

Package ‘metrosp’

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Type Package

Title São Paulo Metro Passenger Demand Data

Version 2.0.0

Description Provides passenger demand data for the São Paulo metro system, covering 2012 to 2026. Datasets include monthly passenger entries and transported counts by line, average weekday passengers transported by station, daily station entries, and spatial geometries for metro and commuter train lines and stations. The bundled datasets are a fixed snapshot, so analyses stay reproducible and examples run offline. More recent data is published to 'GitHub' releases as the upstream sources are updated, and `read_metro_demand()` downloads, caches, and reads it, optionally pinned to a dated monthly batch.

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URL <https://github.com/viniciusoike/metrosp>,
<https://viniciusoike.github.io/metrosp/>

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VignetteBuilder quarto

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Contents

calendar_spo	2
line_entries_monthly	3
line_transported_monthly	5
metrosp_cache	7
metrosp_cache_clear	8
metro_colors	8
rail_lines	9
rail_stations	10
read_metro_demand	11
station_entries_daily	12
station_transported_monthly	14
Index	17

calendar_spo	<i>São Paulo Holiday and Business-Day Calendar</i>
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Description

A daily calendar for São Paulo (city) covering 2012–2030, classifying each date as a holiday or business day. Includes national, state, and municipal holidays in São Paulo, with flags for optional work days (`is_optional_holiday`) and extended holiday weekends (`is_long_weekend`).

Usage

calendar_spo

Format

- A data frame with one row per day and the following columns:
- date** Calendar date (Date).
 - year** Calendar year (integer).
 - weekday** Day of week from `lubridate::wday()`: 1 = Sunday, 2 = Monday, ..., 7 = Saturday (integer).
 - is_weekend** TRUE for Saturdays and Sundays (logical).
 - is_holiday** TRUE when the date is a gazetted holiday at any scope (logical).
 - is_business_day** TRUE when the date is neither a weekend nor a holiday (logical).
 - holiday_name** Name of the holiday in Portuguese (character). NA on non-holiday dates.

holiday_scope Scope of the holiday (character). One of "national", "state", or "municipal"; NA on non-holiday dates.

is_optional_holiday TRUE for holidays that are technically optional at the federal level (Carnaval, Corpus Christi) but observed as holidays in São Paulo (logical).

is_long_weekend TRUE when a holiday falls on Monday, Tuesday, Thursday, or Friday, creating a potential extended weekend with the adjacent Saturday/Sunday (logical).

Details

The calendar covers the full date range of the [station_entries_daily](#) dataset (Lines 4/5 from January 2012) and extends through 2030 for forecasting use.

See Also

[station_entries_daily](#) for daily passenger data that can be joined on date.

line_entries_monthly *Passengers Entering Metro SP Stations by Line*

Description

Monthly count of passengers entering São Paulo metro stations, aggregated by metro line. Data covers January 2016 through 2026 for Lines 1, 2, 3, and 15; Line 4 from January 2012; Line 5 from January 2016. July 2017 is the one missing month, absent for every line the METRO portal covers. Sourced from the METRO SP transparency portal and the Insper Dataverse.

Usage

```
line_entries_monthly
```

Format

A data frame with the following columns:

date First day of the month (Date).

year Calendar year (integer).

line_number Metro line number: 1, 2, 3, 4, 5, or 15 (integer).

line_name English name of the metro line (character).

line_name_pt Portuguese name of the metro line (character).

metric Metric code (character). One of: "total", "mdu", "msa", "mdo", "max".

metric_name Measurement type in English (character). One of: "Total", "Average on Business Days", "Average on Saturdays", "Average on Sundays", "Daily Peak".

metric_name_pt Measurement type in Portuguese (character). One of: "Total", "Média dos Dias Úteis", "Média dos Sábados", "Média dos Domingos", "Máxima Diária".

value Passenger count, in individual passengers (numeric).

Details

Data by source and line:

- Lines 1, 2, 3, and 15: METRO SP transparency portal, January 2016–2026, except July 2017.
- Line 4 (Amarela/ViaQuatro): Insper Dataverse, January 2012–2026.
- Line 5 (Lilás/ViaMobilidade): METRO SP transparency portal, January 2016–July 2018, except July 2017; Insper Dataverse, August 2018–2026.

