



May 30, 2013

Re: Attached Excerpt from the Ministry of Transportation and Infrastructure Road Register (Excerpt, Information and Matters set out or otherwise contemplated in the attached Excerpt herein referred to as “Attached Excerpt”)

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Any questions may be directed to our District office at 250-828-4002.

Ministry of Transportation and Infrastructure
Thompson Nicola District

Attachment

Road Name Scott Road Route/Road No. 4310

Electoral District Kamloops Arterial No. Page 1/1

KILOMETRE LOG

Definitions of these classifications may be found in the Manuals of Policy and Procedures and Maintenance Management

Initial Point Deleeuw Road (km 3.7) 1463

Terminal Point City Bdy.

Establishment: When Unknown

How
Section 4

Gazette Aug. 6/1909 km 0.0-0.6

Date Compiled
or Revised Nov./84 Oct '94 Closed Class of Inst 2,382 from 7F to 7D.

Nov/84 Oct 94 Chap of Chap of list 2,382 from 7F to 7D

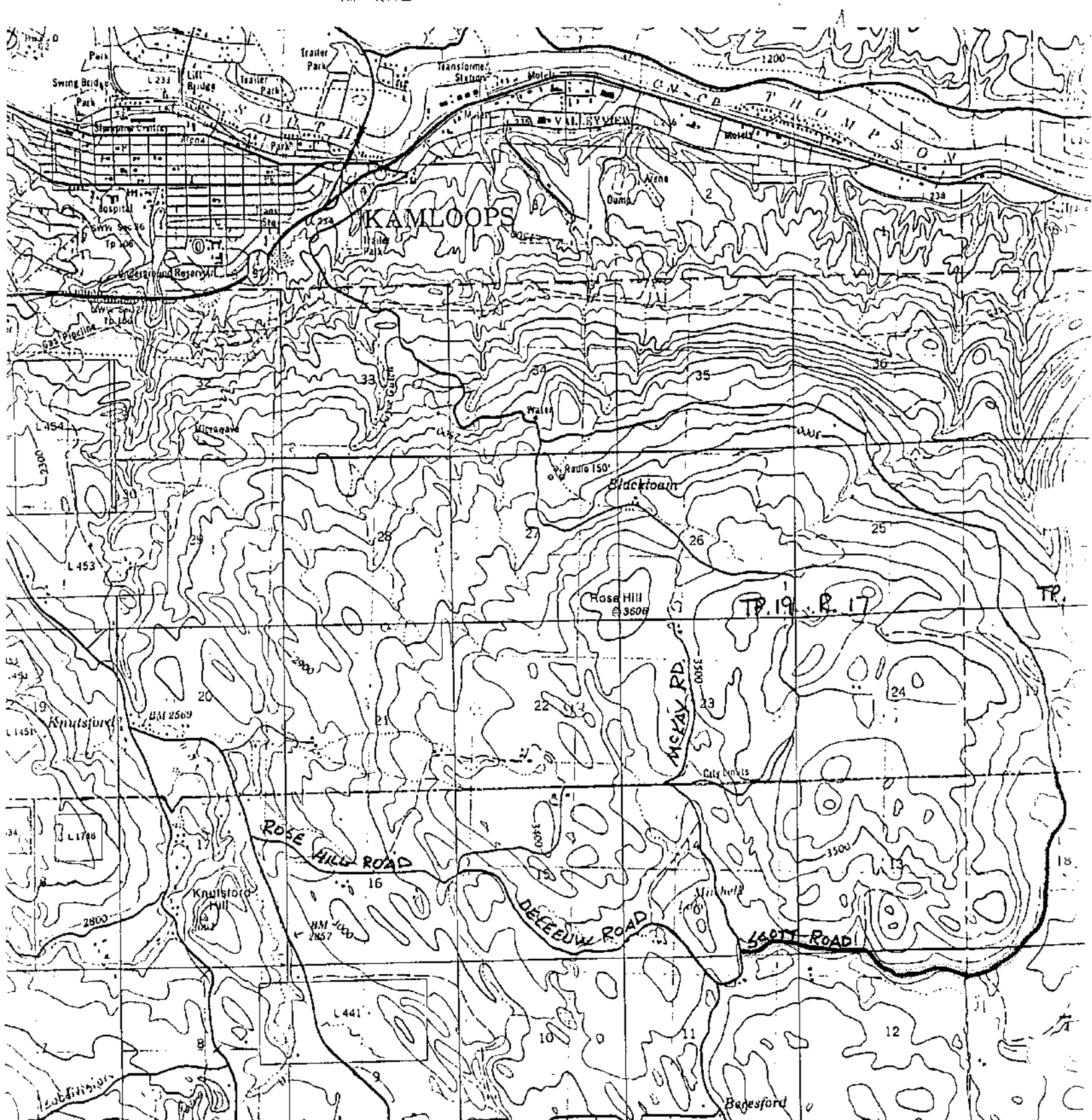
| Remarks | Rose Hill area | X-ref | KP52065 | KP52066 |
|---------|----------------|-------|---------|---------|
| | | | | |

7.8 km inside of city limits

Cadastral Map - 92-1-069.2.2

Air Interim Map - 92 1/9b





Contract Area : 15 THOMPSON
Area Manager Area A KAMLOOPS EAST
Arterial No :
Sub Area:

Road Name : SCOTT ROAD

Route/Road No : 4310

Electoral District

100.00 % 18 Kamloops

0.00 %

0.00 %

0.00 %

0.00 %

CLASSIFICATIONS

| FUNCTION | | SURFACE | | OPERATION | |
|---|-------|--------------|-------|-------------|-------------|
| Organized: Arterial Secondary | | A-PC | | Summer | Winter |
| | | A-BPM | | 1 | A |
| | | O | | 2 | B |
| | | B | | 3 | C |
| Unorganized: Trunk Main Collector Minor | 4.830 | T | 4.830 | 4 | D 2.382 |
| | | C | | 5 | E |
| | | D | | 6 | F 2.448 |
| | | Total open | | 7 4.830 | |
| | | E | | 8 | |
| | | F | | | |
| Unconstructed: | | Total unopen | | | |
| Total | 4.830 | Total | 4.830 | Total 4.830 | Total 4.830 |

Definitions of these classifications may be found in the Manuals of Policy and Procedures and Maintenance Management

Initial Point : Deleeuw Road (km 3.7)

Terminal Point : Kamloops City Boundary

Establishment: When // Unknown

How Section 4
1909/08/06 Gazette km 0 - 0.6

Date Compiled : 1984/11/01

or Revised : 1996/05/02 Trans to ERR

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Remarks : 94/10 - Changed class of first 2.382 km, from 7F to 7D

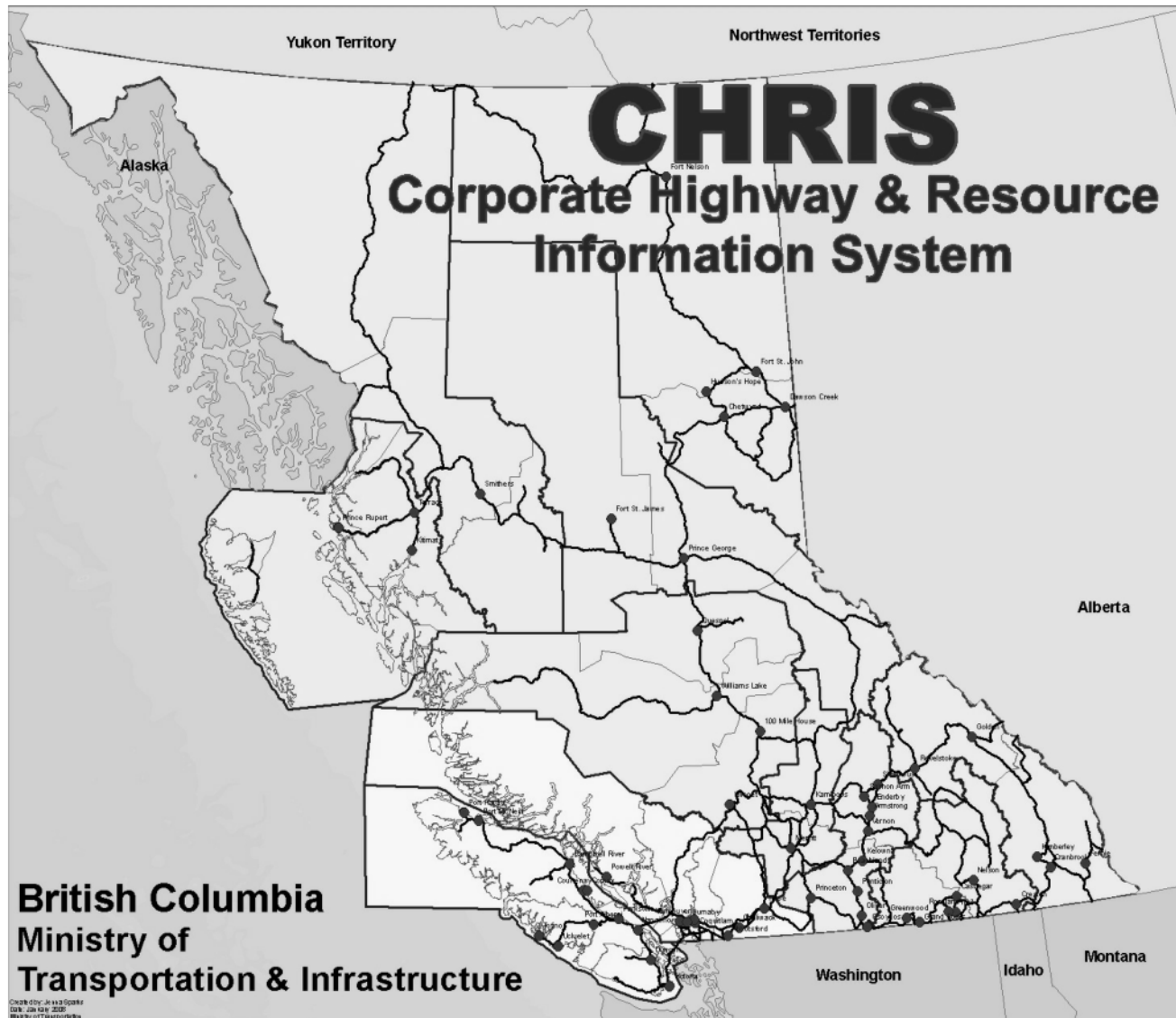
x-reference - KAP 52065, 52066, 52067 B.C.Hydro S.R.W.

7.8 km Inside City limits.

Cadastral Map - 92.1.069.2.2

Air Interim Map - 92 1/9b

INVENTORY TYPE DETAILS



Open Data Only
(Detailed Inventory Type Attributes and Business Rules)
Last Revision Date: 25-May-2017

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1. Introduction

CHRIS – Inventory Type Details:

This document identifies all of the Inventory Types that are picked up with the field collection of Highway data for use in CHRIS (Corporate Highway and Resource Information System). It also includes the Attributes and Rules/Considerations for each individual Inventory Type.

This is a living document - subject to change.

2. RFI Network

The RFI Network identifies all of the roads in the province of BC that belong to MoT with the exception of those roads that are **Notionals** or **Pedestrian Notionals** (these roads do not belong to MoT, but with our current way of business we need a road to be able to display Structures that belong to us; therefore we own the structure but NOT the road).

- All RFI Highways start or end at the centreline of the intersecting highway (not at the shoulder).

RFI Unique Identifier (SASHH-H):

- S – Service Area (01 through to 28 plus the 5 Concession Areas 40 through to 44)
- A – Area Manager Area (@ symbol if there is not an Area Manager Area)
- S – Sub Area (@ symbol if there is not a Sub Area)
- H – Highway Type (0 (zero) for Road; E for Easement; N for Notional; P for Pedestrian Notional)
- H – Highway Number – consists of 4 digits always (pre-ceded by 0 zeroes)
- H – Highway Alpha – if applicable – not always used – 2 characters (combination of letters and single digit numbers)

3. Service Area Admin Units

Valid Admin Unit Codes:

| Admin Unit | Service Area Number | Service Area Name | District Number | District Name |
|------------|---------------------|--|-----------------|------------------|
| 401 | 1 | South Island | 2 | Vancouver Island |
| 402 | 2 | Central Island | 2 | Vancouver Island |
| 403 | 3 | North Island | 2 | Vancouver Island |
| 404 | 4 | Howe Sound | 1 | Lower Mainland |
| 405 | 5 | Sunshine Coast | 1 | Lower Mainland |
| 406 | 6 | Lower Mainland | 1 | Lower Mainland |
| 407 | 7 | Fraser Valley | 1 | Lower Mainland |
| 408 | 8 | South Okanagan | 5 | Okanagan-Shuswap |
| 409 | 9 | Kootenay Boundary | 4 | West Kootenay |
| 410 | 10 | Central Kootenay | 4 | West Kootenay |
| 411 | 11 | East Kootenay | 3 | Rocky Mountain |
| 412 | 12 | Selkirk | 3 | Rocky Mountain |
| 413 | 13 | Okanagan-Shuswap | 5 | Okanagan-Shuswap |
| 414 | 14 | Nicola | 6 | Thompson-Nicola |
| 415 | 15 | Thompson | 6 | Thompson-Nicola |
| 416 | 16 | South Cariboo | 7 | Cariboo |
| 417 | 17 | Central Cariboo | 7 | Cariboo |
| 418 | 18 | North Cariboo | 7 | Cariboo |
| 419 | 19 | Fort George | 9 | Fort George |
| 420 | 20 | Robson | 9 | Fort George |
| 421 | 21 | South Peace | 8 | Peace |
| 422 | 22 | North Peace | 8 | Peace |
| 423 | 23 | Nechako | 9 | Fort George |
| 424 | 24 | Lakes | 10 | Bulkley-Stikine |
| 425 | 25 | Bulkley Nass | 10 | Bulkley-Stikine |
| 426 | 26 | Skeena | 11 | Skeena |
| 427 | 27 | North Coast | 11 | Skeena |
| 428 | 28 | Stikine | 10 | Bulkley-Stikine |
| 440 | 40 | Sea to Sky Concession | | |
| 441 | 41 | WR Bennett Bridge Concession | | |
| 442 | 42 | Kicking Horse Canyon Concession | | |
| 443 | 43 | Port Mann Highway 1 Concession | | |
| 444 | 44 | South Fraser Perimeter Road Concession | | |

Note: The 40 series are the Concession Areas.

4. General Inventory Type Collection Rules

Overall Statement:

The Cardinal Direction for a Highway/Traversal should be Eastbound (EB) or Northbound (NB), where feasible. The Inventory should be picked up in the same direction that the road was entered into CHRIS. The direction of travel must remain the same from start to finish.

Road Inventory:

There are basically three types of road Inventory that can be collected:

- Points
- Lines (linear)
- Polygons

Points:

Location information should be collected at the centre of the Inventory Item, first access to the Item or beginning of the Item. The location should be collected by being positioned perpendicular to the Inventory Item whether it is on the right hand or left hand side of the road. The location information should be collected in the direction of highway travel.

- Exceptions to the above statement are:
 - **APU** - Animal Pedestrian Underpasses – Skewed APUs (not at 90 degrees across the highway) are collected where the end is found on the right side of the highway in the direction of travel
 - **CULV** - Culverts - Skewed culverts are collected where the culvert end is found on the right side of the highway in the direction of travel

Lines (Linear):

Linear items on both sides of the highway should be collected in the direction of highway travel.

- Exceptions to the above statement are:
 - **DR** - Dust Control Range - calculate offsets for entry of this Item so that the item of warrant is located at the centre of the dust range
 - **HP** – Highway Profile & **SL** – Special Lanes – these need to be inventoried correctly – the HP should only be the Through Lanes, including Passing or Truck Lanes. All other lanes should be SL

Polygons:

Polygon features will not be collected via the FDCU at this time. When implemented, a rule on collecting this inventory type will be added.

Mandatory Attributes:

Some Inventory Items in CHRIS have Mandatory Attributes that have not been populated. If a project that is Checked Out contains any of these existing Inventory Items with unpopulated Mandatory Attributes and the user makes any changes to the existing Inventory Items (including populating the Mandatory Attribute), then the Inventory Items will fail upon Check-In.

- The recommendation is to record the information manually while in the field and then update the Inventory Item using the Core Application in the office.

5. Identification of Cross Sectional Position (XSP)

XSP Codes:

Inventory Items are laterally located on the highway based on the following guidelines and relative to the direction of increasing LRM chainage.

- XSPs are Left and Right relative the direction of increasing LRM chainage offset in which the LRM element is defined.
- In the case of a divided highway XSP the assumed road **Centreline** is the **Left Shoulder** marking.
- Where required, a List of Values (LOV) table is provided for each individual Inventory Type.

Valid CHRIS XSP Codes:

| XSP Code | Meaning | Description |
|-------------|--|---|
| X | All Lanes | Includes all through and special lanes |
| RRW | Right of Way – Right | The Right of Way to the right in the direction of chainage |
| RD | Ditch – Right | The Ditch to the right in the direction of chainage |
| RS | Shoulder – Right | The Shoulder to the right in the direction of chainage |
| RL9 | 5 th Lane – Right | The Fifth Lane to the right of Centreline in the direction of chainage |
| RL7 | 4 th Lane – Right | The Fourth Lane to the right of Centreline in the direction of chainage |
| RL5 | 3 rd Lane – Right | The Third Lane to the right of Centreline in the direction of chainage |
| RL3 | 2 nd Lane – Right | The Second Lane to the right of Centreline in the direction of chainage |
| RL1 | 1 st Lane - Right | The First Through Lane to the right of Centreline in the direction of chainage |
| SRL1 | 1 st Inside Lane – Right | The First Inside Lane, adjacent to the First Through Lane to the right of Centreline |
| SRL3 | 2 nd Inside Lane – Right | The Second Inside Lane, adjacent to Centreline, next to SRL1 |
| M | Division of Travel Direction/End of Road | Division of Direction of Travel, Centreline, End of Road or Median |
| SLL4 | 2 nd Inside Lane – Left | The Second Inside Lane, adjacent to Centreline, next to SLL2 |
| SLL2 | 1 st Inside Lane – Left | The First Inside Lane, adjacent to the First Through Lane to the left of Centreline |
| LL2 | 1 st Lane - Left | The First Through Lane to the left of Centreline in the direction of chainage |
| LL4 | 2 nd Lane – Left | The Second Lane to the left of Centreline in the direction of chainage |
| LL6 | 3 rd Lane – Left | The Third Lane to the left of Centreline in the direction of chainage |
| LL8 | 4 th Lane – Left | The Fourth Lane to the left of Centreline in the direction of chainage |
| LL10 | 5 th Lane – Left | The Fifth Lane to the left of Centreline in the direction of chainage |
| LS | Shoulder – Left | The Shoulder to the left in the direction of chainage |
| LD | Ditch – Left | The Ditch to the left in the direction of chainage |
| LRW | Right of Way – Left | The Right of Way to the left in the direction of chainage |

| XSP Code | Meaning | Description |
|-----------------|-----------------|--|
| AL | Above Left | Above Left (the Structure is Above the Road – Walls) |
| AR | Above Right | Above Right (the Structure is Above the Road – Walls) |
| BL | Below Left | Below Left (the Structure is Below the Road – Walls) |
| BR | Below Right | Below Right (the Structure is Below the Road – Walls) |
| BB | Below Both | Below Both (the Structure is Below the Road on Both Sides – Walls) |
| AZ | Above Unknown | Above Unknown (the Structure is Above the Road – Walls) |
| BZ | Below Unknown | Below Unknown (the Structure is Below the Road – Walls) |
| O | Over | Over (the Structure is Over the Road) |
| U | Under | Under (the Structure is Under the Road – Bridge going over another bridge) |
| L | Left | An Inventory Item or event located on the Left of the Centreline of the Highway in the direction in which data is collected |
| R | Right | An Inventory Item or event located on the Right of the Centreline of the Highway in the direction in which data is collected |
| XL | All Left Lanes | An Inventory Item or event located across all lanes Left of the Centreline |
| XR | All Right Lanes | An Inventory Item or event located across all lanes Right of the Centreline |
| Z | Unknown | Not known at Data Conversion – should not be used |

The placement of Inventory (including Special Lanes) in accordance with the above codes is further illustrated in the diagrams below.

