Efficiency Compounded

HOW PORTLAND USED A SIMPLE GIS APP TO COORDINATE A MULTI-MILLION DOLLAR, CITYWIDE LED CONVERSION

Dan Spoelstra, Engineering Associate

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The Journey

- LED Luminaires – A recommended practice(?)
- GIS – A life-saving acronym
- Collector for ArcGIS – App-etizing
- Public Transparency – Avoiding pitfalls
- Other apps for the app
- Is the “Portland Method” good for you?

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The Emergence of LED Luminaires

- Early 2000s, LEDs used in street lighting application
  - 2007 – Raleigh, NC – First municipality to utilize LEDs for street lighting.
- By 2013, large-scale conversions in Seattle, Los Angeles, Phoenix
  - Proving that LED technology is suitable for roadway lighting
  - City of Portland begins sample LED conversion
- Summer 2014 – Portland began one of the largest energy efficiency based projects in history with aggressive cobrahead LED conversion
- How did we get off the ground?

What do we have?

- Existing GIS layer for street lights
  - Location
  - Asset ID / Map and Pole Number
  - Luminaire Description
  - Owner / Maintainer
- How can we use this info during conversion?
- What other data do we need?
- How can we use this existing information system to our advantage?

ARCGIS – STREET LIGHTS

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GIS and YOU!

- A contractor, an engineer, and an accountant walk into a bar…
- Need for user interface that can produce a usable output
  - Who are the end users? Is there an end user?
- Out with old, in with the new
  - Trimbles
  - iPads (or any mobile smart device)
- Collector for ArcGIS, by ESRI

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App-etite for Conversion

LET'S EXPLORE THE APP…

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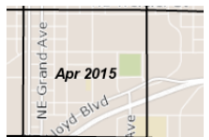
●●●●○ Verizon LTE 1:39 PM 62%

All Maps

Search maps

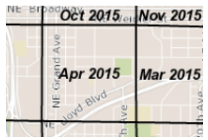
All | On Device

3 maps



PBOT Street Light Replacement

4/28/15 | Mike Quetel



Option C Street Lights

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Option B Street Lights

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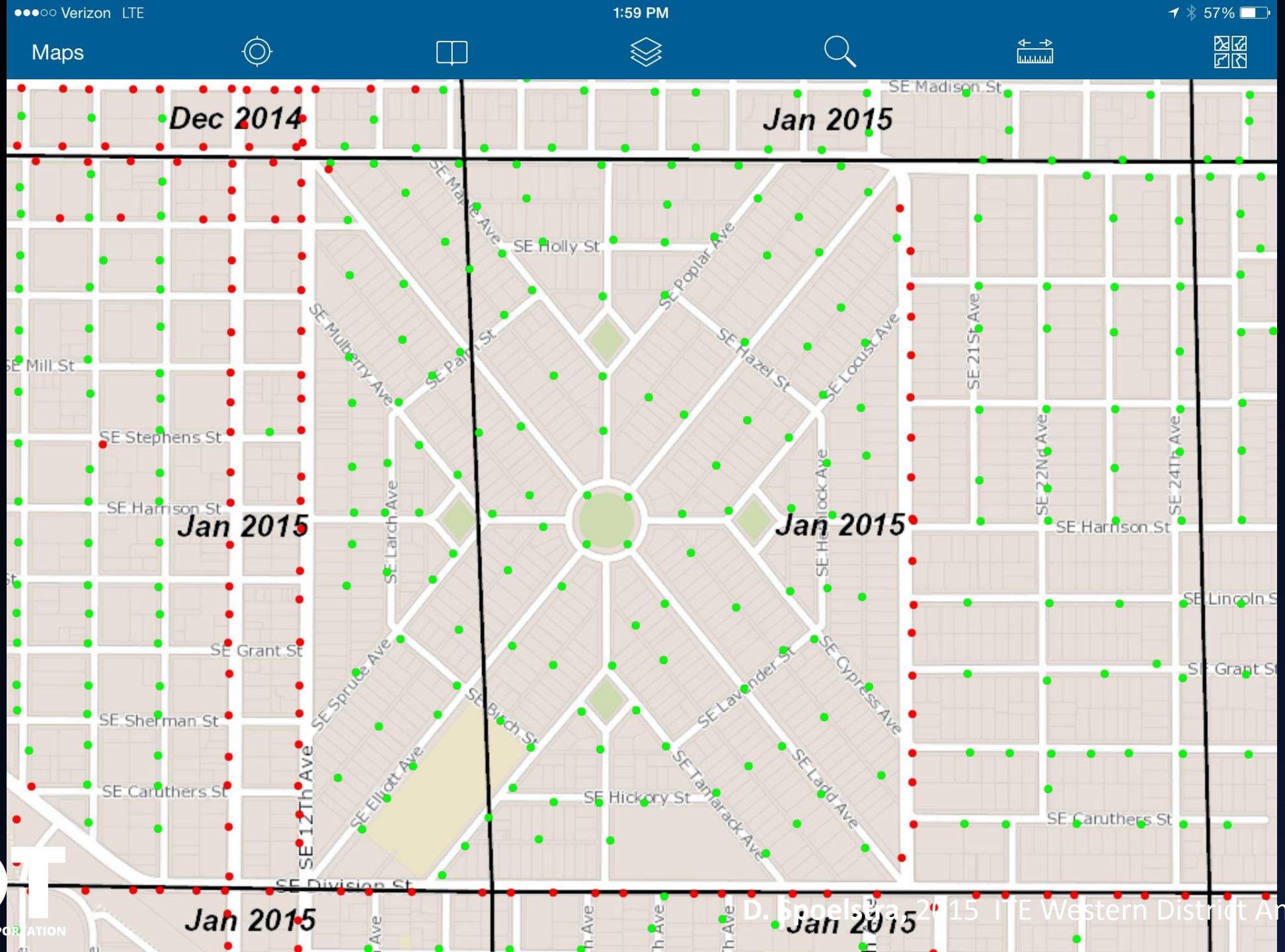

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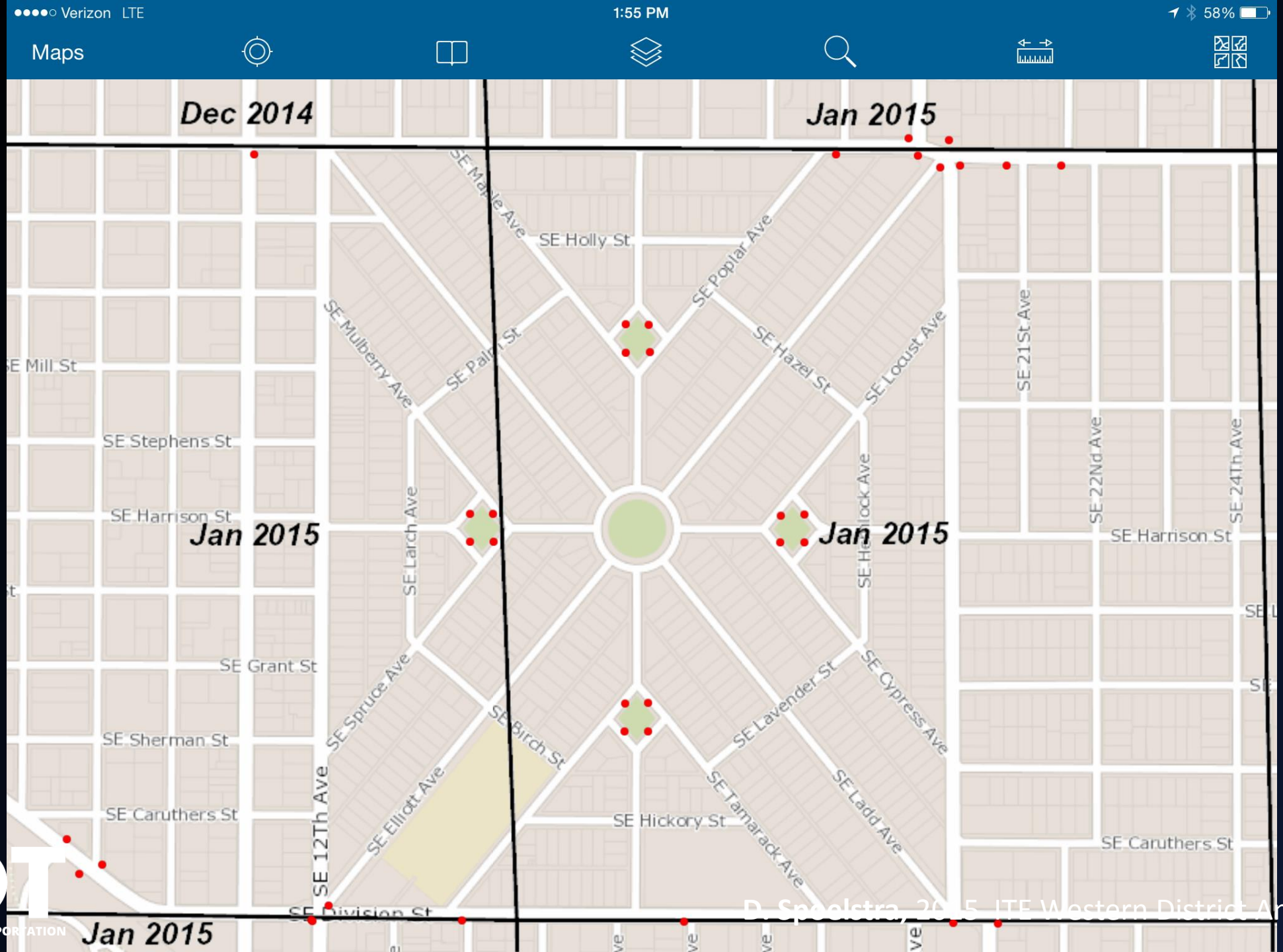

