



Empowering your Workforce with Google Maps

June 28, 10:15am–11:15am

Dave Day and David Owens



The Question We Want To Help Answer:

Where's my stuff?

- where are my people, vehicles, and other mobile objects?
- what are they doing?
- how can they be more effective?



1.3 billion mobile workers by 2015



Google Maps Coordinate

&

Google Maps Tracks API





Google Maps Coordinate

Google Maps Coordinate: What is it?



A web and mobile application that helps enterprises manage their mobile workforce.

And an API, too!



Google Maps Coordinate: Where's my stuff?

Jobs — the work to be done

Team — the people who use Coordinate to do work



Google Maps Coordinate: Show me!

Google Maps Coordinate

Jobs [+Add job](#) [See job history](#)

Show **Incomplete** | [Unassigned](#)

Sort by [Creation time](#) | [Job name](#) |

Scheduled time

James Lick's: 2G Chocolate, 1G Vanilla ✕

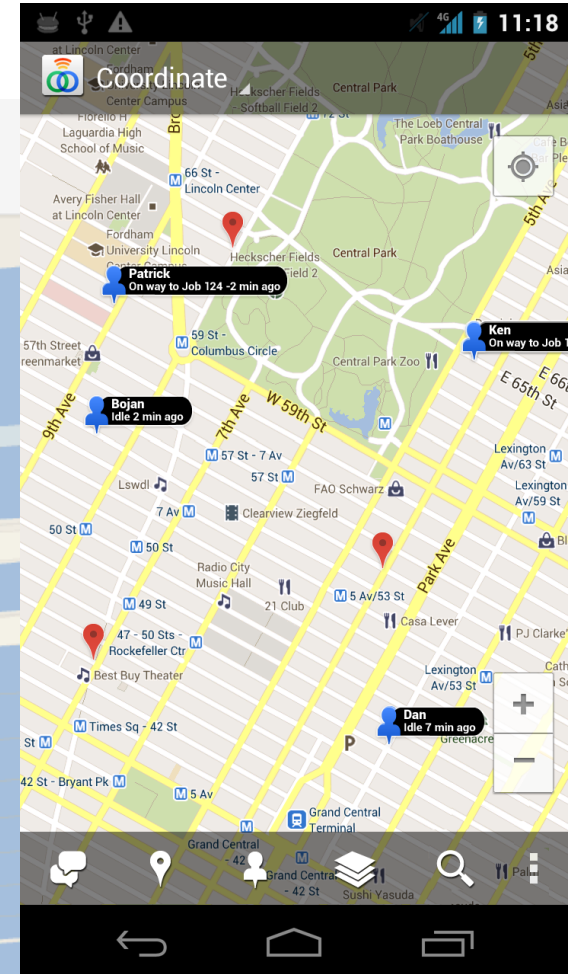
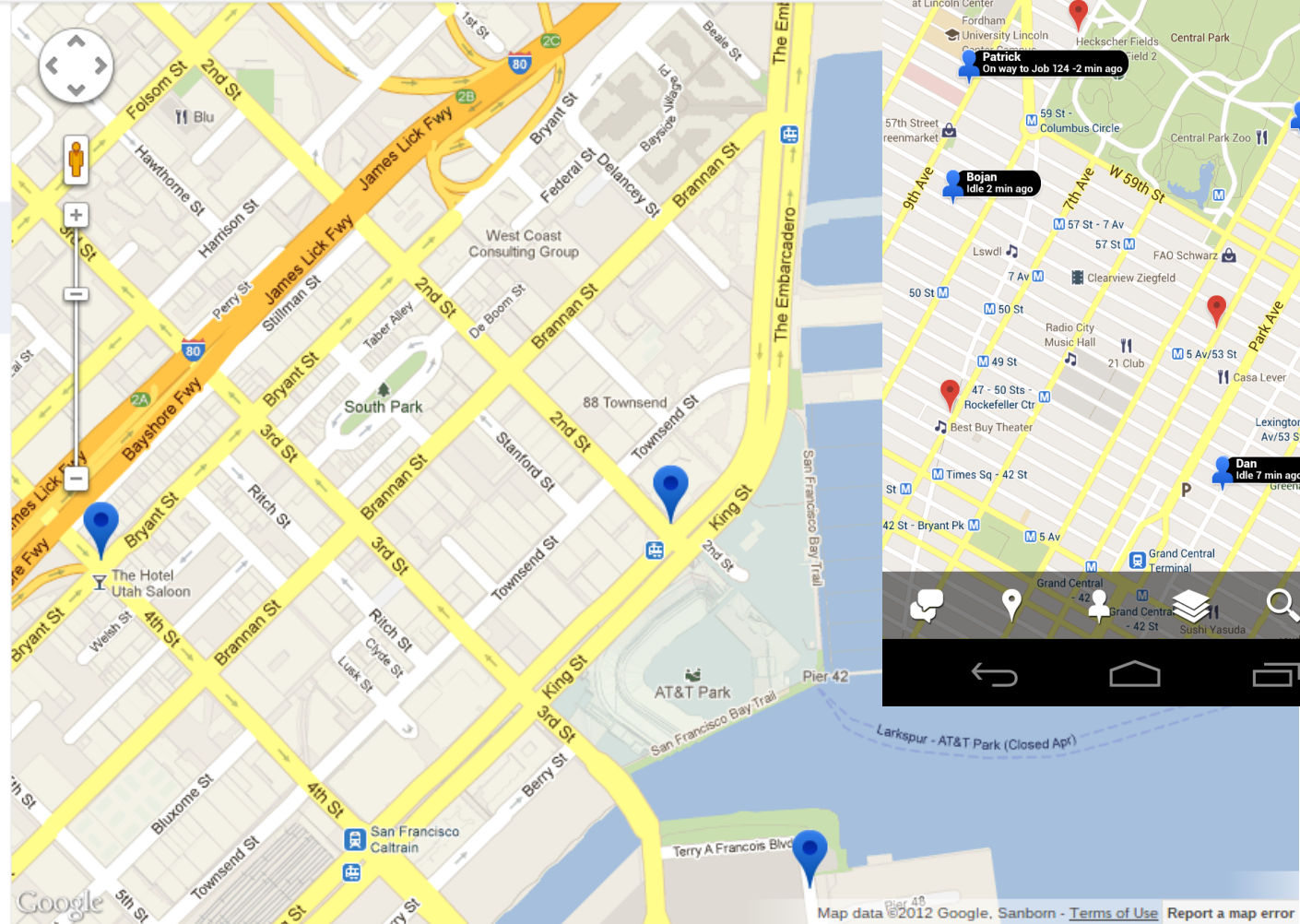
Assigned, <unscheduled>
Bryant Street and 4th Avenue, San Francisco
Assigned to [Dave Owens](#)

