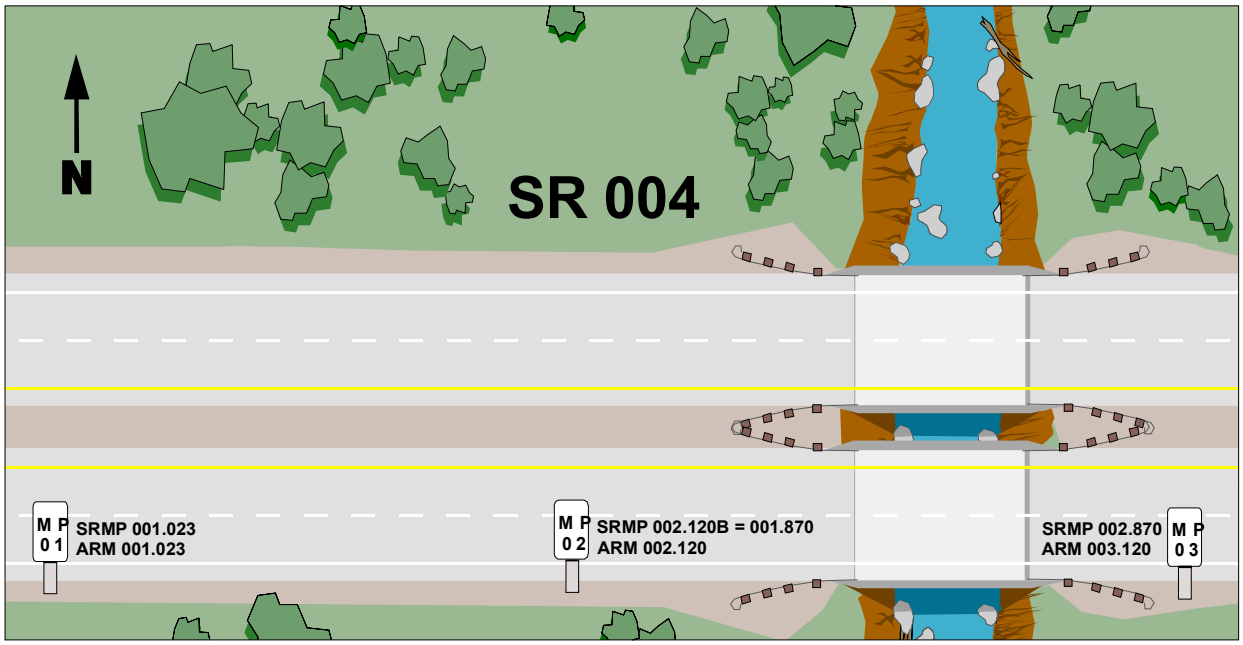
DMI/LRS

Linear Referencing System

Washington State Department of Transportation
Transportation Data Office

Linear Referencing System (LRS)



STATE ROUTE (SR)

A road for which the State of Washington has some level of responsibility that is identified by a three digit number (e.g., 004).

STATE ROUTE MILEPOST (SRMP)

A linear referencing system used to assign a logical number to a given point along a route. Currently, the SRMP is carried to the hundredth of a mile (123.45). With the new LRS, this will be carried to the thousandth (123.450). If a realignment shortens or lengthens a section of an SR, the SRMP will adjust with an equation and the SRMP will not change through the rest of the route.

