# Street Use & Construction Coordination Tool - PlanIt

*Presented by*
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City of Vancouver

December 6 2016

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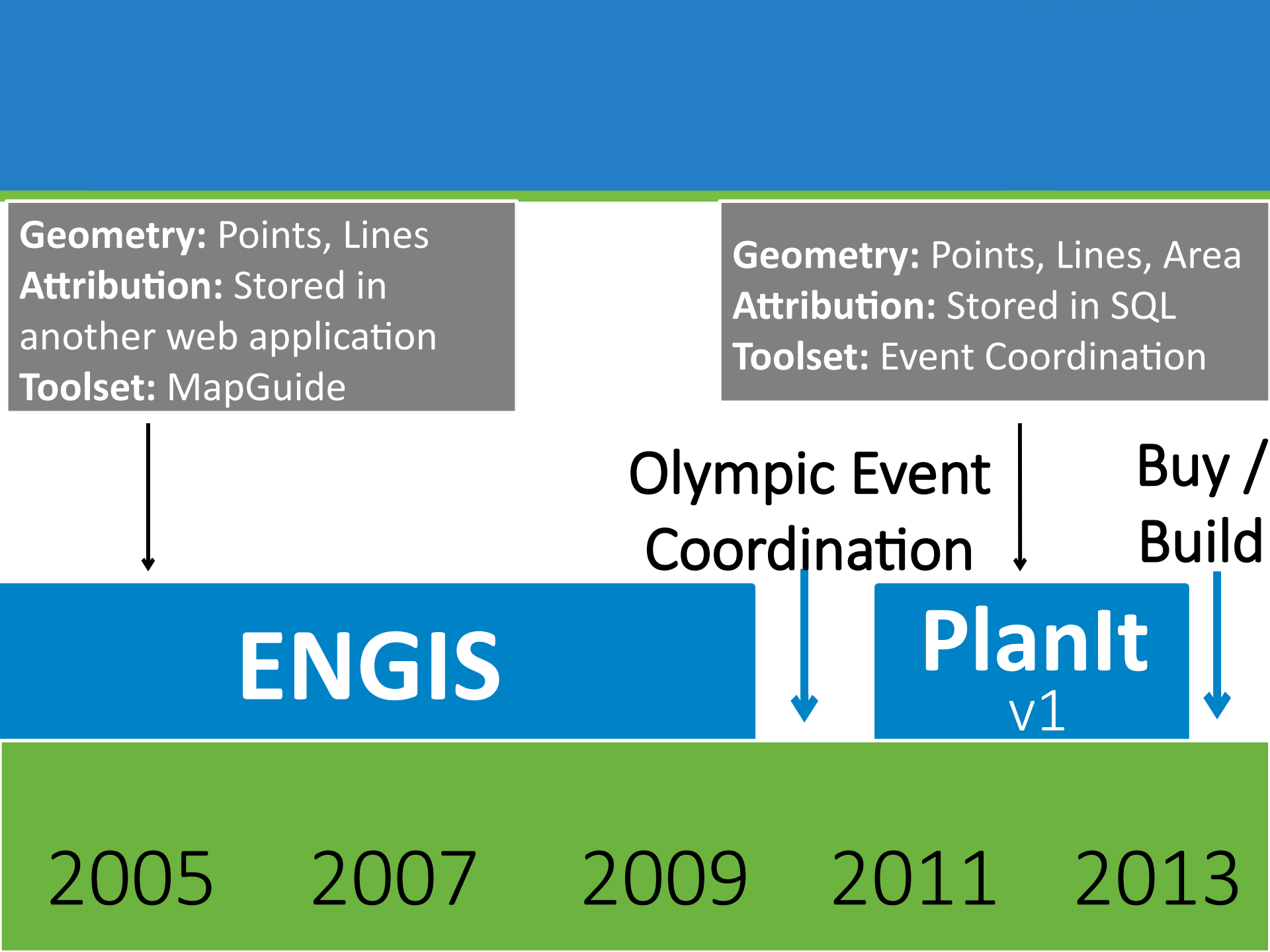
THIS IS MY PROJECT SITE!
NO, IT'S MINE!
URBAN SEWERAGE
WATER SUPPLY
DREDGING INITIATIVE
BUT I WAS HERE FIRST!
THEY SHOULD'VE CONSULTED ONE ANOTHER
... AND TALKED TO US, TOO

# Street Construction Management:
## Over the past 20 years

**Geometry:** Points
**Attribution:** Limited

**SAMS**

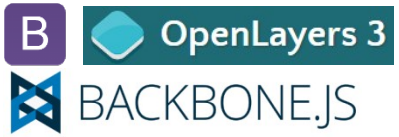
1995 1997 1999 2001 2003


Geometry: Points, Lines
Attribution: Stored in another web application
Toolset: MapGuide
Geometry: Points, Lines, Area
Attribution: Stored in SQL
Toolset: Event Coordination
Olympic Event Coordination
Buy / Build
ENGIS
PlanIt
v1
2005
2007
2009
2011
2013

# Dedicated Engineering Coordination Team

Re-Assess Tool

**Geometry:** Points, Lines, Area
**Attribution:** Stored in Oracle
**Toolset:** Open Toolsets




**PlanIt**
v2

NOW

2015

2017

# Key Aspects of PlanIt (v2) Development

- **Agile Methodology:**
  - Small Team of Subject Matter Experts (6)
  - Monthly Sprints focused on:
    - 60% Sprint Goal
    - 20% Value Add
    - 20% Bug Fix
- Open Source Tools:
    - Development
    - Project Task Management