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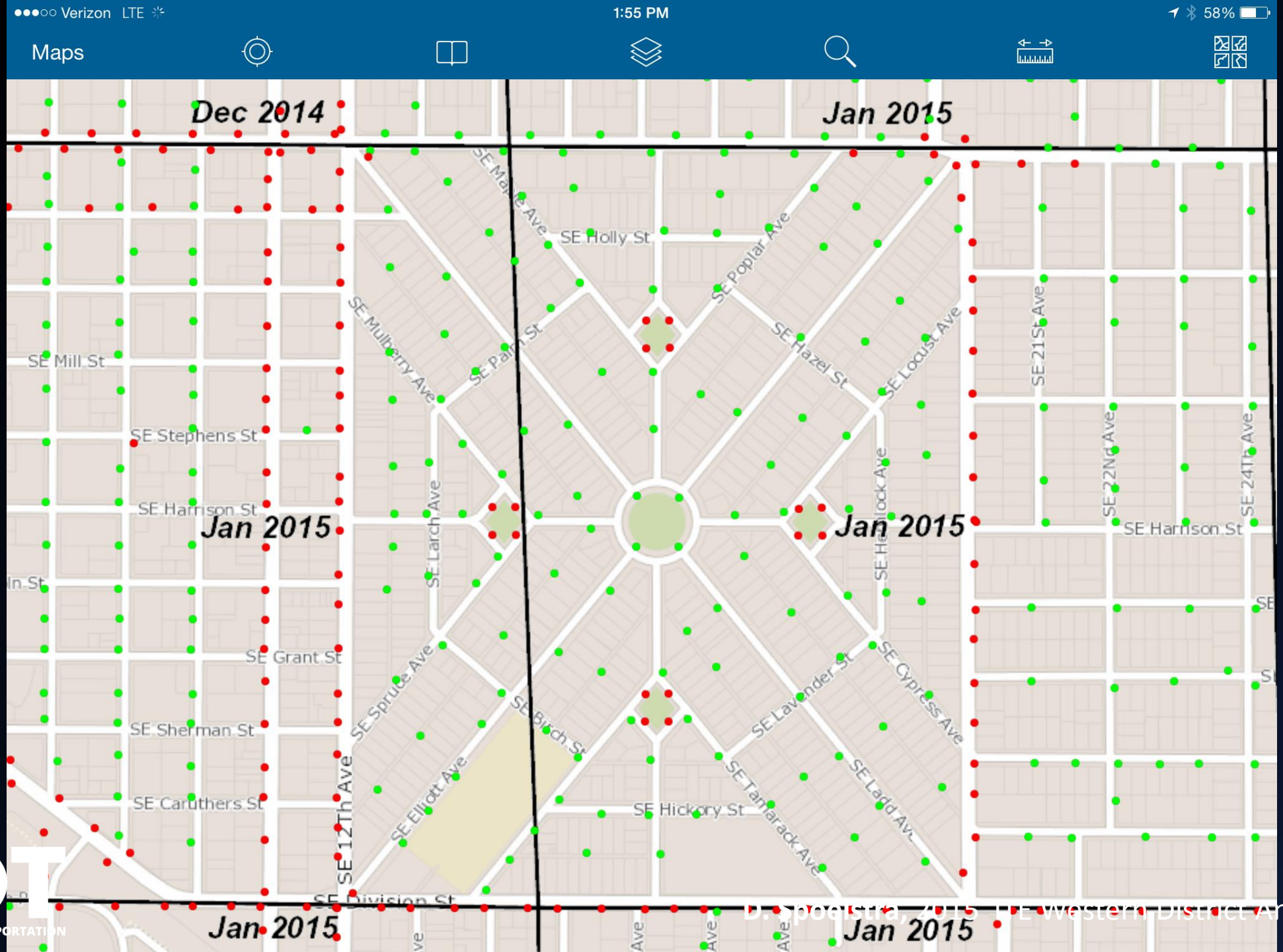

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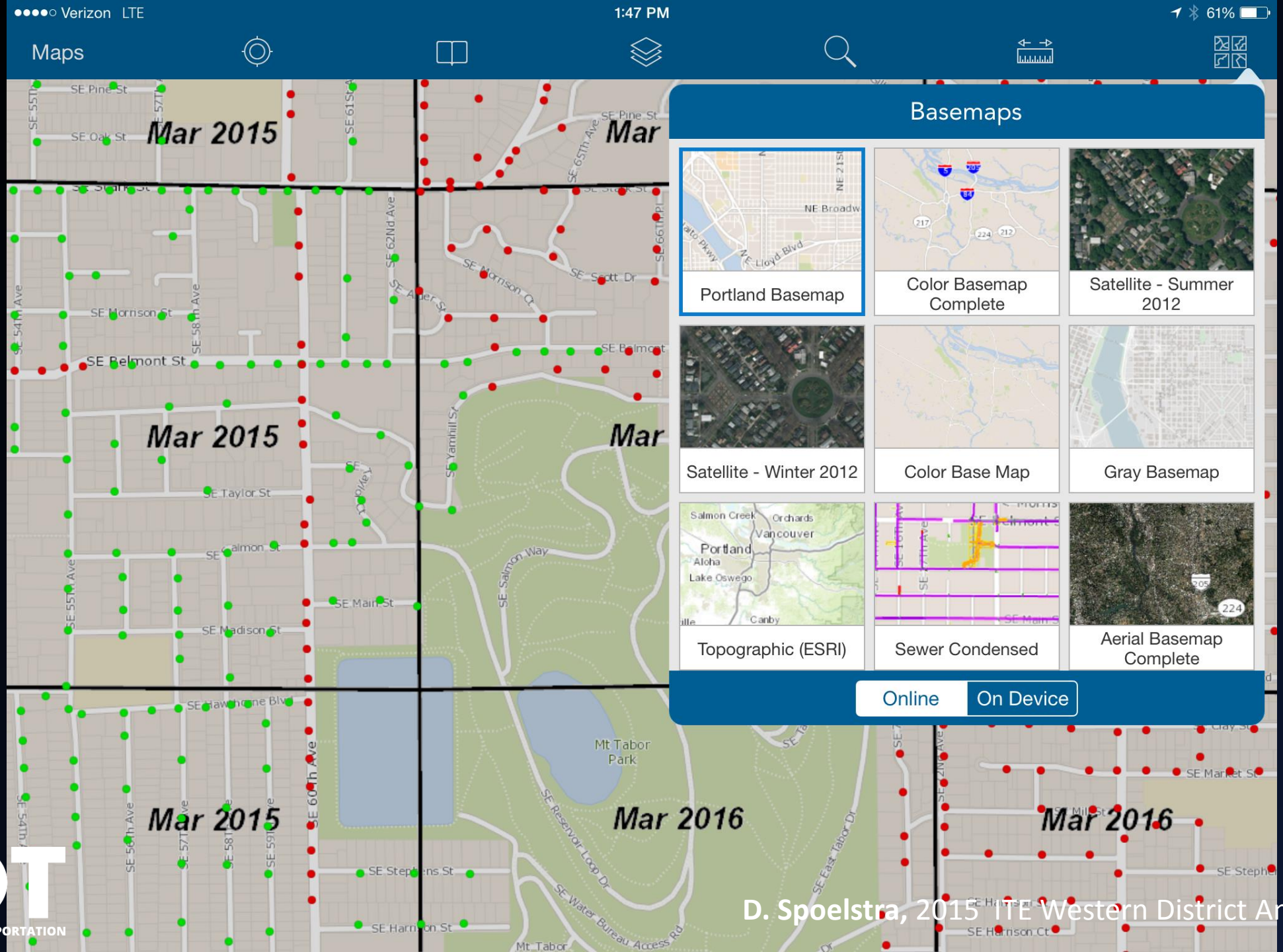

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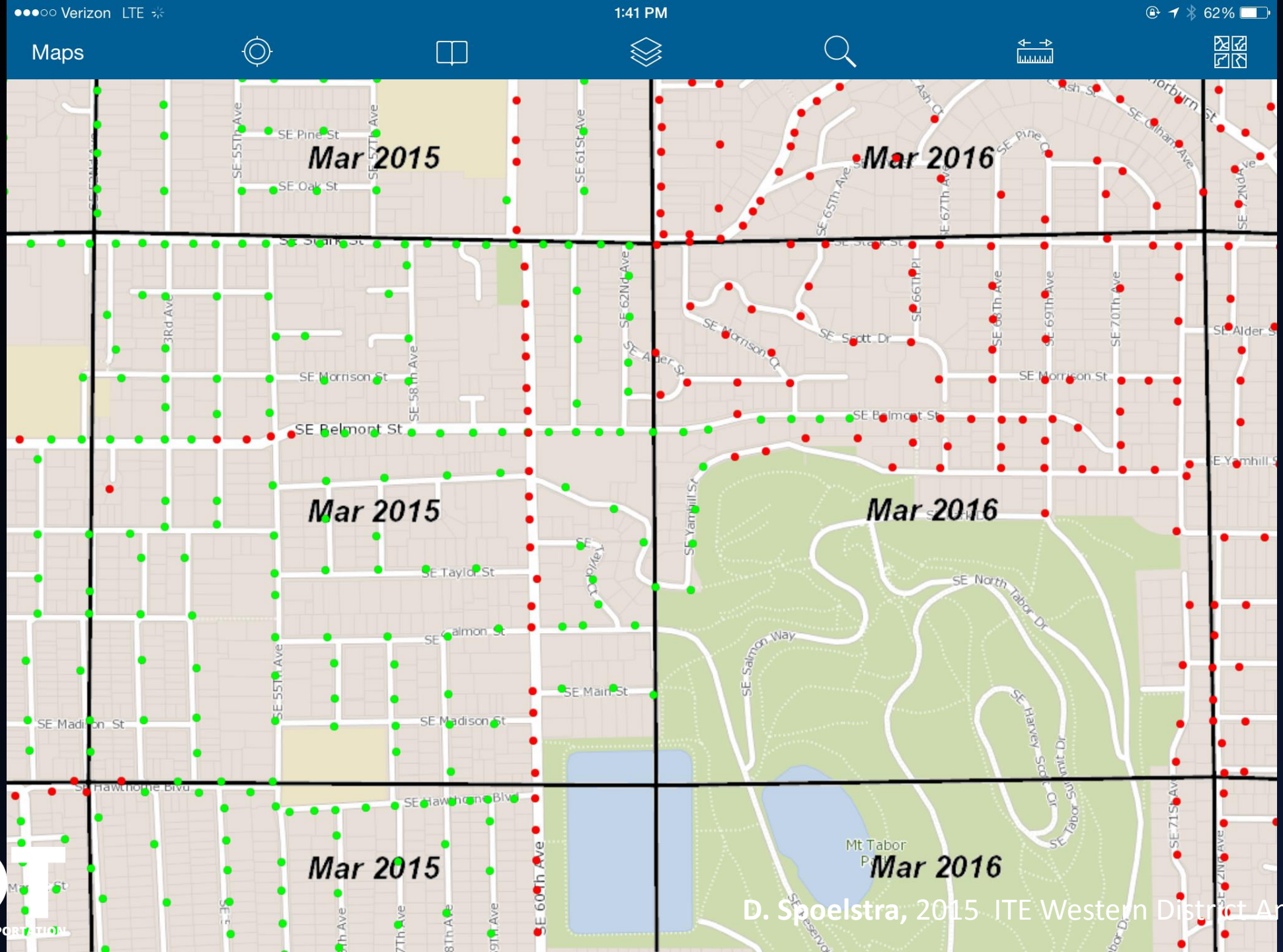

