

Waze Travel Time/Congestion Poller



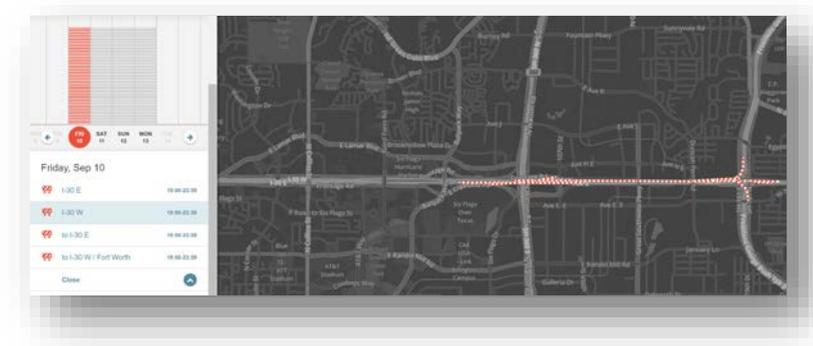
ARLINGTON SM
THE AMERICAN DREAM CITY

Daniel Burnham and Helen Zhou

..... Waze Travel Time/Congestion Poller



- City of Arlington, TX - Background
 - Third largest city in the Dallas-Ft Worth Metroplex
 - Home of University of Texas at Arlington, Dallas Cowboys and Texas Rangers stadiums
 - Appx 100 sq mi., estimated population over 400K
 - 364 Signals
 - 175 PTZ monitoring cameras
 - Multiple roadways with 50K+ traffic per day

