GIS Cooperative Street Centerline Database Standards and Specifications

Yolo County GIS Cooperative

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Version 2.0

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1. Introduction

1.1. Background

The main purpose of the Yolo GIS Cooperative is to maintain a seamless and centralized spatial database of the county's street network, which will include a master discrete address reference database to support a diverse set of applications for various public, private and emergency response agencies. This database will contain all street types including public and private streets, alleys, etc. and will be the heart of many systems related to emergency response and planning.

1.2. Purpose of this Document

The purpose of this document is to present agreed upon standards for storing street segment data into the centerline database. These standards are based on two sources. The first is the document titled "Regional Street Network and Address Database System Design" prepared in 2002. The second source is the agreements coming out of the Cooperative meetings. During these meetings, issues were discussed and standards were established to meet the needs of all agencies in the county.

The next section will briefly discuss the overall standards for the database design. Then, the following section will present the standards and specifications for storing address range information for street segments. Finally, the last section will outline the standards and specifications for storing street names.

2. General Database Standards

2.1. Street Network Database Design

In 2002 a project was underway to gather street network data requirements from regional agencies in order to design a seamless spatial database of the region's street network as well as include a master discrete address reference database that will support a diverse set of applications for various public, private and emergency response agencies. An entity relationship diagram of this database design is shown in Figure 1.

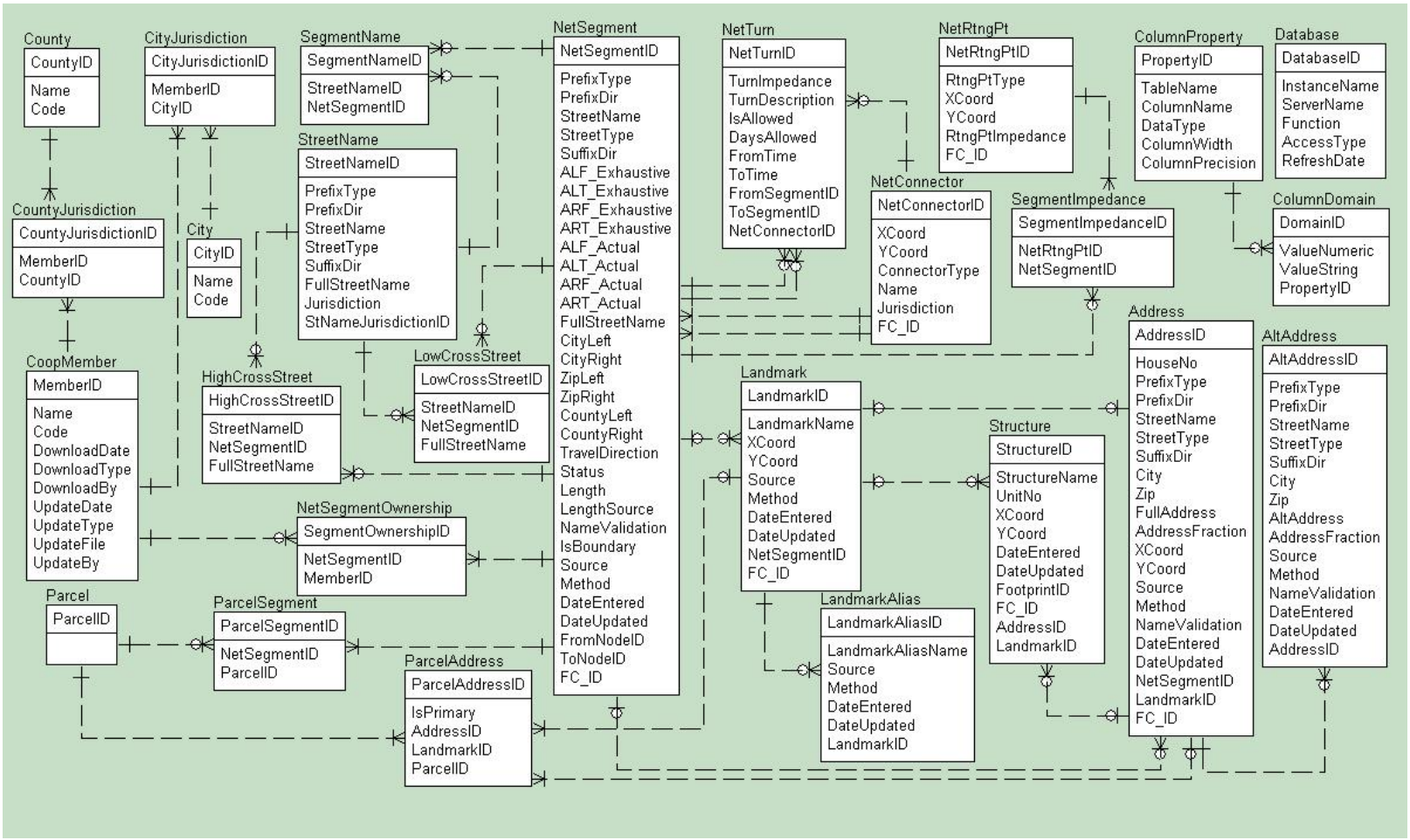


Figure 1. Original Street Network Database Design

Achieving this database design shown in Figure 1 is ultimately the goal of the GIS Cooperative. However, the GIS Cooperative is taking an incremental approach to reaching this design. At the time of the writing, the database consists only of the NetSegment entity shown in the diagram. The current artifact modeled after the NetSegment entity is an ESRI shapefile consisting of PolyLines. This is referred to as the "Street Centerline file", and the attribute table of this dataset is based on the structure of NetSegment.

2.2. Current Centerline Table Structure

As mentioned in the previous section, the current structure for the street centerline table is based on the original design. However, it has been modified based on the needs of the member agencies, which were determined during discussion sessions. Therefore, some fields not specified in the original design have been added. Fields that were specified in the original design that are not yet in the current table may be added as more data is collected for the street segments. In addition, some fields have been renamed from the original design for clarity and simplicity.

