Routing API

Migration Guide

Version 7.2.59

Contents

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Document Information

Product	
Name:	Routing API
Version:	Version 7.2.59

Document	
Name:	Routing API Migration Guide
Id:	9341653-1438761031
Status:	DRAFT
Date:	2015-Aug-05, 7:59 (GMT)

Chapter 1

Overview

Topics:

This guide describes the changes required to migrate successfully from HERE Enterprise Routing API to Routing API APIs. It provides information on the differences between HERE Routing API and Enterprise Routing API and the advantages in migrating to Routing API. The intended audience for this guide includes users of Enterprise Routing API, HERE technical customer support engineers and any stakeholders involved in a Routing API switch.

The guide covers:

- Feature-by-feature descriptions of the differences
- Descriptions of changes in the API, including behavioral aspects
- Examples showing the differences between the two API versions
- Alternatives to removed functionality, where appropriate

What is HERE Routing API?

HERE Routing API provides access to core routing functionality. There are two versions of the API:

- 6.2 API is the legacy API and is referred to as *Enterprise Routing API*
- 7.2 API is the new API and is referred to as *Routing API*

Table 1: Overview of Routing Features Availability

Feature	Description	Version 6.2	Version 7.2
Public Transport Routing	Obtain a route to be traversed by public transport.	-	+
Car Routing	Obtain a route to be traversed by car.	+	+
Pedestrian Routing	Obtain a route to be traversed on foot.	+	+
Truck Routing	Obtain a route to be traversed by truck.	+	+
GetRoute	Update a route along a current route.	+	+
GetLinkInfo	Retrieve specific link information, such as nearest links to a waypoint.	+	**BETA**
Calculate Isoline	Retrieve a polyline that connects the end points of multiple routes.	+	+
Calculate Reverse Flow	Retrieve a set of links from which a given destination point is reachable in a specified travel time or travel distance.	+	-
Matrix Routing	Obtain routes between M x N locations.	+	+

In the table above:

+ indicates that a feature is available

- indicates that a feature is unavailable

Why Switch to HERE Routing API?

HERE Routing API offers the following benefits:

- Improved performance

- More accurate information in the responses
- Weekly map updates
- Alternative routes
- Reverse Isoline Routing
- Extended range of Isoline Routing
- Extended range of Pedestrian Routing
- New mode Public Transport
- Capability to avoid seasonal closures
- Conditional truck restrictions (time or trailer dependent)
- Weight dependent truck speed limits

Chapter 2

Differences By Feature

Topics:

The articles in this section describe some highlighted differences between Routing API and Enterprise Routing API from the feature description.

Basic Differences

The following section discusses the changes expected when you migrate your code to Routing API, starting with the basic topics. On the basic level, the APIs do not differ much. However, there are some changes for improved API usability and performance.

The basic differences between Enterprise Routing API and Routing API are:

- Routing API does not support the same `app_id`/`app_code` credentials used in Enterprise Routing API. Using credentials from Enterprise Routing API will return errors.
- The generated `RouteId` is not compatible between APIs. In case you are using `RouteId` in your request, please generate a new id.
- In Enterprise Routing API the `CalculateRoute` responses include `RouteId` by default. You can disable this behavior by setting the request parameter `calcRouteId=false`.

  As calculating `RouteId` decreases performance, Routing API does not provide it by default. It has to be requested explicitly using the parameter `routeattributes=routeId`. Routing API does not support the `calcRouteId` parameter.

  Note: In both versions of the API, calculating the `RouteId` increases the calculation and the response time.
- In Routing API, `TrafficMode` is disabled by default.

Basic Request Example

The following example demonstrates a simple request of a fastest route by car between two waypoints with optimization for current traffic conditions disabled.

Enterprise Routing API

```
..http://route.st.nlp.nokia.com/routing/6.2/calculateroute.json
?app_id={YOUR_APP_ID}
&app_code={YOUR_APP_CODE}
&waypoint0=geo!52.5,13.4
&waypoint1=geo!52.5,13.45
&mode=fastest;car;traffic:disabled
```

Routing API

```
..http://route.cit.api.here.com/routing/7.2/calculateroute.json
?app_id={YOUR_APP_ID}
&app_code={YOUR_APP_CODE}
&waypoint0=geo!52.5,13.4
```

```
&waypoint1=geo!52.5,13.45
&mode=fastest;car;traffic:disabled
```

Isolines

Isoline routing provides the area (isoline or isochrone) from a given location which can be reached by driving for a given time or distance.

Using both Enterprise Routing API and Routing API, one can retrieve a polyline that connects the end points of multiple routes. However, the isoline algorithm for calculating polygons in Routing API, offers greater precision and allows the request to stipulate different levels of details.

For example, in Routing API, each isoline can contain multiple polygons (known as components). To retrieve one polygon, as in the Enterprise Routing API implementation, add the parameter `singlecomponent=true` to the request.

Moreover, in Routing API, customizing the isoline quality or limiting the amount of points in the returned isoline reduces response times. .

Feature Availability

The table below compares availability of isoline functionality.

Table 2: Overview of Isoline Feature Availability

Feature	Enterprise Routing API	Routing API
Isolines based on distance	+	+
Isolines based on travel time	+	+
Isolines for cars	+	+
Isolines for pedestrians	+	+
Isolines for trucks	+	+
Calculation mode fastest	+	+
Calculation mode shortest	+	+
Calculation mode scenic	+	-
Penalizing certain types of roads	+	+
Favouring certain types of roads	+	-

Feature	Enterprise Routing API	Routing API
Avoid links	+	-
Avoid areas	+	-
Traffic awareness	+	+
Time awareness	+	+
Customizable isoline resolution	-	+
Customizable isoline components	-	+
Customizable number of maximum points returned	-	+
Customizable isoline quality	-	+

API Differences

See *Summary* on page 26 for details of the differences between the two versions of the API.

Truck Routing

Truck Routing supports a truck specific route calculation using dedicated truck data such as height/ width restrictions and hazardous goods restrictions.