- The XSP values of SRL and SLL are used for all Special Lanes that are found in the centre of the road and are designated their number from the first through lane towards the centre – typically these will be Special Lane Types of Two Way Left Turn Lanes, Turn Slots and HOV or Bus Lane.
 - If the Special Lane (e.g. HOV or Bus Lane) is found in the centre of the road, the XSP value would be SRL or SLL BUT if it is found on the outside of the road, the XSP value would be RL or LL.
 - If the Special Lane is a Two Way Left Turn Lane, choose the appropriate Inside Lane XSP or right of Centreline (e.g. SRL1, SRL3), even though this lane falls both right and left of the split centreline.
- Other Special Lane Types (e.g. Acceleration Lane, Bus Bay, Deceleration Lane, Ramp) are typically found on the outside of the road and are designated LL or RL with the appropriate number.

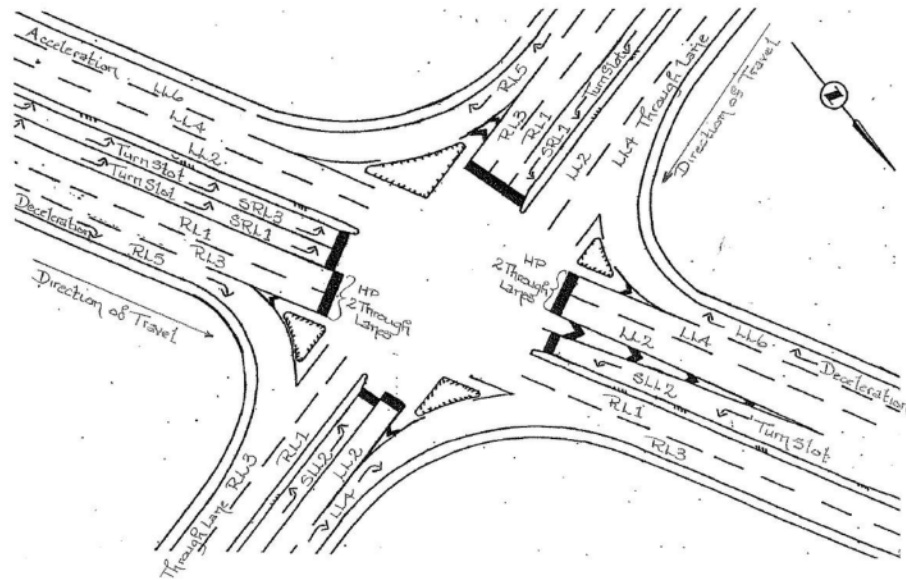


Figure 1 - XSP - Undivided Highway

Note: The Through lanes (including passing or truck lanes) are identified in the HP (Highway Profile). On an Undivided Highway, the inside lanes are SRL or SLL and the outside lanes are RL or LL.

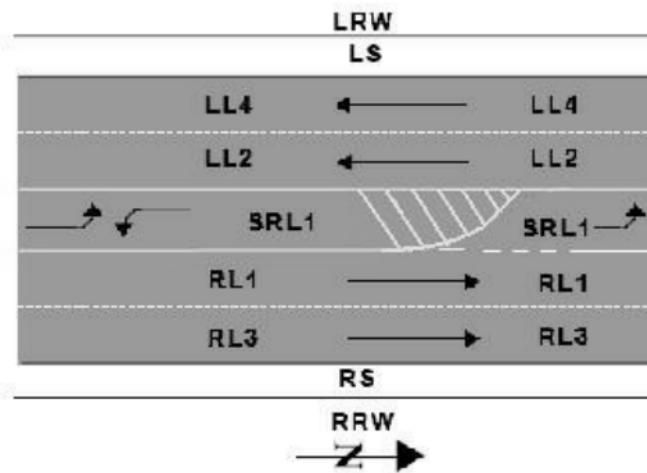


Figure 2 - XSP - Undivided Highway with Two Way Left Turn Lane and Left Turn Slot

Note: The Two-Way Left Turn Lane will always be right of Centreline and designated a SRL, not SLL.

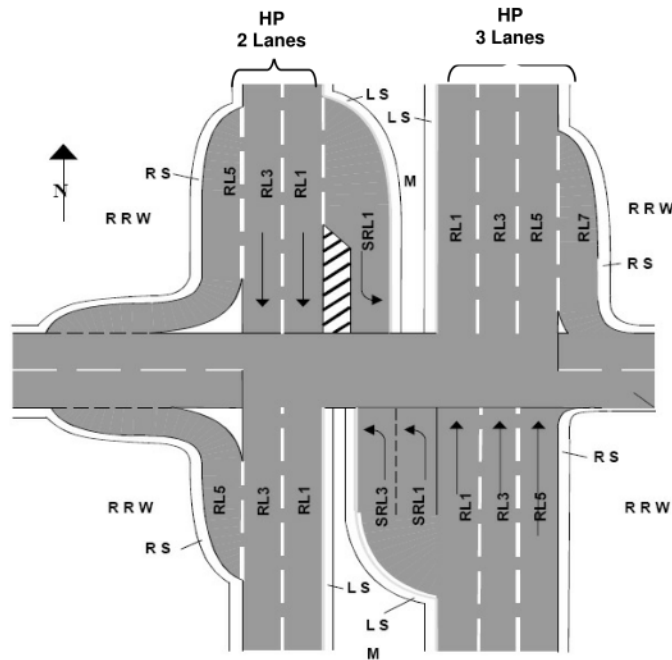


Figure 3 - XSP - Divided Highway

Note: This is a Divided Highway – the assumed road Centreline is the Left Shoulder marking, therefore there are no LL or SLL XSP values, only RL & SRL.

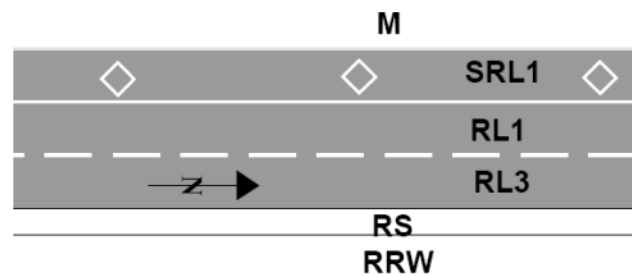


Figure 4 - XSP - Divided Highway with HOV or Bus Lane

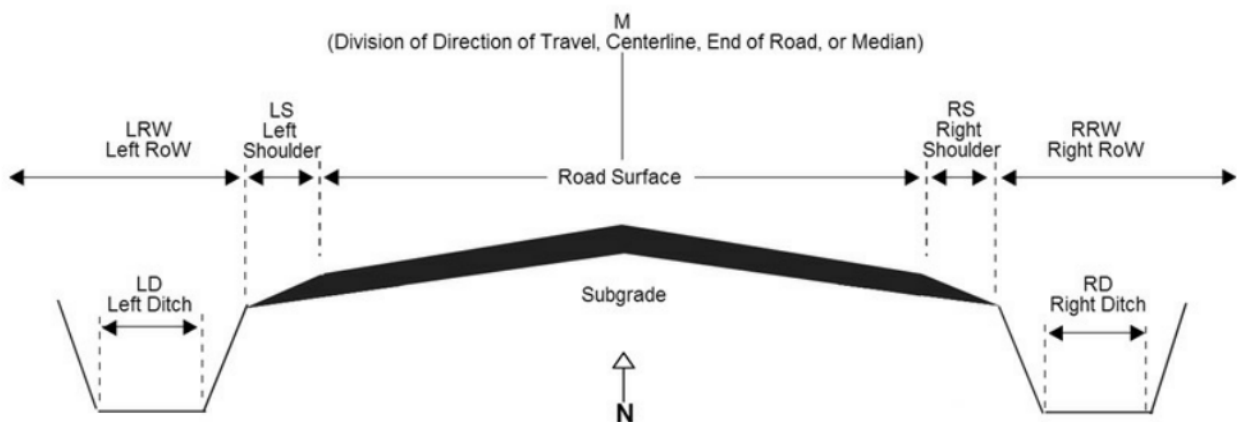


Figure 5 – Basic Road Cross Section

Note: Diagram indicating location for Inventory Items such as Sign, Guardrail, etc.

6. General Comments

All Attribute Fields:

All values entered into all attribute fields must be in Uppercase.

Description Field:

In the Inventory Items form, this field is an integral part of the 'off the shelf' application and cannot be removed from CHRIS. This field is Optional and does not need to be filled in for most Inventory Types.

Figure 6 - Inventory Items Form - Description Field

The Description field of the following Inventory Types will be automatically populated with values from their 'name' attributes when the Inventory Item is updated or when it is a new item.

- **APU** – the Description field will be automatically populated with the value of the Underpass Name attribute.
- **HRP** – the Description field will be automatically populated with the value of the Landmark Description attribute.
- **LA** – the Description field will be automatically populated with the value of the Landscape Area Name attribute.
- **MA** – the Description field will be automatically populated with the value of the Mowing Area Name attribute.
- **MFB** – the Description field will be automatically populated with the value of the Maintenance Facility Bldg Name attribute.
- **RA** – the Description field will be automatically populated with the value of the Rest Area Name attribute.
- **RF** – the Description field will be automatically populated with the value of the Roadside Facility Name attribute.

When a new Inventory Item (APU, HRP, LA, MA, MFB, RA or RF) from above is entered in through the CHRIS forms, a warning will come up after clicking the Save button. This is letting the user know that the trigger to update the Description field has been completed. Requery the Inventory Item using the Primary Key to ensure that the update has happened.

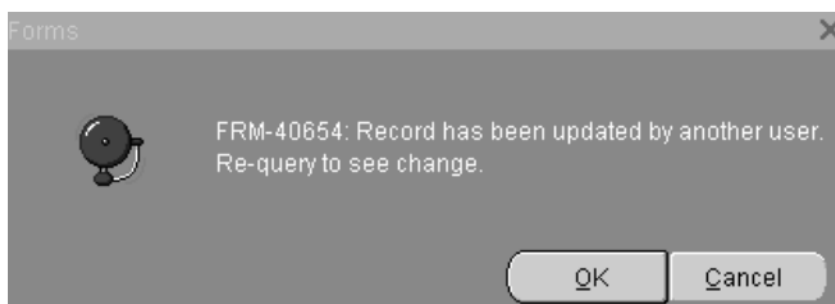


Figure 7 - Inventory Items Form – New Inventory Item Warning

Detailed XSP Field:

In the Inventory Items form, this field is an integral part of the 'off the shelf' application and cannot be removed from CHRIS. This field is Optional and does not need to be filled in.

Figure 8 - Inventory Items Form - Detailed XSP

Open Attribute Fields:

Do not use any punctuation in Attribute fields that are open to the user for input. The use of punctuation causes problems with the CSV reports. This would include fields such as:

- **APU** – Underpass Name
- **HRP** – Landmark Description
- **LA** – Landscape Area Name
- **MA** – Mowing Area Name
- **MFB** – Maintenance Facility Bldg Name
- **RA** – Rest Area Name
- **RF** – Roadside Facility Name

Note: This would also apply to the **Comments** field, which is an Attribute of most of the Inventory Types.

Date Attributes:

In all Inventory Types that require a date (e.g. Start Date, End Date, etc.), the format will always be **YYYY-MM-DD**. This will also include the dates for attributes of Inventory Items as well:

- APU, CG, CULV, GR, LSF, RW, SF & SIGN have Installation Date
- LPM & TPM have Date Painted and Date Last Painted, respectively
- SZBL, SZPR and SZIN have Date Established
- TME has Date Installed and Date Replaced
- RREG has Date Compiled and Date Last Revised
- RRKL has Date Established

The date format for Rest Areas does not include the year; it is only **MM-DD**.

- RA has Open Date and Close Date

Flag/Code Attributes:

In some Inventory Types a Flag Data Type is required to display the information pertaining to the Attribute (e.g. for a Storm Sewer, the Confined Space has a Flag Data Type of Yes or No).

- If the Attribute is Mandatory, the Flag Data Type values are Yes or No
 - CULV, DA, GL, HP, LA, MFB, SIGN and SS have Yes/No values
- If the Attribute is Optional, the Code Data Type values are Yes, No or Unknown
 - CG, CULV and MC have Yes/No/Unknown values

LOV/Code Table Values – Mandatory Attributes:

| Value | Meaning | Description |
|----------|---------|-------------|
| Y | Yes | |
| N | No | |

LOV/Code Table Values – Optional Attributes:

| Value | Meaning | Description |
|----------|---------|-------------|
| Y | Yes | |
| N | No | |
| U | Unknown | |

Exclusive:

In simple terms this means that items of the Inventory Type may only exist once for a given Network Location. If the 'XSP Allowed' flag is also selected and the Inventory Type can reside in Multiple XSP's, then exclusivity is applied within a given XSP (i.e. many Inventory Items of an exclusive Inventory Type may exist at the same linear offset but each must reside in a different XSP). However, Exclusivity may also be applied by virtue of the value of an 'Exclusive Flexible Attribute'. This means that many Items of an Exclusive Type may exist at the same linear offset within the same XSP, but the values of the 'Exclusive Flexible Attributes' must differ for each item. (e.g. an Inventory Type of SHOU – Shoulders are flagged as Exclusive, have an allowable XSP value and have an Exclusive attribute for Surface Type. This would mean that Shoulders could be located at the same Network Location but they must either have a different XSP value or a different Surface Type or both). The following Inventory Types are exclusive:

- CA – Contract Area (Security)
 - CACC – Controlled Access
 - DR – Dust Control Range
 - HP – Highway Profile
 - LSF – Linear Safety Feature
 - MC – Maintenance Class
- exclusive by XSP and/or LSF Type

- MS – Mowing Swath exclusive by XSP
- PINV – Provincial Inventory (Security)
- RREG – Road Register
- SHOU – Shoulder exclusive by XSP and/or Surface Type
- SL – Special Lane Profile exclusive by XSP
- SURF – Surface Type
- SZBL – Blanket Speed Zone exclusive by XSP
- SZPR – Primary Speed Zone exclusive by XSP
- SZIN – Intervening Speed Zone exclusive by XSP
- TI – Traffic Island exclusive by XSP
- UTVS – Uniform Traffic Volume Segment

Inventory Type Attributes for CSV Loaders:

All Values for the Inventory Type Attributes must be entered in Uppercase so that the CSV Loaders will work properly.

- Other Attributes required for filling in the CSV Loader file (**M**):
 - These Attributes are not part of the Inventory Type per se, but are required (mandatory) for the CSV loaders to work properly. They include Inventory Type Code, RFI Route Unique Identifier, Start Chainage, End Chainage, Admin Unit, Start Date and XSP (where applicable).
 - The XSP attribute is only applicable if the Inventory Type actually requires a Cross Sectional Position; if it does not, this attribute can be left blank.
- Mandatory Attributes are defined in each Inventory Type (**M**):
 - These Mandatory attributes must be completed with appropriate values as defined in this document (Inventory Type Details).
- Optional Attributes are defined in each Inventory Type (**O**):
 - These Optional attributes may be completed or populated, if known.
 - * The Optional **Comments** attribute may be needed for general info about a particular Inventory Item (e.g. SIGN: entering the actual Posted Speed of a R-004 sign – see Rules/Considerations).

7. Inventory Types

7.1. CULV (Culvert) – Corporate Mandatory

Inventory Type Description: A Culvert is a pipe (less than 3m in diameter) or half-round flume used to transport or drain water under or away from the road and/or Right of Way. Culverts that are greater than or equal to 3m in diameter are described in BMIS and stored in the MoT Road Structure Dataset. It is represented by a **Point** feature.

| Attribute | Data Type | Mandatory/Optional | Description/Comment |
|------------------------------|-----------|--------------------|---|
| Culvert Type | LOV | M | As per LOV |
| Culvert Diameter (mm) | Num | M | Min=100mm; Max=2999mm |
| Culvert Material | LOV | M | As per LOV |
| Confined Space | Flag | M | Yes/No (see Rules / Considerations for a definition of Confined Space) |
| Installation Date | Date | O | Date installed – format yyyy-mm-dd |
| Fish Sensitive | LOV | O | Yes/No/Unknown |
| Fish Passage Type | LOV | O | As per LOV |
| Grate | LOV | O | Yes/No/Unknown |
| Flap Grate | LOV | O | Yes/No/Unknown |
| Comments | Text | O | Enter Culvert, Material and/or Fish Passage Type if Other is chosen; See Rules |
| X_Coord | Num | O | Longitude is the geographic coordinate, in decimal degrees (-ddd.dddddd) – WGS84 as a reference datum |
| Y_Coord | Num | O | Latitude is the geographic coordinate, in decimal degrees (dd.dddddd) – WGS84 as a reference datum |

LOV/Code Table Values – **Culvert Type:**

| Value | Meaning | Description |
|----------|------------|--|
| D | Down Drain | Carries water over embankment |
| E | Entrance | The culvert carries water under an access or parallel to roadway |
| F | Flume | Half round culvert on surface – used to prevent slope erosion |
| H | Horizontal | The culvert relieves hydro-static pressure and can be located in retaining walls, rock faces and road beds in slip areas |
| N | Other | Culvert Type information to be entered in the Comments field |
| R | Roadway | The culvert crosses the Highway |
| Z | Unknown | Unknown at Data Conversion – must be redefined as another type |

LOV/Code Table Values – **Culvert Material:**

| Value | Meaning | Description |
|----------|----------------------------|---|
| B | Box | Concrete formed allows passage way for water, pedestrians or animals |
| C | Concrete | Pre-cast concrete culvert |
| G | Galvanized | Galvanized steel culvert |
| L | Plastic | PE (polyethylene) plastic drainage pipe |
| M | Multiplate | Galvanized steel plates either bolted or riveted together to form a culvert |
| N | Other | Culvert Material information to be entered in the Comments field |
| P | Galvanized Perforated Pipe | Perforated galvanized steel culvert |
| Q | Plastic Perforated Pipe | Perforated PE (polyethylene) plastic drainage pipe |
| W | Wood | Wood stave culvert |
| Z | Unknown | Unknown at Data Conversion – must be redefined as another type |

LOV Domain Culvert Material Type also used by:
Animal-Pedestrian Underpass & Storm Sewer

LOV/Code Table Values – **Fish Sensitive / Grate / Flap Grate:**

| Value | Meaning | Description |
|----------|---------|--|
| Y | Yes | |
| N | No | |
| Z | Unknown | Unknown at Data Conversion – must be redefined as another type |

LOV/Code Table Values – **Fish Passage Type:**

| Value | Meaning | Description |
|----------|-------------|--|
| A | Bottomless | Not a full round culvert |
| B | Baffle | Artificially constructed counter to slow water flow for fish passage |
| L | Fish Ladder | A special series of boxes to bring the level up for fish passage |
| N | Other | Fish Passage Type information to be entered in the Comments field |
| S | Skylight | Gratings in road to allow light into large culverts for fish migration |
| W | Weir | A dam to raise the water level or divert is flow |
| X | None | No Fish Passage Type |
| Z | Unknown | Unknown at Data Conversion – must be redefined as another type |

LOV/Code Table Values – **Valid XSPs:**

| XSP Code | Cross Sectional Position |
|-----------------|--|
| LD | Ditch – Left |
| LRW | Right of Way – Left |
| LS | Shoulder – Left |
| M | Division of Travel Direction/End of Road |
| RD | Ditch – Right |
| RRW | Right of Way – Right |
| RS | Shoulder – Right |
| X | All Lanes |
| Z | Unknown at Data Conversion – must be redefined as another type |

Rules / Considerations:

- All culverts less than 3.0 metres in width at their widest horizontal point (regardless of height) are to be inventoried. Culverts greater than 3.0 metres in width should be added to BMIS as a structure.
- Location information should be recorded at the end of the culvert on the right side of the Highway in the direction of highway travel.
- Fish sensitive culverts should attach the document related to specific maintenance requirements via document manager or make a note of document in the **Comments** field.
- Down drains that are associated with Catch Basins should not be inventoried as a Culvert. Down drains are usually paved aprons over an embankment that must be maintained to prevent erosion of the slope. Some down drains are a series of connected pipes and elbows used to carry water over the embankment in a closed system. Use the Flumes option if the down drain is constructed of half round flume.
- Entrance culverts provide for the movement of water parallel to the road, and are usually under the driveways of homes and businesses. These driveway entrance culverts must be inventoried; even though the landowner is supposed to maintain them (access permits say the owner is responsible, the maintenance standards say the maintenance contractor is responsible).
- Do not inventory the culverts under BC MoT side streets as entrance culverts on another highway. They are roadway culverts to be inventoried with the side street.
- Culverts that are skewed may have the degree of skew entered in the **Comments** field.
- Punchin culverts, log stringers covered with earth fill, are to be inventoried as wooden culverts if they are less than 3 metres in width. If they are greater than 3 metres they should be added to BMIS as a structure.
- Enter the inside diameter (measured in millimetres) of each culvert. For non-round culverts (box culverts, arches) enter the widest opening measurement in the Culvert Diameter field, and put both measurements in the **Comments** field.
- Culverts that cross two RFI Highways (e.g. a divided highway) should be picked up against each individual Highway as two separate records.
- Confined Space is defined as an area that is enclosed or partially enclosed, not designed for human occupancy, and large enough so the worker can enter. Confined Space has limited or restricted access or exit that could complicate first aid or the evacuation of an injured worker.

