



# Google Maps API Quickstart

刘晓宇  
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Google Cloud



# Self-introduction

刘晓宇

6年云服务从业经验

Google Cloud Certified - Professional Cloud Architect

Google Cloud Certified - Professional Data Engineer



Google Maps Platform

# Content

- Introduction of Google Maps API Platform
- Frequently used Maps APIs
- Frequently used Routes APIs
- Frequently used Places APIs
- Q & A

# Introduction of Google Maps Platform

01



Google Maps Platform

# List of points

- What's Maps API platform?
- How to enable all the APIs in the console?
- How to set the API keys restriction?

# Google Maps platform

**99% coverage of the world**

**25 million updates daily**

**1 billion MAU**



## 3 core products



Maps

Maps  
Street View



Routes

Directions  
Distance Matrix  
Roads



Places

Place Details  
Current Place  
Find Place  
Autocomplete  
Geocoding  
Geolocation  
Time Zone

# **HandsOn:**

## **Start to use Google Maps Platform**

**Demo 1: enable all APIs in the console**

**Demo 2: set the restriction for your keys**



# Demo 1: enable all APIs in the console

1. Go to the GMP official site <https://cloud.google.com/maps-platform/>
2. Click the blue “Get started” button
3. Tick Maps, Routes, Places, then click continue
4. Select a project, click next
5. After setting the billing, it will pop a wizard asking about some questions which you can skip.
6. After the above step, it will tell you “This will enable 15 Google Maps Platform API(s) and create an API key for your implementation”
7. Wait a second while the platform is enabling the APIs for you till you see “You're all set! You're ready to start developing!” Click Done

**Congratulations! Start your Google Maps API now!**



Google Maps Platform

# Welcome to Google Maps Platform

Explore where real-world insights and immersive location experiences can take your business

[GET STARTED](#)

**99%**  
coverage of the world

Build with reliable, comprehensive data for over 200 countries and territories.

**25 million**  
updates daily

Count on accurate, real-time location information.

**1 billion**  
monthly active users

Scale confidently, backed by our infrastructure.



## Enable Google Maps Platform

To enable APIs or set up billing, we'll guide you through a few tasks:

**1. Pick product(s) below**

2. Select a project

3. Set up your billing



**Maps**

Build customized map experiences that bring the real world to your users.



**Routes**

Give your users the best way to get from A to Z.



**Places**

Help users discover the world with rich details.

[CANCEL](#)

[CONTINUE](#)



Google Maps Platform



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CANCEL

CONTINUE



Google Maps Platform



## Enable Google Maps Platform

To enable APIs or set up billing, we'll guide you through a few tasks:

1. Pick product(s) below
- 2. Select a project**
3. Set up your billing

Projects allow you to use APIs, add collaborators, and manage permissions.

Select or create project

+ Create a new project
My First Project
test-nicky-liu

CANCEL NEXT





## Enable Google Maps Platform

### Enable your APIs

This will enable 15 Google Maps Platform API(s) and create an API key for your implementation

CANCEL

NEXT



Google Maps Platform



## Enable Google Maps Platform

You're all set!

You're ready to start developing!

YOUR API KEY

AIzaSyC3Po21uzEPJLUFmaHycQ [REDACTED]




To improve your app's security, restrict this key's usage in the [API Console](#).

DONE



Google Maps Platform

## Demo 2: set the restrictions for your keys

1. After login the console, from the navigation menu choose **API & Services**, click **credentials**, you will see the created keys.
2. Select the API key and click  to edit the key
3. In the **Application restriction** section, you can control which websites, IP addresses, or applications can use your API key.
4. In the **API key restriction** section, tick **Restrict key**, then you can choose which APIs this key can use from **select APIs**
5. You can also regenerate or delete your key if needed.



Google Cloud Platform My First Project

Home

Pins appear here ? X

Marketplace

Billing

APIs & Services >

Support >

IAM & admin >

Getting started

Security >

Dashboard

Library

Credentials

OAuth consent screen

Domain verification

Page usage agreements

API APIs

Requests (requests/sec)

1.0

0.8

0.6

0.4

0.2

0

3:15 3:30 3:45 4 PM

No data is available for the selected time frame.

Go to APIs overview

API APIs & Services

Dashboard

Library

Credentials

OAuth consent screen

Domain verification

Page usage agreements

Credentials

Create credentials

Delete

Create credentials to access your enabled APIs. For more information, see the [authentication documentation](#).