Using both Enterprise Routing API and Routing API, one can obtain a route traversable by truck.

In addition, the following behaviors are found in Routing API:

- Evaluation of weight-dependent truck speed limits takes into account the weight condition.
- Itinerary warnings are provided for applicable time-dependent truck restrictions on a route.

If a route includes links with time-dependent truck restrictions, the Routing API provides an itinerary warning note in the attributes of the affected maneuver (see also *Time Aware Routing* in the Routing API Developers Guide). The warning notes can be of the following types:

- *restriction* – is issued when a driver, while following a route, executes a maneuver that would otherwise be subject to a restriction at a time when the restriction does not apply
- *violation* – is issued when a driver, while following a route, executes a maneuver that is subject to a restriction when the restriction is in force

The example below shows a *violation* note.

```
<Maneuver ...>
    <Note>
        <Type>violation</Type>
        <Code>timeDependentRestriction</Code>
        <Text>Road may be temporarily closed</Text>
    </Note>
</Maneuver>
```

Feature Availability

The table below compares availability of truck routing functionality.

Table 3: Overview of Truck Routing Feature Availability

Feature	Enterprise Routing API	Routing API
Truck specific road network	+	+
Physical restrictions	+	+
Hazardous goods restrictions	+	+
Restrictions on tunnel categories	+	+
Restrictions on trailers	+	+
Restrictions on semi-trailers	-	+
Time dependent restrictions	+	+
Conditional restrictions	-	+
Truck specific speed limits	+	+
Weight dependent speed limits	-	+
Truck speed profiles	+	+
Historical speed patterns	+	+
Traffic aware routing	+	+
Avoidance of long term closures	+	+
Avoidance of seasonal closures	+	+
Fastest route calculation	+	+

Feature	Enterprise Routing API	Routing API
Shortest route calculation	+	-
Scenic route calculation	+	-
Alternative routes calculation	-	+
Penalizing certain types of roads	+	+
Favouring certain types of roads	+	-
Itinerary warnings	+	+
Avoid links	+	+
Avoid areas	+	+
CO2 emission calculation	+	+
Toll roads distance	+	+
Toll prices	+	-
Isolines for trucks	+	+

API Differences

Truck routing implementation touches many parts of the API. Hence the API differences specific to truck routing are summarized here as a feature in addition to the documentation in the *API Differences* on page 16.

Request Differences

Request parameters `hasTrailer`, `trailerWeight` and `permittedGrossWeight` are obsolete in Routing API. The use of these parameters results in an error response.

Therefore, in Routing API, use the parameter `trailersCount` to specify that a vehicle has a trailer and `limitedWeight` parameter to specify the vehicle weight.

New request parameters available in Routing API are `trailersCount` and `truckType`. Refer to the Routing API Developers Guide for details.

Response Differences

In Routing API, `permittedGrossWeight` and `trailerWeight`, which are sub-elements of the attribute `truckRestrictions`, are obsolete. Vehicle weight restrictions are now expressed only with `limitedWeight`.

In Enterprise Routing API, links forbidden for trucks are indicated using `permittedGrossWeight` with the value 0. Routing API does not provide this information.

Routing API extends the link `truckRestrictions` with the sub-element(s) named `conditionalRestriction`. This makes it possible to express such restrictions as weight limits dependent on the trailer type or time dependent on access restrictions.

The example below shows a part of a Routing API response with restrictions that apply to a single link:

```
<TruckRestrictions>
    <LimitedWeight>10</LimitedWeight>
    <ConditionalRestriction>
        <LimitedWeight>15</LimitedWeight>
        <TruckProfile>
            <TrailersCount>1</TrailersCount>
        </TruckProfile>
    </ConditionalRestriction>
    <ConditionalRestriction>
        <AccessForbidden>true</AccessForbidden>
        <TimeDependent>true</TimeDependent>
    </ConditionalRestriction>
</TruckRestrictions>
```

In plain text, these are:

- "No vehicles with weight over 10 tonnes"
- "No vehicles with trailers and weight over 15 tons"
- "No trucks during certain periods"

Chapter 3

API Differences

Topics:

The articles in this section describe the differences between Routing API and Enterprise Routing API from the API view point. For a summary of API differences specific to truck routing, see also *in the Truck Routing section.*

Calculate Route

The articles in this section describe differences in the calculateRoute service.

Summary

The sections below describe three types of API differences:

- *request differences*
- *response differences*
- *behavioral differences*

Request Differences

Routing API does not support the following parameters:

Table 4: Unsupported parameters

Parameter	Description/Alternative
`calcRouteId`	In Enterprise Routing API, this parameter is used to prevent the default inclusion of a route id in the response. The default behavior in Routing API is not to provide a route id, instead the route id must be requested using the paramtere `routeattributes` with the value `routeid` (`routeattributes=routeId`).
`gen`	In Enterprise Routing API, this parameter is used to control the inclusion of the link flag `builtUpArea` and the truck restriction `allHazardousGoods` in the response. Routing API always provides them when present on the computed route.
`hasTrailer`	This parameter is obsolete and its use results in an error response. To specify that a truck has a trailer, use the parameter `trailersCount` with a non-zero value.
`permittedGrossWeight`	This parameter is obsolete and its use results in an error response. To specify truck weight, use the prameter `limitedWeight`.
`trailerWeight`	This parameter is obsolete and its use results in an error response. The truck weight value should include trailers.

