Fleet Telematics API

Technical Introduction

Last update 2019-08-23
https://hmcs.sharepoint.com/sites/FleetTelematics2/Shared%20Documents/Forms/AllItems.aspx?id=%2Fsites%2FFleetTelematics2%2FShared%20Documents%2F02%2E%20Product%2FFleetTelematicsAPI

HERE Web Services

HLS Services

- Map Rendering Service (incl. satellite)
- Geocoder (incl. Places & Rev. Geo)
- Router
- Traffic
- Fleet Telematics API

CVS Connected Vehicle Services

- Truck Parking availability
- Weather
- Fuel Prices
- Parking availability

OLS Services

- Vector Tile Rendering Service (incl. satellite)
- Open Search (Geocoder + Places + Rev. Geo)
- Open Router
- Open Traffic
- Map Matcher

- Fleet Telematics API

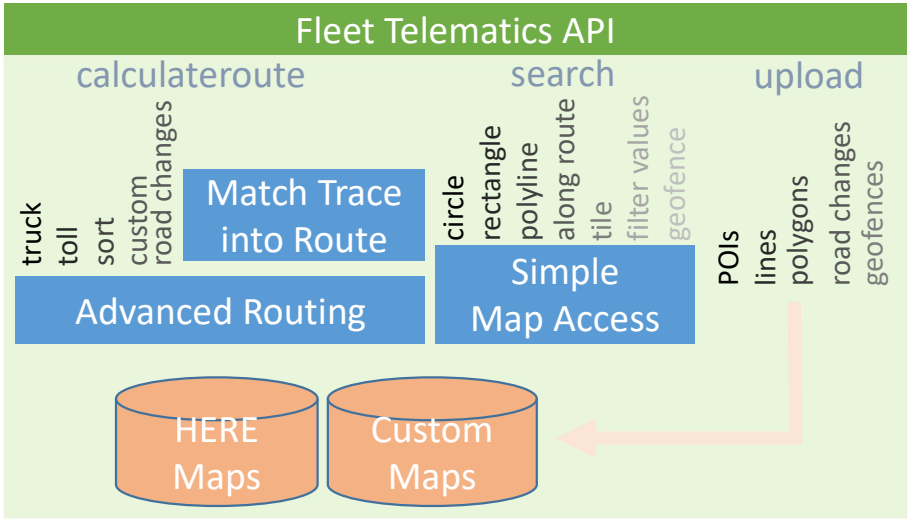
Applications

- Multi vehicle route planning (last mile project Nile)
- Tracking
- Positioning
- Private Venues

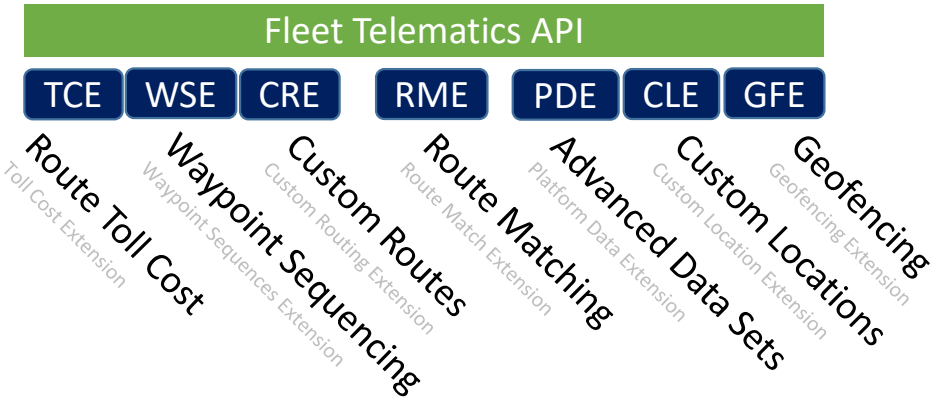
Fleet Telematics API

https://developer.here.com/products/fleet-telematics

= Fleet Routing
+ Route Match
+ Map Access
+ Customizable



Fleet Telematics API
Combines & Extends
the separate Fleet Telematics Services*



* Formerly known as Platform Extensions, part of the HERE Location Services

Fleet Telematics Routing Features

- Hierarchical A* algorithm
  50km in 20ms, 500km in 200ms, 5000km in 2s
- Multiple waypoints
- Departure time
- Live traffic + Traffic patterns
- Arrival time
- Access & turn restrictions
- Avoid toll, motorways, ferries, u-turns, links
- Prefer ferries, motorways
- Truck restrictions link based + admin wide
- Virtual connections for pedestrian

- GPS trace → route matching

- Way point opening hours
- Loading time at way points
- Driver rest times
- Custom speed profiles
- Cost optimized
- Toll cost + toll cost optimized
- Fuel optimized
- Isoline links along route time, cost, fuel
- Custom road changes block, change, add
- Way point sequencing sort 100s of points
- Pickup along route choose from 100s of points

Adding Business Features to HLS Router

When to use Plain HLS Routing vs. Fleet API Routing?

- HLS Router has highest performance → default Routing API to use
- Only HLS Router offers Matrix Routing, scooter routing, environmental zones with license plates.
- Features currently only via Fleet Telematics API Routing:
  - **given arrival time**
  - Way point opening hours, deadlines, loading time
  - Sort way points, choose optional pickup way points
  - Legal driver rest times
  - Road & ferry toll cost
  - **Cost optimize (driver cost, vehicle cost, toll cost, fuel cost)**
  - **Isoline – reachable links**
  - Custom road changes
  - **get any map attributes along the road**
  - **Customizable speed profiles**
  - Country wide truck restrictions

Fleet Telematics Map Content

OLP e.g. for sensor data processing	Advanced Data Sets (PDE) SIMPLE
Full HERE Map content	Full HERE Map content
Catalogs, Layers, Partitions	Maps, Layers, Tiles
REST Web Service	REST Web Service
Topo Seg IDs	Link IDS and Topo Seg IDs
Binary Format tiles	Text or JSON tiles
1. Get token 2. Query catalog -> partition id 3. Query partition -> URL 4. Request partition content	1. Request tile content
Include into your OLP processing pipelines (using Flink or Spark)	Processing on customer site
Customer data	Customer data (incl. road network changes)
Retrieve a partition	Retrieve a tile or search tile content by bounding box, circle, polygon, polyline buffer or along the route
Customers cannot directly use OLP content in their applications. They have to • implement a compiler that transforms the data • store the data in new OLP partitions • retrieve the tiles from there	Customers can directly use the content in their applications. Format, tiling and response time are optimized for • Map display • Routing • Enhance route links with attributes • Guidance

Introduction by Web Demos…

- https://tcs.ext.here.com/examples/v3/pde_truck_pois_along_a_route
- https://tcs.ext.here.com/examples/v3/pde_postal_bounds
- https://tcs.ext.here.com/examples/v3/pde_adas_curvature_along_route
- https://tcs.ext.here.com/examples/v3/pde_speed_limits_along_route
- https://tcs.ext.here.com/examples/v3/pde_traffic_signs
- https://tcs.ext.here.com/examples/v3/check_asset_position_on_core_maps
- https://tcs.ext.here.com/examples/v3/calculate_poi_along_isoline_route
- https://tcs.ext.here.com/examples/v3/route_with_tce
- https://tcs.ext.here.com/examples/v3/cost_optimized_route
- https://tcs.ext.here.com/examples/v3/rme_basic
- https://tcs.ext.here.com/examples/v3/rme_trip_anomalies_detection
- https://tcs.ext.here.com/examples/v3/waypoint_sequence_extension
- https://tcs.ext.here.com/examples/v3/custom_routing_basic

Calculate Route Parameters

/2/calculateroute.json GET / POST calculateroute.xml for backward compatibility

parameters & response HLS Router compatible

- app_id, app_code
- mode fastest;<vehicleType>;traffic:enabled/disabled; … ;motorway: ;tollroad: ;boatFerry ;railFerry 0,-1,-2,-3
- waypoint0 … waypointN
- usetrafficpattern
- departure, arrival
- restTimes
- driver_cost, vehicle_cost, currency
- height, limitedWeight, weightPerAxle, width, length, trailersCount, shippedHazardousGoods, tunnelCategory
- overlays
- language
- speedFcCat
- avoidLinks, avoidCountries, traverseGates, linkaccess
- attributes
- jsoncallback

Calculate Route Toll Calculation/Optimization

/2/calculateroute.json all general parameters apply

- tollVehicleType
- driver_cost, vehicle_cost, currency
- vehicleWeight, limitedWeight, weightPerAxle, height, heightAbove1stAxle, width, length, vehicleNumberAxles, tiresCount
- trailerHeight, trailerType, trailersCount, trailerNumberAxles
- emissionType, minimalPollution, hybrid
- hov, passengersCount, disabledEquipped
- commercial
- shippedHazardousGoods
- tollPass
- rollups

Calculate Route

Match a Trace

/2/calculateroute.json GET / POST

- routematch=1
- waypoint0 … waypointN, or POST body containing a CSV, GPX, KML or NMEA trace
- mode
- attributes
- legal, traverseGates, linkaccess, avoidLinks
- height, limitedWeight, weightPerAxle, width, length, trailersCount, shippedHazardousGoods, tunnelCategory
- language
- overlays

Calculate Route

Way Points order/constraints

/2/calculateroute.json

- capacity — e.g. 7.5 tons and 20 square meter floorspace
- waypoint0 … waypointN
  - stopOver, passThrough
  - optional — if the detour cost is smaller than the order value then take it
  - sort — please determine the best traversal order of these waypoints
  - taketo:[destination waypoint];value:35.80;load:2.8,10 — pick up an order here and earn $35.80 at delivery – payload is 2.8 tons & 10 square meter floorspace
  - opening:[relative or absolute time]
  - closing:[relative or absolute time]
  - openingHours:[mo-fr09:00-17:,sa-sa10:00-12:00]
  - before:1,3,15
  - stopover,[delay to way point]!

Global optimization:
Whether it is worthwhile to pick & drop
an optional point, and in which order,
is determined
in combination with all optional points
and with all other mandatory unsorted points

Fleet Telematics API: Use Cases

➡ 1 slide for each

- Departure time or Arrival time
- Departure time and Arrival time
- Live traffic + Traffic patterns
- Truck restrictions
- Admin truck restrictions
- Environmental Zones
- Custom speed profiles
- Alternative routes
- Driver Rest Time
- Driver Rest Time + Truck Bans + Arrival Time
- Sorting points
- Sorting large scale
- Pickup
- Sorting + pickups
- Sorting / Pickup with Capacity
- Sorting with Order Constraints
- Sorting with traffic
- Way point deadlines, opening hours, delay at waypoint
- Cost optimized
- Toll cost + optimize
- Fuel cost + optimize
- Cost isoline
- Routing on custom blocked / added roads
- Routing with private facilities
- Route Matching
- Route Matching for Driver Analysis
- Route Matching with private facilities
- Routing & route match + attributes in response
- Isoline along route, POIs along route isoline
- When to use Plain HLS Routing vs. Fleet API Routing?

Departure time or Arrival time

- &departure → when will I arrive?
  traffic, time dependent restrictions…

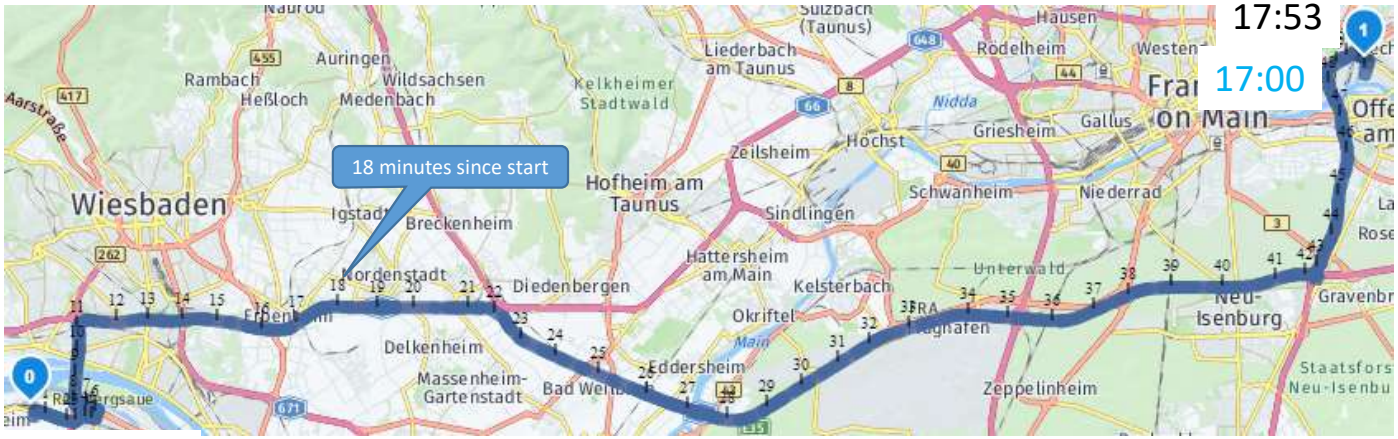
https://tcs.ext.here.com/examples/v3/fleet_telematics_api
&waypoint0=50.02713,8.19463 Vehicle: Truck
&waypoint1=50.11965,8.74892
Departure 2018-03-24T17:00:00 → arrive after 55 min

- &arrival → when do I have to start, to arrive at that time?
  traffic, time dependent restrictions…

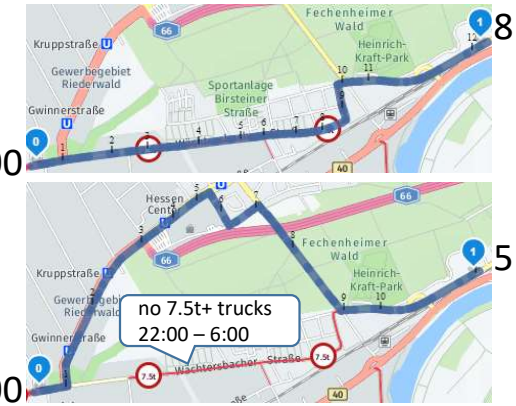
https://tcs.ext.here.com/examples/v3/fleet_telematics_api
&waypoint0=50.02713,8.19463
&waypoint1=50.11965,8.74892
Arrival 2018-03-24T17:00:00 → start 53 min earlier

