TRANSPORTATION SYSTEM TRANSPORTATION SAFETY AND SECURITY

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS



APPENDIX 1 OF 2 SAN BERNARDINO INSTRUCTIONS

ADOPTED ON SEPTEMBER 3, 2020

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TECHNICAL REPORT

TRANSPORTATION SAFETY AND SECURITY APPENDIX 1 OF 2 ADOPTED ON SEPTEMBER 3, 2020

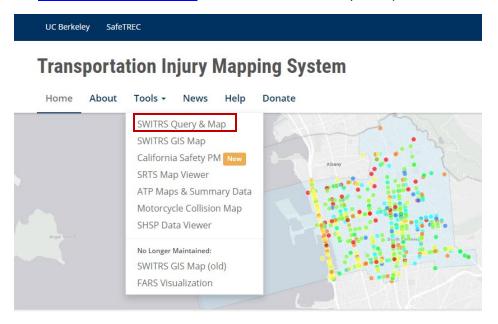
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APPENDIX 1 OF 2 San Bernardino Instructions

The following instructions were created using ArcMap 10.5.1.

PART ONE: GATHER DATA

1. Acquire the latest Transportation Injury Mapping System (TIMS) data. Visit https://tims.berkeley.edu/ and select "SWITRS Query & Map."



2. Login or create an account to access the data.

Transportation Injury Mapping System

Home

About	Tools +	News	Help	Donate	
				Welcome to the TIMS	
				Transportation Injury Mapping System	
				Please sign in to see the page you requested. Click here to create a free account if you don't have one.	
				Login to your account	
				1 Email	
				Password	
				Remember me	
				Sign in	
				Forget your password ? Click here to reset your password.	
	About	About Tools -	About Tools - News		Welcome to the TIMS Transportation Injury Mapping System Please sign in to see the page you requested. Click here to create a free account if you don't have one. Image: Comparison of the term of the term of te

- 3. Select the desired data the user would like to analyze. For this exercise on Fatal and Serious Injuries (FSI), select the following attributes:
 - a. Specify the ${\it Date}$ to range from ${\it 01/01/2010}$ to ${\it 12/31/2014}$
 - b. Select the County to be **San Bernardino** at the **City** level
 - c. Select All under the City subcategory
 - d. Filter **Collision factors** to only include incidents where the **Collision Severity** criteria is either **1 Fatal** or **2 Injury (Severe)**
 - e. Filter State Highway to only include incidents that did not occur on a State Highway

SWITRS Query & Map

The SWITRS Query & Map application is a tool for accessing and mapping collision data from the California Statewide Integrated Traffic Records System (SWITRS).

1. Please specify date and location		New Query / Query by Case ID(s) / Load / Help	
A Date 01/01/2010 to	* 2006 to 2018 is available (2016 - 2018 is provisional and s		
County San Bernardino	City B2 State Route	City All Onincorporated Adelanto Apple Valley Barstow Big Bear Lake Chice	
2. (OPTIONAL) Narrow down your results by Selected Factors Collision Severity State Highway 1 - Fatal No 2 - Injury (Severe)	adding specific factors to the query.	State Highway Choose criteria of State Highway No Yes	×
Collision factors - 2 factors selected	D	Update	Cancel
Alcohol Involved Bicycle Collision Road Type Motor Vehicle Involved Injured Victims Killed V Truck Collision Type of Collision Weather	Collision Severity Day of Week Hit And Run Intersection /ictims F Violation Pedestrian Collision Pedestrian Act Collision Severity		
Party factors - All factors selected Victim factors - All factors selected	Choose criteria of Collision Severity I - Fatal 2 - Injury (Severe) 3 - Injury (Other Visible) 4 - Injury (Complaint of Pain)	Show Result	
		Update Cancel	

- 4. Click Show Result
- 5. On the **Result Summary** page, click the **Download** button and select **Collisions** as the Data File Type.

Download Raw Data				×
You can download SW download?	/ITRS Data as	a CSV file.	Which data	a do you want to
Choose Data File Type	Collisions	Parties	Victims]
				Download Close

PART TWO: UPLOADING DATA

- 1. Open ArcMap and upload the street line shapefile available on the user's servers.
 - a. SCAG will use a street line shapefile informed by TomTom for instructional purposes.
- 2. Load the Collision CSV file to ArcMap.
- 3. Right click the Collision CSV file and select **Display XY Data**.

