





<b>Project Title:</b>	<b>Development of a Semi-Rigid Longitudinal Barrier System Capable of Withstanding Low-Speed Transverse Impacts</b>
<b>Project Synopsis:</b>	<p>A MASH compliant semi-rigid longitudinal barrier system capable of withstanding both longitudinal and transverse impacts would be desirable along streets, such as service drives along depressed freeways, with intersecting side streets. Under this type of condition, the barrier would be subjected to both longitudinal impacts, from traffic flowing along the barrier, and lower-speed transverse impacts due to intersecting side street traffic.</p> <div style="display: flex; justify-content: space-around;">   </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <p><i>Service Drive Along Depressed Freeway</i></p> <p><i>Side Street and Service Drive Intersection</i></p> </div>
<b>Project Goal(s):</b>	<ol style="list-style-type: none"> <li>1. Develop a Barrier System Consisting of Traditional Beam Guardrail, Cable Barrier, or a Combination of the Two             <ul style="list-style-type: none"> <li>• Example: Using slotted thrie-beam panels with cables behind the posts, and controlled release terminal (CRT) wood posts in the vicinity of the T-intersection</li> </ul> </li> <li>2. Capable of Meeting MASH, TL-2 (or TL-3 if deemed possible) as a longitudinal barrier</li> <li>3. Capable of Capturing Crash Test Vehicles when Impacting the Barrier at a 90-degree angle, and Meeting Applicable Evaluation Criteria from MASH, TL-1 (or TL-2 if deemed possible)</li> <li>4. Explore if system can be used with and without curb &amp; gutter</li> </ol>
<b>Project Background:</b>	<p>Some transportation agencies have depressed freeways with service drives along the freeway. Typically, there are streets and drives intersecting the service drives. Consequently, there is a need for barriers placed alongside a service drive to not only redirecting impacting vehicles traveling along the service drive, but also capture any vehicles traveling on intersecting side streets that may errantly drive through the intersection and potentially enter the freeway.</p> <div style="display: flex; justify-content: space-around;">   </div>

Traditional guardrail and different types of cable barrier systems have been used in an attempt to capture side street vehicles impacting the barrier transversely. However, these designs have either proven to be ineffective, or have not been subjected to successful crash testing.



**Proposed Work Plan:**

- Task 1. Design /FEA Simulations (Design, CIPs definition, predictive tests outcome, & drawings) **\$77K**
- Task 2. Construction (Material + Installation + Repairs) **\$77K**
- Task 3. Full-Scale Crash Testing **\$142K**  
MASH 3-11 & MASH 3-10  
90-Degree, 44 mph pickup truck
- Task 4. Reporting **\$4K**

**Deliverables:**

A MASH-compliant semi-rigid longitudinal barrier system capable of withstanding low-speed transverse impacts.  
Final report with full documentation of the research effort, videos and photographs of the system construction, installation and performed full-scale crash testing.

**Urgency and Expected Benefit:**

There are currently no barrier options for this application conforming to NCHRP 350 or MASH criteria. The development of a longitudinal semi-rigid barrier system capable of withstanding both longitudinal and transverse impacts, and meeting MASH criteria, would have immediate safety benefits for applications where a barrier may be subjected to both longitudinal and transverse impacts.

**Problem Funding and Research Period:**

Funding: **\$300,000**  
Period of Performance: **20 months**

**Developer(s) of the Problem Statement:**

Name: Carlos Torres  
Email: [torresc@michigan.gov](mailto:torresc@michigan.gov)  
Phone: (517) 335-2852