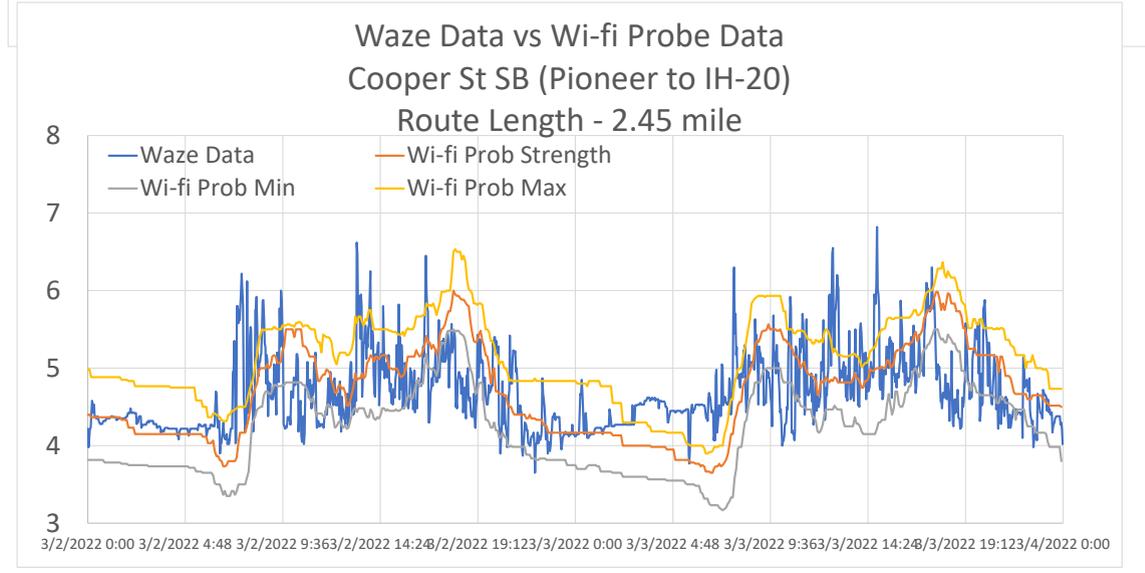
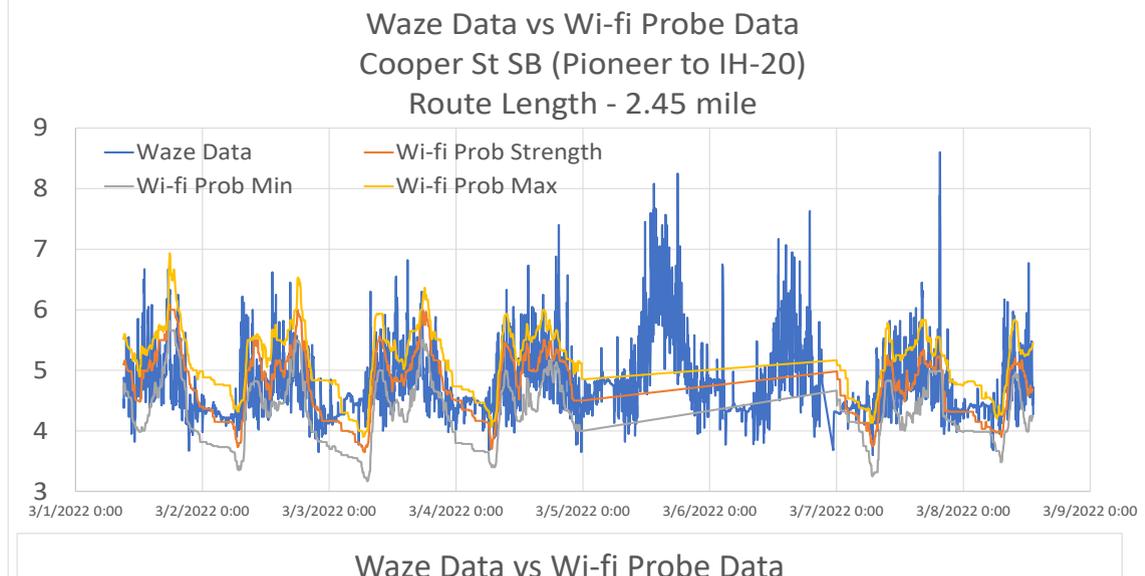
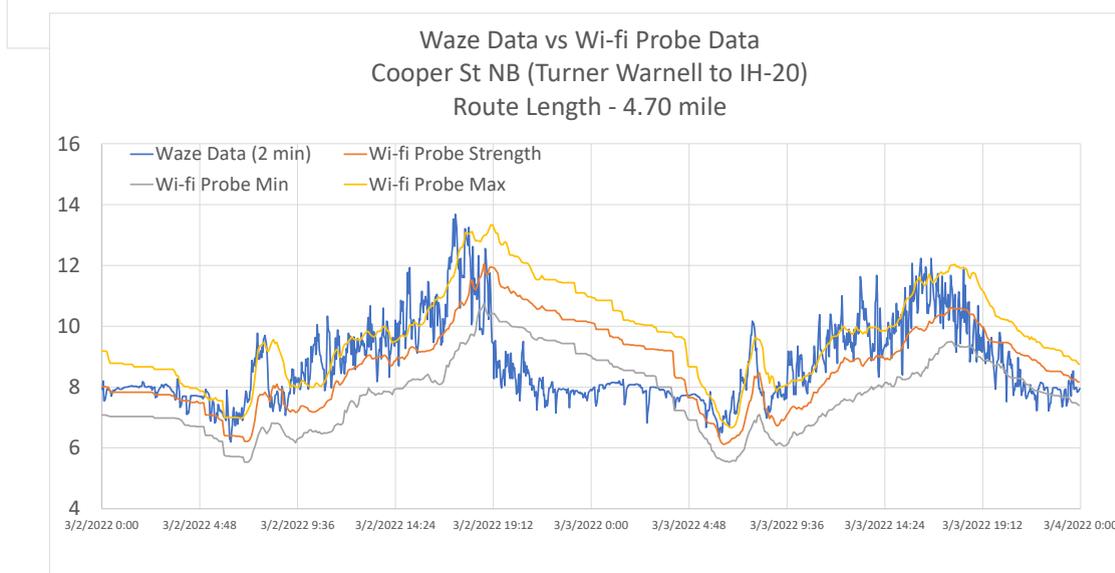
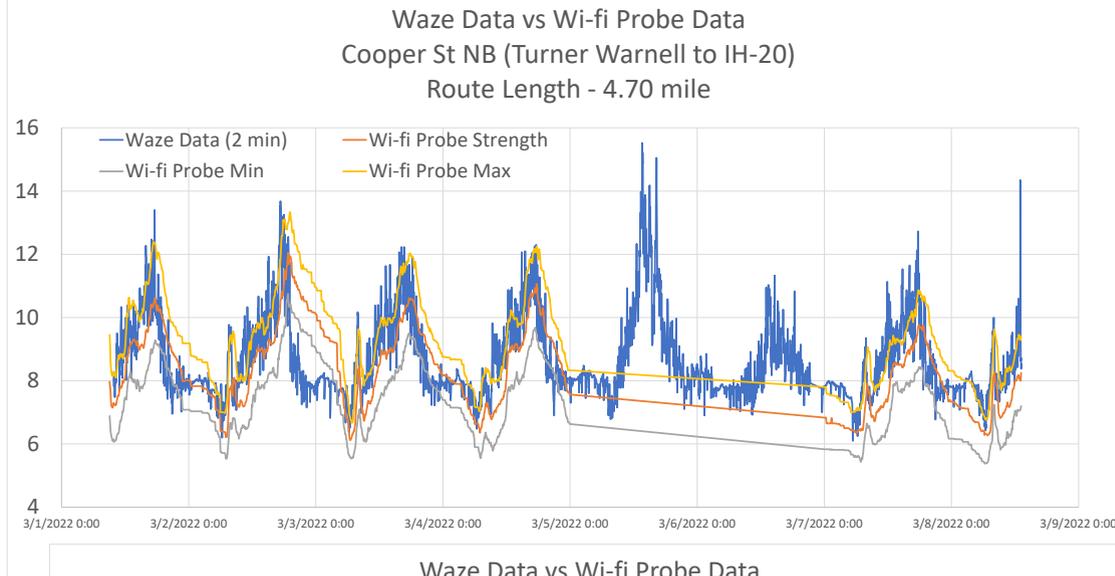


