a) Unit price is based upon recent payment unit price amounts for conventional bridges constructed in New York and New Jersey. As this is a payment unit price, by definition the unit price include mark-up.

JACOBS

Project: **Bronx River Parkway**
Replacement of Crane Road Bridge
Village of Scarsdale and Town of Greenburgh Westchester County
P.I.N. 8110.13

By: RKS | Date: 11/21/2008 |

COST WORKSHEET

Proposal No: 22
Idea No: 6

Item	Qty	Unit	Original Estimate Cost	Original Estimate Total	New Estimate Cost	New Estimate Total
Current Design						
Sheeting		ls		$ -		
Scaffolding to construct bridge 1/2 at a time		ls		$ -		
Pour deck as dual operation		ls		$ -		
24 month schedule duration (a) (b)	24	mos		$ 7,056,880		
MPT	1	LS	1,953,000	$ 1,953,000		
Structures and Approach Walls (70%) (d)	23100	sf	$ 460	$ 10,626,000		
Proposed Design						
Eliminate sheeting (deduct allowance)		allow				$ (100,000)
Eliminate second set-up of scaffolding (deduct allowance)		allow				$ (100,000)
Pour deck as single operation		allow				$ (100,000)
18 month schedule duration	18	mos				$ 5,292,660
MPT (assume 50% reduction)	50%	ls				$ 976,500
Conventional bridge with steel frame, one center pier.	23100	sf			$ 350	$ 8,085,000
Subtotals:				$ 19,635,880		$ 14,054,160
Mark-up :	31.4%			$ 6,165,666		$ 4,413,006
Total:				$ 25,801,546		$ 18,467,166
				$ (18,467,166)		
Difference :				**$ 7,334,380**		

Notes:
(a) Schedule is 24 months per Draft Design Report; Ch III pg 49.
(b) Unit prices are assumed to iclude 15% overhead and 10% profit ($28,227,520*(15%+10%) = $7,056,880)
(c) Allowances are made for deletion of certain deleted work where there is no method of calculation a project specific cost.
(d) Assumes 70% of Structures and Walls cost is Mushroom Bridge related.

VE RECOMMENDATION	Proposal No. 23
JACOBS	Project: Bronx River Parkway Replacement of Crane Road Bridge Village of Scarsdale and Town of Greenburgh, Westchester County P.I.N. 8110.13 **New York State Department of Transportation - Region 8**

Current Design:

The Value Engineering Team was requested to comment on project alternates.

Description of VE Alternative - Idea No. 24:

Reconsider the project alternate called Crane Road Underpass. This proposal has highway alignment benefits similar to Proposal 21. If the existing Crane Road Bridge is to be demolished, this proposal should be reconsidered.

This proposal locates the new structure further away from Scarsdale center and the Metro-North station.

Advantages:

- Improves BRP alignment
- Normalizes bridge geometry
- Allows consistent BRP traffic speed
- Improved traffic control
- Reduces accidents
- Mitigates BRP access/egress conflicts
- Can add Crane Road deceleration lane

Disadvantages:

- Requires a temporary bridge
- Impacts County's BRPR maintenance facility
- Requires demolition of historic Crane Road Bridge

Cost Summary			
	Capital Cost	O&M Cost	Total
Original			
Proposed			Concept Suggestion
Additional cost			

III. Cost Data

III. COST DATA

A. General

1. The VE Team was provided with the preliminary project estimate as prepared by Stantec, and dated November 5, 2008. The estimated project total construction cost is $37,084,400, which includes 31.4% mark-up for contingency and construction inspections. Because of the preliminary nature of the design the cost estimate is based upon a unit price per estimate category.

2. In instances where the cost estimate is not in sufficient detail, separate cost data and/or calculations were obtained as necessary to establish effective cost information.

B. Cost Models

The VE Team was provided with the Preliminary project estimate as prepared by Stantec, and dated November 5, 2008. The estimate project total construction cost is $37,084,400 and includes a 31.4% contingency.

The attached cost model is based upon the Preliminary cost estimate, and is intended to show the distribution of the estimated project cost.