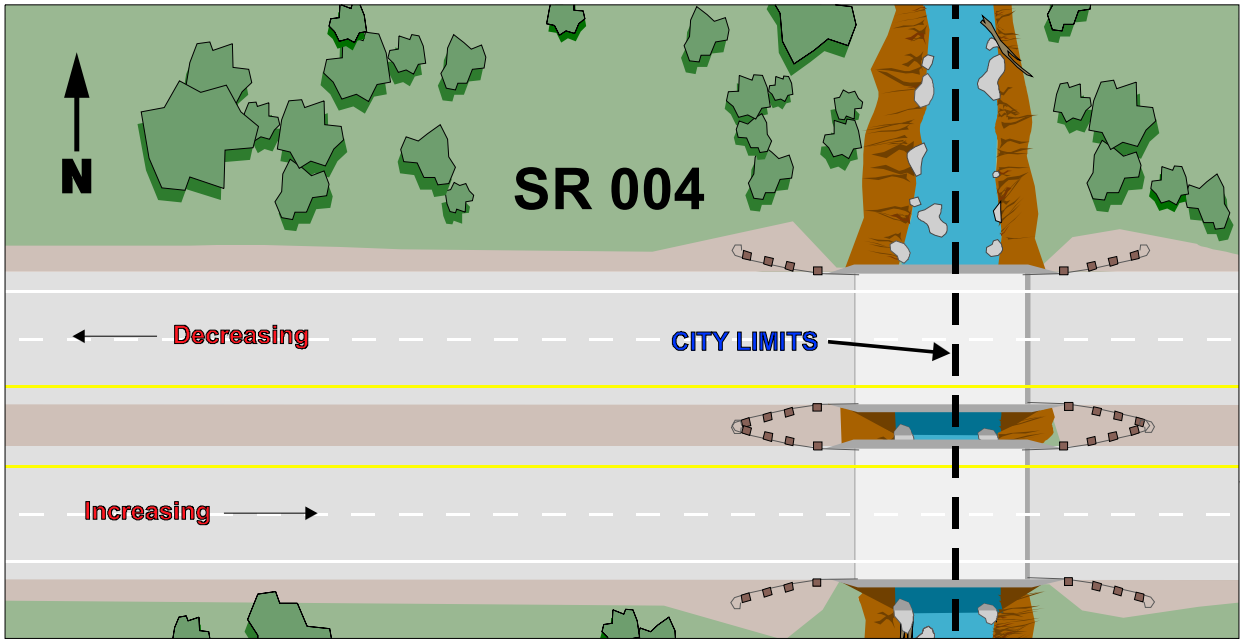
The SRMP identifies reference points and should **NOT** be used for computing distance.

ACCUMULATED ROUTE MILE (ARM)

The ARM is an accrual of mileage from the beginning of a route to the end of the route. It accrues through coincident sections where two or more SR's share one physical alignment. The ARM is an important factor in the realignment of a State Route. It does **not** contain equations - it flows through them to give true mileage (see section on

equations). Currently, the ARM is carried to the hundredth of a mile (123.45). With the new LRS, this will be carried to the thousandth (123.450).

All length measurements are calculated using the ARM value.



DIRECTION OF INVENTORY

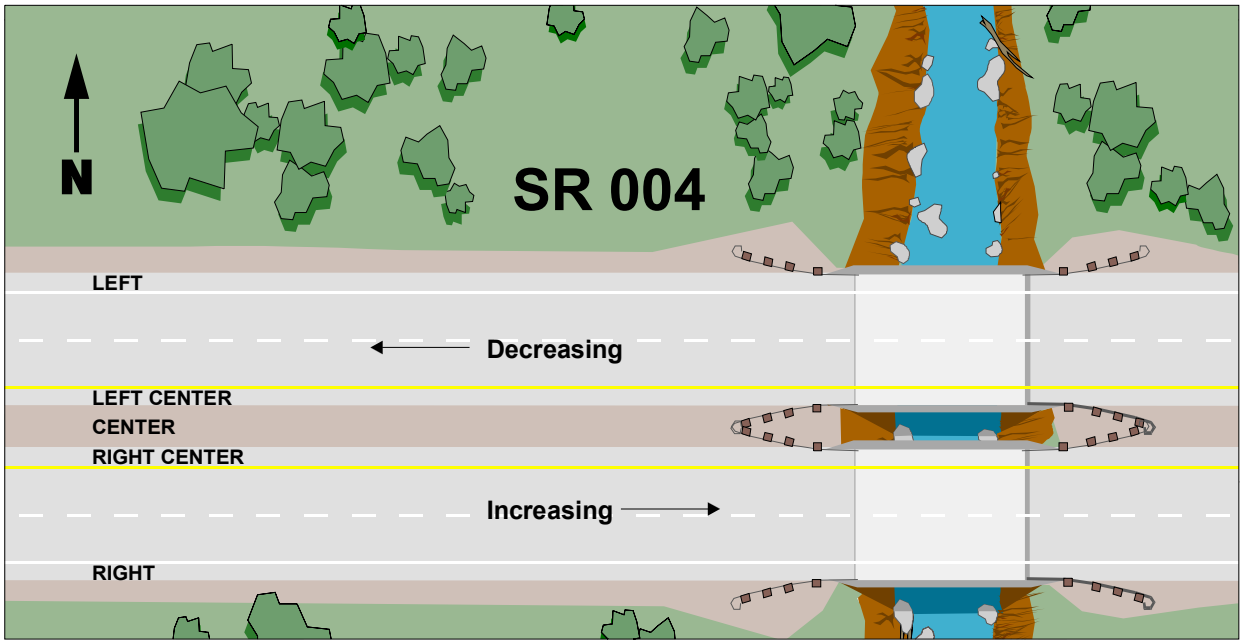
Features that get tagged with this code occur **ON** the main traveled way.

