

# Exploring Solar Permit Data in R

Page Piccinini

# Introduction to R::tidyverse

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tidyverse

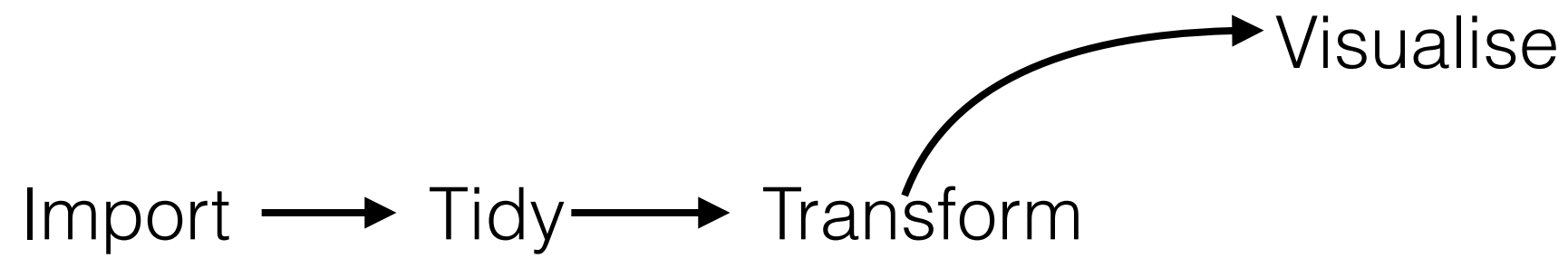


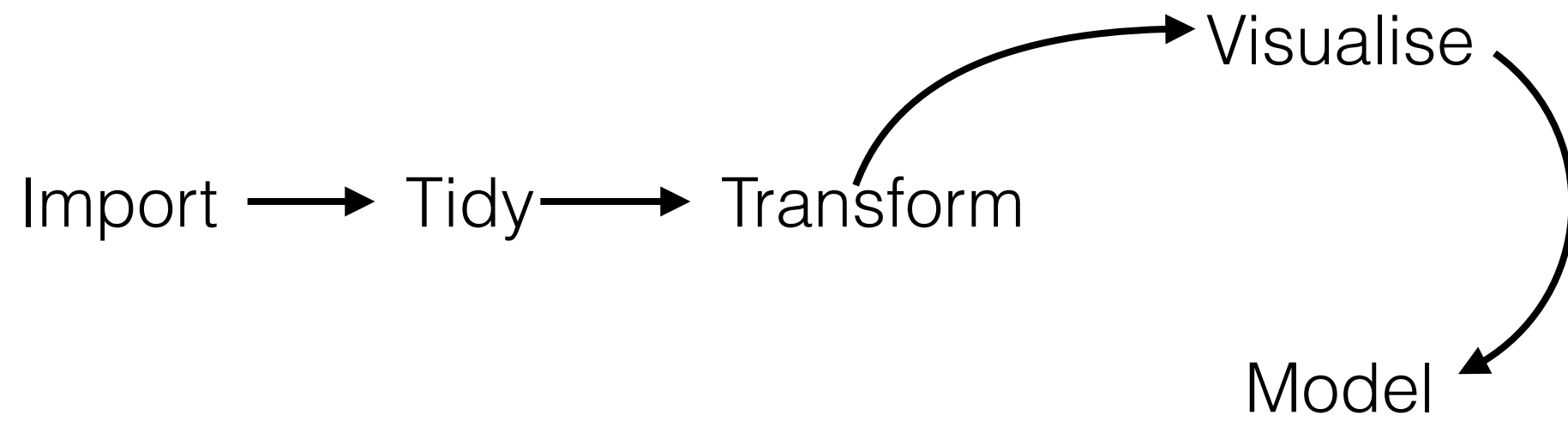


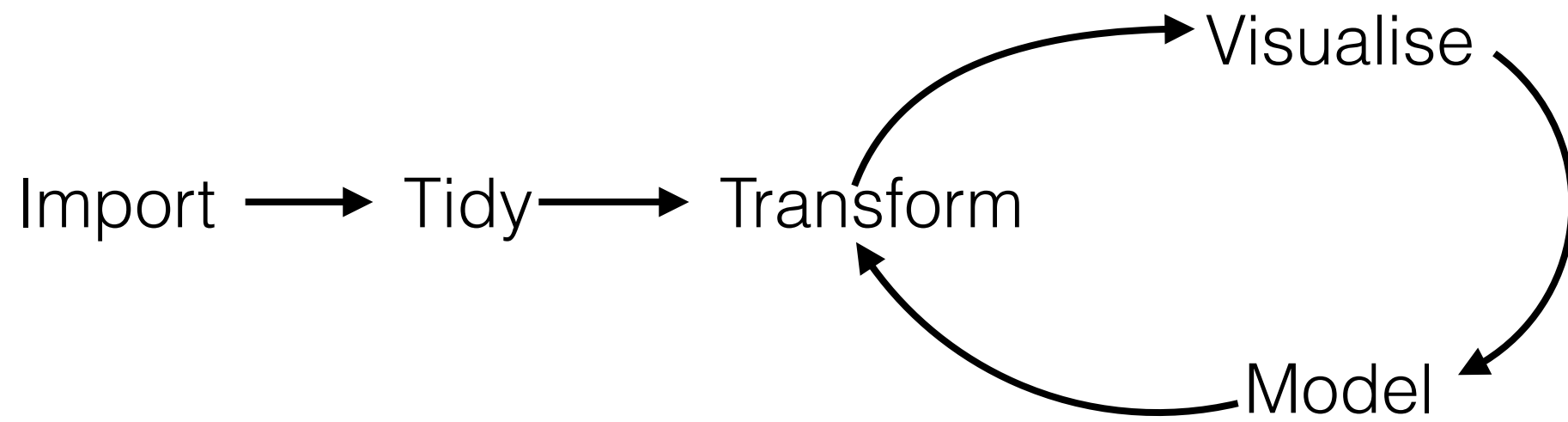
Import

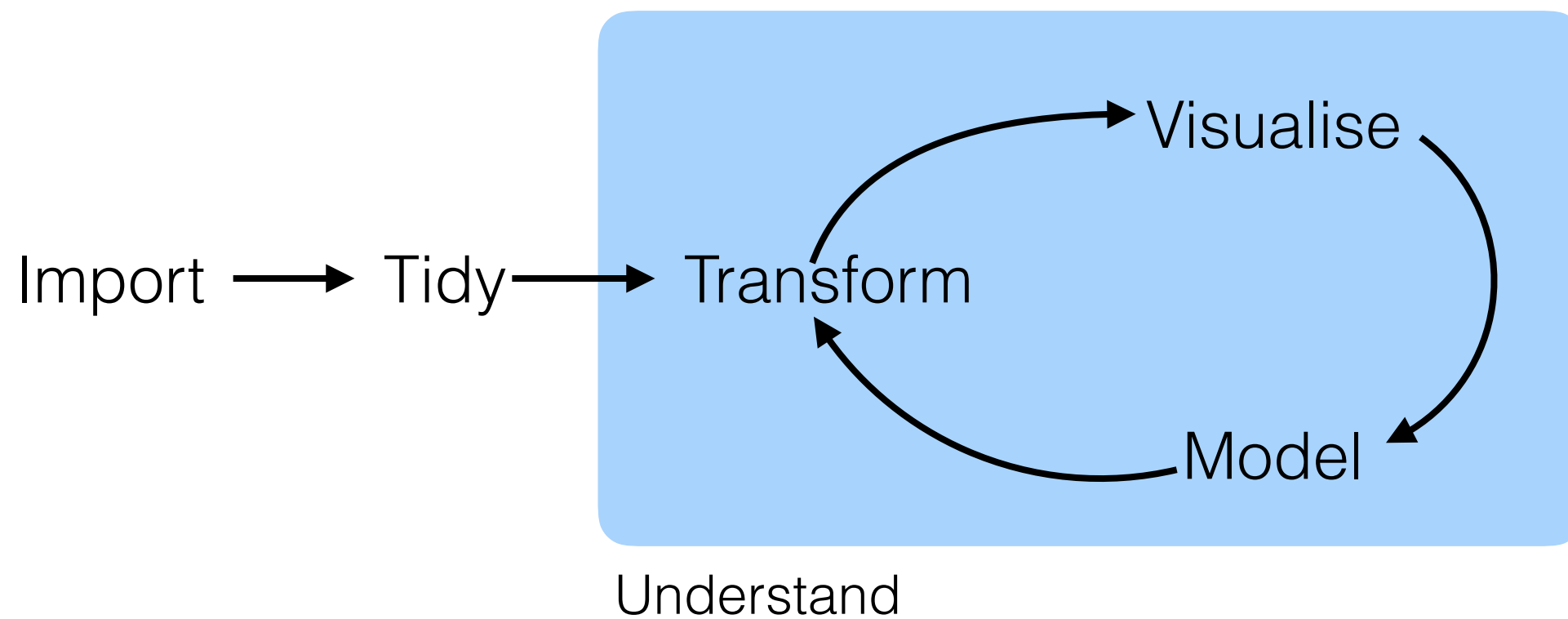
Import → Tidy

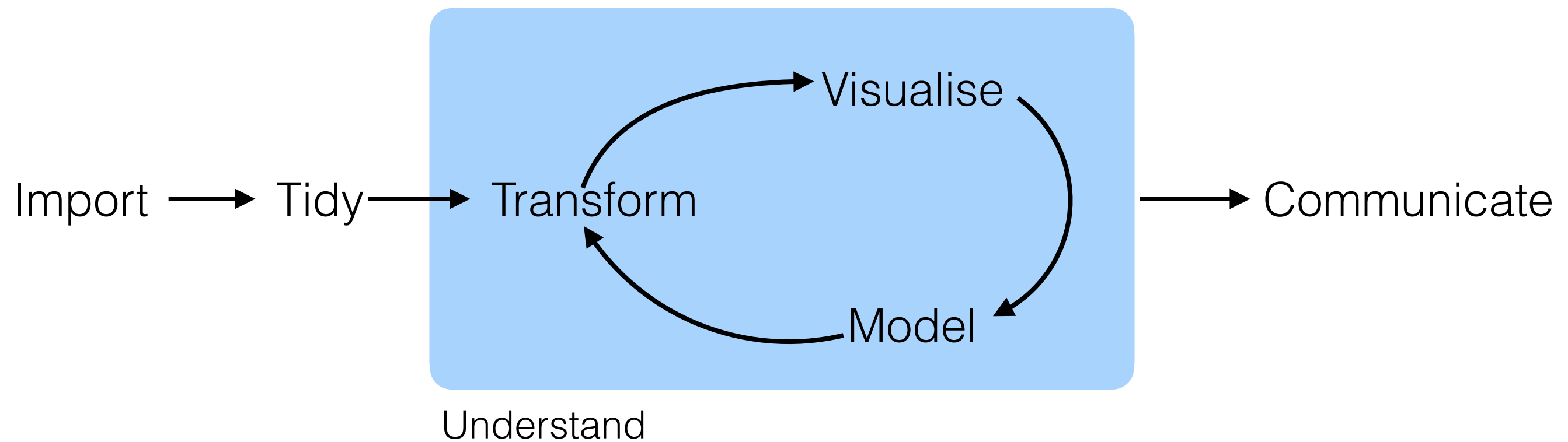
Import → Tidy → Transform



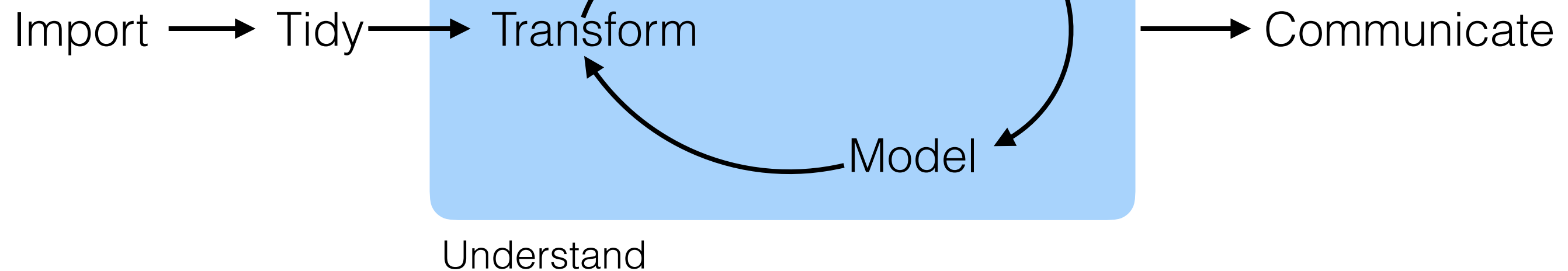










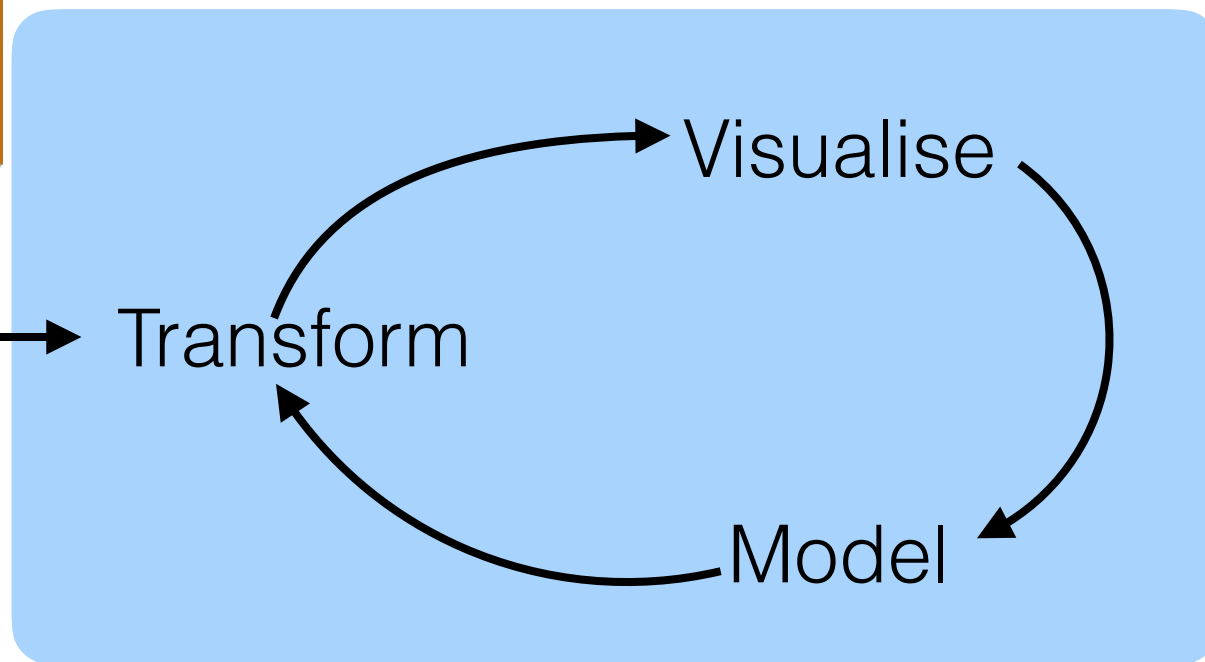




Import



Tidy



Transform

Visualise

Model

Understand

Communicate



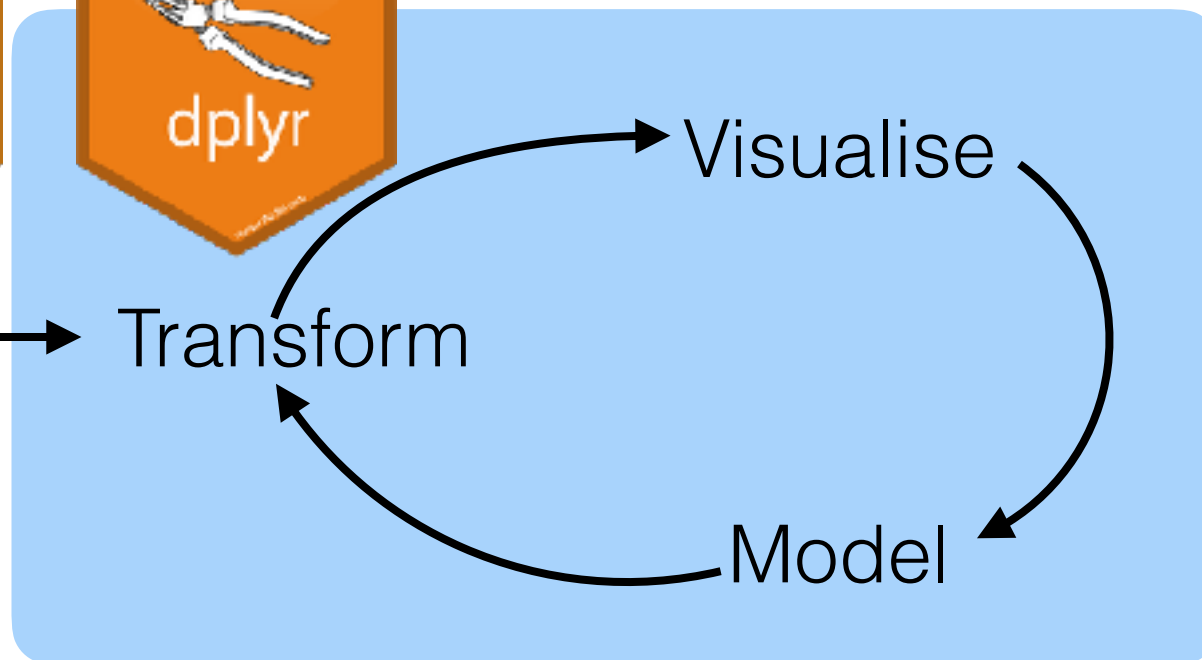
Import



Tidy

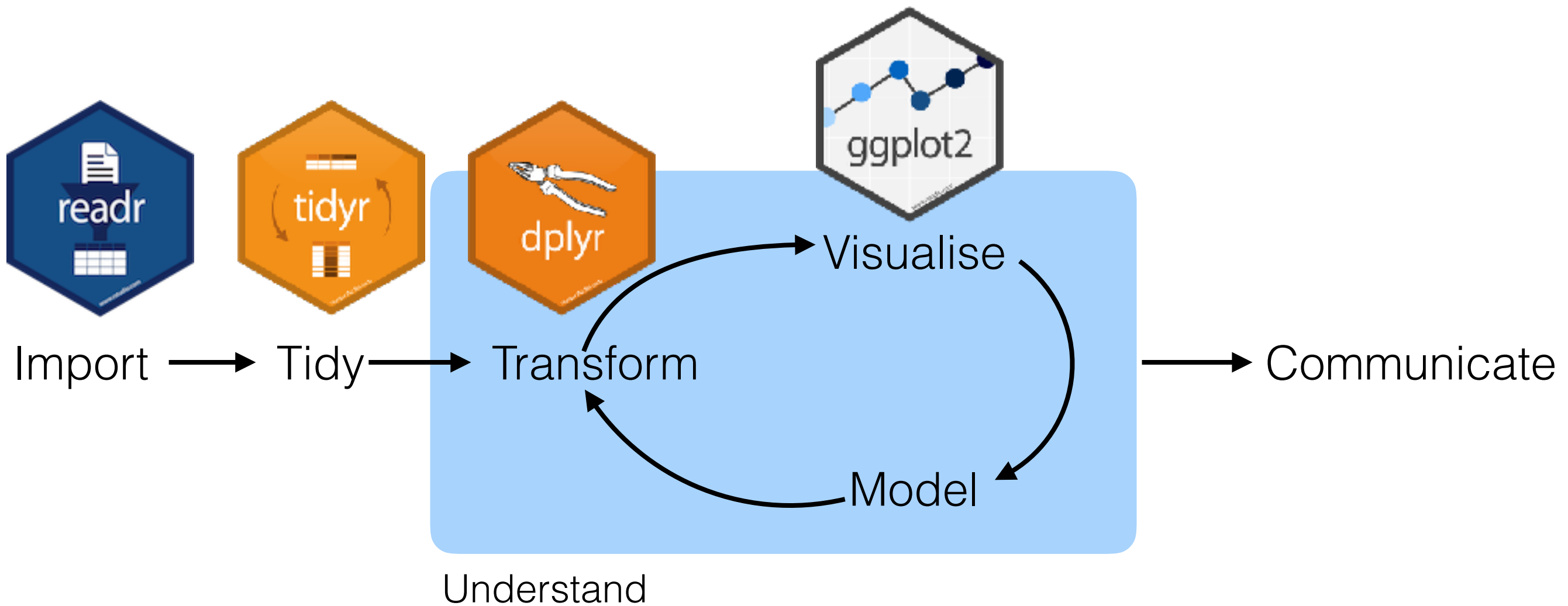


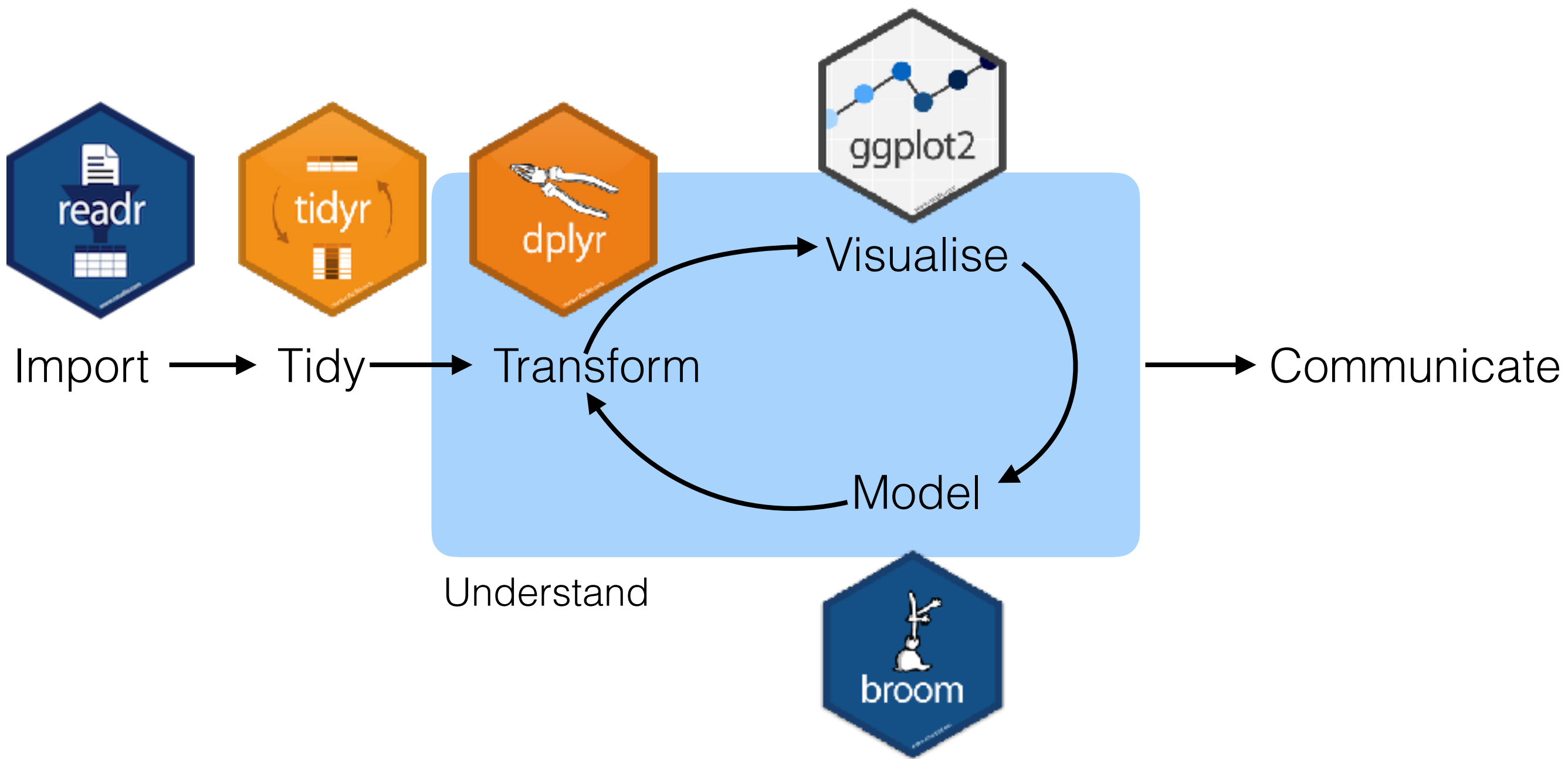
