LADOTD LRS ID Procedure
(Revised 12/20/2007)

LADOTD has made the decision to attain an accurate, geo-referenced, topologically correct public road feature. It will consist of state maintained roads and all other public non-state maintained roads (including all divided roads having two independent carriageways at any point, one-way couplets, frontage roads, and ramps or wyes). To support the business needs of the LADOTD, this feature must support linear referencing. To accomplish this, it will be necessary to create a unique identifier (LRS_ID) for each individual linear segment in the public road feature. The "network" of road segments creates a linear referencing system (LRS) that can support a number of different linear referencing methods (LRM) for locating "events" along the roads. These events can be either point features (signs, drains, ITS devices, ITS incidents, *etc*.) or linear features (pavement characteristics, bridges, lane configurations, pavement conditions, *etc*.).

Requirements for creating a unique LRS ID Identifier include:

The ID must be constructed from existing data elements.
The ID format must be consistent across all segments.
The ID should reflect information about each segment and its location.
The ID should be different for each side of divided highways.
The ID should be stable and not subject to change.
The ID should be created with future functionality in mind.

Reference Materials provided by LADOTD:

- The current LADOTD Control Section Manual which describes each unique state maintained roadway segments.

- The current polyline_zm feature **(DOTD_Inventory_GPS)** developed from LADOTD field inventory GPS data representing the "right hand travel lane" of all state maintained roads in both directions of the control section. This feature also represents many of the frontage roads and ramps or wyes that are state maintained. The feature field, **Ramps_Uniq**, will be used to assist in identifying the **Feature Type code** in the LRS ID. This feature is not to be used in determining the spatial accuracy of the new public road feature. For spatial adjustment, the LADOTD Pavement Management GPS data is to be used.

- The current polyline feature **(BM_COUPLETS)** developed from the LADOTD mapping unit couplet data representing the "centerline" of state maintained one-way couplets, digitized in the opposite direction of the control section. This feature contains a unique identifier for each feature based on the LADOTD Control Section Manual.

- The current polyline feature **(BM_DIVIDED)** developed from the LADOTD mapping unit divided highway data representing the "centerline" of state maintained divided highways, digitized in the opposite direction of the control section. This feature contains a unique identifier for each feature based on the LADOTD Control Section Manual.

  Note: All couplets and divided highways identified in current DOTD databases are included in these features; however, there may be additional one-way couplets or divided highways that are not identified by current databases and thus not shown in this feature.

Create the LRS ID Field in the Public Road Feature

The linear referencing ID field, **LRS_ID,** for all public roads, whether state maintained or non-state maintained, must be a text field of **18** characters with No Null values allowed. The format of this field will distinguish state maintained roads from non-state maintained roads as follows:

STATE MAINTAINED ROADS

XXX-XX-F-LLL

The LRS ID for state maintained roads will be created from the existing five-digit Control Section number including a dash between the third and fourth digit (**XXX-XX**), a dash (**-**), the one-digit Feature Type code (**F**), a dash (**-**), and a three-digit number representing the sequential occurrence of the feature (**LLL**). This data will be available in the **(DOTD_Inventory_GPS)** polyline feature provided by the LADOTD.

Note: All state maintained roads will have a twelve (**12**) character LRS ID which will remain as a fixed identification number for each roadway segment. This LRS ID includes the current control section number as LADOTD employees are familiar with and avoids possible confusion between control section numbers and Parish FIPS numbers used to identify non-state maintained roads.

NON-STATE MAINTAINED ROADS

PPPXNNNNNNTTTSFLLL

The LRS ID for non-state maintained roads will be created from the three-digit Parish FIPS number (**PPP**), the one-digit Prefix Code number (**X**), the six-digit Road Name Code number (**NNNNNN**), the three-digit Street Type Code number (**TTT**), the one-digit Suffix Code number (**S**), the one-digit Feature Type code (**F**), and a three-digit number representing the sequential occurrence of the feature (**LLL**). Discontinuous roadway segments of the same name within the same Parish will be unique based on the sequential occurrence number. The Parish FIPS number is determined based on the physical location of the road. The Street naming conventions are found in the existing TIGER data. The Feature Type must be derived from information provided in this document.

Note: All non-state maintained roads will have an eighteen (**18**) character LRS ID which will remain as a fixed identification number for each roadway segment.

Assigning the State Maintained Road LRS ID

1. Using the **(DOTD_Inventory_GPS)** feature representing the "right hand travel lane" of state maintained roads, select the segments in the public road feature corresponding to the main direction of the state maintained control sections. Populate the LRS ID field of the selected road segments with the five-digit control section number including the dash between the third and fourth digit (XXX-XX), a dash (-), the number one (1) for the feature type of segments in the direction of the control section, a dash (-), and the number ten (010) for the sequential occurrence of the features.

2. Once the LRS ID has been determined for the public road feature segments representing the main direction of the state maintained control sections, use the current **(BM_COUPLETS)** polyline feature, the current **(BM_DIVIDED)** polyline feature, and the **(DOTD_Inventory_GPS)** feature to assist in determining the opposite direction of the state maintained control section segments, frontage roads, and connecting ramps of the state maintained roads and the corresponding public road feature segments. Populate the LRS ID field of these corresponding public road feature segments with the five-digit control section number including the dash between the third and fourth digit (XXX-XX), a dash (-), the feature type code (F), a dash (-), and the sequential occurrence number of the features (LLL).