Field Name	Type	Description
Shape	ESRI_SHAPE (Binary)	The shape field contains geometry information.
Unique_ID	Long Integer	System ID for records of this table. Each numeric value is unique. See the discussion below.
PrefixType	String	Prefixed street type (e.g. Avenida, etc.)
PrefixDir	String	Prefixed street direction (e.g. S in 'S Main St').
StreetName	String	Primary name of the street segment.
StreetType	String	Type of street (e.g. st, ave, blvd, etc.)
SuffixDir	String	Street direction as suffix (e.g. West in 'Embarcadero West').
FullStreet	String	Fully specified name of the street segment (e.g. 'S Main St.').
LF_Actual	Long Integer	Beginning actual left address for the segment
LT_Actual	Long Integer	Ending actual left address for the segment
RF_Actual	Long Integer	Beginning actual right address for the segment
RT_Actual	Long Integer	Ending actual right address for the segment
LF_Exhaust	Long Integer	Beginning exhaustive left address for the segment
LT_Exhaust	Long Integer	Ending exhaustive left address for the segment
RF_Exhaust	Long Integer	Beginning exhaustive right address for the segment
RT_Exhaust	Long Integer	Ending exhaustive right address for the segment
CityLeft	String	City on the left of the segment
CityRight	String	City on the right of the segment
ZipLeft	String	Zip code on the left of the segment
ZipRight	String	Zip code on the right of the segment
CountyLeft	String	County on the left of the segment
CountyRight	String	County on the right of the segment
TravelDirection	String	Indicates allowable travel direction. FR for 'from node' to 'to node', TO for 'to node' to ' from node', and BH for both directions.
Status	String	Status of the segment (e.g. existing or planned). A segment entered in the database before the roadway is built would have the status of planned.
Length_Cal	Long	Calculated length of the segment.
LengthSource	String	Length collection method (e.g., GIS, field, other database, etc.)
NameValidation	String	Indicates whether, or not the street name used should be validated. When a street name is not found in the master street name table, users may be allowed to type in the name while entering a new record by indicating that the name must be validated later on.
IsBoundary	Short Integer	Indicates whether or not the segment runs along jurisdiction boundary.
Source	String	Indicates which agency/department has entered the data. This helps in identifying the responsible party for the data.
Method	String	Indicates how the data was collected. This information will help in understanding the quality of data.
CFCC	String	Functional classification of street segment based on census feature class codes (CFCC).
DateEntered	String	Date when the segment was first created in the database.
DateUpdate	String	Date in yyyymmdd format of most recent segment spatial change
Ac_Date	String	Date in yyyymmdd format of most recent segment attribution change
Qc_Exhaust	String	Flag indicating entity responsible for exhaustive range
Exh_Except	String	Exhaustive range exception codes (see section on address range standards).

Field Name	Type	Description
YCFC	String	Functional classification of street segment type.

When the centerline attribute table is undergoing quality checking and/or maintenance, it will have the additional fields listed below. The values for these fields are described in the "Centerline Maintenance Procedures" document.

Attribute Name	Type	Description
ERROR_CODE	String	Indicates the type of error in the exhaustive range (see the Maintenance Procedures document).
ADDL_ERR	String	Contains a comma-delimited list of additional codes if the segment contains more than one error.
Exh_Except	String	Exhaustive range exception codes to indicate that the segment has an exception if it is flagged as having an error during the QC analysis (see the Maintenance Procedures document).
EDIT_COMME	String	Contains the editor's comment (or "Correction Code") about the type of edit that was made on the segment.
COMMENT	String	Stores additional editor comments up to 250 characters long.
CHG_DATE	String	A timestamp date of when the segment was last updated using the RangeEdit tool. RangeEdit automatically updates this field during an edit.
EDITOR_ID	Long Integer	Contains the id of the person who edited the exhaustive ranges of the segment.

2.3. Unique ID Field

The Unique ID Field (named "UNIQUE_ID") stores unique values for street segments. This is the primary key field. The unique id values are assigned to the segments when they are created, and persist as long as the segment exists or its geometry does not change. When a street segment is created, it is assigned the next available unique id number. The next available id number will be generated based on the member agency responsible for editing the segment. This will ensure that two member agencies don't use the same unique id.

The prescribed unique id range for each member agency is listed below.

Member Agency	ID Range for Segments
Davis	30,000 – 39,999
West Sacramento	12,000 – 19,999
Woodland	40,000 – 49,999
County of Yolo	20,000 – 29,999

The unique id number will be retired if the segment is deleted. If a segment is split the number from the parent segment is retired and the child segments will be assigned next available unique id numbers. If two segments are merged into one the unique ids for the two segments will be retired and the result segment will be assigned the next available unique id number.

3. Address Range Standards

Each segment has two possible sets of address ranges. The first set are the Actual (or "real", or "empirical") ranges. The second set, are the Exhaustive (or "theoretical") ranges. The orientation (or "directionality") of the segment must correspond with increasing address range values. For example if the range values, for a particular east-west segment, increase in the east direction then the "from" endpoint of the segment will be toward the west and the "to" endpoint of the segment will be toward the east. This is illustrated in the Figures below.

3.1. Actual Address Ranges

Actual address ranges are specifically assigned according to the locations of the “from” and “to” endpoints of the street segment with respect to the address numbers of the adjacent parcels. This is intended to reflect the precise address locations to their associated parcel.

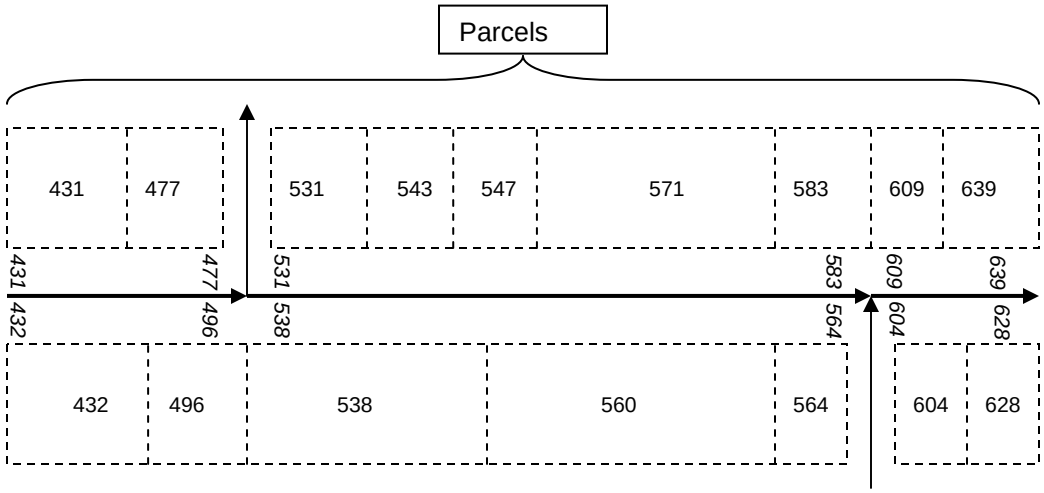


Figure 2. Actual Address Ranges

Note that the range values attempt to correlate to the parcel address numbers with the endpoints of the segment. For the middle horizontal segment shown in Figure 2 the actual address range values will be defined as:

LF_Actual = 531
RF_Actual = 538
LT_Actual = 583
RT_Actual = 564

Actual address numbers are optional, and some streets may have them and others may not.

3.2. Exhaustive Address Ranges

Exhaustive address ranges attempt to be more flexible by encompassing all possible address values on both sides of the street segment. Basically, there should be no gap between successive address ranges from one segment to the next (see Figure 3).

