

# Package ‘pct’

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**Type** Package

**Title** Propensity to Cycle Tool

**Version** 0.2.5

**Description** Functions and example data to teach and increase the reproducibility of the methods and code underlying the Propensity to Cycle Tool (PCT), a research project and web application hosted at <<https://www.pct.bike/>>. For an academic paper on the methods, see Lovelace et al (2017) <[doi:10.5198/jtlu.2016.862](https://doi.org/10.5198/jtlu.2016.862)>.

**Depends** R (>= 3.5.0)

**License** GPL-3

**URL** <https://itsleeds.github.io/pct/>, <https://github.com/ITSLeeds/pct>

**BugReports** <https://github.com/ITSLeeds/pct/issues>

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---

desire\_lines\_leeds      *Cycle route desire lines for Leeds*

---

**Description**

Cycle route desire lines for Leeds

**Examples**

```
# see data-raw folder for generation code
desire_lines_leeds
```

---

get_centroids_ew	<i>Download MSOA centroids for England and Wales</i>
------------------	--

---

**Description**

Downloads and processes data on where people live in England and Wales. See [geoportal.statistics.gov.uk](http://geoportal.statistics.gov.uk).

**Usage**

```
get_centroids_ew()
```

**Examples**

```
pwc = get_centroids_ew()
plot(pwc[sample(nrow(pwc), 1000), ])
```

---

get_desire_lines	<i>Desire lines</i>
------------------	---------------------

---

**Description**

This function generates "desire lines" from census 2011 data. By default gets all desire lines from census in region, but can get the top n.

**Usage**

```
get_desire_lines(region = NULL, n = NULL, omit_intrazonal = FALSE)
```

**Arguments**

region	The PCT region or local authority to download data from (e.g. west-yorkshire or Leeds). See <code>View(pct_regions_lookup)</code> for a full list of possible region names.
n	top n number of destinations with most trips in the 2011 census within the region.
omit_intrazonal	should intrazonal OD pairs be omitted from result? FALSE by default.

**Examples**

```
desire_lines = get_desire_lines("wight")
plot(desire_lines)
intra_zonal = desire_lines$geo_code1 == desire_lines$geo_code2
plot(desire_lines[intra_zonal, ])
```

---

get\_od *Get origin destination data from the 2011 Census*

---

### Description

This function downloads a .csv file representing movement between MSOA zones in England and Wales. By default it returns national data, but region can be set to subset the output to a specific local authority or region.

### Usage

```
get_od(region = NULL, n = NULL, type = "within",
       omit_intrazonal = FALSE)
```

### Arguments

region	The PCT region or local authority to download data from (e.g. west-yorkshire or Leeds). See View(pct_regions_lookup) for a full list of possible region names.
n	top n number of destinations with most trips in the 2011 census within the region.
type	the type of subsetting: one of from, to or within, specifying how the od dataset should be subset in relation to the region.
omit_intrazonal	should intrazonal OD pairs be omitted from result? FALSE by default.

### Examples

```
get_od("wight", n = 3)
```

---

get\_pct *Generic function to get regional data from the PCT*

---

### Description

This function gets data generated for the Propensity to Cycle Tool project and returns objects in the modern sf class.

### Usage

```
get_pct(base_url = "https://github.com/npct/pct-outputs-regional-R/raw/master",
       purpose = "commute", geography = "msoa", region = NULL,
       layer = NULL, extension = ".Rds", national = FALSE)
```

**Arguments**

base_url	Where the data is stored.
purpose	Trip purpose (typically school or commute)
geography	Geographic resolution of outputs (msoa or lsoa)
region	The PCT region or local authority to download data from (e.g. west-yorkshire or Leeds). See View(pct_regions_lookup) for a full list of possible region names.
layer	The PCT layer of interest, z, c, l, rf, rq or rnet for zones, centroids, desire lines, routes (fast or quiet) and route networks, respectively
extension	The type of file to download (typically .Rds)
national	Download nationwide data? FALSE by default

**Examples**

```
rf = get_pct(region = "isle-of-wight", layer = "rf")
names(rf)[1:20]
vars_to_plot = 10:13
plot(rf[vars_to_plot])
z = get_pct(region = "isle-of-wight", layer = "z")
# rf = get_pct(region = "west-yorkshire", layer = "rf")
# z_all = get_pct(layer = "z", national = TRUE)
```

---

get_pct_centroids	<i>Get centroid results from the PCT</i>
-------------------	--

---

**Description**

Wrapper around [get\_pct()] that gets centroid data from the PCT.

**Usage**

```
get_pct_centroids(region = NULL, purpose = "commute",
  geography = "msoa", extension = ".Rds")
```

**Arguments**

region	The PCT region or local authority to download data from (e.g. west-yorkshire or Leeds). See View(pct_regions_lookup) for a full list of possible region names.
purpose	Trip purpose (typically school or commute)
geography	Geographic resolution of outputs (msoa or lsoa)
extension	The type of file to download (typically .Rds)

**Examples**

```
z = get_pct_centroids("isle-of-wight")
plot(z)
```

---

get\_pct\_lines                      *Get desire lines results from the PCT*

---

### Description

Wrapper around [get\_pct()] that gets l (lines) data from the PCT.