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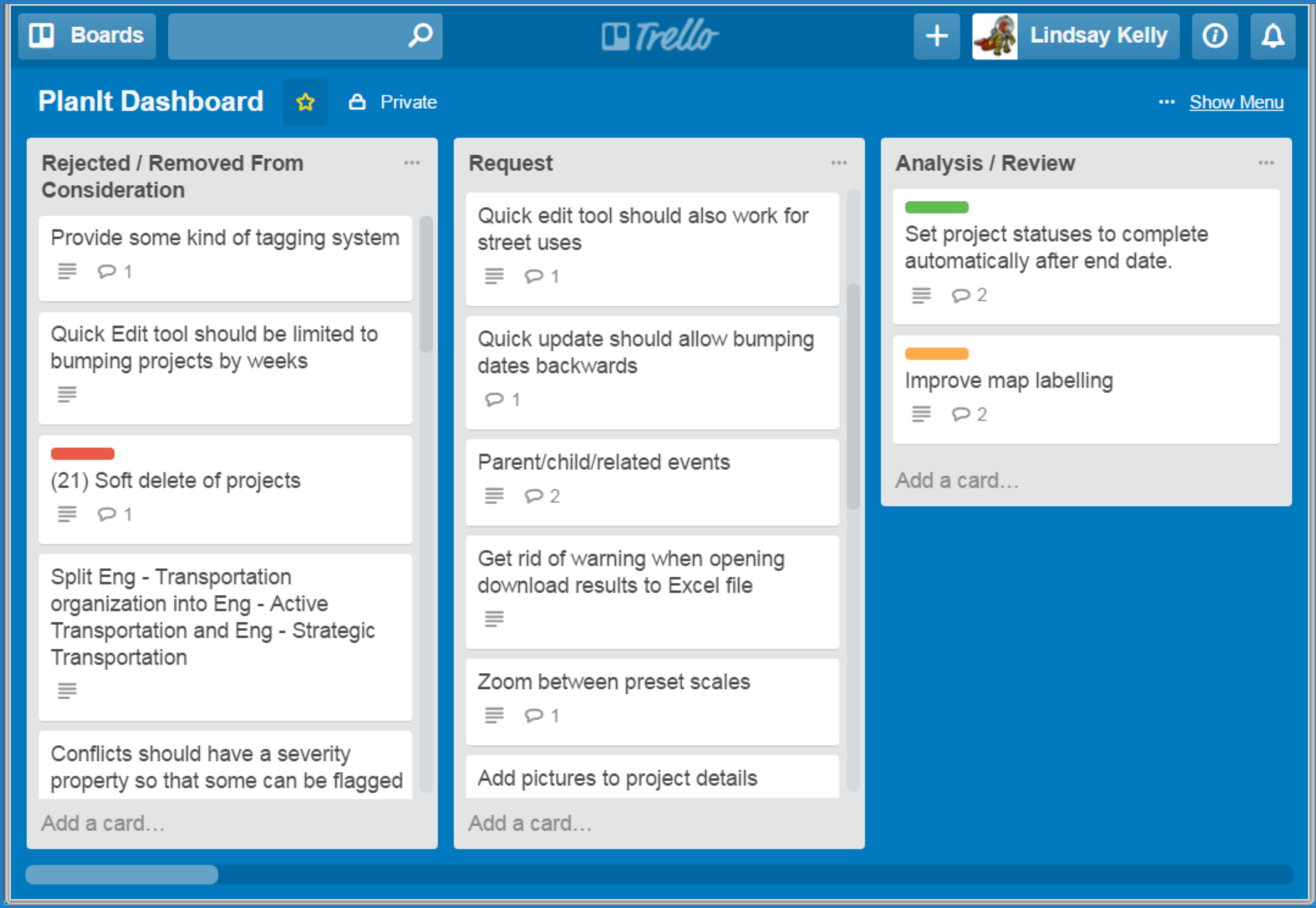
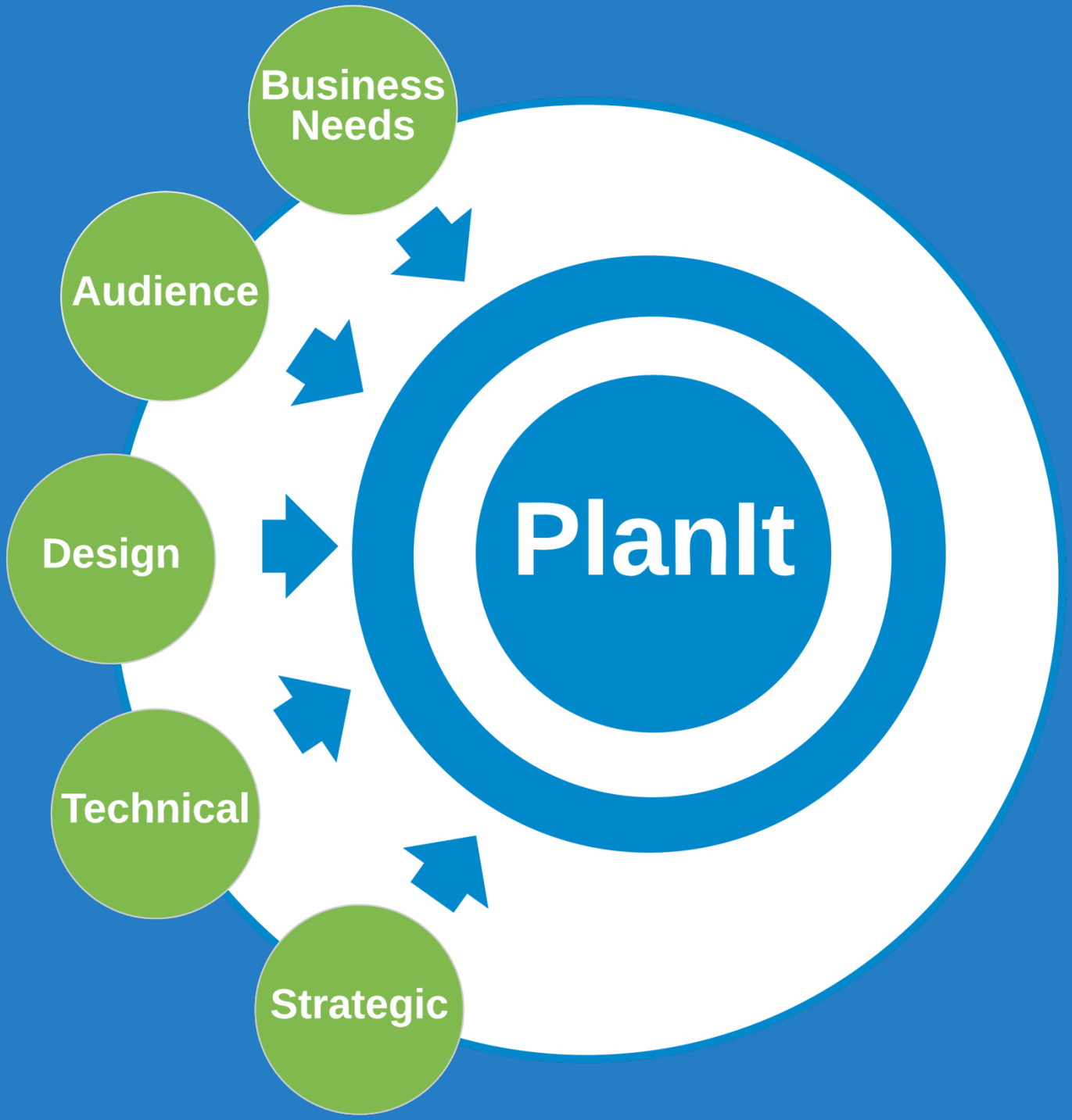

Boards
Trello
Lindsay Kelly
PlanIt Dashboard
Private
Show Menu
Rejected / Removed From Consideration
Provide some kind of tagging system
1
Quick Edit tool should be limited to bumping projects by weeks
(21) Soft delete of projects
1
Split Eng - Transportation organization into Eng - Active Transportation and Eng - Strategic Transportation
Conflicts should have a severity property so that some can be flagged
Add a card...
Request
Quick edit tool should also work for street uses
1
Quick update should allow bumping dates backwards
1
Parent/child/related events
2
Get rid of warning when opening download results to Excel file
Zoom between preset scales
1
Add pictures to project details
Add a card...
Analysis / Review
Set project statuses to complete automatically after end date.
2
Improve map labelling
2
Add a card...