API keys

<input type="checkbox"/>	Name	Creation date	Restrictions	Key	
<input type="checkbox"/>	API key	Dec 4, 2019	None	AlzaSyC3Po21uzZPJLUFmsHycQ_rG	<div><div></div><div></div></div>
<input type="checkbox"/>	API key	Oct 12, 2019	13 APIs	AlzaSyCQxwYpANFPSaePh1BGgCws	<div><div></div><div></div></div>

Google Cloud PlatformMy First Project

APIs & Services

Dashboard

Library

Credentials

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Domain verification

Page usage agreements

RESTRICT AND RENAME API KEY

REGENERATE KEYDELETE

Name \*  
API key

API Key  
AIzaSyC3Po21uzZPJLUFmsHycQ\_rG E

Key restrictions

This key is unrestricted. Restrictions help prevent unauthorized use and quota theft. [Learn more](#)

Application restrictions

An application restriction controls which websites, IP addresses, or applications can use your API key. You can set one application restriction per key.

None

HTTP referrers (web sites)

IP addresses (web servers, cron jobs, etc.)

Android apps

iOS apps

API restrictions

API restrictions specify the enabled APIs that this key can call

Don't restrict key  
This key can call any API

Restrict key

Note: It may take up to 5 minutes for settings to take effect

SAVECANCEL

Creation date  
December 4, 2019 at 3:33:24 PM GMT+8

Created by  
nickyl.liu@hkmci.com (you)

Total usage (last 30 days)  
0

Use this key in your application by passing it with `key=API_KEY` parameter.

# Frequently used Maps APIs

02

# List of points

- Maps Static
- Maps JavaScript
- Street view
- Demo: Street View Side-By-Side



# Maps Static

Add simple, embeddable map **images** to your website with minimal code.



# Maps Static

The Maps Static API returns an image (either GIF, PNG or JPEG) in response to an HTTP request via a URL.

<https://maps.googleapis.com/maps/api/staticmap?parameters>

- Location Parameters
- Map Parameters
- Feature Parameters

## Developer Guide:

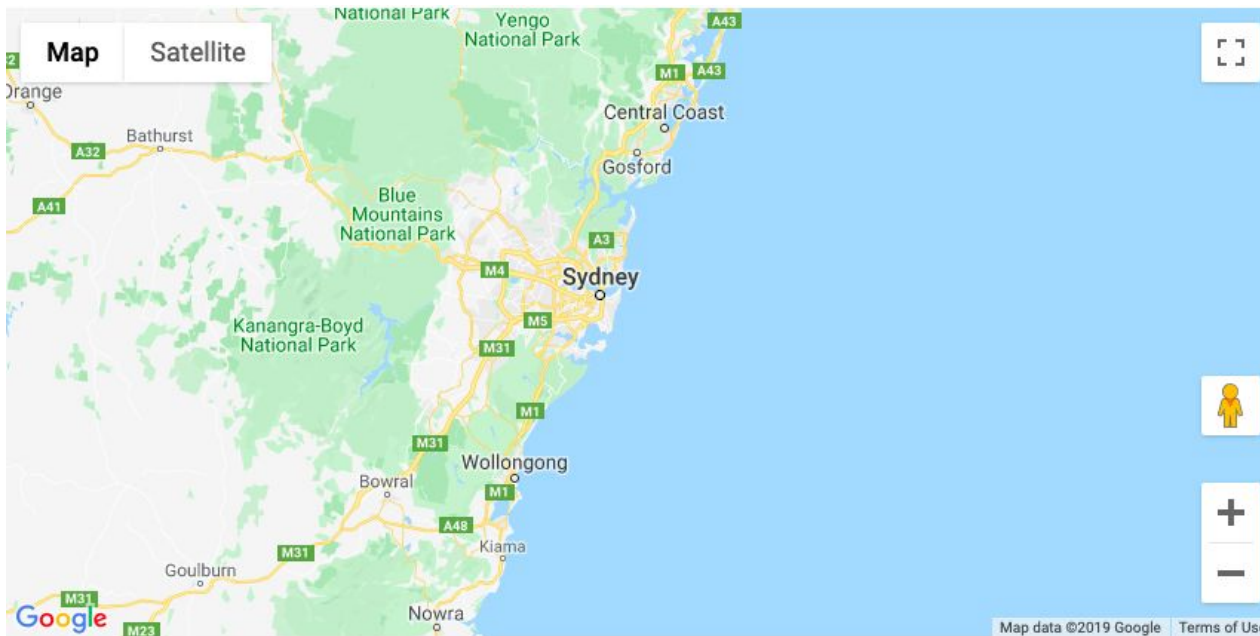
<https://developers.google.com/maps/documentation/maps-static/dev-guide>



Google Maps Platform

# Maps JavaScript

Add an **interactive** map to your website. Customize it with your own content and imagery.





