



CITY OF ANN ARBOR, MICHIGAN

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Public Services Area
Project Management Unit
September 17, 2007

University of Michigan
Architecture, Engineering, and Construction
326 E. Hoover – Mailstop E
Ann Arbor, Michigan 48109

Attention: Susan J.D. Gott
University Planner

Re: E. Stadium Boulevard Bridges Replacement Project
Investigation of "No Bridge" Option
Our File No. 2006-045.16

Dear Ms. Gott:

We are writing to follow-up on the results of our investigation of the "No Bridge" Option that was suggested by a member of the U of M Staff at one of our recent City/U of M coordination meetings.

We have preliminarily reviewed the idea of removing one, or both, of the E. Stadium Boulevard Bridges as part of our planned improvements to the E. Stadium Boulevard corridor. There are three possibilities. They are:

- 1) Maintain the bridge over the Ann Arbor Railroad tracks and construct an at-grade crossing of S. State Street and E. Stadium Boulevard
- 2) Maintain the bridge over S. State Street and construct an at-grade crossing of the Ann Arbor Railroad
- 3) Eliminate both bridges and construct at-grade crossings at S. State Street and the Ann Arbor Railroad tracks

In reviewing Options 1 and 2, due to the proximity of the existing site features within the area (the Ann Arbor Railroad Tracks and S. State Street are separated by about 300 feet), it is not possible to construct one bridge without the other. It is impossible to maintain a roadway profile along S. State Street that could be compatible with the elevations of the existing private properties along S. State Street and still allow a longitudinal roadway profile along E. Stadium Boulevard that wouldn't be dangerous. The longitudinal road grades that will result along E.

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Stadium Boulevard by eliminating either of the bridges will be unacceptably steep (well in excess of 7%). Also, we cannot provide the required site distance as defined by the AASHTO Standards. In looking at several different options, I believe that it would not be possible to even maintain the insufficient, existing, vertical clearance of E. Stadium Boulevard over S. State Street. As a result, Options 1 and 2 will not work.

Option 3, the at-grade crossing of the Ann Arbor Railroad Tracks and the at-grade crossing of S. State Street, proposes some operational difficulties that we do not believe are easily overcome. The proposed intersection of E. Stadium Boulevard and S. State Street would need to be signalized due to the expected volumes. As a result, we have used a SEMCOG Crash Prediction Model for signalized intersections and based on the anticipated traffic volumes that would be expected (approximately 45,700 vpd) it appears that about 19 crashes could be expected at this intersection each year; of the 19 crashes, six of them are expected to be injury-type accidents. Assuming that the six injury accidents are of the least severe variety (I do not believe that this is a prudent assumption, but will use it in this example) and the remaining 13 crashes are property-damage-only accidents (again, not a prudent assumption, but I'll use it here as a best-case scenario), the model would suggest that the societal cost of the at-grade intersection would be about \$250,000 per year. We have assumed that the life span of the bridges, and in turn the at-grade intersection, would be 75 years. We have also assumed a 3% rate of annual inflation. The resultant net present worth of this yearly expenditure would be about \$7,425,000 over the analysis period. We have also estimated the incremental increase in the cost of delay and fuel used if this intersection were to be constructed. Again, assuming a 75-year life span of the structure and a 3% rate of inflation, we believe that it will cost approximately \$500,000 annually to society in additional fuel used and delay costs associated with the construction of the at-grade intersection. The net present worth of this annual expenditure would be about \$14,841,000 over the analysis period. The sum of the societal cost of the crashes and the incremental costs of delay and increased fuel consumption is about \$22,266,000. This is about \$2,900,000 more than the currently estimated cost of \$19,355,000 to construct the two bridge structures, retaining walls, and roadway and utility improvements. This **does not** take into account the additional right-of-way costs that would be incurred if this option were studied further. These right-of-way costs would push the results further in the direction of constructing the bridges. Also, in order to signalize this intersection, improvements would need to be made to both E. Stadium Boulevard and S. State Street. E. Stadium Boulevard would need to be widened to 5 lanes throughout its length within the project corridor in order to allow left turns to be made onto S. State Street. Similarly, S. State would need to be widened to at least three lanes, and possibly even 5 lanes, in order to allow the needed connectivity with E. Stadium and to avoid significant congestion and operational problems with the Stimpson intersection located several hundred feet to the south. While we have not performed an operational or queuing analysis along E. Stadium Boulevard or S. State Street, based on our experience, we

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believe that an intersection that functions at LOS D could be the best-case result we could achieve. The actual results would probably be worse.