# What is PlanIt?


Business Needs
Audience
Design
Technical
Strategic
PlanIt

# Business Needs Driving Development

Event Conflict Detection Types
(Over Time & Geometry)

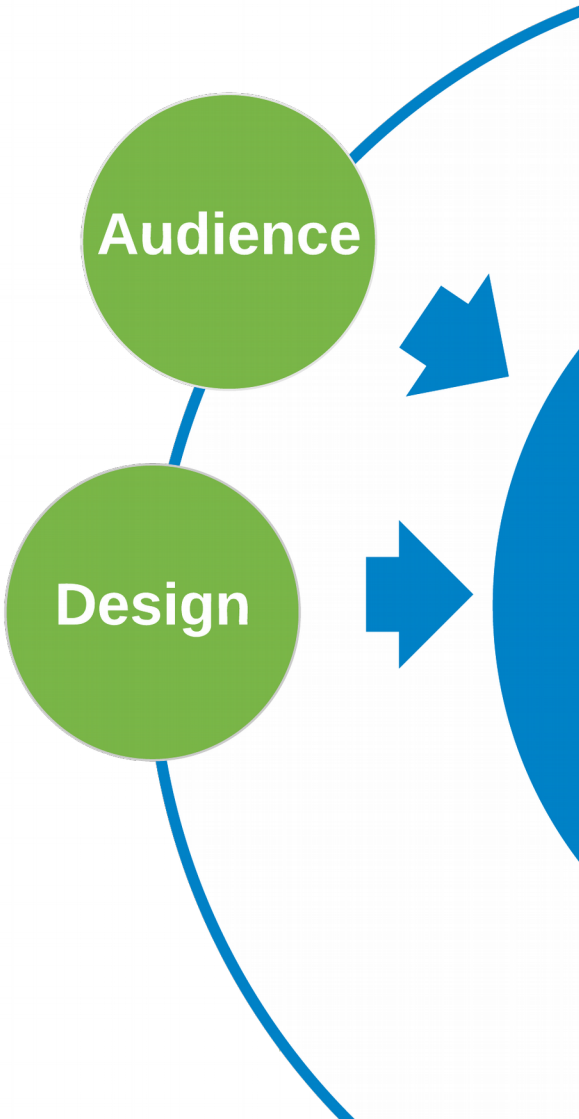
Geometry Type Appropriate for Event Type

Many Data Sources
(Internal & External)

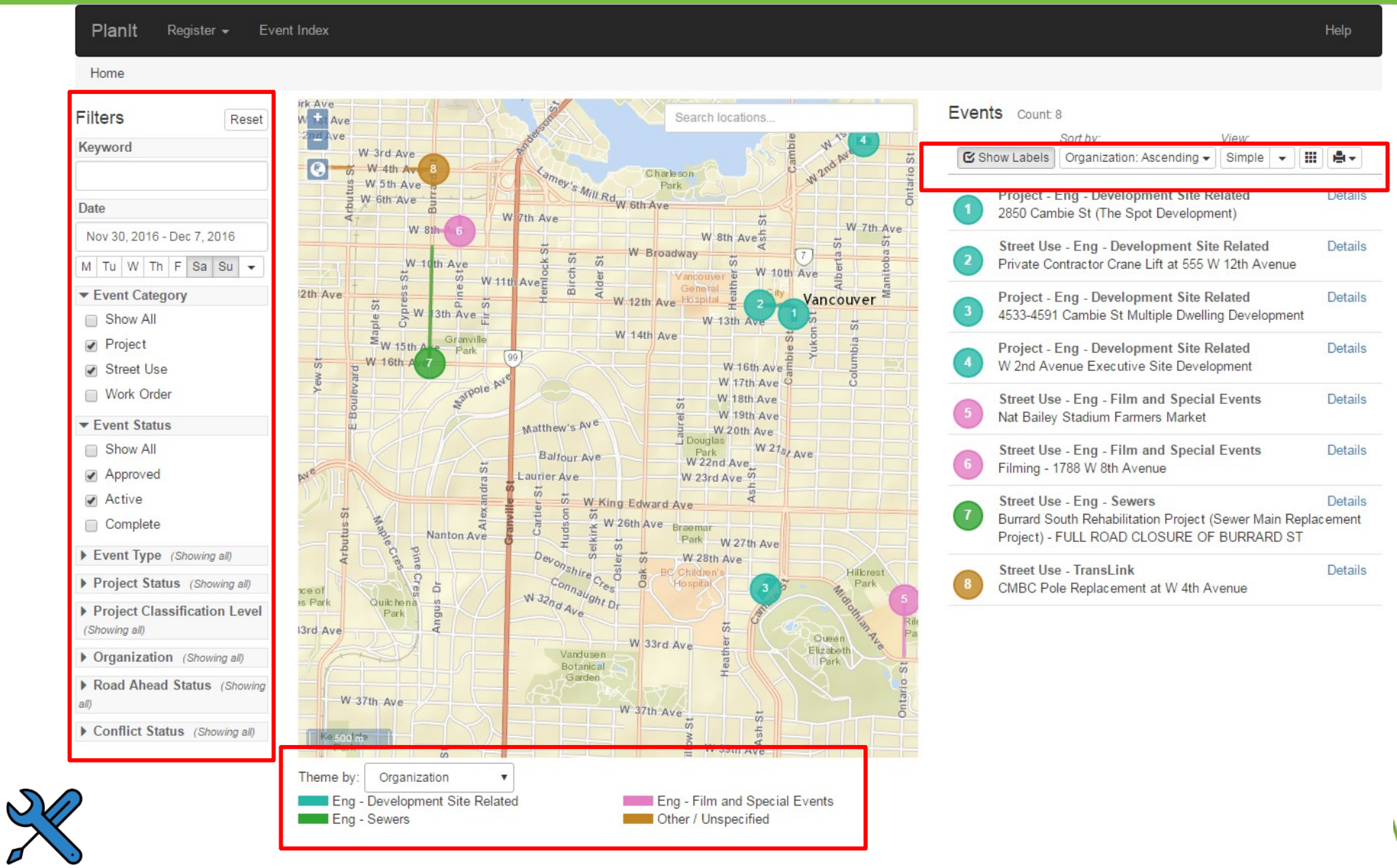
# Audience Needs Driving Design

**Design Parameters based on Audience:**

- Fast
- Flexible
- Maximize Screen Real Estate
- Minimal Scrolling
- Showing info differently to different users
- Features to Ease Data Entry
- Responsive Web Design



