

Simple Indoor Routing on SVG Maps

Julian Ohrt, Volker Turau
LISE2013, October 28



Finding the way inside

FLOORPLAN

OG 2

THIRD FLOOR



OG 1

SECOND FLOOR

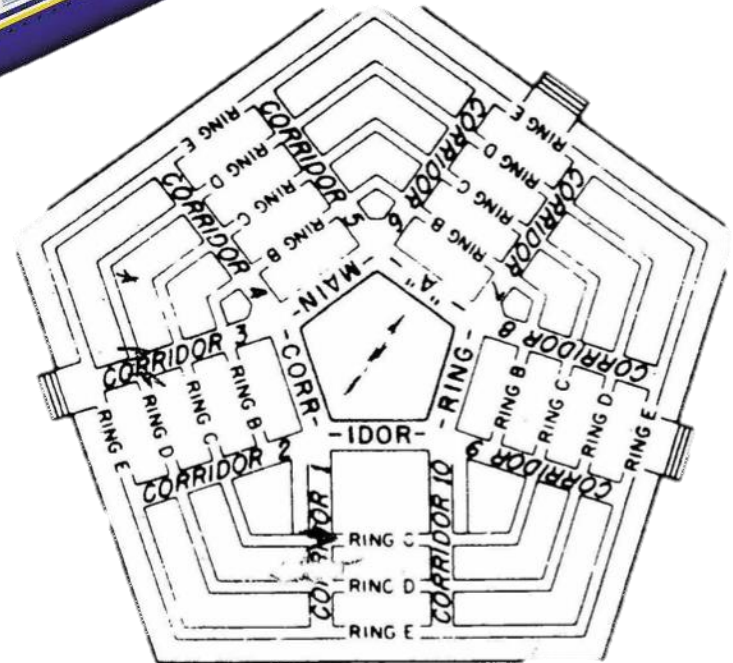
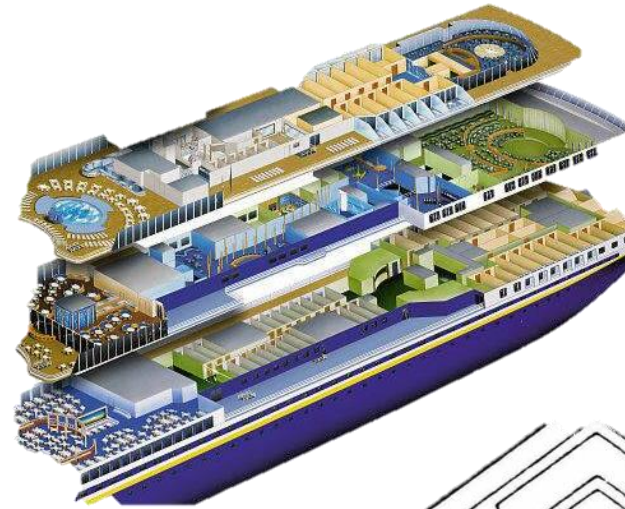