7.2. DA (Drainage Appliance) – Corporate Mandatory

Inventory Type Description: A Drainage Appliance is an apparatus (that has not been described as a culvert), or earth works that is designed to facilitate the movement of water in a controlled manner. Drainage Appliance includes some appliances/earth works that work in conjunction with culverts. It is represented by a **Point** feature.

| Attribute | Data Type | Mandatory/Optional | Description/Comment |
|--------------------------------|-----------|--------------------|---|
| Drainage Appliance Type | LOV | M | As per LOV |
| Appliance Count | Num | M | Number of appliances |
| Confined Space | Flag | M | Yes/No (see Rules / Considerations for a definition of Confined Space) |
| Comments | Text | O | Enter Drainage Appliance Type if Other is chosen; See Rules |
| X_Coord | Num | O | Longitude is the geographic coordinate, in decimal degrees (-ddd.dddddd) – WGS84 as a reference datum |
| Y_Coord | Num | O | Latitude is the geographic coordinate, in decimal degrees (dd.dddddd) – WGS84 as a reference datum |

LOV/Code Table Values – Drainage Appliance Type:

| Value | Meaning | Description |
|-----------|--------------------------|---|
| C | Catch Basins | A single catch basin with a standard grate |
| D | CB Double Grate | A single catch basin with one or two grates that are twice the area as a standard grate |
| DT | Debris Torrent Structure | Used to control water and reduce the risk of debris entering a culvert inlet - includes trash racks and debris basins |
| DW | Dry Well | A vertical culvert or other vertical drainage feature (e.g. French drain) |
| E | Engineered Wetland | A man made wetland used to control runoff from highway infrastructure |
| M | Manholes | Structures that permit a person to access a storm sewer system |
| MC | Manhole and Catch Basin | A single unit that is comprised of both a catch basin and a manhole |
| N | Other | Drainage Appliance Type information to be entered in the Comments field |
| S | Settlement Pond | A low area constructed in advance of a culvert inlet to allow material to settle out of the water |

LOV/Code Table Values – **Valid XSPs:**

| XSP Code | Cross Sectional Position |
|-----------------|--|
| LD | Ditch – Left |
| LL2 | 1 st Lane – Left |
| LL4 | 2 nd Lane – Left |
| LL6 | 3 rd Lane – Left |
| LL8 | 4 th Lane – Left |
| LL10 | 5 th Lane – Left |
| LRW | Right of Way – Left |
| LS | Shoulder – Left |
| M | Division of Travel Direction/End of Road |
| RD | Ditch - Right |
| RL1 | 1 st Lane – Right |
| RL3 | 2 nd Lane – Right |
| RL5 | 3 rd Lane – Right |
| RL7 | 4 th Lane – Right |
| RL9 | 5 th Lane – Right |
| RRW | Right of Way – Right |
| RS | Shoulder – Right |
| SLL2 | 1 st Inside Lane – Left |
| SLL4 | 2 nd Inside Lane – Left |
| SRL1 | 1 st Inside Lane – Right |
| SRL3 | 2 nd Inside Lane – Right |
| Z | Unknown at Data Conversion – must be redefined as another type |

Rules / Considerations:

- Manholes that provide access to utilities such as cable, electrical, phones, etc. should not be inventoried as a Drainage Appliance.
- Down drains that are connected to catch basins should not be inventoried as culverts. They should be noted in the **Comments** field with the catch basin if desired.
- Confirm maintenance responsibility before collecting catch basins and/or manholes on arterial section of highways where there is curb and gutter. These storm systems may be a municipal responsibility. If there is a storm sewer system for a non-curb and gutter arterial highway, it is likely ours to maintain. Check local knowledgeable persons before entering into the system.
- When entering more than one in the Appliance Count attribute, all values for Drainage Appliance Type, Confined Space and XSP must be the same.
- Confined Space is defined as an area that is enclosed or partially enclosed, not designed for human occupancy, and large enough so the worker can enter. Confined Space has limited or restricted access or exit that could complicate first aid or the evacuation of an injured worker.

7.3. GR (Guardrail) – Corporate Mandatory

Inventory Type Description: A Guardrail is a barrier fastened to the end of a bridge abutment, along the shoulder of a road or between travel lanes of opposing traffic. It is represented by a **Linear** feature.

| Attribute | Data Type | Mandatory/Optional | Description/Comment |
|--------------------------|-----------|--------------------|---|
| Guardrail Type | LOV | M | As per LOV |
| Installation Date | Date | O | Date installed at site – format yyyy-mm-dd |
| Comments | Text | O | Enter Guardrail Type if Other is chosen; See Rules |
| Start_X | Num | O | Start Longitude is the geographic coordinate, in decimal degrees (-ddd.dddddd) – WGS84 as a reference datum |
| Start_Y | Num | O | Start Latitude is the geographic coordinate, in decimal degrees (dd.dddddd) – WGS84 as a reference datum |
| End_X | Num | O | End Longitude is the geographic coordinate, in decimal degrees (-ddd.dddddd) – WGS84 as a reference datum |
| End_Y | Num | O | End Latitude is the geographic coordinate, in decimal degrees (dd.dddddd) – WGS84 as a reference datum |

LOV/Code Table Values – **Guardrail Type:**

| Value | Meaning | Description |
|----------|---------------------|--|
| A | 690mm NP Old Style | 27" Old Style concrete barrier – no lifting holes |
| B | 460mm NP Old Style | 18" Old Style concrete barrier – no lifting holes |
| C | 760mm NP Old Style | 30" Old Style concrete barrier – no lifting holes |
| D | Sub-Standard W-Beam | Metal rail on wood posts |
| E | Standard W-Beam | Standard W-Beam post mounted barrier - Metal rail on wood or metal posts |
| F | 690mm NP New Style | 27" New Style concrete barrier - with lifting holes |
| G | 810mm NP New Style | 32" New Style concrete barrier - with lifting holes |
| H | Cable Barrier | Steel Rope Tension Cable |
| N | Other | Guardrail Type information to be entered in the Comments field |

LOV/Code Table Values – **Valid XSPs:**

| XSP Code | Cross Sectional Position |
|------------|--|
| LRW | Right of Way – Left |
| LS | Shoulder – Left |
| M | Division of Travel Direction/End of Road |
| RRW | Right of Way – Right |
| RS | Shoulder – Right |
| Z | Unknown at Data Conversion – must be redefined as another type |

Rules / Considerations:

- Inventory a transition piece with the larger of the two barriers.
- The date of installation can be found in the Guard Rail Warrants Index Reports. If not noted, seek out someone who can make an educated guess.
- When old style of guardrail is replaced with new, use the new installation date and enter the date the original installation of old guardrail occurred in the **Comments** field.
- Include bull noses with the barrier.

Guardrail Types:

Figure 9 - XSP – A – 690mm (27") Old Style Concrete Barrier – no Lifting Holes

Note: Does not need transitions, bullnoses meet with standard pieces.



Figure 10 - XSP – B – 460mm (18") Old Style Concrete Barrier – no Lifting Holes

Note: Does not need transitions, bullnoses meet with standard pieces.



Figure 11 - XSP – C – 760mm (30") Old Style Concrete Barrier – no Lifting Holes

Note: Typically used on bridge approaches, needs custom transition from 760mm to 690mm. (Similar to 810mm New Style).



Figure 12 - XSP – D – Sub Standard W-Beam

Note: Metal railing on wood posts; typically used on Side Roads.



Figure 13 - XSP - E - Standard W-Beam

Note: Metal railing on wood or metal posts; typically used on Bridges.



Figure 14 - XSP – F – 690mm (27”) New Style Concrete Barrier – with Lifting Holes

Note: Has transition between bullnose and standard pieces.



Figure 15 - XSP – G – 810mm (32”) New Style Concrete Barrier – with Lifting Holes

Note: Typically used on bridge approaches, sometimes as median barrier. Has transition from 810mm to 690mm.



Figure 16 - XSP – H – Cable Barrier

Note: *Roadside/shoulder installation – often used in median for divided highways.*



Figure 17 - XSP – N – Other

Note: *An example would be “Thrie-Beam” as depicted in above picture.*

7.4. HP (Highway Profile) – Corporate Mandatory

Inventory Type Description: A Highway Profile defines the number of through travel lanes, including passing and truck lanes, and whether the road is divided or not. It is represented by a **Linear** feature.

| Attribute | Data Type | Mandatory/Optional | Description/Comment |
|----------------------|-----------|--------------------|---|
| Number of Lanes | Num | M | Number of Through Lanes, including passing or truck lanes |
| Divided Highway Flag | Flag | M | Yes/No (refer to Divided Highway Business Rules below) |
| Comments | Text | O | |
| Start_X | Num | O | Start Longitude is the geographic coordinate, in decimal degrees (-ddd.dddddd) – WGS84 as a reference datum |
| Start_Y | Num | O | Start Latitude is the geographic coordinate, in decimal degrees (dd.dddddd) – WGS84 as a reference datum |
| End_X | Num | O | End Longitude is the geographic coordinate, in decimal degrees (-ddd.dddddd) – WGS84 as a reference datum |
| End_Y | Num | O | End Latitude is the geographic coordinate, in decimal degrees (dd.dddddd) – WGS84 as a reference datum |

LOV/Code Table Values – **Valid XSPs:**

- No XSPs required

Rules / Considerations:

- This Inventory Type is **Exclusive**.
- The number of lanes should only be the **Through Lanes**, including **passing** or **truck lanes**.
- Other lanes, such as deceleration lanes, turn slots, slip bys, etc. should be entered as Inventory Type Special Lanes (SL).
- Where a road or portion of a road is not constructed, but the right of way has been entered into CHRIS, the number of lanes should equal 1 or 2.
- A one lane highway is any road that is open for public travel that has inadequate width for two 'normal' vehicles (cars, pick-ups) to pass at the normal driving speed. An occasional narrow spot would not change the overall road profile to one lane. It includes cleared right-of-way open to traffic without other improvements.
- Measure increase of lanes from start of taper. Measure decrease of lanes to end of taper.

Divided Highway:

- A divided highway has a median space equal to or greater than 1.8 metres in width between opposing lanes of traffic and is greater than 100 metres in length. It may be grade separated. The median will have at least one of: a median barrier, a grassed or similar vegetative area or a hard surface.
- Lane turn islands and traffic islands are not considered divided highway barriers.

Undivided Highway:

- A highway is not a divided highway if it is only divided by a traffic island, or similar extended areas of asphalt or concrete curbing. Traffic islands are often found in urban centres (such as lane separation islands at accesses to major shopping centres) and intersections as acceleration and deceleration taper guides.
- An undivided highway has less than 1.8 metres of median or no median barrier. It is not grade separated. It may have some areas of painted or built up traffic islands and raised curbing to define acceleration and deceleration tapers.

7.5. HRP (Highway Reference Point – RFI Landmark) – Corporate Mandatory

Inventory Type Description: A Highway Reference Point is a landmark that is a visibly recognizable feature used to describe and identify a point on the road. Landmarks from the legacy (Clarion) RFI have been loaded into CHRIS so that distance data is not lost. HRP Landmarks are used in order to provide reference points relating to Inventory Item data. It is represented by a **Point** feature.

| Attribute | Data Type | Mandatory/Optional | Description/Comment |
|-----------------------------|-----------|--------------------|---|
| Landmark Type | LOV | M | As per LOV |
| Landmark Number | Text | M | A number which uniquely identifies the landmark – the user can either enter a number into the field if they have some system to their numbering and if not, they are to enter in the Primary Key as the Landmark Number |
| Landmark Description | Text | M | A description of no more than 40 characters which assists in the location/identification of this landmark |
| X_Coord | Num | O | Longitude is the geographic coordinate, in decimal degrees (-ddd.dddddd) – WGS84 as a reference datum |
| Y_Coord | Num | O | Latitude is the geographic coordinate, in decimal degrees (dd.dddddd) – WGS84 as a reference datum |

LOV/Code Table Values – **Landmark Type:**

| Value | Meaning | Description |
|-----------|-------------------------|--|
| A | Intersection | The intersection of one or more highways |
| B | Bridge Abutment | The First abutment of a Bridge (Chainage Direction) |
| E | End of Maintenance | End of constructed RoW |
| ER | End RoW | End of non-constructed RoW |
| J | Jurisdictional Boundary | A boundary between Service Areas or at Municipal Boundaries |
| N | Other | Should be used sparingly. If used, the Landmark Description should include information about the Other type (e.g. if a Cattle Guard, use this in the description, if a creek, use the word creek in the description, etc.) |
| R | Railroad Crossing | Rail road tracks cross the highway |
| S | Start of Maintenance | Start of constructed RoW |
| SR | Start RoW | Start of non-constructed RoW |
| Z | Unknown | Unknown at Data Conversion – must be redefined as another type |

LOV/Code Table Values – **Valid XSPs:**

- No XSPs required

Rules / Considerations:

- The Description field in CHRIS will be automatically populated with the same data as in the Landmark Description attribute field.
- The existing HRP Landmark Numbers in CHRIS reflect legacy RFI Landmark data. As CHRIS does not auto-generate New HRP Landmark Numbers, the Inventory Item Primary Key should be assigned to ensure no duplication within Service Area. For initial data collection / entry, assign the number "1". Once the record has been located in CHRIS, the Landmark Number will be automatically modified to the Primary Key value in CHRIS. The exception to this would be where the Service Area HRPs were assigned by the DOT, not by CHRIS.
- Landmarks must be stationary and stable features that will be easily visible and identifiable from the Road, during daylight hours in all seasons, for at least 10 years.
- Landmarks must have an easily identifiable text description as well as a location.
- Landmarks should occur with a frequency of at least 2 to 5 Km in rural areas (where possible) and 1 to 2 Km in urban areas.
- In the case that a Landmark is at one end of a feature which has a length (such as a bridge) the feature description shall include a directional code indicating the position of that end in relation to the principle direction of highway travel.

Example: Tunnels on Highway 1 in the Fraser Canyon will have their ends designated as with 'W' or 'E' with the former being the one reached first when travelling in the principle direction. The actual physical layout of the feature in relation to cardinal map directions will be ignored. This will help eliminate confusion over the exact position of many landmarks. Scott's Hill is not a landmark, but the start of the rock bluffs on south side of Hwy on east approach to Scott's Hill may be acceptable in a remote area without many other landmarks.

All of the following can be landmarks:

- A
 - Roadway intersections (record centre of intersection)
- B
 - Bridges (record first encountered abutment in direction of highway)
- E or S
 - Start of Construction
 - End of Construction
- ER or SR
 - Start of RoW
 - End of RoW
- J
 - Service Area Boundaries
 - Area Manager Area Boundaries
 - Sub-Area Boundaries
 - District Lot Boundaries (for non-constructed RoW)
 - Municipal Boundaries
- N
 - Creek crossings (record the right side of culvert in direction of highway)
 - Cattle Guards (record the centre of the cattle guard)
- R
 - Railway crossings (record the centre of the crossing)

7.6. LSF (Linear Safety Feature) – Corporate Mandatory

Inventory Type Description: A Linear Safety Feature is one of a number of various appliances/appurtenances that have been installed or constructed either alongside or as an integral part of the road infrastructure to reduce the severity or potential of accidents. These items are represented by a Linear feature, versus the Inventory Item, Safety Feature which is represented by a Point feature. It is represented by a **Linear** feature.

| Attribute | Data Type | Mandatory/Optional | Description/Comment |
|--------------------------|-----------|--------------------|---|
| LSF Type | LOV | M | As per LOV |
| Material Type | LOV | M | As per LOV |
| Installation Date | Date | O | Date installed – format yyyy-mm-dd |
| Comments | Text | O | Enter LSF and/or Material Type if Undefined is chosen |
| Start_X | Num | O | Start Longitude is the geographic coordinate, in decimal degrees (-ddd.dddddd) – WGS84 as a reference datum |
| Start_Y | Num | O | Start Latitude is the geographic coordinate, in decimal degrees (dd.dddddd) – WGS84 as a reference datum |
| End_X | Num | O | End Longitude is the geographic coordinate, in decimal degrees (-ddd.dddddd) – WGS84 as a reference datum |
| End_Y | Num | O | End Latitude is the geographic coordinate, in decimal degrees (dd.dddddd) – WGS84 as a reference datum |

LOV/Code Table Values – LSF Type:

| Value | Meaning | Description |
|-----------|--------------|--|
| AB | Arrestor Bed | The portion of a truck escape ramp (runaway lane) designed to assist safe vehicle stopping |
| GS | Glare Screen | A screen placed above median barriers to reduce headlight glare between opposing traffic |
| RS | Rumble Strip | Milled or pressed rumble strips on shoulders, centrelines and traffic lanes |
| RL | Runaway Lane | A lane that is designed to assist safe vehicle exiting from the highway and stopping |
| UD | Undefined | |

LOV/Code Table Values – **Material Type:**

| Value | Meaning | Description |
|-----------|-----------------|--|
| CA | Clean Aggregate | Clean Aggregate |
| CN | Concrete | Concrete |
| FG | Fiber Glass | Fiber Glass |
| MS | Masonry | Rock, Brick or Ceramic Tiles held together by Mortar |
| PL | Plastic | Plastic or Polymer based |
| ST | Steel | Steel or Metal |
| TR | Timber/Wood | Timber or Wood |
| UD | Undefined | Mixture of mediums, a non-existent medium (e.g. for rumble strips) or a material not otherwise defined |
| Z | Unknown | Unknown at Data Conversion – must be redefined as another type |

LOV/Code Table Values – **Valid XSPs:**

| XSP Code | Cross Sectional Position |
|------------|--|
| LRW | Right of Way – Left |
| LS | Shoulder – Left |
| M | Division of Travel Direction/End of Road |
| RRW | Right of Way – Right |
| RS | Shoulder – Right |

Rules / Considerations:

- This Inventory Type is **Exclusive** by the XSP value and by the LSF Type.
- Rumble strips can be continuous through intersections, but should show breaks at curb and gutter, guardrail (where not in existence) and bridges with flares.

