Redistribution Technology Panel

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What the operator wants

- Where are my current hotspots? ✓
- What to do now to avoid short term issues?
- What can be done in order for the system to rebalance itself?

Multiple rebalancing needs

- Nighttime rebalancing
  - Dispatching
  - Route optimisation
- On-the-fly rebalancing
  - Based on actual demand

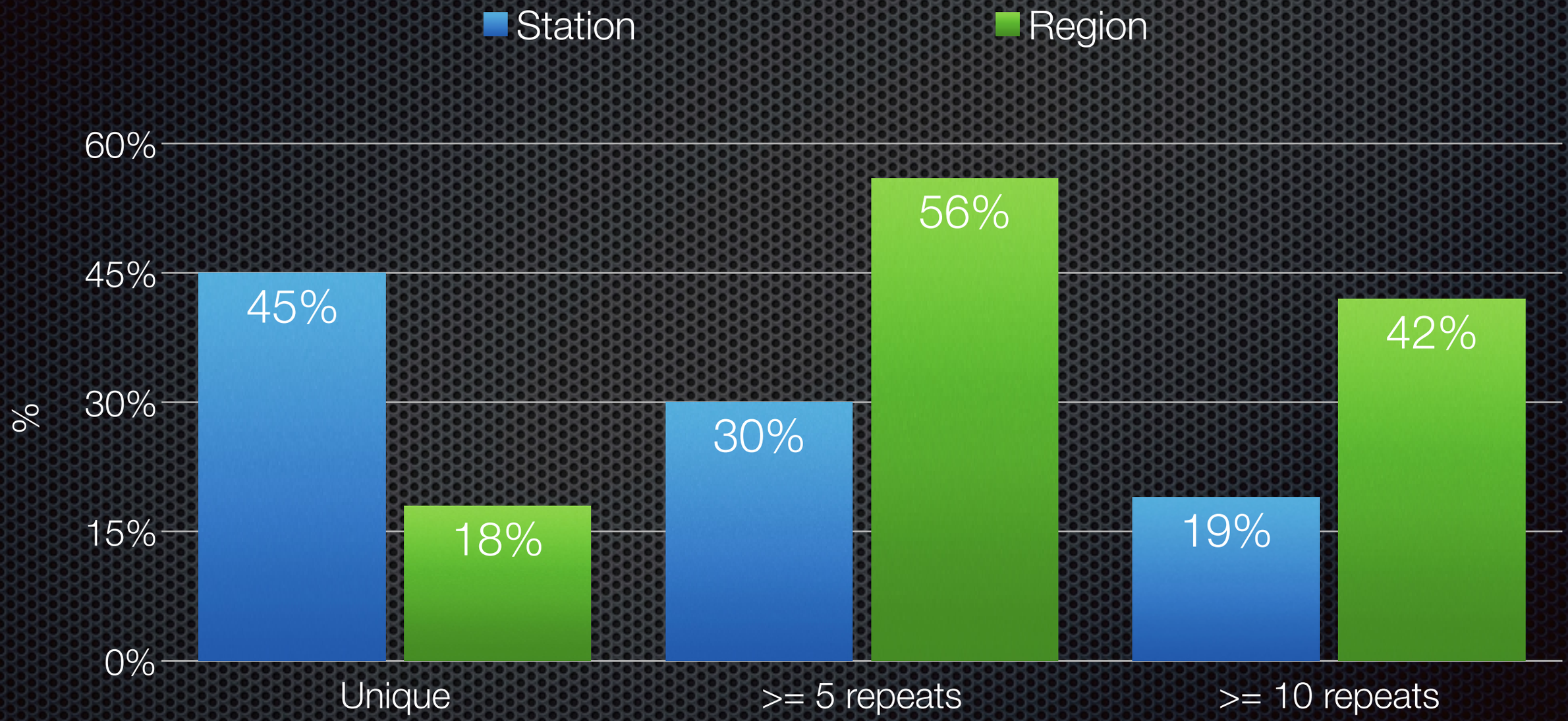
Goals

- Just in time rebalancing tool
- Predict full stations for the next 15, 30, or 45 minutes
- Predict the expected demand for empty docks

The “Live-tracking” algorithm

- Can we predict the destination station and arrival time as soon as a rental is started?
- Data analysis
- Montreal, summer 2014
- 2.5M rentals, 90% made by members