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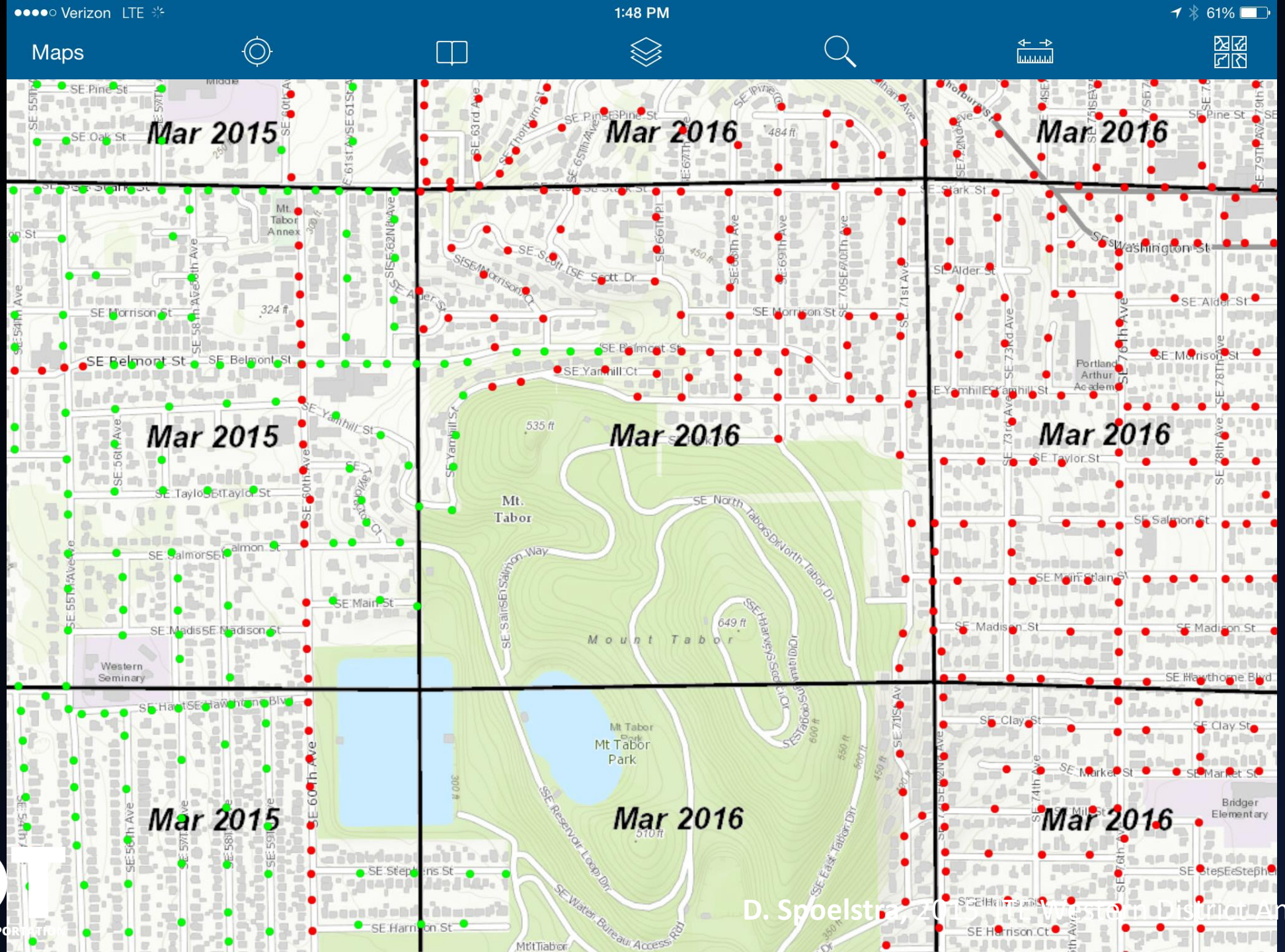

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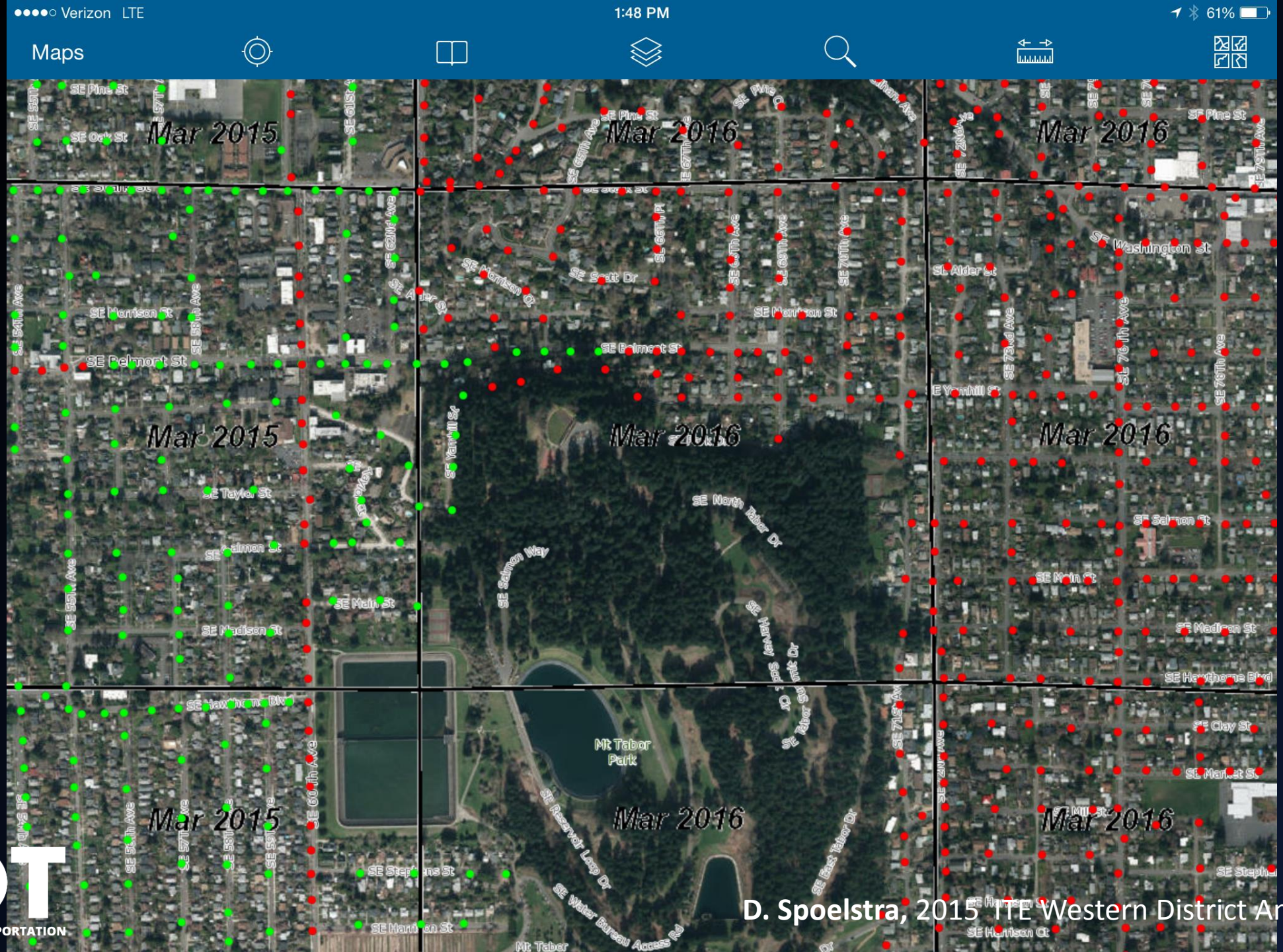

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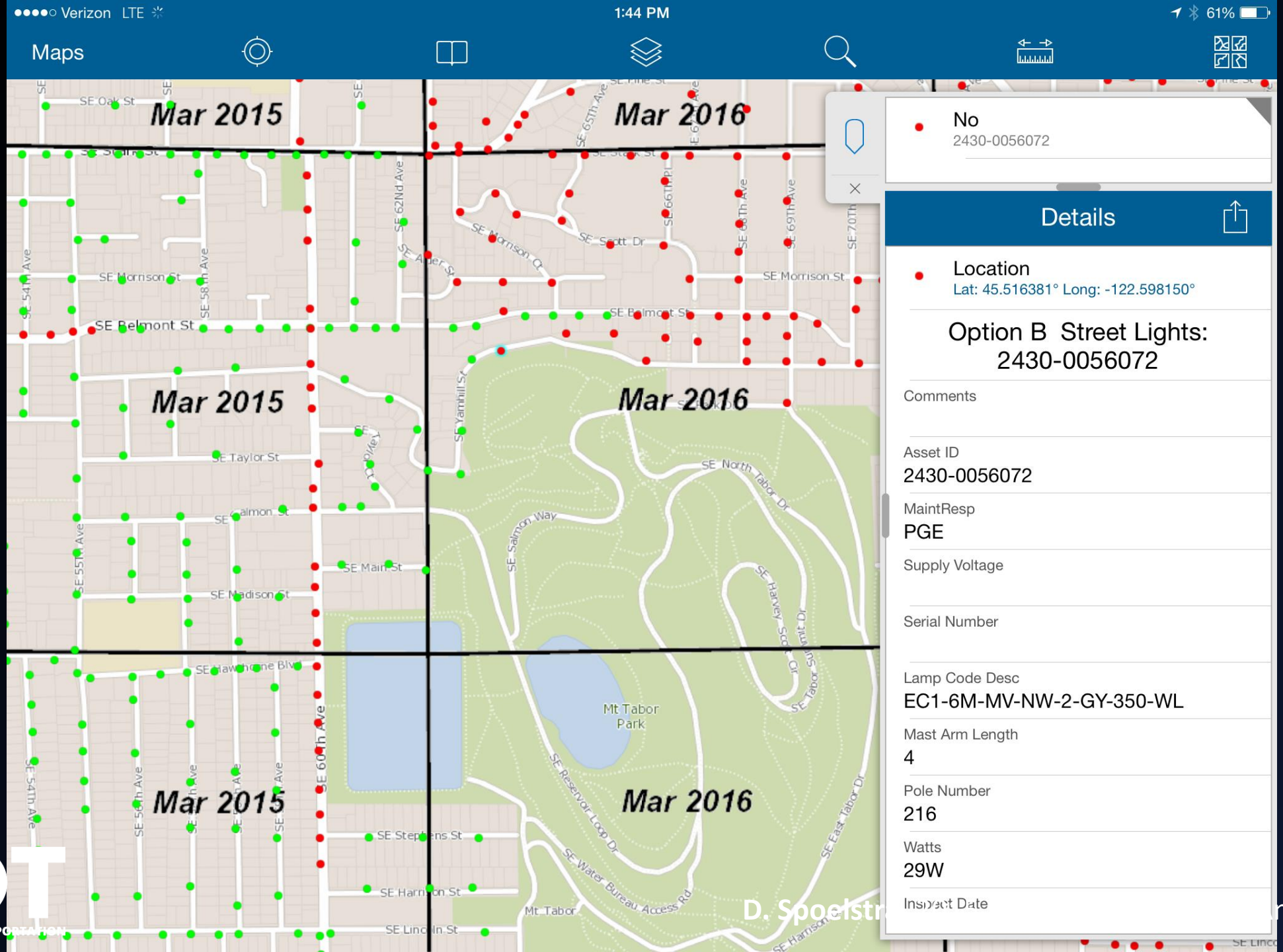