# User Interface Design



vanmaps3.vancouver.ca/planit/#view=simple

PlanIt | Register | Event Index | Help

Home

## Filters

Reset

**Keyword**

**Date**

Dec 1, 2016 - Dec 8, 2016

M Tu W Th F Sa Su

**Event Category**

- [ ] Show All
- [x] Project
- [x] Street Use
- [ ] Work Order

**Event Status**

- [ ] Show All
- [x] Approved
- [x] Active
- [ ] Complete

**Event Type** *(Showing all)*

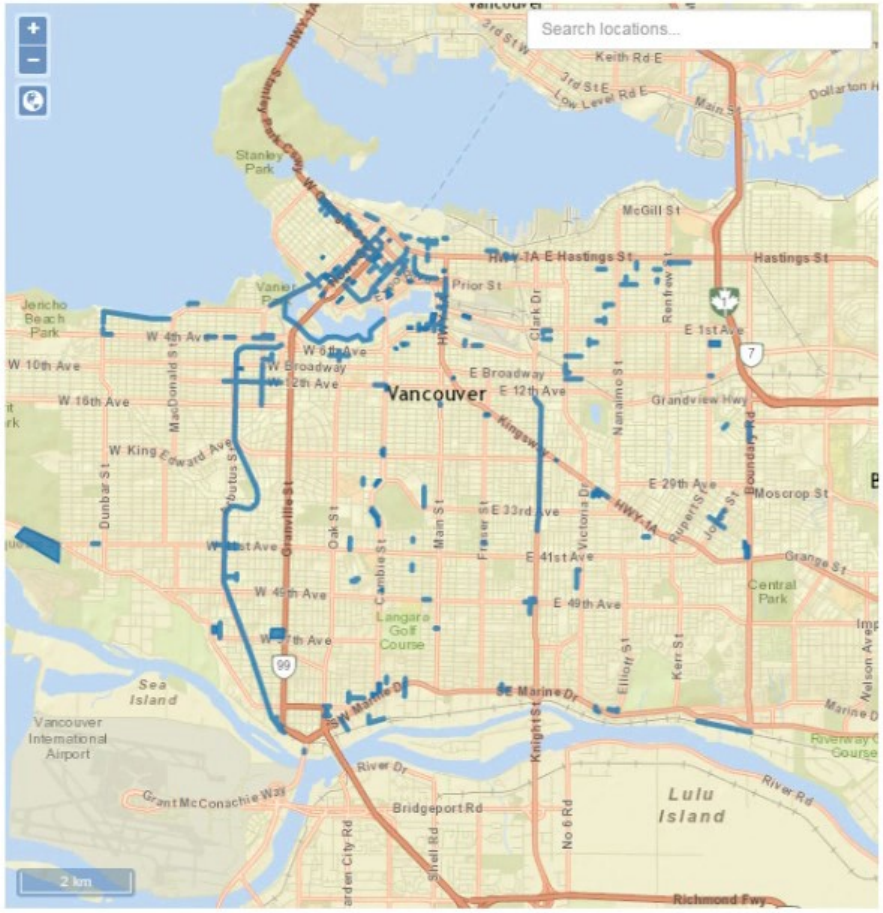
**Project Status** *(Showing all)*

**Project Classification Level** *(Showing all)*

**Organization** *(Showing all)*

**Road Ahead Status** *(Showing all)*

**Conflict Status** *(Showing all)*




Theme by: No theme

Event

## Events

Count: 136

Sort by: Organization: Ascending | View: Simple

Show Labels

**Street Use** — Details
Intermittent Lane Closure - TCP Trainining at 500 blk Penticton St

**Project** — Details
1520 Atlas Lane Shannon Mews Developments

**Street Use - BC Hydro** — Details
BC Hydro Pole Replacement at E 43rd Avenue

**Street Use - BC Hydro** — Details
BC Hydro Pole Replacement at E 38th Avenue

**Street Use - BC Hydro** — Details
BC Hydro Pole Replacement at Culloden Street

**Street Use - BC Hydro** — Details
BC Hydro Utility Construction at Robson Street

**Street Use - BC Hydro** — Details
BC Hydro Utility Maintenance at Ash Street

**Street Use - BC Hydro** — Details
BC Hydro Utility Maintenance at W Kent Ave North

**Street Use - BC Hydro** — Details
BC Hydro Utility Construction at Seymour Street

**Street Use - BC Hydro** — Details
BC Hydro Utility Maintenance at Cambie Street

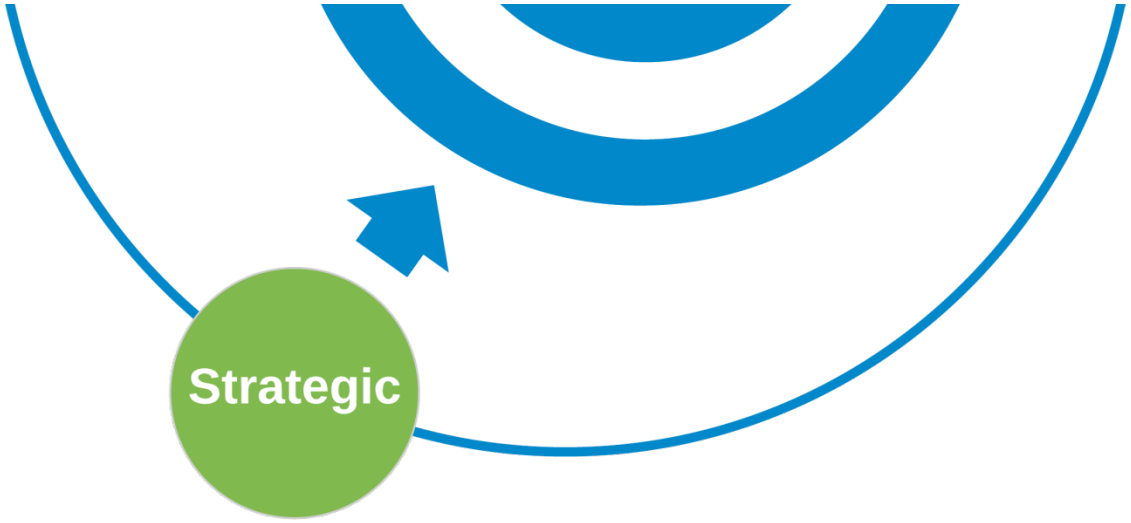
**Street Use - BC Hydro** — Details
BC Hydro Utility Construction at W 46th Avenue

**Street Use - BC Hydro** — Details
BC Hydro Pole Replacement at Maple Street and E Boulevard

**Street Use - BC Hydro** — Details
BC Hydro Utility Maintenance at E Hastings Street

**Street Use - BC Hydro** — Details

# Designed with Strategy




| | | |
|---|---|---|
| OPEN511<br>Intention of **Publishing to** Open 511 API | infor<br>Intention of **Pulling from** COV Application APIs | Intention of **Replacing** the Backbone of COV RoadAhead |

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Ingest Hansen WO & Posse Permits

