Intersection Database

Version 2.4
January 2, 2018

County Roadway Safety Plan Updates

Background Information

Data Input Protocol

- **Allowed**
  - **“Other”**
    - The allowed inputs for the applicable attribute do not include the correct type for the horizontal curve under review
      - E.g., Intersection *Design Type* is ‘Displaced Left Turn’, but this intersection type is not listed as one of the approved values under *Design Type*
    - Action: Describe in the “Comments” attribute
  - **“Unknown”**
    - The attribute cannot be confidently determined with the given sources of information (i.e., MnDOT Video Log, Google Earth)
      - E.g., No Google Street View/MnDOT Video Log at location
  - **“NA” – Not Applicable**
    - The attribute does not include a valid input due to another attribute
      - E.g., “Right_Turn_On_Red” attribute for a Thru-Stop intersection
  - **“NV” – No Value**
    - Used when data would otherwise be blank

- **Not Allowed**
  - Review your work regularly to check for and correct instances of the following:
    - Blanks
    - Dashes “-”
    - Acronyms (if not specified)
    - Abbreviations
    - Typos

Supporting Data

The attributes in the following slides will generally be pre-populated and no action is required.

- A basic understanding of these pre-populated attributes is recommended.
- Errors and other inconsistencies in this data should be identified and reported to the appropriate data manager for review.
- Any attribute may be pre-populated due to varying sources of data. This data should always be reviewed for accuracy.

Supporting Data: Attributes

- **Phase**
  - CRSP2 project phase
    - E.g., summer 2018 data collection is “2”
- **District**
  - MnDOT District/ATP number best corresponding to the county per a one-to-one correlation (note: not district boundaries)
    [SEE NEXT SLIDE]
- **County_Name**
  - County name with spelling as defined
    [SEE NEXT SLIDE]
- **County_Number**
  - County number: 1-87 (note: not FIPS)
    [SEE NEXT SLIDE]

Supporting Data: County Information

Counties participating in Phase 2:

County Number	County Name	District	Phase
7	Blue Earth	7	2
10	Carver	5	2
14	Clay	4	2
20	Dodge	6	2
31	Itasca	1	2
34	Kandiyohi	8	2
37	Lac qui Parle	8	2
42	Lyon	8	2
60	Polk	2	2
64	Redwood	8	2
66	Rice	6	2
68	Roseau	2	2
70	Scott	5	2
71	Sherburne	3	2
80	Wadena	3	2
82	Washington	5	2

Complete list of all 87 counties in Minnesota:

Refer to Excel Worksheet (May 2018 Version):

