

TECHNICAL MEMORANDUM

Project: Railroad Crossing of International Boulevard
Longview, WA

Subject: Support for Petition to
Install Stop Signs at Crossing

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The memorandum presents information and analysis to support a *Petition to the Washington Utilities and Transportation Commission to Modify Warning Devices at a Highway Railroad Grade Crossing*. The subject crossing is on International Way in unincorporated Cowlitz County as shown on Figure 1. The detailed location characteristics are provided in Table 1.

Figure 1. Railroad Crossing of International Way



Source: Google Earth, accessed April 26, 2023.

Table 1. Railroad Crossing Location and Operating Metrics

1. Existing highway / roadway	International Way
2. Existing railroad	Longview Switching Company performs all moves on subject rail segment including for both BNSF and Union Pacific trains.
3. USDOT Crossing Number	914213L
4. GPS location	Latitude: 46° 6'42.36"N Longitude: 122°56'20.16"W
5. Railroad mile post	n/a
6. City / County	Near Longview / Cowlitz County

1. Reason for Requested Change

The request to change the existing yield-sign-controlled crossing to stop-sign control is because there are limited sight lines for vehicles approaching the crossing, even at slow speeds. In 2017, a vehicle drove into the side of a moving train at this crossing and railroad personnel have reported several near-misses. Stop-sign control would force motorists to stop where there are adequate sight lines to approaching trains in both directions.

2. Railroad Operations and Crossing Characteristics

Information about the current rail network in the area was defined in the *Port of Longview's Transportation Optimization Plan Report*.¹ The tracks that cross International Way are part of the Longview Industrial Rail Corridor (IRC) that connects between the BNSF Railway (BNSF) and Union Pacific Railroad (UPRR) mainline corridors to the east and the Port of Longview's industrial areas. The existing rail network in the near-site vicinity is shown on Figure 2.

Currently, unit trains moved by the two Class 1 railroads (BNSF and UPRR) are transferred to the Longview Switching Company (LSC) at the interchange yard located east of the Port. On average, the Port of Longview estimates that two to four trains per day currently cross International Way; the number of trains can be as high as six per day on high-volume days. Train lengths range from about 3,000 feet (estimated at rail 50 cars) to about 4,150 feet (about 71 rail cars), the higher of which reflects the maximum train weight of about 10,000 tons. Analysis performed for the *Transportation Optimization Plan* estimated that a full-length unit-train can block International Way for about 15 minutes. In 2018, total rail traffic at the Port was 9.4 million tons. Per LSC, the maximum speed for trains on these tracks is 10 mph.²

¹ KPFF, Transystems, and Heffron Transportation, Inc., 2020.

² E-mail from Simon Walbruch, General Manager, Longview Switching Company, May 10, 2023.

Figure 2. Existing Rail Network at Port of Longview



Source: KPFF, Transportation Optimization Plan, August 2022.

The rail crossing at International Way has two tracks that split at a wye about 180 feet east of International Way. Just west of the International Way crossing, there is another wye west of which there are three tracks. The multiple tracks are used to facilitate deliveries to customers where segments of trains may be temporarily set on tracks while switching other segments into local spurs.

The existing railroad crossing has passive warning devices along northbound and southbound International Way that consist of the following:

- “RR Xing” warning sign located 130 feet from the tracks in the southbound direction and 250 feet from the tracks in the northbound direction;
- Painted-on-pavement “RR Xing” markings located about 100 feet from the tracks (centerline of marking to nearest track) in each direction; and
- Yield signs plus stop bars located about 20 feet from the nearest track in each direction.

It is noted that on-street parking is allowed on both sides of International Way and parked vehicles (including large trucks) can obscure a driver’s view of the warning signs located at the edge of the roadway. In addition, trains staged on the outside tracks can obscure the view to a moving train.

3. Federal and State Guidance

The US Department of Transportation provides guidance for railroad crossing signage and control in the *Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways*.³ Part 8 of the MUTCD addresses “Traffic Control for Railroad and Light Rail Transit Grade Crossings.” Section 8B.04 states:

A YIELD sign shall be the default traffic control device for Crossbuck Assemblies on all highway approaches to passive grade crossings unless an engineering study performed by the regulatory agency or highway authority having jurisdiction over the roadway approach determines that a STOP sign is appropriate.