Recurring rides

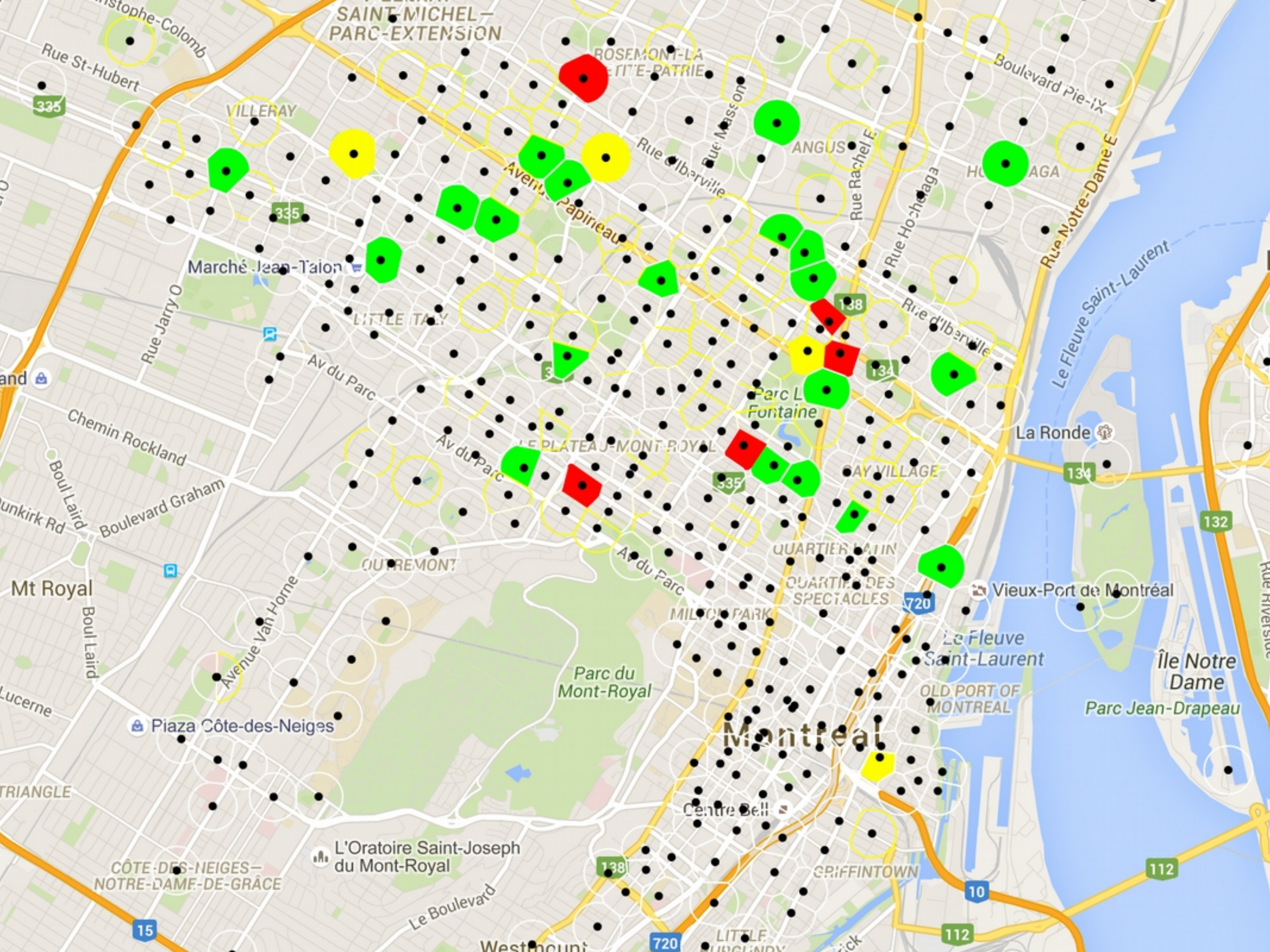


The “Station history” algorithm

- Use station occupancy rate history
- Predict demand based on historical demand data (Δ)

Testing the approach

- Build a tool that could “play back” the algorithm and validate results
  - Where it detects hotspots
  - Determine if it is a hotspot (false-positive)
  - Determine if it misses hotspots (false-negative)



