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# Multimodal routing for Philadelphia

— Takeaways from building  
GoPhillyGo —

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# What is GoPhillyGo?

A website featuring area destinations and events, that can provide directions without a car to get around the greater Philadelphia area.

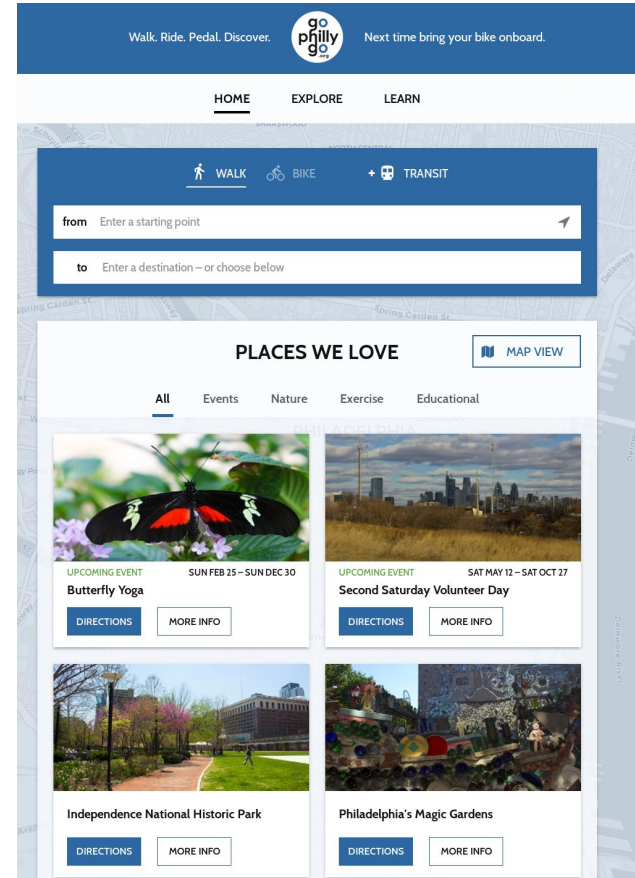
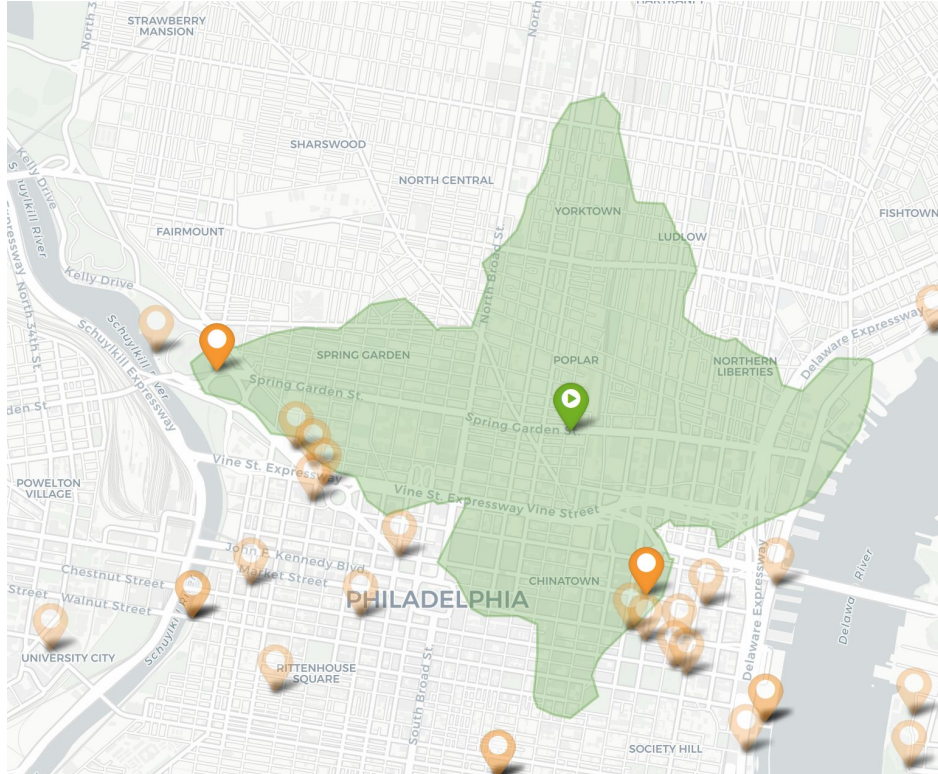
<https://gophillygo.org/>

