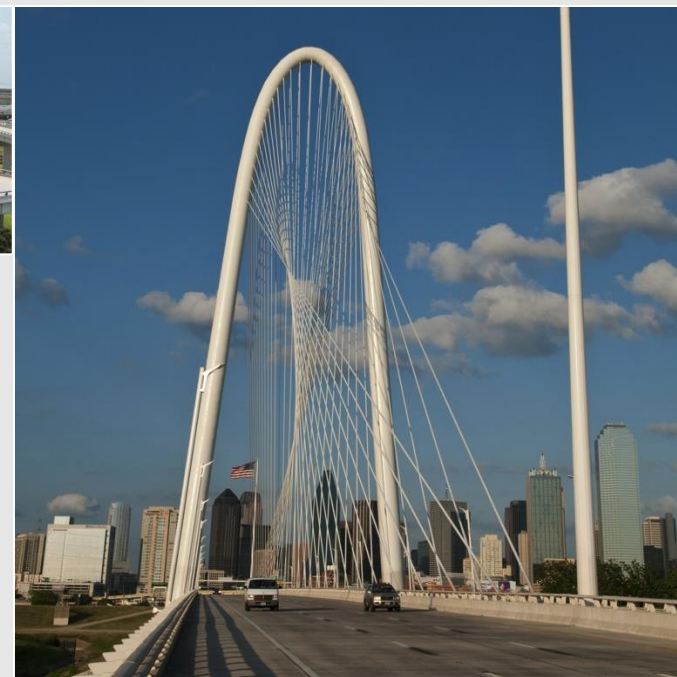




QUICK! FIND MY GUARDRAILS!

Guardrail End Treatment
Data Collection



Problem

- TxDOT was notified of a specific Guardrail End Treatment device which was altered after testing
- The altered G.E.T. type had been installed on an unknown number of guardrails across the country and was later proven to be defective
- The existence of this defective G.E.T. device on roadways posed as an extremely dangerous and potentially deadly hazard to motorists
- TxDOT needed to find the location of all defective G.E.T.s and quickly implement a replacement program



...but where are they?

Purpose

The Data Management group was called upon to help locate the defective G.E.T.s to facilitate TxDOT crews in replacing them...

- Collect GPS locations and guardrail end treatment types (along on-system roadways) in order to determine the total number of each treatment type and their approximate location
- Establish an inventory for long-term management of this asset and a replacement program



End Treatment Examples



ET PLUS



X-LITE



ET 2000



Turndown

Project Roles

- TPP: Transportation Planning & Programming Division
 - Workspace, Data Collection Framework, Map, SharePoint, Training
- Design and Maintenance Divisions
 - Subject Matter Experts, Organization, Support

The greatest resource...

- District Maintenance Section Personnel
 - Data Collection and Reporting



SharePoint Route Planning & Tracking Site

Home	Edit	District Number	District Abbreviation	County Name	Route Prefix	Route Name	Complete	Modified	Modified By
Notebook					Count= 281	Count= 281	Count= 0		
Documents		8	ABL	Borden	US	US0180	No	5/18/2015 11:58 AM	<input type="checkbox"/> Chris Bardash
Recent		8	ABL	Borden	FM	FM0612	No	5/18/2015 11:46 AM	<input type="checkbox"/> Michael Chamberlain
End Treatments		8	ABL	Borden	FM	FM0669	No	5/18/2015 11:46 AM	<input type="checkbox"/> Michael Chamberlain
Site Contents		8	ABL	Borden	FM	FM1054	No	5/18/2015 11:46 AM	<input type="checkbox"/> Michael Chamberlain
Recycle Bin		8	ABL	Borden	FM	FM1205	No	5/18/2015 11:46 AM	<input type="checkbox"/> Michael Chamberlain
EDIT LINKS		8	ABL	Borden	FM	FM1210	No	5/18/2015 11:46 AM	<input type="checkbox"/> Michael Chamberlain
		8	ABL	Borden	FM	FM1584	No	5/18/2015 11:46 AM	<input type="checkbox"/> Michael Chamberlain
		8	ABL	Borden	FM	FM1610	No	5/18/2015 11:46 AM	<input type="checkbox"/> Michael Chamberlain
		8	ABL	Borden	FM	FM1785	No	5/18/2015 11:46 AM	<input type="checkbox"/> Michael Chamberlain
		8	ABL	Borden	FM	FM2350	No	5/18/2015 11:46 AM	<input type="checkbox"/> Michael Chamberlain
		8	ABL	Callahan	IH	IH0020	No	5/18/2015 1:09 PM	<input type="checkbox"/> Michael Chamberlain
		8	ABL	Callahan	US	US0283	No	5/18/2015 11:46 AM	<input type="checkbox"/> Michael Chamberlain
		8	ABL	Callahan	SH	SH0006	No	5/18/2015 11:46 AM	<input type="checkbox"/> Michael Chamberlain
		8	ABL	Callahan	SH	SH0036	No	5/18/2015 11:46 AM	<input type="checkbox"/> Michael Chamberlain
		8	ABL	Callahan	SH	SH0206	No	5/18/2015 11:46 AM	<input type="checkbox"/> Michael Chamberlain
		8	ABL	Callahan	SH	SH0279	No	5/18/2015 11:46 AM	<input type="checkbox"/> Michael Chamberlain
		8	ABL	Callahan	SH	SH0351	No	5/18/2015 11:46 AM	<input type="checkbox"/> Michael Chamberlain
		8	ABL	Callahan	FM	FM0018	No	5/18/2015 11:46 AM	<input type="checkbox"/> Michael Chamberlain
		8	ABL	Callahan	FM	FM0374	No	5/18/2015 11:46 AM	<input type="checkbox"/> Michael Chamberlain
		8	ABL	Callahan	FM	FM0603	No	5/18/2015 11:46 AM	<input type="checkbox"/> Michael Chamberlain

