# Background:

In March 2010 – presented this application at a GIS Co-Op.

Current Status: waiting for DOT approval to serve the application from their website to the public.

Re Cap.

Demo Application.

Layers Generated.

Improvements Made / Features Added.

# Current DOT Traffic Engineering Web Site for Traffic Counts:

http://dot.pima.gov/trafeng/trafcnt/index.html

Serving current Traffic Count Data to the Public:

- Major Road Average Daily Traffic (24 Hr 2-way)
- Intersection Approach Counts (24 Hr)
- Minor Road Average Daily Traffic (24 Hr 2-way)
- Turning Movement Count Availability
- Permanent Counter Stations

# Current Site:

Data served to the public in a Report Type Format.

The Site is a simple way for the public (contractors / designers / realtors) to access Traffic Count data.

In house (GIS department) users of the data – difficulty in using / viewing data / connecting data.

Opportunity to create a more “User Friendly” view/access to the data utilizing some of the newer GIS / Web Technologies

Created a prototype.

Traffic Count Application:

Customer will not only be able to get traffic statistics

- Will automatically get a spatial location – and be able to place the traffic count segment / intersection in context with other data - surrounding roads / intersections

- Roads are symbolized based on 4 breakdowns of Traffic Counts customers will be able to tell at a glance where the segment of road/roads they are interested in falls in relation to the other data

- Because application accesses all available Traffic Count Data will be able to get historic perspective – with nice visual trend line

- Application is simple / focused with 1 purpose – displaying – accesses Traffic Count Data – should be relatively easy to understand and use

Demo Site – DOT link to this site – DOT's traffic count data still not accessible to the public (served from an internal development ArcGIS Server):

http://gis.pima.gov/apps/trafficcounts/DOTTrafficCounts.htm

Testing Further functionality:

http://gis.pima.gov/apps/appdev/trafficcounts/DOTTrafficCountsTest.htm

Demo: Compare Traffic Count Information for Segment of Road:

http://dot.pima.gov/trafeng/trafcnt/adt.htm

Alvernon Wy: Los Reales Rd / Valencia Rd

# How:

GIS Layer(s) did not exist

- Data Mapped through Linear Referencing Overnight Process
- Generates spatial / GIS data by mapping To / From information – stored in Traffic Engineering SQL Server Tables
- (Ray)

# GIS Layers Used in Traffic Engineering Web App

- **stadtpc** displays the Traffic Engineering Average Daily Traffic (ADT) Counts for road segments maintained by Pima County. ADT is the "Average Daily Traffic" that is traveling (both directions) at a point location on a roadway segment over a 24-hour period.

- **stuadtpc** displays the Unique Traffic Engineering Average Daily Traffic (ADT) Counts for road segments maintained by Pima County. ADT is the "Average Daily Traffic" that is traveling (both directions) at a point location on a roadway segment over a 24-hour period. It differs from stadtpc in that only unique segments are represented based on SEQNO and max ADT for the **most recent traffic sampling**. This layer is used on the Traffic Engineering web application and SEQNO is used to return multiple records for a particular segment from the database tables on saruman.

# Traffic Engineering

## Segments_ADT Table

saruman.TRAFE...QLQuery1.sql* | SARUMAN.TRA...EGMENTS_DEFINE | SARUMAN.TRA...EGMENTS_ADT | Object Expl

```
use trafeng;
select * from dbo.SEGMENTS_ADT
order by fref
```