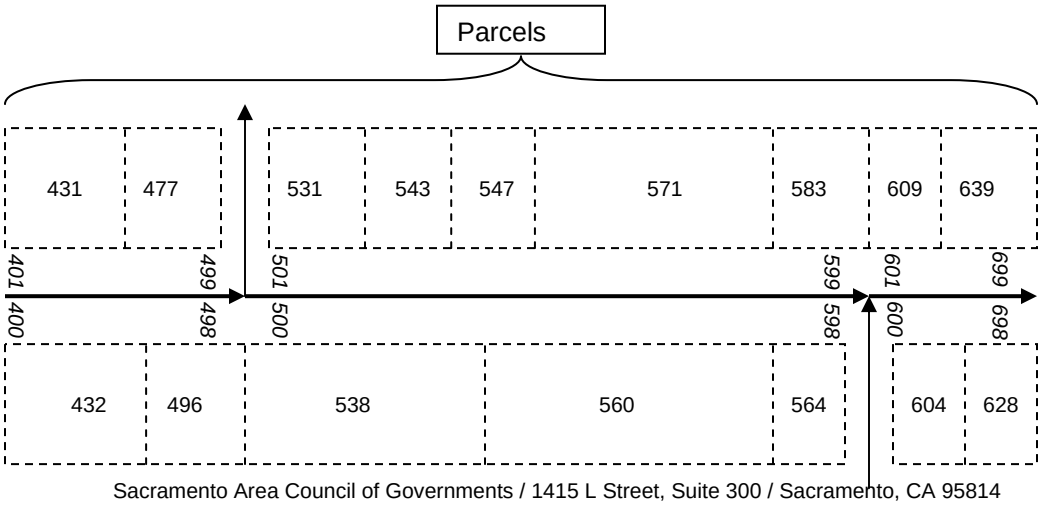


Figure 3. Exhaustive Address Ranges

For the middle horizontal segment shown in Figure 3 the actual address range values will be defined as:

LF_Actual = 501
RF_Actual = 599
LT_Actual = 500
RT_Actual = 598

3.3. How Address Ranges are Assigned

Exhaustive address ranges are typically assigned based on address values assigned to adjacent parcels. Therefore, address ranges follow the address numbers closely to what is seen in the parcel file. An exhaustive range will only have a two-digit gap between ranges and end in 98 and 99 when possible. The figure below illustrates some of these concepts.

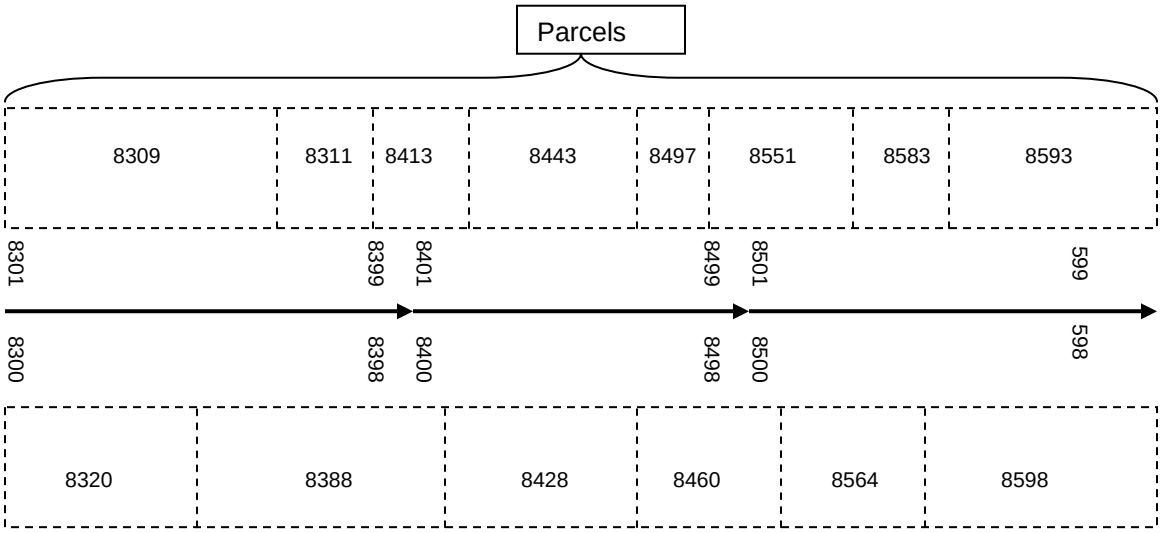
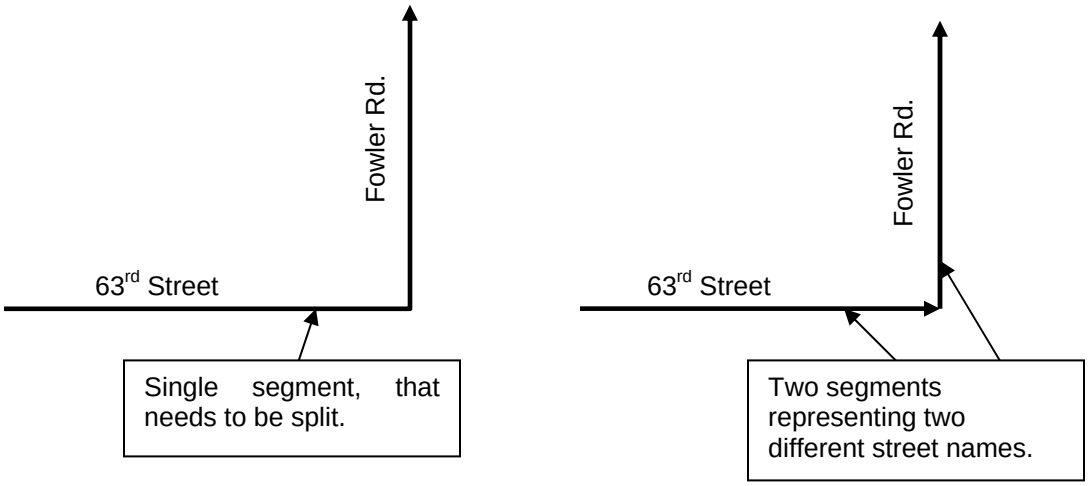


