Time Sensitive Isochrone Maps Using GTFS

Innovative isochrones maps using google data ...

Sumit Sen
An isochrone is an isoline for travel time, that is a curve of equal travel time. Closely related is isodistance, which is a curve of equal travel distance. Typically these are based upon following transportation routes such as public transit, roadways, or foot paths rather than using a simple circle (a.k.a. buffer of a point, "as the crow flies" distance). This article will use the term isochrones, however any weighting factor can be used such as distance, or even a combination such as safety and time.

Examples
- Safe Routes to School Mapping Toolkit - working to create travel distance/time web app for pedestrians and bicyclists using OSM data (source code available)
- OpenTripPlanner - a development branch has work on an Analytics Extension, which currently provides isochrones based on the OSM network and GTFS data (source code available)
- OpenRouteService Accessibility Analysis Service - uses OSM data and map, shows isochrones within Europe (no source code available)
- OneBayArea Travel Time and Housing Prices map - uses OSM at least for base map, with lots of options for mode of travel (no source)
- isochrones - isochrones for subway systems in French cities (Paris, Rennes), shows where friends should meet up; uses OSM for base map (no source)
- mySociety Commuting Time Maps - combines subway travel time with housing costs, doesn't use OSM (source code available)
- Travel Time Tube Map - not based on OSM data, but uses London Underground map based on travel time (no source)
- Manhattan - isochrones for public transit, but doesn't use OSM and no source available
- TriMet - public transit isochrones for NYC, no OSM or source
- ArcGIS Service ArcMap - with app using OSM ArcGIS
- Walkscore Transit Time Maps - uses GTFS and OSM data for maps of Seattle, San Francisco, and Washington DC. Built on the open source Graphserver library (no source)
- Travel Time Search - uses some OSM data - Create own travel time maps for Analysis, or add travel time search to your site.
- isochrone.ch - Create isochrone maps for the travel time with public transport in Switzerland.
- Research on isochrones - Scientific research with isochrones at the Free University Bolzano/Bozen
- OSM isochrone Generator - Generate isochrones from OSM using OSMRM
- Graphhopper can be used to calculate a very detailed time information for every point within a certain time or distance reach.
- Route51 - can be used via an API

Software
- isychrone - is a Python script and simple web interface for computing and displaying isochrones from an OGR-supported data source (e.g. PostGIS)
- GRASS v.net.iso module
- pyRouting driving_distance() function
- IsoApp isochrone/isodistance map api service

See also
- Isoline
- Distance maps - this should likely be consolidated with this page
Isochronic Passage Chart by Francis Galton (1881)

Explanation of colours. Green = within 10 days. Yellow = 10–20 days. Pink = 20–30 days. Blue = 30–40 days. Brown = more than 40 days journey.

Published for the Proceedings of the Royal Geographical Society, 1881.
Article

Transport Accessibility Analysis Using Assessing Sustainable Transport in Los Angeles

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Maximum number of reachable retail employees for a 20-minute buffer by transit by time of day in Central Los Angeles.

Maximum number of reachable education employees for a 20-minute buffer by transit by time of day in Central Los Angeles.

Opportunity-Based Dynamic Transit Accessibility in Southern California Measurement, Findings, and Comparison with Automobile Accessibility

Ting L. Lei, Yaili Chen, and Konstadinos G. Goulas
This is how classical Isochrones look
This is what I am able to show
- Dynamic data
- Personalized maps
- On Demand
- Programming capabilities
- Standardized access
- Pervasive ubiquitous
Google Maps API 3 and DistanceMatrix

- Returns travel times/distances for
  - Driving
  - Walking
  - Biking
  - Transit
- Upto 20 points at a time (60 points for one search)
- Excellent approach for exploratory Isochrones!
• GTFS data format
• Feed
  – Route
  – Schedule
  – Multiagency
  – Trips

Distance Matrix in Google API V3 support

Image credit- The OpenPlans Guide to GTFS Data jameswong (August 2, 2012)
Some cases in the DC metro area

Airports
- BWI
- DCA
- IAD

Rockville, Union station and other examples
Distances and drive times-BWI
How long does it take to get to the airport?
- Urban Planning
- Buying a house

Drivetimes ≠ Distances
Urban clusters increase commute time...

DC, VA have faster access to IAD
Just as MD has better access to BWI
If you want to have a quick lunch near IAD go away from the metro area.
DCA has a more circular isochrone.

Gets distorted as we move away from the center.
Some places are more than 30 minutes from every airport

But public transit has another scenario…
Public transit access to DCA
At peak hours
BWI Public transit access
Peak hours
Isochrones for metro stations

- Bike travel times
- Public transit access
- Facilities
Biking from Shady grove
IsoChrones do not work for small regions and public transit.
But insights are useful...
Restaurants near Rockville station using public transit
Biking Isochrones for Rockville
Walking Distances Near Union Station

Possible Isochrones
Transit distances
At 5 am - Union Station
Isochrones
Other
Next steps

- Scalability tests
- Compare with www.here.com
- Usability

JavaScript APIs
JavaScript APIs to integrate interactive maps and advanced HERE features into your applications.

The HERE Maps API for JavaScript is a set of programming interfaces that enable developers to build Web applications with feature rich, interactive HERE Maps at their center. The API consists of libraries of classes and methods with which to implement the functionality of an interactive application.

See our JavaScript API description below or click on API explorer to experience the power of HERE JavaScript APIs.

Documentation links
- JavaScript API 3.0
- Discussion
- Community Wiki
- FAQs

HERE Maps API for JavaScript 3.0
Thank you ...

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