I = INCREASING (Inc) Milepost increases when traveling the roadway in the increasing direction. Usually odd numbered routes run south to north increasing and even numbered routes run west to east increasing. There are some exceptions to this rule.

D = DECREASING (Dec) Milepost decreases when traveling the roadway in the decreasing direction. Usually odd numbered routes run north to south decreasing and even numbered routes run east to west decreasing. There are some exceptions to this rule.

B = BOTH The feature affects both the increasing and decreasing direction of travel. Examples:

- Bridge (overcrossing)
- Speed Limit
- Street Name
- Legislative District
- Number of Lanes



LEFT/RIGHT INDICATOR

Features that get tagged with this code occur **ALONG SIDE** the main traveled way. All Left Right Indicators are assigned based on the **INCREASING** direction of travel, starting from the left and working to the right.

L = LEFT Represents features located along side the decreasing traveled way.

LC = LEFT CENTER Represents features located along side the median side of the decreasing traveled way.

C = CENTER Represents a feature that occurs between the increasing and decreasing traveled way.

RC = RIGHT CENTER Represents features located along side the median side of the increasing traveled way.

R = RIGHT Represents features located along side the increasing traveled way.

B = BOTH The feature occurs along side both the increasing and decreasing traveled way. Examples:

- Parking Zone
- Flyer Stop
- Park n Ride Lot
- Rest Area
- Weigh Station
- Intersection

STATE ROUTE MILEPOST BACK (B) INDICATOR

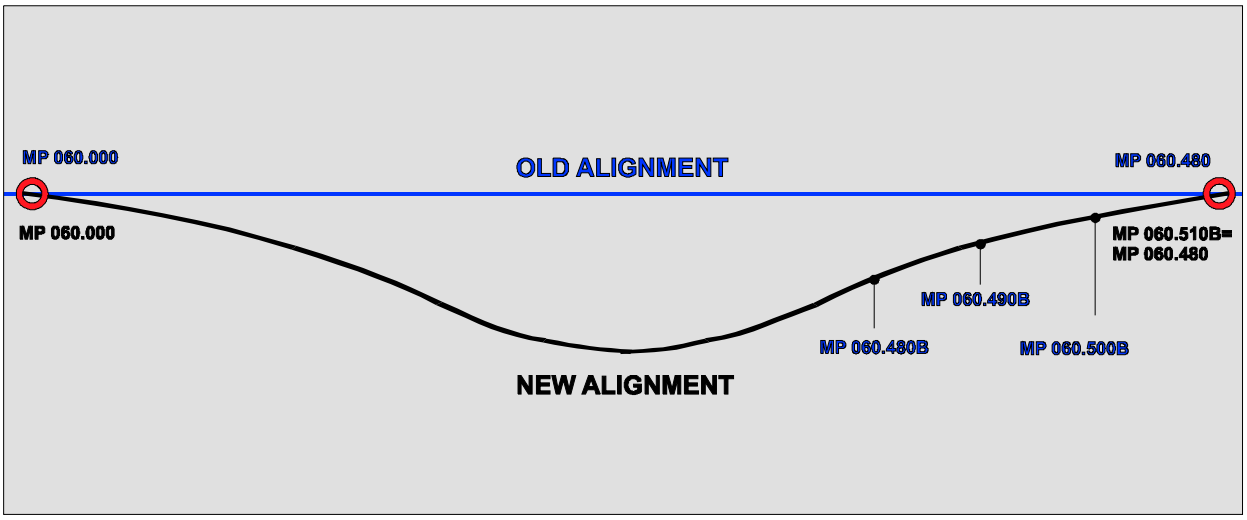
Indicates whether the milepost value is the duplicate (back) of a milepost value on the route. Ahead values are implied (blank).

A back SRMP occurs as a result of:

- Realignment which lengthens a section of an SR other than at the end of the route.
- Adding mileage to the beginning of an SR.