If departure or arrival given, then
time dependent restrictions are obeyed:

https://tcs.ext.here.com/examples/v3/fleet_telematics_api
&waypoint0=50.13146,8.73873
&waypoint1=50.13775,8.77513 Vehicle: Truck
Departure 2018-03-24T05:00:00 Limited Weight: 10



17:00 16:07



Departure time and Arrival time

- &departure + &arrival → we start at 8:00 and we must arrive before 9:00

  - for cost optimized routing (fuel, toll…): As cheap as possible, but meet the deadline

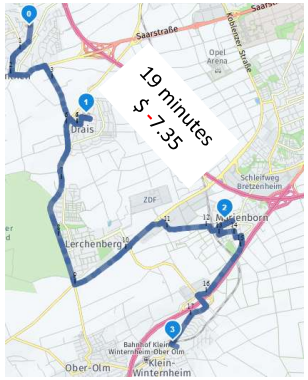
https://tcs.ext.here.com/examples/v3/fleet_telematics_api
&waypoint0=49.99066,8.17920 Vehicle: car
&waypoint1=49.94177,8.21374
&driver_cost=20
&vehicle_cost=0.5

Cheap driver →
take shortest route,
although motorway
would be faster

Departure 2018-03-28T07:00:00
Arrival 2018-03-28T07:11:00

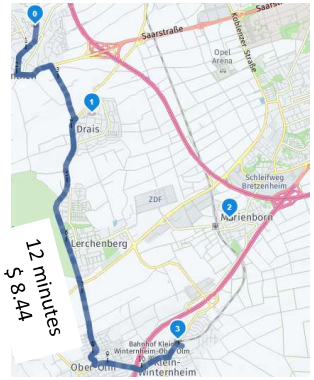
We've got only 11 minutes
→ take fastest route
although more expensive

  - with optional way points: Pick up as much as possible, but meet the deadline



https://tcs.ext.here.com/examples/v3/fleet_telematics_api
&waypoint0=49.990657,8.179202
&waypoint1=49.976963,8.193020;optional;taketo:2;value:20
&waypoint2=49.960637,8.226401;optional
&waypoint3=49.941768,8.213739
&driver_cost=20 &vehicle_cost=0.5

Pick order at (1)
and it drop at (2)
to earn $20 = worth 60 minutes at $20/h



Departure 2018-03-28T07:00:00
Arrival 2018-03-28T07:15:00

We've got only 15 minutes
→ skip all optional way points

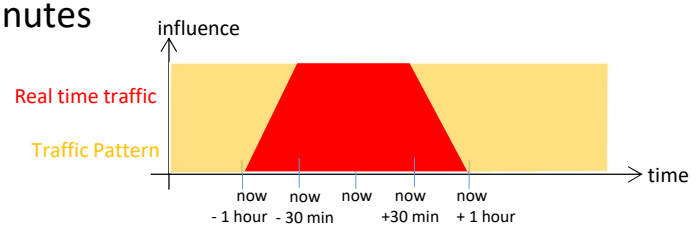
Live traffic + Traffic patterns

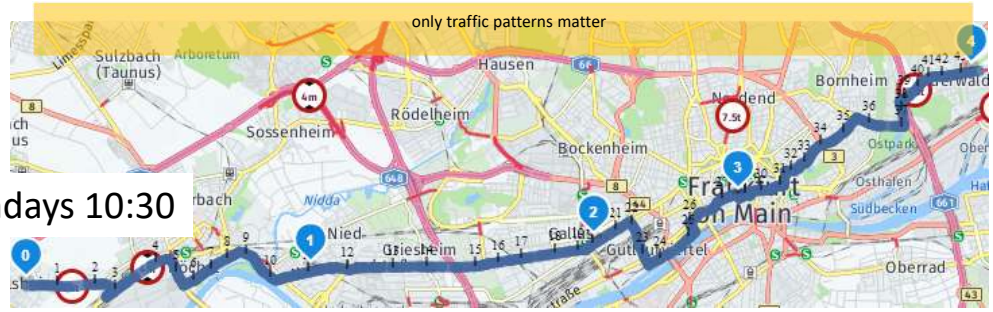
- Delivery tour through Frankfurt in the morning

https://tcs.ext.here.com/examples/v3/fleet_telematics_api
&waypoint0=50.097131,8.502689 Vehicle: car
&waypoint1=50.099488,8.575120
&waypoint2=50.104118,8.647101
&waypoint3=50.111442,8.683777
&waypoint4=50.131915,8.743222
Departure now (which is Monday 10:30)
Traffic-aware routing: enabled

now = Mon 10:30

48 minutes

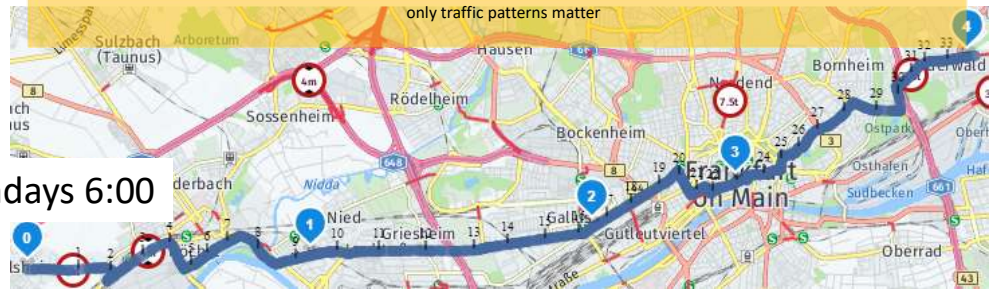




Mondays 10:30

43:30 minutes

Departure 2018-03-19T10:30:00 (a Monday in the past)
Traffic-aware routing: enabled



Mondays 6:00

33 minutes

Departure 2018-03-19T06:00:00
Traffic-aware routing: enabled

Truck Restrictions

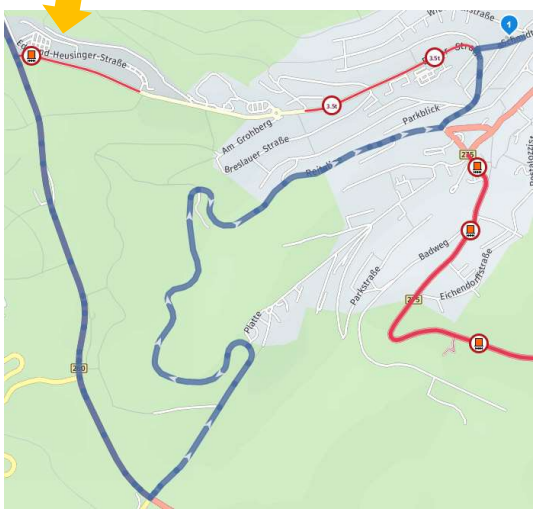
https://tcs.ext.here.com/examples/v3/fleet_telematics_api
&waypoint0=50.15484,8.02707
&waypoint1=50.14351,8.07056
Limited Weight = 5t
poisonous Inh.

- mode=fastest;truck;traffic:enabled
- height, limitedWeight, weightPerAxle, width
- length, trailersCount, shippedHazardousGoods, tunnelCategory

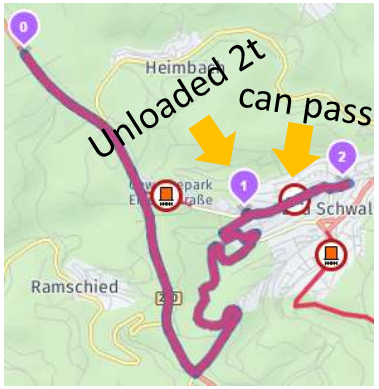
car can drive the direct path

5t not allowed here

hazardous goods not allowed here



Truck Measures
can change at each waypoint



&waypoint0=50.154840,8.027070
&waypoint1=50.140983,8.057128;deltaWeight:-2t
&waypoint2=50.143510,8.070560

Admin truck restrictions

https://tcs.ext.here.com/examples/v3/fleet_telematics_api
&waypoint0=50.81468,5.18946
&waypoint1=52.18030,20.8569
Limited Weight 8t

- mode=fastest;truck;traffic:enabled
- height, limitedWeight, weightPerAxle, width
- length, trailersCount, shippedHazardousGoods, tunnelCategory
- departure

Departure 2018-03-21T17:00:00

Departure 2018-03-24T17:00:00

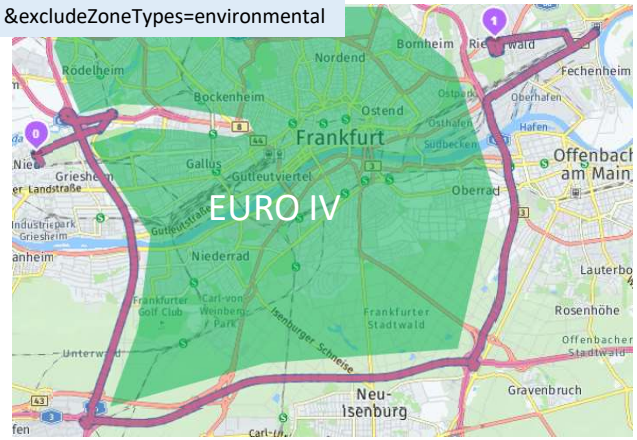
Environmental Zones

- excludeZoneTypes = environmental
- fuelType = Diesel, Petrol, LPG, LNG …
- emissionType=1, 2, 3, 4, 5, 6 Euro I – VI

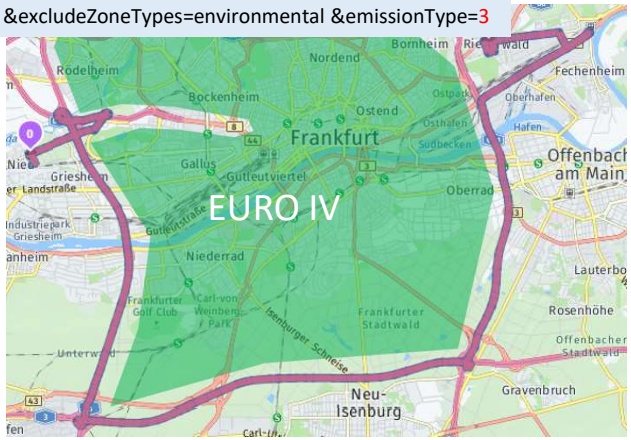
https://tcs.ext.here.com/examples/v3/fleet_telematics_api
&waypoint0=50.10719,8.58684
&waypoint1=50.13039,8.73500
Vehicle: car

&excludeZoneTypes=environmental &emissionType=5

&excludeZoneTypes=environmental

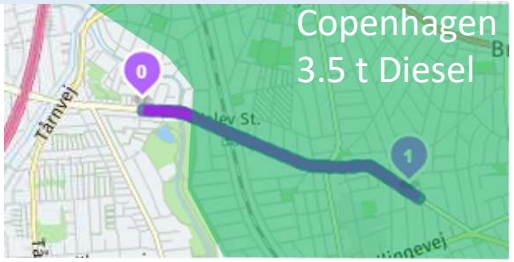


&excludeZoneTypes=environmental &emissionType=3

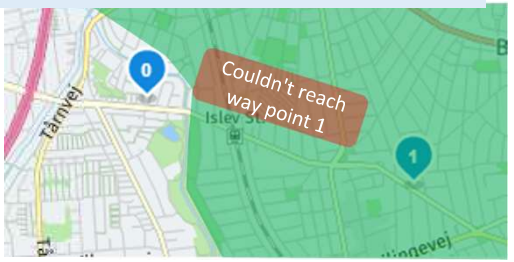


https://tcs.ext.here.com/examples/v3/fleet_telematics_api
&waypoint0=55.70110,12.46036
&waypoint1=55.69616,12.48803
Vehicle: truck Limited Weight: 4t

&excludeZoneTypes=environmental &fuelType=LPG



&excludeZoneTypes=environmental &fuelType=DIESEL



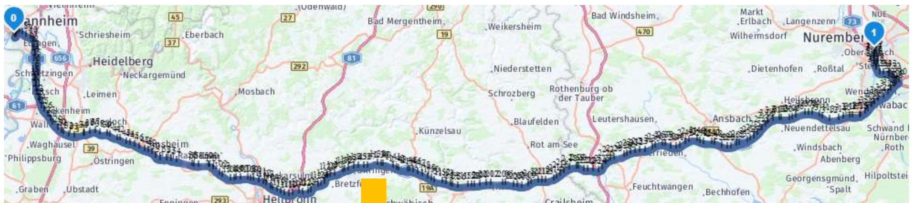
Custom Speed Profiles

- &speedFcCat   [kph]
- Modify the default table for your vehicle
- 4 default speed tables exist: car, truck, truck over 7.5t, truck over 18t

Speed profile for heavy trucks

kph

SpeedCategory FC	1	2	3	4	5	6	7	8
1	71	69	62	54	46	31	35	10
2	71	66	58	54	46	34	34	10
3	70	66	58	54	46	34	34	10
4	53	53	53	45	45	34	30	10
5	36	36	36	30	18	16	12	10
VC	20	18	18	15	12	10	10	10



8 minutes

3:38 hours

https://tcs.ext.here.com/examples/v3/fleet_telematics_api
&waypoint0=49.466522,8.480756
&waypoint1=49.437217,11.070657
Vehicle: truck   Limited Weight 30

- My truck/driver drives 10% faster on motorways

7 minutes

3:19 hours

router's default: 71,69,62

&speedFcCat=80,76,68,,,,,;,,,,,,,;,,,,,,,;,,,,,,,;,,,,,,,;,,,,,,,
Vehicle: truck   Limited Weight 30

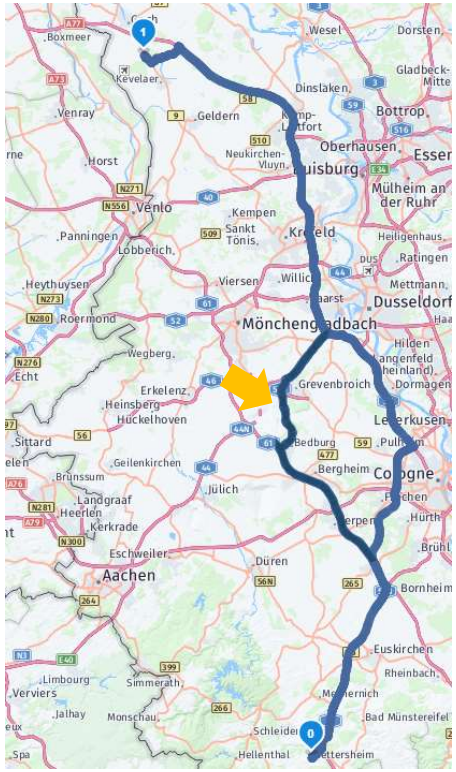
Alternative Routes

https://tcs.ext.here.com/examples/v3/fleet_telematics_api
&waypoint0=50.493019,6.633480 Vehicle: car
&waypoint1=51.622656,6.204913
&alternatives=3

