

# Getting Mobile with Mobile Devices: Using the Web to Improve Transit Accessibility

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University  
of Victoria

# About Us

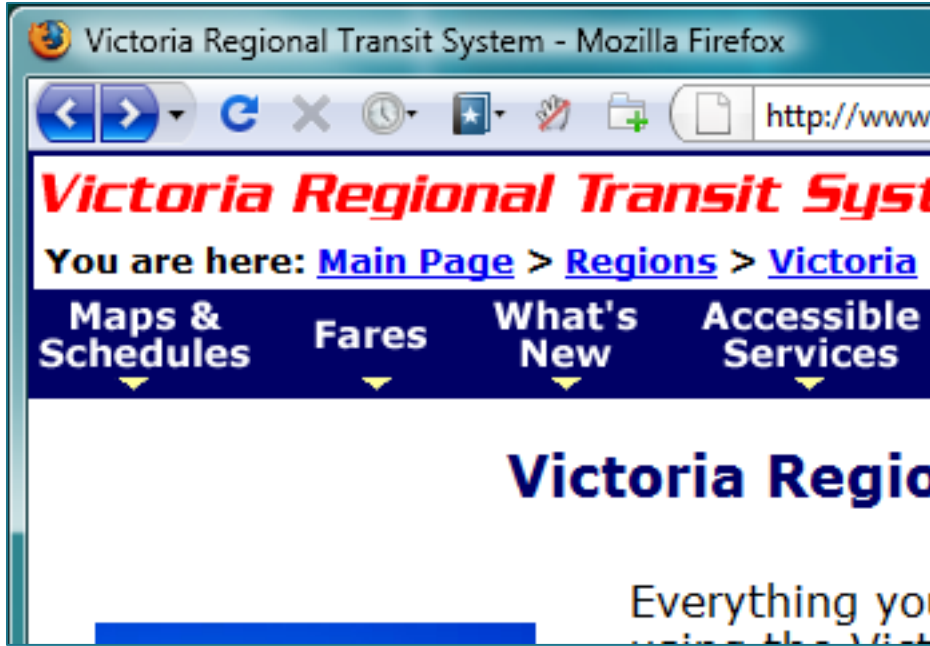
- ▶ University of Victoria / Department of Computer Science Mobile Device Group
- ▶ Our work is supported by:
  - NSERC
  - The University of Victoria
  - Nokia Canada

# Difficulties with Transit Systems

- ▶ Physical problems:
  - Finding the right bus
  - Finding the bus door
  - Staying independent
- ▶ Technology Problems
  - JavaScript fly-out menus
  - Complicated tables of schedule data
  - Most of Web 2.0



# Remarkable Similarities



Visually impaired using  
desktop PC



Non-impaired using  
mobile device

# Fly-Out Menus

**Victoria Regional Transit System**

You are here: [Main Page](#) > [Regions](#) > [Victoria](#)

- Maps & Schedules
- Fares
- What's New
- Accessible Services
- Library & Programs
- New Users
- Contact Us

How to Get to Popular Destinations (ferries, attractions & ...)

Victoria CRD Map

- Combined Routes Map
- Greater Victoria Map
  - Downtown Victoria Map
- Saanich Peninsula Map
- Sooke Area Map
- Western Communities Map

Transit Exchanges

Park 'n Ride Locations

- Routes 1 to 11
- Routes 14 to 25
- Routes 26 to 33
- Routes 35 to 55
- Routes 56 to 70
- Routes 71 to 81
- Routes 82 to 70,71,72,73