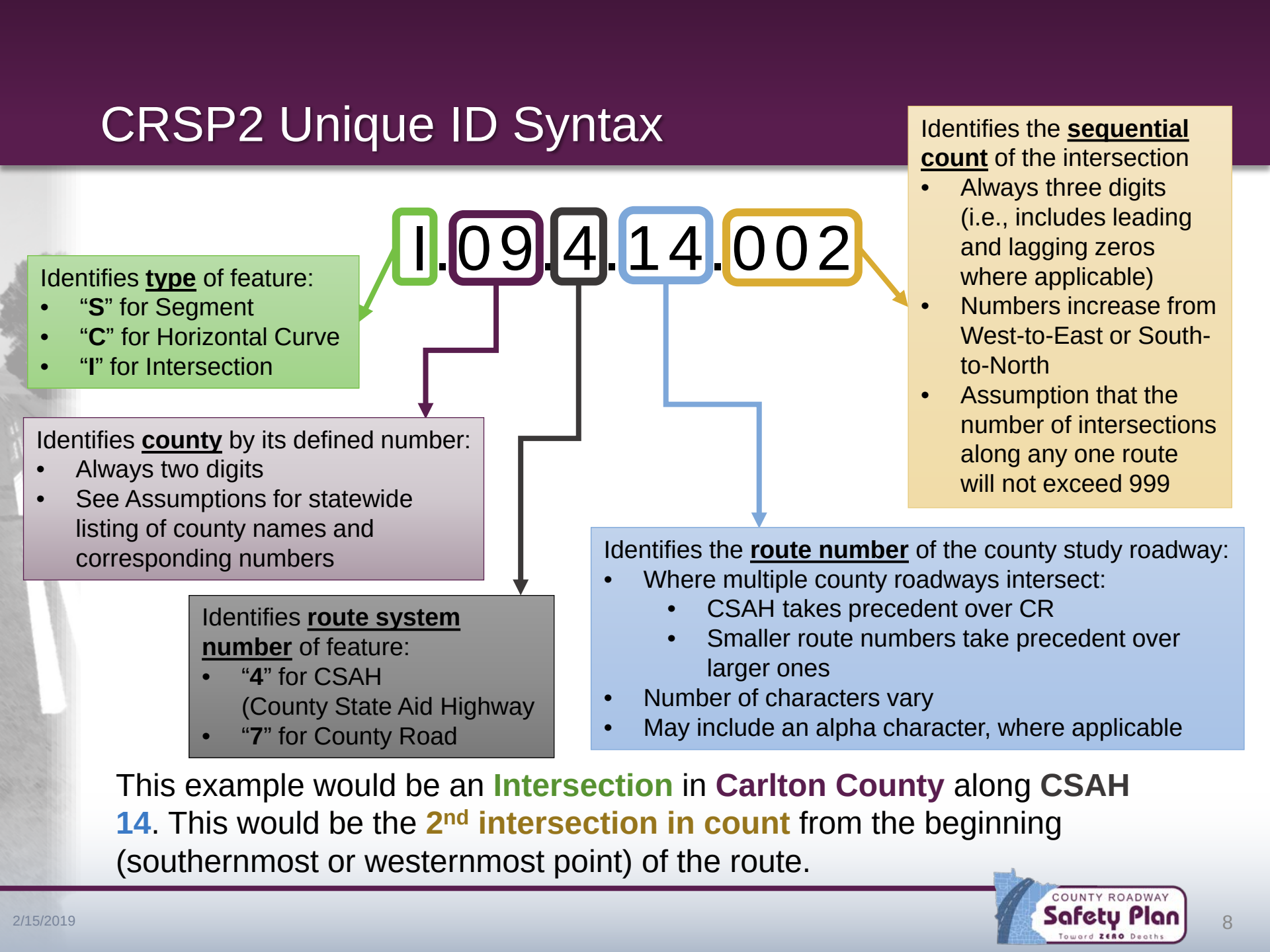
Microsoft Excel Worksheet

Supporting Data: Attributes

Roadway Feature Identifiers

- **County_ID**
  - *Only applicable if county has requested a correlation between the CRSP2 study network and the county's internal use unique identifier*
- **CRSP1_Unique_ID**
  - If applicable, unique identifier as existing in CRSP1 deliverable database
- **CRSP2_Unique_ID**
  - Primary unique identifier for this project
    - Generated with a specific syntax that identifies key *[SEE NEXT SLIDE]*
    - This identifier is used among all files (KMZ, Excel, geodatabase, etc.) throughout this project.

CRSP2 Unique ID Syntax



This example would be an **Intersection** in **Carlton County** along **CSAH 14**. This would be the **2nd intersection in count** from the beginning (southernmost or westernmost point) of the route.

Supporting Data: Attributes

- **Route_System_Number & Route_System**
  - Route System [Number] per MnDOT TIS codes
  - Most common will be:
    - 04 – County State Aid Highway (CSAH)
    - 07 – County Road (CR)
- **Route_Number**
  - Route/highway number
    - E.g., CSAH 17 = '17'
    - Corresponds to Route Number in CRSP2_Unique_ID attribute
- **Cross_Street_Route_System**
  - Can be any of the follow but not limited to
    - 01 – Interstate (ISTH)
    - 02 – US Trunk Highway (USTH)
    - 03 – State Trunk Highway (MNTH)
    - 04 – County State Aid Highway (CSAH)
    - 05 – Municipal State Aid System (MSAS)
    - 07 – County Road (CR)
    - 08 or 09 – Township or Unorganized Township Roads (TWNS)
    - 10 – Municipal Streets (MUN)
    - ≥11 – Any other jurisdiction description will be labeled a "OTHER"