EG 2

FIRST FLOOR

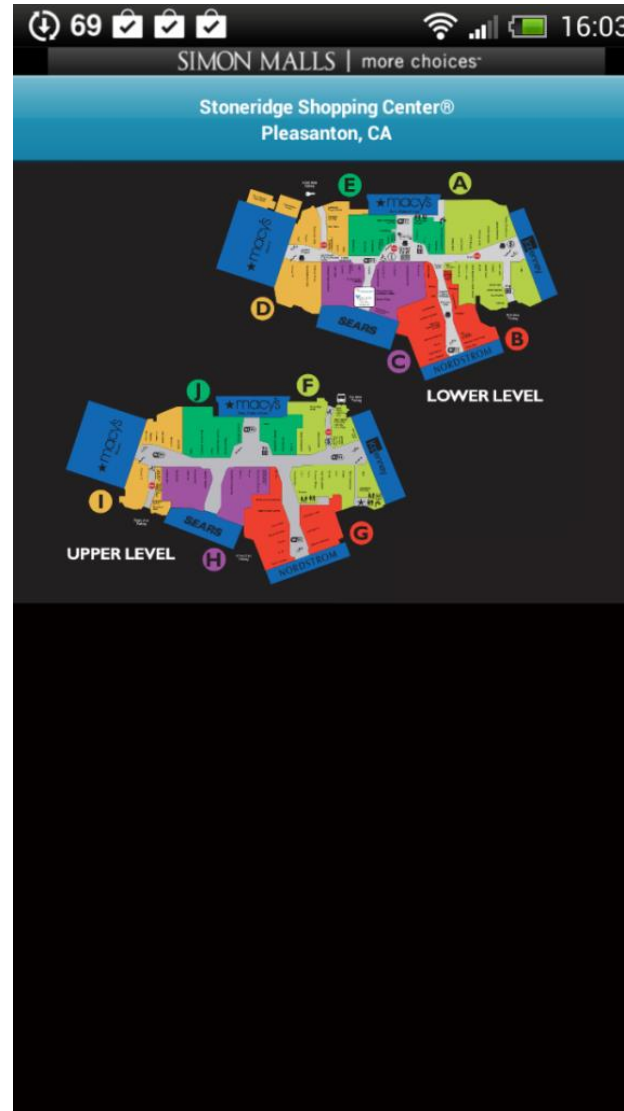


Finding the way inside



Approaches for indoor maps

	Creation	Routing?
Simple pixel graphics	+	x



Approaches for indoor maps

	Creation	Routing?
Simple pixel graphics	+	✗
Graphics with POIs	○	✗



Stone ridge Map

You are here
(Beretta & Naidoo Sports & Medical Physiotherapists)

Beretta & Naidoo Sports & Medical Physiotherapists (U33A)

UPPER LEVEL
CENTRE COURT
TOYS
4 UP

FREE PARKING

MEZZANINE LEVEL
FURNISH ACTIVE

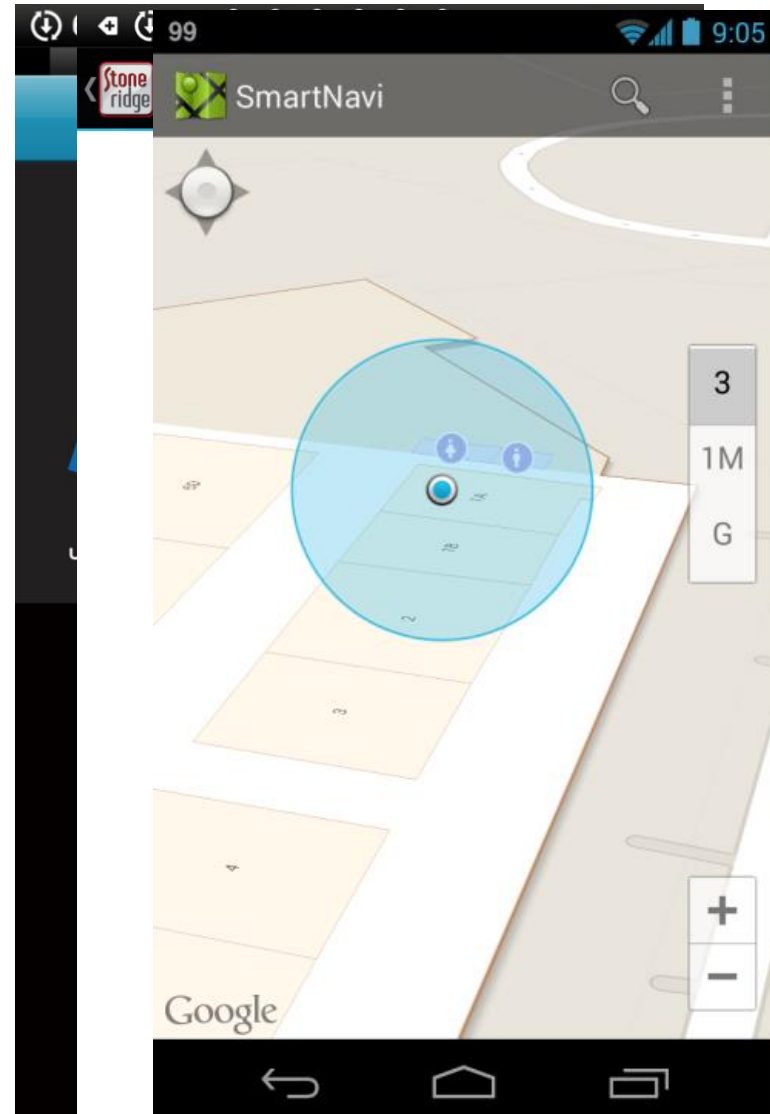
LOWER LEVEL

maps by: 

You want to be here (Beds & ...)