PlanIt

Publish PlanIt data via COV RoadAhead

Publish data via Open 511

Microsoft Azure

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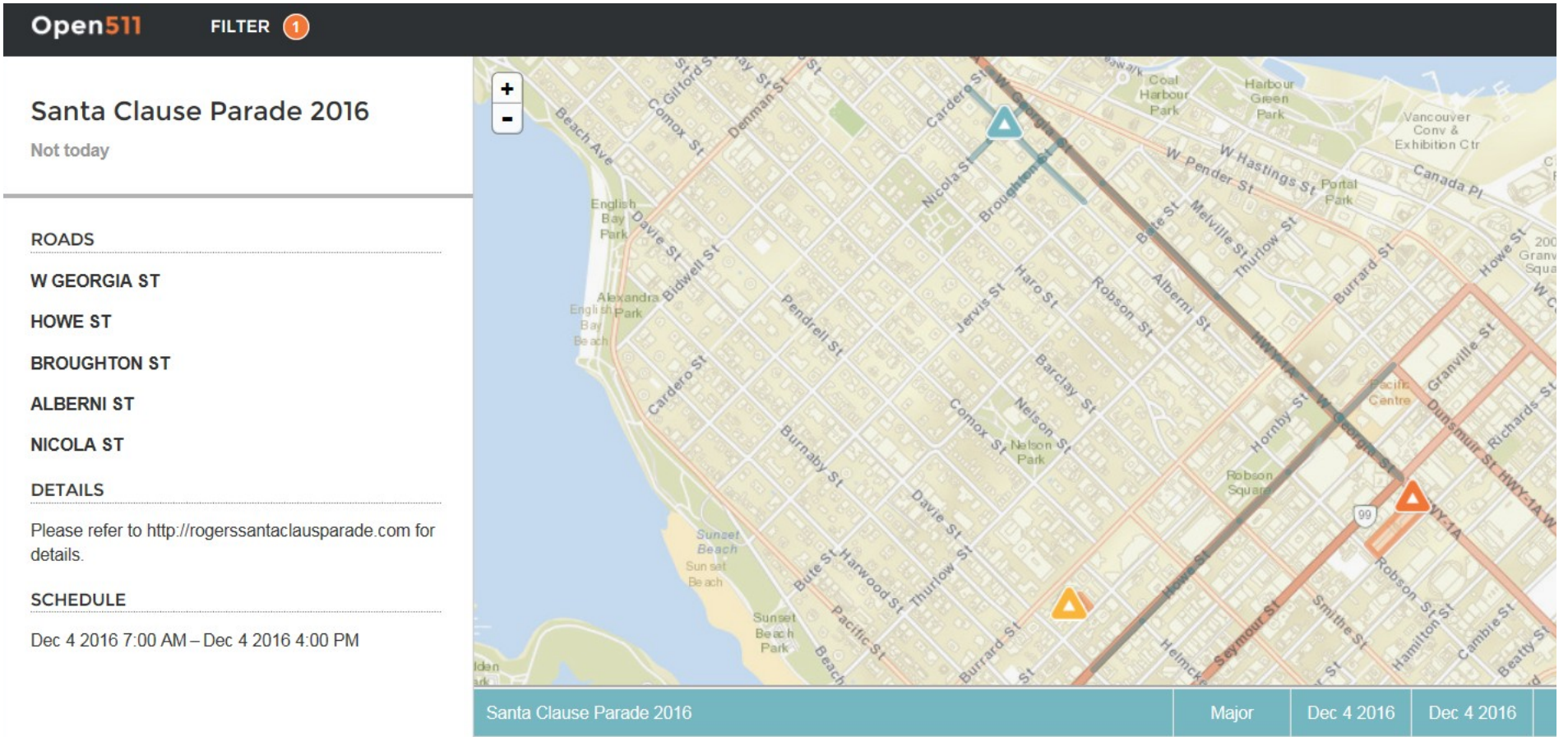
# Open 511 – what is it

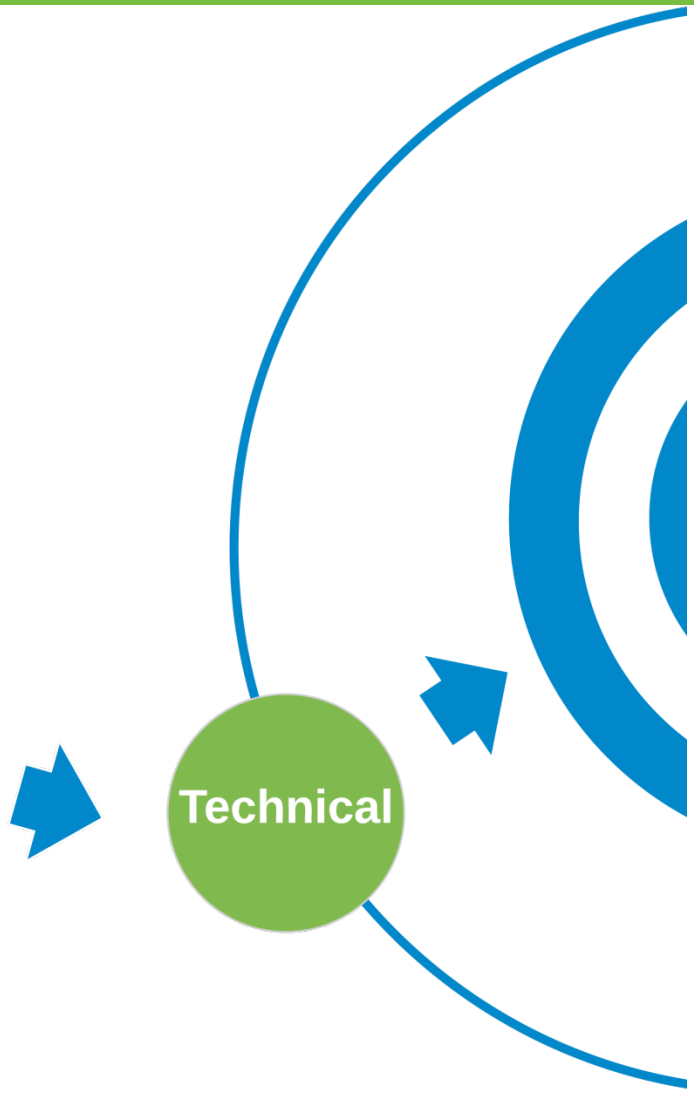
## International Standard to allow sharing of “Events” that impede traffic flow via Standardized API



# Technical

How did we make it "Work"?

- Open Layers Faceted Search
- Backbone.JS
- Bootstrap
- ASP.Net MVC
- Elastic Search
- Oracle



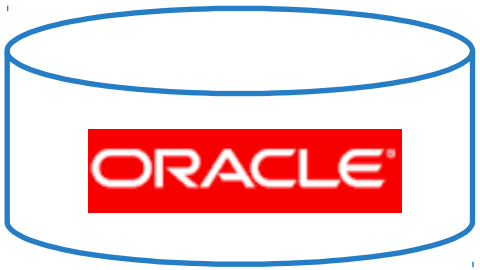
# Technology Stack

Bootstrap CSS

Client

.NET (ASP.NET MVC)