Figure 4. Assigning Exhaustive Address Ranges

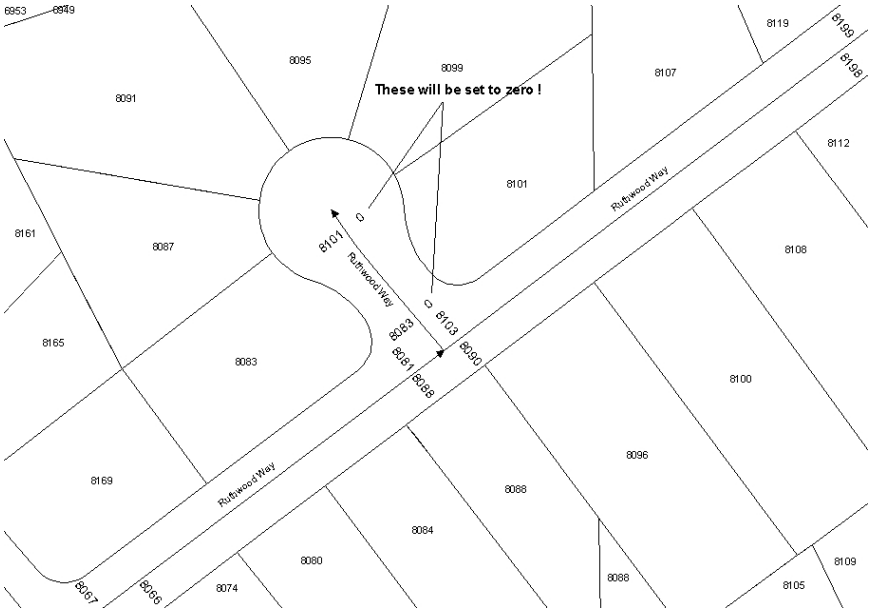
Some additional rules are as follows:

- When extending exhaustive ranges to cover a gap, extend the TO address ranges wherever possible. This means that the next segments FROM Ranges start on the parcel address where possible.
- If there is no next segment in the addressing sequence, the ranges should end on 98 and 99.
- If there is no previous segment in the sequence, the range should begin with 01 and 00.
- A segment should not model a street where a name change occurs. A segment should be split where a name changes (see below).



3.3.1. Cul-de-Sacs and Stub Courts

Stub courts (or "spurs") occur where three segments with the same street name join at a common node and one of the segments doesn't connect with any other segment (see figure below for "Ruthwood Way"). These segments can have zero ranges on one side where the address numbers of the parcels are absent. See example below.



3.3.2. Zero Ranges

In some cases there will be no property addressed to a street. In this case, and editor may need to rely upon the grid book. When using these grid books note the grid number at the beginning of the segment and at the major intersections along the segment. Develop a series of ranges that make sense for the entire street.

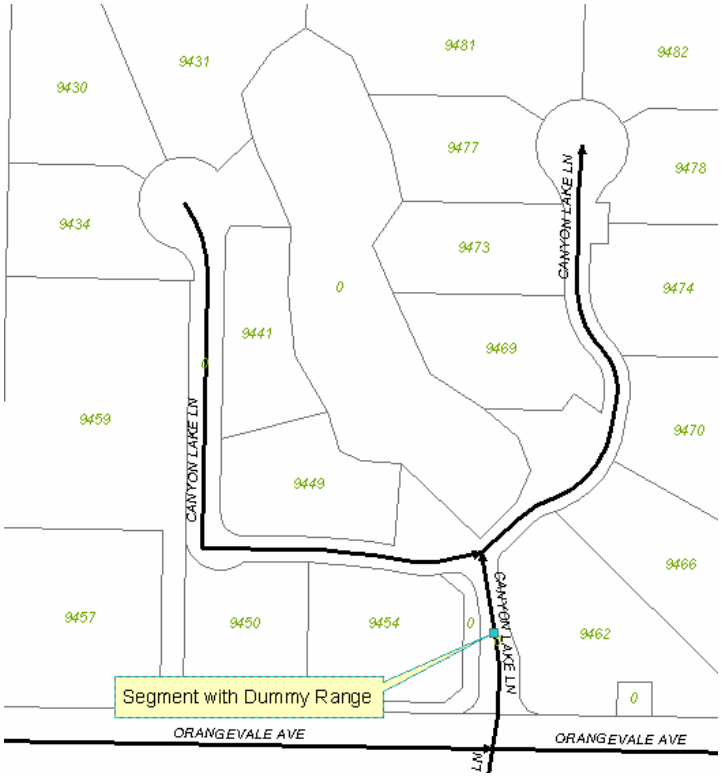
3.3.3. Other Anomalies

Many of the address ranges will not follow the same rules as on common odd even rules. Here are some rules that have been developed; the rule list will grow as more anomalies are determined. Additional versions of this document will be published as new anomaly anomalies rules are developed.

- All alleys should have zero ranges if there are no parcels addressed to the alley in that block.

- Regarding dual centerlines - if the odd or even addresses exist on a different segment, your segment should have zero ranges on that side. If odd or even addresses do not exist for that street name anywhere, your segment should have appropriate values on that side of the segment.

- Short connector streets will have dummy values for ranges. The dummy values for these ranges are “0”. An example of a short connector street is shown below.



3.4. Address Range Errors

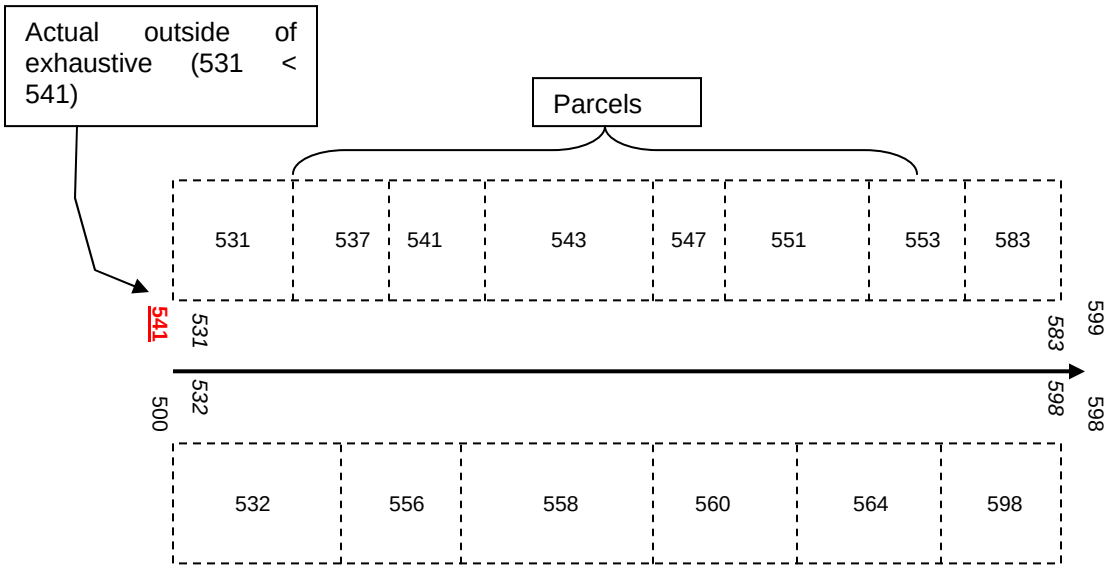
The error checking process involves running an Arc Macro Language (AML) script against the exhaustive address ranges in the street centerline database. Initially the street centerline database must be converted into ArcInfo coverage format. Then the script named "rangecheck.aml" is executed against the coverage in the ArcInfo Workstation environment. When the script is complete, error codes will be generated in new fields named "R_ERROR" and "L_ERROR". A GIS analyst will then concatenate these codes into fields named "ERROR_CODE" and "ADDL_ERR". The "ERROR_CODE" field will contain only one error code for a segment whereas the "ADDL_ERR" field will contain a comma-delimited list of additional codes if the segment contains more than one error. Finally, these codes are transferred to the "ERROR_CODE" and "ADDL_ERR" fields in the street centerline database by joining the "UNIQUE_ID" field of the coverage.

