

## STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

**Administrative Circular No. 16-90**

<b>SUBJECT</b>	Procedure for Installation and Maintenance of Uniform Reference Markers		
<b>TO</b>	Deputy Directors, District Engineers and Division Heads		
<b>REFERENCE</b>	Administrative Order No. 30-88		
<b>RESPONSIBLE OFFICE</b>	Transportation Planning Division (D-10)	<b>DATE</b>	August 20, 1990

**Background**

The initial installation of the reference markers on the state maintained highway system is outlined in Administrative Circular No. 1-90 and should be completed by August 31, 1990. On the interstate highways, the existing mileposts will serve as the reference markers without modification.

This Administrative Circular describes the Reference Marker Number (RMN) System and sets required procedures to maintain a uniform posting system for use in collecting data along the highway. These procedures are for districts and The Transportation Planning Division to use when new reference marker numbers need to be assigned after the initial installation. Districts must also include reference marker numbers on all PS&E packages currently being submitted.

**Definitions****Reference Marker Number (RMN) System**

A posting of numbers on each highway so that the number plus the route number provides a unique reference to the specific location on that highway.

**Primary Markers**

For single roadway highways:

are all reference markers

For divided highways:

are located on the side of the highway where the reference marker numbers (RMNs) increase. Numbers increase west to east and north to south except for interstate highways which increase south to north.

**Reference Markers**

- Identify a specific physical location.
- Provide continuous reference marker numbering across the state to precisely identify highway sections and to provide a consistent method for the department, the Department of Public Safety and other interested parties to report, store, and access information
- Allow highway routing changes and roadway additions without major changes to the marker numbers.
- Minimize future post renumbering in the field.

## Reference Marker Locations

Reference markers shall be located:

- On all routes regardless of length
- On both sides of reassurance route marker supporting posts, two inches below the route marker so it is visible to drivers on both sides of the road.

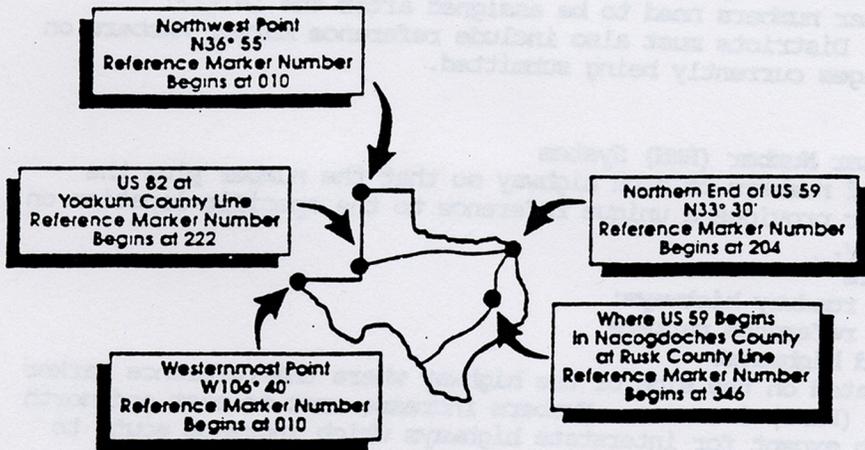
Reference markers may be located:

- On frontage roads
- On roadbeds opposite the primary marker on divided highways (desirable)
- Approximately every two miles or less on alternating sides of single roadway highways

## Reference Marker Numbering System

Reference marker numbers (RMNs) are derived by imposing a grid on a map of Texas. Grid axes are set on extreme western and northern points, where numbering begins with ten. The first RMN, which will be assigned by D-10 for a given route, matches an approximate grid location. Subsequent RMNs normally increase by two. Numbers increase north to south and west to east, depending on the highway's general direction (except north-south interstates, where numbers increase south to north.) The numbers are continuous from beginning to end across the state and do not start over at county lines.

Example: US 82 begins at RMN 222 on the western edge of Yoakum county and ends at RMN 798 on the eastern edge of Bowie county.



## District Coordination

D-10 is responsible for coordinating procedures. The district reference marker coordinator shall notify D-10 whenever a reference marker is moved, renumbered, removed or added, or whenever questions need to be resolved. Notification guidelines shall be in accordance with current procedures as specified by D-10.