# Maps JavaScript

Even in a simple example, there are a few things to note:

1. We declare the application as HTML5 using the `<!DOCTYPE html>` declaration.
2. We create a `div` element named "map" to hold the map.
3. We define a JavaScript function that creates a map in the div.
4. We load the Maps JavaScript API using a script tag.

## Developer Guide:

<https://developers-dot-devsite-v2-prod.appspot.com/maps/documentation/javascript/tutorial>

# Maps JavaScript

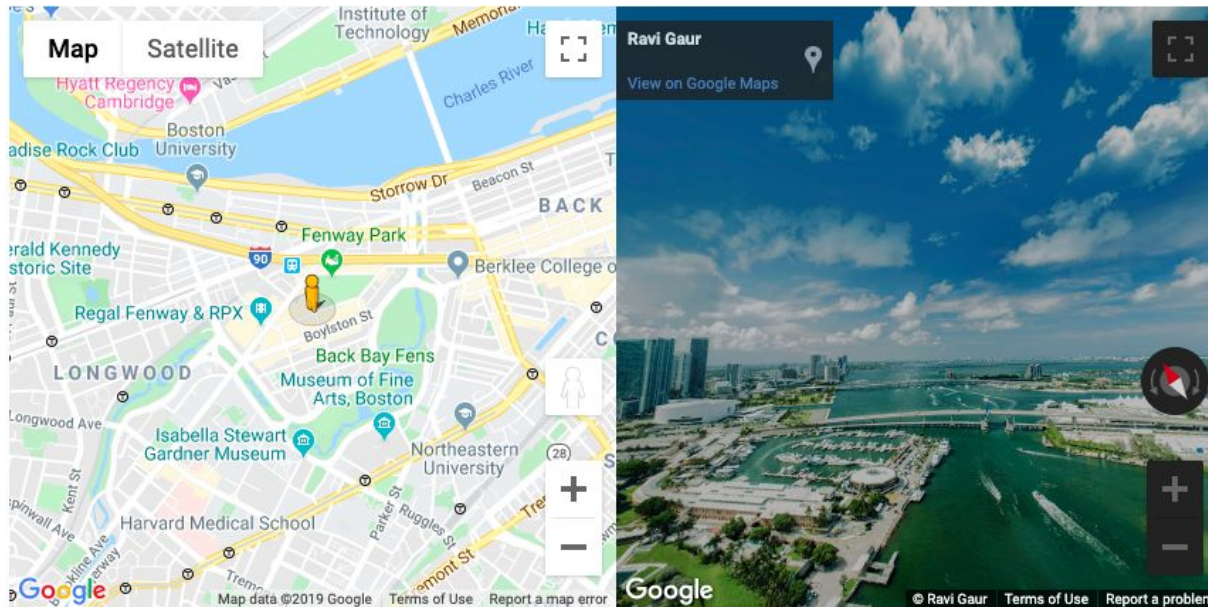
## Libraries

Libraries are modules of code that provide additional functionality to the main Maps JavaScript API but are not loaded unless you specifically request them.

- **drawing**
- **geometry**
- **places**
- **visualization**

# Street View

Street View provides panoramic 360 degree views from designated roads throughout its coverage area.



# Street View

- Dynamic : Allow user to interact with Street View
  - An instantiation of a panorama object in a Maps JavaScript API, Maps SDK for Android, Maps SDK for iOS application.
- Static: No interaction
  - A request to the Street View API to embed a static (non-interactive) Street View panorama.

## Developer Guide:

<https://developers.google.com/maps/documentation/streetview/intro>

# Maps Optimization

- The use of a single map per page is a good way to optimize maps display
- Identify if it is better to use a Dynamic or Static Map/Street View
  - What is the value to the customer and the end user
- Display a map at the right time