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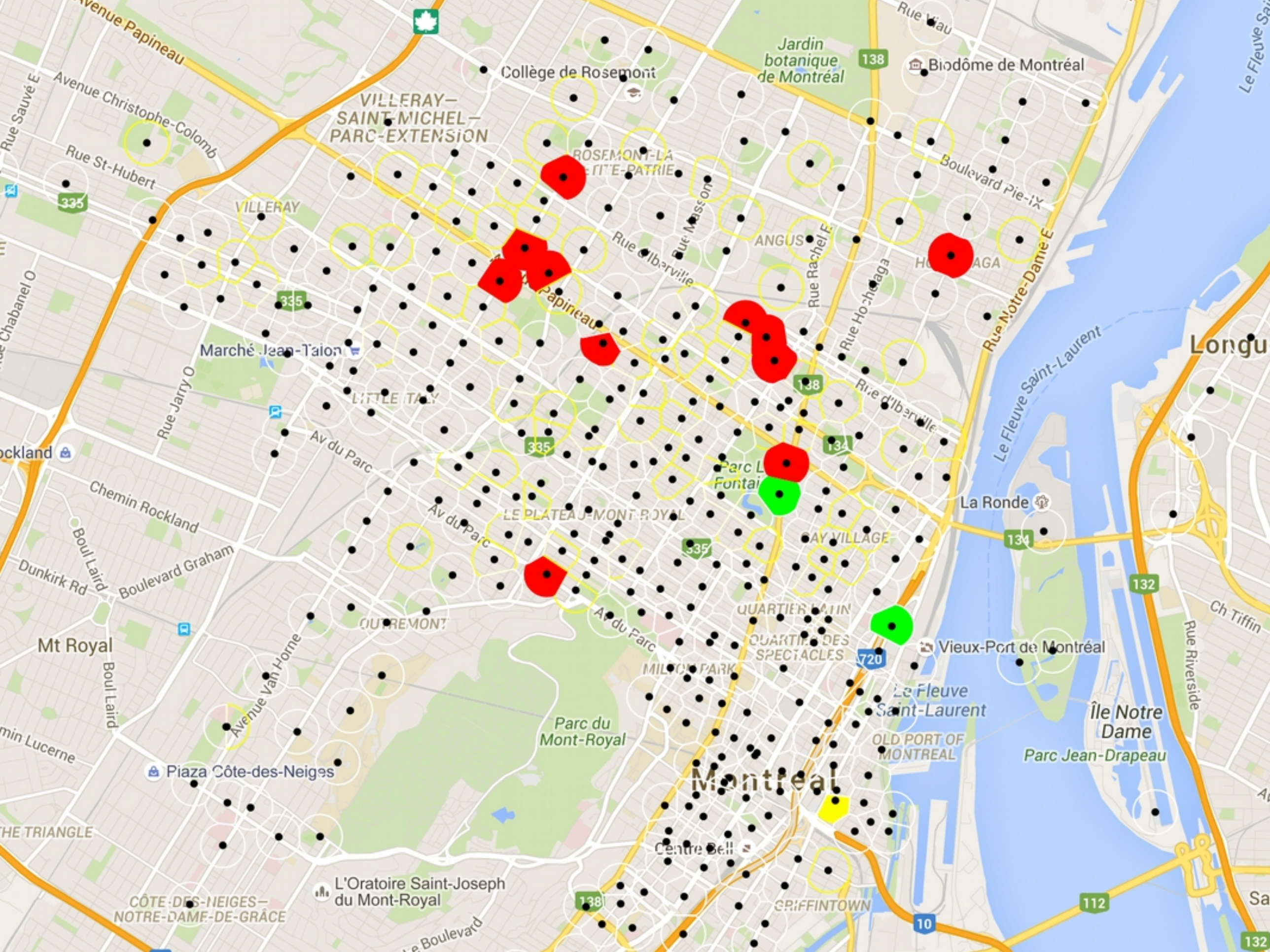

