



**Oregon
Department
of Transportation**

Traffic Barrier Data Collection Guide

Traffic-Roadway Section | Delivery & Operations Division

June 2020

Oregon Department of Transportation

Delivery & Operations Division – Engineering & Technical Services Branch

Traffic-Roadway Section

4040 Fairview Industrial Dr. SE MS#5

Salem, Oregon 97302-1142

503.986.3568

<https://www.oregon.gov/odot/engineering/pages/index.aspx>

This guide has been prepared for use by the Traffic-Roadway Section and has evolved over time with input and expertise from a variety of resources. It will continue to evolve as new standards and requirements are established. The sources include the links provided throughout the document and the individuals listed below. Sincere gratitude is extended to these individuals for their support in the compilation of this document.

This manual has been reviewed and approved by the following Oregon DOT personnel:

- Christopher Henson, Senior Roadside Design Engineer
- Heidi Shoblom PE, State Roadway Manager
- Laura Hansen, Traffic Roadway Data & Systems Coordinator

Former contributions made by:

- Sarah VanHynning, Traffic-Roadway Intern, 2019-2020
- Noah Oliver, Traffic-Roadway Intern, 2019-2020
- Mason Riedman, Traffic-Roadway Intern, 2019-2020
- Timothy Walz, Traffic-Roadway Intern, 2018-2019
- Sharon Ballard, Roadway Asset Inventory Specialist
- Kayl Enders, Research Specialists for Asset Management; October 2014
- Jennifer Cunningham, Research Specialists for Asset Management; October 2014
- Melissa Donnini, OPI Asset Management Intern; PSU; 2009
- Lily Nguyen, Operation and Design Manual Engineer
- Steve Lindland, Roadway Engineering Manager
- Laura Wipper, Performance Management Consultant
- Laura Hansen, Asset Management Integration Implementation Manager
- Tyler Ferguson, Statewide Asset Specialist



This icon indicates important information.

Table of Contents

INTRODUCTION	6
BASIC INVENTORY	8
Before Inventory Begins.....	8
INVENTORY DEFINITIONS & PHOTOGRAPHS	10
LOCATION	11
LRM	11
ODOT's Highway/Milepoint LRM.....	11
Highway Number.....	12
Highway Suffix	12
Roadway Identifier	13
Mileage Type	14
Overlap Mileage Code	14
Milepoints: Start MP/End MP.....	15
Position.....	15
TERMINALS	16
Terminal Type	16
Bridge Ends.....	24
Impact Attenuator.....	25
Transition	32
Continuation.....	34
Terminal Height.....	35
Terminal Condition	36
Shared Terminal.....	37
BARRIERS.....	38
Barrier Type.....	38
Barrier Description	39

Barrier Height.....	46
Concrete Construction Type	47
Barrier Condition	47
Concrete Connection	49
Post Spacing.....	50
Post Type.....	51
Block-Outs.....	52
FREQUENTLY ASKED QUESTIONS	53
CONTACTS AND OTHER USEFUL RESOURCES	55
WEBSITES	56
APPENDIX A - COMMONLY USED TERMS.....	58
APPENDIX B - HIGHWAY INVENTORY SUMMARY	59
APPENDIX C - STATE, DISTRICT, & REGION MAPS	61
APPENDIX D - LIST OF ROUTE NUMBERS (2018).....	62
APPENDIX E - INVENTORY COLLECTION WORKFLOW	68
APPENDIX F - DATA COLLECTION TIPS.....	76
APPENDIX G - ABBREVIATIONS FOR DATA ENTRY	81
APPENDIX H - STANDARD COMMENTS	86
APPENDIX I - DIGITAL VIDEO LOG (DVL)	87
APPENDIX J - CRASH TESTING COMPLIANCE	97

INTRODUCTION

In an effort to monitor inventory, condition and asset performance, Oregon Department of Transportation (ODOT) has adopted asset management principles for a proactive approach to stewardship of the transportation infrastructure. Asset Management is a systematic and strategic approach to maintain, upgrade and operate physical assets. In order to maximize the benefits of asset management, a standardized method of data collection and data processing is needed. This will not only benefit the individual asset managers, but will also create “corporate” data that can be used by all ODOT employees. Commonly understood corporate data will allow for informed decision-making, as well as better communication between asset managers and other ODOT departments (e.g., Maintenance, Construction, GIS, etc.). Data collection standards will lay the foundation for a regular cycle of communication about asset needs and conditions.

In January 2007, the draft ODOT Asset Management Region 2 Pilot Report was produced. This report documented experiences over the course of the previous year in collecting, integrating and reporting data about a variety of assets within specific highway segments. The state of available data for the assets included ranged from zero to well-established management systems. Research was done to analyze the data collection process, resources used, and condition of those assets that lacked previously existing data. Among the findings of the Pilot Report were recommendations specific to the assets included in the report, the methods and tools for data collection, and the quantity of data needed to build capacities for informed decisions.

The purpose of this guide is to assist ODOT employees and outside sources in gathering traffic barrier inventory information and to maintain a consistent data collection method throughout the state. Basic inventory supported by consistent data collection; sharing and reporting; and integration into a decision-making framework result in noticeable cost-savings as well as communication and data-sharing improvements have resulted in more cross-divisional collaborations; and additional inventory has also helped with other compliance requirements as well as improved programmatic plans.

A commitment to utilize the definitions, processes, and procedures contained in this manual is an important step in managing the program and moving the agency forward.

The dedication to Asset Management principles by ODOT will foster the development of strategic methods to evaluate asset data and communicate asset needs. This system will prove beneficial throughout the agency in ways such as:

- provide reliable and accurate asset information;
- provide data for 1R/3R decision documentation;
- ensure that public agency activities are consistent with existing federal guidelines, current accounting practices, such as Governmental Accounting Standards Board (GASB) Statement 34; and
- Help ODOT as an agency demonstrate to the public that they are responsible stewards of Oregon's transportation assets.

Traffic barriers and standards will continue to evolve, updates will be made as warranted and resources allow. Should you have any question, contact the asset owner, [Christopher Henson](#), at 503.986.3561.

BASIC INVENTORY

Inventory processes have changed over time and will continue to morph based on agency priority and resource availability. The business is currently testing a new data collection technology option; until implementation current business practice will not involve hand-held devices and if data collection is warranted field work will require a manual paper process, in office will be desktop inventory.

Prep work is required regardless of the process used and the steps and definitions are explained on the following pages.

Before Inventory Begins

Before collecting inventory, you will first need to do the following:

- Identify the segment of roadway to be inventoried with asset owner.
- Prepare collection method
 - Digital or physical excel spreadsheet: Use the FACS-STIP Tool Data-To-Go function to export a spreadsheet to the assets to be inspected/collected. Refer to the FACS-STIP User Guide for instructions on how to accomplish this. The FACS-STIP Tools and User Guide are available at:
<http://gisintra.odot.state.or.us/facsstip/>
 - Acquire fundamental working knowledge of the Digital Video Log (DVL).
 - See Appendix B
 - Access the DVL's User's Guide:
<https://dvlprod-ordot.msappproxy.net/cf/dvl/>
 - Link provides access to a list of the available video logs:
https://www.oregon.gov/ODOT/Data/Documents/DVL_Available_Years.pdf
- Gain working knowledge of location and asset [terminology](#) (e.g., milepoints, add/non-add direction, etc.).

Print a copy or have access to the Highway Inventory Summary Report for the relevant segment of highway you are inventorying ([see Appendix D](#)). The following website contains reports by highway number:

<https://www.oregon.gov/ODOT/Data/Documents/Routes-to-Highway-Cross-Reference-Table.pdf>

High-level Process:

Office: Validate and update inventory from the office.

Field: Validate and update inventory with paper; tablet/ruggedized laptop; or handheld device.

INVENTORY DEFINITIONS & PHOTOGRAPHS

Traffic Barrier (a.k.a. guardrail or crash barrier) - Keep vehicles within their roadway and prevent them from colliding with dangerous obstacles. This is a linear asset with both a begin point and end point.

The following pages describe the features, attributes and domain values for traffic barriers. The description and images should be used to determine the appropriate details for the asset while conducting the data collection effort. Should you be unable to make a determination, or have questions, flag it for follow up with the asset owner.

Feature: A homogenous collection of common features, each having the same spatial representation and common set of attribute columns. Examples: BARR_Start_Point, BARR_End_Point, IATN_Point.

Attribute: A piece of information which determines the properties of a field in a database: Highway #, Hwy Suffix, Roadway ID, Mileage Type, Overlap Type, Start MP, End MP, Position, etc.

Domains Values: The set of all possible values which will make the function 'work' and will output 'real' values. In the example of Highway # it is a three-digit state number used by ODOT assigned to a length of highway for specific use in the corporate enterprise database. Valid highway numbers range from 001 to 499. Position has a domain of L for left and R for right. Only those values for the domain will be accepted into the enterprise system; any others will error out when trying to load the data.

LOCATION

This refers to the information that is needed to geographically reference the location of the traffic signal. The goal is to use this information to map the location of features along roadways.

Definitions for the location data that will help in filling in the location data fields are provided below:

Field: When a GPS point location is taken using a device with the approved level of GPS accuracy, the GPS unit should be held directly over the traffic terminal.

Office: When doing desktop inventory you will validate inventory based on what you see utilizing the tools available to you (DVL, straightline charts, FACS-STIP, TransGIS).

Definitions for location for the following attributes are listed on the following pages:

HWY	Start_MP	End_MP	Position
------------	-----------------	---------------	-----------------

LRM

The HWY attribute for traffic barrier is also the LRM. Linear referencing methods (LRM) existed long before GIS and computers. As highway systems were improved in the early 1900s, transportation departments developed referencing systems to describe locations on their infrastructure.

LRM is defined as ‘a method of determining the position of an entity relative to other entities to some external frame of reference.’

There are an infinite number of methods used to describe locations on a transportation network.

ODOT's Highway/Milepoint LRM

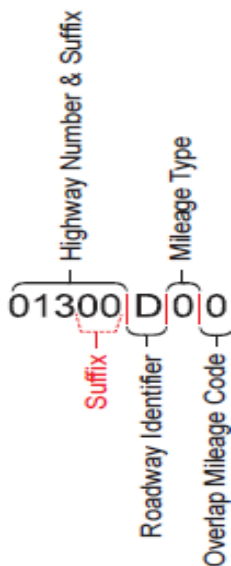
ODOT has used a Linear Reference Method (LRM) for many years to establish unique locations on state managed highways, connections and frontage roads. ODOT's

Highway Milepoint LRM is a combination of fields from legacy data that have been concatenated into the new LRM, which can be pulled apart to match up with legacy data.

This is what ODOT's Highway LRM looks like without its milepoint: 01300D00.

LRM is made up of the following components in this order:

Figure 1: Hwy LRM without its milepoint: 01300D00



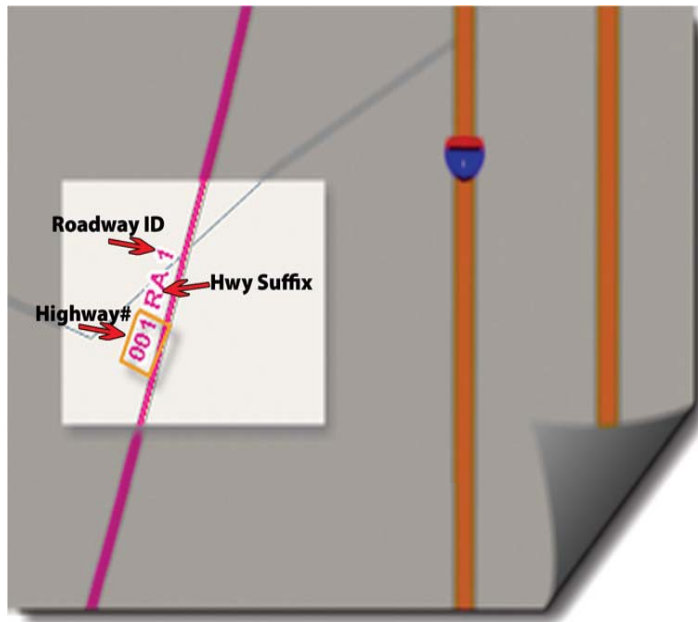
Highway Number

Three-digit state number (**not** route number) used by ODOT assigned to a length of highway for specific use in the corporate enterprise database. Valid highway numbers range from 001 to 499. See [Appendix D](#) for a complete list of highways.

Highway Suffix

Two-digit code; can have a numerical value of '00' (used for mainline) or any alphabetical characters ranging from 'AA – ZZ' (used for connections and frontage roads). Off-ramps, overpasses, service roads and express lanes are good examples of connections and frontage roads.

Figure 2: Displayed to show highway suffix example from TransGIS.



Roadway Identifier

The roadway identifier (RDWY_ID) is a one-digit code used in conjunction with the highway number and milepoint to identify the alignment on which the milepoint exists.

Following is a list of valid roadway identifiers:

1 - Milepoint exists on the primary roadway. This will be on the increasing-mileage alignment of the highway.

2 - Milepoint exists on the decreasing alignment.

Exception: Highway 001, Roadway 2 is the add-mileage alignment and Highway 001, Roadway 1 is the non-add mileage alignment.