The new parameters in Routing API are:

Table 5: New parameters

Parameter	Description
`alternatives`	This parameter specifies the maximum number of alternative routes to be calculated (for example, if you wish to obtain the fastest route and shortest route). No alternative routes are calculated if the parameter is not included in the request or if its value is 0.
`avoidSeasonalClosures`	This parameter disables use of seasonally closed links.
`avoidTransportTypes`	This parameter specifies public transport types that shall not be included in the response route.
`combineChange`	This parameter enables the `change` maneuver in the response.
`generalizationTolerance`	This parameter specifies the desired tolerances for generalizations of the base route geometry.
`lineAttributes`	This parameter defines which attributes are included in the response as part of the data representation of the public transport line elements.
`maxNumberOfChanges`	This parameter restricts number of changes in a public transport route to a given value.
`returnElevation`	This parameter is used to control the inclusion of the elevation data in the response.
`trailersCount`	This parameter specifies the number of trailers.
`truckType`	This parameter specifies the truck type. To avoid restrictions for trucks with a semi-trailer, specify truck type as `tractorTruck` and a non-zero trailer count (`trailerCount`).
`walkSpeed`	This parameter specifies the speed which will be used as a walking speed for pedestrian routing.
`walkTimeMultiplier`	This parameter allows to prefer or avoid public transport routes with longer walking distances.

Differences in request parameters:

Table 6: Differences in request parameters

Parameter	Description
`instructionFormat`	Routing API does not support the instruction format `native`. The default format is changed to `html`.
`language`	Routing API supports more languages. The language code of British English is different. In Routing API, it is coded as `en-gb` while Enterprise Routing API uses the code `en-uk`.
`legAttributes`	Routing API supports extra options `indices`, `boundingBox`, `baseTime`, `trafficTime` and `summary`.
`linkAttributes`	Routing API does not support options `address`, `confidence`, `externalResources`, `freewayExit`, `freewayJunction`, `incidents`, `jamFactorTrend`, `speedCategory`, `tmcCodes`. New option available is `publicTransportLine`. See the response attribute *Link* on page 33 for more details.

Parameter	Description
maneuverAttributes	Routing API supports extra options publicTransportLine, indices, waitTime, boundingBox, roadShield, shapeQuality, nextManeuver, publicTransportTickets and startAngle.
mode	There are several differences with regard to this parameter, see *Mode* on page 32 for details.
routeAttributes	Routing API supports extra options lines, routeid, groups and tickets.
representation	This parameter has changed in Routing API with respect to the following values: • display does not cause the direction attribute to be included in the default set of maneuverAttributes • navigation, turnByTurn and linkPaging do not cause the route id (routeId) to be included in the default set of routeAttributes • navigation, turnByTurn and linkPaging cause all link attributes to be included in the default set of linkAttributes like in Enterprise Routing API, but Routing API does not support all options, see differences in linkAttributes mentioned above for details.
waypoint	There are several differences with regard to this parameter in some use cases, see *Waypoint* on page 21 for details.

Response Differences

Differences in response attributes:

Table 7: Differences in response attributes

Attribute	Parent	Description
DynamicSpeedInfo	Link	See *Dynamic Speed Info* on page 33 for details on differences.
Flags	Link Summary SummaryByCountry	Routing API does not support the flags stairs, gatedArea, scenic and fourWheelDrive. In addition, it replaces the flag unpaved with dirtRoad.
Instruction	Maneuver	Routing API words maneuver instructions differently.
Link	Leg	See *Link* on page 33 for details on differences.
Maneuver	Leg	There are several differences in supported attributes. Refer to the Developers Guide for details.
MetaInfo	n/a	Routing API provides similar meta information as Enterprise Routing API (except traffic related data) but it uses explicit attributes instead of AdditionalData. Thus, the structure of the attribute is different. See *Meta Info* on page 35 for details.

Attribute	Parent	Description
`Note`	`Maneuver`, `Route`	There are differences in supported route notes and their attributes. Routing API does not provide `LinkIds` and `Position`. It uses the `Text` attribute instead of `AdditionalData`. The content of the `Text` attribute is not localized.
`Mode`	`Route`	The sub-element `TrafficMode` has changed. In an Enterprise Routing API response, it echoes the value specified in the request or is absent if the request does not provide it. By contrast, a Routing API response always includes `TrafficMode` and its value is the value used in the route calculation: either the value from the request or `disabled` if the request does not specify `TrafficMode` at all or sets it to `default`.
`Route`	n/a	Routing API supports an extra attribute `PublicTransportLine`.
`SummaryByCountry`	`Route`	In Routing API, the subelement `AdditionalData` is not supported, see *Summary by Country* on page 36 for details.
`TruckRestrictions`	`Link`	The structure has changed slightly, see *Truck Restrictions* on page 37 for details.

Behavioral Differences

Differences in behavior:

1. Routing API does not include the attribute `RouteId` in the response by default. It has to be requested explicitly with the option `routeId` of the `routeAttributes` parameter.
2. In Routing API, responses always include the attribute `TrafficMode`.
3. In Routing API, parameters `hasTrailer`, `trailerWeight` and `permittedGrossWeight` are obsolete. Requests using these parameters result in an error response.
4. In Routing API, the route calculation takes the weight condition into account if weight-dependent truck speed limits apply.
5. In Routing API, time-dependent truck restrictions along the route result in itinerary warnings in the response.
6. In Routing API, seasonally closed roads are avoided if the computed route would pass them during a closure period.
7. In Routing API, if the computed route passes through a built-up area, the response always includes the link flag `builtUpArea`. (In Enterprise Routing API, the request parameter *gen* is used to control the inclusion of this flag in the response.)

Request Parameters

The articles in this section describe differences between request parameters.

Waypoint

There are several use cases where the usage of the parameter `waypoint` has changed between Enterprise Routing API and Routing API. We describe the differences in the tables in the following sections.

Common Components of Waypoint

The table below describes the differences in the common components of `waypoint`.

Table 8: Differences in common waypoint components

Parameter component	Description
Entity Attributes	Routing API does not support the components `entityType` and `entityDetails`. To customize the start or end instruction for stop-over waypoints, use `userLabel`.
User Label	`userLabel` is a new component introduced in Routing API. It is used to assign a custom name to waypoints for easier identification. It also affects the start and end instructions on `stopOver` waypoints.
Series	Enterprise Routing API requires `waypoint0` and `waypoint1`; if any intermediate waypoints are missing, they are extrapolated to enable a route calculation. By contrast, Routing API requires a complete sequence of waypoints, otherwise it produces an error response.