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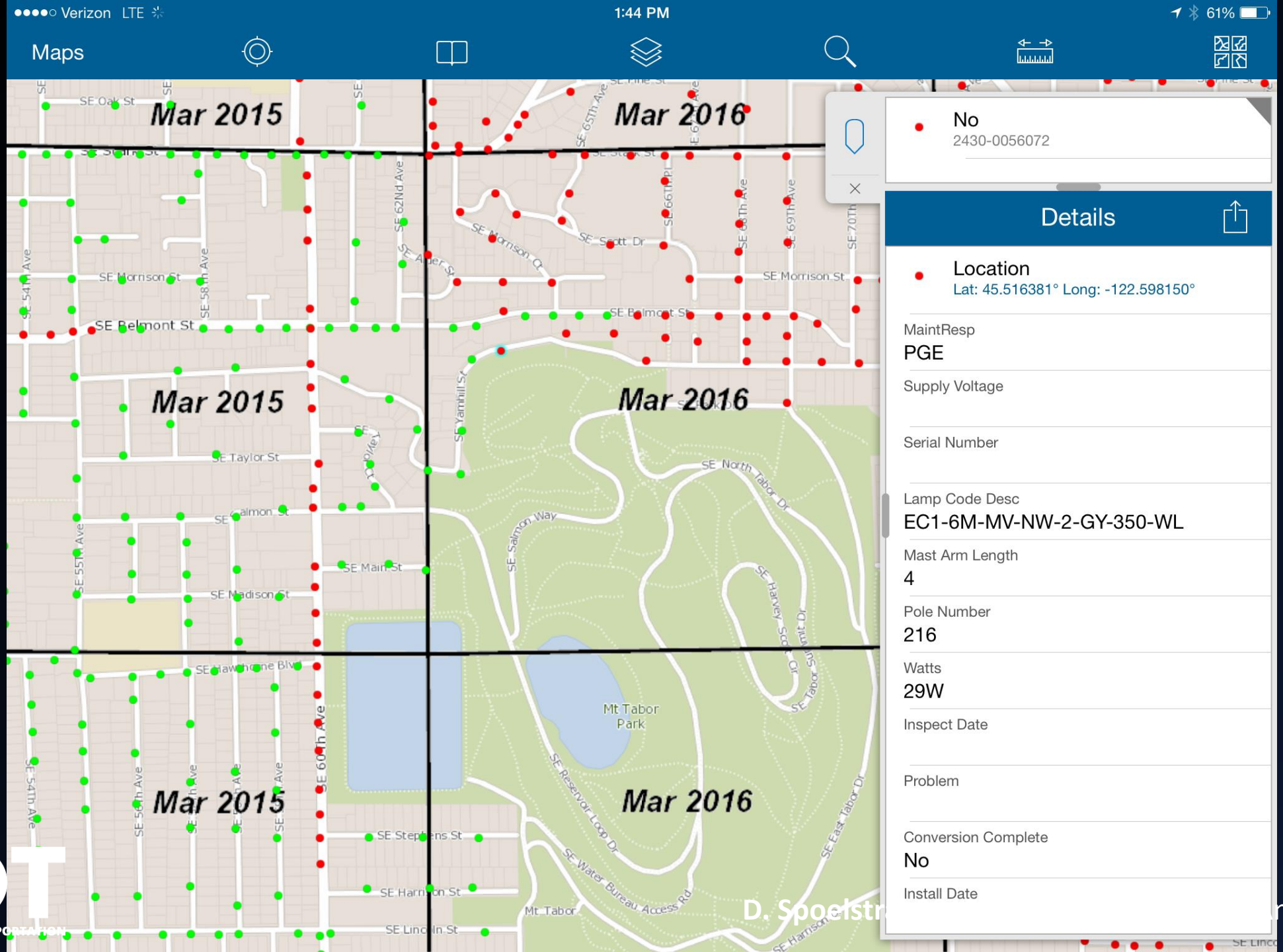

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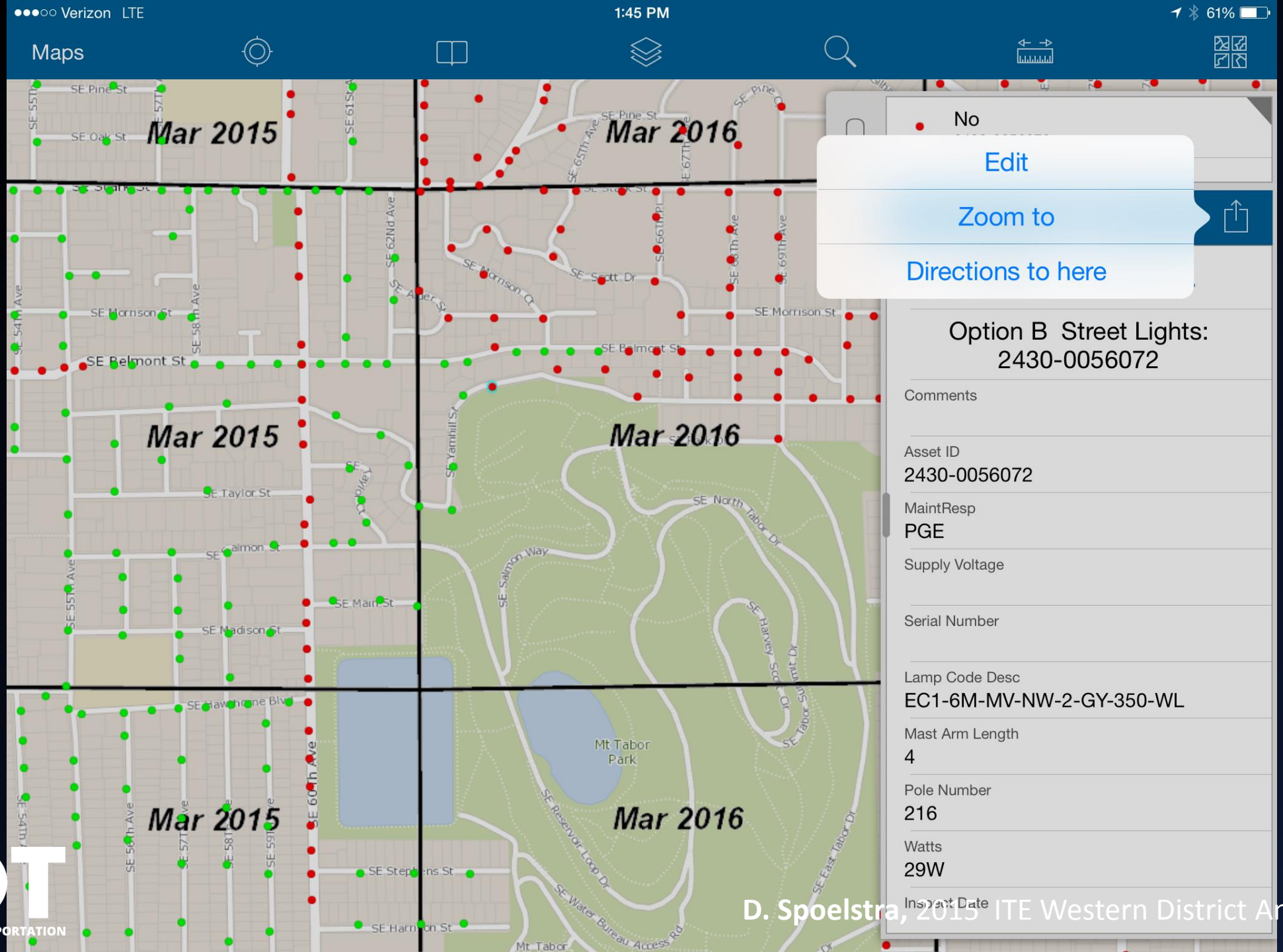

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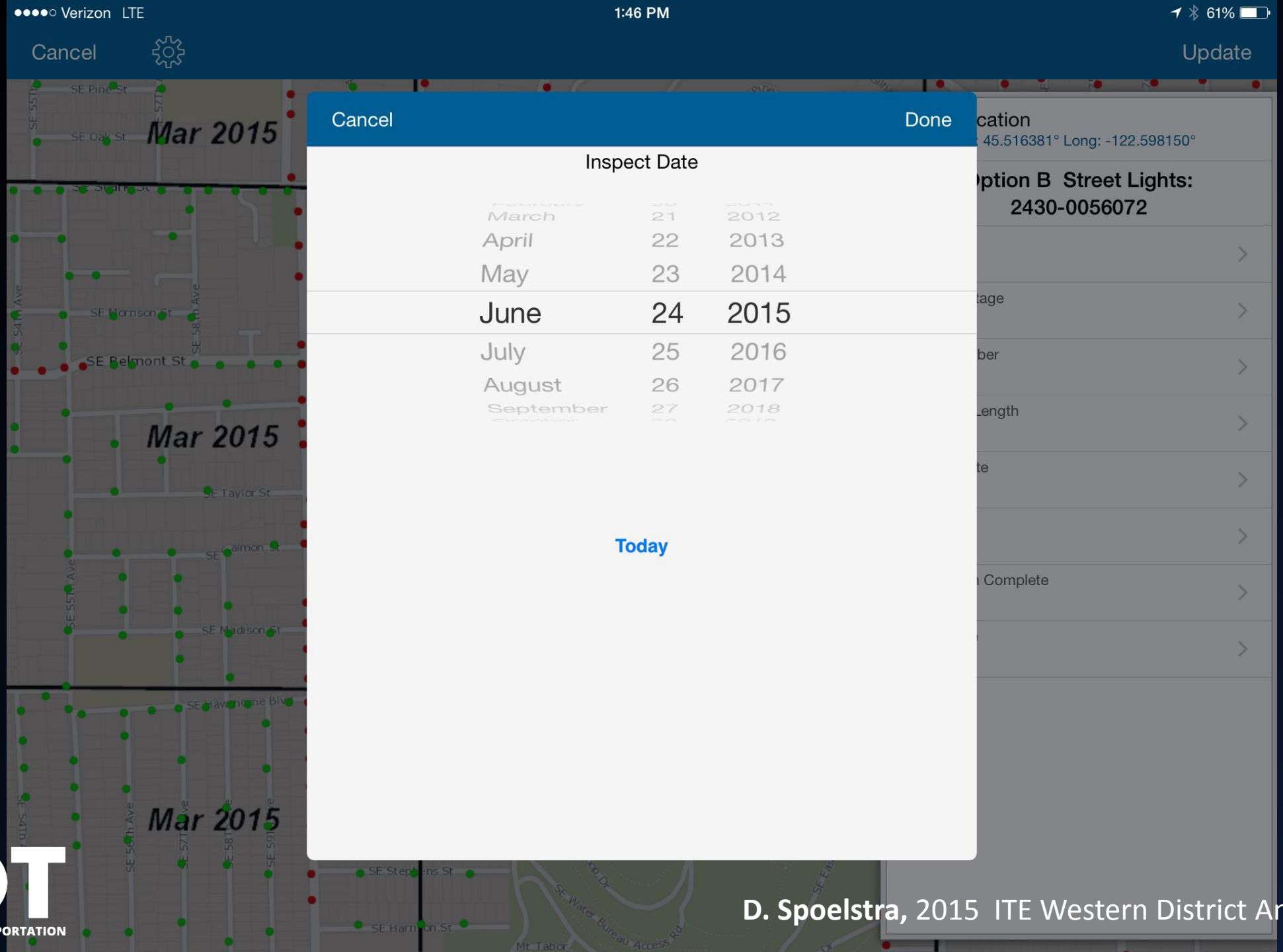