RTSYS (ROUTE SYSTEM)
1=INTERSTATE-ISTH
2=US TRNK HWY-USTH
3=MN ST TRUNK HWY
4=CNTY ST AID HWY
5=MUN STAT AID HWY
7=COUNTY RD-CNTY
8=TOWNSHIP RD-TWNS
9=UNRGNZD TNSHP RD
10=MUNIPAL STRT-MUN
11=NATL PRK RD-NATP
12=NTL FRST RD-NATF
13=INDN SRVC RD-IND
14=ST FOREST RD-SFR
15=ST PRK ROAD-SPRK
16=MILITARY RD-MIL
17=NTL MNNT RD-NATM
18=NTL WLDLF RFG RD
19=FRNTGE ROAD-FRNT
20=ST GAME RESRV RD
21=PRV RD OP TO PUB
23=AIRPORT ROADS
25=NON-TRAFFIC WAYS
30=ALLEYS & SO ON
98=NOT LOCATED

Rules for Which Intersections & What Data to Collect

- **Only collect Signalized Intersection attributes for Signals**
- **Only collect Pedestrian & Bicyclist attributes for intersections whose AREA_TYPE ≠ Rural**
- **Do not collect data if surface type for both major & minor approaches is gravel.**

  - Major Roadway are typically roadways where the thru movement does not stop, has more lanes, and or has higher ADT.

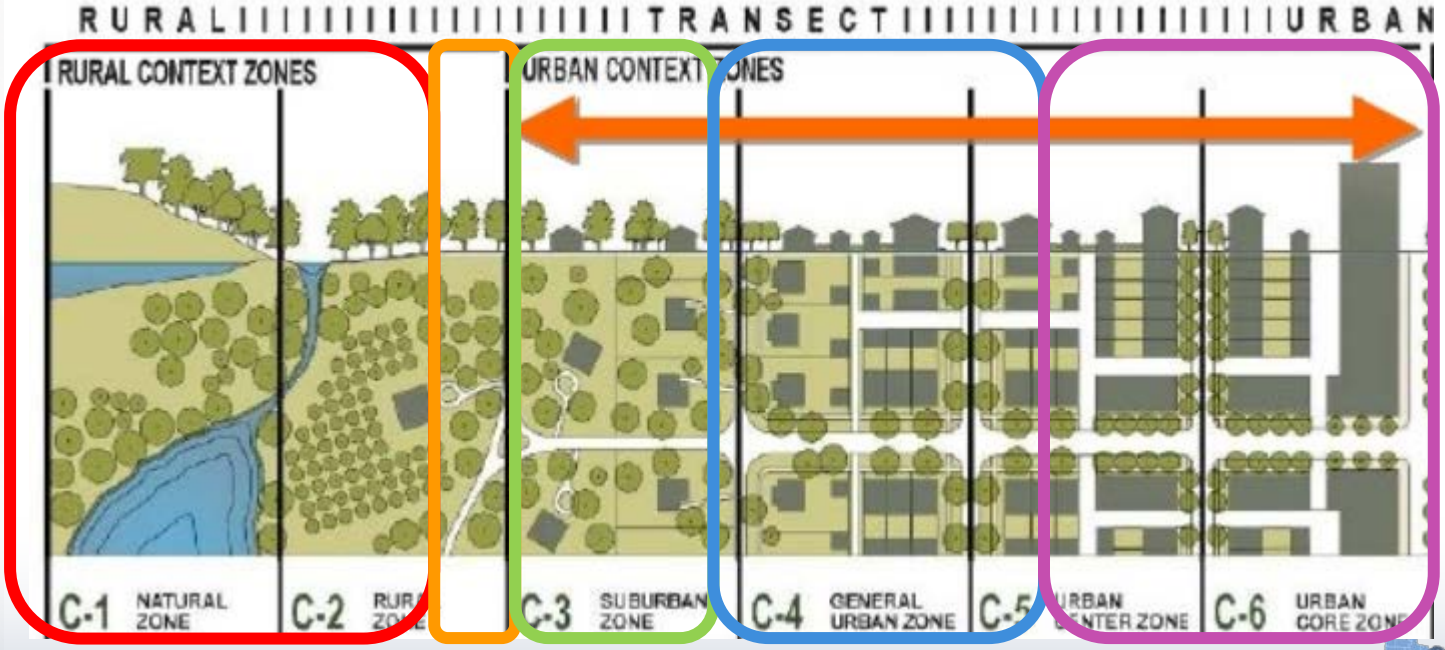
- **Major_Surface_Type & Minor_Surface_Type**
  - Paved
  - Gravel
  - If two legs are different, use the worse case.