Waypoint Parameter `geo`

The table below describes the differences in the waypoint parameter `geo`.

Table 9: Differences in waypoint parameter `geo`

Parameter component	Description
Type	In Enterprise Routing API, the default `type` of intermediate waypoints depends on `transitRadius`. If `transitRadius` is specified for intermediate waypoints, they are considered to be `passThrough` by default. In Routing API, the default type of all waypoints is `stopOver` even if `transitRadius` is used, `passThrough` waypoints must be defined explicitly.
Transit Radius	Enterprise Routing API returns an error when the position of a waypoint cannot be matched inside the transit radius. Routing API tries to match waypoint position outside the transit radius if it cannot match in transit radius range.

Waypoint Parameter `street`

The table below describes the differences in the waypoint parameter `street`:

Table 10: Differences in waypoint parameter `street`

Parameter component	Description
Street Positions	Routing API does not support multiple `StreetPositions` in a `street` waypoint.

Waypoint Parameter `link`

The table below describes the differences in the waypoint parameter `link`.

Table 11: Differences in waypoint parameter `link`

Parameter component	Description
Display position	Routing API allows you to omit the display position in the link (`'link!<linkId>'`).
LinkId	Enterprise Routing API supports `linkId` with a positive ('+' or no sign) and negative ('-') direction. Routing API supports `linkId` with a positive ('+') direction, negative ('-') direction or either/unspecified ('*'). The prefix for `LinkId` cannot be omitted.
Spot	In Enterprise Routing API the default `spot` value of a link waypoint is 0 if it is the first waypoint of the route. Otherwise, the default `spot` value is 1. In Routing API, the default `spot` value of a link waypoint is 0.5 if the request does not provide `spot` and display position. If the waypoint in the request includes only a display position, an attempt to match to the position on the link does not take `spot` into account. `spot` specifies the distance from the link reference node. In Enterprise Routing API, the waypoint position is mapped to the beginning of the link by default, while in Routing API, it is mapped to the middle of the link or to the position on the link closest to the provided display position.
Side of Street	In Enterprise Routing API, an end action and instruction takes into account the `SideOfStreet` sub-element of the `waypoint` parameter specified in the request. Routing API does not support the `SideOfStreet` component nor does it override the real side of street. To indicate the intended side of street, use `linkId` with the appropriate sign. The routing engine derives the correct side of street from the travel direction and the link properties, and includes it in the end instructions if the end instructions are stipulated.

Get Route

The articles in this section describe differences in the `getRoute` service.

Summary

The sections below describe three types of differences between Enterprise Routing API and Routing API:

- *request differences*
- *response differences*

Request Differences

Differences in request parameters:

Table 12: Differences in request parameters

Parameter	Description
`instructionFormat`	Routing API does not support the instruction format `native`. The default format is changed to `html`.
`language`	Routing API supports more languages. The language code of British English is different. In Routing API, it is coded as `en-gb` while Enterprise Routing API uses the code `en-uk`.
`legAttributes`	Routing API supports extra options `indices`, `boundingBox`, `baseTime`, `trafficTime` and `summary`.
`linkAttributes`	Routing API does not support options `address`, `confidence`, `externalResources`, `freewayExit`, `freewayJunction`, `incidents`, `jamFactorTrend`, `speedCategory`, `tmcCodes`. New option available is `publicTransportLine`. See the response attribute *Link* on page 33 for more details.
`maneuverAttributes`	Routing API supports extra options `publicTransportLine`, `indices`, `waitTime`, `boundingBox`, `roadShield`, `shapeQuality`, `nextManeuver`, `publicTransportTickets` and `startAngle`.
`mode`	There are several differences with regard to this parameter, see *Mode* on page 32 for details.
`routeAttributes`	Routing API supports extra options `lines`, `routeid`, `groups` and `tickets`.
`representation`	This parameter has changed in Routing API with respect to the following values: • `display` does not cause the `direction` attribute to be included in the default set of `maneuverAttributes` • `navigation`, `turnByTurn` and `linkPaging` do not cause the route id (`routeId`) to be included in the default set of `routeAttributes` • `navigation`, `turnByTurn` and `linkPaging` cause all link attributes to be included in the default set of `linkAttributes` like in Enterprise Routing API, but Routing API

Parameter	Description
	does not support all options, see differences in `linkAttributes` mentioned above for details.

Response Differences

Differences in response attributes:

Table 13: Differences in response attributes

Attribute	Parent	Description
`DynamicSpeedInfo`	`Link`	See *Dynamic Speed Info* on page 33 for details on differences.

`Flags`	`Link`
	`Summary`
	`SummaryByCountry`
		Routing API does not support the flags `stairs`, `gatedArea`, `scenic` and `fourWheelDrive`. In addition, it replaces the flag `unpaved` with `dirtRoad`.

`Instruction`	`Maneuver`	Routing API words maneuver instructions differently.
`Link`	`Leg`	See *Link* on page 33 for details on differences.
`Maneuver`	`Leg`	There are several differences in supported attributes. Refer to the Developers Guide for details.
`MetaInfo`	n/a	Routing API provides similar meta information as Enterprise Routing API (except traffic related data) but it uses explicit attributes instead of `AdditionalData`. Thus, the structure of the attribute is different. See *Meta Info* on page 35 for details.
`Note`	`Maneuver`, `Route`	There are differences in supported route notes and their attributes. Routing API does not provide `LinkIds` and `Position`. It uses the `Text` attribute instead of `AdditionalData`. The content of the `Text` attribute is not localized.
`Mode`	`Route`	The sub-element `TrafficMode` has changed. In an Enterprise Routing API response, it echoes the value specified in the request or is absent if the request does not provide it. By contrast, a Routing API response always includes `TrafficMode` and its value is the value used in the route calculation: either the value from the request or `disabled` if the request does not specify `TrafficMode` at all or sets it to `default`.
`Route`	n/a	Routing API supports an extra attribute `PublicTransportLine`.
`SummaryByCountry`	`Route`	In Routing API, the subelement `AdditionalData` is not supported, see *Summary by Country* on page 36 for details.
`TruckRestrictions`	`Link`	The structure has changed slightly, see *Truck Restrictions* on page 37 for details.