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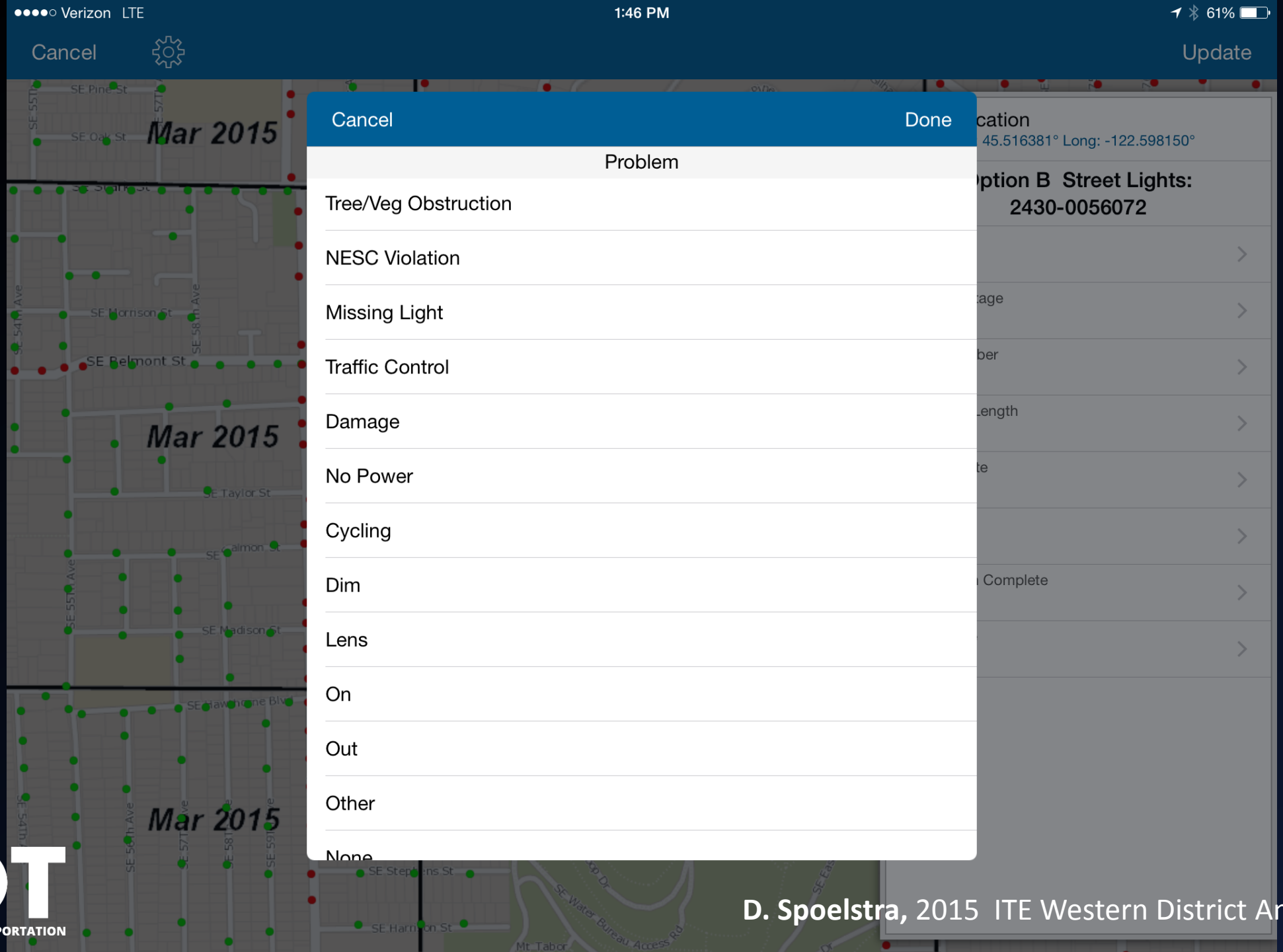

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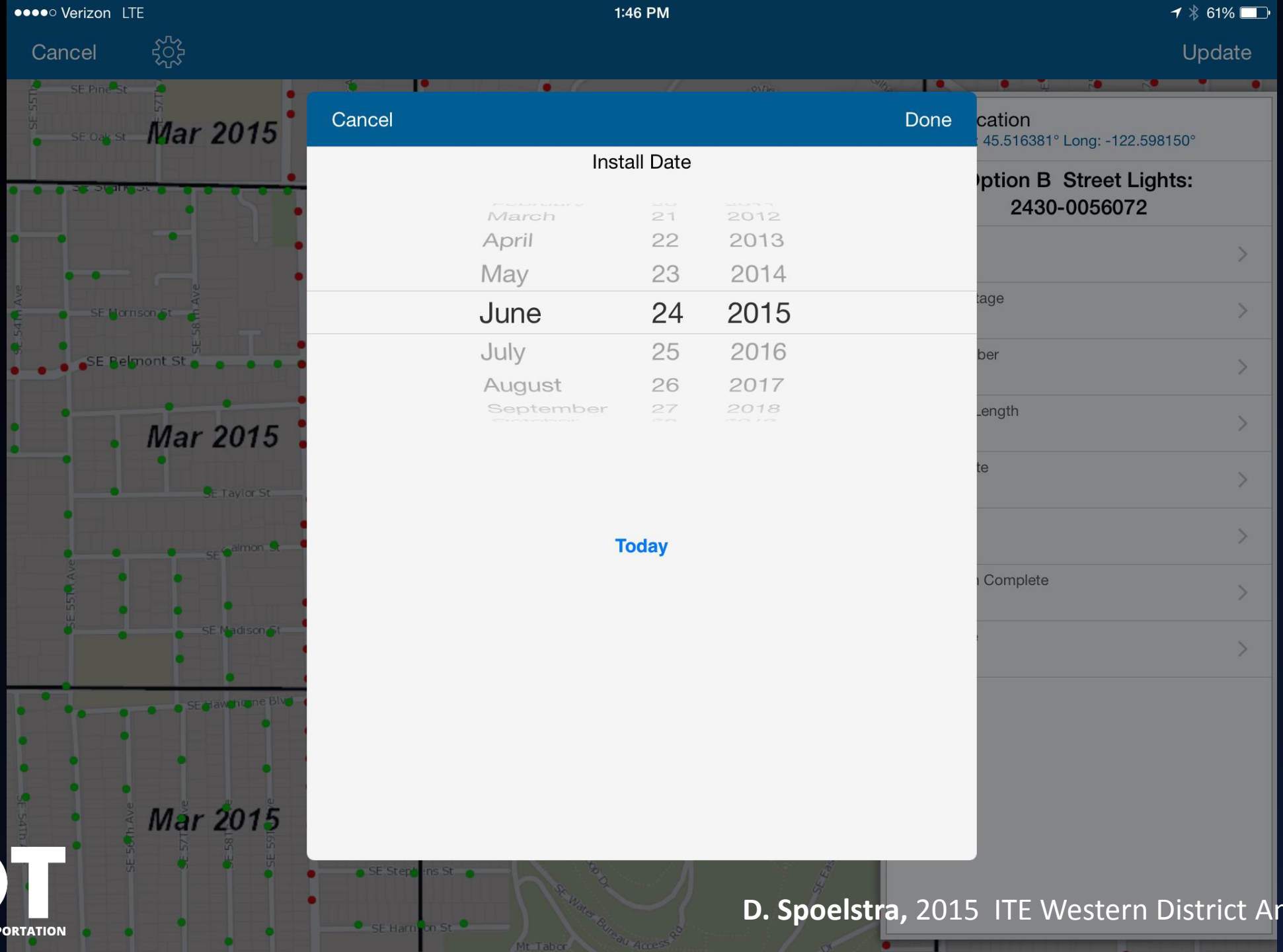

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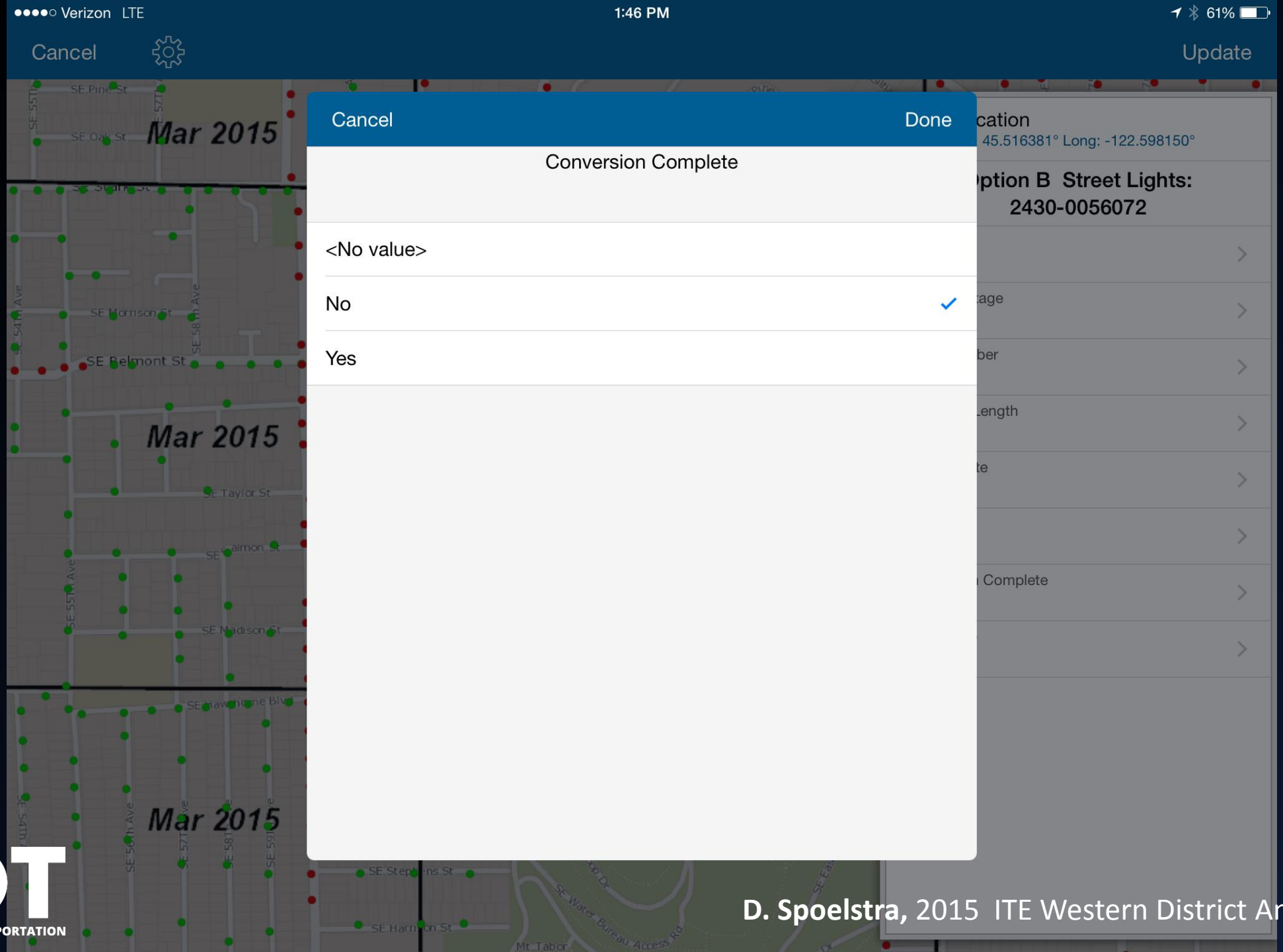