The use of STOP signs at passive grade crossings should be limited to unusual conditions where requiring all highway vehicles to make a full stop is deemed essential by an engineering study. Among the factors that should be considered in the engineering study are the line of sight to approaching rail traffic (giving due consideration to seasonal crops or vegetation beyond both the highway and railroad or LRT rights-of-ways), the number of tracks, the speeds of trains or LRT equipment and highway vehicles, and the crash history at the grade crossing.

The Washington State Department of Transportation (WSDOT) *Design Manual*⁴ provides guidance for the sight distance that should be provided at Railroad Grade Crossings. Section 1350.02(1)(a) states:

Sight Distance at railroad grade crossing is comparable to the intersection of two highways where a sight triangle is kept clear of obstructions (including vegetation) and may be protected by a traffic control device. When designing for these locations, provide for both corner and clearing sight distance.

Corner sight distance allows a driver, traveling towards the crossing, to see an approaching train at a distance that allows the vehicle to stop in advance of the crossing. (see Exhibit 1350-1, Case A). Clearing sight distance allows a driver stopped at a crossing to see far enough down the tracks that they may decide to proceed and cross those tracks before a train, approaching at its maximum allowable speed, reaches the crossing (see Exhibit 1350-1, Case B.)

For Cases A and B, the minimum distance for removing signs, brush and timber in the vicinity of the grade crossing that obstruct the view of an approaching train is 100 feet, measured along the tracks from the crossing.

Among the challenges associated with providing sight distance at railroad grade crossing locations are topography, seasonal crops or other vegetation, and structures or other obstructions in properties that the sight lines cross, including the railroad.

USDOT and Federal Highway Administration, 2009 Edition including Revisions 1, 2, and 3, Last Updated July 2022.

<https://mutcd.fhwa.dot.gov/pdfs/2009r1r2r3/mutcd2009r1r2r3edition.pdf>

⁴ WSDOT Design Manual, September 2022. <https://www.wsdot.wa.gov/publications/manuals/fulltext/M22-01/design.pdf>

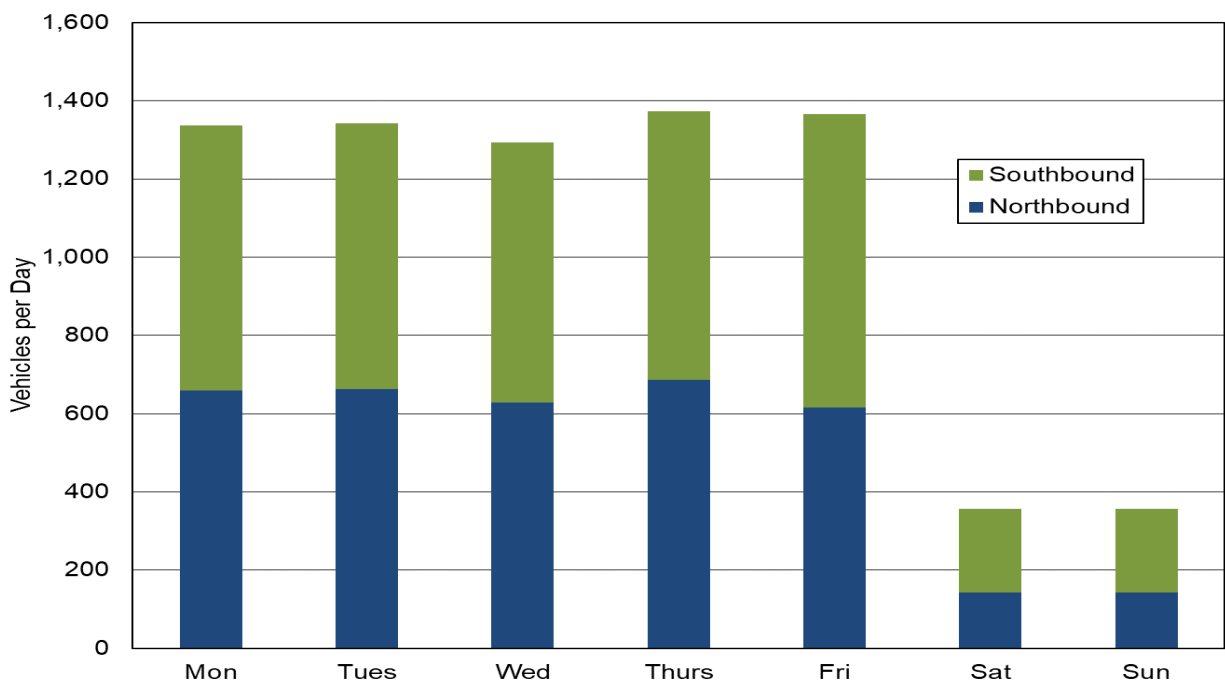
4. Traffic Volumes and Speeds on International Way

