

Business Objectives

Request in Brief:

Identifying the problem of the cabs which may cause for Non-availability or Cancellation the Trip From Railway-station to Different parts of City

In [1]:

```
#Import the Packages
import pandas as pd
import numpy as np
import datetime as dt
import seaborn as sns
import matplotlib.pyplot as plt
```

IMPORT DATA

In [2]:

```
obj_uber = pd.read_csv('F:/Uber_Request_Data.csv')
obj_uber.head(5)
```

Out[2]:

	Request_id	Pickup_point	Driver_point	Status	Request_timestamp	Drop_timestamp
0	619	Railwaystation	Hyderabad	Trip Completed	11/7/2016 11:51	11/7/2016 13:00
1	867	Railwaystation	Hyderabad	Trip Completed	11/7/2016 17:57	11/7/2016 18:47
2	1807	Airport	Hyderabad	Trip Completed	12/7/2016 9:17	12/7/2016 9:58
3	2532	Railwaystation	Hyderabad	Trip Completed	12/7/2016 21:08	12/7/2016 22:03
4	3112	Airport	Hyderabad	Trip Completed	13-07-2016 08:33:16	13-07-2016 09:25:47

In [3]:

```
obj_uber.describe()
```

Out[3]:

	Request_id
count	6745.000000
mean	3384.644922
std	1955.099667
min	1.000000
25%	1691.000000
50%	3387.000000
75%	5080.000000
max	6766.000000

In [4]:

```
# Checking for data types for each column
obj_uber.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 6745 entries, 0 to 6744
Data columns (total 6 columns):
Request id      6745 non-null int64
```

```
Request_id      6745 non-null object
Pickup_point    6745 non-null object
Driver_point    6745 non-null object
Status          6745 non-null object
Request_timestamp 6745 non-null object
Drop_timestamp  2831 non-null object
dtypes: int64(1), object(5)
memory usage: 184.5+ KB
```

In [5]:

```
obj_uber.shape
#so there are 6745 records
```

Out[5]:

```
(6745, 6)
```

In [6]:

```
obj_uber
```

Out[6]:

	Request_id	Pickup_point	Driver_point	Status	Request_timestamp	Drop_timestamp
0	619	Railwaystation	Hyderabad	Trip Completed	11/7/2016 11:51	11/7/2016 13:00
1	867	Railwaystation	Hyderabad	Trip Completed	11/7/2016 17:57	11/7/2016 18:47
2	1807	Airport	Hyderabad	Trip Completed	12/7/2016 9:17	12/7/2016 9:58
3	2532	Railwaystation	Hyderabad	Trip Completed	12/7/2016 21:08	12/7/2016 22:03
4	3112	Airport	Hyderabad	Trip Completed	13-07-2016 08:33:16	13-07-2016 09:25:47
5	3879	Railwaystation	Hyderabad	Trip Completed	13-07-2016 21:57:28	13-07-2016 22:28:59
6	4270	Railwaystation	Hyderabad	Trip Completed	14-07-2016 06:15:32	14-07-2016 07:13:15
7	5510	Railwaystation	Hyderabad	Trip Completed	15-07-2016 05:11:52	15-07-2016 06:07:52
8	6248	Airport	Hyderabad	Trip Completed	15-07-2016 17:57:27	15-07-2016 18:50:51
9	267	Airport	Hyderabad	Trip Completed	11/7/2016 6:46	11/7/2016 7:25
10	1467	Railwaystation	Hyderabad	Trip Completed	12/7/2016 5:08	12/7/2016 6:02
11	1983	Airport	Hyderabad	Trip Completed	12/7/2016 12:30	12/7/2016 12:57
12	2784	Railwaystation	Hyderabad	Trip Completed	13-07-2016 04:49:20	13-07-2016 05:23:03
13	3075	Airport	Hyderabad	Trip Completed	13-07-2016 08:02:53	13-07-2016 09:16:19
14	3379	Airport	Hyderabad	Trip Completed	13-07-2016 14:23:02	13-07-2016 15:35:18
15	3482	Railwaystation	Hyderabad	Trip Completed	13-07-2016 17:23:18	13-07-2016 18:20:51
16	4652	Airport	Hyderabad	Trip Completed	14-07-2016 12:01:02	14-07-2016 12:36:46
17	5335	Railwaystation	Hyderabad	Trip Completed	14-07-2016 22:24:13	14-07-2016 23:18:52
18	535	Railwaystation	Hyderabad	Trip Completed	11/7/2016 10:00	11/7/2016 10:31
19	960	Railwaystation	Hyderabad	Trip Completed	11/7/2016 18:45	11/7/2016 19:23
20	1934	Railwaystation	Hyderabad	Trip Completed	12/7/2016 11:17	12/7/2016 12:23
21	2083	Railwaystation	Hyderabad	Trip Completed	12/7/2016 15:46	12/7/2016 16:40
22	2211	Railwaystation	Hyderabad	Trip Completed	12/7/2016 18:00	12/7/2016 18:28
23	3096	Railwaystation	Hyderabad	Trip Completed	13-07-2016 08:17:29	13-07-2016 09:22:37
24	3881	Railwaystation	Hyderabad	Trip Completed	13-07-2016 21:54:18	13-07-2016 22:51:23
25	5254	Airport	Hyderabad	Trip Completed	14-07-2016 21:23:03	14-07-2016 22:25:19
26	5434	Airport	Hyderabad	Trip Completed	15-07-2016 02:41:38	15-07-2016 03:24:43
27	5916	Airport	Hyderabad	Trip Completed	15-07-2016 10:00:43	15-07-2016 10:53:06
28	669	Airport	Hyderabad	Trip Completed	11/7/2016 13:08	11/7/2016 13:49

29	1567	Railwaystation	Hyderabad	Trip Completed	12/7/2016 6:21	12/7/2016 7:10
Request_id	Pickup_point	Driver_point	Status	Request_timestamp	Drop_timestamp	
...
6715	6683	Airport	Begumpet	No Cars Available	15-07-2016 22:34:01	NaN
6716	6686	Railwaystation	Begumpet	No Cars Available	15-07-2016 22:36:13	NaN
6717	6688	Railwaystation	Begumpet	No Cars Available	15-07-2016 22:37:37	NaN
6718	6689	Railwaystation	Begumpet	No Cars Available	15-07-2016 22:43:46	NaN
6719	6693	Airport	Begumpet	No Cars Available	15-07-2016 22:49:33	NaN
6720	6696	Airport	Begumpet	No Cars Available	15-07-2016 22:49:45	NaN
6721	6697	Railwaystation	Begumpet	No Cars Available	15-07-2016 22:51:18	NaN
6722	6709	Railwaystation	Begumpet	No Cars Available	15-07-2016 22:56:00	NaN
6723	6706	Railwaystation	Begumpet	No Cars Available	15-07-2016 22:58:15	NaN
6724	6708	Airport	Begumpet	No Cars Available	15-07-2016 23:03:23	NaN
6725	6713	Airport	Begumpet	No Cars Available	15-07-2016 23:08:14	NaN
6726	6715	Airport	Begumpet	No Cars Available	15-07-2016 23:11:41	NaN
6727	6716	Airport	Begumpet	No Cars Available	15-07-2016 23:14:36	NaN
6728	6718	Railwaystation	Begumpet	No Cars Available	15-07-2016 23:14:39	NaN
6729	6720	Airport	Begumpet	No Cars Available	15-07-2016 23:16:48	NaN
6730	6722	Railwaystation	Begumpet	No Cars Available	15-07-2016 23:18:21	NaN
6731	6725	Railwaystation	Begumpet	No Cars Available	15-07-2016 23:21:53	NaN
6732	6728	Airport	Begumpet	No Cars Available	15-07-2016 23:26:50	NaN
6733	6730	Railwaystation	Begumpet	No Cars Available	15-07-2016 23:27:55	NaN
6734	6732	Railwaystation	Begumpet	No Cars Available	15-07-2016 23:35:50	NaN
6735	6737	Railwaystation	Begumpet	No Cars Available	15-07-2016 23:39:15	NaN
6736	6744	Railwaystation	Begumpet	No Cars Available	15-07-2016 23:42:51	NaN
6737	6740	Airport	Begumpet	No Cars Available	15-07-2016 23:43:54	NaN
6738	6746	Airport	Begumpet	No Cars Available	15-07-2016 23:46:03	NaN
6739	6739	Airport	Begumpet	No Cars Available	15-07-2016 23:46:20	NaN
6740	6745	Airport	Begumpet	No Cars Available	15-07-2016 23:49:03	NaN
6741	6752	Railwaystation	Begumpet	No Cars Available	15-07-2016 23:50:05	NaN
6742	6751	Airport	Begumpet	No Cars Available	15-07-2016 23:52:06	NaN
6743	6754	Airport	Begumpet	No Cars Available	15-07-2016 23:54:39	NaN
6744	6753	Railwaystation	Begumpet	No Cars Available	15-07-2016 23:55:03	NaN

