SAFETY STUDY REPORT
FOR
CUY-90-10.92 TO 11.22
DISTRICT 12
June 17, 2019
Revised July 16, 2019

OHIO DEPARTMENT OF TRANSPORTATION

PID 109499
CUY 90 10.92 to 11.22
Safety Study 2017
TABLE OF CONTENTS

Purpose and Background................................................................. 1
Existing Conditions ........................................................................... 1
Crash Information ........................................................................... 3
  Table 1 - Crash Types................................................................. 3
  Table 2 - Additional CRASH Information................................. 4
Probable Causes............................................................................... 5
Recommended Countermeasures.................................................... 5
PURPOSE AND BACKGROUND

As a requirement of the Federal Highway Administration (FHWA), states must have a Highway Safety Improvement Program (HSIP). As part of the HSIP, the FHWA encourages each state to use more than one network screening approach to find locations that have the highest potential for safety improvement. The FHWA developed Safety Analyst (SA), a network screening program designed to improve the programming of site-specific highway safety improvements by incorporating safety management approaches with computerized analytical tools.

The Ohio Department of Transportation’s (ODOT’s) Highway Safety Program uses eight main categories that were developed using the SA program: Rural, Suburban and Urban - Freeway Segments (Rural and Urban only), Non-Freeway Segments and Intersections. The program typically studies the top 50 locations statewide in each category and recommends countermeasures to reduce crashes. Based on funding availability, the HSIP locations are then improved based on the recommendations.

The section being studied is an Urban Freeway segment. The segment is ranked #79.

The study will consider probable causes for the crashes and recommend suitable countermeasures to mitigate the safety issues on the corridor.

EXISTING CONDITIONS

The segment being studied is located in the central portion of the City of Cleveland. The segment is between the interchanges of W. 117th St. and West Blvd. A portion of the westbound exit and eastbound entrance ramp for W. 117th St. and the eastbound exit and westbound entrance for West Blvd. are within the study area. The study area is approximately 3.5 miles west of I-71.
The freeway is four lanes in both directions with standard shoulders and an auxiliary between the ramps.

Two overhead structures are within the study limits: 110th St. and 106th St. The outside slope, between the structures, is supported by a high retaining wall of approximately 25 feet (see photo).

A barrier is used along the grass median in both directions. Openings exist to allow for maintenance of the grass median (see photo).

The pavement markings are in good condition. Dotted lines are utilized to differentiate the auxiliary lanes from the main line lanes.

Signs are in good condition. The exit signs are on cantilevers or attached to the bridge. One sign westbound is attached to the retaining wall. A sign for no trucks is present on the overhead sign for the eastbound exit to West Blvd./Lorain Ave. (SR10) (see photo).

The westbound exit to 117th St. is a two-lane exit, with the inside lane being an optional lane.

Highmast lighting is used for this segment of IR90.

See Appendix D for the existing conditions diagram.

The roadway is relatively flat with a slight horizontal curve on the east end of the segment.

The posted speed is 60 mph.

According to ODOT's Transportation Information Management System (TIMS), the 2017 Annual Average Daily Traffic (AADT) is 135,376 (4% trucks) for mainline. The AADT for the ramps to and from West Blvd. are 6,694 (2% trucks) and 6,959.
(2% trucks) respectively. The AADT for the ramps to and from W. 117th St. are 12,111 (5% trucks) and 5,599 (3% trucks) respectively.

No construction activities were expected to have impacted this segment of I-90.

CRASH INFORMATION

ODOT’s GCAT analysis tool was used to retrieve the crashes at the intersection for the years 2015, 2016 and 2017. Originally 67 crash reports were retrieved for the log points of CUY-90-10.92 to 11.22. Eighteen of the crashes were found to be outside of the study area and one was a blown tire, leaving 48 crashes. The analysis of the 48 crashes and diagrams can be found in Appendix A and Appendix B, respectively. The 19 crashes that were excluded can be found in Appendix C.

As expected for an urban freeway, the predominant crash types are rear end and sideswipe passing, accounting for almost 80% of the crashes. This is shown in Table 1 below:

<table>
<thead>
<tr>
<th>Type of Crash</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rear End</td>
<td>23</td>
<td>47.9%</td>
</tr>
<tr>
<td>Fixed Object</td>
<td>12</td>
<td>25.0%</td>
</tr>
<tr>
<td>Sideswipe – Passing</td>
<td>8</td>
<td>16.7%</td>
</tr>
<tr>
<td>Angle</td>
<td>4</td>
<td>8.3%</td>
</tr>
<tr>
<td>Sideswipe – Meeting</td>
<td>1</td>
<td>2.1%</td>
</tr>
<tr>
<td>Grand Total</td>
<td>48</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
For the 48 total crashes, see Table 2 below for crash facts:

**TABLE 2 - ADDITIONAL CRASH INFORMATION**

<table>
<thead>
<tr>
<th>Crash Information</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury Crash (no fatal or one incapacitating)</td>
<td>21</td>
<td>43.8%</td>
</tr>
<tr>
<td>7:00 to 10:00 AM</td>
<td>16</td>
<td>33.4%</td>
</tr>
<tr>
<td>2016</td>
<td>22</td>
<td>45.8%</td>
</tr>
<tr>
<td>2017</td>
<td>11</td>
<td>22.9%</td>
</tr>
<tr>
<td>Ages 16-25</td>
<td>20</td>
<td>41.6%</td>
</tr>
<tr>
<td>Tuesday and Wednesday</td>
<td>25</td>
<td>52.1%</td>
</tr>
<tr>
<td>Crashes from July thru September</td>
<td>15</td>
<td>31.3%</td>
</tr>
<tr>
<td>Non-Daylight</td>
<td>21</td>
<td>43.8%</td>
</tr>
<tr>
<td>Alcohol- or Drug-Related</td>
<td>2</td>
<td>4.2%</td>
</tr>
<tr>
<td>Wet, Snow or Ice</td>
<td>21</td>
<td>43.8%</td>
</tr>
<tr>
<td>Eastbound</td>
<td>32</td>
<td>66.7%</td>
</tr>
</tbody>
</table>

Based on the data, the crashes mostly occur during morning peak hours (33.4%). A high percentage of crashes occurred on non-dry pavement (43.8%) and involved young drivers ages 16 to 25 (41.6%). No fatal and only one incapacitating injury occurred during this timeframe. Two-thirds of the crashes involved eastbound traffic. Thirteen of the 21 wet/snow/ice crashes occurred in the eastbound direction.

Three crashes occurred eastbound in the snow on 2/9/16 near the W. 106th St. overpass.

None of the crashes appear to be due to queuing at the exit ramps. No queues were observed during the morning peak period.
PROBABLE CAUSES

Based on the review of the crash data, the most prominent crash types are rear end, fixed object and sideswipe passing. After analyzing the crashes and performing a field review, the following are a list of probable causes for these crashes:

- Congestion (18 of the 32 eastbound crashes occurred between 6:00 to 10:00 AM)
- Young drivers
- Driver inattention/driver following too close

The existing striping and signing are in good condition. The advanced signing for the various exits is appropriate.

RECOMMENDED COUNTERMEASURES

Based on the crash analysis and field review, the following countermeasures are recommended:

- Consider hard shoulder running in the AM
- Consider anti-skid treatment to address wet/snow/ice pavement conditions (especially eastbound)
- Consider variable speed limit signing