2019 ITS-NY Annual Meeting

June 13-14, 2019

"ITS Applications: Technology Advancements and the Human Connection"

Panel 1: There's an App for That!

Panel Moderator:

- Susan Thomas, PE, Vice President, KLD Engineering, P.C.

Speakers:

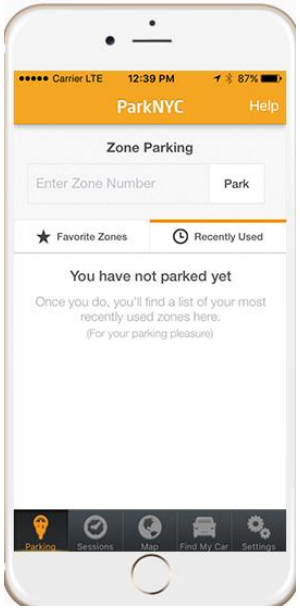
- "ParkNYC NYC Mobile Parking App." Michael Marsico, PE, Assistant Commissioner, Bureau of Parking Operations, Modeling and Data Analysis, Division of Traffic Operations Office, NYC Dept. of Transportation
- "Partnerships Transforming Communication and Operations." Paul Zawadzki, PE, Traffic Engineer, The Port Authority of New York and New Jersey
- "Thruway Mobile App Overview." Timothy Bonney, Director of Applications, New York State Thruway Authority
- "Assistive Intelligence: Advancing the Value of Mobile Apps." Dr. Catherine T. Lawson, Associate Professor, University at Albany/AVAIL

ParkNYC

nyc.gov/dot

Why an App?

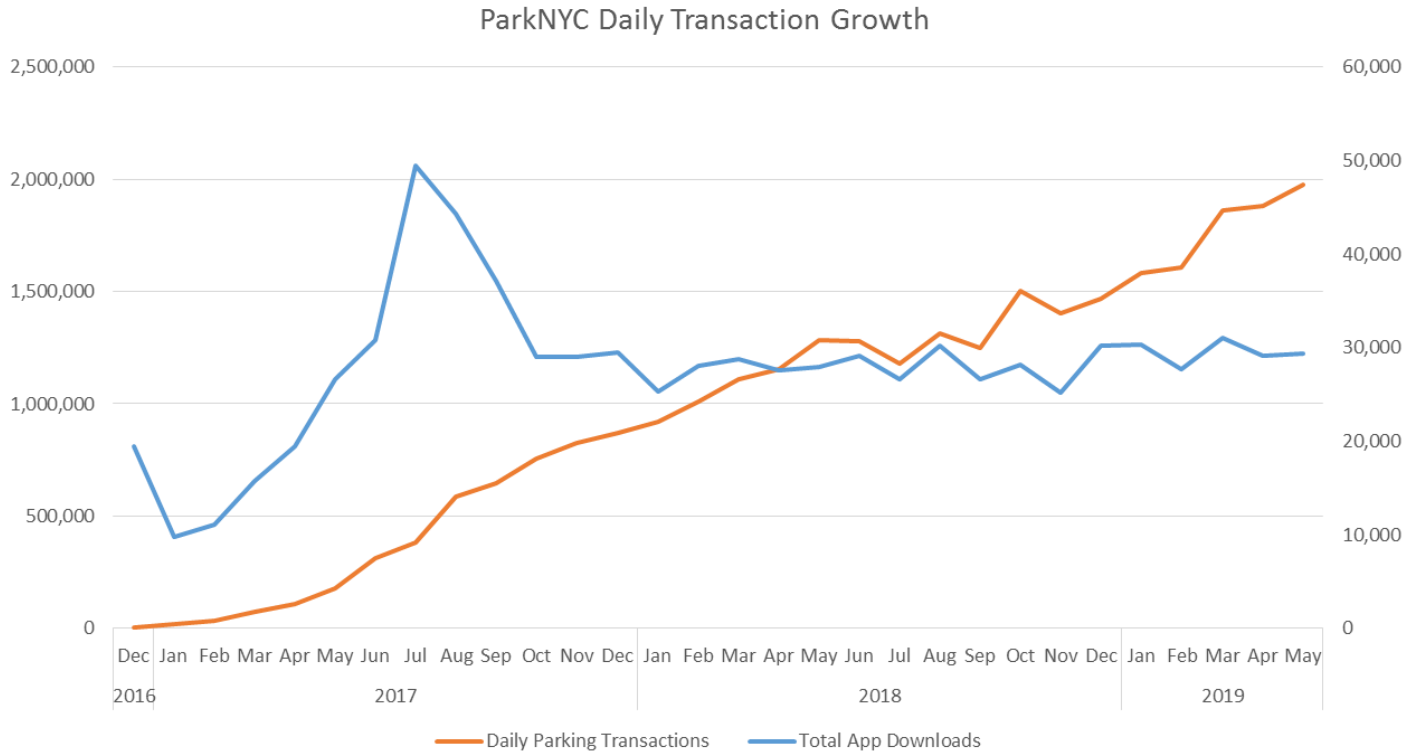
- Embrace emerging technology
- Provides a new and convenient payment option
- Advanced features available to users
- For NYC - reduced expenses related to credit card fees, management of a pre-paid debit card fulfillment program and physical cash collection



ParkNYC Deployment

- Created unique block face IDs for over 12,000 NYC zones
- Designed and implemented outreach and media campaign
- Worked with stakeholders to achieve the best outcome
  - NYPD IT Division for data transmission, back end data systems and handheld software and enforcement training
  - Department of Finance portal to verify app payments for summons adjudication

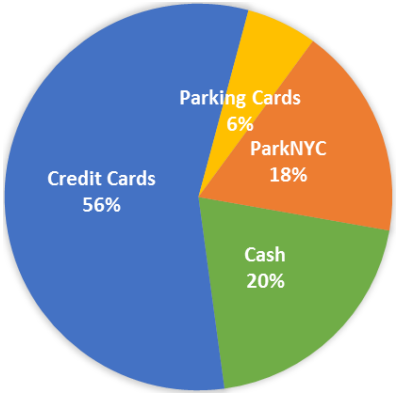
ParkNYC Takes Off



ParkNYC Status

- 739,732 Registered Users Since Launch
- 70,000 Average Daily Transactions
- 17% Current Citywide Transaction Adoption Rate

End June 2020 Projection



Lessons Learned

- Create focus groups to determine usability and needs to have a successful program
- ParkNYC wallet payment structure confused public leading to discontinued use of app
- Continued marketing is required to inform users and gain new customers
- App design limitations reduced adoption rate as customers want app to reflect the latest in software innovations

ParkNYC obstacles

- Responses to a survey about the ParkNYC app, almost 7 in 10 respondents note the inability to pay for parking beyond the regulation limit a significant barrier to use the ParkNYC app. These are policy issues, however functionality is an important indicator for continued use.

How much of a barrier is each of the following for the ParkNYC app? *Showing 'A Great Deal'. Ranked by Overall.*	**Overall** (n=15,837)	**Personal** (n=15,461)	**Commercial** (n=376)	**Long Term** (n=9,252)	**Short Term** (n=6,585)
Inability to reload meter past time limit	66%	66%	65%	67%	64%
Functionality of the app	35%	35%	41%	35%	36%
Zone restrictions	35%	35%	42%	36%	34%
Lack of reliable alerts about meter expiration	32%	32%	39%	32%	33%
Lack of customer support	29%	29%	36%	29%	29%
Requirement of a minimum starting balance	24%	24%	24%	23%	26%
Limit of a maximum wallet load	21%	20%	24%	20%	21%

Questions?

THE PORT AUTHORITY OF NY & NJ

Partnerships Transforming Communication and Operations

Paul Zawadzki, P.E.
The Port Authority of New York and New Jersey

ITS- NY Annual Meeting
Saratoga Springs NY

What is the Port Authority of New York and New Jersey?

