



MapKit has Competitors?

Walter Tyree

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About Us

- Apple][in 1979
- Recovering IT Manager
- Consulting for iOS, web, etc. for 3 years

I got my first taste of computing when the family brought home an Apple II in 1979. I spent about 12 years recently in various jobs in corporate IT before I finally left it all to run my own shop about 3 years ago. So far so good.

Overview

- Why Look Beyond MapKit?
- Other Frameworks We Have Known
- Interesting Topics

Why MapKit

- Easy to implement
- Integrates with Maps and Mobile Safari
- Apple support
 - WWDC Videos
- Well documented
- Demos Actually Compile!

Why Not MapKit

- Area required is not well covered
- Routing and Turn-by-turn needed
- Alternate Tiles desired
- Advertising or other Data Set
- Offline Use

If you have a requirement that does not fit within MapKit, then you will probably need to look outside of MapKit. In lots of places, MapKit is a black box to us. Another really important thing to pay attention to is how does this other company plan to stay in business? In addition to offering some neat features, the other choices may have a transaction fee, subscription or advertising.

Why Not MapKit

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Why Not MapKit?

- My App Requires It

ArcGIS

- SDK <http://resources.arcgis.com/en/communities/runtime-ios-sdk/index.html>
- Integrates with the ArcServer and ESRI data. So much demographic data.
- Big data for enterprise
- Create your own tiles
- Server licenses, data purchasing, subscriptions

If you are working for a big firm or already have an arrangement with ESRI, this might be the best route to go. The ArcGIS SDK is best when it is paired with some enterprise ESRI data. If you are trying to make it stand alone, you may be disappointed.

Mapquest

- SDK <http://developer.mapquest.com>
- Licensed Overlay Data (traffic, commercial)
- No offline rendering
- Pay for data, pay for transactions

Bing

- SDK <http://www.microsoft.com/en-us/download/details.aspx?id=1112>
- License http://www.microsoft.com/maps/product/licensing_for_mobile.aspx
- And as always, developers can integrate Bing Maps into consumer-facing mobile applications for free.... We think you will find that the terms of use are less restrictive than what you find with the Apple Map Kit, with no sacrifice in functionality.

(http://www.bing.com/community/site_blogs/b/maps/archive/2011/05/05/new-bing-maps-ios-sdk.aspx)

As with MapQuest, Bing is trying to be a drop-in replacement for MapKit. This will be obvious in the API structure. If you already know MapKit, these two are easy to transition into. Beware of Bing's terms of service (a few slides from now)

Cloudmade

- SDK <http://cloudmade.com/products/iphone-sdk>
- License <http://cloudmade.com/about/api-terms-and-conditions>
- Tiles are Open StreetMaps
- Payment for datasets, transaction limits

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Cloudmade is a wrapper around the Open StreetMap data. You could always just go get the Open Streetmap information, but they also offer a number of interesting data sets (Europe focus)

MapBox

- SDK <http://mapbox.com/mobile/docs/sdk/>
- License <http://mapbox.com/tos/>
- Based on RouteMe and Open StreetMaps
(see Cloudmade)
- Pay for Transactions, Analytics and
Uploaded data

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Map Box is also based on Open StreetMaps. They have tools for you to make your own overlays and maps pretty easily.

Licensing and Pricing

- You are licensing the data
- Pay for Tiles and Server Calls
- Pay for Data Sets
- Logos and Watermarks and Attribution

Bing License

(ii) Restrictions on your use: We do have some restrictions on your use of the service. You may not:

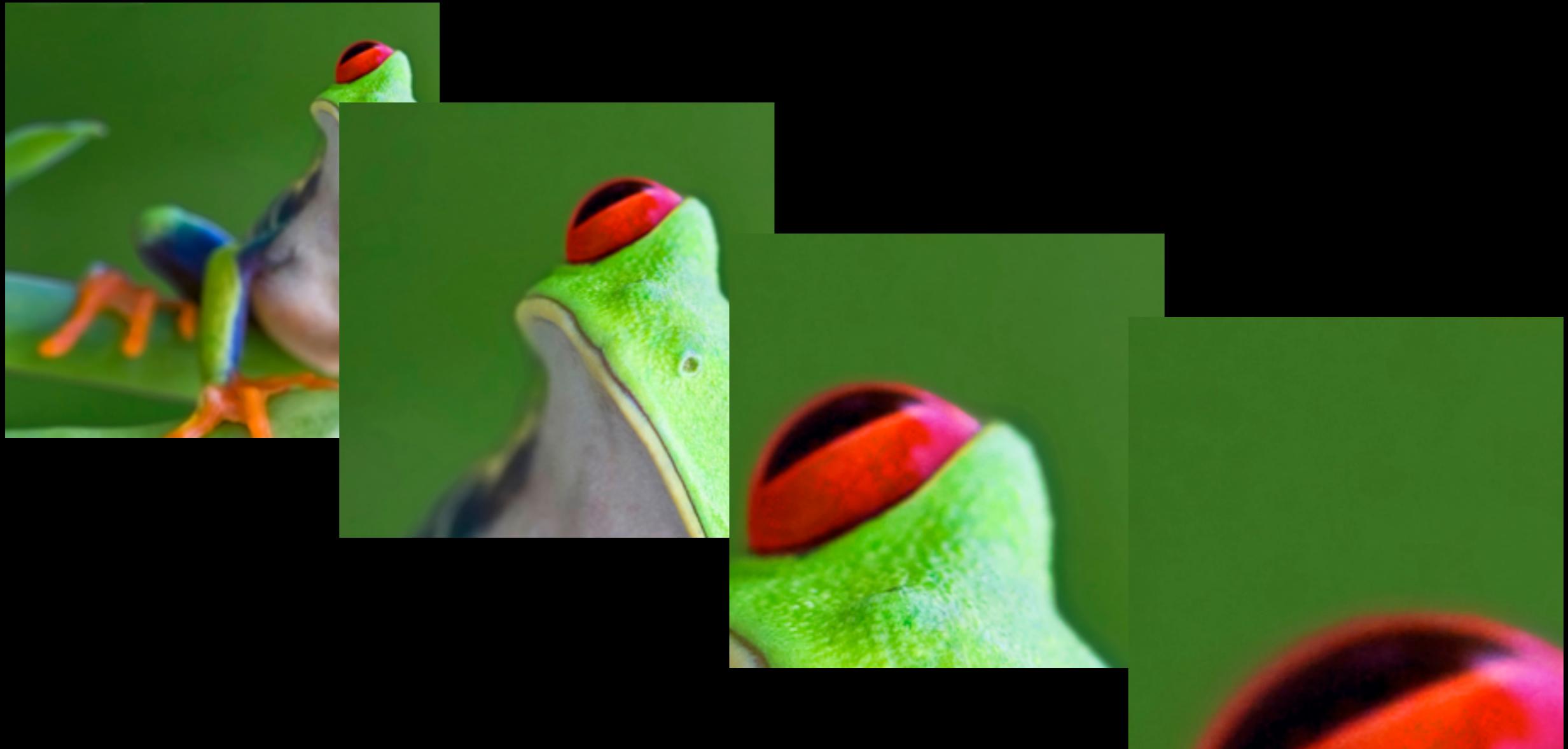
- copy, store, archive, or create a database of the content, except that geocodes may be stored locally only for use with your Mobile App;
- use the service for business asset tracking, fleet management, or dispatch (for information on licensing for these types of applications, please contact maplic@microsoft.com);
- present or alert an end user to individual maneuvers of a route in any way that is synchronized with the end-user's sensor-based position along the route (e.g. "real-time" navigation);
- change, obscure or remove any search box or any portion of the results, including, without limitation, any logo, trademark, copyright or other notice of Microsoft or its suppliers, digital watermarks, or any advertisement;
- integrate the service or any of its content with any other mapping platform; or
- use the service for or in connection with enterprise applications unless the application is made publicly available without restriction (for information on licensing for these types of applications, please contact maplic@microsoft.com).