- &alternatives=3
  - up to 3 alternatives in the response
  - only useful ones – up to 10% more time, significantly different from each other

alternatives=0

alternatives=1



alternatives=2

alternatives=3

Driver Rest Time

- EU: After 4.5 h rest 45 minutes (lunch break), after 9 h rest 11 h (sleep)

No rest: 30h

With rest: 65h

https://tcs.ext.here.com/examples/v3/fleet_telematics_api
&waypoint0=48.29463,-3.51996 Vehicle: 45 t truck
&waypoint1=51.98216,19.91223
&restTimes=16200,2700,32400,39600

- Rest earlier, if anyway waiting at a way point, or until way points opens … if worthwhile → router decides

&waypoint0=49.974948,7.878313 Departure: 2018-04-09T08:00:00 Vehicle: truck
&waypoint1=stopOver,3600!49.996785,8.241256;stopOverDelayRestTime:1800;opening:3600
&waypoint2=49.987436,9.039120
&waypoint3=49.995766,9.683012
&restTimes=9000,9000,60000,60000 = 2.5h drive, 2.5 h break, … long rest not relevant here

8:00 8:30 (2.5h break + 0.5h work) - 11:30 12:30 13:30

If way point 2 has a deadline, then we cannot take break at point 1, because we would miss the deadline → final arrival time is 1 hour later

&waypoint2=49.987436,9.039120;closing:15300 closes at 12:15

8:00 8:30-9:00 wait & 9:00-10:00 load 11:00 deadline 12:15 11:30-14:00 short break due 14:30

Note: 2 x 30 minutes idle at way point 1 shift the short break due time from 10:30 to 11:30

- Driver not fresh? → Specify his drive time since last break & since last rest

&restTimes=162,27,324,396,36,3600

Driver Rest Time + Truck Bans + Arrival Time

- Arrive Monday 8am → when to start? Weekend truck bans? Driver rest?

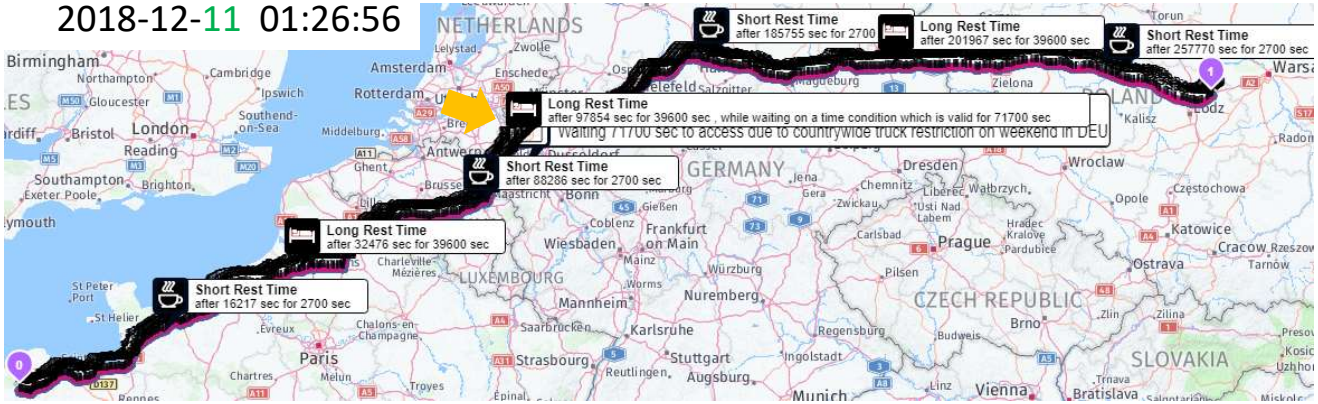
departure: 2018-12-07 04:08:11
arrival: 2018-12-10 01:07:26
69 hours

Must depart (and hence arrive) a little earlier to cross Germany before the weekend track ban

https://tcs.ext.here.com/examples/v3/fleet_telematics_api
&waypoint0=48.29463,-3.51996 Vehicle: 30 t truck
&waypoint1=51.98216,19.91223
&restTimes=16200,2700,32400,39600
&arrival=2018-12-10T08:00:00

- Arrive Tuesday 8am → runs into Germany weekend truck ban

departure: 2018-12-07 22:55:03
arrival: 2018-12-11 01:26:56



The truck cannot enter Germany
--> Router uses the time to drive further North
--> is closer to the destination when he finally enters Germany

&arrival=2018-12-11T08:00:00

Sorting points

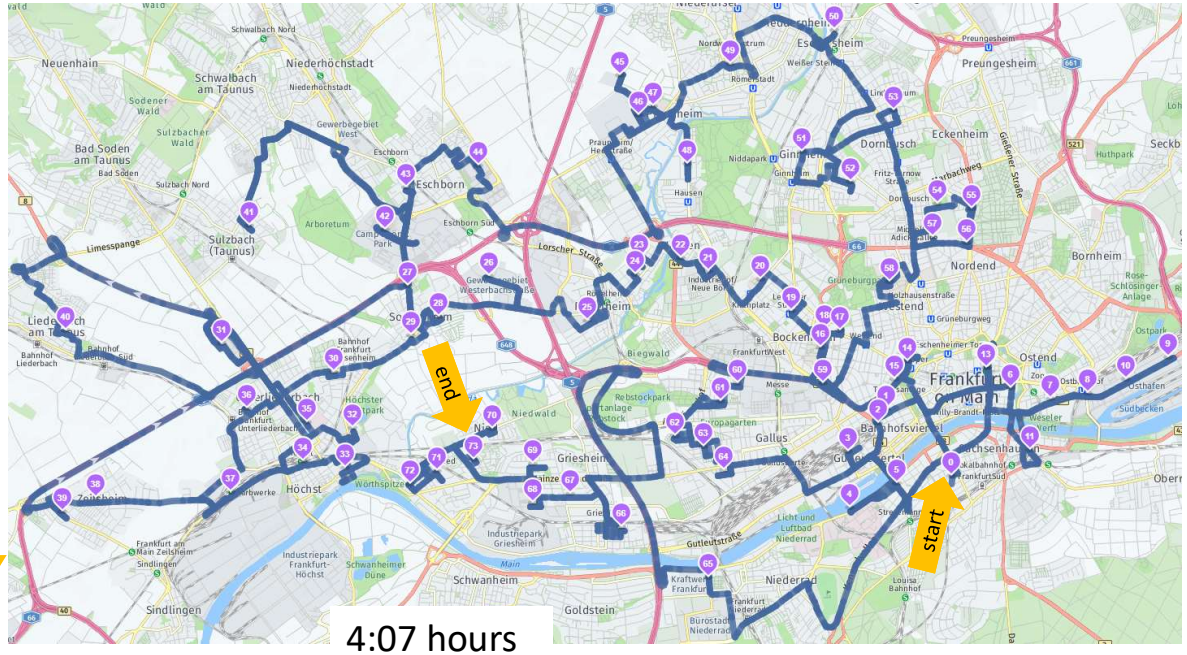
https://tcs.ext.here.com/examples/v3/fleet_telematics_api

&waypoint0=50.1001,8.6802
&waypoint1=50.1605,8.6555;sort
&waypoint2=50.0991,8.6687;sort
&waypoint3=50.1126,8.6531;sort
&waypoint4=50.12,8.6535;sort
&waypoint5=50.1198,8.6568;sort
&waypoint6=50.1156,8.6710;sort
&waypoint7=50.1034,8.6584;sort
&waypoint8=50.1264,8.6672;sort
&waypoint9=50.0958,8.6588;sort
&waypoint10=50.1091,8.6665;sort
&waypoint11=50.1132,8.6683;sort
&waypoint12=50.1175,8.6526;sort
&waypoint13=50.1066,8.5538;sort
&waypoint14=50.1036,8.6970;sort
&waypoint15=50.1120,8.6928;sort
&waypoint16=50.1147,8.6877;sort
&waypoint17=50.1148,8.6880;sort
&waypoint18=50.1317,8.6836;sort
&waypoint19=50.1224,8.6465;sort
&waypoint20=50.1267,8.6399;sort
&waypoint21=50.1278,8.6290;sort
&waypoint22=50.1132,8.7172;sort
&waypoint23=50.1296,8.6231;sort
&waypoint24=50.1544,8.6102;sort
&waypoint25=50.1559,8.6336;sort
&waypoint26=50.1502,8.6173;sort
&waypoint27=50.1490,8.6142;sort
&waypoint28=50.1021,8.5433;sort
&waypoint29=50.0979,8.5281;sort
&waypoint30=50.0990,8.5660;sort
&waypoint31=50.1012,8.5523;sort
&waypoint32=50.1074,8.5441;sort
&waypoint33=50.1162,8.7261;sort
&waypoint34=50.1363,8.6845;sort
&waypoint35=50.1370,8.6774;sort
&waypoint36=50.1440,8.6487;sort
&waypoint37=50.0971,8.4996;sort
&waypoint38=50.0952,8.4925;sort
&waypoint39=50.1191,8.5661;sort
&waypoint40=50.1258,8.5655;sort
&waypoint41=50.1325,8.6763;sort
&waypoint42=50.1105,8.7013;sort
&waypoint43=50.1113,8.7091;sort
&waypoint44=50.0863,8.6289;sort
&waypoint45=50.1072,8.6649;sort
&waypoint46=50.110212,8.631541;sort
&waypoint47=50.104111,8.628011;sort
&waypoint48=50.101712,8.591941;sort
&waypoint49=50.097688,8.599805;sort
&waypoint50=50.127194,8.582621;sort
&waypoint51=50.100830,8.632239;sort
&waypoint52=50.121131,8.603324;sort
&waypoint53=50.129570,8.614300;sort
&waypoint54=50.142389,8.624417;sort
&waypoint55=50.096505,8.591892;sort
&waypoint56=50.109255,8.531530;sort
&waypoint57=50.093209,8.610555;sort
&waypoint58=50.105493,8.621874;sort
&waypoint59=50.112699,8.635124;sort
&waypoint60=50.127397,8.613570;sort
&waypoint61=50.139893,8.659036;sort
&waypoint62=50.149670,8.668094;sort
&waypoint63=50.121653,8.571899;sort
&waypoint64=50.106513,8.583320;sort
&waypoint65=50.119829,8.493143;sort
&waypoint66=50.134029,8.531952;sort
&waypoint67=50.139157,8.565140;sort
&waypoint68=50.142127,8.580354;sort
&waypoint69=50.114224,8.549862;sort
&waypoint70=50.118049,8.526125;sort
&waypoint71=50.133445,8.560617;sort
&waypoint72=50.100719,8.571544;sort
&waypoint73=50.102344,8.579270

&algopts=sortQuality10

- Start + destination given, please sort the intermediate stops

Vehicle: car

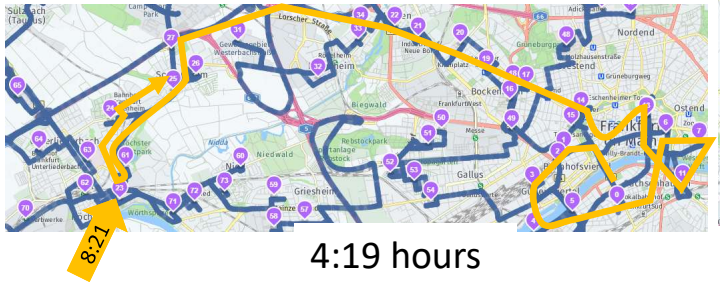


4:07 hours

- Deadlines for way points

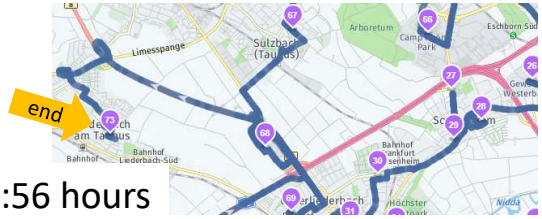
&departure=2018-01-01T08:00:00
&waypoint31=50.1012,8.5523;sort;closing:2018-01-01T08:50:00

Router changes the sort order to be at point 31 due 9:30



4:19 hours

- Open ended tour – driver sleeps in a rest area

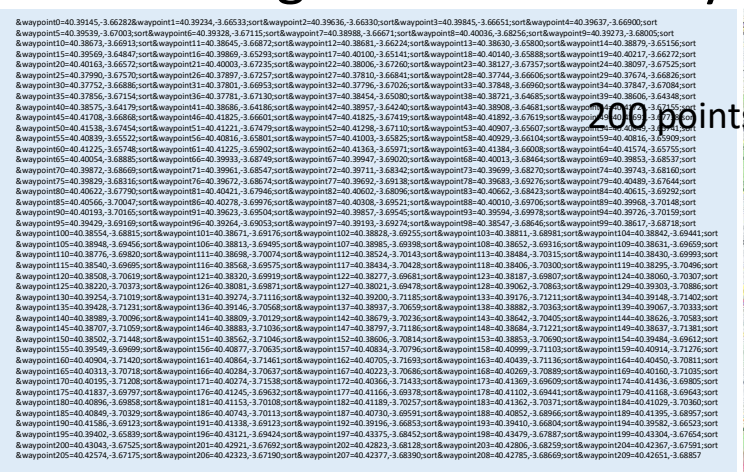


3:56 hours

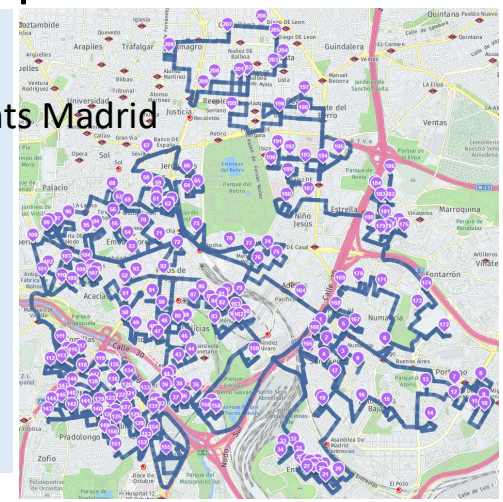
…
&waypoint71=50.133445,8.560617;sort
&waypoint72=50.100719,8.571544;sort
&waypoint73=50.102344,8.579270;sort