In order to determine the sight distance needed for traffic approaching the crossing and to assess potential impacts of a change in traffic control, a new seven-day traffic count and speed study was performed on International Way, with data collected from Tuesday, May 9 through Monday, May 15, 2023. These counts were performed by a specialized vendor, Innovative Data Acquisitions, LLC (IDAX), using a double-set pneumatic tube located about 185 feet south of the crossing's southern stop bar. This location was selected to determine the speed of travel before vehicles begin to slow approaching the crossing.

4.1. Daily Traffic Volumes

Figure 3 shows the observed daily traffic volumes at the crossing. As shown, volumes are highest on weekdays, with an average weekday traffic volume of 1,342 vehicles. Traffic flows are slightly unbalanced with 650 northbound vehicles and 692 southbound vehicles. This unbalanced flow is likely related to access restrictions on the west side of the Port area where vehicles cannot enter the site directly from southbound Oregon Way (State Route [SR] 433).

Figure 3. Daily Traffic Volumes – International Way south of Railroad Crossing (May 2023)

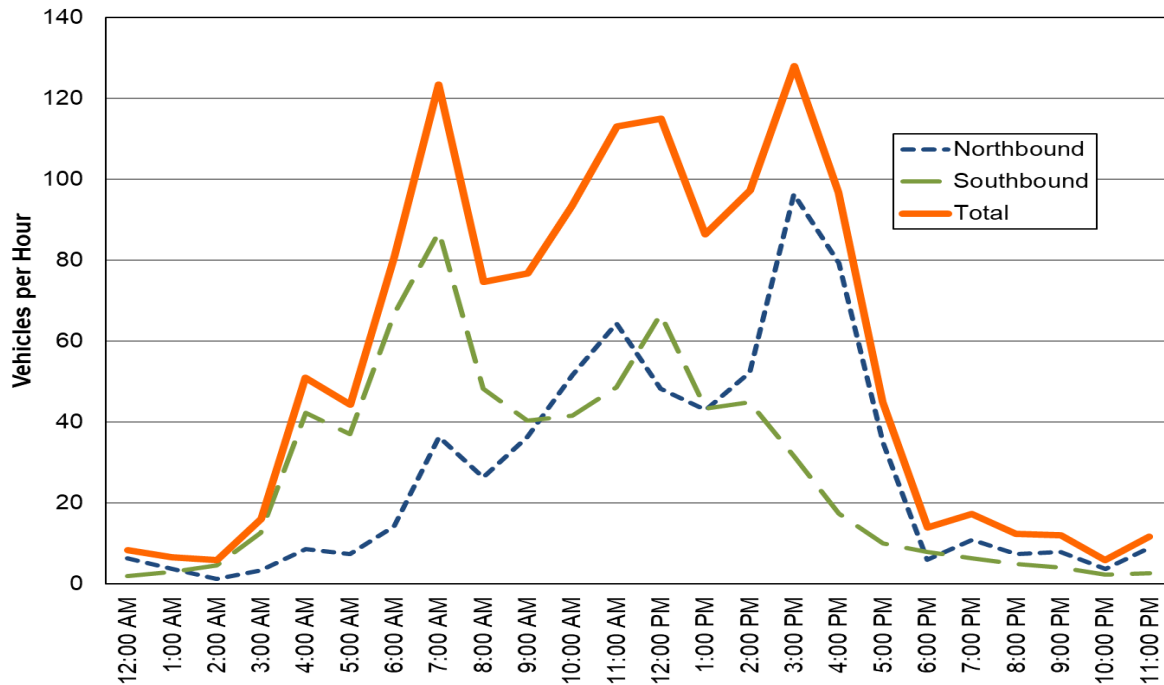


Source: IDAX. Counts performed from Tuesday May 9 through Monday, May 15, 2023. Data compiled by Heffron Transportation, Inc.