Offline Viewing

- Supported by
 - ArcGIS
 - Cloudmade
 - Mapbox
- Watch the Terms of Service

CATiledLayer

WWDC UIScrollView Talks



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All of the mapping solutions are based on a CATiledLayer. Watch the frog sessions to learn all about the CATiledLayer.



```
n = 2 ^ zoom  
xtile = ((lon_deg + 180) / 360) * n  
ytile = (1 - (ln(tan(lat_rad)) + sec(lat_rad)) / Pi)) / 2 * n
```

Note: ln stands for natural logarithm

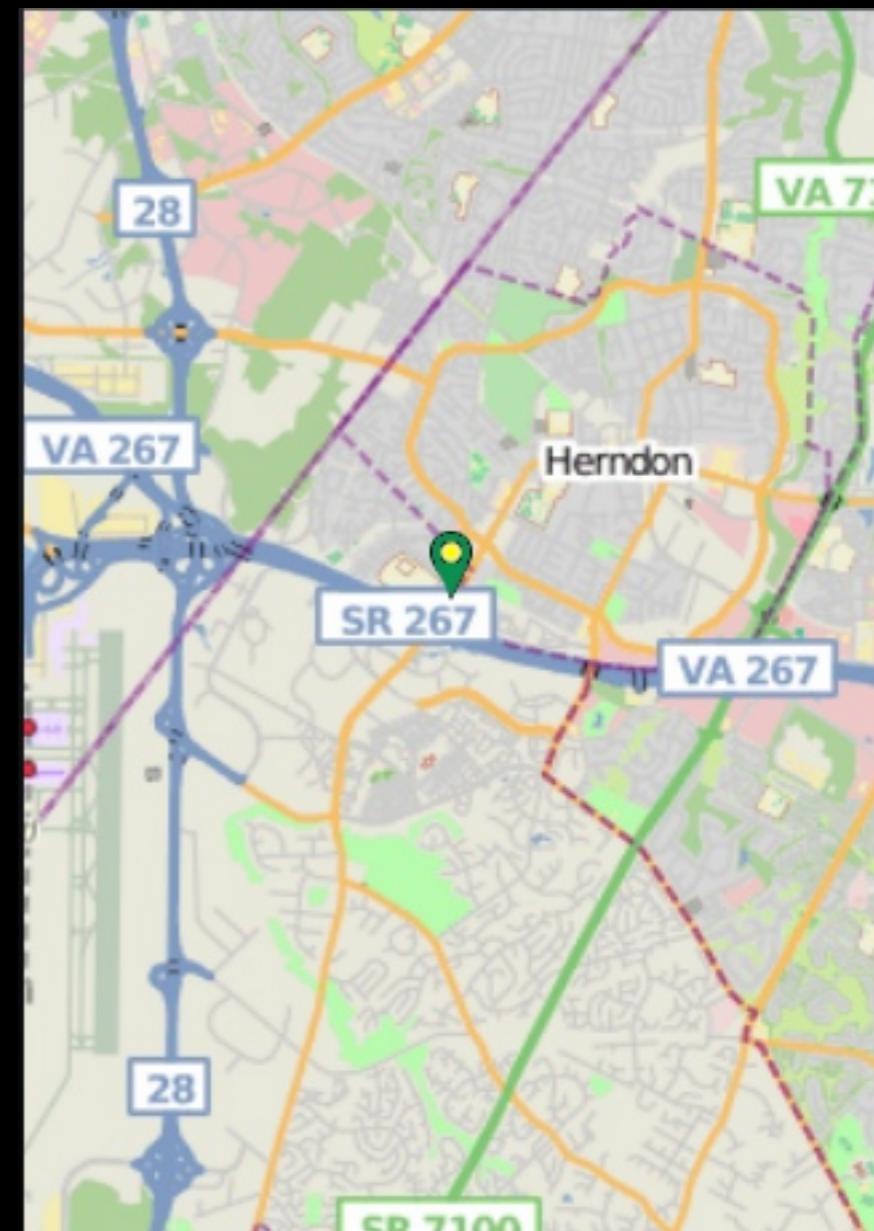
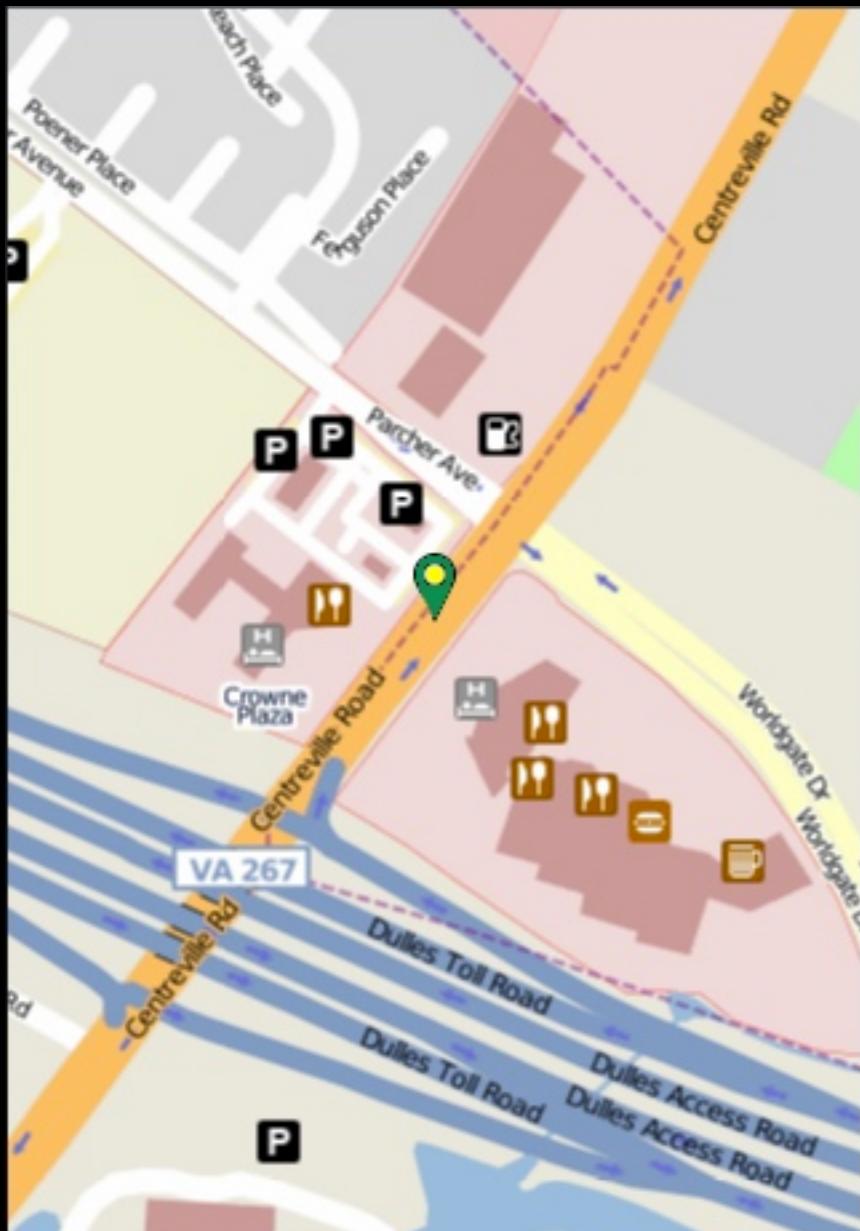
<http://developers.cloudmade.com/projects/tiles/examples/convert-coordinates-to-tile-numbers>

User Generated Styles

- User Styling <http://maps.cloudmade.com>
- Over 66K User Generated Styles
- 8 Generated by Cloudmade
- Watch out for Performance

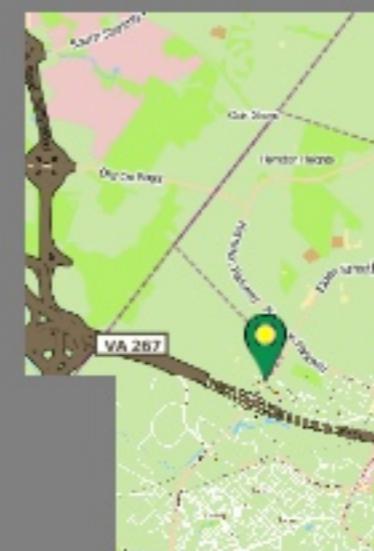
A feature of Cloudmade is that users can generate different styles for the maps. If your app has a specific color palette that you want to carry over to the maps in the app, you can do that. Be careful, we saw that many of the styles that are not generated by Cloudmade themselves take an unacceptable time to render.