- Open source and backed by open data
- Built in partnership with the Clean Air Council, who curate content
- Highlights [Watershed Alliance of the Delaware River](#) environmental centers






# What are some features?

- “Explore” tab, which displays a travel isochrone for the selected mode and highlights destinations within it
- A content management system for the Clean Air Council to curate content and upload images for the destinations and events featured
- Bicycle share directions, which takes into account current reported station status (whether bikes are available, or docks are free)
- Configurable bicycle routing preferences for a faster, flatter, or safer ride
- Permalinks to share routes
- Can “install to home screen” since it is a progressive web app

# What does it look like?




# Bike share directions





from 990 Spring Garden St, Philadelphia, PA, 19123


to Philadelphia Museum of Art


Directions


 Depart 990 Spring Garden St, Philadelphia, Pennsylvania, 19123 at 4:12pm

 Walk west on Spring Garden St  
0.4 miles

 Arrive Inego station, Spring Garden Station, BSL

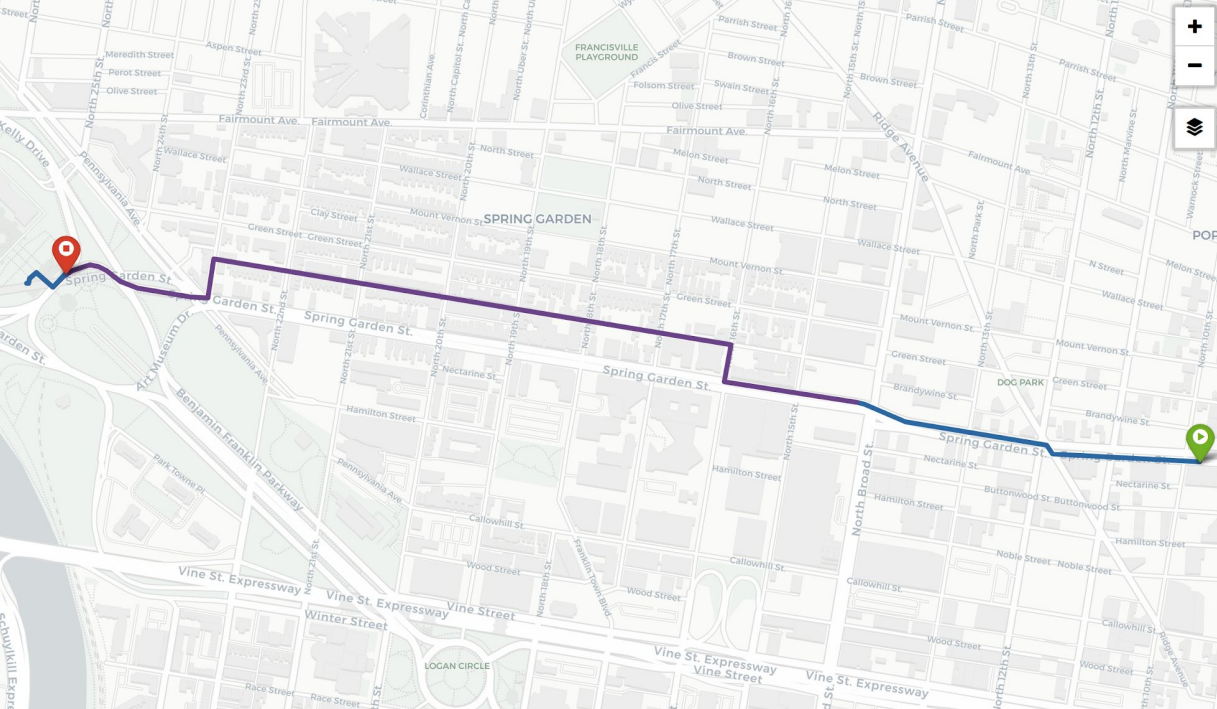
 Bike west on Spring Garden St  
820 feet