C. VE Proposal Estimates and Markups

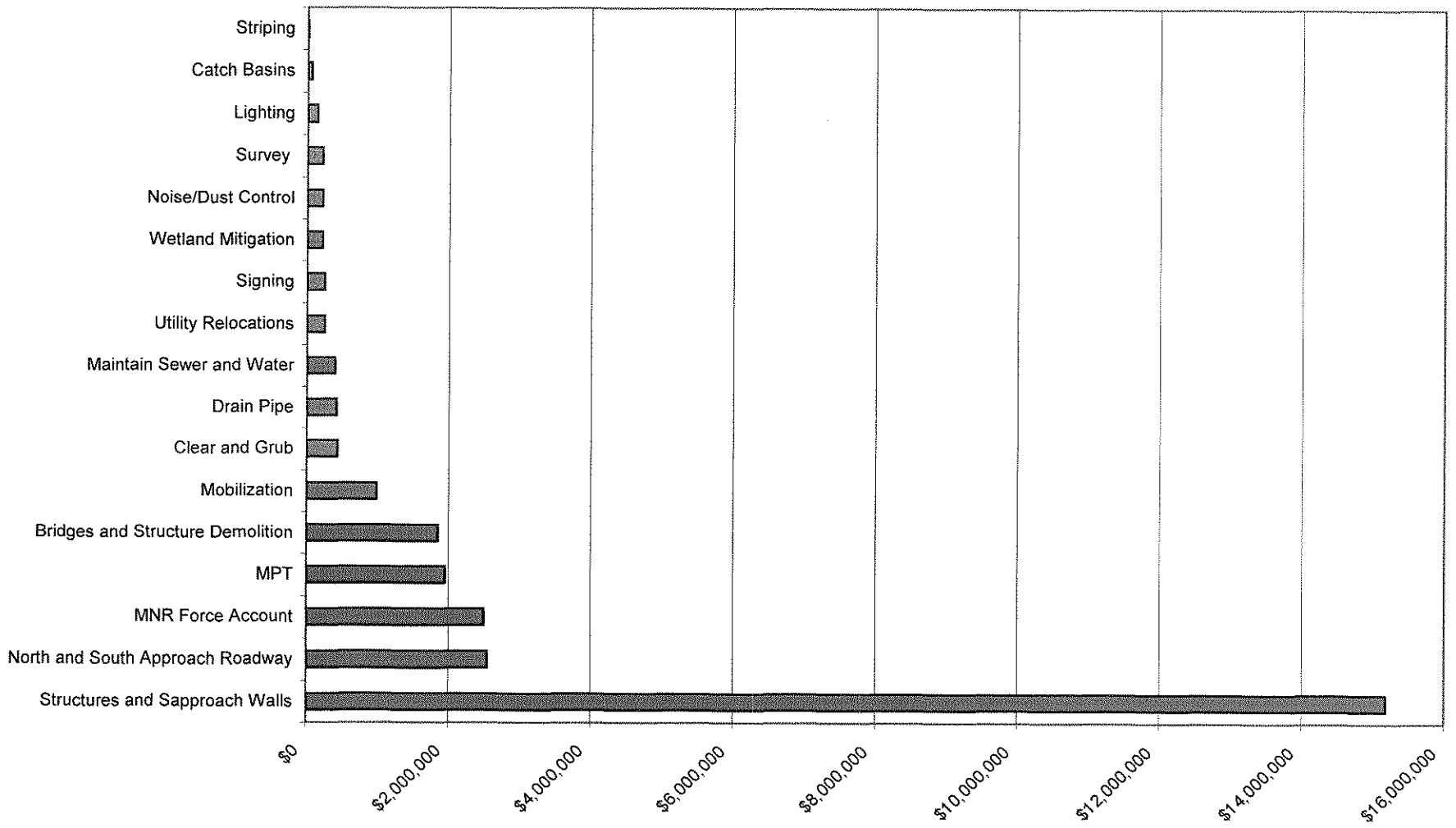
For the purpose of this study, the VE Team applied the same lump sum multipliers for common items as used in the design, including contingencies. Where possible, VE proposals used proportional estimates for the project areas based on area, volume, etc.

VE Proposals do not include the cost of engineering redesign, if required.

D. Life Cycle Costs

The VE Team did not specifically address life cycle costs and no quantitative life cycle analyses were performed.

NYSDOT Region 8 - Bronx River Parkway
Crane Road Bridge Replacement
Pareto Sort 80% of Project Cost



IV. Appendix

Appendix A

Appendix A

METHODS AND PROCEDURES

A. General

1. Jacobs Engineering, Inc. was commissioned to conduct a 5-day Value Engineering (VE) Study of this project.

2. The study was conducted using the Value Engineering and/or Value Analysis techniques created by Larry Miles and promoted by The Lawrence D. Miles Value Foundation and SAVE International–"The Value Society" (formerly the Society of American Value Engineers), utilizing a multi-disciplined team approach stressing function and creativity.