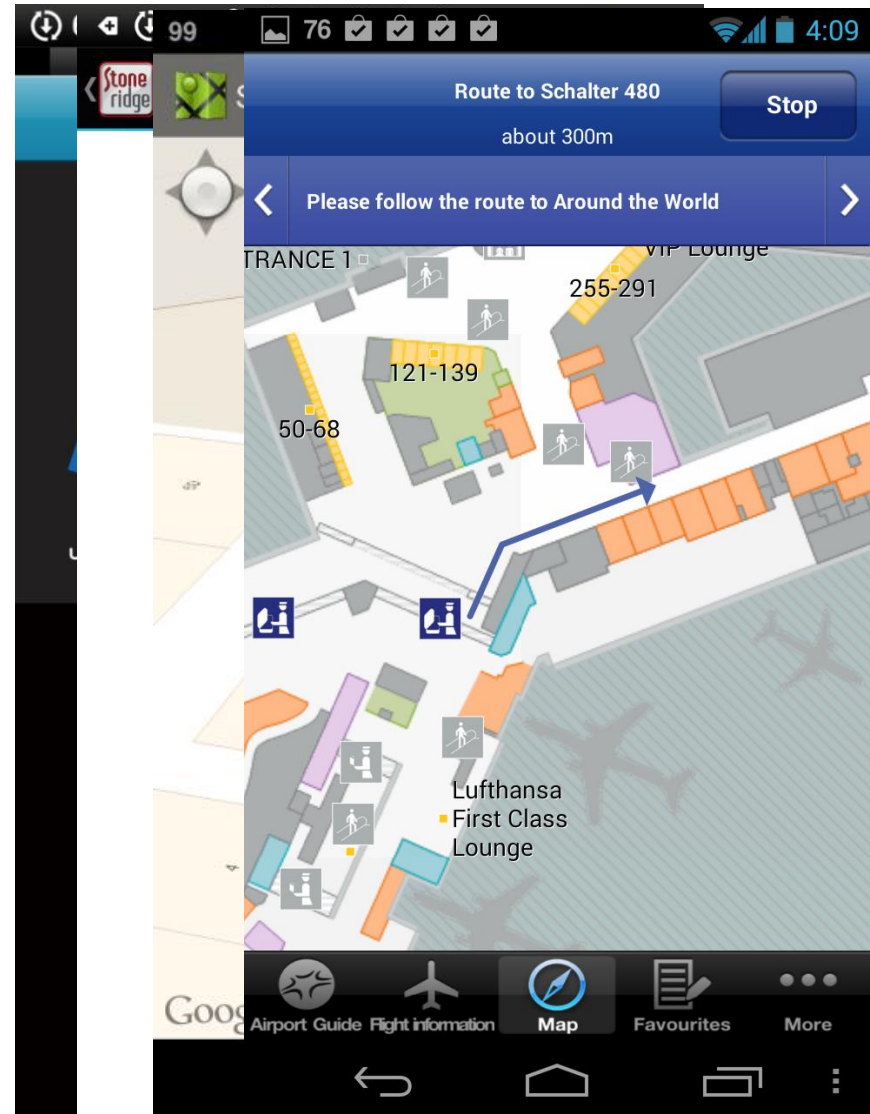
Approaches for indoor maps

	Creation	Routing?
Simple pixel graphics	+	x
Graphics with POIs	○	x
Global map providers (Google, Bing, OSM)	○	x