NOTE: The **Ramps_Uniq** field containing the feature type code for state maintained roads is located in the **(DOTD_Inventory_GPS)** feature developed from LADOTD field inventory GPS data.

See the **Items 1, 2, 3, 4, 5 and 6** under the **General Notes** on pages 5-7 to assist in determining the proper codes to use in the LRS ID for **State Maintained and Non-State maintained roads**.

Assigning the Non-State Maintained Road LRS ID

1. The LRS ID for non-state maintained roads must be determined by using data that exists in the public road feature or the source data that LADOTD provides. This process will require intermediate steps to produce codes prior to populating the final LRS ID field.

- A three-digit Parish FIPS code number (PPP) must be assigned for each non-state maintained road based on the parish (county) where the road is located. See **Item 7** under the **General Notes** on page 8.

- A one-digit Prefix Code number (X) must be determined by using the field representing the PREFIX in the public road feature or the source data that LADOTD provides to assign a number to each unique prefix. See **Item 8** under the **General Notes** on page 8.

- A six-digit Road Name Code number (NNNNNN) must be determined by using the fields representing the FEATURE NAME in the public road feature or the source data that LADOTD provides to assign a number to each unique street name. See **Item 9** under the **General Notes** on pages 9-10.

- A three-digit Road Type Code number (TTT) must be determined by using the field representing the FEATURE TYPE in the public road feature or the source data that LADOTD provides to assign a number to each unique road type. See **Item 10** under the **General Notes** on page 11.

- A one-digit Suffix Code number (S) must be determined by using the field representing the SUFFIX in the public road feature or the source data that LADOTD provides to assign a number to each unique suffix. See **Item 11** under the **General Notes** on page 11.

2. The main direction of non-state maintained roads is defined as south to north for roads oriented in that direction and west to east for roads oriented in that direction. The LRS ID for the main direction of the non-state maintained roads can be populated by combining the codes that were determined above (the three-digit Parish FIPS number (PPP), the one-digit Prefix Code number (X), the six-digit Road Name Code number (NNNNNN), the three-digit Street Type Code number (TTT), the one-digit Suffix Code number (S), the one-digit Feature Type code (F), and a three-digit number representing the sequential occurrence of the feature (LLL)).

3. After determining the LRS ID for the main direction of non-state maintained roads, determine the opposite direction, frontage roads, and connecting ramps of the non-state maintained roads and the corresponding public road feature segments. Populate the LRS ID field of these corresponding public road feature segments as described above for the main direction of non-state maintained roads.

Assure that ALL segments in the final improved, geo-referenced public road feature have a twelve (12) character value for state maintained roads and an eighteen (18) character value for non-state maintained roads in the LRS ID field.

Create the LRS (polyline_m) for the Public Road Feature

Using the LRS_ID assigned in the steps above in the Public Road polyline feature, create the LRS (polyline_m) feature to be used for linear referencing. Where available, the polyline_m feature will be based on the actual measured distance of the roadway segments, otherwise the shape lengths of the graphic elements will be used. State maintained measured roadway lengths for the main direction of the road (control section) can be found in the Control Section Manual that is provided by LADOTD.

GENERAL NOTES:

1. Control section numbers have leading zeroes.
   For example, the first control section designated as “001-01” should appear as “001-01” in the first six characters of the LRS ID.

2. The current polyline_zm feature **(DOTD_Inventory_GPS)** developed from LADOTD field inventory GPS data representing the “right hand travel lane” of all state maintained are used to identify and assign control section numbers to the public road feature segments that represent state maintained roads.

3. When assigning the LRS ID value for frontage roads, ramps, and connecting segments at an intersection, all segments receive the control section value of the **priority route**. The one-digit Feature Type code (F) is determined based on the relationship to the **priority route**. Once the control section and feature type values have been determined, a three-digit number representing the sequential occurrence of the feature (LLL) can be determined. The **priority route** is determined based on route system (Interstate, U.S., State, Non-State). If the route system is the same, the lowest route number receives priority. Where two non-state maintained roads are involved, priority is given to the road in the north to south direction. The route number for the state maintained public road feature segment is determined by the **BM_STL_StateMaintainedHighways** feature supplied by the LADOTD.