5 - Preliminary Alignment (Located Line) - This milepoint indicates the mileage is on an alignment not yet built or the mileage is on a non-state owned roadway and considered located. This mileage is neither add nor non-add. For non-divided highways use Roadway 1 or the letter 'I'.

For divided highways:

- Increasing Direction = Roadway 1 = Letter 'I'
- Decreasing Direction (couplet) = Roadway 2 = Letter 'D'

Figure 3: Example increasing and decreasing roadways.



Mileage Type

This is used to make milepoints unique in areas where there are multiple occurrences of a milepoint on a single highway.

Mileage types are identified as follows:

- '0' if no Z mileage (default)
- Overlaps are indicated with a 'Z'

Z-mileage refers to a section of road that has been lengthened in the middle due to realignment.

Sources: TransInfo, FACS-STIP, TransGIS, Straight line Charts, ODOT Data Reports.

Overlap Mileage Code

This is used only in conjunction with "Z" mileage. The first chronological occurrence of 'Z' mileage will have an overlapping mileage code of 1, the second occurrence will have an overlapping mileage code of 2, etc. Overlapping mileage occurs when a section of highway is lengthened in the middle due to realignment.

Example: Section of highway from milepoint 49.00 to milepoint 50.00 is washed out. The washed-out section must be replaced, but old alignment cannot be used. A new alignment is built around problem area, but new alignment is 4.62 miles longer than original alignment. New distance between milepoint 49.00 and milepoint 50.00 is now 5.62 miles. To reflect true distance along the highway without renumbering all of the milepoints along the entire road, “overlapping mileage” is created.

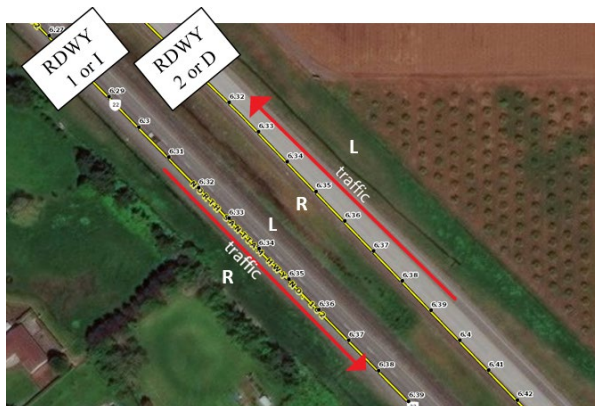
Milepoints: Start MP/End MP

Start and End milepoints (MP_NO). These are two separate fields that represent the distance in miles from the original beginning of the highway. This distance, measured along the contours of the traveled roadway, is derived from construction plans and verified using field inventory. For the purpose of collecting traffic barrier inventory, record the beginning and ending milepoints, to the hundredth decimal place (.01), of each barrier. The begin milepoint is always the lower milepoint, and the end milepoint is always the higher. Sources include TransInfo, FACS_STIP, TransGIS, straightline charts, and DVL.

Position

Refers to the location along the highway, identified as Left (L) or Right (R) based on the increasing mile direction.

Figure 4: Example showing the Left (L) and Right (R) positions.



TERMINALS

These are the end of the barriers.

Figure 5: Image of terminal



Terminal Type

Terminal type; the type categories are as follows:

- Terminal
- Impact Attenuator
- Transition
- Continuation

When gathering inventory data, you will need to identify the type of terminal located at both the start mile point (BARR_Start_Point) and ending mile point (BARR_End_Point) of the traffic barrier.

The data collection abbreviations of the following terminal types can be found in [Appendix G](#).

None - Indicates there is no terminal is present. A barrier terminal that is not a transition, a continuation, or an impact attenuator, but simply the terminus of the barrier.

Other - A terminal other than those listed in Terminal Type - usually used for Timber Rails or the transition between two different types of Concrete Barriers.

Figure 6: **Sloped End Unburied** - End slopes down toward the road.



Figure 7: **Mound** - End is buried in a man-made mound of earth.



Figure 8: **Buried in Back Slope (BIBS)** - End is buried into the slope of the land (i.e., side of hill).



Figure 9: Another example of **Buried in Back Slope** (BIBS) - End is buried into the slope of the land (i.e., side of hill).



Figure 10: **Blunt A** - The terminal has a blunt end that resembles a shovel head. Second post is not breakaway, there is no hole drilled in post (see ET 2000).



Figure 11: **Blunt B** - Similar to the Blunt A but the end is a bit more rounded. Second post is not breakaway (see ET 2000).



Figure 12: **Blunt C** Second post is not breakaway (see ET 2000).



Figure 13: **Breakaway Cable Terminal (BCT)** - Terminal head has various forms. The first two posts are drilled to be breakaway (see ET 2000). A cable connects the back of the rail with the first post.



Figure 14: **ET 2000** - Has a flat end that is perpendicular to the road. All posts are drilled to breakaway; and there is a ground strut. ET 2000 has a square end.



Figure 15: **ET Plus** - Has a flat end that is perpendicular to the road. All posts are drilled to breakaway; and there is a ground strut. ET Plus has a rectangular end.



Figure 16: **SRT (Slotted Rail Terminal)** - All posts are drilled to breakaway and the system has a ground strut. There are pre-formed slots cut in the rail. This terminal is 37' 6" long.



Figure 17: **SRTs** may have different terminal heads.



Figure 18: **FLEAT (Flared Energy Absorbing Terminal)** - The terminal head has a straight flare, and is 37' 6" in length. There is a tube bracket on top of the terminal.



Figure 19: **MFLEAT (MASH- Flared Energy Absorbing Terminal)** - Upgraded version of the FLEAT. Differentiated by the solid side panel (as shown) and a 39' 7" straight flared length. There is still a tube bracket on top of the terminal.



Figure 20: **CBT (Cable Barrier Terminal)** - The cable strands are brought down and anchored to the ground.



Figure 21: Another example of a **CBT (Cable Barrier Terminal)** - The cable strands are brought down and anchored to the ground.



Figure 22: **SKT - (Sequential Kinking Terminal)** - Characterized by a center horizontal brace and two vertical braces. This terminal is available in two lengths: 37'6" and 50'.

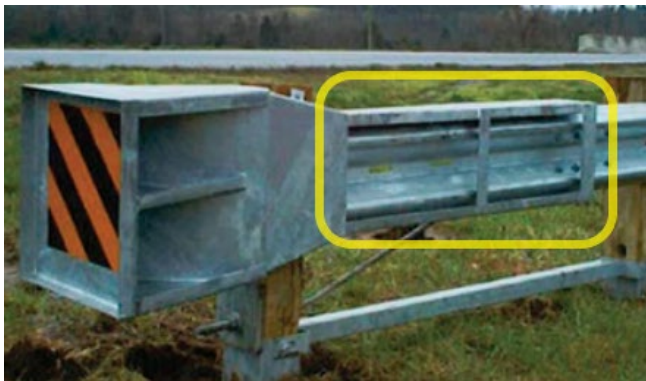


Figure 23: **MSKT- (MASH- Sequential Kinking Terminal)** - Upgraded version of the SKT. Differentiated by the solid side panel.



Figure 24: **MAX-Tension** - Rectangular impact head with two cables that extend from underneath the head to a ground strut in front. The cables extend 27ft on the backside of the rail to a plate located on the rail between the 5th and 6th posts.



Figure 25: **MAX-Tension Median** - For median guardrail (two rails mounted to each side of the posts). A wider rectangular impact head with two cables that extend from one side of the head to a ground strut in front. The cables extend 27ft on the backside.



Figure 26: **SOFT-STOP** - Tall and narrow extruder head and 8" or 12" offset block guardrail systems. Unique anchor at head of system.



Bridge Ends

Bridge ends are typically protected with a transition, guardrail run and end terminal. In some cases, a continuation of concrete barrier or an impact attenuator may be used to protect the bridge end. However, many bridge ends are unprotected or the transition is missing (unconnected) and each of these unprotected or unconnected locations needs to be identified.

When collecting data:

- An **UNPROTECTED** bridge end will be recorded in the IATN asset data as a point asset. Record the same way as an impact attenuator, but input UNPROTECTED as the TRMNL_TYP.
- An **UNCONNECTED** bridge end will be recorded as a beginning or end terminal of a pre-existing rail in the TBARR asset data.

Figure 27: **Unprotected (Bridge End Unprotected)** - No barrier system present to prevent a vehicle from impacting the end of the bridge rail.



Figure 28: **Unconnected (Bridge End Unconnected)** - A barrier system is installed at the bridge end, but there is no physical connection to the bridge rail.



Impact Attenuator

This is a terminal used to shield a point hazard where it is not effective or practical to use a longitudinal barrier or to place a terminal end on a median barrier. The main element for identifying an impact attenuator is to match what you see on the DVL or in the field with one of the pictures below. An impact attenuator can be attached to a traffic barrier (i.e., a Rail, Cable Barrier, or Concrete Barrier), or it can stand alone.



If the impact attenuator is attached to a traffic barrier follow the same guidelines used for all other terminals when recording inventory data.



If the impact attenuator is an independent feature (i.e. connected to a structure), it is to be treated as a point feature rather than a line segment. To record this, BARR_Start_Point, BARR_End_Point, and IATN_Point must all have the same recorded location.

Figure 29: **IA-Sentre** - The system contains a cable and anchor, three rail side panels, and sand-filled boxes set into the middle. Can be installed as a straight (parallel to roadway) or flared (angled) unit.

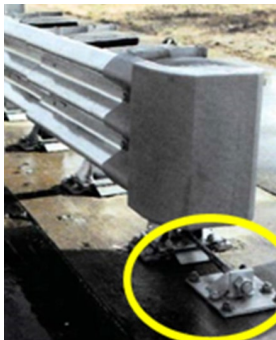


Figure 30: **IA-QuadTrend (IA-QT)** - The system is very similar to the Sentre in that it contains a cable and anchor, and sand-filled boxes set into the middle. The distinguishing characteristic is the quad-rail side panels with slots.



Figure 31: **IA-QuadGuard (Narrow or Wide) (IA_QG)** - The side panels are made of quad rail and the modules inside are similar to those used in the GREAT and Hex- Foam Sandwich.



Figure 32: **IA-QuadGuard Elite (IA_QGE)** - Similar to the QuadGuard, except, the system has cylinders made of high density polyethylene plastic.



Figure 33: **QuadGuardM10 (IA_QGM10)** - Upgraded version of the Quad-Guard, differentiated by the steel nose.



Figure 34: **TAU-M** - Upgraded version of the TAU II, it still has 3 ridges on the side and round energy absorbing cartridges placed inside. It has 7 bays and a flat steel nose.



Figure 35: **IA-TRACC (IA-TRINITY ATTENUATING CRASH CUSHIONS)** - Similar to the QuadGuard in that the side panels are made of quad rail; but, unlike the QuadGuard, there are no modules.



Figure 36: **IA-SCI 100 GM (IA-Smart Cushion Impact Attenuator 100)** - Characterized by 4 evenly spaced ridges along the sides. There are no modules inside, but there is a cable located at the bottom of the attenuator.



Figure 37: **IA-Hex-Foam Sandwich** - The attenuator has crushable modules in the center. There are deflective panels.



Figure 38: **IA-GREAT - (Guard Rail Energy Absorbing Terminal)** - The sides telescope and are made of three rail. The modules inside are similar to the type used in Hex-Foam & QuadGuard.



Figure 39: **IA-REACT (Redirective Energy Absorbing Crash Terminal)** - Polyethylene tubes (barrels) that flatten out in a hit and then open back up. Note: Need to identify the number of barrels in the "Comments" field.



Figure 40: **IA-CAT 350 - (Crash Cushion Attenuating Terminal)** - Posts are drilled for easy breakaway. There are perforations in the rail, and it has a ground strut.



Figure 41: **IA-CAT 350 - IA-Brakemaster** - This attenuator telescopes when hit and is characterized by the braking mechanism located in the head of the barrier.



Figure 42: **IA-QUEST** - Characterized by two round steel pipes angled down at the front of the unit. There is also a round tube set longitudinally along the bottom.



Figure 43: **IA-TAU II** - Has three ridges and round energy absorbing cartridges placed inside.
Narrow IA-TAU II is shown below.



Figure 44: **IA-TAU II** - Has three ridges and round energy absorbing cartridges placed inside.
Wide IA-TAU II is shown below.



Figure 45: **IA-Hi-Dro Sandwich** - Contains rubber tubes filled with water to absorb the crash.



Figure 46: **IA-Sand Barrels** - Consists of multiple barrels filled with sand organized in front of a hazard.



Transition

Refers to the connection between two traffic barriers, or a traffic barrier and another structure (e.g., bridge rail).



When one transition connects two traffic barriers it is labeled as the end of one, and the beginning of the other.

Figure 47: **Tran-Pre 230** - Attached with w-rail (2 crests, 1 trough). It is the only transition without thrie rail. See "Rail Type" under guardrails for a close-up picture of w-rail/w-beam.