 Turn right on to N 16th St  
234 feet

 Turn left on to Brandywine St  
0.6 miles

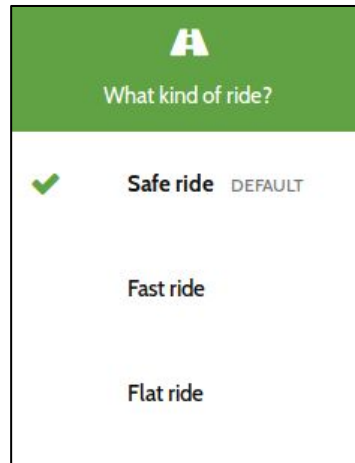
EXPLORE

LEARN



# Trip Routing with GoPhillyGo

- Uses [OpenTripPlanner](#) routing engine
- Includes transit agencies: SEPTA, NJ Transit, PATCO, Delaware DART
- Covers Delaware Valley area, plus all of the state of Delaware
- Includes Philly's bike share system, [Indego](#)
- Includes elevation data for custom bike routes
- Can edit OpenStreetMap to improve street network for GoPhillyGo



A screenshot of the GoPhillyGo app interface. At the top is a green header with a white 'A' logo and the text 'What kind of ride?'. Below the header, there are three options: 'Safe ride' (with a green checkmark icon and 'DEFAULT' text), 'Fast ride', and 'Flat ride'.

# Takeaways

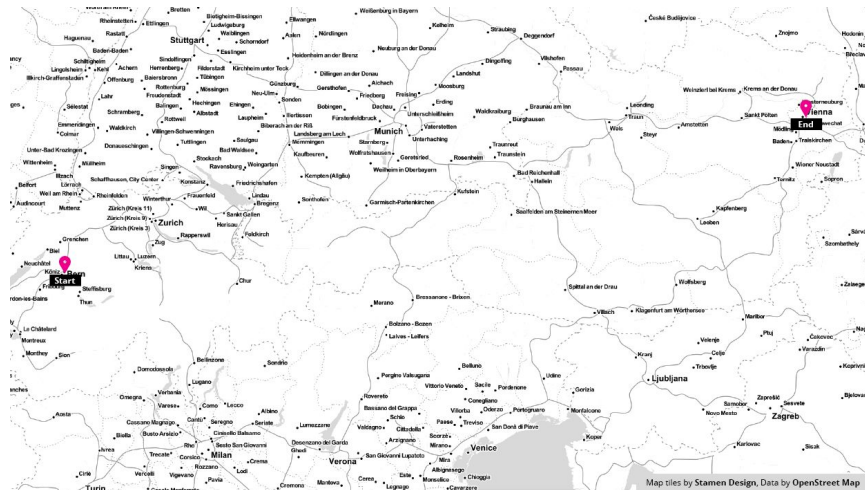
# UX design is hard

- First version of the app was desktop-only, but people want directions on the go (first launched June 2015)
- Redesign as a progressive web app
- OpenTripPlanner offers powerful routing we could use as-is
- OpenTripPlanner has an [built-in front end](#) that builds with the Java backend, but its interactions have room for improvement
- Most of the work has been in designing and implementing a front-end site that makes OpenTripPlanner easy and intuitive to interact with



# Routing engine is a memory hog

- Routing connected metro areas consumes a lot of memory
- The Valhalla project has been doing interesting work with tiling
- Reduces memory footprint by only loading parts of the graph as needed
- Also interesting engine for its dynamic costing
- Valhalla doesn't support transit (yet)
- Team now works at Mapbox
- Mapbox navigation APIs don't support transit either



[From Valhalla project documentation](#)

**What's next**

# Looking ahead

- We've got an Android app in the works

Location technology is changing:

- GPS units with dual frequency coming out mean better accuracy outdoors
- Dual radio access points supporting newly adopted [WiFi Location](#) (standard IEEE 802.11) mean support for indoor navigation is coming
- The combination of GPS and WiFi Location advances mean step-by-step pedestrian navigation will be possible
- A [recorded session](#) at Google I/O this year talked about the above

# Thank you!

- Source: <https://github.com/azavea/cac-tripplanner>
- Project page at Azavea: <https://www.azavea.com/projects/gophillygo/>
- I'm [@Banderkat](#)