# HandsOn:

## Start to use Google Maps API

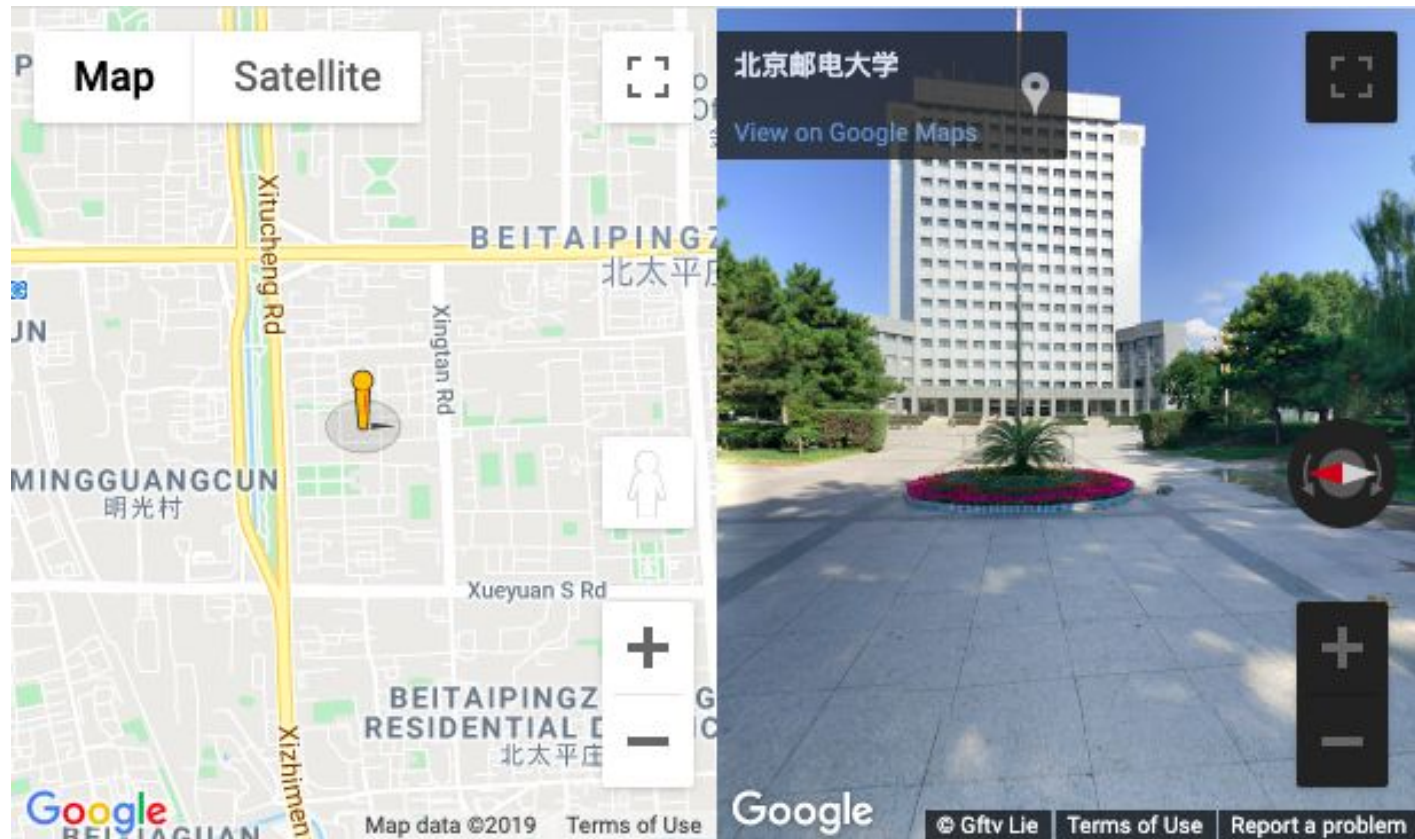
[Demo: Street View Side-By-Side](#)



Google Maps Platform

```
function initialize() {  
    var bupt = {lat: 39.962796, lng: 116.358103};  
    var map = new  
google.maps.Map(document.getElementById('map'), {  
    center: bupt,  
    zoom: 14  
});  
    var panorama = new google.maps.StreetViewPanorama(  
    document.getElementById('pano'), {  
        position: bupt,  
        pov: {  
            heading: 90,  
            pitch: 0  
        }  
    });  
    map.setStreetView(panorama);  
}
```