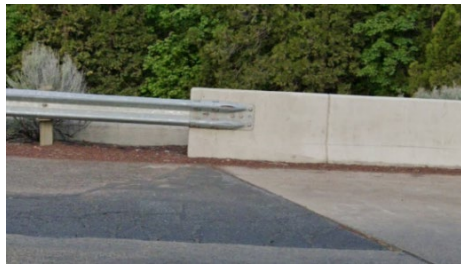


Figure 48: **Tran-230** - Attached with thrie rail (3 crests, 2 troughs) and post spacing of 3' 1½". See "Rail Type" under guardrail for a close-up picture of thrie rail.



Figure 49: **Tran-350** - Attached with thrie rail (see transition 230) and post spacing of 18.75" (1' 6¾").



Figure 50: **Connected to Structure** - Refers to a concrete barrier that connects directly to a structure (e.g., a bridge rail).



Figure 51: **Tran-CB/GR (Cable Connected Through Guardrail)** - The cable is connected through the guardrail and anchored to the back.



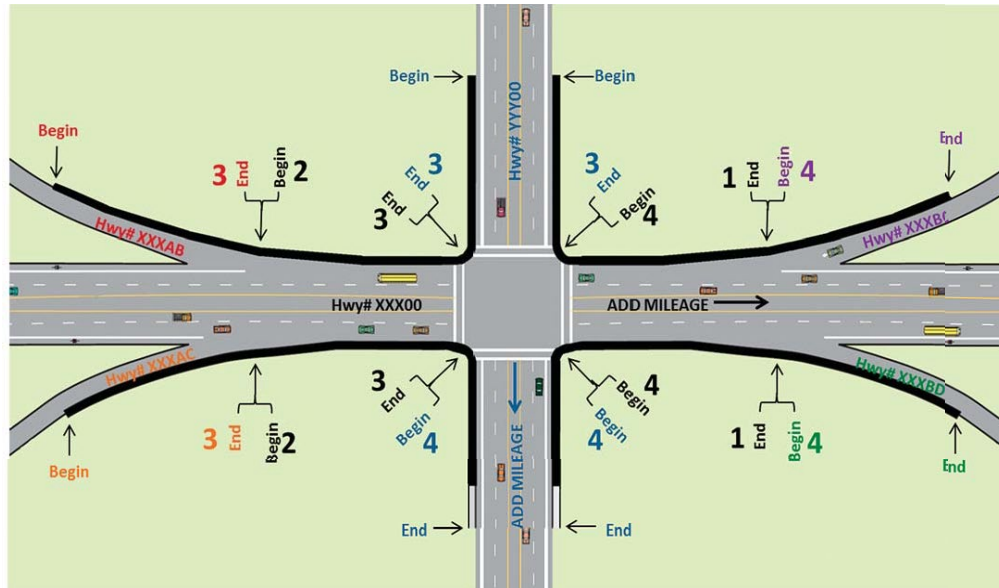
Figure 52: **Tran-MASH** – Three rail attached to MGS at the same height.



Continuation

Refers to a traffic barrier with a beginning and/or ending milepoint on a side road or ramp. An explanation for how to properly collect inventory data for continuations is provided after the definition of each type of continuation listed below.

Figure 53: Illustrated example of continuations connecting to highway.



1. **Continues to Ramp** - Only valid for Barrier End Point terminal type - Traffic barrier begins on a mainline and ends on a ramp.
2. **Continues from Ramp** - Only valid for Barrier Start Point terminal type - Traffic barrier begins on a ramp and ends on a mainline.
3. **Continues to Other Roadway** - Only valid for Barrier End Point terminal type - A traffic barrier that begins on a mainline and ends on a side road or off ramp.



Write down the name or highway number of the road the barrier continues to in the “Comments” box.

4. **Continues from Other Roadway** - Only valid for Barrier Start Point terminal type - A traffic barrier that begins on a side road or on ramp and ends on a mainline.



Record the name or highway number of the road the barrier continues from in the “Comments” box.

Terminal Height

Refers to the distance measured from the road surface to the top of the terminal. This will not be a precise measurement; instead, it will be given a classification of **Low**, **OK** or **High**. The height assessment is made with relation to the standard height of the terminals. The initial height assessment should be made with your best judgment while using the DVL, then field verified.



Sometimes there are objects on the screen that can provide a good reference for measurements.

- High** The terminal has been incorrectly installed and is higher than the standard (higher than 32.5 inches), or when it visually stands out as appearing high in height. There should not be many terminals fitting the “high” category.
- OK** The terminal has been properly installed according to the standards, and it meets the height requirements. Typically impact attenuators that meet the ‘OK’ classification are between 28.5 inches and 32.5 inches.
- Low** A terminal should be classified as low when it is noticeably lower than the standard height (lower than 28.5 inches), or when it visually stands out as appearing short.
- Unknown** Only use if condition cannot be determined without field verification.

Terminal Condition

This refers to an assessment of the overall appearance of the terminal. The initial condition assessment should be made when using the DVL, and then verified when in the field.

- | | |
|----------------|--|
| Good | Appears to have been correctly installed, and there are no visible indications of impact. |
| Fair | Appears to have been correctly installed, but there are signs of impact which have not rendered the terminal ineffective (e.g., dents, misshapen end, misshapen rail). |
| Poor | Obvious signs of incorrect installation, or impact that has rendered the barrier non-functional (e.g., broken terminal end, missing or broken posts). |
| Unknown | Only use if condition cannot be determined without field verification. |

Shared Terminal

This refers to a terminal that is used for two traffic barriers, such as a terminal that is used for both the barrier on the left edge of a right side exit lane and the right side of the mainline. Also refers to a transition terminal.

- When a terminal is used by two traffic barriers, both should say 'Y'.
- When a traffic barrier ends/starts at a bridge rail, shared terminal is 'N'.
- When a terminal is a 'Continue' type, Shared Terminal is 'N'.
- When a Transition Terminal is used to connect two traffic barriers, Shared Terminal is 'Y'.

BARRIERS

Barrier Type

Portion of barrier located between the beginnings and ending terminals; refers to the horizontal portion of the barrier. Requires one of the following:

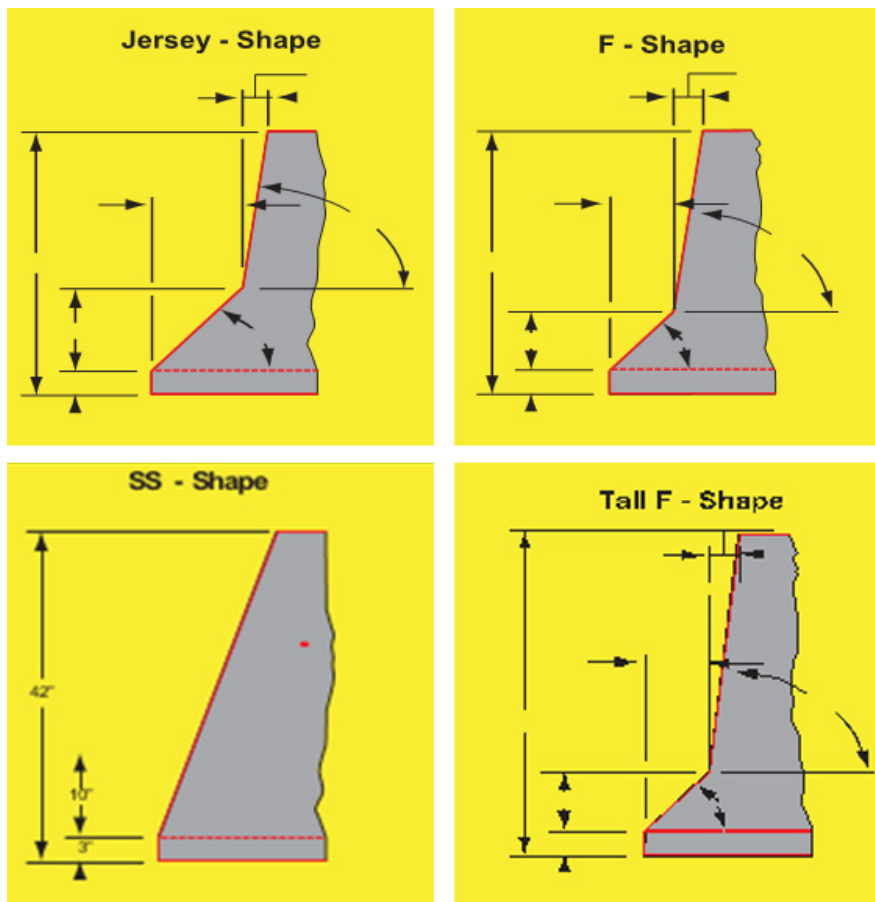
- Cable Barrier
- Concrete Barrier
- Rail Barrier

Barrier Description

Refers to portion of barrier located between the beginning and ending terminals, and is dependent on barrier type. A barrier description of “Other” means there are currently no records in the database.

- When barrier type is **Concrete Barrier**, the description requires one of the following:
 - Jersey
 - F
 - SS (Single Slope)
 - Tall_F

Figure 54: Various concrete barrier types



- When barrier type is **Cable Barrier**, the description requires one of the following:
 - 3 - STRAND
 - 4 - STRAND
 - BRIFEN O-POST
 - CASS-S3-M10
 - OTHER

Figure 55: **CASS-S3-M10 (Cass Safety System Cable Barrier)** - High tension cable barrier system – The posts have an I-Beam cross-section. The top two cables are positioned in slots in the posts. The bottom two cables are retained by hook bolts on opposite sides of the post.



Figure 56: **BRIFEN O-Post (Brifen O-Post Cable Barrier)** - High tension cable barrier system – the posts have a circular cross-section; the four cables are “woven” between the posts.



Figure 57: **3-STRAND** - High tension cable barrier with three cables.



Figure 58: **4-STRAND** - Other high tension cable barrier with four cables not matching the description of either the CASS-S3-M10 or the BRIFEN O-Post systems shown above.



- When barrier type is **Rail Barrier**, the description requires a combination of shape, material, and/or finish type of the horizontal rail displayed below:
 - FLYNG W
 - MOD THRIE
 - HALF MOON
 - TIMBER
 - SBT (Steel Backed Timber)
 - THRIE
 - TWO RAIL SBT (Steel Backed Timber)
 - CORTEN
 - GALV
 - GALV/THRIE
 - GALV/CORTEN
 - GALV/PAINT
 - PAINT
 - PAINT/CORTEN
 - GALV W/RUBRAIL
 - OTHER

Figure 59: **CORTEN (Rusty Rail)** - This refers to the use of weatherized steel, which has a “weathered” or “natural” appearance.



Figure 60: **GALV (W-Beam 350 Galvanized)** - W-beam has been coated with rust-resistant zinc. Splice is on the post. W-Beam rail is characterized by having two distinct waves (2 crests, 1 trough).



Figure 61: **MGS (Midwest Guardrail System)** - W-Beam guardrail with the splice between the posts. Posts may be steel or wood.



Figure 62: **GALV W/RUBRAIL** - As shown in the picture, this system has a W-beam with the addition of a rail along the bottom (rub rail). The purpose of this rub rail is to prevent vehicle tires from snagging on the posts in the event of a crash.



Figure 63: **PAINT (W-Beam 350 Painted)** - A W-beam with a paint finish.



Figure 64: **THRIE (Thrie Beam Guardrail)** - Characterized by having three distinct waves (3 crests, 2 troughs).



Figure 65: **FLYING W** - Characterized by a “wing” on each side of the guardrail; hence the name.



Figure 66: **MOD THRIE (Modified Thrie)** - Characterized by the notch in the block-out.



Figure 67: **HALF MOON** - The rail is shaped like a half-circle. It does not have the typical ridges other guardrails do.



Figure 68: **TIMBER (Round Timber)** - The rail is made of round timber and has steel backing.



Figure 69: **SBT (Steel Backed Timber)** - Rectangular prism shaped timber with steel backing.



Figure 70: **TWO RAIL SBT (Two Rail Steel Backed Timber)** - Two wooden rails painted white with steel backing.



Barrier Height

Refers to the distance measured from the road surface to the top of the traffic barrier. This will not be a precise measurement. Assessing the height is done with regard to ODOT standards. The standard height for a w-beam rail is 31", and the standard height for a thrie rail is 32.5". The initial height assessment should be made with your best judgment using the DVL and then field verified.



Sometimes there are objects on the screen that can provide a good reference for measurement.

- High** Incorrectly installed, higher than standard (higher than 32.5 inches), or when it stands out as visually appearing high in height. There should not be many rail type barriers in this category.
- OK** Properly installed, meets height requirements (between 28 and 32.5 inches).
- Low** Lower than standard height (lower than 28 inches) or visually stands out as appearing short in height, and/or, road surface covers more than the bottom "reveal" segment (i.e. 3") on a Jersey, F, Tall-F concrete traffic barriers, and/or, SS concrete traffic barrier is less than 42" tall.
- Unknown** Only use if height cannot be determined without field verification.

Concrete Construction Type

Type of method used to construct concrete barriers and place them in a location.

Barrier Condition

Overall appearance

- Good** Correctly installed, no visual indications of impact, no rust.
- Fair** Correctly installed, signs of impact which has not rendered the traffic barrier ineffective, and/ or some rust. e.g., bent posts, misshapen rail /cable, barrier connection that appears to be out of alignment.
- Poor** Incorrect installation, impact rendered barrier non-functional, and/or significant rust. e.g., missing or broken posts, terminals, rails, or concrete barriers cable stand, cracks or breaks in the concrete barrier.
- Unknown** Only use if condition cannot be determined without field verification.