China Basin Specialty Treats: 3G Peanut Butter Lemon Swirl ✕

Assigned, <unscheduled>
2nd Street at King Street
Assigned to [Dave Owens](#)

Pier 48 Ice Cream: 2G Rocky Road ✕

Assigned, <unscheduled>
48 Pier, San Francisco, CA
Assigned to [Dave Day](#)



Send Feedback



Map data ©2012 Google, Sanborn - [Terms of Use](#) [Report a map error](#)

Demo!

Google Maps Coordinate



Google Maps Coordinate: With it users can...



Communicate with
your mobile workforce



See all of their
locations on a map



Pinpoint and assign
jobs to your workforce



Notify and update
your workforce instantly



Report and review
everything that happens

- communicate with your workforce
- see all of their locations on a map
- pinpoint assets and assign jobs
- notify and update instantly
- report and review





Google Maps Coordinate API

Google Maps Coordinate API

OAuth2, REST API that allows integration of Google Maps Coordinate with existing systems.

- create and assign jobs
- track progress of jobs
- report over job history



Google Maps Coordinate: Creating a job

POST /coordinate/v1/teams/<TEAM>?

title=Job&address=Somewhere&lat=45&lng=55

JSON

```
{
  "kind": "coordinate#job",
  "id": "16726",
  "state": {
    "kind": "coordinate#jobState",
    "location": {
      "kind": "coordinate#location",
      "lat": 45.0, "lng": 55.0, "addressLine": [ "Somewhere" ]
    },
    "title": "Job"
  }
}
```



Google Maps Coordinate: Assigning a job

POST

/coordinate/v1/teams/<TEAM>/jobs/16726?assignee=dave@icecream.com

JSON

```
{
  "kind": "coordinate#job",
  "id": "16726",
  "state": {
    "kind": "coordinate#jobState",
    "assignee": "dave@icecream.com",
    "location": {
      "kind": "coordinate#location",
      "lat": 45.0, "lng": 55.0, "addressLine": [ "Somewhere" ]
    },
    "title": "Job"
  }
}
```



Google Maps Coordinate: Listing jobs

```
GET /coordinate/v1/teams/<TEAM>/jobs?  
minModifiedTimestampMs=1340836532257
```

JSON

```
// Data job data including a continue token for paging
```



Google Maps Coordinate API

How will you use it?