---

## Process for Assigning Reference Marker Numbers

---

1. District reference marker coordinators must submit a request to the Transportation Planning Division (D-10) reference marker coordinator for an assignment of RMNs for all projects that:
    - create a new route
    - affect the reference marker's location on a current route (changes in the distance from route origin, route realignment etc.)
  2. Districts should include the following with their request:
    - Approved schematics
    - Any reference marker numbering scheme previously agreed to by telephone with D-10
    - Identification of all concurrent routes
    - Disposition of an old section of a route (ie, deletion, redesignation) with commission approval
  3. D-10 will assign at least the beginning reference marker and return this information to the districts.
  4. Districts will:
    - Determine the number of markers needed and assign the subsequent number(s).
    - Include the RMNs and their locations in all plans, specifications and estimates packages
    - Install the reference markers before opening either a new route or a realigned route to traffic.

NOTE: All signs posted must agree with the highway designation.
    - Notify D-10 of the location of additional reference markers which are needed or desired on an existing route.

Example: Adding reference markers at closer intervals along a route, or to extended sections of routes. Accuracy will be at .01 mile from a known location like the primary marker.

NOTE: Use vehicles with calibrated distance measuring instruments (DMI's) or other more accurate distance measuring equipment. Take measurements while traveling on the inside lane in the direction of increasing RMNs if possible.
    - Notify D-10 of a change in the reference marker numbering scheme in the event that RMNs must be reversed on an existing route.
    - NOT MOVE reference markers once they are physically in the ground unless absolutely necessary. In the event that a reference marker must be moved, districts must notify D-10 of the new location. A letter suffix must be added to the RMN (See figure 7.2A for an exception.)
    - Post reference markers on temporary posts during roadway maintenance or construction work.

NOTE: If reference markers are removed due to roadway work, accidents, or for any other reason, the markers should be replaced in the same location as soon as possible.
-

---

 Highway System Hierarchy
 

---

Interstate Highway  
 US Highway  
 US Highway Alternate  
 US Highway Spur  
 OGR  
 NASA  
 State Highway  
 State Highway Alternate  
 State Highway Loop  
 State Highway Spur  
 Beltway  
 \* Off Interstate Business Highway  
 \* Off US Business Highway  
 Off State Business Highway  
 Off Farm to Market Business Road  
 Farm to Market Road  
 Ranch to Market Road  
 Ranch Road  
 Farm to Market Road Spur  
 Ranch to Market Road Spur  
 Ranch Road Spur  
 Park Road  
 Recreation Road  
 Recreation Road Spur  
 Principal Arterial Street System ( PASS )  
 Metropolitan Highway

{ = routes are of equal value for signing, concurrent routing, data collection and reference marker posting

Concurrent route signing that does not conform to this hierarchy must be corrected to avoid inaccurate data reporting.

- \* 'Off-Business Interstate Highway' and 'Off-Business US Highway' are state designations and therefore do not conform to AASHTO guidelines. For more information on business route designations, refer to minute order no. 89979, administrative circular no. 4-90, and sign designs for Off-Business routes.

---

Reference Marker Numbers are assigned:

---

- 1 When a new route is developed in sections (pages 6 & 7)
- 2 When two different routes are joined (pages 8 & 9)
- 3 When a route is extended (page 10)
- 4 When a route is realigned (page 11,12 & 13)
- 5 For business routes and spurs that have parent routes (page 14)
- 6 For circumferential routes (page 14)
- 7 When an existing reference marker is moved (page 15)
- 8 When there are concurrent routes (page 16)

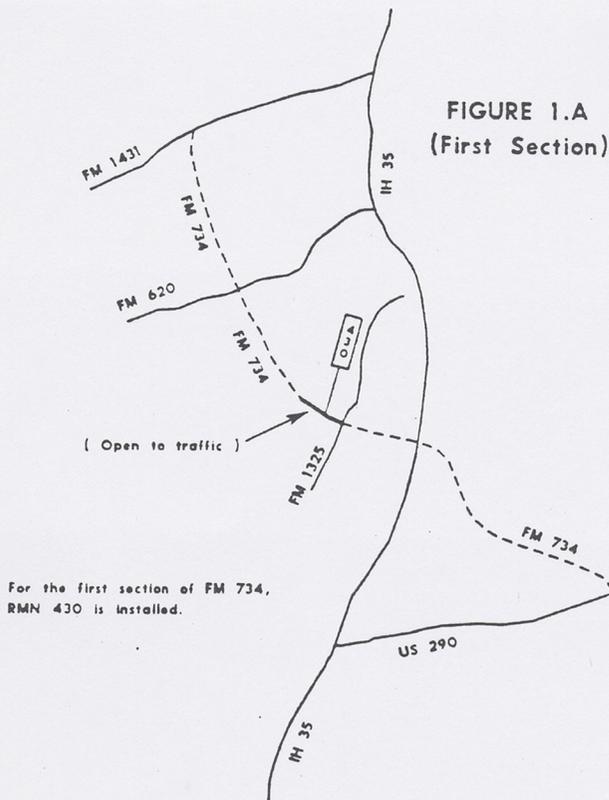
The identified pages contain examples and figures.

