

CHAPTER 22

LOCATION REFERENCING SYSTEM

TABLE OF CONTENTS

22.1	Introduction	22-1
22.2	County Names, Numbers and Maintenance District Numbers.....	22-2
22.3	State Routes (SR).....	22-3
22.4	Segments (SEG).....	22-6
22.5	Offsets	22-10
22.6	Segment Markers	22-10

22.1 INTRODUCTION

The Location Referencing System (LRS) is designed to bring Pennsylvania's state-owned roadway feature data into a verifiable, flexible, and constant engineering standard. It is the system used to index and designate the state highway network; to define roadway lengths, locations and route connectivity.

CO/SR/SEG/OFFSET is the fourteen digit KEY series of numbers given to the location of a point or feature on a state route. This KEY is an integral part of the Department's computerized Roadway Management System (RMS) where key roadway data is stored.

Each component of the fourteen digit RMS KEY is determined as follows:

Pennsylvania is divided into 67 counties. Each county (CO) is represented by a two-digit number that makes up the first two digits of the RMS KEY. In each county there are State Routes (SR's) identified by four-digit numbers. SR's are subdivided into approximate one-half mile segments (SEG), also identified by four digit numbers. Finally, the OFFSET is an even smaller subdivision of the segment. The offset is the distance (in feet) to a particular roadway feature from the beginning of the segment, expressed as a four digit number. An example of a fourteen digit RMS KEY is:

KEY = 07/4016/0100/0857

CO = 07 (Blair)

SR = 4016

SEG = 0100

OFFSET = 0857

The LRS adds permanence, accuracy, and stability to our linear reference marker system. It is easy to understand, and generates a computerized representation of the state highway network.

The following Sections of this Chapter will provide insight into how the LRS was developed and the type of information that can be inferred utilizing the 14 digit KEY.

The Location Referencing System (LRS) Introduction and Technical Manual provides more detail regarding LRS related definitions, codes, and locations. Contact the District RMS Coordinator or the Bureau of Maintenance and Operations, Asset Management Division, Pavement Testing and Asset Management Section, Roadway Inventory and Testing Unit for more information or questions related to the LRS.

22.2 COUNTY NAMES, NUMBERS AND MAINTENANCE DISTRICT NUMBERS

COUNTY NAME	COUNTY No. (CO)	MAINT DIST. No.
ADAMS	1	8-1
ALLEGHENY	2	11-1
ARMSTRONG	3	10-1
BEAVER	4	11-2
BEDFORD	5	9-1
BERKS	6	5-1
BLAIR	7	9-2
BRADFORD	8	3-9
BUCKS	9	6-1
BUTLER	10	10-2
CAMBRIA	11	9-3
CAMERON	12	2-4
CARBON	13	5-2
CENTRE	14	2-1
CHESTER	15	6-2
CLARION	16	10-3
CLEARFIELD	17	2-2
CLINTON	18	2-3
COLUMBIA	19	3-1
CRAWFORD	20	1-1
CUMBERLAND	21	8-2
DAUPHIN	22	8-5
DELAWARE	23	6-3
ELK	24	2-8
ERIE	25	1-2
FAYETTE	26	12-1
FOREST	27	1-3
FRANKLIN	28	8-3
FULTON	29	9-4
GREENE	30	12-2
HUNTINGDON	31	9-5
INDIANA	32	10-4
JEFFERSON	33	10-5
JUNIATA	34	2-9
LACKAWANNA	35	4-2
LANCASTER	36	8-7
LAWRENCE	37	11-4
LEBANON	38	8-8

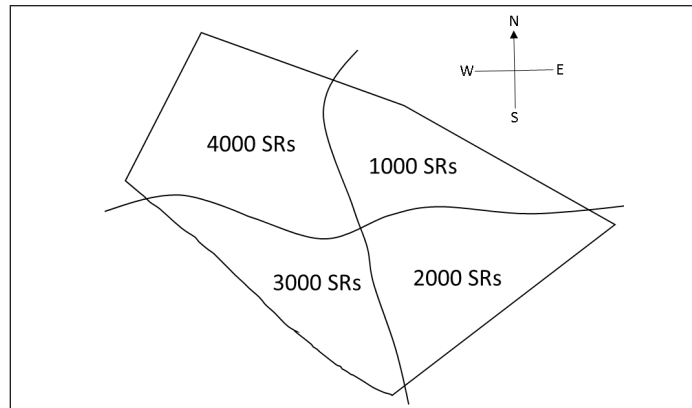
COUNTY NAME	COUNTY No. (CO)	MAINT DIST. No.
LEHIGH	39	5-3
LUZERNE	40	4-3
LYCOMING	41	3-2
MCKEAN	42	2-5
MERCER	43	1-4
MIFFLIN	44	2-7
MONROE	45	5-4
MONTGOMERY	46	6-4
MONTOUR	47	3-3
NORTHAMPTON	48	5-5
NORTHUMBERLAND	49	3-4
PERRY	50	8-9
PIKE	51	4-4
POTTER	52	2-6
SCHUYLKILL	53	5-6
SNYDER	54	3-5
SOMERSET	55	9-7
SULLIVAN	56	3-6
SUSQUEHANNA	57	4-5
TIOGA	58	3-7
UNION	59	3-8
VENANGO	60	1-5
WARREN	61	1-6
WASHINGTON	62	12-4
WAYNE	63	4-6
WESTMORELAND	64	12-5
WYOMING	65	4-7
YORK	66	8-4
PHILADELPHIA	67	6-5