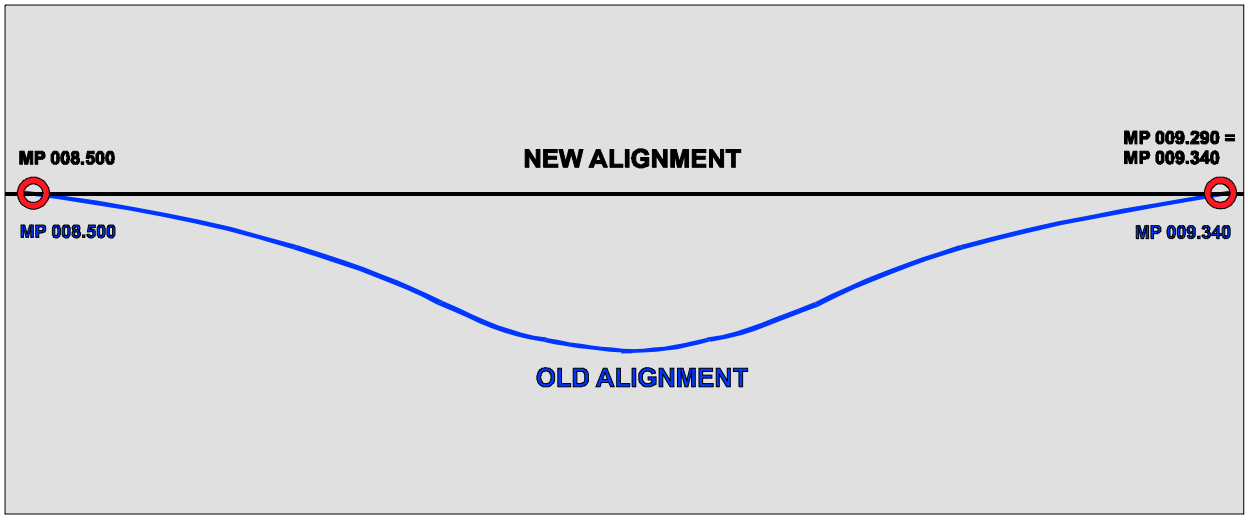
EQUATION (EQ)