METRO published January–September 2017 only as PDFs, with no machine-readable equivalent. Those months were transcribed from the reports and reconciled against the published totals. July 2017 has no entrance table at all, because the file METRO published under that name repeats the transported figures. Lines 1, 2, 3, 5, and 15 therefore carry no value for that month; Line 4 comes from the Dataverse and is unaffected.

Summing across lines does not give a clean network total. METRO line entries include transfers arriving from Lines 4 and 5, while Lines 4 and 5 count turnstiles only, so a Line 4 → Line 1 journey counts twice. Do not sum max: individual lines may peak on different days. See the Metro Demand Data article for details: <https://viniciusoike.github.io/metrosp/articles/metro-demand-data.html>.

Metrics:

- total: Total passengers in the month.
- mdu: Average daily entries on business days (Média dos Dias Úteis).
- msa: Average daily entries on Saturdays (Média dos Sábados).
- mdo: Average daily entries on Sundays (Média dos Domingos).
- max: Daily maximum (Máxima Diária).

Months beyond the last published data point for each line are trimmed during assembly; interior NAs (e.g. operational outages) are preserved.

Data vintage

This dataset is a fixed snapshot, current through July 2026. It ships with the package so examples, vignettes, and offline analysis always have data to hand. The snapshot moves only when the column schema changes or a release deliberately carries new data, not when new months are published upstream.

METRO SP publishes on an irregular schedule and revises already-published years, so the numbers here will drift from the source over time. Freshly rebuilt data is published on every pipeline run at <https://github.com/viniciusoike/metrosp/releases>.

Source

Companhia do Metropolitano de São Paulo (METRO SP). <https://transparencia.metrosp.com.br/dataset/demanda>

See Also

[line_transported_monthly](#) for transported counts, [station_transported_monthly](#) for station-level weekday averages.

line_transported_monthly

Passengers Transported by Metro SP Line

Description

Monthly count of passengers transported by São Paulo metro, aggregated by metro line. Data covers January 2016 through 2026 for Lines 1, 2, 3, and 15; January 2016 through August 2018 for Line 5; and January 2012 through 2026 for Line 4. Sourced from the METRO SP transparency portal and the Insper Dataverse.

Usage

```
line_transported_monthly
```

Format

A data frame with the following columns:

date First day of the month (Date).

year Calendar year (integer).

line_number Metro line number: 1, 2, 3, 4, 5, or 15 (integer).

line_name English name of the metro line (character).

line_name_pt Portuguese name of the metro line (character).

metric Metric code (character). One of: "total", "mdu", "msa", "mdo", "max".

metric_name Measurement type in English (character). One of: "Total", "Average on Business Days", "Average on Saturdays", "Average on Sundays", "Daily Peak".

metric_name_pt Measurement type in Portuguese (character). One of: "Total", "Média dos Dias Úteis", "Média dos Sábados", "Média dos Domingos", "Máxima Diária".

value Passengers transported (numeric).

Details

A transported passenger is one who boarded a train on that line, whether through a turnstile or by transferring from another line at an interchange station. METRO's term is *passageiros transportados*: turnstile entries plus transfers between lines. Transported counts therefore run above entry counts for the same line and month. Do not sum this dataset to estimate unique network passengers: a journey using multiple lines is counted once on each line. See the Metro Demand Data article for details: <https://vinciusoike.github.io/metrosdp/articles/metro-demand-data.html>.

Line 4 (Amarela/ViaQuatro) comes from the Insper Dataverse, January 2012–2026, all five metrics, summing both Bloqueio (turnstile) and Integracao (transfer) boarding types. Line 5 (Lilás) is available from the METRO portal only for January 2016–August 2018: the line was handed over to ViaMobilidade in August 2018 and the portal stopped reporting its transported counts afterwards. The Dataverse feed for Line 5 records turnstiles only, so no transported measure exists for it after

the handover. August 2018 covers only the days before the handover: its `total` is a partial month, and `msa` and `mdu` are NA.

METRO SP publishes these counts in thousands of passengers. They are multiplied by 1000 here, so value counts individual passengers like every other demand dataset and carries METRO's rounding to the thousand. Line 4 comes from the Dataverse in individual passengers.