22.3 STATE ROUTES (SR)

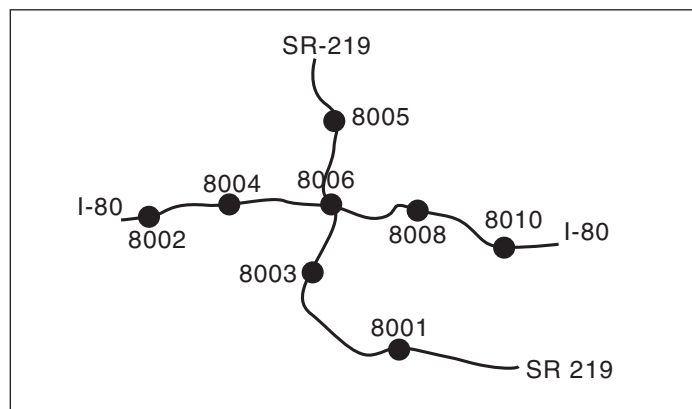
A. SR's are identified by the following four-digit numbering convention:

- | | |
|---|-----------|
| 1. Traffic Routes: Routes that have been designated as Interstates, US or PA Routes | 0001-0999 |
| 2. Quadrant Routes (Non-Traffic Routes) | 1001-4999 |
| 3. Relocated Traffic Routes | 6000-6999 |
| 4. Turned Back, Abandoned, or Null Routes | 7000-7999 |
| 5. Interchanges | 8001-8999 |
| 6. WYE's | 9101-9199 |

- 7. Rest Areas 9201-9299
 - 8. Truck Escape Ramps 9301-9399
 - 9. Others 9401-9499
 - 10. Park and Rides 9501-9599
- B. Non-tolled roads owned and maintained by the Pennsylvania Turnpike Commission are of special interest to the Department. These roads are assigned a 5000-series number, to reference physical and administrative data related to the roadway. These roads are not stored in the RMS, but they are tracked internally by both the District and Central Office.
- 1. Non-tolled Pennsylvania Turnpike Roads 5001-5999
- C. Odd/Even Convention: Odd numbers are typically assigned to SR's in the North/South direction. Even numbers are typically assigned to SR's in the East/West direction.
- 1. The Odd/Even convention applies to Interstate Routes, except those that are Beltways or Spurs.
 - 2. The Odd/Even convention applies to most, if not all, PA or US Traffic Routes.
 - 3. The Odd/Even convention applies to most, if not all, Quadrant Routes.
- D. Other Numbering Conventions:
- 1. The first digit of a quadrant route is determined by which quadrant of the county the route is located, as shown in the following diagram.