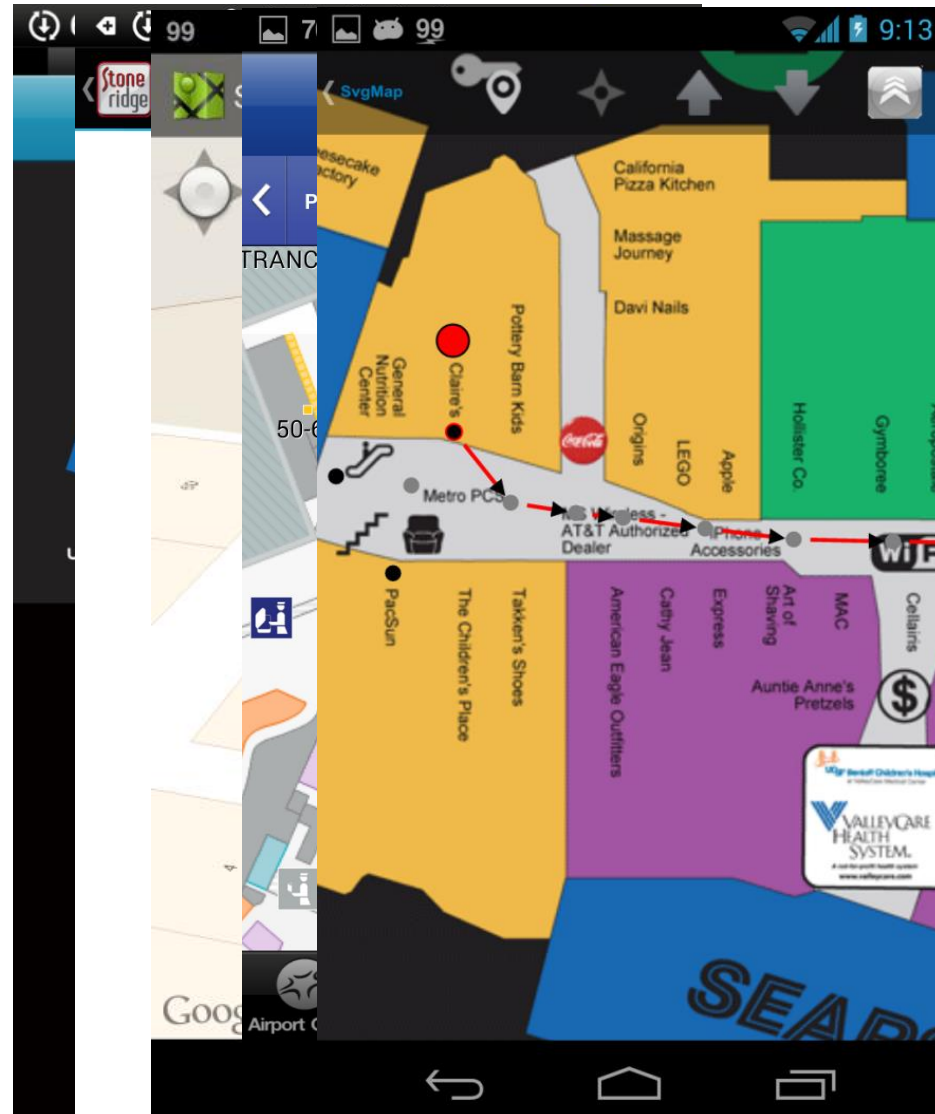
Approaches for indoor maps

	Creation	Routing?
Simple pixel graphics	+	x
Graphics with POIs	○	x
Global map providers (Google, Bing, OSM)	○	x
Custom maps	-	?



Approaches for indoor maps

	Creation	Routing?
Simple pixel graphics	+	✗
Graphics with POIs	○	✗
Global map providers (Google, Bing, OSM)	○	✗
Custom maps	-	?
SvgNaviMap	○	✓