NOTE: The figures are not drawn to scale

## Assignment of Reference Marker Numbers

## 1 When a new route is developed in sections

- The first reference marker number is assigned by D-10 ( Figure 1.A )

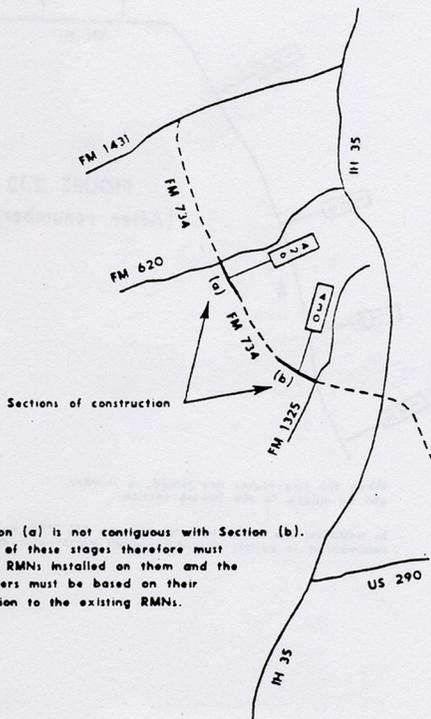


## Assignment of Reference Marker Numbers

## 1 When a new route is developed in sections

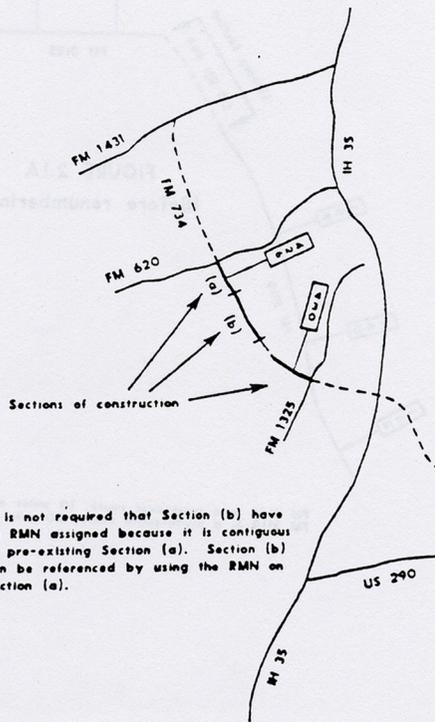
- Additional sections of a route which are not contiguous with any other section(s) shall have an RMN assigned to them and these RMNs shall be numbered based on their relationship to the existing RMNs ( Figure 1.B )
- Additional sections of a route which are contiguous with other section(s) can use pre-existing RMNs as their location keys ( Figure 1.C )

FIGURE 1.B  
(Successive Section)



Section (a) is not contiguous with Section (b). Each of these stages therefore must have RMNs installed on them and the numbers must be based on their relation to the existing RMNs.

FIGURE 1.C  
(Successive Section)



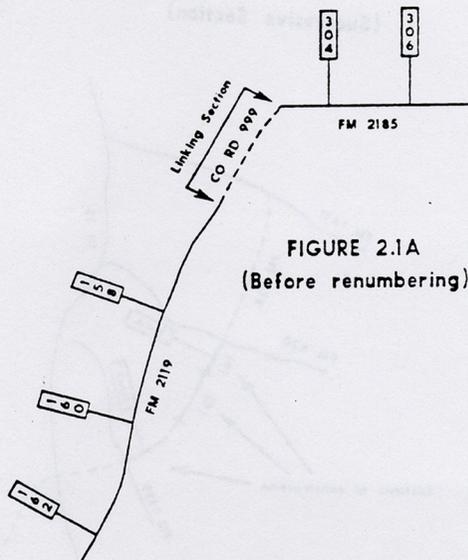
It is not required that Section (b) have an RMN assigned because it is contiguous to pre-existing Section (a). Section (b) can be referenced by using the RMN on Section (a).