The generated error codes are OVRLAP, ACTL, GAP, FROMTO, FLIP, LFTRGT, ZERO and PARITY. These codes are described below.

3.4.1. Errors with 'ACTL' Error Code

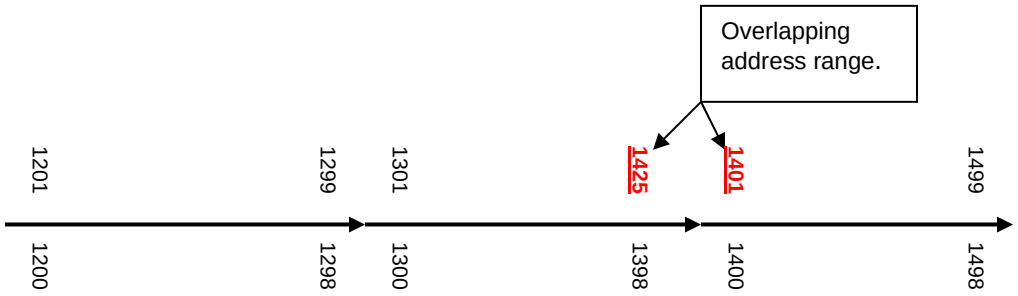
This code indicates that the exhaustive range does not accommodate the true actual range. In other words, the actual range is outside of the exhaustive range. The following query statement will identify these errors: "LF_EXHAUST" > "LF_ACTUAL" AND "LF_ACTUAL" <> 0 OR "RF_EXHAUST" > "RF_ACTUAL" AND "RF_ACTUAL" <> 0 OR "LT_EXHAUST" < "LT_ACTUAL" AND "LT_ACTUAL" <> 0 OR "RT_EXHAUST" < "RT_ACTUAL" AND "RT_ACTUAL" <> 0

As shown below the actual ranges are directly tied to the address number of the parcels. Therefore the exhaustive ranges must extend beyond the actual ranges. In the figure below, the parcels are shown with their address numbers and the actual ranges are shown in italics.



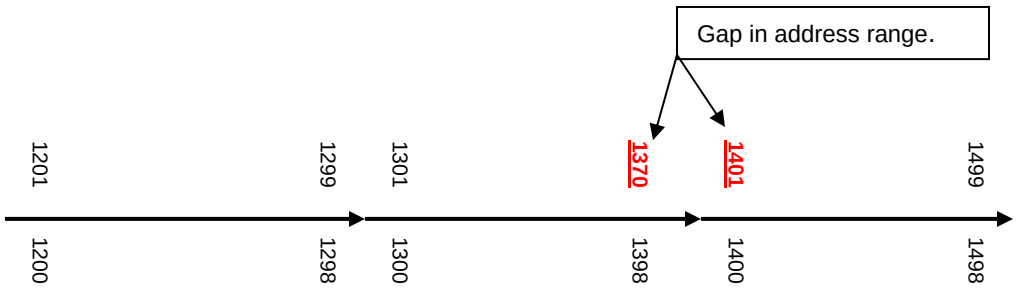
3.4.2. Errors with 'OVRLAP' Error Code

This code indicates an overlap in exhaustive ranges between segments.



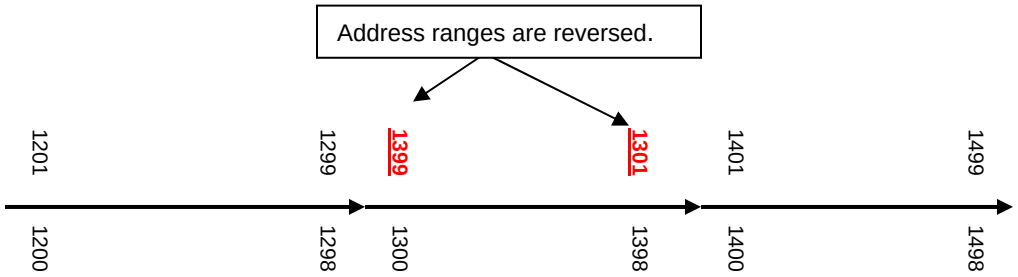
3.4.3. Errors with 'GAP' Error Code

This code indicates a gap in exhaustive ranges between segments.



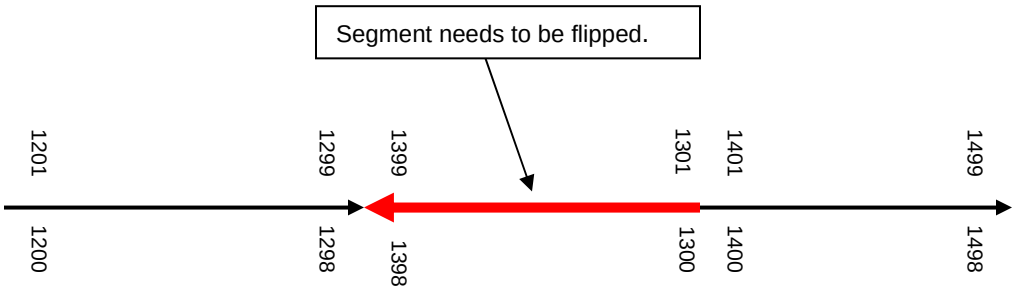
3.4.4. Errors with 'FROMTO' Error Code

This code indicates that the address range is the reverse of other ranges.



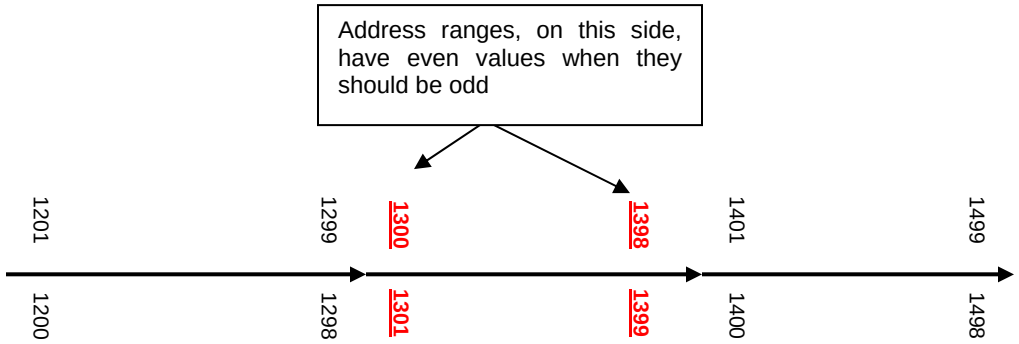
3.4.5. Errors with 'FLIP' Error Code

This code indicates that the segment's orientation and attributes may be flipped.



