

Bike Sharing Availability Dashboard

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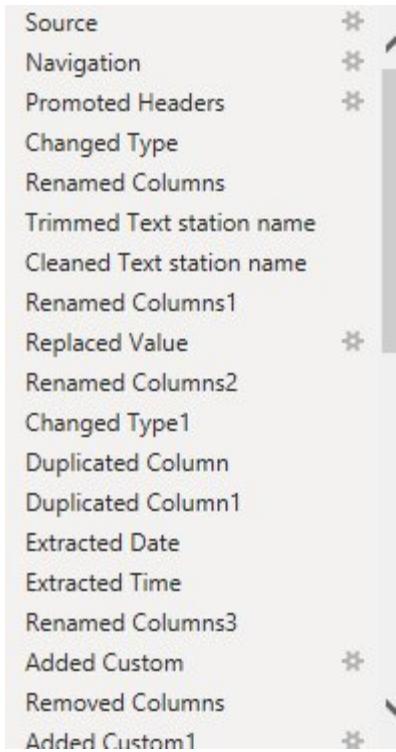
The dataset contains station-level bike availability information including station details, bike stands, available bikes, status, date/time, and geographic coordinates.

1. Data Import & Exploration (Power BI)

- Imported the dataset into **Power BI Desktop**
- Reviewed schema, data types, and data quality issues
- Identified key analytical fields: station_id, station_name, available_bike, available_bike_stand, total_bike_stand, status, date/time, latitude, longitude

2. Data Cleaning & Transformation (Power Query)

- Standardized column names and data types
- Split DateTime into Date, Time, Hour, and Day Name



- Created Peak Hour / Non-Peak indicator

date_update	time_update	hour_update	day_update	DayType	Peak_Hour
6/2/2022	3:14:38 PM	15	Thursday	Weekday	Non-Peak
4/6/2022	12:54:35 PM	12	Wednesday	Weekday	Non-Peak
9/27/2022	10:57:48 AM	10	Tuesday	Weekday	Peak
6/8/2022	11:50:13 AM	11	Wednesday	Weekday	Non-Peak
5/23/2022	8:11:50 PM	20	Monday	Weekday	Peak
9/13/2022	11:28:01 AM	11	Tuesday	Weekday	Non-Peak
9/6/2022	6:02:17 PM	18	Tuesday	Weekday	Peak
9/14/2022	1:27:09 PM	13	Wednesday	Weekday	Non-Peak
9/12/2022	11:18:28 AM	11	Monday	Weekday	Non-Peak
10/3/2022	11:34:01 AM	11	Monday	Weekday	Non-Peak
9/13/2022	3:41:24 PM	15	Tuesday	Weekday	Non-Peak
9/26/2022	4:44:57 PM	16	Monday	Weekday	Non-Peak
10/3/2022	12:02:43 PM	12	Monday	Weekday	Non-Peak
10/10/2022	12:40:37 PM	12	Monday	Weekday	Non-Peak
9/26/2022	11:29:34 AM	11	Monday	Weekday	Non-Peak
10/17/2022	11:36:42 AM	11	Monday	Weekday	Non-Peak
10/24/2022	1:08:08 PM	13	Monday	Weekday	Non-Peak
10/4/2022	11:49:03 AM	11	Tuesday	Weekday	Non-Peak
8/30/2022	9:00:02 PM	21	Tuesday	Weekday	Non-Peak
11/8/2022	2:53:04 PM	14	Tuesday	Weekday	Non-Peak
11/22/2022	12:47:11 PM	12	Tuesday	Weekday	Non-Peak
10/11/2022	11:40:16 AM	11	Tuesday	Weekday	Non-Peak
11/28/2022	2:00:36 PM	14	Monday	Weekday	Non-Peak