7.7. MC (Maintenance Class) – Corporate Mandatory

Inventory Type Description: Maintenance Class defines the Level of Service for maintenance of the road, normally, a function of the traffic usage type and traffic volume. It is represented by a **Linear** feature.

| Attribute | Data Type | Mandatory/Optional | Description/Comment |
|---------------------|-----------|--------------------|---|
| Summer Class Rating | LOV | M | Based on peak ADT |
| Winter Class Rating | LOV | M | Based on winter ADT and commuter, school bus and ski hill routes |
| School Bus Route | LOV | O | Yes/No/Unknown (Based on discussions with school district, school bus district) |
| Start_X | Num | O | Start Longitude is the geographic coordinate, in decimal degrees (-ddd.dddddd) – WGS84 as a reference datum |
| Start_Y | Num | O | Start Latitude is the geographic coordinate, in decimal degrees (dd.dddddd) – WGS84 as a reference datum |
| End_X | Num | O | End Longitude is the geographic coordinate, in decimal degrees (-ddd.dddddd) – WGS84 as a reference datum |
| End_Y | Num | O | End Latitude is the geographic coordinate, in decimal degrees (dd.dddddd) – WGS84 as a reference datum |

LOV/Code Table Values – **Summer Class Rating Type:**

| Value | Meaning | Description |
|-------|-----------------------|---|
| 1 | ADT >10,000 | Average Daily Traffic is an exclusive measure of traffic - ADT >10,000 is the average traffic count of Vehicles per day on a highway, high volume |
| 2 | ADT 5,000 to 10,000 | Average traffic count of Vehicles per day |
| 3 | ADT 1,000 to 5,000 | Average traffic count of Vehicles per day |
| 4 | ADT 500 to 1,000 | Average traffic count of Vehicles per day |
| 5 | ADT 100 to 500 | Average traffic count of Vehicles per day |
| 6 | ADT 10 to 100 | Average traffic count of Vehicles per day, based on 5 ADT per household, low volume |
| 7 | ADT 0 to 10 | Average traffic count of Vehicles per day, based on 5 ADT per household, low volume |
| 8 | No Summer Maintenance | Surface not maintained in the summer, but other attributes must be maintained for safety of the public and the existing infrastructure |

LOV/Code Table Values – **Winter Class Rating Type:**

| Value | Meaning | Description |
|----------|-----------------------|---|
| A | WADC >5,000 | High volume traffic (>5,000 Winter Average Daily Count) or commuter routes - Includes very high volume ski hill commuter routes |
| B | WADC 1,000 to 5,000 | All trunk and main routes (1,000 to 5,000 WADC) not included in A - Includes lower volume ski hill routes |
| C | SBR and TTR | All school bus routes and truck traffic routes (>25% industrial traffic) not included in A or B |
| D | Other Regular | All other regularly maintained winter routes |
| E | Other Irregular | All other irregularly maintained winter routes |
| F | No Winter Maintenance | Roads not maintained in winter or not open |

LOV/Code Table Values – **School Bus Route:**

| Value | Meaning | Description |
|----------|---------|--|
| Y | Yes | |
| N | No | |
| Z | Unknown | Unknown at Data Conversion – must be redefined as another type |

LOV/Code Table Values – **Valid XSPs:**

- No XSPs required

Rules / Considerations:

- This Inventory Type is **Exclusive**.
- Every Road must have both a summer and a winter classification. It is critical these are correctly established as the Maintenance Contract value is based on these classifications.
- For roads that are open to travel, the summer classification is based on the peak ADT (Average Daily Traffic count), with some consideration for the amount of industrial traffic on Class 6 and 7 roads. The designated classifications must be accurate and consistent.
- The amount of travel can be established by a variety of methods:
 - Summer Traffic Volumes, published by the Traffic Section
 - Actual field counts
 - Educated local guess (for most subdivision roads, a typical ADT is 5 trips per household (each house on the road generates five vehicle passes on the road, thus a street with 6 houses has an ADT of 30, and gets a Class 6 designation).

7.8. RA (Rest Area) – Corporate Mandatory

Inventory Type Description: A Rest Area is a developed Roadside area for the use of the traveling public which must contain a washroom, and often has litter receptacles, picnic tables and other facilities. It is represented by a **Point** feature.

| Attribute | Data Type | Mandatory/Optional | Description/Comment |
|-------------------------------------|-----------|--------------------|---|
| Rest Area Name | Text | M | Rest Area Name |
| Rest Area Number | Text | M | Unique number set by District - should always start with an "R" followed by a four digit number |
| Rest Area Class | LOV | M | As per LOV |
| Associated Numbered Route | LOV | M | As per LOV |
| Distance from Municipality | Text | M | Enter the distance in kilometres from the closest Municipality (e.g. 28.7km North of Victoria) |
| Number of Toilets | Num | M | Count item |
| Toilet Type | LOV | M | As per LOV |
| Wheelchair Access Toilet | Flag | M | Yes/No |
| EV Charging Station | Flag | M | Yes/No |
| Wi-Fi | Flag | M | Yes/No |
| Number of Tables | Num | O | Count item |
| Number of Standard Barrels | Num | O | Count item |
| Number of Bear Proof Barrels | Num | O | Count item |
| Power Type | LOV | M | As per LOV |
| Power Responsibility | LOV | M | As per LOV |
| Direction of Traffic | LOV | M | As per LOV |
| Access Restriction | LOV | M | As per LOV |
| Deceleration Lane | Flag | M | Yes/No |
| Acceleration Lane | Flag | M | Yes/No |
| Direct Access | Flag | M | Yes/No |
| Accom Commercial Trucks | LOV | M | Yes/No/Only (see Note under Rules/Considerations) |
| Open Year Round | Flag | M | Yes/No |
| Open Date | Date | O | Date of Spring opening – format mm-dd |
| Close Date | Date | O | Date of Autumn closing – format mm-dd |
| Comments | Text | O | Enter Toilet Type if Other is chosen; See Rules |
| X_Coord | Num | O | Longitude is the geographic coordinate, in decimal degrees (-ddd.dddddd) – WGS84 as a reference datum |
| Y_Coord | Num | O | Latitude is the geographic coordinate, in decimal degrees (dd.dddddd) – WGS84 as a reference datum |

LOV/Code Table Values – **Rest Area Maintenance Class Type:**

| Value | Meaning | Description |
|----------|-------------|--|
| A | RAM Class A | A major full service facility containing a large, permanent building with sinks, usually with 9 or more flush or composting toilets, power and illumination of pedestrian and/or parking facilities (these sites may also contain a tourist information facility operated by others) |
| B | RAM Class B | A moderate sized facility containing a permanent building, usually with 4 or more flush or composting toilets |
| C | RAM Class C | A small facility containing one or more one-person structures with pit or chemical toilet facilities |

LOV/Code Table Values – **Associated Numbered Route:**

| Value | Meaning | Description |
|----------|---------|--|
| # | Route # | The table contains 64 Numbered Routes |
| N | Other | If there is no Associated Numbered Route, enter the Road Name into the Distance from Municipality followed by the kilometre distance from the closest Municipality |

LOV/Code Table Values – **Toilet Type:**

| Value | Meaning | Description |
|-----------|----------|--|
| CH | Chemical | |
| CO | Compost | |
| F | Flush | |
| P | Pit | |
| N | Other | Toilet Type information to be entered in the Comments field |

LOV/Code Table Values – **Power Type:**

| Value | Meaning | Description |
|-----------|------------|-------------|
| B | Battery | |
| E | Electrical | |
| G | Generator | |
| S | Solar | |
| NP | No Power | |

LOV/Code Table Values – **Power Responsibility:**

| Value | Meaning | Description |
|-----------|----------------|--|
| C | Contractor | Contractor Type (Maintenance or Electrical) to be entered in the Comments field |
| P | Province | |
| NA | Not Applicable | |

LOV/Code Table Values – **Direction of Traffic:**

| Value | Meaning | Description |
|-----------|------------|-------------|
| NB | Northbound | |
| SB | Southbound | |
| EB | Eastbound | |
| WB | Westbound | |

LOV/Code Table Values – **Access Restriction:**

| Value | Meaning | Description |
|-----------|----------------|-------------|
| NB | Northbound | |
| SB | Southbound | |
| EB | Eastbound | |
| WB | Westbound | |
| NR | No Restriction | |

LOV/Code Table Values – **Accom Commercial Trucks:**

| Value | Meaning | Description |
|----------|---------|--|
| Y | Yes | Accommodates both Commercial Trucks and General Public |
| N | No | Accommodates General Public – no Commercial Trucks |
| O | Only | Accommodates Commercial Trucks ONLY |

LOV/Code Table Values – **Valid XSPs:**

| XSP Code | Cross Sectional Position |
|------------|--|
| LRW | Right of Way – Left |
| M | Division of Travel Direction/End of Road |
| RRW | Right of Way – Right |
| Z | Unknown at Data Conversion – must be redefined as another type |

Rules / Considerations:

- The Description field will be automatically populated with the value of the Rest Area Name attribute.
- The Rest Area Number should always start with an “R” and should be followed by a four digit number. This number must be assigned by the District Operations Tech and must be unique within a Service Area.
- Location information should be recorded at the centre of the first access to the site or at the beginning of the Rest Area in the direction of highway travel.
- **Toilets** - count the number of stalls in the facilities, not the number of buildings.
- **Wheelchair Access Toilets** - if at least one toilet has wheelchair access, enter a “Y”. You do not need to enter a number.
- **Bear Proof Barrel** – if there are two separate compartments, then the barrel count for this ‘barrel’ should be two.
- **Direction of Traffic** - indicate the direction the traffic is heading when approaching the Rest Area (i.e. the rest area would be on the passenger side of the vehicle).
- **Access Restriction** - specify which direction does NOT have access.

- **Direct Access** - a “Y” indicates the rest area is accessible directly from the Numbered Route (i.e. not down a frontage road or other side road).
- **Accom Commercial Trucks** – an Only (O) value is valid if the use of the Rest Area is **limited** to commercial or industrial (e.g. a Rest Area (toilet only) at an Inspection Station or Brake Check)
 - These Rest Areas generally have no tables or views, and may be considered too busy and noisy to be a resting area
 - There is high potential for conflict between pedestrian and uncontrolled traffic movement within these areas
- **Direct Access** - a “Y” indicates the rest area is accessible directly from the Numbered Route
- **Comments** field - please use this space to add any additional information you think is important

7.9. RW (Retaining Wall) – District Discretion

Inventory Type Description: A Retaining Wall is a structure designed to protect the road infrastructure by retaining materials on the fill side to prevent road bed slips and by retaining materials on the cut side to prevent the road surface being covered by debris. Retaining Walls that are greater than or equal to 2m in height are described in BMIS and stored in the MoT Road Structure dataset. It is represented by a **Linear** feature.

| Attribute | Data Type | Mandatory/Optional | Description/Comment |
|----------------------------|-----------|--------------------|---|
| Retaining Wall Type | LOV | M | As per LOV |
| Installation Date | Date | O | Date installed – format yyyy-mm-dd |
| Comments | Text | O | Enter Retaining Wall Type if Other is chosen |
| Start_X | Num | O | Start Longitude is the geographic coordinate, in decimal degrees (-ddd.dddddd) – WGS84 as a reference datum |
| Start_Y | Num | O | Start Latitude is the geographic coordinate, in decimal degrees (dd.dddddd) – WGS84 as a reference datum |
| End_X | Num | O | End Longitude is the geographic coordinate, in decimal degrees (-ddd.dddddd) – WGS84 as a reference datum |
| End_Y | Num | O | End Latitude is the geographic coordinate, in decimal degrees (dd.dddddd) – WGS84 as a reference datum |

LOV/Code Table Values – Retaining Wall Type:

| Value | Meaning | Description |
|----------|-----------------|--|
| A | Guardrail | Constructed from Guardrail |
| B | Bin Wall | Constructed from Bin Wall Metal |
| C | Poured Concrete | Constructed from formed concrete |
| G | Gabian Cage | Constructed from rock filled gabian cages |
| L | Lock Block | Constructed from Concrete Lock Blocks |
| N | Other | Retaining Wall Type information to be entered in the Comments field |
| S | Log Stringer | Constructed from Logs or other timber materials |
| Z | Unknown | Unknown at Data Conversion – must be redefined as another type |

LOV/Code Table Values – Valid XSPs:

| XSP Code | Cross Sectional Position |
|------------|--|
| LRW | Right of Way – Left |
| LS | Shoulder – Left |
| RRW | Right of Way – Right |
| RS | Shoulder – Right |
| Z | Unknown at Data Conversion – must be redefined as another type |

Rules / Considerations:

- If the retaining wall is not associated with a Bridge, but is greater than or equal to 2 metres in height, it should be recorded as a Bridge Structure Item.
- Retaining walls which constitute a part of a Bridge Structure (e.g. used for abutment support) should not be collected as an entity separate from BMIS.

7.10. SF (Safety Feature) – Corporate Mandatory

Inventory Type Description: A Safety Feature is one of a number of various appliances/appurtenances that have been installed or constructed either alongside or as an integral part of the road infrastructure to reduce the severity or potential of accidents. It is represented by a **Point** feature.

| Attribute | Data Type | Mandatory/Optional | Description/Comment |
|-----------------------------|-----------|--------------------|---|
| Safety Feature Type | LOV | M | As per LOV |
| Safety Feature Count | Num | M | Count |
| Installation Date | Date | O | Date installed – format yyyy-mm-dd |
| Comments | Text | O | Enter Safety Feature Type if Other is chosen |
| X_Coord | Num | O | Longitude is the geographic coordinate, in decimal degrees (-ddd.dddddd) – WGS84 as a reference datum |
| Y_Coord | Num | O | Latitude is the geographic coordinate, in decimal degrees (dd.dddddd) – WGS84 as a reference datum |

LOV/Code Table Values – **Safety Feature Type:**

| Value | Meaning | Description |
|-----------|-------------------|--|
| B | Barrels | Foam or soft filled Crash Barrels |
| N | Other | Safety Feature Type information to be entered in the Comments field |
| SB | Sand Barrel Crash | Sand filled Crash Barrels |
| SL | Sliding | Rail mounted Crash Attenuator |
| ST | Styrofoam Block | Styrofoam block Crash Attenuator |
| Z | Unknown | Unknown at Data Conversion – must be redefined as another type |

LOV/Code Table Values – **Valid XSPs:**

| XSP Code | Cross Sectional Position |
|-----------|--|
| LS | Shoulder – Left |
| M | Division of Travel Direction/End of Road |
| RS | Shoulder – Right |
| Z | Unknown at Data Conversion – must be redefined as another type |

Rules / Considerations:

- Inventory each site, not the number of components. If on both sides of a center pier of an overhead structure, you would count this as two sites, one on each side, one for each direction of travel.
- The Safety Feature Count represents the number of components within each site.

7.11. SIGN (Sign) – Corporate Mandatory

Inventory Type Description: A Sign is a lettered board, message or other display which includes all regulatory, warning, guide, informational, advisory, construction and maintenance and route markers, but excluding electronically controlled messages/displays. It is represented by a **Point** feature.

| Attribute | Data Type | Mandatory/Optional | Description/Comment |
|----------------------|-----------|--------------------|---|
| Catalog Number | LOV | M | As per LOV which contains the Ministry standard signs |
| Direction Facing | LOV | M | The cardinal direction, relative to the predominant direction of the highway, that the outward face of the sign points toward |
| Sign Post Type | LOV | M | As per LOV |
| Number of Posts | Num | M | |
| Large Sign Flag | Flag | M | Yes/No; Yes-greater than 3.2m ² |
| District Sign Number | Text | O | The unique number that identifies this sign in the District |
| Installation Date | Date | O | Date installed – format yyyy-mm-dd |
| Comments | Text | O | Non generic sign information; Enter Sign Post Type if Other is chosen; See Rules |
| X_Coord | Num | O | Longitude is the geographic coordinate, in decimal degrees (-ddd.dddddd) – WGS84 as a reference datum |
| Y_Coord | Num | O | Latitude is the geographic coordinate, in decimal degrees (dd.dddddd) – WGS84 as a reference datum |

LOV/Code Table Values – **Catalog Number**

- See the Sign Catalog

LOV/Code Table Values – **Direction Facing Type:**

| Value | Meaning | Description |
|-------|---------|--|
| E | East | Facing East, relative to the predominant direction the road, for west bound traffic |
| N | North | Facing North, relative to the predominant direction of the road, for south bound traffic |
| S | South | Facing South, relative to the predominant direction of the road, for north bound traffic |
| W | West | Facing West, relative to the predominant direction of the road, for east bound traffic |
| Z | Unknown | Unknown at Data Conversion – must be redefined as another type |

LOV/Code Table Values – **Sign Post Type:**

| Value | Meaning | Description |
|-----------|-------------------|---|
| B | Bridge | Bridge Structure including Overpasses and Sign Bridges and end posts |
| G | Gate | Installed on a gate |
| I | Illuminaire/Davit | Light Standard or Davit |
| M | Metal | Metal U-channel type post |
| N | No Post | Used for multiple sign faces on one structure/support or for signs attached to poles, rockwalls, etc. |
| P | Plastic | Plastic or Polypost |
| RS | Round Steel | Round Steel post |
| RW | Retaining Wall | Installed on a retaining wall |
| SB | Steel Beam | Break away steel beam |
| T | Telspar | Metal telescopic style post |
| W | Wood | Wood Post |
| X | Other | Sign Post Type information to be entered in the Comments field |
| Z | Unknown | Unknown at Data Conversion – must be redefined as another type |

LOV/Code Table Values – **Valid XSPs:**

| XSP Code | Cross Sectional Position |
|------------|--|
| LD | Ditch – Left |
| LRW | Right of Way – Left |
| LS | Shoulder – Left |
| M | Division of Travel Direction/End of Road |
| O | Overhead |
| RD | Ditch - Right |
| RRW | Right of Way – Right |
| RS | Shoulder – Right |
| Z | Unknown at Data Conversion – must be redefined as another type |

Rules / Considerations:

- All permanent or semi-permanent and seasonal Highway signs maintained by the Ministry must be inventoried.
- On Arterial Highways, the Ministry must maintain any Regulatory, Warning, Route, and Directional signs. The city maintains the parking and street name signs.
- Do not inventory Construction signs, Construction Project signs or signs being maintained by Construction crews.
- Do not inventory permitted signs unless the Ministry has agreed to maintain the entrance, exit, and regulatory signing at a private entrance. Check the applicable access permits for the details. Inventory these signs only if they are the Ministry's responsibility.
- Truck Crossing, Truck Turning signs, Stop signs, and any temporary (covered or removed when hauling is not happening) on the highway for industrial accesses are the usually the responsibility of the holder of the permit to maintain. Year round Truck crossing and Truck Turning signs may be a maintenance responsibility of the Ministry. Check the industrial access permit for details. Inventory these signs only if they are the Ministry's responsibility.

- The direction facing should be relative to the highway direction. (e.g. If the sign is facing east bound traffic on highway one, then the sign is facing West, even if the compass direction is “North” for that portion of highway).
- If there are many signs on one post, then only one sign record is assigned a post count. All other sign records except the one, must be given a value of zero posts. All sign records for that one post may be given the same post type (e.g. telspar).
- Locate road name signs at an intersection against only one road.