Cloudmade



Style #1

Cloudmade



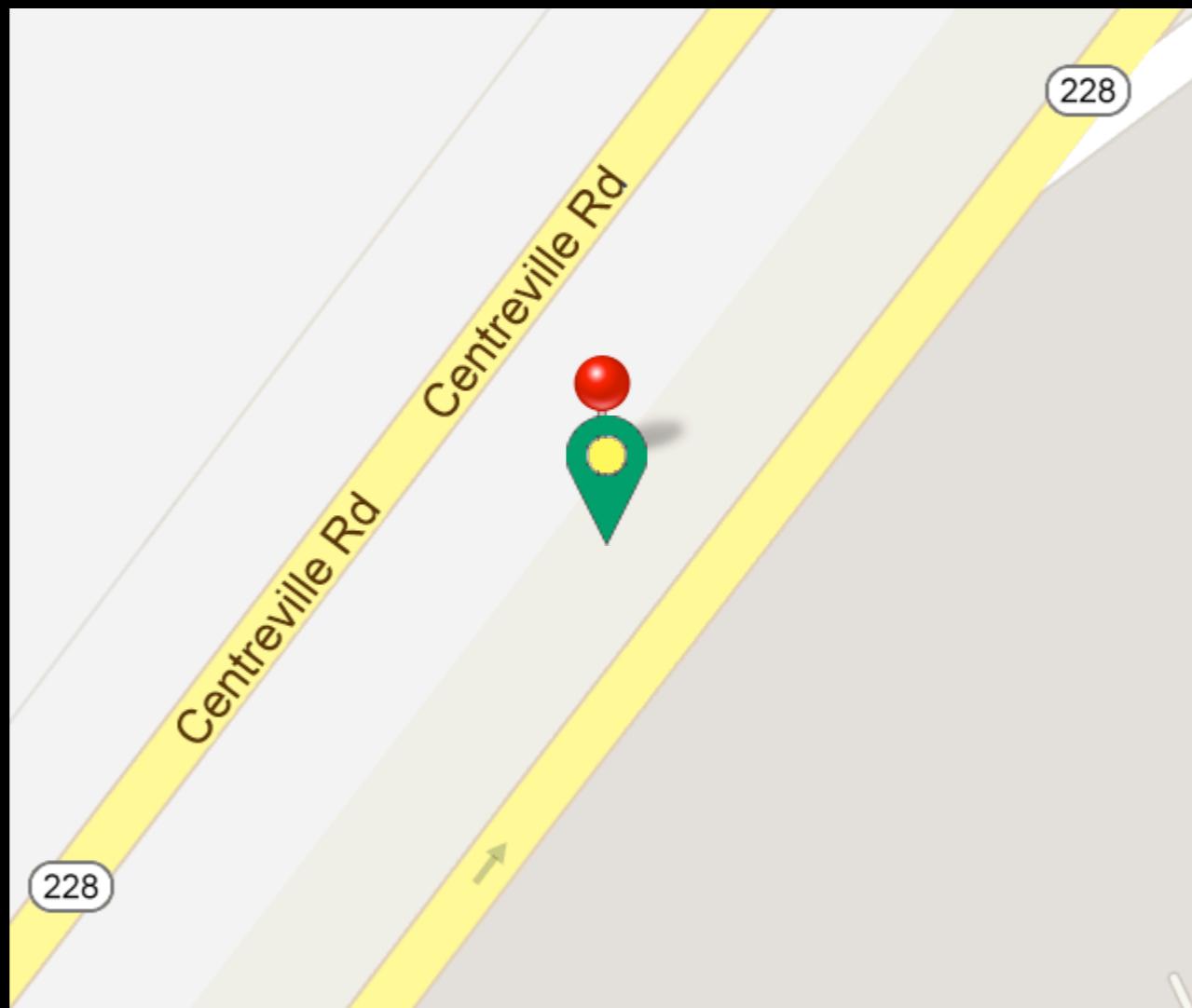
Style #65922

General Maply Things

- Marker Offset
- Routes as opaque objects
- Powers of 10

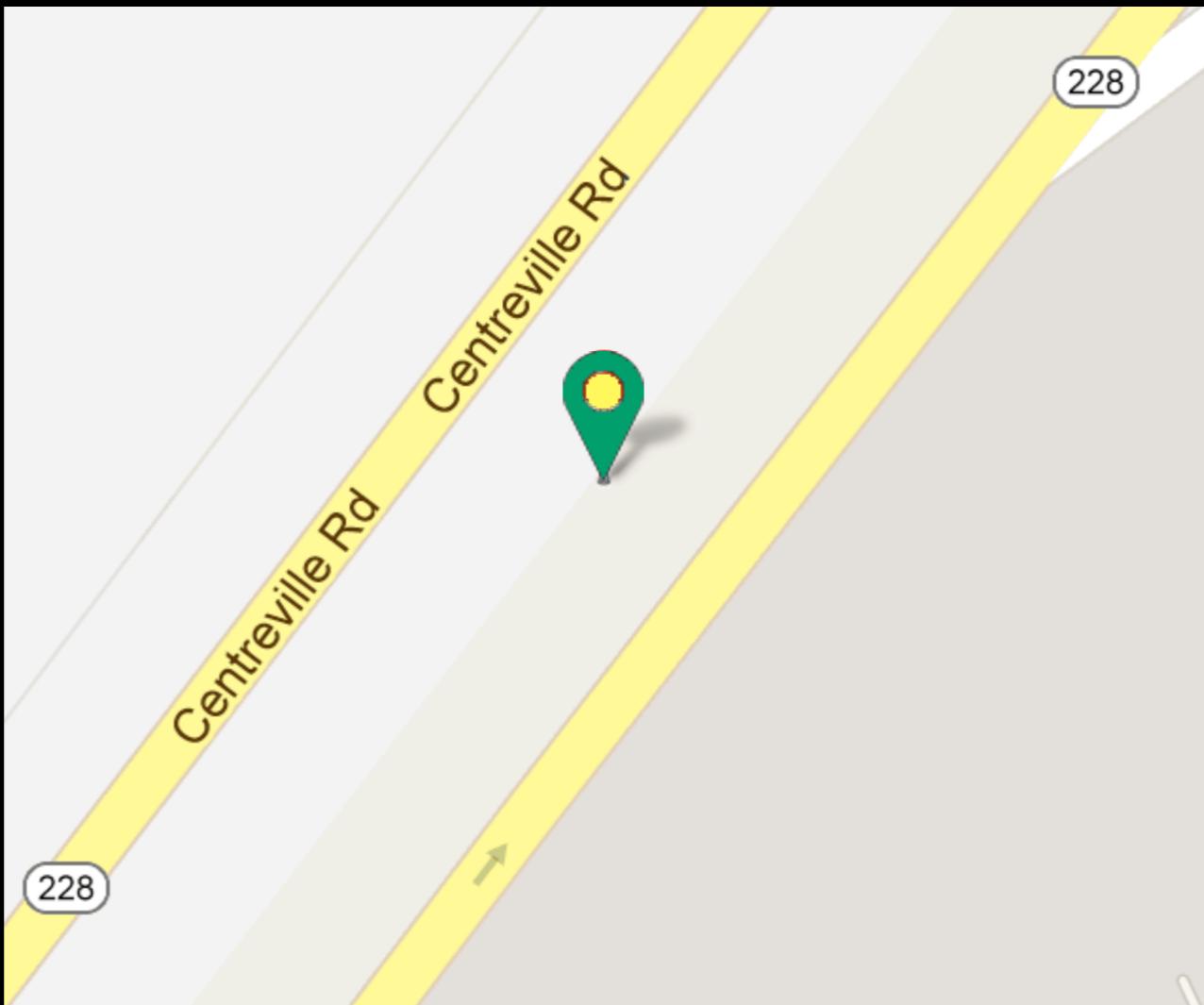
Center Offset

- Pins are placed using the .center point
- Light source is to the top left
 - Apple is moving away from this (see Find My Friends)



```
CGPoint offsetPoint = CGPointMake(0, 0);  
[av setCenterOffset:offsetPoint];
```

Your expectation may be that the offset will be where the pin point is, however graphics are placed at the center. You will need to manipulate your graphic to make it look correct based on where the “point” of the marker is.



```
CGPoint offsetPoint = CGPointMake(0, -(annotationView.frame.size.height)/2);
[annotationView setCenterOffset:offsetPoint];
```

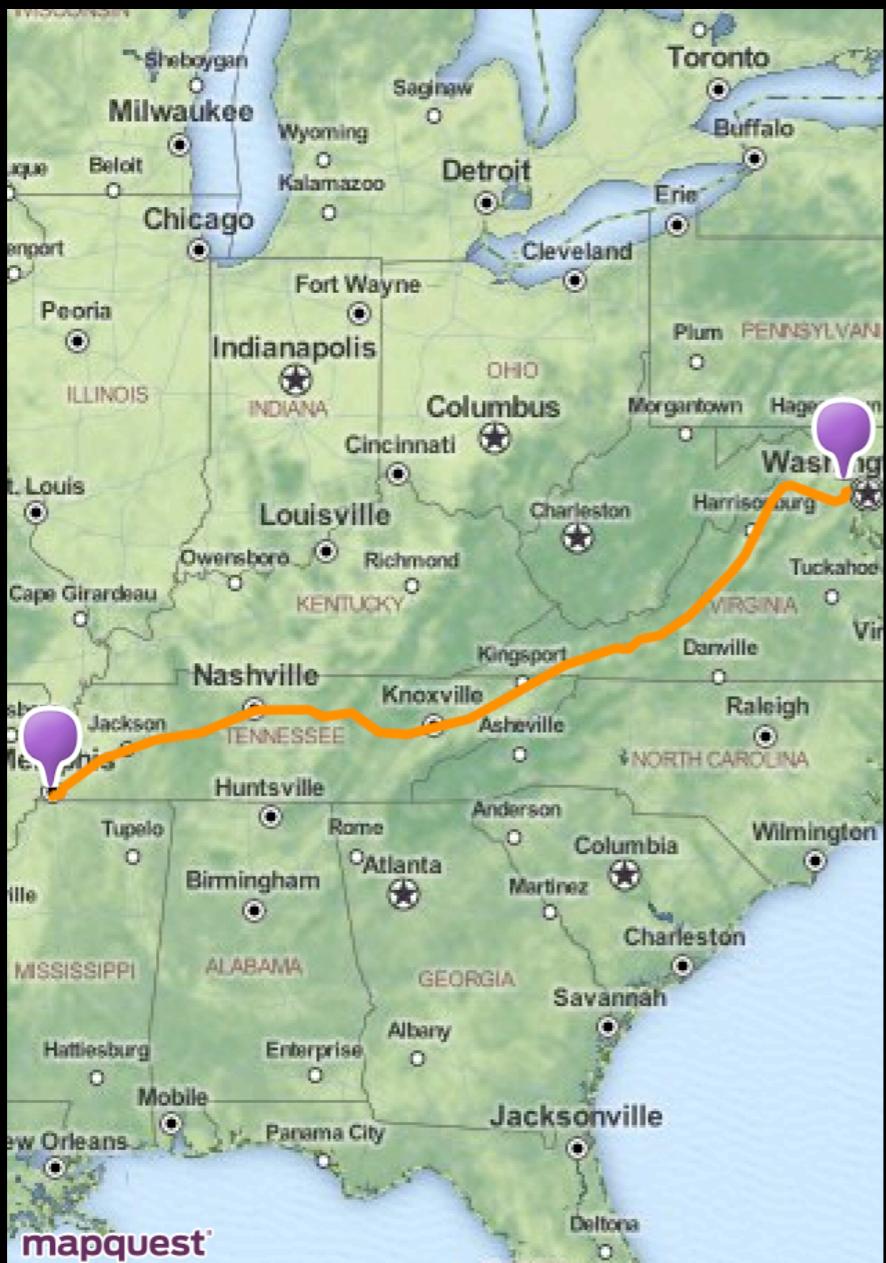
Different Ways

- MapQuest and Bing use centerOffset property
- CloudMade and MapBox use the anchorPoint of the layer of the image
- ArcGIS expects you to use the center