4. The Feature Type codes (F) used in the LRS ID for both state maintained and non-state maintained roadways are defined below:

Main Roadways

1 = direction of control section or roadway
2 = opposite direction of control section or roadway

Frontage Road Coding for Travel Lane on the right side of the Main Direction of Control Section or Roadway

3 = frontage or service road in the direction of control section or roadway

Frontage Road Coding for Travel Lane on the right side of the Opposite Direction of Control Section or Roadway

4 = frontage or service road in the opposite direction of control section or roadway

Ramp Coding for Travel Lane in the Direction of Control Section or Roadway

A = ON ramp from the right of the roadway
B = ON ramp from the left of the roadway
C = OFF ramp to the right of the roadway
D = OFF ramp to the left of the roadway
E = Ramp off a ramp to the right
F = Ramp off a ramp to the left
G = Ramp on a ramp from the right
H = Ramp on a ramp from the left

Ramp Coding for Travel Lane in the Opposite Direction of Control Section or Roadway

L = ON ramp from the right of the roadway
M = ON ramp from the left of the roadway
N= OFF ramp to the right of the roadway
O = OFF ramp to the left of the roadway
P = Ramp off a ramp to the right
Q = Ramp off a ramp to the left
R = Ramp on a ramp from the right
S = Ramp on a ramp from the left

Connectors

V = High Occupancy Vehicle Roadway (HOV)
X = Cross-over between carriageways of roadways
Z = Contra-flow cross-over between carriageways of roadways

U-Turns are designated as a **Ramp off a Ramp to the Left** for the first half and a **Ramp on a Ramp from the Left** for the second half.

NOTE: See illustrations denoting ramp identification methods on sheets 12 - 16.

Additional Information Concerning RAMPS:

The term “ramp” is used for travel lane connectors or wyes. These segments of roadway are considered a separate travel lane due to a visible obstruction that controls travel. The obstruction may be a raised barrier or it may be delineated by striping indicating the obstruction and separate travel lane. A flared out intersection with no visible obstruction to separate travel lanes is not considered a “ramp”.

At the intersection of roadways, the linear elements must provide connectivity to promote routing in all possible directions of travel. In some cases, this may require “cross-over connectors” to be inserted. These cross-over connectors that provide connectivity to an intersecting roadway should be identified with the ID number of the intersecting roadway. This will provide better routing capability. These connectors are to be treated as a “ramp”. They will be coded with the “ramp” feature type code with the intersecting roadway given priority.

Cross-over connectors that only provide a connection between the main direction and opposite direction of travel should be identified with the ID number of the roadway and the feature type code is an “X” for a true cross-over.

5. The three-digit number representing the sequential occurrence of the feature along the primary direction of the roadway (LLL) will be selected by 10’s with preceding 0’s so that future additions may be added between the existing features if necessary.

   For example, the first feature will be “010”. The second feature will be “020”.
   (This sequencing will be used mostly for couplets, divided highway instances, frontage roads and access ramps.)

6. **Public Ferry Boat codes**

There are 15 public ferry boats in operation in Louisiana. Below is a table showing the Ferry Boat name, the Parish FIPS, and the code to be used to identify these ferry boats:

Ferry Boat Codes:

Ferry Boat Name		Parish FIPS		Ferry Boat Code
GRETNA/JACKSON AVE FERRY		071		721-01-1-010
CANAL STREET/ALGIERS FERRY		071		721-03-1-010
LOWER ALGIERS/CHALMETTE FERRY		071		721-05-1-010
NEW ROADS/ST. FRANCISVILLE FERRY		125		735-03-1-010
EDGARD/RESERVE FERRY		095		735-06-1-010
PLAQUEMINE FERRY		047		735-07-1-010
MELVILLE FERRY		097		735-08-1-010
MONKEY ISLAND FERRY		023		735-09-1-010
DUTY/ENTERPRISE FERRY		025		735-10-1-010
WHITE CASTLE FERRY		047		735-13-1-010
ANGOLA PRISON FERRY		125		735-14-1-010
CAMERON FERRY		023		735-17-1-010
BELLE CHASSE/SCARSDALE FERRY		075		F05111010
POINT LA HACHE FERRY		075		F05121010
AVACA ISLAND/MORGAN CITY FERRY		101		F10111010

NOTE: All characters in the non-state maintained roadway LRS ID will be used. Each code used for this LRS ID use preceding 0's to insure the use of all 18 characters.

NOTE: The contractor should supply LADOTD with the final list of names and codes used in the LRS ID of non-state maintained roads for the categories listed in Items #7 through #11 so that LADOTD personnel can continue to maintain this information. Any questions concerning these codes should be addressed with the designated LADOTD contact.

7. The three-digit Parish FIPS numbers (PPP) were established by the National Institute of Standards and Technology. This applies to all non-state maintained roads. In the case of a roadway falling on a parish boundary, use the Parish FIPS for the parish to the south side or the east side of the road depending on direction of travel (west to east or south to north). Below is a list of all Parishes and their Parish FIPS numbers:

Acadia	001	Grant	043	Sabine	085
Allen	003	Iberia	045	St. Bernard	087
Ascension	005	Iberville	047	St. Charles	089
Assumption	007	Jackson	049	St. Helena	091
Avoyelles	009	Jefferson	051	St. James	093
Beauregard	011	Jefferson Davis	053	St. John the Baptist	095
Bienville	013	Lafayette	055	St. Landry	097
Bossier	015	Lafourche	057	St. Martin	099
Caddo	017	Lasalle	059	St. Mary	101
Calcasieu	019	Lincoln	061	St. Tammany	103
Caldwell	021	Livingston	063	Tangipahoa	105
Cameron	023	Madison	065	Tensas	107
Catahoula	025	Morehouse	067	Terrebonne	109
Claiborne	027	Natchitoches	069	Union	111
Concordia	029	Orleans	071	Vermilion	113
DeSoto	031	Ouachita	073	Vernon	115
E. Baton Rouge	033	Plaquemines	075	Washington	117
East Carroll	035	Pointe Coupee	077	Webster	119
East Feliciana	037	Rapides	079	West Baton Rouge	121
Evangeline	039	Red River	081	West Carroll	123
Franklin	041	Richland	083	West Feliciana	125
				Winn	127