Presentation Organization

Including Challenges, Lessons Learned and Examples

Needs *Prompting Partnerships*

Customer Service

Situational Awareness

Delivering the 10-year $32B Capital Plan

Informed Decision-Making

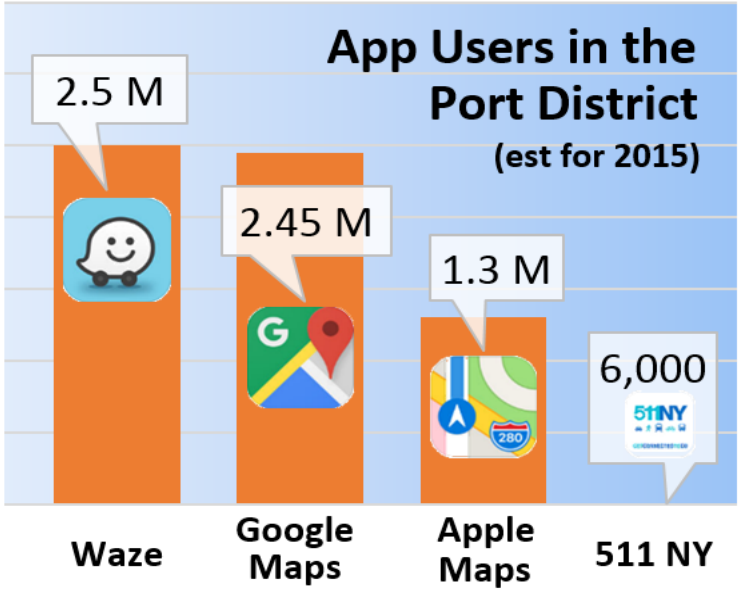
Context *of New Possibilities*

Rapid Technology Change

Funding

Mobile & Apps

Cross-Jurisdictional



Tools and Services

Fall into Three Categories:

Awareness

Routing

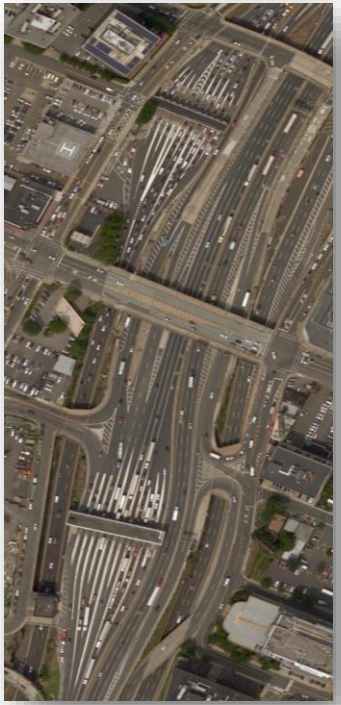
Messaging

Tools and Services – Awareness

Travel Time

Sensors Everywhere

Analysis and Reporting



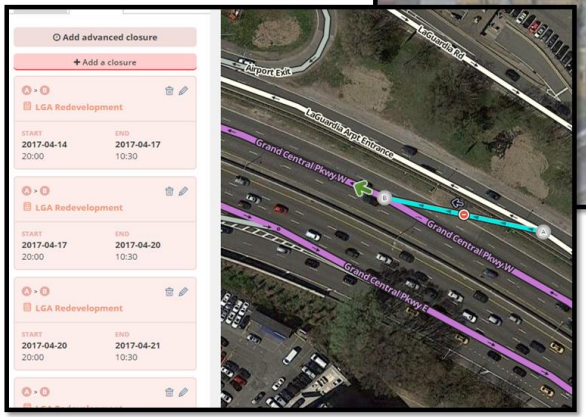
Tools and Services – Routing

Construction

Roadways Up to Date

Safety

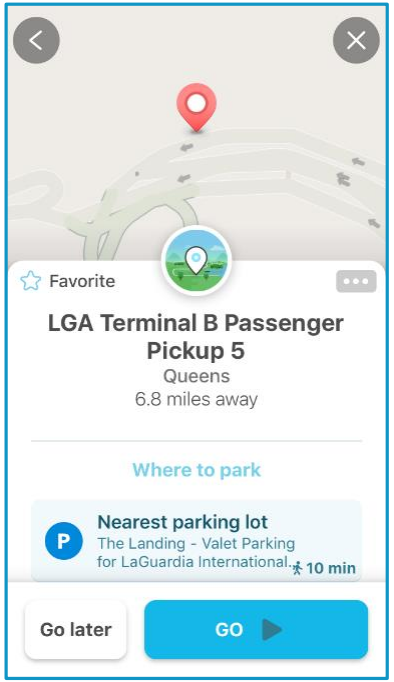
Example at LGA

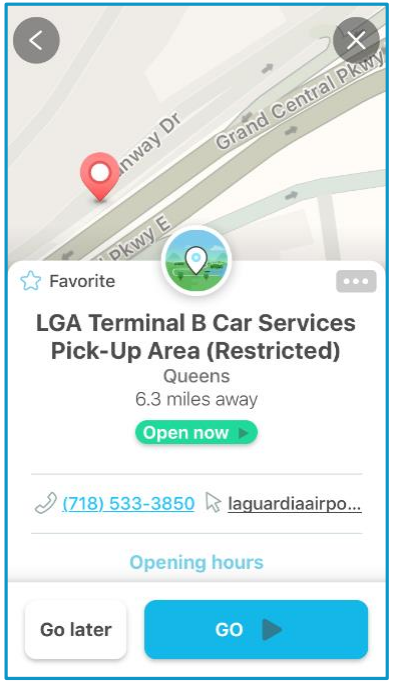


CONNECTED CITIZENS by waze

Tools and Services – Routing

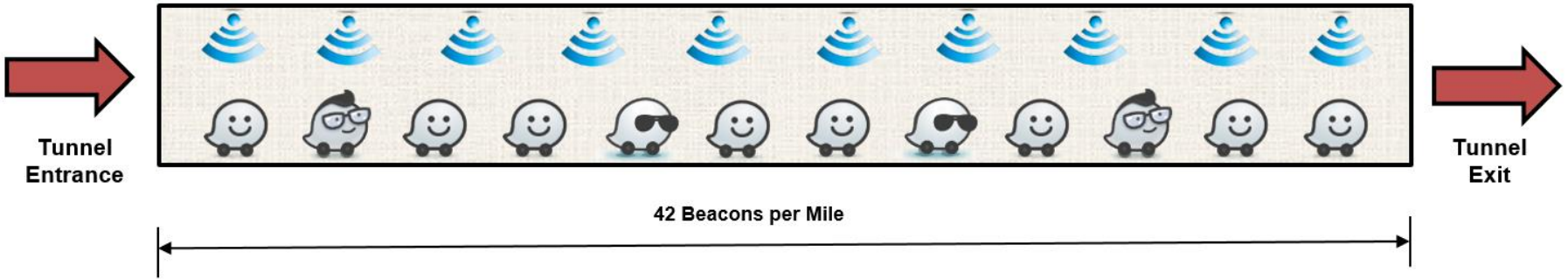
Points of Interest





Tools and Services – Routing

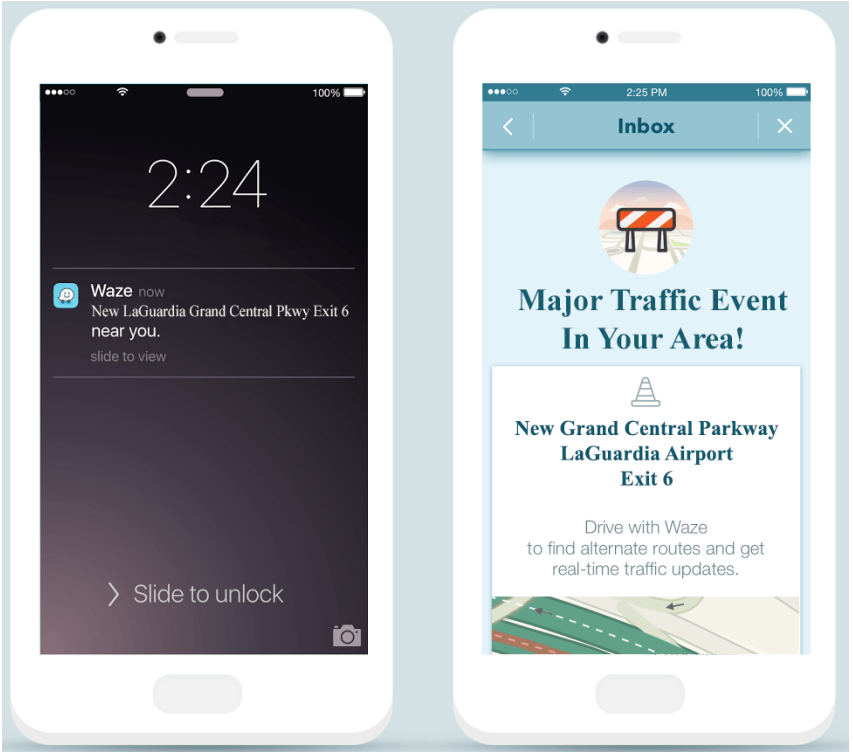
Beacons



Tools and Services – Messaging

Targeted Push Notifications

Hazard Alerts



Give People Information Where they are Looking…

…and Providing Data

Lessons Learned

Challenges	Best Practices
When moving towards 3rd party platforms (ex. Waze) and away from agency platforms (ex. 511), fear of loss of total control of information	Convey the need to reach customers where they are looking (private company apps) and the importance of having a seat at the table to provide information
Agency staff and leadership can be resistant to change and accepting risks; support for investing in partnerships when the precise outcomes are not yet clear is difficult	Make connections to agency needs and the changing context; show small wins to build confidence, both within the agency and the examples of other agencies being successful

Lessons Learned

The Port Authority's experience shows that:

- Developing partnerships opens the door to valuable data for situational awareness, analysis, performance management, informed decision-making, and even safety applications.
- Investing in these partnerships is essential.
- Transferring data and information among a network of peer agencies, travelers, and private companies is the basis for informed decision-making both by customers and by the agencies that are managing traffic.