Transform

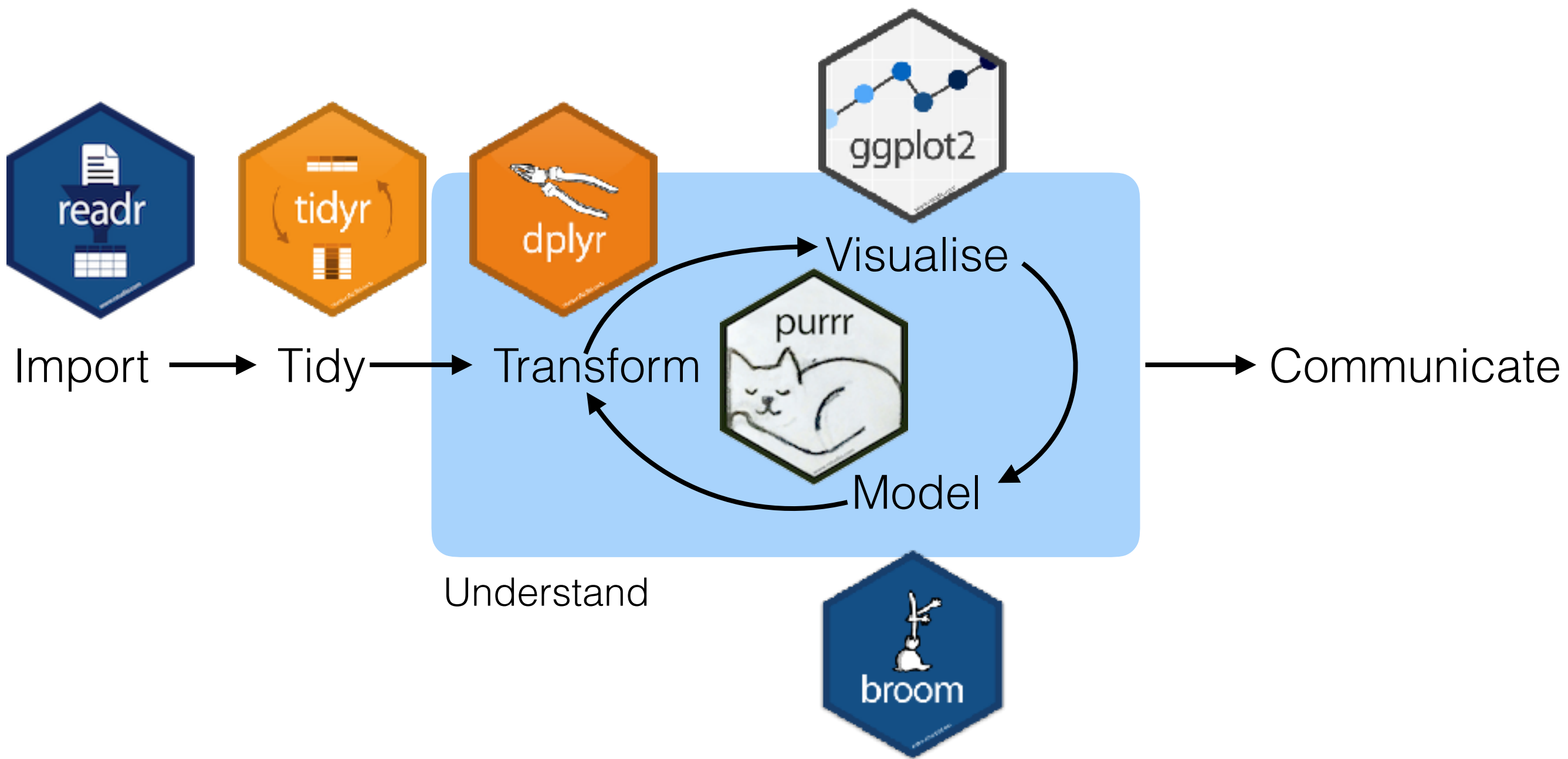


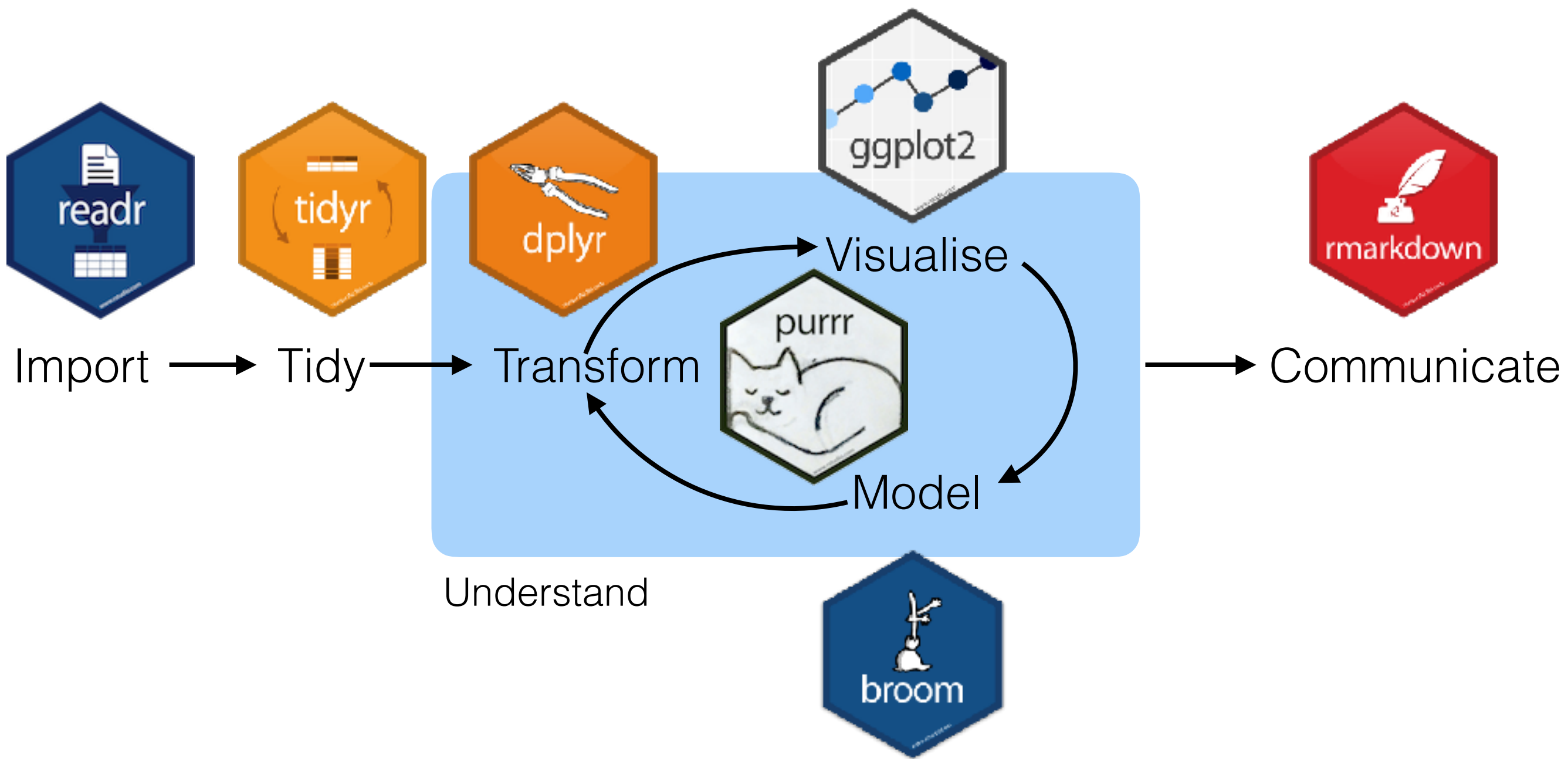
Understand

Communicate











**% > %**

*Ceci n'est pas un pipe.*



# solar\_permits

solar_permits										
	approval_id	approval_type	approval_type_id	application_date	issue_date	first_inspection_date	complete_cancel_date	latitude	longitude	issued_by
1	1625109	Electrical-Photovoltaic	293	2016-01-02 07:54:00	2016-01-02 06:54:43	2016-03-22 17:01:22	2016-04-20 13:33:36	32.90992	-117.1570	Perez, Sylvia
2	1625112	Electrical-Photovoltaic	293	2016-01-02 08:00:00	2016-01-02 07:01:02	2016-04-11 16:24:59	NA	33.03982	-117.0827	Perez, Sylvia
3	1625115	Electrical-Photovoltaic	293	2016-01-02 08:07:00	2016-01-02 07:07:47	2016-02-02 10:34:12	2016-02-03 17:11:07	32.82363	-117.2204	Perez, Sylvia