Google Maps Tracks API

*Where's **all** my stuff?*

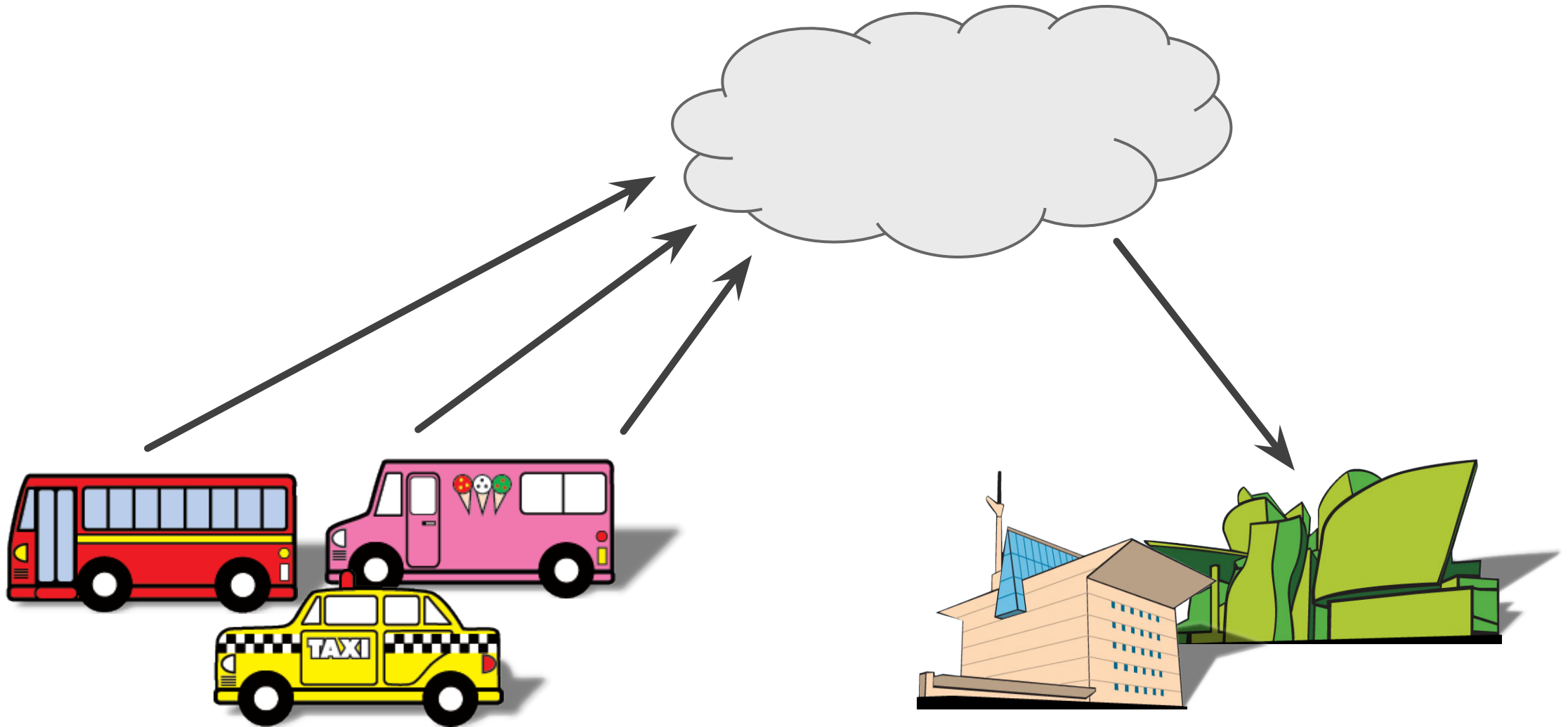


1 000s of entities

1 000 000s of points



Keeping your Location Data in Google's Cloud



It is

- a location data store
 - specialised
 - secure
 - scalable
- an HTTP API

It ain't

- a generic, relational database
- an end-to-end solution

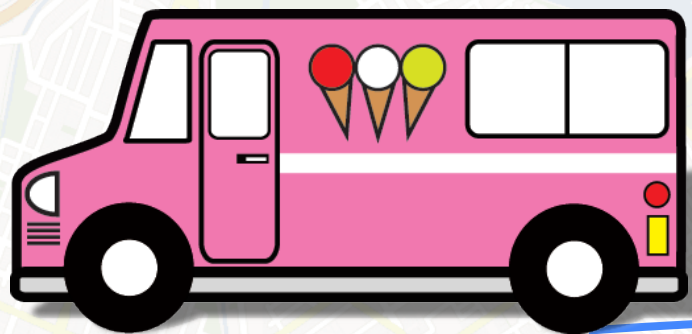


Securing the Google Maps Tracks API

- . Authentication using OAuth2
- . All requests over SSL
- . All location data is stored encrypted
- . Fully consistent data storage



The First Building Blocks



entity

crumb

track



Creating an entity

POST /tracks/v1/entities/create

```
{  
  "entities": [  
    { "name": "Fred's ice-cream experience", "type": "AUTOMOBILE" },  
    { "name": "The Susie Soft Serve", "type": "AUTOMOBILE" }  
  ]  
}
```

JSON



Creating an entity

POST /tracks/v1/entities/create

JSON

```
{
  "entities": [
    { "name": "Fred's ice-cream experience", "type": "AUTOMOBILE" },
    { "name": "The Susie Soft Serve", "type": "AUTOMOBILE" }
  ]
}

{
  "entityIds": [ "0123456789abcdef", "1337cafeba5eba11" ]
}
```



Recording crumbs

POST /tracks/v1/crumbs/record

JSON

```
{
  "entityId": "1337cafeba5eba11",
  "crumbs": [{
    "location": { "lat": -33.860, "lng": 151.211 },
    "timestamp": 431014090,
    "metadata": {
      "freezerTemp": "-6.2"
    }
  }, ..., ]
}
```



Recording crumbs

POST /tracks/v1/crumbs/record

JSON

```
{
  "entityId": "1337cafeba5eba11",
  "crumbs": [{
    "location": { "lat": -33.860, "lng": 151.211 },
    "timestamp": 431014090,
    "metadata": {
      "freezerTemp": "-6.2"
    }
  }, ..., ]
}
```



Retrieving a track

POST /tracks/v1/crumbs/gethistory

```
{  
  "entityId": "1337cafeba5eba11",  
  "timestampMax": 431604740  
}
```

