

# Turning Movement & Short Count Data Processing

Iowa DOT – MTMUG – 10/24/2018

# Overview

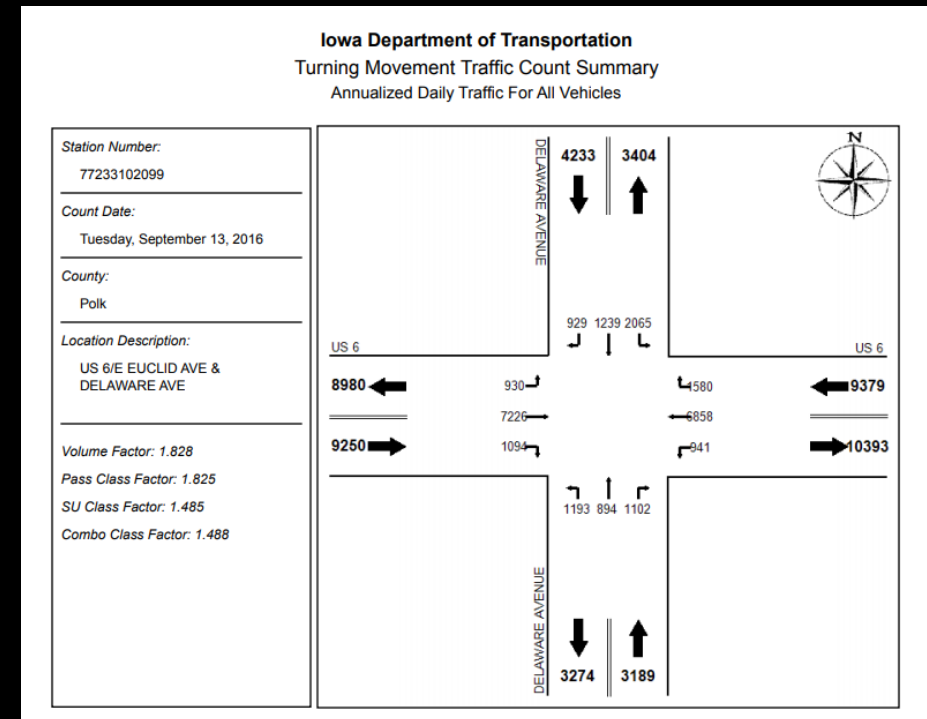
- Brief Description
- Examples of Issues
- Turning Movement Process
- Short Count Process
- Challenges
- Future Use

# Brief Description

- Data stored in TRADAS Database
- Goal: Assign turning movement and short term counts spatially
  - Turning movement – Including AADT, AADTT, Percentages, etc.
  - \*Short term counts – Including road volumes and peak-hour counts for all modes (personal, single, combo).
    - Eventually, data to be processed for individual modes.
- Problems:
  - Shapefile data was 'stacked'
  - Projections of coordinates skewed
  - Data had to be pulled from TRADAS

# Example – Turning Movements

- Delaware & E.Euclid Ave (US 6).  
Des Moines, IA
- Desired goal: [Turning Movement Diagram](#)



# Turning Movements

- Used SQL to pull all data from TRADAS
  - Included AADT to/from for all vehicle types
  - All years pulled separately.
- Imported Data to ArcMap
- Defined XY Coordinates
- Added 4 fields (NewX, NewY, Dist1, Dist2)
  - Used field calculator to fill Dist1 with 50 and Dist2 with 25
  - Trigonometry
- Used Python Scripting to calculate & update the offset of the new XY coordinates
- Verified a random sample of stations to ensure accuracy
- All data merged into 1 shapefile as well as individual-year shapefiles