- Handled missing values and replaced nulls appropriately

i^2_3 station_id	A _C station_name	A _C address	1.2 lat
1	2000 TEST DSI PLAISIR	Not Available	
2	1297 ST FÉRÉOL DAVSO	ST FERREOL DAVSO - RUE FRANCIS DAVSO ANGLE RUE SAINT FERREOL	
3	8265 NÉGRESKO - PAULET	NEGRESKO PAULET - FACE AU 42 RUE NEGRESKO	
4	8065 PROMENADE POMPIDOU PALM B...	PROMENADE POMPIDOU PALM BEACH - 6 PROMENADE GEORGES PO...	
5	1011 BORNE TEST NANTES 1	Borne test 1	
6	4342 FLAMMARION MONTRICHET	FLAMMARION MONTRICHET - PLACE LE VERRIER ANGLE BD FLAMMAR...	
7	6176 CANTINI ROUET	CANTINI ROUET - FACE AU 27 AVENUE JULES CANTINI	
8	3322 ARENC CHANTERAC	32 rue de Chanterac 13003 Marseille	
9	1264 CANEBIÈRE DUGOMMIER	CANEBIERE DUGOMMIER - LA CANEBIÈRE ANGLE BOULEVARD DUGO...	
10	1191 CANEBIERE-ST FERREOL	CANEBIERE SAINT FERREOL - ANGLE CANEBIÈRE SAINT FERREOL	
11	5058 SAKAKINI - SAINT PIERRE	SAKAKINI SAINT PIERRE - BOULEVARD SAKAKINI ANGLE RUE SAINT PIE...	
12	4293 BLANCARDE	BLANCARDE - GARE DE LA BLANCARDE	
13	1245 GAMBETTA - LAFAYETTE	GAMBETTA LAFAYETTE - 6 ALLEES LEON GAMBETTA	
14	7153 CORSE ST MAURICE	CORSE SAINT MAURICE - 28 AVENUE DE LA CORSE ANGLE RAMPE SAIN...	
15	6154 PIERRE PUGET BRETEUIL	PIERRE PUGET BRETEUIL - COURS PIERRE PUGET ANGLE RUE BRETEUIL	
16	1002 HOTEL DE VILLE	HOTEL DE VILLE - Face au 42 QUAI DU PORT	
17	1224 PLAINE - BIBLIOTHEQUE	PLAINE BIBLIOTHEQUE - 45 RUE DE LA BIBLIOTHEQUE	
18	1287 STALINGRAD - RÉFORMÉS	STALINGRAD REFORMES - SQUARE STALINGRAD	
19	500 IT PLAISIR	Not Available	
20	5220 ROOSEVELT - ORAN	ROOSEVELT ORAN - 53 COURS FRANKLIN ROOSEVELT ANGLE RUE D'OR...	
21	6160 153 PARADIS	153 PARADIS - 153 RUE PARADIS	

- Split latitude and longitude from combined position field
- Ensured numeric consistency for availability and capacity fields

Queries [2]

BikeData = Table.ReplaceValue(#"Replaced Value2", "false", "Invalid", Replacer.ReplaceText, {"Valid_Record"})

fact_bike_availability

i^2_3 station_id	A _C status	i^2_3 total_bike_stand	i^2_3 available_bike_stand	i^2_3 available_bike	date_upd
1	2000 OPEN	1	0	0	
2	1297 OPEN	9	0	0	
3	8265 OPEN	15	0	0	
4	8065 OPEN	15	15	0	
5	1011 OPEN	0	0	0	
6	4342 OPEN	10	0	0	
7	6176 OPEN	24	24	0	
8	3322 OPEN	20	13	7	
9	1264 OPEN	10	0	0	
10	1191 OPEN	20	2	0	
11	5058 OPEN	10	10	0	
12	4293 OPEN	14	0	0	
13	1245 OPEN	15	0	0	
14	7153 OPEN	10	0	0	
15	6154 OPEN	8	0	0	
16	1002 OPEN	32	0	0	
17	1224 OPEN	16	0	0	
18	1287 OPEN	17	0	0	
19	500 OPEN	1	0	1	
20	5220 OPEN	10	0	0	
21	6160 OPEN	14	0	0	
22	7026 OPEN	17	0	0	
23	54000 OPEN	1	1	0	