There are 3 kinds of Equations: Back, Gap & Physical Gap



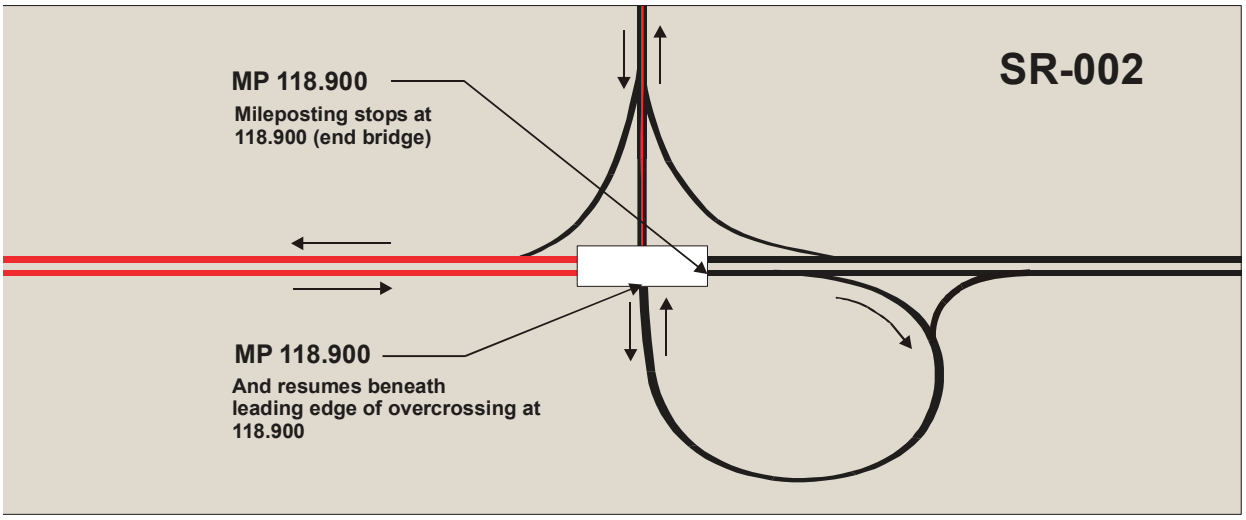
BACK EQUATION

This type of EQ occurs when a realignment lengthens a section of an SR. An example (shown above) would be a contract that reconstructs the alignment of a SR from MP 060.000 to 060.480. As a result, the alignment is .030 longer. Because 060.480 to 060.510 already exists (not part of the alignment change), the MPs that are duplicated need to be identified. This is done by assigning a 'B' (back) to the new MPs 60.480, 60.490. 60.500, and 60.510. This lengthening will result in a Back EQ of 60.510B = 60.480. The MP of 60.510B is no longer a valid MP as two MPs cannot occupy the same point. This allows for adjustment to the section affected but does not affect the MP of the rest of the SR. The ARM is the factor that gets adjusted for the rest of the SR.



GAP EQUATION

This type of EQ occurs when a realignment shortens a section of SR. An example might be a contract that reconstructs the alignment of a SR from MP 8.500 to 9.340. Throughout this section some curves are straightened out and the alignment is .050 shorter (8.500 - 9.290). This shortening would result in a gap EQ of 9.290 = 9.340 at MP 9.340. The MP of 9.290 is no longer a valid MP as two MPs cannot occupy the same point. This allows for adjustment to the section affected but does not affect the MP of the rest of the SR. The ARM gets adjusted for the rest of the SR.



PHYSICAL GAP

This indicator may or may not have an EQ associated with it. A Physical Gap is a location where there is a physical break in the continuity of the SR. An example would

be SR 2 in Wenatchee where SR 2's mileposting stops at the end of the overcrossing (MP 118.900) then resumes below at the leading edge of the overcrossing (MP 118.900).

COINCIDENT (COINC)

This situation occurs when two (or more) SRs run along the same physical alignment. A Coincident location carries one Major SR and 1 to 3 Minor SR(s). The Major SR carries all the data. The Minor SR(s) will only contain Region and County numbers.

The assignment of Major or Minor is first based on functional classification. A Principal Arterial would take precedence over a Minor Arterial and/or Collector. A Minor Arterial would take precedence over a Collector. A Interstate would take precedence over all other routes. If both highways have the same functional classification, the route with the lowest SR number will take precedence. ARM accumulates through the Coinc section on the Minor SR. The mileage for the minor route must be adjusted. A listing is available that identifies Coincident locations by SR, SRMP & ARM.

RELATED ROADWAY TYPE (RRT)

Before TRIPS, the SR number represented the main traveled way of our highways. This left out other pieces of our highways like Ramps, Spurs, Couplets, etc. and in numerous cases, caused location data to be inaccurate.

With TRIPS came RRT and RRQ. Together with the SR number, these descriptors identify very precisely any piece of the highway system in the State.

RRT = A two character abbreviation for a type of roadway. The following is a list of RRTs in the system.

AR	Alternate Route	CD	Collector Distributor Dec
CO	Couplet	CI	Collector Distributor Inc
FD	Frontage Road Dec	LX	Crossroad within Interchange
FI	Frontage Road Inc	P1 - P9	Off Ramp, Inc
FS	Ferry Ship (Boat)	PU	Extension of P ramp
FT	Ferry Terminal	Q1 - Q9	On Ramp, Inc
PR	Proposed Route	QU	Extension of Q ramp
RL	Reversible Lane	R1 - R9	Off Ramp, Dec
SP	Spur	RU	Extension of R ramp
TB	Transitional Turnback	S1 - S9	On Ramp, Dec
TR	Temporary Route	SU	Extension of S ramp