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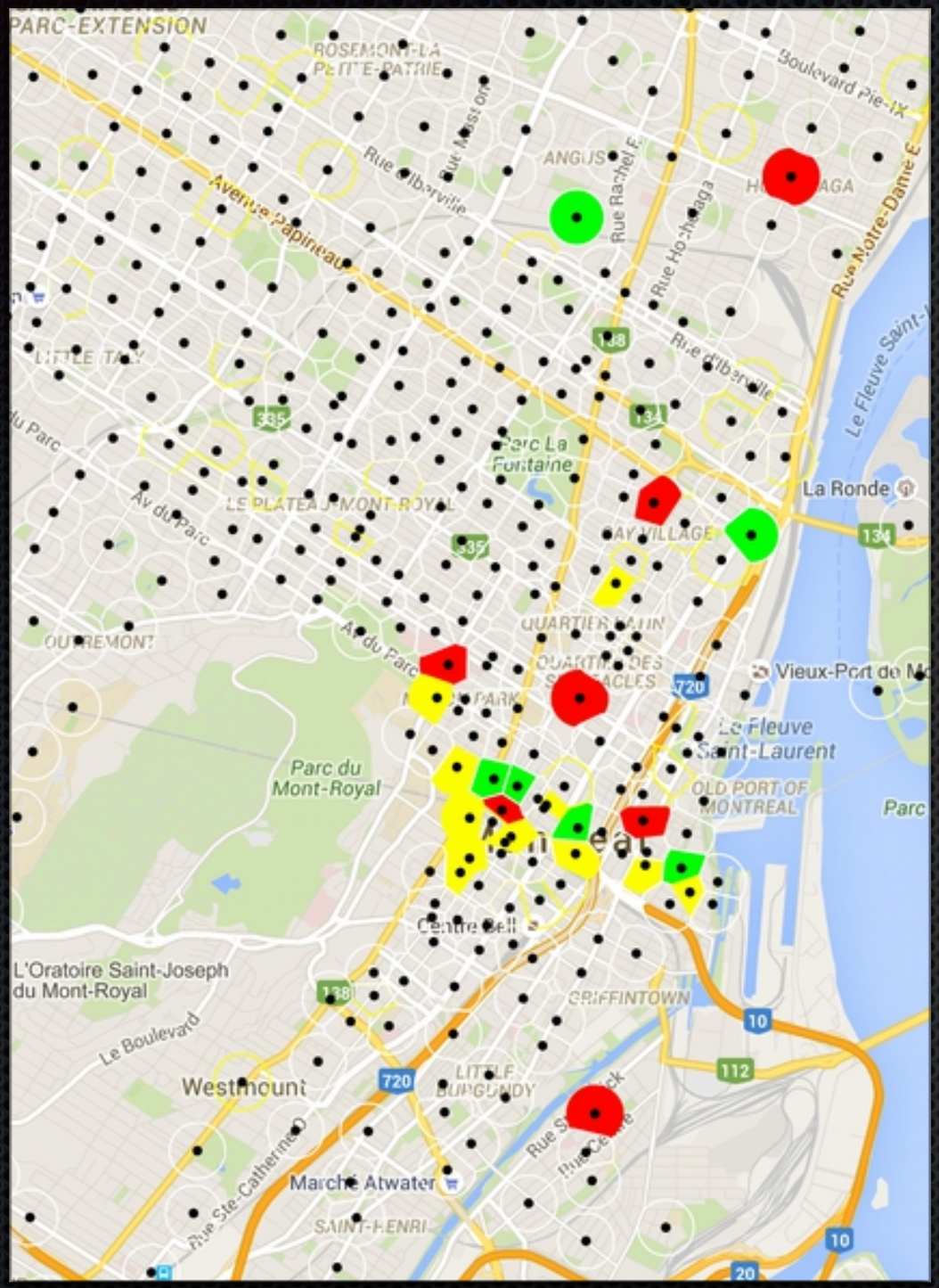
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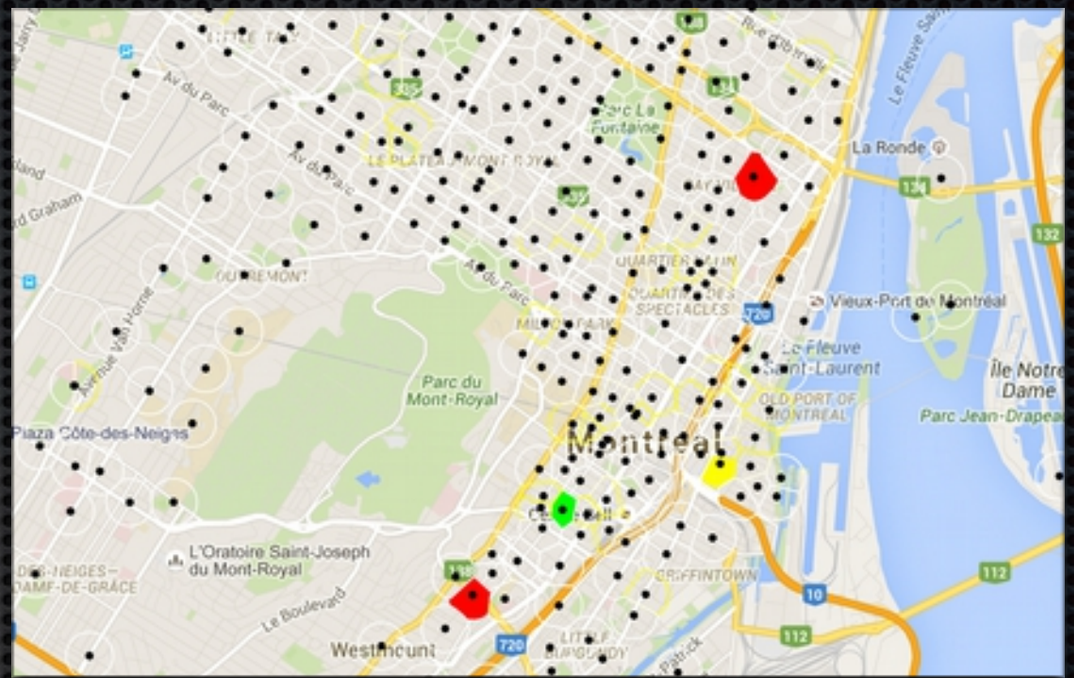
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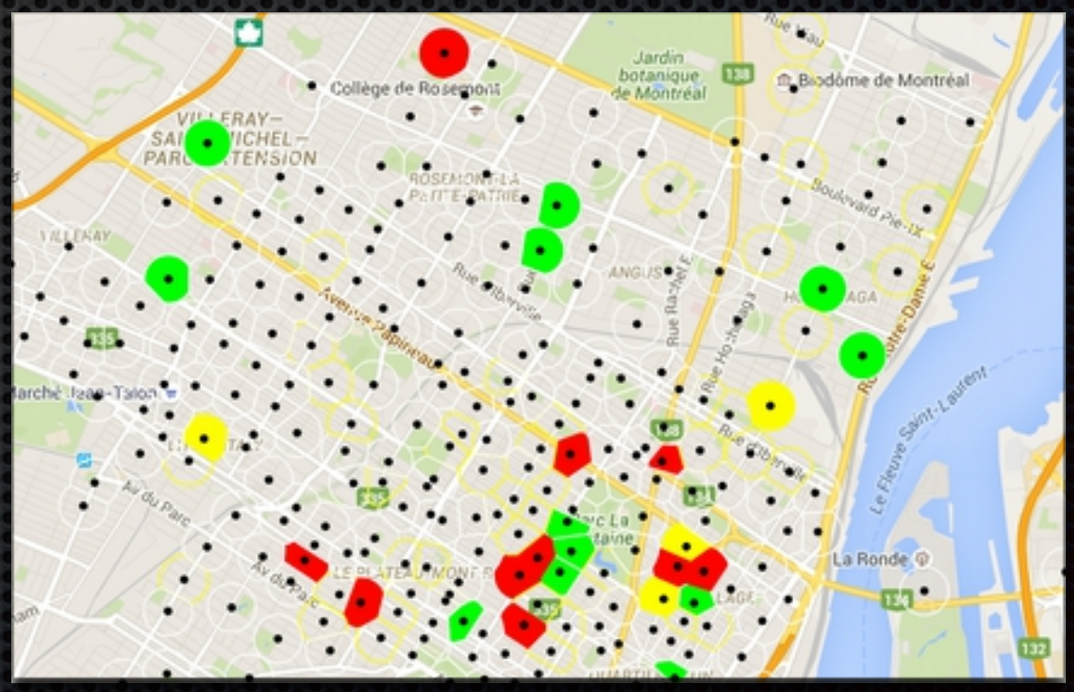
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Improving accuracy

- Improve the “Live-tracking” algorithm to support more variables
- Improve the “Station history” algorithm to include neighbour stations
  - Quantify “late demand”
- Combine both algorithms and introduce additional inputs
  - Weather
  - Special events
  - Transit system failures