Thank You

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The Port Authority of New York & New Jersey

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NEW YORK STATE OF OPPORTUNITY. | Thruway Authority

THRUWAY MOBILE APP

For Apple iOS and Android

July 16, 2019

Overview of Design

Overview of Design

- Design and Development Process 1-year – Released 6/29/2017
  - Identify a reasonable core set for app functionality
  - Utilize web views (MVC) where viable to speed up development of several features however applied native views as much as possible
  - Provide all data via external interfaces enabling developers to focus on core app functionality
  - Create an easy-to-use interface with large photos
  - Efficient and easy use of most functions without the need of a tutorial

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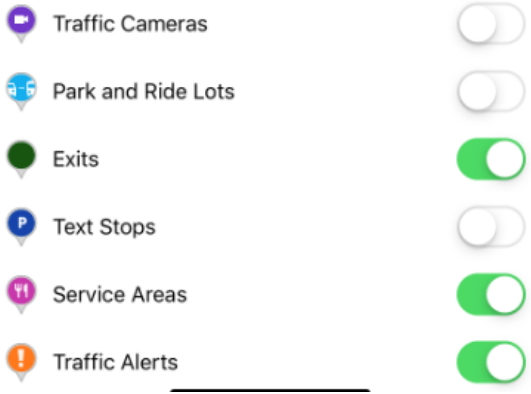
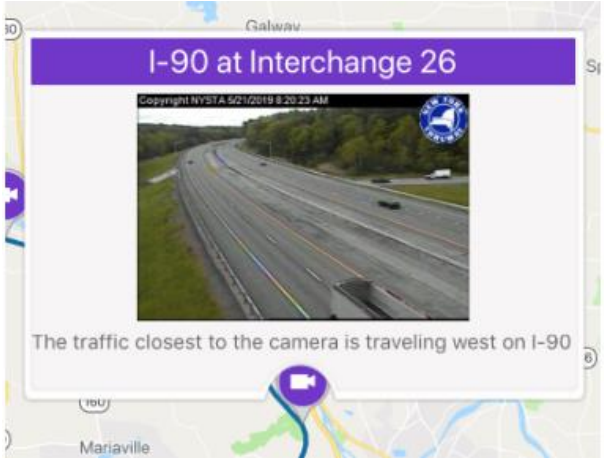
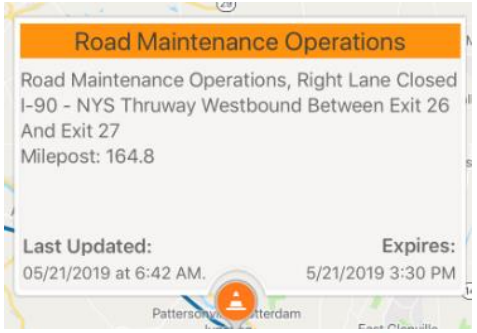
App Features

App Features

- Interactive Map
  - Voice mode to notify of upcoming events (e.g., Exits, Text Stops, etc.)
  - User controls for voice notifications and map layout
  - Use of Google Maps API – Placement of map markers
  - Utilized Android map zones for easy navigation







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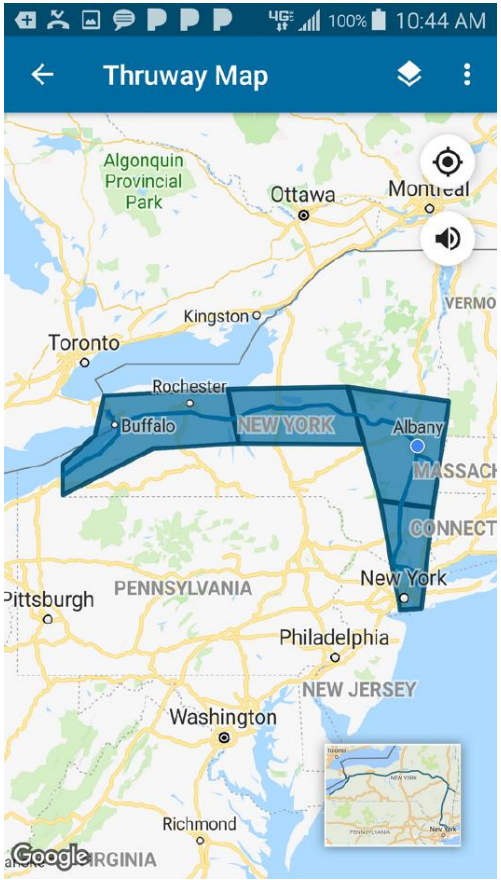
App Features

- Map Zones – Android
  - Google Shapes API



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App Features

- Traffic Cameras
  - Android – Mark favorite camera and swipe in direction of travel

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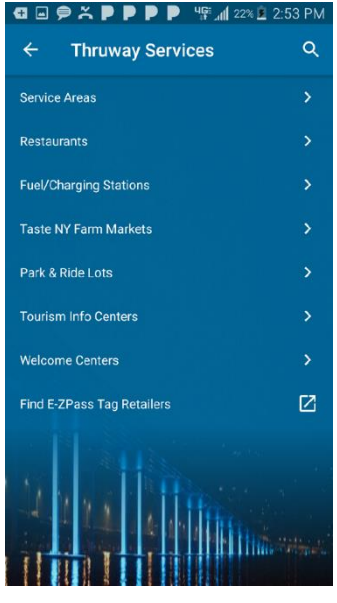
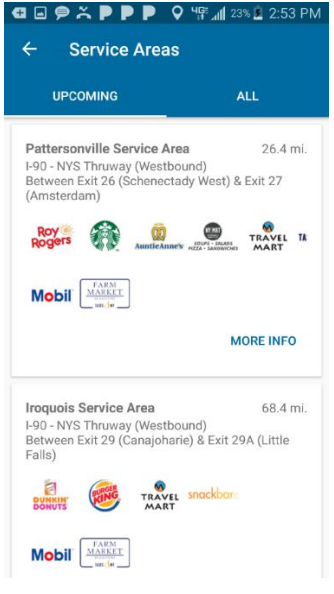
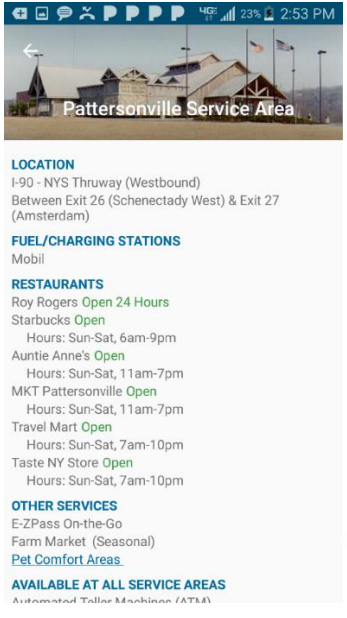
App Features

- Find Thruway Services
  - Location based in travelers direction of travel
  - All data is controlled by back end web services
  - Realtime open/closed hours of operation status



Restaurant logos are cached from NYSTA servers and can be added, removed or updated at anytime





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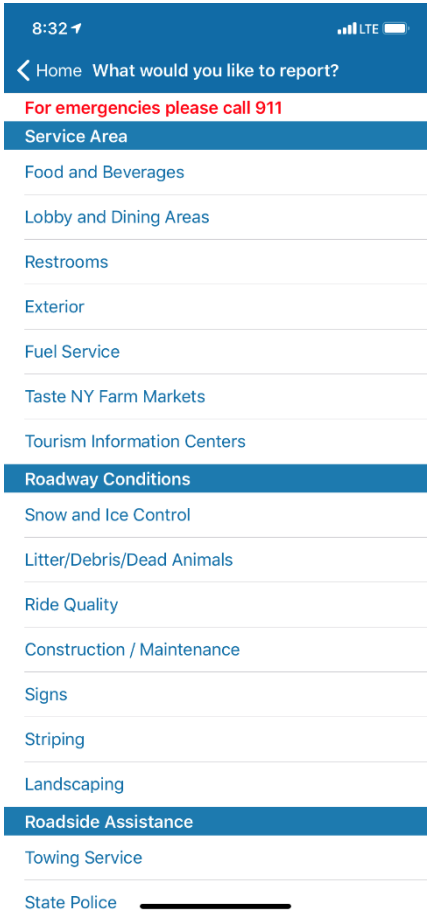
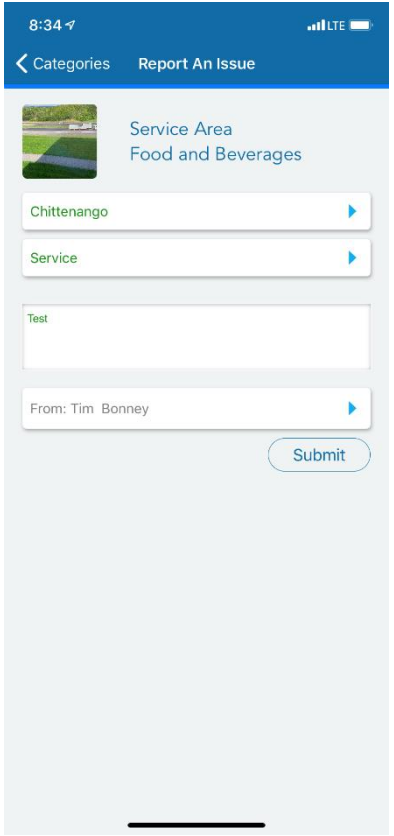
App Features