## Assignment of Reference Marker Numbers

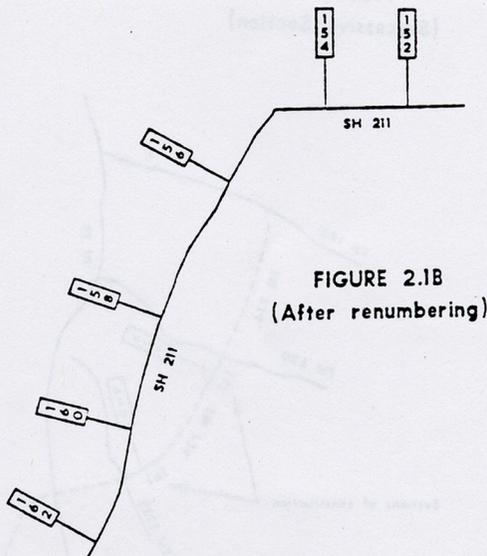
## 2 When two different routes are joined

- New markers can be placed on the linking section of the joined route. These shall be approximately two miles from markers on the original routes.
- The new combined route will be numbered or a section renumbered in accordance with the overall route direction.

**Example 1:** If a section is to be renumbered, the location of the markers will stay the same, if possible, but the RMN will change.



FM 2185 is a west-east route, 10 miles in length.  
FM 2119 is a north-south route, 50 miles in length.



When the two routes are joined, a marker can be added to the linking section.

In addition, the RMNs on original-route FM 2185 must be renumbered to reflect the new overall north-south direction.

Assignment of Reference Marker Numbers

2 When two different routes are joined

Example 2: The distance between existing markers is more than two miles, but the numbers were already in contiguous order ( Figure 2.2A ). Choices for dealing with the linking section include:

- Adding an additional marker between existing markers ( Figure 2.2B ) **OR**
- Moving existing reference markers closer together ( Figure 2.2C ) **OR**
- Moving existing reference markers closer together **AND** adding additional markers ( Figure 2.2D )

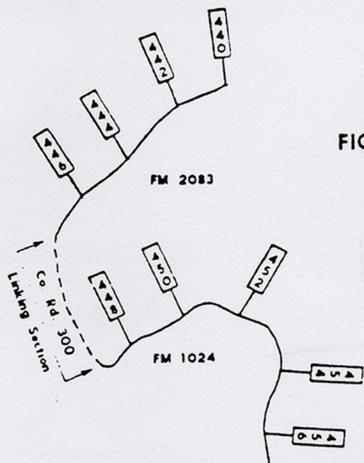


FIGURE 2.2A

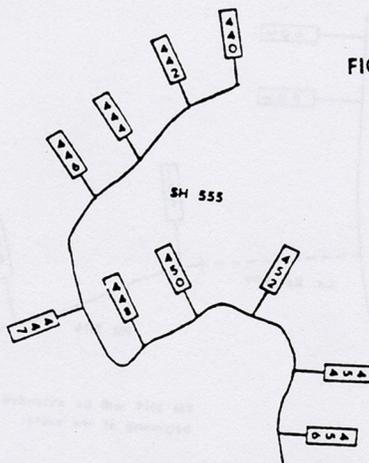


FIGURE 2.2B

When the two routes are joined, a large distance is created between the markers closest to the linking section.

New RMN 447 is added to the route in the linking section

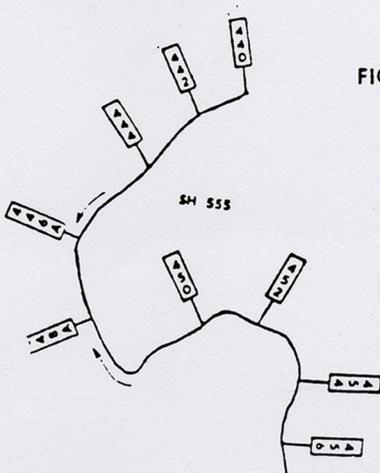


FIGURE 2.2C

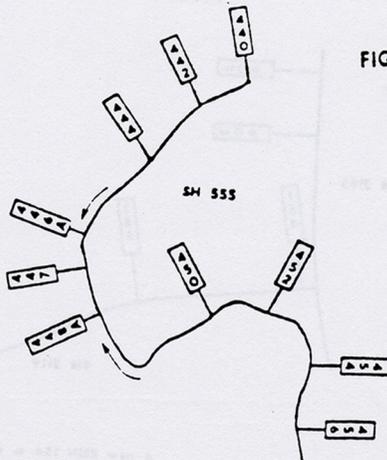


FIGURE 2.2D

Markers 446 and 448 are physically moved to fill in the interval. They

A combination of adding a new RMN and of moving existing markers is used.