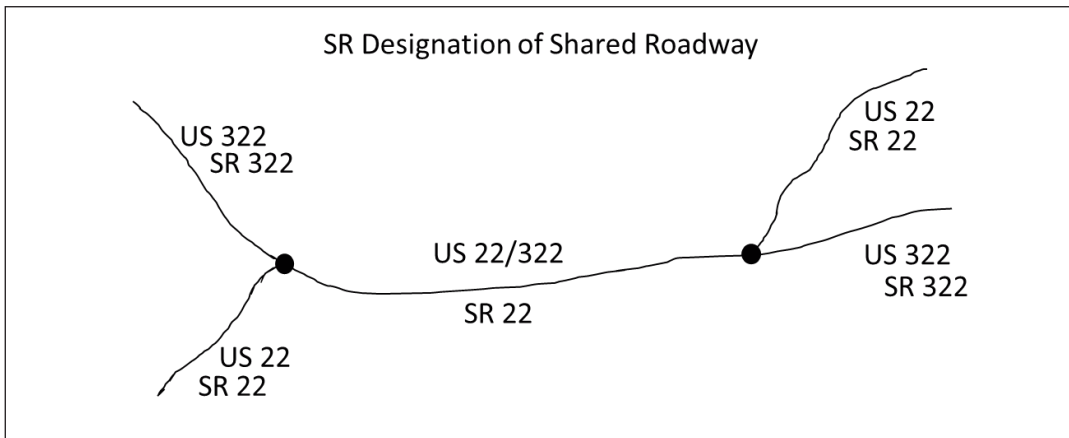


- 2. The last three digits of a Relocated Traffic Route are the same as the Traffic Route that was relocated; i.e., SR 214, located in Quadrant 3, becomes SR 3214.
- 3. Interchanges are typically numbered sequentially within a County. Odd numbers are given to Interchanges along SR's in the North/South direction; even numbers are given to Interchanges along SR's in the East/West direction.



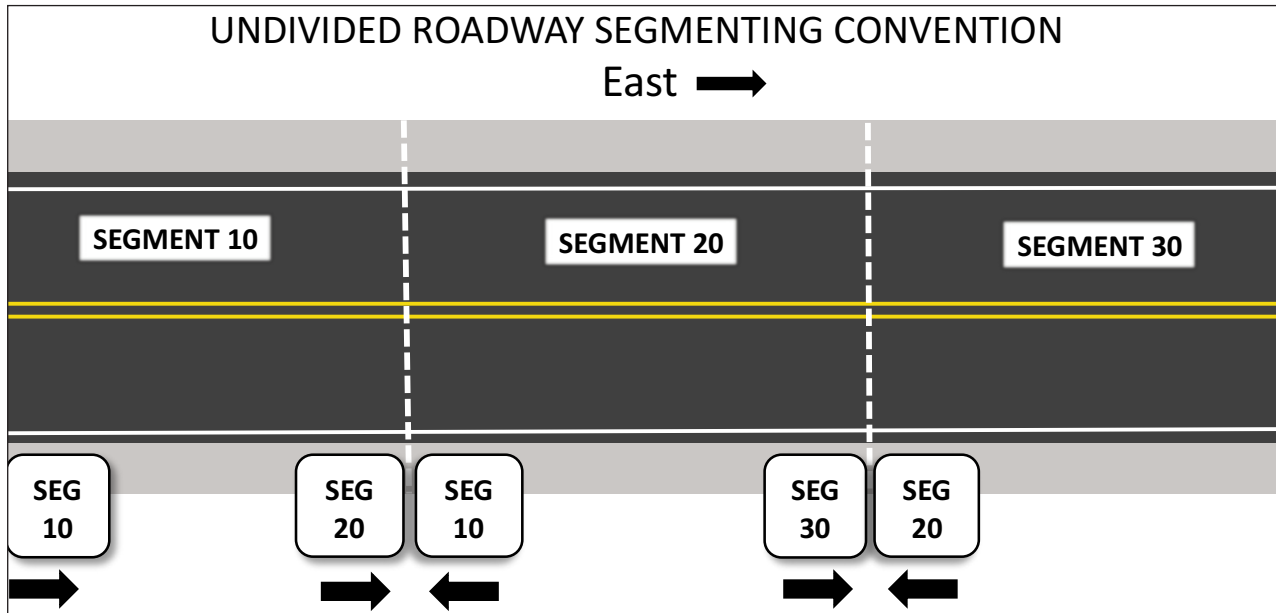
4. WYE's aid the traffic flow at an at-grade intersection, and must be at least 200 feet long. WYE's are given odd numbers if the connecting SR is odd numbered, or branches off the Southbound or Westbound direction of a divided SR; even numbers if the connecting SR is even numbered.
 5. Rest Areas or Truck Escape Ramps are given odd numbers if they connect to the Southbound or Westbound side of an SR, and even numbers if they connect to the Northbound or Eastbound side of an SR.
- E. Hierarchy: If two or more traffic routes occupy (or share) the same section of roadway, the SR number for the section of roadway that is shared is based on the "higher" type route, according to the following hierarchy.
1. Interstates
 2. U.S. Traffic Routes
 3. PA Traffic Routes
 4. Quadrant Routes