8. The one-digit Prefix Code number (X) should use the “Prefix field” in the public road feature to assign a number for each unique prefix value. This applies to all non-state maintained roads. If a road does not have a Suffix, the number will be “1”.
Below is a **sample list** of Suffix Code Numbers:

Prefix	Number
	1
E	2
W	3
S	4
N	5
NE	6
SE	7
SW	8
NW	9

9. The six-digit Road Name Code number (NNNNNN) should use the “fields” in the public road feature that defines the FEATURE NAME to assign a number to each unique road name. This applies to all non-state maintained roads. If a roadway does not have a Road Name listed, the number will be “000001”. Below are two **sample lists** of Feature Name Code Numbers:

The list of names and their corresponding codes should be supplied to LADOTD so that this list can be maintained as additional road names are established in the database.

Sample ONLY:

Feature Name	Number		Feature Name	Number		Feature Name	Number
	000001		124th	000041		150th	000081
03RURAL	000002		125th	000042		151st	000082
1	000003		126th	000043		152nd	000083
1 Hornet	000004		127	000044		153rd	000084
10	000005		127th	000045		154th	000085
10 Mile	000006		128th	000046		155th	000086
10 Row	000007		129	000047		156th	000087
100 Clear Creek	000008		129th	000048		157th	000088
100 St	000009		12th	000049		158th	000089
100th	000010		12th A	000050		159th	000090
101 Outback	000011		13	000051		15th	000091
101st	000012		130th	000052		160th	000092
102nd	000013		131st	000053		161st	000093
103rd	000014		132nd	000054		162nd	000094
104th	000015		133rd	000055		163rd	000095
106th	000016		134th	000056		164th	000096
107th	000017		135th	000057		165st	000097
108th	000018		136th	000058		165th	000098
109th	000019		137th	000059		166th	000099
10M Edwards	000020		138th	000060		167th	000100
10st	000021		139th	000061		168th	000101
10th	000022		13th	000062		169th	000102
11 Pines	000023		13th	000063		16th	000103
110th	000024		13th Street	000064		16th Section	000104
111th	000025		140th	000065		170th	000105

Sample ONLY:

Feature Name	Number		Feature Name	Number		Feature Name	Number
Magnate	025101		Mahaffey	025141		Maison Orleans	025181
Magness	025102		Mahan	025142		Maison Ridge	025182
Magnifique	025103		Maharry	025143		Maison Rue	025183
Magnola	025104		Mahaw	025144		Majean	025184
Magnolia	025105		Mahfooz	025145		Majestic	025185
Magnolia Banks	025106		Mahlay	025146		Majestic Oak	025186
Magnolia Beach	025107		Mahler	025147		Majestic Oaks	025187
Magnolia Bend	025108		Mahlon	025148		Majic	025188
Magnolia Blossom	025109		Mahogany	025149		Major	025189
Magnolia Bluff	025110		Mahon	025150		Major Bonnette	025190
Magnolia Bridge	025111		Mahone	025151		Major Dixon	025191
Magnolia Camp	025112		Mahoney	025152		Major Doughty	025192
Magnolia Cemetery	025113		Mai Frances	025153		Major Farm	025193
Magnolia Chase	025114		Maid Marian	025154		Major Oak	025194
Magnolia Church	025115		Maid Marien	025155		Major Oaks	025195
Magnolia Courtyard	025116		Maid Marion	025156		Majorie	025196
Magnolia Farm	025117		Maid Stone	025157		Majors	025197
Magnolia Farms	025118		Maiden	025158		Makar	025198
Magnolia Gardens	025119		Mailbox	025159		Mako Nako	025199
Magnolia Heights	025120		Mailhes	025160		Malain	025200
Magnolia Lawn	025121		Main	025161		Malapart	025201
Magnolia Line	025122		Main Line	025162		Malatak	025202
Magnolia Marble	025123		Main Project	025163		Malaudos	025203
Magnolia Mound	025124		Main St	025164		Malborough	025204
Magnolia Oaks	025125		Main St Ext	025165		Malbrough	025205
Magnolia Park	025126		Main Street Boliver	025166		Malby	025206
Magnolia Ridge	025127		Maine	025167		Malcolm	025207
Magnolia School	025128		Mainegra	025168		Malcolm Bertrand	025208
Magnolia Trace	025129		Maines	025169		Malcolm Jerry	025209
Magnolia Wood	025130		Mains L	025170		Malcolm Moses	025210
Magnolia Woods	025131		Maintenance	025171		Malcolm Smart	025211
Magnolialake	025132		Mair	025172		Malcolm Turner Park	025212
Magnon	025133		Maire	025173		Malcom	025213
Magnum	025134		Mairi	025174		Malcomb	025214
Magolia	025135		Maise	025175		Malcombe	025215
Magoun	025136		Maison	025176		Maleda	025216
Magpie	025137		Maison Belle	025177		Malgum	025217
Magrata	025138		Maison Dans Lebois	025178		Malibou	025218
Maguerite	025139		Maison Deville	025179		Malibu	025219
Magun	025140		Maison Dville	025180		Malick	025220