Routes

- An array of points
- Route doesn't always mean what you think it means

Mapquest



A MQRoute object
contains an array of
maneuvers

Mapquest

```
▼ L maneuver = (MQManeuver *) 0x00282630
  ► NSObject(NSObject)
  ► m_narrative = (NSString *) 0x00282af0 "Start out going southeast on Parcher Avenue toward VA-6...
  ► m_iconURLString = (NSString *) 0x002835a0 "http://content.mapquest.com/mqsite/turnsigns/rs...
  ► m_mapURLString = (NSString *) 0x00283640 "http://open.mapquestapi.com/staticmap/v4/getm...
  m_duration = (NSTimeInterval) 16
  m_distance = (float) 0.04
  m_turnType = (MQManeuverType) MQManeuverStraight
  m_turnDirection = (MQManeuverDirection) MQManeuverDirectionSE
```

maneuver->m_narrative:

Start out going southeast on Parcher Avenue toward VA-657/Centreville Road.

maneuver->m_iconURLString:

http://content.mapquest.com/mqsite/turnsigns/rs_straight_sm.gif



maneuver->m_mapURLString:

<http://open.mapquestapi.com/staticmap/v4/getmap?type=map&size=225,160&pois=purple-2,38.959602,-77.402549,0,0|purple-3,38.959224,-77.401985,0,0|¢er=38.959413,-77.402267&zoom=15&key=Kmjtd%7Cluu7n162n1%2C22%3Do5-h61wh&rand=1904167924&session=4feef074-0001-000d-02b7-67fa-0026557e2d0a>



Notice that we really have to dig in order to get the Lat/Long. This goes back to MapQuest's heritage as a web company. The route is presented so that it would be really easy to present in a printable list (just like their web app).

Floating Point Precision

- Latitude and Longitude are provided as doubles
- Watch out for the significant digits

An Age Old Problem

<http://stackoverflow.com/questions/5098558/float-vs-double-precision>

```
float x = 3.141592653589793238;
double z = 3.141592653589793238;
printf("x=%f\n", x);
printf("z=%f\n", z);
printf("x=%20.18f\n", x);
printf("z=%20 18f\n" z);
```

will give you the output

```
x=3.141593
z=3.141593
x=3.141592741012573242
z=3.141592653589793116
```



Powers of Ten

30

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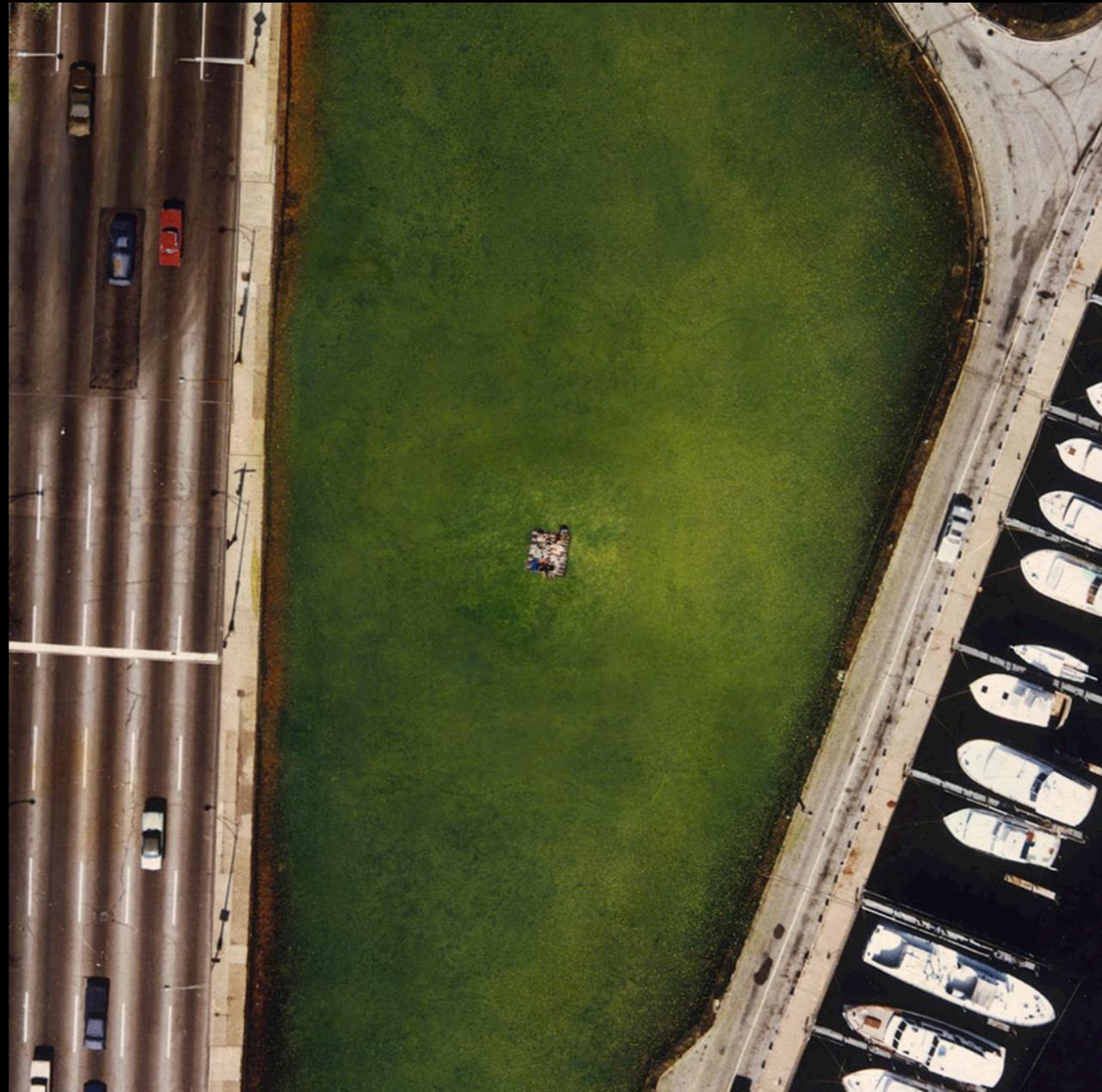
This will be familiar if you are of a certain age, pay attention to how the scene changes with each order of magnitude. Here we are 10^0 meters above the man.