Server




Database / Storage

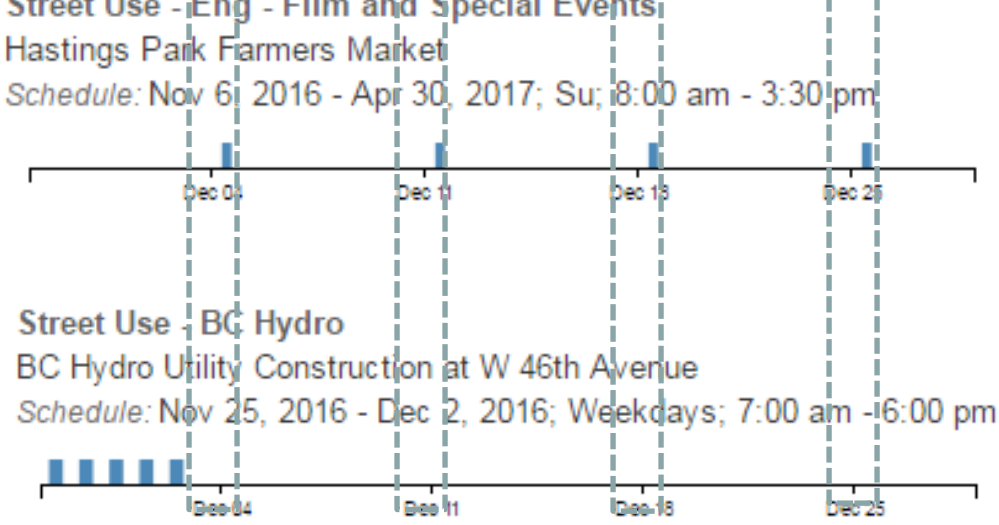
# Business Requirement: Scheduling

Filters

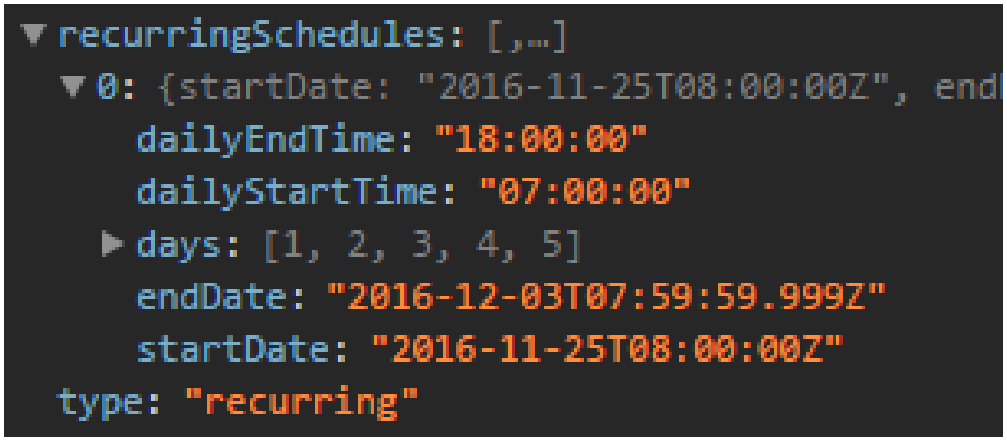
Date

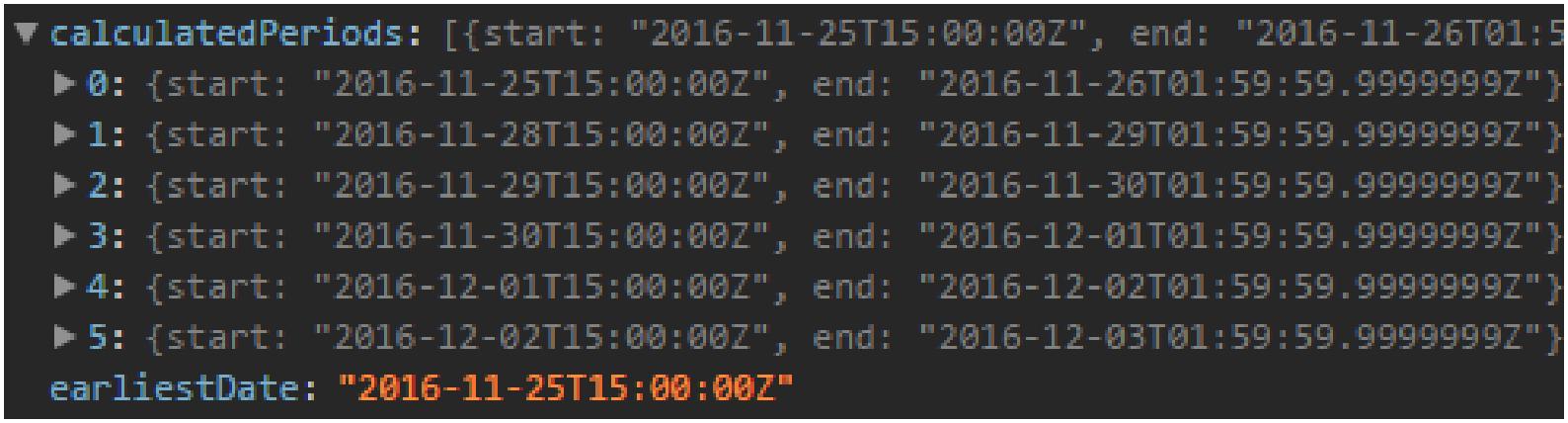
Nov 28, 2016 - Dec 28, 2016

M Tu W Th F Sa Su



# Scheduling in Elasticsearch



Time Period Library for .NET

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# Conflict Detection

## Street Use Details

Edit | Delete

This street use has at least one unresolved conflict. Please review the conflicts section below.

| | |
|---|---|
| **Title** | BC Hydro Utility Construction at Campbell Avenue |
| **Schedule** | Nov 23, 2016 - Nov 30, 2016; Weekdays; 7:00 AM - 6:00 PM |
| **Event Type** | Roadwork - Utilities |
| **Description** | Traffic at both sides of Campbell Ave from E Hastings St to E Cordova St will be reduced to one lane in each direction from 7am to 6pm. Work also requires the closure of lane north of E Hastings St from Campbell Ave to Raymur Ave. |
| **Location Description** | Campbell Ave from E Hastings St to E Cordova St |

### Conflicts

*This street use has 1 unresolved and 0 resolved conflicts.*

| Event Title | Explanation | Status | |
|---|---|---|---|
| Telus Utility Maintenance at Campbell Avenue | Events intersect in space and time | Unresolved | Manage Conflict |