- One of the oldest CCP members in the DFW area
- Share roadway closure data with Waze
- City developed application for sharing event road closures to Waze
- Frequent user of Waze Traffic View tool

..... Waze Travel Time/Congestion Poller



- Waze vs Wi-Fi Probe Data



Waze Travel Time/Congestion Poller



GIS Map Integration

WAZEtravelTimePoller - Map - ArcGIS Pro

Contents

- Map
- Waze Travel Time Route
- Road Centerlines
- Topographic
- Standalone Tables
 - Waze Travel Time Table
 - Waze Travel Time Table Current

| OBJECTID | Current Time | Historical Time | Jam Level | Updated | Route ID | Current Time Minute | Historical Time Minute | PercentCongested |
|----------|--------------|-----------------|-----------|----------------------|----------|---------------------|------------------------|------------------|
| 1 | 890 | 871 | 1 | 10/5/2021 3:24:23 PM | 6858 | 14.83 | 14.52 | 102 |
| 2 | 1190 | 1162 | 1 | 10/5/2021 3:24:23 PM | 6861 | 19.83 | 19.37 | 102 |
| 3 | 750 | 755 | 1 | 10/5/2021 3:24:23 PM | 6863 | 12.5 | 12.58 | 99 |
| 4 | 710 | 700 | 1 | 10/5/2021 3:24:23 PM | 6864 | 11.83 | 11.67 | 101 |
| 5 | 1177 | 1147 | 1 | 10/5/2021 3:24:23 PM | 6865 | 19.62 | 18.13 | 102 |

GIS Dashboard Application

WAZE Route Congestion Dashboard

List of WAZE Congestion where Jam Level >= 1

- Mayfield EB is 118% congested at 3/9/2022, 5:01 PM
- Mayfield WB is 115% congested at 3/9/2022, 5:01 PM
- Cooper St NB is 111% congested at 3/9/2022, 5:01 PM
- Cooper St SB is 110% congested at 3/9/2022, 5:01 PM
- Matlock Rd NB is 109% congested at 3/9/2022, 5:01 PM
- Division EB is 107% congested at 3/9/2022, 5:01 PM
- Matlock Rd SB is 107% congested at 3/9/2022, 5:01 PM
- S Collins St, Collins St, N Collins St Arlington is 107% congested at 3/9/2022, 5:01 PM
- Division WB is 106% congested at 3/9/2022, 5:01 PM
- Sublett Rd WB is 105% congested at 3/9/2022, 5:01 PM

Last update: a few seconds ago

List of WAZE Congestion Top 5 Congestion Percentages

- Mayfield EB is 118% congested at 3/9/2022, 5:01 PM
- Mayfield WB is 115% congested at 3/9/2022, 5:01 PM
- Cooper St NB is 111% congested at 3/9/2022, 5:01 PM
- Cooper St SB is 110% congested at 3/9/2022, 5:01 PM
- Matlock Rd NB is 109% congested at 3/9/2022, 5:01 PM

