City of Havre de Grace

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Susquehanna River Rail Bridge Project
Advisory Board
Of the Mayor and City Council

Advisory Bulletin #20

Bridge Architecture – First Update

July 21, 2015

Background

The Advisory Board met on March 12, 2015, and on a number of previous occasions to study the various options of bridge architecture, particularly as they relate to pier spans, type of structure, river viewscape, and impact on the intersection of Union Avenue and Otsego Street. References should be made to Advisory Bulletins #2, #3, #11, #14, and #15, which are directly related to this bulletin. The Board is deeply concerned that the SRRBP Project Team may now be focusing its work product on a simple vertical pier and deck beam type of structure with very short pier spacing (bridge spans), which the Board believes will negatively impact the intersection and overall bridge appearance.

Objectives

The Advisory Board, with much community input, has concluded that bridge architecture is the single most dominant concern of the citizens of Havre de Grace, Perryville, and both Counties, for all the reasons expressed in Advisory Bulletin #2. The same bulletin provided general design recommendations to achieve a desired effect. Primary objectives should be an increase of pier-to-pier spans as much as possible, with the use of graceful lines of arch-like curvature. To this end, the Board has embraced a "delta" type of structure, which permits much longer spans and a far more graceful appearance than a simple "deck" type structure put forth by the Project Team.

Further objectives relating directly to bridge span and pier placement include creation of an imposing gateway entrance into downtown Havre de Grace and enlargement of David Craig Park to accommodate a bridge history display area. The critical element in both objectives is location of the first pier beyond the bridge abutment in such a way to avoid blocking gateway viewscapes or dividing the avenue under the bridges. The Board is convinced that this can only be achieved by a much longer-span bridge design. More detailed discussions of this very sensitive area, with specific objectives and recommendations, have been stated in Advisories #3, #11, #14, and #15.

Bridge Configurations

The Advisory Board has taken measurements of the gateway entrance area and existing truss-deck bridge, and has extrapolated measurements of four suggested bridge configurations offered by the SRRBP Design Team at its public presentations. This information was then used to develop simplistic elevation views, in scale, of the existing bridge and both basic types of new bridge design known as "deck" type and "delta" type, so that the public can gain a greater understanding of bridge appearance and its impact on the avenue intersection area.

This depiction of elevations entitled Bridge Configurations is attached, along with a previously developed aerial (plan) view of a proposed intersection alignment entitled Concept Road Alignment. It should be noted that the aerial view is consistent with Configuration C in the depiction. It should also be noted that all configurations are shown from the south (downtown) side of the bridges, just as each street section emerges from under the bridge. The street sections all curve to the left before emerging out from under the north side of the bridges, as can be plainly seen in the aerial view.

The SRRBP Project Team faces design challenges of fitting a curving street under the span(s), dealing with road clearance under delta legs, and landing the bridges clear of Otsego Street. The Advisory Board has measured minimum road clearance under the existing bridge as 14.83 feet at the lowest eye-bar connection. It believes the new design objective should be a minimum vertical clearance of 16 feet from street elevation at the curb line to any part of an overhead delta leg. All new bridge configurations shown would otherwise create no clearance issues.

Configuration A

The Project Team appears to favor a simple deck beam design supported by tall piers as being much more cost-efficient, less expensive to maintain, and easier to repair/replace major components. Although it would require more piers in the river, pier structure would be less massive. Taller and more slender piers would open up the river viewscape in one sense, but adding more pier sets will tend to have the opposite effect. Vertical piers also eliminate clearance concerns for boaters passing under the bridge outside the main channel.

This configuration is limited to 170 feet of span between pier centers, which is 30 feet less than that of the existing bridge. Architecture notwithstanding, such pier spacings would grossly impact the Otsego/Union intersection area, cluttering the streetscape and ruining the opportunity for an imposing gateway entrance to the downtown. It would also require a divided main avenue at best or a standard street corner at worst, neither of which would align smoothly with the Union/St John intersection area or with Water Street.

This type of bridge architecture is very plain and ordinary, offering little opportunity for enhancement other than some flair at the pier tops (as depicted). It is comparable to common highway bridges of recent decades and cannot be dramatically enhanced by accent lighting. Such an unremarkable structure should be seen as an insult to the riverscapes of both communities, with its unique setting as the "gateway bridge" at the confluence of this great American river and the world's largest estuarial bay. This was also the immediate scene of colonial era crossings, more importantly traveled during the time of our nation's founding.

Configuration B

The Project Team has presented an optional delta design based on spans of 240 feet. The term "delta" refers to the diagonal legs that form a triangle with the bridge deck. This configuration permits the deck structure to be cantilevered some distance beyond the delta, where it would connect with a simple deck beam in mid-span. This type of structure allows a much longer span between piers, by an additional 70 feet or 41%, as presented. Since a delta leg is not required at the abutment, this particular configuration would reduce the first span from 240 feet to 180 feet. The net effect of this configuration would be to constrain the intersection even more than in Configuration A, due to street clearance under the first pier delta legs.

