Geo API

Version 1.0.6

Confidential

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Change Request Reference

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Document Summary

Document Title:	CMT – Geo API
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Document Change History

Date of Change	Version	Reason for Change	Summary of Change	Build #	Author
July 6, 2015	1.0.0		Initial version	1.0.0	S. Selikoff
July 9, 2015	1.0.1		Added ETA Resource	1.0.1	S. Selikoff
July 20, 2015	1.0.2		Changed oid from int to String	1.0.2	S. Selikoff
July 23, 2015	1.0.3		Added etaInMeters	1.0.3	S. Selikoff
July 30, 2015	1.0.4		Updated documentation	1.0.3	S. Selikoff
August 5, 2015	1.0.5		Added optional parameter for map matching in ETA	1.0.5	S. Selikoff
August 21, 2015	1.0.6		Added fleet id in vehicle record respond	1.0.6	S. Selikoff
October 27, 2015	1.0.9		Added legacy dispatch id	1.0.9	S. Selikoff

Overview

Creative Mobile Technologies has developed a RESTful API to allow developers to programmatically interface with our geo processing infrastructure.

Document Usage

This document was designed to be used by developers to wish to integrate with CMT's geo processing infrastructure. A basic understanding of RESTful services, JSON and communications over HTTP are required.

General Information

Distances

All distances are in _meters_ unless otherwise specified.

API Summary

CMT's Geo API is a RESTful service providing developers access to route, map-matching, and vehicle availability information.

HTTP Response Codes

The following table lists the possible http response codes returned by the CMT Platform API and their corresponding description.

Code	Description
200	Request processed successfully. Check response codes for additional status indicators.
400	Bad request. Includes validation errors, bad JSON.
401	Unauthorized. The response code is returned if: - OAuth authentication failure - Session timeout (if session is supported)
403	Forbidden. Customers will receive this response code if they try to access a method without proper authorization.
500	Server Error. Retry request or contact CMT.

Authentication Summary

Developers must first obtain an **access_token** from CMT. All requests to the Geo API must include this access_token in the header of the request.

Using the access_token

Once the app client has been properly authenticated, the access token may be used to access secure consumer resources (account, card on file, etc…). To properly authenticate to secure resources, developers must add the following value to the HTTP header as defined below.

HTTP Header

Field	DataType	Size	Required	Notes
Authorization	String	256	Y	Set to "Bearer <access_token>" where <access_token> is a valid accesstoken

Below is a sample with a sample header value.

Authorization: Bearer MWwhMTM3ZjAtOGRiYy00NGQwLWI1OGItZjE4Y2U2MDjklajA

Once a developer is properly authenticated with the API, it will receive a list of security roles. If the user requests access to a resource that it does not access to, a 403 (Forbidden) HTTP status code will be returned.

Safeguarding Information

In order to ensure the security and safety of cardholder data, CMT strongly suggests storing access_token. Never share these keys/tokens with anyone.

A. POST /availability

This resource is designed to display available vehicles for a location given the provided input filters and options.

Availability Resource URLs

Production: https://geo.cmtapi.com/availability

Sandbox: http://geo-sandbox.cmtapi.com/availability

If the event that the response sub-code is HTTP 400 indicating an error, then only two fields, responseCode and responseMessage, will be returned.

URL Parameters

Field	DataType	Size	Required	Notes

Request Field Description

Field	Type	Max Len	Required	Notes
lat	Decimal		X	The latitude of the origin to search from.
lon	Decimal		X	The longitude of the origin to search from.
rad	Decimal		X	The radius in meters to limit the search from the origin location
limit	Integer		X	The number of vehicles to limit the search to. Must be set to 12 or less if includeETA is set to true.
meterState	Integer			Meter State filter to use: 0 For Hire 1 Hired
logonState	Integer			Logon State filter to use: 0 Logged off 1 Logged on
ehailState	Integer			Ehail State filter to use: 0 Not paired 1 Paired with RideLinQ 2 Paired with Other
deviceType	Integer			Device Type filter to use: 0 Unknown 1 Taxi 2 Livery 3 Black Car 4 Mobile App 5 Driver App
wavState	Integer			Wheel-chair accessibility state filter to use: 0 All 1 WAV Enabled
availState	Integer			Availability State filter to use: 0 Logged Off 1 Available 2 On Job 3 Unavailable 4 Meter on
markets	String[]			List of market segment codes to filter search on
fleets	Integer[]			List of fleet ids to filter search on
medallions	String[]			List of medallions to filter search on
includeMapMatch	Boolean			If set to true, results will be matched to nearest street location. Default is false.

includeETA	Boolean			If set to true, results will include ETA in seconds from vehicle to origin. Default is false.