This field is only applicable to **Concrete Type Barriers**.

Figure 71: **CIP (Cast in Place)** - The barrier is formed on site, and has contraction joints every 15 feet and expansion joints every 90 feet. The picture is of a Single Slope, Cast in Place concrete barrier.



Figure 72: **Precast** - The barrier is formed off site and transferred to location in 10 foot sections. A precast concrete barrier will have one of the connections listed in the following section.



Concrete Connection

Identifies the type of connection used to hold the precast sections of concrete barriers together. This does not apply to cast in place concrete barriers.

Figure 73: **4PL or 6PL (4 or 6 Pin and Loop)** - Used on Jersey and F concrete traffic barriers. Sections are held together by a pin that is placed between 4 or 6 loops. The loops can be made of cable or rebar. 6PL shown below.



Figure 74: **CHAN (C-Channel)** - Channel Connection - Used only on Single Slope and Tall F-Shape barriers. It is characterized by four opposing 'C' channels locked together by a 1" diameter bolt.



Figure 75: **TG (Tongue and Groove)** - Sections fit together with a lengthwise tongue which extends out on one side and fits into a channel or groove on the opposite side.



Post Spacing

Measurement in feet and inches of the space between the posts that anchor the barrier and whether or not, block-outs exist.

Type 1	12'6" spacing, no block-outs
Type 1A	12'6" spacing, with block-outs
Type 2	6'3" spacing, no block-outs
Type 2A	6'3" spacing, with block-outs



Other options can include: OTHER, 1/2A, 1A/2A or 2/2A.

Figure 76: **Type 1** - 12'6" spacing, no block-outs.

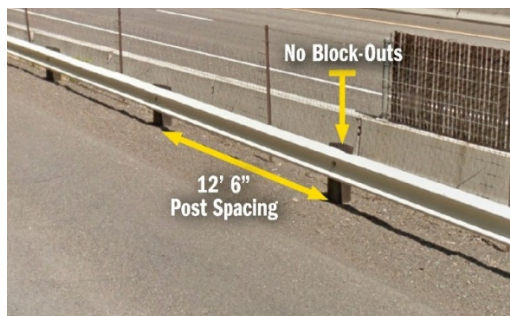
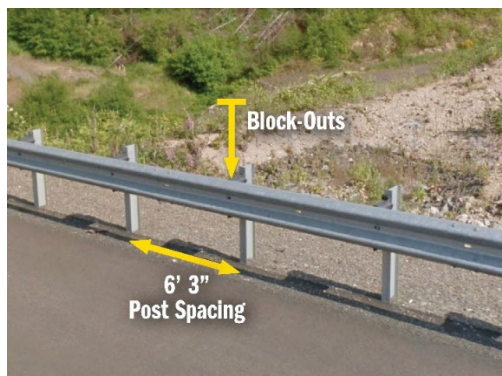


Figure 77: **Type 2A** - 6'3" spacing, with block-outs.



Post Type

The post material of Rail type barriers. Posts can be wood, steel, concrete, or a combination of two of these materials.

Figure 78: **Steel** posts **with steel** block-outs.

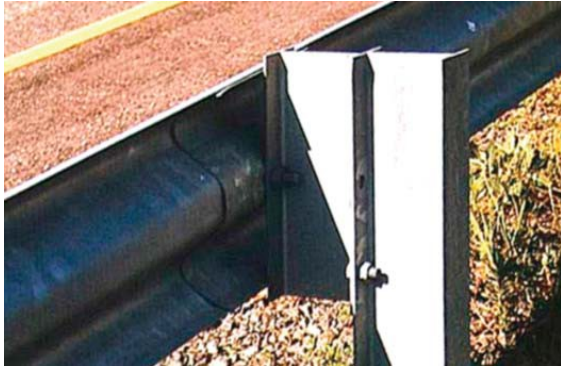


Figure 79: **Concrete** Posts.



Figure 80: **Wood** Posts with wood block-outs.



Block-Outs

Block-outs are the section of material between the post and the rail. The block-out material of Rail type barriers can be wood, steel, plastic, or there could be none (Type 1, Type 2 spacing). There can also be a combination of two of these materials: wood/steel; wood/plastic or steel/plastic.

Figure 81: **Steel** Posts with **Plastic** block-outs (black polycarbonate).



Frequently Asked Questions

Why do we need to inventory traffic barriers?

As ODOT moves toward an asset management approach, it is important that we have an accurate record of the existing transportation infrastructure. ODOT needs to know what type, and how many traffic barriers are present on the highways. This information will help ODOT maintain and upgrade assets in a cost-effective way. In addition, maintaining a record of current inventory data is also important for funding purposes.

What is the difference between an “ODOT Highway Number” and the Highway “Route Number”?

An ODOT highway number is a three-digit ODOT number that is assigned to a length of highway. This number is used by ODOT transportation staff as a referencing system to identify a particular road for inventory or research purposes. A route number is assigned to a particular route (e.g., interstate route, US route, OR route) and is used to follow a particular path through a road network. This route number is mainly used by drivers for traveling purposes.

What is the Highway Inventory Summary Report?

This is a report detailing the milepoint locations of roadway features. This report is run by accessing TransViewer online; which is continually updated by ODOT’s Road Inventory and Classification Services (RICS) Unit

What should I do when there are multiple traffic barriers in one location?

Inventory all the barriers present. If necessary use the comment field to add any additional information, such as overlapping barriers, etc.

What is the best way to estimate the size of traffic barriers from the video log? (Any other estimates that might be necessary?)

Sometimes there are other objects in the picture which may provide a height reference, otherwise, just use your best judgment. If you are really unsure about a particular traffic barrier – or portion of one - be sure to mark “Field verify

height” in the “Comments” field so you know to check the height when out in the field. Your ability to estimate height using the DVL will improve with time.

How accurate does the milepoint data need to be?

Use the milepoint number shown on the DVL screen. The number should be identified to the second decimal place (e.g., 7.35). As long as the data is within .03 of a mile of what can be seen on the DVL then it is accurate and should not be changed.

How should I inventory traffic barriers on sections of highway that have multiple highways that cover the same section of road?

To avoid having more than one data set with the same traffic barrier inventory information, inventory should be collected and recorded for the highway with the lowest ODOT highway number only.

Are there traffic barriers that we do not inventory?

Yes. We do not inventory traffic barriers that are part of other structures, such as bridges (e.g., bridge rails). If you’re not sure if a barrier is part of another structure, collect the inventory information, make a note in the “comments” field and make a note for yourself to check with a supervisor. Check highway reports and straight line charts to see whether or not there is a structure in that place.

What if I see something in the field that I do not know how to identify in my inventory?

Take a picture of the object, take note of the condition and milepoints, and ask a supervisor, or someone listed under “Contacts & Other Useful Resources” for assistance.

Construction barriers/temporary barrier - is this captured in inventory?

No, it is not considered permanent.

Contacts and Other Useful Resources

Christopher Henson (Asset Owner) | Sr. Roadside Design Engineer
Roadway Engineering

christopher.s.henson@odot.state.or.us

4040 Fairview Industrial Dr. SE, Salem, OR 97302-1142 (503) 986-3561

Heidi Shoblom | State Roadway Manager
Engineering and Technical Services Branch

heidi.e.shoblom@odot.state.or.us

4040 Fairview Industrial Dr. SE, Salem, OR 97302-1142 (503) 986-3557

Sharon Ballard | Asset Management Specialist
Roadway Engineering

sharon.ballard@odot.state.or.us

4040 Fairview Industrial Dr. SE, Salem, OR 97302-1142 (503) 986-7212

Laura Hansen | Traffic Roadway Data & Systems Coordinator

laura.l.hansen@odot.state.or.us

4040 Fairview Industrial Dr. SE, Salem, OR 97302-1142 (503) 986-3308

Road Inventory & Classification Services (RICS)

ODOTRICS@odot.state.or.us Mill Creek Office Building

555 13th Street NE, Suite 2, Salem, OR 97301-4178 (503) 986-4157

Websites

- Acronyms:
<http://transnet.odot.state.or.us/odot/home/web%20part%20pages/acronyms.aspx>
- Construction Plans - Link to construction plan search & highway reports:
<https://ecmnetintra.odot.state.or.us/MapCenter/ContractPlanSearch>
<http://highway.intranet.odot.state.or.us/cf/highwayreports/>
- DVL (Digital Video Log):
<https://dvlprod-ordot.msappproxy.net/cf/dvl/>
- FACS-STIP:
<http://gisintra.odot.state.or.us/facsstip/>
- Federal Highway Administration (FHWA):
https://safety.fhwa.dot.gov/roadway_dept/countermeasures/reduce_crash_severity/
- Highway Inventory Summary Report:
http://highway.odot.state.or.us/cf/highwayreports/aml_summary_parms_by_route_no.cfm
- ODOT Intranet link:
<http://transnet.odot.state.or.us/odot/home/default.aspx>
- ODOT Roadway Engineering:
<http://www.oregon.gov/ODOT/HWY/ENGSERVICES/pages/index.aspx>
- ODOT Travel Guide is useful for planning trips:
<http://www.tripcheck.com/>
- Road Inventory and Classification Services Unit:
[http://www.oregon.gov/ODOT/TD/TDATA/TDATA
All_Contacts.shtml#Road_Inventory_Classification_Services](http://www.oregon.gov/ODOT/TD/TDATA/TDATA_All_Contacts.shtml#Road_Inventory_Classification_Services)
- Roadside Pooled Fund:
<https://www.roadsidepooledfund.org/mash-implementation/>

- State Highway Inventory Reports:
<http://highway.intranet.odot.state.or.us/cf/highwayreports/>
- Trans Data Portal:
http://transnet.odot.state.or.us/tdd/tdata/Shared%20Documents/TDS_Data_Portal.aspx
- Policy Data & Analysis Division (Transportation Development): ODOT intranet link:
<http://transnet.odot.state.or.us/tdd/home/default.aspx>
- ODOT internet link:
<https://www.oregon.gov/Pages/index.aspx>
- TransGIS:
<https://gis.odot.state.or.us/transgis/>

Appendix A - Commonly Used Terms

Longitudinal Barrier

A barrier designed to prevent penetration and safely redirect an errant vehicle away from a traffic or median hazard.

MASH

Manual for Assessing Safety Hardware. Contains the current standard criteria for evaluating and crash testing roadside hardware. Older standards include NCHRP 230 and NCHRP 350.

Median Barrier

A traffic barrier designed to protect against median crossover head-on crashes.

Module

An independent unit set inside an impact attenuator that can be easily rearranged, replaced or interchanged as needed.

Strut

A rigid structural member used as a support.

Telescope

Refers to the contracting motion that takes place when the sections of an impact attenuator slide neatly, one inside another, like the sections of a telescope.

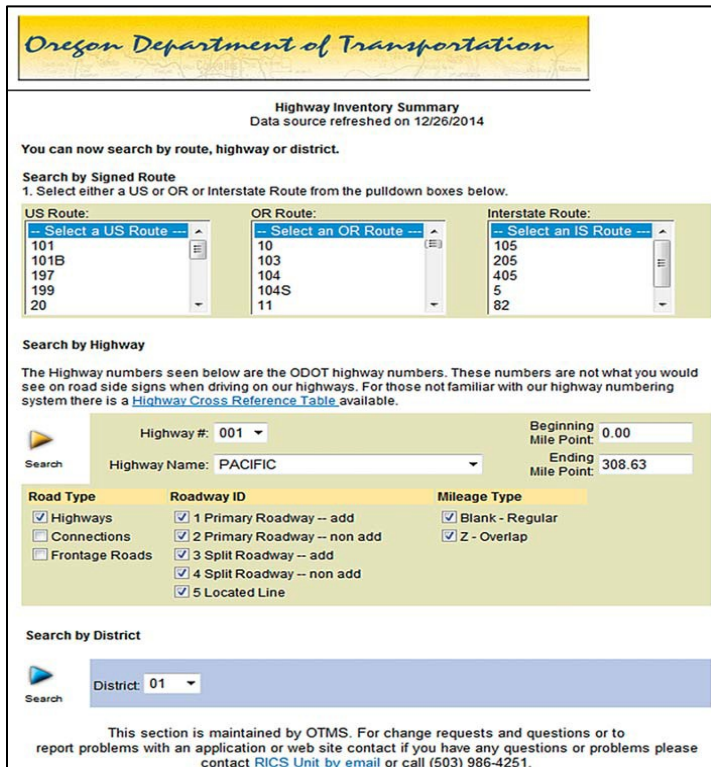
Appendix B - Highway Inventory Summary

Below is a screen print of the web page which you will utilize to access Highway Inventory Summary Reports. As you can see there are several different ways to search for a report; by route, by highway, or by district. Only the search by highway is addressed here.

You can choose to search by either the highway name or the highway number. Once you have **selected the appropriate highway** all you need to do is **click on the search arrow in the upper left corner** of the 'Search by Highway' section and **a list of information** about the entire stretch of highway **will pop up in a new window**.

However, you may choose to **narrow your search by entering in the milepoints** for the segment of road you are inventorying. You could also narrow, or even expand, your search by **checking or un-checking the boxes below under 'Road Type', 'Roadway ID', and 'Mileage Type'**.