3. The VE Study was conducted at Jacobs' Morristown, New Jersey offices on November 17 through 21, 2008.

4. The VE Team consisted of the following individuals:

Participant	Role	Representing
Randall K. Sprague, CVS	VE Team Leader	Jacobs
Anthony Scolaro, AICP	Urban Planner	Jacobs
Kimberly Murray, PE	Structural Engineer	Jacobs
David Schnabel, PE	Highway Engineer	Jacobs
Giuliano Giudici, PE	Civil Engineer	YU & Associates, Inc.

B. Procedures

The five-step "Value Engineering Job Plan" was followed throughout the VE Study effort and the following paragraphs outline specifics of each step.

1. Information Phase: Prior to the workshop, available materials were reviewed by each team member. After the kick-off meeting and site visit, Project Functions were identified (Appendix B).

2. Speculation Phase: During this phase, a "creative thinking" atmosphere was established and ideas were generated through the use of the group "brainstorming" techniques. A list of the ideas generated during the Speculation Phase of this study has been compiled and is presented for reference in Appendix C.

3. Analysis Phase: During this phase of the study, an analysis of each idea generated during the Speculation Phase was undertaken. Additional function analysis, matrix evaluation and rough cost/worth analyses were implemented, and the basic advantages / disadvantages of each primary alternative were reviewed.

4. Development Phase: Each of the viable alternatives developed during the "Analysis Phase" were studied in detail, using additional function analysis techniques. During this phase some of the alternatives were discarded (i.e. they proved to be either not cost effective or of low value).

5. Presentation Phase: This report represents the results of the VE Study. Each viable alternative that was developed is presented in detail as a specific "VE Proposal" in this report.

Appendix B

Appendix B

INFORMATION PHASE

1. The following Project Documents were provided by NYSDOT for the VE Study:

   - Draft Design Report, Reconstruction / Replacement of Structures Carrying the Bronx River Parkway over the Bronx River and the Metro-North Railroad, Village of Scarsdale and Town of Greenburgh, Westchester County, dated November 5, 2008. The Draft Design Report consisted of the following sections:
     - Introduction
     - Project Identification, Evolution, Conditions and Needs, and Objectives
     - Alternatives
     - Social, Economic, and Environmental Considerations
     - Evaluation and Comparison of Alternatives

   - Right-of-Way Acquisition Table and Maps for proposed Alternatives;
   - Original Contract Drawings (20 sheets); and
   - Preliminary Design Alternative Cost Estimate

2. Site Observations:

   The VE Team visited the project site, accompanied by Westchester County Department of Public Works, Kevin Roseman. Mr. Roseman gave a thorough tour, pointing out prominent features of the project and surrounding context, and identified items that are driving the current design.

3. Function Analysis:

   As part of the Information Phase of the VE Study, design documents were studied and discussed. The VE Team then identified the functions of the project and its specific design elements, and then ranked those functions in term of being Basic (B), Secondary (S), or Higher Order (HO). The table on the following page contains a listing of the functions identified by the VE Team for the various project elements:

FUNCTION ANALYSIS

ITEM	VERB	NOUN	B	S	HO
PROJECT:	Replace	Bridge	B	S	
	Reduce	Accidents	B		
	Improve	Geometry	B		
	Maintain	Access		S	
	Accommodate	Pedestrians		S	
	Preserve	Aesthetics	B		
	Preserve	Sight Lines	B		
	Satisfy	SHPO			HO
	Avoid	Acquisitions		S	
	Protect	Park			HO
	Mitigate	Trees			HO
	Add	Shoulders		S	
	Maintain	Traffic	B		
	Treat	Runoff			HO
	Reuse	Stone Face		S	
	Protect	Railroad			HO
	Add	Lighting		S	
	Maintain	Signing		S	
	Minimize	Non-Standard Features		S	
	Avoid	New Overhead Signs		S	
	Protect	Sewer			HO
	Protect	Water Main			HO
	Minimize	Vibration (Construction)		S	
	Minimize	Noise (Construction)		S	
	Update	Seismic			HO
	Improve	River Walk		S	
	Incorporate	Structural Redundancy (RR Bridge)			HO
	Stabilize	River Bank		S	
	Minimize	Scarsdale Disruption		S	
	Conceal	Structural Steel			HO
	Eliminate	Structural Deficiencies	B		

Appendix C

JACOBS

Appendix C

BRAINSTORMING & IDEA EVALUATION

The following pages contain a list of ideas generated by the Value Engineering (VE) Team during the Brainstorming Session/Speculation Phase of the study. The listing also displays advantages and disadvantages of each idea that were discussed during the Evaluation/Analysis Phase of the study. Each idea was rated to indicate its potential for proposal development.