Query Settings

Properties

Name: fact_bike_availability

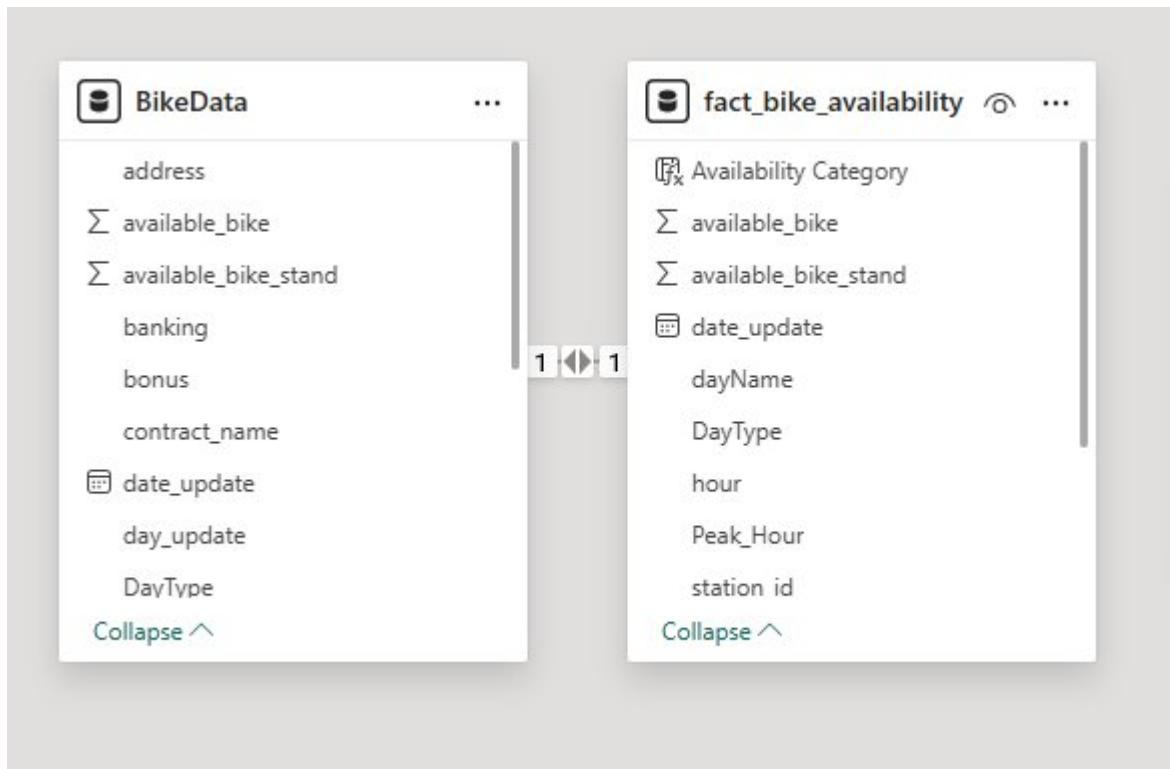
All Properties

Applied Steps

- Renamed Columns4
- Removed Duplicates- stati...
- Replaced Value1
- Split Column by Delimiter
- Changed Type2
- Added Custom6
- Reordered Columns
- Filtered Rows
- Removed Columns2
- Reordered Columns1
- Cleaned Text
- Trimmed Text
- Renamed Columns5
- Removed Columns3
- Renamed Columns6
- Added Custom7
- Changed Type3
- Replaced Value2
- Replaced Value3

3. Data Modeling

- Designed a **snapshot-based logical data model**
- Created a **fact table** representing current bike availability per station
- Maintained station descriptive attributes (name, location, status)
- Established a **1:1 relationship** based on snapshot granularity

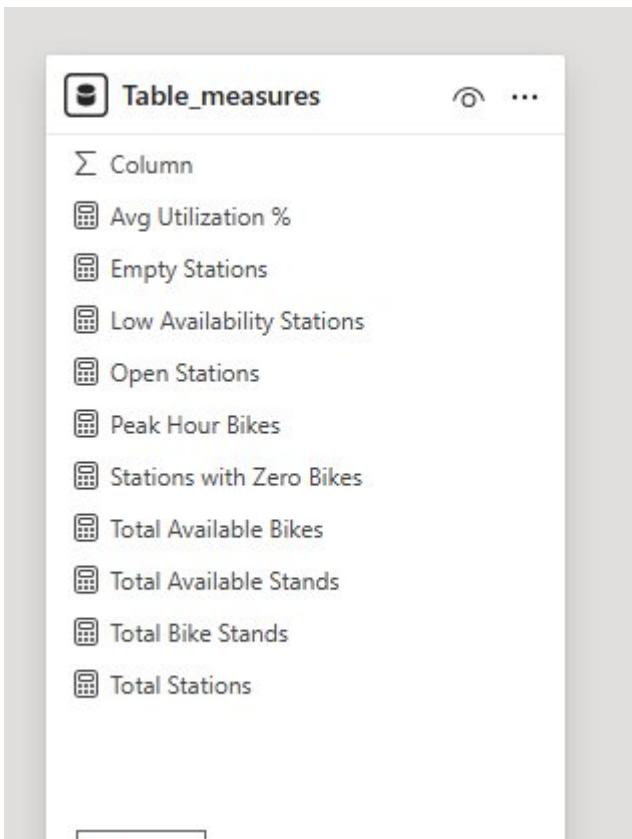


4. DAX Measures & Calculated Columns

Key Measures Created

- Total Stations
- Total Available Bikes
- Total Available Bike Stands
- Total Bike Stands
- Average Utilization %
- Stations with Zero Bikes