_	Collisions	<u></u>		
▦	Collisions_		Open	
			Joins and Relates	•
		×	Remove	
			Data	•
			Edit Features	•
		P	Geocode Addresses	
		<mark>.++</mark> -	Display Route Events	
		**+ X Y	Display XY Data	
		8	Properties	

4. Assign the X Field and Y Field to **POINT_X** and **POINT_Y** respectively. Assign the Geographic Coordinate System to GCS_WGS_1984

	Display XY Data	x			
A table containi map as a layer	A table containing X and Y coordinate data can be added to the map as a layer				
Choose a table	from the map or browse for anot	ner table:			
Collisions	_SB.csv	• E			
Specify the fie	elds for the X, Y and Z coordinate	s:			
X Field:	POINT_X	¥			
Y Field:	POINT_Y	~			
Z Field:	<none></none>	~			
Coordinate System of Input Coordinates Description: Geographic Coordinate System: Name: GCS_WGS_1984					
Show Details					
Warn me if the resulting layer will have restricted functionality					
About adding X	<u>r data</u> OK	Cancel			

5. Export the Collisions events to the project folder or geodatabase.

PART THREE: PREPARE STREET DATA

SOURCE: SCAG TomTom street network

Use the Functional Road Classification (FRC) to filter the street line shapefile (TomTom) to only represent the local roads.

FRC

0: Motorway, Freeway, or Other Major Road (highway)

1: A Major Road Less Important than a Motorway (highway)

2: Other Major Road (highway)

3: Secondary Road (arterial)

- 4: Local Connecting Road (Local)
- 5: Local Road of High Importance (Local)
- 6: Local Road (Local)
- 7: Local Road of Minor Importance (Local)
- 8: Other Road (Local)
- 1. Open Layer Properties to execute a **definition query** which will select local roads (i.e.: FRC that ranges from 1 to 6). Export the shapefile/data to the project folder or geodatabase.

	Layer Properties			
	General Source Selection Display Symbology Fields Definition Query Labels Joins & Relates Time HTML Popup			
FRC >=1 AND FRC<=6	Defnition Query:			
	OK Cancel Apply			

2. Dissolve the local road shapefile by street name and street direction. For example, the TomTom data SCAG used for this process have the attributes **NAME** and **RTEDIR**.

				Dissolve		
			Input Features SB_Streets_Local Output Feature Class		2	Dissolve_Field(s) (optional)
Geo	processing Customize Wind	lows Help			6	The field or fields on which to aggregate features.
~~~~	Buffer	I C	Disolve_Frield(s) (optional)  Viewe NAMELC SOL NUMETYP OHARGE SHELDNJM RTETYP R RTEDIR RTEDIRVO		~	The Add Field button, which is used only in ModelBuilder, allows you to add expected fields so you can complete the dialog box and continue to build your model.
5	Merge		< III		>	
5	Dissolve		Select All Unselect All Statistics Field(s) (optional)	Add Field	~	
5	Search For Tools		Field	Statistic Type	+	
<b></b>	ArcToolbox				×	
R	Environments				1	
1	Results				Ŧ	
300	ModelBuilder		< Ⅲ ✓ Create multipart features (optional)	>		
>	Python		Unsplit lines (optional)			· ·
	Geoprocessing Options		OK Cance	Environments	ide Help	Tool Help

- 3. Create a new field ("MILES") in the dissolved street shapefile. Execute **Calculate Geometry** to determine the length of each polyline in Miles US.
  - a. **Select By Attributes** polylines with a distance less than one quarter (.25) mile in length. Delete highlighted selection.
  - b. **Select By Attributes** polylines with a distance more than eighty (80) miles in length. Delete highlighted selection.

Select by Attributes	Select by Attributes
Enter a WHERE clause to select records in the table window.	Enter a WHERE clause to select records in the table window.
Method : Create a new selection	Method : Create a new selection
OBJECTID NAME RTEDIR Shape_Length MILES	OBJECTID F NAME RTEDIR Shape_Length MILES
=         <>         Like           >         >=         And           <	=         <>         Like           >         >         =         And           <
SELECT * FROM SB_Streets_Dissolve1 WHERE:	SELECT * FROM SB_Streets_Dissolve1 WHERE:
MILES < 25	
Clear Verify Help Load Save	Clear Verify Help Load Save
Apply Close	Apply Close

4. Execute python script to break the remaining streets into 0.5 mile segments.

```
>>> in_fc='P:\Ariel
Pepper\GIS\Safety\Safety.gdb\SB_Streets_Dissolve_deleted'
```

6 .....