4.2. Hourly Traffic Volumes

Figure 4 shows the hourly weekday volumes, which reflect the average of counts for Tuesday, Wednesday, and Thursday. This figure shows the peak morning arrivals (southbound to the Port) and the peak afternoon departures (northbound), as well as the midday lunch period. Peak volumes did not exceed 100 vehicles per hour per direction.

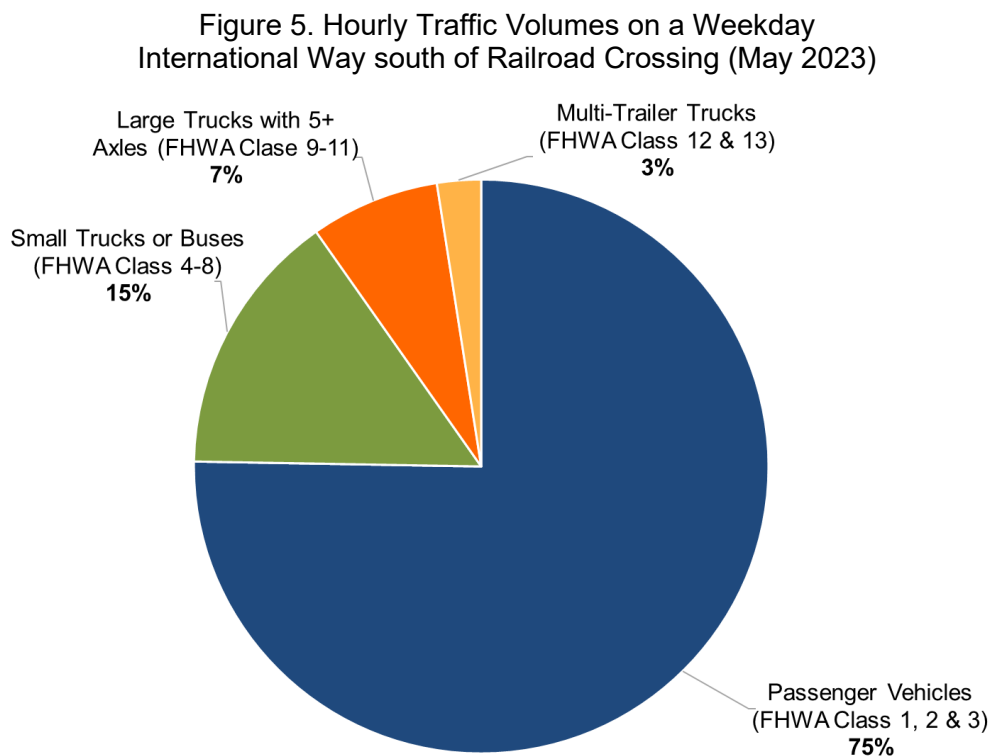
Figure 4. Hourly Weekday Traffic Volumes
International Way south of Railroad Crossing (May 2023)



Source: IDAX. Counts performed from Tuesday May 9, through Monday, May 15, 2023. Data compiled by Heffron Transportation, Inc. The hourly volumes reflect the average of Tuesday, Wednesday, and Thursday volumes.

4.3. Vehicle Classification

The types of vehicles were also captured during the traffic counts and were classified according to FHWA axle configurations. The classes were then grouped to show relative sizes of vehicles ranging from passenger vehicles to multi-trailer trucks. Figure 5 shows that 75% of the vehicles on International Way are passenger vehicles and 25% are trucks. About 10% of all vehicles are large trucks with more than five axles or trucks with multiple trailers.



Source: IDAX. Counts performed from Tuesday, May 9 through Monday, May 15, 2023. Data compiled by Heffron Transportation, Inc.