6745 rows x 6 columns

In [7]:

```
# If duplicate requests are recorded
sum(obj_uber['Request_id'].value_counts()>1)
```

Out[7]:

0

DATA CLEANING

In [8]:

```
#Checking for null value
obj_uber.isnull().sum()
```

Out[8]:

Request_id 0

```
Request_id      0
Pickup_point    0
Driver_point    0
Status          0
Request_timestamp 0
Drop_timestamp  3914
dtype: int64
```

In [9]:

```
print(obj_uber['Status'].value_counts())
print(' - For "No car available"')
print(obj_uber[obj_uber['Status']=='No Cars Available'].isnull().sum())
print(' - For "Cancelled"')
print(obj_uber[obj_uber['Status']=='Cancelled'].isnull().sum())
print(2650+1264)
# All the blank values are valid
```

```
Trip Completed      2831
No Cars Available    2650
Cancelled           1264
Name: Status, dtype: int64
- For "No car available"
Request_id          0
Pickup_point        0
Driver_point        0
Status              0
Request_timestamp    0
Drop_timestamp      2650
dtype: int64
- For "Cancelled"
Request_id          0
Pickup_point        0
Driver_point        0
Status              0
Request_timestamp    0
Drop_timestamp      1264
dtype: int64
3914
```

In [10]:

```
# Driver id put as 0 if NA
obj_uber['Driver_point'].fillna(0,inplace=True)
```

In [11]:

```
# converting Requestid to categorical variable
obj_uber['Request_id'] = obj_uber['Request_id'].astype(str)
```

In [12]:

```
# converting Request timestamp to datetime
obj_uber['Request_timestamp'] = pd.to_datetime(obj_uber['Request_timestamp'],dayfirst=True)
e)
```

In [13]:

```
obj_uber.isnull
```

Out[13]:

```
<bound method DataFrame.isnull of      Request_id  Pickup_point  Driver_point
Status \
0          619  Railwaystation  Hyderabad    Trip Completed
1          867  Railwaystation  Hyderabad    Trip Completed
2         1807      Airport      Hyderabad    Trip Completed
3         2532  Railwaystation  Hyderabad    Trip Completed
4         3112      Airport      Hyderabad    Trip Completed
5         3879  Railwaystation  Hyderabad    Trip Completed
6         4270  Railwaystation  Hyderabad    Trip Completed
7         5510  Railwaystation  Hyderabad    Trip Completed
```

8	6248	Airport	Hyderabad	Trip Completed
9	267	Airport	Hyderabad	Trip Completed
10	1467	Railwaystation	Hyderabad	Trip Completed
11	1983	Airport	Hyderabad	Trip Completed
12	2784	Railwaystation	Hyderabad	Trip Completed
13	3075	Airport	Hyderabad	Trip Completed
14	3379	Airport	Hyderabad	Trip Completed
15	3482	Railwaystation	Hyderabad	Trip Completed
16	4652	Airport	Hyderabad	Trip Completed
17	5335	Railwaystation	Hyderabad	Trip Completed
18	535	Railwaystation	Hyderabad	Trip Completed
19	960	Railwaystation	Hyderabad	Trip Completed
20	1934	Railwaystation	Hyderabad	Trip Completed
21	2083	Railwaystation	Hyderabad	Trip Completed
22	2211	Railwaystation	Hyderabad	Trip Completed
23	3096	Railwaystation	Hyderabad	Trip Completed
24	3881	Railwaystation	Hyderabad	Trip Completed
25	5254	Airport	Hyderabad	Trip Completed
26	5434	Airport	Hyderabad	Trip Completed
27	5916	Airport	Hyderabad	Trip Completed
28	669	Airport	Hyderabad	Trip Completed
29	1567	Railwaystation	Hyderabad	Trip Completed
...
6715	6683	Airport	Begumpet	No Cars Available
6716	6686	Railwaystation	Begumpet	No Cars Available
6717	6688	Railwaystation	Begumpet	No Cars Available
6718	6689	Railwaystation	Begumpet	No Cars Available
6719	6693	Airport	Begumpet	No Cars Available
6720	6696	Airport	Begumpet	No Cars Available
6721	6697	Railwaystation	Begumpet	No Cars Available
6722	6709	Railwaystation	Begumpet	No Cars Available
6723	6706	Railwaystation	Begumpet	No Cars Available
6724	6708	Airport	Begumpet	No Cars Available
6725	6713	Airport	Begumpet	No Cars Available
6726	6715	Airport	Begumpet	No Cars Available
6727	6716	Airport	Begumpet	No Cars Available
6728	6718	Railwaystation	Begumpet	No Cars Available
6729	6720	Airport	Begumpet	No Cars Available
6730	6722	Railwaystation	Begumpet	No Cars Available
6731	6725	Railwaystation	Begumpet	No Cars Available
6732	6728	Airport	Begumpet	No Cars Available
6733	6730	Railwaystation	Begumpet	No Cars Available
6734	6732	Railwaystation	Begumpet	No Cars Available
6735	6737	Railwaystation	Begumpet	No Cars Available
6736	6744	Railwaystation	Begumpet	No Cars Available
6737	6740	Airport	Begumpet	No Cars Available
6738	6746	Airport	Begumpet	No Cars Available
6739	6739	Airport	Begumpet	No Cars Available
6740	6745	Airport	Begumpet	No Cars Available
6741	6752	Railwaystation	Begumpet	No Cars Available
6742	6751	Airport	Begumpet	No Cars Available
6743	6754	Airport	Begumpet	No Cars Available
6744	6753	Railwaystation	Begumpet	No Cars Available