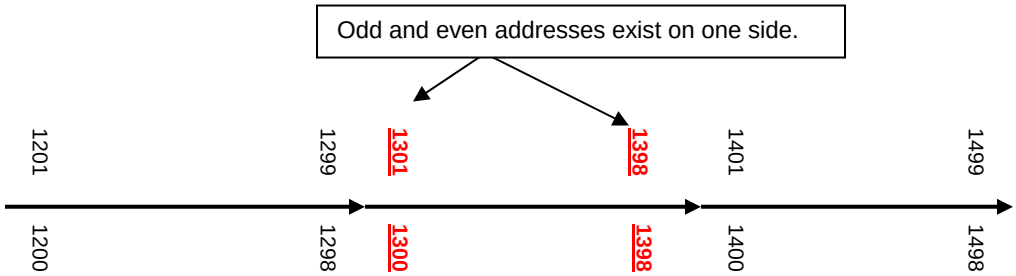
3.4.6. Errors with 'LFTRGT' Error Code

This code indicates that the ranges may be flipped between the left and right sides. This is a type of parity error.



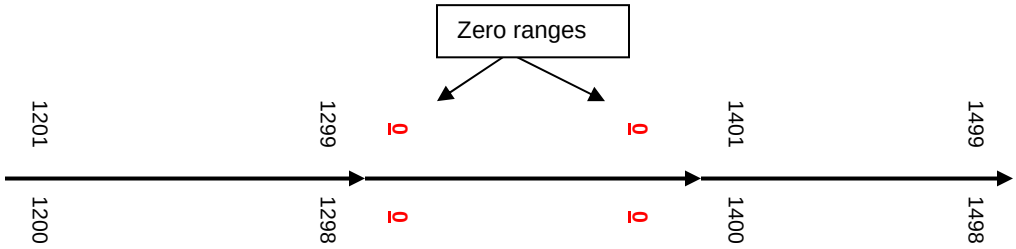
3.4.7. Errors with 'PARITY' Error Code

This code indicates a segment that has even and odd addresses on the same side.



3.4.8. Errors with 'ZERO' Error Code

This code indicates that zero values exist in the exhaustive ranges.



3.4.9. Exception Codes

Sometimes the unique circumstances of a particular segment will cause the generation of an error during the QA/QC process even though standards and specifications are being violated and there is no available fix. In such cases, the segments are tagged with an “exception code”. The type of exception code indicates the type of circumstance that is causing an error to be generated and why the segment cannot undergo a fix. The exception codes are stored in the ‘exh_except’ field and the possible values are listed below.

EXCEPTION CODES	
exc-ok	The segment reports an error code but there is no identifiable problem.
exc-source	No source for addresses exist. This occurs in areas like McClellan, SAC Airport and trailer parks. Therefore no correction was made.
exc-driveway	Roads that do not have addresses because they are private driveways
exc-apt	Apartment roads with no addresses. This is a more specific description than "exc-source" to be used if possible.
exc-parity	A parity error is reported but the addresses are ok. This is a more specific description than "exc-ok" and should be used if possible.
exc-gap	A gap error is reported but the addresses are ok. This is a more specific description than "exc-ok" and should be used if possible.
exc-court	A gap error is reported but it is due to a cul-de-sac or court and not really an error. This is a more specific description than "exc-ok" and should be used if possible.
exc-nonseq	An error is reported but it is due to intentional coding of non-sequential actual address ranges.
exc-ramp	A ZERO error is reported but ramps are an exception.
exc-fwy	A ZERO error is reported but freeways are an exception.
exc-unamed	A ZERO error is reported but the feature is an unnamed street, therefore has no address information, which makes it an exception.
exc-alley	A ZERO error is reported but alleys are an exception.
exc-loop	The street forms a loop and could result in a GAP error.
exc-bike	A ZERO error is reported but bikeways are an exception.

Pickup here (remember to delete the above stuff)

4. Street Naming Standards

The purpose of this section is not to set forth a standard for naming new streets in the region. This is the responsibility of the local jurisdictions. The overall purpose of this section is to define the standards and format of storing the given name of a street in the regional centerline database.

4.1. Components of a Full Street Name

Each street feature in the centerline database that is part of an addressing system must have a street name. A street name generally consists of the actual unique name given to the street along with a combination of possible prefixes and suffixes. Most commonly, a street is given a primary name and a street type. For example, a street named “ELM ST” has a primary street name of “ELM” and a street type of “ST” which is abbreviated for the word “STREET”.

An entire street or highway name may be broken up into five components. These five components are described below:

1. Prefix Direction

The prefix direction component is a leading directional specification in a street name. Typical values of this component are N, S, E, W, NW, NE, SW and SE. For example, “W” is the prefix direction for “W EL CAMINO AVE”. However, discretion is required in some cases where a direction is part of a street name. For example, there is a street in Sacramento named “WEST

WIND CT". In this case "WEST" is not a directional since it is part of the actual street name, which is "WEST WIND".

2. Prefix Type

Prefix type is rare for streets with addresses since it is generally used for freeways and highways. For these facilities the prefix type is usually "I" for interstate or "HWY" for State or US highway. Some cities and counties use prefix types for streets that have the type preceding the name. For example, "AVENUE B" or "ROAD 43A".

3. Street Name

The street name component is the given primary street name without the directional prefixes/suffixes and types. For example, "ELM" is the street name for "ELM ST".

4. Street Type

The street type component is the type assigned with the street name and may or may not be related to the functional classification of the street. For example, "CT" (abbreviated for "Court") is the street type for "FAIRLAWN CT".

The street type should be abbreviated when stored in the street type field in the database. The valid abbreviations are listed below.

Street Type	Abbreviation
ALLEY	ALY
AVENUE	AVE
BOULEVARD	BLVD
BYPASS	BYP
CAUSEWAY	CSWY
CIRCLE	CIR
COURT	CT
CRESCENT	CRES
DRIVE	DR
EXPRESSWAY	EXPY
FREEWAY	FWY
HIGHWAY	HWY
LANE	LN
LOOP	LOOP
MOTORWAY	MTWY
PARKWAY	PKWY
PATH	PATH
PLACE	PL
ROAD	RD
SKYWAY	SKWY
SQUARE	SQ
STREET	ST
TERRACE	TER
THROUGHWAY	TRWY
TURNPIKE	TPKE
WALK	WALK
WAY	WAY

5. Suffix Direction

Occasionally the directional component of a street name will be a suffix. For example, in the City of Sacramento there is a street named "MILL VALLEY CIR N". In this case the "N" is the suffix direction.