Ideas were rated as '1' for carry forward, and '0' (zero) for drop; based on the overall feasibility of being implemented and the opportunity to improve driving and work zone safety considerations. Ideas rated '1' were further developed into Proposals. Design Comments to drawings are contract-document-related considerations the VE Team observed, which should be addresses as design development continues.

All ideas generated were retained on the list, as future considerations may warrant that these items be revisited.

IDEAS ADVANTAGES/DISADVANTAGES

IDEA No.	DESCRIPTION	ADVANTAGES	DISADVANTAGES	RATING	NAME
1	Move bridge alignment further Southeast	✧ Improves alignment ✧ Increases speed ✧ Reduces accidents ✧ Avoids tie-in conflicts ✧ Normalizes bridge geometry ✧ Reduces footprint on reservation if existing bridge demolished ✧ Saves time ✧ Improves traffic control ✧ Supports #4, 5 & 15 ✧ Supports #6 ✧ Allows addition of Crane Rd. deceleration lane	✧ Increases bridge length ✧ Increases skew ✧ Affects viewsheds	1	DS GG KM
2	Provide additional ground-level signage	✧ Improves safety ✧ Improves driver awareness	✧ Adds cost ✧ Visual impact	1	GG

IDEA No.	DESCRIPTION	ADVANTAGES	DISADVANTAGES	RATING	NAME
3	Install radar feedback speed display	✧ Improves safety ✧ Provides Driver-specific info	✧ Increased cost	1 DS	GG
4	Leave existing bridge intact for historical purposes (rehab/protect)	✧ Saves demo cost ✧ Preserves historic structure	✧ Some preservation cost	1	AS
5	Use existing bridge as footbridge (15 & 25)	✧ Increases pedestrian access ✧ Adds recreational use/value	✧ Adds safety cost	1	AS
6	Construct new bridge as modern economical structure (15 & 21)	✧ Saves construction time ✧ Saves construction costs ✧ Increases contractor competition ✧ Reduces impacts to public ✧ Complies with modern design ✧ Improves constructibility ✧ Is supported by #4, 5 & 15	✧ Requires aesthetic treatment ✧ Affects viewsheds	1	KM
7	Eliminate BRP SB Exit to Crane Road	✧ Improves safety ✧ Improves traffic flow ✧ Eliminates signal	✧ Increases traffic on Popham Road	1	RS
8	Use Traffic Signals to Reduce NB and SB BRP Speed	✧ Prevents high speeds through bridge section ✧ Improves safety	✧ Reduces capacity	0	
9	Install At-Grade Ramp for SB BRP Direct to East Parkway South	✧ Same as #8 ✧ Reduces driver confusion at Crane Road ✧ Eliminates wrong-way traffic accidents ✧ Allows a NB acceleration lane at Crane Road	✧ Reduces capacity ✧ Adds cost ✧ Requires a deceleration lane	1	RS

IDEA No.	DESCRIPTION	ADVANTAGES	DISADVANTAGES	RATING	NAME
10	Use Spiral Curves for Mainline BRP	✧ Allows safer transition speeds ✧ Improves safety ✧ Transitions superelevation	✧ Complicates bridge geometry	1 DS	DS
11	Use Compound Curves for NB BRP Scarsdale Ramp to East Parkway South	✧ Facilitates better speed transition ✧ Improves safety	✧ None	1 DS	DS
12	Crest Vertical Alignment over Center of Metro-North tracks	✧ Reduces overall height of bridge ✧ Maximizes viewshed to existing bridge ✧ Use with #19	✧ None	1 DS	DS
13	Install Adequate Length NB Ramp from East Parkway to Allow Acceleration and Merge	✧ Supported by #9 land use ✧ Improves traffic merge	✧ Requires #9 ✧ May require acquisition	1	RS
14	Eliminate Broken Back Vertical Curve at Station 106 of Alternative C	✧ Could reduce fill ✧ Could save cost	✧ None	1	DS
15 after 5	Keep Historic Bridge as Visual Element; Allow to Deteriorate	✧ Same as #4	✧ Adds small safety cost	1	AS
16	Eliminate Broken Back Horizontal Curve between Stations 98 and 99 of Alternative C	✧ Allows better drivability ✧ Allows a better superelevation design	✧ None	1	DS
17	Reduce inside shoulders to 1.5 feet and increase deceleration lane width from 10 feet to 11 feet	✧ Improves exit safety ✧ Improves driveability	✧ Reduces distance to center obstruction (barrier)	1	DS
18	Use 4 percent for shoulder cross-slopes, both inside and outside, and make first through lane 1.5 percent and 2 percent for next lane, and 2.5 percent for auxiliary lane	✧ Improves drainage ✧ Improves safety	✧ None	1	DS