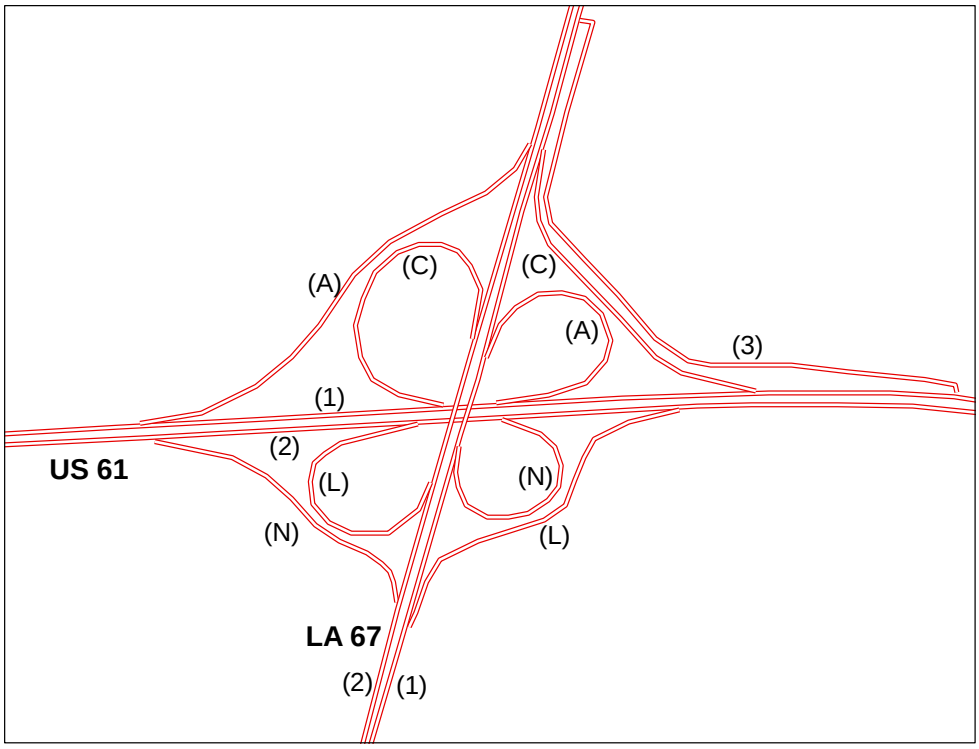
10. The three-digit Road Type Code number (TTT) should use the “Feature Type field” in the public road feature to assign a number to each unique road type. This applies to all non-state maintained roads. If a roadway does not have a Road Type listed, the number will be “001”. Below is a **sample list** of Road Type Code Numbers:

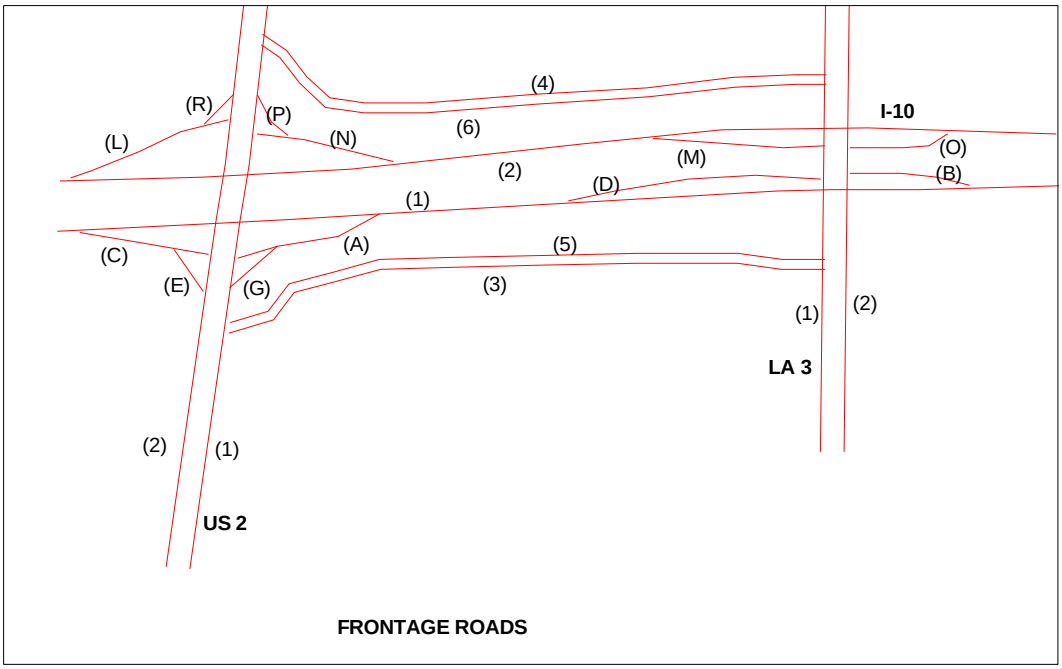
Feature Type	Number		Feature Type	Number		Feature Type	Number
	001		FMRd	017		Run	033
Aly	002		Fwy	018		Spur	034
Arc	003		Hwy	019		Sq	035
Ave	004		Ln	020		St	036
Blvd	005		Loop	021		Ter	037
Br	006		Ovps	022		Thwy	038
Brg	007		Pass	023		Tpke	039
Byp	008		Path	024		Trce	040
Cir	009		Pkwy	025		Trl	041
Cres	010		Pl	026		Trwy	042
Cswy	011		Plz	027		Tunl	043
Ct	012		Ramp	028		Walk	044
Ctr	013		Rd	029		Way	045
Cv	014		Row	030		Xing	046
Dr	015		Rte	031		Xrds	047
Expy	016		Rue	032			