1 of 2

Waze Travel Time Current: Cooper St NB

RouteName Cooper St NB

RouteFrom S Cooper St

RouteTo N Cooper St

Type STATIC

ROUTEID 5,844

CurrentTimeSecond 1,648

HistoricalTimeSecond 1,497

JamLevel 1

Updated 3/9/2022, 5:03 PM

CurrentTimeMinute 27.47

HistoricalTimeMinute 24.95

PercentCongested 110

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Waze Travel Time/Congestion Poller



- Current Uses
 - Travel Time Monitoring and Reporting
 - Active Traffic Management with Email Alerts
 - Signal Timing Implementation Study Support
- Potential Future Developments
 - Integration with ATMS
 - Integration with ATSPM – UTA collaboration study
 - Part of the Big Data Decision Support System



Waze Travel Time/Congestion Poller

Lake County Illinois Open-source application

- Github url: <https://github.com/lakecountypassage/WazeTravelTimesPoller>
- Source code is in Python Script
- Build-In SQLite Database or Postgres Database
- Easy implementation: update Configuration file for WazeUIDS, email etc

```
[WazeUIDS]
# examples, you need to insert your own UID from Waze
5e0a2effdb15aa2c58b5b8f5a276cc52

# uses gmail to send emails
[EmailSettings]
SendEmailAlerts = False
SendWithOath = False
Username =
Password =

# email addresses of people that will receive alerts, this is a list, just keep adding below
[Emails]
# examples, you need to remove these and use your own
helen.zhou@arlingtontx.gov
```

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Waze Travel Time/Congestion Poller



A few things to consider for City of Arlington

- Database
 - City of Arlington Enterprise Geodatabase is in Microsoft SQL Server
 - SQL Server Database connections are registered as datastore items in ArcGIS servers and Portal federated GIS servers.
- Customization and Maintenance
 - Customized feature class schema
 - Email notification
 - Congestion triggering threshold
 - Email out frequency
 - Email when new route is added
 - Other future customizations

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Waze Travel Time/Congestion Poller



Implementation - Design

- Database: Microsoft SQL Server
- Program language: C# .Net
- Publish feature services to be used in GIS applications.

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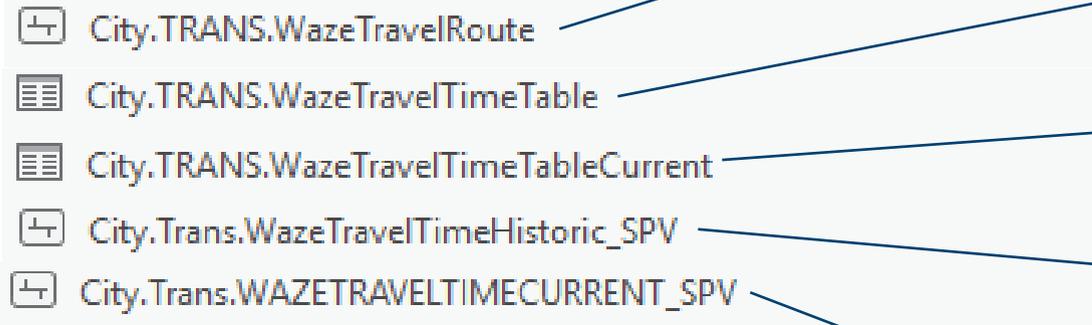
Implementation - Preparation

1. City Arlington has been a member of Waze for Cities (formerly Waze CCP)
2. Request access to the Waze Traffic View tool through the partner dashboard
3. Request access to the Waze Traffic View Feed through the partner dashboard
4. Add routes through the Waze Traffic View website
5. Get the broadcasterId (BUID) from the Traffic View Feed (from step #3).
6. Coding in C# .NET with https request to the above feed and write the response to SQL server database.
7. Set a Windows Scheduled Task to run the program every 2 minutes

..... Waze Travel Time/Congestion Poller



Implementation – Output Feature classes and tables



- Polyline feature class for routes defined in Waze traffic viewer
- Registered GIS table to record travel time for routes every 2 minutes
- Registered GIS table to record the last travel time for each route.
- Spatial view created by joining the WazeTravelRoute and WazeTravelTimeTable
- Spatial view created by joining the WazeTravelRoute and WazeTravelTimeTableCurrent