### Usage

```
get_pct_lines(region = NULL, purpose = "commute", geography = "msoa",
              extension = ".Rds")
```

### Arguments

region	The PCT region or local authority to download data from (e.g. west-yorkshire or Leeds). See View(pct_regions_lookup) for a full list of possible region names.
purpose	Trip purpose (typically school or commute)
geography	Geographic resolution of outputs (msoa or lsoa)
extension	The type of file to download (typically .Rds)

### Examples

```
z = get_pct_lines("isle-of-wight")
plot(z)
```

---

get\_pct\_rnet                      *Get road network results from the PCT*

---

### Description

Wrapper around [get\_pct()] that gets centroid data from the PCT.

### Usage

```
get_pct_rnet(region = NULL, purpose = "commute", geography = "msoa",
              extension = ".Rds")
```

### Arguments

region	The PCT region or local authority to download data from (e.g. west-yorkshire or Leeds). See View(pct_regions_lookup) for a full list of possible region names.
purpose	Trip purpose (typically school or commute)
geography	Geographic resolution of outputs (msoa or lsoa)
extension	The type of file to download (typically .Rds)

**Examples**

```
z = get_pct_rnet("isle-of-wight")
plot(z)
```

---

get\_pct\_routes\_fast *Get fast road network results from the PCT*

---

**Description**

Wrapper around [get\_pct()] that gets rf data from the PCT.

**Usage**

```
get_pct_routes_fast(region = NULL, purpose = "commute",
  geography = "msoa", extension = ".Rds")
```

**Arguments**

region	The PCT region or local authority to download data from (e.g. west-yorkshire or Leeds). See View(pct_regions_lookup) for a full list of possible region names.
purpose	Trip purpose (typically school or commute)
geography	Geographic resolution of outputs (msoa or lsoa)
extension	The type of file to download (typically .Rds)

**Examples**

```
z = get_pct_routes_fast("isle-of-wight")
plot(z)
```

---

get\_pct\_routes\_quiet *Get quiet road network results from the PCT*

---

**Description**

Wrapper around [get\_pct()] that gets rq data from the PCT.

**Usage**

```
get_pct_routes_quiet(region = NULL, purpose = "commute",
  geography = "msoa", extension = ".Rds")
```

**Arguments**

region	The PCT region or local authority to download data from (e.g. west-yorkshire or Leeds). See View(pct_regions_lookup) for a full list of possible region names.
purpose	Trip purpose (typically school or commute)
geography	Geographic resolution of outputs (msoa or lsoa)
extension	The type of file to download (typically .Rds)

**Examples**

```
z = get_pct_routes_quiet("isle-of-wight")
plot(z)
```

---

get_pct_zones	<i>Get zone results from the PCT</i>
---------------	--------------------------------------

---

**Description**

Wrapper around [get\_pct()] that gets zone data from the PCT.

**Usage**

```
get_pct_zones(region = NULL, purpose = "commute", geography = "msoa",
  extension = ".Rds")
```

**Arguments**

region	The PCT region or local authority to download data from (e.g. west-yorkshire or Leeds). See View(pct_regions_lookup) for a full list of possible region names.
purpose	Trip purpose (typically school or commute)
geography	Geographic resolution of outputs (msoa or lsoa)
extension	The type of file to download (typically .Rds)

**Examples**

```
z = get_pct_zones("isle-of-wight")
plot(z)
```

---

leeds_uber_sample	<i>Top 15 min mean journey times within Leeds from Uber</i>
-------------------	---

---

**Description**

Data downloaded 4th March 2019. According to Uber, the dataset is from: 1/1/2018 - 1/31/2018 (Every day, Daily Average)

**Examples**

```
# see data-raw folder for generation code  
leeds_uber_sample
```

---

mode_names	<i>Mode names in the Census</i>
------------	---------------------------------

---

**Description**

And conversion into R-friendly versions

**Examples**

```
mode_names
```

---

od_leeds	<i>Example OD data for Leeds</i>
----------	----------------------------------

---

**Description**

od\_leeds contains the 100 most travelled work desire lines in Leeds, according to the 2011 Census.

**Examples**

```
# see data-raw folder for generation code  
od_leeds
```

---

pct_regions	<i>PCT regions from www.pct.bike</i>
-------------	--------------------------------------

---

**Description**

See data-raw folder for generation code

**Examples**

```
pct_regions
```

---

pct\_regions\_lookup      *Lookup table matching PCT regions to local authorities*

---

**Description**

For matching pct\_regions object with local authority names in England and Wales.