	Request_timestamp		Drop_timestamp	
0	2016-07-11	11:51:00	11/7/2016	13:00
1	2016-07-11	17:57:00	11/7/2016	18:47
2	2016-07-12	09:17:00	12/7/2016	9:58
3	2016-07-12	21:08:00	12/7/2016	22:03
4	2016-07-13	08:33:16	13-07-2016	09:25:47
5	2016-07-13	21:57:28	13-07-2016	22:28:59
6	2016-07-14	06:15:32	14-07-2016	07:13:15
7	2016-07-15	05:11:52	15-07-2016	06:07:52
8	2016-07-15	17:57:27	15-07-2016	18:50:51
9	2016-07-11	06:46:00	11/7/2016	7:25
10	2016-07-12	05:08:00	12/7/2016	6:02
11	2016-07-12	12:30:00	12/7/2016	12:57
12	2016-07-13	04:49:20	13-07-2016	05:23:03
13	2016-07-13	08:02:53	13-07-2016	09:16:19
14	2016-07-13	14:23:02	13-07-2016	15:35:18
15	2016-07-13	17:23:18	13-07-2016	18:20:51
16	2016-07-14	12:01:02	14-07-2016	12:36:46

```

17 2016-07-14 22:24:13 14-07-2016 23:18:52
18 2016-07-11 10:00:00 11/7/2016 10:31
19 2016-07-11 18:45:00 11/7/2016 19:23
20 2016-07-12 11:17:00 12/7/2016 12:23
21 2016-07-12 15:46:00 12/7/2016 16:40
22 2016-07-12 18:00:00 12/7/2016 18:28
23 2016-07-13 08:17:29 13-07-2016 09:22:37
24 2016-07-13 21:54:18 13-07-2016 22:51:23
25 2016-07-14 21:23:03 14-07-2016 22:25:19
26 2016-07-15 02:41:38 15-07-2016 03:24:43
27 2016-07-15 10:00:43 15-07-2016 10:53:06
28 2016-07-11 13:08:00 11/7/2016 13:49
29 2016-07-12 06:21:00 12/7/2016 7:10

```

```

...
6715 2016-07-15 22:34:01 NaN
6716 2016-07-15 22:36:13 NaN
6717 2016-07-15 22:37:37 NaN
6718 2016-07-15 22:43:46 NaN
6719 2016-07-15 22:49:33 NaN
6720 2016-07-15 22:49:45 NaN
6721 2016-07-15 22:51:18 NaN
6722 2016-07-15 22:56:00 NaN
6723 2016-07-15 22:58:15 NaN
6724 2016-07-15 23:03:23 NaN
6725 2016-07-15 23:08:14 NaN
6726 2016-07-15 23:11:41 NaN
6727 2016-07-15 23:14:36 NaN
6728 2016-07-15 23:14:39 NaN
6729 2016-07-15 23:16:48 NaN
6730 2016-07-15 23:18:21 NaN
6731 2016-07-15 23:21:53 NaN
6732 2016-07-15 23:26:50 NaN
6733 2016-07-15 23:27:55 NaN
6734 2016-07-15 23:35:50 NaN
6735 2016-07-15 23:39:15 NaN
6736 2016-07-15 23:42:51 NaN
6737 2016-07-15 23:43:54 NaN
6738 2016-07-15 23:46:03 NaN
6739 2016-07-15 23:46:20 NaN
6740 2016-07-15 23:49:03 NaN
6741 2016-07-15 23:50:05 NaN
6742 2016-07-15 23:52:06 NaN
6743 2016-07-15 23:54:39 NaN
6744 2016-07-15 23:55:03 NaN

```

[6745 rows x 6 columns]>

In [14]:

```

obj_fillna=obj_uber.fillna(0)
obj_fillna

```

Out[14]:

	Request_id	Pickup_point	Driver_point	Status	Request_timestamp	Drop_timestamp
0	619	Railwaystation	Hyderabad	Trip Completed	2016-07-11 11:51:00	11/7/2016 13:00
1	867	Railwaystation	Hyderabad	Trip Completed	2016-07-11 17:57:00	11/7/2016 18:47
2	1807	Airport	Hyderabad	Trip Completed	2016-07-12 09:17:00	12/7/2016 9:58
3	2532	Railwaystation	Hyderabad	Trip Completed	2016-07-12 21:08:00	12/7/2016 22:03
4	3112	Airport	Hyderabad	Trip Completed	2016-07-13 08:33:16	13-07-2016 09:25:47
5	3879	Railwaystation	Hyderabad	Trip Completed	2016-07-13 21:57:28	13-07-2016 22:28:59
6	4270	Railwaystation	Hyderabad	Trip Completed	2016-07-14 06:15:32	14-07-2016 07:13:15
7	5510	Railwaystation	Hyderabad	Trip Completed	2016-07-15 05:11:52	15-07-2016 06:07:52
8	6248	Airport	Hyderabad	Trip Completed	2016-07-15 17:57:27	15-07-2016 18:50:51
9	267	Airport	Hyderabad	Trip Completed	2016-07-11 06:46:00	11/7/2016 7:25

10	Request_id	Pickup_point	Driver_point	Trip Completed	Status	Request_timestamp	Drop_timestamp
11	1467	Railwaystation	Hyderabad	Trip Completed	2016-07-12 05:08:00	12/7/2016 6:02	
12	1983	Airport	Hyderabad	Trip Completed	2016-07-12 12:30:00	12/7/2016 12:57	
13	2784	Railwaystation	Hyderabad	Trip Completed	2016-07-13 04:49:20	13-07-2016 05:23:03	
14	3075	Airport	Hyderabad	Trip Completed	2016-07-13 08:02:53	13-07-2016 09:16:19	
15	3379	Airport	Hyderabad	Trip Completed	2016-07-13 14:23:02	13-07-2016 15:35:18	
16	3482	Railwaystation	Hyderabad	Trip Completed	2016-07-13 17:23:18	13-07-2016 18:20:51	
17	4652	Airport	Hyderabad	Trip Completed	2016-07-14 12:01:02	14-07-2016 12:36:46	
18	5335	Railwaystation	Hyderabad	Trip Completed	2016-07-14 22:24:13	14-07-2016 23:18:52	
19	535	Railwaystation	Hyderabad	Trip Completed	2016-07-11 10:00:00	11/7/2016 10:31	
20	960	Railwaystation	Hyderabad	Trip Completed	2016-07-11 18:45:00	11/7/2016 19:23	
21	1934	Railwaystation	Hyderabad	Trip Completed	2016-07-12 11:17:00	12/7/2016 12:23	
22	2083	Railwaystation	Hyderabad	Trip Completed	2016-07-12 15:46:00	12/7/2016 16:40	
23	2211	Railwaystation	Hyderabad	Trip Completed	2016-07-12 18:00:00	12/7/2016 18:28	
24	3096	Railwaystation	Hyderabad	Trip Completed	2016-07-13 08:17:29	13-07-2016 09:22:37	
25	3881	Railwaystation	Hyderabad	Trip Completed	2016-07-13 21:54:18	13-07-2016 22:51:23	
26	5254	Airport	Hyderabad	Trip Completed	2016-07-14 21:23:03	14-07-2016 22:25:19	
27	5434	Airport	Hyderabad	Trip Completed	2016-07-15 02:41:38	15-07-2016 03:24:43	
28	5916	Airport	Hyderabad	Trip Completed	2016-07-15 10:00:43	15-07-2016 10:53:06	
29	669	Airport	Hyderabad	Trip Completed	2016-07-11 13:08:00	11/7/2016 13:49	
...	1567	Railwaystation	Hyderabad	Trip Completed	2016-07-12 06:21:00	12/7/2016 7:10	
...
6715	6683	Airport	Begumpet	No Cars Available	2016-07-15 22:34:01	0	
6716	6686	Railwaystation	Begumpet	No Cars Available	2016-07-15 22:36:13	0	
6717	6688	Railwaystation	Begumpet	No Cars Available	2016-07-15 22:37:37	0	
6718	6689	Railwaystation	Begumpet	No Cars Available	2016-07-15 22:43:46	0	
6719	6693	Airport	Begumpet	No Cars Available	2016-07-15 22:49:33	0	
6720	6696	Airport	Begumpet	No Cars Available	2016-07-15 22:49:45	0	
6721	6697	Railwaystation	Begumpet	No Cars Available	2016-07-15 22:51:18	0	
6722	6709	Railwaystation	Begumpet	No Cars Available	2016-07-15 22:56:00	0	
6723	6706	Railwaystation	Begumpet	No Cars Available	2016-07-15 22:58:15	0	
6724	6708	Airport	Begumpet	No Cars Available	2016-07-15 23:03:23	0	
6725	6713	Airport	Begumpet	No Cars Available	2016-07-15 23:08:14	0	
6726	6715	Airport	Begumpet	No Cars Available	2016-07-15 23:11:41	0	
6727	6716	Airport	Begumpet	No Cars Available	2016-07-15 23:14:36	0	
6728	6718	Railwaystation	Begumpet	No Cars Available	2016-07-15 23:14:39	0	
6729	6720	Airport	Begumpet	No Cars Available	2016-07-15 23:16:48	0	
6730	6722	Railwaystation	Begumpet	No Cars Available	2016-07-15 23:18:21	0	
6731	6725	Railwaystation	Begumpet	No Cars Available	2016-07-15 23:21:53	0	
6732	6728	Airport	Begumpet	No Cars Available	2016-07-15 23:26:50	0	
6733	6730	Railwaystation	Begumpet	No Cars Available	2016-07-15 23:27:55	0	
6734	6732	Railwaystation	Begumpet	No Cars Available	2016-07-15 23:35:50	0	
6735	6737	Railwaystation	Begumpet	No Cars Available	2016-07-15 23:39:15	0	
6736	6744	Railwaystation	Begumpet	No Cars Available	2016-07-15 23:42:51	0	
6737	6740	Airport	Begumpet	No Cars Available	2016-07-15 23:43:54	0	
6738	6746	Airport	Begumpet	No Cars Available	2016-07-15 23:46:03	0	