Sorting Large Scale

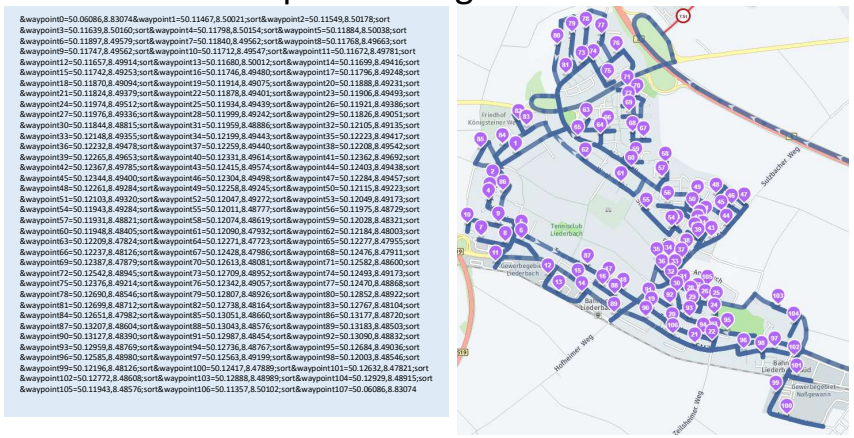
- Large number of way points



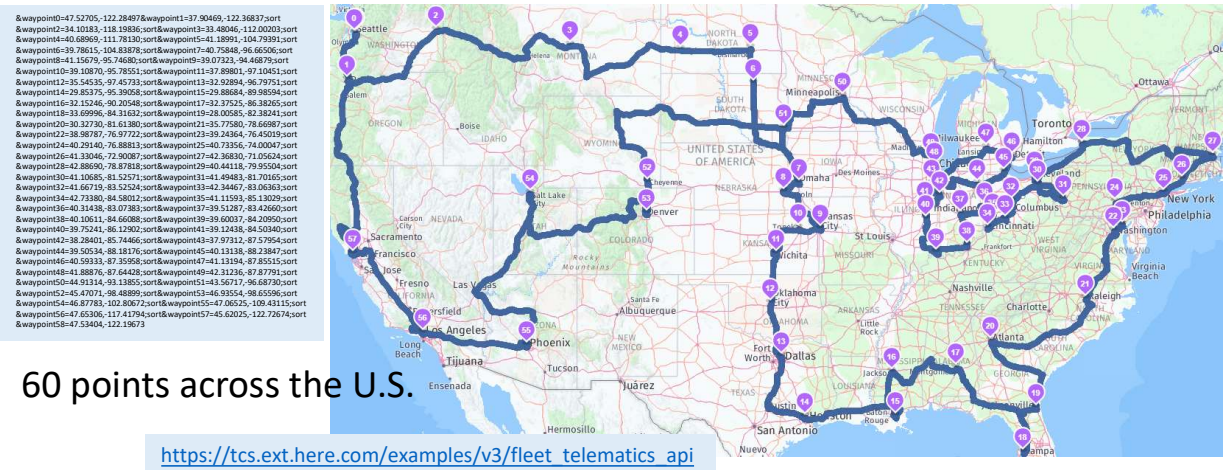
200 points Madrid



110 points village near Frankfurt



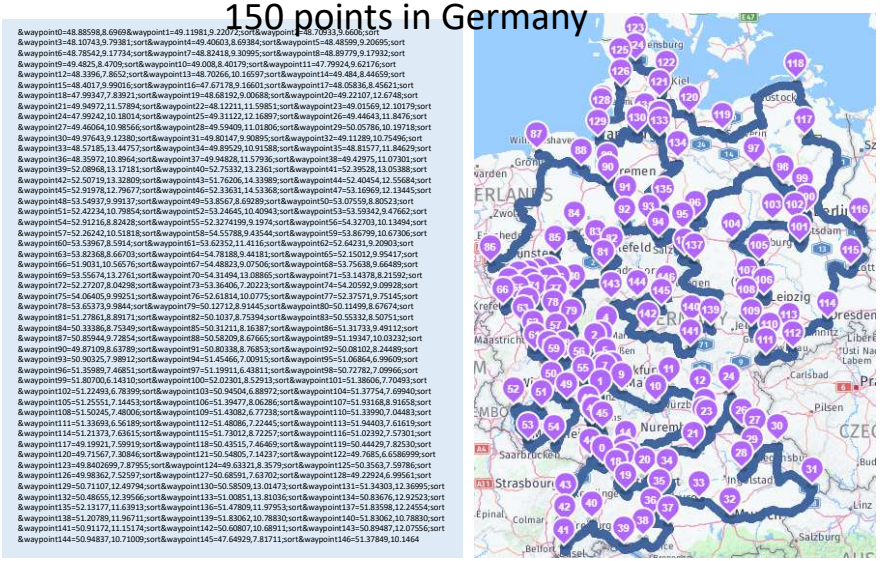
- Large spatial extent



60 points across the U.S.

https://tcs.ext.here.com/examples/v3/fleet_telematics_api

150 points in Germany



Pickup

- Start + destination given, pick & drop some orders along the route

not worth the detours

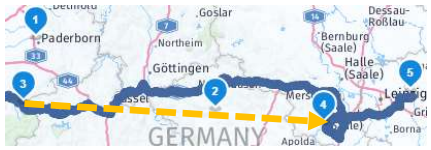
6:18h €126

https://tcs.ext.here.com/examples/v3/fleet_telematics_api
&driver_cost=20 Vehicle: car
&waypoint0=51.20422,4.42218
&waypoint1=51.72089,8.74305;optional;taketo:2;value:20
&waypoint2=51.24689,10.65526;optional
&waypoint3=51.29686,8.60895;optional;taketo:4;value:30
&waypoint4=51.15923,11.80929;optional
&waypoint5=51.36948,12.73167

&waypoint1= … value:30
&waypoint3= … value:30

1→2 is worth it

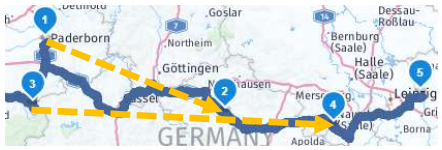
7:36h €122



&waypoint1= … value:30
&waypoint3= … value:40

3→4 beats 1→2

8:05h €121

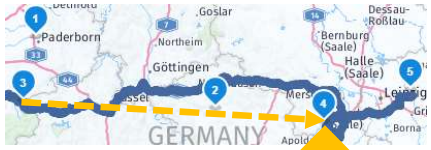


&waypoint1= … value:40
&waypoint3= … value:50

do both orders

9:40h €104

- Deadlines at way points



&waypoint1= … value:40
&waypoint3= … value:50
&waypoint4=…;closing:28800

can only take 3→4

must arrive within 8 hours

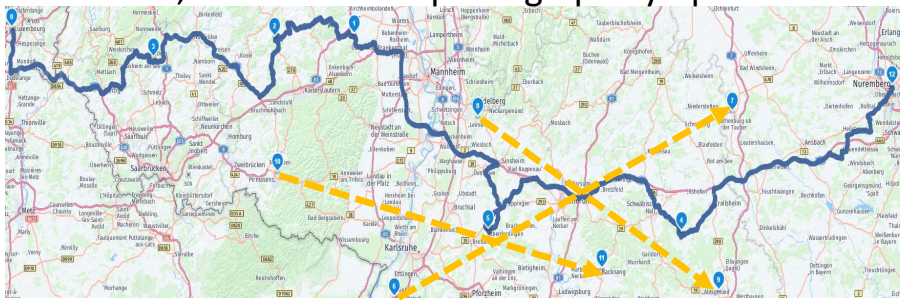
with both orders we'd arrive at 4 after 8:36 hours

- Open ended tours also possible, truck capacity, driver rest times, toll cost, delays at way points, way point opening hours, overall deadline …

Sorting + Pickups

- Some way points we must meet (in any order), others are optional

At 1€ each, it is not worth picking up any optional order



https://tcs.ext.here.com/examples/v3/fleet_telematics_api
&driver_cost=30 Vehicle: car
&waypoint0=49.60960,6.12840
&waypoint1=49.59177,8.05147;sort
&waypoint2=49.58401,7.60400;sort
&waypoint3=49.52840,6.92489;sort
&waypoint4=49.05822,9.89216;sort
&waypoint5=49.06391,8.80614;sort
&waypoint6=48.87660,8.27872;optional;taketo:7;value:1
&waypoint7=49.38276,10.17921;optional
&waypoint8=49.36725,8.74666;optional;taketo:9;value:1
&waypoint9=48.89626,10.10099;optional
&waypoint10=49.21683,7.62123;optional;taketo:11;value:1
&waypoint11=48.95438,9.44634;optional
&waypoint12=49.45431,11.07520

6→7 for 30€ we pick

&waypoint6=48.87660,8.27872;optional;taketo:7;value:30

for 30€ each we pick them all, and integrate all into the optimal sequence order

&waypoint6=48.87660,8.27872;optional;taketo:7;value:30
&waypoint8=49.36725,8.74666;optional;taketo:9;value:30
&waypoint10=49.21683,7.62123;optional;taketo:11;value:30

Sorting / Pickup with Capacity

without pickups
5:18 h

- No capacity limits: first picks up all 3 loads (or people), then drops them

11:01 h

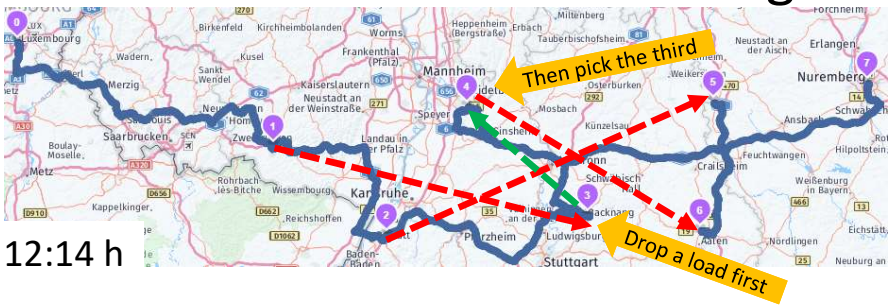
https://tcs.ext.here.com/examples/v3/fleet_telematics_api
&driver_cost=30 Vehicle: truck, Limited Weight 7.5t
&waypoint0=49.60960,6.12840
&waypoint1=48.87660,8.27872;optional;taketo:2;value:70
&waypoint2=49.38276,10.17921;optional
&waypoint3=49.36725,8.74666;optional;taketo:4;value:70
&waypoint4=48.89626,10.10099;optional
&waypoint5=49.21683,7.62123;optional;taketo:6;value:70
&waypoint6=48.95438,9.44634;optional
&waypoint7=49.45431,11.07520

- 7.5 tons capacity, each load is 3 tons → skips a load

9:20 h

&capacity=7500
&waypoint1=48.87660,8.27872;optional;taketo:2;value:70;load:3000
&waypoint2=49.38276,10.17921;optional;load:-3000
&waypoint3=49.36725,8.74666;optional;taketo:4;value:70;load:3000
&waypoint4=48.89626,10.10099;optional;load:-3000
&waypoint5=49.21683,7.62123;optional;taketo:6;value:70;load:3000
&waypoint6=48.95438,9.44634;optional;load:-3000

- … unless the orders have enough value

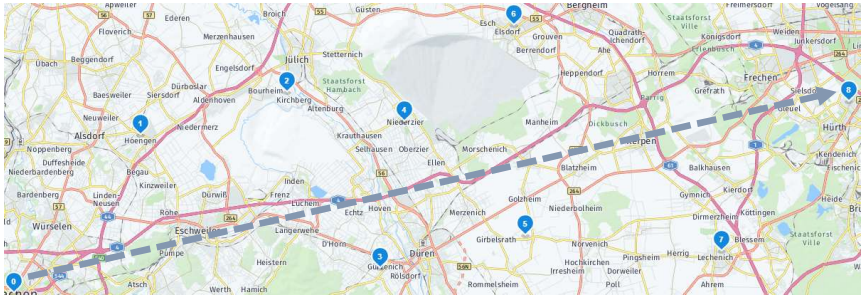


12:14 h

&waypoint1=48.87660,8.27872;optional;taketo:2;value:100;load:3000
&waypoint3=49.36725,8.74666;optional;taketo:4;value:100;load:3000
&waypoint5=49.21683,7.62123;optional;taketo:6;value:100;load:3000

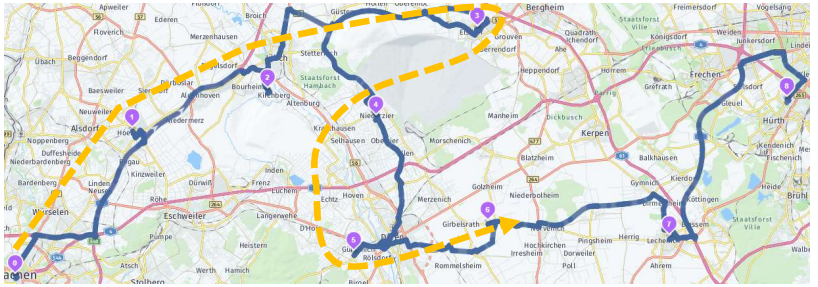
Sorting with Order Constraints

https://tcs.ext.here.com/examples/v3/fleet_telematics_api
Vehicle: truck
&waypoint0=50.775864,6.088867
&waypoint1=50.872257,6.211031;sort
&waypoint2=50.898175,6.352480;sort
&waypoint3=50.791409,6.442584;sort
&waypoint4=50.880693,6.465798;sort
&waypoint5=50.811105,6.582300;sort
&waypoint6=50.939187,6.571252;sort
&waypoint7=50.801703,6.772160;sort
&waypoint8=50.892528,6.89495

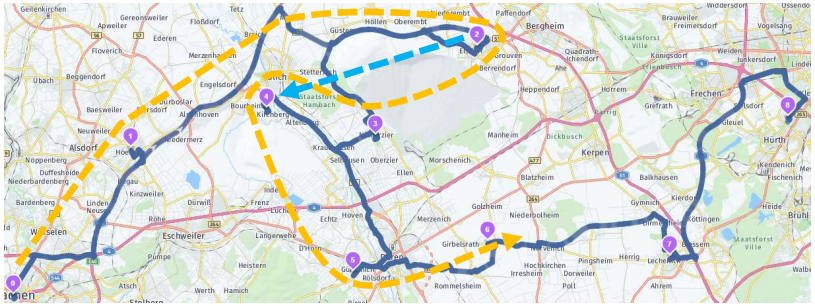


unsorted
way points
1 … 7

- Router sorts the points:

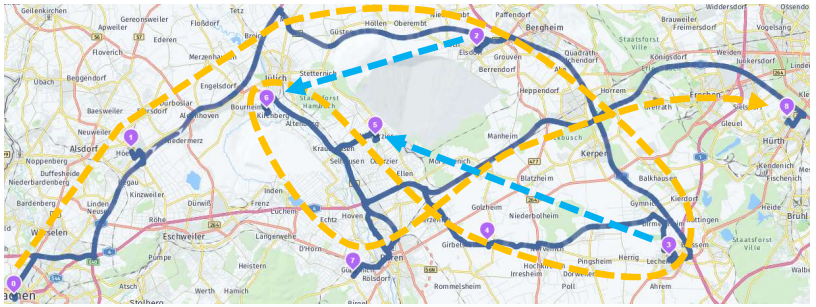


- but at point 6 we pick up goods for 2:



&waypoint6=50.939187,6.571252;sort;before:2

- and in addition we must meet 7 before 4:



&waypoint7=50.801703,6.772160;sort;before:4

Sorting with Traffic

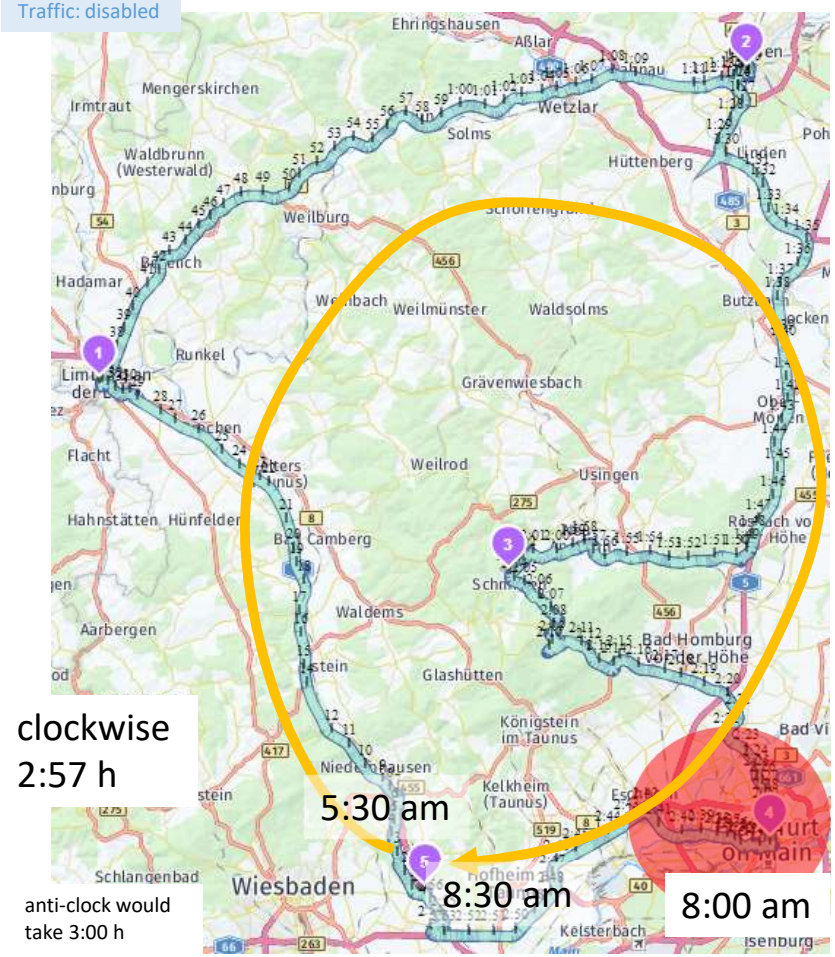
https://tcs.ext.here.com/examples/v3/fleet_telematics_api
&driver_cost=30 Vehicle: truck, Limited Weight 7.5t
&departure=2018-05-29T05:30:00
&waypoint0=50.080414,8.365784
&waypoint1=50.109448,8.690288;sort
&waypoint2=50.270692,8.444060;sort
&waypoint3=50.571600,8.667434;sort
&waypoint4=50.385947,8.059138;sort
&waypoint5=50.080414,8.365784

Router chooses the fastest path, depending on the traffic situation:

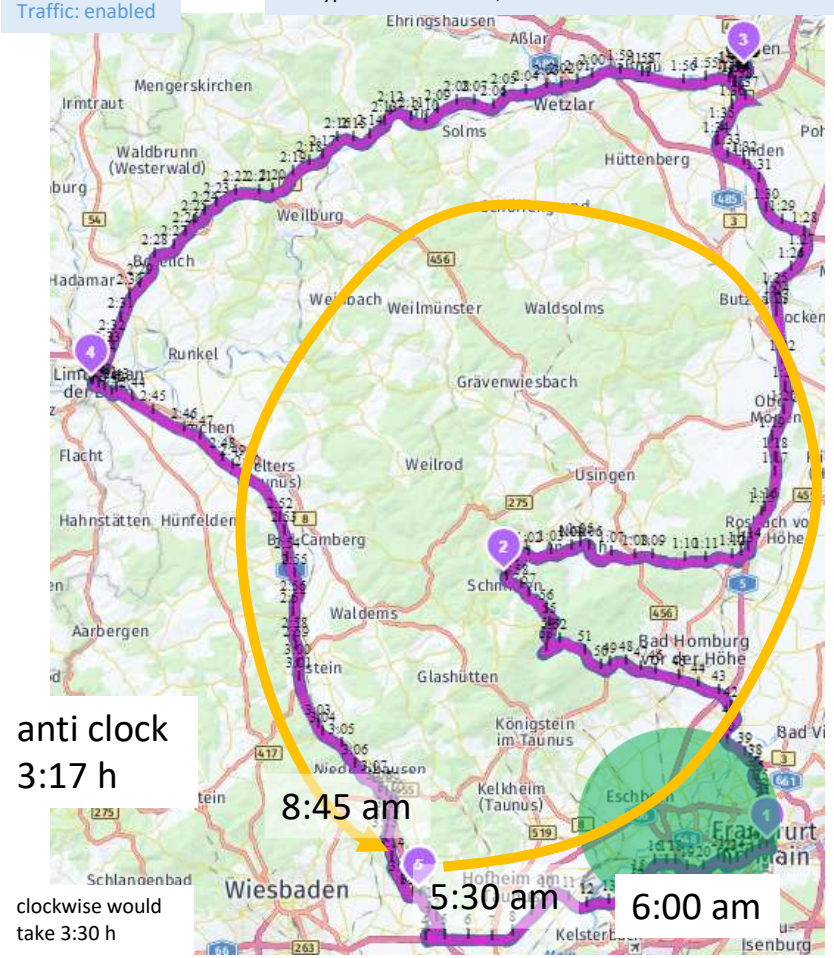
It avoids Frankfurt morning peak traffic

Works with
- traffic patterns
- real time traffic

Traffic: disabled

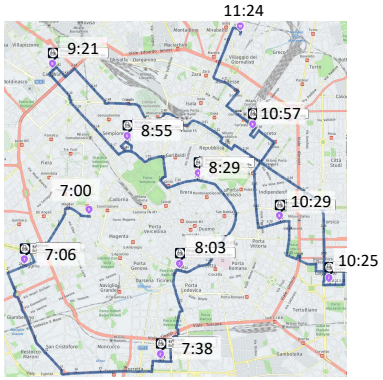


Traffic: enabled



Way point deadlines, opening hours, delay at waypoint

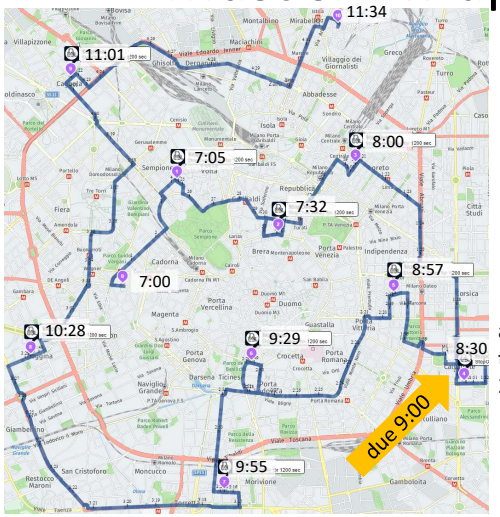
- Mainly relevant when sorting way points, or pickup orders along route
- Start 7:00,
  20 min work at each point
- Without time constraints:



https://tcs.ext.here.com/examples/v3/fleet_telematics_api
Departure 2018-04-23T07:00:00 Vehicle: truck
&waypoint0=45.46634,9.16167
&waypoint1=stopOver,1200!45.46521,9.21219;sort
&waypoint2=stopOver,1200!45.45623,9.18569;sort
&waypoint3=stopOver,1200!45.47317,9.19071;sort
&waypoint4=stopOver,1200!45.48007,9.17178;sort
&waypoint5=stopOver,1200!45.48226,9.20508;sort
&waypoint6=stopOver,1200!45.45709,9.14449;sort
&waypoint7=stopOver,1200!45.43938,9.18068;sort
&waypoint8=stopOver,1200!45.45357,9.22537;sort
&waypoint9=stopOver,1200!45.49357,9.15193;sort
&waypoint10=45.50054,9.20188

- Must show up at way point 8 before 9:00:

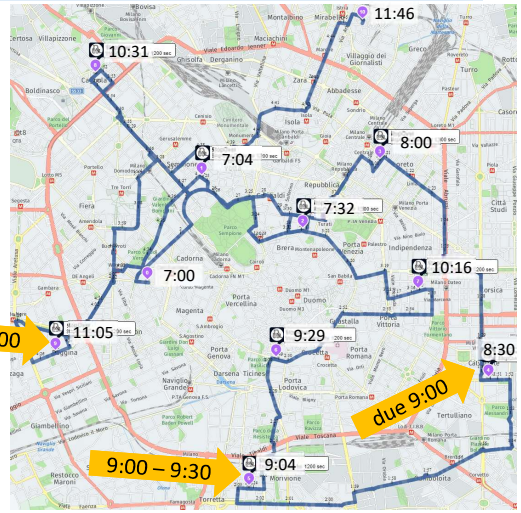
&waypoint8=stopOver,1200!45.45357,9.22537;sort;closing:2018-04-23T09:00:00



actually due 8:40,
to perform the
20 min. work

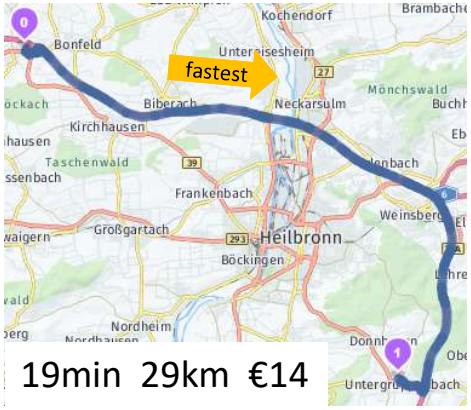
+ Way point 6 doesn't
  open before 11:00 and
+ Way point 7 only
  open 9:00 – 9:30

&waypoint6=stopOver,1200!45.45709,9.14449;sort;opening:2018-04-23T11:00:00
&waypoint7=stopOver,1200!45.43938,9.18068;sort;openingHours:mo-fr09:00-09:30

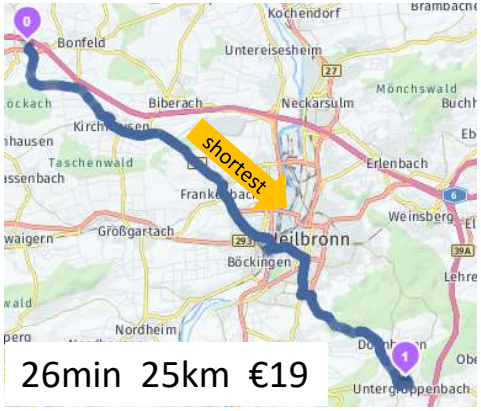


Cost Optimized

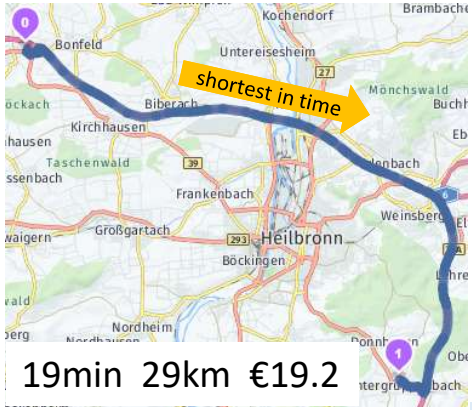
- Minimize (cost per hour * time + cost per kilometer * distance)
- Router always cost optimizes! cheapest
  Default optimization is fastest: high driver_cost$_{€/hour}$ + 0 vehicle_cost$_{€/km}$
- Can optimize for any combination of
  driver_cost$_{/hour}$, vehicle_cost$_{/km}$, toll cost, fuel cost $_{electricity\ or\ fuel}$, pickup value
- For time constrained optimization: set departure + arrival
  → lowest cost but don't be late



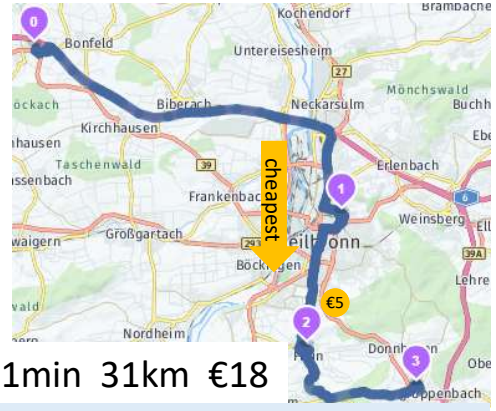
19min 29km €14



26min 25km €19



19min 29km €19.2



31min 31km €18

https://tcs.ext.here.com/examples/v3/fleet_telematics_api
&waypoint0=49.21076,9.06463 Vehicle: car
&waypoint1=49.08840,9.27590
&driver_cost=35&vehicle_cost=0.1