- Report an Issue / Thruway Feedback
  - Considered utilizing See, Click Fix API
    - Data with See, Click Fix all publicly posted
    - Needed more control over categories and drill down
  - Created a back end web service that controls categories and processes the request (e.g., Service Areas, Roadway Assistance, etc.) – highly customizable
  - Utilized location services to find closest Service Area, Roadway, or Toll Plaza
  - Developed a second MVC app to manage and resolve issues
  - Includes app feedback through a web service

App Features

- Report an Issue and Thruway Feedback





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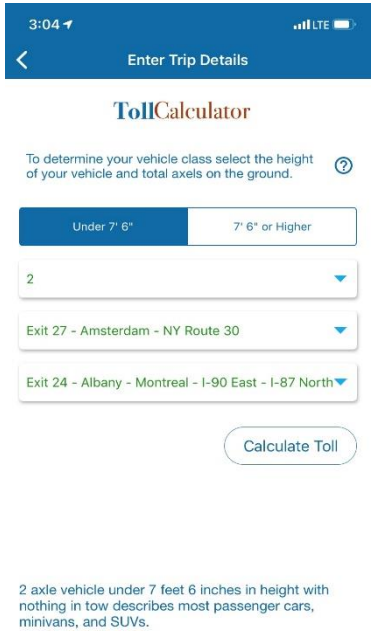
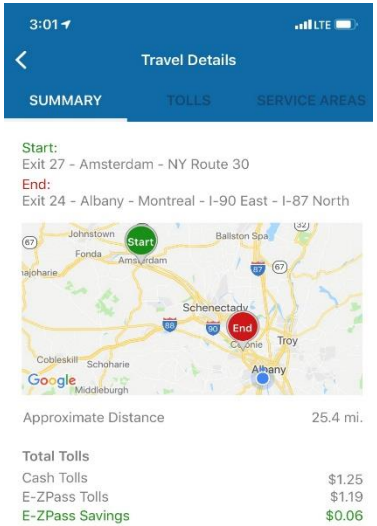
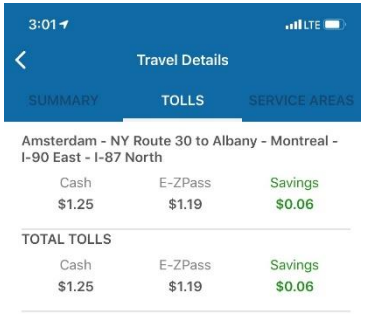
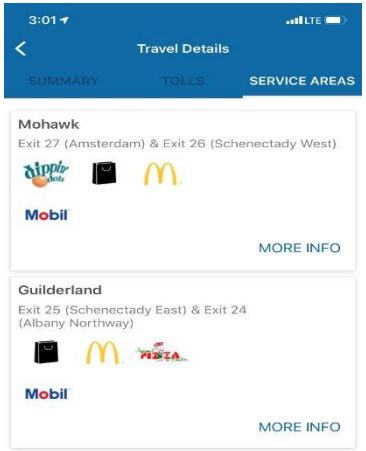
App Features

- Toll Calculator- NYSTA Web service









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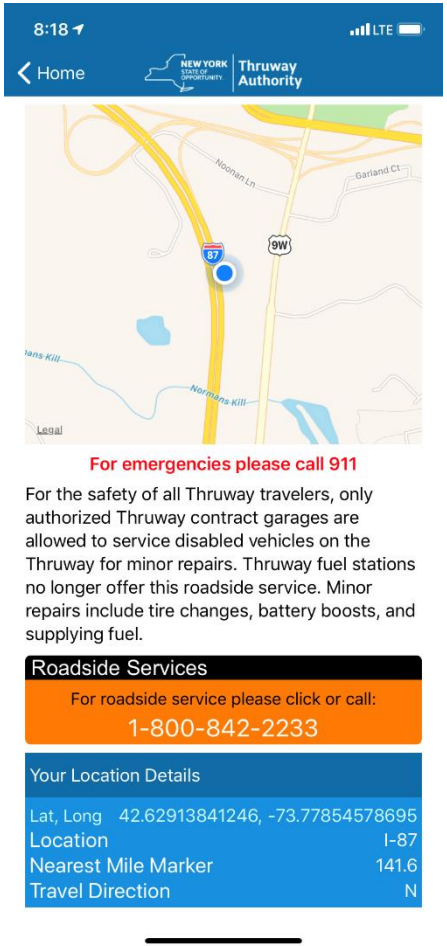
App Features

- Roadside Assistance
  - GPS location services
  - Used by Thruway Statewide Operations Center to locate patrons in need of assistance



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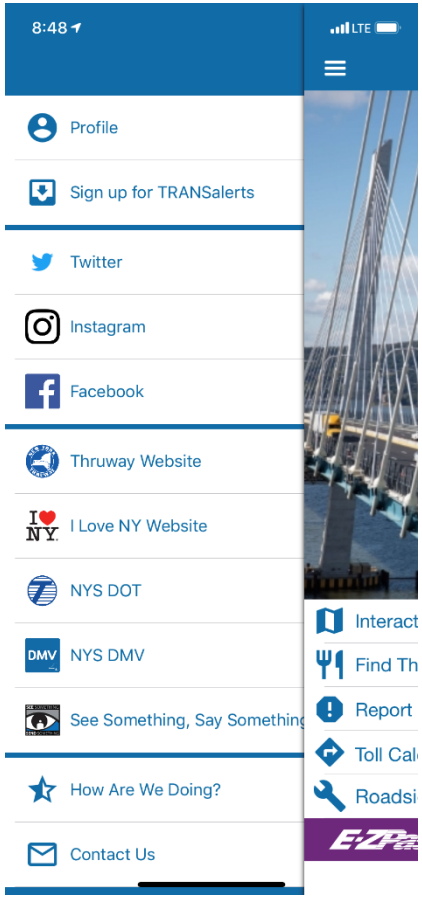
App Features

- Side/Hamburger menu – External links to agencies and social media
- “How are we doing?” – a star rating model served under the “Report an Issue” web service



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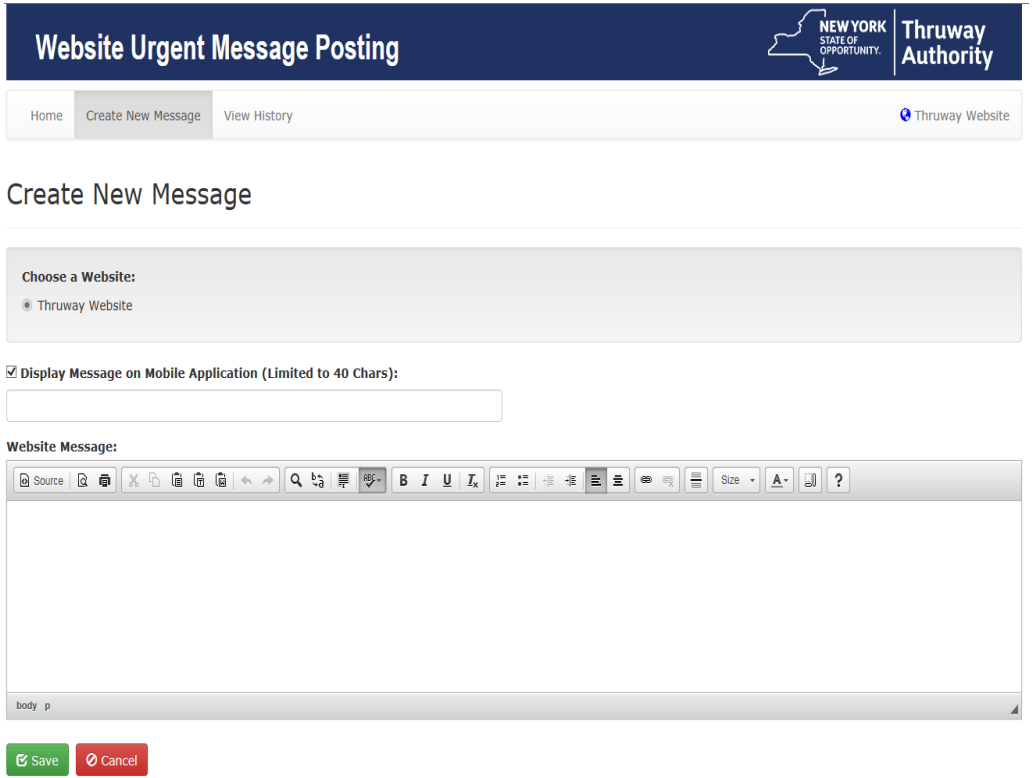
App Features

- Web Urgent Message Protocol (WUMP)
  - Developed internally – alternative to push notifications without extra overhead
  - Controlled by Media & Government Relations