## Assignment of Reference Marker Numbers

## 3. When a route is extended

- Add reference markers to the new section if needed or desired.

**Example:** Add a reference marker if the distance between existing markers is greater than two miles between:

- The beginning of the route and the first marker
- The end of the route and the last marker

FIGURE 3.A

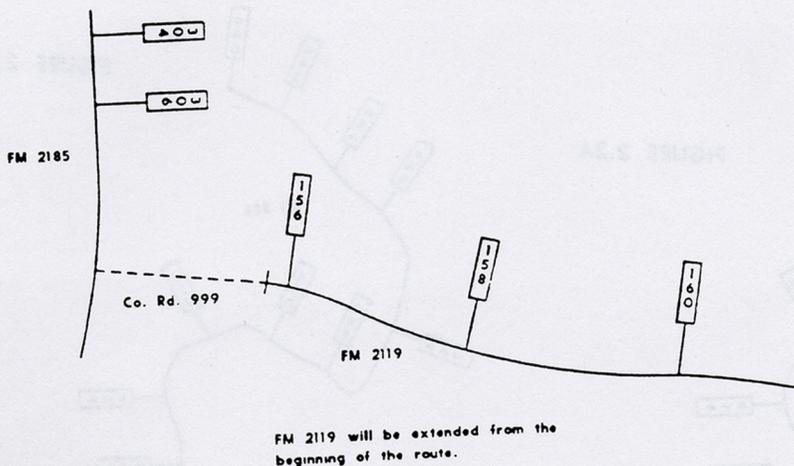
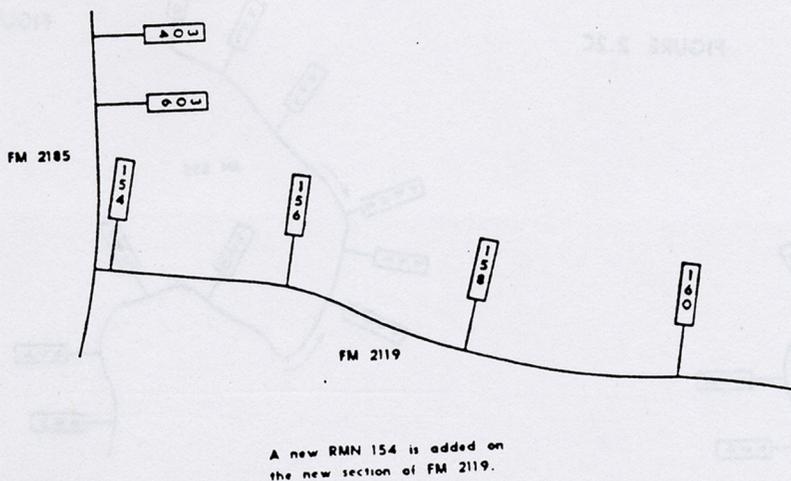