IDEA No.	DESCRIPTION	ADVANTAGES	DISADVANTAGES	RATING	NAME
19	Increase profile grades from max. 5 percent to 7 percent	✧ Supports #12 ✧ Improves viewshed ✧ Reduces NB speed ✧ Supported by #1	✧ Increases SB speed	1	GG
20	Use Popham Road as a NB exit to Scarsdale, and eliminate Crane Road exit.	✧ Improves safety	✧ Requires structure ✧ Increases Popham Road traffic ✧ Impacts BRP Reservation	0	
21	Use new stone veneer on piers and abutments	✧ Saves time ✧ Simplifies construction ✧ Saves costs ✧ Satisfies BRPR Aesthetics	✧ None	1	KM
22	Maintain continuous geometry for mushroom pier segments	✧ Allows for repetitive use of forms ✧ Saves time ✧ Simplifies construction and detailing ✧ Supports #1 ✧ Reduces loading	✧ Forces alignment to the southeast	1	KM
23	Construct bridge deck as single operation in lieu of half deck at a time	✧ Avoids cantilever loads on new and existing bridge, ✧ Avoids bridge deck constructability conflicts on the last three mushrooms	✧ None	1	KM

IDEA No.	DESCRIPTION	ADVANTAGES	DISADVANTAGES	RATING	NAME
24	Crane Road Underpass (Reconsider this Alternative)	✧ Improves alignment ✧ increases design speed ✧ Reduces accidents ✧ Avoids tie-in conflicts ✧ Normalizes bridge geometry ✧ Saves time ✧ Improves traffic control ✧ Allows addition of deceleration lane at Crane Rd.	✧ Requires a temporary bridge ✧ Impacts BRPR Maintenance Facility	1	RS
25	Maintain existing bridge as scenic overlook	✧ Same as #5	✧	1	AS
26	Install stairs only at Crane Road to MNR platforms	✧ Lowers cost ✧ Reduces aesthetic impact to BRPR	✧ Necessitates ADA accessibility at Scarsdale Station	1	AS
27	Add ADA elevator to MNR Inbound platform from East Parkway overhead walkway	✧ Adds ADA functionality ✧ Completes ADA access to both sides of station	✧	1	AS

Rating Codes
1 = Proposal developed
0 = Idea not pursued or developed further

Appendix D

JACOBS

Appendix D

DESIGN PRESENTATION MEETING MEMORANDUM

DATE:	November 17, 2007
TIME:	10:00 AM
LOCATION:	Westchester County Offices White Plains, New York
ATTENDEES:	See attached "Meeting Attendance Sheet"

Mr. Kevin Roseman opened the meeting by thanking all who attended. The design was then presented by Brian O'Donnell and Russell Tomer of Stantec Consulting.

The Crane Road Bridge, constructed in 1925, is a unique design made up of six 'mushroom bridge' single center pier supported segments. Over the years the bridge has increasingly deteriorated, with two recent separate incidents where holes developed in the concrete deck, which resulted in travel lane closures until repairs could be completed. The need is to replace the bridge in its entirety, which includes the bridge over Metro-North Railroad. The intent is to replace the 'mushroom bridge' with a new bridge having the same design.

Based on observations and field investigations, the underside of the deck exhibits numerous areas of deterioration in terms of hollow concrete, spalls, cracks, and extensive efflorescence, and a significant number of areas that have been repaired (confirmed by VE site visit). The overall condition of the deck is rated poor and is quickly approaching severe.