Results | Messages

| | ROADNAME | F_BLOCK | F_CARD | RECORDED | AT_BLOCK | AT_CARD | ADT | FREF |
|---|---|---|---|---|---|---|---|---|
| 348 | LA CANADA DR | 20900 | S | 1997-04-01 00:00:00.000 | 19350 | S | 12434 | 6 |
| 349 | LA CANADA DR | 20900 | S | 1996-12-01 00:00:00.000 | 20800 | S | 14357 | 6 |
| 350 | LA CANADA DR | 20900 | S | 1996-09-01 00:00:00.000 | 19350 | S | 9338 | 6 |
| 351 | HOUGHTON RD | 9800 | S | 1996-12-01 00:00:00.000 | 10300 | S | 3919 | 8 |
| 352 | HOUGHTON RD | 9800 | S | 1995-08-01 00:00:00.000 | 10300 | S | 3653 | 8 |
| 353 | HOUGHTON RD | 9800 | S | 2000-08-16 00:00:00.000 | 9700 | S | 6232 | 8 |
| 354 | HOUGHTON RD | 9800 | S | 2001-05-15 00:00:00.000 | 9400 | S | 6703 | 8 |
| 355 | HOUGHTON RD | 9800 | S | 1972-03-01 00:00:00.000 | 10300 | S | 2512 | 8 |
| 356 | HOUGHTON RD | 9800 | S | 1970-02-01 00:00:00.000 | 10300 | S | 1799 | 8 |
| 357 | HOUGHTON RD | 9800 | S | 1968-05-01 00:00:00.000 | 10300 | S | 1296 | 8 |
| 358 | HOUGHTON RD | 9800 | S | 1994-09-01 00:00:00.000 | 10450 | S | 3954 | 8 |
| 359 | HOUGHTON RD | 9800 | S | 1988-08-01 00:00:00.000 | 9400 | S | 2646 | 8 |
| 360 | HOUGHTON RD | 9800 | S | 2006-12-04 00:00:00.000 | 9570 | S | 16458 | 8 |
| 361 | HOUGHTON RD | 9800 | S | 1993-01-01 00:00:00.000 | 10300 | S | 3954 | 8 |
| 362 | HOUGHTON RD | 9800 | S | 2005-05-11 00:00:00.000 | 9350 | S | 11430 | 8 |
| 363 | HOUGHTON RD | 9800 | S | 2008-08-26 00:00:00.000 | 9520 | N | 11751 | 8 |
| 364 | HOUGHTON RD | 3800 | S | 2005-05-10 00:00:00.000 | 3150 | S | 15675 | 10 |
| 365 | HOUGHTON RD | 3800 | S | 2002-06-27 00:00:00.000 | 3700 | S | 11928 | 10 |
| 366 | HOUGHTON RD | 3800 | S | 2002-10-01 00:00:00.000 | 3690 | S | 16552 | 10 |

SEGMENTS_DEFINE Table

SEGMENTS_ADT.fref = SEGMENTS_DEFINE.seqno

saruman.TRAFE...QLQuery1.sql* | SARUMAN.TRA...MENTS_DEFINE | SARUMAN.TRA...EGMENTS_ADT | Object Explorer Details

```
use trafeng;
select roadname,seqno,* from dbo.SEGMENTS_define
```

Results | Messages

| | roadname | seqno | ROADNAME | F_BLOCK | F_CARD | F_ROADNAME | F_ROADDESC | T_BLOCK | T_CARD | T_ROADNAME | T_ROADDESC | LENGTH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ABREGO DR | 1 | ABREGO DR | 21900 | S | CONTINENTAL RD | | 20900 | S | ESPERANZA BL | | 1.4 |
| 2 | ABREGO DR | 2 | ABREGO DR | 20900 | S | ESPERANZA BL | NULL | 20050 | S | PASEO DE GOLF | NULL | 1.1 |
| 3 | ABREGO DR | 3 | ABREGO DR | 20050 | S | PASEO DE GOLF | | 19300 | S | DUVAL RD | | 1.1 |
| 4 | LA CANADA DR | 4 | LA CANADA DR | 22450 | S | MISSION-TWIN BUTTES RD | NULL | 21900 | S | CONTINENTAL RD | NULL | 0.8 |
| 5 | LA CANADA DR | 5 | LA CANADA DR | 21900 | S | CONTINENTAL RD | NULL | 20900 | S | ESPERANZA BL | NULL | 1.3 |
| 6 | LA CANADA DR | 6 | LA CANADA DR | 20900 | S | ESPERANZA BL | NULL | 19300 | S | DUVAL MINE RD | .1 S | 2.0 |
| 7 | HOUGHTON RD | 8 | HOUGHTON RD | 9800 | S | S.P.R.R. | .5 S | 9300 | S | S.P.R.R. | .1 N | 0.6 |
| 8 | HOUGHTON RD | 10 | HOUGHTON RD | 3800 | S | ESCALANTE RD | NULL | 2700 | S | GOLF LINKS RD | .1 S | 0.9 |
| 9 | HOUGHTON RD | 12 | HOUGHTON RD | 1100 | N | SPEEDWAY BL | NULL | 2400 | N | TANQUE VERDE RD | NULL | 1.0 |
| 10 | HOUGHTON RD | 13 | HOUGHTON RD | 3600 | N | PRINCE RD | NULL | 3900 | N | CATALINA HY | NULL | 0.4 |
| 11 | HOUGHTON RD | 14 | HOUGHTON RD | 3900 | N | CATALINA HY | NULL | 4800 | N | SNYDER RD | NULL | 1.1 |
| 12 | FREEMAN RD | 15 | FREEMAN RD | 3300 | S | OLD SPANISH TR | NULL | 0 | N | BROADWAY BL | NULL | 2.6 |
| 13 | FREEMAN RD | 16 | FREEMAN RD | 0 | N | BROADWAY BL | NULL | 1100 | N | SPEEDWAY BL | NULL | 1.0 |
| 14 | AJO WY | 17 | AJO WY | 3100 | E | COUNTRY CLUB RD | NULL | 3500 | E | PALO VERDE RD | NULL | 0.5 |
| 15 | AJO WY | 18 | AJO WY | 3500 | E | PALO VERDE RD | NULL | 3800 | E | ALVERNON WY | NULL | 0.4 |
| 16 | ALVERNON WY | 20 | ALVERNON WY | 8900 | S | HUGHES ACCESS RD | NULL | 7300 | S | LOS REALES RD | NULL | 2.0 |
| 17 | ALVERNON WY | 21 | ALVERNON WY | 7300 | S | LOS REALES RD | NULL | 6500 | S | VALENCIA RD | NULL | 1.0 |
| 18 | ALVERNON WY | 22 | ALVERNON WY | 6100 | S | DREXEL RD | .5 S | 4900 | S | IRVINGTON RD | NULL | 1.5 |

