Using a web based GIS system to visually depict the predicted effects of bus frequency changes on the Chicago Transit Authority network

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What does it all mean?

- What we did: We built an intuitive tool (dashboard) to explore our results using web technologies

- Goal: To convey results of our bus frequency optimization on the CTA network to decision makers
Why does it matter?

- Web based: Lots of programmers and developers
- Software costs: low
- Unique and customizable: adjust for client concerns
- Familiar web map interface: MapQuest, Google Maps, Bing Maps
CTA’s Bus Network

129 Routes
~20,000 Route Miles on weekdays
~11,500 Stops
~1 Million trips per weekday
End Users

Researchers
Analysts
PI’s

Advisors and Decision Makers
Other methods

• Summary Tables may not tell the story and can be too simplistic

• Detailed tables can be overwhelming and hard to understand

• We need a middle path to supplement these methods
What does a middle path provide?

A different way to examine data
A different way to organize data
A different way to present data
Why a web dashboard?
Main user advantages

• Harnessing the support and power of consumer technologies to our advantage

• People are much more familiar with consumer map software than GIS software
Main researcher advantages

- Better support for programmers
- Vendor independent (open source!)
- Lower costs (open source!)
Methodology

- **Coding**: HyperText Markup Language (HTML), Cascading Style Sheets (CSS), Javascript (in the form of JQuery)
- **Preprocessing**: PHP Hypertext Preprocessor (PHP)
- **Relational Database**: MySQL
- **Mapping software**: Google Maps
- **Charting software**: Google Charts
- **Sever software**: Apache Web Server with PHP and MySQL
  [-AMP stack]
The ‘Tool’
Simple Interface

Able to access individual values

Clickable elements for more detail

Dynamic graphs on calculated values

Customized bi-directional view based on client request

Please select a route from the form below. Direction and Time information will be provided when a route is selected.
Minimize Cost - Medium Riders - Medium WS vs. CTA Current (Fare=$0.98, Op. Cost=\_\_\_/hr., No Pattern Drop)

Please select a time from the form below. Options will display after each selection.
Observations

Researchers better understood the data

PI’s and decision makers explored the solution beyond summary data
Wrapping up

- The web: Ubiquitous, friendlier, easier to understand, device agnostic
- The web: Open source, large community of programmers, portable
- The web: we already use it!