11. The one-digit Suffix Code number (S) should use the “Suffix field” in the public road feature to assign a number for each unique suffix value. This applies to all non-state maintained roads. If a road does not have a Suffix, the number will be “1”.
Below is a **sample list** of Suffix Code Numbers:

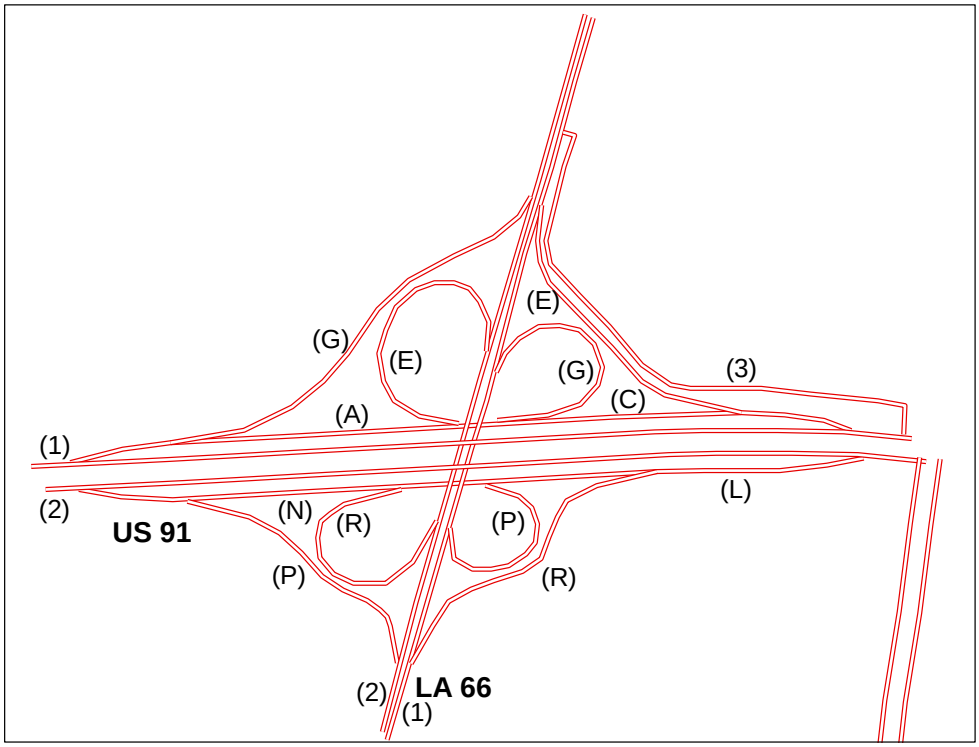
Suffix	Number
	1
E	2
S	3
W	4
N	5
SW	6
NE	7
SE	8
NW	9

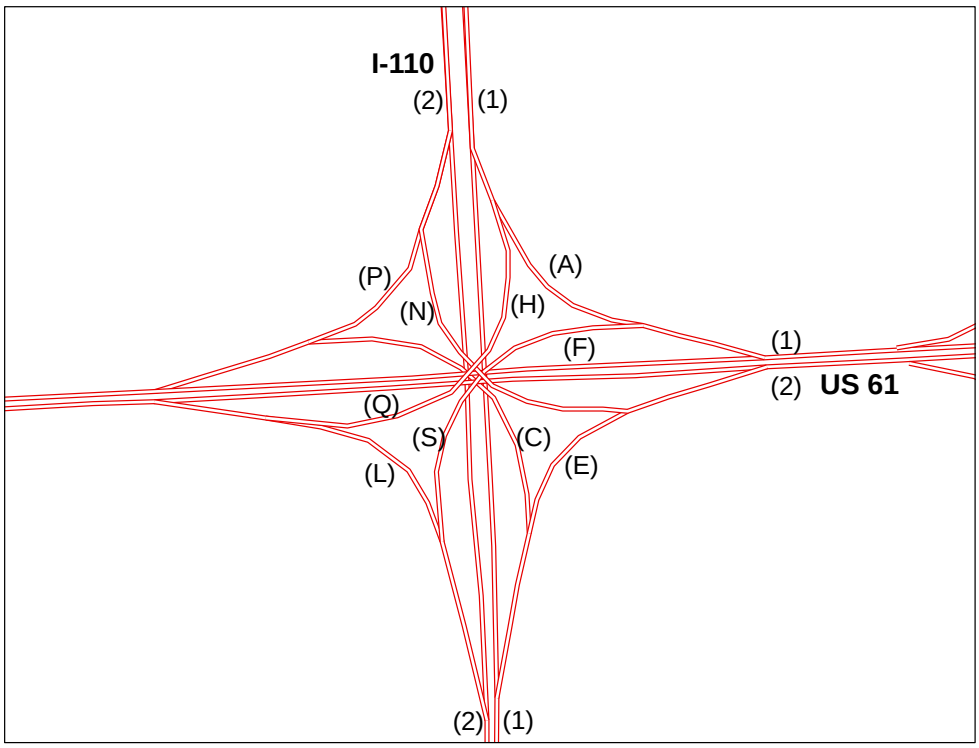
Pictures detailing the identification methods of common ramps.