Example: A Stop sign with ‘Smith’ road name sign and ‘Main’ road name sign (one post) is located on Smith Road at its intersection with Main Road.

- a) Where do you locate the R-001 Stop sign & post?
- b) Where do you locate the G-007 for Smith Road?
- c) Where do you locate the G-007 for Main Road?

Procedure: All signs and post are located against Smith Road.

- Only give standards/davits a count if they do not have any electrical attachments.
 - If the Sign Post Type (I-Illuminaire/Davit) has electricity, then under the Number of Posts, the count would be 0 (zero). If the Sign Post Type (I-Illuminaire/Davit) does not have electricity, then under the Number of Posts, the count would be 1.
- Do not give bridge end posts a count, they are a part of the bridge.
- Catalog Numbers should be generic, (e.g. G-007-1 is sufficient for a street name and doesn’t need to be further defined by size).
- When choosing the Catalog number for Parking, Speed or Distance related signs, enter the appropriate non-generic information in the **Comments** field. For example:
 - P series – where applicable enter the **arrow direction** in the **Comments** field
 - R-003 & R-004 – enter the **speed** in the **Comments** field
 - W-022 to W-025 – enter the **speed/distance** in the **Comments** field
- Where there is a unique District Sign Number assigned to a sign, the following should be put in the Catalog Number field:
 - PB for Parks Branch
 - SA for Service and Attraction
 - G-001 to G-006 for Guide Signs
 - LR for Local Radio Signs
- Catalog numbers with "DO NOT USE" in the description/number are signs that are being phased out through attrition. Ensure that the sign in the field is the old version before accepting this catalog number.
- Large Signs are those signs that are over 3.2m².
- Non generic sign information should be added to the **Comments** field.

Example: Overhead clearance sign W-018 would require a height “9.9m” to be added to the **Comments** field. This allows other business units who require specific information to query CHRIS directly without involving the Districts for data requests.
- If **W-055 series** are being used to delineate/show alignment of curve or merging lanes or barriers and there are several/many of them, add them as “REFL” and in the attributes, indicate the product being used in the **Comments** field:

Example: REFL Type = Roadway Square, RS
 Installation = PostColour = White, White & Yellow, Yellow
 Spacing = # m apart
 Comments = “W-055-1 or -2” (or if you not using the W-055 series, then the “Product code”, or description “Button” - put the type of product you used in this field)
- If **W-055 series** are being used to delineate (mark/indicate) an Electrical Junction, Traffic Counter, Street Lamp, Drainage Appliance, Start of Curbing, etc. (usually only 1 or 2 being used and they are not lineal in nature) then they should be added as a “SIGN”.
- If the Catalog Number for the MoT owned Sign does not exist in CHRIS, then use **N-000-Other** and enter the information regarding the design of the Sign in the **Comments** field. Also, take a picture of the sign for follow-up.

7.12. SL (Special Lane Profile) – Corporate Mandatory

Inventory Type Description: A Special Lane Profile defines the number of special lanes that are not defined as through travel lanes, passing lanes or truck lanes which are described in the Highway Profile dataset. It is represented by a **Linear** feature.

| Attribute | Data Type | Mandatory/Optional | Description/Comment |
|--------------------------|-----------|--------------------|---|
| Special Lane Type | LOV | M | As per LOV - based on purpose of lane |
| Number of Lanes | Num | M | |
| Comments | Text | O | Enter Special Lane Type if Other is chosen |
| Start_X | Num | O | Start Longitude is the geographic coordinate, in decimal degrees (-ddd.dddddd) – WGS84 as a reference datum |
| Start_Y | Num | O | Start Latitude is the geographic coordinate, in decimal degrees (dd.dddddd) – WGS84 as a reference datum |
| End_X | Num | O | End Longitude is the geographic coordinate, in decimal degrees (-ddd.dddddd) – WGS84 as a reference datum |
| End_Y | Num | O | End Latitude is the geographic coordinate, in decimal degrees (dd.dddddd) – WGS84 as a reference datum |

LOV/Code Table Values – **Special Lane Type:**

| Value | Meaning | Description |
|----------|------------------------|---|
| A | Acceleration Lane | A lane that provides the opportunity to accelerate and merge with traffic after entering the highway; no yield sign |
| B | Bus Bay | |
| D | Deceleration Lane | A lane that provides the opportunity to reduce speed prior to exiting the highway |
| H | HOV or Bus Lane | A lane for exclusive use of Buses, HOV vehicles (may include motorcycles) |
| N | Other | Includes Slip-bys (Special Lane Type information to be entered in the Comments field) |
| R | Right Turn Channel | A short lane for vehicles that are exiting or entering a highway; it is controlled by a yield sign; it is at a level intersection; it does not include an acceleration or deceleration lane |
| S | Two Way Left Turn Lane | A centre lane that is used to store left turning traffic from opposing directions |
| T | Left Turn Lane | A lane that is used to store left turning traffic from a single direction |
| Z | Unknown | Unknown at Data Conversion – must be redefined as another type |

LOV/Code Table Values – **Valid XSPs:**

| XSP Code | Cross Sectional Position |
|-----------------|--|
| LL2 | 1 st Lane – Left |
| LL4 | 2 nd Lane – Left |
| LL6 | 3 rd Lane – Left |
| LL8 | 4 th Lane – Left |
| LL10 | 5 th Lane – Left |
| RL1 | 1 st Lane – Right |
| RL3 | 2 nd Lane – Right |
| RL5 | 3 rd Lane – Right |
| RL7 | 4 th Lane – Right |
| RL9 | 5 th Lane – Right |
| SLL2 | 1 st Inside Lane – Left |
| SLL4 | 2 nd Inside Lane – Left |
| SRL1 | 1 st Inside Lane – Right |
| SRL3 | 2 nd Inside Lane – Right |
| Z | Unknown at Data Conversion – must be redefined as another type |

Rules / Considerations:

- This Inventory Type is **Exclusive** by the XSP value.
- The number of lanes should not include “Through Lanes” nor passing or truck lanes. These are inventoried as Highway Profile.
- Other lanes, such as deceleration lanes, turn lanes, slip-bys, etc. should be entered as inventory item type Special Lanes (SL).
- Level Intersections:
 - The difference between a Special Lane Profile ‘Right Turn Channel’ and a Ramp you find on an Interchange is that they are Level, Short and Controlled with a yield sign
 - Ramps at Interchanges are added as their own road and typically not controlled by a yield sign

7.13. SS (Storm Sewer) – Corporate Mandatory

Inventory Type Description: A Storm Sewer is an enclosed system of pipes or drains that divert water away from the road and/or Right of Way. It also includes culverts that run under enclosed ditches. It is represented by a **Linear** feature.

| Attribute | Data Type | Mandatory/Optional | Description/Comment |
|-----------------------------|-----------|--------------------|---|
| Storm Sewer Diameter | Num | M | Diameter in millimetres |
| Storm Sewer Material | LOV | M | As per LOV |
| Confined Space | Flag | M | Yes/No (see Rules / Considerations for a definition of Confined Space) |
| Comments | Text | O | Enter Storm Sewer Material Type if Other is chosen |
| Start_X | Num | O | Start Longitude is the geographic coordinate, in decimal degrees (-ddd.dddddd) – WGS84 as a reference datum |
| Start_Y | Num | O | Start Latitude is the geographic coordinate, in decimal degrees (dd.dddddd) – WGS84 as a reference datum |
| End_X | Num | O | End Longitude is the geographic coordinate, in decimal degrees (-ddd.dddddd) – WGS84 as a reference datum |
| End_Y | Num | O | End Latitude is the geographic coordinate, in decimal degrees (dd.dddddd) – WGS84 as a reference datum |

LOV/Code Table Values – Storm Sewer Material:

| Value | Meaning | Description |
|----------|----------------------------|---|
| B | Box | Concrete formed allows passage way for water |
| C | Concrete | Pre-cast concrete culvert |
| G | Galvanized | Galvanized steel culvert |
| L | Plastic | PE (polyethylene) plastic drainage pipe |
| M | Multiplate | Galvanized steel plates either bolted or riveted together to form a culvert |
| N | Other | Storm Sewer Material information to be entered in the Comments field |
| P | Galvanized Perforated Pipe | Perforated galvanized steel culvert |
| Q | Plastic Perforated Pipe | Perforated PE (polyethylene) plastic drainage pipe |
| W | Wood | Wood stave culvert |
| Z | Unknown | Unknown at Data Conversion – must be redefined as another type |

LOV Domain Culvert Material Type also used by:
Animal-Pedestrian Underpass & Culvert

LOV/Code Table Values – **Valid XSPs:**

| XSP Code | Cross Sectional Position |
|-----------------|--|
| LD | Ditch – Left |
| LL2 | 1 st Lane – Left |
| LL4 | 2 nd Lane – Left |
| LL6 | 3 rd Lane – Left |
| LL8 | 4 th Lane – Left |
| LL10 | 5 th Lane – Left |
| LRW | Right of Way – Left |
| LS | Shoulder – Left |
| M | Division of Travel Direction/End of Road |
| RD | Ditch - Right |
| RL1 | 1 st Lane – Right |
| RL3 | 2 nd Lane – Right |
| RL5 | 3 rd Lane – Right |
| RL7 | 4 th Lane – Right |
| RL9 | 5 th Lane – Right |
| RRW | Right of Way – Right |
| RS | Shoulder – Right |
| SLL2 | 1 st Inside Lane – Left |
| SLL4 | 2 nd Inside Lane – Left |
| SRL1 | 1 st Inside Lane – Right |
| SRL3 | 2 nd Inside Lane – Right |

Rules / Considerations:

- Do not inventory if the Storm Sewer is maintained by others.
- Confined Space is defined as an area that is enclosed or partially enclosed, not designed for human occupancy, and large enough so the worker can enter. Confined Space has limited or restricted access or exit that could complicate first aid or the evacuation of an injured worker.

7.14. SURF (Surface Type) – Corporate Mandatory

Inventory Type Description: Surface Type describes the type of surface of the road. It is represented by a **Linear** feature.

| Attribute | Data Type | Mandatory/Optional | Description/Comment |
|-----------------------------|-----------|--------------------|---|
| Surface Type | LOV | M | As per LOV |
| Year Paved | Num | O | Include year surfaced, if known |
| Year Hot-in-Place | Num | O | Include year surfaced, if known |
| Year Surface Treated | Num | O | Include year surfaced, if known |
| Year Micro-Surfaced | Num | O | Include year surfaced, if known |
| Year Quiet-Surfaced | Num | O | Include year surfaced, if known |
| Comments | Text | O | |
| Start_X | Num | O | Start Longitude is the geographic coordinate, in decimal degrees (-ddd.dddddd) – WGS84 as a reference datum |
| Start_Y | Num | O | Start Latitude is the geographic coordinate, in decimal degrees (dd.dddddd) – WGS84 as a reference datum |
| End_X | Num | O | End Longitude is the geographic coordinate, in decimal degrees (-ddd.dddddd) – WGS84 as a reference datum |
| End_Y | Num | O | End Latitude is the geographic coordinate, in decimal degrees (dd.dddddd) – WGS84 as a reference datum |

LOV/Code Table Values – **Surface Type:**

| Value | Meaning | Description |
|----------|-----------------|---|
| 1 | Hot Mix | Hot mix, machine laid pavement - includes hot-in-place asphalt recycling |
| 2 | Cold Mix | Cold mix surface |
| 3 | Concrete | Concrete surface |
| 4 | Surface Treated | Seal coat, chip seal or asphalt grindings surface (rap) - applies to surface treatments applied to gravel roads |
| 5 | Gravel | Gravel roads - pit run or crushed gravel surface |
| 6 | Dirt | Road surface is native material |
| 7 | Other | Surface Type information to be entered in the Comments field |
| E | Cleared | No grade construction, Right-of-Way has been cleared, but road grade has not been constructed |
| F | Uncleared | An area of Right-of-Way only, no clearing |
| Z | Unknown | Unknown at Data Conversion – must be redefined as another type |

LOV Domain Surface Material Type also used by:
Shoulder

LOV/Code Table Values – **Valid XSPs:**

- No XSPs required

Rules / Considerations:

- This Inventory Type is **Exclusive**.
- If the original Surface Type is Type 1, 2 or 3 and is Surface Treated at a later date, the surface type remains as 1, 2 or 3, but the Year Treated indicates an 'updated' surface treatment.
- Pavement dates must be noted as accurately as the information available will allow. For major highways, the Region Paving Branch may have good information.
- When reviewing paved surface, and encountering overlay/replacement (maintenance) type patches, don't change the Pavement year.
- Do not change the Surface Type due to Bridge Deck Type - keep the Surface continuous.
- A **Surface Treated** road is any formerly gravel road that has never been hot mix, cold mix, or concrete paved, but has had a chip, or graded aggregate seal coat wearing surface applied. Roads surfaced with asphalt millings will also be coded as Surface Treated. Do not include roads stabilized with dust palliatives such as Calcium Chloride, Magnesium Chloride, Lignosulphonates, or Enzyme based products.
- A **Micro-Surfaced** road works on a similar principle to Seal Coating (using emulsified asphalt), but the application method is completely different and it is more costly. It is basically an emulsified asphalt with the aggregate mixed directly with the asphalt and laid directly onto the road surface by a special machine at a specified thickness. It takes less than an hour to set up before traffic can drive on it.
- A **Quiet-Surfaced** road is a special asphalt blend that is used to reduce travel noise. Usually using smaller aggregates and usually used in slower speed urban areas.
- A **Gravel** road is any road surface where good granular material has been applied in the past. The material need not be evident now. Good granular material could be crushed granular surfacing aggregate, a crushed granular base course, or material meeting the select granular sub-base (SGSB) specification (i.e. a fragmented material coarser than sand, soft shale, etc.)
- A **Dirt** road is any road surface of native materials that is not clean and granular.
- For Gravel and Dirt roads, do not include the intersecting highway surface type, unless there is a hard surfaced apron on the side road of 10 metres or more:



Figure 18 – Road with No Apron

Note: Gravel road intersects Hard Surfaced road (**no apron**) – Surface is all Gravel.



Figure 19 – Road with Apron

Note: Gravel road intersects Hard Surfaced road (with apron) – Surface is Paved from centerline to end of pavement, then Gravel.

8. Inventory Items – Handled by Bridge Engineering - BMIS

8.1. BSR (Bridge Structure Road)

Inventory Type Description: Bridge Structure Road displays the roads that the Structures are found on. Structures on the road that are maintained by MoT and, about which information is recorded in BMIS. Road Structures include Bridges, Culverts (greater than or equal to 3m diameter), Marine, Retaining Walls (perpendicular height greater than or equal to 2m), Sign Bridges and Tunnels (includes Snowsheds). It is represented by a **Linear** feature.

Note: This inventory item type is updated by BMIS - all associated information is to be added and edited in BMIS.

| Attribute | Data Type | Mandatory/Optional | Description/Comment |
|-------------------------------------|-----------|--------------------|---|
| Structure Road ID | Text | M | BMIS Structure Road ID as recorded in BMIS |
| Structure No | Text | M | BMIS Structure Number in the form nnnnA (the Alpha character is optional) |
| Structure Name | Text | M | Structure Name as recorded in BMIS. |
| Structure Type | LOV | M | Structure Type will be as per BMIS LOV below. |
| Structure Status Code | Text | M | Structure Status Type Code as defined in BMIS |
| Structure Status Description | Text | M | The Description is a textual description of the Structure Status Type Code as defined in BMIS |

LOV/Code Table Values – **Structure Type:**

| Value | Meaning | Description |
|----------------|----------------|---|
| BRIDGE | Bridge | A structure that exists to traverse a natural or other hazard or another road; also including Ungulate Guards ≥ 3.0 metres in length |
| CULVERT | Culvert | Culverts with a diameter ≥ 3.0 metres |
| MARINE | Marine | A Structure that provides a means of transit from land to ferry |
| RWALL | Retaining Wall | A structure that retains rocks or earth and is ≥ 2 metres in height |
| SIGN | Sign Bridge | A structure that exists solely to support large signs |
| TUNNEL | Tunnel | Includes Snow sheds |

LOV/Code Table Values – **Valid XSPs:**

| XSP Code | Cross Sectional Position |
|-----------|--|
| AL | Above Left (the Structure is Above the Road – Walls) |
| AR | Above Right (the Structure is Above the Road – Walls) |
| BL | Below Left (the Structure is Below the Road – Walls) |
| BR | Below Right (the Structure is Below the Road – Walls) |
| BB | Below Both (the Structure is Below the Road on Both Sides – Walls) |
| AZ | Above Unknown (the Structure is Above the Road – Walls) |
| BZ | Below Unknown (the Structure is Below the Road – Walls) |
| O | Over (the Structure is Over the Road) |
| U | Under (the Structure is Under the Road – Bridge going over another bridge) |

| XSP Code | Cross Sectional Position |
|----------|---|
| X | All Lanes (the Structure is on the Road – across all lanes) |
| Z | Unknown |

Rules / Considerations:

- The structure must be added and located in BMIS before it can be viewed in CHRIS.
- Location must be recorded against an RFI highway, with the start at the first abutment and the end at the second abutment in the direction of highway travel. Location offsets may be referenced as a distance from an HRP in the direction of highway travel.
- Only those structures in BMIS with a status “**Open and in Use**” will be viewed in CHRIS.
- Bridges/Structures on notional Highways should be added to CHRIS via BMIS, once the Notional Highway has been added.
- Ungulate Guards identified as a sub-type of a bridge structure are a protection device over 3m in length, in fact, all existing ungulate guards are exactly 5m in length. The extra length is needed to prevent wild ungulates (e.g. sheep, deer, moose) from jumping across the guard.