# Frequently used Routes APIs

03



Google Maps Platform

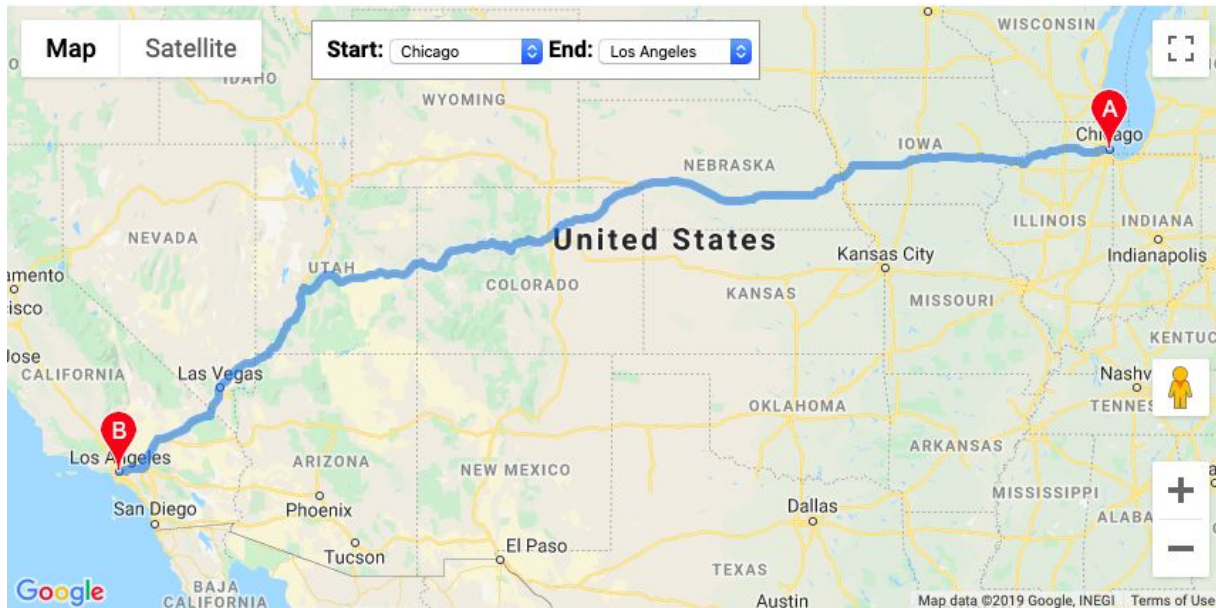
# List of points

- Directions
- Distances Matrix
- Roads



# Directions

Provide directions for transit, biking, driving, or walking between multiple locations.



# Directions

## Useful parameters

- mode
- alternatives
- avoid
- arrival\_time
- Departure\_time

## Developer Guide:

<https://developers.google.com/maps/documentation/directions/intro>

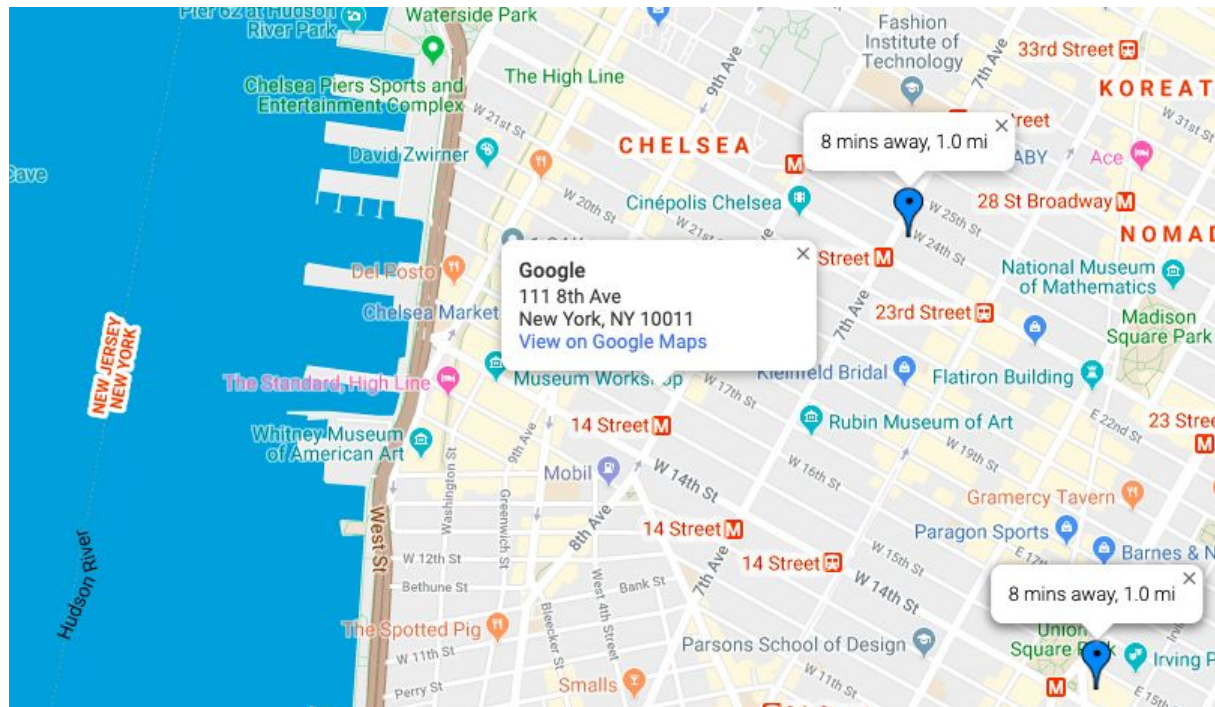
# Waypoints Optimization

- By default, the Directions service calculates a route through the provided waypoints in their given order. Optionally, you may pass **optimize:true** as the first argument within the waypoints parameter to allow the Directions service to optimize the provided route by rearranging the waypoints in a more efficient order.
- If you instruct the Directions service to optimize the order of its waypoints, their order will be returned in the `waypoint_order` field within the `routes` object. The `waypoint_order` field returns values which are zero-based.
- **Caution:** Requests using waypoint optimization are billed at a higher rate



# Distance Matrix

Provides travel distance and time for a matrix of origins and destinations.