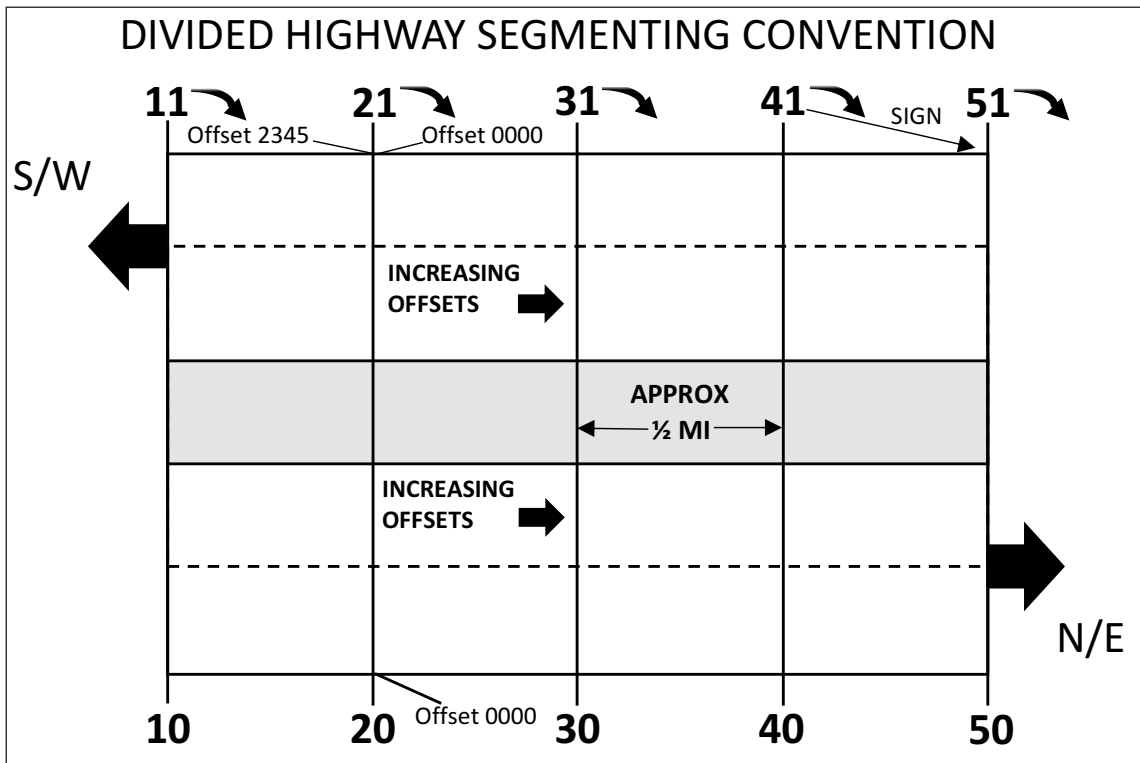
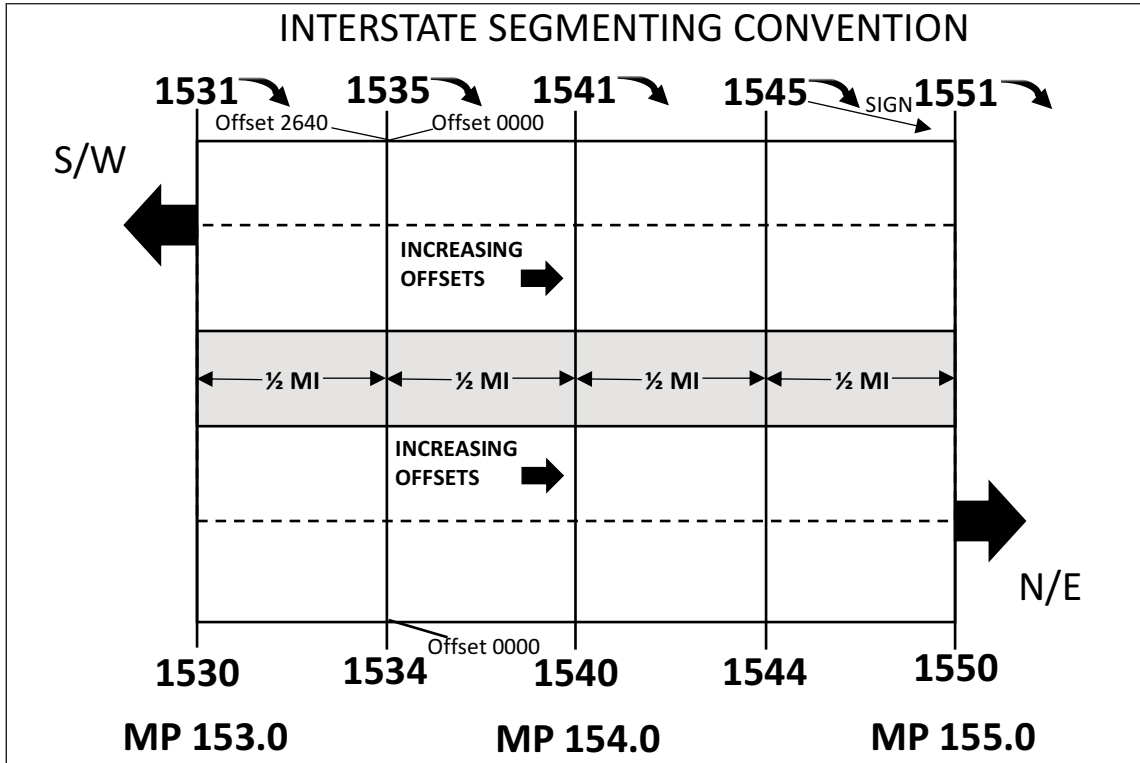
If the traffic routes are the same hierarchy class, then the SR number is assigned the lower numbered traffic route.