Translation Table – **XSPs**:

| XSP Value | | Bridge | Culvert | Tunnel | Sign | Retaining Wall |
|-----------|---------------|--------|---------|---------|-------|----------------|
| X | All Lanes | On | n/a | Through | n/a | n/a |
| O | Over | Under | n/a | n/a | Under | n/a |
| U | Under | Over | Over | Over | n/a | n/a |
| AL | Above Left | n/a | n/a | n/a | n/a | Below-R |
| AR | Above Right | n/a | n/a | n/a | n/a | Below-L |
| BL | Below Left | n/a | n/a | n/a | n/a | Above-R |
| BR | Below Right | n/a | n/a | n/a | n/a | Above-L |
| BB | Below Both | n/a | n/a | n/a | n/a | Above-B |
| AZ | Above Unknown | n/a | n/a | n/a | n/a | Below-Z |
| BZ | Below Unknown | n/a | n/a | n/a | n/a | Above-Z |
| Z | Unknown | n/a | n/a | n/a | n/a | n/a |

Translation Table – **Proximity**:

| Proximity | | Bridge | Culvert | Tunnel | Sign | Retaining Wall |
|----------------|---------------|--------|---------|--------|------|----------------|
| | On | X | n/a | n/a | n/a | n/a |
| | Over | U | U | U | n/a | n/a |
| | Under | O | n/a | n/a | O | n/a |
| | Through | n/a | n/a | X | n/a | n/a |
| Above-L | Above Left | n/a | n/a | n/a | n/a | BR |
| Above-R | Above Right | n/a | n/a | n/a | n/a | BL |
| Above-B | Above Both | n/a | n/a | n/a | n/a | BB |
| Below-L | Below Left | n/a | n/a | n/a | n/a | AR |
| Below-R | Below Right | n/a | n/a | n/a | n/a | AL |
| Above-Z | Above Unknown | n/a | n/a | n/a | n/a | BZ |
| Below-Z | Below Unknown | n/a | n/a | n/a | n/a | AZ |

Structure Status Code & Description:

| Structure Status Code | Structure Status Description |
|-----------------------|--|
| A | In Design |
| C | Under Construction |
| F | Open/In Use |
| G | Closed |
| I | Replaced |
| J | Bridge Replaced by Culvert |
| K | No Longer Exists |
| L | Transferred |
| M | Marine Structures – in Bridge Format prior to 2011 |

| Structure Status Code | Structure Status Description |
|-----------------------|------------------------------|
| U | Other |
| UCV | Undefined at Conversion |
| V | Not Applicable/None |
| W | Unknown |
| X | Drawings Only |
| Y | Correspondence Only |
| Z | To be Deleted from BMIS |

Structure Type and Sub Function Code & Description:

| Structure Type | Sub Function Code | Structure Status Description |
|----------------|-------------------|------------------------------|
| Bridge | A | Road Bridge |
| Bridge | B | Foot Bridge |
| Bridge | C | Overpass |
| Bridge | D | Underpass |
| Bridge | E | Flyover |
| Bridge | F | Overhead |
| Bridge | G | Rail Underpass |
| Bridge | H | Pedestrian Overpass |
| Bridge | O | Boardwalk |
| Bridge | P | Miscellaneous Structure |
| Bridge | S | Ungulate Guard |
| Culvert | M | Culvert |
| Culvert | P | Misc Structures |
| Marine | T | Reaction Ferry Dock |
| Marine | U | Aerial Ferry Dock |
| Marine | V | Cable Ferry Dock |
| Marine | W | Free Run Ferry Dock |
| Marine | X | Reaction Vessel |
| Rwall | P | Misc Structures |
| Rwall | R | Retaining Wall |
| Sign | N | Sign Structure |
| Tunnel | I | Road Tunnel |
| Tunnel | J | Other Tunnel |
| Tunnel | K | Rail Tunnel |
| Tunnel | L | Snowshed |

9. Inventory Items – Handled by Bridge Engineering - Rail

9.1. RRX (Railway Crossing)

Inventory Type Description: A Railway Crossing is where the road surface is common to both the Railway Authority and the Ministry of Transportation Road Network; also includes overhead and under passes. It is represented by a **Point** feature.

Note: This inventory item type is updated by Engineering Branch-Rail - all associated information is to be added and edited in Rail.

| Attribute | Data Type | Mandatory/Optional | Description/Comment |
|-------------|-----------|--------------------|--------------------------------------|
| Crossing ID | Text | M | Unique identifier obtained from RCIS |

LOV/Code Table Values – **Valid XSPs:**

| XSP Code | Cross Sectional Position |
|----------|--|
| AL | Overhead – Left - A structure to the left of a Ministry highway over a Railway line (Railway Underpass) |
| AR | Overhead – Right - A structure to the right of a Ministry highway over a Railway line (Railway Underpass) |
| BL | Underpass – Left - A structure to the left of a Ministry highway under a Railway line (Railway Overpass) |
| BR | Underpass – Right - A structure to the right of a Ministry highway under a Railway line (Railway Overpass) |
| L | Level – Left - A Level Crossing that is to the left of the road centreline |
| O | Overhead - A structure carrying a Ministry highway over a Railway line (Railway Underpass) |
| R | Level – Right - A Level Crossing that is to the right of the road centreline |
| U | Underpass - A structure carrying a Ministry highway under a Railway line (Railway Overpass) |
| X | Level - A Level Crossing that straddles all lanes of the highway |

Rules / Considerations:

- Location information should be recorded at the centre of the crossing.
- All of the attribute data should be provided by the Engineering Branch who is responsible for the maintenance of RCIS (and children) data.
- The District Operations Tech may be asked to identify and provide a CHRIS location for the crossing. This may be recorded on paper and submitted to the appropriate RCIS data manager for updating in CHRIS.

CHRIS
Corporate Highway & Resource
Information System

Yukon Territory Northwest Territories

Alaska

Alberta

Washington Idaho Montana

British Columbia
Ministry of
Transportation & Infrastructure

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1. Introduction

CHRIS - Network Business Rules

This document describes the processes and rules associated with the field collection of Highway centreline data for use in CHRIS (Corporate Highway and Resource Information System).

This is a living document - subject to change.

This document describes:

- The processes and rules associated with the field collection of Highway Centreline data.
- The business processes for Collecting new RFI Highway attributes and measured values.
- A set of business rules outlining acceptable Node locations for defining the start or end of anchor sections including the real world points at which measures are taken, and the expected precision as well as methods of improving precision.
- The safety factor requirements for field work involving the collection of highway data using a DMI (Distance Measuring Instrument) and/or GPS.

2. General Network Rules

RFI Unique Identifier:

New RFI Highways would be identified by the Districts. To create a new RFI Highway, the following information is required:

- Service Area - the Service Area where the road is located
- RFI Highway Unique - this is the Unique Identifier for the RFI Highway identified by the District (SASHH-H):
 - S – Service Area (01 to 28)
 - A – Area Manager Area
 - S – Sub Area
 - H – HighwayType (0-Road; E-Easement; N-Notional)
 - H – Highway Number (4 digits)
 - H - HighwayAlpha (if applicable) – maximum of 2 characters
- Examples
 - 09-A-@-00001
 - 02-B-@-E02086
 - 21-A-1-00004

RFI Highway Descriptions:

This is the name of the road:

- Examples
 - Anaconda Road (09-A-@-00001)
 - Viking Way Easement #1 (02-B-@-E02086)
 - Briar Ridge Road (21-A-1-00004)

Anchor Section Descriptions:

This is the description of the road from Landmark to Landmark. If there is to be more than one Anchor Section, then a description for each one is required:

- Examples
 - ANACONDA ROAD from End of RoW to 2nd St
 - VIKING WAY EASEMENT #1 from Admiral Tryon Blvd to Viking Way
 - BRIAR RIDGE ROAD from Rte 2 to Dayus Rd

Anchor Section Types:

This is the type of Anchor Section. Each RFI Highway needs to be broken down into the different Anchor Section Types and they are as follows:

- CR – Constructed Road
- UR – Unopened Right of Way
- FC – Ferry Connection
- E – Easement
- N – Notional

Geometry Source:

This indicates the source of the geometry for the Anchor Section that was initially picked up with the FDCU:

- TRCE – Traced from DRA
- GNSS – Global Navigation Satellite System (GPS)
- HD – Hand Drawn
- DC – Description Change (HQ Use Only)
- QI – Quality Issue (HQ Use Only)
- DRA – Digital Road Atlas (HQ Use Only)

Creating Network on the FDCU:

- When creating a piece of Network on the FDCU, the Anchor Section segment is entered as a RFI Highway. All of the information regarding the SASHH-H and the Anchor Section (Anchor Section Type & Geometry Source) is entered. If the route spans more than one Anchor Section, a second RFI Highway needs to be created – the RFI Unique Identifier must be unique – add a Highway Alpha so that it will be different than the first segment that was created.

Note: When entering the description for a route in the FDCU, the format of the description should be **Road Name from ____ to ____** (e.g. Sooke Road from Start of RoW to End of Row or Sooke Rd from Kelly Rd to Metchosin Rd) so that both the RFI Description and the Anchor Section description is captured.

Route Length - Bridge Length:

- Do not subtract Bridge lengths from the Road length when calculating the distance of the route.

Route Direction:

Generally, the Cardinal Direction for a Highway will be Eastbound (EB) or Northbound (NB).

- When deciding on a route's cardinal direction, the direction is determined from the overall direction of the route, not the individual pieces – start to end. (e.g. Route #1 starts in a northbound direction on Vancouver Island, but its overall direction is eastbound.)
- When a route crosses over a Service Area Boundary consideration must be given to the direction of the route in the adjoining Service Area as well as its overall direction.
- If the new route intersects with an existing route, consideration can be made from the existing route's cardinal direction but again, the overall direction of the new route is the deciding factor. (e.g. Existing route is northbound then new route could also be northbound if that is its overall direction.)

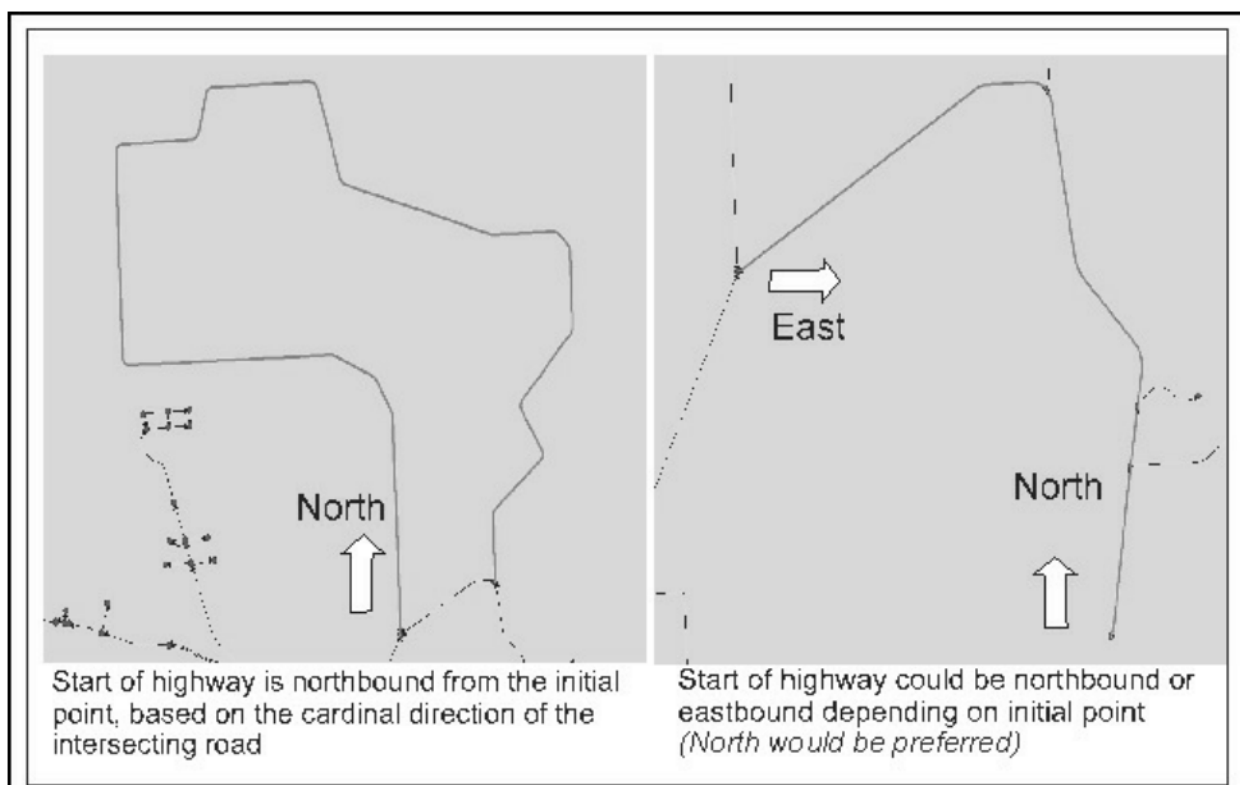


Figure 1 – Route Direction - Example 1

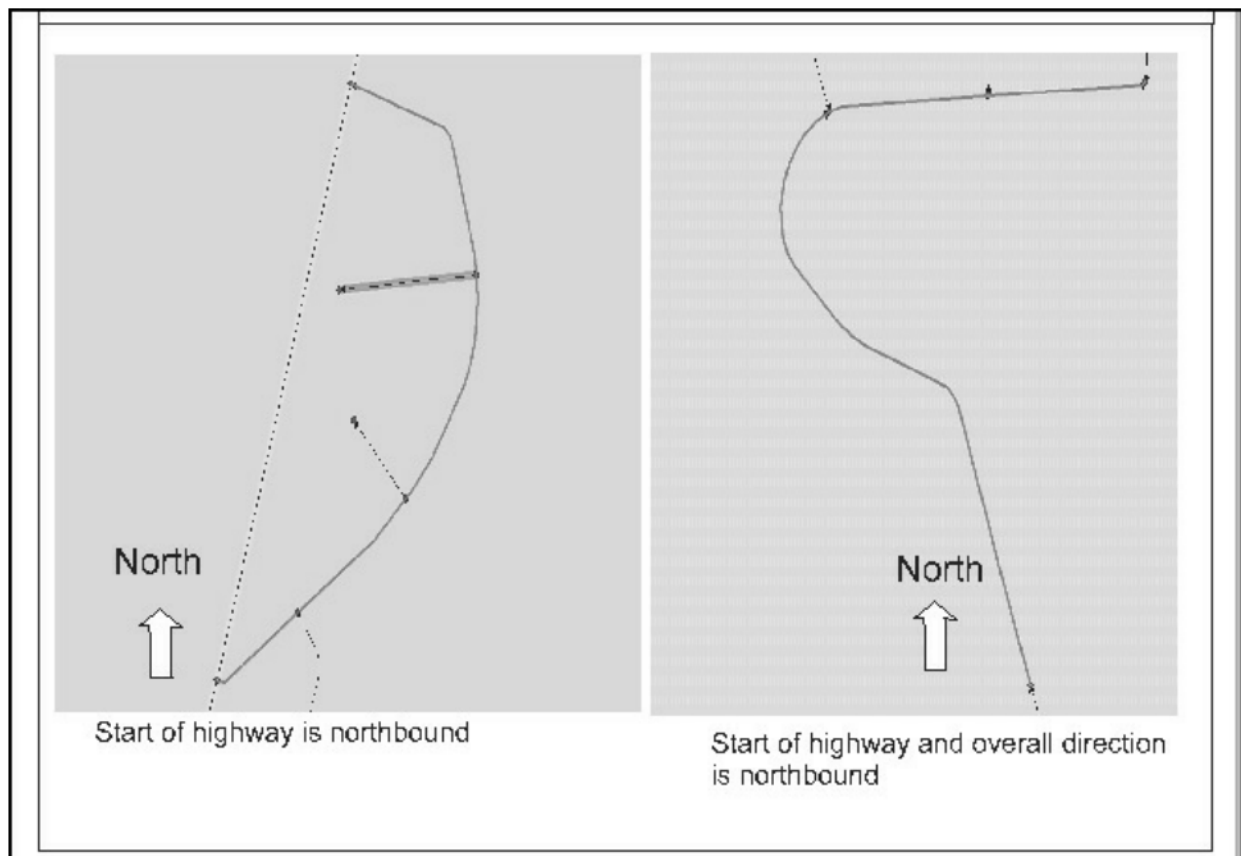


Figure 2 – Route Direction - Example 2

3. Collecting New RFI Highway Centrelines

A Distance Measuring Instrument (DMI) is required to determine the length of a route that is to be created in CHRIS.

Business rules are defined for the collection of various types of RFI Highways:

- Divided Highways
- Non-divided Highways
- Interchange Ramps
- Frontage Roads with Multiple Accesses
- Offset Roads
- Cul-De Sacs
- Roundabouts

3.1. Centreline Require DMI Values to Locate Inventory on a New Route

Establish correct lengths for an RFI Highway:

“RFI Highways” may include, but are not limited to, foot or bike paths, right-of-ways, future corridors, trails, unopened 'highways', etc. Note that there is currently no underlying datum for these network types.

1. Using the DMI, measure the actual length of the anchor sections that will define the new highway and record the lengths;

Note: *Generally, the Cardinal Direction for a Traversal/Highway will be Eastbound (EB) or Northbound (NB).*

2. Return to the office and in NWM/SDM create the anchor sections and RFI Highways or recalibrate the previously created anchor section(s) to the actual DMI field measured value(s); and
3. Enter the surveyed inventory data into the CHRIS database.

If previously entered route data is not recalibrated first, the location of the inventory will be incorrect along the route.

3.2. Business Rules Defining RFI Highway Types

There are various types of RFI Highways that need to be collected:

- Divided Highways
- Non-divided Highways
- Interchange Ramps
- Frontage Roads with Multiple Accesses
- Roundabouts
- Highways that Share a Portion of a Corridor with Other Highways

3.2.1. Divided Highways

For a highway to be divided one of the three following criterion must be fulfilled:

- The highway has a median equal to or greater than 1.8 meters.
- The highway is grade separated.
- The highway has a physical barrier, which restricts crossing from one side to the other.

In addition to meeting one of the above criteria, the length of the divided road section must be greater than 100 meters long.

Components of intersections such as turning islands, shopping access and turn lanes of any length are **not** considered sufficient to divide a highway.

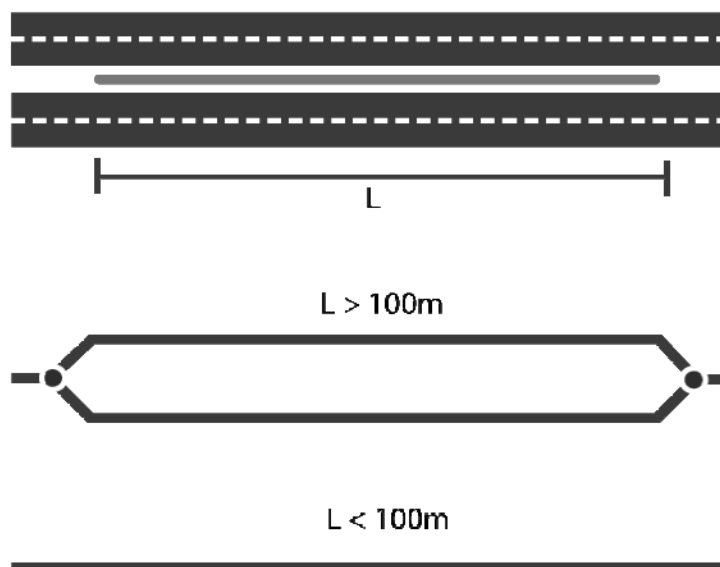


Figure 3 – Divided Highways

Each direction of travel of a divided highway must be treated as a stand alone (separate) RFI Highway. Where a highway is intermittently divided as shown in the diagram below, the non-divided sections belong to the Eastbound or Northbound highway and a distance break must be inserted to provide connectivity for the Westbound or Southbound divided sections.

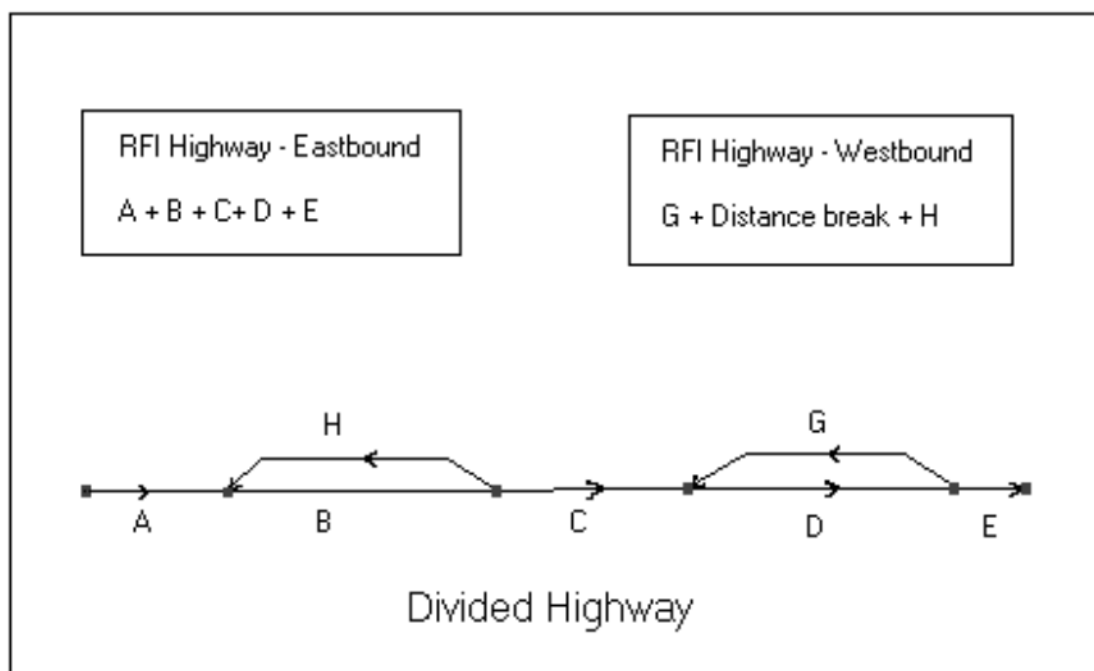


Figure 4 – Divided Highway

Sections of a divided highway that fail to meet one of the first three criterion, must be a minimum of 100 meters in length to be represented as a single line, measuring between the gore points.