Progress managed through a Sharepoint list with every route broken down by district and county

Smart Device Data Collection

- Agnostic HTML5 Web Application with Javascript
- ESRI JS API, Geolocation, & Local Storage
- Feature service hosted on ArcGIS Online
- Allows any person with a smart device to collect mapping-grade data at highway speeds

The screenshot shows a mobile application interface for data collection. At the top, the status bar displays the time as 1:46 PM and battery level at 83%. The app's header shows the current location as 30.25719,-97.74523 and 0 point(s) logged. The main content area features two vertical columns of buttons, each enclosed in an orange rounded rectangle labeled "Guardrails on the Left side of the Road" and "Guardrails on the Right side of the Road". The buttons in both columns are: ET Plus, ET 2000, SKT 350, Turndown, X-Lite, SoftStop, and Other. Below these columns is a section titled "Options" containing two buttons: "Start Over" (labeled "Clears All Points (Good for Training)") and "Delete Last Point" (labeled "If you make a mistake, Delete Last Point"). Below the "Options" section is a button labeled "Upload Collected Data" (labeled "Upload to Map"). At the bottom of the screen, a green message reads "Data uploaded successfully!" (labeled "Upload Successful"). The bottom of the screen features a standard mobile navigation bar with icons for home, back, and other functions.

Current Location → 30.25719,-97.74523

0 point(s) logged. ← # of Points Collected

Guardrails on the Left side of the Road

Guardrails on the Right side of the Road

Options

Start Over → Clears All Points (Good for Training)


Delete Last Point ← If you make a mistake, Delete Last Point












Upload Collected Data ← Upload to Map




Upload Successful → Data uploaded successfully!

** may appear slightly different on various devices (Apple, etc.)

ArcGIS Online Map – Real Time Quality Control








HOME ▾ Guardrail End Treatments NEW MAP  Chris ▾

 Details  Add ▾ |  Edit  Basemap |  Save ▾  Share  Print |    Find address or place 