In addition to the deteriorated condition of the structures, traffic safety along the Bronx River Parkway within the project limits continues to be a major concern. Narrow travel lanes, minimum shoulders, sharp curves, and limited sight distance have created a condition where highway accidents per million vehicle miles ranges between 3.30 and 12.94, while the current state average for a divided four-lane highway is 2.06.

The Bronx River Parkway Restoration area and the 'mushroom' bridge are considered locally to be historic and the application is in progress seeking to have the area declared historic. The intent is to reuse the stone facing from the existing bridge as the facing for the replacement bridge.

The objectives of this project are to

1. address Accident Rates,
2. allow for average speeds of 45-55 mph (as opposed to the current posted speed of 20 mph),
3. reduce the number of Accidents near Crane Road,
4. minimize the occurrence of southbound wrong-way accidents in the northbound lane (at Crane Road),

5. provide a smoother merge to the Bronx River Parkway Northbound from Crane Road, increase Merge and Deceleration distances,
6. curtail excessive speeds (up to 70 mph observed) on the Bronx River Parkway,
7. simplify the confusing traffic circulation patterns in the vicinity of Crane Road and East Parkway in the Village of Scarsdale and
8. improve pedestrian use and access to the area.

The current design, "Alternative C," consists of a new mushroom bridge, designed to mimic the appearance of the original structure and be constructed on a new alignment slightly southeast of the existing bridge. The bridge will be constructed in order to maintain traffic on the original bridges until the new structures are completed. The cross section of the new structure is significantly wider than the original, to provide more standard lane widths and shoulders.

CRANE ROAD VALUE ENGINEERING 11/17/08

ATTENDEE	FIRM	TEL #
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Russell Tomer	Stantec	212 366 5600
Kevin Roseman	WCDPW	914-995-4084
JORGE MARMOL	WCDPW	914-995-5584
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MIKE GIBBONS	WCDPW	914-995-2573
Anthony Scolaro	JACOBS	973-267-8830 x 1320
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Kim Murray	Jacobs	" x1250
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FRANK HSU		
FRANK SHU		

Appendix E

JACOBS

Appendix E

VE PRESENTATION MEETING MINUTES

DATE:	November 21, 2008
TIME:	1:30 p.m.
LOCATION:	Westchester County Department of Public Works Offices 148 Martine Avenue, White Plains, New York
ATTENDEES:	See attached "Meeting Attendance Sheet"

Following introductions and welcome, Randall Sprague (Jacobs Team Leader) presented an overview of the study phases and previous week's schedule, thanked all for attending, and stated the purpose of the meeting was to present VE Recommendations and respond to questions relating to the proposed alternatives. With the use of visual aids, including display materials utilized during the actual VE analysis, the VE Team summarized the results of each Proposal (see table on pp. 4 and 5 of the Preliminary Value Engineering Report).

The VE Team generated 27 brainstorming ideas during the study, and developed 23 VE Recommendations, including numerous Design Suggestions. The VE Proposals were divided into five groups, as follows:

- Pedestrian Access—It was suggested to replace ADA ramps at the north end of the MNR Scarsdale Station platform with stairs and provide an elevator from the inbound platform to the pedestrian overpass.
- Highway—The VE Team suggested a number of improvements to signage, vertical and horizontal geometry, and lane configurations.
- Crane Road Exit—Suggested major alterations to the confusing configuration at Crane Road and the Bronx River Parkway.
- Historic Bridge—Preservation of the historic resource was suggested, with several ideas for the reuse, or at least retention, stable portions of the original structure.
- Replacement Bridge and Alignment—In conjunction with preserving the existing mushroom bridge, the VE Team suggested constructing a modern bridge on a new alignment to the south of the existing bridge.

Representatives of Westchester County Department of Public Works and their Design consultants provided feedback on the VE Recommendations. Some of the points were well taken and would be incorporated into the final design of the project. Others, while feasible, need further consideration or may be subject to local opposition.

Mr. Sprague stated that the Design Team would receive the Value Engineering Report in approximately two weeks.

Following a question and answer period, the meeting was adjourned at approximately 3:30 PM.

JACOBS
Edwards and Kelcey

Meeting Attendance Sheet **Value Engineering Study**

Date: November ~~17~~ 21, 2008 Project: Replacement of Crane Road Aqueduct
Time: ~~Monday, 10 AM~~ 1:30 PM P.I.N. 8110.13
Location: NYSDOT – Region 8
Poughkeepsie,
NY

Name	Position	Representin	Telephone #	Fax #	E-mail #
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