Figure 82: Screenshot from Highway Inventory Summary page.





When you need a report containing ramp information, be sure to check the 'Connections' box.

The following web page can be accessed with the following web link:

https://highway.odot.state.or.us/cf/highwayreports/aml_summary_parms_by_route_no.cfm

A variety of other reports are available here:

<http://highway.intranet.odot.state.or.us/cf/highwayreports/>

Appendix C - State, District, & Region Maps

A variety of maps are available, in both electronic and hard copy version:

City Maps

Pavement Condition Maps

County Maps

Seismic Lifeline Maps

Statewide Maps

SPIS Maps (2013)

ODOT Region Maps

Microstation Map Files

ODOT District Maps

GIS

Mapping Applications

To access, go to the following website:

<http://www.oregon.gov/ODOT/TD/TDATA/Pages/gis/odotmaps.aspx>

Appendix D - List of Route Numbers **(2018)**

HWY#	HIGHWAY NAME	ROUTE NUMBER(S)	HWY#	HIGHWAY NAME	ROUTE NUMBER(S)
001	PACIFIC	I-5, US30, OR99, OR99E, OR138	30	WILLAMINA-SALEM	OR22
1E [81]	PACIFIC HIGHWAY EAST	OR99E, OR214	31	ALBANY-CORVALLIS	US20
1W [91]	PACIFIC HIGHWAY WEST	US20, OR10, OR34, OR99, OR99W, OR126, OR126B, OR219	32	THREE RIVERS	OR22
002	COLUMBIA RIVER	I-84, US30, US395, US730	33	CORVALLIS-NEWPORT	US20, OR34
2W [92]	LOWER COLUMBIA RIVER	US30	35	COOS BAY-ROSEBURG	OR42, OR99
003	OSWEGO	OR43	36	PENDLETON-COLD SPRINGS	OR37
004	THE DALLES-CALIFORNIA	US26, US30, US97, US197, OR216	37	WILSON RIVER	OR6
005	JOHN DAY	US26, US395, OR19, OR206,	38	OREGON CAVES	OR46
006	OLD OREGON TRAIL	I-84, US30, US395, OR203	39	SALMON RIVER	OR18, OR22, OR233
007	CENTRAL OREGON	US20, US26, US395, OR201	40	BEAVERTON-HILLSDALE	OR10
008	OREGON-WASHINGTON	US30, OR11	41	OCHOCO	US26, OR126
009	OREGON COAST	US101, OR255	42	SHERMAN	US97
010	WALLOWA LAKE	OR82	43	MONMOUTH-INDEPENDENCE	OR51
011	ENTERPRISE-LEWISTON	OR3	44	WAPINITIA	OR216
012	BAKER-COPPERFIELD	OR7, OR86	45	UMPQUA	OR38, OR99
014	CROOKED RIVER	OR27	46	NECANICUM	OR53
015	MCKENZIE	US20, OR126, OR126B, OR242	47	SUNSET	US26, OR47

HWY#	HIGHWAY NAME	ROUTE NUMBER(S)	HWY#	HIGHWAY NAME	ROUTE NUMBER(S)
016	SANTIAM	US20, OR126	48	JOHN DAY-BURNS	US395
017	MCKENZIE-BEND	US20, US97B	49	LAKEVIEW-BURNS	US395
018	WILLAMETTE	OR58, OR99	50	KLAMATH FALLS-MALIN	US97B, OR39 OR140
019	FREMONT	US395, OR31, OR140	51	WILSONVILLE-HUBBARD	OR551
020	KLAMATH FALLS-LAKEVIEW	US97B, OR39, OR140	52	HEPPNER	OR74, OR207
021	GREEN SPRINGS	OR66, OR140	53	WARM SPRINGS	US26
022	CRATER LAKE	OR62	54	UMATILLA-STANFIELD	US395
023	DAIRY-BONANZA	OR70	58	ALBANY-JUNCTION CITY	US20, OR99E
025	REDWOOD	US199, OR99	60	ROGUE RIVER	OR99
026	MT. HOOD	US26, OR35	61	STADIUM FREEWAY	I-405, US26, US30
027	ALSEA	OR34	62	FLORENCE-EUGENE	OR126
028	PENDLETON-JOHN DAY	US395, OR37	63	ROGUE VALLEY	OR99
029	TUALATIN VALLEY	OR8, OR47	64	EAST PORTLAND FREEWAY	I-205, OR213
66	LA GRANDE-BAKER	US30, OR7, OR203, OR237	162	NORTH SANTIAM	OR22
67	PENDLETON	US30, OR37	163	SILVER CREEK FALLS	OR214
68	CASCADE HWY NORTH	OR213	164	JEFFERSON	OR164
69	BELTLINE	OR126, OR569	171	CLACKAMAS	OR211, OR212, OR213, OR224
70	M McNARY	I-82, US395	172	EAGLE CREEK-SANDY	OR211

HWY#	HIGHWAY NAME	ROUTE NUMBER(S)	HWY#	HIGHWAY NAME	ROUTE NUMBER(S)
71	WHITNEY	OR7	174	CLACKAMAS-BORING	OR212
72	SALEM	OR22, OR99EB	180	EDDYVILLE-BLODGETT	OR180
75	SUNRISE EXPRESSWAY	OR224	181	SILETZ	OR229
100	HISTORIC COLUMBIA RIVER	US30, OR35	189	DALLAS-RICKREALL	OR223
102	NEHALEM	US101B, OR47, OR202	191	KINGS VALLEY	OR223
103	FISHHAWK FALLS	OR103	193	INDEPENDENCE	OR51
104	FORT STEVENS	OR104	194	MONMOUTH	OR194
105	WARRENTON-ASTORIA	US101B	200	TERRITORIAL	OR200
110	MIST-CLATSKANIE	OR47	201	ALSEA-DEADWOOD	OR501
120	SWIFT	OR120	210	CORVALLIS-LEBANON	US20, OR34
123	NORTHEAST PORTLAND	US30BY	211	ALBANY-LYONS	OR226
130	LITTLE NESTUCCA	OR130	212	HALSEY-SWEET HOME	OR228
131	NETARTS	OR131	215	CLEAR LAKE-BELKNAP SPRINGS	OR126
138	NORTH UMPQUA HIGHWAY EAST	OR99, OR138	222	SPRINGFIELD-CRESWELL	OR222
140	HILLSBORO-SILVERTON	OR214, OR219	225	MCVAY	OR225
141	BEAVERTON-TUALATIN	OR141	226	GOSHEN-DIVIDE	OR99
142	FARMINGTON	OR10	227	EUGENE-SPRINGFIELD	I-105, OR126
143	SCHOLLS	OR210	228	SPRINGFIELD	OR528

Traffic Barrier Data Collection Guide

HWY#	HIGHWAY NAME	ROUTE NUMBER(S)	HWY#	HIGHWAY NAME	ROUTE NUMBER(S)
144	BEAVERTON-TIGARD	OR217	229	MAPLETON-JUNCTION CITY	OR36
150	SALEM-DAYTON	OR221	231	ELKTON-SUTHERLIN	OR138
151	YAMHILL-NEWBERG	OR240	233	WEST DIAMOND LAKE	OR230
153	BELLEVUE-HOPEWELL	OR153	240	CAPE ARAGO	OR540
154	LAFAYETTE	OR154, OR233	241	COOS RIVER	OR241
155	AMITY-DAYTON	OR233	242	POWERS	OR542
157	WILLAMINA-SHERIDA	OR18B	244	COQUILLE-BANDON	OR42S
160	CASCADE HWY SOUTH	OR213	250	CAPE BLANCO	OR250
161	WOODBURN-ESTACADA	OR211	251	PORT ORFORD	OR251
255	CARPENTERVILLE	OR255	402	KIMBERLY-LONG CREEK	OR402
260	ROGUE RIVER LOOP	OR260	410	SUMPTER	OR410
270	LAKE OF THE WOODS	OR140	413	HALFWAY-CORNUCOPIA	OR413
271	SAMS VALLEY	OR99, OR234	414	PINE CREEK	OR414
272	JACKSONVILLE	OR238	415	DOOLEY MOUNTAIN	OR245
273	SISKIYOU	OR273	420	MIDLAND	
281	HOOD RIVER	OR281	422	CHILOQUIN	OR422
282	ODELL	OR282	424	SOUTH KLAMATH FALLS	OR140
290	SHERARS BRIDGE	OR216	426	HATFIELD	OR39
291	SHANIKO-FOSSIL	OR218	429	CRESCENT LAKE	OR429

HWY#	HIGHWAY NAME	ROUTE NUMBER(S)	HWY#	HIGHWAY NAME	ROUTE NUMBER(S)
292	MOSIER-THE DALLES	US30	431	WARNER	OR140
293	ANTELOPE	OR293	440	FRENCHGLEN	OR205
300	WASCO-HEPPNER	OR206, OR207	442	STEENS	OR78
301	CELILO-WASCO	OR206	449	HUNTINGTON	US30
320	LEXINGTON-ECHO	OR207	450	SUCCOR CREEK	OR201
321	HEPPNER-SPRAY	OR207	451	VALE-WEST	OR451
330	WESTON-ELGIN	OR204	453	ADRIAN-ARENA VALLEY	OR453
331	UMATILLA MISSION	OR331	454	ADRIAN-CALDWELL	OR454
332	SUNNYSIDE-UMAPINE	OR332	455	OLDS FERRY-ONTARIO	US30B, OR201
333	HERMISTON	OR207	456	I.O.N.	US95
334	ATHENA-HOLDMAN	OR334	457	SNAKE RIVER CORR INST	
335	HAVANA-HELIX	OR335	481	BAKER-COPPERFIELD	OR86S
339	FREEWATER	OR339	482	REDWOOD SPUR	US199
340	MEDICAL SPRINGS	OR203	483	MCMINNVILLE SPUR	
341	UKIAH-HILGARD	OR244	484	ESPLANADE SPUR	US97B
342	COVE	OR237	485	FORT STEVENS SPUR	OR104S
350	LITTLE SHEEP CREEK	OR350	486	GOLD HILL SPUR	OR99, OR234
351	JOSEPH-WALLOWA LAKE	OR351	487	CELILO-WASCO SPUR	
360	MADRAS-PRINEVILLE	US26	488	CHILOQUIN SPUR	OR422S

HWY#	HIGHWAY NAME	ROUTE NUMBER(S)	HWY#	HIGHWAY NAME	ROUTE NUMBER(S)
361	CULVER	OR361	489	PARMA SPUR	OR452
370	O NEIL	OR370	490	HOMEDALE SPUR	OR201
372	CENTURY DRIVE		491	WEISER SPUR	US95S
380	PAULINA	OR380	492	PAYETTE SPUR	OR52
390	SERVICE CREEK- MITCHELL	OR207	493	ONTARIO SPUR	US30, US30B

Appendix E - Inventory Collection Workflow

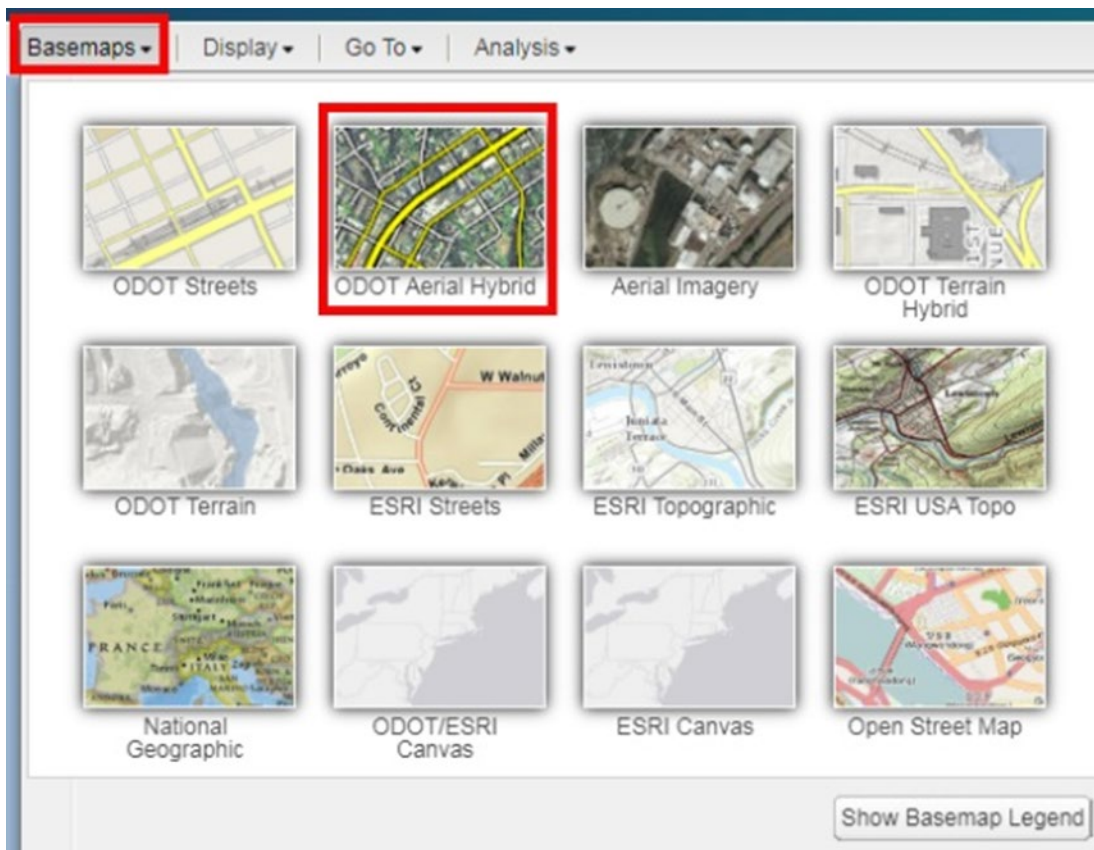


The following outlines the workflow for desktop asset collection and steps taken to QA & load the data into the enterprise source system at TLC. This process may not be useful, or of interest to those not involved in the data collection efforts.