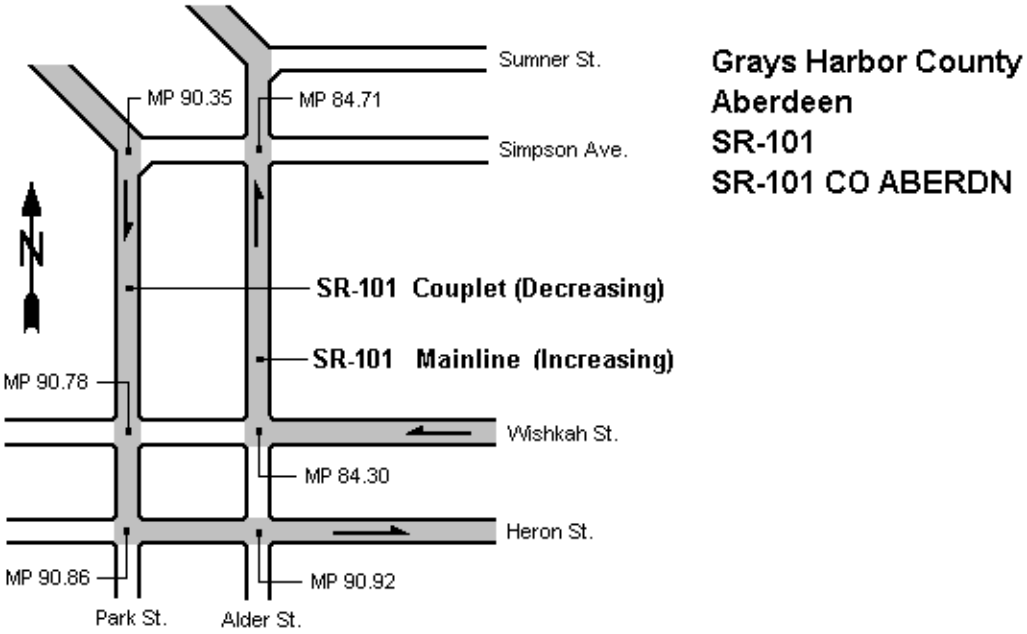
RELATED ROADWAY QUALIFIER (RRQ)

The RRQ is a six digit field which uniquely identifies the RRT since there may be more than one of of the same type of RRT for a route. The assigning of RRQ is done in one of three ways depending on the RRT.

(1) The following RRTs use descriptive location names (i.e., city, street, or junction) for the RRQ and the begin SRMP of that RRT is relative to the Mainline SRMP where the RRT intersects with the Mainline.

AR	Alternate Route	SP	Spur
CO	Couplet	TB	Transitional Turnback
PR	Proposed Route	TR	Temporary Route