Attributes (Location Type)

- **Area_Type**
  - Rural
  - Small Town
  - Suburban
  - Urban
  - Urban Core

Modified version of the ITE Context Zone definitions: http://library.ite.org/pub/e1cfb244-2354-d714-517d-2004292b5f99

** Be aware of which municipalities are county seats; roadways in these areas may receive additional attention.*



Attributes (Surroundings)

- **Context_Zone (listed by Hierarchy)**
  - Commercial
    - Business which is usually for serving customers.
  - Campus
    - E.g., Hospital, University
  - Mixed Use
    - Zoned specifically to be a combination of commercial and residential
    - E.g., multi-story building with offices or restaurants on the first floor with apartments on higher floors
  - Industrial
  - Recreational
    - E.g., Regional Park, Zoo, Theme Park, Golf Course
  - Residential
  - Cabins
  - Agriculture
    - E.g., Farmland
  - Natural

Attributes (Surroundings - Campus)

Context_Zone

- Campus
  - E.g., Hospital, University

Attributes (Surroundings – Mixed Use)

Context_Zone

- Mixed Use

  Zoned specifically to be a combination of commercial and residential

  E.g., multi-story building with offices or restaurants on the first floor with apartments on higher floors

  Mixed_Use IS NOT a combination of a Commercial area adjacent to Residential area. The hierarchy in this example would be Commercial.

Mixed Use Context Zone definitions: https://en.wikipedia.org/wiki/Mixed-use_development

Attributes (Surroundings - Industrial)

Context_Zone

- Industrial
  - Manufacturing of goods, factories or construction that deals with big items.
  - Not intended to include temporary/short-term use such as construction zones

Attributes (Surroundings - Cabins)

Context_Zone

- Cabins
  - Seasonal residences, typically near natural areas
  - May fall under either rural, small town, or suburban area types

Data Collection: Aerial Attributes

Redraw_Flag

- Indicate whether linework may require redrawing and/or realignment to match existing geometry.
  - “Yes”
  - “No”

Note: does not need to be perfect, but should roughly reflect the actual geometry, placement, etc. of the Intersection.

Attributes (Location Context)

- **City**
  - Name of city/municipality that intersection falls within
    - Source data: MnDOT municipality polygon GIS feature class
- **Major and Minor Street_Names**
  - Reference page 26 to identify major and minor streets
  - If applicable, use both county level name and local street name
    - E.g., “CSAH 17/12th Avenue East” or “CR 7/North Minnesota Street”
- **Intersection_Description**
  - Free form description in format “[MAJOR] & [MINOR]”
  - Should be sufficient for location identification independent from other attributes
- **Multi_Point**
  - Identifies the number of points representing the intersection in the study network geodatabase (i.e., ≥1)
- **Latitude; Longitude**
  - Format: -9X.XXXXX, 44.XXXXXX

Attributes (Intersection Format)

- **Int_Type**
  - Intersection
  - Ramp Terminal
  - Driveway (Residential)
  - Driveway (Commercial)
  - Pedestrian Crossing
  - At-Grade RR Crossing
  - Trail Crossing
  - Not an Intersection
    - E.g., Overpass, Recently Closed, Misidentified Point
- **Design_Type**
  - Traditional
  - Roundabout
  - SPI [Single Point Interchange: https://en.wikipedia.org/wiki/Single-point_urban_interchange]
  - RCI [Reduced Conflict Intersection: http://www.dot.state.mn.us/roadwork/rci/]
  - RIRO [Right-In/Right-Out: https://en.wikipedia.org/wiki/Right-in/right-out]
  - 3-4 [Three-Quarter Access: http://modot.gov/central/major_projects/documents/Rte763_7TEST_002.pdf]
  - DDI [Diverging Diamond Interchange https://en.wikipedia.org/wiki/Diverging_diamond_interchange]
- **Traffic_Control**
  - Uncontrolled
  - Thru-Stop (Include red flashing lights)
  - All-Way Stop (Include red flashing lights)
  - Yield [Either Thru-Yield or All-Way Yield]
  - Signal (Exclude flashing red or yellow lights)