TransGIS Setup

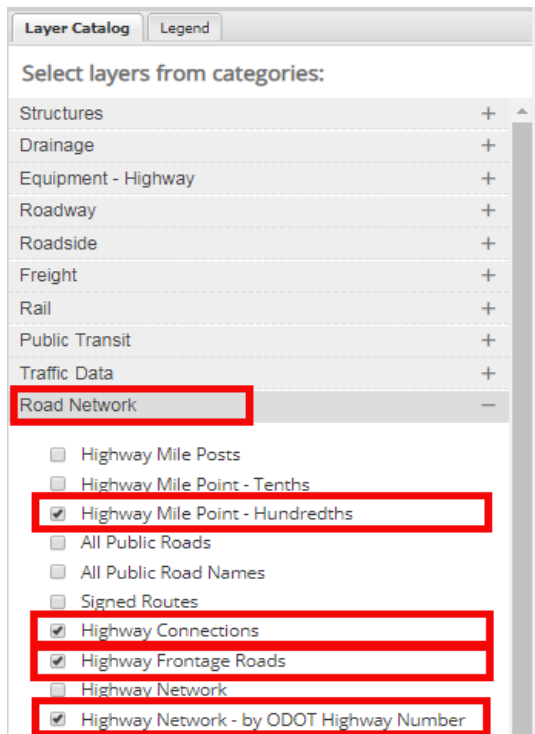
- Open a tab in Internet Explorer or Google Chrome
- Log into [TransGIS](#)
- Click 'Basemaps' drop down from middle tabs
 - Select any map that is most convenient, ESRI Aerial Hybrid is the map being demonstrated

Figure 83: Display of 'Basemaps' options to pick from in TransGIS.



- In 'Layers Catalog' in the left panel - apply the following
 - Road Network drop-down:
 - Highway Mile Point Hundredths
 - Highway Connections
 - Highway Frontage Roads
 - Highway Network by ODOT HWY Number
 - Roadside:
 - Select the asset being inventoried
 - Select 'Apply' at the bottom of the screen.

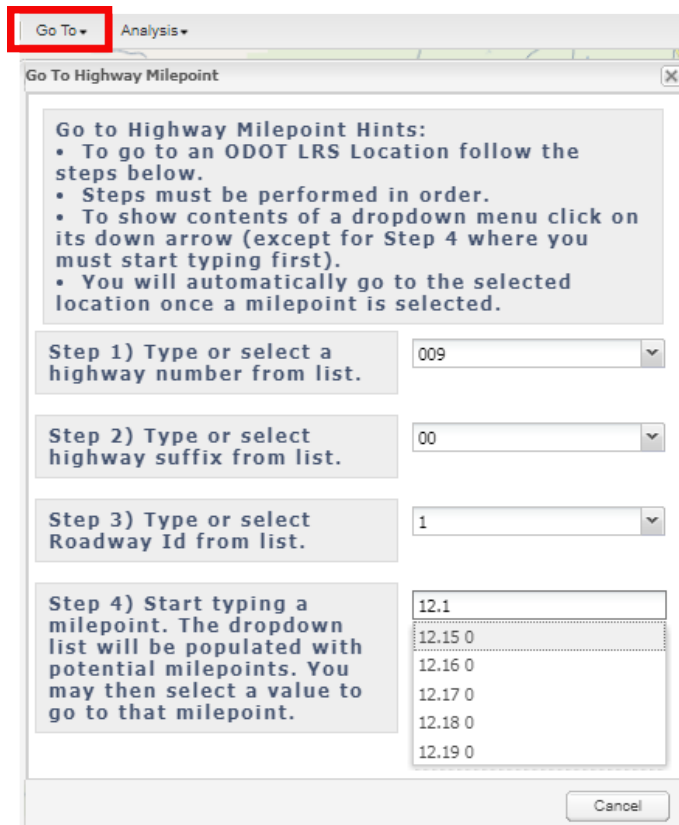
Figure 84: Commonly used layers in data collection which can be selected in the 'Layers Catalog' in TransGIS.



- Go To' drop down from middle tabs
 - Click 'Highway Milepoint' (dialog box)
 - Window will pop up prompting the user to enter location, enter information in following order:
 - Highway Number (0-499)

- Suffix '00', 'AA', etc...
- Roadway ID: 1 or 2 (increasing or decreasing)
- Milepoint
- TransGIS will locate the milepoint according to the information provided in dialog box

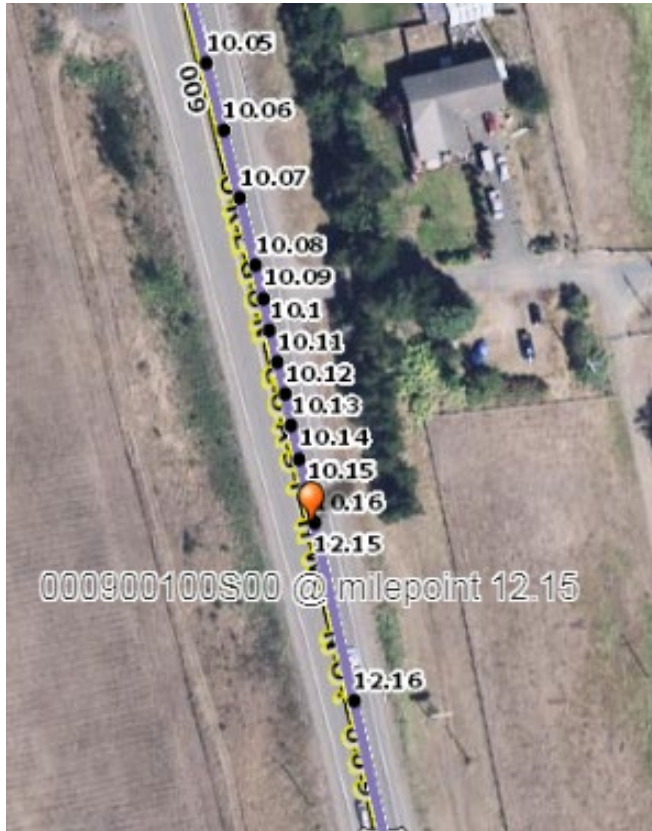
Figure 85: Highway Milepoint selection method in the 'Go To' tab in TransGIS.



- Go To' drop down; enter appropriate data for specific location
 - Highway Milepoint (dialog box)
 - Window will pop up prompting the user to enter location information, enter information in following order:
 - Highway Number (0-499)
 - Suffix '00', 'AA', etc...
 - Roadway ID: 1 or 2 (increasing or decreasing)
 - Milepoint

- TransGIS will locate the milepoint according to the information provided in the dialog box.

Figure 86: Milepoint hundredths layer displayed in TransGIS.



- 'Analysis' drop down
 - Street View: Google street view powered by Google maps; generally great visuals, but sometimes is outdated.
 - Won't show the increasing or decreasing direction of milepoints, reference TransGIS aerial map view, which will have the layers applied to get orientation. (This is only possible to get accurate location after adding layers listed above in 'Road Network' drop-down).
 - This can be used to examine an asset at a certain milepoint. It is valuable when obtaining location information and to determine asset attributes.

Digital Video Log Setup

- Open another tab in your preferred web browser
- Log into [DVL](#)
- Click 'Click to Begin'
- 'Season Range'
 - Verify that the most current box is selected
- 'Highway'
 - Click the drop-down menu and select the highway being inventoried
- 'Road Type'
 - Select the road type using the boxes. This will allow for connections and frontage roads to drop down in the 'Highway' box
- 'Mileage Type'
 - Keep all options selected to make sure all data present is inventoried
- 'Season'
 - Verify that the most recent year is selected using the drop down menu
- 'Starting Milepoint (MP)'
 - Select where data collection starts. If nothing is changed, the DVL will start at the beginning of the highway. The drop down menu can be used to select a different milepoint, or a milepoint can be manually typed in.
- 'Direction'
 - Select the direction that the DVL drives. If the roadway is split, it will be difficult to see the left side of the roadway. Cross-reference with TransGIS if this is the case.
- Click 'Play Images'
- Set 'Increment' and 'Play Speed' to preference
- It can be helpful to hold 'Ctrl' and scroll up with the mouse to zoom in to allow the DVL to utilize the entirety of the computer screen
- Reference [Appendix I](#) if there are more questions regarding DVL

Locate Highway Asset Files (Internal Use)

- Share files
 - Click on File tab located on desktop – if you do not have the file on your desktop, get the path ([Z:\INVENTORY](#)) and create a shortcut.
 - Locate “shar” file located in left column and open it
 - Locate ‘INVENTORY’ folder and open it
 - Locate desired asset folder (ramp, sidewalk, barriers, bike facility, etc...) and open the folder
 - Select desired *region* and *district* folder and open the folders
 - List of HWY with Excel Spreadsheets will show up, select desired HWY and open the file
- Editing Spreadsheet Cells
 - Spreadsheets
 - All cells are going to have no color to start out
 - Asset recording requirements are explained in asset manual, flipbook, and other training materials/sessions
 - Apply appropriate assessments to the asset
 - Using TransGIS and DVL with the settings from above, inventory the designated highway, comparing the data found to that on the spreadsheet
 - Color Coding
 - There are 3 colors to use when updating spreadsheets: Green, Yellow, Red
 - Green: use when cell description hasn’t changed from its previous inspection data
 - Yellow: use to show that a change has been made by you that is different from the previous inspection data
 - Red: use to show that cell(s) need to be deleted



Do not delete red cells in this process.

- Notes
 - Red cells may be marked for various reasons:
 - Data row(s) from previous inspection no longer represent a segment of mile points and new data is entered so that a more accurate segment overrides the red one
 - The 'NOTES' column may have comments that don't need to be filled in, equations (ex: MP 1.00 = MP 1.11), etc...
 - Once you perform review of the segment and make the necessary changes, save the document in the folder that it was saved in initially (refer to share files bullet above for further instructions)
 - Regular check-ins for QA and to answer questions with asset manager
 - Document any necessary changes
 - Make adjustments as needed
 - Save and move on to next District/Hwy

Once the entire District is completed and reviewed you will need to prepare the loader file.

- Loader file is what is used to get the data into our enterprise source system – TransInfo. It is IMPERATIVE that the data is in the format to match the loader file or it WILL NOT LOAD.
 - Request the loader file
 - Load data into loader file format

Asset Loader File Entry (Internal Use)

Step 1

- Total up all rows for the first highway in a district
- Total up all rows for the rest of the highways in each district omitting the title rows
- Save the total of these two

Step 2

- Create a rough draft loader file and upload all counted rows
- Ensure the row count correlates with the total that you saved
- Save this file with the appropriate name

Step 3

- Make a copy of the file that you saved previously and name it appropriately
- Make sure that this file correlates to the file that you copied

Step 4

- Ensure that all of the domain values are valid within the document from step 3
- Ensure that all notes meet standards or have a reason not to
- Delete all red cells
- Ensure that all MP are within current district boundaries

Step 5

- Create a copy of the document from step 4 and name it appropriately
- Review edits to ensure correctness

Step 6

- After reviewing all edits and the file is completely revised, send it to the Traffic/Roadway Data Systems Coordinator for uploading to TransInfo

Appendix F - Data Collection Tips

- TransInfo requires all values to be in UPPER CASE.
- The values **must** match the Domain values for each attribute.
- Leading/trailing spaces are **not** allowed
- Records can only be added to currently valid highway segments. If a section of highway has been removed from the highway system by Jurisdictional Transfer, inventory, etc. or is within a milepoint equation then an asset cannot be added to that location.
- An asset cannot have the same begin and end milepoint. If the guardrail is very short the end milepoint should have 0.001 added to its value. (Example: A guardrail is only 10 feet long. If the Begin MP is 2.45 then the End MP would be 2.451)
- The 'Note' field is limited to 100 characters - separate multiple notes with a semicolon (;).
- Commas, Bar (|), or at sign (@) cannot be used in the Note field or any other free text field.
- If TransGIS is being used, and the 'Highway Report Tool' is accidentally clicked instead of 'Street View', go through the steps that are given. It is much easier to do this rather than restart TransGIS

Common Differentiation

This section is meant to help distinguish between similar barriers or end terminals.

BCT and Blunt C terminals are commonly confused due to them both having the rail completely wrapped at the end. Below is the best way to differentiate.