FIGURE 3.B

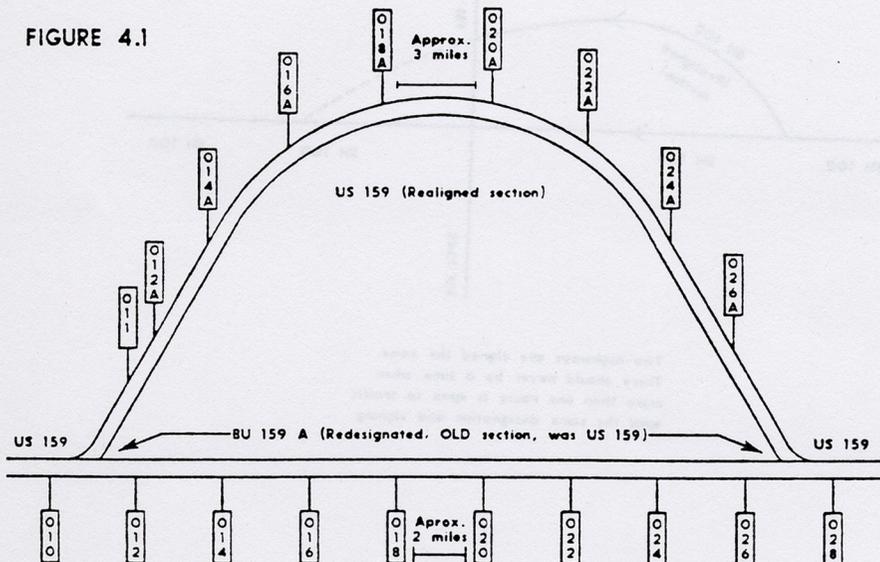


## Assignment of Reference Marker Numbers

## 4. When a route is realigned

- The realigned section will have the same RMNs, but will have a letter suffix added
- If necessary, markers on the realigned section can be spaced or added so that no renumbering is required
- The old section retains the same RMNs and locations if possible

Example 1: A route is realigned and the old section is redesignated.



The RMNs on the realigned section of US 159 are spaced so that the original numbering scheme is not disturbed. Also, RMN O11 is added, but not required.

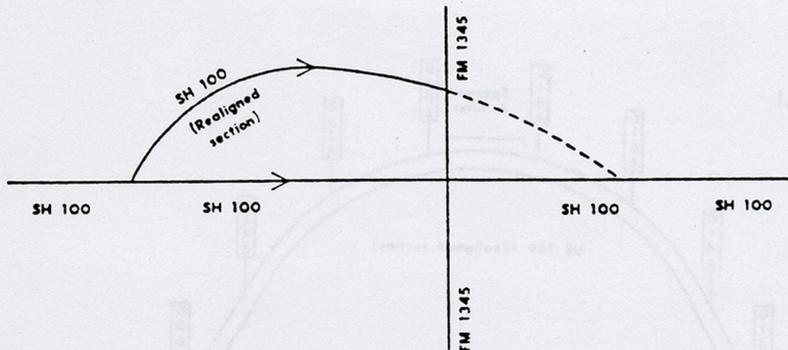
## Assignment of Reference Marker Numbers

## 4. When a route is realigned

- Routes must not be open at the same time with the same designation

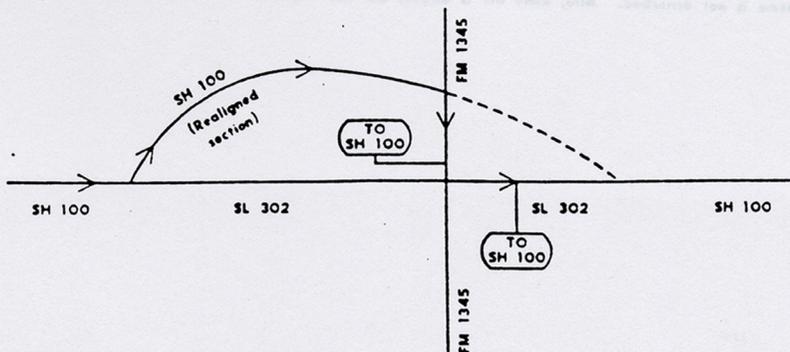
**Example 2:** A route is realigned. Figure 4.2A, the incorrect approach, leaves two routes open at the same time with the same designation. Figure 4.2B is the correct approach showing the redesignation of the old section.

FIGURE 4.2A  
(Incorrect Approach)



Two highways are signed the same. There should never be a time when more than one route is open to traffic with the same designation and signing

FIGURE 4.2B  
(Correct Approach)