Attributes (Intersection Format)

- **Leg_Configuration**
  - T
  - Y
  - X
  - TT
  - 5-Leg

"T" Type Intersection


"Y" Type Intersection

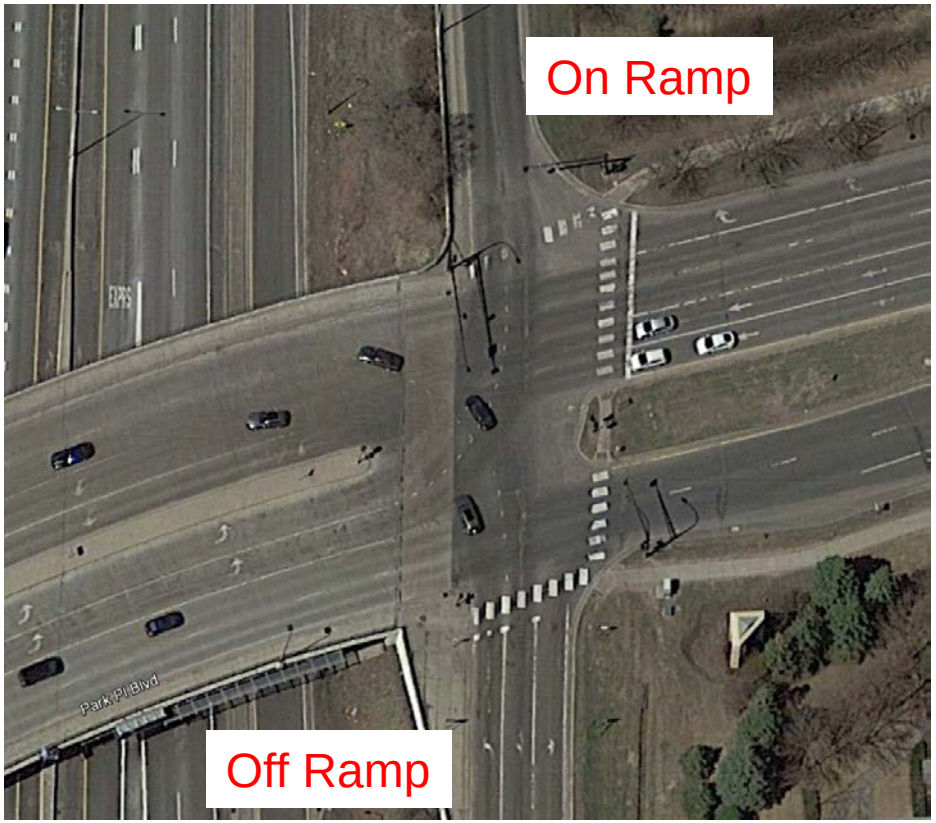

"X" Type Intersection


"TT" Type Intersection


5-leg Type Intersection

Attributes (Intersection Format)

- **Leg_Configuration Notes**
  - Ramp Terminals:
    - Ramp terminals will be labeled the same as any leg configuration. If it is a 3 leg ramp terminal it will be designated a “T”, if it is a 4 leg ramp terminal it will be designated an “X”.



Attributes (Intersection Format)

- **Major_Division_Configuration & Minor_Division_Configuration**
  - Undivided
  - Barrier
  - Curb
  - Depressed
  - Painted
  - Mixed
    - A mix of different division types at intersection.