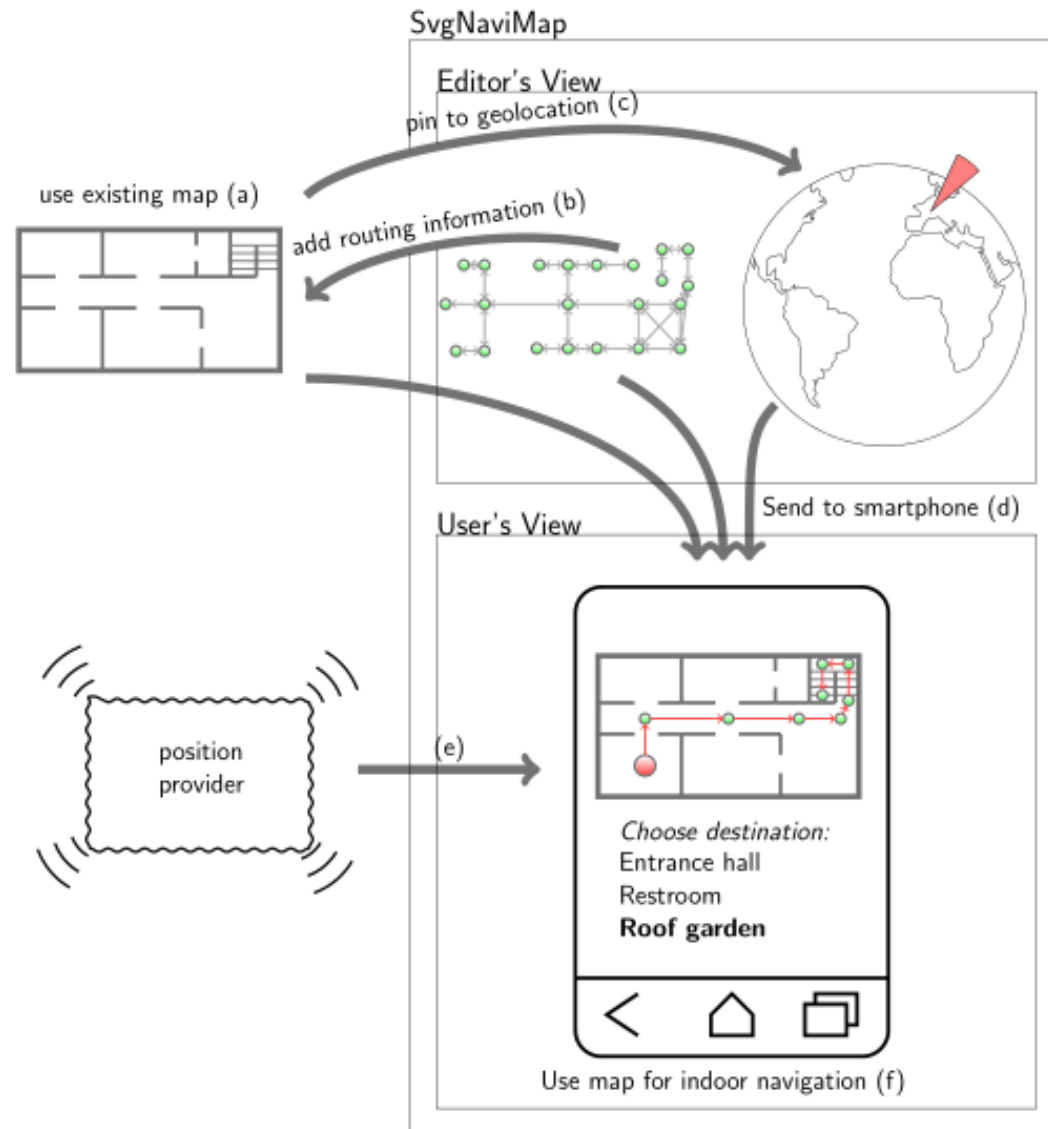


Premises for our navigable maps

- Re-use existing floor plans
- Support multiple levels
- Allow easy point-to-point navigation
- Run inside web browser
- Offline and locally stored maps
- Integratable with future positioning technologies

System design: SvgNaviMap

- Use existing map
- Add routing information
- Pin to geolocation
- Send to smartphone
- (integrate position provider)
- Use map for indoor navigation