4	1625118	Electrical-Photovoltaic	293	2016-01-02 08:17:00	2016-01-02 07:18:34	2016-02-16 15:00:00	NA	32.96853	-117.1457	Perez, Sylvia
5	1625122	Electrical-Photovoltaic	293	2016-01-02 08:26:00	2016-01-02 07:28:12	2016-02-26 13:06:18	2016-02-26 13:06:20	32.97168	-117.0884	Perez, Sylvia
6	1625127	Electrical-Photovoltaic	293	2016-01-02 17:00:00	2016-01-02 07:57:03	2016-04-19 11:46:13	2016-04-25 09:47:58	32.83568	-117.1913	Perez, Sylvia
7	1625130	Electrical-Photovoltaic	293	2016-01-02 09:02:00	2016-01-02 08:03:25	2016-01-21 15:00:00	NA	32.97453	-117.1372	Perez, Sylvia
8	1625133	Electrical-Photovoltaic	293	2016-01-02 09:09:00	2016-01-02 08:10:45	2016-04-07 12:52:28	2016-04-27 16:31:35	32.78945	-117.1224	Perez, Sylvia
9	1625139	Electrical-Photovoltaic	293	2016-01-02 09:21:00	2016-01-02 08:22:48	2016-06-05 20:35:13	2016-06-14 21:11:26	32.71559	-117.0847	Perez, Sylvia
10	1625142	Electrical-Photovoltaic	293	2016-01-02 09:46:00	2016-01-02 08:46:44	2016-03-04 15:00:00	2016-03-07 05:57:42	33.00090	-117.0860	Perez, Sylvia
11	1625145	Electrical-Photovoltaic	293	2016-01-02 09:52:00	2016-01-02 08:53:23	2016-01-22 15:00:00	2016-01-25 06:04:29	32.92475	-117.0555	Perez, Sylvia
12	1625148	Electrical-Photovoltaic	293	2016-01-02 10:06:00	2016-01-02 09:07:28	2016-01-14 10:58:05	NA	32.74196	-117.1353	Perez, Sylvia