(Center two-way left turn) Undivided

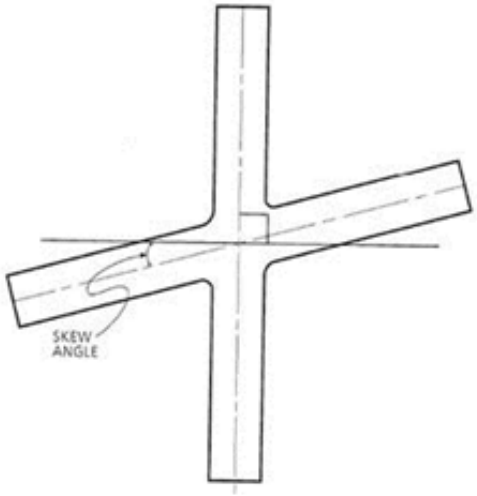
(Depressed Median Type) Divided

(Painted Median Type) Divided

(Curb Median Type) Divided

Attributes (Intersection Format)

- **Alignment_Skew**
  - [Numeric Value: Intersection skew to the nearest 5°]
    - A non-skewed intersection has a value of 0°
    - If multiple legs are skewed, use the largest absolute skew value



Attributes (Nearby Features)

- **Railroad_Crossing**
  - At-grade rail crossing on any approach within ~300 ft of intersection
    - Present
    - None
- **Adjacent_Curve**
  - Within ~100 ft of intersection
    - Horizontal
    - Vertical
    - Both
    - None
- **Adjacent_Development**
  - Commercial development within ~200 ft of intersection(E.g. shopping mall)
    - Present
    - None
- **Street_Parking**
  - On-street parking on any approach within ~100 ft of intersection
    - Present
    - None
- **Lighting_Present**
  - At least one post- or pole-mounted street light at the intersection
    - Present
    - None

Attributes (Surrounding Regulations)

- **Previous_Stop**
  - Specific to the approaches that have a STOP or YIELD condition, did any of these approaches have a STOP requirement within the past 5 miles? How far away was the nearest STOP condition for any of these STOP-controlled approaches?
    - >5 Miles
    - <5 Miles
- **Major_Speed_Limit & Minor_Speed_Limit**
  - Speed limit in MPH of major and minor roadways; If speed limit changes at intersection, larger speed limit retained
  - *For reference: Statutory Speed Limits* https://www.house.leg.state.mn.us/hrd/pubs/ss/ssspdlt.pdf
    - *10 – Alleys, mobile home parks and campgrounds*
    - *30 – Urban Streets*
    - *55 – Rural 2-Lane undivided*
    - *65 – Divided Highways with controlled access*
- **SpeedLimit_Source**
  - Because the speed limit may not be easily determined, the source of speed limit should be documented:
    - Statutory
    - Imagery (YEAR)
    - County
- **Flashers**
  - Specific to Thru-Stop, All-Way Stop, and Thru-Yield Intersections:
    - Overhead
    - Sign-Mounted
    - LED
    - None

LED Stop-Sign Flasher

Attributes (Approaches)

- **Maj1_Lane_Config &Maj2_Lane_Config**
  - **Hierarchy of Major/Minor Approach Identification**
- If the intersection control is Thru-Stop/Yield, the Thru/Free movement is the MAJOR Approach
- If the intersection control is All-Way Stop or Signal, the MAJOR Approach will be
  - Approach with HIGHEST number of THRU lanes, if same then:
  - Approach with HIGHEST Jurisdiction, if same then:
    - *Interstate Highway (ISTH)*
    - *U.S. Highway (USTH)*
    - *State Highway (MNTH)*
    - *County State Aid Highway (CSAH)*
    - *County Road (CR)*
    - *Municipal State Aid Street (MSAS)*
    - *Township Roads (TWNS)*
  - Approach with HIGHER traffic volume
    - http://dotapp9.dot.state.mn.us/tfa/ ⬅ MnDOT Online Traffic Map
  - If both/all approaches are indistinguishable from one another, then it does not make a difference which approaches are the major/minor.