Response Field Description

Field	Type	Max Len	Required	Notes
total	Integer		x	Total number of vehicles in results
vehicles			x	List of vehicle records
dt	Integer			Device Type filter to use: 0 Unknown 1 Taxi 2 Livery 3 Black Car 4 Mobile App 5 Driver App
dn	String			Device name (unique)
tm	Long			Timestamp of the last vehicle update in epoch millisecond value
lt	Decimal			Latitude of the vehicle
lg	Decimal			Longitude of the vehicle
cc	Decimal			Compass course of vehicle in degrees
ve	Decimal			Speed over ground of vehicles in knots
vl	Integer			Wheel-chair accessibility state: 0 All 1 WAV Enabled
as	Integer			Availability State filter to use: 0 Logged Off 1 Available 2 On Job 3 Unavailable 4 Meter on
mk	String			Market segment identifier of vehicle
fi	Integer			Fleet or Operator Id of vehicle
md	String			Taxi medallion
ms	Integer			Meter State filter to use: 0 For Hire 1 Hired
ls	Integer			Logon State filter to use: 0 Logged off 1 Logged on
es	Integer			Ehail State filter to use: 0 Not paired 1 Paired with RideLinQ 2 Paired with Other
dr	String			Driver id
sn	String			Shift number
tn	Integer			Trip number
ax	Integer			Action code
rt	Integer			Rate code
tt	Integer			Total fare in cents
ac	Decimal			Horizontal dilution of position
gv	Integer			GPS validity
ec	Decimal			Ecio - Signal to noise ratio
rs	Decimal			RSS - Signal strength

cq	Integer			Carrier signal quality
db	Integer			Signal DB
sr	Integer			Signal ration
pc	Integer			Passenger count
ave	Decimal			Average velocity
zv	Integer			Zone violation
street	String			Street address
dtm	String			GPS Time hhmmss.SSS (where SSS is milliseconds)
ddt	String			GPS Date in DDMMYY format
pid	String			Pim Id
oid	String			Order id
ldi	String			Legacy Dispatch Id for fleets that use the older dispatch integration
etaInSeconds	Integer			ETA to location in seconds
etaInMeters	Integer			ETA distance to location in meters
mapMatched	Boolean			True if location was able to be map matched

Availability Response Codes

Success Sub-codes (HTTP 200)

Code	Description

Error Sub-codes (HTTP 400)

Code	Description
441	Missing required input
442	Unexpected Error

Sample Availability Request (POST):

URL: *https://geo.cmtapi.com/availability*

POST Data Request (JSON)

```
{
    "lat":40.7127,
    "lon":-74.0059,
    "rad":300.0,
    "limit":10,
    "meterState":1,
    "logonState":2,
    "ehailState":0,
    "deviceType":1,
    "wavState":0,
    "availState":1,
    "markets":["NYC","NYSHL"],
    "fleets":[1,2,921,291],
    "medallions":["M12N1","M2129"],
    "includeMapMatch":true,
    "includeETA":true
}
```