# Distance Matrix

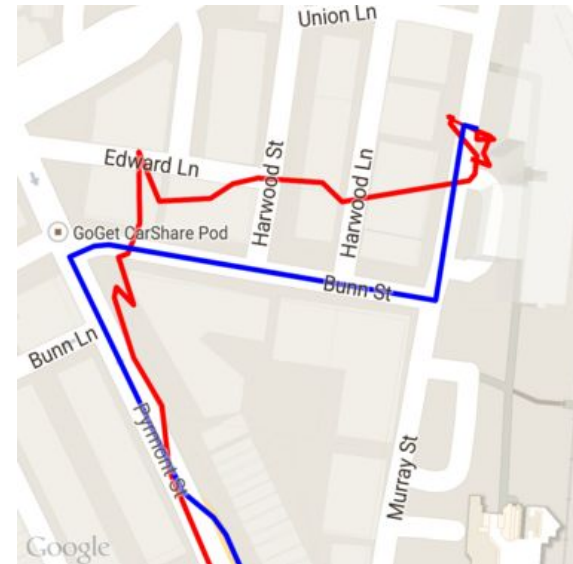
Note: This service does not return detailed route information. Route information can be obtained by passing the desired single origin and destination to the [Directions API](#).

## Developer Guide :

<https://developers.google.com/maps/documentation/distance-matrix/intro>

# Roads

- Snap to roads
- Nearest roads
- Speed limits





# Roads

## When to use?

Use	Avoid
<ul style="list-style-type: none"><li>• When you need a smooth visualization</li><li>• When GPS is imprecise</li><li>• Where points are not too far apart</li><li>• In the city, where visualization is critical</li></ul>	<ul style="list-style-type: none"><li>• If you have accurate gps and enough data points</li></ul>