4.2. Database Fields for Storing Street Names

The table below summarizes these components and lists the fields that store the components.

Street Name Component	Field Name	Description
Prefix Type	PREFIXTYPE	Prefixed street type (e.g. Avenue in 'Avenue B')
Prefix Direction	PREFIXDIR	Prefixed street direction (e.g. S in 'S Main St')
Street Name	STREETNAME	Primary name of street segment.
Street Type	STREETTYPE	Type of street (e.g. St, Ave, Blvd, etc.)
Suffix Direction	SUFFIXDIR	Street direction as a suffix

All characters stored in these fields must all be UPPERCASE.

4.2.1. Excluding Special Characters

Street name components should only consist of alphanumeric characters. Special characters may cause errors when a program is reading from or writing to the database. These special characters include: & ,' ,@ ,(,) ,[,] ,{ ,} ,/ ,\ ,* ,+ ,= ,^ ," ,' as well as the comma (,). Hyphens (-) are okay.

4.2.2. Proper Use of Whitespace

When separating words in any of the fields related to street name there should never be more than one white space. There must never be leading or trailing white spaces with the values in the street fields.

4.3. The FULLSTREET Field

The FULLSTREET field in the centerline database is simply the concatenation of all street name components separated by a space. The FULLSTREET should not be edited directly but be calculated from the component fields.

The order of the concatenated street name components that make up the FULLSTREET value are as follows: 1) Prefix Direction, 2) Prefix Type, 3) Street Name, 4) Street Type and 5) Suffix Direction.

4.4. Rules for Arterial, Collector and Local Streets

The majority of features in the centerline database represent arterial, collector and local streets. The general rules for storing the names of these streets are outlined below.

4.4.1. Directional Names and Direction

Sometimes the primary name of a street will include a directional name. For example, the primary name of 'South Park Dr' (located in Sac County) is 'South Park' and therefore 'South' is part of the primary name and not the directional prefix. However there is a 'S Park Place' in Placer County. In this case 'S' represents 'South' as a directional prefix and the primary name is 'Park'

Data-entry/edit personnel must be aware of these naming conventions and if they are unable to distinguish, whether a street name component is part of a primary name or a directional prefix, then they should contact the local jurisdiction for the street.

4.4.2. Irish-Style Names

Irish style names involve the "Mc" and the " O' " as the first characters of the name. For names that begin with "Mc", all characters stored in the database will be upper case according to the standard. In most cases there will NOT be a whitespace between the "MC" and the rest of the name. For example, the name "McClaren" will be stored as "MCCLAREN".

4.4.3. Examples

To illustrate some of the rules listed above, some examples are provided.

1. Park Village Street

Field	Value
PREFIXDIR	
PREFIXTYPE	
STREETNAME	PARK VILLAGE
STREETYPE	ST
SUFFIXDIR	
FULLSTREET	PARK VILLAGE ST

2. O'Neil Court

Field	Value
PREFIXDIR	
PREFIXTYPE	
STREETNAME	ONEIL
STREETYPE	CT
SUFFIXDIR	
FULLSTREET	ONEIL CT

3. McClintock Way

Field	Value
PREFIXDIR	
PREFIXTYPE	
STREETNAME	MCCLINTOCK
STREETYPE	WAY
SUFFIXDIR	
FULLSTREET	MCCLINTOCK WAY

4. Self-Esteem Lane

Field	Value
PREFIXDIR	
PREFIXTYPE	
STREETNAME	SELF-ESTEEM
STREETYPE	LN
SUFFIXDIR	
FULLSTREET	SELF-ESTEEM LN

5. South Avenue

Field	Value
PREFIXDIR	
PREFIXTYPE	
STREETNAME	SOUTH
STREETYPE	AVE
SUFFIXDIR	
FULLSTREET	SOUTH AVE

6. West Pacific Bypass

Field	Value
PREFIXDIR	
PREFIXTYPE	
STREETNAME	WEST PACIFIC
STREETYPE	BYP
SUFFIXDIR	
FULLSTREET	WEST PACIFIC BYP

4.5. Rules for Freeways and Highways

The naming conventions for freeways and highways are based upon their designated route numbers established by the State Department of Transportation (Caltrans) or Federal Highway

Administration. Typically these highways have a prefix type such as “Interstate” or “US” followed by a route shield number (such as “5” for Interstate 5).

The standard format will define the prefix type as the highway type and the route number as the street name. The standard values for prefix type are listed below.

Prefix Type Value	Description
I	Interstate highways as part of the National System of Interstate and Defense Highways, commonly called "The Interstate System”
US	US Routes not part of the Interstate System
HWY	California state routes
BUS	Business routes which are a subclass of highways in the Interstate System

If the facility is a divided highway then the suffix direction for a particular segment will be NB, EB, SB or WB to indicate northbound, eastbound, southbound or westbound direction respectively. For a northbound segment on Interstate 5, the value for PREFIXTYPE will be “I”, the value for STREETNAME will be “5” and the value for SUFFIXDIR will be “NB”. Some additional examples are shown below.