# Outcome

Delaware and E. Euclid Ave. (US 6)  
Des Moines, IA



Identify

Identify from: <Top-most layer>

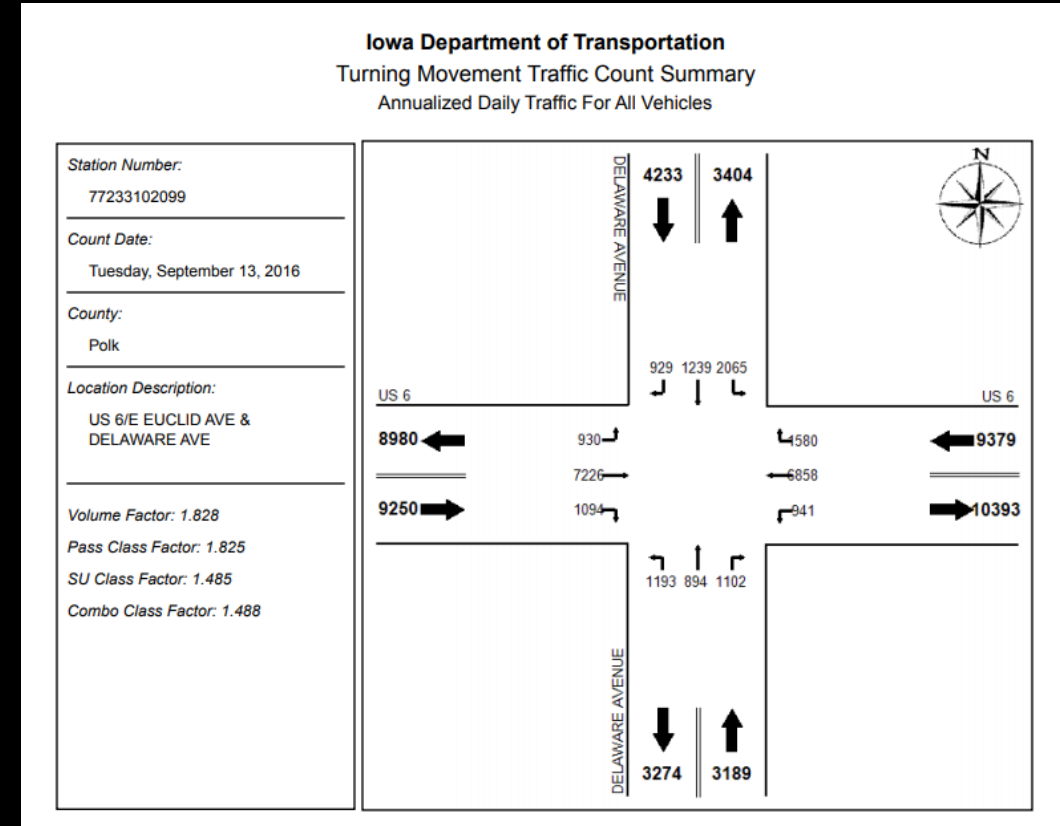
2010\_2017\_TM\_DATA

- 77233102110
- 77233102110

Location: 493,222.456 180,823.922 Meters

| Field      | Value        |
|------------|--------------|
| FID        | 20627        |
| Shape      | Point        |
| OBJECTID   | 20628        |
| ID         | 2504         |
| YEAR       | 2016         |
| ROADNAME   | 77233102110  |
| INTERSECTI | 77233102099  |
| DTTM_BEGIN | 9/13/2016    |
| LEG        | N            |
| FROM_AADT  | 3404         |
| TO_AADT    | 4233         |
| FROM_BIN1  | 2756         |
| FROM_BIN2  | 475          |
| FROM_BIN3  | 173          |
| TO_BIN1    | 3559         |
| TO_BIN2    | 465          |
| TO_BIN3    | 210          |
| CITY_NUMBE | 1945         |
| COUNTY_NO  | 77           |
| LEG_DIRECT | 1            |
| LEG_TYPE   | 10           |
| TWP        | 23           |
| NODE       | 3102         |
| RANGE      |              |
| ESRI_OID   | 644          |
| TOTAL_VOL  | 7637         |
| PRCNT_FROM | 44.57        |
| PRCNT_TO   | 55.43        |
| PASS_F_AAD | 2756         |
| PASS_TO_AA | 3559         |
| TOT_PASS   | 6315         |
| FROM_AADT_ | 648          |
| TO_AADT_T  | 675          |
| TOT_TRUCKS | 1323         |
| POINT_X    | 298024.86289 |
| POINT_Y    | 180745.47501 |
| NewX       | 298024.86289 |
| NewY       | 180795.47501 |

Identified 2 features



# Example – Short Counts

University Ave and S. 4<sup>th</sup> Street,  
Ames, IA

The screenshot shows the ArcMap interface with the following components:

- Table of Contents:** Lists layers including SDE.DEFAULT (sde), S1532010.TRADAS\_SHORT\_VOL\_2015\_SO\_V, W:\Planning\SystemPlanning\Highway\SQL\F, SW\_QUAD, SE\_QUAD, NW\_QUAD, NE\_QUAD, SDE.DEFAULT (sde), and RAMSLRSE\_ROADSYSTEM.
- Identify Window:** Shows metadata for a selected feature with the following table:

| Field              | Value                     |
|--------------------|---------------------------|
| ID                 | 6979                      |
| STATION            | 85217355510               |
| LOCATION           | S 4TH ST & UNIVERSITY AVE |
| PGM_CODE           | CZ                        |
| ROADADDT           | 20764                     |
| DATEADT            | 9/14/2015                 |
| CITY_NUMBER        | 0155                      |
| COUNTY_NO          | 85                        |
| START_DATE         | 2/4/2008 8:10:15 AM       |
| END_DATE           | <null>                    |
| LEG_DIRECTION      | S                         |
| LEG_DIRECTION_DESC | Count on South Leg        |
| LEG_TYPE           | 10                        |
| TMP                | 21                        |
| NOISE              | 7355                      |
| RANGE              |                           |
| GEOMETRY           | Point                     |
| ESRI_OID           | 1                         |
- Map:** Shows a road network with a specific intersection highlighted in green.
- Catalog:** Lists various data sources including TRAFFIC\_BOOK, CNT\_LOC\_MAN\_SO, CNT\_LOC\_REC\_HST\_SO\_V, CNT\_LOC\_REC\_SO\_V, CNT\_SCH\_FINAL\_SO\_V, CNT\_SCH\_MAN\_SO\_UPDAT, CNT\_SCH\_REC\_SO\_V, COUNT\_LOCATION\_SO\_V, RAMS\_ROAD\_NETWORK, TRADAS\_CONT\_PEAK\_2011, TRADAS\_CONT\_PEAK\_2012, TRADAS\_CONT\_PEAK\_2013, TRADAS\_CONT\_PEAK\_2014, TRADAS\_CONT\_PEAK\_2015, TRADAS\_CONT\_PEAK\_2016, TRADAS\_CONT\_PEAK\_2017, TRADAS\_CONT\_PEAK\_2018, TRADAS\_SHORT\_AADT\_201, TRADAS\_SHORT\_AADT\_2011, TRADAS\_SHORT\_AADT\_2012, TRADAS\_SHORT\_AADT\_2013, TRADAS\_SHORT\_AADT\_2014, TRADAS\_SHORT\_AADT\_2015, TRADAS\_SHORT\_AADT\_2016, TRADAS\_SHORT\_AADT\_2017, TRADAS\_SHORT\_AADT\_2018, TRADAS\_SHORT\_AADT\_2019, TRADAS\_SHORT\_AADT\_2020, TRADAS\_SHORT\_AADT\_2021, TRADAS\_SHORT\_AADT\_2022, TRADAS\_SHORT\_AADT\_2023, TRADAS\_SHORT\_AADT\_2024, TRADAS\_SHORT\_AADT\_2025, TRADAS\_SHORT\_AADT\_2026, TRADAS\_SHORT\_AADT\_2027, TRADAS\_SHORT\_AADT\_2028, TRADAS\_SHORT\_AADT\_2029, TRADAS\_SHORT\_AADT\_2030.

# Short Count Process

- Still a work in progress
- SQL to pull count quadrants from TRADAS via Oracle
  - Due to nature of counts, it was advisable to work by quadrants instead of years.
  - Credit to Cameron Mason for developing code
- Export count quadrant as duplicate file
- SQL to pull station number and year from TRADAS via Oracle
- Data management in excel
- Add excel file to ArcMap as a table
- Joined table to duplicate file
- Export new shapefile as a copy.



# Short Count Process Cont.

- Deleted duplicate fields.
- Defined XY Coordinates
- Added 6 new fields(N\_POINT\_X, N\_POINT\_Y, Dist1, Dist2, Dist3, Dist4)
  - Field calculator on Dist1 through Dist4: 100, 75, 50, 25 respectively
- Developed similar Python Script to offset and update shapefiles
- Verified a random sample of stations to ensure accuracy