| 0 |

3 |

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| 0²

32

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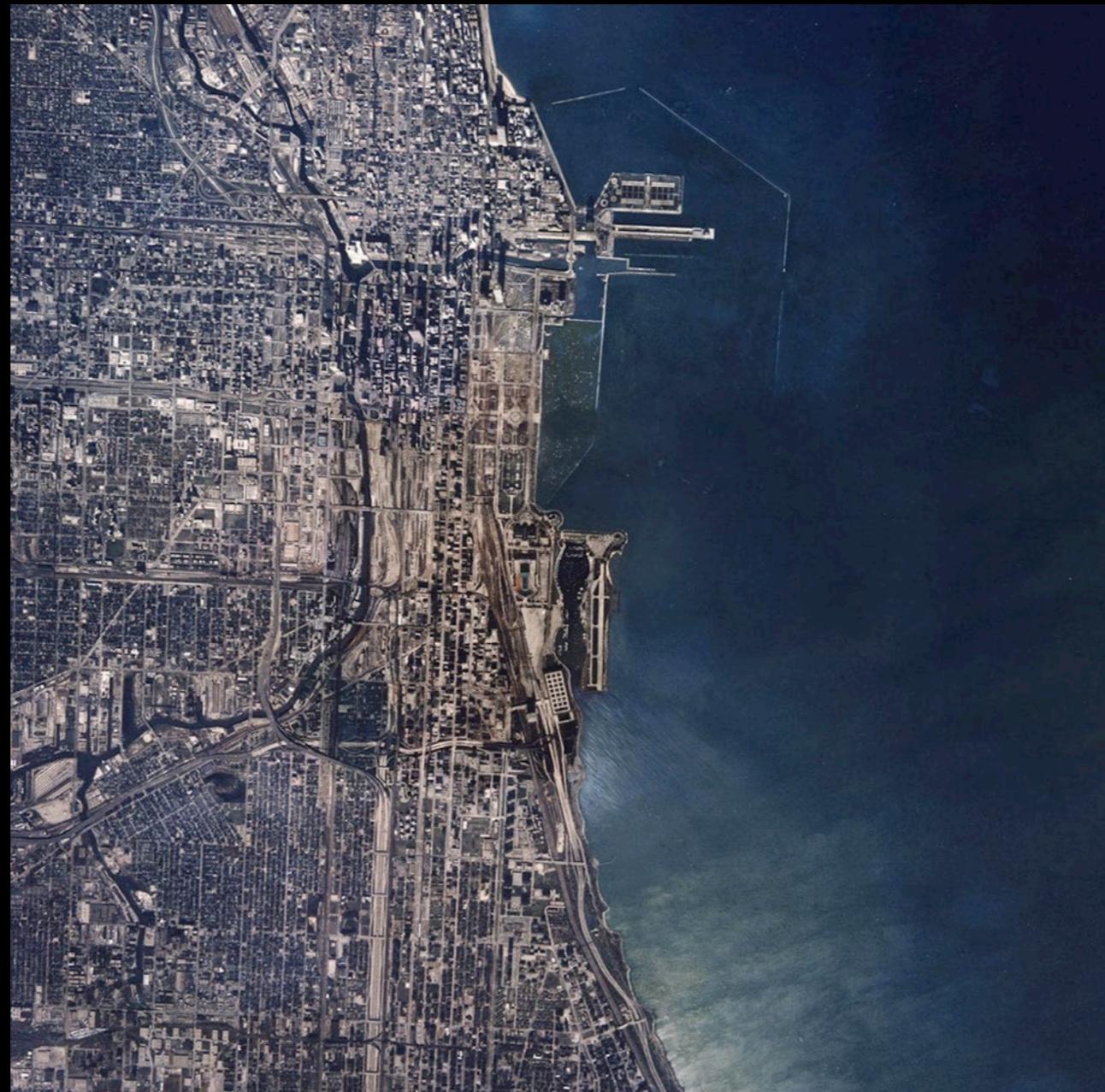


10³

33

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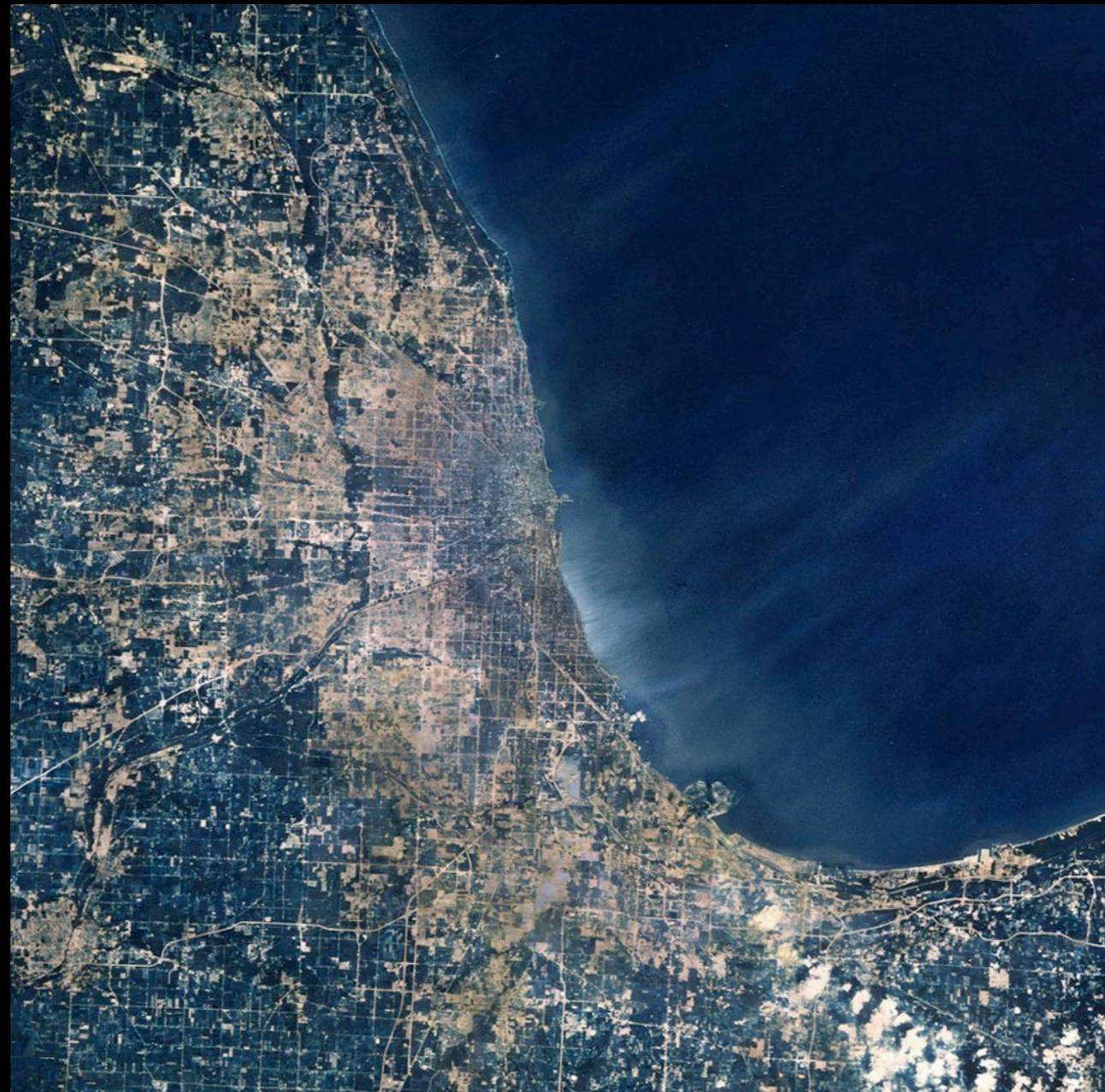
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| 10⁴