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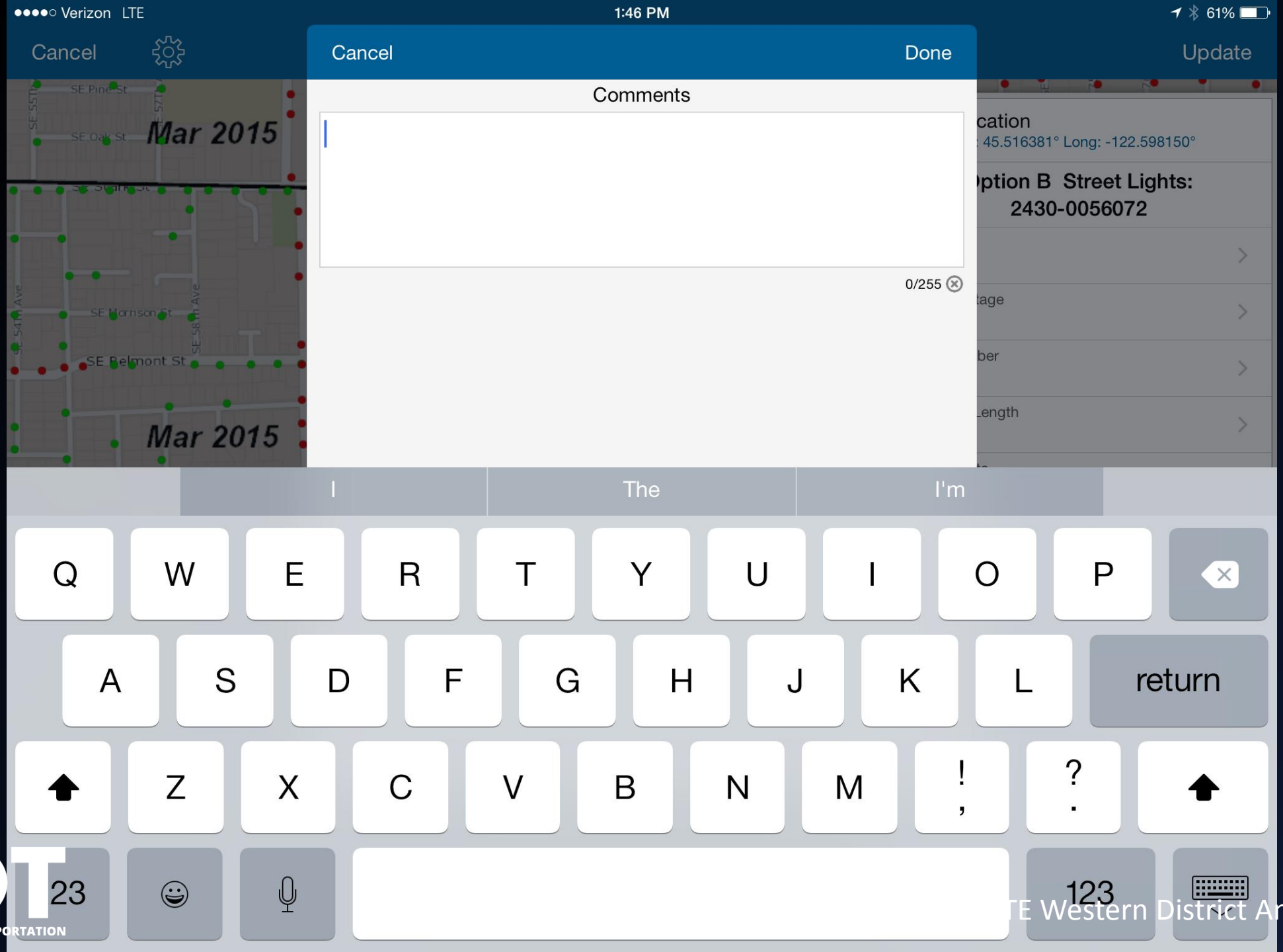

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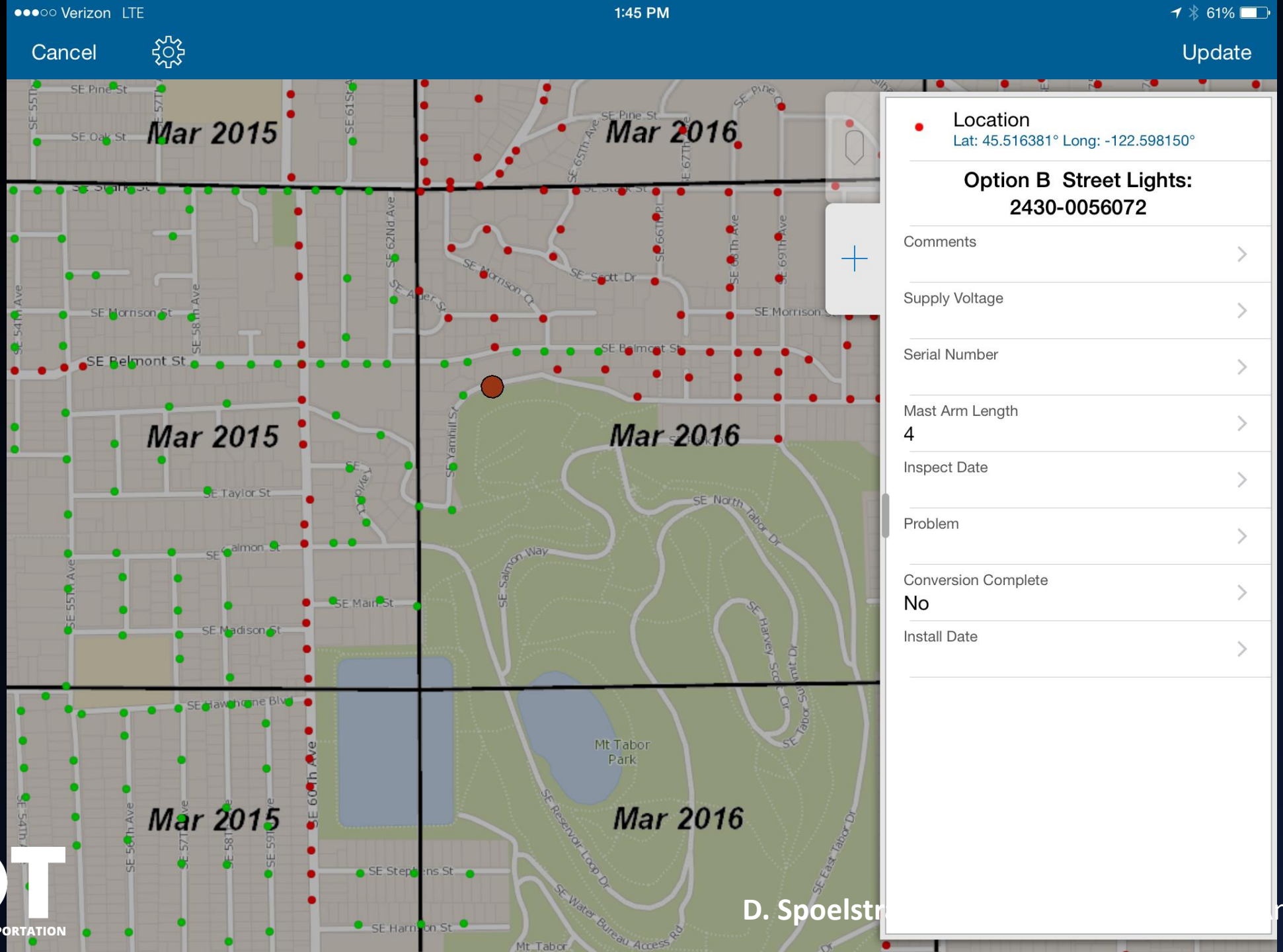

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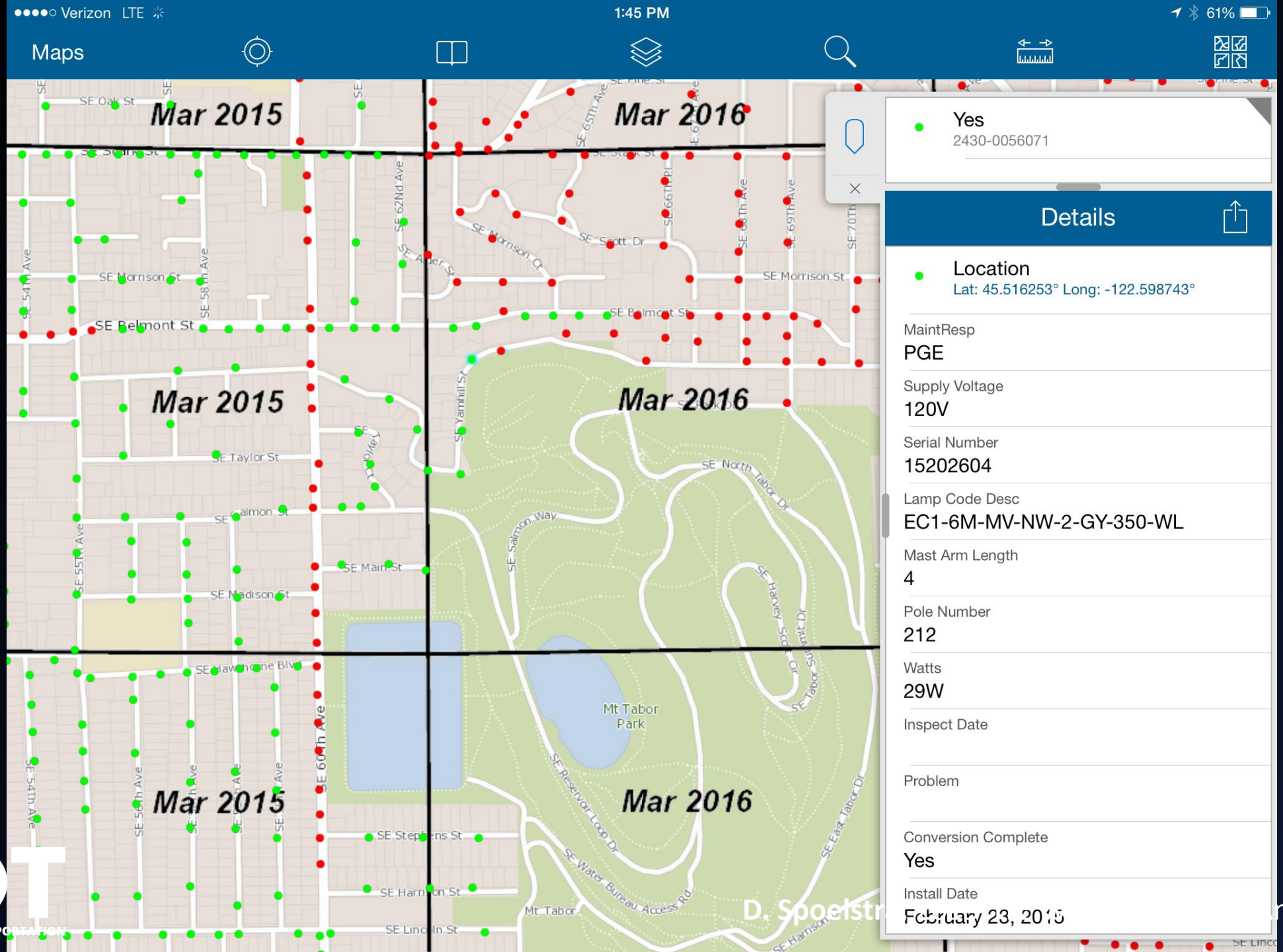

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Initial Impressions: Best. Investment. Ever.

- Live feedback: Monitoring your dollars at work
- Limitations of Collector – Keep the training wheels on
  - Purposefully limit which features can be edited
  - Intentionally create redundant layer specifically for conversion, separate from GIS Street Lighting layer (assets)
- Cellular coverage – Updates to GIS server can become delayed or unresponsive if limited data service available
- Bluetooth Serial Code Scanner – Important for Warranty
- Our maps are only as accurate as our records

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COMMENTS – The most useful feature

- Useful tool for communications between field and office.
- Equally as important – Avenue of Humor
  - “Semi buried. (Removed semi from tree and informed driver that city ordinance forbids trucks from stopping in trees unless marked as a loading zone.)”
  - “Radioactive mutant spiders of doom live here.”
  - “Created by the Street Light Import Tool [Trimble]. (Converted by the apprentice lineman tool.)”
  - “Could not find this pole or light anywhere. It must be covered with the cloak of invisibility or Sasquatch ripped it down because he hates streetlights in the middle of the woods.”
  - “Mmmmmmmm……..”

