Crash Data Analysis 202

DOTD Highway Safety Section

5

Crash Report Etiquette

- Personal information should be ignored
- Do not print crash reports
- Do not include copies of crash reports in studies or Stage 0

6

CAT Scan

- Visual Optimization
  - Spreadsheets hidden
  - Columns minimized
- Open – Nothing locked
  - Careful not to delete
  - Careful to modify

7

Agenda

Duration	
30	Rectifying location data
30	AADT Acquisition & Linear Interpolation
60	CAT Scan's Error Detection Algorithms
30	Construct Analysis Log-miles
10	CAT Scan's Evaluation Score
10	CAT Scan's Research Section
10 (minute)	CAT Scan's Geolinear Segregator

8

Decision: Rectify Location Data

- Not for Intersections
- Each year, crashes are assigned to one road system
- Most often analysis segment isn't different – no need to rectify

9

Decision: Rectify Location Data

- If analysis segment does not posses a consistent road profile
- Use the Coordinate Converter to determine consistency
  - examining each geographical end for each year
  - Control-Section & Log-mile
  - Or Route & Mile-point

10

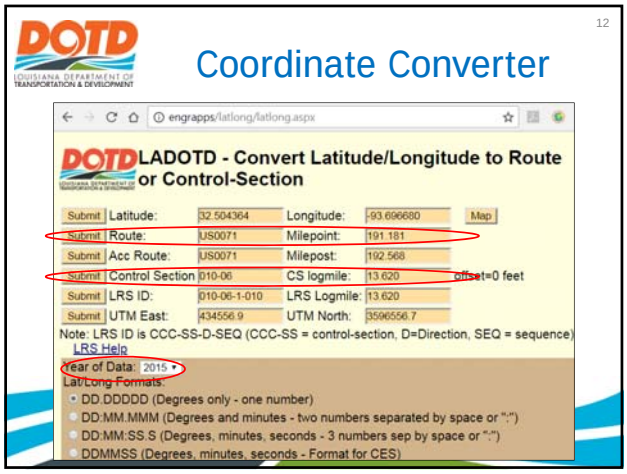
Find Coordinate Converter

11

Find Coordinate Converter

12

Coordinate Converter



13

Decision: Rectify Location Data

- Use "End-point Evaluator" on the Input spreadsheet
  - Ensure Highway Classification set
  - Enter coordinates from Coordinate Converter
  - If evaluation is "Too Large"
  - Then rectify location data

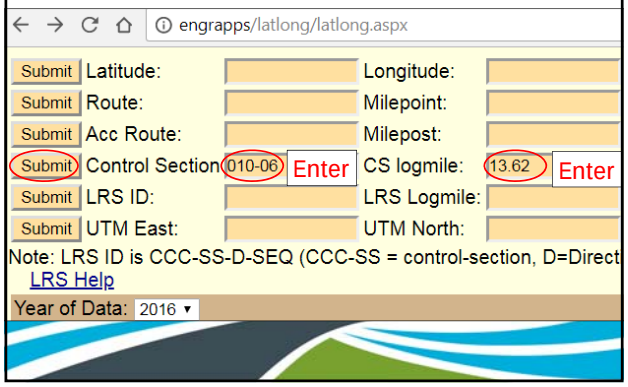
14

Rectify Decision Example

- Example:
  - Control-Section: 010-06
  - Log-miles: 13.62
  - Route: US 71
  - Years: from 2014 to 2016

15

Rectify Decision Example



16

Rectify Decision Example

engrapps/latlong/latlong.aspx

Submit	Latitude:	32.504359	Longitude:	-93.696678
Submit	Route:	US0071	Milepoint:	190.899
Submit	Acc Route:	US0071	Milepost:	192.568
Submit	Control Section	010-06	CS logmile:	13.620
Submit	LRS ID:	010-06-1-010	LRS Logmile:	13.620
Submit	UTM East:	434557.1	UTM North:	3596556.1

Note: LRS ID is CCC-SS-D-SEQ (CCC-SS = control-section, D=Direct

LRS Help

Year of Data: 2016

17

Rectify Decision Example

End-point Evaluator

	32.504359	-93.696678	211.2	#####
2016	32.504359	-93.696678	Fine	0
2015			Too large	2E+07
2014			Too large	2E+07

Enter

Start | Data | CH | Inputs | QA | Ou ...

18

Rectify Decision Example

engrapps/latlong/latlong.aspx

Submit	Latitude:	32.504364	Longitude:	-93.696680
Submit	Route:	US0071	Milepoint:	191.181
Submit	Acc Route:	US0071	Milepost:	192.568
Submit	Control Section	010-06	CS logmile:	13.62
Submit	LRS ID:	010-06-1-010	LRS Logmile:	13.62
Submit	UTM East:	434556.9	UTM North:	3596556.7

Note: LRS ID is CCC-SS-D-SEQ (CCC-SS = control-section, D=Direct

LRS Help

Year of Data: 2015

2016
2015
2014
2013
2012

Lat/Long Form

DD.DDDD ees only - one number)

DD:MM.M grees and minutes - two numbers separated by

DD:MM:SS grees, minutes, seconds - 3 numbers sep by spa

19

Rectify Decision Example

End-point Evaluator

	32.504362	-93.696679	211.2	#####
2016	32.504359	-93.696678	Fine	1
2015	32.504364	-93.696680	Fine	1
2014			Too large	2E+07

Enter

Start | Data | CH | Inputs | QA | Ou ...

23

Rectify Decision Example

End-point Evaluator

	32.503922	-93.696212	211.2	144.33
2016	32.504359	-93.696678	Fine	
2015	32.504364	-93.696680	Fine	
2014	32.503044	-93.695278	Too large	216

If one value of "Too large", then rectify

Start | Data | CH | Inputs | QA | Ou ...

24

Rectify Decision Example

Query Helper	2014	2015	2016	2017	2018	2019	widest extents
Log-mile from	13.498	13.62	13.62				13.498
Log-mile to	14.726						14.726

Start | Data | CH | Inputs | QA | Outputs | CM

25

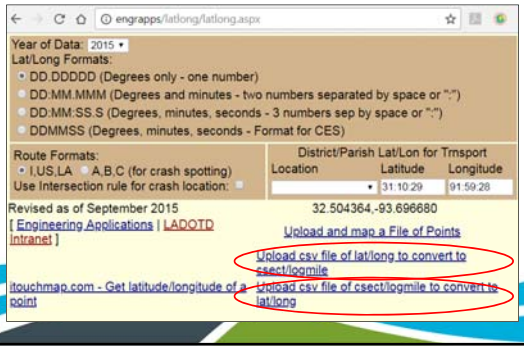
Rectifying Location Data

- Query crash data with widest extents
  - Submit coordinates & note log-mile or mile-point
  - Use set with largest range
- Open CSV for CAT Scan file
- Copy the Latitude and Longitude columns (at the right end)
- Paste into a new workbook and save as a CSV file

26

Rectifying Location Data

Upload the data to the link labeled "Upload csv file of ..."



27

Rectifying Location Data

- Manually correct inaccurate data
  - Resubmit individual coordinates into the Coordinate Converter
- Update crash data

Column	Data Name
BI	Control-Section
BO	Log-mile
BW	Route
CF	Mile-point
CL	LRS id

28

Agenda

- ✓ Rectifying location data
- AADT Acquisition & Linear Interpolation
- CAT Scan's Error Detection Algorithms
- Construct Analysis Log-miles
- CAT Scan's Evaluation Score
- CAT Scan's Research Section
- CAT Scan's Geolinear Segregator

29

AADT Acquisition

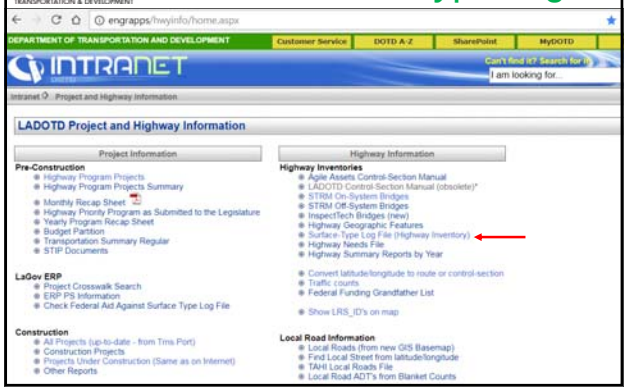
- Annual Average Daily Traffic
- Units: Vehicles/day
- Surface Type Log (STL)

30

Find Surface Type Log

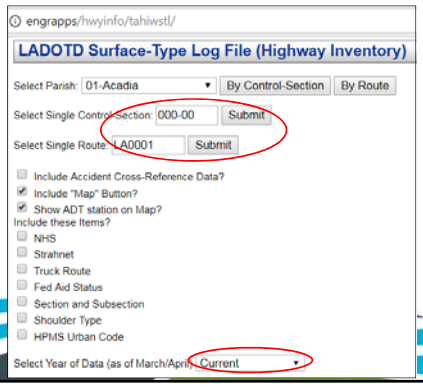
31

Find Surface Type Log

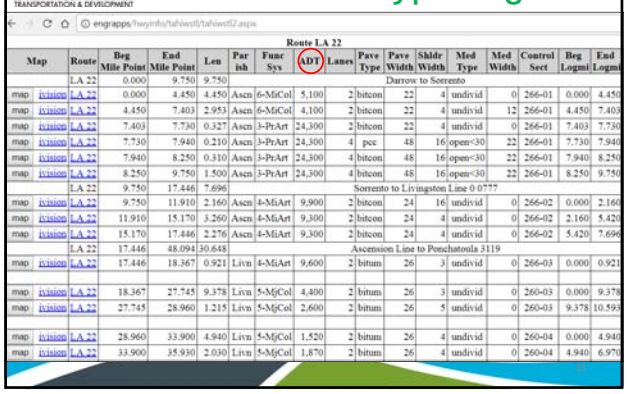


32

STL Query



Surface Type Log



Route LA 22

Map		Route	Beg Mile Point	End Mile Point	Len	Parish	Func Sys	ADT	Lanes	Pave Type	Pave Width	Shldr Width	Med Type	Med Width	Control Sect	Beg Logmi	End Logmi
		LA 22	0.000	9.750	9.750					Darrow to Sorrento							
map	ivision	LA 22	0.000	4.450	4.450	Ascn	6-MiCol	5,100	2	bitcon	22	4	undivid	0	266-01	0.000	4.450
map	ivision	LA 22	4.450	7.403	2.953	Ascn	6-MiCol	4,100	2	bitcon	22	4	undivid	12	266-01	4.450	7.403
map	ivision	LA 22	7.403	7.730	0.327	Ascn	3-PrArt	24,300	2	bitcon	22	4	undivid	0	266-01	7.403	7.730
map	ivision	LA 22	7.730	7.940	0.210	Ascn	3-PrArt	24,300	4	pcc	48	16	open<30	22	266-01	7.730	7.940
map	ivision	LA 22	7.940	8.250	0.310	Ascn	3-PrArt	24,300	4	bitcon	48	16	open<30	22	266-01	7.940	8.250
map	ivision	LA 22	8.250	9.750	1.500	Ascn	3-PrArt	24,300	4	bitcon	48	16	open<30	22	266-01	8.250	9.750
		LA 22	9.750	17.446	7.696					Sorrento to Livingston Line 0 0777							
map	ivision	LA 22	9.750	11.910	2.160	Ascn	4-MiArt	9,900	2	bitcon	24	16	undivid	0	266-02	0.000	2.160
map	ivision	LA 22	11.910	15.170	3.260	Ascn	4-MiArt	9,300	2	bitcon	24	4	undivid	0	266-02	2.160	5.420
map	ivision	LA 22	15.170	17.446	2.276	Ascn	4-MiArt	9,300	2	bitcon	24	4	undivid	0	266-02	5.420	7.696
		LA 22	17.446	48.094	30.648					Ascension Line to Ponchatoula 3119							
map	ivision	LA 22	17.446	18.367	0.921	Livn	4-MiArt	9,600	2	bitum	26	3	undivid	0	266-03	0.000	0.921
map	ivision	LA 22	18.367	27.745	9.378	Livn	5-MjCol	4,400	2	bitum	26	3	undivid	0	260-03	0.000	9.378
map	ivision	LA 22	27.745	28.960	1.215	Livn	5-MjCol	2,600	2	bitum	26	5	undivid	0	260-03	9.378	10.593
map	ivision	LA 22	28.960	33.900	4.940	Livn	5-MjCol	1,520	2	bitum	26	4	undivid	0	260-04	0.000	4.940
map	ivision	LA 22	33.900	35.930	2.030	Livn	5-MjCol	1,870	2	bitum	26	4	undivid	0	260-04	4.940	6.970