METRO published January–September 2017 only as PDFs, with no machine-readable equivalent. Those months were transcribed from the reports and reconciled against the published totals.

Metrics:

- `total`: Total passengers in the month.
- `mdu`: Average daily transported passengers on business days (Média dos Dias Úteis).
- `msa`: Average daily transported passengers on Saturdays (Média dos Sábados).
- `mdu`: Average daily transported passengers on Sundays (Média dos Domingos).
- `max`: Daily maximum (Máxima Diária).

Months beyond the last published data point for each line are trimmed during assembly; interior NAs (e.g. operational outages) are preserved.

Data vintage

This dataset is a fixed snapshot, current through July 2026. It ships with the package so examples, vignettes, and offline analysis always have data to hand. The snapshot moves only when the column schema changes or a release deliberately carries new data, not when new months are published upstream.

METRO SP publishes on an irregular schedule and revises already-published years, so the numbers here will drift from the source over time. Freshly rebuilt data is published on every pipeline run at <https://github.com/viniciusoike/metrosp/releases>.

Source

Companhia do Metropolitano de São Paulo (METRO SP). <https://transparencia.metrosp.com.br/dataset/demanda>

See Also

[line_entries_monthly](#) for entry counts, [station_transported_monthly](#) for station-level week-day averages.

metrosp_cache	<i>Inspect cached Metro SP data</i>
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Description

Lists the files downloaded by [read_metro_demand\(\)](#). The cache directory is resolved from the `metrosp.cache_dir` option, then the `METROSP_CACHE_DIR` environment variable, and finally `tools::R_user_dir()`. Printing the result also shows the resolved directory.

Usage

```
metrosp_cache()

## S3 method for class 'metrosp_cache'
print(x, ...)
```

Arguments

<code>x</code>	A cache listing returned by metrosp_cache() .
<code>...</code>	Additional arguments passed to the data-frame print method.

Details

Each read marks its vintage as used. A vintage left unused for 90 days is deleted the next time [read_metro_demand\(\)](#) touches the cache.

Value

A data frame with one row per cached file, holding the vintage tag, file name, size in bytes, and modification time. Zero rows when the cache is empty.

`x`, invisibly.

See Also

[metrosp_cache_clear\(\)](#) to remove cached files.

Examples

```
metrosp_cache()
```

metrosp_cache_clear	<i>Delete cached Metro SP data</i>
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Description

Delete cached Metro SP data

Usage

```
metrosp_cache_clear(vintage = NULL)
```

Arguments

vintage	Vintage to remove, such as "latest" or "2026-09". When NULL, removes every package-managed data-latest or data-YYYY-MM vintage directory. The cache root and unrelated files are preserved.
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Value

The number of files removed, invisibly.

See Also

[metrosp_cache\(\)](#) to inspect cached files.

Examples

```
# Point the cache at a temporary directory so the example leaves yours alone.
old <- options(metrosp.cache_dir = tempfile("metrosp-cache"))

metrosp_cache_clear("2026-09")
metrosp_cache_clear()

options(old)
```

metro_colors	<i>Metro SP Official Line Colors</i>
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Description

A named character vector of official hex color codes for the six metro lines operated by METRO SP (Lines 1–3 and 15) and ViaMobilidade (Lines 4 and 5).

Usage

```
metro_colors
```

Format

A named character vector of length 6. Names are English color names; values are hex color codes:

Blue Line 1 — "#171796"

Green Line 2 — "#007A5E"

Red Line 3 — "#ED2E38"

Yellow Line 4 — "#FFD525"

Lilac Line 5 — "#874ABF"

Silver Line 15 — "#8F8F8C"

Details

Colors follow official METRO SP and ViaMobilidade branding. Only the six currently operating metro lines are included; CPTM train lines and planned future lines (e.g., Line 6 Orange, Line 17 Gold) are not covered.

See Also

[rail_lines](#) for the full line reference (numbers, names, and route geometries).

rail_lines

Metro and Train Line Routes

Description

Spatial line geometries for São Paulo metro (METRO SP) and commuter train (CPTM) lines, including both currently operating lines and planned future expansions.