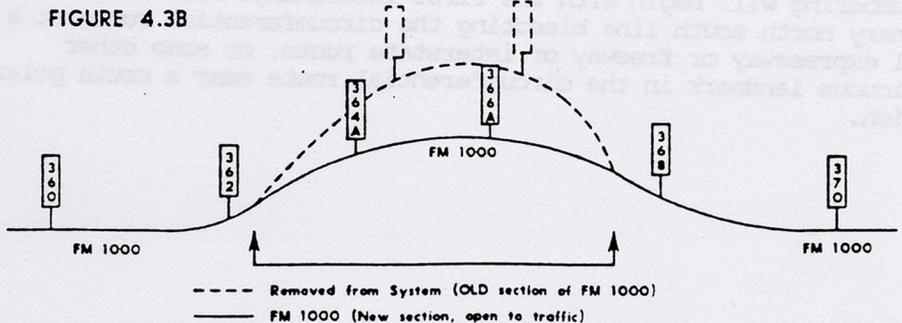
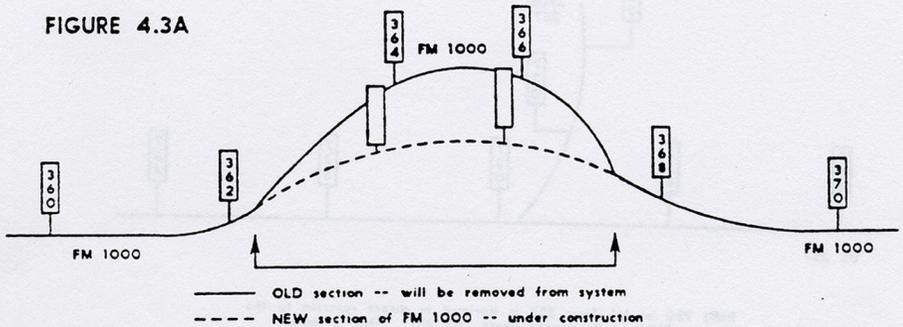
SH 100 will be temporarily trail blazed over FM 1345 and over SL 302. SH 100 will be signed as "TO SH 100" over FM 1345 and over SL 302

Assignment of Reference Marker Numbers

4. When a route is realigned

- The construction plans can indicate the locations of reference markers for the new route section ( Figure 4.3A )
- If the old highway section is no longer under state maintenance, then it is taken off system and the reference marker posts are removed ( Figure 4.3B )

Example 3: No section is redesignated:



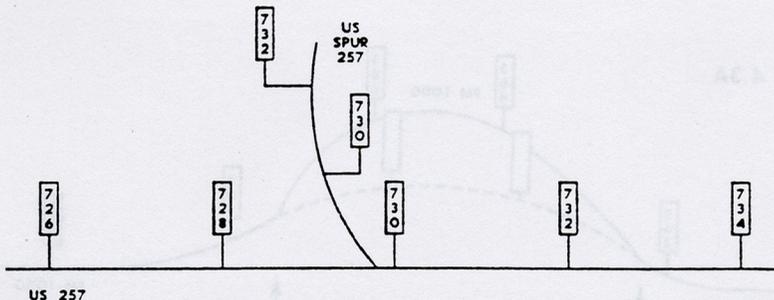
## Assignment of Reference Marker Numbers

## 5. For business routes and spurs that have parent routes:

- The initial reference marker will be derived in direct relation to the nearest RMN on the parent route.

NOTE: With the exception of interstate business routes, direction of travel and location on the grid map have no bearing on the initial assignment of RMNs on spurs with parent routes or on business routes.

FIGURE 5



RMN 730 on US Spur 257 is derived in direct relation to the nearest RMN on its parent route, US 257. This is done regardless of either the overall direction of US Spur 257 or its possible location on the grid map.

## 6. For circumferential routes:

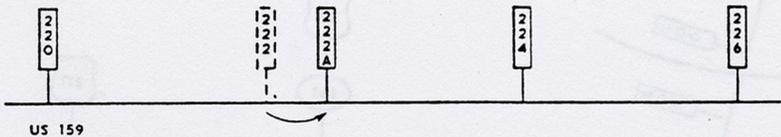
- The numbering will be in an east to west clockwise direction
- The numbering will begin with the first interchange west of an imaginary north south line bisecting the circumferential route at a radial expressway or freeway or interstate route, or some other conspicuous landmark in the circumferential route near a south polar location.

Assignment of Reference Marker Numbers

7. When an existing reference marker is moved

- If the new location affects the distance from route origin by more than 50 feet, a letter suffix is required to show that the location has been changed. ( Figure 7.1 )
- If the new location affects the distance from route origin by less than 50 feet, a letter suffix is not required. No update transaction to the TRM database is required. ( Figure 7.2B )

FIGURE 7.1



RMN 222 is moved down the road and a suffix "A" is added. RMN 222 is removed when RMN 222A is in place.

NOTE: Because alternating reference markers on either side of the roadway is not required, RMN 104 can simply be moved across the roadway.

