

WHY WE MOVED FROM GOOGLE TO ESRI MAPS AND OPEN TRIP PLANNER IN ROUTEMATCH MOBILITY

Google Maps is ubiquitous – as are Google’s trip planning, transit, and navigation services. Many high-profile companies within the transit space, including Lyft, also use Google APIs within their products.

However, as Routematch charts the future of transit, we have discovered that Google APIs do not allow us to create the experiences we seek to deliver to our clients and their riders. The future of mobility on demand requires that Routematch opens new possibilities for transit by meeting transit agencies and their riders in the spaces that Google can’t reach.

As part of our work to deliver our mobility solution, we encountered several challenges using Google APIs, including 1) limitations on the types of multimodal trips that Google can offer riders; 2) restrictions on how maps and trip information can be displayed, stored, and edited; as well as 3) Google Transit’s limited coverage of the world’s cities and towns.

Google Transit in particular has several limitations that make it difficult to provide riders with multimodal trips that meet their unique mobility type and requirements. Google Transit does not support the use of *travel training* (services offered to those who need assistance to increase their mobility and travel on public transportation independently) and *mobility hubs* (high traffic stops or “transfer points” staffed with personnel who can assist riders). Specifically, Google Transit cannot reliably or efficiently:

- limit transfers between transit modes only to designated travel hubs, where riders would be travel trained or have access to assistance
- enforce a “buffer” time to allow riders sufficient time to transfer vehicles at a hub
- prevent a rider from spending too much time onboard a vehicle during a trip
- limit the amount of walking in a trip
- limit the number of transfers between transit modes within a trip
- limit the types of transit modes (bus, light rail, walking, etc.) in a multimodal trip

These trip planner rules are particularly important in helping traditional paratransit riders use other transit options to move around. These rules also ensure that our trip planning services comply with legal and regulatory codes.

The terms of service of Google Maps also imposes additional limitations:

- Google requires that trip information pulled from Google be displayed on a Google Map. This limits the types of UI/UX experiences that we can offer our users.
- Since we do not control Google map data, we cannot add, remove, or edit maps; this prevents users from making dynamic edits, such as blocking off an area for a day due to a parade.
- We cannot store information returned from Google APIs beyond 30 days.

A final concern is Google Transit's lack of coverage for all but the world's largest cities and towns:

- Google Transit covers only 2,023 of the world's nearly 350,000 cities and towns.
- In the State of Georgia, where Routematch's Atlanta office resides, only Metro Atlanta and the city of Savannah and area are covered, omitting areas like Augusta (population 197K) Athens (120K), and Macon (90K). This prevents us from providing innovative transit solutions in regions not covered by Google Transit.

Taken together, Google's limitations prompted us to seek alternatives. For the trip planner component of our mobility solution, we have chosen Open Trip Planner (OTP) as an alternative to Google Transit. As an off-the-shelf open-source tool, we utilize OTP via RESTful interfaces in virtually the same way we have used Google Transit.

OTP's customizability allows us to provide multimodal trip services that more readily accommodate riders with a variety of needs and mobility types. We can configure OTP to support some of the trip planner rules and avoid inefficient – and expensive – workarounds using Google Transit. Further, being open source, we can extend OTP to support additional rules that may be needed.

Open Trip Planner is currently in production backing a number of trip planning sites now, including:

- TriMet for Portland Oregon (<http://ride.trimet.org>)
- Valley Ride for Boise Idaho (<https://tripplanner.vta.org/planner>)
- New York State Transit Trip Planner (<https://511ny.org/transittripplanner/index/8>)

For the mapping component of our mobility solution, we have adopted Esri as an alternative to Google Maps. As a supplier of GIS, mapping, and analytics tools, Esri products are intended for commercial, high-volume use. Many government agencies are also familiar with Esri since many of them rely on Esri for other infrastructure needs.

Esri maps are server-based and integrated into our Rider Platform products, including web and mobile. Esri opens a wider array of UI/UX experiences for our users than is currently possible under the terms and conditions of Google APIs. This includes how our products display trip information, as well as how users interact with maps. Unlike Google Maps, Esri maps can be edited and modified. With Google, we consume a “one size fits all” service provided to us – one bound to an SLA and subject to potential changes. By comparison, we “own” the Esri and OTP services, and we can modify, host, and make these services available as we see fit to meet our customers’ needs.

We believe these design decisions will allow us greater control and flexibility as we work to deliver our vision of mobility on demand. At the same time, this translates into better functionality for the agencies and riders who use our products.