

## SH 6 Bellaire and Westheimer Intersection Recommendations

### **Background**

At the September meeting of the Transportation Policy Council (TPC), a delegation representing some of the businesses and neighborhoods in the vicinity of the Bellaire and Wertheimer intersections with State Highway 6 spoke in opposition to the development of the proposed grade separation of SH 6 at these two cross streets. Elevated grade separation of four SH 6 main lanes (two in each direction) with the cross streets of Bellaire and Wertheimer were approved by the Texas Transportation Commission under the Safety Bond Program as mitigation measures for the significant number of vehicle crashes at these locations. TxDOT requires TPC approval of these projects in the 2008-11 Transportation Improvement Program before these projects may be implemented.

The Houston-Galveston Area Council (in cooperation with the Cities of Sugar Land, Missouri City, and Houston, and the Counties of Fort Bend and Harris) is undertaking an independent study of access management improvements along Highway 6 that includes the Bellaire and Westheimer intersections with SH 6. As a consequence, the Policy Council tabled the proposed inclusion of the grade separations in the TIP and directed staff to:

- Review and verify the crash experience at the two intersections;
- Determine the extent to which access management measures other than elevated grade separations (raised medians, protected turn lanes and other modifications to the intersection) might reduce vehicle crashes;
- Examine the impact of the grade separations (and any alternative measures) on intersection and corridor mobility (reduction in traffic congestion); and
- Return to the TPC with recommendations at its November, 2007 meeting.

An excerpt of the draft consultant report describing investigation of these two intersections has been attached for your review. A brief summary has been provided below.

### **Current Conditions**

SH 6 is a major north-south arterial on the west side of the region connecting US 290 to US 59 S. It is located roughly mid-way between BW 8 and the existing portion of SH 99 in Fort Bend County. Although a state highway, it has traditionally served as both a local arterial and a major interregional route.

Since 2001, vehicle travel has increased 25 to 40% in the section between Sugar Land and I-10 (Katy Freeway). Over the next decade, future travel growth is expected to become limited by the available roadway capacity, with travel volumes in excess of 80,000 cars per day in the section between Westheimer and I-10.

Another concern is the crash history in the corridor, particularly at key intersections such as Westheimer and Bellaire Boulevard. A total of 867 crashes were reported over the last five years within one half mile of the two intersections. Approximately 50% of these were immediately within the intersection or within one block. Over 90% of the crashes were with vehicles entering or exiting driveways, right angle or rear end crashes. Crashes were highly correlated to evening peak traffic conditions, particularly at Westheimer. The crash experience at these intersections

ranks them among the highest on the non-freeway portions of the state highway system.

**Alternatives Considered**

A package of access management measures including the installation of raised medians, operational improvement of traffic signals in the two intersections and the addition of some protected turning lanes was developed as the primary alternative to the proposed grade separations. Other access management treatments, such as driveway consolidation and median treatments beyond the grade separations are recommended to be incorporated in both alternatives. A comparison of the access management measures with and without the grade separations is shown below.

**SH 6/Westheimer Analysis Summary**

Design Concepts	Crashes Mitigated	Intersection Volume/Capacity*	
		AM	PM
Current Conditions	0	1.52	1.24
Access Management	54	1.22	1.11
Grade Separation	144	1.02	1.03

**SH 6/Bellaire Analysis Summary**

Design Concepts	Crashes Mitigated	Intersection Volume/Capacity*	
		AM	PM
No-Build	0	1.16	1.10
Access Management	67	0.98	0.92
Grade Separation	258	0.86	0.83

Please note that the larger the ratio of traffic volumes to design capacity, the greater the severity of congestion, vehicle delay and traffic backups at the intersection. For both intersections, staff analysis demonstrates almost a threefold increase in the crash reductions from a grade separation. This improvement is largely attributed to the reduction in the number of vehicles traveling through the intersections with the grade separation scenario.

H-GAC’s consultants were also ask to consider the impact of the grade separations on nearby signalized intersections, as reducing the delay experienced at the current intersections would be expected to more quickly release traffic to the next intersection, potentially creating a new “bottleneck”. This was of particular concern at Piping Rock, the intersection immediately north of the SH 6 grade separation with Westheimer. Because of the much more limited turning volumes at Piping Rock, simulation analysis shows that signal timing modifications will be adequate to accommodate the traffic flows from the Westheimer grade separation, assuming overall peak travel demand remains similar.

The cost of access management measures within the two intersections would cost a total of approximately one and one half to two million dollars (depending on the right of way needed for additional dedicated left turn lanes on Westheimer). The cost of grade separations for Highway 6 would be approximately 18 million dollars each (36 million total). Depressing the grade separation of SH 6 under the two cross streets would double their cost due to the land and construction costs associated with pump stations.

15 million dollars for each of the grade separations has been committed by the Texas Transportation Commission through its statewide Safety Bond Program. Although no funding is specifically committed to the access management measures in the SH 6 corridor, many of the measures investigated will be highly cost effective either as a package or as complementary measures to the proposed grade separations.

**Recommendations**

Staff recommends approval of the proposed grade separation of four SH 6 main lanes at Bellaire and Westheimer with the addition of a second dedicated turn lane on Westheimer and early implementation of access management in the SH 6 corridor as the most effective measures available for crash reduction and congestion mitigation.