

Cars + Communications = Smart Opportunities

Third party apps and the US Department of
Transportation communications architecture

June 11, 2014



U.S. Department of Transportation

The US Department of Transportation (US DOT) is developing a safe, interoperable wireless communications network that include cars, buses, trucks, trains, traffic signals, cell phones, and other devices.

The network is called the US DOT Architecture.



Several connected vehicle test beds were built throughout the US to support the development of the US DOT Architecture. The test beds are open to third parties to understand how to use the US DOT Architecture for V2V and V2I communications.

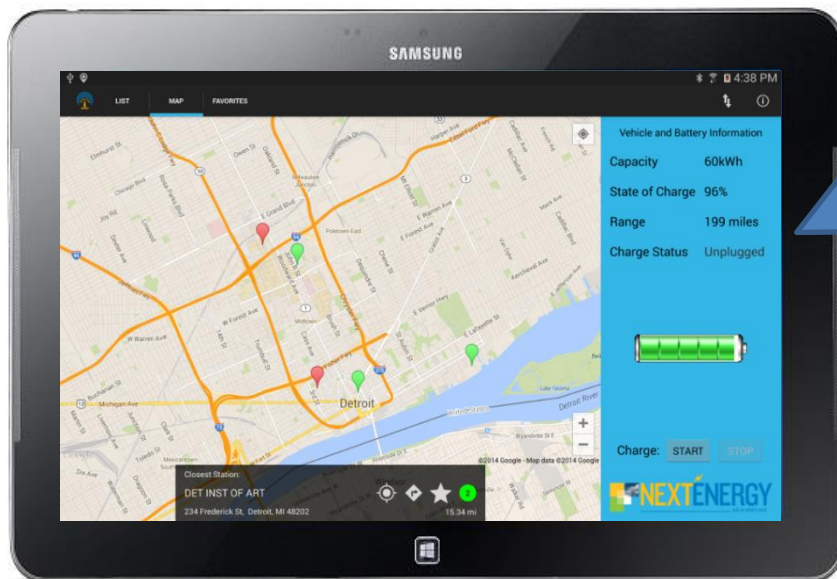


DSRC roadside unit located in Novi, Michigan

There are multiple test beds in Michigan, including the Southeast Michigan Connected Vehicle Test Bed in Novi, Michigan and the NextEnergy Affiliated Test Bed in Detroit.

The SmartAmerica Challenge was the catalyst to bring together the US DOT and NextEnergy to build the first third party app using the US DOT Architecture – initially built for safety – for mobility or environmental applications.

The NextEnergy app sends and receives messages between the electric vehicle and charging stations via US DOT Architecture.



```
Started listening on 192.168.1.57 port 4449

Received data from 192.168.1.25 port 55648
Data message contains 5 charging stations

Received data from 192.168.1.25 port 55653
Data message contains 5 charging stations

Received data from 192.168.1.25 port 55654
Data message contains 5 charging stations

Received data from 192.168.1.25 port 55655
Data message contains 5 charging stations
```

The NextEnergy app demonstrates how to send messages via the US DOT Architecture to request and receive information from local charging stations. In order to perform this function, the NextEnergy app required two elements:

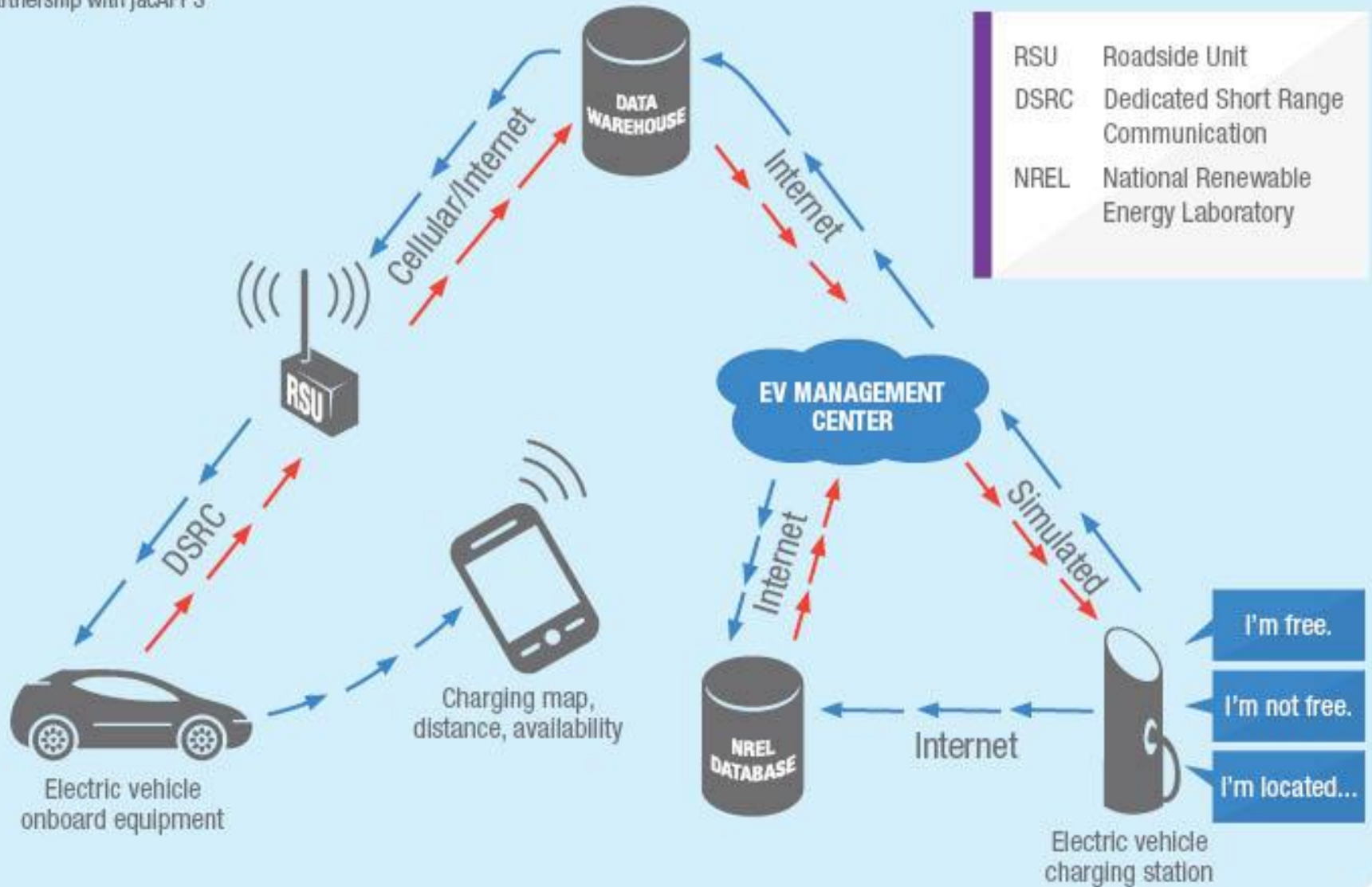
- **An electric vehicle (EV) management center** to interface between the US DOT communications framework and EV charging infrastructure
- **A tablet application** to make the information available to end users



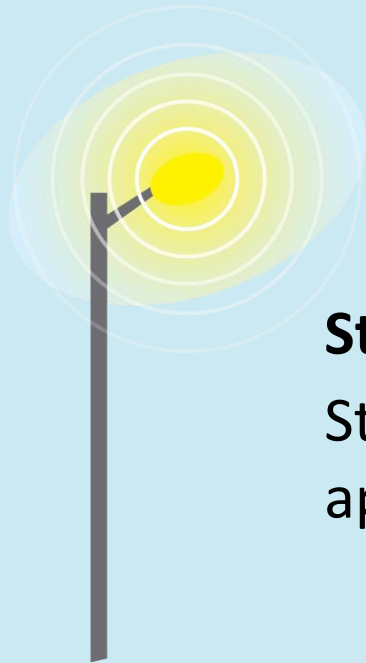
TODAY

Developed by NextEnergy in partnership with jacAPPS

US DOT ARCHITECTURE



As additional types of infrastructure – street lights , parking spaces, toll booths, etc. – are integrated into the US DOT Architecture, they will require additional third party apps.



EXAMPLE

Street Light Management System

Street light gets brighter as EV approaches

The app will be available at the NextEnergy Affiliated Test Bed as an educational tool for third parties interested in learning how to develop and test mobility and environmental applications using the US DOT Architecture.