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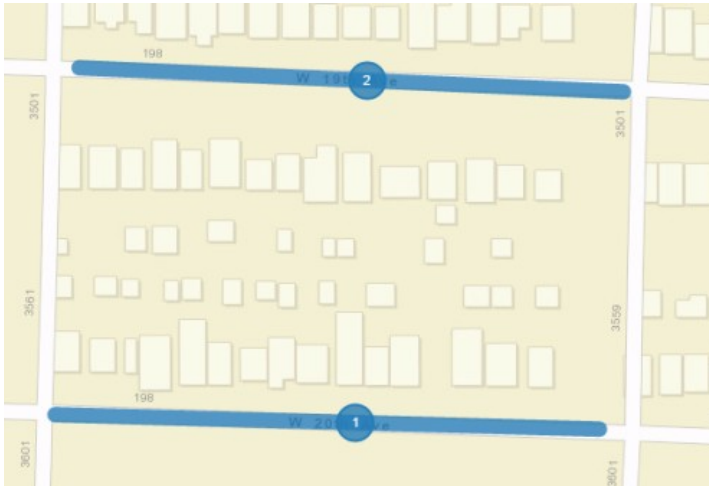
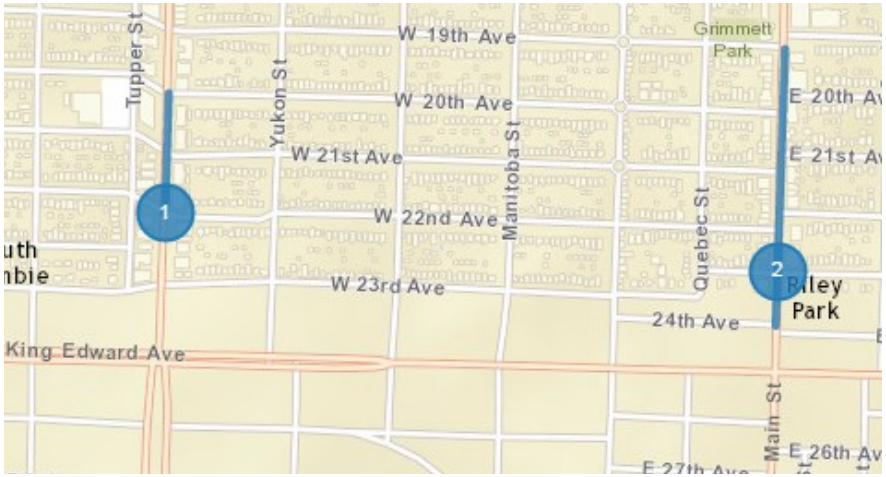
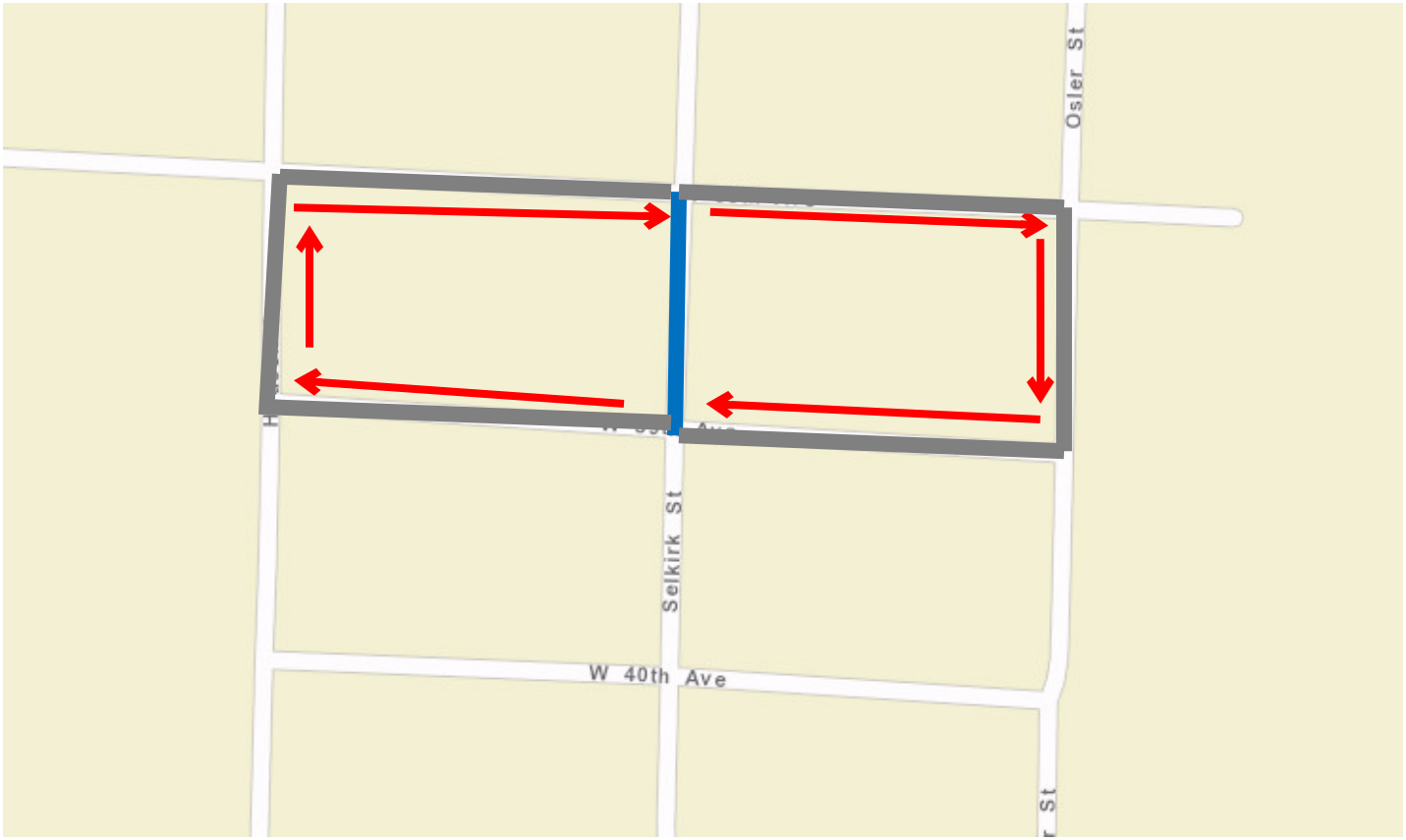
# Conflict Detection- Rules



# Conflict Detection – Street Reservation System

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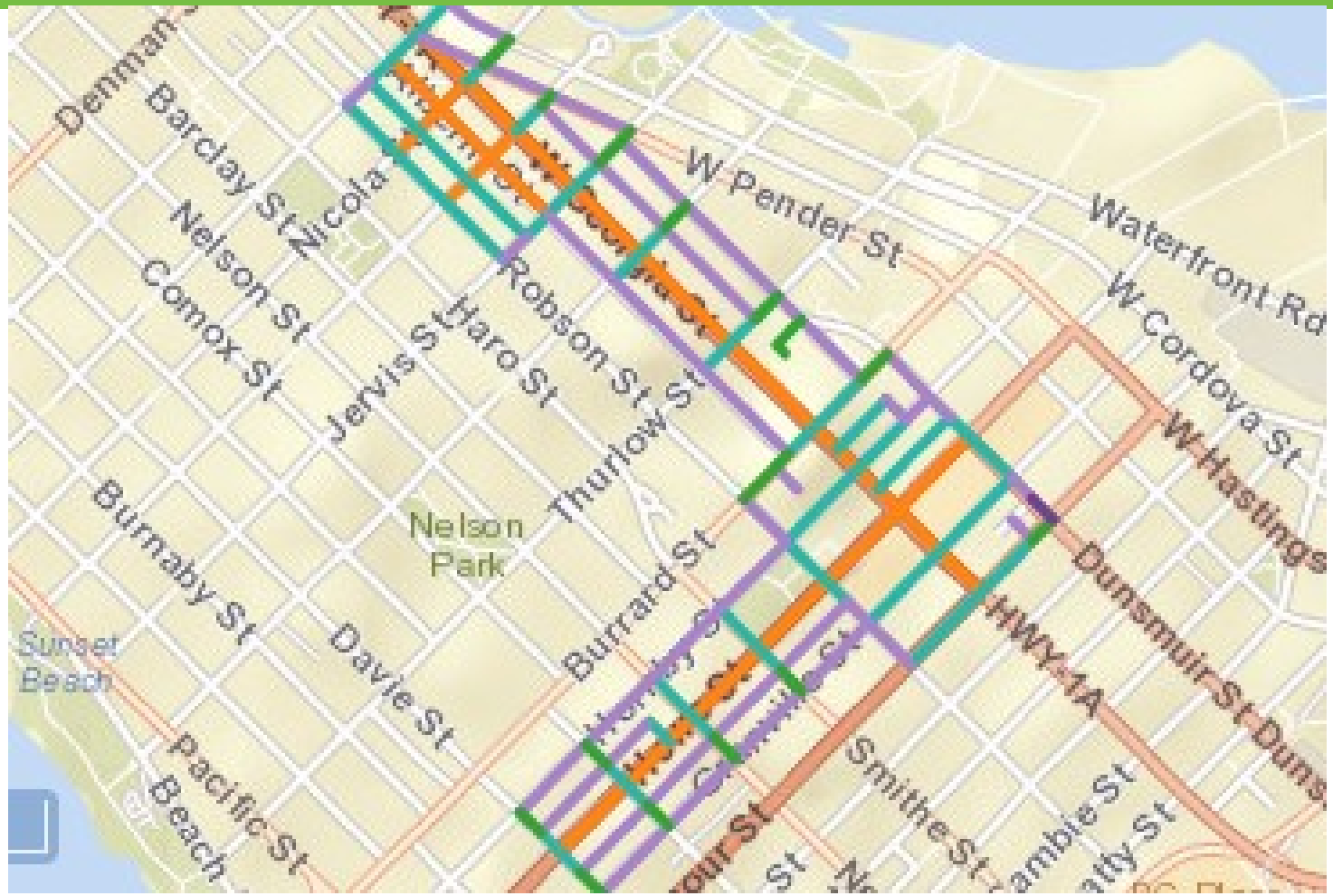
# Conflict Detection – *e.g.* Santa Claus Parade