34

AADT Acquisition

- Some issues
  - Divided by humans
  - Occasionally values misdirected
  - Non access controlled routes, AADT changes more gradual than abrupt
- Solution => Linear Interpolation

35

AADT Linear Interpolation

- Use Count Stations Location
- Find a station beyond either end of the segment
- Collect the unique location of each station
- Collect the AADT of each station

36

Linear Interp. Example

- Example:
  - Control-Section: 246-01
  - Log-miles: from 0.77 to 2.38
  - Route: LA 57
  - Years: from 2014 to 2016

37

Linear Interp. Example

	Name	Input	Suggested
11	Location Method	Log-Mile	
14	Route	LA 57	LA 57
16	Control-Section	246-01	246-01
18	Log-mile from	0.77	0.776
20	Log-mile to	2.38	2.377
22	Highway Classification	Urban 5-Lane	

Start | Data | CH | Inputs | QA | Ou ...

38

Linear Interp. Example

engrapps/hwyinfo/tahiwstl/

LADOTD Surface-Type Log File (Highway Inventory)

Select Parish: 01-Acadia | By Control-Section | By Route

Select Single Control-Section: 246-01 | Submit

Select Single Route: LA0022 | Submit

- Include Accident Cross-Reference Data?
- Include "Map" Button?
- Show ADT station on Map?

Include these Items?

- NHS
- Strahnet
- Truck Route
- Fed Aid Status
- Section and Subsection
- Shoulder Type
- HPMS Urban Code

Select Year of Data (as of March/April) Current

39

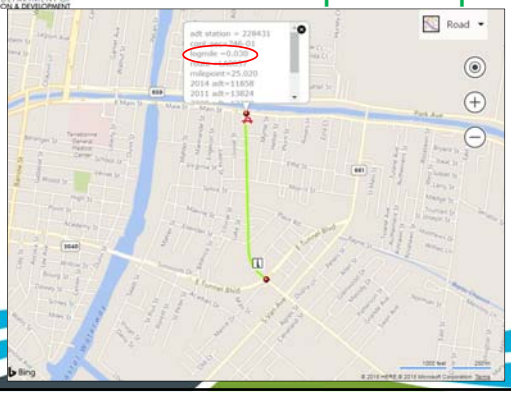
Linear Interp. Example

Control Section 246-01

Map	Control Sect	Beg Logmi	End Logmi	Parish	Func Sys	ADT	Lanes	Pave Type	Pave Width	Shldr Width	Med Type	Med Width	Route	Beg Mile Point	End Mile Point	Len
	246-01	from: Houma (Jct LA 24, on Grand Caillou Rd at E Main)											to: Jct LA 56 (4.68 mi N of Cocodrie)			
map	ivision	246-01	0.000	0.710	Terr	3-PrArt	12300	4	bitcon	48	0	undivid	0	LA 57	25.053	24.343	0.710
map	ivision	246-01	0.710	2.471	Terr	3-PrArt	32500	4	bitcon	48	0	cnt trn	14	LA 57	24.343	22.582	1.761
map	ivision	246-01	2.471	4.127	Terr	3-PrArt	22700	4	bitcon	48	16	cnt trn	14	LA 57	22.582	20.926	1.656
map	ivision	246-01	4.127	5.251	Terr	5-MjCol	22700	2	bitcon	24	6	undivid	0	LA 57	20.926	19.802	1.124
map	ivision	246-01	5.251	6.411	Terr	5-MjCol	22700	2	bitcon	24	8	undivid	0	LA 57	19.802	18.642	1.160
map	ivision	246-01	6.411	7.471	Terr	5-MjCol	22700	2	bitcon	24	8	undivid	0	LA 57	18.642	17.582	1.060
map	ivision	246-01	7.471	7.580	Terr	5-MjCol	6000	2	bitcon	24	6	undivid	0	LA 57	17.582	17.473	0.109
map	ivision	246-01	7.580	12.801	Terr	5-MjCol	6000	2	bitcon	24	6	undivid	0	LA 57	17.473	12.252	5.221
map	ivision	246-01	12.801	16.791	Terr	5-MjCol	2000	2	bitcon	24	6	undivid	0	LA 57	12.252	8.262	3.990
map	ivision	246-01	16.791	17.194	Terr	5-MjCol	2000	2	bitcon	24	6	undivid	0	LA 57	8.262	7.859	0.403
map	ivision	246-01	17.194	17.351	Terr	7-Local	2000	2	bitcon	22	6	undivid	0	LA 57	7.859	7.702	0.157
map	ivision	246-01	17.351	25.053	Terr	7-Local	370	2	bitcon	20	6	undivid	0	LA 57	7.702	0.000	7.702

40

Linear Interp. Example



41

Linear Interp. Example

	AE	AF	AH	AI	AJ	AK	AL
29				AADT			
30			2014	2015	2016	2017	2018
31	Station1	3.14	8900	8900	8400	8400	11200
32	Station2	6.73	10800	10800	10800	10800	10300
33	Begin	3.14	8900	8900	8400	8400	11200
34	End	2.38	8498	8498	7892	7892	11391
35		m =	529	529	669	669	-251
36		b =	7238	7238	6301	6301	11987
37			8700	8700	8150	8150	11300
39	Station A	0.03					

Start | Data | CH | Inputs | QA | Ou ...

42

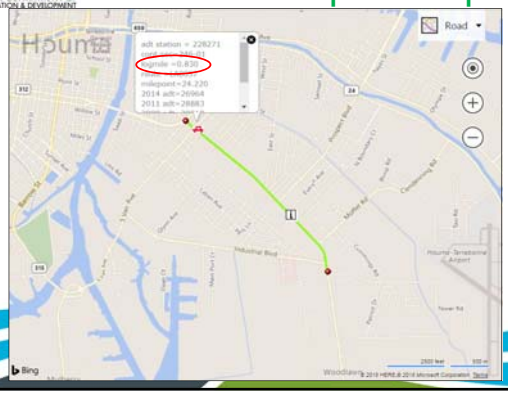
Linear Interp. Example

Control Section 246-01

Map	Control Sect	Beg Logmi	End Logmi	Parish	Func Sys	ADT	Lanes	Pave Type	Pave Width	Shldr Width	Med Type	Med Width	Route	Beg Mile Point	End Mile Point	Len
	246-01	from: Houma (Jct LA 24, on Grand Caillou Rd at E Main)											to: Jct LA 56 (4.68 mi N of Cocodrie)			
map	ivision	246-01	0.000	0.710	Terr	3-PrArt	12300	4	bitcon	48	0	undivid	0	LA 57	25.053	24.343	0.710
map	ivision	246-01	0.710	2.471	Terr	3-PrArt	32500	4	bitcon	48	0	cnt trn	14	LA 57	24.343	22.582	1.761
map	ivision	246-01	2.471	4.127	Terr	3-PrArt	22700	4	bitcon	48	16	cnt trn	14	LA 57	22.582	20.926	1.656
map	ivision	246-01	4.127	5.251	Terr	5-MjCol	22700	2	bitcon	24	6	undivid	0	LA 57	20.926	19.802	1.124
map	ivision	246-01	5.251	6.411	Terr	5-MjCol	22700	2	bitcon	24	8	undivid	0	LA 57	19.802	18.642	1.160
map	ivision	246-01	6.411	7.471	Terr	5-MjCol	22700	2	bitcon	24	8	undivid	0	LA 57	18.642	17.582	1.060
map	ivision	246-01	7.471	7.580	Terr	5-MjCol	6000	2	bitcon	24	6	undivid	0	LA 57	17.582	17.473	0.109
map	ivision	246-01	7.580	12.801	Terr	5-MjCol	6000	2	bitcon	24	6	undivid	0	LA 57	17.473	12.252	5.221
map	ivision	246-01	12.801	16.791	Terr	5-MjCol	2000	2	bitcon	24	6	undivid	0	LA 57	12.252	8.262	3.990
map	ivision	246-01	16.791	17.194	Terr	5-MjCol	2000	2	bitcon	24	6	undivid	0	LA 57	8.262	7.859	0.403
map	ivision	246-01	17.194	17.351	Terr	7-Local	2000	2	bitcon	22	6	undivid	0	LA 57	7.859	7.702	0.157
map	ivision	246-01	17.351	25.053	Terr	7-Local	370	2	bitcon	20	6	undivid	0	LA 57	7.702	0.000	7.702

43

Linear Interp. Example



44

Linear Interp. Example

	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1									
29					AADT				
30				2014	2015	2016	2017	2018	
31	Station1	3.14		8900	8900	8400	8400	11200	
32	Station2	6.73		10800	10800	10800	10800	10300	
33	Begin	3.14		8900	8900	8400	8400	11200	
34	End	2.38		8498	8498	7892	7892	11391	
35		m =		529	529	669	669	-251	
36		b =		7238	7238	6301	6301	11987	
37				8700	8700	8150	8150	11300	
38									
39	Station A	0.03							
40	Station B	0.83							
41									

Start | Data | CH | Inputs | QA | Ou ...

48

Linear Interp. Example

engrapps/hwyinfo/tahiwstl/tahiwstl2.aspx

Control Section 246-01

Map		Control Sect	Beg Logmi	End Logmi	Par ish	Func Sys	ADT	Lanes	Pave Type	Pave Width	Shldr Width	Med Type	Med Width	Route	Beg Mile Point	End Mile Point	Len
		246-01	from: Houma (Jct LA 24, on Grand Caillou Rd at E Main)								to: Jct LA 56 (4.68 mi N of Cocodrie)						
map	ivision	246-01	0.000	0.710	Terr	3-PrArt	12500	4	bitcon	48	0	undivid	0	LA 57	25.053	24.343	0.710
map	ivision	246-01	0.710	2.471	Terr	3-PrArt	32500	4	bitcon	48	0	cnt trn	14	LA 57	24.343	22.582	1.761
map	ivision	246-01	2.471	4.127	Terr	3-PrArt	22700	4	bitcon	48	16	cnt trn	14	LA 57	22.582	20.926	1.656
map	ivision	246-01	4.127	5.251	Terr	5-MjCol	22700	2	bitcon	24	6	undivid	0	LA 57	20.926	19.802	1.124
map	ivision	246-01	5.251	6.411	Terr	5-MjCol	22700	2	bitcon	24	8	undivid	0	LA 57	19.802	18.642	1.160
map	ivision	246-01	6.411	7.471	Terr	5-MjCol	22700	2	bitcon	24	8	undivid	0	LA 57	18.642	17.582	1.060
map	ivision	246-01	7.471	7.580	Terr	5-MjCol	6000	2	bitcon	24	6	undivid	0	LA 57	17.582	17.473	0.109
map	ivision	246-01	7.580	12.801	Terr	5-MjCol	6000	2	bitcon	24	6	undivid	0	LA 57	17.473	12.252	5.221
map	ivision	246-01	12.801	16.791	Terr	5-MjCol	2000	2	bitcon	24	6	undivid	0	LA 57	12.252	8.262	3.990
map	ivision	246-01	16.791	17.194	Terr	5-MjCol	2000	2	bitcon	24	6	undivid	0	LA 57	8.262	7.859	0.403
map	ivision	246-01	17.194	17.351	Terr	7-Local	2000	2	bitcon	22	6	undivid	0	LA 57	7.859	7.702	0.157
map	ivision	246-01	17.351	25.053	Terr	7-Local	370	2	bitcon	20	6	undivid	0	LA 57	7.702	0.000	7.702

49

Linear Interp. Example

engrapps/hwyinfo/tahiwstl/

LADOTD Surface-Type Log File (Highway Inventory)

Select Parish: 01-Acadia

Select Single Control-Section: 246-01

Select Single Route: LA0022

By Route

Include Accident Cross-Reference

Include "Map" Button?