&driver_cost=15&vehicle_cost=0.5

Departure: 2018-04-27T10:00:00 Arrival: … 10:25:00
&driver_cost=15&vehicle_cost=0.5

&waypoint0=49.21076,9.06463
&waypoint1=49.15065,9.23436;optional;taketo:2;value:5
&waypoint2=49.10242,9.21492;optional
&waypoint3=49.08840,9.27590
&driver_cost=15&vehicle_cost=0.5

Toll Cost + optimize

- Compute the toll cost along the route
- Cost per link
- List of toll structures
- Different rollups possible:
  - none = only details
  - total = total sum
  - country = total per country
  - tollsys = total per toll system
  - country;tollsys = total per each pair

Travel time 4h 54min 7s, Distance 335.5km, Cost 193.40

COSTS FOR MAIN ROUTE

Total Cost: 193.4 EUR
- Driver Cost: 171.57 EUR
- Vehicle Cost: 0.0 EUR
- Toll Cost: 21.83 EUR

TOLL COST FOR MAIN ROUTE

FRA
- Toll System APRR: 7 EUR

CHE
- Toll : 14.83 EUR

Paypoint Type A: Country wide toll - payed somewhere else.
Paypoint Type S: Toll section from one toll booth or between two toll boths.
Paypoint Type p: Toll - payed somewhere else.
Paypoint Type F: Toll section belonging to a toll system.
Paypoint Type K: Toll section defined between junctions.
UFR: Usage fee required link(s).

https://tcs.ext.here.com/examples/v3/fleet_telematics_api
Vehicle: truck
&waypoint0=47.32699,5.043
&waypoint1=47.37708,8.53956
&currency=EUR
&tollVehicleType=3
&vehicleNumberAxles=2
&emissionType=5
&vehicleWeight=7500
&passengersCount=1
&tiresCount=4
&commercial=1
&heightAbove1stAxle=1m
&width=2.5
&length=7.2
&rollups=none,country;tollsys

detail per link

total per country/toll system

Specify driver_cost and/or vehicle_cost to get a (driver + vehicle + toll) cost optimized route

To only compute the toll cost, but not optimize the route: Pass a very high driver cost

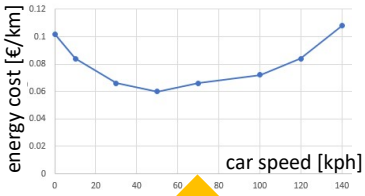
Vehicle : car
&tollVehicleType=2
&driver_cost=2 €/h
&vehicle_cost=1 €/km

Driver & kilometer cheap
→ toll cost are most important
→ circumvent toll section

- Cost optimized can also consider toll cost:

Fuel Cost + optimize

- Compute the energy consumption along the route
- Response: Cost per link + total
- To optimize, provide a driver_cost



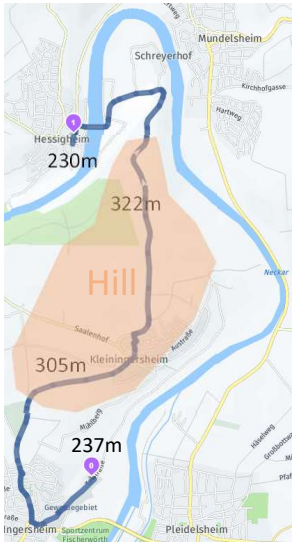
At 70 kph the car consumes 5.5 liter/100km.
If fuel costs 1.20 €/liter → 5.5*1.20€/100km = 0.066 €/km

Downhill fuel savings

https://tcs.ext.here.com/examples/v3/fleet_telematics_api Vehicle: car
&waypoint0=48.96444,9.19229
&waypoint1=48.99227,9.19009
&customConsumptionDetails=speed,0,0.102,10,0.084,30,0.066,50,0.06,70,0.066,100,0.072,120,0.084,140,0.108;ascent,0.4;descent,0.1
&driver_cost=1 cheap driver → fuel matters

Fuel cost per altitude climbed: Work to lift 1.5t up 1 km = 1.5t * 1km * g = 15MJ
Gasoline delivers 42MJ/liter → 15 MJ/km / 42 MJ/liter * 1.20€/liter = 0.4 €/km

…ascent,0.4…



…ascent,3.0 …

If uphill cost are bigger (e.g. truck) then fuel optimized routing avoids the hills above the river


```
{
    linkId: "-72726732",
    remainTime: 533,
    remainDistance: 6277,
    consumption: 0.00387,
  - shape: [
        48.96223,
        9.18884,
        48.96221,
        9.18873,
        48.96196,
        9.18833
    ],
    functionalClass: 5
},
```



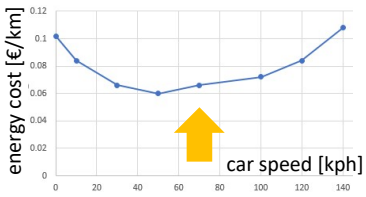
```
summary: {
    travelTime: 601,
    distance: 6631,
    baseTime: 601,
    trafficTime: 601,
    flags: null
},
cost: {
    totalCost: "0.64",
    currency: null,
  - details: {
        driverCost: "0.17",
        vehicleCost: "0.0",
        optionalValue: 0,
        energyCost: "0.4732"
```


Hint:
Routers drive fast on motorways
→ high fuel consumption
→ use &maxSpeed=90

Hint:
You can customize the consumption for driving through cities by parameter ;builtupFactor=3

Optimize for Fuel Cost + Toll Cost

- Compute the cheapest route w.r.t. fuel + toll cost
  - Note: If you want the fastest route, and just see the fuel + toll cost (but not optimize the route) then specify a high driver_cost in addition



At 70 kph the car consumes 5.5 liter/100km.
If fuel costs 1.20 €/liter → 5.5*1.20€/100km = 0.066 €/km

https://tcs.ext.here.com/examples/v3/fleet_telematics_api Vehicle: car
&waypoint0=43.87870,10.32402
&waypoint1=43.83699,10.47858
&customConsumptionDetails=speed,0,0.102,10,0.084,30,0.066,50,0.06,70,0.066,100,0.072,120,0.084,140,0.108;ascent,0.4;descent,0.1
&driver_cost=1
&tollVehicleType=car
&rollups=none

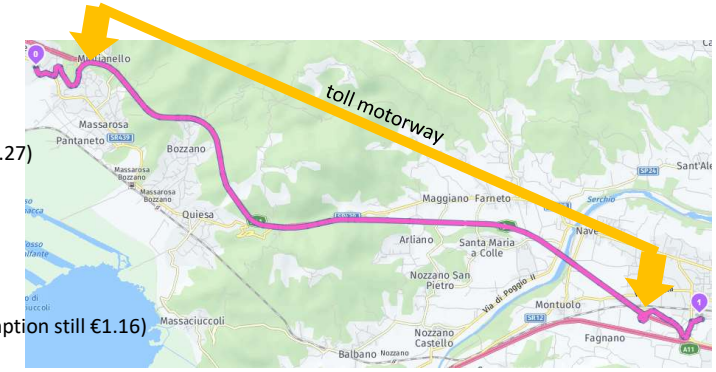
Downhill fuel savings

cheap driver →fuel & toll matter

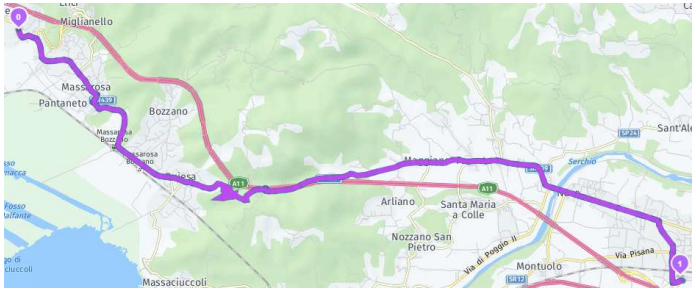
Fuel cost per altitude climbed: Work to lift 1.5t up 1 km = 1.5t * 1km * g = 15MJ
Gasoline delivers 42MJ/liter → 15 MJ/km / 42 MJ/liter * 1.20€/liter = 0.4 €/km

No fuel or toll cost: Uses toll motorway
- travelTime: 693 sec
- distance: 15.8 km

No fuel, just toll cost: Avoids toll road (€2.40)
- travelTime: 1123 sec
- distance: 16.9 km
- tollCost: 0

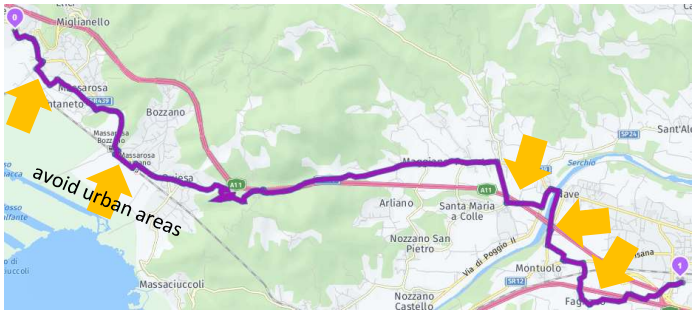


No toll, just fuel cost: Avoids motorway (high speed → high consumption €1.27)
- travelTime: 1123 sec
- distance: 16.9 km
- tollCost: 0
- energyCost: €1.12



Stay slow on the motorway, &maxSpeed=90: Still avoids motorway (consumption still €1.16)
- travelTime: 1123 sec
- distance: 16.9 km
- tollCost: 0
- energyCost: €1.12

Consider higher fuel usage in urban areas, ;builtupFactor=3: Still avoids motorway, routes mostly around the villages
- travelTime: 1147 sec
- distance: 16.8 km
- tollCost: 0
- energyCost: €1.13

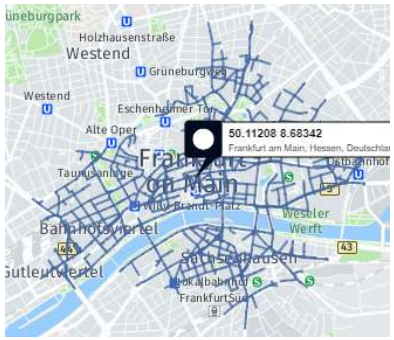


Only if time matters, like driver_cost=30, or urban fuel consumption is 10 times as high, then the motorway is used

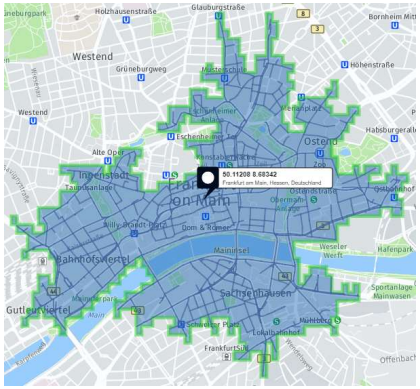
Cost Isoline

Time / Distance / Fuel / Cost

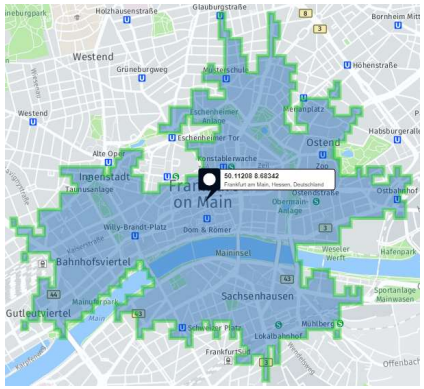
https://tcs.ext.here.com/examples/v3/calculate_isoline_links
Center: Start Frankfurt am Main
Range Type: Time 3 minutes
Display: Links



Display: Links + Outline Shape

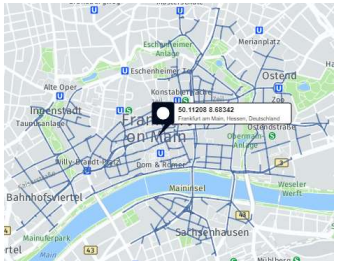


Display: Outline Shape

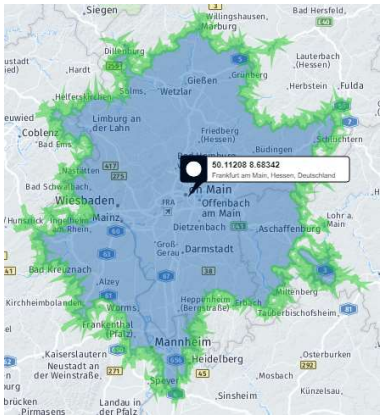


Range Type: Distance 5 km

Range Type: Consumption 0.1€
Consumption details:
speed,0,0.102,10,0.084,30,0.066,50,0.06,70,0.066,100,0.072,120,0.084,140,0.108;ascent,0.4;descent,0.1



Big ranges: 45 minutes

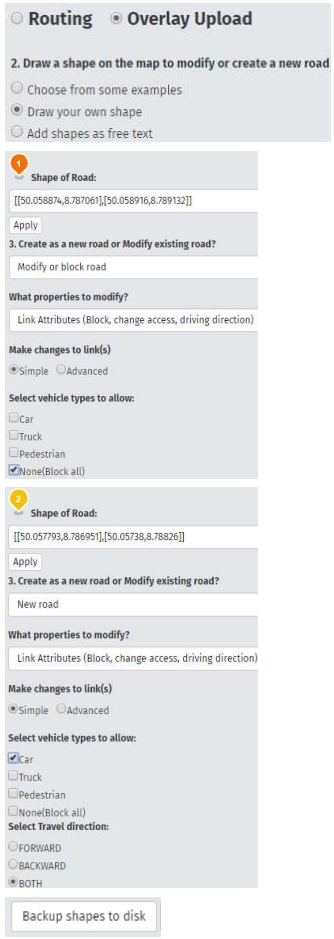


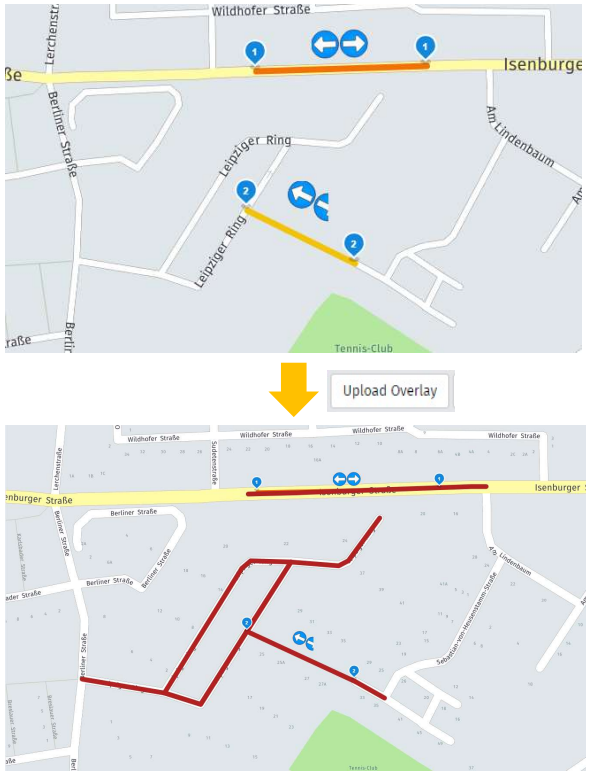
- Cost is any combination of time + distance + fuel + toll