App Features



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Development Platforms

Development Platforms

- Swift for iOS – Development on a high end Mac Mini
- Android Studio for Windows
  - Looked at Xamarin at the start of the project
    - At the time needed to SSH to a mac to build and test
- Use of Firebase/Crashlytics for bug tracking

Data Sources and Security

Data Sources and Security

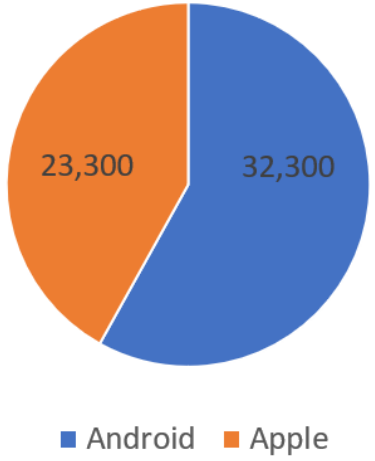
- Utilizes NYSTA developed web services, JSON and XML data files
- No personal/identifiable information transferred
- Utilizes Secure Transport Layer for enhanced integrity
- Generates a UID for each use when processing services

App Statistics

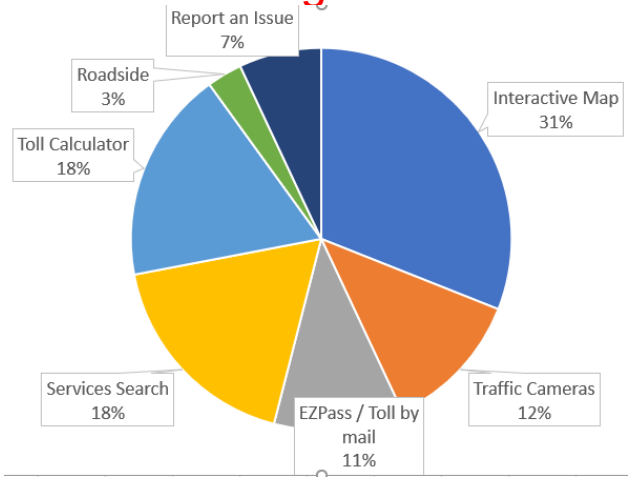
App Statistics

- Usage increases 50%+ on holidays and inclement weather
- 7000 active users in the last month – more downstate, less upstate
- 40% usage of interactive maps followed by toll calculator and traffic cams

Lifetime downloads:



Usage:



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Lessons Learned

Lessons Learned

- Utilize a Graphic Artist if possible
- Utilize quick tutorial overlay for some enhanced features (e.g., interactive map)
- Consider app development trends
- Development platforms are continually being updated, implementing and deprecating functions, necessitating code updates
- Development platform updates are fast moving and require a dedicated development team to stay current and up to date
- Users do not like web views – use native views as much as possible.
- Use a common development platform to develop for both Android and iOS that can meet your application needs as tools mature

Future Enhancements

Future Enhancements

- Consolidation to 1 development platform
- Integration with the new Mario Cuomo Bridge
- Real-time information on the MCB Shared Use Path

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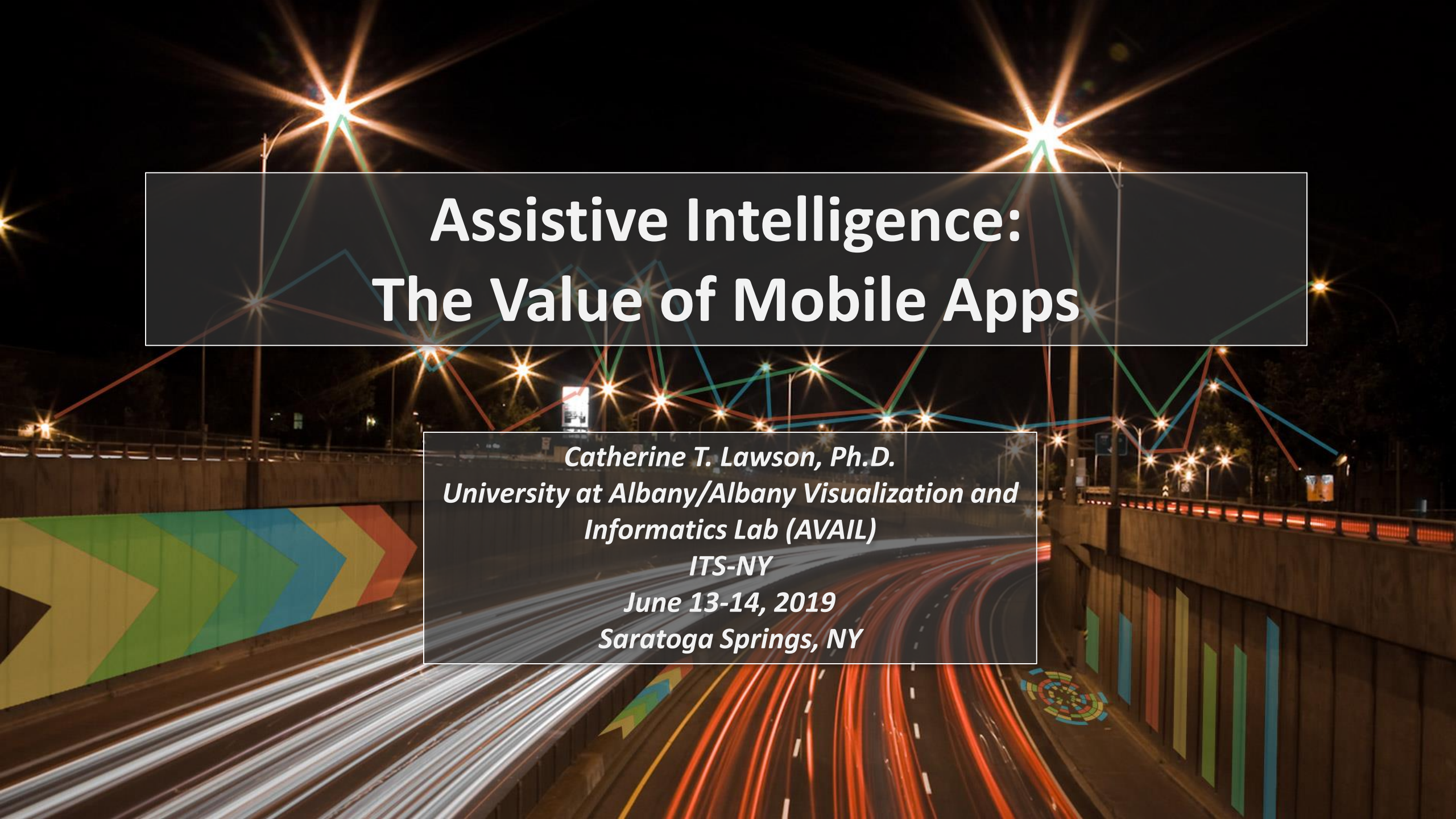
End of Presentation Thank You!



Assistive Intelligence: The Value of Mobile Apps

Catherine T. Lawson, Ph.D.
University at Albany/Albany Visualization and Informatics Lab (AVAIL)
ITS-NY
June 13-14, 2019
Saratoga Springs, NY

Background

- Using the 4-Step model to plan for system expansion
  - 1960s – 1980s
  - 20-year traffic estimates based on population and employment to accommodate growth
  - Used to inform infrastructure expansion
  - Primarily used by transportation engineers, transportation planners, and modelers

Background

- Intelligent Transportation Systems (ITS)
  - 1990s - 2018
  - Real-time management and short-term planning
  - Operations and management techniques to improve traffic operations and enable better utilization of existing infrastructure
  - Dynamic Message Signs (DMS) to guide drivers in real-time
  - Requires electrical engineers, operations staff and traffic simulation modelers

Recent Developments

- On-board guidance systems
  - In-vehicle systems with voice commands
    - Real-time guidance to regularizing driver experiences using GPS technology
    - Driver-chosen routes based on information provided
  - Smartphone Apps
    - Real-time guidance, including construction and incidence to accommodate driver's needs
    - Driver-chosen routes based on real-time events provided in Apps
    - Transit services apps
  - Requires data scientists to develop algorithms and data management strategies

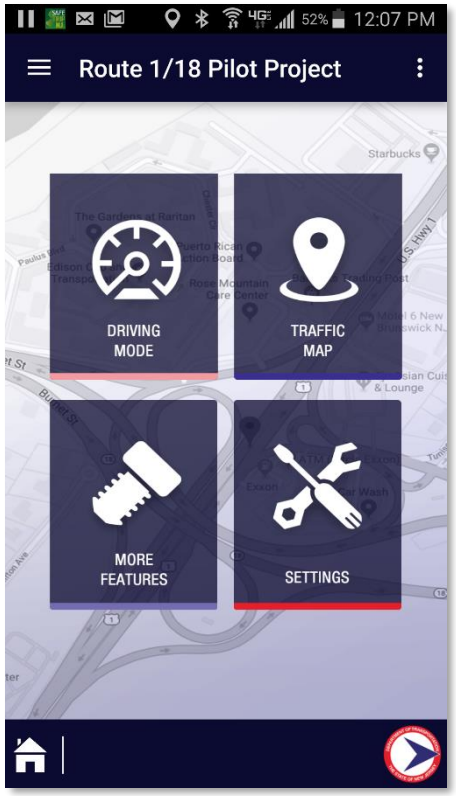
New Jersey DOT Research Objective:

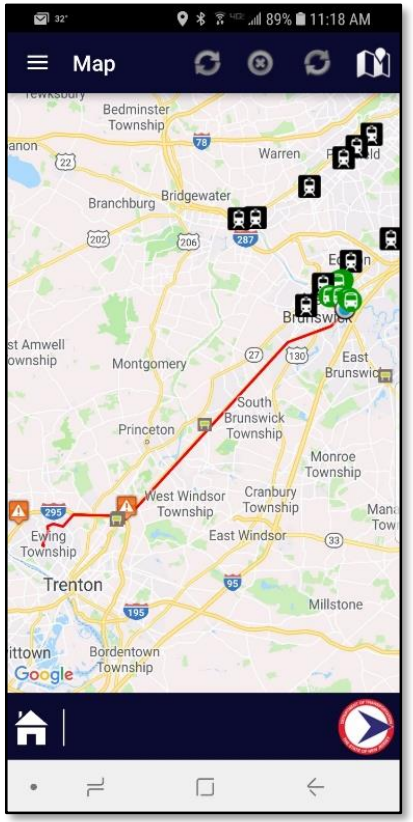
- ***To develop a hands-free Mobile Application (app) platform to aid travelers by offering travel information that utilizes the data it currently collects from its real-time transportation information systems and includes additional travel related information such as transit and shuttle schedules and availability of parking.***

New Jersey DOT Project

- Albany Visualization and Informatics Lab (AVAIL) teamed with Information Logistics (ILOG) to build a mobile aggregation app
  - Driver-chosen information flows and alerts
  - Opportunity to switch modes mid-journey
    - Driving conditions, parking reservations, and real-time bus and train availability on-the-fly, based on changing traffic events and time constraints

Routes 18 & 1
Traveler Information Application Pilot Interface





Application Feature List

- **Hands-free/eyes-free audio alerts**
  - **Alert Types: Construction, Incidents, Slowdown, Virtual DMS - Travel Times**
  - **User-specific alerts relevant to user's location**
  - **User-defined or DOT-defined ranges for alerts (or both)**
  - **User-centered map that displays relevant alerts**
  - **User determines types of alerts they hear/see on map**
- **The App aggregates many data feeds, including NJ & PA 511 data, NJ Transit info, and parking information.**

Application Feature List

- Virtual DMS
- Interoperable with data from other states (PA)
- Integrated with Google Maps and Waze
- Mapped Information
  - Traffic/Visualized speeds
  - Incidents/Construction/Virtual DMS
  - Train - Route/Bus Number + Departure Time
  - Bus - Route/Bus Number + Departure Time
  - Parking info - Availability/Truck Warning

One App - Variety of Services

SAFE TRIP NJ + 511 + trip talk PENNA TURN PIKE + G

NJ + P + P + Waze

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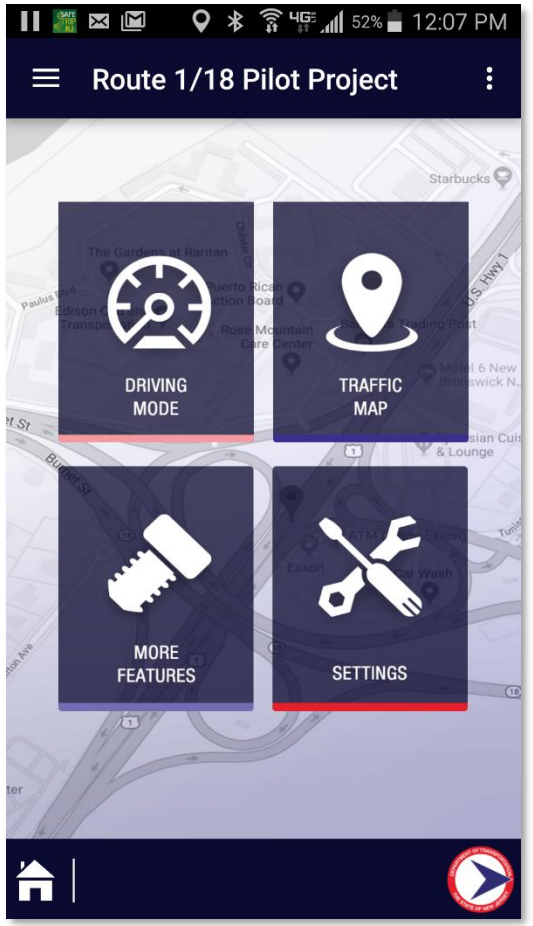

AVAIL

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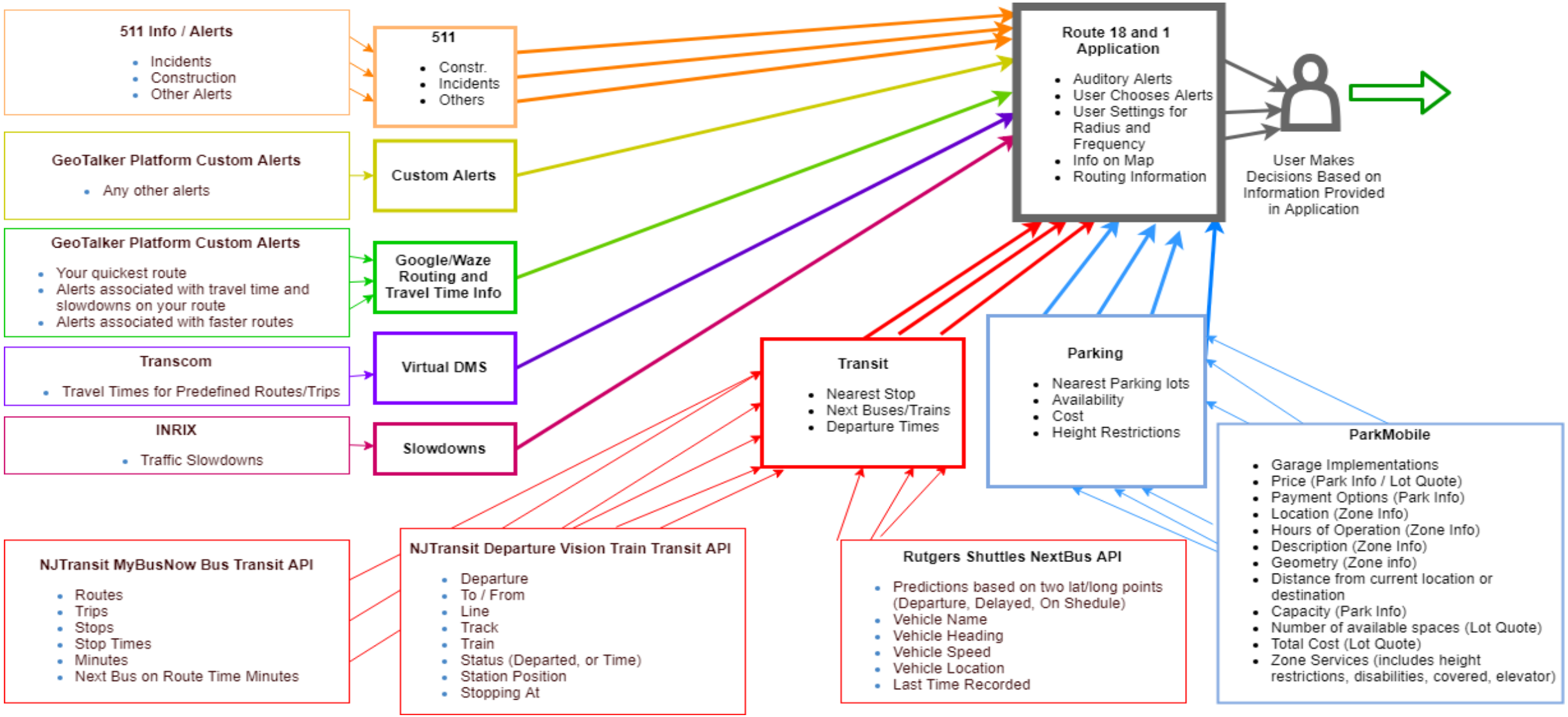
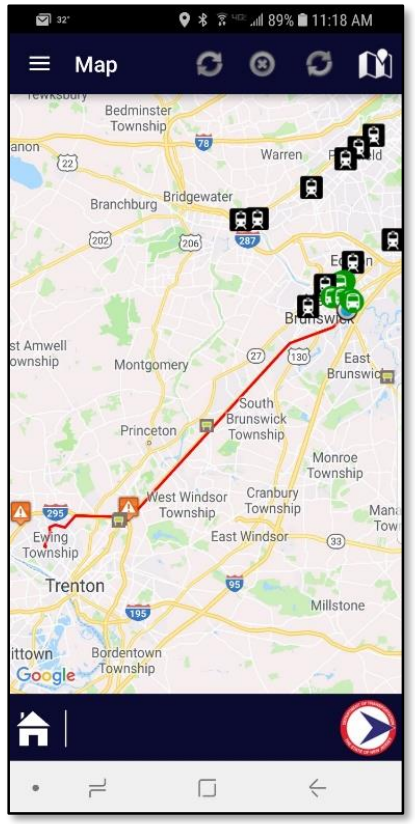
INFORMATION LOGISTICS