Show ADT station on Map?

Include these Items?

NHS

Strahnet

Truck Route

Fed Aid Status

Section and Subsection

Shoulder Type

HPMS Urban Code

Select Year of Data (as of March/April): Current

Current, 2018 (2017 data), 2017 (2016 data), 2016 (2015 data), 2015 (2014 data), 2014 (2013 data), 2013 (2012 data), 2012 (2011 data), 2011 (2010 data), 2010 (2009 data), 2009 (2008 data), 2008 (2007 data), 2007 (2006 data), 2006 (2005 data), 2005 (2004 data), 2004 (2003 data), 2003 (2002 data), 2002 (2001 data), 2001 (2000 data), 2000 (1999 data)

50

Linear Interp. Example

LADOTD Surface-Type Log File - by Control Section - As of April, 2015 (2014 data)

Control Section 246-01

Map	Control Sect	Beg Logmi	End Logmi	Par ish	Func Class	ADT	Lanes	Pave Type	Pave Width	Shldr Width	Med Type	Med Width	Route	Beg Mile Point	End Mile Point	Len
	246-01	from: Houma (Jct LA 24, on Grand Caillou Rd at E Main)								to: Jct LA 56 (4.68 mi N of Cocodrie)						
map	246-01	0.00	0.71	Terr	16-MiArt	12400	4	bitcon	48	7	undivid	0	LA 57	25.05	24.34	0.71
map	246-01	0.71	0.80	Terr	16-MiArt	30500	4	bitcon	48	7	cnt trn	0	LA 57	24.34	24.25	0.09
map	246-01	0.80	1.76	Terr	16-MiArt	30500	4	bitcon	48	7	cnt trn	13	LA 57	24.25	23.29	0.96
map	246-01	1.76	2.38	Terr	16-MiArt	30500	4	bitcon	48	7	cnt trn	13	LA 57	23.29	22.67	0.62
map	246-01	2.38	2.47	Terr	16-MiArt	30500	2	bitcon	24	7	undivid	15	LA 57	22.67	22.58	0.09
map	246-01	2.47	4.17	Terr	16-MiArt	21400	2	bitcon	24	7	undivid	0	LA 57	22.58	20.88	1.70
map	246-01	4.17	5.15	Terr	16-MiArt	21400	2	bitcon	24	7	undivid	0	LA 57	20.88	19.90	0.98
map	246-01	5.15	6.14	Terr	16-MiArt	21400	2	bitcon	24	7	undivid	0	LA 57	19.90	18.91	0.99
map	246-01	6.14	7.50	Terr	16-MiArt	21400	2	bitcon	24	7	undivid	0	LA 57	18.91	17.55	1.36
map	246-01	7.50	7.57	Terr	16-MiArt	5300	2	bitcon	24	4	undivid	0	LA 57	17.55	17.48	0.07
map	246-01	7.57	9.60	Terr	07-MjCol	5300	2	bitcon	24	4	undivid	0	LA 57	17.48	15.45	2.03
map	246-01	9.60	12.21	Terr	07-MjCol	5300	2	bitcon	24	4	undivid	0	LA 57	15.45	12.84	2.61

51

Linear Interp. Example

	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1									
30				2014	2015	2016	2017	2018	
31	Station1	3.14		8900	8900	8400	8400	11200	
32	Station2	6.73		10800	10800	10800	10800	10300	
33	Begin	3.14		8900	8900	8400	8400	11200	
34	End	2.38		8498	8498	7892	7892	11391	
35		m =		529	529	669	669	-251	
36		b =		7238	7238	6301	6301	11987	
37				8700	8700	8150	8150	11300	
38									
39	Station A	0.03		12400					
40	Station B	0.83		30500					
41	Station C	3.35		21400					

Start | Data | CH | Inputs | QA | Ou ...

52

Linear Interp. Example

LADOTD Surface-Type Log File - by Control Section - As of April, 2016 (2015 data)

Control Section 246-01

Map		Control Sect	Beg Logmi	End Logmi	Par ish	Func Sys	ADT	Lanes	Pave Type	Pave Width	Shldr Width	Med Type	Med Width	Route	Beg Mile Point	End Mile Point	Len
		246-01	from: Houma (Jct LA 24, on Grand Caillou Rd at E Main)									to: Jct LA 56 (4.68 mi N of Cocodrie)					
map	ivision	246-01	0.000	0.710	Terr	3-PrArt	12300	4	bitcon	48	0	undivid	0	LA 57	25.052	24.342	0.710
map	ivision	246-01	0.710	2.400	Terr	3-PrArt	31500	4	bitcon	48	0	cnt trn	14	LA 57	24.342	22.652	1.690
map	ivision	246-01	2.400	2.470	Terr	3-PrArt	31500	2	bitcon	24	16	undivid	0	LA 57	22.652	22.582	0.070
map	ivision	246-01	2.470	4.160	Terr	3-PrArt	22100	2	bitcon	24	16	undivid	0	LA 57	22.582	20.889	1.693
map	ivision	246-01	4.160	5.250	Terr	5-MjCol	22100	2	bitcon	24	6	undivid	0	LA 57	20.889	19.802	1.087
map	ivision	246-01	5.250	6.410	Terr	5-MjCol	22100	2	bitcon	24	8	undivid	0	LA 57	19.802	18.642	1.160
map	ivision	246-01	6.410	7.470	Terr	5-MjCol	22100	2	bitcon	24	8	undivid	0	LA 57	18.642	17.582	1.060
map	ivision	246-01	7.470	7.570	Terr	5-MjCol	5700	2	bitcon	24	6	undivid	0	LA 57	17.582	17.473	0.109
map	ivision	246-01	7.570	12.800	Terr	5-MjCol	5700	2	bitcon	24	6	undivid	0	LA 57	17.473	12.252	5.221
map	ivision	246-01	12.800	16.790	Terr	5-MjCol	2000	2	bitcon	24	6	undivid	0	LA 57	12.252	8.262	3.990
map	ivision	246-01	16.790	17.190	Terr	5-MjCol	2000	2	bitcon	24	6	undivid	0	LA 57	8.262	7.859	0.403
map	ivision	246-01	17.190	17.350	Terr	7-Local	2000	2	bitcon	22	6	undivid	0	LA 57	7.859	7.702	0.157
map	ivision	246-01	17.350	25.050	Terr	7-Local	370	2	bitcon	20	6	undivid	0	LA 57	7.702	0.000	7.702

53

Linear Interp. Example

	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1									
30				2014	2015	2016	2017	2018	
31	Station1	3.14		8900	8900	8400	8400	11200	
32	Station2	6.73		10800	10800	10800	10800	10300	
33	Begin	3.14		8900	8900	8400	8400	11200	
34	End	2.38		8498	8498	7892	7892	11391	
35			m =	529	529	669	669	-251	
36			b =	7238	7238	6301	6301	11987	
37				8700	8700	8150	8150	11300	
38									
39	Station A	0.03		12400	12300				
40	Station B	0.83		30500	31500				
41	Station C	3.35		21400	22100				

Start Data CH Inputs QA Ou ...

56

Linear Interp. Example

	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1									
30				2014	2015	2016	2017	2018	
31	Station1	3.14		8900	8900	8400	8400	11200	
32	Station2	6.73		10800	10800	10800	10800	10300	
33	Begin	3.14		8900	8900	8400	8400	11200	
34	End	2.38		8498	8498	7892	7892	11391	
35			m =	529	529	669	669	-251	
36			b =	7238	7238	6301	6301	11987	
37				8700	8700	8150	8150	11300	
38									
39	Station A	0.03		12400	12300	12300			
40	Station B	0.83		30500	31500	32500			
41	Station C	3.35		21400	22100	22700			

Copy

Start Data CH Inputs QA Ou ...

57

Linear Interp. Example

	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1									
30				2014	2015	2016	2017	2018	
31	Station1	0.03		12400	12300	12300	[illegible]	[illegible]	
32	Station2	0.83		30500	31500	32500	[illegible]	[illegible]	
33	Begin	0.77		29143	30060	30985	10620	10368	
34	End	0.83		30500	31500	32500	10800	10300	
35			m =	22625	24000	25250	3000	-1125	
36			b =	11721	11580	11543	8316	11234	
37				29820	30780	31740	10710	10330	
38									
39	Station A	0.03		12400	12300	12300			
40	Station B	0.83		30500	31500	32500			
41	Station C	3.35		21400	22100	22700			

Paste

Start Data CH Inputs QA Ou ...

58

Linear Interp. Example

	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1									
30				2014	2015	2016	2017	2018	
31	Station1	0.03		12400	12300	12300	8400	11200	
32	Station2	0.83		30500	31500	32500	10800	10300	
33	Begin	0.77		29143	30060	30985	10620	10368	
34	End	0.83		30500	31500	32500	10800	10300	
35			m =	22625	24000	25250	3000	-1125	
36			b =	11721	11580	11543	8316	11234	
37				29820	30780	31740	[illegible]	[illegible]	
38									
39	Station A	0.03		12400	12300	12300			
40	Station B	0.83		30500	31500	32500			
41	Station C	3.35		21400	22100	22700			

Copy

Start Data CH Inputs QA Ou ...

59

Linear Interp. Example

	I	J	K	L	M	N
1						
30			Average Daily Traffic (ADT)			
31	2014	2015	2016	2017	2018	2019
32	29820	30780	31740	[illegible]	31740	31740
33	29820	30780	31740	31740	31740	31740
34	29820	30780	31740	31740	31740	31740
35	29820	30780	31740	31740	31740	31740
36	29820	30780	31740	31740	31740	31740
37	29820	30780	31740	31740	31740	31740
38	29820	30780	31740	31740	31740	31740
39	29820	30780	31740	31740	31740	31740
40	29820	30780	31740	31740	31740	31740
41	29820	30780	31740	31740	31740	31740

Paste

Start Data CH Inputs QA Ou ...

60

Linear Interp. Example

	R	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL
1											
30	Mile						2014	2015	2016	2017	2018
31	end			Station1	0.03		12400	12300	12300	8400	11200
32	0			Station2	0.83		30500	31500	32500	10800	10300
33	0			Begin	0.77		29143	30060	30985	10620	10368
34	0			End	0.83		30500	31500	32500	10800	10300
35	0				m =		22625	24000	25250	3000	-1125
36	0				b =		11721	11580	11543	8310	11234
37	0						29820	30780	31740	10710	10330
38	0										
39	0			Station A	0.03		12400	12300	12300		
40	0			Station B	0.83		Copy	31500	32500		
41	0			Station C	3.35		21400	22100	22700		

Start | Data | CH | Inputs | QA | Ou ...