Get Link Info

The articles in this section describe differences in the getLinkInfo service.

Summary

The sections below describe three types of API differences:

- *request differences*
- *response differences*

Note: In Routing API to get detailed link information it is recommended to use *HERE Platform Data Extension (PDE)* service.

Request Differences

Routing API does not support the following parameters:

Table 14: Unsupported parameters

Parameter	Description/Alternative
`routeId`	This parameter is not supported in Routing API
`referenceTime`	This parameter is not supported in Routing API
`waypoint`	This parameter is not supported in Routing API

Differences in request parameters:

Table 15: Differences in request parameters

Parameter	Description
`language`	Routing API supports more languages. The language code of British English is different. In Routing API, it is coded as `en-gb` while Enterprise Routing API uses the code `en-uk`.
`linkAttributes`	Routing API does not support options `address`, `confidence`, `externalResources`, `freewayExit`, `freewayJunction`, `incidents`, `jamFactorTrend`, `speedCategory`, `tmcCodes`. New option available is `publicTransportLine`. See the response attribute *Link* on page 33 for more details.

Response Differences

Differences in response attributes:

Table 16: Differences in response attributes

Attribute	Parent	Description
`DynamicSpeedInfo`	`Link`	See *Dynamic Speed Info* on page 33 for details on differences.

`Flags`	`Link`
	`Summary`
	`SummaryByCountry`
		Routing API does not support the flags `stairs`, `gatedArea`, `scenic` and `fourWheelDrive`. In addition, it replaces the flag `unpaved` with `dirtRoad`.

`Link`	`Leg`	See *Link* on page 33 for details on differences.
`MetaInfo`	`n/a`	Routing API provides similar meta information as Enterprise Routing API (except traffic related data) but it uses explicit attributes instead of `AdditionalData`. Thus, the structure of the attribute is different. See *Meta Info* on page 35 for details.
`TruckRestrictions`	`Link`	The structure has changed slightly, see *Truck Restrictions* on page 37 for details.

Calculate Isoline

The articles in this section describe differences in the calculate isoline service.

Summary

Request Differences

The size of an isoline was previously specified either through the parameter `distance` or through `time`. In Routing API, this mechanism is replaced with a combination of `range` and `rangetype` parameters. `rangetype=distance` indicates that the value of `range` is specified in meters, while `rangetype=time` means that `range` is defined in seconds. In addition, the isoline service supports a number of new parameters, please see the user guide documentation for details.

Response Differences

In Routing API, the response structure has been completely replaced with a new simpler structure. Please see the user guide documentation for details.

Behavioral Differences

In Routing API, each isoline can contain multiple polygons. To force a result with only one polygon (as in the previous implementations), add the parameter `singlecomponent=true` to the request. In

Routing API, the isoline service uses a new algorithm for calculating polygons, which offers greater precision and allows the request to stipulate different levels of details.

Calculate Matrix

The articles in this section describe differences of the calculate matrix service.

Summary

The sections below describe three types of API differences:

- *request differences*
- *response differences*
- *behavioral differences*

Request Differences

Routing API does not support the following parameters:

Table 17: Unsupported parameters

Parameter	Description/Alternative
`hasTrailer`	This parameter is obsolete and its use results in an error response. To specify that a truck has a trailer, use the parameter `trailersCount` with a non-zero value.
`trailerWeight`	This parameter is obsolete and its use results in an error response. The truck weight value should include trailers.

The new parameters in Routing API are:

Table 18: New parameters

Parameter	Description
`matrixAttributes`	This parameter defines which attributes are included in the response as part of the data representation of the route matrix entries. See *Matrix Attributes* on page 29 for details.
`searchRange`	This parameter defines the maximum search range for destination waypoints.
`summaryAttributes`	This parameter defines which attributes are included in the response as part of the data representation of the matrix entries summaries. See *Summary Attributes* on page 29 for details.
`trailersCount`	This parameter specifies the number of trailers.

Parameter	Description
`truckType`	This parameter specifies the truck type. To avoid restrictions for trucks with a semi-trailer, specify truck type as `tractorTruck` and a non-zero trailer count (`trailerCount`).

Differences in request parameters:

Table 19: Differences in request parameters

Parameter	Description
`mode`	• Routing API does not support combination of the mode type `shortest` with the `truck` transport mode • Routing API additionally supports transport types `carHOV` and `pedestrian` • In Routing API, traffic mode is disabled by default • Routing API does not support route features `HOVLane` and `stairs` • Routing API does not support the feature weight `prefer`

POST Request Differences

There are differences in the supported syntax of a POST request. In Routing API, POST payload may contain only `start` and `destination` waypoints as in the example below.

Routing API POST payload example:

```
start0=52.60,13.24&destination0=52.61,13.25
```

Response Differences

Differences in response attributes:

Table 20: Differences in response attributes

Attribute	Parent	Description
`MatrixEntry`	n/a	See *Matrix Entry* on page 30 for details on differences.
`MetaInfo`	n/a	Routing API provides similar meta information as Enterprise Routing API (except traffic related data) but it uses explicit attributes instead of `AdditionalData`. Thus, the structure of the attribute is different. See *Meta Info* on page 35 for details.

Request Parameters

The articles in this section describe differences between request parameters.

Matrix Attributes

The request parameter `matrixAttributes` is new in Routing API. It affects the contents of the element `MatrixEntry` in the response to a CalculateMatrix routing request (see also *Matrix Entry* on page 30).

Routing API parameter `matrixAttributes` supports the following values:

- `indices` – enables matrix indices of `MatrixEntry`
- `summary` – enables summary of `MatrixEntry`
- `none` – disables all subelements of `MatrixEntry`

  Note: Requests disabling summary are considered invalid.
- `all` – enables all available subelements of `MatrixEntry`

The example below demonstrates how to optimize the response by requesting only summary information of resulting matrix entries. Matrix indices are not included in the response.