NextEnergy Affiliated Test Bed includes:

1. Arada DSRC roadside unit
2. Wi-Fi hot spot
3. Electric vehicle charging stations
4. Connected residential home
5. Intelligent street lights

The next step is to take learnings from the NextEnergy app development to inform decisions around policy, infrastructure investments and R&D activities related to additional applications.

Examples include:

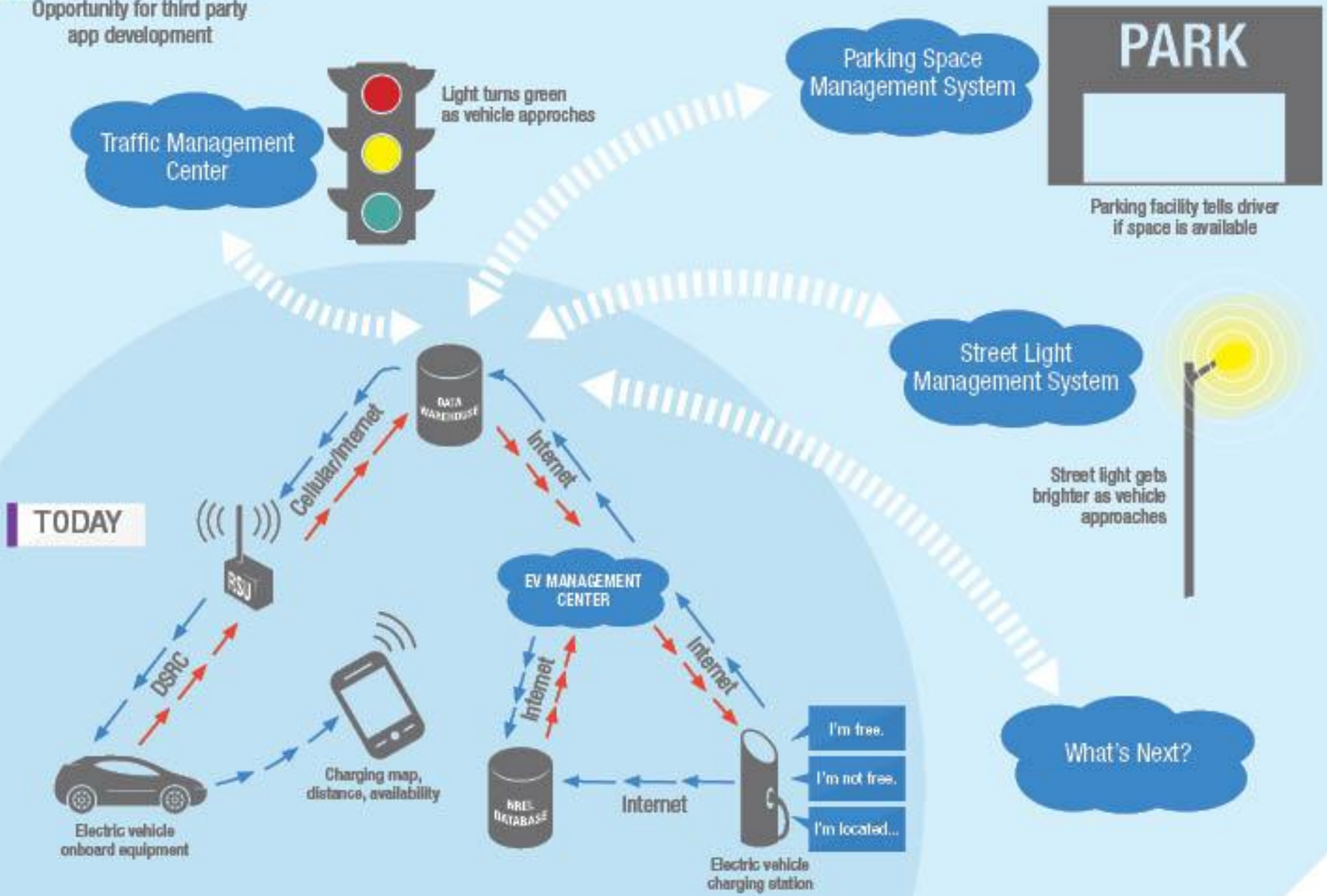
- Traffic lights changing from red to green when no other traffic is present
- Location-based notification open parking spaces
- Driving through high-speed toll booths



FUTURE

Opportunity for third party app development

US DOT ARCHITECTURE





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