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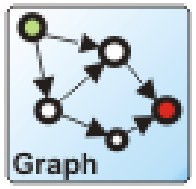
# Conflict Detection

## Challenges

- Performance
- Data integrity for topology

## Technical

**NetTopologySuite**




QuickGraph, Graph Data Structures And Algorithms for .NET

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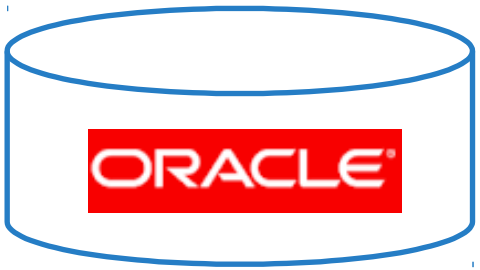
# Strategic Integration

Bootstrap CSS

Client

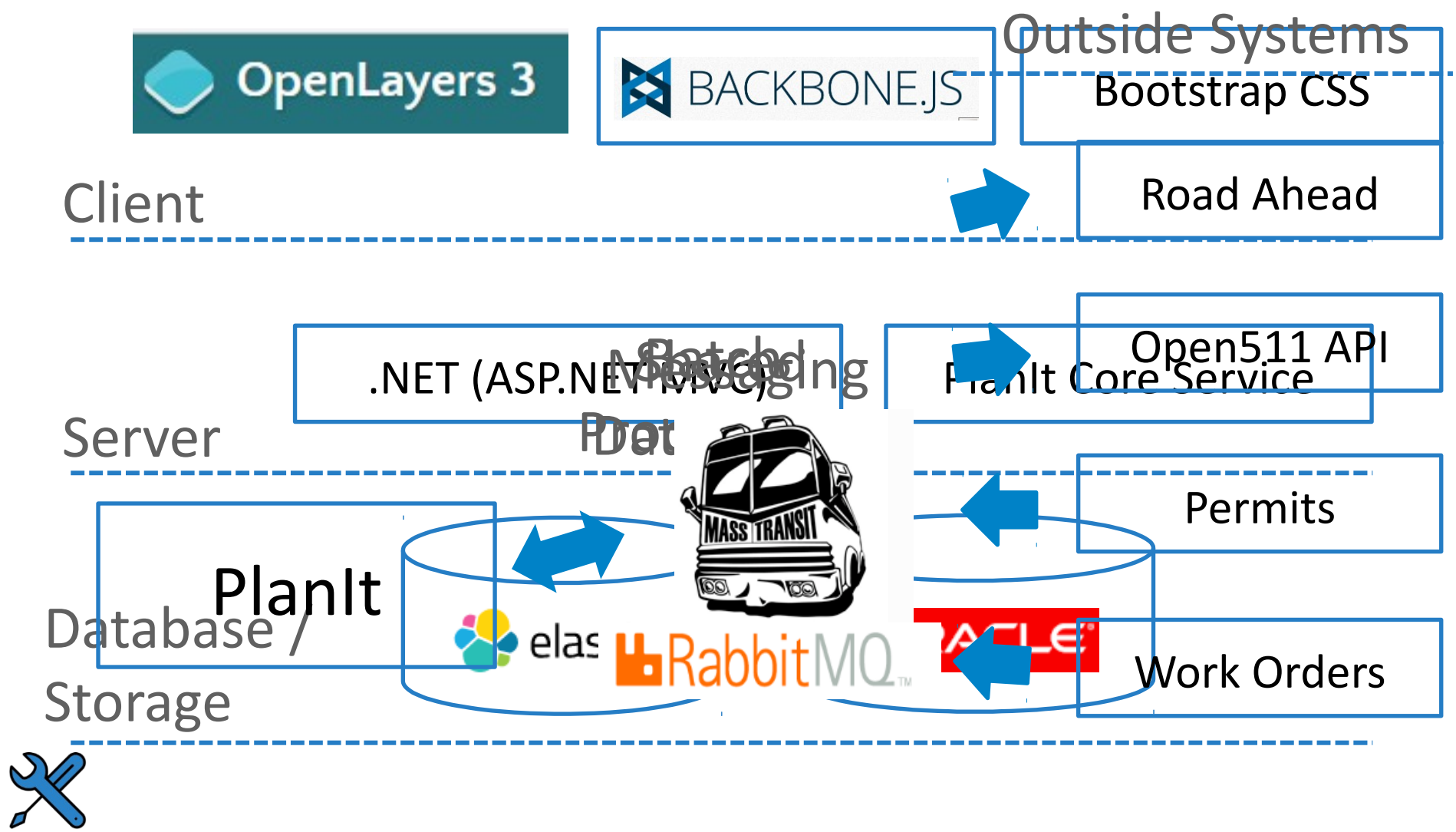
.NET (ASP.NET MVC) PlanIt Core Service

Server




Database / Storage

# Strategic Integration



# Lessons Learned

- Automated Unit Tests
- OpenLayers more flexible than Leaflet
- Conflict Detection – Topology
- Optimization
- Agile design enables users to be participants
- Longer & Complicated
- Visualization is key

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# How has PlanIt enabled City of Vancouver?

- Source for ALL Construction Planning meetings
- Data entry & Update Tools for Planners & Project Coordinators
- Enabled the City to meet Open Data and Digital Strategy initiatives
- Encouraged other city departments to build integration capabilities PlanIt data into their displays/workflow roadmaps:
  - Vehicle GPS Driver Display
  - Parking Enforcement Display

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# What Are we Working On (2017+)

- Long term capital planning details from Utilities
- Concept of “Street Construction Moratorium” on streets
- Publishing data to Open 511 API & Drive BC

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For more information please contact:


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