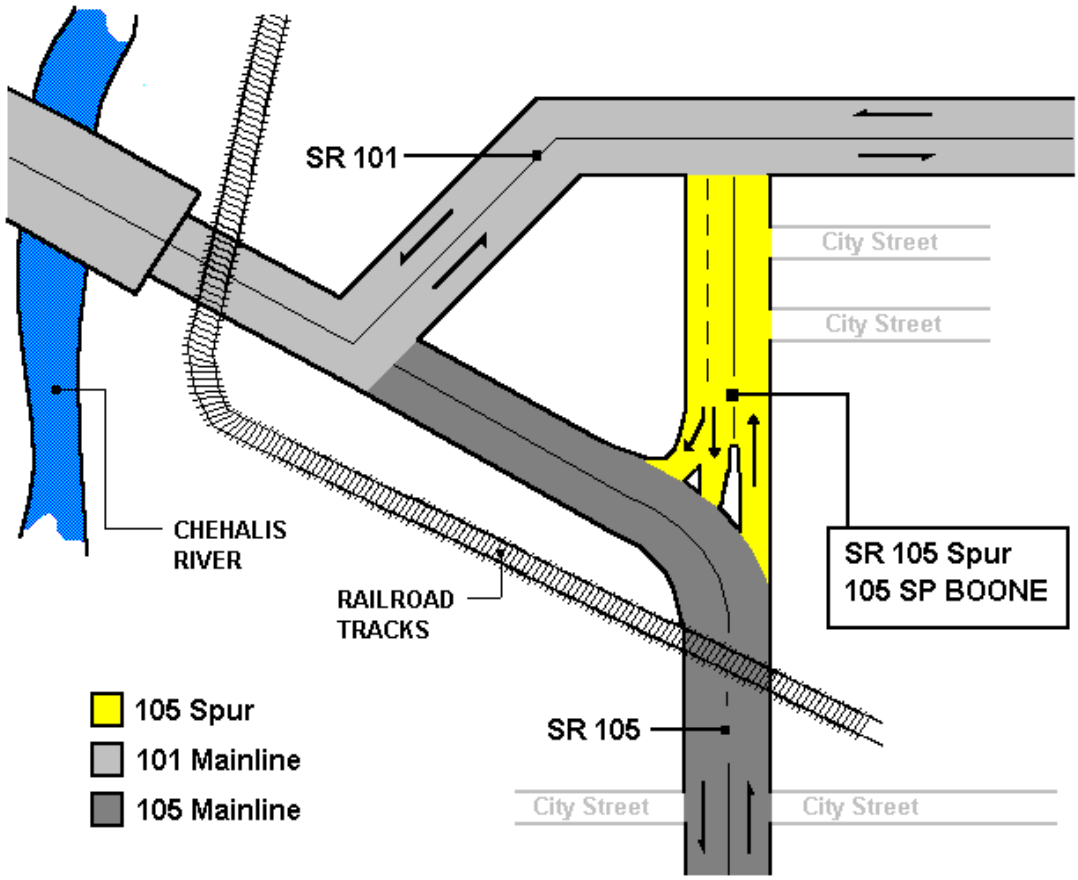
COUPLET EXAMPLE



EXAMPLE: 101 CO ABERDN

where:	101	=	SR Number
	CO	=	RRT for Couplet
	ABERDN	=	Abbreviated name of city where RRT exists

SPUR EXAMPLE



EXAMPLE: 105 SP BOONE

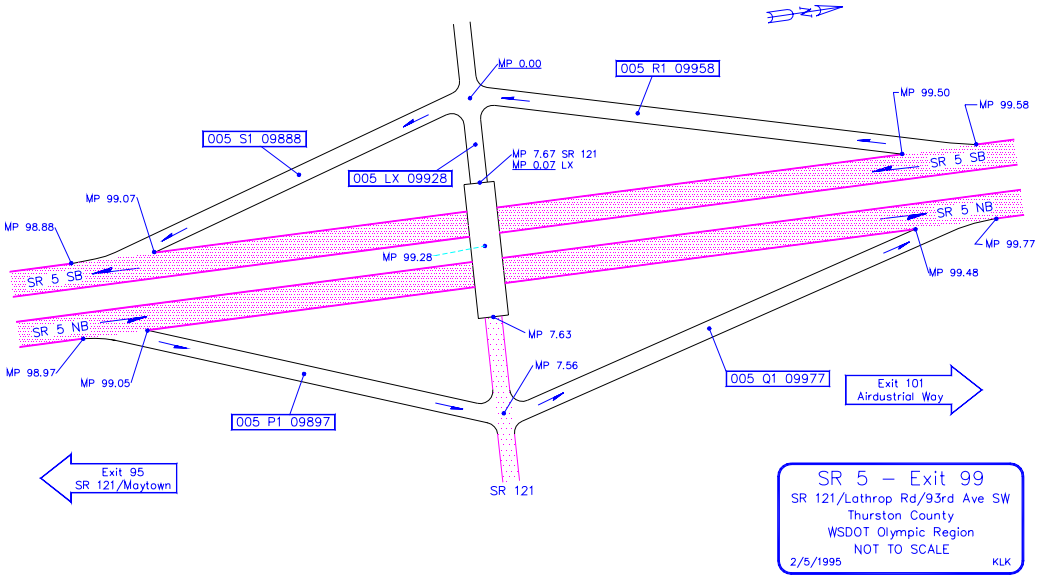
where:	105	=	SR Number
	SP	=	RRT for Spur
	BOONE	=	Name of street where RRT exists

(2) The following RRTs use the Mainline SRMP where the RRT attaches to the Mainline. The begin SRMP for that RRT will be 0.000.

CD	Collector Distributor Dec	P1 - P9	Off Ramp, Inc
CI	Collector Distributor Inc	PU	Extension of P ramp
FD	Frontage Road Dec	Q1 - Q9	On Ramp, Inc
FI	Frontage Road Inc	QU	Extension of Q ramp
LX	Crossroad within Interchange	R1 - R9	Off Ramp, Dec
RL	Reversible Lane **	RU	Extension of R ramp
		S1 - S9	On Ramp, Dec
		SU	Extension of S ramp