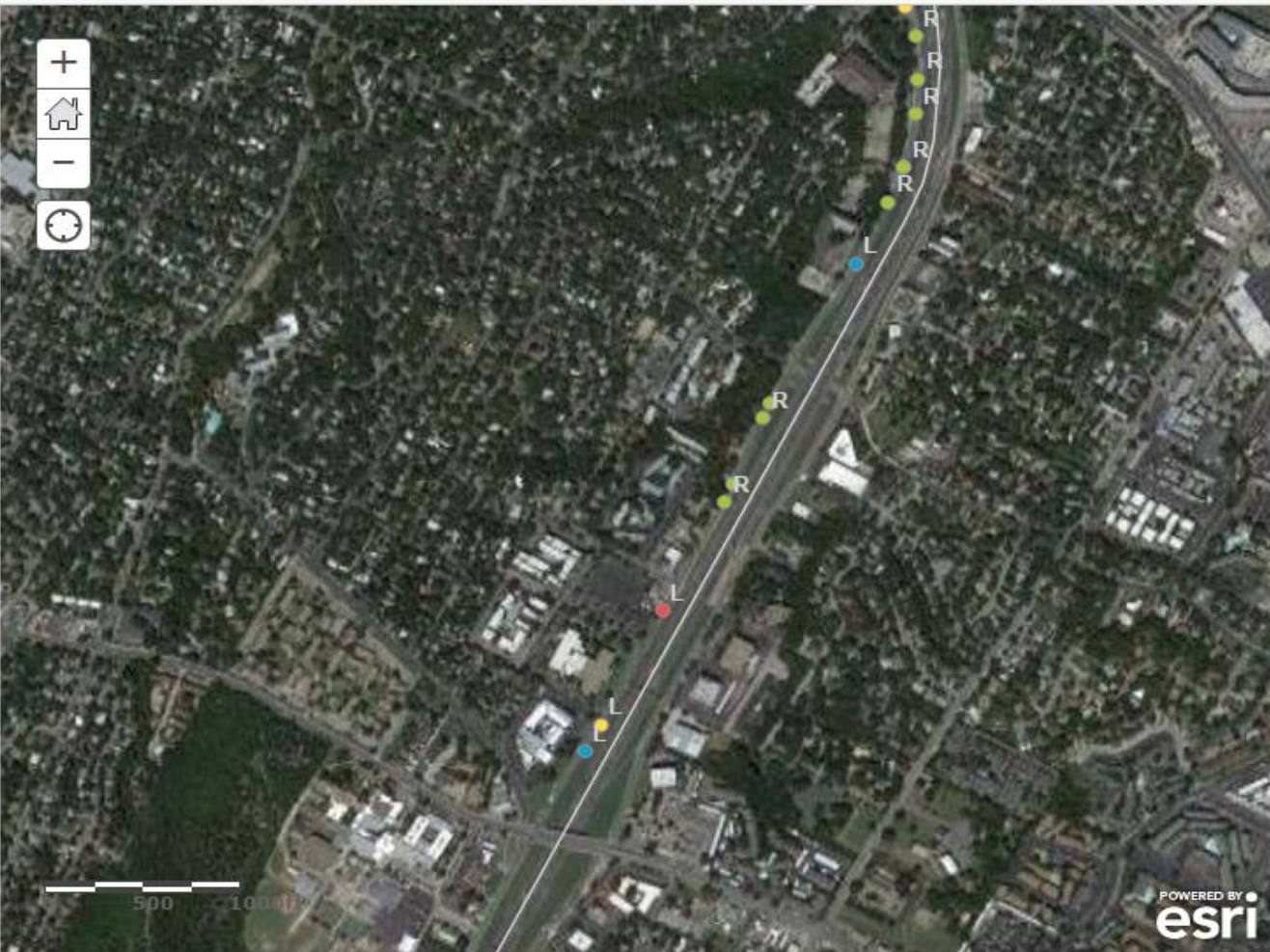
  

Legend

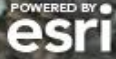
Guardrail End Treatments

-  ET Plus
-  ET 2000
-  SKT 350
-  X-Lite
-  SoftStop
-  Turndown
-  Other

TxDOT Roadways



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POWERED BY 

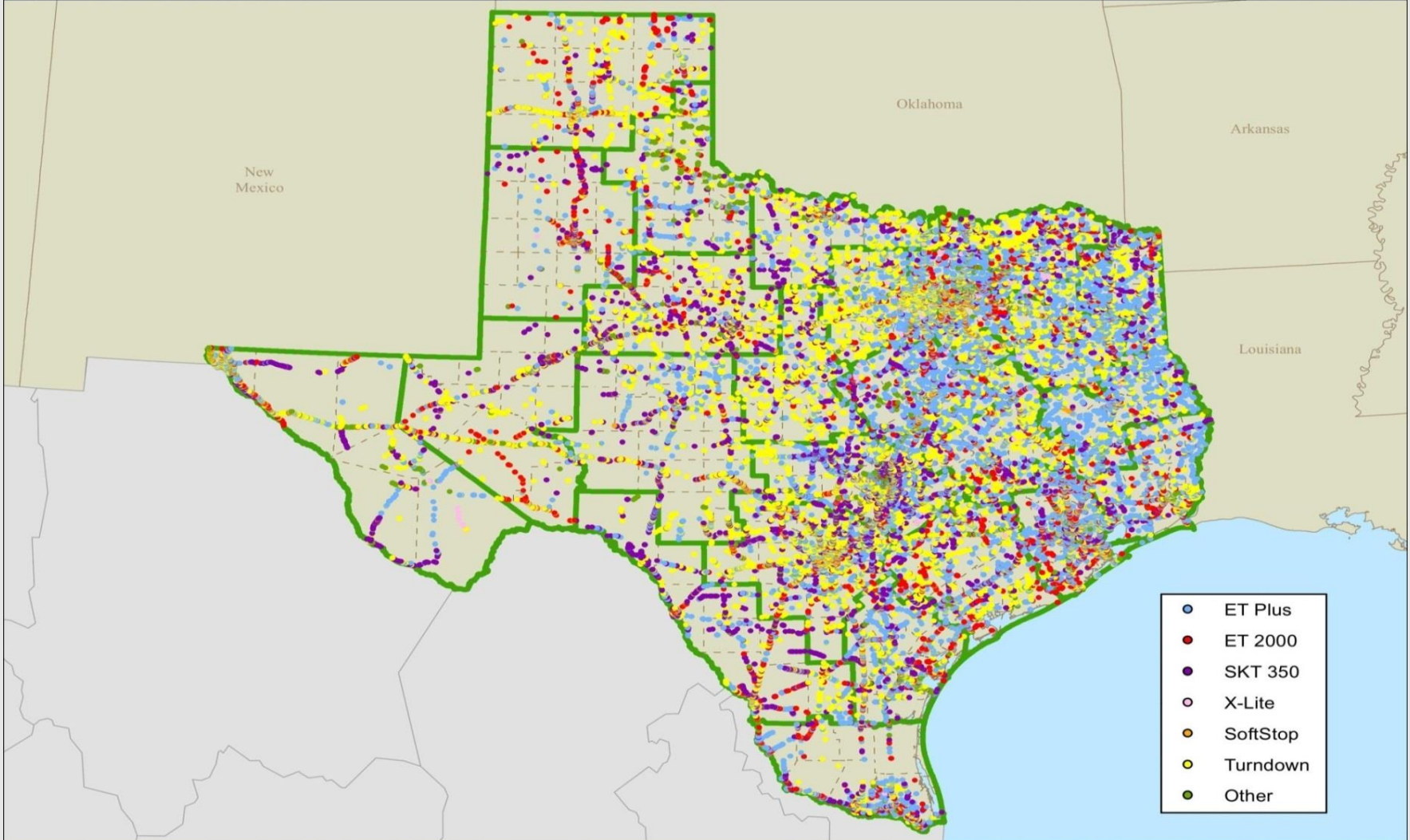
District Type Totals Summary

District	ETPLUS	ET2000	OTHER	SKT350	SOFTSTOP	TURNDOWN	XLITE	TOTAL
Abilene	521	260	344	1,355	2	2,578	4	5,064
Amarillo	681	660	44	273	3	1,623	12	3,296
Atlanta	1,933	254	179	761	1	1,349	2	4,479
Austin	3,630	355	1,182	2,947	8	4,154	45	12,321
Beaumont	1,437	477	136	362	0	1,178	6	3,596
Brownwood	577	86	44	574	1	1,677	12	2,971
Bryan	1,688	504	94	484	0	1,985	57	4,812
Childress	531	203	386	267	0	659	0	2,046
Corpus Christi	1,469	397	333	730	3	1,551	2	4,485
Dallas	5,409	1,792	888	349	22	3,846	151	12,457
El Paso	1,022	300	454	886	239	1,650	26	4,577
Fort Worth	3,198	654	242	280	11	4,225	154	8,764
Houston	4,051	1,194	322	848	2	2,525	52	8,994
Laredo	783	389	77	1,118	2	1,204	1	3,574
Lubbock	320	590	151	538	0	723	30	2,352
Lufkin	2,331	75	118	346	36	982	57	3,945
Odessa	164	354	272	559	1	1,397	6	2,753
Paris	1,851	645	398	738	5	2,285	47	5,969
Pharr	1,063	435	79	405	2	774	9	2,767
San Angelo	922	278	57	693	2	1,999	14	3,965
San Antonio	2,948	1,157	428	1,905	3	6,119	17	12,577
Tyler	1,966	307	248	285	5	1,742	13	4,566
Waco	2,789	569	481	633	8	1,062	42	5,584