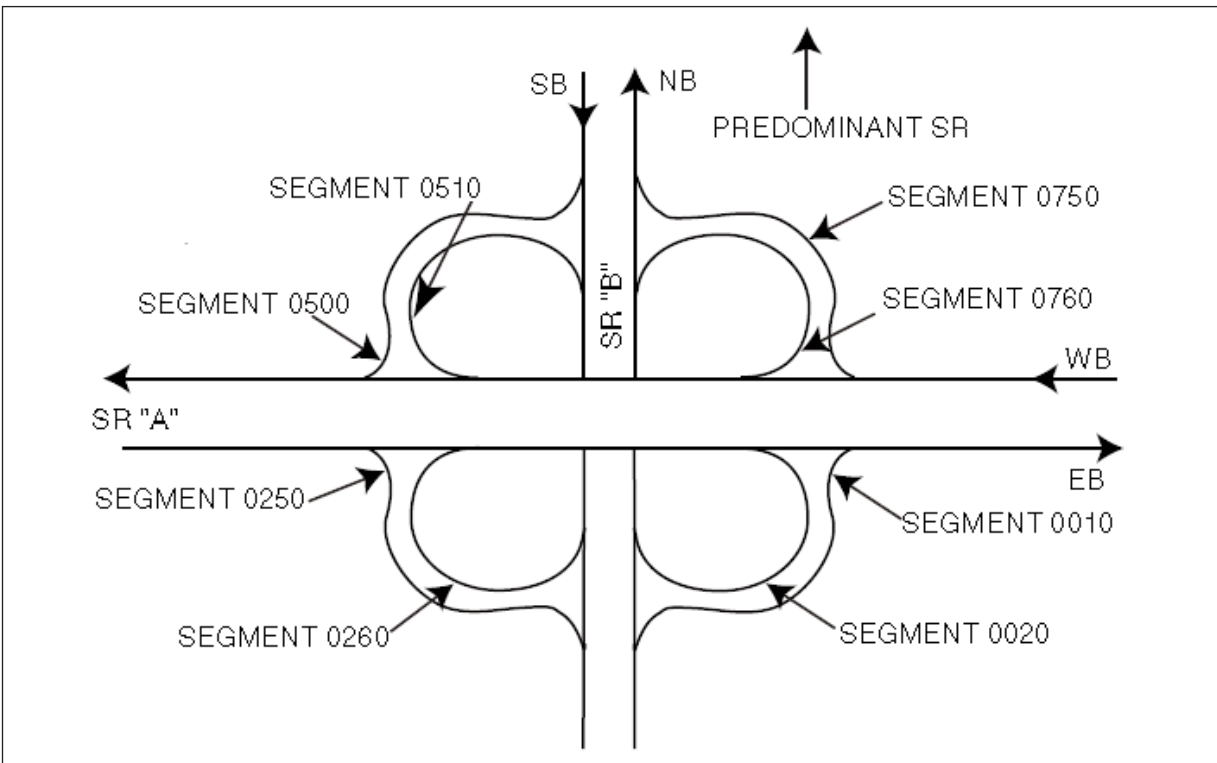
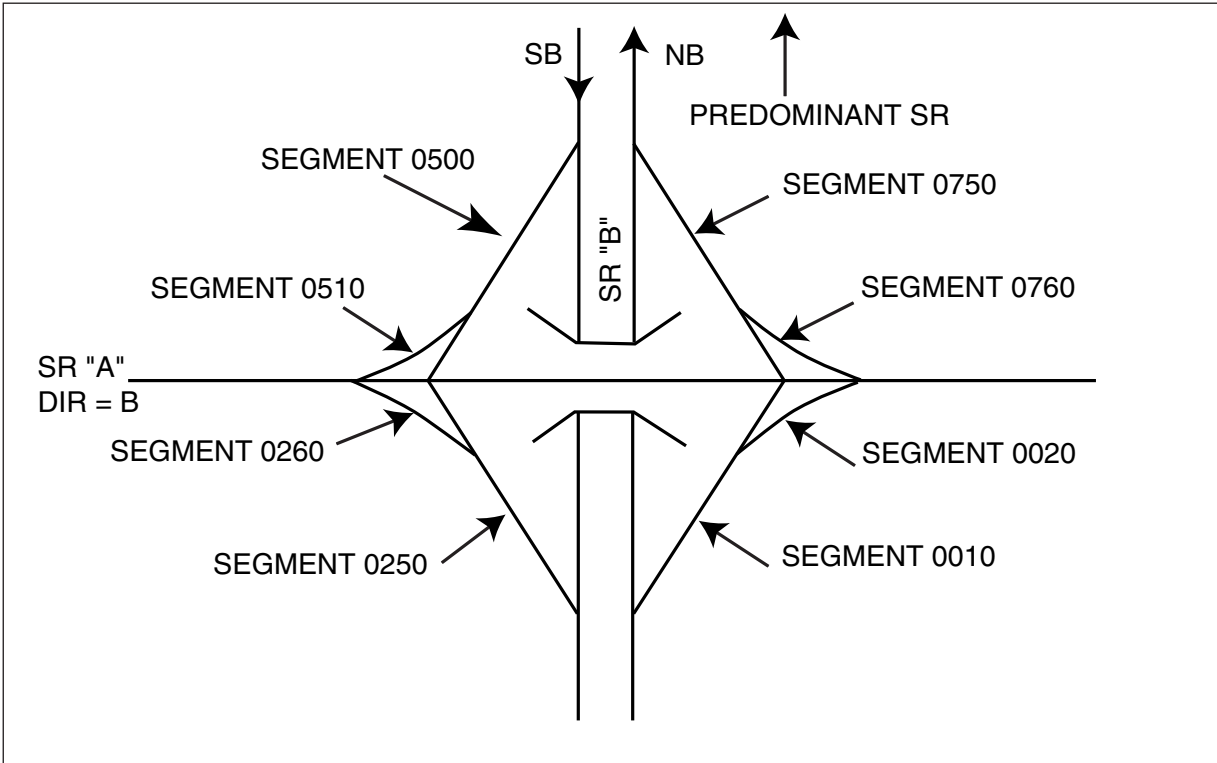
22.4 SEGMENTS (SEG)