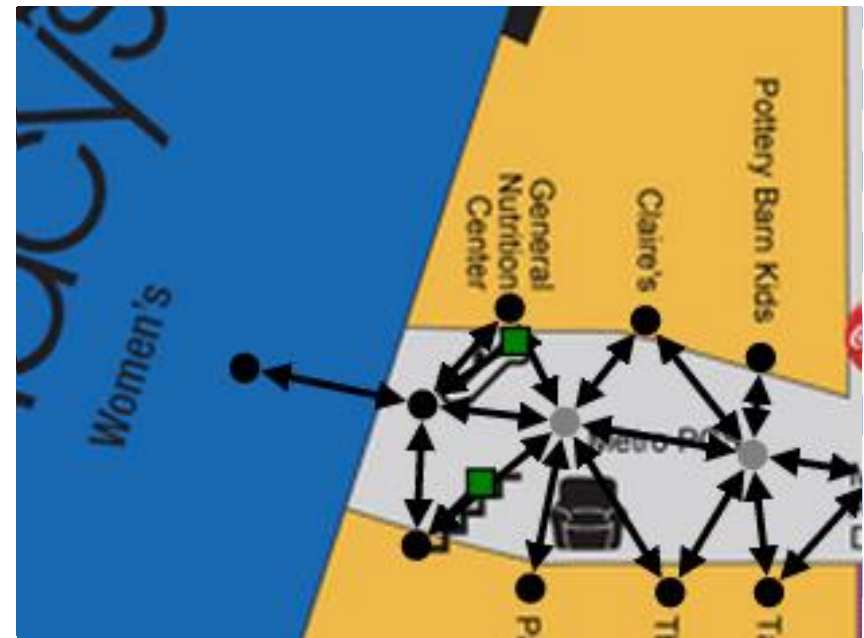
Routing information

- Draw on top of map (overlay)



Routing information

- Draw on top of map (overlay)
- Bi-directional graph (across levels)



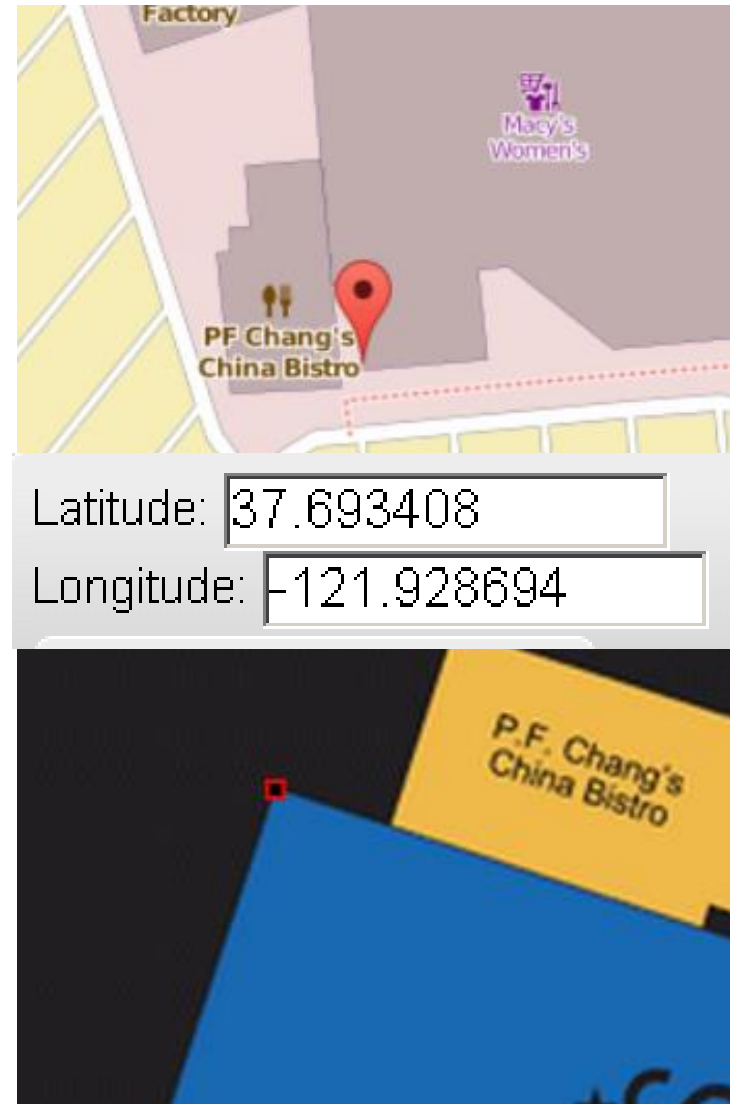
Routing information

- Draw on top of map (overlay)
- Bi-directional graph (across levels)
- Affiliation areas (for each node)