# Methodology to Create Layers

- “GIS” fields were added to SEGMENTS_DEFINE table and populated with correct ROADNAME, FINT and TINT
- SQL Views are used to further massage the data into route event format adding: ROUTE, FMEAS, TMEAS fields
- Nightly Scheduled Task is run to Display Route Events from event tables to create shapefiles

# GIS Fields Populated

saruman.TRAFE...QLQuery1.sql* | SARUMAN.TRAF...ENTS_DEFINE* | Object Explorer Details

```
use trafeng
select roadname, seqno, f_roadname, t_roadname, gis_f_roadname,gis_t_roadname, gis_fint, gis_tint from dbo.
```

Results | Messages

| | roadname | seqno | f_roadname | t_roadname | gis_f_roadname | gis_t_roadname | gis_fint | gis_tint |
|---|---|---|---|---|---|---|---|---|
| 1 | ABREGO DR | 1 | CONTINENTAL RD | ESPERANZA BL | CONTINENTAL RD | ESPERANZA BL | NULL | NULL |
| 2 | ABREGO DR | 2 | ESPERANZA BL | PASEO DE GOLF | ESPERANZA BL | PASEO DE GOLF | NULL | 13840 |
| 3 | ABREGO DR | 3 | PASEO DE GOLF | DUVAL RD | PASEO DE GOLF | DUVAL RD | 13840 | NULL |
| 4 | LA CANADA DR | 4 | MISSION-TWIN BUTTES RD | CONTINENTAL RD | MISSION TWIN BUTTES RD | CONTINENTAL RD | NULL | NULL |
| 5 | LA CANADA DR | 5 | CONTINENTAL RD | ESPERANZA BL | CONTINENTAL RD | ESPERANZA BL | NULL | NULL |
| 6 | LA CANADA DR | 6 | ESPERANZA BL | DUVAL MINE RD | ESPERANZA BL | DUVAL MINE RD | NULL | NULL |
| 7 | HOUGHTON RD | 8 | S.P.R.R. | S.P.R.R. | ROCKET RD | OLD VAIL RD | NULL | 4331 |
| 8 | HOUGHTON RD | 10 | ESCALANTE RD | GOLF LINKS RD | ESCALANTE RD | GOLF LINKS RD | NULL | NULL |
| 9 | HOUGHTON RD | 12 | SPEEDWAY BL | TANQUE VERDE RD | SPEEDWAY BL | TANQUE VERDE RD | NULL | NULL |
| 10 | HOUGHTON RD | 13 | PRINCE RD | CATALINA HY | PRINCE RD | CATALINA HY | NULL | NULL |

Correct “FROM ROAD” is ROCKET RD
Correct “TO ROAD” is OLD VAIL RD

# Application:

- JavaScript API
- Dojo – good job of shielding the programmer form various browser incompatibilities
- Traffic Layers – optimized ArcGIS Dynamic Map Service
- Reference Layers – BaseMap
    - Fastest Way to Serve Reference Layers
    - Cached Tiles – Exploded Cache
        - Updated through daily process

# Additions:

New in ArcGIS 10.0

Ability to reference a related table resource published through an ArcServer Service – ( .mxd / .msd )

Previously – we accessing Traffic Engineering tables though cold fusion calls to tables – converting results to JSON string – converted to tables / charts in JavaScript API

Currently – created a view in GIS reference geodatabase – (SQL tables - backend not registered with SDE / geodatabase)

- through a linked server request (Traffic Engineering data located on different server than reference geodatabase)

- Results are not ordered in JSON (has no order) – order by in view did not work – needed to sort the results in JavaScript

Demo: http://starcgis.central.pima.gov/ArcGIS/rest/services/

AREF = 154

# Additions:

- Use of Widgets – both new ESRI widgets (BaseMap Widget) -

  our own custom widget(s) - find

  - One source – if template for widget modified in one place reflected in all the apps

- Multiple Custom BaseMaps (cached) – updated nightly

- New Hillshade – 10 ft created via Spatial Analyst – to be used in larger scales - BaseMaps

Application makes Traffic Count Data more navigable

Easy access to Data –

Cleaning data – keeping data in sync

Keeping calls to a minimum

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