Configuration C

In order to achieve an acceptable gateway and intersection layout, the Advisory Board is convinced that a delta leg must be included at the abutment to extend the first span out to 240 feet. The Board concedes that such a configuration will still be tight and will need to be designed very carefully to avoid street clearance issues at the delta legs. In order to ease this situation, the Board recognizes that the Otsego Street curve may need to begin at a more eastward point, perhaps centering on Pearl Street, than shown in the attached aerial view.

Configuration D

A better solution for the downtown gateway area would be to extend the first span an additional forty feet by using a significantly deeper and stronger beam section than would be used for all other spans. This beam section could be extended through the half-delta at the abutment and entire delta at the first pier, as depicted, or limited to the span between delta legs. Either design would be architecturally pleasing to the eye.

Conclusions

The Advisory Board is convinced that Configurations A and B would be entirely unsatisfactory to the downtown gateway objectives of the City of Havre de Grace, and would present a more cramped and obstructed streetscape than exists today, especially when coupled with the effects of a double-wide bridge complex. The Board is also deeply opposed to a divided thoroughfare at the confluence of so many streets, which would become necessary with much closer pier spacing.

In macro perspective, the Board is uniformly opposed to any bridge architecture that suggests simple vertical piers supporting horizontal deck beams, especially when such a design requires much shorter spans and more structural clutter at river level. This particular bridge, being in a geographically and historically unique location, and dominating an incredible panorama for miles, demands an architectural style worthy of its place and symbolic of its diverse rail transportation function.

Recommended Action

The Advisory Board urges the City of Havre de Grace, the Town of Perryville, and both County governments to vigorously oppose a simple, short-span design for these bridges, and to push hard in favor of a more graceful and stylistic architecture, regardless of the direction the Project Team now seems to be taking. The City of Havre de Grace should also insist on a more open gateway area under the bridges which would not require a divided street passage or a sharply curving intersection.