- A. A Segment is a section of an SR approximately one-half mile in length.
- B. Segments are usually numbered by 10's, and increase in the North or East direction.
- C. Segments are even numbered on undivided roadways and in the North or East direction of divided roadways. There is a corresponding odd segment in the South or West direction of divided roadways.
- D. The beginning and ending points of Segments are placed at physical features where possible.
- E. Interstate Segmenting is associated with the mile post and half-mile posts.
- F. Segment locations are identified in the field by segment marker signs, which are located according to the segment and offset in the RMS. On the Southbound or Westbound side of divided roadways, segment markers are placed at the "high end" or "high offset" of the segment being entered.

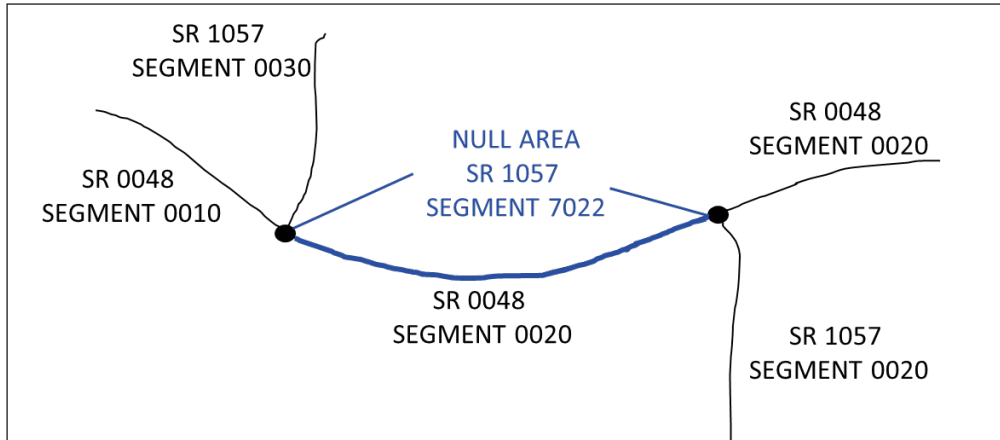




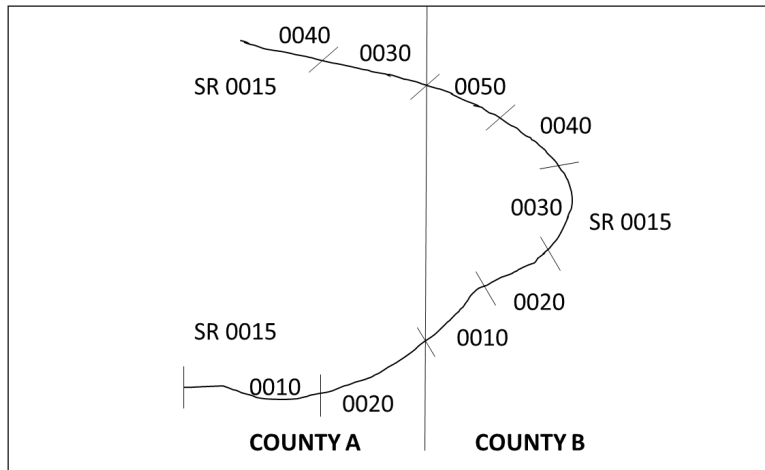
G. Common Interchange Configurations and their Segmentation. Ramps within an interchange are segmented according to the mainline SR's involved. The higher priority mainline route (according to the hierarchy listed in Section 22.3E) will establish the quadrant configuration for the interchange. Quadrants are defined as shown in the following figures:



- H. Null Segments, including Turned Back and Abandoned Segments. When multiple SR's share a section of roadway, the SR assignment is based on the hierarchy from Section 22.3E. All other SR's that share that section of the roadway are considered "Null." Nulls are also used when a portion of a route is not State-owned as in the case of Turnback and Abandoned roadway sections.

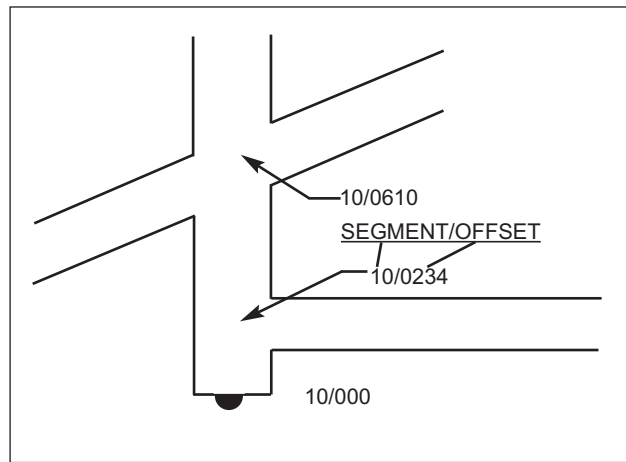


- I. Segment Numbering of Traffic Routes at County Boundaries. When an SR extends into a neighboring County, the segmentation in the second County starts over. If the SR then goes back into the first County, the segmentation picks up where the previous segmentation stopped in that County.



22.5 OFFSETS

Distance in linear feet from the beginning of a segment to a point of interest measured in the INCREASING segment direction.

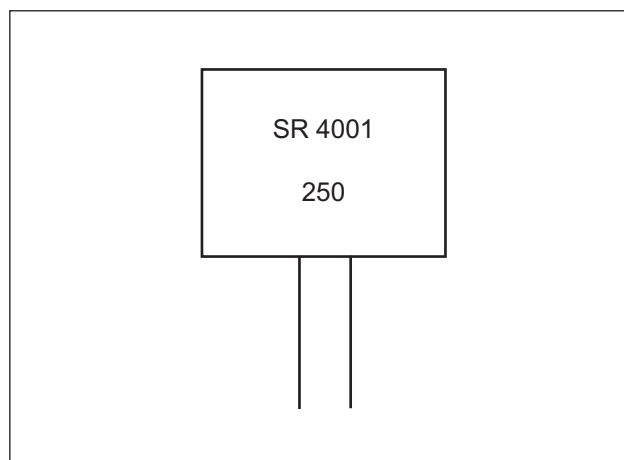


Note: In most cases, the location of a feature is defined as the point where that feature meets the centerline of the route. When the feature is located to the side of the route, the location is defined as the point at which the roadway centerline and an “imaginary” line drawn perpendicular from the centerline to the feature would meet. The Location Referencing System (LRS) Introduction and Technical Manual provides more detail regarding LRS related definitions, codes, and locations. Contact the District RMS Coordinator or the Bureau of Maintenance and Operations, Asset Management Division, Pavement Testing and Asset Management Section, Roadway Inventory and Testing Unit for more information or questions related to the LRS.

