



Early Warning Detection using Big data



Introduction to PTC
What data?
Lets get SHIRKED!!
EWD tool
What's next



*Celebrate 77 years as Americas First
Super Highway*

Total miles -552

Total employees - 2045

Vehicles per day – 543,934

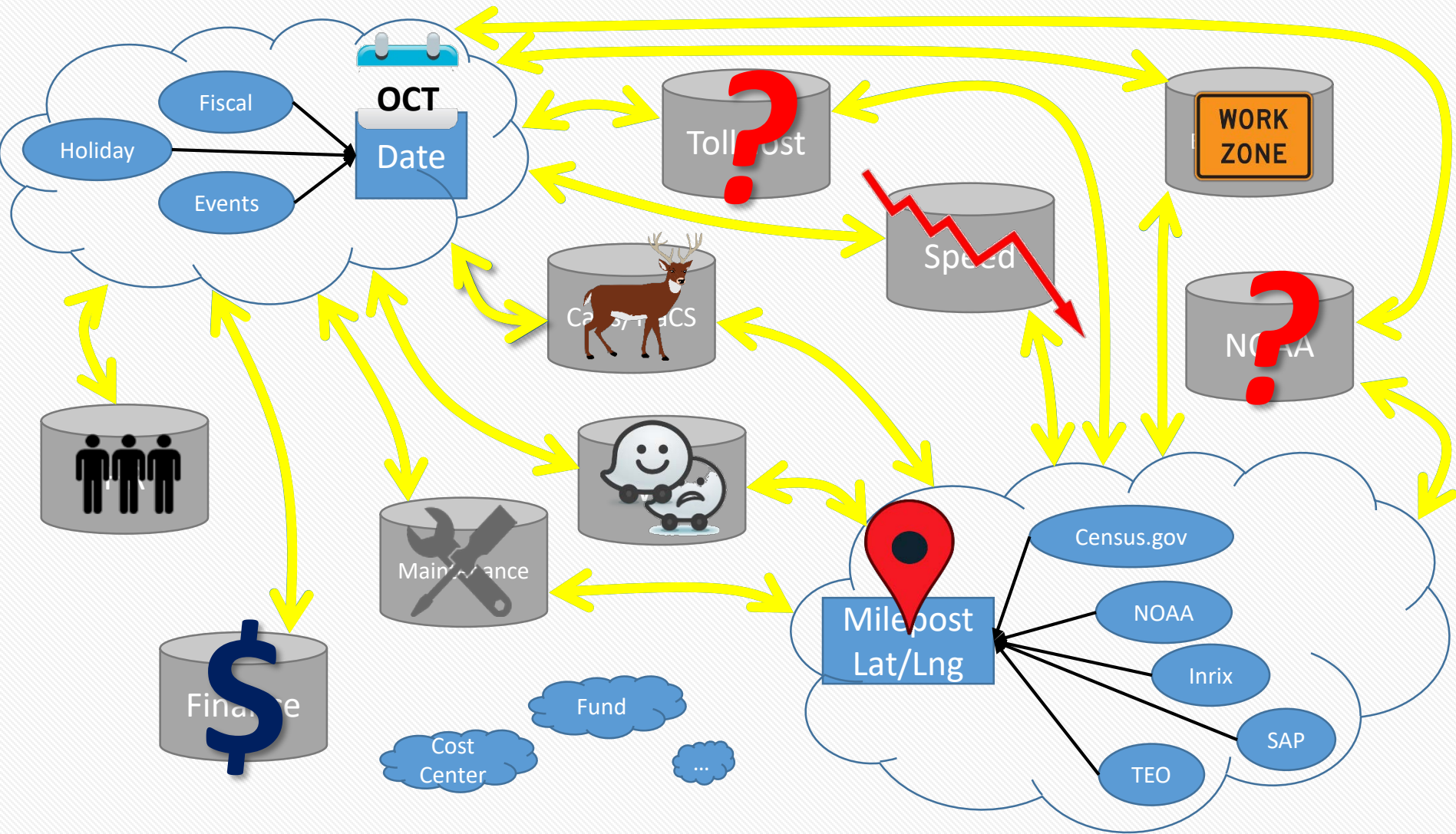
Net Annual Toll Revenue– 932.1
million

**PA Turnpike
Fast Facts**

BIG flat data facts

DAILY		ANNUAL	
Feed	Records	Feed	Records
Inrix	749k	Inrix	273.4MM
Waze	45.5k	Waze	16.6MM
NOAA	4,320	NOAA	1.6MM

Conceptual Architecture





- Need for early detection
- Waze alerts are 4 minutes faster nationwide
- Combination of weather/speed/incidents

**Business
Need**

What is EWD



Early Warning Detection
as of: 11/20/2017 12:45:26 PM

District	Roadway
<input type="checkbox"/> District 1	<input type="checkbox"/> A. Hutchinson
<input type="checkbox"/> District 2	<input type="checkbox"/> Beaver Valley
<input type="checkbox"/> District 3	<input type="checkbox"/> Mainline
<input type="checkbox"/> District 4	<input type="checkbox"/> Mon-Fayette
<input type="checkbox"/> District 5	<input type="checkbox"/> NE Ext.
	<input type="checkbox"/> Southern Beltway

3 Active Watch Points

District	Segment	Conditions	Speed Differential	Speed (LastHour)	Waze Alerts	Visibility	Wind Speed	NWS Alerts
District 1	Beaver Valley, Westbound: 30.2 - 30.6	Fair (F)	-15		0	10.00	11.5 (Southwest)	0
District 1	Beaver Valley, Westbound: 17.8 - 18.3	Fair (38.0F)	-14		0	10.00	10.4 (Southwest)	0
District 5	NE Ext., Southbound: 121 - 121.4	Mostly Cloudy (38.0F)	-32		0	10.00	12.7 (West)	0

Animal Activity (Waze)

Dist	Segment	Free Text

Accidents (Waze)

Dist	Segment	Free Text

Active NWS Alerts

Title	Urgency	Certainty	Severity	Expires

Speed Threshold

-49 -47 -45 -43 -41 -39 -37 -35 -33 -31 -29 -27 -25 -23 -21 -19 -17 -15 -13 -11 -9 -7 -5 -3 -1
-50 -48 -46 -44 -42 -40 -38 -36 -34 -32 -30 -28 -26 -24 -22 -20 -18 -16 -14 -12 -10 -8 -6 -4 -2 0

Waze Type

Accident
 Jam
 Weather Hazard

Waze Rating Minimum

Waze Confidence Minimum

Waze Reliability Minimum

Visibility Threshold

Wind Speed Threshold

<http://viewdev.paturndpike.com/QvAJAXzfc/AccessPoint.aspx?open=&id=QVS%40cvqlikviewd1%7CAccessPoint-All%20Users%2FTEO%20LiveStream.qvw&client=Plugin>





What we learned? |

Next step?

Data mining

Calibration

Verification

Geo Analytics