Routing API Request

```
http://route.cit.api.here.com/routing/7.2/calculatematrix.xml?
  app_code={YOUR_APP_CODE}
  &app_id={YOUR_APP_ID}
  &start0=52.6160539,13.2490323
  &destination0=52.6168201,13.2503942
  &mode=fastest;car
  &matrixattributes=none,summary
```

Routing API Response

```
<MatrixEntry>
  <Summary>
    <Distance>320</Distance>
    <TravelTime>334</TravelTime>
  </Summary>
</MatrixEntry>
```

Summary Attributes

The request parameter `summaryAttributes` is new in Routing API. The parameter affects the content of the `Summary` element in the response to the CalculateMatrix routing request.

Routing API parameter `summaryAttributes` supports the following values:

- `traveltime` – enables `TravelTime` element in `Summary`
- `costfactor` – enables `CostFactor` element in `Summary`
- `distance` – enables `Distance` element in `Summary`
- none – disables all fields of `Summary`
- `all` – enables all fields of `Summary`

Note that `costfactor` is enabled by default.

The example below demonstrates how to request multiple summary elements with a single request.

Routing API Request

```
http://route.cit.api.here.com/routing/7.2/calculatematrix.xml?
  app_code={YOUR_APP_CODE}
  &app_id={YOUR_APP_ID}
  &start0=52.6160539,13.2490323
  &destination0=52.6168201,13.2503942
  &mode=fastest;car
  &matrixattributes=none,summary,indices
  &summaryattributes=traveltime,costfactor,distance
```

Routing API Response

```
<MatrixEntry>
  <StartIndex>0</StartIndex>
  <DestinationIndex>0</DestinationIndex>
  <Summary>
    <Distance>320</Distance>
    <TravelTime>334</TravelTime>
    <CostFactor>334</CostFactor>
  </Summary>
</MatrixEntry>
```

Response Attributes

The articles in this section describe differences between the two versions of the API in response attributes.

Matrix Entry

The contents of the `MatrixEntry` attribute in Routing API responses are customizable (see *Matrix Attributes* on page 29). Routing API does not support the `Route` subelement of `MatrixEntry`. It uses the `Summary` element to provide the summary of the route.

Routing API brings a number of changes in the `Summary` attribute:

- New sub-elements `CostFactor` and `TravelTime`
- By default, the summary includes only `CostFactor`
- Travel time provided in `TravelTime` attribute instead of `BaseTime`
- Values of the distance and the travel time do not include a fractional part
- Attribute content customizable (see *Summary Attributes* on page 29)

The examples below demonstrate the differences.

Routing API Response

```
<MatrixEntry>
  <StartIndex>0</StartIndex>
  <DestinationIndex>1</DestinationIndex>
  <Summary>
    <Distance>149191</Distance>
    <TravelTime>119353</TravelTime>
    <CostFactor>121353</CostFactor>
  </Summary>
</MatrixEntry>
```

Enterprise Routing API Response

```
<MatrixEntry>
  <StartIndex>0</StartIndex>
  <DestinationIndex>1</DestinationIndex>
  <Route>
    <Summary>
      <Distance>149191.0</Distance>
      <BaseTime>119353.0</BaseTime>
    </Summary>
  </Route>
</MatrixEntry>
```

Common Request Parameters

The articles in this section describe differences between Enterprise Routing API and Routing API related to common request parameters.

Mode

The use of the parameter `mode` remains largely unchanged, but notable differences exist. The table below details them.

Table 21: Differences in the parameter `mode`

Parameter component	Differences
`modeN` (multiple modes)	In Routing API, it is possible to specify only one routing mode in a request. Numbered mode parameters such as `mode0` or `mode1` are not supported. To calculate a route with several modes, a separate request has to be used for each mode. In Enterprise Routing API, multiple modes are commonly used to request the fastest route and its shortest alternative. To obtain alternative routes through the Routing API, use the parameter `alternatives` (see also *description* in the table with new parameters in *Summary* on page 17).
`Mode Type`	Routing API does not support the mode type `scenic` and the convenience modes `fastestNow` and `directDrive`. The traffic mode and departure time must be specified explicitly.
`Transport Type`	Enterprise Routing API uses an implicit transport type `car`, when the transport type is not specified in the mode parameter. Routing API requires an explicit specification of the transport type. Mode values such as `mode=fastest` or `mode=fastest;;traffic:enabled` are considered as invalid. Routing API supports the transport type `truck` only with mode `fastest`. To obtain alternative routes, use the parameter `alternatives` (see new parameters in *Summary* on page 17). If the request transport type is `pedestrian` in an Enterprise Routing API request, the length of the route is limited to a certain threshold. Routing API does not use thresholds to limit the route length. Routing API supports extra types `carHOV`, `publicTransport` and `publicTransportTimeTable`.
`Traffic Mode`	In Routing API, the traffic mode is disabled by default. To calculate a route, taking into consideration live traffic, always enable the traffic mode explicitly (`traffic:enabled`).
`Feature`	The route feature `HOVLane` is not supported. HOV lanes are not used with transport types other than `carHOV` if an alternative route is available. The route feature `stairs` is not supported. Links with stairs are not used with the transport types `car`, `carHOV` and `truck`. The weighting feature `prefer` is not supported. The most common use case in Enterprise Routing API is to specify a preference for motorways (`motorway:1`). Routing API automatically favors motorways with the mode type `fastest` because they allow higher travel speeds than regular roads.

Common Response Attributes

The articles in this section describe differences between Enterprise Routing API and Routing API related to the common response attributes.

Dynamic Speed Info

This part of migration guide describes differences in the `DynamicSpeedInfo` attributes.