Attributes (Approaches)

- **Min1_Lane_Config & Min2_Lane_Config & Min3_Lane_Config**
  - Presents the number and arrangement of Left Turn(L), Thru (T), Right Turn (R) and Bypass (B) lanes for the ***APPROACH lanes***
  - ***Always record from left to right of the traffic direction (RTTL is not allowed)***
  - ***Examples:***
    - **T**= just one approach lane (with no turn lanes)
    - **LTTR**= one left turn lane, two thru lanes, and a right turn lane
    - **TB** = one thru and one bypass lane
      - ***Bypass lane:*** ***https://ops.fhwa.dot.gov/access_mgmt/presentations/am_principles_intro/images/s30.jpg***
  - Ramp terminal on/off ramps would be considered the minor approaches.
    - The off ramp will have specific lane configuration shown on Google Earth.
    - The on ramp will only be through movement. “T” for a single lane on ramp, “TT” for 2 lane on ramps, and etc..
- **Maj1_ADT & Maj2_ADT & Min1_ADT & Min2_ADT & Min3_ADT**
  - 2-way official or estimated AADT/ADT for each leg of the intersection

Attributes (Only for Signalized Intersections)

- **Overhead_Signal**
  - Pedestal
  - Span Wire (may applicable to flashing red lights)
  - Overhead – All Present [All lanes have a signal head aligned specifically to them]
  - Overhead – Some [Only some lanes have a signal head aligned to them]
  - NA (if not signalized intersection, exclude flashing red lights)
- **Left_Turn_Phasing_Maj & Left_Turn_Phasing_Min**
  - Permitted
  - Permitted/Protected [Both direction use the permitted and protected phasing method]
  - Protected
  - Both [Opposite directions of travel use different phasing methods]
  - Unknown (if no street view or video log)
  - NA (if not signalized intersection), Unknown (if no street view or video log)
- **Flashing_Yellow_Arrow**
  - Present [http://www.dot.state.mn.us/trafficeng/signals/flashingyellowarrow.html]
  - None Typically indicated with a Flashing Yellow Arrow sign.
  - NA (if not signalized intersection), Unknown (if no street view or video log)
- **Right_Turn_On_Red** [*No Turn On Red* sign must be present to indicate non-allowance]
  - Fully Allowed
    - Allowed on all legs
  - Partially Allowed
    - Allowed on some but not all legs
  - Not Allowed
    - Not allowed on any legs
  - NA (if not signalized intersection), Unknown (if no street view or video log)
- **Ped_Indicator**
  - None
  - Standard
  - Countdown
  - NA (if not signalized intersection), Unknown (if no street view or video log)

Attributes (Pedestrian & Bicyclist Amenities)

- **No need to collect pedestrian/bike information in rural environment**
- **Max_Lanes_Cross**
  - The maximum number of lanes (among all legs of the intersection), including turn lanes, that a pedestrian must cross without a refuge or surrogate refuge
- **Sidewalk**
  - Presence of sidewalk along the approaches to the intersection:
    - None
    - Some
    - All
      - E.g., for a standard 4-legged intersection, there should be 8 'pieces' of sidewalk to constitute "All"
- **Refuge_Island**
  - Presence of a pedestrian refuge island [designed to be such]:
    - Major [at least 1 of the 2 major approaches]
    - Minor [at least 1 of the 2 minor approaches]
    - All [at least 1 of the major and at least 1 of the minor approaches]
    - None
- **Ped_Crossing**
  - Presence and type of pedestrian crossing device:
    - None
    - Markings
    - Signs & Markings
    - RRFB [http://pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=54]
    - HAWK [https://en.wikipedia.org/wiki/HAWK_beacon]

Attributes (Pedestrian & Bicyclist Amenities)

- **Bike_Facility**
  - **Presence and type of bicyclist facilities**
    - None
    - Bike Lane [Dedicated on-street bike lane]
    - Sharrow [https://en.wikipedia.org/wiki/Shared_lane_marking]
    - Bike Boulevard [https://en.wikipedia.org/wiki/Bicycle_boulevard]
    - Off-Street Trail
- **Transit_Adjacent**
  - Bus stop, train, or other transit station within ~300 ft
    - Present; None
- **School_Crosswalk**
  - Explicitly a school zone crosswalk within ~200 ft
    - Present; None
- **PedBike_Apparatus1 & PedBike_Apparatus2**
  - Freeform description of other pedestrian or bicyclist amenities not covered in the prior attributes
    - E.g., Bike Boxes, Curb Extensions, Yield-to-Pedestrian Channelizing Devices

Attributes (Intersection)

- **Comments**
  - Free form field allowing for any miscellaneous information
  - Note: This is the one attribute that is allowed to remain blank