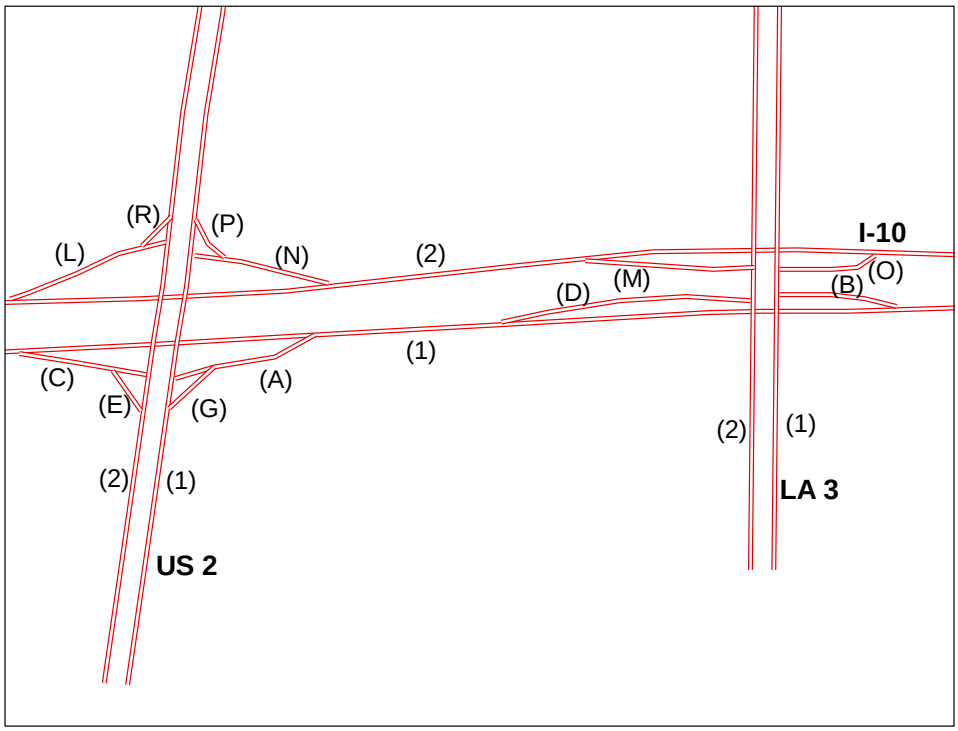


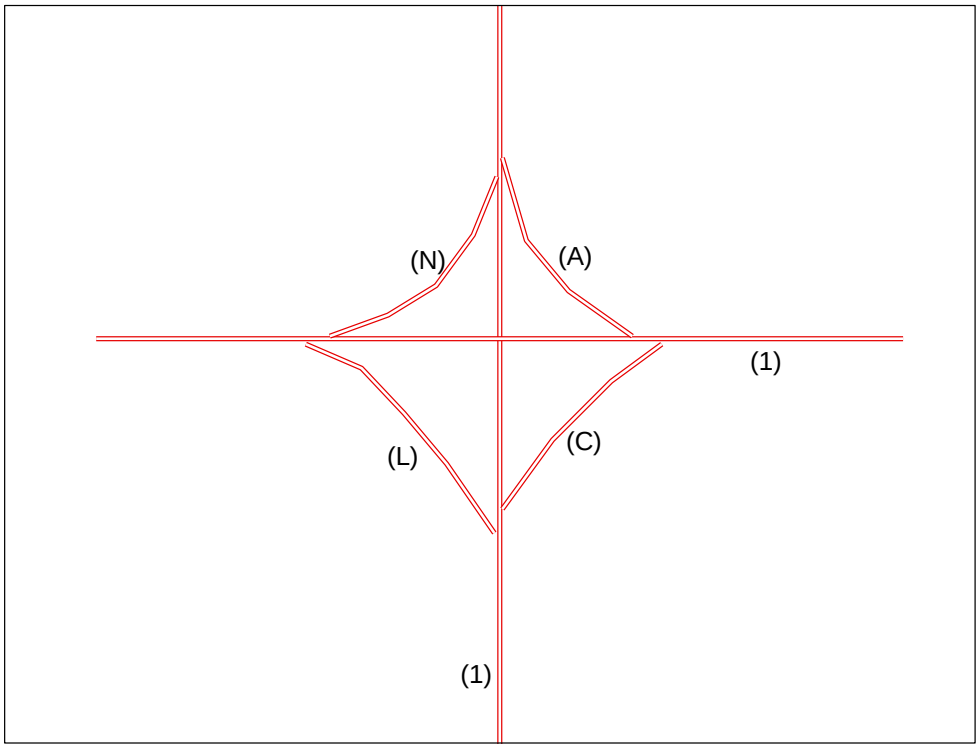
Pictures detailing the identification methods of common ramps.