# Outcome

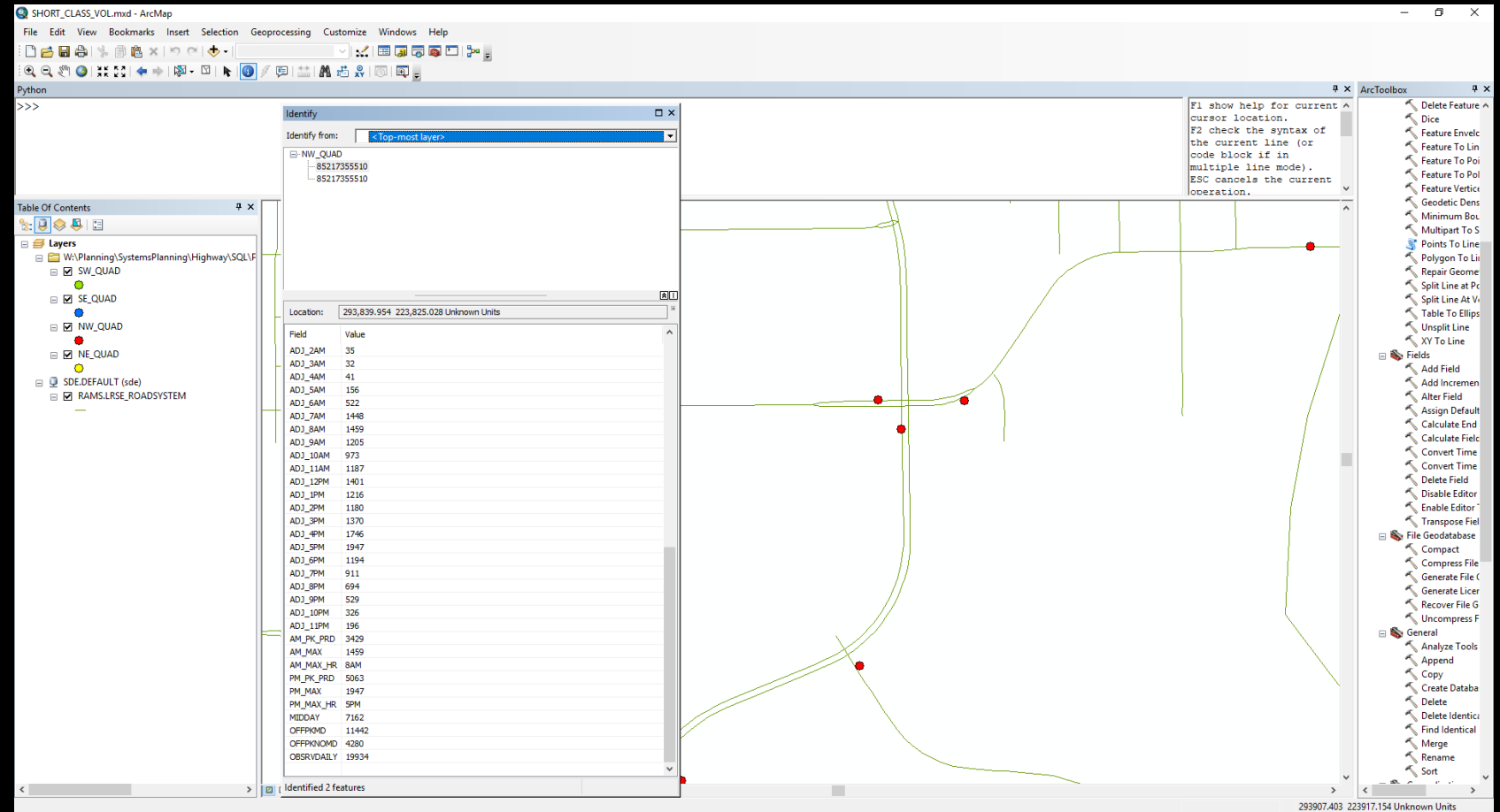
University Ave & S. 4<sup>th</sup> Street.  
Ames, IA

AM Peak Hour: 8am – 1,459

PM Peak Hour: 5pm – 1,947

Observed daily(Road Volume):  
19,934

Offsetting coordinate points  
helps visually see where  
counts were conducted



# Challenges

- Unable to use Python script outside of ArcMap
  - Changing code to be able to be entered via the ArcMap Python Interpreter
  - Will be utilizing FME in the future.
- Long Process for both TM and SC– Heavily Documented
- Projection Issues occurred with all initial data from Oracle
  - Spatial Data was not centered on Iowa
  - Aided by the Iowa DOT Cartography team
- Some 2017 short term counts have not been processed yet, leading to 70 stations missing data.
  - Future work to be done

# Future Uses

- Data to eventually be shipped back to TRADAS
- Can be used in models to ensure more accurate counts and cut down on prep time
- Potential use in traffic forecasting
- Data will be more easily accessible for all users
- Processes in place for future year count data processing

Questions?