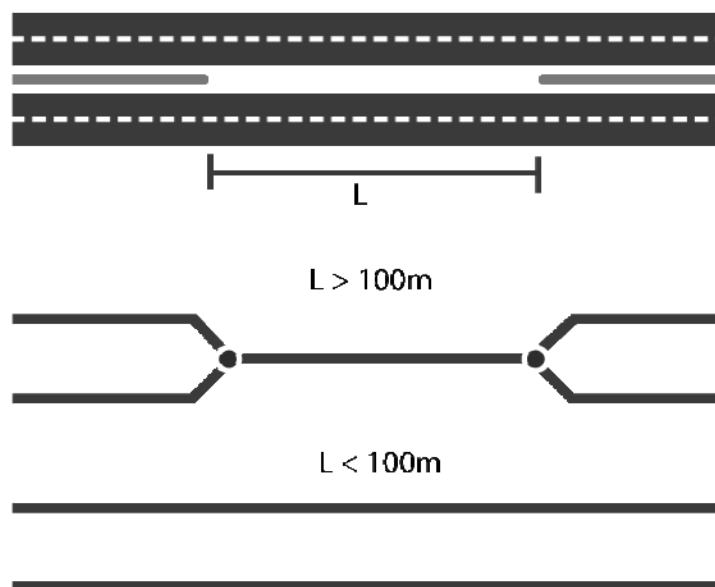


Figure 5 – Divided Highway

3.2.2. Non-Divided Highways

Data describing non-divided RFI Highways will be collected in either the Northbound or Eastbound direction wherever feasible.

If a RFI Highway spans Service Area Boundaries, the direction of data collection and the direction of the shape files must be the SAME for all Service Areas that the highway is located within.

3.2.3. Interchange Ramps

A ramp is defined as a roadway connecting overpasses and underpasses, where no four way intersection exists.

A level crossing that has a four way intersection and turning lanes divided by islands or painted lines will be represented as a standard intersection.

Interchange ramps usually have one-way-traffic flow. Data will be collected in the direction of traffic flow.

A single ramp within an interchange may be described as an individual RFI Highway to prevent logic errors in CHRIS when locating inventory.

Ramps and highways are captured so that they intersect at the tail of the gore. In some cases this may coincide with the gore point.

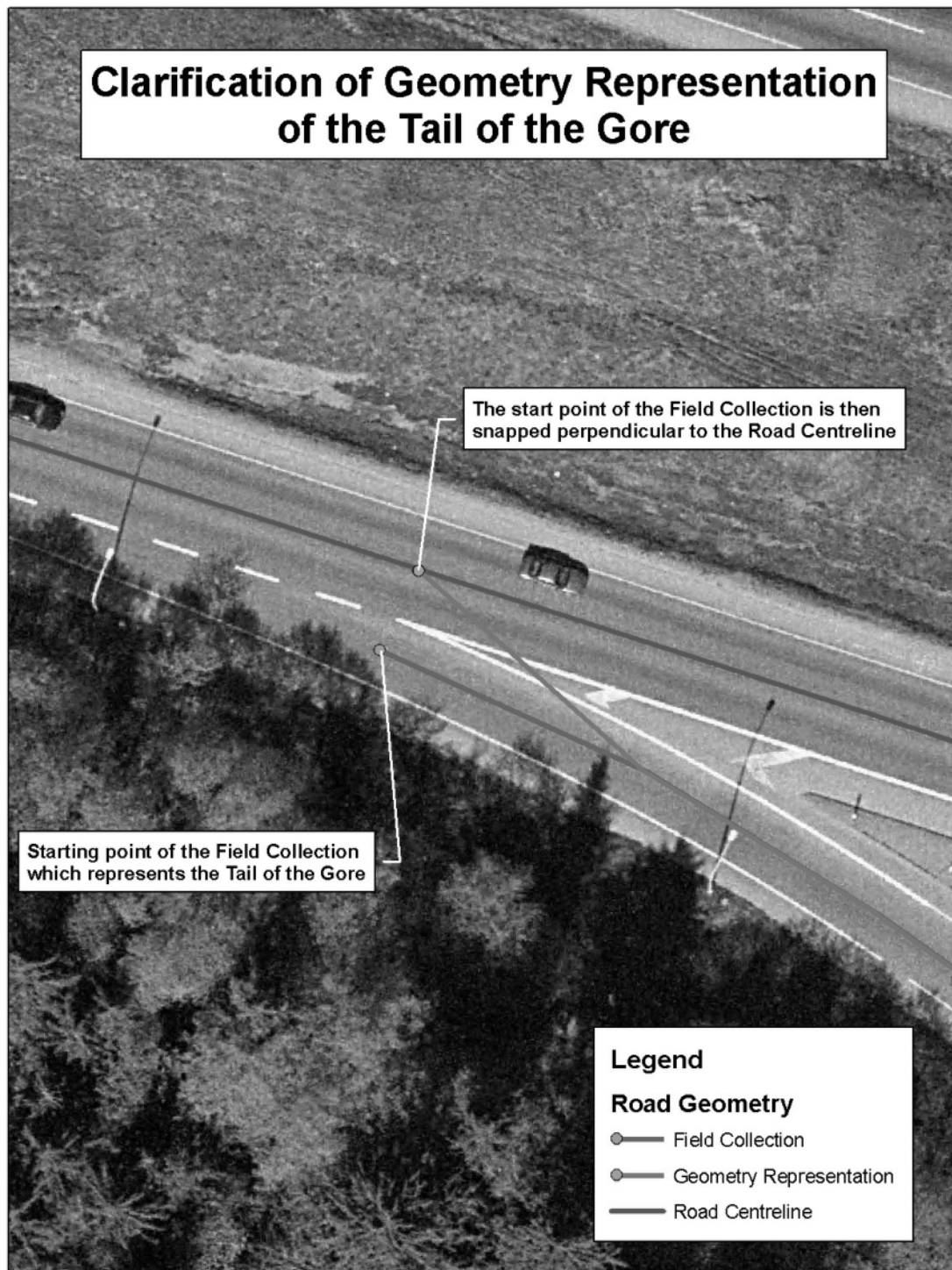


Figure 6 – Tail of the Gore

Collection is done starting at the Tail (the beginning of the solid line at the front of the gore).

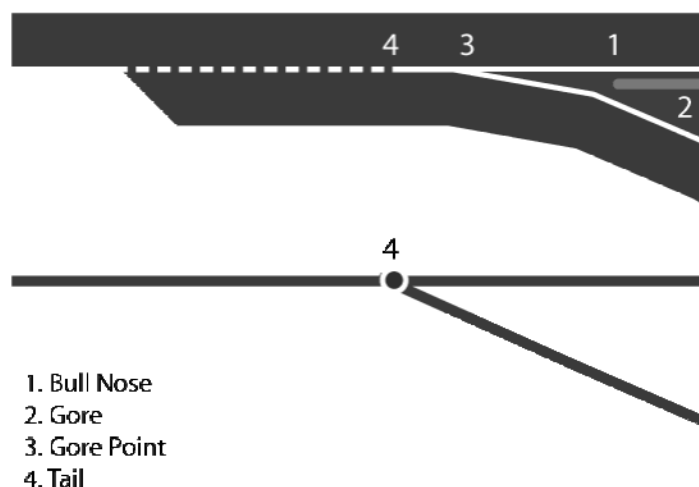


Figure 7 – Interchange Ramp

3.2.4. Frontage Roads with Multiple Accesses

Where feasible, it is recommended that the CHRIS Data Manager define the Frontage Road and Accesses as more than one RFI Highway:

- Collect road from A to D as one RFI Highway
- Collect and define Accesses 'B' and 'C' as individual RFI Highways
- These three routes can be given the same Highway Numbers and the two, Accesses can be assigned different Highway Alphas

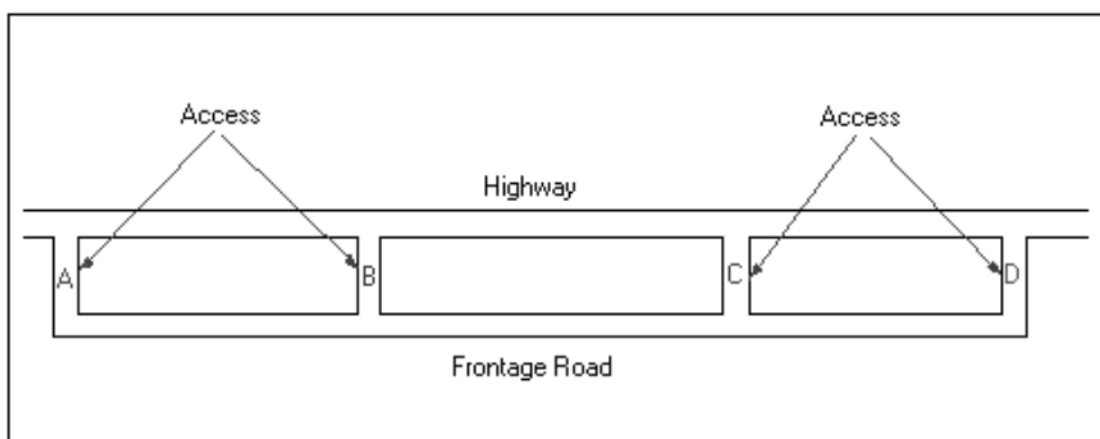


Figure 8 – Frontage Road Access

3.2.5. Roundabouts (Traffic Circles)

Roundabouts with a diameter of less than 10 meters are represented as a standard intersection.

Where the diameter of a roundabout is greater than 10 meters, the circular geometry of the roundabout is captured.

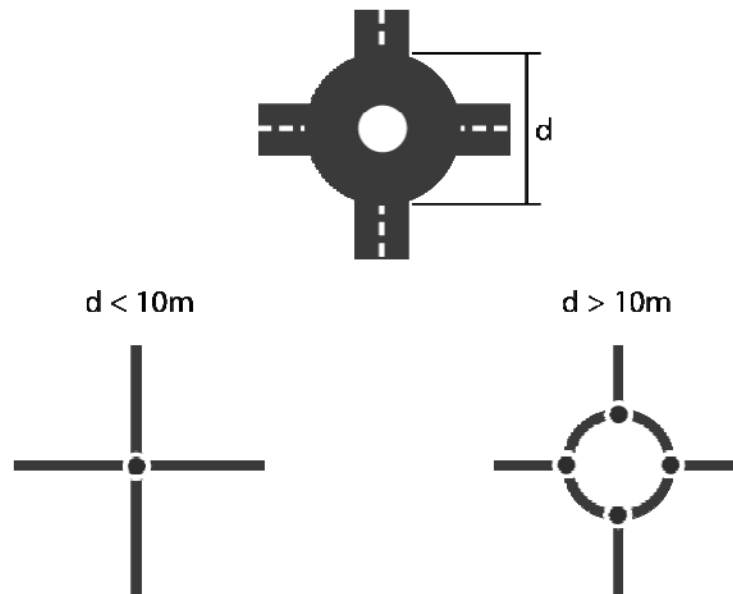


Figure 9 – Roundabouts

The four extra segments that represent the circular part of the roundabout are associated with the main roadway passing through the roundabout (if two Numbered Routes intersect, take the lower number first).

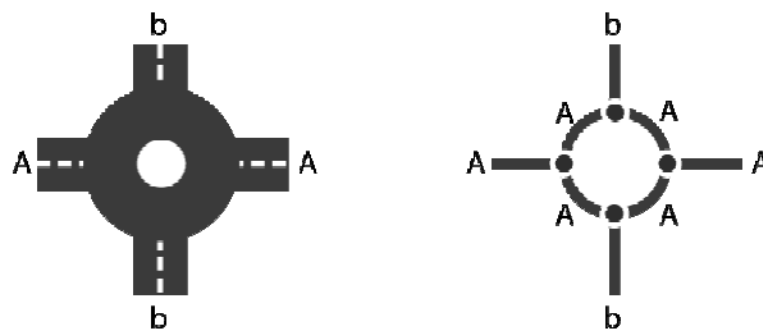


Figure 10 – Roundabouts

Anchor sections describing the “Main” route must complete the roundabout and will require a distance break as shown in Figure 8 and Figure 9.

- A-G, G-B, Distance break B-C, then C-D

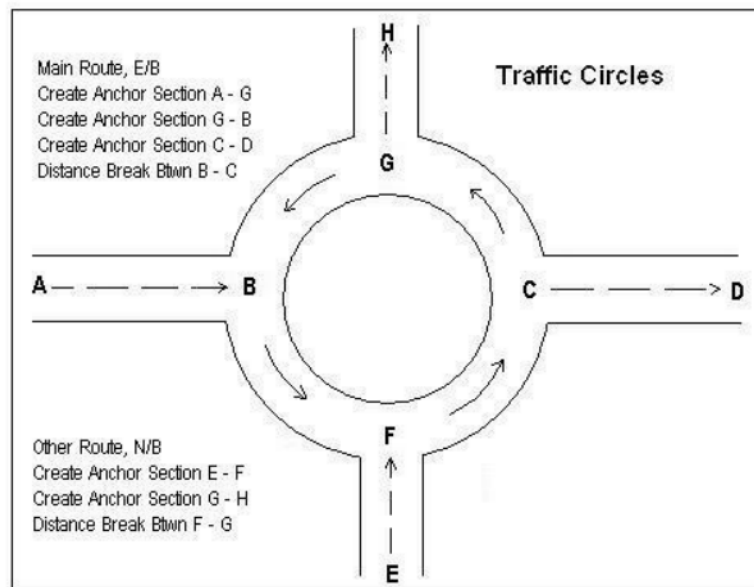


Figure 11 – Roundabout 1

- A-F, F-B, Distance break B-C, then C-D

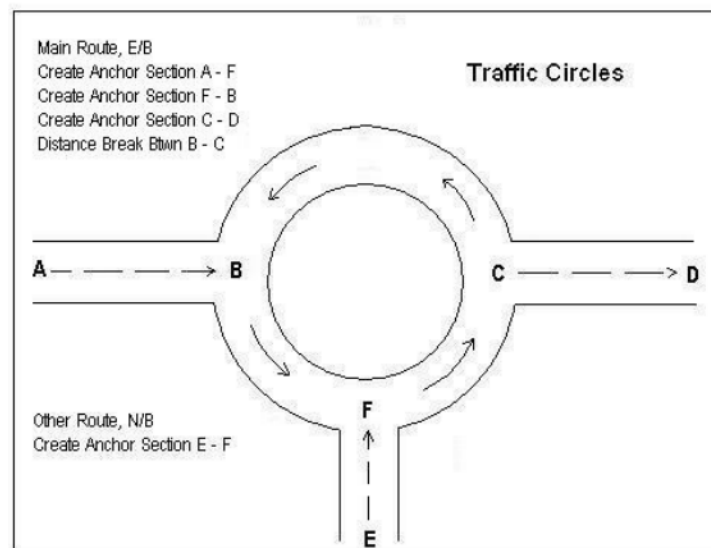


Figure 12 – Roundabout 2

3.2.6. Cul-de-Sacs

Cul-de-Sacs are represented as a single line where the diameter of the cul-de-sac is less than 30 meters. In cases where the diameter of the Cul-de-Sac exceeds 30 meters, a loop is used to represent the Cul-de-Sac.

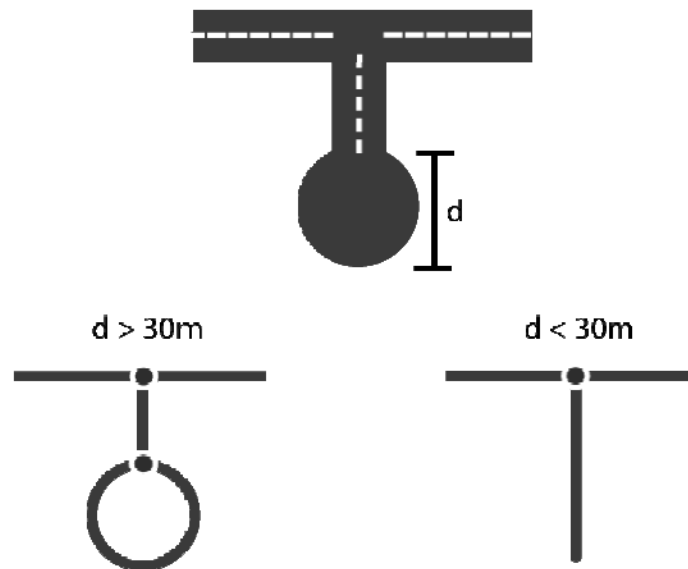


Figure 13 – Cul-de-Sacs

3.2.7. Offset Roads

Offset roads where there is an offset of 6 meters or greater will be represented by two intersections.

Roads that are less than 6 meters will be represented as continuous with a single intersection.

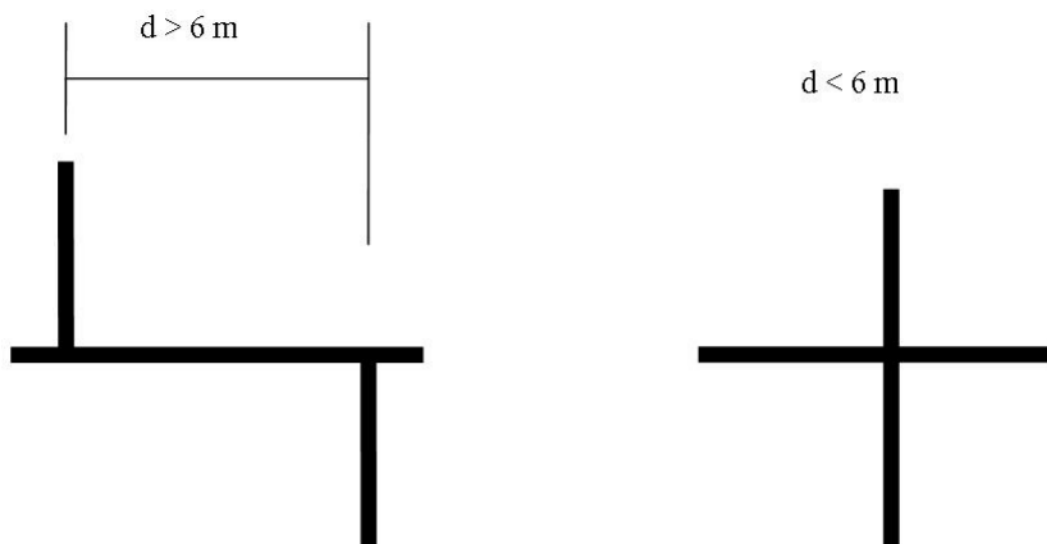


Figure 14 – Offset Roads

3.2.8. Distance Breaks

Distance Breaks are required where the road Right of Way is disconnected.

- This could be the result of a road going through a Municipality, a roundabout or a road with a T-intersection in it.

A new route with a distance break would be collected as two separate Anchor Sections, one on each side of the Distance Break.