Table 22: Differences in the `DynamicSpeedInfo` attributes

Attribute	Description
`BaseSpeed`	In Enterprise Routing API, the base speed on the link depends on a speed category and the speed limit on that link. Routing API uses a static free flow speed instead of the speed category which tends to be more adequate. This affects how speed profiles for trucks are handled in Routing API. A truck base speed is now a function of a car base speed. However, Routing API applies the same constraints on the truck speeds as Enterprise Routing API.
`Confidence`	This attribute is not supported.
`JamFactor`	Enterprise Routing API does not include this attribute in the response if its value is not known. Routing API includes `JamFactor` with value `-1` in such cases.
`JamFactorTrend`	This attribute is not supported.

Link

This part of migration guide describes differences in the response attribute `Link` with regard to:

- *unsupported attributes*
- *new attributes*
- *dynamic speed info*
- *truck restrictions*
- *public transport*

Unsupported Attributes

Routing API does not support the following link attributes:

Table 23: Unsupported link attributes

Link Attribute	Description/Alternative
`Address`	This attribute is not supported. To obtain address information, use the *Geocoder service* (see *Geocoder API* documentation).
`ExternalResources`	This attribute is not supported.
`FreewayExit`	This attribute is available in the response in the `Maneuver` attribute.
`FreewayJunction`	This attribute is available in the response in the `Maneuver` attribute.
`Incident`	This attribute is not supported.
`SpeedCategory`	This attribute is not supported. In Routing API, the base speed does not directly depend on the speed category. See `BaseSpeed` in *Dynamic Speed Info* on page 33 for more details on the speed criteria.
`TMCCodes`	This attribute is not supported.

New Attributes

The new link attributes in Routing API are:

Table 24: New link attributes

Link Attribute	Description
`Consumption`	This attribute provides the amount of energy or fuel consumed while traversing the link.
`FirstPoint`	This attribute provides the index pointing to the point in the route shape that is the first point of the link.
`LastPoint`	This attribute provides the index pointing to the point in the route shape that is the last point of the link.

See also new link attributes specific to public transport documented in the section *Public Transport* on page 35.

Dynamic Speed Info

For details on differences in the `DynamicSpeedInfo` attribute, see *Dynamic Speed Info* on page 33.

Truck Restrictions

For details on differences in the `TruckRestrictions` attribute, see *Truck Restrictions* on page 37.

Public Transport

Routing API uses a custom type of the `Link` attribute in case of the Public Transport routing modes. The table below describes the new link attributes that are specific to the public transport.

Table 25: Public transport link attributes

Link Attribute	Description
`Line`	This attribute provides the reference to the relevant `Line` attribute included the `Route`.
`NextStopId`	This attribute provides the list of intermediate stops.
`NextStopName`	This attribute provides the the name of the stop at the end of the link.

Meta Info

Routing API uses explicit attributes instead of `AdditionalData` elements in `MetaInfo`. The data provided is similar to the one in Enterprise Routing API except traffic-related meta information.

Routing API provides the time of traffic last update in the response header `X-LastUpdateFromTrafficUpdater`.

Enterprise Routing API contains the following elements:

```
<MetaInfo>
    <Timestamp>2015-01-29T10:51:24.481Z</Timestamp>
    <AdditionalData
 key="CurrentTrafficLastUpdate">2015-01-29T10:50:00.152+0000</
AdditionalData>
    <AdditionalData key="CurrentTrafficElementsCount">10417917</
AdditionalData>
    <AdditionalData
 key="LongTermClosureLastUpdate">2015-01-29T10:50:00.008+0000</
AdditionalData>
    <AdditionalData key="LongTermClosureElementsCount">24483</
AdditionalData>
    <AdditionalData
 key="ShortTermClosureLastUpdate">2015-01-29T10:50:00.008+0000</
AdditionalData>
    <AdditionalData key="ShortTermClosureElementsCount">3807</
AdditionalData>
    <AdditionalData key="Map0">2014Q1</AdditionalData>
    <AdditionalData key="Module0">routeserver,9.3-2014.07.11</
AdditionalData>
    <AdditionalData key="Module0ExecTime">26</AdditionalData>
    <AdditionalData key="Module0ExecTimeMicro">26269</AdditionalData>
    <AdditionalData key="Service">routing-route-service,6.2.36.0</
AdditionalData>
</MetaInfo>
```

Routing API contains the following elements:

```
<MetaInfo>
    <Timestamp>2015-01-30T11:12:34Z</Timestamp>
    <MapVersion>8.30.57.150</MapVersion>
    <ModuleVersion>7.2.53.0-1127_1</ModuleVersion>
    <InterfaceVersion>2.6.7</InterfaceVersion>
</MetaInfo>
```

Summary by Country

The sub-element `AdditionalData` is obsolete in the Routing API. Please note:

- `TollRoadDistance` is now an explicit attribute
- `EcoTax` is obsolete
- `TollPrice` is obsolete; to obtain toll cost information, use the *Toll Cost Extension* (see *TCE* documentation)

Example

The example below demonstrates the difference in how the responses generated by the two versions of the API convey `TollRoadDistance`.

Enterprise Routing API Response:

```
<SummaryByCountry>
    <Distance>384582.0</Distance>
    <TrafficTime>16667.0</TrafficTime>
    <BaseTime>16667.0</BaseTime>
    <Flags>tollroad</Flags>
    <AdditionalData key="TollRoadDistance">361864.0</AdditionalData>
    <Country>FR</Country>
</SummaryByCountry>
```

Routing API Response:

```
<SummaryByCountry>
    <Distance>385110</Distance>
    <TrafficTime>17183</TrafficTime>
    <BaseTime>16759</BaseTime>
    <Flags>tollroad</Flags>
    <TravelTime>16759</TravelTime>
    <Country>FRA</Country>
    <TollRoadDistance>362509</TollRoadDistance>
```

```
</SummaryByCountry>
```

Truck Restrictions

The attributes `permittedGrossWeight` and `trailerWeight` are obsolete in Routing API. Vehicle weight restrictions are expressed using the `limitedWeight` attribute.

Routing API extends link `truckRestrictions` with `conditionalRestrictions`. The extension makes it possible to express such restrictions as weight limits dependent on a trailer type and many others.