- Low Availability Stations
- Peak Hour Available Bikes

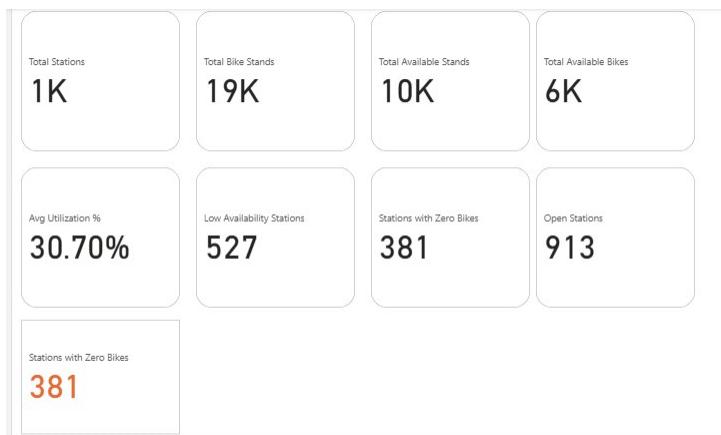


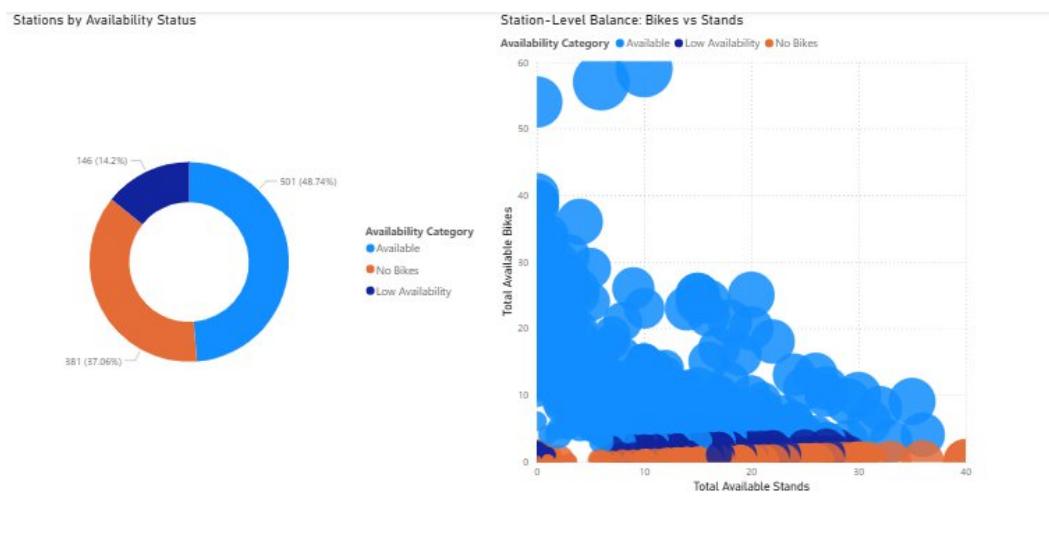
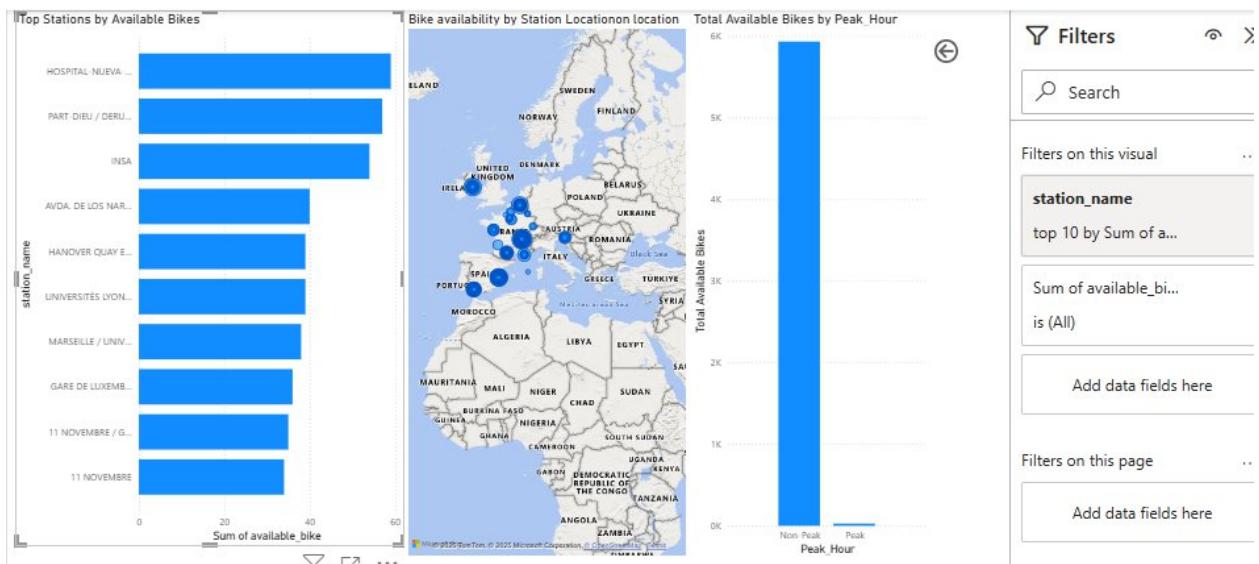
Calculated Columns