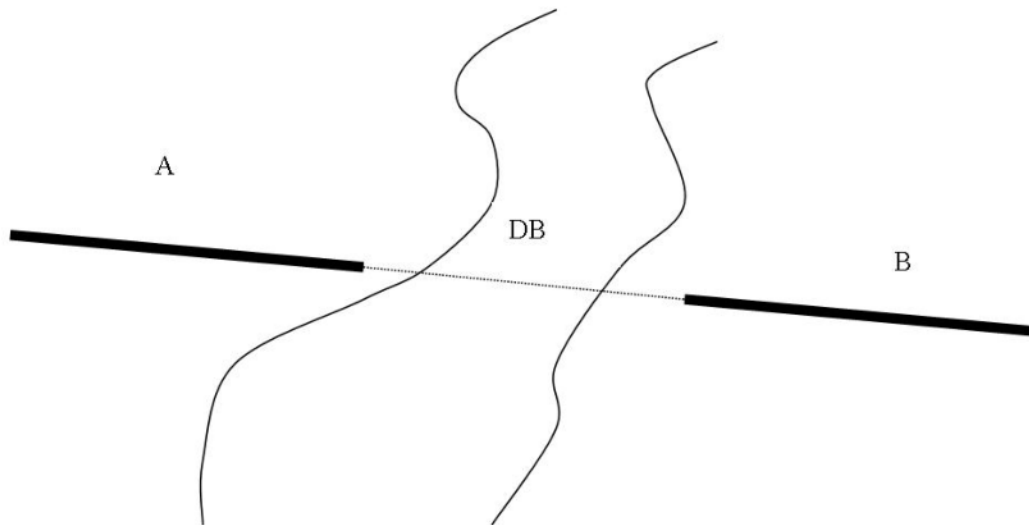


Figure 15 – Distance Breaks

3.2.9. Highways that Share a Portion of a Corridor with Other Highways

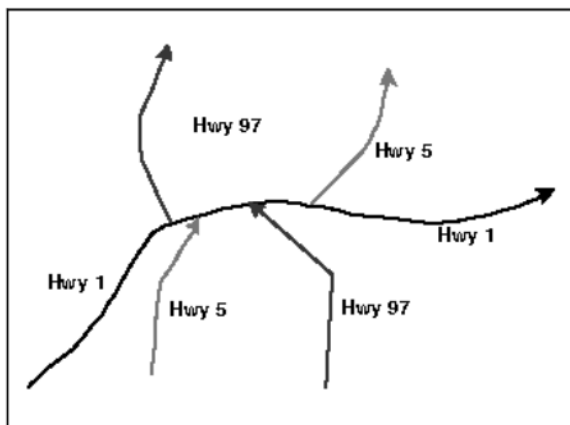


Figure 16 – Highway Corridor 1

Start at the beginning of a route

- Create anchor sections for the highway from its start to where it begins to share a corridor with another highway;
- Create anchor section - distance break where it shares a corridor;
- Create anchor section from the intersection where it stops sharing the corridor and continues along it's own direction

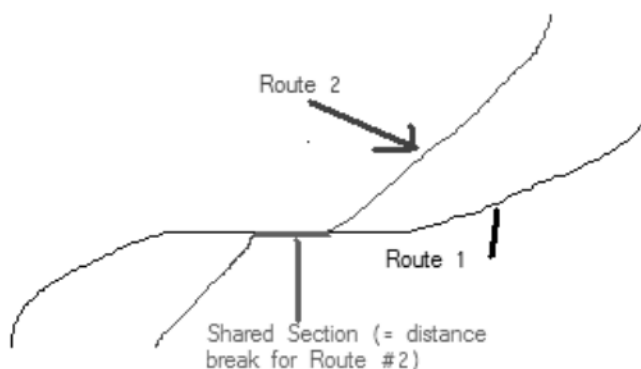


Figure 17 – Highway Corridor 2

Note: In the diagram above, corridors representing Routes that share sections with other Routes will be split. For example, data located on the section of "Route 2" that is shared with "Route 1" will be located on the Traversal/Highway representing "Route 1". Route 1 would be contiguous and Route 2 would be non-contiguous.

4. Business Process of Correcting Existing RFI Highway Centreline Shapes and Attributes

This section describes the business processes related to correcting, replacing or relocating existing RFI Highway centreline shapes and attributes. It describes instances where existing highway centrelines do not correctly represent the real-world shape or location of the highways.

There are at least two situations that require the replacement of an existing centreline shape:

- The centreline shape is not representative of the actual road shape
- The centreline shape is corrupted (e.g. the measure points do not ascend in chainage order) and the inventory items are displayed incorrectly along the route

If a CHRIS Data Manager identifies to the CHRIS Administrator or CHRIS Coordinator that the DRA centreline is in error or not complete, the CHRIS Administrator will contact the managers of the DRA to either recollect the problem centreline or collect the missing centreline. The CHRIS user will be notified of availability of the new shape. Or the CHRIS Data Manager picks up the centreline shape and sends it to the CHRIS Administrator or CHRIS Coordinator to “clean up” the shape. The resulting shape will be used to replace the existing centreline shape in CHRIS and to notify the DRA of the requirement for a future update to their file.

4.1. *Process to Replace Shapes*

In order to replace an existing anchor section shape in SDM, the CHRIS user must create a shape file to use as a trace theme from the DRA base map or pick up the centreline shape using the FDCU (Field Data Collection Unit). The CHRIS user may require assistance from the CHRIS administrator to ensure that the new trace theme is useable (e.g. all sections were collected in the same direction).

The CHRIS User must advise the CHRIS Administrator of the Anchor Section number (ne_unique) of the shape that needs to be replaced and provide a copy of the trace theme. The CHRIS Administrator needs to ‘replace’ the anchor section when there are no other users on the system so the CHRIS User may need to wait for one or two working days until the ‘replacement’ process is completed. The CHRIS Administrator will advise the CHRIS User of the new anchor section number that ‘replaces’ the old number. The replacement process used by the CHRIS Administrator will ensure that all related inventory items are transferred to the new anchor section.

5. Business Rules Describing Acceptable Node Locations

This section describes the business rules for acceptable node locations.

Roads need to be picked up from centerline to centerline – or length needs to be added to each end of the road to compensate if road is picked up from shoulder to shoulder due to safety and traffic considerations.

Acceptable node locations are limited to the following:

- The start of a route;
- The end of a route;
- An intersection between two or more roads;
- A Service Area boundary;
- A Municipal /Arterial boundary where the Arterial Route is non-contiguous.
- Anchor Section Type changes – CR-Constructed, UR-Unopened Right of Way, FC-Ferry Connection, E-Easement or N-Notional

There may be instances where routes are not contiguous (have more than one non-connected sections). In such cases, there should be a node located at the start and end of each disparate section of the route, with a distance break logically connecting the physically separated sections. CHRIS specifications do not allow for partial sections in the middle of a route.

Most node locations are easy to determine. The start and end of a route are exactly that, the physical location at which the route either starts or ends. For routes ending or starting at the intersection of another road, the node will be located at the centre point of the intersection.

The following six figures demonstrate the business rules for locating nodes at:

- The transition between Divided Highways and Non-divided Highways
- Interchange Ramps and Main Routes
- Divided Highways crossing Non-divided Highways
- Divided Highways crossing Divided Highways
- 90 Degree Intersections
- Oblique (Skewed) Intersections
- Roundabouts

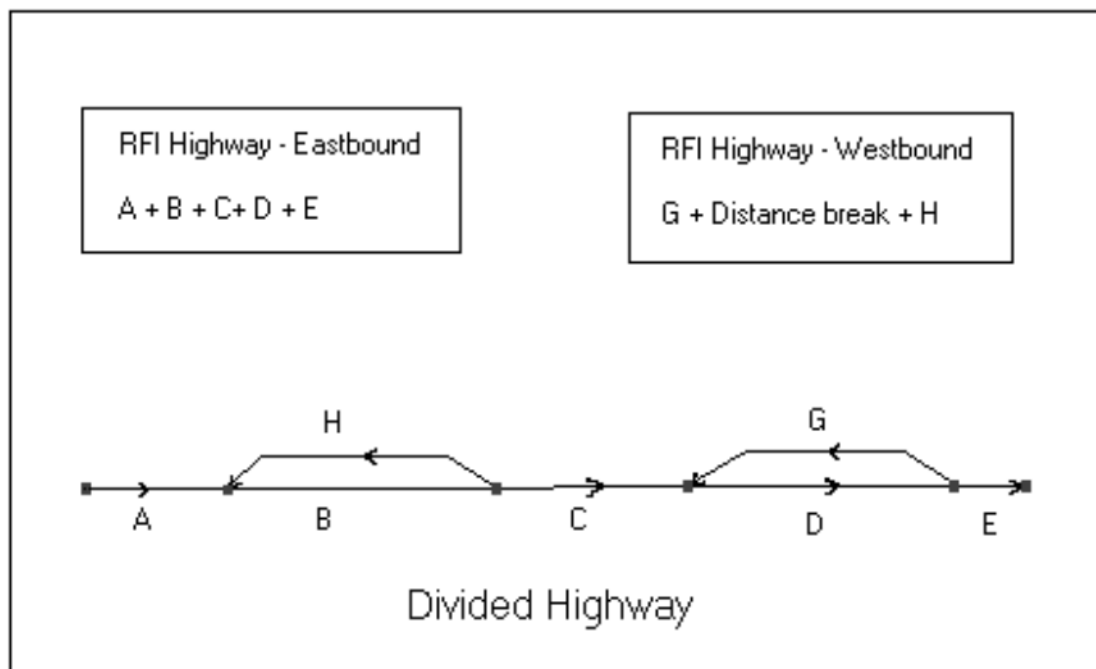


Figure 18 – Divided Highway Transition Node Placement

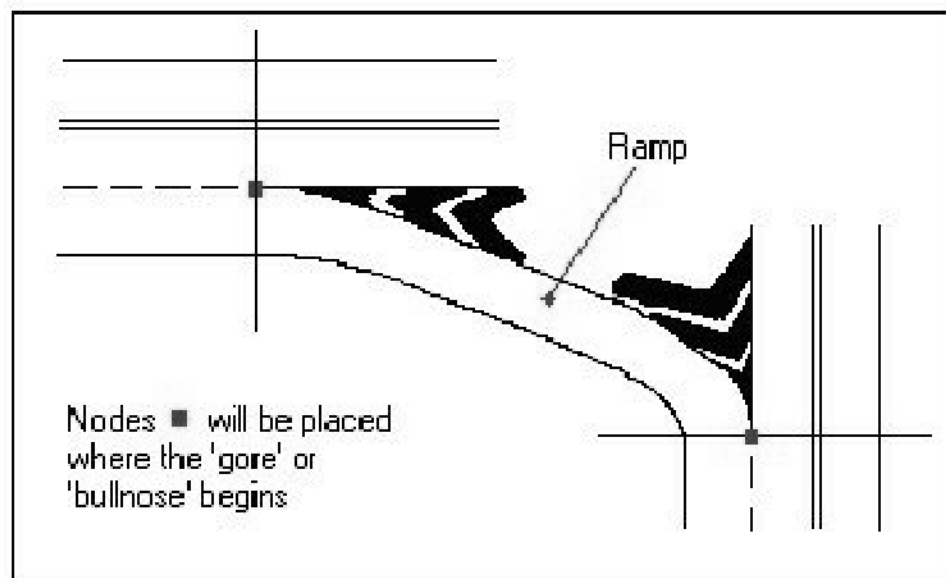


Figure 19 – Ramp Node Placement

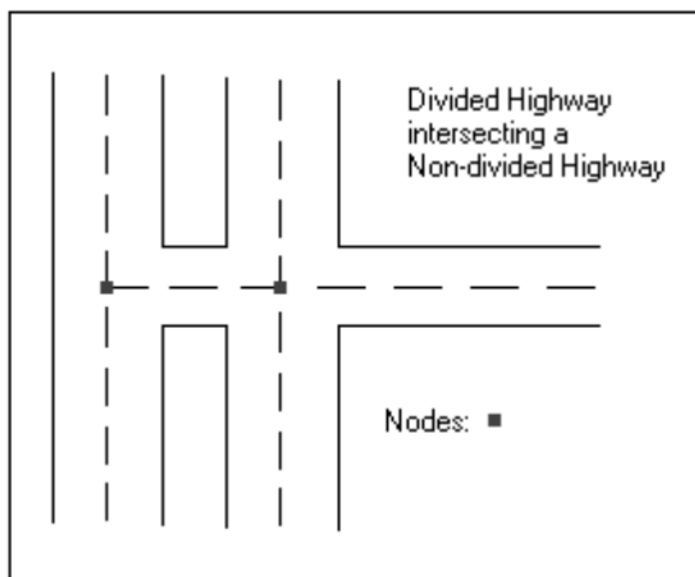


Figure 20 – Divided Highway / Non-Divided Highway Node Placement

Note: In the diagram above, the node on the right is not necessary, even though it is at an acceptable location.

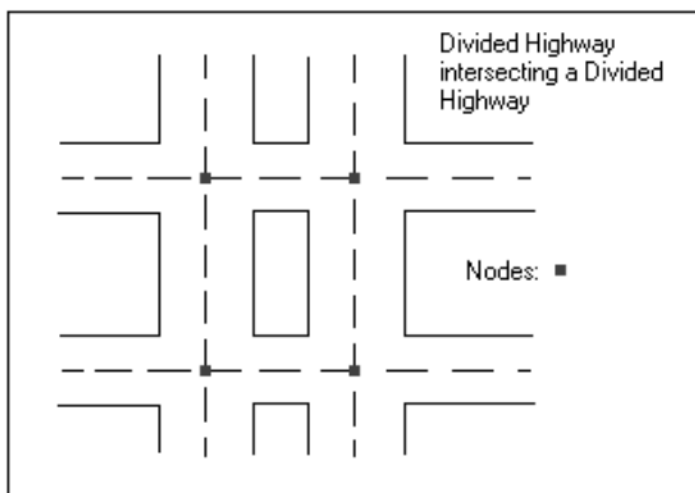


Figure 21 – Divided Highway / Divided Highway Node Placement

Note: In the diagram above, although all four nodes locations are acceptable, none of the above nodes are necessary, assuming that none of the depicted highways start or end at the intersections shown.

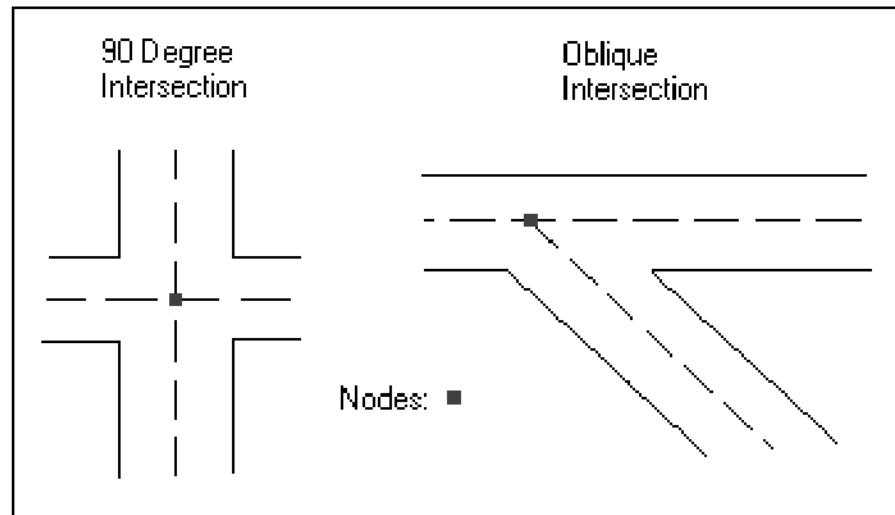


Figure 22 – Divided Highway Node Placement

Note: In the schematic on the left of the diagram above, the node shown is at an acceptable location, but is not necessary unless a route starts or ends at that intersection.

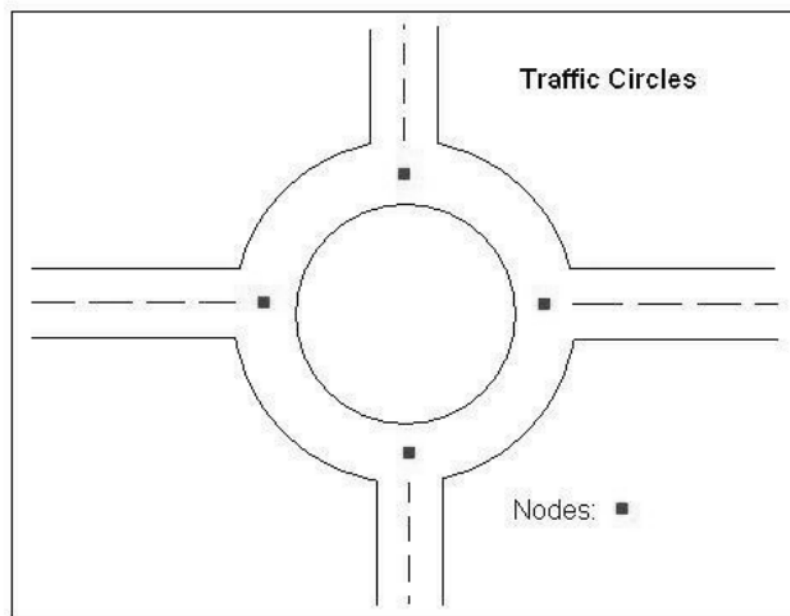


Figure 23 – Roundabout Node Placement

A Service Area boundary is the physical location where one Service Area meets another. It represents the end of a highway in one Service Area and the start of the highway in the adjoining Service Area.

A node may be required at a Municipal Boundary to accommodate an Arterial Route that is non-contiguous.

6. Precision Expectations and Steps to Improve Precision

The precision of a highway section created in SDM using secondary sources (construction plans or as-built plans) will be dependent on the accuracy of those drawings and on the ability of the user to accurately interpret the physical representation of the highway from the plans into a shapefile.

The process for validating the length of highway sections using a DMI will have a precision measure of +/- 10 metres or 0.1%.

In order to improve the precision of the DMI measurement the user should ensure that the DMI calibration is recent and correct and that data collection methodology is consistent. This can be accomplished by ensuring that the DMI measurement coincides with a consistent vehicle reference feature (e.g. edge of side mirror, edge of window) being perpendicular to the start of a highway section and ending when the same vehicle reference feature aligns with the highway section end.

7. Safety Factors for Highway Centreline Collection

The following section describes safety factors to consider for highway centre-line verification or collection in the field.

7.1. General Safety Factors

It is recommended that the CHRIS data manager also refer to the general safety considerations that are outlined in the MoT Safety Manual, with the section General Field Operations Manual being of particular interest.

Only authorized Ministry personnel or contractors will operate data collection vehicles. At a minimum, this will mean that the Operator must have a valid BC Driver's License.

Each vehicle used by MoT personnel for data collection must be equipped with a hard wired or magnet mounted, amber, rotating safety light. A copy of the User Permit for operating an amber safety light must be available in the vehicle at all times. These safety lights are to be turned on at all times when a data collection vehicle is on a survey site and is traveling below the posted speed limit. It is recommended that vehicle flashers are also used when traveling below the posted speed limit.

Field operators should use mission planning to schedule highway data collection fieldwork for times when traffic is lightest.

The data collection vehicle should be in the centre travel lane when traveling at the posted speed limit. If the vehicle is traveling significantly slower than the posted speed and is visibly affecting traffic flow, then the vehicle may need to validate the centre-line while traveling on the road shoulder.

For more information about health and safety, please refer to the Ministry's Health and Safety intranet site:

<http://gwww.th.gov.bc.ca/gwwhr/Content/Health/HSHome.asp>