Sample Successful Availability Response (HTTP 200):

```json
{
    "total":2,
    "vehicles":[
        {
            "dt":1,
            "dn":"M2J42",
            "tm":1436215007123,
            "lt":40.512368,
            "lg":-74.004494,
            "cc":332.3,
            "ve":0.0,
            "as":0,
            "mk":"NYC",
            "fi":123,
            "md":"2J42",
            "ms":0,
            "ls":0,
            "es":0,
            "ax":0,
            "ac":0.86,
            "gv":1,
            "dtm":"203645.000",
            "ddt":"060715",
            "ldi":"0123",
            "etaInSeconds":26,
            "etaInMeters":1873
            "mapMatched":true
        },
        {
            "dt":1,
            "dn":"M7F11",
            "tm":1436215011578,
            "lt":40.752627,
            "lg":-74.003584,
            "cc":263.69,
            "ve":0.17491096,
            "as":4,
            "mk":"NYC",
            "fi":123,
            "md":"7F11",
            "ms":0,
            "ls":1,
            "es":0,
            "dr":"469136",
            "ax":0,
            "ac":1.24,
            "gv":1,
            "dtm":"203650.000",
            "ddt":"060715",
            "ldi":"0124",
            "etaInSeconds":119,
            "etaInMeters":1873
            "mapMatched":true
        }
    ]
}
```

Unsuccessful Availability Response (HTTP 400):

```json
{
    "responseCode":441,
    "responseMessage":"Missing required input: limit"
}
```

B. POST /eta

This resource is designed to display device and ETA information for a vehicle in transit to a passenger.

ETA Resource URLs

Production: https://geo.cmtapi.com/eta

Sandbox: http://geo-sandbox.cmtapi.com/eta

If the event that the response sub-code is HTTP 400 indicating an error, then only two fields, responseCode and responseMessage, will be returned.

URL Parameters

Field	DataType	Size	Required	Notes

Request Field Description

Field	Type	Max Len	Required	Notes
lat	Decimal		X	The latitude of the origin to search from.
lon	Decimal		X	The longitude of the origin to search from.
deviceName	String		X	Unique identifier for vehicle in system
includeMapMatch	Boolean			If set to true, results will be matched to nearest street location. Default is false.

Response Field Description

Field	Type	Max Len	Required	Notes
dt	Integer			Device Type: 0 Unknown 1 Taxi 2 Livery 3 Black Car
dn	String			Device name (unique)
tm	Long			Timestamp of the last vehicle update in epoch millisecond value
lt	Decimal			Latitude of the vehicle
lg	Decimal			Longitude of the vehicle
cc	Decimal			Compass course of vehicle in degrees
ve	Decimal			Speed over ground of vehicles in knots
vl	Integer			Wheel-chair accessibility state: 0 All 1 WAV Enabled
as	Integer			Availability State filter to use: 0 Logged Off 1 Available 2 On Job 3 Unavailable 4 Meter on
mk	String			Market segment identifier of vehicle
fi	Integer			Fleet or Operator Id of vehicle
md	String			Taxi medallion
ms	Integer			Meter State filter to use: 0 For Hire 1 Hired
ls	Integer			Logon State filter to use: 0 Logged off

				1	Logged on	
es	Integer			Ehail State filter to use:		
				0	Not paired	
				1	Paired with RideLinQ	
				2	Paired with Other	
dr	String			Driver id		
sn	String			Shift number		
tn	Integer			Trip number		
ax	Integer			Action code		
rt	Integer			Rate code		
tt	Integer			Total fare in cents		
ac	Decimal			Horizontal dilution of position		
gv	Integer			GPS validity		
ec	Decimal			Ecio - Signal to noise ratio		
rs	Decimal			RSS - Signal strength		
cq	Integer			Carrier signal quality		
db	Integer			Signal DB		
sr	Integer			Signal ration		
pc	Integer			Passenger count		
ave	Decimal			Average velocity		
zv	Integer			Zone violation		
street	String			Street address		
dtm	String			GPS Time hhmmss.SSS (where SSS is milliseconds)		
ddt	String			GPS Date in DDMMYY format		
pid	String			Pim Id		
oid	String			Order id		
ldi	String			Legacy Dispatch Id for fleets that use the older dispatch integration		
etaInSeconds	Integer			ETA to location in seconds		
etaInMeters	Integer			ETA distance to location in meters		
mapMatched	Boolean			True if location was able to be map matched		

ETA Response Codes

Success Sub-codes (HTTP 200)

Code	Description

Error Sub-codes (HTTP 400)

Code	Description
441	Missing required input
442	Unexpected Error

Sample ETA Request (POST):

