connect. comprehend.
Deploying IoT devices to collect and decimate information

To be truly a smart city everything needs to be connected to everything

Connecting the Citizens to the Traffic System so they become part of the solution not part of the problem

Be ready for the Autonomous Vehicles (They coming and much sooner than you think)
Your Smart City just got smarter.

Connected Vehicle & Smart City Solutions
How TravelSafely Works

TravelSafely™ uses cutting edge technology to connect your phone to a network of traffic intersections, school beacons, motorists, cyclists and pedestrians.

**TRAFFIC SIGNALS**
Drivers can see when traffic lights will change.

**SCHOOL BEACONS**
Drivers are alerted when they are speeding in a school zone.
The app uses audible warnings to alert you to potentially dangerous road conditions. By utilizing spoken alerts, TravelSafely allows you to focus on the road and receive alerts while using your favorite mapping app.

- **TravelSafely** app: Citizens using the TravelSafely app are seamlessly connected to your city and other motorists using the app.

- **Cyclists & Pedestrians**: Cyclists and other Vulnerable Road Users are alerted of speeding vehicles.

- **Emergency Vehicles**: Motorists are alerted to emergency vehicles miles ahead of the actual arrival.
Signal Phase and Timing (SPaT)
Red-light running at traffic signals

Smartphone anticipates red light running
Curve warning/reduce speed

Speeding alerts provided in Sharp Curve Zones
School beacons slow down

School Zone connected to TravelSafely application
Emergency Response
Where Emergency Vehicle coming from?

Emergency vehicle alerts provided directly to motorists and pedestrians
Motorist/Cyclist communications

Audible alarm alerts cyclist of danger

Vehicle & Cyclist talking to each other

Audible alarm alerts motorist of danger
Motorist/Pedestrian communication
Work zone Warnings

Speeding alerts provided in Work Zones
City of Marietta, GA
University of Alabama
University Real Time Data Feed

Real time data of all Traffic Intersection Signal Phase and Timing information and BSM messages.

Real time information on all motorists, cyclists and pedestrians.

Includes all the information in BSM messages: Speed, Acceleration, GPS positions, Vehicle type (emergency vehicle, school bus, motorist)

Signal Phase and Timing status information including all signal phases current status, time to change.
Questions

Peter Ashley
Applied Information Inc
TravelSafelyApp.com
Renew Atlanta Smart City Project

City of Atlanta Smart Corridor CV and Autonomous
TravelSafely Connected Vehicle Service Message flows...

TravelSafely Connected Vehicle Message Flow
Rev 1

Mobile App
- Motorist
  > BSM
  < BSM, PSM, SPAT, MAP
- Cyclist
  > PSM
  < BSM, PSM
- Pedestrian
  > PSM
  < BSM, PSM

EVP/TSP
- Fire Truck
  > BSM

DSRC - OBU
- Motorist
  > BSM
  < BSM
  > BSM
  < SPAT, MAP
- Motorist
  > BSM
  < SPAT, MAP

DSRC Radio

RSU Processor (AI500-085)
> Priority, Preempt, Detector
< SPAT

Cell Network

School Beacons, Curve Warning, Work Zone, Wrong Way

Intersection Signal Controller

BSM = Basic Safety Messages (vehicles)
PSM = Personal Safety Message (cyclists and pedestrians)
SPAT = Signal Phase and Timing Messages
MAP = Geometry Message
TravelSafely Connected in-Vehicle Service Message flows...

Cellular connection for backhaul

TravelSafely Application and User Interface

Bluetooth (or WiFi/USB)

Leer OBU

TravelSafely In-vehicle
Rev 1

BSM = Basic Safety Messages (vehicles)
SPAT = Signal Phase and Timing Messages
MAP = Geometry Message

DSRC
In: SPAT, MAP, BSM
Out: BSM

Note: All TravelSafely applications run on DSRC and/or cellular communications
Current TravelSafely Apps

- SPaT/MAP display of signal timing – V2I
- Red-light running at traffic signals – V2I
- Bus/transit priority – V2I
- Intelligent school beacons – V2I
- Emergency vehicle getting through the signal – V2I
- Where is the emergency vehicle coming from? – V2V
- Motorist – Cyclist communication – V2V
- Motorist – Pedestrian communication – V2V
- Workzone warnings – V2I
- Curve warning/reduce speed – V2I
- Rear end collision warning – V2V
Future TravelSafely Apps - 2018

- Virtual/advance traffic detectors to make signals work better – V2I
- Wrong way detection – V2I
- DMS message sign annunciation – V2I
- Weather Warnings – V2V
- Congestion Ahead Warning – V2I
- Railroad crossing active ahead – V2I
- Event management area management V2I
Virtual Advanced Detection

- Advanced detection at each traffic signal
- ETA based (10sec) or location based
- Can detect different classes (vehicle, cyclist)
- On actuated intersection at night no reason for someone to arrive on red
- Working on pedestrian detection
Wrong Way Driver
DMS Message Sign Annunciation

SLOW MOVING TRAFFIC

ROAD CLOSED AHEAD
Severe Weather Warnings

- Advanced warning of slippery conditions
- Severe rainfall ahead warnings
- Ice and snow warnings
Congestion Ahead Warnings

- Advanced warning of congestion ahead
- When activated warning provided to motorist
Railroad Active Ahead Warnings

• Advanced warning of railroad active ahead
Railroad Active Ahead Warnings

• Advanced warning of railroad active ahead
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Glance Event Management - Falcons

Map showing various parking lots and their capacities.
Glance Event Management - Falcons
TravelSafely Components

RSU Processor Front

RSU Processor Back

DSRC On Board Unit

DSRC Road Side Unit
Marietta, GA Smart City Deployment