In order to perform the necessary widening, right-of-way would certainly be required. Without performing a detailed analysis, it appears that at least eleven feet (one standard roadway lane) of additional land would be required. The affected properties would most probably be located along the west side of S. State Street, several hundred feet both north and south of E. Stadium Boulevard. The properties along the east side are residential with small front yards and any taking of more than a couple feet would most probably be considered a significant "taking" and the costs most assuredly would be large. Widening along E. Stadium Boulevard in the vicinity of the bridges would also be required. The University is realistically the only property owner in the area that could be expected to provide the needed land in order to effect the necessary changes. The properties that would be affected probably would include the Field Hockey/Soccer/Football complex north of E. Stadium and the Red Lot, and potentially the golf course, to the south. The golf course and the parking lot north of E. Stadium Boulevard would be impacted with any widening along E. Stadium as well. Based on our previous conversations, we would not expect that your organization would be very receptive to our requests for additional land. Finally, an at-grade intersection at this location would fundamentally change the traffic patterns within a large area of town that would need to be thoroughly studied. It would be our expectation that the public would ultimately not be receptive to the required changes.

The at-grade crossing of the Ann Arbor Railroad tracks provides similar results. We used three different crash prediction models. They are; Peabody-Dimmick; NCHRP 50; and, the New Hampshire Index. These models predict somewhat differing results. The Peabody-Dimmick model suggests that there will be 8 crashes during a five-year period. The NCHRP 50 Model suggests that 13 crashes per year will result with automatic gates and 106 crashes per year will result with other less protective devices used to regulate traffic through the intersection. The New Hampshire Index is a tool that measures the relative hazard presented by an at-grade railroad intersection. The index suggests that even with the installation of automatic flashing lights and gates that the hazard presented at this crossing will be about 50% higher than an actionable level, or that this at-grade crossing should be studied for additional protective measures. Based on these analyses, it appears that crashes will occur. As you can well imagine, car-train accidents are almost always serious and very expensive. While we are not attempting to suggest that there will be a multitude of accidents at this location, it is noted, however, during the anticipated life span of a bridge structure, there most certainly will be accidents due to the high volume of traffic using E. Stadium Boulevard. Note, we have not included a present worth analysis of the possible costs of the car-train accidents that could occur at the proposed at-grade intersection, but believe that they, too, will be significant. You may recall that we previously stated it is the goal of most agencies to eliminate at-grade railroad crossings, not construct them anew. We believe that the Ann Arbor Railroad and MDOT would oppose this option. It would

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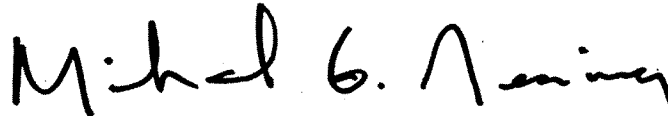
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be my recommendation to anyone within the City not to construct a new at-grade crossing at this location. While it is not possible to predict the future, the possibility of increased rail traffic along this corridor either in the form of passenger or freight service, is real. With all the above factors in mind, we do not believe that any potential savings in short-term costs can actually be realized by the removal of the bridge over the Ann Arbor Railroad tracks due to long-term costs that will be experienced at this location and the E. Stadium Boulevard/S. State intersection.

After having reviewed these concepts, we have concluded that there would be several obstacles that either couldn't be overcome, or would be difficult and equally expensive to overcome, in order to make this a viable option. As a result, it appears that the "No Bridge" Option is not feasible and recommend that it not be given further consideration.

Please forward this response onto the appropriate staff members within your organization. I am always willing to discuss these matters with you, or U of M Staff in more detail, if you wish.

Very Truly Yours,



Michael G. Nearing, P.E.
Senior Project Manager
Project Management Unit

MGN:mgn (uofm no bridge option response 070917.doc)

cc: Homayoon Pirooz, P.E., Project Management Manager
Craig Hupy, P.E., Systems Planning Manager
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