Holiday Schedule

Route Descriptions

Community Bus

**Victoria Regional Transit System**

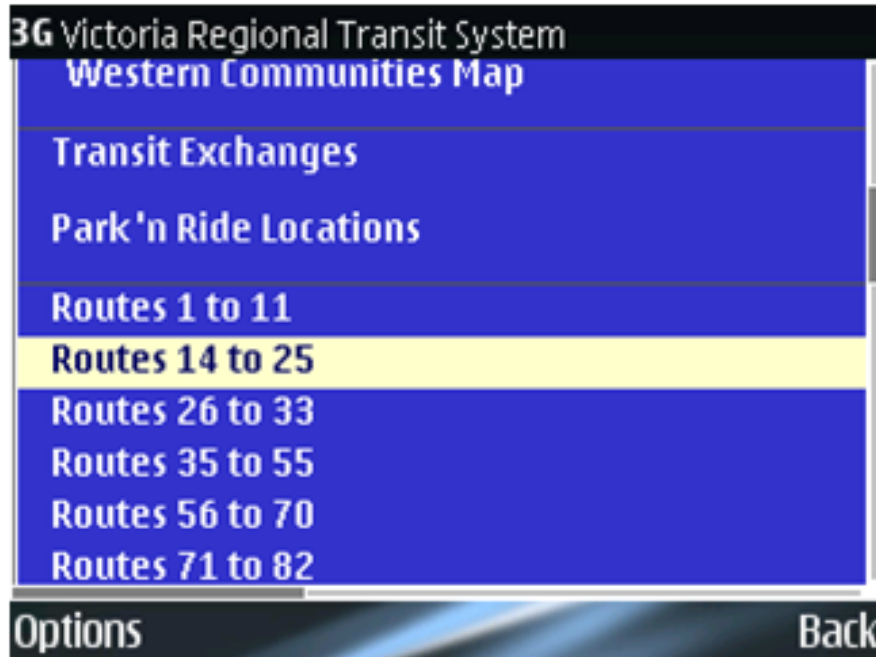
... about using the Victoria Regional Transit System.

... en days a week, 365 days a year. The service

... s and service levels are made by the [Victoria](#) ...  
... mation and planning provided by BC Transit.

- Route 14--VIC GENERAL / UVIC
- Route 16--HILLSIDE MALL
- Route 17--CEDAR HILL SCHOOL SPECIAL (Christmas Hill)
- Route 18--CEDAR HILL SCHOOL SPECIAL (Cloverdale)
- Route 21--INTERURBAN / DOWNTOWN
- Route 22--VIC GENERAL / HILLSIDE MALL
- Route 24--CEDAR HILL / ADMIRALS WALK
- Route 25--MAPLEWOOD / ADMIRALS WALK / WESTERN E

# Fly-Out Menus



- ▶ Using a visual accessibility zoom feature can be similar to a mobile web browser
- ▶ Selecting the menu item shows no action – the fly-out is hidden

# Tabled Data

Choose direction  WEST  EAST

Choose day  Monday through Friday  Saturday  Sunday

**Monday through Friday - Morning**

Bus Type	UVic Exchange	Oak Bay Junction	Douglas at Johnson	Bay at Government	Craigflower at Tillicum	Victoria General Hospital
Access	5:51	6:02	6:09	6:14	6:20	6:31
Access	5:56	6:08	6:15	-	-	-
Access	6:12	6:25	6:32	6:36	6:42	6:52
Access	6:22	6:39	-	-	-	-
Access	6:32	6:49	6:57	7:01	7:10	7:23
Access	6:50	7:07	7:15	7:19	7:28	7:41
Access	7:05	7:22	7:30	7:34	7:43	7:56
Access	7:20	7:37	7:45	7:49	7:58	8:11
Access	7:21	7:38	7:45	-	-	-
Access	7:29	7:46	7:53	-	-	-
Access	7:35	7:52	8:00	8:04	8:13	8:26
Access	7:41	7:58	8:05	-	-	-
Access	7:50	8:07	8:15	8:19	8:28	8:41



# Tabled Data

10:00	10:17	10:25	-
10:06	10:23	-	-
10:15	10:32	10:40	10:44
10:17	10:34	10:42	-
10:30	10:47	10:55	10:59
10:36	10:53	-	-
10:45	11:02	11:10	11:14
10:56	11:13	11:21	-
11:00	11:17	11:25	11:29
11:06	11:23	-	-



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# Tabled Data

UVic Exchange
5:51
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7:41
7:50