Data Inputs and Outputs



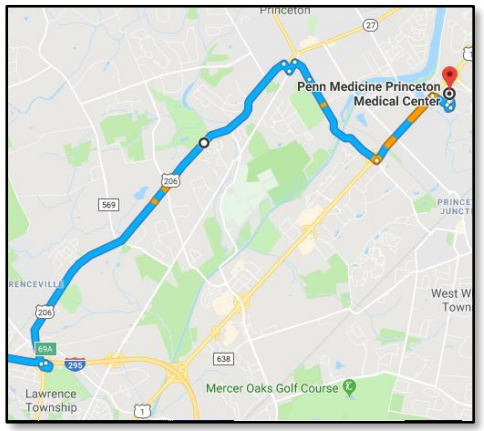
AVAIL UALBANY State University of New York INFORMATION LOGISTICS

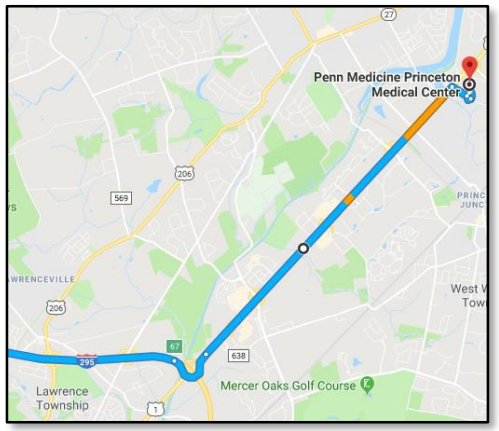
User Story #1: Todd
Trip Planning & Visual (Map) Features



- **Undergraduate student at Rutgers University (New Brunswick Campus).**
- **Commutes on class days from the Trenton area.**
- **Considers multiple modes of transportation to get to class.**

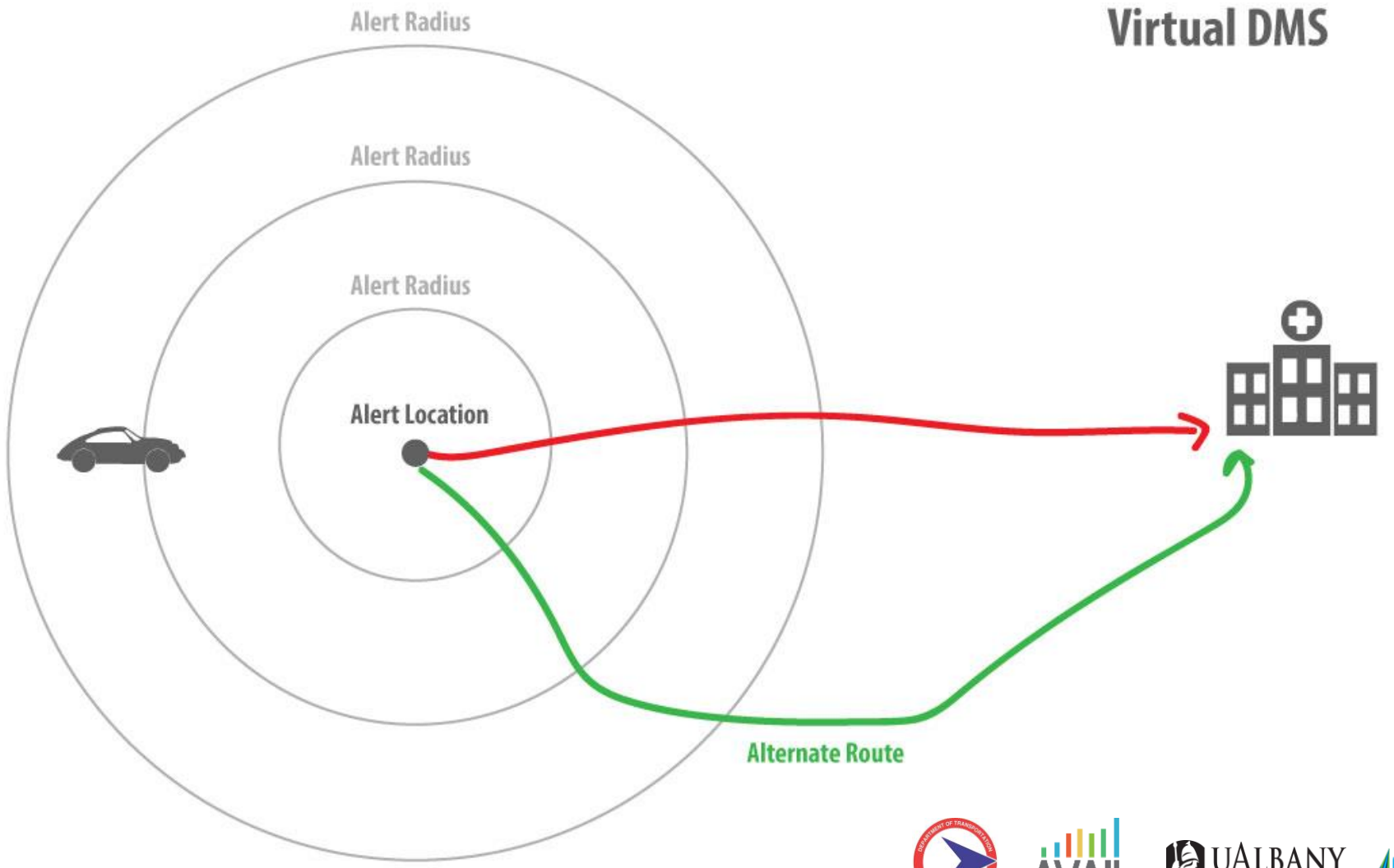
User Story #2: Dr. Smith
Virtual DMS





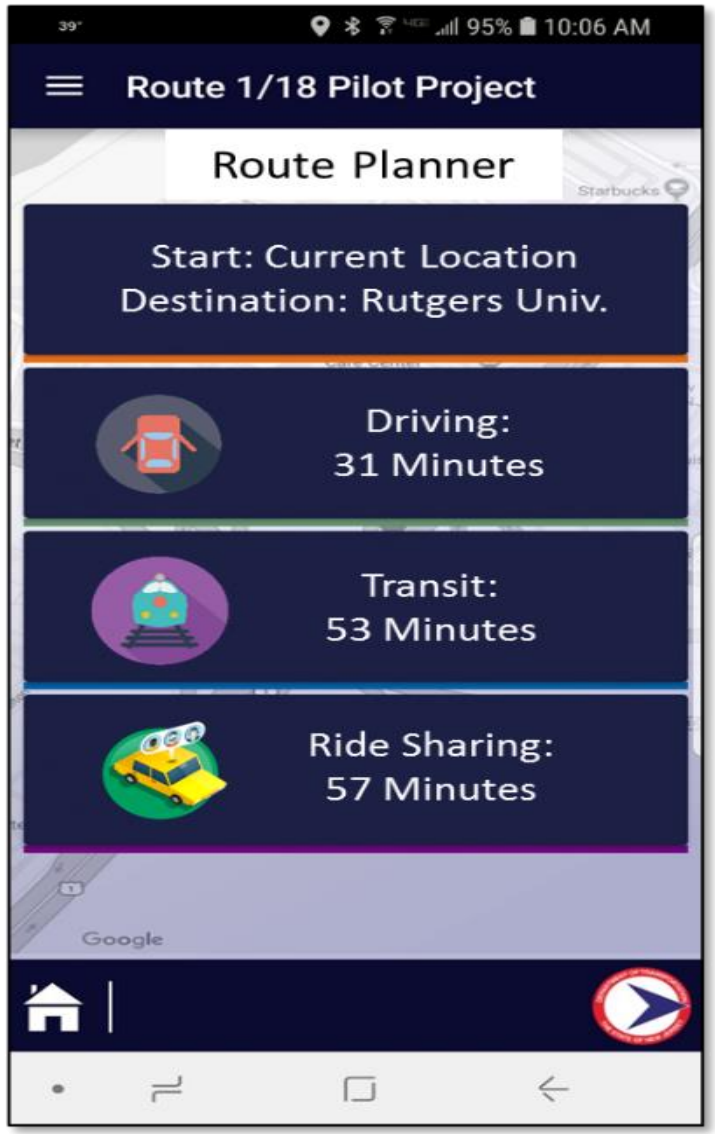
- **Endocrinologist for Penn Medicine.**
- **Commutes two days per week to the Princeton Medical Center location.**
- **Always drives, but has multiple routes she can take.**