### Developer Guide:

<https://developers.google.com/maps/documentation/roads/intro>



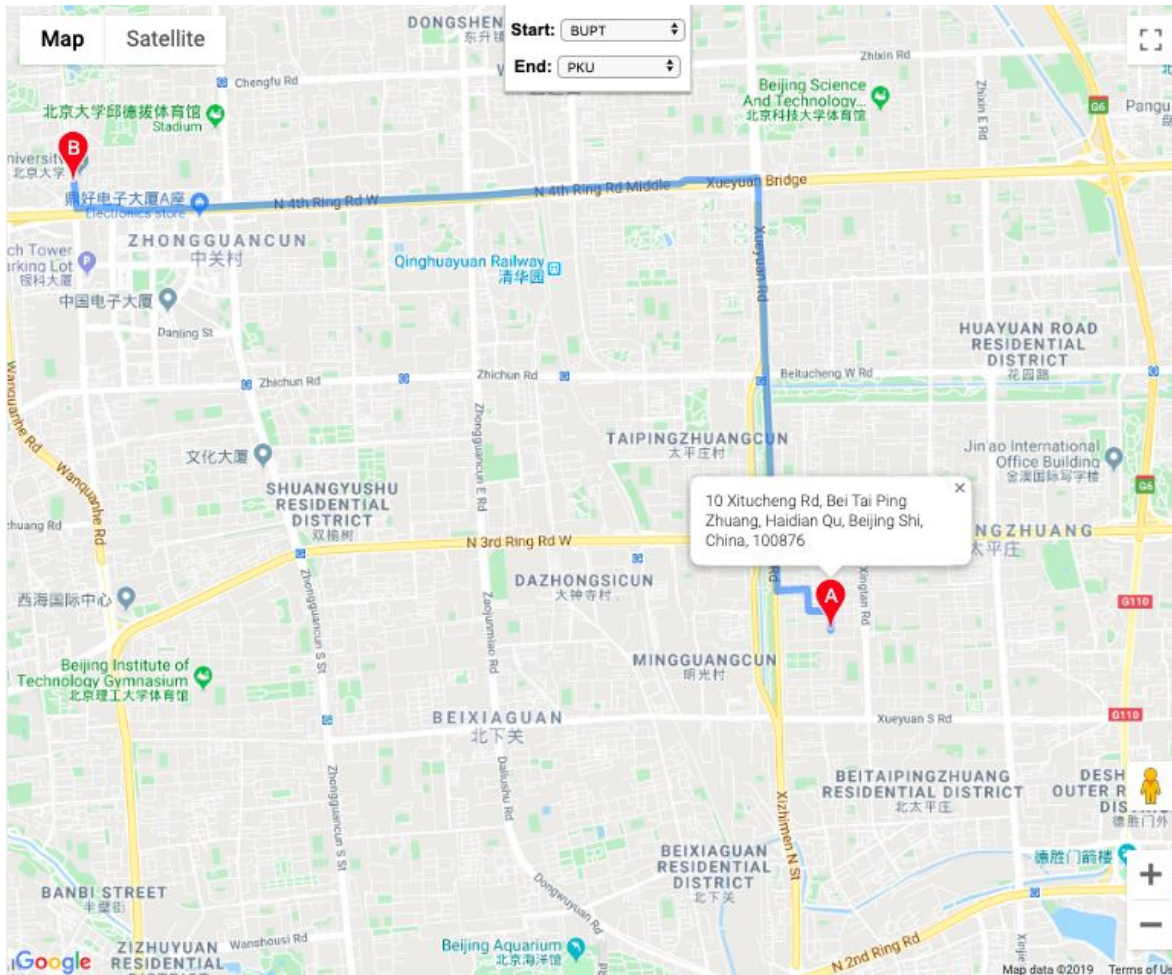
Google Maps Platform

# HandsOn:

## Start to use Routes API

[Demo : Displaying Text Directions With setPanel\(\)](#)





**A** 10 Xitucheng Rd, Bei Tai Ping Zhuang, Haidian Qu, Beijing Shi, China, 100876

7.3 km. About 12 mins

1. Head north 0.1 km
2. Turn left 0.1 km
3. Turn right toward 师大北路 0.1 km
4. Turn left onto 师大北路 0.2 km
5. Turn right onto 西土城路辅路 0.2 km
6. Take the ramp on the left onto 西土城路 1.4 km
7. Continue onto 学院路 0.9 km
8. Turn left onto 北四环中路辅路 0.4 km
9. Take the ramp on the left onto 北四环中 1.0 km 路
10. Continue onto 北四环西路 2.4 km
11. Exit onto 北四环西路辅路 0.3 km
12. Turn right onto 颐和园路 0.2 km

**B** 5 Yiheyuan Rd, Haidian Qu, China, 100871

Map data ©2019

# Frequently used Places APIs

04



Google Maps Platform

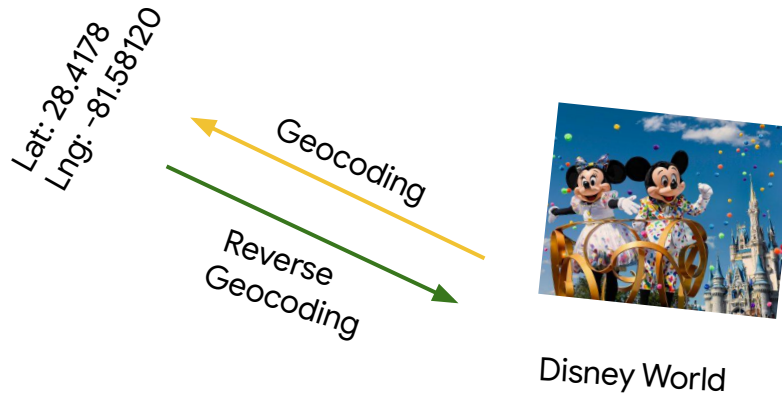
# List of points

- Geocoding
- Place Autocomplete
- Place Details



# Geocoding

Convert addresses to geographic coordinates or the reverse.



# Geocoding

- Geocoding (Latitude/Longitude Lookup)
- Reverse Geocoding (Address Lookup)

Useful parameters:

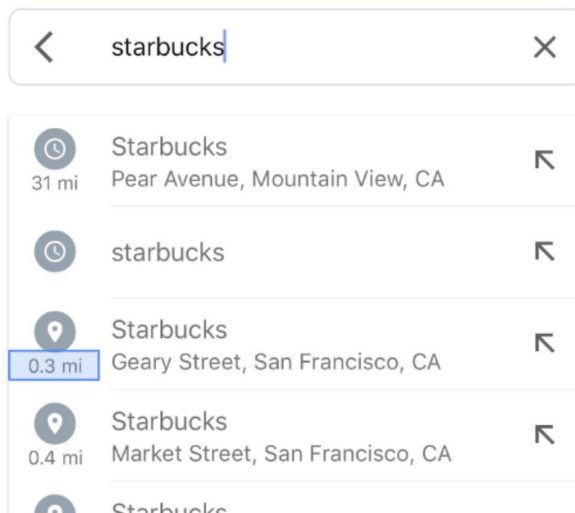
- Language(for both)
- bounds(for geocoding)
- result\_type(for reverse geocoding)