Public Transparency

- PBOT has webpage dedicated to LED conversion, complete with FAQ section, design standards, and more.
- Live online map, mirroring GIS conversion layer
  - Shows conversion schedule based on quarter-sections
  - Limited to cobrahead, NESC conversion – “Phase 1”
  - Lights have pole number, along with quarter-section map number
  - Residents can use this information to provide comments aimed at a specific light location

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PBOT Portland Bureau of Transportation
PHONE: 503-823-5185
FAX: 503-823-7576
1120 SW Fifth Ave, Suite 800, Portland, OR 97204
MORE CONTACT INFO

LED Street Light Conversion Program

Questions and comments related to The City of Portland's Street Light Conversion Program are welcome. To help us identify the correct Street Light, please provide the Map and Pole numbers, as well as the address nearest to the Street light.

Map/Pole Numbers

Map and Pole numbers can either be found on the Map above or on the Pole Tag. A Pole Tag is a three inch round metal plate on the Street Light pole located at about eye level (NOTE: Pole numbers will appear as map is zoomed in. There may not be a Pole Tag).

Map #	
Pole #	
Address Nearest to Street Light*	Verify Location *e.g.* 1120 SW 5TH *or* 5TH AND MAIN *or* 100-200 5TH
Questions/Comments*	
Your Name*	
Your Email Address	
Your Day Time Phone #*	
Call Back Requested	
Picture	Choose File No file chosen (Maximum file size: 30MB)

* Required Field

Submit

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One App to Rule them All…

- What else could we do with this mobile interface?
  - Electrical Staff Request: Additional features – conduit, service panel location
- Thinking beyond LED conversion – Maintenance Response
  - Tracking repairs via inspection date, problem, and comments fields.
  - LED failures – replaced with new fixture, scan new serial number, updated installation date.
    - If not LED failure, comment field used to provide description. (ex: service connection).
- Field Checks – provide notes from night drives, etc.

Ornamental Light Pole Survey

- A recognized need for refurbishing ornamental light poles.
  - We know where our poles are.
  - We don’t know what kind of shape they are in (paint, damage, tagged, etc.)
- Use existing resources to create the framework for the project.
  - Use the existing street light layer in GIS, filter for lamp code that correlates to ornamental fixtures, and publish new map to GIS server online.
  - The new map is shared with selected users (fellow employees).
  - Make editable features that include condition rating, comments, inspection date, and anything else you want to know about the asset.
- Hit the streets!

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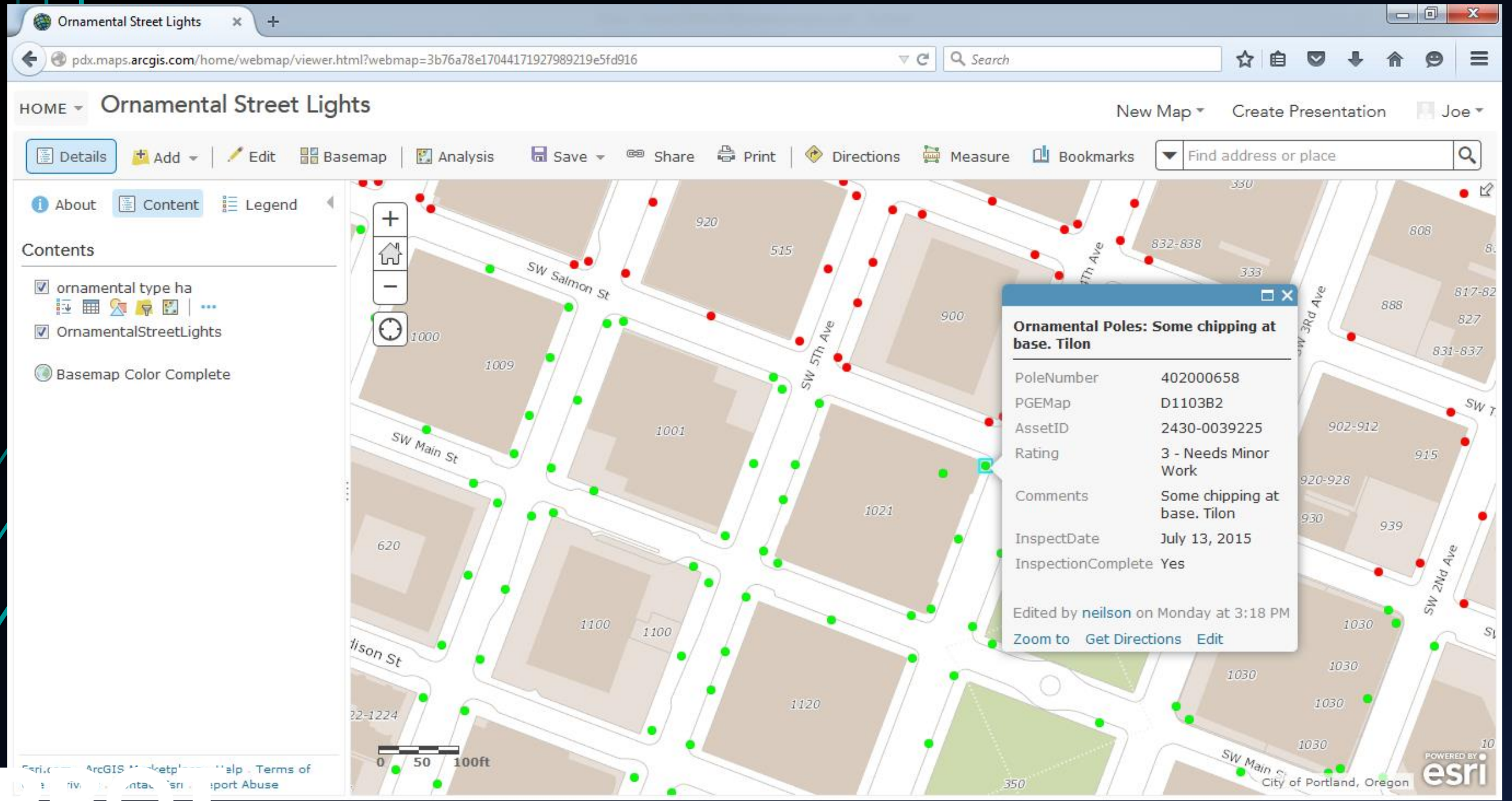

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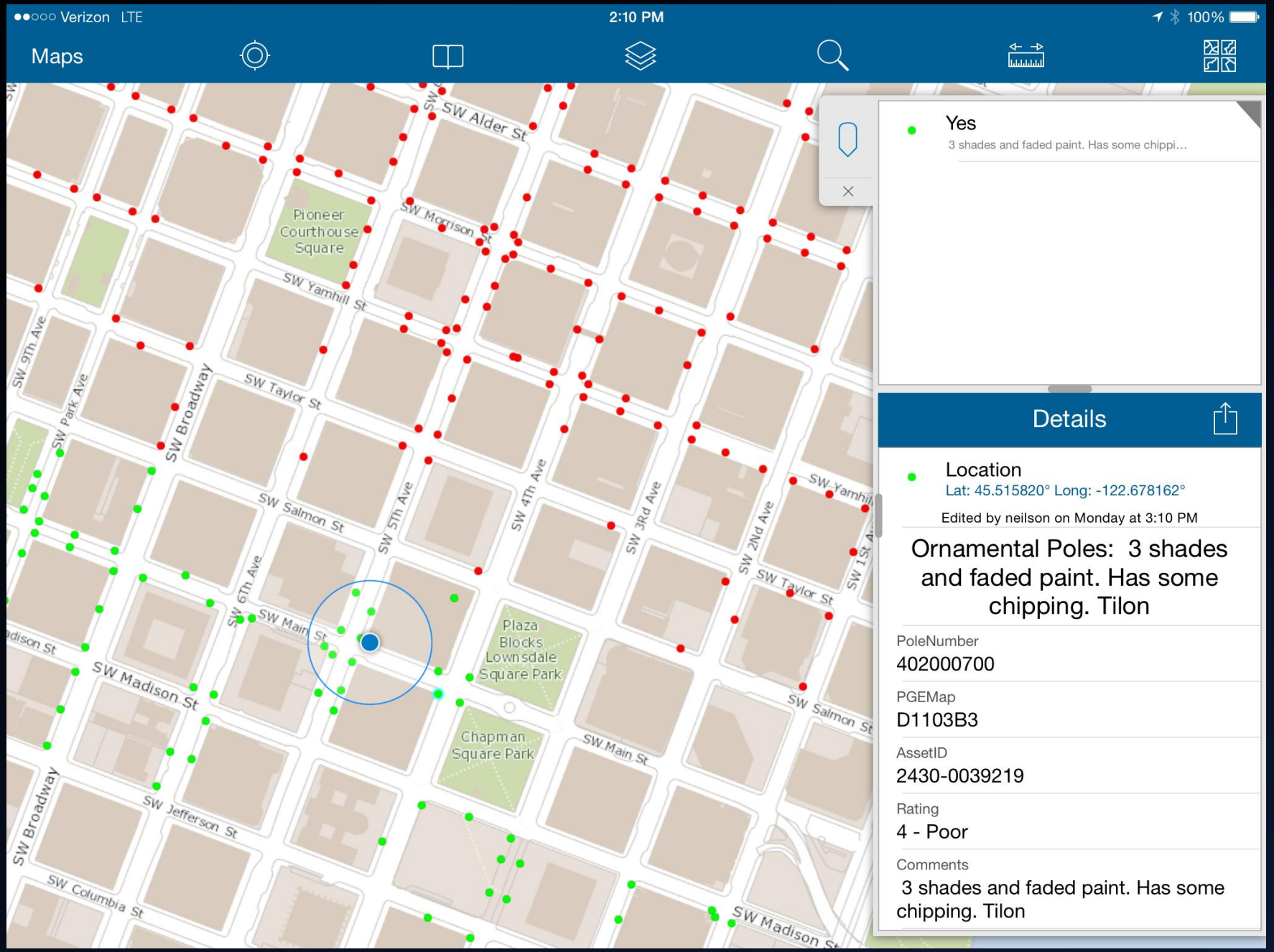