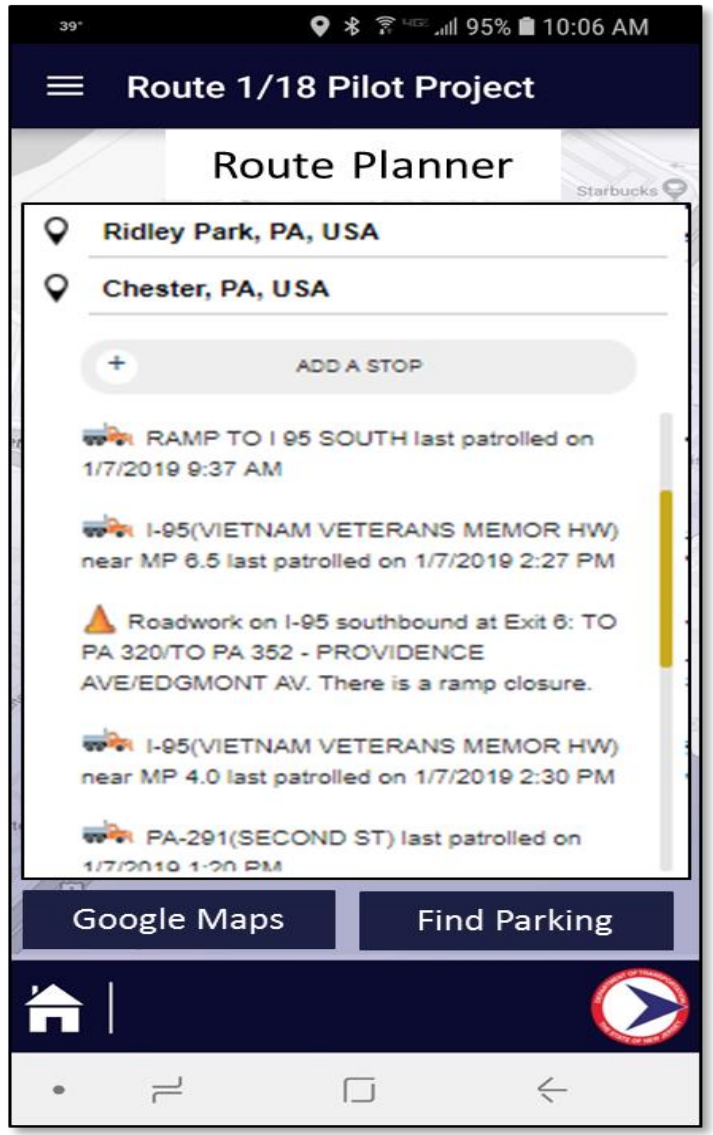
Traveler Information by Route or Mode



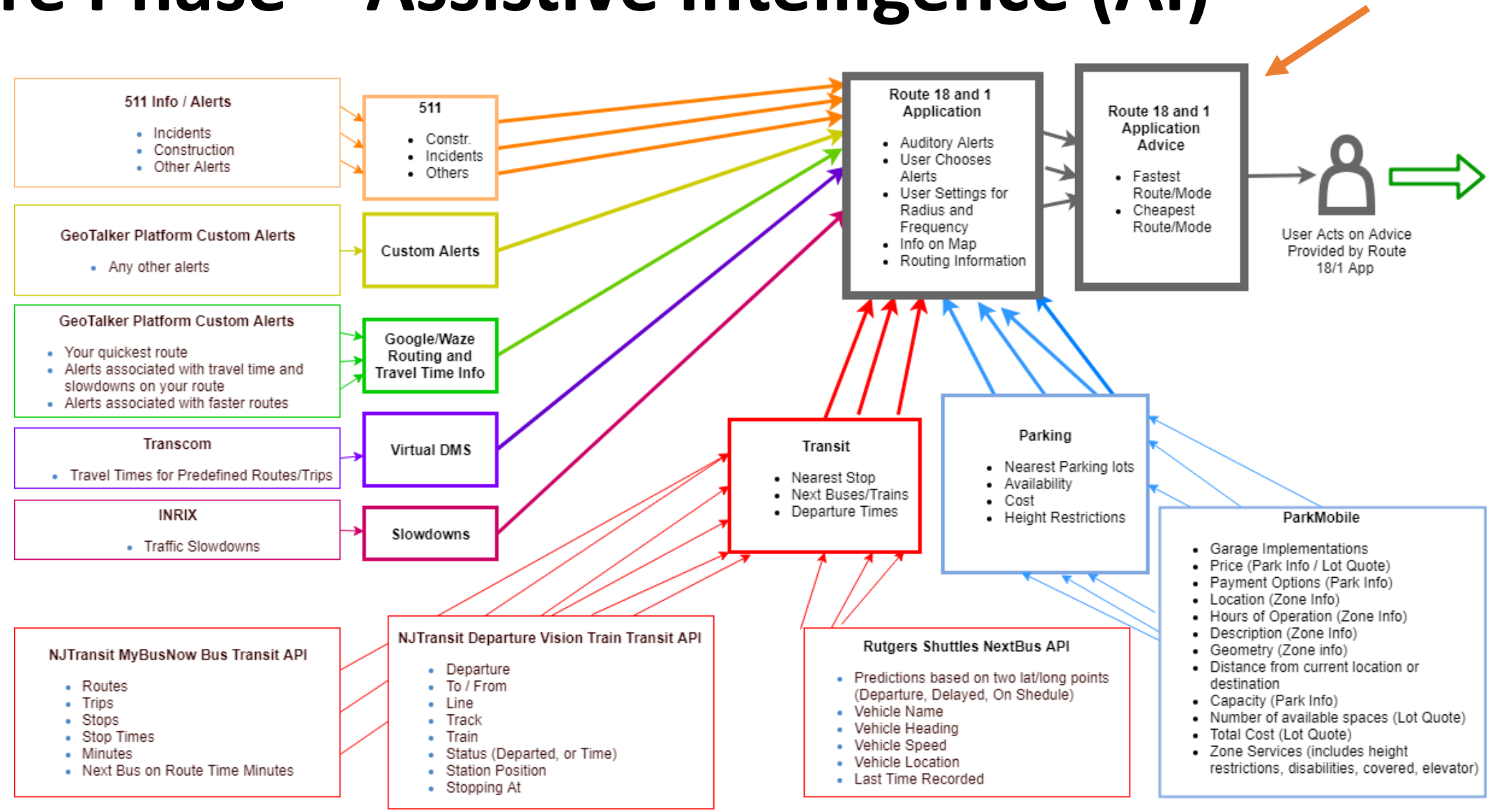
Select the pin icon to add Transit and Parking to the map
Select an advisory on the map to view the information
These map advisories (red exclamation point) are the written version of the audio advisories the user has selected.
Select the layers icon in the top right to view the traffic map legend
Bus Info: stop location, upcoming trains with route info, and approximate arrival times
Waze Directions
Google Maps Directions
End User License Agreement
Transit Info: stop location, upcoming trains with route info, and approximate arrival times
Menu icon
Driving Mode
Traffic Map
Settings
More Features
Edit Advisory Radius
Edit Repeat Interaval
VDMS info is based on preset Origin and Destination data. Travel Times are pulled from the Transcom Trips XML Feed
Edit Location Preferences
Selections of audio advisories
Advisory Type Preferences.
In order to view VDMS info on the map, a user must select SUNY VDMS
Emergency Numbers
Feedback Feature
All Directions Control info
Transit Finder Bus Tab
Get Service Status
Train Tab
Get Service Status
Anonymous Speed Reporting Info

Future Phase: Modal Options Analytics





Future Phase – Assistive Intelligence (AI)



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Future Use of Real-time AI for Natural Hazards

http://stevebarclay.net/work-to-find-a-solution-to-flood-road-problem-is-on-track/

https://www.nytimes.com/interactive/2018/sunday-review/year-in-pictures.html

NEW YORK STATE
MitigateNY
LOGIN
SIGN UP
2019 New York State Hazard Mitigation Plan
HOME
HAZARDS
RISK
NYS CAPABILITIES
STRATEGIES
LOCAL MITIGATION PLANNING
ABOUT

New Analytics: Responsiveness Measures to AI

- **Mobile Apps produce data streams for:**
  - **Post-processing techniques (e.g., aggregates and clusters for disclosure protection) to measure driver responsiveness to inform modern behavioral models.**
  - **Determining effectiveness of AI for hazard naturals by hazard type and magnitude (e.g., forest fires, floods, nuisance high tides).**
  - **Expanding approach to measure behavioral response for mode options (e.g., bus, train, TNC).**

New Analytics: Responsiveness Measures to AI

- **Mobile Apps produce data streams for:**
  - **Integrating behavioral responses in the traffic simulations models at the regional, local, and neighborhood levels.**
  - **Combining traffic types.**
    - **Freight and passenger vehicles**
  - **Measuring effectiveness of AI responses for safety and system operations improvements.**
    - **Truck parking options**
  - **Providing new behavioral assumptions and travel patterns for Travel Demand Forecasting models for the next generation of transportation planners.**

Questions?

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