61

Linear Interp. Example

	Q	R	AC	AD	AE	AF	AG	AH	AI	AJ
1										
30	Log-Mile							2014	2015	2016
31	begin	end			Station1	0.03		12400	12300	12300
32	0.77	0.83			Station2	0.83		30500	31500	32500
33	0.83	0			Begin	0.77		29143	30060	30985
34	0	0			End	0.83		30500	31500	32500
35	0	0				m =		22625	24000	25250
36	0	0				b =		11721	11580	11543
37	0	0						29820	30780	31740
38	0	0								
39	0	0			Station A	0.03		12400	12300	12300
40	0	0			Station B	0.83		30500	31500	32500
41	0	0			Station C	3.35		21400	22100	22700

Paste

Start | Data | CH | Inputs | QA | Ou ...

62

Linear Interp. Example

	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1									
30				2014	2015	2016	2017	2018	
31	Station1	0.03		12400	12300	12300	8400	11200	
32	Station2	0.83		30500	31500	32500	10800	10300	
33	Begin	0.77		29143	30060	30985	10620	10368	
34	End	0.83		30500	31500	32500	10800	10300	
35		m =		22625	24000	25250	3000	-1125	
36		b =		11721	11580	11543	8310	11234	
37				29820	30780	31740	10710	10330	
38									
39	Station A	0.03		12400	12300	12300			
40	Station B	0.83		30500	31500	32500			
41	Station C	3.35		21400	22100	22700			

Copy

Start | Data | CH | Inputs | QA | Ou ...

63

Linear Interp. Example

	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1									
30				2014	2015	2016	2017	2018	
31	Station1	0.83		30500	31500	32500		200	
32	Station2	3.35		21400	22100	22700		800	
33	Begin	0.83		30500	31500	32500	8400	11200	
34	End	2.38		24903	25718	26472	9876	10646	
35		m =		-3611	-3730	-3889	952	-357	
36		b =		33497	34590	35728	7610	11496	
37				27700	28610	29490	9140	10920	
38									
39	Station A	0.03		12400	12300	12300			
40	Station B	0.83		30500	31500	32500			
41	Station C	3.35		21400	22100	22700			

Paste

Start | Data | CH | Inputs | QA | Ou ...

64

Linear Interp. Example

	AE	AF	AG	AH	AI	AJ	AK	AL	AM
1									
30				2014	2015	2016	2017	2018	
31	Station1	0.83		30500	31500	32500	8400	11200	
32	Station2	3.35		21400	22100	22700	10800	10300	
33	Begin	0.83		30500	31500	32500	8400	11200	
34	End	2.38		24903	25718	26472	9876	10646	
35		m =		-3611	-3730	-3889	952	-357	
36		b =		33497	34590	35728	7610	11496	
37				27700	28610	29490		920	
38									
39	Station A	0.03		12400	12300	12300			
40	Station B	0.83		30500	31500	32500			
41	Station C	3.35		21400	22100	22700			

Copy

Start | Data | CH | Inputs | QA | Ou ...

65

Linear Interp. Example

	I	J	K	L	M	N
1						
30			Average Daily Traffic (ADT)			
31	2014	2015	2016	2017	2018	2019
32	29820	30780	31740	31740	31740	31740
33	27700	28610	29490		29490	29490
34	27700	28610	29490	29490	29490	29490
35	27700	28610	29490	29490	29490	29490
36	27700	28610	29490	29490	29490	29490
37	27700	28610	29490	29490	29490	29490
38	27700	28610	29490	29490	29490	29490
39	27700	28610	29490	29490	29490	29490
40	27700	28610	29490	29490	29490	29490
41	27700	28610	29490	29490	29490	29490

Paste

Start | Data | CH | Inputs | QA | Ou ...

66

Linear Interp. Example

	A	B	C	D
1		Name	Input	
37			Note: One may find that it is easier to enter data into the ADT Corridor Calculator than to determine the value below.	
38				
39				
40				
41				
42				
43				
44				
45		AADT	28700	

Start | Data | CH | Inputs | QA | Ou ...

67

Agenda

- ✓ Rectifying location data
- ✓ AADT Acquisition & Linear Interpolation
- CAT Scan's Error Detection Algorithms
- Construct Analysis Log-miles
- CAT Scan's Evaluation Score
- CAT Scan's Research Section
- CAT Scan's Geolinear Segregator

69

QA EDA

- Error Detection Algorithms
  - Compare data and note issues
  1. Collision Manner & Crash Type
  2. Collision Manner & Angle
  3. Intersection & Intersection ID
  4. Collision Manner & Location Type & Access
  5. Same as Original
  6. Might be Night
  7. Crossed Center & White Line
  8. Road Depart & Crash Type

70

QA EDA 1

- Error Detection Algorithm
  1. Collision Manner & Crash Type
     - Issue1: No Collision Manner
     - Issue2: No Crash Type
     - Issue3: Collision Manner & Crash Type do not match two-vehicle combinations
     - Some over-writes allowed:
     - Issue5: Collision Manner & Crash Type do not match one-vehicle combinations
     - Issue7: Collision Manner = Other
     - Issue9: Crash Type = Not Fixed

71

QA EDA 2

- Error Detection Algorithms
  2. Collision Manner & Angle
     - Collision Manner = Noncollision & Travel Direction >1
     - Collision Manner <> Noncollision & Travel Direction <2
     - Collision Manner = D, G, I, or M & Travel Directions <> NE, ES, SW, WN, EN, SE, or WS
     - Collision Manner = C, F, K, N, or P & Travel Directions <> NS, EW, SN, or WE
     - Collision Manner = B, E, J, or L & Travel Directions <> NN, EE, SS, WW

72

QA EDA 2

- Error Detection Algorithms
  2. Collision Manner & Angle
     - Some over-writes allowed:
     - Prior Move = I (Left turn) & Collision Manner <> D, E, F, G, M, or P
     - Prior Move = J (Right turn) & Collision Manner <> H, I, or L
     - Prior Move = D (Backing) & Collision Manner <> O

73

QA EDA 3 & 5

- Error Detection Algorithms
  3. Intersection & Intersection ID
     - Intersection = 1 & Intersection ID = Null
     - Intersection = 0 & Intersection ID <> Null
  5. Same as Original
     - If the Corrected value of certain elements is the same as the Original value
     - Check Error Notation for values of "why"
     - Collision Manner, Crash Type, Intersection, Travel Direction, Road Departure, Location Type, Lighting, or Hour

74

QA EDA 6, 7; 8

- Error Detection Algorithms
  6. Might be Night: Compares Hour to Lighting
  7. Crossed Center & White Line: Notes if Traffic Control = R (White dashed line) & Most Harmful or Move Prior is "Crossed Centerline"
  8. Road Depart & Crash Type
     - Road Depart = 1 & Crash Type <> A, B, E, F, G, H, N, P, or T
     - Road Depart = 0 & Crash Type <> A, B, C, D, J, K, L, M, N, Q, R, S, or T

75

QA EDA 4

- Error Detection Algorithms
  4. Collision Manner & Location Type & Access
     - Intersection = 1 & Location Type <> D & Hwy Type = A
     - Intersection = 0 & Location Type = D & Hwy Type = A
     - Intersection = 0 & Location Type = A & Hwy Type <> A

76

QA EDA 4

- Error Detection Algorithms
  4. Collision Manner & Location Type & Access
     - Access = 1, When Location Type = A, B, C, or J, or Intersection = 1; Otherwise Access = 0
     - Some over-writes allowed:
     - Collision Manner = D, E, F, G, H, I, L, M, N, or P & Access = 0
     - Collision Manner = A, C, J, or K & Access = 1 & Prior Move <> I, J, K, L, M, N, O, or P

77

QA Process (1 of 4)

A. After establishing parameters – *Input*

B. After running PRA – *Output*

C. Initiate QA spreadsheet

1. Filter Authenticity by Z – delete entries
2. Filter Status1 by Yes

D. Start at bottom – work upward

E. Run PRA – if not first time and segment

78

QA Process (2 of 4)

F. Copy crash number

G. Paste into Crash2 & run query

1. Open location
2. Open report
   a. If Investigating Agency <> A (LSP) – open crash report
   b. If Investigating Agency = A (LSP), Then go to ThinkStream to open crash report

79

QA Process (3 of 4)

H. Review location and either:
   1. Update Lat/Long or
   2. Location Evaluation
I. Review Notes (optional)
J. Possible Solutions
K. Resolve Errors

80

QA Process (4 of 4)

L. Loop back to F – until no new crashes appear
M. Reapply filter
N. Do more crashes appear
   1. Yes: Loop back to E
   2. No: proceed to Step 7

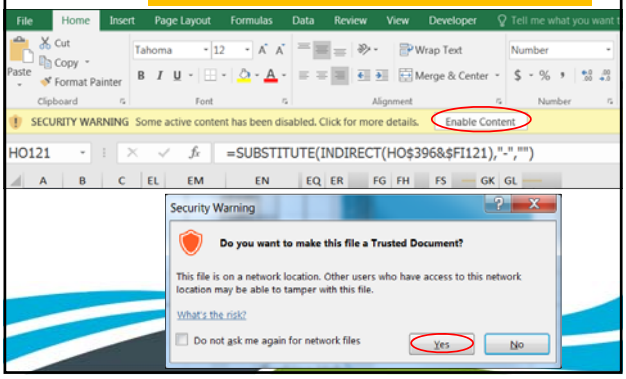
82

QA Exercise

- Open Folder "Crash Data Analysis Class"
- Open Folder "Advanced Crash Analysis ..."
- Open Folder "... Exercise 1"
- Open File "CAT Scan - 55LA24@HOLLYWOOD QA practice – 20180326"

83

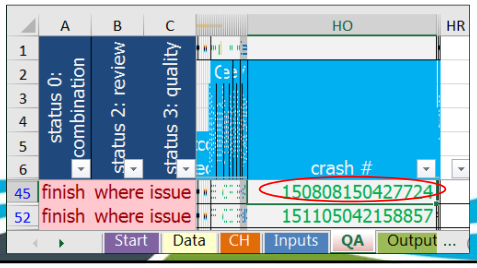
QA Exercise



84

QA Exercise

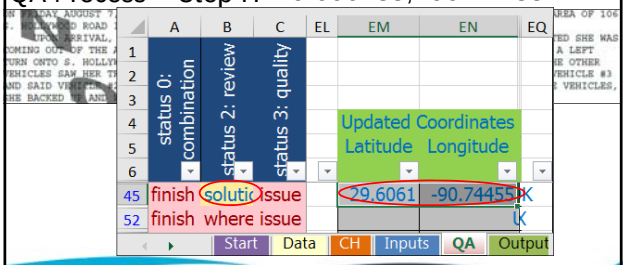
QA Process – Steps F & G modify for exercise
- Step G1: Open "... location map"
- Step G2: Open "... crash report"



85

QA Exercise

QA Process – Step H: 29.606135, -90.744554



86

QA Exercise

QA Process – Steps I & J

	A	B	C	DT	DU	DV	DW
1	status 0: combination	status 2: review	status 3: quality				Initials
2							
3					62		
4					775%		
5					Review Notes	Possible Solutions	
6							
45	finish	done	issue		access management	median barrier	BC
52	finish	where	issue				

Start | Data | CH | Inputs | QA | Output ...