34

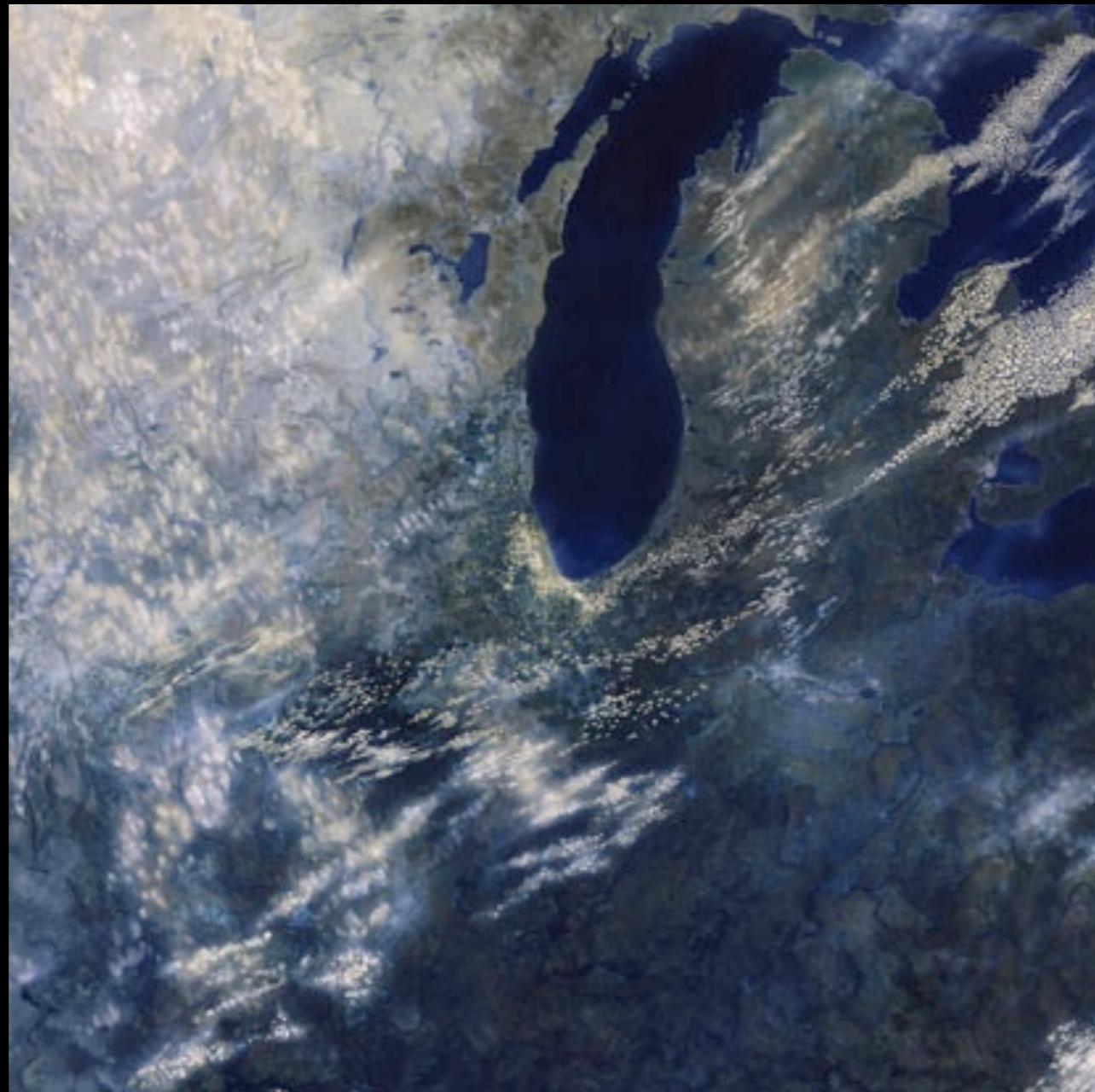
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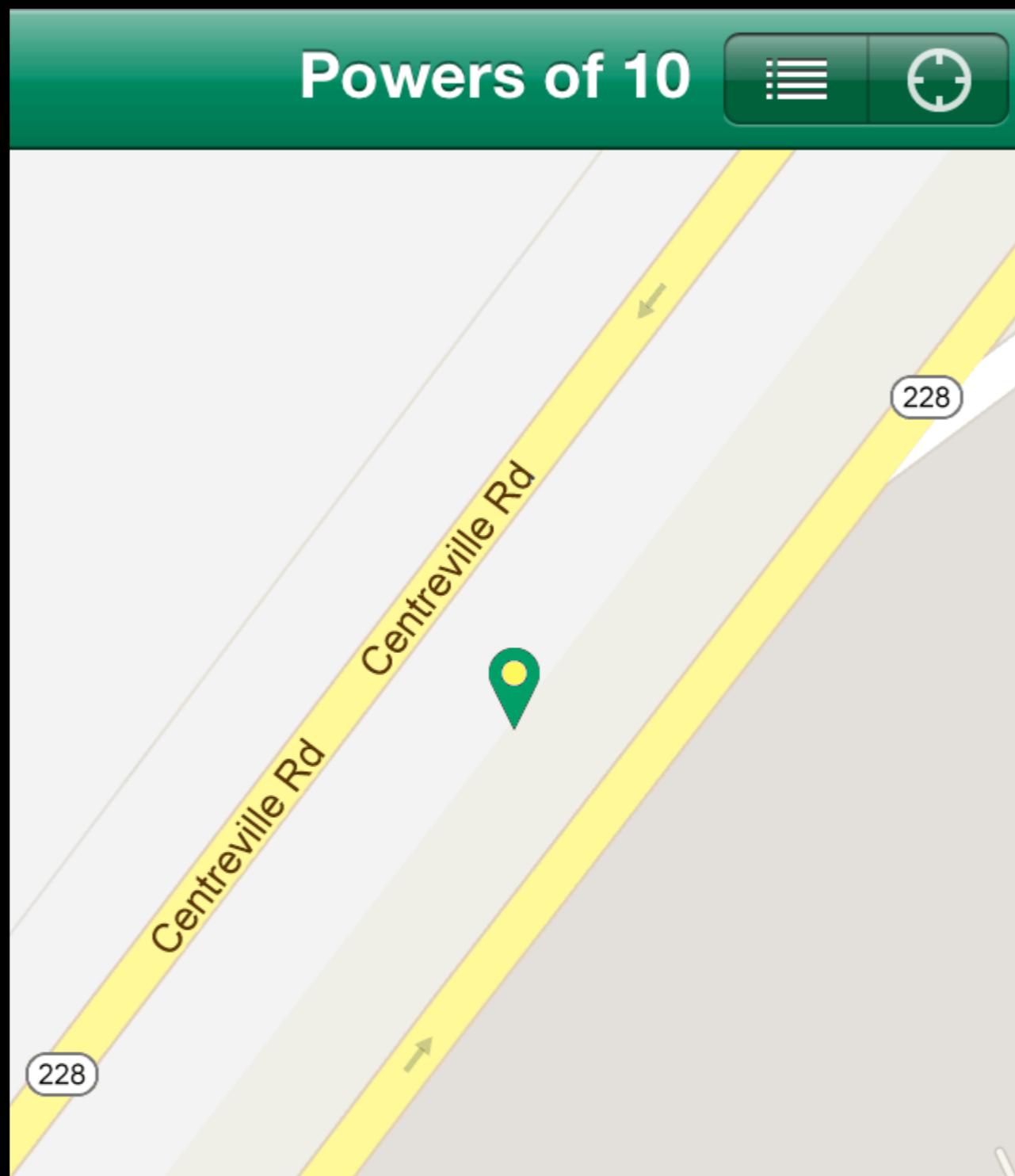
| 10⁵

35

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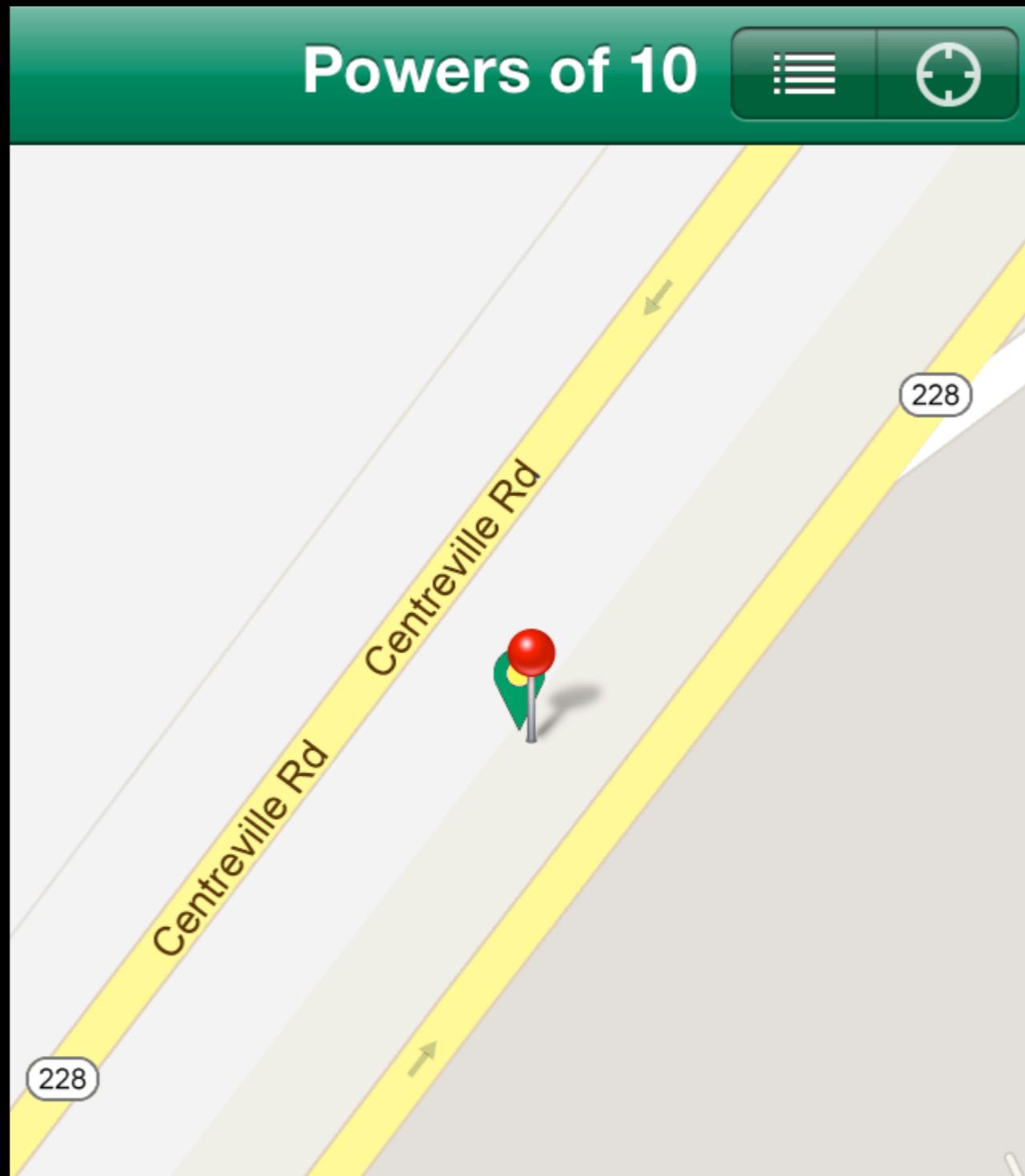