1. Westbound Business 80

Field	Value
PREFIXDIR	
PREFIXTYPE	BUS
STREETNAME	80
STREETYPE	
SUFFIXDIR	WB
FULLSTREET	BUS 80 WB

2. Northbound State Route 99

Field	Value
PREFIXDIR	
PREFIXTYPE	HWY
STREETNAME	99
STREETYPE	
SUFFIXDIR	NB
FULLSTREET	HWY 99 NB

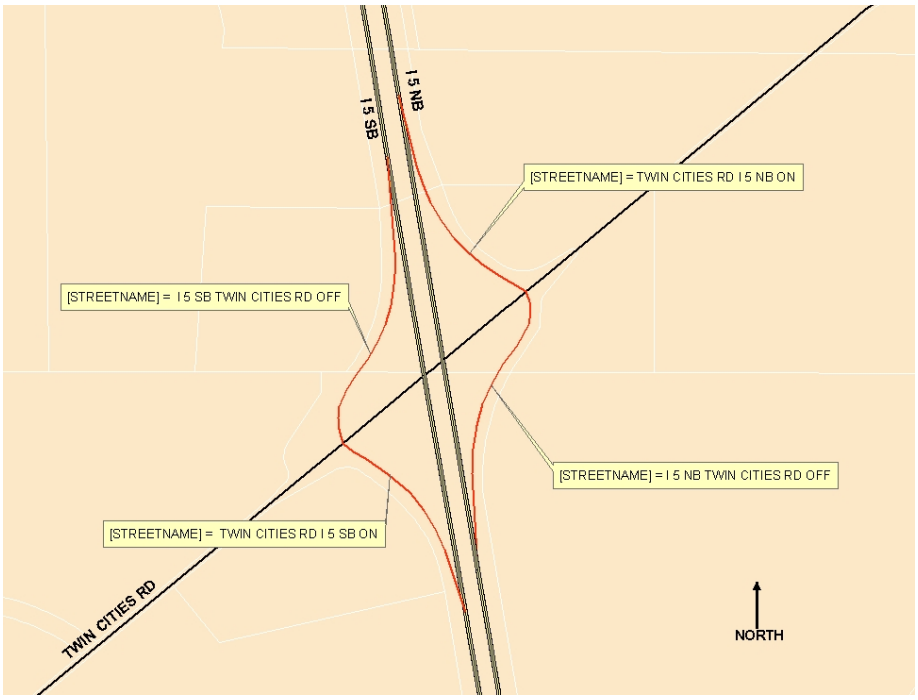
3. Eastbound US Route 50

Field	Value
PREFIXDIR	
PREFIXTYPE	US
STREETNAME	50
STREETYPE	
SUFFIXDIR	EB
FULLSTREET	US 50 EB

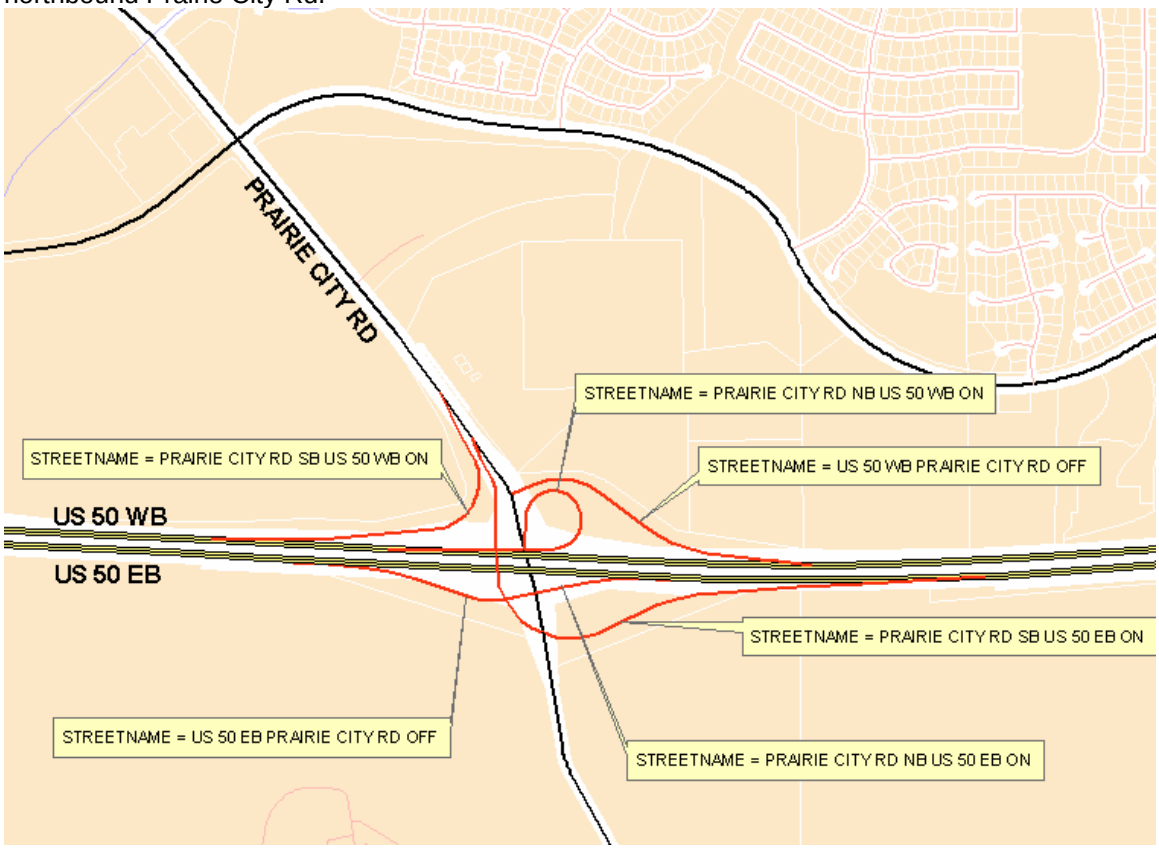
4.6. Rules for Freeway Ramps

Ramps operate solely to provide access to or from freeways from non-freeways or other freeways. Since ramps do not provide accessibility to adjacent parcels, they are not part of the address system. Therefore, they do not require address names or street names. Nevertheless, they should have names for identification and annotation purposes. This is useful for identifying locations of incidents on ramps.

The accepted convention for naming ramps is to populate the STREETNAME field with the FULLSTREET value of the “from” highway/street concatenated with the FULLSTREET value of the “to” highway/street along with an “ON” or “OFF” indicator concatenated at the end. For example, an on-ramp that connects Twin Cities Road to the I-5 northbound would be named “TWIN CITIES ROAD I 5 NB ON”. The figure below illustrates this.



A complex example is shown below where there are six ramps at the interchange. In this case there are multiple on-ramps as one can note that there are two ramps carrying traffic to the US 50 EB. One ramp is coming from the southbound Prairie City Rd and the other is coming from the northbound Prairie City Rd.



For “freeway to freeway” ramps the “ON” or “OFF” indicators will not be used since the ramps operate as both on-ramps and off-ramps.

5. Other Street Segment Attribute Standards

5.1. Functional Classification Attribute

A field named ‘CFCC’ is used to store information about the functional classification of the street segment. This field uses the U.S. Bureau of the Census feature class codes (CFCC). The possible values are listed below.

Value	Description
A00	Road, major and minor categories unknown
A01	Road, unseparated
A11	Primary road with limited access or interstate highway, unseparated
A15	Primary road with limited access or interstate highway, separated
A21	Primary road without limited access, U.S. and State highways, unseparated
A31	Secondary and connecting road, State and county highways, unseparated
A40	Local, neighborhood, and rural road, city street, major category
A41	Local, neighborhood, and rural road, city street, unseparated
A43	Local, neighborhood, and rural road, city street, unseparated, underpassing
A63	Access ramp, the portion of a road that forms a cloverleaf or limited access interchange
A70	Other thoroughfare, major category used when the minor category could not be determined
A73	Alley, road for service vehicles, usually unnamed, located at the rear of buildings and property

5.2. Standards for Remaining Attributes

Appendix A – References

United States Postal Service. Postal Addressing Standards, Publication 28. Nov. 2000 <http://pe.usps.gov/text/pub28/PUB28C2.html>

Lucy, William M. Addressing Systems: A Training Guide for 9-1-1. Coshocton, Ohio: National Emergency Number Association, 1995