Usage

rail_lines

Format

An sf data frame with LINESTRING geometry (CRS: WGS84 / EPSG:4326) and the following columns:

line_number Official line number (integer).

line_name English color name of the line (character).

line_name_pt Portuguese color name of the line (character).

company_name Operating company name (character).

type Either "metro" (METRO SP) or "train" (CPTM) (character).

status Either "current" (operating) or "future" (planned expansion) (character).

geom Line route geometry (sfc_LINESTRING).

Details

Requires the **sf** package to work with spatial features. The distinction between types follows GeoSampa's classification. Broadly, "metro" lines run underground as a subway and "train" lines run above ground as commuter rail, though exceptions exist.

Source

GeoSampa, Prefeitura de São Paulo. <https://geosampa.prefeitura.sp.gov.br/>

See Also

[rail_stations](#) for station point locations.

rail_stations	<i>Metro and Train Station Locations</i>
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Description

Spatial point locations for São Paulo metro (METRO SP) and commuter train (CPTM) stations, including both currently operating stations and planned future stations.

Usage

```
rail_stations
```

Format

An sf data frame with POINT geometry (CRS: WGS84 / EPSG:4326) and the following columns:

station_id Stable identifier for the physical station complex (character). Shared across lines and modes; treat as opaque.

station_name Station name in title case (character).

station_code Three-letter METRO abbreviation when available (character).

line_number Line number the station belongs to (integer).

line_name English color name of the line (character).

line_name_pt Portuguese color name of the line (character).

company_name Operating company name (character).

type Either "metro" (METRO SP) or "train" (CPTM) (character).

status Either "current" (operating) or "future" (planned expansion) (character).

geom Station location (sfc_POINT).

Details

Requires the **sf** package to work with spatial features. The distinction between types follows GeoSampa's classification. Broadly, "metro" lines run underground as a subway and "train" lines run above ground as commuter rail, though exceptions exist.

Source

GeoSampa, Prefeitura de São Paulo. <https://geosampa.prefeitura.sp.gov.br/>

See Also

[rail_lines](#) for line route geometries, [station_transported_monthly](#) for passenger data by station.

read_metro_demand	<i>Read Metro SP demand data</i>
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Description

Reads one of the four passenger demand datasets, preferring the most recently published version over the frozen snapshot bundled with the package. Published data lives in the repository's GitHub releases and is rebuilt from the upstream sources on every pipeline run.

Usage

```
read_metro_demand(
  dataset = c("line_entries_monthly", "line_transported_monthly",
    "station_transported_monthly", "station_entries_daily"),
  source = c("auto", "cache", "remote", "bundled"),
  vintage = "latest",
  cache = TRUE,
  quiet = FALSE
)
```

Arguments

dataset	Dataset to read. One of "line_entries_monthly", "line_transported_monthly", "station_transported_monthly", or "station_entries_daily".
source	Where to read from. • "auto" (default) uses the cache, downloads when it is stale or empty, and falls back to the bundled snapshot with a warning if the download fails. When a stale manifest cannot be refreshed, it reads the cached copy with a warning instead. • "cache" reads only what is already on disk and errors otherwise. • "remote" downloads and errors if that fails. • "bundled" reads the frozen snapshot and never touches the network.
vintage	Which published batch to read. "latest" tracks the rolling release; a year-month string such as "2026-09" reads the last batch published in that month. A month's batch can be republished until the month ends, so a monthly vintage is revisable rather than an exact pin.
cache	Whether to store downloads in the persistent cache. Set to FALSE to use session-temporary storage instead.
quiet	Whether to suppress progress messages.

Details

Only the demand datasets are published separately. The reference datasets ([rail_lines](#), [rail_stations](#), [calendar_spo](#), and [metro_colors](#)) do not change with new months, so read them directly.

Each vintage's `manifest.json` is cached and checked again once it is older than `getOption("metrosp.cache_ttl")` seconds (six hours by default). This applies to dated vintages too, so a month republished after your first read is picked up; cached assets whose checksum is unchanged are not downloaded again.

Downloads verify the manifest's SHA-256 when the **digest** package is installed and skip verification otherwise.

Value

A data frame. See [line_entries_monthly](#), [line_transported_monthly](#), [station_transported_monthly](#), and [station_entries_daily](#) for the column definitions, which are identical across sources.

See Also

[metrosp_cache\(\)](#) and [metrosp_cache_clear\(\)](#) for cache management.