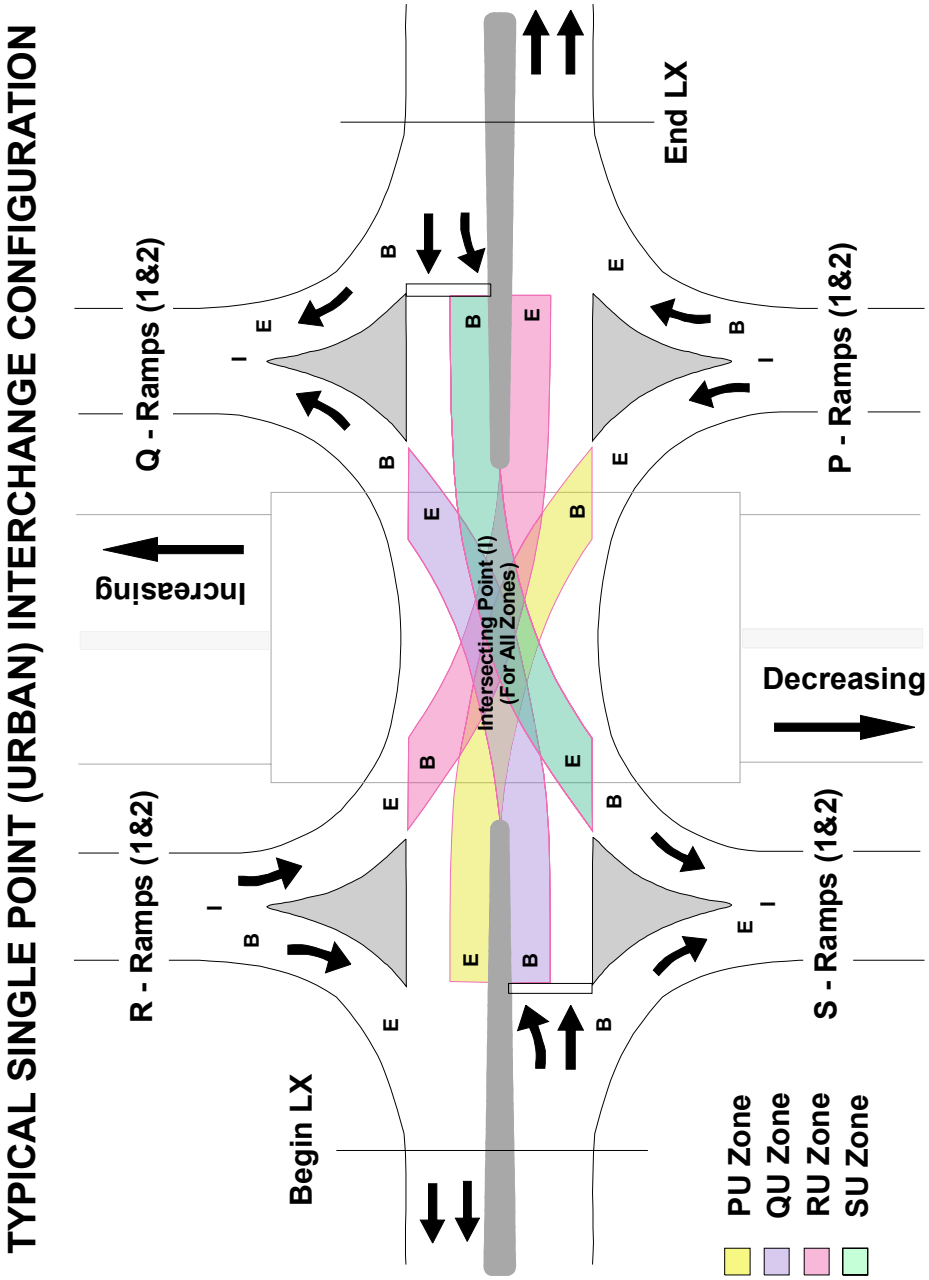
*** At this time, this RRT does not follow standard naming convention*

DIAMOND INTERCHANGE EXAMPLE



EXAMPLE: 005 R1 09958

where:	005	=	SR Number
	R1	=	RRT for decreasing MP direction off-ramp (R ramp)
	09958	=	Mainline SRMP at beginning of the R ramp where the R ramp leaves the mainline



EXAMPLE: 101 RU 36542

where:	005	=	SR Number
	RU	=	RRT for extension of R ramp to LX tangent
	36542	=	Mainline SRMP at beginning of the R ramp where the R ramp leaves the mainline

(3) The following RRTs use descriptive names such as a city or ship name for the RRQ. The begin SRMP is always a zero value (000.000).

FS Ferry Ship
FT Ferry Terminal

An SR number of 999 is used for Ferry Ships since they are not assigned to a specific route. The RRQ represents the name or abbreviated name of the ship.

An SR number of 999 is used for Ferry Terminals only if the terminal is not located on a route. The RRQ represents the name or abbreviated name of the city where the terminal is located.