FIGURE 7.2A  
(Before)

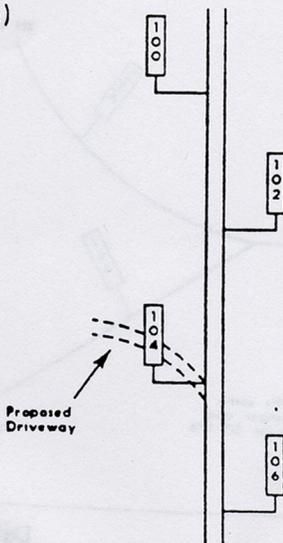
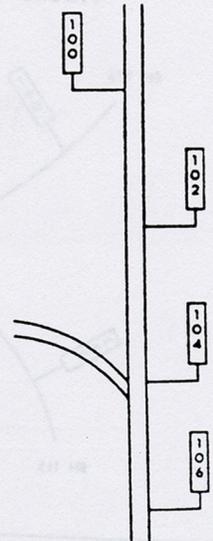


FIGURE 7.2B  
(After)

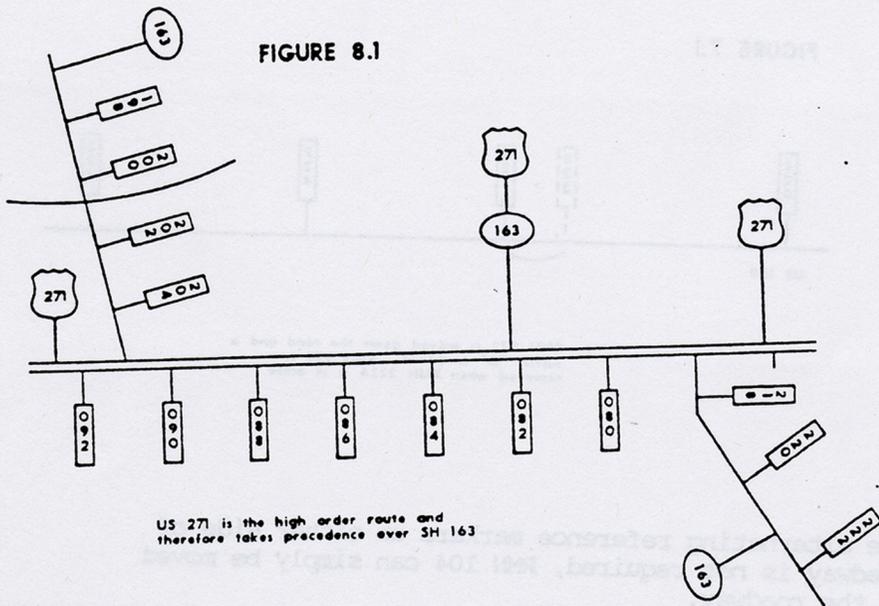


Assignment of Reference Marker Numbers

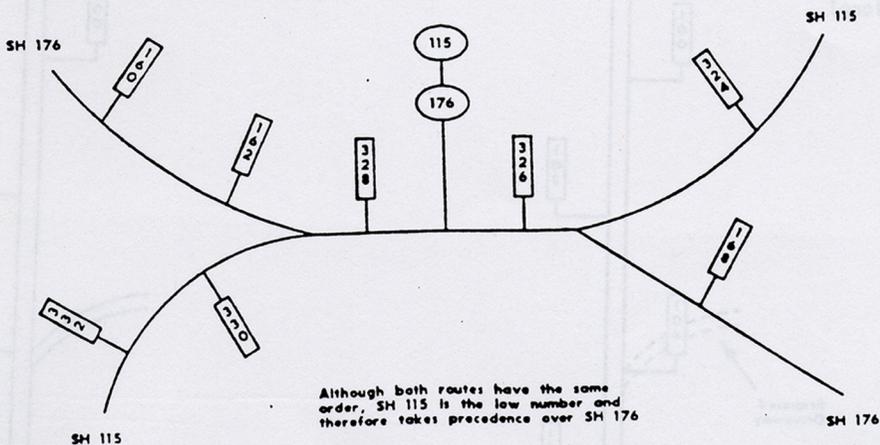
8. When there are concurrent routes:

- Reference marker numbers for the high order route take precedence ( Figure 8.1 )
- If the routes are the same order, the lower numbered route takes precedence ( Figure 8.2 )

NOTE: See "Highway System Hierarchy", page 4



**FIGURE 8.2**



Approved:

Date:

01/15/90