4.4. Vehicle Speeds

Finally, the traffic count machines also recorded vehicle travel speed. As noted previously, the pneumatic tubes were located about 185 feet south of the railroad tracks to assess travel speeds prior to the point where northbound vehicles typically begin slowing when approaching the tracks. The count location is very close to a southbound speed limit sign that posts the limit on the Cowlitz County segment of roadway at 35 miles per hour (mph). The segment of International Way north of the tracks is in the City of Longview, and northbound traffic also has a 35-mph speed limit sign posted about midway between Columbia Boulevard and Industrial Way (SR 432).

Travel speeds are typically reported as the 85th-percentile speed, which means that 85% of the vehicles were observed traveling at or below that speed. For the data collection location, the 85th-percentile speed was 35.9 mph in the northbound direction and 35.7 mph in the southbound direction, nearly identical to the posted speed limit. Therefore, a speed of 35 mph was applied for the sight-line analysis presented in the following section.

5. Sight Line Analysis

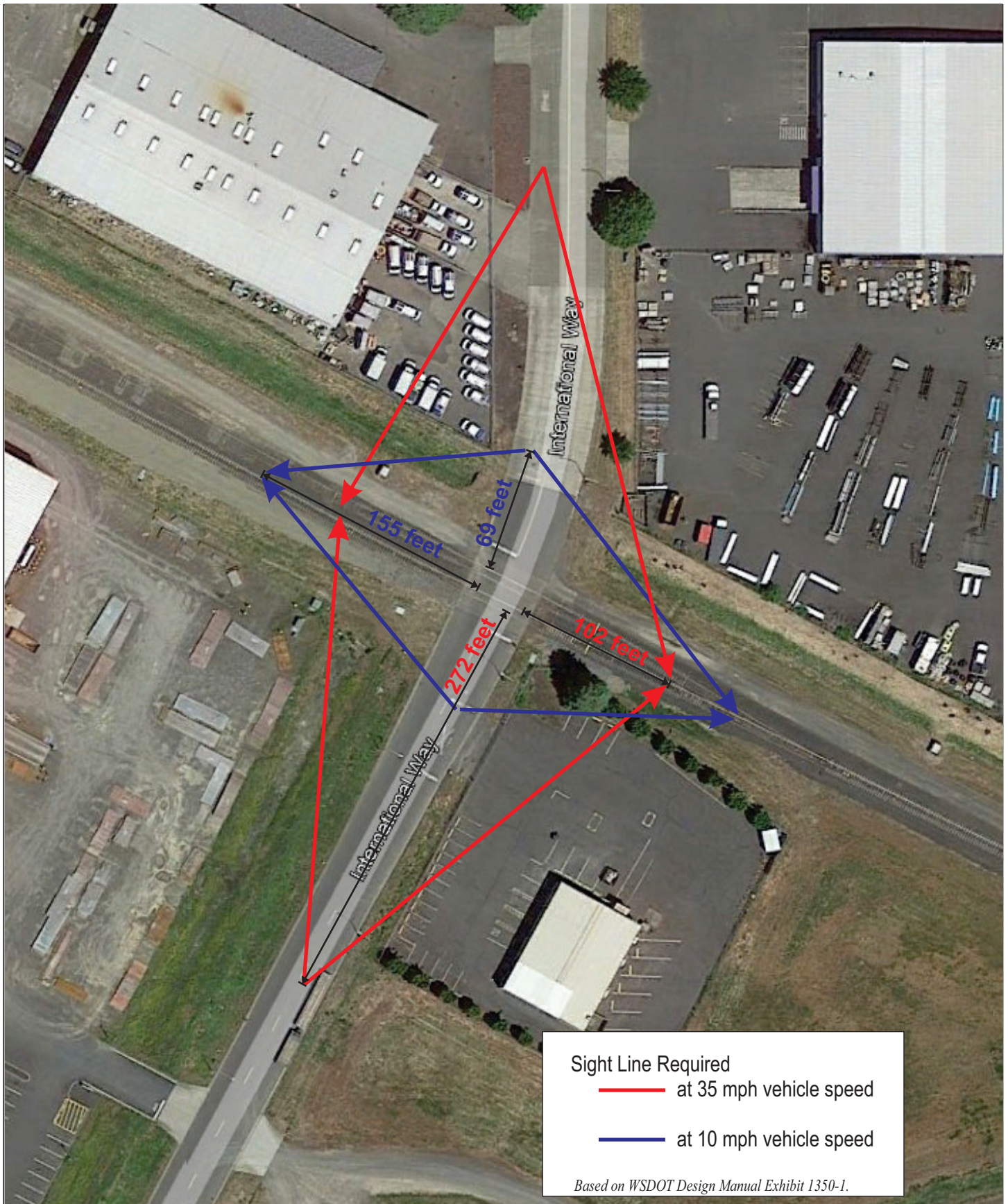
Guidance from the *WSDOT Design Manual*⁵ were used to assess the adequacy of the sight lines given the vehicles speeds (posted and measured at 35 mph) and the maximum train speed (10 mph). Per Exhibit 1350-1 (Sight Distance at Railroad Crossing), the following sight triangle dimensions would be needed for the existing yield condition.