$| 10^6$



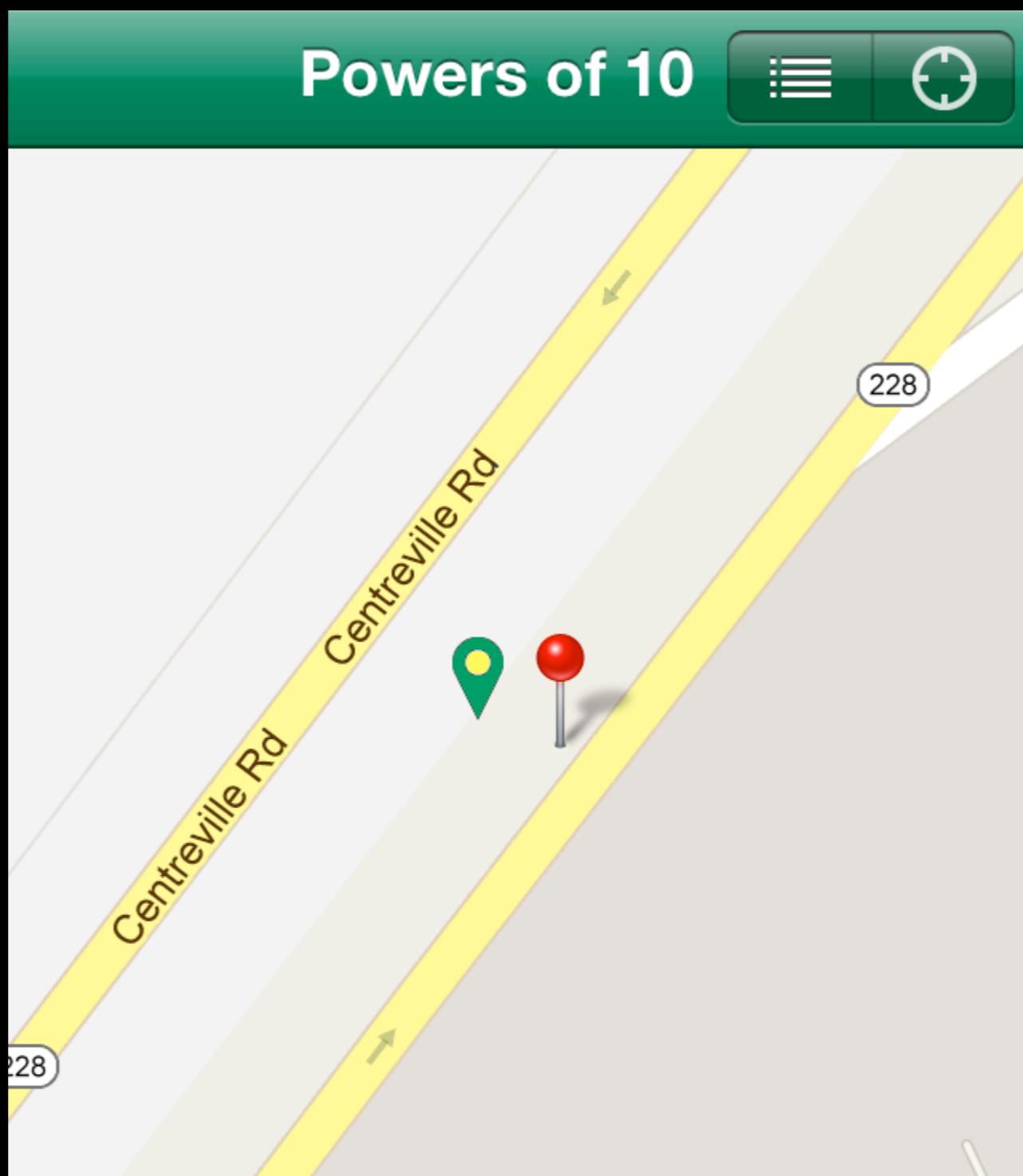
38.958616, -77.402469

Powers of 10

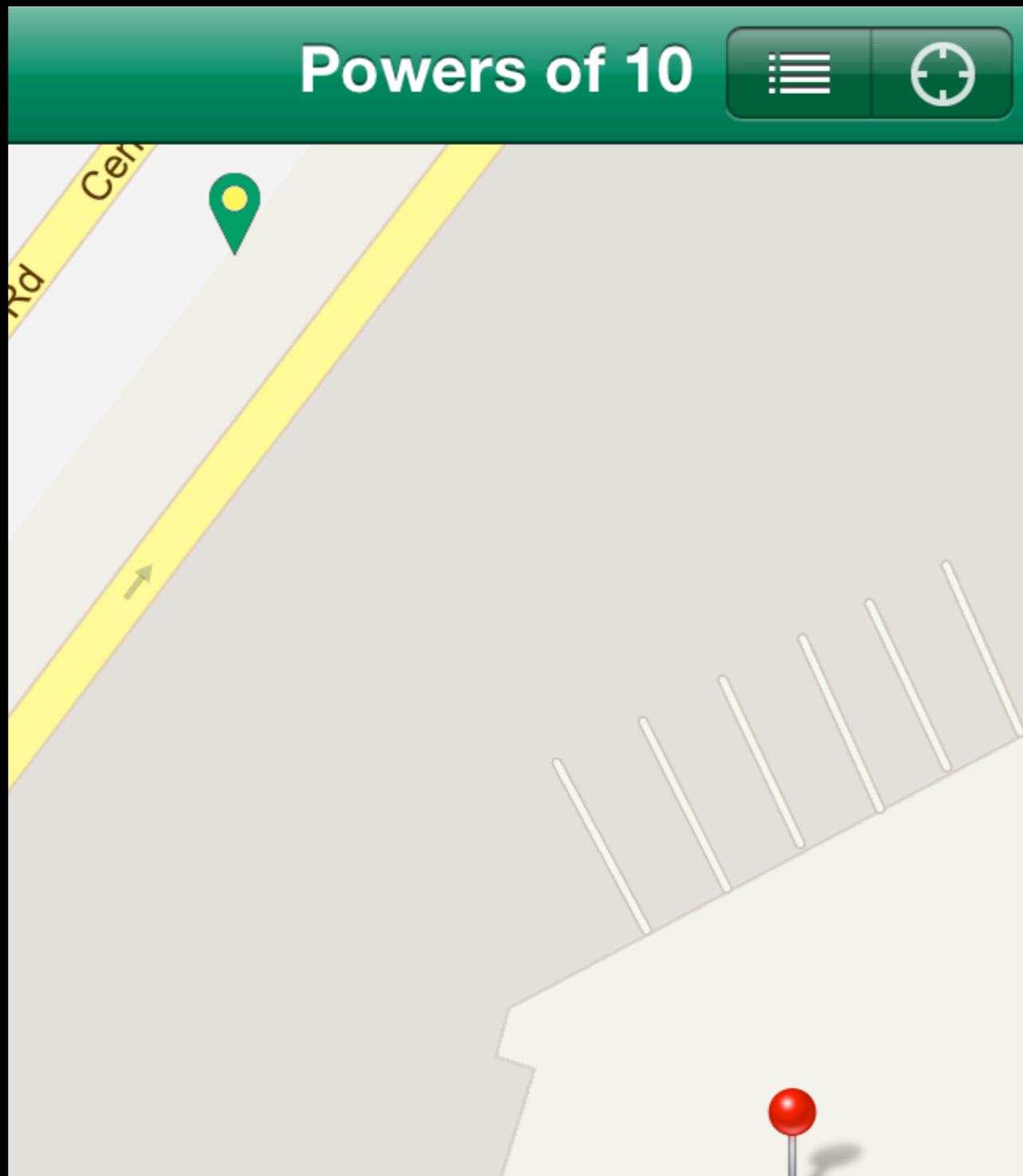


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Powers of 10

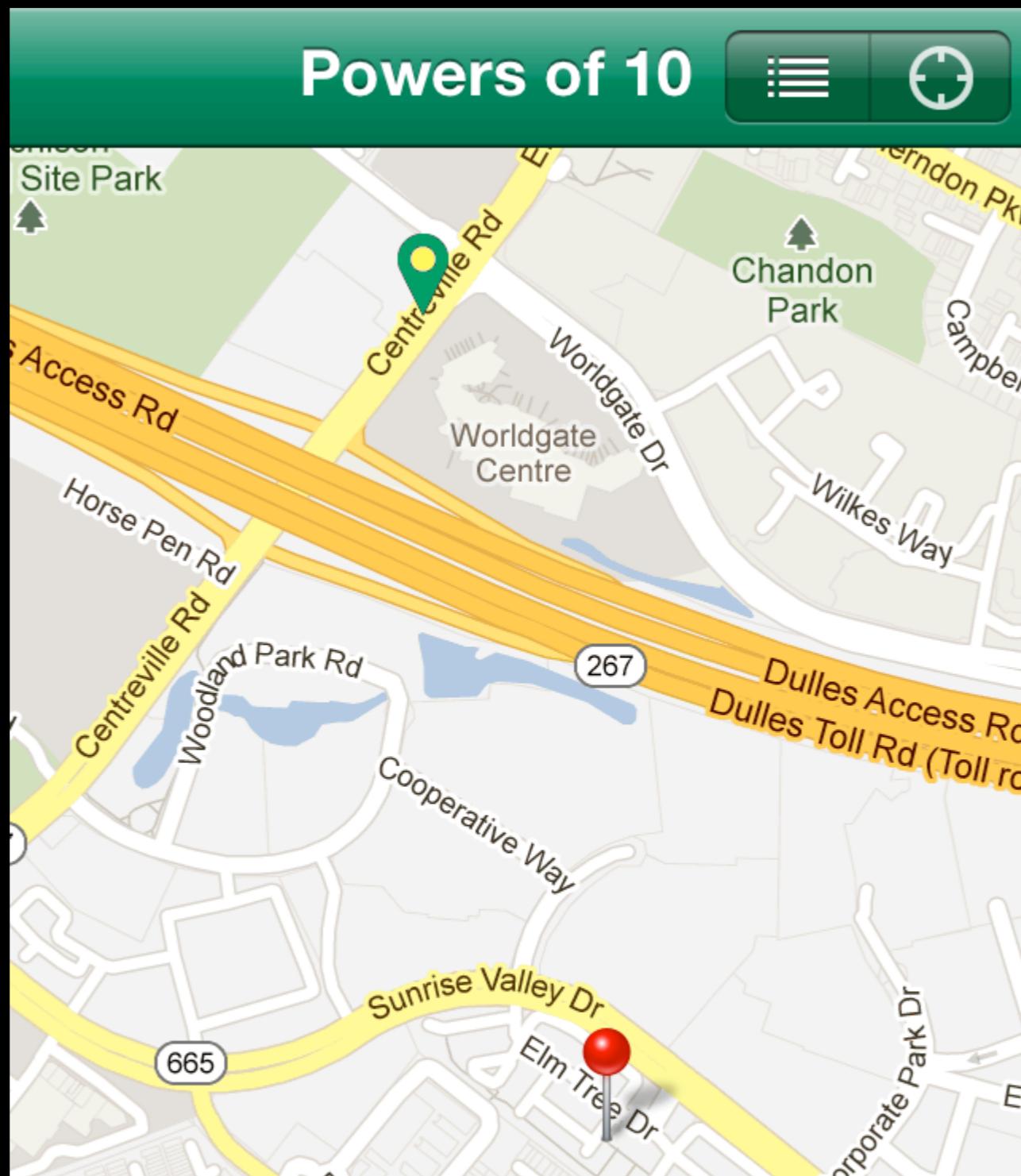