87

QA Exercise

QA Process – Step K

	A	B	C	CJ	CK	CL	CM	CN	CO
1	status 0: combination	status 2: review	status 3: quality	Travel Directions					
2				e		Intersection / Access			
3				Collision Manner & Angle Agree?		Intersection & Intersection ID Agree?		Collision Manner & Location Type & Access Agree?	
6									
45	finish	done	issue	check	NSS	check	0 0	check	X
52	finish	where	issue	X		check	0 0	check	X

Start | Data | CH | Inputs | QA | Outputs | CM

88

QA Exercise

QA Process – Step K

	A	B	C	EA	EB	EC	ED
1	status 0: combination	status 2: review	status 3: quality			Corrected Valu	
2							
3							
4						ne values in the below columns will s	
5				Surf con	Travel Directio	Collision Manner	Crash type
6							
45	finish	done	issue		SWW	Rt Angle	
52	finish	where	issue				

Start | Data | CH | Inputs | QA | Outputs | CM

89

QA Exercise

QA Process – Step K

	A	B	C	CJ	CK	CL	CM	CN	CO
1	status 0: combination	status 2: review	status 3: quality	Travel Directions					
2				e		Intersection / Access			
3				Collision Manner & Angle Agree?		Intersection & Intersection ID Agree?		Collision Manner & Location Type & Access Agree?	
6									
45	finish	done	issue	X	SWW	check	0 0	check	X
52	finish	where	issue	X		check	0 0	check	X

Start | Data | CH | Inputs | QA | Outputs | CM

90

QA Exercise

QA Process – Step K

	A	B	C	AH	AI
1	status 0: combination	status 2: review	status 3: quality		
2					
3					
4					
5				Intersection ID	Lo
6				ol	Typ
45	finish	done	issue	55LA24@HOLLYWOOD	NotRe
52	finish	where	issue	55LA24@HOLLYWOOD	NotRe

Start | Data | CH | Inputs | QA | Outputs | CM

91

QA Exercise

QA Process – Step K

	A	B	C	EE	EF	EG	E
1	status 0: combination	status 2: review	status 3: quality	s			
2							
3							
4					persede raw-data values		
5				Inter-sectio	Inter-section I	Road Departur	Loc Ty
6							
45	finish	done	issue		0		
52	finish	where	issue				

Start | Data | CH | Inputs | QA | Outputs | CM

92

QA Exercise

QA Process – Step K

	A	B	C	CJ	CK	CL	CM	CN	CO
1	status 0: combination	status 2: review	status 3: quality	Travel Directions					
2				e		Intersection / Access			
3				Collision Manner & Angle Agree?		Intersection & Intersection ID Agree?		Collision Manner & Location Type & Access Agree?	
45	finish	done	issue	X	SWW	X	0 0	check	X
52	finish	where	issue	X		check	0 0	check	X

Start | Data | CH | Inputs | QA | Outputs | CM

93

QA Exercise

QA Process – Step K

	A	B	C	AL	AM	AN
1	status 0: combination	status 2: review	status 3: quality			
5				Loc	Computed	Computed
6				Type	Latitude	Longitud
45	finish	done	issue	NotRelated	29.606262	-90.74407
52	finish	where	issue	NotRelated	29.606344	-90.74385

Start | Data | CH | Inputs | QA | Outputs | CM

94

QA Exercise

QA Process – Step K

	A	B	C	EF	EG	EH	EI
1	status 0: combination	status 2: review	status 3: quality	raw-data values			
6				Inter-section I	Road Departur	Location Type	Log Mile
45	finish	done	issue				
52	finish	where	issue				
72	finish	where	issue				
99	finish	where	issue				

BusStop
Crossover
Driveway
Merge
Turn-Lane
Ramp
Intersection
Path

Start | Data | CH | Inputs | QA

Ready | Filter Mode | Calculate

95

QA Exercise

	A	B	C	EF	EG	EH	EI
1	status 0: combination	status 2: review	status 3: quality	raw-data values			
6				Inter-section I	Road Departur	Location Type	Log Mile
45	done	done	good	0		Driveway	
52	finish	where	issue				

Start | Data | CH | Inputs | QA | Outputs | CM

QA Process – Step L: Loop back to Step F

102

QA Exercise

Might be Night:

	A	B	C	CQ	CR	CS	CT	CU	CV
1	status 0: combination	status 2: review	status 3: quality				Roadway Departure		
2					Crash Hour				
3					Might be Night		Crossed Center & White Line		Road D & Cra Type A
99	finish	where	issue		check		X	0	Y

Start | Data | CH | Inputs | QA | Outputs | CM

103

QA Exercise

http://www.sunrisesunset.com/usa/Louisiana.asp

DY350 | http://www.sunrisesunset.com/usa/Louisiana.asp

	A	B	C	DV	DW	DX	DY	DZ	EA
1	status 0: combination	status 2: review	status 3: quality		Initials				the val
6				Possible Solutions		Alcohol	Light Conditic	Hour of Day	Surf con
350	solution?						http://www.sunrisesunset.com/usa/Louisiana.asp		

Start | Data | CH | Inputs | QA | Outputs | CM

104

QA Exercise

Secure | https://www.sunrisesunset.com/USA/Louisiana/

Sunrise Sunset Calendar

Louisiana Locations

The drop-down includes: Alexandria, Baton Rouge, Covington, Lafayette, Lake Charles, Monroe, New Orleans, Shreveport and more...

TOTAL NUMBER OF VEHICLES INVOLVED 2

STATE OF LOUISIANA
UNIFORM MOTOR VEHICLE TRAFFIC CRASH REPORT

1 4 1 1 2 4 0 3 1 6 3 7 3 9 3

DATE OF CRASH 1 1 0 2 2 0 1 4 TIME (0000) 1 9 1 5 DISTRICT/ZONE TROOP

PARISH TERREBONNE PARISH CODE 5 5

CITY OR TOWN CITY CODE 0

LAT. 2 9 . 6 0 6 6 8 LONG. 9 0 . 7 4 3 0 0

Quadrant NW SW NE SE Service Road N E S W

PAGE # 0 1

K-01994-14

105

QA Exercise

Search for a Louisiana city, town or a U.S. zip code

Search LA

OR

Select Your City, Town or POI

Houma

month, year

November 2014

then set your calendar options and press "Make Calendar"

- Civil twilight
- Nautical twilight
- Astronomical twilight
- Latitude, longitude[1] and time info
- Moon phases
- Moonrise and moonset
- Solar noon
- Day length

Time style: am/pm AM/PM 24-hour

Week starts on: Sunday Monday

Help with printing...

Make Calendar

106

QA Exercise

November 2014

Houma, Louisiana

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 Sunrise: 7:16am Sunset: 6:17pm
2 DST Ends Sunrise: 6:17am Sunset: 5:16pm	3 Sunrise: 6:17am Sunset: 5:16pm	4 Sunrise: 6:18am Sunset: 5:15pm	5 Sunrise: 6:19am Sunset: 5:14pm	6 Sunrise: 6:20am Sunset: 5:13pm	7 Sunrise: 6:20am Sunset: 5:13pm	8 Sunrise: 6:21am Sunset: 5:12pm
9 Sunrise: 6:22am Sunset: 5:11pm	10 Sunrise: 6:23am Sunset: 5:11pm	11 Sunrise: 6:24am Sunset: 5:10pm	12 Sunrise: 6:24am Sunset: 5:09pm	13 Sunrise: 6:25am Sunset: 5:09pm	14 Sunrise: 6:26am Sunset: 5:08pm	15 Sunrise: 6:27am Sunset: 5:08pm
16 Sunrise: 6:28am Sunset: 5:07pm	17 Sunrise: 6:28am Sunset: 5:07pm	18 Sunrise: 6:29am Sunset: 5:07pm	19 Sunrise: 6:30am Sunset: 5:06pm	20 Sunrise: 6:31am Sunset: 5:06pm	21 Sunrise: 6:32am Sunset: 5:05pm	22 Sunrise: 6:33am Sunset: 5:05pm
23 Sunrise: 6:33am Sunset: 5:05pm	24 Sunrise: 6:34am Sunset: 5:05pm	25 Sunrise: 6:35am Sunset: 5:04pm	26 Sunrise: 6:36am Sunset: 5:04pm	27 Sunrise: 6:37am Sunset: 5:04pm	28 Sunrise: 6:37am Sunset: 5:04pm	29 Sunrise: 6:38am Sunset: 5:04pm
30 Sunrise: 6:39am Sunset: 5:04pm						

107

QA Exercise

	A	B	C	DW	DX	DY	DZ	EA
1	status 0: combination	status 2: review	status 3: quality	Initials				the va
2					Alcohol	Light Conditic	Hour of Day	Surf con
99	finish where issue				Night - SL@I			

Start | Data | CH | Inputs | QA | Outputs | CM

108

QA Exercise

	A	B	C	CO	CP	CQ	CR	CS	CT
1	status 0: combination	status 2: review	status 3: quality						Road
2							Crash Hour		
3					Correct Same as Original		Might be Night		Cross Cente & Whi Line
99	finish where issue			X	X		X		X

Start | Data | CH | Inputs | QA | Outputs | CM

109

QA Exercise

- Now try the next six on your own
- Remember help on Start spreadsheet
  - EDA: N28:N58
  - EDA help: P34:Q58

111

QA Exercise

Answers:

	A	B	C	DT	DU	DV	DW	DX	DY
1									
2									
3					69				
4					863%				
5	status 0: combination	status 2: review	status 3: quality				Initials	Alcohol	Light Conditic
6					Review Notes	Possible Solutions			
38	done	done	good		permitted v protected	protect turn from Hollywo	BC		
45	done	done	good		access management	median barrier	BC		
52	done	done	good		access management	median barrier	BC		
72	done	done	good		driver error - mistake	none	BC		
99	done	done	good		not understand lane confi	add lane guidance sign	BC		Night - SL@
100	done	done	good		not understand lane confi	add lane guidance sign	BC		
102	done	done	good		depart lane while turning	add turn-lane guide track	BC		
121	done	done	good		ran red	add back-plates	BC		

Start | Data | CH | Inputs | QA | Outputs | CM

112

QA Exercise

Answers:

	A	B	C	EB	EC	ED	EE	EF	EG	EH	EI	EJ
1					Corrected Values							0.0%
2												
3					ns in the below columns will supersede raw-data values							
4												Location Evaluation
5	status 0: combination	status 2: review	status 3: quality	Travel Directi	Collision Manner	Crash type	Inter-secti	Inter-section I	Road Departu	Location Type	Log Mile	
6												
38	done	done	good				1					good location
45	done	done	good	SWW	Rt Angle			0		Driveway		
52	done	done	good				1			Driveway		
72	done	done	good	S		Parked	1			Intersection		OK location
99	done	done	good		Left Turn-e							good location
100	done	done	good		S Swipe(sd)							good location
102	done	done	good		S Swipe(sd)							good location
121	done	done	good		Rt Angle		1					good location

Start | Data | CH | Inputs | QA | Outputs | CM

113

Agenda

- ✓ Rectifying location data
- ✓ AADT Acquisition & Linear Interpolation
- ✓ CAT Scan's Error Detection Algorithms
- Construct Analysis Log-miles
- CAT Scan's Evaluation Score
- CAT Scan's Research Section
- CAT Scan's Geolinear Segregator

114

Construct Analysis Log-miles

- Use: combine different linear reference systems (LRS) systems
- Why?: so Pattern Recognition Analysis can correctly calculate
- Application
  - Local roads
  - Local roads + state roads
- For segments – not intersections

115

Construct Analysis Log-miles

- Method
  - Straight: Use great circle formula
  - Curve: Use existing LRS log-mile
- Understand LRS log-mile system
  - Extract LRS-id from crash data
  - Plot most frequent LRS-id

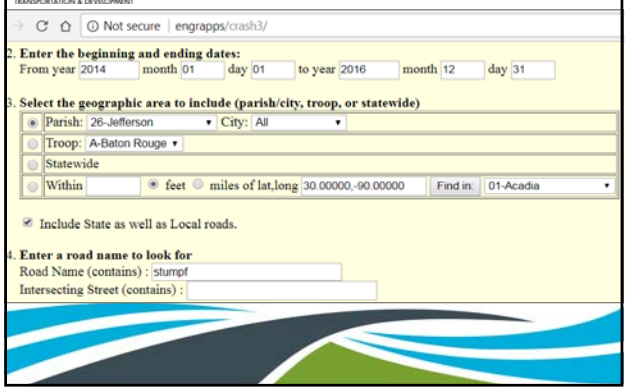
116

Construct log-miles Example

- Example:
  - Parish: Jefferson
  - Route: Stumpf Blvd.

