

# Package ‘osrm’

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**Type** Package

**Title** Interface Between R and the OpenStreetMap-Based Routing Service  
OSRM

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**Date** 2017-11-13

**Description** An interface between R and the OSRM API. OSRM is a routing service based on OpenStreetMap data. See <http://project-osrm.org/> for more information. This package allows to compute distances (travel time and kilometric distance) between points and travel time matrices.

**License** GPL-3

**LazyData** TRUE

**Imports** jsonlite, RCurl, utils, stats, rgeos, methods, gepaf, raster

**Depends** R (>= 2.10), sp

**Suggests** cartography (>= 2.0.1)

**URL** <https://github.com/rCarto/osrm>

**BugReports** <https://github.com/rCarto/osrm/issues>

**Encoding** UTF-8

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**NeedsCompilation** no

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**R topics documented:**

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apotheker.df	<i>Coordinates of 100 Random Pharmacies in Berlin</i>
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**Description**

A data.frame of coordinates of 100 random pharmacies in Berlin. The projection is WGS 84.

**Source**

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apotheker.sp	<i>SpatialPointsDataFrame of 100 Random Pharmacies in Berlin</i>
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**Description**

100 random pharmacies in Berlin. The projection is WGS 84 / UTM zone 34N.

**Source**

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com	<i>Communes Coordinates</i>
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## Description

Coordinates of a set of communes in France. Coordinates are in WGS84.

## Source

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## Examples

```
## Not run:
# Load data
data("com")

### osrmTable ###
# Inputs are data frames
# Travel time matrix
distCom <- osrmTable(loc = com[1:50, c("comm_id", "lon", "lat")])
# First 5 rows and columns
distCom$durations[1:5,1:5]

# Travel time matrix with different sets of origins and destinations
distCom2 <- osrmTable(src = com[1:10, c("comm_id", "lon", "lat")],
                      dst = com[11:20, c("comm_id", "lon", "lat")])
# First 5 rows and columns
distCom2$durations[1:5,1:5]

# Inputs are SpatialPointsDataFrames
distCom <- osrmTable(loc = src)
# First 5 rows and columns
distCom$durations[1:5,1:5]

# Travel time matrix with different sets of origins and destinations
distCom2 <- osrmTable(src = src, dst = dst)
# First 5 rows and columns
distCom2$durations[1:5,1:5]

### osrmRoute ###
# Travel path between points
route <- osrmRoute(src = com[1, c("comm_id", "lon", "lat")],
                  dst = com[15, c("comm_id", "lon", "lat")])
# Display the path
plot(com[c(1,15),3:4], asp = 1, col = "red", pch = 20, cex = 1.5)
points(route[,1:2], type = "l", lty = 2)
text(com[c(1,15),3:4], labels = com[c(1,15),2], pos = 2)
```

```

# Travel path between points - output a SpatialLinesDataFrame
route2 <- osrmRoute(src=c("Bethune", 2.64781, 50.5199),
                    dst = c("Renescure", 2.369521, 50.72761),
                    sp = TRUE, overview = "full")

# Display the path
plot(com[c(1,4),3:4], asp =1, col = "red", pch = 20, cex = 1.5)
plot(route2, lty = 1,lwd = 4, add = TRUE)
plot(route2, lty = 1, lwd = 1, col = "white", add=TRUE)
text(com[c(1,4),3:4], labels = com[c(1,4),2], pos = 2)

# Input is SpatialPointsDataFrames
route3 <- osrmRoute(src = src[1,], dst = dst[1,], sp = TRUE)
route3@data

### osrmTrip ###
# Get a trip with a id lat lon data.frame
trips <- osrmTrip(loc = com[1:9, c(1,3,4)])

# Display the trip
plot(trips[[1]]$trip , col = 1:5)
points(com[1:10, 3:4], pch = 20, col = "red", cex = 0.5)

# Map
if(require("cartography")){
  osm <- getTiles(x = trips[[1]]$trip, crop = TRUE, type = "osmgrayscale")
  tilesLayer(x = osm)
  plot(trips[[1]]$trip, col = 1:5, add = TRUE)
  points(com[1:9, 3:4], pch = 20, col = "red", cex = 2)
}

# Get a trip with a SpatialPointsDataFrame
trips <- osrmTrip(loc = src)

# Map
if(require("cartography")){
  osm <- getTiles(x = trips[[1]]$trip, crop = TRUE, type = "osmgrayscale")
  tilesLayer(x = osm)
  plot(src, pch = 20, col = "red", cex = 2, add = TRUE)
  plot(trips[[1]]$trip, col = 1:5, add = TRUE, lwd=2)
}

### osrmIsochrone
# Get isochones with lon/lat coordinates, default breaks
iso <- osrmIsochrone(loc = c(6.026875, 48.93447))
plot(iso, col = paste0(rep("grey", nrow(iso)), c(seq(80,20,length.out = nrow(iso))))))

# Map
if(require("cartography")){
  osm <- getTiles(x = iso, crop = TRUE, type = "osmgrayscale")

```

```

tilesLayer(x = osm)
breaks <- sort(c(unique(iso$min), max(iso$max)))
cartography::choroLayer(spdf = iso,
                        var = "center", breaks = breaks,
                        border = NA,
                        legend.pos = "topleft", legend.frame = TRUE,
                        legend.title.txt = "Isochrones\n(min)",
                        add = TRUE)
}

# Get isochones with a SpatialPointsDataFrame, custom breaks
iso2 <- osrmIsochrone(loc = src[1,], breaks = seq(from = 0, to = 40, by = 5))

# Map
if(require("cartography")){
  osm2 <- getTiles(x = iso2, crop = TRUE, type = "osmgrayscale")
  tilesLayer(x = osm2)
  breaks2 <- sort(c(unique(iso2$min), max(iso2$max)))
  cartography::choroLayer(spdf = iso2,
                          var = "center", breaks = breaks2,
                          border = NA,
                          legend.pos = "topleft", legend.frame = TRUE,
                          legend.title.txt = "Isochrones\n(min)",
                          add = TRUE)
}

## End(Not run)

```

---

dst

*SpatialPointsDataFrame of 10 Communes in France*


---

## Description

10 communes in France. The projection is RGF93 / Lambert-93.

## Source

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## Examples

```

## Not run:
# Load data
data("com")

### osrmTable ###
# Inputs are data frames
# Travel time matrix
distCom <- osrmTable(loc = com[1:50, c("comm_id", "lon", "lat")])

```

```

# First 5 rows and columns
distCom$durations[1:5,1:5]

# Travel time matrix with different sets of origins and destinations
distCom2 <- osrmTable(src = com[1:10,c("comm_id","lon","lat")],
                     dst = com[11:20,c("comm_id","lon","lat")])
# First 5 rows and columns
distCom2$durations[1:5,1:5]

# Inputs are SpatialPointsDataFrames
distCom <- osrmTable(loc = src)
# First 5 rows and columns
distCom$durations[1:5,1:5]

# Travel time matrix with different sets of origins and destinations
distCom2 <- osrmTable(src = src, dst = dst)
# First 5 rows and columns
distCom2$durations[1:5,1:5]

### osrmRoute ###
# Travel path between points
route <- osrmRoute(src = com[1, c("comm_id", "lon","lat")],
                  dst = com[15, c("comm_id", "lon","lat")])
# Display the path
plot(com[c(1,15),3:4], asp =1, col = "red", pch = 20, cex = 1.5)
points(route[,1:2], type = "l", lty = 2)
text(com[c(1,15),3:4], labels = com[c(1,15),2], pos = 2)

# Travel path between points - output a SpatialLinesDataFrame
route2 <- osrmRoute(src=c("Bethune", 2.64781, 50.5199),
                   dst = c("Renescure", 2.369521, 50.72761),
                   sp = TRUE, overview = "full")

# Display the path
plot(com[c(1,4),3:4], asp =1, col = "red", pch = 20, cex = 1.5)
plot(route2, lty = 1,lwd = 4, add = TRUE)
plot(route2, lty = 1, lwd = 1, col = "white", add=TRUE)
text(com[c(1,4),3:4], labels = com[c(1,4),2], pos = 2)

# Input is SpatialPointsDataFrames
route3 <- osrmRoute(src = src[1,], dst = dst[1,], sp = TRUE)
route3@data

### osrmTrip ###
# Get a trip with a id lat lon data.frame
trips <- osrmTrip(loc = com[1:9, c(1,3,4)])

# Display the trip
plot(trips[[1]]$trip , col = 1:5)
points(com[1:10, 3:4], pch = 20, col = "red", cex = 0.5)

```

```

# Map
if(require("cartography")){
  osm <- getTiles(x = trips[[1]]$trip, crop = TRUE, type = "osmgrayscale")
  tilesLayer(x = osm)
  plot(trips[[1]]$trip, col = 1:5, add = TRUE)
  points(com[1:9, 3:4], pch = 20, col = "red", cex = 2)
}

# Get a trip with a SpatialPointsDataFrame
trips <- osrmTrip(loc = src)

# Map
if(require("cartography")){
  osm <- getTiles(x = trips[[1]]$trip, crop = TRUE, type = "osmgrayscale")
  tilesLayer(x = osm)
  plot(src, pch = 20, col = "red", cex = 2, add = TRUE)
  plot(trips[[1]]$trip, col = 1:5, add = TRUE, lwd=2)
}

### osrmIsochrone
# Get isochones with lon/lat coordinates, default breaks
iso <- osrmIsochrone(loc = c(6.026875, 48.93447))
plot(iso, col = paste0(rep("grey", nrow(iso)), c(seq(80,20,length.out = nrow(iso))))))

# Map
if(require("cartography")){
  osm <- getTiles(x = iso, crop = TRUE, type = "osmgrayscale")
  tilesLayer(x = osm)
  breaks <- sort(c(unique(iso$min), max(iso$max)))
  cartography::choroLayer(spdf = iso,
                          var = "center", breaks = breaks,
                          border = NA,
                          legend.pos = "topleft", legend.frame = TRUE,
                          legend.title.txt = "Isochrones\n(min)",
                          add = TRUE)
}

# Get isochones with a SpatialPointsDataFrame, custom breaks
iso2 <- osrmIsochrone(loc = src[1,], breaks = seq(from = 0, to = 40, by = 5))

# Map
if(require("cartography")){
  osm2 <- getTiles(x = iso2, crop = TRUE, type = "osmgrayscale")
  tilesLayer(x = osm2)
  breaks2 <- sort(c(unique(iso2$min), max(iso2$max)))
  cartography::choroLayer(spdf = iso2,
                          var = "center", breaks = breaks2,
                          border = NA,
                          legend.pos = "topleft", legend.frame = TRUE,
                          legend.title.txt = "Isochrones\n(min)",
                          add = TRUE)
}

```

```
}
## End(Not run)
```

---

osrm	<i>Shortest Paths and Travel Time from OpenStreetMap via an OSRM API</i>
------	--

---

### Description

An interface between R and the OSRM API.

OSRM is a routing service based on OpenStreetMap data. See <http://project-osrm.org/> for more information. This package allows to compute distances (travel time and kilometric distance) between points and travel time matrices.

- `osrmTable` Get travel time matrices between points.
- `osrmRoute` Get the shortest path between two points.
- `osrmTrip` Get the travel geometry between multiple unordered points.
- `osrmIsochrone` Get a `SpatialPolygonsDataFrame` of isochrones.

### Note

This package relies on the usage of a running OSRM service (tested with version 5.12.0 of the OSRM API).

To change the OSRM server, change the `osrm.server` option:

```
options(osrm.server = "http://address.of.the.server/").
```

To change the profile (driving is set by default), use the `osrm.profile` option:

```
options(osrm.profile = "name.of.the.profile")
```

---

osrmIsochrone	<i>Get a SpatialPolygonsDataFrame of Isochrones</i>
---------------	---

---

### Description

Based on `osrmTable`, this function builds a `SpatialPolygonsDataFrame` of isochrones.

### Usage

```
osrmIsochrone(loc, breaks = seq(from = 0, to = 60, length.out = 7),
  res = 30)
```



**Arguments**

loc	a numeric vector of longitude and latitude (WGS84) or a SpatialPointsDataFrame or a SpatialPolygonsDataFrame of the origine point.
breaks	a numeric vector of isochrone values (in minutes).
res	number of points used to compute isochrones, one side of the square grid, the total number of points will be res*res.

**Value**

A SpatialPolygonsDateFrame of isochrones is returned. The data frame of the output contains four fields: id (id of each polygon), min and max (minimum and maximum breaks of the polygon), center (central values of classes).

**See Also**

[osrmTable](#)

**Examples**

```
## Not run:
# Load data
data("berlin")

# Get isochones with lon/lat coordinates, default breaks
iso <- osrmIsochrone(loc = c(13.43853,52.47728), breaks = seq(0,15,1), res = 70)
plot(iso, col = colorRampPalette(colors = c('grey80', 'grey20'))(14))

# Map
if(require("cartography")){
  osm <- getTiles(x = iso, crop = TRUE, type = "osmgrayscale")
  tilesLayer(x = osm)
  breaks <- sort(c(unique(iso$min), max(iso$max)))
  cartography::choroLayer(spdf = iso,
                          var = "center", breaks = breaks,
                          col = paste0(rev(carto.pal("green.pal",
                                                  length(breaks)+1)),99),
                          border = NA,
                          legend.pos = "topleft", legend.frame = TRUE,
                          legend.title.txt = "Isochrones\n(min)",
                          add = TRUE)
}

# Get isochones with a SpatialPointsDataFrame, custom breaks
iso2 <- osrmIsochrone(loc = apotheke.sp[10,],
                      breaks = seq(from = 0, to = 16, by = 2))

# Map
if(require("cartography")){
  osm2 <- getTiles(x = iso2, crop = FALSE, type = "osmgrayscale")
  tilesLayer(x = osm2)
```

```

breaks2 <- sort(c(unique(iso2$min), max(iso2$max)))
cartography::choroLayer(spdf = iso2,
  var = "center", breaks = breaks2,
  border = NA,
  legend.pos = "topleft", legend.frame = TRUE,
  legend.title.txt = "Isochrones\n(min)",
  add = TRUE)
}

## End(Not run)

```

---

osrmRoute

*Get the Shortest Path Between Two Points*


---

## Description

Build and send an OSRM API query to get the travel geometry between two points. This function interfaces the *route* OSRM service.

## Usage

```
osrmRoute(src, dst, overview = "simplified", sp = FALSE)
```

## Arguments

src	a numeric vector of identifier, longitude and latitude (WGS84), a SpatialPoints-DataFrame or a SpatialPolygonsDataFrame of the origine point.
dst	a numeric vector of identifier, longitude and latitude (WGS84), a SpatialPoints-DataFrame or a SpatialPolygonsDataFrame of the destination point.
overview	"full", "simplified" or FALSE. Add geometry either full (detailed), simplified according to highest zoom level it could be display on, or not at all.
sp	if sp is TRUE the function returns a SpatialLinesDataFrame.

## Value

If sp is FALSE, a data frame is returned. It contains the longitudes and latitudes of the travel path between the two points.

If sp is TRUE a SpatialLinesDataFrame is returned. It contains 4 fields : identifiers of origine and destination, travel time in minutes and travel distance in kilometers.

If overview is FALSE, a named numeric vector is returned. It contains travel time (in minutes) and travel distance (in kilometers).

**Examples**

```
## Not run:
# Load data
data("berlin")

# Travel path between points
route <- osrmRoute(src = apotheker.df[1, c("id", "lon", "lat")],
                  dst = apotheker.df[15, c("id", "lon", "lat")])
# Display the path
plot(route[,1:2], type = "l", lty = 2, asp = 1)
points(apoltheke.df[c(1,15),2:3], col = "red", pch = 20, cex = 1.5)
text(apoltheke.df[c(1,15),2:3], labels = c("A", "B"), pos = 1)

# Travel path between points - output a SpatialLinesDataFrame
route2 <- osrmRoute(src = c("A", 13.23889, 52.54250),
                  dst = c("B", 13.45363, 52.42926),
                  sp = TRUE, overview = "full")

# Display the path
plot(route2, lty = 1, lwd = 4, asp = 1)
plot(route2, lty = 1, lwd = 1, col = "white", add=TRUE)
points(x = c(13.23889, 13.45363), y = c(52.54250, 52.42926),
       col = "red", pch = 20, cex = 1.5)
text(x = c(13.23889, 13.45363), y = c(52.54250, 52.42926),
     labels = c("A", "B"), pos = 2)

# Input is SpatialPointsDataFrames
route3 <- osrmRoute(src = apotheker.sp[1,], dst = apotheker.sp[2,], sp = TRUE)
route3@data

## End(Not run)
```

---

osrmTable

*Get Travel Time Matrices Between Points*


---

**Description**

Build and send OSRM API queries to get travel time matrices between points. This function interfaces the *table* OSRM service.

**Usage**

```
osrmTable(loc, src = NULL, dst = NULL, gepaf = FALSE)
```

**Arguments**

**loc** a data frame containing 3 fields: points identifiers, longitudes and latitudes (WGS84). It can also be a `SpatialPointsDataFrame` or a `SpatialPolygonsDataFrame`, then row names are used as identifiers. If `loc` parameter is used, all pair-wise distances are computed.

src	a data frame containing origin points identifiers, longitudes and latitudes (WGS84). It can also be a SpatialPointsDataFrame or a SpatialPolygonsDataFrame, then row names are used as identifiers. If dst and src parameters are used, only pairs between scr/dst are computed.
dst	a data frame containing destination points identifiers, longitudes and latitudes (WGS84). It can also be a SpatialPointsDataFrame or a SpatialPolygonsDataFrame, then row names are used as identifiers.
gepaf	a boolean indicating if coordinates are sent encoded with the google encoded algorithm format (TRUE) or not (FALSE). Must be FALSE if using the public OSRM API.

### Details

If loc, src or dst are data frames we assume that the 3 first columns of the data.frame are: identifiers, longitudes and latitudes.

### Value

A list containing 3 data frames is returned. durations is the matrix of travel times (in minutes), sources and destinations are the coordinates of the origin and destination points actually used to compute the travel times (WGS84).

### Note

If you want to get a large number of distances make sure to set the "max-table-size" argument (Max. locations supported in table) of the OSRM server accordingly.

### See Also

[osrmIsochrone](#)

### Examples

```
## Not run:
# Load data
data("berlin")

# Inputs are data frames
# Travel time matrix
distA <- osrmTable(loc = apotheker.df[1:50, c("id", "lon", "lat")])
# First 5 rows and columns
distA$durations[1:5, 1:5]

# Travel time matrix with different sets of origins and destinations
distA2 <- osrmTable(src = apotheker.df[1:10, c("id", "lon", "lat")],
                   dst = apotheker.df[11:20, c("id", "lon", "lat")])
# First 5 rows and columns
distA2$durations[1:5, 1:5]

# Inputs are SpatialPointsDataFrames
```

```

distA3 <- osrmTable(loc = apotheker.sp[1:10,])
# First 5 rows and columns
distA3$durations[1:5,1:5]

# Travel time matrix with different sets of origins and destinations
distA4 <- osrmTable(src = apotheker.sp[1:10,], dst = apotheker.sp[11:20,])
# First 5 rows and columns
distA4$durations[1:5,1:5]

## End(Not run)

```

---

osrmTrip

*Get the Travel Geometry Between Multiple Unordered Points*


---

### Description

Build and send an OSRM API query to get the shortest travel geometry between multiple points. This function interfaces the *trip* OSRM service.

### Usage

```
osrmTrip(loc, overview = "simplified")
```

### Arguments

<code>loc</code>	a <code>SpatialPointsDataFrame</code> of the waypoints, or a <code>data.frame</code> with points as rows and 3 columns: identifier, longitudes and latitudes (WGS84 decimal degrees).
<code>overview</code>	"full", "simplified". Add geometry either full (detailed) or simplified according to highest zoom level it could be display on.

### Details

As stated in the OSRM API, if input coordinates can not be joined by a single trip (e.g. the coordinates are on several disconnecte islands) multiple trips for each connected component are returned.

### Value

A list of connected components. Each component contains:

**trip** A `SpatialLinesDataFrame` (`loc`'s CRS if there is one, WGS84 else) containing a line for each step of the trip.

**summary** A list with 2 components: duration (in minutes) and distance (in kilometers).

### See Also

[osrmRoute](#)

**Examples**

```

## Not run:
# Load data
data("berlin")

# Get a trip with a id lat lon data.frame
trips <- osrmTrip(loc = apotheker.df)

# Display the trip
plot(trips[[1]]$trip, col = "black", lwd = 4)
plot(trips[[1]]$trip, col = c("red", "white"), lwd = 1, add=T)
points(apoltheke.df[, 2:3], pch = 21, bg = "red", cex = 1)

# Map
if(require("cartography")){
  osm <- getTiles(x = trips[[1]]$trip, crop = TRUE,
                 type = "cartolight", zoom = 11)
  tilesLayer(x = osm)
  plot(trips[[1]]$trip, col = "black", lwd = 4, add=T)
  plot(trips[[1]]$trip, col = c("red", "white"), lwd = 1, add=T)
  points(apoltheke.df[, 2:3], pch = 21, bg = "red", cex = 1)
}

# Get a trip with a SpatialPointsDataFrame
trips <- osrmTrip(loc = apotheker.sp[1:10,])

# Map
if(require("cartography")){
  osm <- getTiles(x = trips[[1]]$trip, crop = TRUE,
                 type = "cartolight", zoom = 11)
  tilesLayer(x = osm)
  plot(trips[[1]]$trip, col = "black", lwd = 4, add=T)
  plot(trips[[1]]$trip, col = c("red", "white"), lwd = 1, add=T)
  plot(apoltheke.sp[1:10,], pch = 21, bg = "red", cex = 1, add=T)
}

## End(Not run)

```

---

src

*SpatialPointsDataFrame of 10 Communes in France*


---

**Description**

8 communes in France. The projection is RGF93 / Lambert-93.

**Source**

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## Examples

```

## Not run:
# Load data
data("com")

### osrmTable ###
# Inputs are data frames
# Travel time matrix
distCom <- osrmTable(loc = com[1:50, c("comm_id", "lon", "lat")])
# First 5 rows and columns
distCom$durations[1:5,1:5]

# Travel time matrix with different sets of origins and destinations
distCom2 <- osrmTable(src = com[1:10, c("comm_id", "lon", "lat")],
                     dst = com[11:20, c("comm_id", "lon", "lat")])
# First 5 rows and columns
distCom2$durations[1:5,1:5]

# Inputs are SpatialPointsDataFrames
distCom <- osrmTable(loc = src)
# First 5 rows and columns
distCom$durations[1:5,1:5]

# Travel time matrix with different sets of origins and destinations
distCom2 <- osrmTable(src = src, dst = dst)
# First 5 rows and columns
distCom2$durations[1:5,1:5]

### osrmRoute ###
# Travel path between points
route <- osrmRoute(src = com[1, c("comm_id", "lon", "lat")],
                  dst = com[15, c("comm_id", "lon", "lat")])
# Display the path
plot(com[c(1,15),3:4], asp = 1, col = "red", pch = 20, cex = 1.5)
points(route[1:2], type = "l", lty = 2)
text(com[c(1,15),3:4], labels = com[c(1,15),2], pos = 2)

# Travel path between points - output a SpatialLinesDataFrame
route2 <- osrmRoute(src=c("Bethune", 2.64781, 50.5199),
                   dst = c("Renescure", 2.369521, 50.72761),
                   sp = TRUE, overview = "full")

# Display the path
plot(com[c(1,4),3:4], asp = 1, col = "red", pch = 20, cex = 1.5)
plot(route2, lty = 1, lwd = 4, add = TRUE)
plot(route2, lty = 1, lwd = 1, col = "white", add=TRUE)
text(com[c(1,4),3:4], labels = com[c(1,4),2], pos = 2)

# Input is SpatialPointsDataFrames
route3 <- osrmRoute(src = src[1,], dst = dst[1,], sp = TRUE)
route3@data

```

```

### osrmTrip ###
# Get a trip with a id lat lon data.frame
trips <- osrmTrip(loc = com[1:9, c(1,3,4)])

# Display the trip
plot(trips[[1]]$trip , col = 1:5)
points(com[1:10, 3:4], pch = 20, col = "red", cex = 0.5)

# Map
if(require("cartography")){
  osm <- getTiles(x = trips[[1]]$trip, crop = TRUE, type = "osmgrayscale")
  tilesLayer(x = osm)
  plot(trips[[1]]$trip, col = 1:5, add = TRUE)
  points(com[1:9, 3:4], pch = 20, col = "red", cex = 2)
}

# Get a trip with a SpatialPointsDataFrame
trips <- osrmTrip(loc = src)

# Map
if(require("cartography")){
  osm <- getTiles(x = trips[[1]]$trip, crop = TRUE, type = "osmgrayscale")
  tilesLayer(x = osm)
  plot(src, pch = 20, col = "red", cex = 2, add = TRUE)
  plot(trips[[1]]$trip, col = 1:5, add = TRUE, lwd=2)
}

### osrmIsochrone
# Get isochones with lon/lat coordinates, default breaks
iso <- osrmIsochrone(loc = c(6.026875, 48.93447))
plot(iso, col = paste0(rep("grey", nrow(iso)), c(seq(80,20,length.out = nrow(iso))))))

# Map
if(require("cartography")){
  osm <- getTiles(x = iso, crop = TRUE, type = "osmgrayscale")
  tilesLayer(x = osm)
  breaks <- sort(c(unique(iso$min), max(iso$max)))
  cartography::choroLayer(spdf = iso,
                          var = "center", breaks = breaks,
                          border = NA,
                          legend.pos = "topleft", legend.frame = TRUE,
                          legend.title.txt = "Isochrones\n(min)",
                          add = TRUE)
}

# Get isochones with a SpatialPointsDataFrame, custom breaks
iso2 <- osrmIsochrone(loc = src[1,], breaks = seq(from = 0, to = 40, by = 5))

# Map

```



```
if(require("cartography")){
  osm2 <- getTiles(x = iso2, crop = TRUE, type = "osmgrayscale")
  tilesLayer(x = osm2)
  breaks2 <- sort(c(unique(iso2$min), max(iso2$max)))
  cartography::choroLayer(spdf = iso2,
    var = "center", breaks = breaks2,
    border = NA,
    legend.pos = "topleft", legend.frame = TRUE,
    legend.title.txt = "Isochrones\n(min)",
    add = TRUE)
}

## End(Not run)
```

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