Figure 87: **BCT (Breakaway Cable Terminal)** - It is evident that this is a BCT because of the hole in the second post, making it drilled to breakaway.



Figure 88: **Blunt C** - In contrast to the picture above, Blunt C will not have a hole in the second post.



All four of the terminals below (**ET 2000**, **ET PLUS**, **FLEAT**, and **SKT**) have impact faces on the end, so it is important to see the differences between the four, especially when starting out.

Figure 89: **ET 2000** - The head is square, and is solid. There is no ground strut.



Figure 90: **ET PLUS** - The head is rectangular, and isn't fully solid. There is no ground strut.



Figure 91: **FLEAT** - There is a tube bracket on the top of the terminal head, as well as a ground strut. Posts are drilled to breakaway. There is usually a rectangular head.



Figure 92: **SKT** - There is no tube bracket, and is denser than the FLEAT. They have more of a square end.



Galvanized and MGS rail is very similar due to them both being galvanized. The trick is to look at the splice of the rail.

Figure 93: **MGS** - As seen below, the splice is in between posts.



Figure 94: **GALV** - The splice is on the posts with regular GALV.



Concrete connections can be difficult to grasp due to how small they are. Here are the main three that will be seen:

Figure 95: **4PL** - 4PL will have 2 slots at the top of the barrier, and two at the bottom.



Figure 96: **6PL** - 6PL has three slots at the top of the barrier, and three at the bottom.



Figure 97: **CHAN** - the C-Channel connection has one larger slot at the top and one at the bottom. This connection type will only be used on Tall Barrier or Single Slope barrier.



Appendix G - Abbreviations for Data Entry

The TransInfo is the enterprise source system where the majority of our assets data is stored and maintained. Part of managing the data requires strict rules and standardization on the domain values used to describe an asset. This means that if a value is not in standardized form, the database will not accept it. The list below can be used as a guide when entering data and is effective as of March 2020.

Attribute	Meaning	Value
Side of Road (XSP)	Left	L
	Right	R
	Center	C
Barrier Type	Guardrail Barrier	RAIL
	Concrete Barrier	CONC
	Cable Barrier	CBLE
Terminal Type	None	NONE
	Sloped End Unburied	SLOPED END
	Connected to Structure	CONN. TO STRUCTURE
	Buried in Mound	MOUND
	Buried in Back Slope	BIBS
	Blunt A	BLUNT A
	Blunt B	BLUNT B
	Blunt C	BLUNT C
	Breakaway Cable Terminal	BCT
	Turned Down End (Texas Twist)	TDE
	ET Plus	ET PLUS
	ET 2000	ET 2000
	Soft-Stop	SOFTSTOP
	MASH- Sequential Kinking Terminal	MSKT

	Sequential Kinking Terminal	SKT
	Flared Energy Absorbing Terminal	FLEAT
	MASH- Flared Energy Absorbing Terminal	MFLEAT
	Max-Tension	MAX-TENSION
	Max-Tension Median	MAX-TENSION MEDIAN
	Slotted Rail Terminal	SRT
	Cable Barrier Terminal	CBT
	Other	OTHER
	IA-Sentre	IA-SENTRE
	IA-Sand Barrels	IA-SAND BARRELS
	IA-Hi-Dro Sandwich	IA-HI-DRO-SANDWICH
	IA-QuadGuard (Narrow or Wide)	IA-QG
	IA-QuadGuard Elite	IA-QGE
	IA-QuadTrend	IA-QT
	IA-QuadGuard M10	IA-QG M10
	IA-Breakmaster	IA-BRAKEMASTER
	IA- Redirective Energy Absorbing Crash Terminal	IA-REACT
	IA-Cushion Attenuating Terminal	IA-CAT
Terminal Type	IA- Trinity Attenuating Crash Cushions	IA-TRACC
	IA- Smart Cushion Impact Attenuator 100	IA-SCI 100
	IA- Hexfoam Sandwich	IA- HEXFOAM SANDWICH
	IA- Guardrail Energy Absorbing Terminal	IA-GREAT
	IA-Quest	IA-QUEST
	IA-TAU II	IA-TAU II
	IA-TAU-M	IA-TAU-M
	IA-Other	IA-OTHER
	Tran-230	TRAN-230

	Tran-Pre 230	TRAN-PRE 230
	Tran-350	TRAN-350
	Tran-Cable Connected Through Guardrail	TRAN-CB/GR
	Tran-MASH	TRAN-MASH
	Continues to Ramp	CONT. TO RAMP
	Continues from Ramp	CONT. FROM RAMP
	Continues from Other Roadway	CONT. FROM OTHER RDWY
	Continues to Other Roadway	CONT. TO OTHER RDWY
	Bridge End Unconnected	UNCONNECTED
	Bridge End Unprotected	UNPROTECTED
Terminal Height	LOW	L
	OK	O
	High	H
	Unknown	U
Terminal Condition	Good	G
	Fair	F
	Poor	P
	Not Needed	B
	Unknown	U
Rail Type	W-Beam 350 Galvanized	GALV
	W-Beam 350 Painted	PAINT
	Rusty Rail W-Beam 350 Corten, Rusty Rail	CORTEN
	W-Beam 350 w/ Rubrail	GALV W/ RUBRAIL
	W-Beam 350 Galvanized/W-Beam 350 CORTEN	GALV/CORTEN
	W-Beam 350 Galvanized/W-Beam 350 Painted	GALV/PAINT
	W-Beam 350 Galvanized/Thrie	GALV/THRIE
	W-Beam 350 Painted/W-Beam 350 CORTEN	PAINT/CORTEN

	Half Moon	HALF MOON
	Flying W	FLYING W
	Thrie Beam Guardrail	THRIE
	Modified Thrie	MOD THRIE
	Round Timber	TIMBER
	Steel Backed Timer	SBT
	Two Rail Steel Backed Timber	TWO RAIL SBT
	Midwest Guardrail System W-Beam MASH Splice Between Posts	MGS
Post Spacing	Type 1 (12' 6" spacing with no block-outs)	1
	Type 1A (12' 6" spacing with block-outs)	1A
	Type 2 (6' 3" spacing with no block-outs)	2
	Type 2A (6' 3" spacing with block-outs)	2A
	Other	OTHER
	Type 1 and Type 2A	1/2A
	Type 1A and Type 2A	1A/2A
	Type 2 and Type 2A	2/2A
Block-outs	Wood	W
	Steel	S
	Plastic	P
	Wood/Steel	WS
	Wood/Plastic	WP
	Steel/Plastic	SP
Post Type	Wood	WOOD
	Steel	STEEL
	Concrete	CONC
	Steel/Concrete	STCN
	Wood/Concrete	WDCN

	Wood/Steel	WDST
Barrier Height	Low	L
	OK	O
	High	H
	Unknown	U
Barrier Condition	Good	G
	Fair	F
	Poor	P
	Not Needed	B
	Unknown	U
Cable Barrier Type	3-Strand	3-STRAND
	4-Strand	4-STRAND
	BRIFEN O-Post Cable Barrier	BRIFEN O-POST
	Cass Safety System Cable Barrier	CASS-S3-M10
Concrete Barrier Type	New Jersey (Jersey) Median Barrier	JERSEY
	F Shape 32 inches	F
	Tall F Shape 42 inches	TALL_F
	Single Slope	SS
	Other	OTHER
Concrete Barrier Construction Method	Precast	Precast
	Cast in Place	CIP
Concrete Barrier Connection	Tongue & Groove	TG
	4 Pin & Loop	4PL
	6 Pin & Loop	6PL
	C-Channel	CHAN

Appendix H - Standard Comments

These are the standard comments that may be displayed in the **NOTE** attribute for the asset. This is an area in the data collection where a brief explanation of the coded data may be needed. It is standard practice to use these comments to explain why an asset is poor or to explain special differences in an asset. Though additional comments may be needed in the future it is important to be consistent with future comments. In addition, approval from asset owners will be required in order to add standard comments.

Format	Descriptions
DRNG CRB	Drainage Curb
BT MIF ET MIF BOTH MIF	End Terminal / Beginning Terminal / Both Missing Impact Face
BT GS HI ET GS HI BOTH GS HI	End Terminal / Beginning Terminal / Both Ground strut too high
BT NOT BIBS ET NOT BIBS BOTH NOT BIBS	End Terminal / Beginning Terminal / Both not buried in backslope
STEEL BO PLASTIC BO	Steel/Plastic Block-outs
CONC BARR W BACKFILL	Concrete barrier with Backfill
POST SPACING # FT	Post spacing # feet
QGW	QuadGuard Wide
SGNL	Signal/Railroad crossing signal
MISSING POSTS	Missing Posts
SKIPPED POSTS	Skipped Posts (intentional)
NO SIR	No Slots in rail (SRT)
METAL MEDIAN BARR	Metal Median Barrier

Appendix I - Digital Video Log (DVL)

Background

The Digital Video Log (DVL) is a pictorial record of state highway system from a driver's perspective. The DVL consists of digital images taken every five thousandth of a mile. The DVL proceeds from mile point zero to the end of the highway. You can reverse the direction (end of highway to mile point zero) with the Increasing Mile Points and Decreasing Mile Points radio buttons. By using these two radio buttons you can view the highway in both directions of travel.

Most of the highways were driven in the right lane with a single camera mounted in the center of the vehicle. The shoulders and side conditions of the road are visible, though the perspective may be skewed a bit. Most people find they can get information about road conditions, shoulder width, etc. from the DVL.

For more detailed instructions, go to the "How to Use the Oregon Department of Transportation Digital Video Log (DVL)" instruction sheet located here:

<https://dvlprod-odot.msappproxy.net/cf/dvl/Doc/DVLinstructions2017.pdf>

How to Use the Digital Video Log

1. From the DVL homepage

<https://www.oregon.gov/odot/Data/Pages/Road-Assets-Mileage.aspx#DVL>

<https://dvlprod-odot.msappproxy.net/cf/dvl/Doc/DVLinstructions2017.pdf>

Click on "Click Here to Begin" to activate the Digital Video Log.

2. Choose from the following options on the next screen. Keep in mind that the default settings are the most commonly used. Most people will only need to adjust the Highway Number, Season, and Starting Milepoint to view the images they need.
 - *Highway* – The highways are listed by the official ODOT highway number (not the route number found on maps). Choose any available highway from the drop down menu.

- To find the official ODOT Highway Number Use the State Highway Cross Reference:

<https://www.oregon.gov/ODOT/Data/Documents/Routes-to-Highway-Cross-Reference-Table.pdf>

The list of available highways is based on the criteria selected in the fields 2, 3 and 4. For example, if you uncheck Highways and check Frontage Roads in the Road Type Field, the highway list will only contain Frontage Roads.

- *Road Type* – Accept the default – Highways.
- *Mileage Type* – This is an internal code and is of no use or concern to the lay user. Accept the defaults
- *Season* – The Digital Video Log will automatically default to the most current images for your chosen highway, and will list other available years in the Season pull down list. You can view images from previous seasons by choosing a different year from the Season pull down list. DVL seasons run from May 1 – April 30 each year. Approximately one half of the state highway system is taped annually.
- *Starting Milepoint* – This will default to the beginning milepoint for the chosen highway and year, but you may choose a different starting milepoint from the pull down list, or enter a milepoint in the entry field. East-West roads “begin” (mile point zero) in the West. North-South roads “begin” in the North. I-5 is an exception. It “begins” at the California border.
- *Direction* – The DVL is taped in both traffic directions, so images may be viewed in either Increasing or Decreasing Milepoint direction. The increasing milepoint is the default direction. The DVL proceeds from mile point zero to the end of the highway. You can reverse the direction (end of highway to mile point zero) with the Increasing Mile Points and Decreasing Mile Points radio buttons. By using these two radio buttons you can view the highway in both directions of travel.

3. Choose one of the following to start viewing images:

Display Image button – This will display the images on the same screen as the milepoint DVL for the highway, and will allow the user to scroll through images one at a time. (See below for further information about how to use this feature.)

Play Images button – Allows you to play the images of your selected highway consecutively. (See below for further information about how to use this feature.)

Reset – Resets all fields on the page back to the default settings.

How to Use Display Image

Once the video image is displayed, you can move through the images one at a time by clicking the

<<< (Previous Image) or >>> (Next Image) buttons below the image. The size of the image can be increased by clicking on the image.

Figure 98: Screenshot from Digital Video Log page.



Select New Highway – Goes back to highway selection screen where you can choose a different highway or change options for the same highway (such as choose a different year).

Increment (Inc Amt): The images will change by increments of 0.05 mile by default, but you can change the Increment Amount. For example, entering 10 in the increment box will change the frame by 0.10 mile and 100 will change the frame by 1.00 mile.

Increasing/Decreasing (Incr / Decr): You can choose to view the highway in either increasing (Eastbound or Southbound, except I-5) or decreasing direction Westbound or Northbound, except I-5) by clicking the appropriate direction button.

<<< – Moves to the previous image by increment amount

>>> – Moves to the next image by increment amount

Play Images – Goes to the Play Image tool where the images are played automatically. See “How to Use Play Images” section below for instructions on this tool.