JSON



Retrieving a track

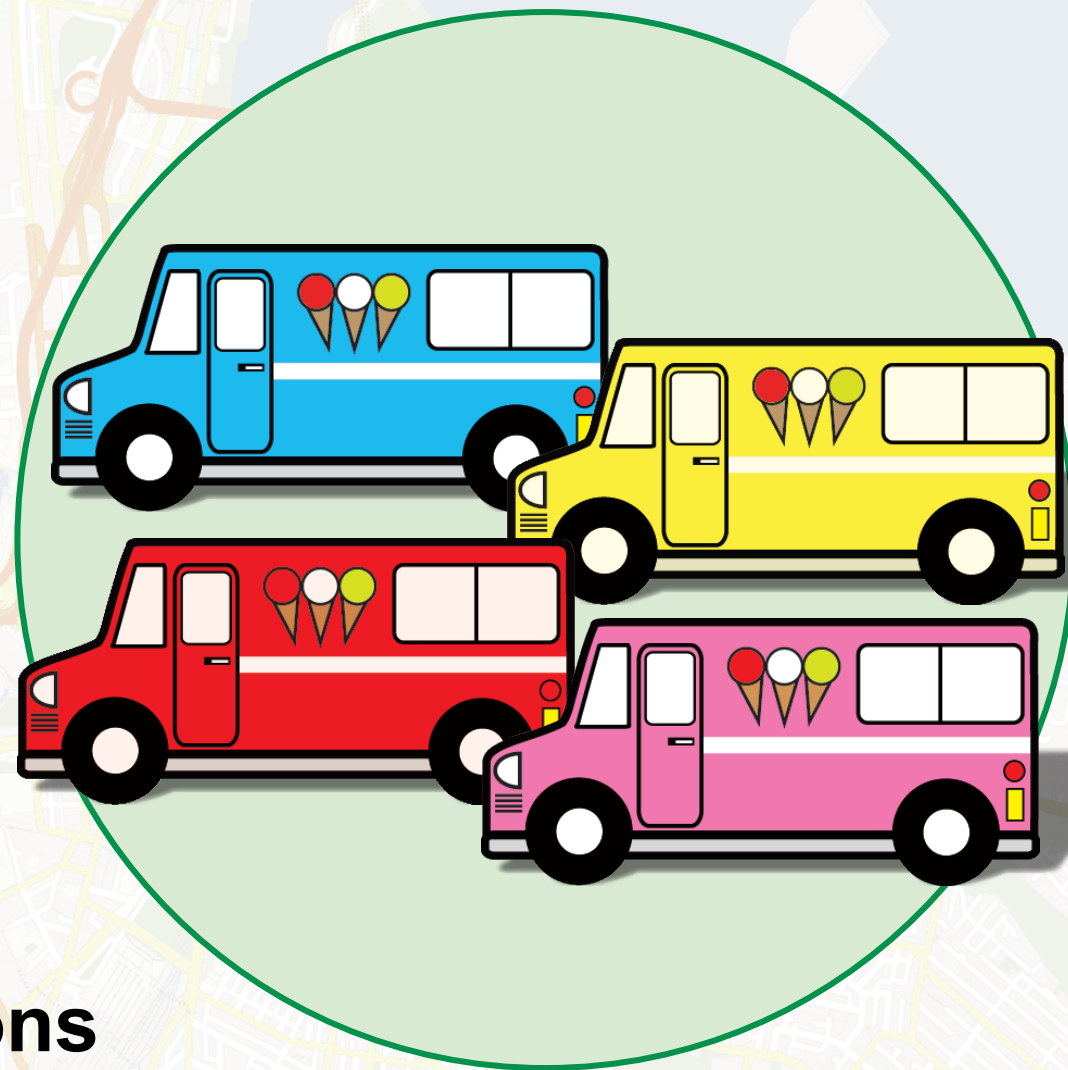
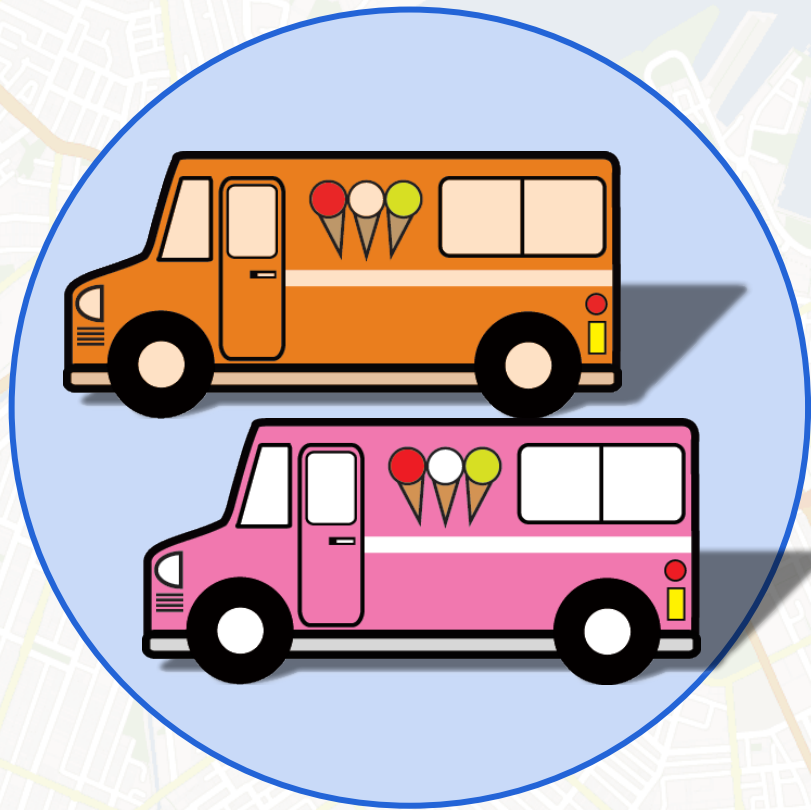
POST /tracks/v1/crumbs/gethistory

```
{  
  "entityId": "1337cafeba5eba11",  
  "timestampMax": 431604740,  
  "timestampMin": 431000000,  
  "numSamples": 137  
}
```