Examples

```
# The bundled snapshot, read without touching the network.
head(read_metro_demand("line_entries_monthly", source = "bundled"))

# Keep this example's downloads out of your persistent cache.
old <- options(metrosp.cache_dir = tempfile("metrosp-cache"))

# The most recently published data, cached between calls.
entrance <- read_metro_demand("line_entries_monthly")

# A monthly vintage, so an analysis can name the batch it used.
entrance_sep <- read_metro_demand(
  "line_entries_monthly",
  vintage = "2026-09"
)

options(old)
```

`station_entries_daily` *Daily Passenger Entries by Metro SP Station*

Description

Daily passenger entries at each station in the São Paulo metro system. Data covers January 2012 through 2026 for Line 4 and August 2018 through 2026 for Line 5 (Insper Dataverse), and 2020 through 2026 for Lines 1, 2, 3, and 15 (METRO SP transparency portal).

Usage

station_entries_daily

Format

A data frame with the following columns:

date Date of observation (Date).

year Calendar year (integer).

line_number Metro line number: 1, 2, 3, 4, 5, or 15 (integer).

station_id Stable identifier for the physical station complex (character). Treat as opaque. An interchange complex keeps one id across the lines that serve it while each line keeps its own official station_name, so group by station_id alone to total a complex.

station_name Full station name (character).

station_code Three-letter station abbreviation used internally by METRO SP (character). NA for Lines 4 and 5 (Dataverse source).

line_name English name of the metro line (character).

line_name_pt Portuguese name of the metro line (character).

value Daily passenger entries (numeric).

Details

This is an entries measure — METRO's *Entrada de Passageiros por Estação*: turnstile entries plus transfers arriving from other operators (CPTM, Line 4, Line 5), excluding transfers between METRO lines. Monthly station sums usually match the line's total in [line_entries_monthly](#); when they differ, the gap is a fraction of a percent.

Station coverage and date range by line:

- Line 1 (Azul/Blue): 23 stations, 2020–2026 (METRO SP portal).
- Line 2 (Verde/Green): 14 stations, 2020–2026 (METRO SP portal).
- Line 3 (Vermelha/Red): 18 stations, 2020–2026 (METRO SP portal).
- Line 4 (Amarela/Yellow): January 2012–2026 (Insper Dataverse); station_code is NA.
- Line 5 (Lilás/Lilac): August 2018–2026 (Insper Dataverse); station_code is NA.
- Line 15 (Prata/Silver): 10 stations in 2020, 11 from 2021 onward (Jardim Colonial added), 2020–2026 (METRO SP portal).

Some stations appear on multiple lines (e.g., Ana Rosa on Lines 1 and 2, Paraíso on Lines 1 and 2, Sé on Lines 1 and 3). These are recorded separately for each line.

Days beyond the last published data point for each line are trimmed during assembly; interior NAs (e.g. operational outages) are preserved.

Data vintage

This dataset is a fixed snapshot, current through July 2026. It ships with the package so examples, vignettes, and offline analysis always have data to hand. The snapshot moves only when the column schema changes or a release deliberately carries new data, not when new months are published upstream.

METRO SP publishes on an irregular schedule and revises already-published years, so the numbers here will drift from the source over time. Freshly rebuilt data is published on every pipeline run at <https://github.com/viniciusoike/metrospp/releases>.

Source

Companhia do Metropolitano de São Paulo (METRO SP). <https://transparencia.metrosp.com.br/dataset/demanda>

See Also

[station_transported_monthly](#) for monthly weekday averages, [line_entries_monthly](#) for monthly line-level totals.

station_transported_monthly

Average Weekday Passengers Transported by Station

Description

Monthly average of weekday (business day) passengers transported for each station in the São Paulo metro system. This is METRO's transported measure — *Demanda de Passageiros por Estação*: boardings on that line plus transfers from the other lines — not turnstile entries. Summed over a line's stations it usually comes within 2% in [line_transported_monthly](#). Line 15 station values are rounded to the thousand, and a few source months differ by more, notably Line 1 from February to June 2016. Data covers January 2016 through 2026 for Lines 1, 2, 3, and 15; Line 4 from January 2012; Line 5 from January 2016 through July 2018. Sourced from the METRO SP transparency portal and the Insper Dataverse.