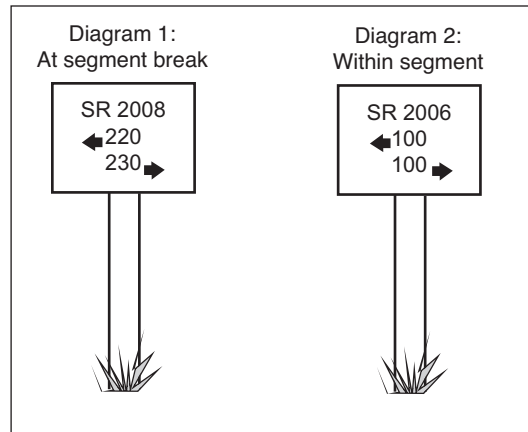
22.6 SEGMENT MARKERS

Identifiable in the field, easy for identification of maintenance/work areas on the State Highway System.

- A. Segment Marker - indicates SR and segment number at the beginning of each segment. If the beginning of a segment occurs at a physical feature, then the point of reference is at the physical feature and NOT the sign.



- B. Intersection - indicates segmentation at the intersection of two or more roadways where at least one roadway is a state-owned highway.

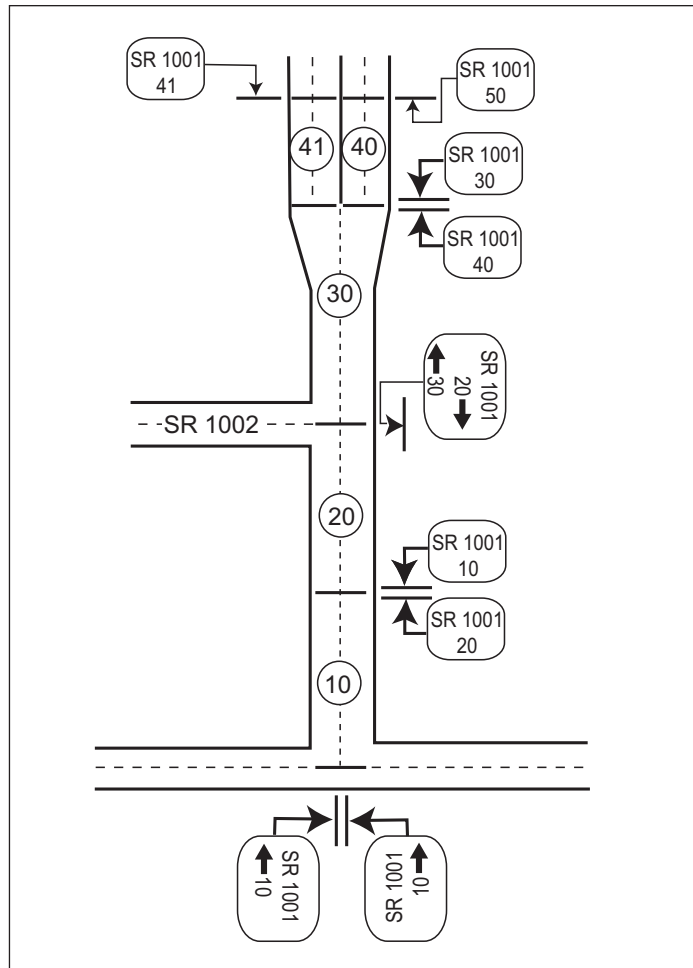


Note: Segment changes at intersections occur at the point that the centerlines of each route intersect. Varying rules apply with regard to intersections of divided routes. Ramps, wyes, rest areas and jug handles begin at the gore area (where pavement meets the unimproved surface). For clarification of a particular intersection, contact the District RMS Coordinator.

- C. SR/Segment Sign Placement - signs that are associated with mileposts, boundaries and sign structures should be located directly on the same sign post or sign structure support truss. Signs associated with Intersections are located diagonally from the center point, to the right and before the intersecting road, and located on an existing intersection sign post when possible.

All other segment signs are placed to the right, corresponding to direction and perpendicular to the center point of the feature.

SAMPLE STATE ROUTE SIGNING



- D. Maintenance – Segment additions, deletions, reversals or adjustments are initiated only by the District RMS Coordinator or the Bureau of Maintenance and Operations, Asset Management Division, Pavement Testing and Asset Management Section, Roadway Inventory and Testing Unit.

If a segment marker is missing, its location is in question, or if changes are necessary, contact the District RMS Coordinator. If required, a work order will be issued by the District RMS Coordinator to facilitate segment marker placement or movement. Under no circumstance should segment markers be placed or moved in the field without receiving a work order from the District RMS Coordinator.

If the Legislative Route (LR) Station paddles, which identify locations according to the former LR method, are still located in the field, they may be removed.