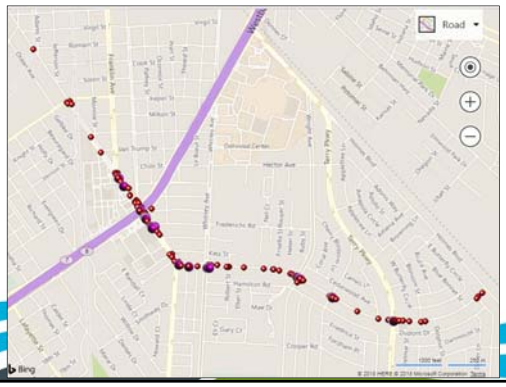
117

Construct log-miles Example



118

Construct log-miles Example



119

Construct log-miles Example

- Examine most frequent LRS-id

Count	LRS-id	owner
70	051904248200591030	local
32	826-46-2-010	state
19	051904248200591020	local
10	826-46-1-010	state
	...	

120

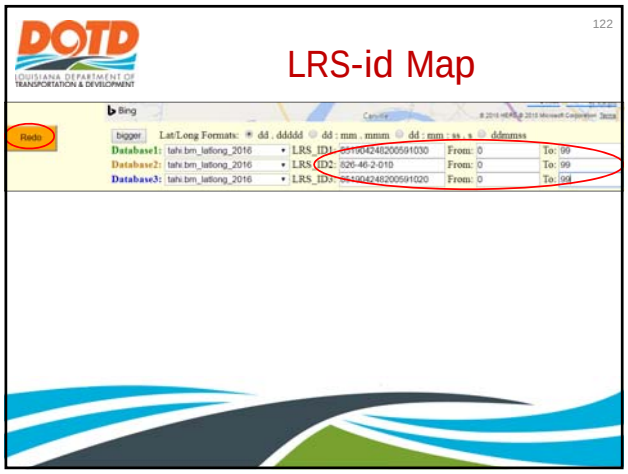
Find LRS-id Map

121

Find LRS-id Map

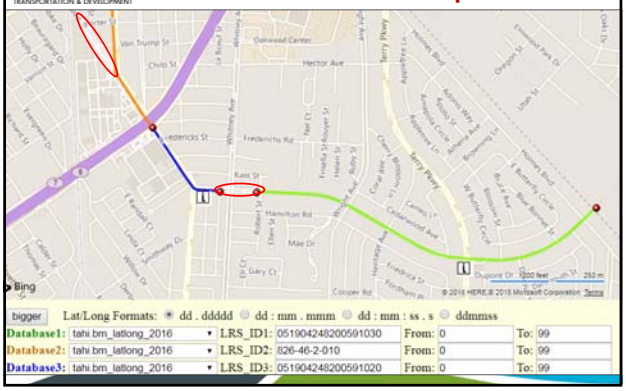
122

LRS-id Map



123

LRS-id Map



124

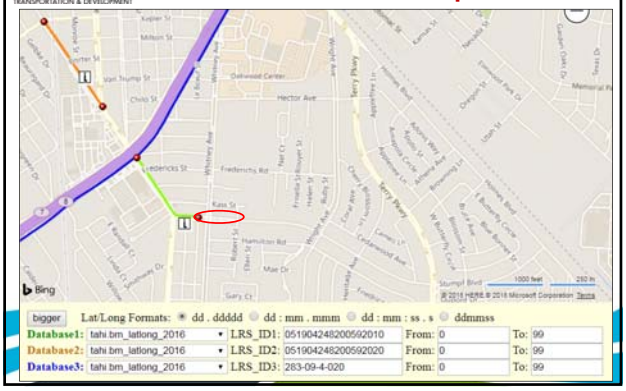
Construct log-miles Example

- Examine next most frequent LRS-id

Count	LRS-id	owner
	...	
9	051904248200592010	local
9	051904248200592020	local
9	283-09-4-020	state
	...	

125

LRS-id Map



126

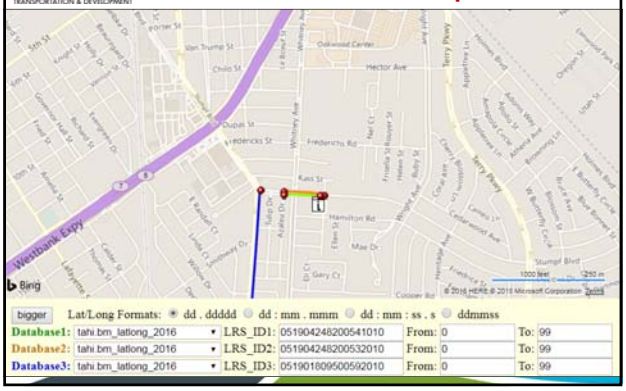
Construct log-miles Example

- Examine next most frequent LRS-id

Count	LRS-id	owner
	...	
7	051904248200541010	local
6	051904248200532010	local
6	051901809500592010	local
	...	

127

LRS-id Map



128

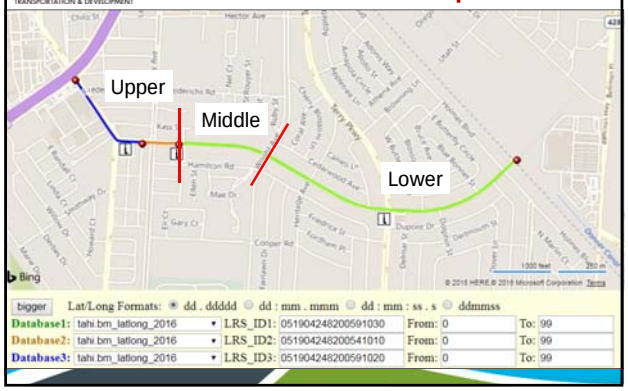
Construct log-miles Example

- Stumpf LRS-id:

Count	LRS-id	group
70	051904248200591030	lower & middle
7	051904248200541010	upper
6	051904248200532010	upper
19	051904248200591020	upper
9	051904248200592010	upper
9	051904248200592020	upper
3	051904248200591020	upper

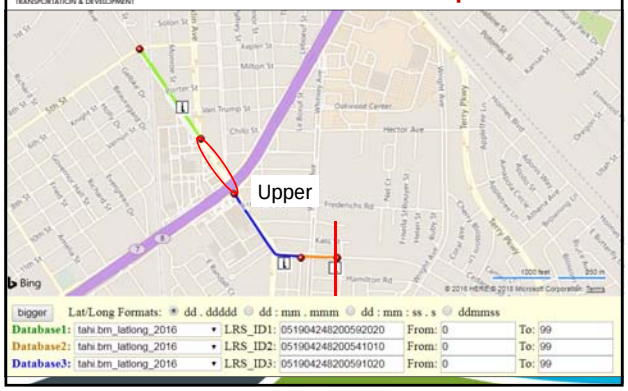
129

LRS-id Map



130

LRS-id Map



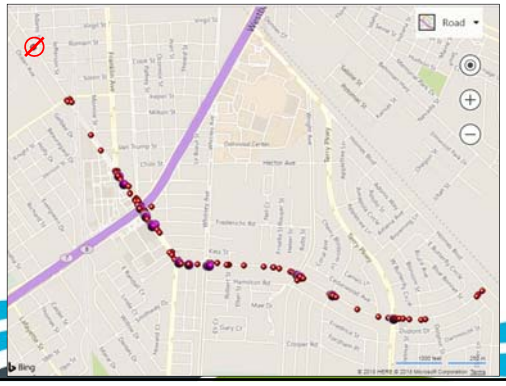
131

Construct Analysis Log-miles

- Choose 0 log-mile point
  - Best at end of straight segment
- Apply Method
  - Straight: Use great circle formula
  - Curve: Use existing LRS log-mile