URL: *https://geo.cmtapi.com/eta*

POST Data Request (JSON)

```
{
```

```
        "deviceName":"M1H66",
        "lat":40.7127,
        "lon":-74.0059
        "includeMapMatch":true
}
```

Sample Successful ETA Response (HTTP 200):

```
{
        "dt":1,
        "dn":"M1H66",
        "tm":1436473810117,
        "lt":40.612345,
        "lg":-74.00885,
        "cc":277.93,
        "ve":1.43529876,
        "as":1,
        "mk":"NYC",
        "fi":123,
        "md":"6H66",
        "ms":0,
        "ls":1,
        "es":0,
        "dr":"5177539",
        "ax":0,
        "ac":2.04,
        "gv":1,
        "dtm":"203005.000",
        "ddt":"090715",
        "ldi":"0123",
        "etaInSeconds":105,
        "etaInMeters":1873
        "mapMatched":true
}
```

Unsuccessful ETA Response (HTTP 400):

```
{
        "responseCode":441,
        "responseMessage":"Missing required input: lat,lon"
}
```

C. POST /match

This resource is used to find nearest lat/lon for a road, given a single position on the map.

Match Resource URLs

Production: https://geo.cmtapi.com/match

Sandbox: http://geo-sandbox.cmtapi.com/match

If the event that the response sub-code is HTTP 400 indicating an error, then only two fields, responseCode and responseMessage, will be returned.

URL Parameters

Field	DataType	Size	Required	Notes

Request Field Description

Field	Type	Max Len	Required	Notes
lat	Decimal		X	The latitude of the origin to search from.
lon	Decimal		X	The longitude of the origin to search from.
tm	Long		X	The timestamp the last GPS event occurred in epoch millisecond value
bearing	Decimal			Compass course of vehicle in degrees
speed	Decimal			Speed in meter per second

Response Field Description

Field	Type	Max Len	Required	Notes
latMatched	Decimal			The map matched lat value if a match can be found
lonMatched	Decimal			The map latched lon value if a match can be found
lat	Decimal		X	The latitude of the origin to search from.
lon	Decimal		X	The longitude of the origin to search from.
tm	Long			The timestamp the last GPS event occurred in epoch millisecond value
bearing	Decimal			Compass course of vehicle in degrees
speed	Decimal			Speed in meter per second

Match Response Codes

Success Sub-codes (HTTP 200)

Code	Description

Error Sub-codes (HTTP 400)

Code	Description
441	Missing required input
442	Unexpected Error

Sample Match Request (POST):

URL: *https://geo.cmtapi.com/match*

POST Data Request (JSON)

```
{
    "tm":1436216781767,
    "lat":40.7127,
    "lon":-74.0059,
    "bearing":20.0,
    "speed":15.0
}
```

Sample Successful Match Response (HTTP 200):

```
{
    "latMatched":40.712124,
    "lonMatched":-74.005692,
    "tm":1436216781767,
    "lat":40.7127,
    "lon":-74.0059,
    "bearing":20.0,
    "speed":15.0
}
```

Unsuccessful Match Response (HTTP 400):

```
{
    "responseCode":441,
    "responseMessage":"Missing required input: lat,lon"
}
```

D. POST /match/path

This resource is used to find nearest lat/lon for a road, given a set of positions.

Match Path Resource URLs

Production: https://geo.cmtapi.com/match/path

Sandbox: http://geo-sandbox.cmtapi.com/match/path

If the event that the response sub-code is HTTP 400 indicating an error, then only two fields, responseCode and responseMessage, will be returned.