- **Distance Along Highway From Crossing** = 272 feet (average of distance for 30 mph and 40 mph). This is the location of the driver's eye approaching the tracks at 35 mph at the last point where they would need to react in order to stop the vehicle for an oncoming train.
- **Distance Along Railroad from Crossing** = 102 feet. This is the distance the train would travel along the tracks.

Figure 6 illustrates the sight triangle needed to avoid a train-vehicle collision. As shown, for both northbound and southbound motorists, the sight triangles cannot be provided within the roadway and/or railroad rights-of-way, but instead are partially located across private property. Sight lines are currently obscured by existing fences, landscaping, parked vehicles, and buildings.

Even if the approach speed for vehicles could be reduced to 10 mph, it would not adequately improve the sight lines. The 10-mph vehicle speed would require a sight triangle located 69 feet back of the crossing and extending 155 feet down the tracks. Figure 6 also illustrates this condition and shows that the sight triangle is obscured by the same fixed features on private property. Figure 7 and Figure 8 are photos of sight lines from south and north of the tracks, respectively, that show the existing view obstructions.

⁵ WSDOT Design Manual, September 2022, Chapter 13 Railroad Grade Crossings.



International Way Railroad Crossing Study

Figure 6
Required Sight Line Triangles at
International Way Railroad Crossing

Figure 7. Available Sight Line for Driver – Looking East, 90-feet South of Tracks



Source: Photo by Heffron Transportation, Inc., April 28, 2023.

Figure 8. Available Sight Line for Driver – Looking West, 220-feet North of Tracks



Source: Photo by Heffron Transportation, Inc., April 28, 2023.

6. Historic Collisions at Railroad Crossing

Collision data for International Way at and near the railroad crossing were obtained from WSDOT. Historic data for a ten-year period were requested. The data indicated one reported train-vehicle collision, on January 11, 2017 at 16:47, when a pick-up truck collided with the side of a moving train at the crossing. The collision report noted that the crossing was dark and the vehicle's headlights were on. No injuries were reported.