```
>>> out fc=arcpy.CreateFeatureclass management("P:\Ariel
Pepper\GIS\Safety\Safety.gdb", "cams long split", "POLYLINE",
spatial reference=in fc)
>>> global feat
>>> feat = []
>>> for row in arcpy.SearchCursor(in fc):
        line = row.shape
. . .
        out count = row.getValue("SplitNumber")
. . .
        feat.append([line.segmentAlongLine(i/float(out count),
. . .
((i+1)/float(out count)), True) for i in range(0, out count)])
       print row.getValue("NAME")
. . .
      arcpy.CopyFeatures management([item for sublist in
. . .
feat item in sublist],out fc)
. . .
```

#### PART FOUR: PREPARE COLLISION DATA

The TIMS fatal and severe injury (FSI) data will be analyzed by four collision-type groupings: 1) Automobile-Automobile, 2) Automobile-Bicycle, 3) Automobile-Pedestrian, and 4) All Collisions.

The collision types will be determined by filtering the **Motor Vehicle Involved With (MVIW)** attribute.

MVIW

- A Non-Collision
- <mark>B Pedestrian</mark>
- C Other Motor Vehicle
- D Motor Vehicle on Other Roadway
- E Parked Motor Vehicle
- F Train

G - Bicycle

- H Animal I - Fixed Object J - Other Object - - Not Stated

.....

More information regarding the attribute table can be found in the <u>TIMS Codebook</u>.

- 1. Open the TIMS shapefile and write the following in the **Select By Attributes** window for each group. Export the selected attributes to the project folder and add exported data to the map as a layer.
  - a. Automobile-Automobile: MVIW = 'C'
  - b. Automobile-Bicycle: MVIW = 'G'
  - c. Automobile-Pedestrian: MVIW = 'B'
  - d. All Fatal and Serious Injury Collisions: [No filter]

#### SAN BERNARDINO INSTRUCTIONS

Select by Attributes	Select by Attributes	Select by Attributes
Enter a WHERE clause to select records in the table window.	Enter a WHERE clause to select records in the table window.	Enter a WHERE clause to select records in the table window.
Method : Create a new selection V	Method : Create a new selection	Method : Create a new selection V
PCF_VICLATION         PCF_VICLATION           PCF_VICL_SUBSECTION         HIT_AND_RUN           HIT_AND_RUN         V           TYPE_OF_COLLISION         V           MVIW         V           = <>         Like           Y'         ^           > >=         And 'B'           =         <	PCF_VIOLATION        PCF_VIOLATION        PCF_VIOLSUBSECTION        HIT_AND_RUN        TYPE_OF_COLLISION        MVIW        =     <>       Like     '.'       >     >=       And     'B'       =     <	PCF_VIOL_SUBSECTION           PCF_VIOL_SUBSECTION           HIT_AND_RUN           TYPE_OF_COLLISION           WVW           = <> Like           %           B:           C:           D'           %           B:           Null           Get Unique Values           SELECT * FROM CollisionSB WHERE:
Clear Verify Help Load Save Apply Close	Clear Verfy Help Load Save Apply Close	Clear Verfy Hep Load Save Apply Close

#### PART FIVE: ASSIGN COLLISION (POINT) TO STREET (LINE)

#### Analysis – Near

- Use near to identify All Fatal and Serious Injury Collisions near the street
- Use near to identify Automobile-Automobile near the street
- Use near to identify Automobile-Pedestrian near the street
- Use near to identify Automobile-Bicycle near the street

#### PART SIX: JOIN NEAR TABLE TO STREET TABLE

- Join the near table for *All Fatal and Serious Injury Collisions* to street table to identify number of collisions per mile
- Join the near table for *Automobile-Automobile* to street table to identify number of collisions per mile
- Join the near table for *Automobile-Pedestrian* to street table to identify number of collisions per mile
- Join the near table for *Automobile-Bicycle* to street table to identify number of collisions per mile

#### PART SEVEN: USE SYMBOLOGY TO IDENTIFY 65% COLLISIONS

- 2. 20 equal classifications
- 3. Reverse sorting
- 4. Capture 65% collisions

#### **References**

San Francisco (Calif.), Department of Public Health, & San Francisco Municipal Transportation Agency. (2013). Identifying high pedestrian injury corridors for targeted safety improvements: a methodology for San Francisco, California : 2013 update. Retrieved from

http://www.sfhealthequity.org/component/jdownloads/finish/8-transportation/280identifying-high-pedestrian-injury-corridors-for-targeted-safety-improvements/0?Itemid=62 Vision Zero High Injury Network Prioritization. (2016, June 17). Retrieved March 14, 2018, from http://visionzero.lacity.org/vision-zero-high-injury-network-prioritization/ Metro. (n.d.). Retrieved March 14, 2018, from https://www.oregonmetro.gov/



#### MAIN OFFICE

900 Wilshire Blvd., Ste. 1700 Los Angeles, CA 90017 Tel: (213) 236-1800

#### **REGIONAL OFFICES**

#### IMPERIAL COUNTY

1405 North Imperial Ave., Ste.104 El Centro, CA 92243 Tel: (213) 236-1967

#### **ORANGE COUNTY**

OCTA Building 600 South Main St., Ste. 741 Orange, CA 92868 Tel: (213) 236-1997

#### **RIVERSIDE COUNTY**

3403 10th St., Ste. 805 Riverside, CA 92501 Tel: (951) 784-1513

#### SAN BERNARDINO COUNTY

1170 West 3rd St., Ste. 140 San Bernardino, CA 92410 Tel: (213) 236-1925

#### VENTURA COUNTY

4001 Mission Oaks Blvd., Ste. L Camarillo, CA 93012 Tel: (213) 236-1960



## **TECHNICAL REPORT**

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