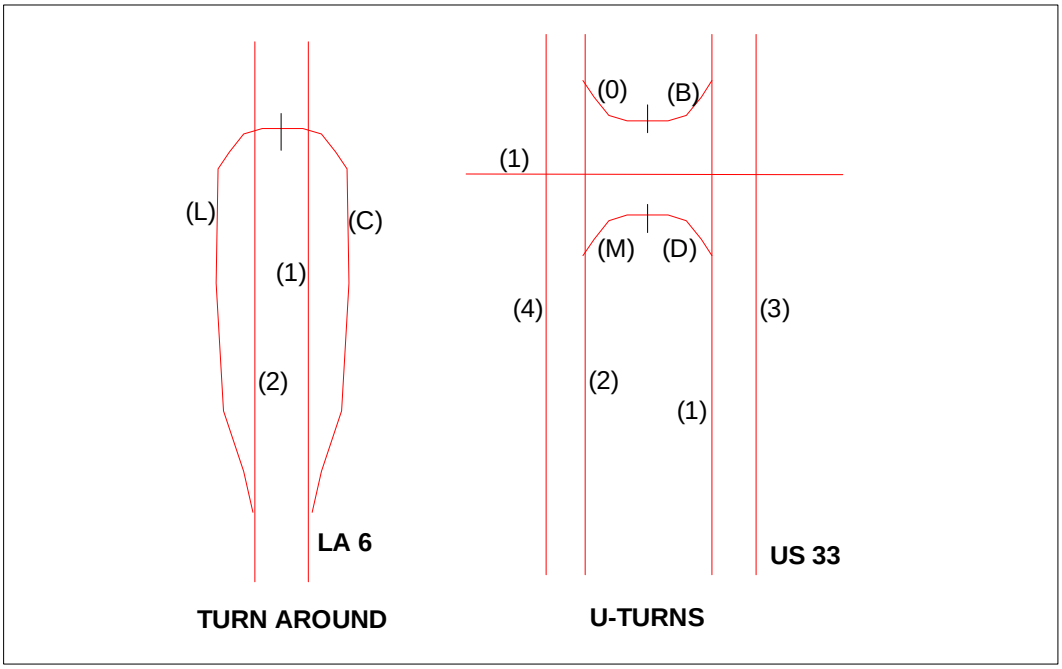


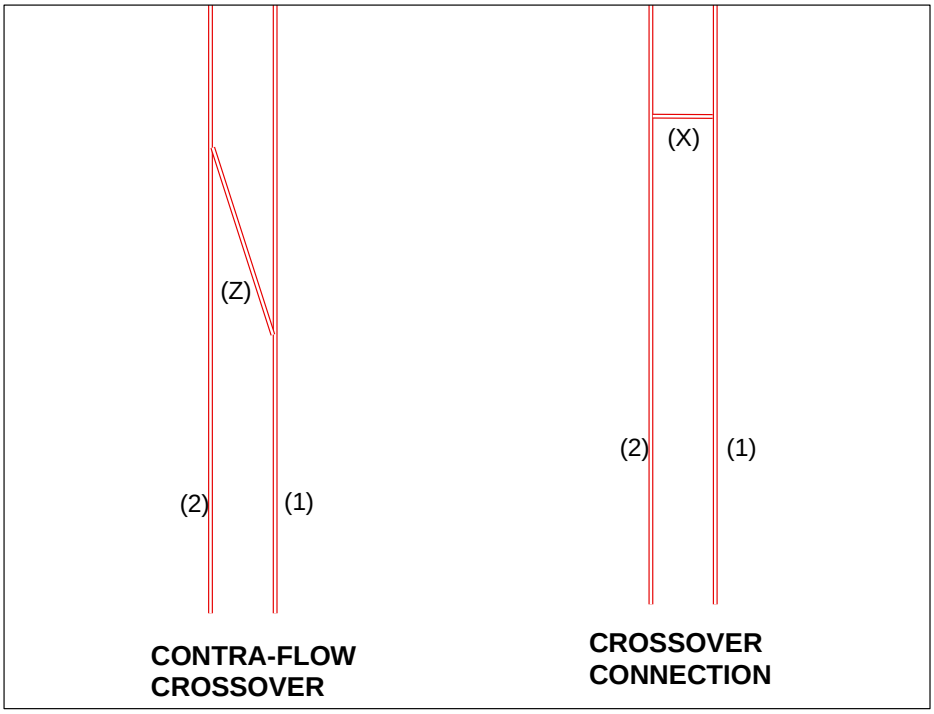
Pictures detailing the identification methods of common ramps.





Pictures detailing the identification methods of common ramps.





Pictures detailing the coding methods of ramps on state maintained and non-state maintained roads showing the considerations to priority of roadway identification.