Wichita Falls	880	155	207	608	1	1,514	69	3,434
Yoakum	1,451	632	251	573	5	1,706	26	4,644
Statewide	43,615	12,722	7,415	18,517	362	50,507	854	133,992

Results Map

Guardrail End Treatments

2015 Collection Project



Texas Department of Transportation
Transportation Planning and Programming Division
Data Analysis, Mapping and Reporting Branch
July 01, 2015

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Texas Department of Transportation
National
This map was produced for internal use
within the Texas Department of Transportation.
Accuracy is limited to the quality of available
data as of December 31, 2014.



Results

General Statistics

- Start Date: May 19th
- End Date: June 30th
- Project Duration: 30 working days
- Average Collection Speed: 35 mph
- Average Accuracy Rating: 26 ft
- Most common Device: iPhone
- Most GET points collected in a day: 10,801 (June 9th)
- Total GET Points Collected: **133, 992**

Device	# GETs Collected
Android	13,557
iPad	18,155
iPhone	102,280

Moving forward...

- Hundreds of maintenance employees trained in data collection with this method
- Demand has risen for using these tools to reinvent numerous routine processes

Questions?

Adam Breznicky, GIS Analyst

adam.breznicky@txdot.gov

410.241.8409

Texas Department of Transportation

Transportation Planning & Programming (TPP) – Mapping Group

Austin, Texas