Waze Travel Time/Congestion Poller



| OBJECTID * | RouteName | RouteFrom | RouteTo | Type | RouteID * | AddedDate | Shape * | Shape.STLength() |
|------------|------------------------|---------------|---------------|--------|-----------|-----------------------|----------|------------------|
| 5 | SBFR SH 360 (Watson... | Six Flags Dr | E Mitchell St | STATIC | 20215 | 1/13/2022 10:15:01 PM | Polyline | 11601.600077 |
| 6 | NBFR SH 360 (Watson... | E Mitchell St | Glenn Dr | STATIC | 20216 | 1/13/2022 10:15:01 PM | Polyline | 10172.283159 |
| 7 | SBFR SH 360 (Watson... | E Mitchell St | Cummins St | STATIC | 20217 | 1/13/2022 10:15:01 PM | Polyline | 16452.40116 |
| 8 | NBFR SH 360 (Watson... | Cummins St | Mitchell St | STATIC | 20218 | 1/13/2022 10:15:01 PM | Polyline | 17761.277872 |

| OBJECTID * | Current Time Second | Historical Time Second | Jam Level | Updated | Route ID | Current Time Minute | Historical Time Minute | PercentCongested |
|------------|---------------------|------------------------|-----------|----------------------|----------|---------------------|------------------------|------------------|
| 1072325 | 337 | 236 | 1 | 5/16/2022 1:26:19 PM | 20216 | 5.62 | 3.93 | 143 |
| 1072326 | 313 | 279 | 1 | 5/16/2022 1:26:19 PM | 19230 | 5.22 | 4.65 | 112 |
| 1072327 | 1180 | 1065 | 1 | 5/16/2022 1:26:19 PM | 20350 | 19.67 | 17.75 | 111 |
| 1072312 | 312 | 235 | 0 | 5/16/2022 1:24:19 PM | 20216 | 5.2 | 3.92 | 133 |
| 1072313 | 1415 | 1343 | 0 | 5/16/2022 1:24:19 PM | 20344 | 23.58 | 22.38 | 105 |
| 1072314 | 469 | 417 | 0 | 5/16/2022 1:24:19 PM | 20217 | 7.82 | 6.95 | 113 |

| OBJECTID * | Current Time Second | Historical Time Second | Jam Level | Updated | Route ID * | Current Time Minute | Historical Time Minute | PercentCongested |
|------------|---------------------|------------------------|-----------|----------------------|------------|---------------------|------------------------|------------------|
| 1 | 337 | 236 | 1 | 5/16/2022 1:26:19 PM | 20216 | 5.62 | 3.93 | 143 |
| 2 | 313 | 279 | 1 | 5/16/2022 1:26:19 PM | 19230 | 5.22 | 4.65 | 112 |
| 3 | 1180 | 1065 | 1 | 5/16/2022 1:26:19 PM | 20350 | 19.67 | 17.75 | 111 |

- GIS feature class for route
- Travel-time is recorded in the table every 2 minutes
- Travel-time current table records only the last travel-time data for each route.
- Route feature class and travel-time table are joined by Route ID

Waze Travel Time/Congestion Poller



■ New route alert

New Waze Travel Time Route found,

 wazetraveltime@arlingtontx.gov
To IT GIS

Retention Policy a Inbox 180 Day (6 months)

Expires 8/17/2022

 log.txt
106 KB

[Phish Alert](#)

RouteID: 20343
RouteName: NB FM 157 (Cooper St) from Turner Warnell to IH 30
FromStreetName: Turner Warnell
ToStreetName: IH 30/Lamar Blvd
Type: STATIC

RouteID: 20350
RouteName: WB SS 303 (Pioneer Pkwy) from East City Limits to West City Limits
FromStreetName: East City Limits
ToStreetName: West City Limits
Type: STATIC

■ Congestion Jam level 3 alert

Congestion Jam Level 3 - NBFR SH 360 (Watson Rd) - Randol Mill to GOB

 wazetraveltime@arlingtontx.gov
To Waze Travel Time DIST

Retention Policy a Inbox 180 Day (6 months)

Expires 10/28/2022

[Phish Alert](#)

Route ID: 20214
Route Name: NBFR SH 360 (Watson Rd) - Randol Mill to GOB
From: Glenn Dr
To: Avenue R
Jam Level: 3
%Congestion: 204.48

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Questions

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