URL Parameters

Field	DataType	Size	Required	Notes

Request Field Description

Field	Type	Max Len	Required	Notes
List of:				
lat	Decimal		X	The latitude of the origin to search from.
lon	Decimal		X	The longitude of the origin to search from.
tm	Long		X	The timestamp the last GPS event occurred in epoch millisecond value
bearing	Decimal			Compass course of vehicle in degrees
speed	Decimal			Speed in meter per second

Response Field Description

Field	Type	Max Len	Required	Notes
List of:				
latMatched	Decimal			The map matched lat value if a match can be found
lonMatched	Decimal			The map latched lon value if a match can be found
lat	Decimal		X	The latitude of the origin to search from.
lon	Decimal		X	The longitude of the origin to search from.
tm	Long		X	The timestamp the last GPS event occurred in epoch millisecond value
bearing	Decimal			Compass course of vehicle in degrees
speed	Decimal			Speed in meter per second

Match Path Response Codes

Success Sub-codes (HTTP 200)

Code	Description

Error Sub-codes (HTTP 400)

Code	Description
441	Missing required input
442	Unexpected Error

Sample Match Path Request (POST):

URL: *https://geo.cmtapi.com/match/path*

POST Data Request (JSON)

```
[
    {
        "tm":1436218551020,
        "lat":40.7613,
        "lon":-73.97223,
        "bearing":20.0,
        "speed":15.0
    },
    {
        "tm":1436218561020,
        "lat":40.76237,
        "lon":-73.97073,
        "bearing":20.0,
        "speed":15.0
    }
]
```

Sample Successful Match Path Response (HTTP 200):

```
[
    {
        "tm":1436218551020,
        "lat":40.7613,
        "lon":-73.97223,
        "latMatched":40.761345,
        "lonMatched":-73.972191,
        "bearing":20.0,
        "speed":15.0
    },
    {
        "tm":1436218561020,
        "lat":40.76237,
        "lon":-73.97073,
        "latMatched":40.762154,
        "lonMatched":-73.970215,
        "bearing":20.0,
        "speed":15.0
    }
]
```

Unsuccessful Match Path Response (HTTP 400):

```
{
    "responseCode":441,
    "responseMessage":"Missing required input: lat,lon"
}
```

E. POST /match/path/last

This resource is used to find nearest lat/lon for a road, given a set of positions. Convenience version of /match/path were only the last location is returned.

Match Resource URLs

Production: https://geo.cmtapi.com/match/path/last

Sandbox: http://geo-sandbox.cmtapi.com/match/path/last

If the event that the response sub-code is HTTP 400 indicating an error, then only two fields, responseCode and responseMessage, will be returned.

URL Parameters

Field	DataType	Size	Required	Notes

Request Field Description

Field	Type	Max Len	Required	Notes
List of:				
lat	Decimal		X	The latitude of the origin to search from.
lon	Decimal		X	The longitude of the origin to search from.
tm	Long		X	The timestamp the last GPS event occurred in epoch millisecond value
bearing	Decimal			Compass course of vehicle in degrees
speed	Decimal			Speed in meter per second

Response Field Description

Field	Type	Max Len	Required	Notes
latMatched	Decimal			The map matched lat value if a match can be found
lonMatched	Decimal			The map latched lon value if a match can be found
lat	Decimal		X	The latitude of the origin to search from.
lon	Decimal		X	The longitude of the origin to search from.
tm	Long			The timestamp the last GPS event occurred in epoch millisecond value
bearing	Decimal			Compass course of vehicle in degrees
speed	Decimal			Speed in meter per second

Match Response Codes

Success Sub-codes (HTTP 200)

Code	Description

Error Sub-codes (HTTP 400)

Code	Description
441	Missing required input
442	Unexpected Error

Sample Match Request (POST):

URL: *https://geo.cmtapi.com/match/path/last*

POST Data Request (JSON)

```
[
    {
        "tm":1436218551020,
        "lat":40.7613,
        "lon":-73.97223,
        "bearing":20.0,
        "speed":15.0
    },
    {
        "tm":1436218561020,
        "lat":40.76237,
        "lon":-73.97073,
        "bearing":20.0,
        "speed":15.0
    }
]
```

Sample Successful Match Path Last Response (HTTP 200):

```
{
    "tm":1436218840364,
    "lat":40.76237,
    "lon":-73.97073,
    "latMatched":40.762154,
    "lonMatched":-73.970215,
    "bearing":20.0,
    "speed":15.0
}
```

Unsuccessful Match Path Last Response (HTTP 400):

```
{
    "responseCode":441,
    "responseMessage":"Missing required input: lat,lon"
}
```