## **Developer Guide:**

<https://developers.google.com/maps/documentation/geocoding/intro>

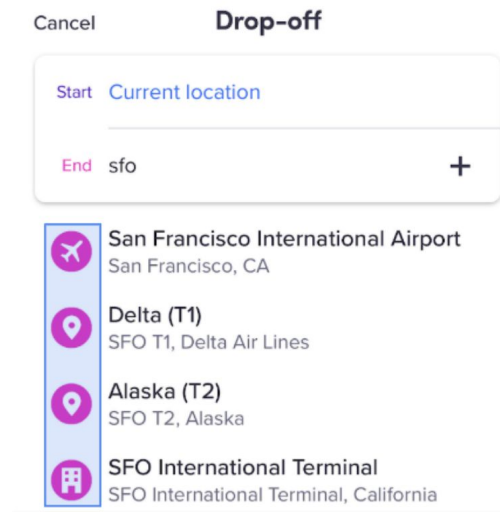
# Place Autocomplete

Place Autocomplete automatically fills in the name and/or address of a place as users type.



A search bar with a back arrow, a text input containing 'starbucks', and a close button (X). Below the bar is a list of search results, each with a clock icon, the name 'Starbucks', a distance, and a location. The third result is highlighted with a blue box.

Distance	Name	Address
31 mi	Starbucks	Pear Avenue, Mountain View, CA
	starbucks	
0.3 mi	Starbucks	Geary Street, San Francisco, CA
0.4 mi	Starbucks	Market Street, San Francisco, CA
	Starbucks	



A 'Drop-off' screen with a 'Cancel' button and a 'Drop-off' title. It features a 'Start' field with 'Current location' and an 'End' field with 'sfo'. Below these fields is a list of destinations, each with a location icon, a name, and an address. The first destination is highlighted with a blue box.

Icon	Name	Address
✈️	San Francisco International Airport	San Francisco, CA
📍	Delta (T1)	SFO T1, Delta Air Lines
📍	Alaska (T2)	SFO T2, Alaska
🏢	SFO International Terminal	SFO International Terminal, California





# Place Autocomplete

Useful Parameters:

- sessiontoken
- radius
- language
- types
- components
- strictbounds

**Developer Guide:**

<https://developers.google.com/places/web-service/autocomplete>

# Autocomplete text vs session

## Text

Easier to implement

1 request = 1 charge

No code changes (If already in use)

## Session

More complex implementation

Unlimited text searches

Implement session ID and ensure it is valid

## More about session token:

<https://developers.google.com/places/web-service/session-tokens>



Google Maps Platform

# Place Details

Returns more comprehensive information about the indicated place.

## Basic

address\_component, adr\_address, formatted\_address, geometry, icon, name, permanently\_closed, photo, place\_id, plus\_code, type, url, utc\_offset, vicinity

## Contact

formatted\_phone\_number, international\_phone\_number, opening\_hours, website

## Atmosphere

price\_level, rating, review, user\_ratings\_total

# Get place photo

A Place Details request returns up to ten photo elements.

Each photo element will contain the following fields:

- photo\_reference
- height
- width
- html\_attributions[]

We can use the [place photo API](#) and photo\_reference to get the place photo

## Developer Guide :

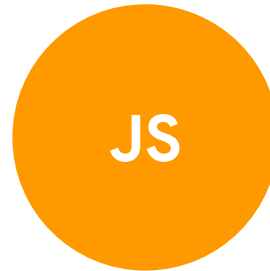
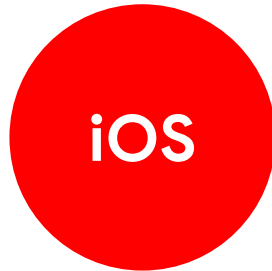
<https://developers.google.com/places/web-service/details>



Google Maps Platform

# Places APIs Availability

## Places API



The Places APIs have **parity for all platforms.**



Google Maps Platform

# HandsOn:

## Start to use multiple Maps APIs

[Demo: Find Your New NYC Home](#)



Google Maps Platform

# More Learning Resource

Continue your Maps API study journey with below resources:

[Maps API documents](#)

[Terms of Service](#)

[Google Maps Platform FAQ](#)

[Udacity Course](#) (ud864)

Q & A