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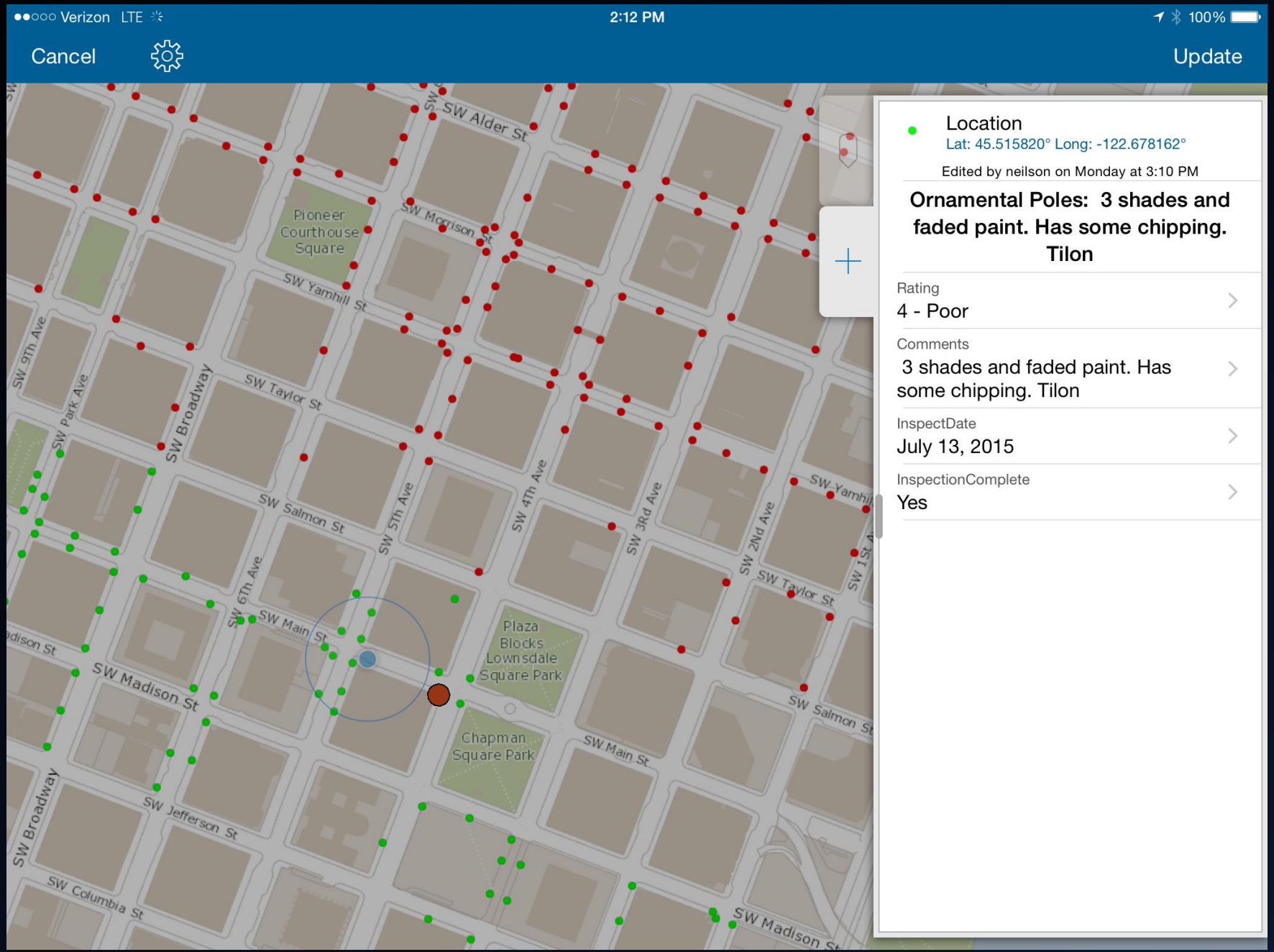

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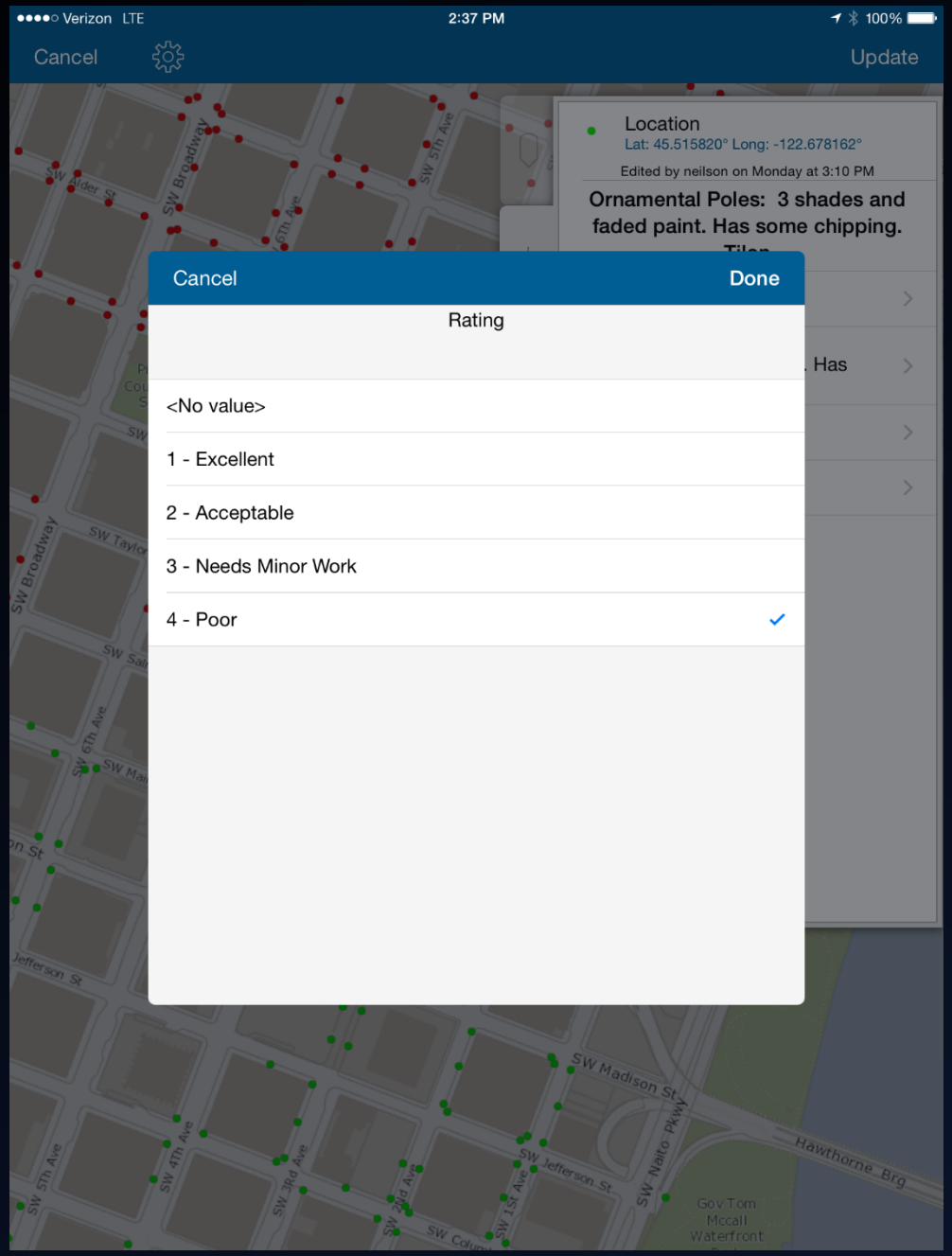

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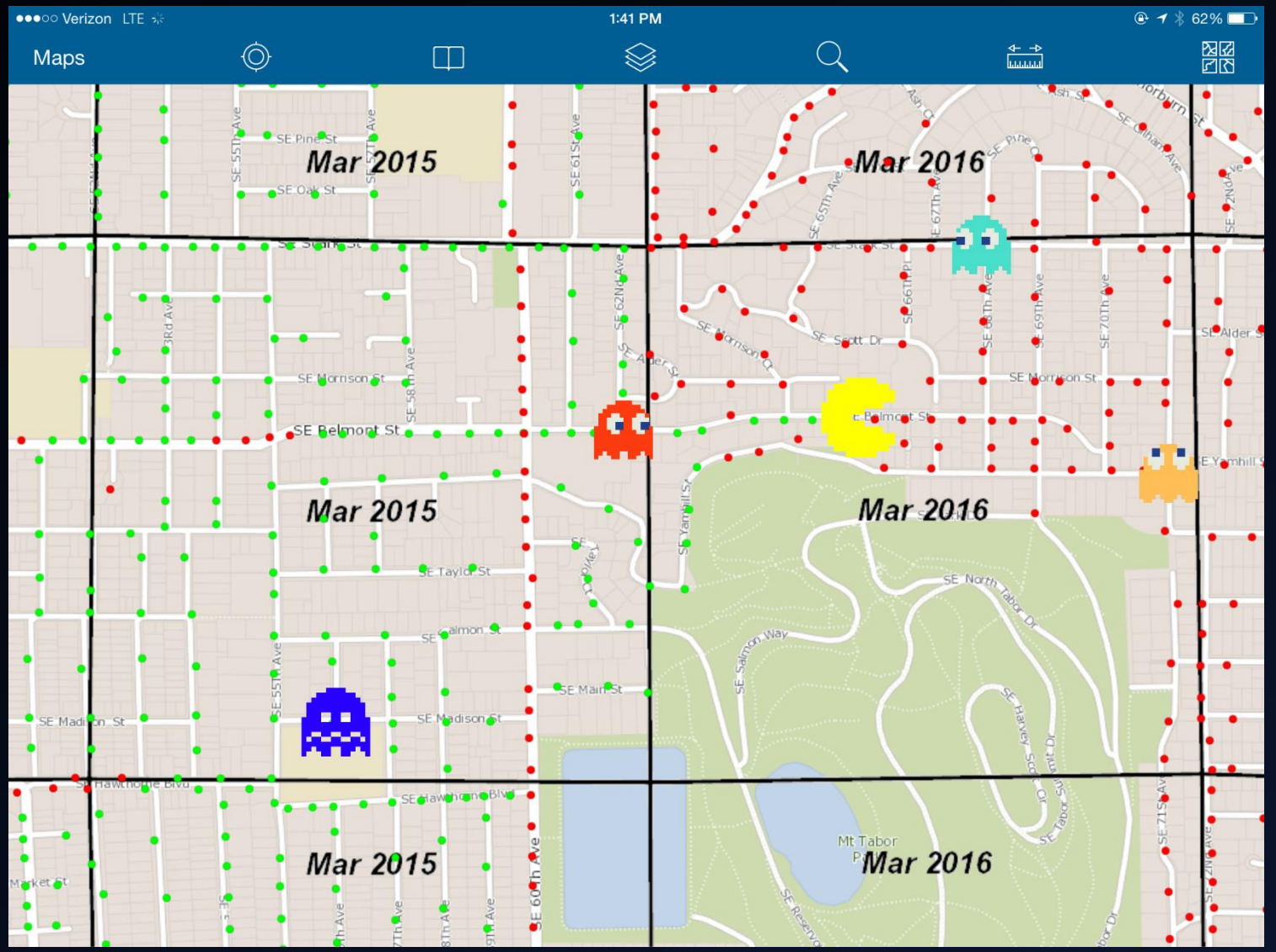
You Can Do It!

- Regardless of size, if you use GIS, you can use the “Portland Method”
- Things you’ll need:
  - GIS Technician (or someone comfortable with creating and managing layers)
  - Mobile Smart Device – iPad, iPad mini, Android Tablet, equivalent
  - Optional (recommended) – Bluetooth barcode scanner
    - We selected a Socket Mobile CHS – excels in outdoor applications
    - Barcode scanner eliminates potential errors when entering serial number
  - Collector for ArcGIS – Upload maps online – Plug and play

It just makes sense.

- In trying to eliminate paper records during this project, the efficiency of cost savings and resourcefulness is compounded each time a light is converted.
- “Self-audit” – Contractors look at every light
  - Verify location accuracy, identify missing lights
  - Provide information on necessary repairs
- Large scale projects rely on team effort
- Fun Fact: 8 lights have been converted during this discussion

Thanks!



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