JSON



Let's get it together



collections



Creating collections

POST /tracks/v1/collections/create

```
{  
  "collections": [  
    { "name": "Trucks with sprinkles" },  
    { "name": "Trucks with musical sirens" }  
  ]  
}
```

JSON



Creating collections

POST /tracks/v1/collections/create

JSON

```
{  
  "collections": [  
    { "name": "Trucks with sprinkles" },  
    { "name": "Trucks with musical sirens" }  
  ]  
}  
  
{  
  "collectionIds": [ "13333333333333337", "01248163264128" ]  
}
```



Creating collections

POST /tracks/v1/collections/addentities

```
{  
  "collectionId": "1333333333333337",  
  "entityIds": [ "0123456789abcdef", "1337cafeba5eba11" ]  
}
```

JSON



Retrieving live locations

POST /tracks/v1/crumbs/getrecent

```
{  
  "collectionId": "1333333333333337"  
}
```

JSON



Retrieving live locations

POST /tracks/v1/crumbs/getrecent

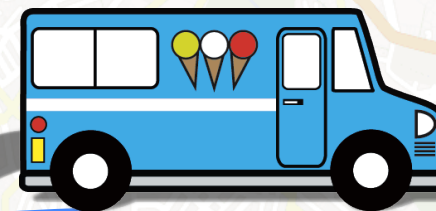
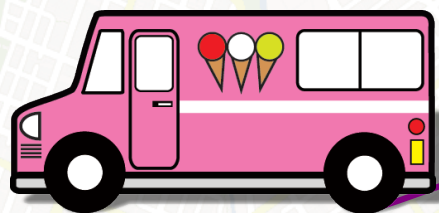
JSON

```
{
  "collectionId": "1333333333333337"
}

{
  "results": [
    { "entityId": "0123456789abcdef", "crumb": { ... } },
    { "entityId": "1337cafeba5eba11", "crumb": { ... } }
  ]
}
```



Setting boundaries



geofences



Creating a geofence

POST /tracks/v1/geofences/create

```
{  
  "geofences": [{  
    "name": "Ice-cream district",  
    "polygon": { "loops": [ ... ] },  
  }]  
}
```

JSON



Creating a geofence

POST /tracks/v1/geofences/create

```
{  
  "geofences": [{  
    "name": "Ice-cream district",  
    "polygon": { "loops": [ ... ] },  
  }]  
}  
  
{  
  "geofenceIds": [ "0102040810204080" ]  
}
```

JSON



Creating geofences

POST /tracks/v1/geofences/addcollections

```
{  
  "geofenceId": "0102040810204080",  
  "collectionIds": [ "1333333333333337", "01248163264128" ]  
}
```

JSON



Retrieving recently active geofences

POST /tracks/v1/geofences/getrecentlyactive

```
{  
  "collectionId": "1333333333333337"  
}
```

JSON



Retrieving recently active geofences

POST /tracks/v1/geofences/getrecentlyactive

JSON

```
{
  "collectionId": "13333333333333337"
}

{
  "results": [{
    "entityId": "0123456789abcdef",
    "geofenceId": "0102040810204080",
    "crumb": { ... } },
  ]
}
```



Where to next?

Google Maps Coordinate

maps.google.com/coordinate

Google Maps Tracks API

g.co/mapstracksapi





Questions?

Thanks for listening!

Empowering your Workforce with Google Maps





Google
Developers