- **Availability Category** (No Bikes / Low Availability / Available)

hour	dayName	DayType	Peak_Hour	Valid_Record	Availability Category
14	Wednesday	Weekday	Non-Peak	Invalid	No Bikes
14	Wednesday	Weekday	Non-Peak	valid	No Bikes
14	Wednesday	Weekday	Non-Peak	valid	Available
14	Wednesday	Weekday	Non-Peak	Invalid	Low Availability
14	Wednesday	Weekday	Non-Peak	valid	No Bikes
14	Wednesday	Weekday	Non-Peak	Invalid	Low Availability
14	Wednesday	Weekday	Non-Peak	valid	Available
14	Wednesday	Weekday	Non-Peak	Invalid	Available
14	Wednesday	Weekday	Non-Peak	valid	Available
14	Wednesday	Weekday	Non-Peak	valid	Available
14	Wednesday	Weekday	Non-Peak	valid	Available
14	Wednesday	Weekday	Non-Peak	valid	Available
14	Wednesday	Weekday	Non-Peak	valid	Available
14	Wednesday	Weekday	Non-Peak	valid	Available
14	Wednesday	Weekday	Non-Peak	valid	No Bikes
14	Wednesday	Weekday	Non-Peak	Invalid	Available
14	Wednesday	Weekday	Non-Peak	valid	No Bikes
14	Wednesday	Weekday	Non-Peak	valid	Available
14	Wednesday	Weekday	Non-Peak	valid	Available
14	Wednesday	Weekday	Non-Peak	invalid	No Bikes
14	Wednesday	Weekday	Non-Peak	valid	Low Availability

5. Dashboard





6. Key Insights (One-Page Summary)

- Only ~31% of total bike stand capacity is utilized
- Over one-third of stations currently have zero bikes available
- Bike availability is significantly lower during peak hours
- Several stations show imbalance between bike supply and dock capacity
- Availability distribution is uneven across geographic locations

Descriptive Analysis

- The bike-sharing network has ~1,000 stations with a total capacity of ~19,000 bike stands.
- Only ~6,000 bikes are available, resulting in ~31% utilization of total capacity.
- 381 stations (~37%) have zero bikes available, meaning users cannot rent bikes at these locations.
- 527 stations (~51%) fall under low availability, indicating insufficient supply.
- Bike availability during non-peak hours (~6,000 bikes) is much higher than during peak hours (near zero).
- This shows that bike availability is highly sensitive to demand timing.

Diagnostic Analysis

- During peak hours, bike demand increases sharply, causing bikes to be depleted quickly.
- The high number of 381 zero-bike stations indicates redistribution delays rather than lack of bikes.
- Scatter analysis shows many stations with:
- High dock capacity but very low bikes, and
- Nearby stations with surplus bikes, highlighting poor allocation.
- More than 50% of stations operate under low availability despite sufficient infrastructure.
- This confirms that the problem lies in operational redistribution, not station capacity.

Predictive Analysis

- Stations currently showing zero bikes (381 stations) are likely to remain unavailable during future peak hours.
- If redistribution is not improved, peak-hour availability will continue to drop sharply.
- Stations already categorized as Low Availability (527 stations) are at high risk of becoming zero-bike stations.

- User dissatisfaction is likely to increase as more users encounter empty stations.
- The imbalance pattern is expected to repeat daily during similar demand periods.

Prescriptive Analysis

- Redistribute bikes before peak hours to at least 381 zero-bike stations as top priority.
- Move surplus bikes from well-stocked stations to reduce the 51% low-availability rate.
- Aim to increase overall utilization from 31% to at least 45–50% through better allocation.
- Monitor stations repeatedly falling into the zero-bike category and flag them for early action.
- Improving redistribution efficiency can reduce shortages without increasing total bike count.