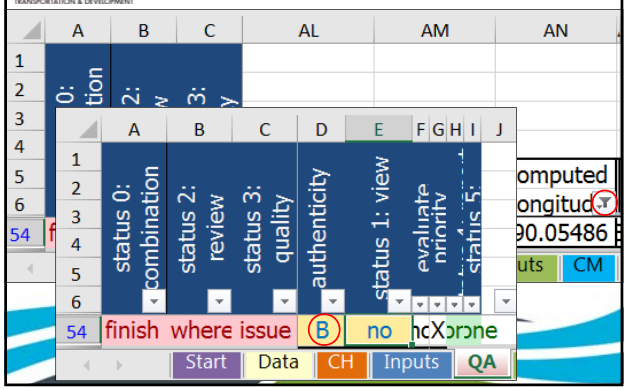
132

Construct log-miles Example



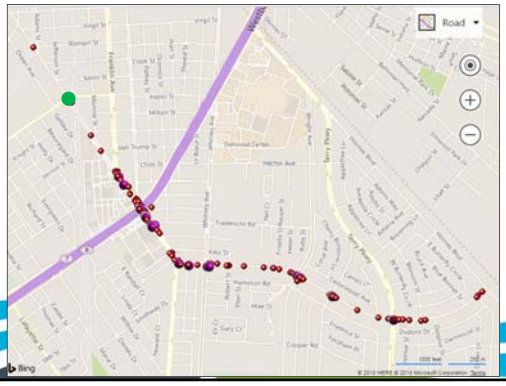
133

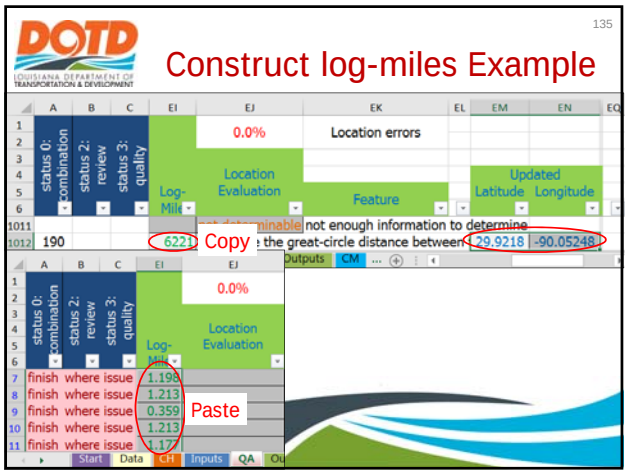
Construct log-miles Example

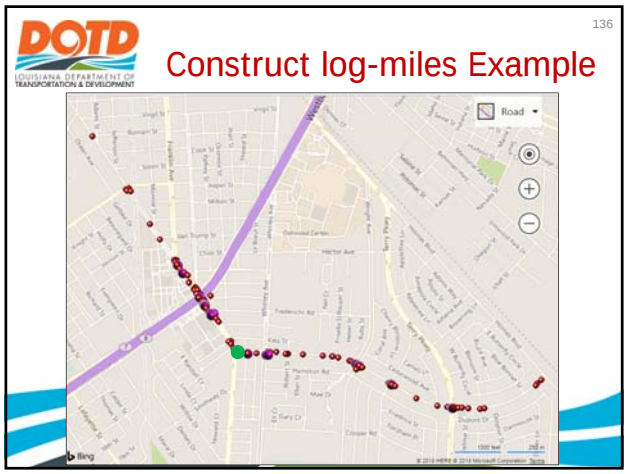


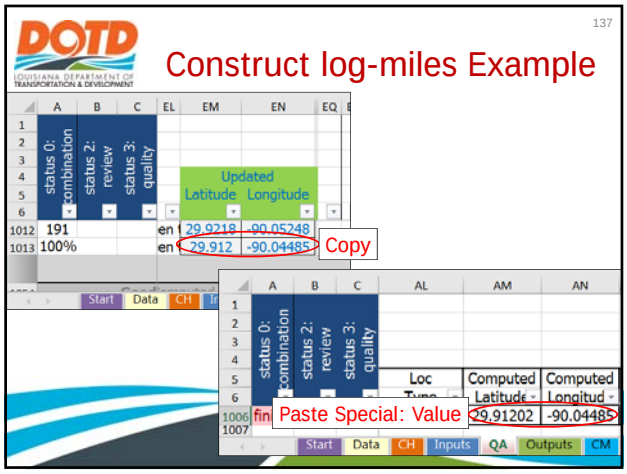
134

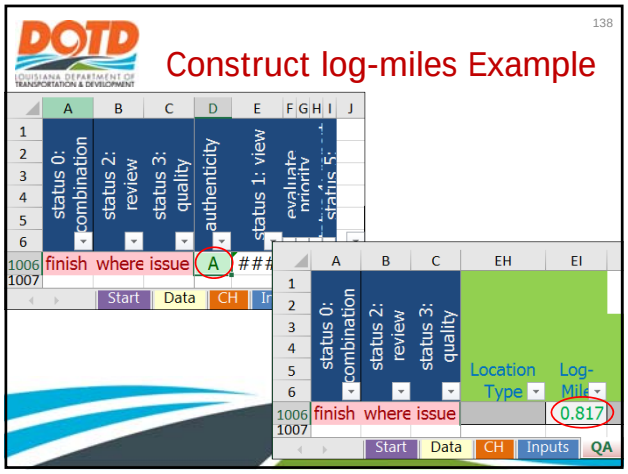
Construct log-miles Example

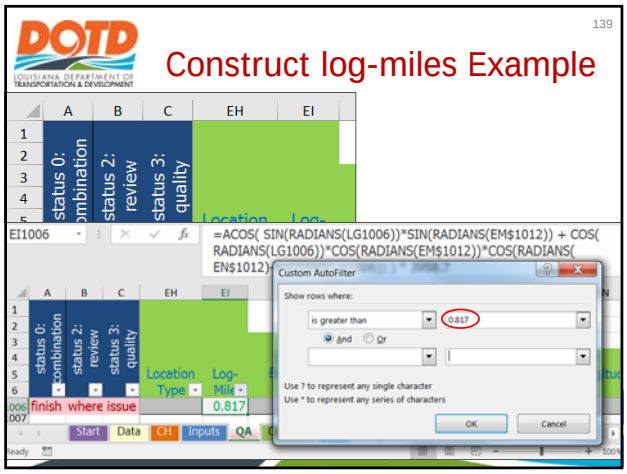


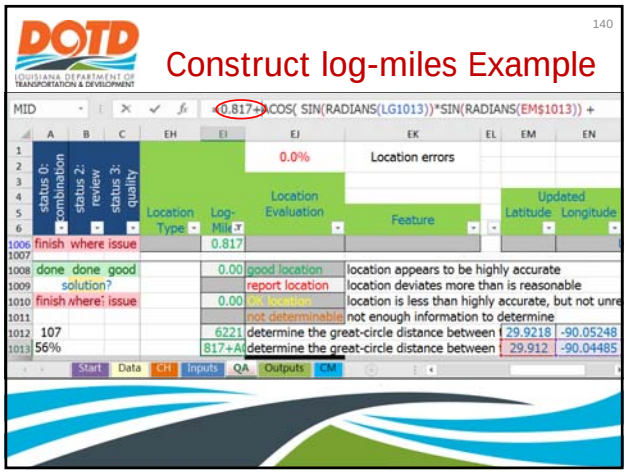

135
Construct log-miles Example
status 0: combination
status 2: review
status 3: quality
Log-Mile
Location Evaluation
Feature
Updated Latitude Longitude
0.0%
Location errors
not enough information to determine
the great-circle distance between
Copy
Paste
finish where issue
1.199
1.213
0.359
1.213
1.177

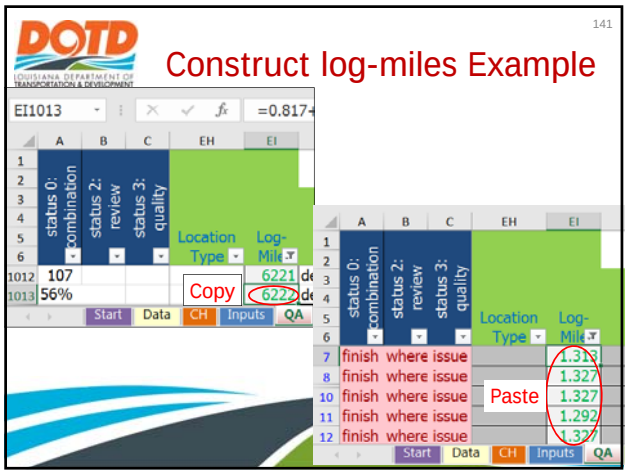

136
Construct log-miles Example
Road

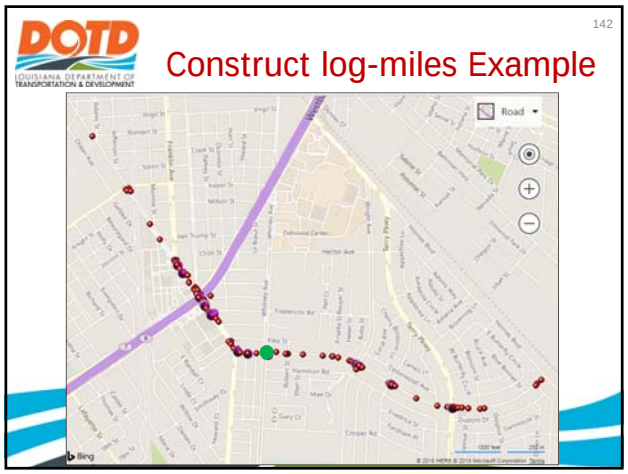

137
Construct log-miles Example
status 0: combination
status 2: review
status 3: quality
Updated Latitude Longitude
191
100%
29.9218
-90.05248
29.912
-90.04485
Copy
Loc Type
Computed Latitude
Computed Longitude
29.91202
-90.04485
Paste Special: Value

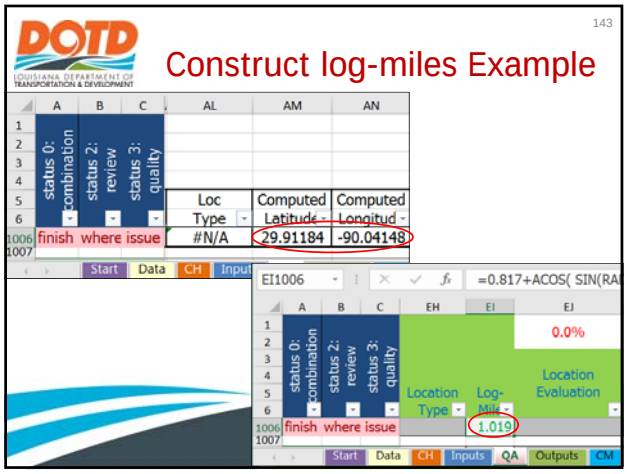

138
Construct log-miles Example
status 0: combination
status 2: review
status 3: quality
authenticity
status 1: view
finish where issue
A
Location Type
Log-Mile
0.817

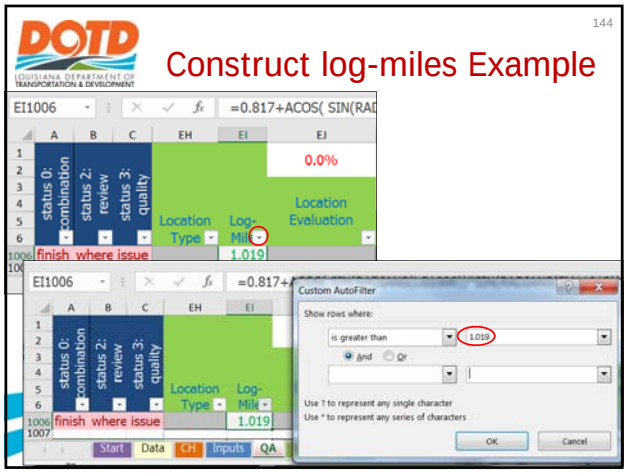

139
Construct log-miles Example
status 0: combination
status 2: review
status 3: quality
EI1006
=ACOS(SIN(RADIANS(LG1006))*SIN(RADIANS(EM$1012)) + COS(
RADIANS(LG1006))*COS(RADIANS(EM$1012))*COS(RADIANS(
EN$1012)
Custom AutoFilter
Show rows where:
is greater than
0.817
And
Or
Use ? to represent any single character
Use * to represent any series of characters
OK
Cancel
finish where issue
0.817

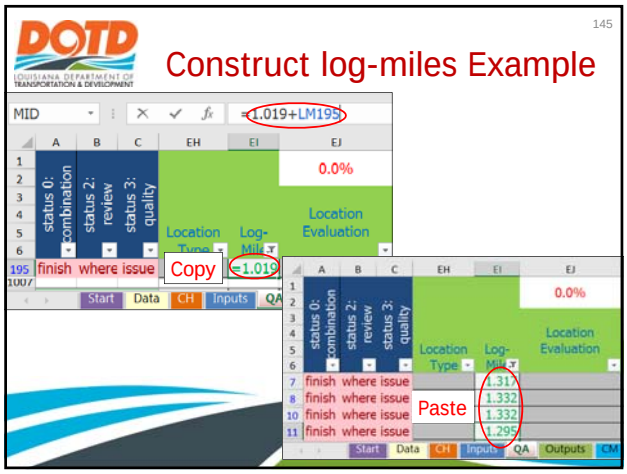

140
Construct log-miles Example
MID
0.817+ACOS(SIN(RADIANS(LG1013))*SIN(RADIANS(EM$1013)) +
status 0: combination
status 2: review
status 3: quality
Location Type
Log-Mile
Location Evaluation
Feature
Updated Latitude Longitude
0.0%
Location errors
finish where issue
0.817
good location
location appears to be highly accurate
report location
location deviates more than is reasonable
location is less than highly accurate, but not unre
not determinable
not enough information to determine
107
56%
determine the great-circle distance between
29.9218
-90.05248
29.912
-90.04485

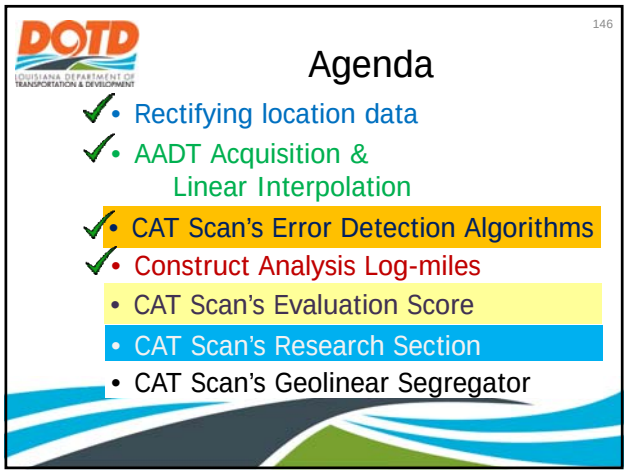

141
Construct log-miles Example
EI1013
=0.817+
status 0: combination
status 2: review
status 3: quality
Location Type
Log-Mile
107
56%
Copy
6221
6222
finish where issue
1.313
1.327
1.327
1.292
1.327
Paste
Start
Data
CH
Inputs
QA