Routing information

- Draw on top of map (overlay)
- Bi-directional graph (across levels)
- Affiliation areas (for each node)
- GPS markers (at least two)



Routing information

- Draw on top of map (overlay)
- Bi-directional graph (across levels)
- Affiliation areas (for each node)
- GPS markers (at least two)
- Altitude of each level

Level 0:	
Bottom	<input type="text" value="0"/>
Top	<input type="text" value="5"/>
Level 1:	
Bottom	<input type="text" value="5"/>
Top	<input type="text" value="10"/>

Routing information

- Draw on top of map (overlay)
- Bi-directional graph (across levels)
- Affiliation areas (for each node)
- GPS markers (at least two)
- Altitude of each level
- Store as XML file

```
<!-- svgmap-data.xml -->
<svgmap-data>
  <levels>
    <level>
      <id>0</id>
      <svgpath>airport_level1_fullsvg_big.svg</svgpath>
      <min_altitude>0</min_altitude>
      <max_altitude>5</max_altitude>
    </level>
    <!-- more levels -->
  </levels>
  <gpsmarkers>
    <gpsmarker>
      <id>0</id>
      <svgid>0</svgid>
      <x-pos>77.62238190267871</x-pos>
      <y-pos>283.2334011527971</y-pos>
      <latitude>53.62841</latitude>
      <longitude>10.002896</longitude>
    </gpsmarker>
    <!-- more gpsmarkers -->
  </gpsmarkers>
  <vertices>
    <vertex>
      <id>0</id>
      <svgid>0</svgid>
      <x-pos>725.6700150991223</x-pos>
      <y-pos>416.44033036772737</y-pos>
      <poi>true</poi>
      <shortDescription>Checkin2</shortDescription>
      <longDescription>Flightline%20Counter</longDescription>
      <borderpoint>
        <id>39</id>
        <x-pos>716.82326568531</x-pos>
        <y-pos>407.068579438365</y-pos>
      </borderpoint>
    </vertex>
  </vertices>
</svgmap-data>
```

Android live demo

- Map of Stoneridge Shopping Center® in Pleasanton, CA, USA
- Map source:
<http://www.simon.com/mall/stoneridge-shoppingcenter/map>

Summary

- SvgNaviMap
- Technology to make available maps routable
- Open source

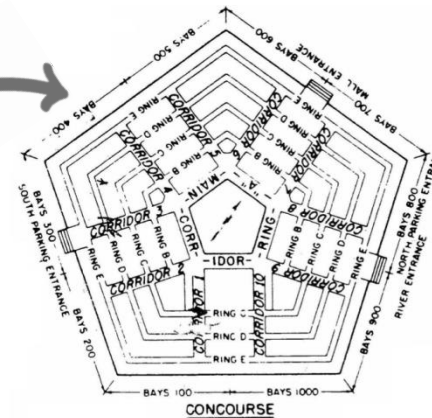
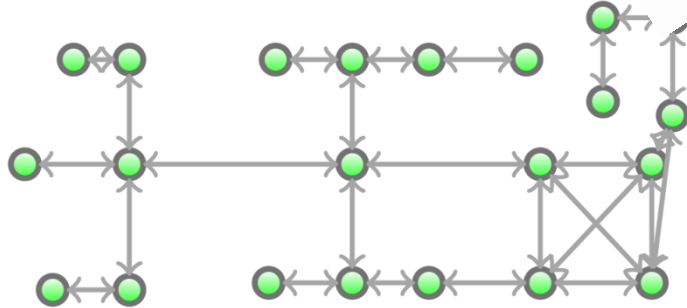


FLOORPLAN

OG 2
THIRD FLOOR



EG 2
FIRST FLOOR



Thank you for your attention