Home – Returns to the DVL home page

Milepoint Log – The milepoint log that corresponds to the year of the images is displayed at the bottom of the screen. You can scroll through the log to look for a particular feature, like a city’s name or a side street. You can jump directly to the image of a specific milepoint by clicking the shaded milepoint button in the milepoint log below the image. See below for more detailed instructions for reading the milepoint log.

How to Use Play Images

Use this feature to play images of the selected highway consecutively. This works much like a VCR, with play, pause and rewind.

Increment: The images will change by increments of 0.015 mile by default, but you can change the Increment Amount. For example, entering 10 in the increment box will change the frame by 0.10 mile and 100 will change the frame by 1.00 mile. To change the increment amount, select a new increment from the pull down list.

Select New Highway – Goes back to highway selection screen where you can choose a different highway or change options for the same highway (such as choose a different year).

||<<< – Jumps to the beginning of the highway. You will need to select Play or Rewind after clicking on this choice.

|<<< – Jumps to the start of the currently selected images (+/- 2 miles of the requested milepoint). You will need to select Play or Rewind after clicking on this choice.

Rewind – Plays images backwards **Pause** – Pause playing of images **Play** – Plays images forward

>>> – Jumps to the end of the currently selected images (+/- 2 miles of the requested milepoint). You will need to select Play or Rewind after clicking on this choice.

>>>| – Reposition to the end of the highway. You will need to select Play or Rewind after clicking on this choice.

Display Image – Goes to the Display Image page

Home – Goes to the DVL home page

Increase / Decrease MP – Click on selection – then click on Play or Rewind

Starting MP – Click on selection – then click on Play or Rewind

Increment – Changes increment between each image.

Play Speed – The default play speed is 1 image every 3.5 second. You can choose between .25 – 5 seconds / image.

Milepoint Log – Clicking on the Milepoint Log button will open up a new window with a corresponding milepoint log. You can scroll through the log to look for a particular feature, and jump directly to the image of a specific milepoint by clicking the shaded milepoint button in the milepoint log. After clicking on a milepoint, minimize the milepoint log window to uncover the Play Images screen.

Reading the Milepoint Log

Roadside features on the state highway system change regularly. With this in mind, the DVL displays the milepoint log that matches the year the pictures were taken.

The Milepoint log displays the following information for each milepoint:

Rdwy ID (Roadway ID) – This number identifies the alignment on which this milepoint exists. Rdwy ID 1 is the increasing mileage direction for traffic and Rdwy ID 2, the decreasing mileage traffic direction. The exception being Hwy. 001 (I-5), on which Rdwy 1 (southbound) is the decreasing mileage direction. *Don't even pay attention to this feature. It's an internal coding system of no consequence to the lay user.*

Mlge Type (Mileage Type) – Z = overlapping, Y = Spur, T = Temporary *Don't even pay attention to this feature. It's an internal coding system of no consequence to the lay user.*

Ovlap Cd (Overlap Code) – Used with 'Z' mileage only. The milepoint overlapping code indicates the sequential order in which 'Z' mileage was added to a highway. *Don't even pay attention to this feature. It's an internal coding system of no consequence to the lay user.*

Milepoint – A number that represents the distance in miles from the original beginning of the highway. This distance, measured along the contours of the traveled roadway, is derived from construction plans and field inventory.

Roadway Codes – These codes indicate the direction (left or right) and jurisdiction of intersecting roads, culverts, structures, boundaries, etc. (The codes have been omitted from these instructions for brevity.)

Update Cycles

Approximately one half of the state highway system is taped annually, with emphasis on Interstate and US Routes. The annual Video Log seasons run from May 1 to April 30.

The highway milepoint log report is a snapshot of data from TransInfo. A yearly snapshot is taken at the beginning of the taping season in May.

Printing

- To print the whole page as seen on your computer screen including the menu, image and beginning of the milepoint log on one page – change to landscape mode under File/Print/Preferences, and click OK. Then choose “As laid out on screen” under Print/Options/Print Frames/OK

- To print just the menu, the image or the milepoint log alone – first click in the section you want, then click File/Print/“Only the selected frame” under Options/Print Frames/Print.
- To print everything, but each on a different page – click on File/Print/“All frames individually” under Options/Print Frames/OK.
- To print only a selected portion of the milepoint log – Highlight the section of the milepoint log wanted, click on File/Print/Change from “All” to “Selection” under Print Range/OK.

Saving an Image

- Right click on the image.
- Click on “Save Picture as”
- Go to the drive/folder you want the image saved in
- Name the file
- Choose to save it as a .jpg file
- Click save

To view the .jpg file, either double click on the file name, or open the file from within Microsoft Photo Editor.

DVL Frequently Asked Questions (FAQ'S)

Why is there an occasional lag while I am viewing a highway?

The DVL automatically goes out and collects images + or - 2 miles on either side of your selected milepoint. This is done to enable faster loading speeds for viewing. Once you reach the outside range of the requested milepoint, the DVL will go out and collect the next set of images. This will result in a short pause while the needed images are stored.

Why do I get the error "Auto Play has been exceeded"?

This message may appear while in play mode. The purpose is to stop continuous playing of a highway by accidentally leaving the DVL playing, which can slow down the server for others. If someone begins playing a highway and the DVL reloads the +/- 2 mile images 21 times then this error message will appear.

Where did my buttons go on the display image screen?

Sometimes when the display image screen is in a minimized window the buttons will be below the viewable area in order to allow room to show the image. Simply drag the lower silver dividing bar directly under the image down and your buttons will appear.

While in 2006 season can I open both images in separate windows?

Yes you can. Simply click on each image to enlarge and they will open in their own windows. The enlarged images will automatically update to reflect the selected milepoint on the main screen.

Is there a web address where customers can access the DVL via the internet?

Yes there is. Go to:

<https://dvlprod-ordot.msappproxy.net/cf/dvl/index.cfm?&fuseaction=entry>

Why do I sometimes see a red X?

This is due to a missing image. Due to the large amount of images collected occasionally one is not collected or is corrupted.

Why can't the images be larger on my screen while viewing the milepoint log?

Users of the DVL have various needs for display. The application was developed to be viewed in many different resolutions and screens.

Can I use the milepoints displayed on the video log for measuring?

Depending on your needs, the Video Log may be used to obtain or verify milepoints. Please keep in mind that the accuracy of the Video Log is +/- .02 miles. In addition, since not all highways are taped each year, there may have been construction work since the last Video Log that could have an effect on the milepoints. The most accurate and up to date milepoints can be obtained through the TransViewer reports located at <http://highway.intranet.odot.state.or.us/cf/HIGHWAYREPORTS/>

Why doesn't the milepoint log reflect a new construction project?

The milepoint log is a snapshot of data each May 1. Due to the timing of the milepoint log snapshot, the collection of the images and the entry of the construction plans, not all projects will be represented in the DVL.

Why is the route on the DVL different than I would expect?

There is not enough room on the images to list all of the routes so a hierarchy is followed: Interstates, US and then Oregon. When there is more than one kind (such as two Oregon Routes) then the lowest route number is used. There are a few exceptions to this rule where the State Highway Engineer has designated which route will be shown such as US97 in Bend instead of US20.

Why doesn't the DVL always show two images?

The addition of a second camera did not occur until the 2006 season. Images collected prior to 2006 utilized the single camera system.

I can't see the milepoints on the .jpg while in "Play Images" mode.

This situation can occur if your monitor resolution is too low. In addition to not being able to view the milepoints, the buttons on the bottom of the page may also disappear.

To remedy both of these situations check to make sure your monitor resolution is set to 1024 x 762, or above.

How can I get only one image to display?

This functionality has been included for those who only want to view a single image on their screen while in “Play Images” mode. You simply uncheck “Display Image” for whichever camera you would like to disappear. Recheck the box and the camera will reappear. While in “Display Images” mode, click on the image you want to display. When the new window opens, the same options for advancing images are available as in the dual image window.

What are the update cycles of the DVL? Approximately May of each year:

Interstate and US Route (NHS) = Annually

OR Route (NHS) = Every 2 years

Other OR Routes = Every 3 years

Interstate Connection Frontage Road, Off-System NHS = Every 5 years

Appendix J – Crash Testing Compliance

Background

NCHRP Report 230 (1980) presented the first national standard for evaluating and crash testing roadside safety hardware. Subsequently, NCHRP Report 350 (1993) and the Manual for Assessing Safety Hardware (MASH 2009, 2016) provided updated standards.

MASH (2009 or 2016) is the current standard (**Good**)

350 hardware is allowed to remain in service (**Fair**)

Pre-350 hardware is considered obsolete (**Poor**)

Poor (Pre-350)

- Terminals (leading end on divided highways, leading and trailing end on undivided highways)

- | | |
|---------------|-------------------------------|
| ○ BLUNT A | BLUNT A |
| ○ BLUNT B | BLUNT B |
| ○ BLUNT C | BLUNT C |
| ○ BCT | BREAKAWAY CABLE TERMINAL |
| ○ SLOPED END | SLOPED END UNBURIED |
| ○ MOUND | MOUND |
| ○ TDE | TURNED DOWN END (TEXAS TWIST) |
| ○ NONE | NONE |
| ○ UNCONNECTED | BRIDGE END UNCONNECTED |

- Impact Attenuators

- | | |
|-----------------------|--|
| ○ IA-HI-DRO-SANDWICH | IA-HI-DRO-SANDWICH |
| ○ IA-GREAT | IA-GUARDRAIL ENERGY ABSORBING TERMINAL |
| ○ IA-HEXFOAM SANDWICH | IA-HEXFOAM SANDWICH |
| ○ IA-OTHER | IA-OTHER |
| ○ UNPROTECTED | BRIDGE END UNPROTECTED |

- Transitions

- TRAN-PRE 230 TRAN-PRE 230
- TRAN-230 TRAN-230

- BARR Desc

- TIMBER ROUND TIMBER
- HALF MOON HALF MOON
- FLYING W FLYING W

- CONC Conn

- 4PL 4 PIN & LOOP
- TG TONGUE & GROOVE

- Post Space

Any combination that includes Type 1, Type 1A and/or Type 2 (only Type 2A is acceptable)

- 1 12'6" SPACING WITH NO BLOCK-OUTS
- 1A 12'6" SPACING WITH BLOCK-OUTS
- 2 6'3" SPACING WITH NO BLOCK-OUTS

OTHER

- 1/2A TYPE 1 AND TYPE 2A
- 1A/2A TYPE 1A AND TYPE 2A
- 2/2A TYPE 2 AND TYPE 2A

Fair (350 compliant)

- Terminals (leading end on divided highways, leading and trailing end on undivided highways)
 - SKT SEQUENTIAL KINKING TERMINAL
 - SRT SLOTTED RAIL TERMINAL
 - CBT CABLE BARRIER TERMINAL
 - ET 2000 ET 2000
 - ET PLUS ET PLUS
 - FLEAT FLARED ENERGY ABSORBING TERMINAL

- Impact Attenuators
 - IA-SENTE IA-SENTE
 - IA-SAND BARRELS IA-SAND BARRELS
 - IA-QG IA-QUADGUARD (NARROW OR WIDE)
 - IA-QGE IA-QUADGUARD ELITE
 - IA-QT IA-QUADTREND
 - IA-BRAKEMASTER IA-BRAKEMASTER
 - IA-REACT IA-REDIRECTIVE ENERGY ABSORBING CRASH TERMINAL
 - IA-CAT IA-CAT 350-CUSHION ATTENUATING TERMINAL
 - IA-TRACC IA-TRINITY ATTENUATING CRASH CUSHIONS
 - IA-QUEST IA-QUEST
 - IA-TAU II IA-ATU II

- Transitions
 - TRAN-350 TRAN-350
 - TRAN-CB/GR TRAN CABLE CONNECTED THROUGH GUARRAIL

- BARR Desc
 - 3-STRAND 3-STRAND
 - 4-STRAND 4-STRAND
 - JERSEY NEW JERSEY (JERSEY) MEDIAN BARRIER
 - SS SINGLE SLOPE
 - CORTEN RUSTY RAIL W-BEAM 350 CORTEN
 - GALV W-BEAM 350 GALVENIZED
 - GALV W/RUBRAIL W-BEAM 350 WITH RUBRAIL
 - MOD. THRIE MODIFIED THRIE
 - PAINT W-BEAM 350 PAINTED
 - SBT STEEL BACKED TIMBER
 - THRIE THRIE BEAM GUARDRAIL
 - TWO RAIL SBT TWO RAIL STEEL BACKED TIMBER
 - GALV/CORTEN W-BEAM 350 GALVENIZED/ W-BEAM 350 CORTEN
 - GALV/PAINT W-BEAM 350 GALVENIZED/ W-BEAM 350 PAINTED
 - GALV/THRIE W-BEAM 350 GALVENIZED/ THRIE
 - PAINT/CORTEN W-BEAM 350 PAINTED/ W-BEAM 350 CORTEN

- Post Space
 - Type 2A (with All W-beam rail except MGS) 2A 6'3" SPACING WITH BLOCK-OUTS

- CONC Con
 - CHAN C-CHANNEL
 - 6PL 6 PIN AND LOOP

- Post Space
 - 2A (with MGS) TYPE 2A 6'3" SPACING WITH BLOCK-OUTS

ODOT provides a safe and reliable multimodal transportation system that connects people and helps Oregon's communities and economy thrive.

www.oregon.gov/ODOT