6739	Request_id	Pickup_point	Driver_point	No Cars Available	Status	Request_timestamp	Drop_timestamp	0
6740	6745	Airport	Begumpet	No Cars Available		2016-07-15 23:49:03		0
6741	6752	Railwaystation	Begumpet	No Cars Available		2016-07-15 23:50:05		0
6742	6751	Airport	Begumpet	No Cars Available		2016-07-15 23:52:06		0
6743	6754	Airport	Begumpet	No Cars Available		2016-07-15 23:54:39		0
6744	6753	Railwaystation	Begumpet	No Cars Available		2016-07-15 23:55:03		0

6745 rows × 6 columns

Checking if Drop time is before request time

In [15]:

```
#obj_uber.loc[obj_uber['Drop_timestamp']<obj_uber['Request_timestamp'],:]
# There are no records with older request date than drop date.
```

In [16]:

```
obj_nan=obj_uber.dropna(axis=1)
obj_nan
```

Out[16]:

	Request_id	Pickup_point	Driver_point	Status	Request_timestamp
0	619	Railwaystation	Hyderabad	Trip Completed	2016-07-11 11:51:00
1	867	Railwaystation	Hyderabad	Trip Completed	2016-07-11 17:57:00
2	1807	Airport	Hyderabad	Trip Completed	2016-07-12 09:17:00
3	2532	Railwaystation	Hyderabad	Trip Completed	2016-07-12 21:08:00
4	3112	Airport	Hyderabad	Trip Completed	2016-07-13 08:33:16
5	3879	Railwaystation	Hyderabad	Trip Completed	2016-07-13 21:57:28
6	4270	Railwaystation	Hyderabad	Trip Completed	2016-07-14 06:15:32
7	5510	Railwaystation	Hyderabad	Trip Completed	2016-07-15 05:11:52
8	6248	Airport	Hyderabad	Trip Completed	2016-07-15 17:57:27
9	267	Airport	Hyderabad	Trip Completed	2016-07-11 06:46:00
10	1467	Railwaystation	Hyderabad	Trip Completed	2016-07-12 05:08:00
11	1983	Airport	Hyderabad	Trip Completed	2016-07-12 12:30:00
12	2784	Railwaystation	Hyderabad	Trip Completed	2016-07-13 04:49:20
13	3075	Airport	Hyderabad	Trip Completed	2016-07-13 08:02:53
14	3379	Airport	Hyderabad	Trip Completed	2016-07-13 14:23:02
15	3482	Railwaystation	Hyderabad	Trip Completed	2016-07-13 17:23:18
16	4652	Airport	Hyderabad	Trip Completed	2016-07-14 12:01:02
17	5335	Railwaystation	Hyderabad	Trip Completed	2016-07-14 22:24:13
18	535	Railwaystation	Hyderabad	Trip Completed	2016-07-11 10:00:00
19	960	Railwaystation	Hyderabad	Trip Completed	2016-07-11 18:45:00
20	1934	Railwaystation	Hyderabad	Trip Completed	2016-07-12 11:17:00
21	2083	Railwaystation	Hyderabad	Trip Completed	2016-07-12 15:46:00
22	2211	Railwaystation	Hyderabad	Trip Completed	2016-07-12 18:00:00
23	3096	Railwaystation	Hyderabad	Trip Completed	2016-07-13 08:17:29
24	3881	Railwaystation	Hyderabad	Trip Completed	2016-07-13 21:54:18
25	5254	Airport	Hyderabad	Trip Completed	2016-07-14 21:23:03
26	5434	Airport	Hyderabad	Trip Completed	2016-07-15 02:41:38

27	Request_id	Pickup_point	Driver_point	Status	Request_timestamp
	3916	Airport	Hyderabad	Trip Completed	2016-07-15 10:00:48
28	669	Airport	Hyderabad	Trip Completed	2016-07-11 13:08:00
29	1567	Railwaystation	Hyderabad	Trip Completed	2016-07-12 06:21:00
...
6715	6683	Airport	Begumpet	No Cars Available	2016-07-15 22:34:01
6716	6686	Railwaystation	Begumpet	No Cars Available	2016-07-15 22:36:13
6717	6688	Railwaystation	Begumpet	No Cars Available	2016-07-15 22:37:37
6718	6689	Railwaystation	Begumpet	No Cars Available	2016-07-15 22:43:46
6719	6693	Airport	Begumpet	No Cars Available	2016-07-15 22:49:33
6720	6696	Airport	Begumpet	No Cars Available	2016-07-15 22:49:45
6721	6697	Railwaystation	Begumpet	No Cars Available	2016-07-15 22:51:18
6722	6709	Railwaystation	Begumpet	No Cars Available	2016-07-15 22:56:00
6723	6706	Railwaystation	Begumpet	No Cars Available	2016-07-15 22:58:15
6724	6708	Airport	Begumpet	No Cars Available	2016-07-15 23:03:23
6725	6713	Airport	Begumpet	No Cars Available	2016-07-15 23:08:14
6726	6715	Airport	Begumpet	No Cars Available	2016-07-15 23:11:41
6727	6716	Airport	Begumpet	No Cars Available	2016-07-15 23:14:36
6728	6718	Railwaystation	Begumpet	No Cars Available	2016-07-15 23:14:39
6729	6720	Airport	Begumpet	No Cars Available	2016-07-15 23:16:48
6730	6722	Railwaystation	Begumpet	No Cars Available	2016-07-15 23:18:21
6731	6725	Railwaystation	Begumpet	No Cars Available	2016-07-15 23:21:53
6732	6728	Airport	Begumpet	No Cars Available	2016-07-15 23:26:50
6733	6730	Railwaystation	Begumpet	No Cars Available	2016-07-15 23:27:55
6734	6732	Railwaystation	Begumpet	No Cars Available	2016-07-15 23:35:50
6735	6737	Railwaystation	Begumpet	No Cars Available	2016-07-15 23:39:15
6736	6744	Railwaystation	Begumpet	No Cars Available	2016-07-15 23:42:51
6737	6740	Airport	Begumpet	No Cars Available	2016-07-15 23:43:54
6738	6746	Airport	Begumpet	No Cars Available	2016-07-15 23:46:03
6739	6739	Airport	Begumpet	No Cars Available	2016-07-15 23:46:20
6740	6745	Airport	Begumpet	No Cars Available	2016-07-15 23:49:03
6741	6752	Railwaystation	Begumpet	No Cars Available	2016-07-15 23:50:05
6742	6751	Airport	Begumpet	No Cars Available	2016-07-15 23:52:06
6743	6754	Airport	Begumpet	No Cars Available	2016-07-15 23:54:39
6744	6753	Railwaystation	Begumpet	No Cars Available	2016-07-15 23:55:03