Usage

station_transported_monthly

Format

A data frame with the following columns:

date First day of the month (Date).

year Calendar year (integer).

line_number Metro line number (integer).

station_id Stable identifier for the physical station complex (character). Treat as opaque. An interchange complex keeps one id across the lines that serve it while each line keeps its own official `station_name`. Grouping by `station_id` on this table gives boardings across the complex's platforms, not people entering it.

station_name Name of the metro station (character).

line_name English name of the metro line (character).

line_name_pt Portuguese name of the metro line (character).

metric Metric code: "mdu" (character).

metric_name Metric name in English (character).

metric_name_pt Metric name in Portuguese (character).

value Average weekday passengers transported (numeric).

Details

Only the weekday average (mdu) metric is available at the station level. For line-level data with all five metrics, see [line_transported_monthly](#). Months beyond the last published data point for each line are trimmed during assembly; interior NAs (e.g. operational outages) are preserved.

Station coverage by line and source:

- Line 1 (Azul/Blue): 23 stations, January 2016–2026 (METRO SP portal).
- Line 2 (Verde/Green): 14 stations, January 2016–2026 (METRO SP portal).
- Line 3 (Vermelha/Red): 18 stations, January 2016–2026 (METRO SP portal).
- Line 4 (Amarela/Yellow): January 2012–2026 (Insper Dataverse, Bloqueio plus Integracao).
- Line 5 (Lilás/Lilac): January 2016–July 2018 (METRO SP portal). From August 2018 the Dataverse feed records turnstiles only, so those rows are dropped here; station data for that era lives in [station_entries_daily](#).
- Line 15 (Prata/Silver): 2 stations in 2016–2017 (assisted operation: Vila Prudente and Oratório), 10 stations in 2020, 11 from January 2021 onward (Jardim Colonial added), January 2016–2026 (METRO SP portal).

METRO published January–September 2017 only as PDFs, with no machine-readable equivalent. Those months were transcribed from the reports and reconciled against the published line totals.

February–June 2016 carries a defect in the Line 1 values. Across those five months the station sum runs about 14% below the transported mdu in [line_transported_monthly](#), and the figures are misallocated across stations, with Santa Cruz and Sé too high and São Bento and Portuguesa-Tietê too low. The defect comes from METRO's retroactive publication of 2016 and is not corrected here, so exclude those five months from station-level baselines.

Data vintage

This dataset is a fixed snapshot, current through July 2026. It ships with the package so examples, vignettes, and offline analysis always have data to hand. The snapshot moves only when the column schema changes or a release deliberately carries new data, not when new months are published upstream.

METRO SP publishes on an irregular schedule and revises already-published years, so the numbers here will drift from the source over time. Freshly rebuilt data is published on every pipeline run at <https://github.com/viniciusoike/metrospt/releases>.

Source

Companhia do Metropolitano de São Paulo (METRO SP). <https://transparencia.metrosp.com.br/dataset/demanda>

See Also

[station_entries_daily](#) for daily station entries, [line_transporteds_monthly](#) for monthly line-level totals.

Index

* datasets

- calendar_spo, [2](#)
- line_entries_monthly, [3](#)
- line_transported_monthly, [5](#)
- metro_colors, [8](#)
- rail_lines, [9](#)
- rail_stations, [10](#)
- station_entries_daily, [12](#)
- station_transported_monthly, [14](#)

calendar_spo, [2](#), [12](#)

line_entries_monthly, [3](#), [6](#), [12–14](#)

line_transported_monthly, [4](#), [5](#), [12](#), [14–16](#)

metro_colors, [8](#), [12](#)

metrosp_cache, [7](#)

metrosp_cache(), [7](#), [8](#), [12](#)

metrosp_cache_clear, [8](#)

metrosp_cache_clear(), [7](#), [12](#)

print.metrosp_cache(metrosp_cache), [7](#)

rail_lines, [9](#), [9](#), [11](#), [12](#)

rail_stations, [10](#), [10](#), [12](#)

read_metro_demand, [11](#)

read_metro_demand(), [7](#)

station_entries_daily, [3](#), [12](#), [12](#), [15](#), [16](#)

station_transported_monthly, [4](#), [6](#), [11](#), [12](#),
[14](#), [14](#)

tools::R_user_dir(), [7](#)