142
Construct log-miles Example
Road


143
Construct log-miles Example
status 0: combination
status 2: review
status 3: quality
Loc Type
Computed Latitude
Computed Longitud
finish where issue
#N/A
29.91184
-90.04148
EI1006
=0.817+ACOS(SIN(RA
0.0%
Location Type
Log-Mile
Location Evaluation
1.019
Start
Data
CH
Inputs
QA
Outputs
CM


144
Construct log-miles Example
EI1006
=0.817+ACOS(SIN(RAI
0.0%
Location Type
Log-Mile
Location Evaluation
1.019
finish where issue
Custom AutoFilter
Show rows where:
is greater than
1.019
And
Or
Use ? to represent any single character
Use * to represent any series of characters
OK
Cancel
Start
Data
CH
Inputs
QA


145
Construct log-miles Example
MID
=1.019+LM195
0.0%
Location Evaluation
finish where issue
Copy
=1.019
1.317
1.332
1.332
1.295
Paste
Start
Data
CH
Inputs
QA
Outputs
CM


146
Agenda
Rectifying location data
AADT Acquisition & Linear Interpolation
CAT Scan's Error Detection Algorithms
Construct Analysis Log-miles
CAT Scan's Evaluation Score
CAT Scan's Research Section
CAT Scan's Geolinear Segregator

147

QA Evaluation Score

- Heuristic for evaluation management
  - Guides partial examination
  - => Optimize QA process
- Factors
  - Segment – 18
  - Intersection – 13

148

QA Evaluation Score

- Influence: most to least, 1 of 3
  - Combined Severity
  - Evaluation – useful to study
  - Harm count (people)
  - Collision Manner factor
    - Infrequency
    - Ability to fix
    - Error likelihood

149

QA Evaluation Score

- Influence: most to least, 2 of 3
  - All over-represent (not intersection)
  - EDA: Collision Manner & Crash Type
  - EDA: Collision Manner & Angle
  - EDA: Intersection & Intersection ID
  - Contributing Factor
  - Collision Manner over-represent

150

QA Evaluation Score

- Influence: most to least, 3 of 3
  - Crash Type over-represent
  - Roadway Depart over-represent (not intersection)
  - Night Crash over-represent
  - Wet-Road over-represent
  - Age

151

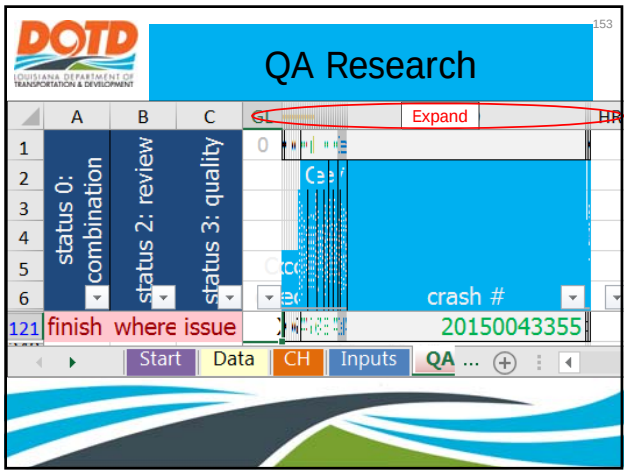
QA Evaluation Score

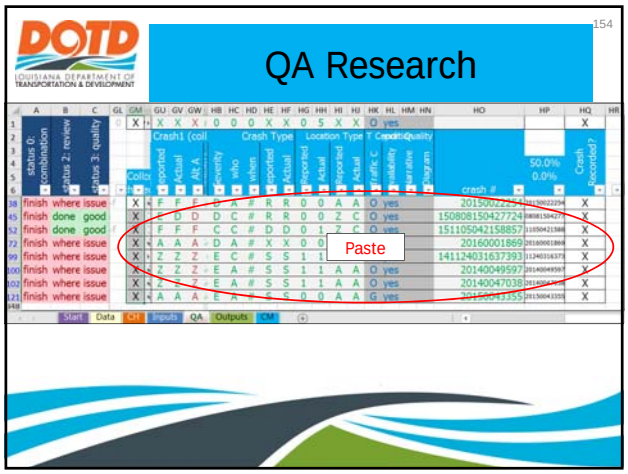
- over-represent
  - Segment – over-represent @ location
  - Intersection – over-represent
- All over-represent: sum of over-represent
- Evaluation – most when
  - Segment: Intersection = 0
  - Intersection: Intersection = 1

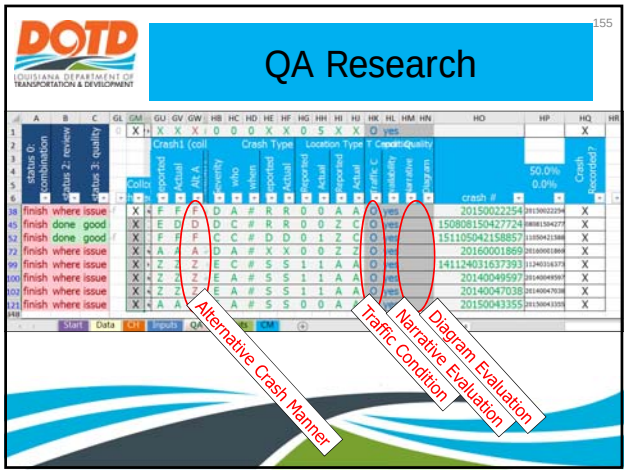
152

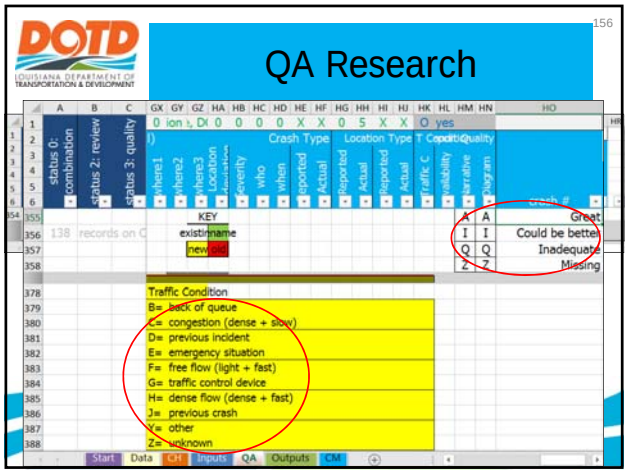
Agenda

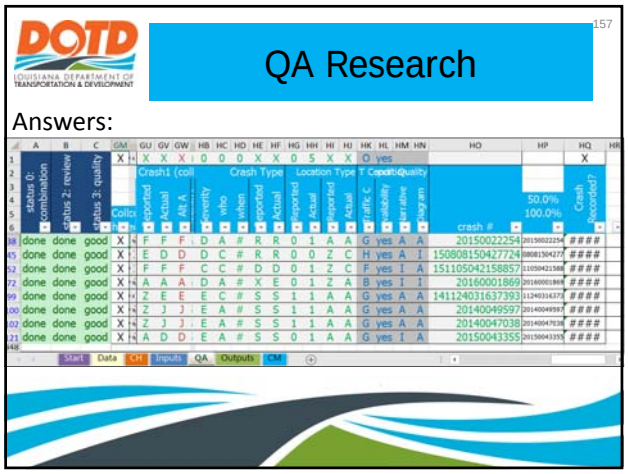
- ✓ Rectifying location data
- ✓ AADT Acquisition & Linear Interpolation
- ✓ CAT Scan's Error Detection Algorithms
- ✓ Construct Analysis Log-miles
- ✓ CAT Scan's Evaluation Score
- CAT Scan's Research Section
- CAT Scan's Geolinear Segregator

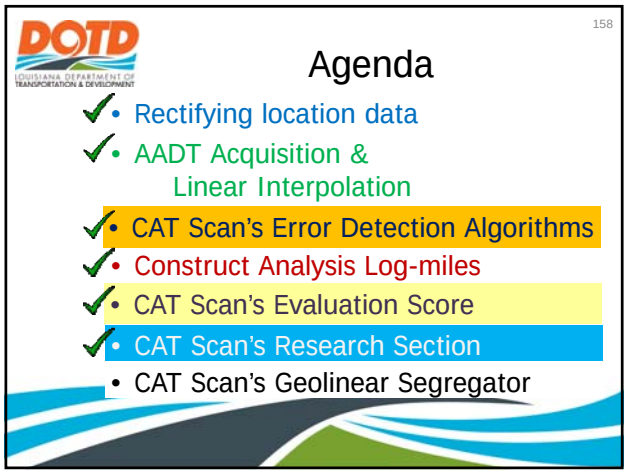

153
QA Research
Expand
status 0: combination
status 2: review
status 3: quality
crash #
121 finish where issue
20150043355
Start
Data
CH
Inputs
QA


154
QA Research
Paste


155
QA Research
Alternative Crash Manner
Traffic Condition
Narrative Evaluation
Diagram Evaluation


156
QA Research
KEY
existinname
new
Great
Could be better
Inadequate
Missing
Traffic Condition
B= back of queue
C= congestion (dense + slow)
D= previous incident
E= emergency situation
F= free flow (light + fast)
G= traffic control device
H= dense flow (dense + fast)
J= previous crash
Y= other
Z= unknown


157
QA Research
Answers:


158
Agenda
Rectifying location data
AADT Acquisition & Linear Interpolation
CAT Scan's Error Detection Algorithms
Construct Analysis Log-miles
CAT Scan's Evaluation Score
CAT Scan's Research Section
CAT Scan's Geolinear Segregator

159

Geolinear Segregator

- Useful to separate crashes
- Process
  - Find line's end-point coordinates
  - Enter coordinates into Input spreadsheet
  - Within QA spreadsheet copy calculations to below rows
- Comparison Meanings:
  - True: crash Northwest of line
  - False: crash Southeast of line

160

Geolinear Segregator

	A	B	C	D	E	F	G
72		Name	Input 1		Input 2		
73							
74		Geolinear Segregator					
75							
76			Latitude		Longitude		
77		Point 1	Latitude		Longitude		
78							
79		Point 2	Latitude		Longitude		

Start | Data | CH | Inputs | QA | Outputs | CM

161

Geolinear Segregator

Expand Columns

	A	B	C	CX	CY	DI	DJ	DK	DL	DR	DS
1											
2											
3											
4											
5											
6	status 0: combination	status 2: review	status 3: quality			Evaluation Score		# Harmed	m= b=	Solutions Count	
7	finish	where	issue			18		0	X	0	
8	finish	where	good			23		1	X	0	
9	finish	where	issue			29		0	X	0	
10	finish	where	issue			26		0	X	0	
11	finish	where	issue			29		0	X	0	

Start | Data | CH | Inputs | QA | Outputs | CM

162

Geolinear Segregator

Copy

Paste

	A	B	C	CX	CY	DI	DJ	DK	DL	DM	DN
1										#VALUE!	#VALUE!
2											
3										m=	0.00
4										b=	0.00
5										Calculated Latitude	Comparison
6	status 0: combination	status 2: review	status 3: quality			Evaluation Score		# Harmed			
7	finish	where	issue			18		0		0.00	TRUE
8	finish	where	good			23		1		0.00	TRUE
9	finish	where	issue			29		0			TRUE
10	finish	where	issue			26		0		0.00	TRUE
11	finish	where	issue			29		0		0.00	TRUE

Start | Data | CH | Inputs | QA | Outputs | CM

Questions

Bryan.Costello@LA.gov