13	1625154	Electrical-Photovoltaic	293	2016-01-02 10:25:00	2016-01-02 09:25:53	2016-05-26 19:06:43	2016-05-26 19:06:57	32.73817	-117.0992	Perez, Sylvia
14	1625157	Electrical-Photovoltaic	293	2016-01-02 10:30:00	2016-01-02 09:30:58	2016-01-23 10:10:44	2016-01-28 18:25:25	32.91105	-117.1564	Perez, Sylvia
15	1625161	Electrical-Photovoltaic	293	2016-01-02 10:34:00	2016-01-02 09:36:09	2016-01-12 11:49:21	NA	32.70194	-117.1310	Perez, Sylvia
16	1625163	Electrical-Photovoltaic	293	2016-01-02 10:46:00	2016-01-02 09:47:06	2016-01-08 10:58:31	2016-01-08 10:58:32	32.81584	-117.2145	Perez, Sylvia
17	1625165	Electrical-Photovoltaic	293	2016-01-02 11:01:00	2016-01-02 10:02:12	2016-01-11 14:05:27	2016-02-03 15:04:39	33.03570	-117.0854	Perez, Sylvia
18	1625169	Electrical-Photovoltaic	293	2016-01-02 11:07:00	2016-01-02 10:08:10	2016-01-21 18:17:18	2016-01-21 18:17:46	32.94410	-117.2102	Perez, Sylvia
19	1625172	Electrical-Photovoltaic	293	2016-01-02 11:12:00	2016-01-02 10:13:19	2016-01-22 15:00:00	2016-03-09 08:12:04	32.91904	-117.0835	Perez, Sylvia
20	1625175	Electrical-Photovoltaic	293	2016-01-02 11:17:00	2016-01-02 10:18:43	2016-01-25 12:08:59	2016-01-25 12:09:02	32.77620	-117.1745	Perez, Sylvia
21	1625178	Electrical-Photovoltaic	293	2016-01-02 11:23:00	2016-01-02 10:23:49	2016-01-11 14:33:00	2016-01-11 14:33:11	32.81667	-117.0945	Perez, Sylvia
22	1625181	Electrical-Photovoltaic	293	2016-01-02 11:31:00	2016-01-02 10:32:24	2016-05-19 09:50:43	2016-05-19 14:17:25	32.83520	-117.2092	Perez, Sylvia
23	1625184	Electrical-Photovoltaic	293	2016-01-02 17:00:00	2016-01-02 11:08:58	2016-04-05 20:59:10	NA	32.59412	-117.0248	Perez, Sylvia
24	1625188	Electrical-Photovoltaic	293	2016-01-03 19:05:00	2016-01-03 18:06:18	2016-02-05 17:29:06	2016-02-05 17:29:11	32.70572	-117.0560	Perez, Sylvia
25	1625299	Electrical-Photovoltaic	293	2016-01-04 08:59:00	2016-01-04 08:01:07	2016-01-12 12:16:10	2016-01-24 16:58:44	32.99996	-117.1057	Perez, Sylvia
26	1625315	Electrical-Photovoltaic	293	2016-01-04 09:05:00	2016-01-04 08:06:51	2016-01-27 12:04:06	NA	32.70308	-117.1353	Perez, Sylvia
27	1625325	Electrical-Photovoltaic	293	2016-01-04 09:18:00	2016-01-04 08:18:52	2016-06-28 11:18:22	2016-06-28 11:18:42	32.58069	-117.0302	Perez, Sylvia