**Examples**

```
names(pct_regions_lookup)
head(pct_regions_lookup)
```

---

rnet\_leeds              *Route network for Leeds*

---

**Description**

Route network for Leeds

**Examples**

```
# see data-raw folder for generation code
rnet_leeds
```

---

routes\_fast\_leeds      *Fastest cycle routes for the desire\_lines\_leeds*

---

**Description**

Fastest cycle routes for the desire\_lines\_leeds

**Examples**

```
# see data-raw folder for generation code
routes_fast_leeds
```

---

santiago_lines	<i>Desire lines in central Santiago</i>
----------------	---

---

**Description**

See <https://github.com/pedalea/pctSantiago> folder for generation code

**Examples**

```
# u = "https://github.com/pedalea/pctSantiago/releases/download/0.0.1/od_agg_zone_sub.Rds"
# download.file(u, destfile = "od_agg_zone_sub.Rds")
# desire_lines = readRDS("od_agg_zone_sub.Rds")
santiago_zones
```

---

santiago_od	<i>OD data in central Santiago</i>
-------------	------------------------------------

---

**Description**

See <https://github.com/pedalea/pctSantiago> folder for generation code

**Examples**

```
# u = "https://github.com/pedalea/pctSantiago/releases/download/0.0.1/santiago_od.Rds"
# download.file(u, destfile = "santiago_od.Rds", mode = "wb")
# santiago_od = readRDS("santiago_od.Rds")
santiago_od
```

---

santiago_routes_cs	<i>200 cycle routes in central Santiago, Chile</i>
--------------------	--

---

**Description**

This data was obtained using code shown in the International application of the PCT methods [vi-gnette](#).

**Examples**

```
names(santiago_routes_cs)
head(santiago_routes_cs)
plot(santiago_routes_cs)
```

---

santiago_zones	<i>Zones in central Santiago</i>
----------------	----------------------------------

---

**Description**

See <https://github.com/pedalea/pctSantiago> folder for generation code

**Examples**

```
# u = "https://github.com/pedalea/pctSantiago/releases/download/0.0.1/z_centre.Rds"
# download.file(u, destfile = "z_centre.Rds", mode = "wb")
# santiago_zones = readRDS("z_centre.Rds")
santiago_zones
```

---

uptake_pct_godutch	<i>Calculate cycling uptake for UK 'Go Dutch' scenario</i>
--------------------	--

---

**Description**

See [uptake\\_pct\\_govtarget\(\)](#).

**Usage**

```
uptake_pct_godutch(distance, gradient, alpha = -3.959, d1 = -0.5963,
  d2 = 1.832, d3 = 0.007956, h1 = -0.2872, i1 = 0.01784,
  i2 = -0.0977)
```

**Arguments**

distance	Vector distance numeric values of routes.
gradient	Vector gradient numeric values of routes.
alpha	The intercept
d1	Distance term 1
d2	Distance term 2
d3	Distance term 3
h1	Hilliness term 1
i1	document!
i2	document!

---

uptake\_pct\_govtarget *Calculate cycling uptake for UK 'Government Target' scenario*

---

### Description

Uptake model that takes distance and hilliness and returns a percentage of people likely to cycle along a desire line. Source: appendix of pct paper, hosted at: [www.jtlu.org](http://www.jtlu.org) which states that:

### Usage

```
uptake_pct_govtarget(distance, gradient, alpha = -3.959, d1 = -0.5963,
  d2 = 1.866, d3 = 0.00805, h1 = -0.271, i1 = 0.009394,
  i2 = -0.05135)
```

### Arguments

distance	Vector distance numeric values of routes.
gradient	Vector gradient numeric values of routes.
alpha	The intercept
d1	Distance term 1
d2	Distance term 2
d3	Distance term 3
h1	Hilliness term 1
i1	document!
i2	document!

### Details

```
logit (pcycle) = -3.959 + # alpha
  (-0.5963 * distance) + # d1
  (1.866 * distancesqrt) + # d2
  (0.008050 * distancesq) + # d3
  (-0.2710 * gradient) + # h1
  (0.009394 * distance * gradient) + # i1
  (-0.05135 * distancesqrt *gradient) # i2

pcycle = exp ([logit (pcycle)]) / (1 + (exp([logit(pcycle)]))
```

### Examples

```
l = routes_fast_leeds
pcycle_scenario = uptake_pct_govtarget(l$length, l$av_incline)
plot(l$length, pcycle_scenario)
```

---

wight\_lines\_30      *Desire lines from the PCT for the Isle of Wight*

---

**Description**

This data was obtained using code shown in the introductory [pct package vignette](#).

**Examples**

```
names(wight_lines_30)
plot(wight_lines_30)
```

---

wight\_od      *Official origin-destination data for the Isle of Wight*

---

**Description**

This data was obtained using code shown in the introductory [pct package vignette](#).

**Examples**

```
names(wight_od)
head(wight_od)
```

---

wight\_routes\_30      *Cycle route data for the Isle of Wight*

---

**Description**

This data was obtained using code shown in the introductory [pct package vignette](#).

**Examples**

```
names(wight_routes_30)
head(wight_routes_30)
plot(wight_routes_30)
```

---

`wight_zones`*Zones and centroid data from the PCT for the Isle of Wight*

---

**Description**

This data was obtained using code shown in the introductory [pct package vignette](#).

**Examples**

```
names(wight_lines_30)
plot(wight_lines_30)
```

---

`zones_leeds`*Zone data for Leeds*

---

**Description**

Zones in Leeds

**Examples**

```
# see data-raw folder for generation code
zones_leeds
```

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