Routing on custom blocked / added roads

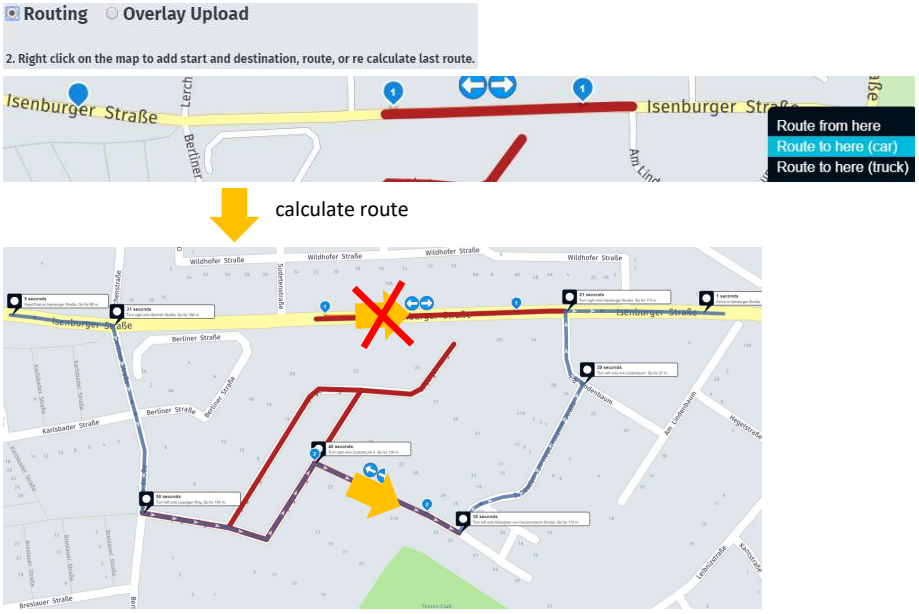
https://tcs.ext.here.com/examples/v3/cre_submit_overlay

1. Where: Heusenstamm, Leipziger Ring





All red links are affected by the modifications. The new link connects in the middle of an existing link, so this existing link gets retired and 2 new links created, and the neighbors of the old link get reconnected to the new links.



Not using the blocked main street anymore, but using the new road.

Routing with private facilities

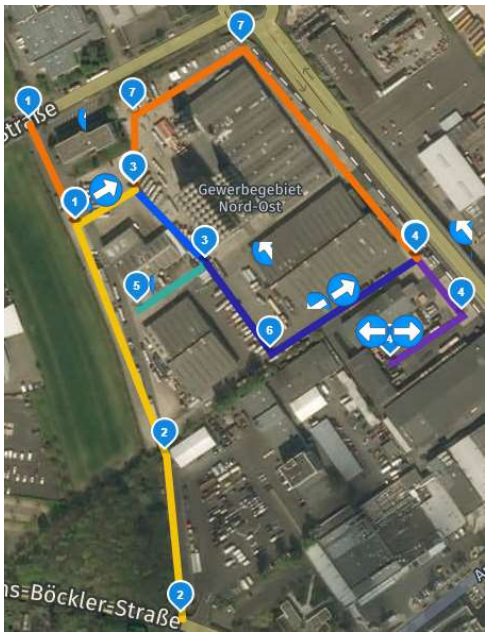
https://tcs.ext.here.com/examples/v3/cre_submit_overlay

1. Where: An der Hasenkaule, Koeln Huerth
2. Custom Map Name: OVERLAYHASENKAULE

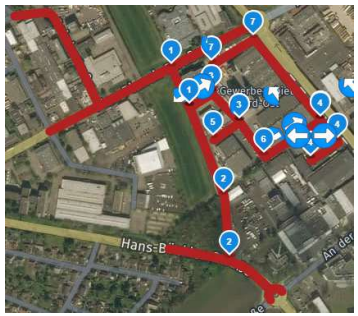
Routing Overlay Upload

2. Draw a shape on the map to modify or create a new road

Choose from some examples
Draw your own shape
Add shapes as free text



upload overlay




```
[{"op":"create","shape":[[50.88356,6.902928],[50.88292,6.90340]],
  "layer":"LINK_ATTRIBUTE_FCN","data":{"VEHICLE_TYPES":"33","TRAVEL_DIRECTION":"BOTH"}}
,{"op":"create","shape":[[50.88292,6.903399],[50.88145,6.90536],[50.880417,6.904466]],
  "layer":"LINK_ATTRIBUTE_FCN","data":{"VEHICLE_TYPES":"33","TRAVEL_DIRECTION":"BOTH"}}
,{"op":"create","shape":[[50.88267,6.904716],[50.88314,6.90399]],
  "layer":"","data":{"VEHICLE_TYPES":"33","TRAVEL_DIRECTION":"BOTH"}}
,{"op":"create","shape":[[50.88270,6.906834],[50.88234,6.90729],[50.882047,6.906577],[50.882047,6.906577]],
  "layer":"","data":{"VEHICLE_TYPES":"33","TRAVEL_DIRECTION":"BOTH"}}
,{"op":"create","shape":[[50.88267,6.904713],[50.88238,6.90402]],
  "layer":"","data":{"VEHICLE_TYPES":"33","TRAVEL_DIRECTION":"BOTH"}}
,{"op":"create","shape":[[50.88268,6.904709],[50.88210,6.90536],[50.88271,6.906831]],
  "layer":"","data":{"VEHICLE_TYPES":"33","TRAVEL_DIRECTION":"BOTH"}}
,{"op":"create","shape":[[50.88271,6.906831],[50.88404,6.90508],[50.883621,6.903981],[50.883149,6.903988]],
  "layer":"","data":{"VEHICLE_TYPES":"33","TRAVEL_DIRECTION":"BOTH"}}
,{"op":"create","shape":[[50.88292,6.903397],[50.88314,6.90398]],
  "layer":"","data":{"VEHICLE_TYPES":"33","TRAVEL_DIRECTION":"BOTH"}}]
```


Backup shapes to disk Restore shapes from disk

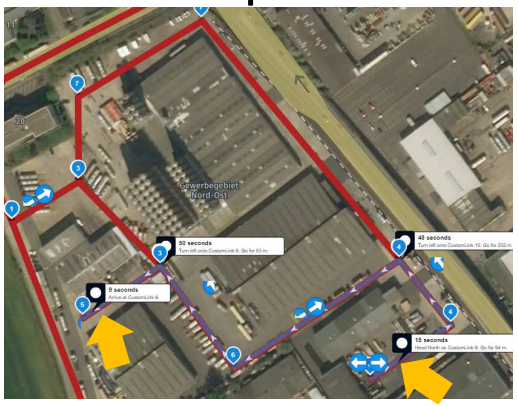
Routing Overlay Upload

2. Right click on the map to add start and destination, route, or re calculate last route.

- Route into private facility

- Route out of private facility

- Route within private facility



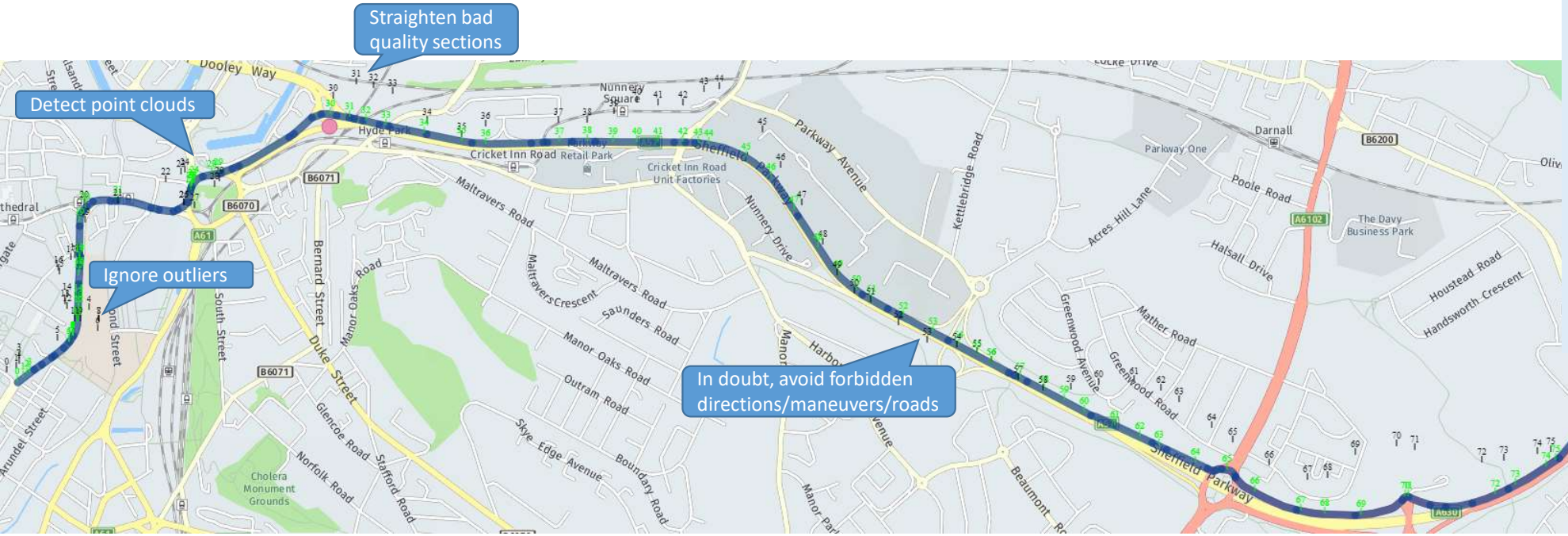
Route Matching

https://tcs.ext.here.com/examples/v3/rme_basic
Submit to
http://cle.cit.api.here.com/2/calculateroute.json?routematch=1&mode=fastest;car;traffic:disabled

Input trace:

```
LATITUDE,LONGITUDE
53.37852,-1.46932
53.37862,-1.46892
53.37876,-1.46878
53.37892,-1.46878
53.38020,-1.46563
53.37937,-1.46704
53.37962,-1.46527
53.37988,-1.46520
53.37988,-1.46520
53.37988,-1.46603
53.37989,-1.46614
53.37987,-1.46629
53.38021,-1.46661
53.38033,-1.46670
53.38051,-1.46661
53.38113,-1.46698
53.38123,-1.46703
53.38153,-1.46647
53.38158,-1.46630
53.38251,-1.46581
53.38298,-1.46587
53.38304,-1.46436
53.38359,-1.46221
53.38379,-1.46152
53.38384,-1.46135
53.38298,-1.46140
53.38298,-1.46140
53.38291,-1.46093
53.38346,-1.46002
53.38362,-1.45980
53.38581,-1.45471
53.38621,-1.45366
53.38611,-1.45290
53.38594,-1.45205
53.38519,-1.45050
53.38479,-1.44893
53.38508,-1.44786
53.38517,-1.44460
53.38518,-1.44334
53.38540,-1.44213
53.38572,-1.44107
53.38565,-1.44015
53.38563,-1.43904
53.38599,-1.43809
53.38607,-1.43742
53.38492,-1.43547
53.38398,-1.43465
53.38297,-1.43373
53.38192,-1.43278
53.38112,-1.43212
53.38063,-1.43137
53.38040,-1.43064
53.37977,-1.42937
53.37932,-1.42809
53.37919,-1.42674
53.37901,-1.42584
53.37878,-1.42521
53.37832,-1.42400
53.37804,-1.42288
53.37807,-1.42167
53.37820,-1.42039
53.37826,-1.41880
53.37804,-1.41760
53.37772,-1.41678
53.37703,-1.41533
53.37666,-1.41438
53.37605,-1.41275
53.37570,-1.41106
53.37632,-1.41016
53.37655,-1.40889
53.37645,-1.40705
53.37613,-1.40625
53.37618,-1.40322
53.37636,-1.40227
53.37640,-1.40076
53.37743,-1.40016
53.37824,-1.39865
53.38100,-1.39787
53.38058,-1.39660
53.37869,-1.39631
53.37875,-1.39603
53.37817,-1.39554
53.37706,-1.39563
53.37706,-1.39549
```

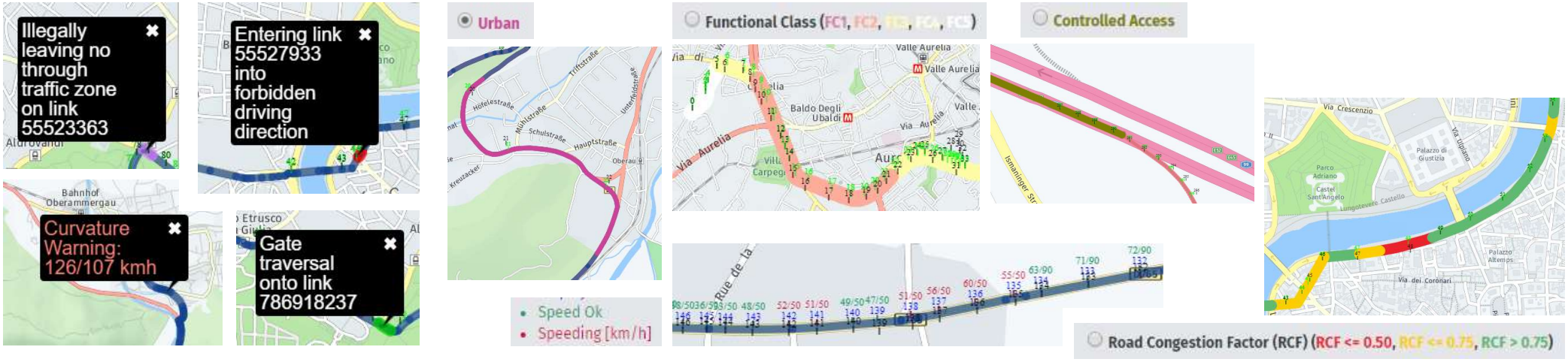
- 10 points per second … 1 point per minute, gaps…
- Traces with 100,000s of points, up to several 100 miles
- Mandatory: coordinates Optional: heading, time, speed
- Returns full route without gaps (some links may have low confidence)