Showing 1 to 28 of 9,103 entries

# solar\_permits

solar_permits										
Filter										
	approval_id	approval_type	approval_type_id	application_date	issue_date	first_inspection_date	complete_cancel_date	latitude	longitude	issued_by
1	1625109	Electrical-Photovoltaic	293	2016-01-02 07:54:00	2016-01-02 06:54:43	2016-03-22 17:01:22	2016-04-20 13:33:36	32.90992	-117.1570	Perez, Sylvia
2	1625112	Electrical-Photovoltaic	293	2016-01-02 08:00:00	2016-01-02 07:01:02	2016-04-11 16:24:59	NA	33.03982	-117.0827	Perez, Sylvia
3	1625115	Electrical-Photovoltaic	293	2016-01-02 08:07:00	2016-01-02 07:07:47	2016-02-02 10:34:12	2016-02-03 17:11:07	32.82363	-117.2204	Perez, Sylvia
4	1625118	Electrical-Photovoltaic	293	2016-01-02 08:17:00	2016-01-02 07:18:34	2016-02-16 15:00:00	NA	32.96853	-117.1457	Perez, Sylvia
5	1625122	Electrical-Photovoltaic	293	2016-01-02 08:26:00	2016-01-02 07:28:12	2016-02-26 13:06:18	2016-02-26 13:06:20	32.97168	-117.0884	Perez, Sylvia
6	1625127	Electrical-Photovoltaic	293	2016-01-02 17:00:00	2016-01-02 07:57:03	2016-04-19 11:46:13	2016-04-25 09:47:58	32.83568	-117.1913	Perez, Sylvia
7	1625130	Electrical-Photovoltaic	293	2016-01-02 09:02:00	2016-01-02 08:03:25	2016-01-21 15:00:00	NA	32.97453	-117.1372	Perez, Sylvia
8	1625133	Electrical-Photovoltaic	293	2016-01-02 09:09:00	2016-01-02 08:10:45	2016-04-07 12:52:28	2016-04-27 16:31:35	32.78945	-117.1224	Perez, Sylvia
9	1625139	Electrical-Photovoltaic	293	2016-01-02 09:21:00	2016-01-02 08:22:48	2016-06-05 20:35:13	2016-06-14 21:11:26	32.71559	-117.0847	Perez, Sylvia
10	1625142	Electrical-Photovoltaic	293	2016-01-02 09:46:00	2016-01-02 08:46:44	2016-03-04 15:00:00	2016-03-07 05:57:42	33.00090	-117.0860	Perez, Sylvia
11	1625145	Electrical-Photovoltaic	293	2016-01-02 09:52:00	2016-01-02 08:53:23	2016-01-22 15:00:00	2016-01-25 06:04:29	32.92475	-117.0555	Perez, Sylvia
12	1625148	Electrical-Photovoltaic	293	2016-01-02 10:06:00	2016-01-02 09:07:28	2016-01-14 10:58:05	NA	32.74196	-117.1353	Perez, Sylvia
13	1625154	Electrical-Photovoltaic	293	2016-01-02 10:25:00	2016-01-02 09:25:53	2016-05-26 19:06:43	2016-05-26 19:06:57	32.73817	-117.0992	Perez, Sylvia
14	1625157	Electrical-Photovoltaic	293	2016-01-02 10:30:00	2016-01-02 09:30:58	2016-01-23 10:10:44	2016-01-28 18:25:25	32.91105	-117.1564	Perez, Sylvia
15	1625161	Electrical-Photovoltaic	293	2016-01-02 10:34:00	2016-01-02 09:36:09	2016-01-12 11:49:21	NA	32.70194	-117.1310	Perez, Sylvia
16	1625163	Electrical-Photovoltaic	293	2016-01-02 10:46:00	2016-01-02 09:47:06	2016-01-08 10:58:31	2016-01-08 10:58:32	32.81584	-117.2145	Perez, Sylvia
17	1625165	Electrical-Photovoltaic	293	2016-01-02 11:01:00	2016-01-02 10:02:12	2016-01-11 14:05:27	2016-02-03 15:04:39	33.03570	-117.0854	Perez, Sylvia
18	1625169	Electrical-Photovoltaic	293	2016-01-02 11:07:00	2016-01-02 10:08:10	2016-01-21 18:17:18	2016-01-21 18:17:46	32.94410	-117.2102	Perez, Sylvia
19	1625172	Electrical-Photovoltaic	293	2016-01-02 11:12:00	2016-01-02 10:13:19	2016-01-22 15:00:00	2016-03-09 08:12:04	32.91904	-117.0835	Perez, Sylvia
20	1625175	Electrical-Photovoltaic	293	2016-01-02 11:17:00	2016-01-02 10:18:43	2016-01-25 12:08:59	2016-01-25 12:09:02	32.77620	-117.1745	Perez, Sylvia
21	1625178	Electrical-Photovoltaic	293	2016-01-02 11:23:00	2016-01-02 10:23:49	2016-01-11 14:33:00	2016-01-11 14:33:11	32.81667	-117.0945	Perez, Sylvia
22	1625181	Electrical-Photovoltaic	293	2016-01-02 11:31:00	2016-01-02 10:32:24	2016-05-19 09:50:43	2016-05-19 14:17:25	32.83520	-117.2092	Perez, Sylvia
23	1625184	Electrical-Photovoltaic	293	2016-01-02 17:00:00	2016-01-02 11:08:58	2016-04-05 20:59:10	NA	32.59412	-117.0248	Perez, Sylvia
24	1625188	Electrical-Photovoltaic	293	2016-01-03 19:05:00	2016-01-03 18:06:18	2016-02-05 17:29:06	2016-02-05 17:29:11	32.70572	-117.0560	Perez, Sylvia
25	1625299	Electrical-Photovoltaic	293	2016-01-04 08:59:00	2016-01-04 08:01:07	2016-01-12 12:16:10	2016-01-24 16:58:44	32.99996	-117.1057	Perez, Sylvia
26	1625315	Electrical-Photovoltaic	293	2016-01-04 09:05:00	2016-01-04 08:06:51	2016-01-27 12:04:06	NA	32.70308	-117.1353	Perez, Sylvia
27	1625325	Electrical-Photovoltaic	293	2016-01-04 09:18:00	2016-01-04 08:18:52	2016-06-28 11:18:22	2016-06-28 11:18:42	32.58069	-117.0302	Perez, Sylvia

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solar\_permits



```
solar_permits_ps <- solar_permits
```

```
solar_permits_ps <- solar_permits %>%
```

```
solar_permits_ps <- solar_permits %>%
```

```
solar_permits_ps <- solar_permits %>%  
  filter(
```

```
solar_permits_ps <- solar_permits %>%  
  filter(issued_by
```



```
solar_permits_ps <- solar_permits %>%  
  filter(issued_by == )
```

```
solar_permits_ps <- solar_permits %>%  
  filter(issued_by == "Perez, Sylvia")
```

```
solar_permits_ps <- solar_permits %>%  
  filter(issued_by == "Perez, Sylvia")
```

<- is used to assign (= also used)

```
solar_permits_ps <- solar_permits %>%  
  filter(issued_by == "Perez, Sylvia")
```

<- is used to assign (= also used)

== is a marker of relationship (e.g. <, >)

```
solar_permits_ps <- solar_permits %>%  
  filter(issued_by == "Perez, Sylvia")
```

```
solar_permits_ps <- solar_permits %>%  
  filter(issued_by == "Perez, Sylvia")
```

*Other ways to do the same thing...*

```
solar_permits_ps <- solar_permits %>%  
  filter(issued_by == "Perez, Sylvia")
```

*Other ways to do the same thing...*

```
solar_permits_ps <-  
solar_permits[solar_permits$issued_by ==  
"Perez, Sylvia",]
```

```
solar_permits_ps <- solar_permits %>%  
  filter(issued_by == "Perez, Sylvia")
```

*Other ways to do the same thing...*

```
solar_permits_ps <-  
solar_permits[solar_permits$issued_by ==  
"Perez, Sylvia",]  
solar_permits_ps <- subset(solar_permits,  
issued_by == "Perez, Sylvia")
```



```
solar_permits_ps <- solar_permits %>%  
  filter(issued_by == "Perez, Sylvia")
```