Example

The example below demonstrates how restrictions applicable to a single link are expressed in a Routing API response. The restrictions in the example are:

- "No vehicles with a weight over 10 tons"
- "No vehicles with trailer and a weight over 15 tons"
- "No trucks at a certain period of time"

```
<TruckRestrictions>
    <LimitedWeight>10</LimitedWeight>
    <ConditionalRestriction>
        <LimitedWeight>15</LimitedWeight>
        <TruckProfile>
            <TrailersCount>1</TrailersCount>
        </TruckProfile>
    </ConditionalRestriction>
    <ConditionalRestriction>
        <AccessForbidden>true</AccessForbidden>
        <TimeDependent>true<TimeDependent>
    </ConditionalRestriction>
</TruckRestrictions>
```

Waypoint

This part of migration guide describes three changes in the response attributes relating to a waypoint:

- *new waypoint attributes*
- *originalposition*
- *matching*

New waypoint attributes

Routing API extends a waypoint with several new attributes:

- Spot
- SideOfStreet
- MappedRoadName
- Label
- UserLabel
- ShapeIndex

Example of new waypoint attributes

The examples below demonstrate the structure of new waypoint attributes in a response, first from Enterprise Routing API, then from Routing API.

Enterprise Routing API Response:

```
<Waypoint>
    <LinkId>-930905264</LinkId>
    <MappedPosition>
        <Latitude>52.4973412</Latitude>
        <Longitude>13.2873411</Longitude>
    </MappedPosition>
    <OriginalPosition>
        <Latitude>52.4973427</Latitude>
        <Longitude>13.2873413</Longitude>
    </OriginalPosition>
    <Type>stopOver</Type>
</Waypoint>
```

Routing API Response:

```
<Waypoint>
    <LinkId>-1609300590142096890</LinkId>
    <MappedPosition>
        <Latitude>52.4973427</Latitude>
        <Longitude>13.2873414</Longitude>
    </MappedPosition>
    <OriginalPosition>
        <Latitude>52.4973427</Latitude>
        <Longitude>13.2873413</Longitude>
    </OriginalPosition>
    <Type>stopOver</Type>
    <Spot>0.2760736</Spot>
    <SideOfStreet>left</SideOfStreet>
    <MappedRoadName>Bornstedter Straße</MappedRoadName>
    <Label>Bornstedter Straße</Label>
```

```
    <UserLabel>UserLabel Test</UserLabel>
    <ShapeIndex>0</ShapeIndex>
</Waypoint>
```

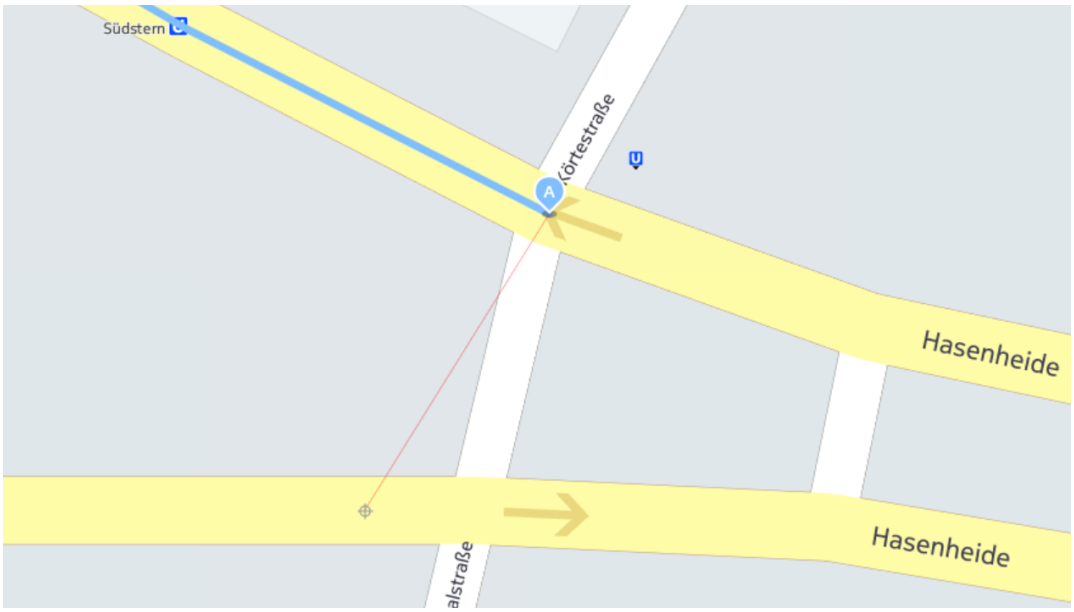
OriginalPosition

Routing API always provides the response field `OriginalPosition` for a `Waypoint` attribute. In case of the waypoint specified with link postion with no `DisplayPosition`, `OriginalPosition` has the same value as the field `MappedPostion`.

Matching

Enterprise Routing API matches the waypoints for intersections from the beginning of the closest link in the direction towards the destination. When the start link is in the middle of or close to an intersection then the start `waypoint` is matched to the nearest link outside the intersection. When the destination link is in the middle or close to an intersection, then the stop `waypoint` is matched to the last link before the intersection. This is illustrated by the figure below.

Figure 1: Enterprise Routing API Waypoint Matching



Routing API matches intersection waypoints with greater precision. The process takes a number of steps. First, the most visible (visible at lower zoom levels) street segment is selected. If the request specifies `TransitRadius` with a value greater than zero, the closest segment to the waypoint is chosen. Otherwise, a segment with the lowest impact on the cost of the route is chosen (its selection causes the smallest change to the route). Next, the selected segment is used to search for links around that segment. The last step verifies whether the waypoint is close to one of the endpoints

of the selected segment and whether it is a junction or not. If the waypoint is close to an endpoint of the segment and that endpoint is near a junction which consists of only two adjacent links, then it remains unchanged. If the waypoint is close to an endpoint of the segment, but is close to a junction, then it is moved to the junction.

Figure 2: Routing API Waypoint Matching