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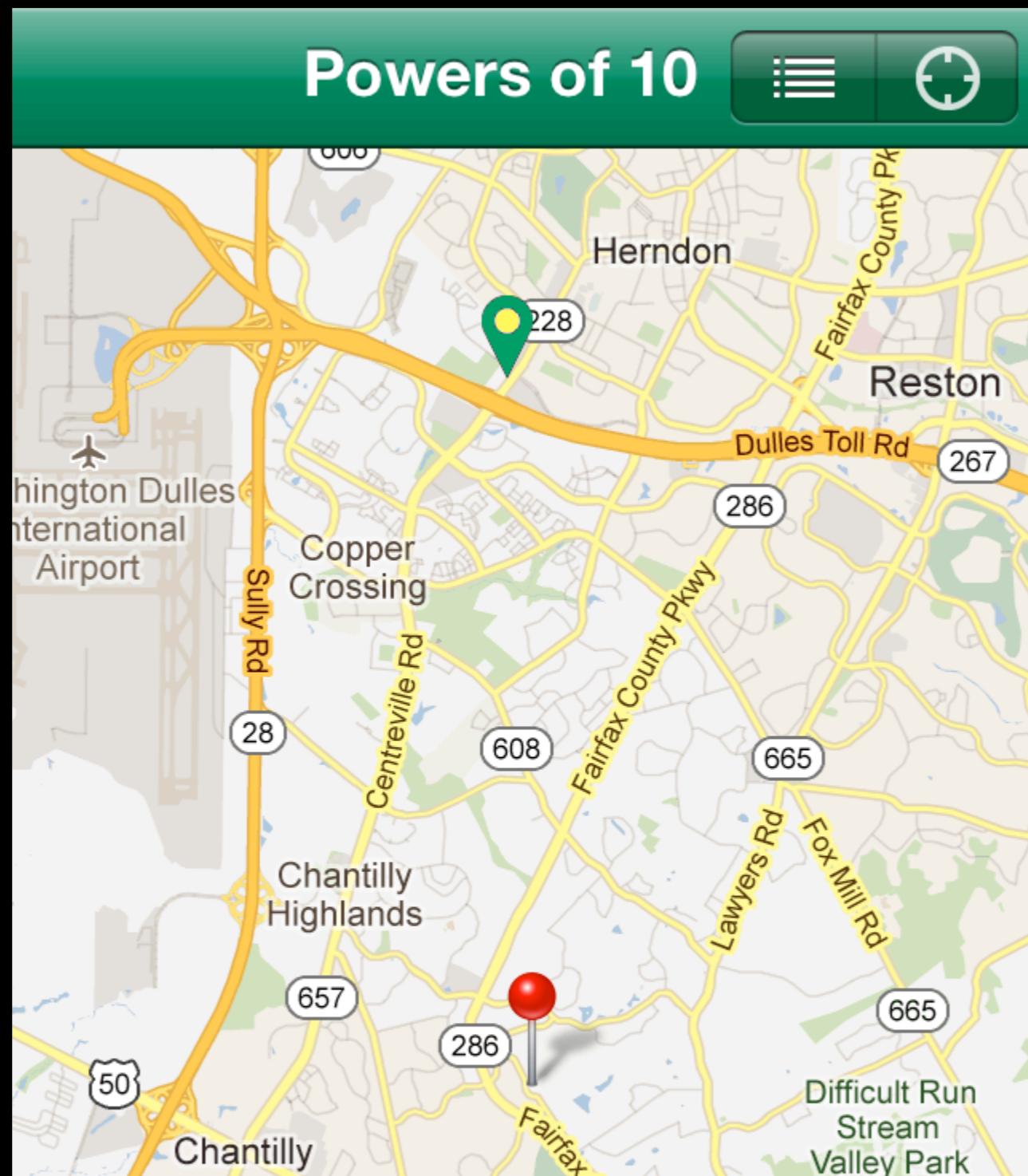


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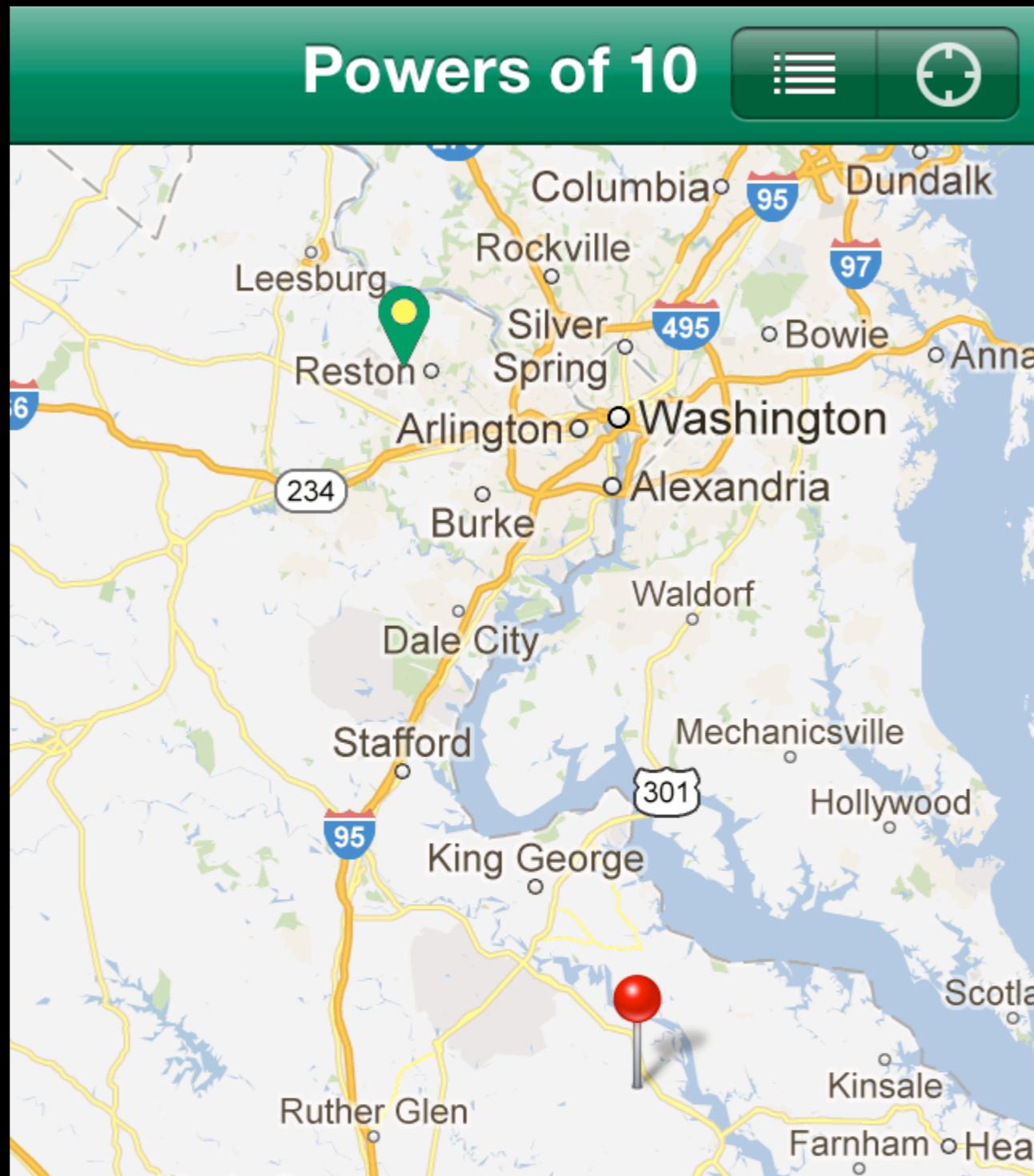
40



38.95,-77.40



38.9,-77.4



38,-77



Thank You

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