# Tabled Data

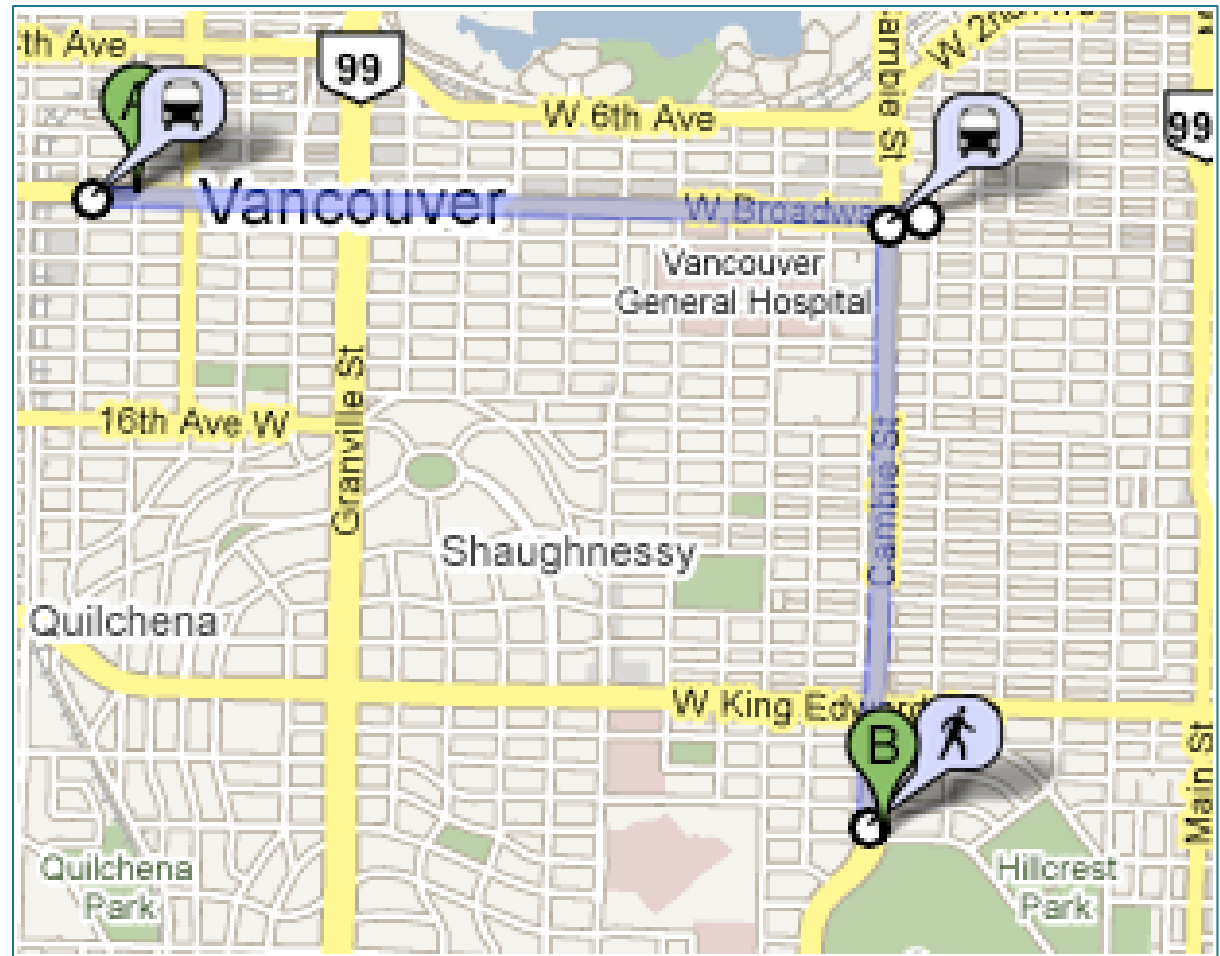
7:05





# Combining Data Sources

- Google currently collects this information
- Google, we'd love to see an API 😊



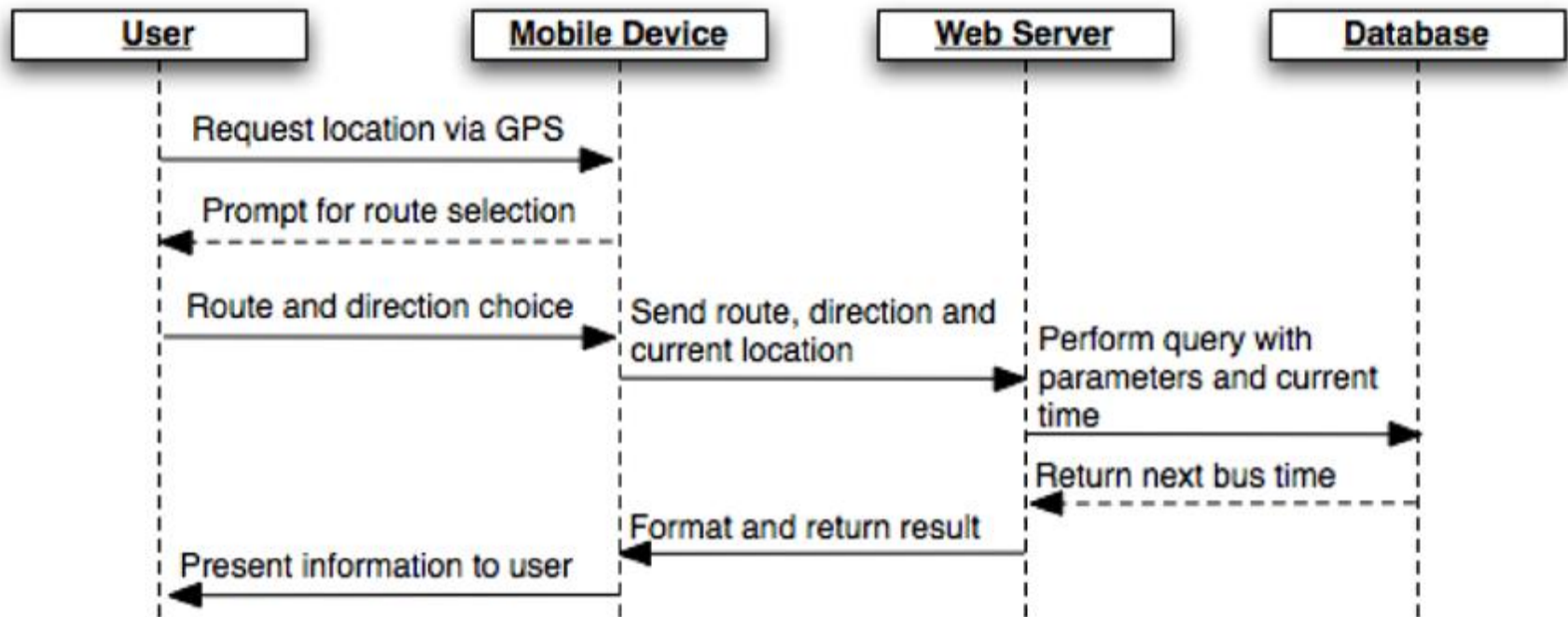
# The BussPass Solution

- ▶ Web Based Mobile Application
- ▶ Filtering schedule data for:
  - Current time
  - Current location
  - User preferences

# BussPass Requirements

- ▶ Web configurable for the abilities of the user
- ▶ Any solution needs to work on as many platforms as possible
- ▶ Creating an application with mass-market appeal