Route Matching for Driver Analysis

- Speeding, Cornering
- Illegal maneuvers, illegal driving direction, illegal roads
  - Vehicle type, weight, height … specific violations, if vehicle defined
- Ignored stop signs
- Percentage in city, on motorways, rural roads
- Match confidence per point & per link → which points links to ignore
- Map attributes from PDE or directly by &attributes= … map layers …

https://tcs.ext.here.com/examples/v3/rme_basic
Submit to
http://cle.cit.api.here.com/2/calculateroute.json?routematch=1&mode=fastest;car;traffic:disabled



Route Matching with private facilities

https://tcs.ext.here.com/examples/v3/cre_submit_overlay

1. Where: An der Hasenkaule, Koeln Huerth
2. Custom Map Name: OVERLAYHASENKAULE

https://tcs.ext.here.com/examples/v3/rme_basic

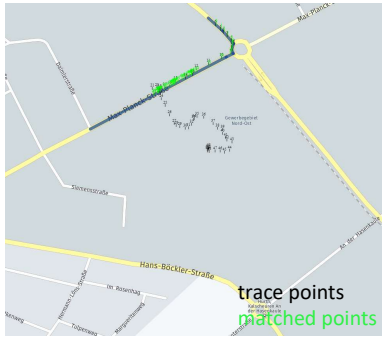
Submit to

http://cle.cit.api.here.com/2/calculateroute.json?routeMatch=1&mode=fastest;car;traffic:disabled&overlays=OVERLAYHASENKAULE

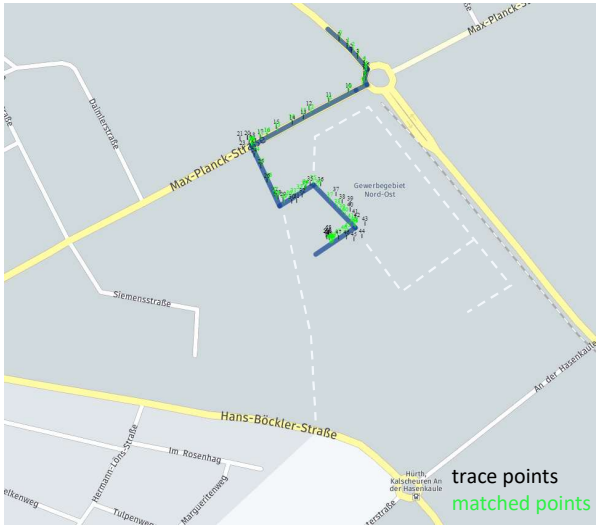
Input trace:

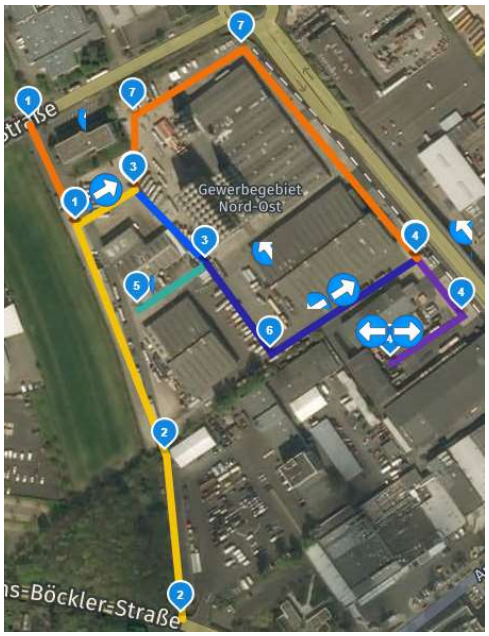
```
SEQNR, LATITUDE, LONGITUDE
0, 50.88472, 6.90444
0, 50.88464, 6.90458
0, 50.88459, 6.90465
0, 50.88453, 6.90476
0, 50.88446, 6.90488
0, 50.88441, 6.90487
0, 50.88439, 6.90494
0, 50.88435, 6.90487
0, 50.88429, 6.90490
0, 50.88423, 6.90486
0, 50.88416, 6.90460
0, 50.88406, 6.90425
0, 50.88396, 6.90391
0, 50.88387, 6.90382
0, 50.88381, 6.90362
0, 50.88376, 6.90334
0, 50.88367, 6.90318
0, 50.88365, 6.90306
0, 50.88362, 6.90292
0, 50.88359, 6.90287
0, 50.88364, 6.90284
0, 50.88363, 6.90271
0, 50.88354, 6.90294
0, 50.88353, 6.90275
0, 50.88345, 6.90296
0, 50.88333, 6.90307
0, 50.88317, 6.90318
0, 50.88302, 6.90331
0, 50.88299, 6.90337
0, 50.88297, 6.90346
0, 50.88294, 6.90361
0, 50.88295, 6.90370
0, 50.88301, 6.90379
0, 50.88309, 6.90384
0, 50.88310, 6.90386
0, 50.88314, 6.90393
0, 50.88313, 6.90412
0, 50.88302, 6.90438
0, 50.88294, 6.90449
0, 50.88292, 6.90463
0, 50.88285, 6.90463
0, 50.88278, 6.90472
0, 50.88274, 6.90475
0, 50.88270, 6.90489
0, 50.88256, 6.90483
0, 50.88253, 6.90469
0, 50.88255, 6.90457
0, 50.88255, 6.90443
0, 50.88254, 6.90427
0, 50.88255, 6.90422
0, 50.88257, 6.90421
0, 50.88259, 6.90424
0, 50.88257, 6.90426
0, 50.88260, 6.90426
```

match trace without overlay

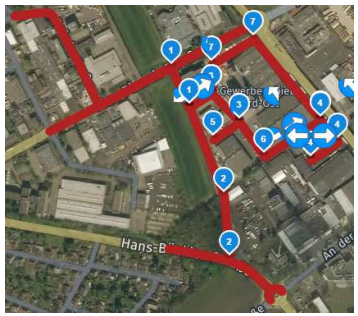


match trace with overlay





upload overlay



match trace

Routing & Route Match + attributes in response

- Add map attributes to the response route
- From PDE link layers: speed limits, slopes, curvatures, road type, lanes…

http://cre.cit.api.here.com/2/**calculateroute.json**?waypoint0=50.041836,8.160661&waypoint1=50.029770,8.184672&mode=fastest;car;traffic:disabled&driver_cost=30
&attributes=SPEED_LIMITS_FCn(FROM_REF_SPEED_LIMIT,TO_REF_SPEED_LIMIT),ADAS_ATTRIB_FCn(slopes,curvatures),TRAFFIC_SIGN_FCn(*)

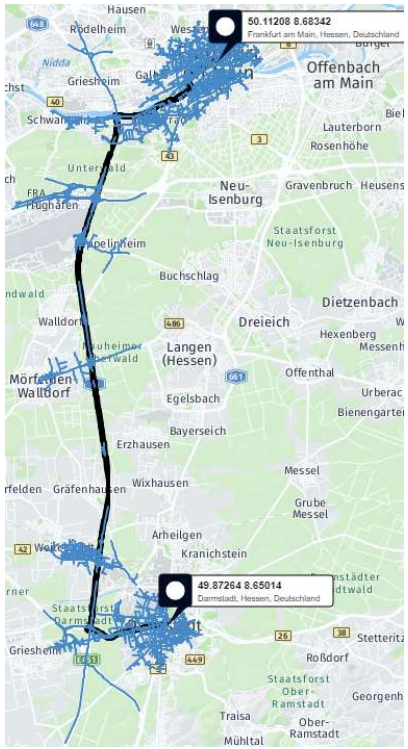
{ **linkId**: "52364524", **remainTime**: 741, **remainDistance**: 9572,
shape: [50.04504, 8.19042, 50.04524, 8.19174] , **functionalClass**: 3,
attributes: {
ADAS_ATTRIB_FCN: [{ **SLOPES**: "[-1018, 353]", **CURVATURES**: "[]“ }],
SPEED_LIMITS_FCN: [{ **FROM_REF_SPEED_LIMIT**: "50", **TO_REF_SPEED_LIMIT**: "50“ }],
TRAFFIC_SIGN_FCN: [{ **CONDITION_TYPE**: "16", **VEHICLE_TYPES**: "1023", **TRAFFIC_SIGN_TYPE**: "0“, …}]
} }

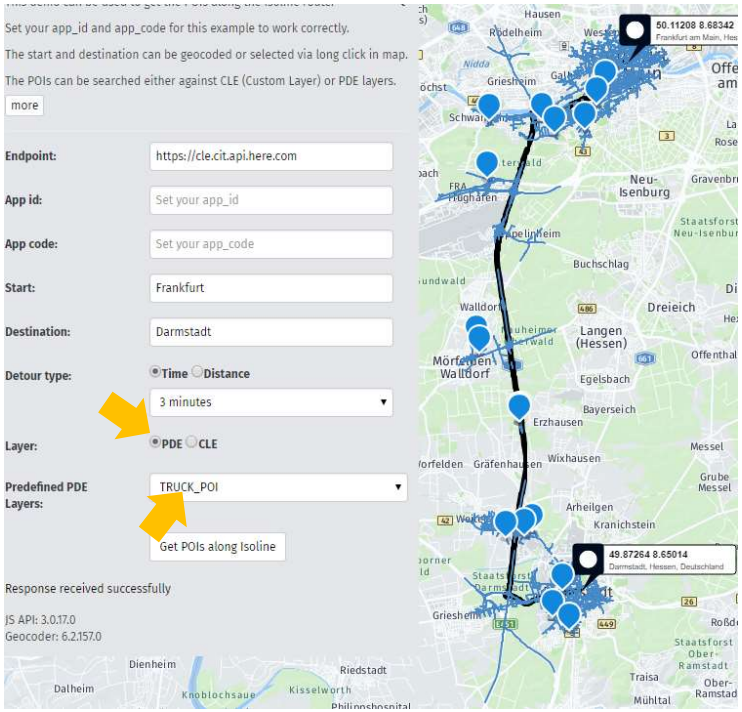
http://cre.cit.api.here.com/2/**calculateroute.json**?routeMatch=1&waypoint0=50.041836,8.160661&waypoint1=50.029770,8.184672&mode=fastest;car;traffic:disabled
&attributes=SPEED_LIMITS_FCn(FROM_REF_SPEED_LIMIT,TO_REF_SPEED_LIMIT),ADAS_ATTRIB_FCn(slopes,curvatures),TRAFFIC_SIGN_FCn(*)

{ **linkId**: "1168057530 “, **remainTime**: 861, **remainDistance**: 11297, **confidence**: 1, **linkLength**: 133.77,
shape: [50.04401, 8.15329, … 50.04444, 8.15208] ", **functionalClass** ”: 3,
attributes: {
ADAS_ATTRIB_FCN: [{ **SLOPES**: "[2880, -410, …]", **CURVATURES**: "[-4158, -4686, …]“ }],
SPEED_LIMITS_FCN: [{ **FROM_REF_SPEED_LIMIT**: "100", **TO_REF_SPEED_LIMIT**: "100“ }],
TRAFFIC_SIGN_FCN: [{ **CONDITION_TYPE**: "17", **VEHICLE_TYPES**: "1023", **TRAFFIC_SIGN_TYPE**: "20", …}]
} }

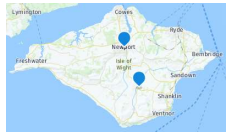
Isoline along route, POIs along route isoline

https://tcs.ext.here.com/examples/v3/calculate_route_isoline



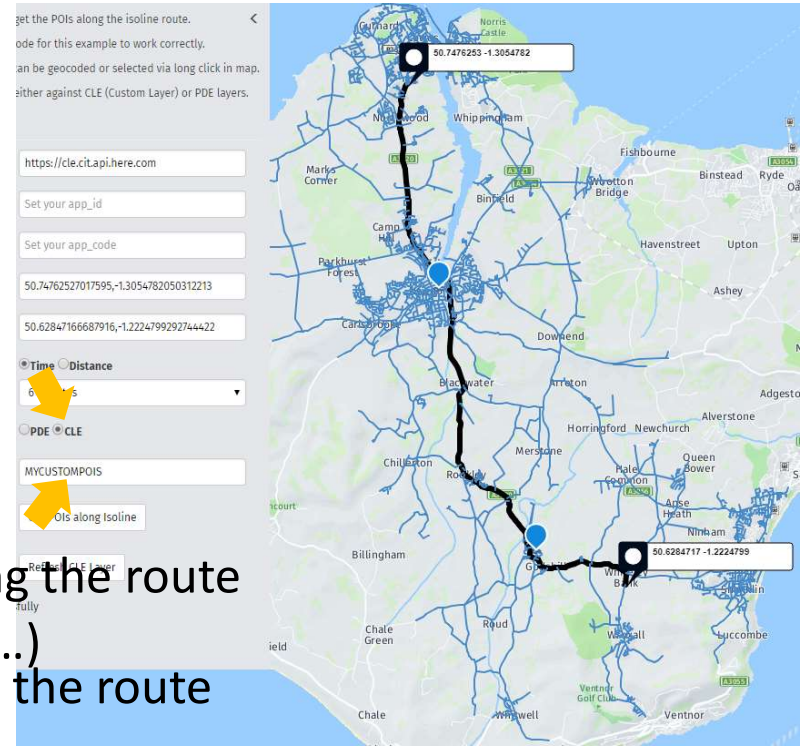


https://tcs.ext.here.com/examples/v3/calculate_poi_along_isoline_route



Create a custom layer:

http://cle.cit.api.here.com/2/layers/upload.json?&layer_id=MYCUSTOMPOIS&file=POI_ID%09LINK_ID%09NAME%09WKT%0d%0a15%0925905766%09FirstPoint%09POINT(-1.29228%2050.69888)%0d%0a16%0925907696%09SecondPoint%09POINT(-1.25548%2050.63631)



- All links reachable within N minutes (or N kilometers) along the route
- All POIs (city center, fuel stations, truck stops, restaurants…) reachable within N minutes (or N kilometer) along the route
- Map POIs (PDE) or custom POIs (CLE)