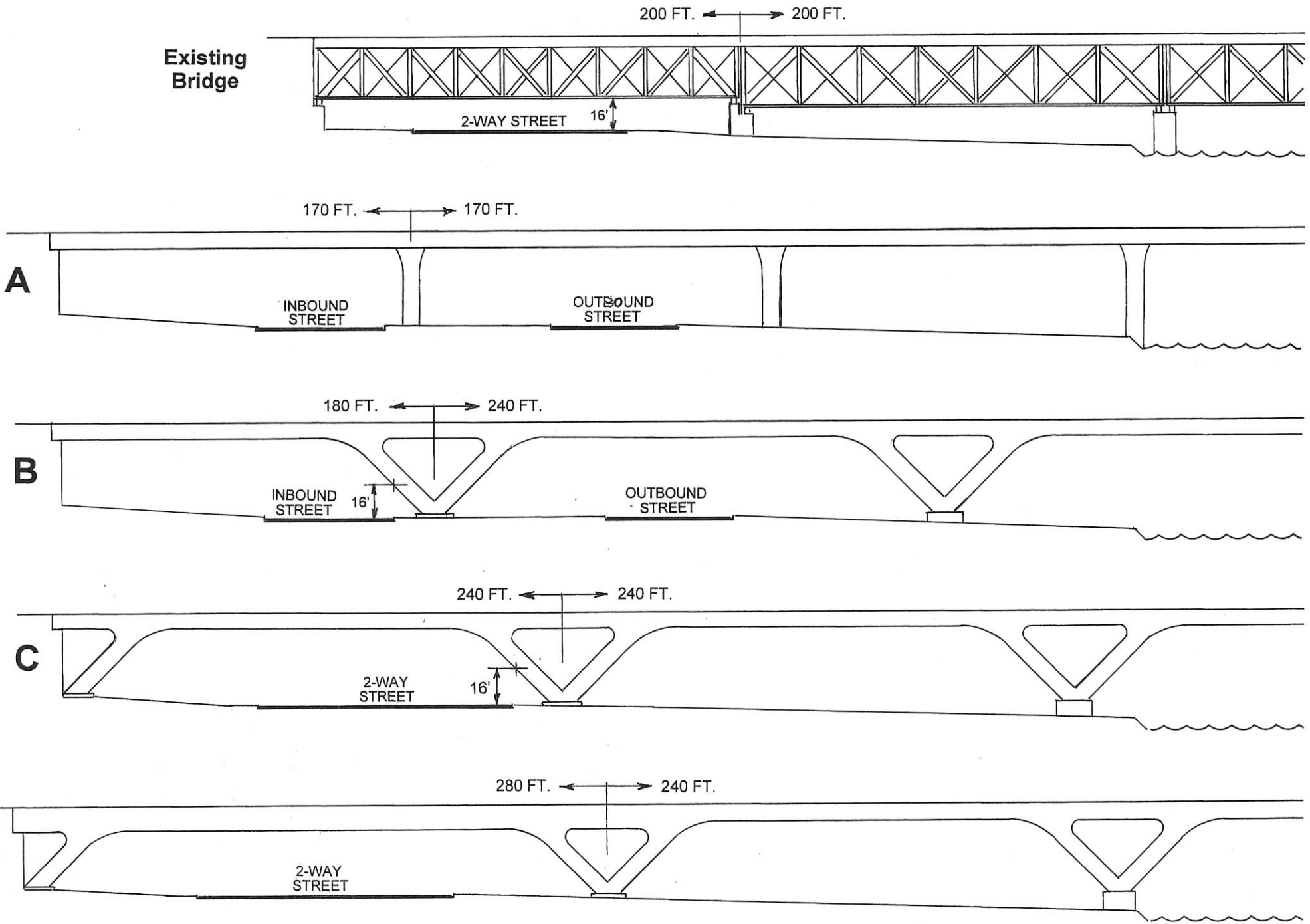
Respectfully submitted,

Volney H. Ford
Chairman

Attachments: Bridge Configurations
Concept Road Alignment

Advisory #20

Bridge Configurations



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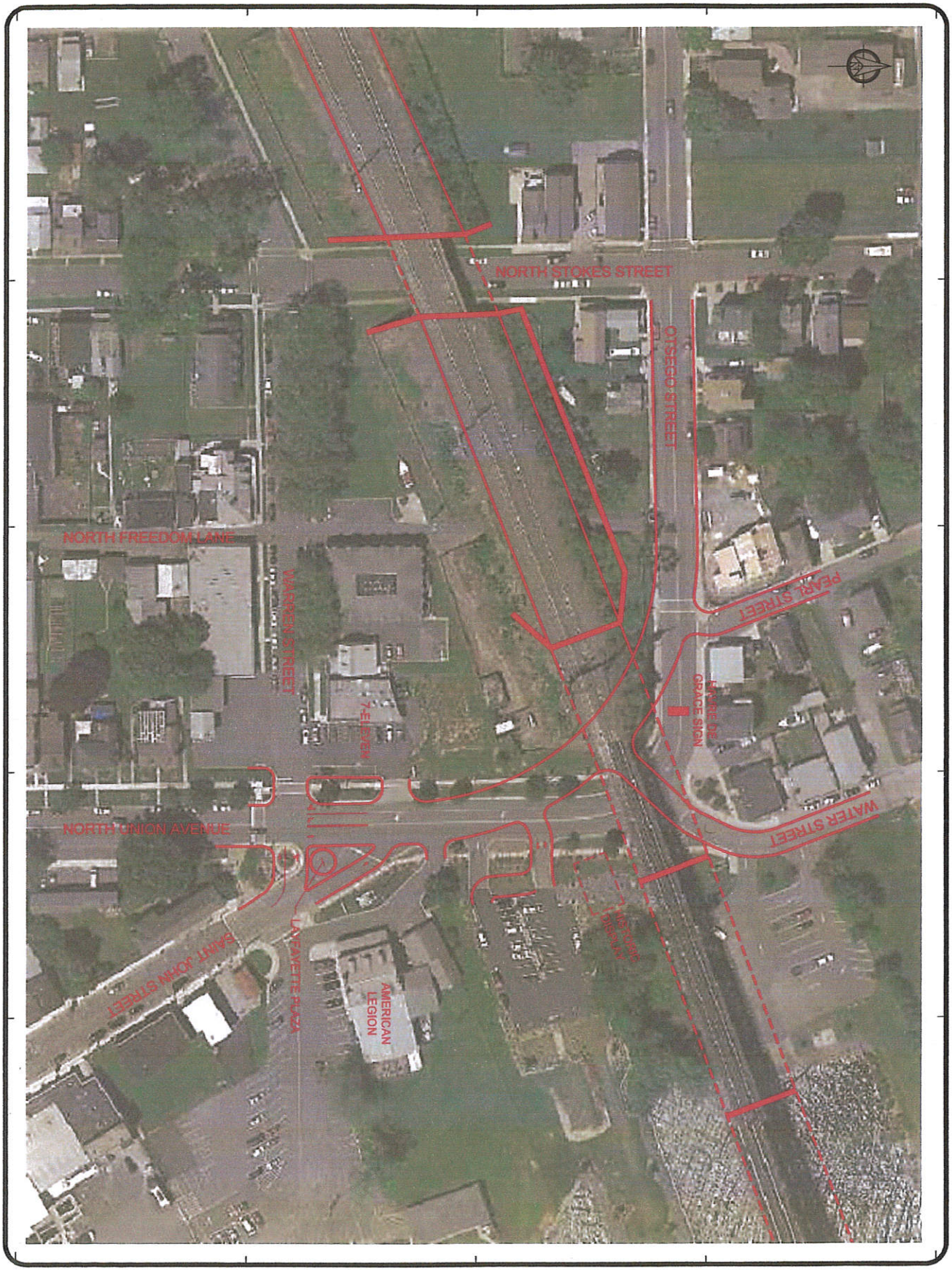

HAVRE DE GRACE

CONCEPT ROAD ALIGNMENT

HAVRE DE GRACE~HARFORD COUNTY~MARYLAND

OWNER:

No.	REVISION	CHKD BY DATE
-		

DESIGNED BY: SJG | CHECKED BY: SJG
DRAWN BY: CMC | FILE NAME: 10544CNCPTRDEXH.DWG

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DATE: 30 JANUARY 2015
SCALE: 1" = 40'
PROJECT NO. 10544.CA
SHEET: 1 OF 1