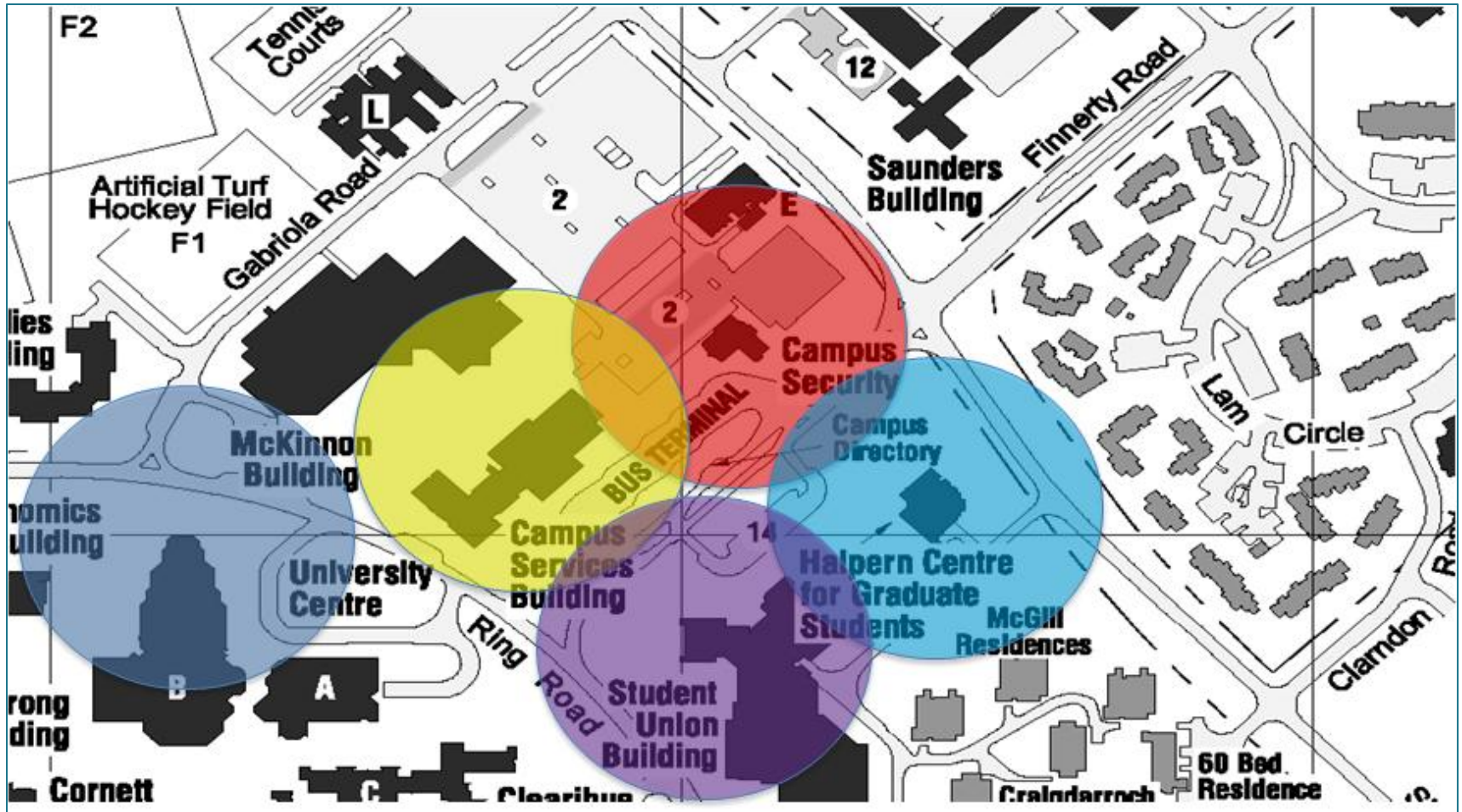
# BussPass Data Flow



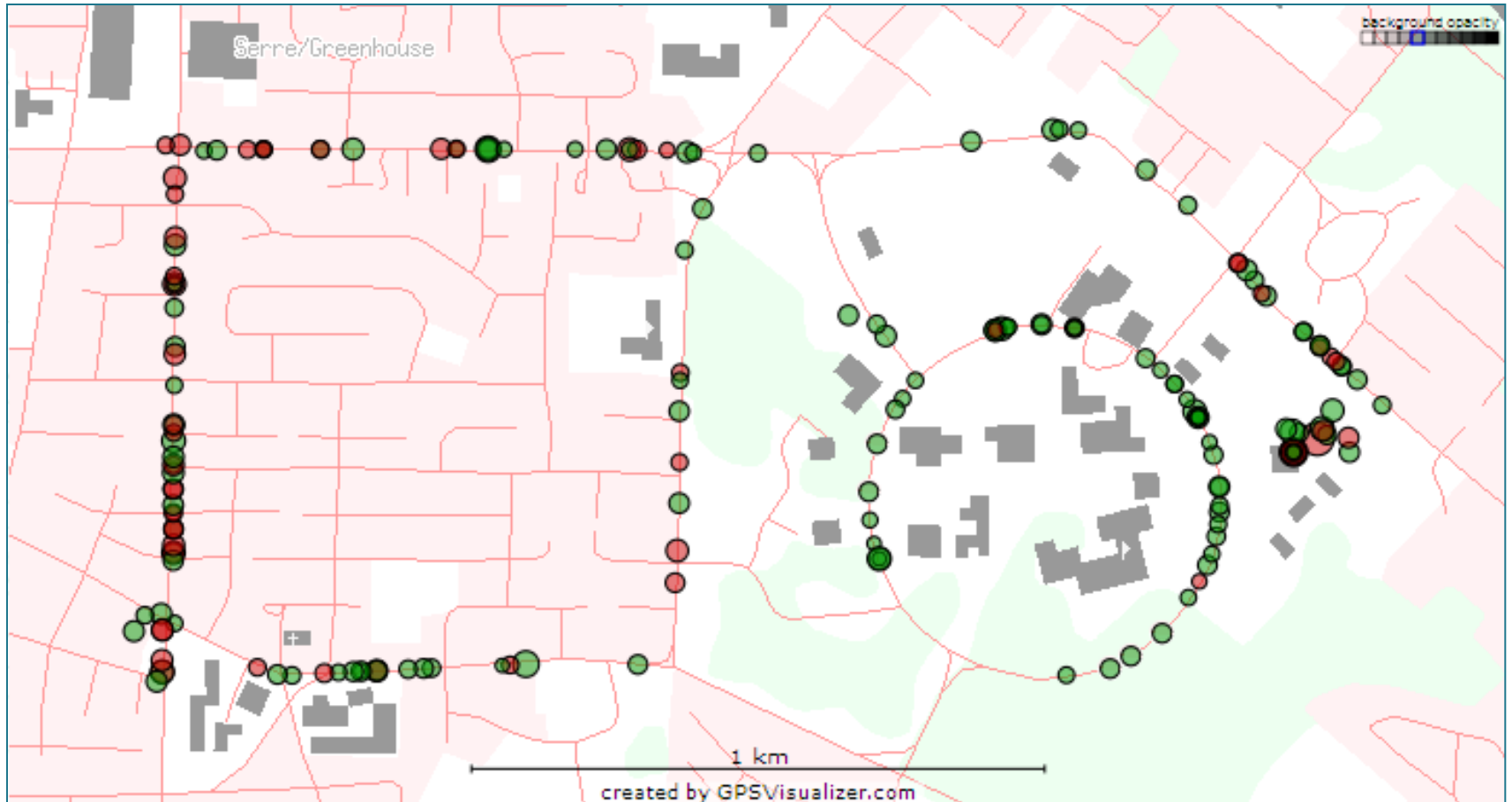
# Acquiring Location Knowledge

- ▶ GPS
- ▶ Wi-Fi scanning
- ▶ Bluetooth scanning

# Wi-Fi Location



# Wi-Fi Location



# Graceful Degradation

- ▶ GPS
- ▶ Wi-Fi
- ▶ Bluetooth



# Modern Mobile Phones

- ▶ iPhone with tactile overlays
- ▶ Trekker Breeze
- ▶ Nokia N97 (releasing soon)
  - 3.5 inch 640×360 touch screen
  - Dual core 370MHz ARM CPU
  - 128MB RAM
  - 32GB internal storage, Micro SD expansion
  - Wi-Fi, Bluetooth, GPS
  - Accelerometer, Digital Compass/3D Magnetometer
  - Slide out keyboard



# Summary

- ▶ There is some room for accessibility improvements in transit systems
- ▶ Existing mobile devices can handle the required functionality
- ▶ The technology is ready

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