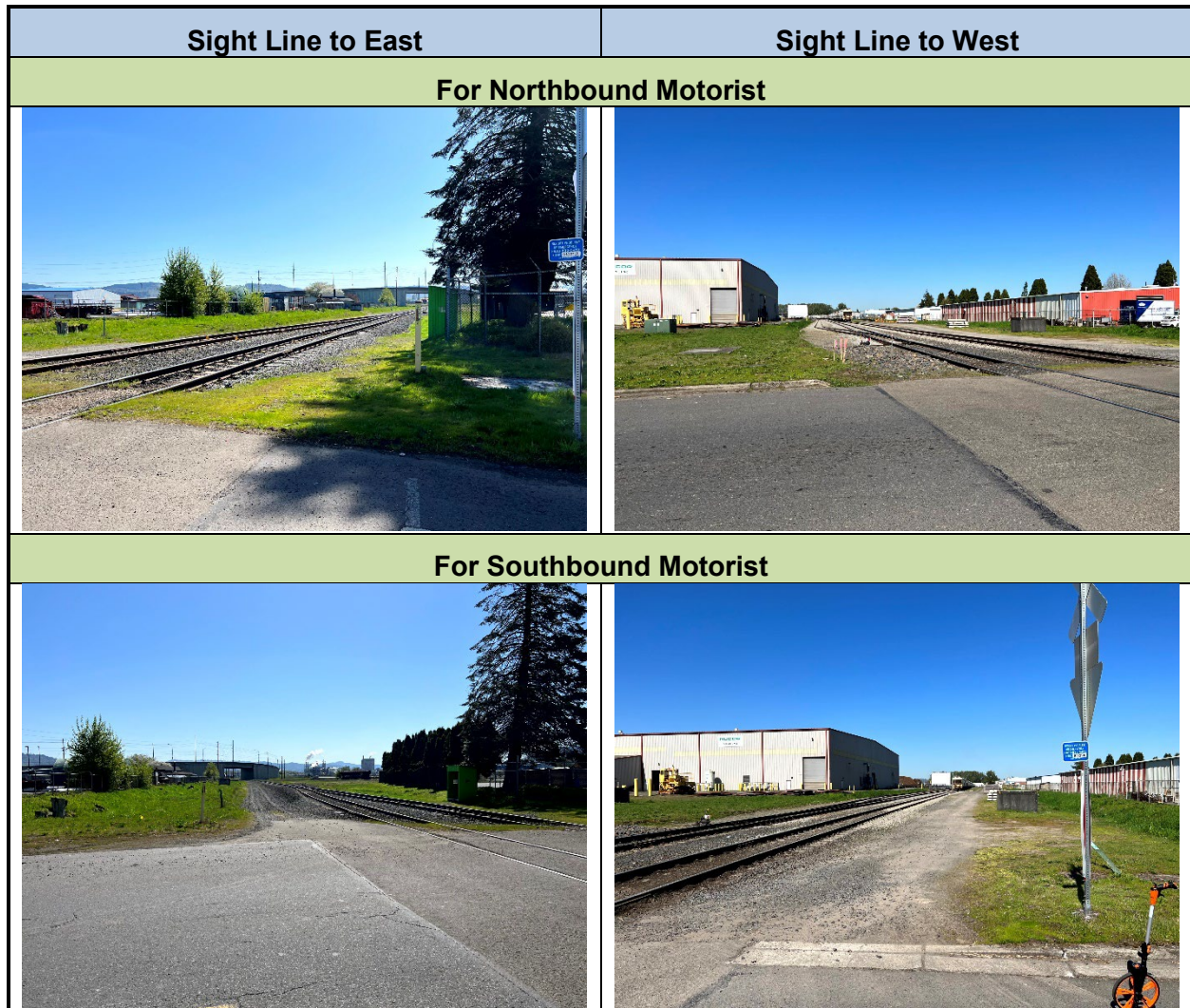
Train crews from LSC have reported near misses where vehicles will speed up to cross the tracks in front of an oncoming train. As previously noted, a full unit-train can block the crossing for about 15 minutes, which may contribute to this behavior.

7. Effect of Traffic Control Change

Changing from a yield sign to a stop sign at the crossing would require all vehicles to stop, which under high volume conditions, could create unnecessary delay and queuing. However, as shown by the traffic volume data presented in Section 4.2, fewer than 100 vehicles per hour per direction cross the railroad tracks. Even during the peak 15-minute period, there were three or fewer vehicles per minute. A few seconds to complete a full stop would not create adverse congestion or queuing issues.

Sight lines needed along the rail tracks would be adequate for a vehicle that stops before proceeding. For train speeds of 10 mph, the minimum sight distance for a "Departure from a Stop" (referred to as Case B on WSDOT Exhibit 1350-1) is 255 feet. Figure 9 shows that the sight lines along the tracks for both directions of vehicle traffic exceed 500 feet.

Figure 9. Sight Lines along Tracks from Vehicle Stop Bar



Source: Photos by Heffron Transportation, Inc., April 28, 2023.

8. Summary

This analysis shows that the existing crossing does not meet minimum sight distance requirements for yield control, but does meet the sight distance requirements for stop control. The roadway traffic volumes are low enough at the crossing such that the change to stop control would not create adverse congestion or queuing. Therefore, it is recommended that the crossing be converted to stop-sign control.

MCH/tsm

International Way - Support for RR Xing Modification Petition - 06-14-2023.docx