6745 rows x 5 columns

In [17]:

```
obj_uber.isnull().sum()
```

Out[17]:

```
Request_id          0
Pickup_point        0
Driver_point        0
Status              0
Request_timestamp    0
Drop_timestamp      3914
dtype: int64
```

We can bin the request time into various categories:

- 1.Early Morning: 00:00:00 to 03:00:00
- 2.Mid Morning: 03:00:01 to 06:00:00
- 3.Late Morning: 06:00:01 to 09:00:00
- 4.Before Noon: 09:00:01 to 12:00:00
- 5.After Noon: 12:00:01 to 15:00:00
- 6.Evening: 15:00:01 to 18:00:00
- 7.Late Evening: 18:00:01 to 21:00:00
- 8.Night: 21:00:01 to 23:59:59

In [18]:

```
# Binning time into part of the day as per above
obj_uber.loc[(obj_uber.loc[:, 'Request_timestamp'].dt.time >= dt.time(0,0,0)) & (obj_uber.
.loc[:, 'Request_timestamp'].dt.time <= dt.time(3,0,0))
, 'Day_part'] = 'EarlyMorning'
```

In [19]:

```
obj_uber.loc[(obj_uber.loc[:, 'Request_timestamp'].dt.time > dt.time(3,0,1)) & (obj_uber.
.loc[:, 'Request_timestamp'].dt.time <= dt.time(6,0,0)),
'Day_part'] = 'MidMorning'
```

In [20]:

```
obj_uber.loc[(obj_uber.loc[:, 'Request_timestamp'].dt.time > dt.time(6,0,1)) & (obj_uber.
.loc[:, 'Request_timestamp'].dt.time <= dt.time(9,0,0)),
'Day_part'] = 'LateMorning'
```

In [21]:

```
obj_uber.loc[(obj_uber.loc[:, 'Request_timestamp'].dt.time > dt.time(9,0,1)) & (obj_uber.
.loc[:, 'Request_timestamp'].dt.time <= dt.time(12,0,0)),
'Day_part'] = 'BeforeNoon'
```

In [22]:

```
obj_uber.loc[(obj_uber.loc[:, 'Request_timestamp'].dt.time > dt.time(12,0,1)) & (obj_uber.
.loc[:, 'Request_timestamp'].dt.time <= dt.time(15,0,0)),
'Day_part'] = 'AfterNoon'
```

In [23]:

```
obj_uber.loc[(obj_uber.loc[:, 'Request_timestamp'].dt.time > dt.time(15,0,1)) & (obj_uber.
.loc[:, 'Request_timestamp'].dt.time <= dt.time(18,0,0)),
'Day_part'] = 'Evening'
```

In [24]:

```
obj_uber.loc[(obj_uber.loc[:, 'Request_timestamp'].dt.time > dt.time(18,0,1)) & (obj_uber.
.loc[:, 'Request_timestamp'].dt.time <= dt.time(21,0,0)),
'Day_part'] = 'LateEvening'
```

In [25]:

```
obj_uber.loc[(obj_uber.loc[:, 'Request_timestamp'].dt.time > dt.time(21,0,1)) & (obj_uber.
.loc[:, 'Request_timestamp'].dt.time <= dt.time(23,59,59)),
'Day_part'] = 'Night'
```

To check how much time each ride took (in Min):

In [26]:

```
obj_uber.head(5)
```

Out[26]:

	Request_id	Pickup_point	Driver_point	Status	Request_timestamp	Drop_timestamp	Day_part
0	619	Railwaystation	Hyderabad	Trip Completed	2016-07-11 11:51:00	11/7/2016 13:00	BeforeNoon
1	867	Railwaystation	Hyderabad	Trip Completed	2016-07-11 17:57:00	11/7/2016 18:47	Evening
2	1807	Airport	Hyderabad	Trip Completed	2016-07-12 09:17:00	12/7/2016 9:58	BeforeNoon
3	2532	Railwaystation	Hyderabad	Trip Completed	2016-07-12 21:08:00	12/7/2016 22:03	Night
4	3112	Airport	Hyderabad	Trip Completed	2016-07-13 08:33:16	13-07-2016 09:25:47	LateMorning

In [27]:

```
#obj_uber['Ride_time'] = obj_uber['Drop_timestamp'] - obj_uber['Request_timestamp']
#obj_uber['Ride_time'] = pd.DatetimeIndex(uber['Ride_time']).hour*60 + pd.DatetimeIndex(uber['Ride_time']).minute
```

In [28]:

```
obj_uber.loc[obj_uber['Pickup_point']=='Airport','Path'] = 'Airport_to_City'
obj_uber.loc[obj_uber['Pickup_point']=='Railwaystation','Path'] = 'Railwaystation_to_City'
```

In [29]:

```
obj_uber.head(5)
```

Out[29]:

	Request_id	Pickup_point	Driver_point	Status	Request_timestamp	Drop_timestamp	Day_part	Path
0	619	Railwaystation	Hyderabad	Trip Completed	2016-07-11 11:51:00	11/7/2016 13:00	BeforeNoon	Railwaystation_to_City
1	867	Railwaystation	Hyderabad	Trip Completed	2016-07-11 17:57:00	11/7/2016 18:47	Evening	Railwaystation_to_City
2	1807	Airport	Hyderabad	Trip Completed	2016-07-12 09:17:00	12/7/2016 9:58	BeforeNoon	Airport_to_City
3	2532	Railwaystation	Hyderabad	Trip Completed	2016-07-12 21:08:00	12/7/2016 22:03	Night	Railwaystation_to_City
4	3112	Airport	Hyderabad	Trip Completed	2016-07-13 08:33:16	13-07-2016 09:25:47	LateMorning	Airport_to_City

In [30]:

```
obj_uber.info()
```

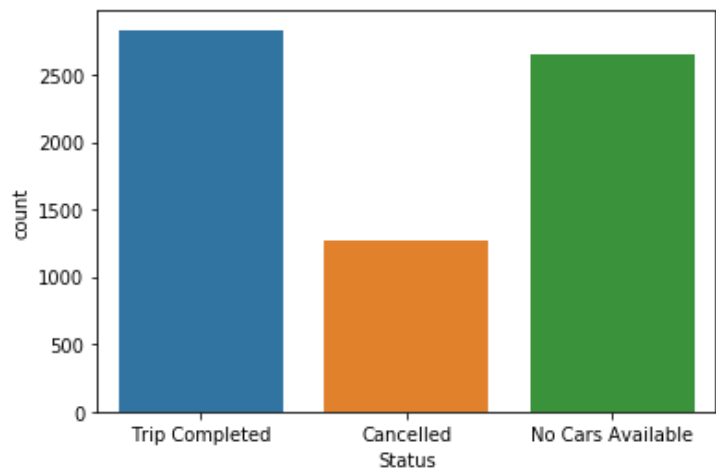
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 6745 entries, 0 to 6744
Data columns (total 8 columns):
Request_id      6745 non-null object
Pickup_point    6745 non-null object
Driver_point    6745 non-null object
Status          6745 non-null object
Request_timestamp 6745 non-null datetime64[ns]
Drop_timestamp  2831 non-null object
Day_part        6745 non-null object
Path            6745 non-null object
dtypes: datetime64[ns](1), object(7)
memory usage: 237.2+ KB
```

In [31]:

```
# Count on Status
#obj_uber['Status'].value_counts().plot(kind='bar')
sns.countplot(x="Status",data=obj_uber)
```

Out[31]:

<matplotlib.axes._subplots.AxesSubplot at 0xea28590>

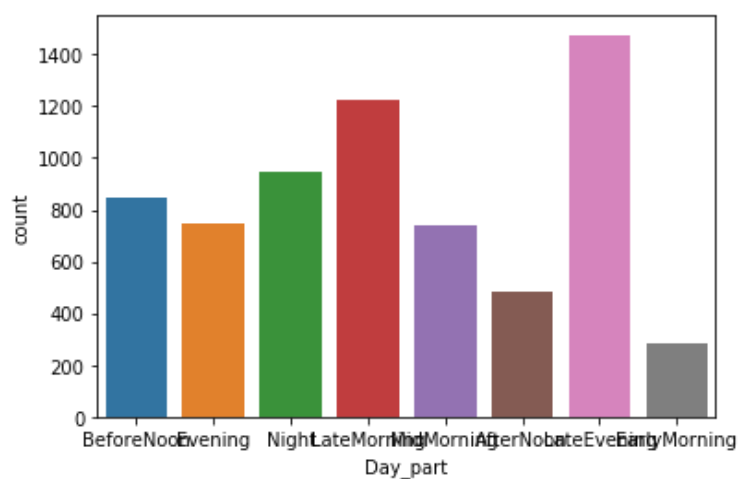


In [32]:

```
# Count on part of the day
#obj_uber['Day_part'].value_counts()
plt.figure(figsize=(80,50))
sns.countplot(x="Day_part",data=obj_uber)
```

Out[32]:

<matplotlib.axes._subplots.AxesSubplot at 0xfa7d210>

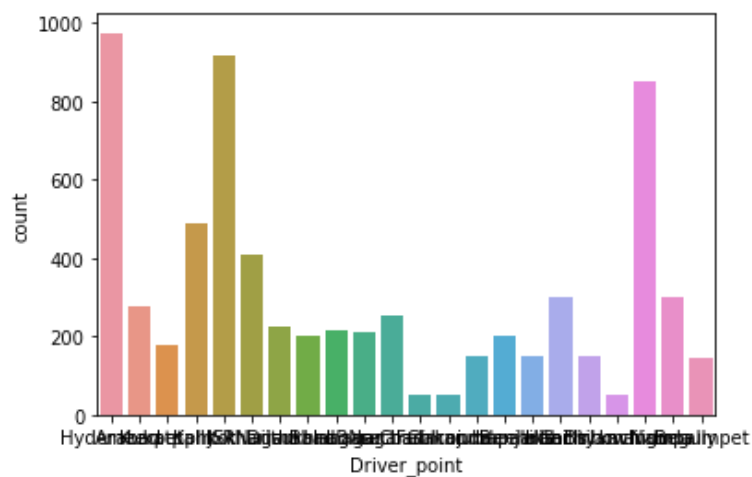


In [33]:

```
# Count on part of the day
plt.figure(figsize=(80,50))
sns.countplot(x="Driver_point",data=obj_uber)
```

Out[33]:

<matplotlib.axes._subplots.AxesSubplot at 0xfb0ad50>

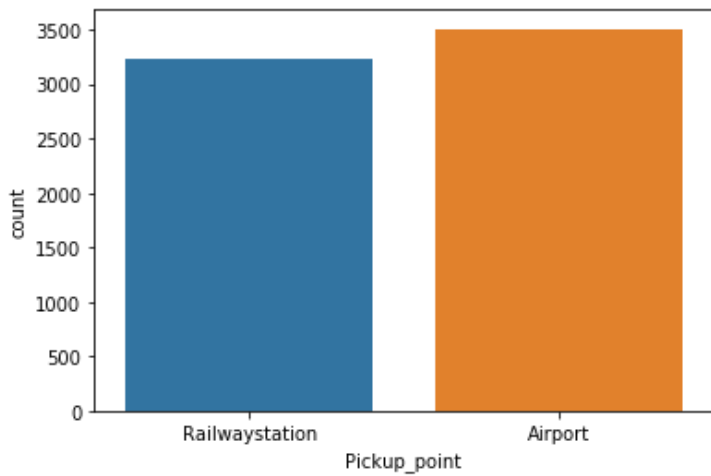


In [34]:

```
#obj_uber['Pickup_point'].value_counts().plot(kind='barh')
sns.countplot(x="Pickup_point",data=obj_uber)
```

Out[34]:

<matplotlib.axes._subplots.AxesSubplot at 0xfb37a30>



In [35]:

```
obj_picktrip = obj_uber[['Pickup_point','Driver_point']]
obj_picktrip.head(6)
```

Out[35]:

	Pickup_point	Driver_point
0	Railwaystation	Hyderabad
1	Railwaystation	Hyderabad
2	Airport	Hyderabad
3	Railwaystation	Hyderabad
4	Airport	Hyderabad
5	Railwaystation	Hyderabad

In [36]:

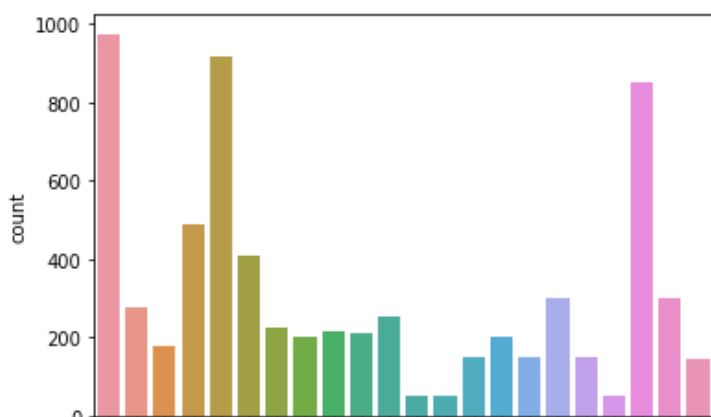
```
# we have to drasn visulization Grap here to show how many are travelling from RS to City
#Airport to CItY
```

In [37]:

```
plt.figure(figsize=(80,50))
sns.countplot(x="Driver_point",data=obj_uber)
```

Out[37]:

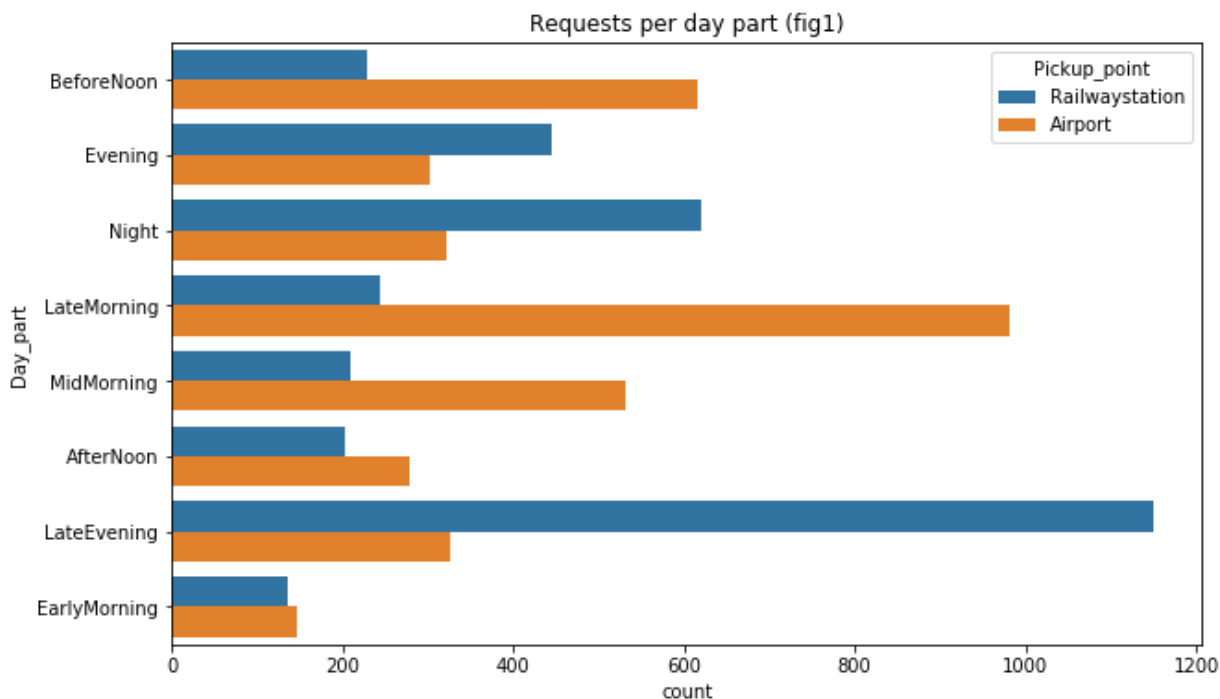
<matplotlib.axes._subplots.AxesSubplot at 0xfbc2f30>



Hyderabad SRNagar Kukatpally Falaknuma Begumpet
Ameerpet KPHB Jubilee Hills Secbad Charimar Golconda

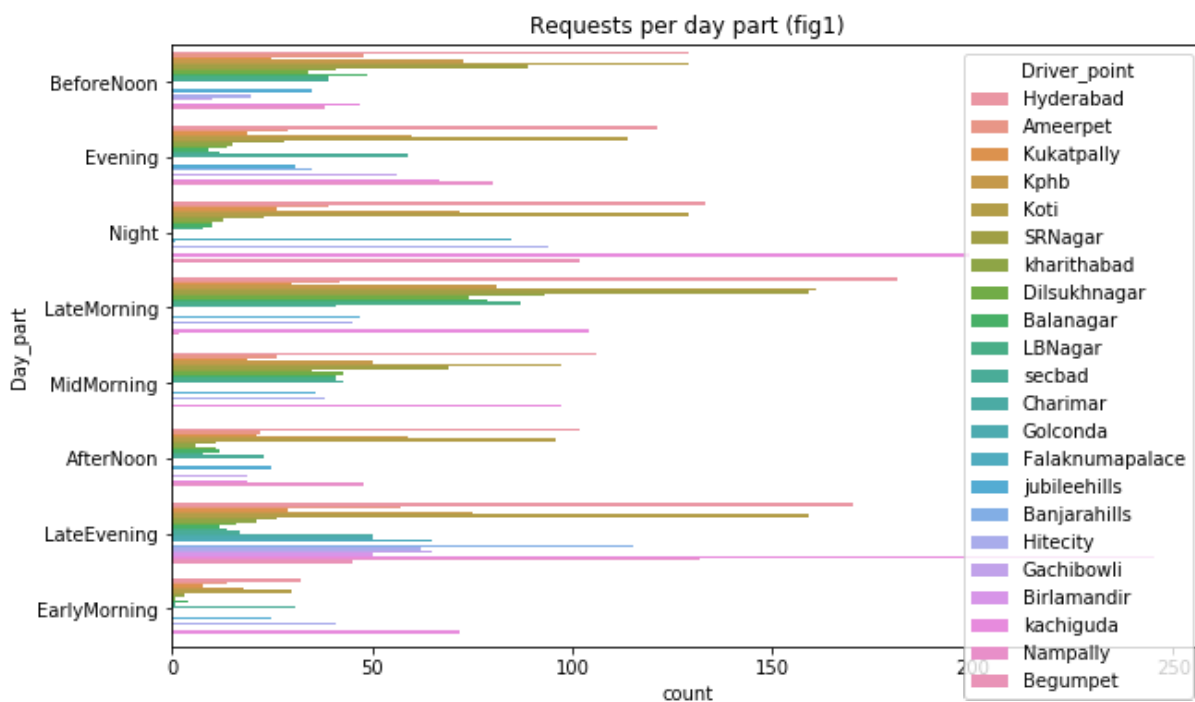
In [38]:

```
# Total requests grouped by Path
fig = plt.figure(figsize=(10,6))
sns.countplot(y='Day_part',hue='Pickup_point',data=obj_uber)
plt.title('Requests per day part (fig1)')
plt.show()
```



In [39]:

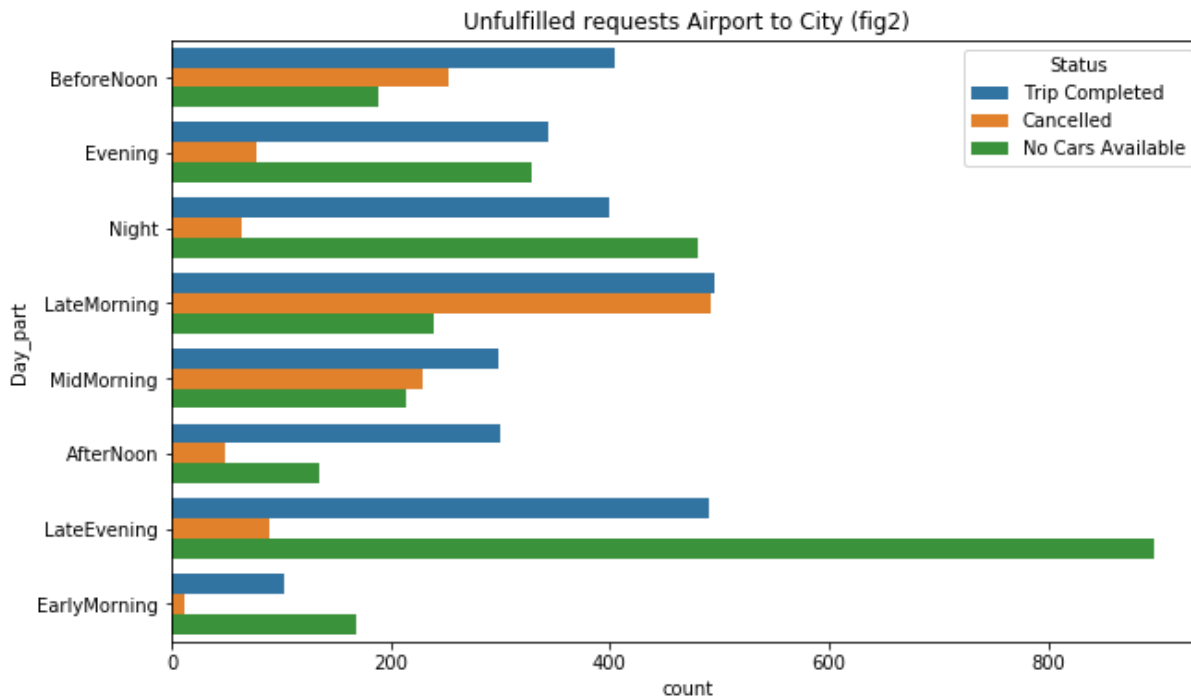
```
fig = plt.figure(figsize=(10,6))
#sns.countplot(y='Day_part',hue='Pickup_point',data=obj_uber)
sns.countplot(y='Day_part',hue='Driver_point',data=obj_uber)
plt.title('Requests per day part (fig1)')
plt.show()
```



In [40]:

```
fig = plt.figure(figsize=(10,6))
sns.countplot(y='Day_part',hue='Status',data=obj_uber)
```

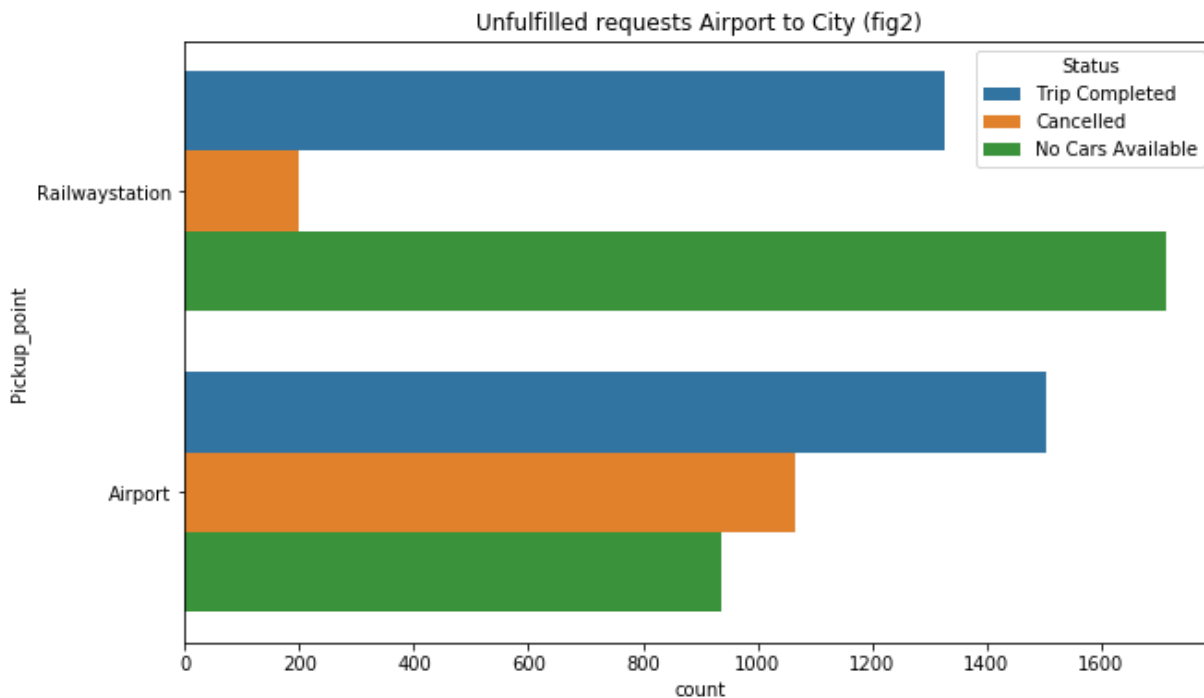
```
#sns.countplot(y='Day_part',hue='Status',data=uber[(uber['Status']!='Trip Completed') & (
uber['Path']=='City_to_Airport')])
plt.title('Unfulfilled requests Airport to City (fig2)')
plt.show()
```



In [41]:

```
fig = plt.figure(figsize=(10,6))
sns.countplot(y='Pickup_point',hue='Status',data=obj_uber)

#sns.countplot(y='Day_part',hue='Status',data=uber[(uber['Status']!='Trip Completed') & (
uber['Path']=='City_to_Airport')])
plt.title('Unfulfilled requests Airport to City (fig2)')
plt.show()
```



In [42]:

```
# Total Metrics for Demand Supply and Gap
Total_Demand = obj_uber.groupby('Day_part')['Request_id'].agg(['count'])
Total_Supply = obj_uber[obj_uber['Status']=='Trip Completed'].groupby('Day_part')['Request_id'].agg(['count'])
DS_Total = pd.concat([Total_Demand['count'],Total_Supply['count']],axis=1,keys=['Demand'
```

```
, 'Supply'])
DS_Total['Gap'] = DS_Total['Demand']-DS_Total['Supply']
```

In [43]:

```
print(DS_Total)
print('--'*20)
print('Mean values from Airport:')
print(DS_Total.describe().mean())
```

	Demand	Supply	Gap
Day_part			
AfterNoon	482	300	182
BeforeNoon	845	404	441
EarlyMorning	283	102	181
Evening	749	343	406
LateEvening	1475	490	985
LateMorning	1226	495	731
MidMorning	741	298	443
Night	944	399	545

Mean values from Airport:

Demand	684.812860
Supply	272.711571
Gap	414.522163

dtype: float64

In [44]:

```
obj_uber.head(5)
```

Out[44]:

	Request_id	Pickup_point	Driver_point	Status	Request_timestamp	Drop_timestamp	Day_part	Path
0	619	Railwaystation	Hyderabad	Trip Completed	2016-07-11 11:51:00	11/7/2016 13:00	BeforeNoon	Railwaystation_to_City
1	867	Railwaystation	Hyderabad	Trip Completed	2016-07-11 17:57:00	11/7/2016 18:47	Evening	Railwaystation_to_City
2	1807	Airport	Hyderabad	Trip Completed	2016-07-12 09:17:00	12/7/2016 9:58	BeforeNoon	Airport_to_City
3	2532	Railwaystation	Hyderabad	Trip Completed	2016-07-12 21:08:00	12/7/2016 22:03	Night	Railwaystation_to_City
4	3112	Airport	Hyderabad	Trip Completed	2016-07-13 08:33:16	13-07-2016 09:25:47	LateMorning	Airport_to_City

In [45]:

```
Total_Demand = obj_uber.groupby('Day_part')['Request_id'].agg(['count'])
Total_Supply = obj_uber[obj_uber['Status']=='No Cars Available'].groupby('Day_part')['Request_id'].agg(['count'])
DS_Total1A = pd.concat([Total_Demand['count'],Total_Supply['count']],axis=1,keys=['Demand','Supply'])
DS_Total1A['Gap'] = DS_Total1A['Demand']-DS_Total1A['Supply']
```

In [46]:

```
print(DS_Total1A)
print('--'*20)
print('Mean values from Airport:')
print(DS_Total1A.describe().mean())
```

	Demand	Supply	Gap
Day_part			
AfterNoon	482	134	348
BeforeNoon	845	189	656
EarlyMorning	283	169	114
Evening	749	343	406
LateEvening	1475	490	985
LateMorning	1226	495	731
MidMorning	741	298	443
Night	944	399	545

Evening	749	328	421
LateEvening	1475	896	579
LateMorning	1226	239	987
MidMorning	741	214	527
Night	944	481	463

Mean values from Airport:

```
Demand      684.812860
Supply      299.911699
Gap         421.198848
dtype: float64
```

In [47]:

```
Total_Demand = obj_uber.groupby('Day_part')['Request_id'].agg(['count'])
Total_Supply = obj_uber[obj_uber['Status']=='Cancelled'].groupby('Day_part')['Request_id'].agg(['count'])
DS_Total2C = pd.concat([Total_Demand['count'],Total_Supply['count']],axis=1,keys=['Demand','Supply'])
DS_Total2C['Gap'] = DS_Total2C['Demand']-DS_Total2C['Supply']
```

In [48]:

```
print(DS_Total2C)
print('--'*20)
print('Mean values from City:')
print(DS_Total2C.describe().mean())
```

	Demand	Supply	Gap
Day_part			
AfterNoon	482	48	434
BeforeNoon	845	252	593
EarlyMorning	283	12	271
Evening	749	78	671
LateEvening	1475	89	1386
LateMorning	1226	492	734
MidMorning	741	229	512
Night	944	64	880

Mean values from City:

```
Demand      684.812860
Supply      151.011486
Gap         573.025260
dtype: float64
```

In [49]:

```
# Percentage of Railway to City Demand
(DS_Total2C.loc['LateEvening','Supply']/DS_Total1A.loc['LateEvening','Demand'])*100
```

Out[49]:

```
6.033898305084746
```

In [50]:

```
# Percentage of Airport demand to City Demand
(DS_Total1A.loc['LateMorning','Demand']/DS_Total2C.loc['LateMorning','Demand'])*100
```

Out[50]:

```
100.0
```

In []: