V2I*f*: Cars to Infrastructure on the Cheap

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December, 2016
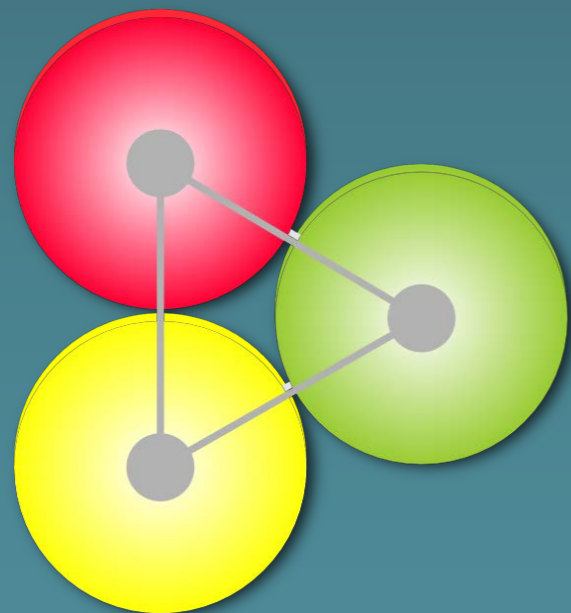
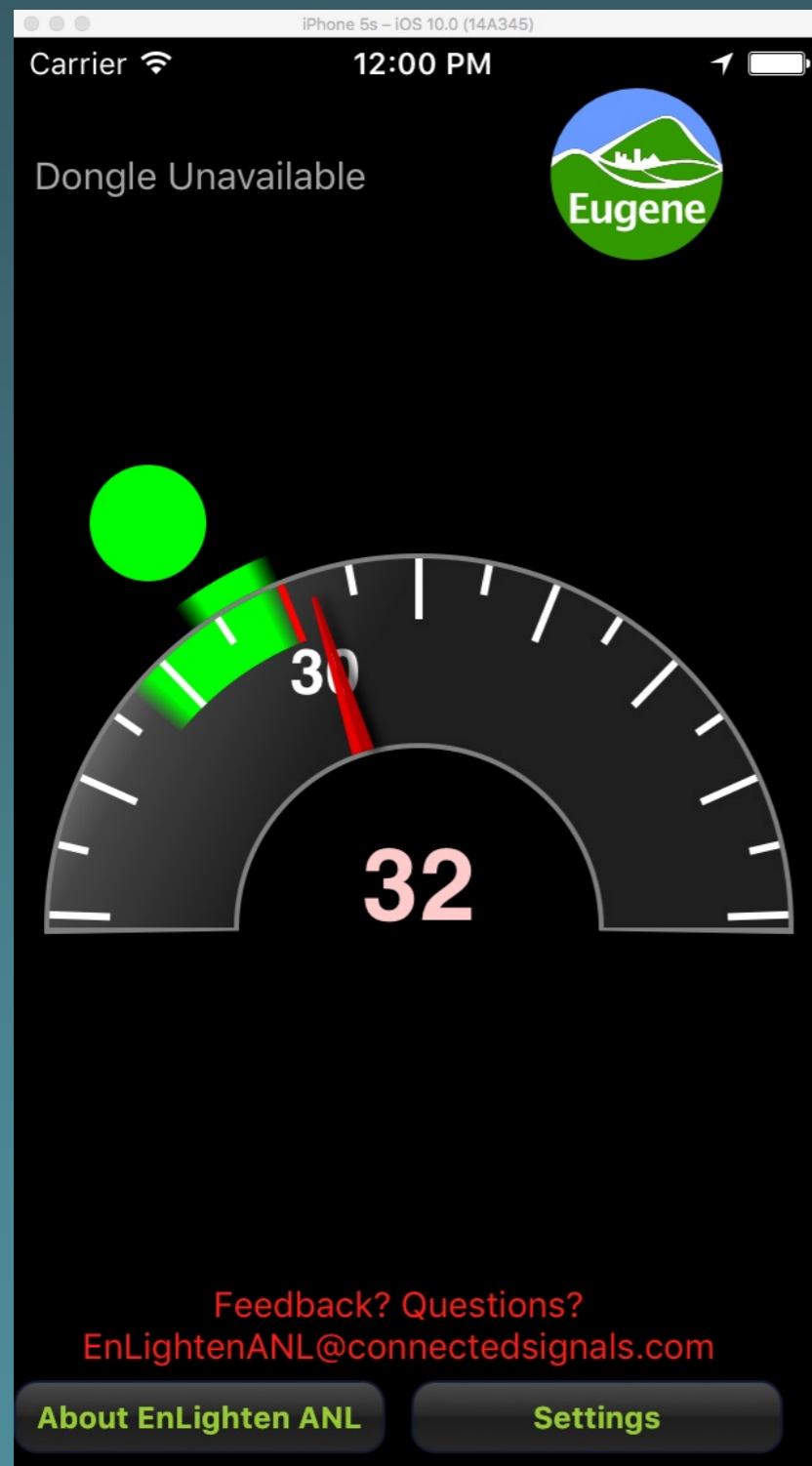**Connected Signals**

See the light.

12/13/2016

The Next Version

- **Drivers appear to really like this**

- **So do OEMs**

- ***Gentle pressure to drive safely***

- **Being deployed in San Jose, evaluated by Argonne National Lab**

- **Accept no substitutions!**

12/13/2016

My Goal Today

- *Not* to convince you that connected vehicles are a good idea

- How can your municipality enable them?

12/13/2016

V2I Goals

- **Retain control of your data and of the applications that use it**

- **Ensure unbiased public access**

- **Protect security of your networks**

- **Minimize computational and network loads**

- **Not spend more than**

12/13/2016

V2I Goals

- **Retain control of your data and of the applications that use it**

- **Ensure unbiased public access**

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- **Not spend more than $0**

12/13/2016

V2I Goals

- **Retain control of your data and of the applications that use it**
  - **Our standard agency agreement is written exactly this way**
  - **You can unplug the device at any time**

V2I Goals

- **Retain control of your data and of the applications that use it**

- **Ensure unbiased public access**
  - **We will bounce your data to any third party you request**
  - **No charge to you or to them**

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V2I Goals

- **Retain control of your data and of the applications that use it**

- **Ensure unbiased public access**

- **Protect security of your networks**
  - **First arrow configured at switch; second arrow uses outbound UDP**
  - *No new packets on your network*
  - **Outbound packets cryptographically signed**

Signal switch

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V2I Goals

- **Retain control of your data and of the applications that use it**

- **Ensure unbiased public access**

- **Protect security of your networks**

- **Minimize computational and network loads**
  - *10 bytes* per intersection per second

Raspberry Pi

12/13/2016

V2I Goals

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Requirements

- **Communicate with your lights over ethernet (not twisted pair)**

  Signal switch

- **Protocol is NTCIP or AB3418 (or Trafficware/Siemens proprietary)**

- **All major TMS vendors supported**

- **$0**

  - **Possible Trafficware/Siemens license**

Summary

V2I*f* lets you connect vehicles and:

- **Retain control of your data and of the applications that use it**

- **Ensure unbiased public access**

- **Protect security of your networks**

- **Minimize computational and network loads**

- **Not spend more than $0**

Questions?