

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

Source	✳
Navigation	✳
Promoted Headers	✳
Changed Type	
Renamed Columns	
Trimmed Text station name	
Cleaned Text station name	
Renamed Columns1	
Replaced Value	✳
Renamed Columns2	
Changed Type1	
Duplicated Column	
Duplicated Column1	
Extracted Date	
Extracted Time	
Renamed Columns3	
Added Custom	✳
Removed Columns	
Added Custom1	✳

- Created **Peak Hour / Non-Peak** indicator

time_update	time_update	ABC 123 hour_update	ABC 123 day_update	ABC 123 DayType	ABC 123 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

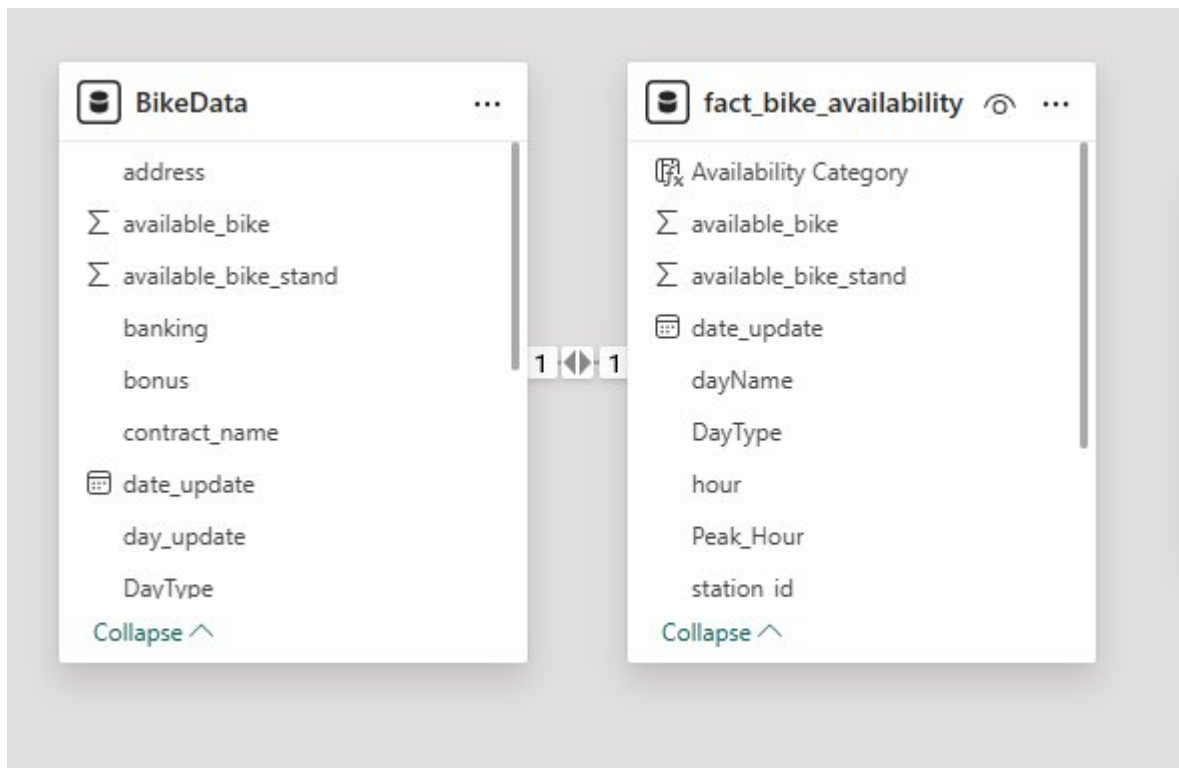
	1 ₃ station_id	A _C station_name	A _C address	1.2 lat
1	2000	TEST DSI PLAISIR	Not Available	
2	1297	ST FÉRRÉOL DAVSO	ST FERREOL DAVSO - RUE FRANCIS DAVSO ANGLE RUE SAINT FERREOL	
3	8265	NÉGRESKO - PAULET	NEGRESKO PAULET - FACE AU 42 RUE NEGRESKO	
4	8065	PROMENADE POMPIDOU PALM B...	PROMENADE POMPIDOU 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 CANEBIERE ANGLE BOULEVARD DUGO...	
10	1191	CANEBIERE-ST FERREOL	CANEBIERE SAINT FERREOL - ANGLE CANEBIERE 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]	= Table.ReplaceValue(*"Replaced Value2","false","Invalid",Replacer.ReplaceText,{"Valid_Record "})						Query Settings
BikeData	1 ₃ station_id	A _C status	1 ₃ total_bike_stand	1 ₃ available_bike_stand	1 ₃ available_bike	date_upd	PROPERTIES Name fact_bike_availability All Properties
fact_bike_availability	1	2000 OPEN		1	0	0	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 Column5 Removed Columns3 Renamed Columns6 Added Custom7 Changed Type3 Replaced Value2 Replaced Value3
	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	

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

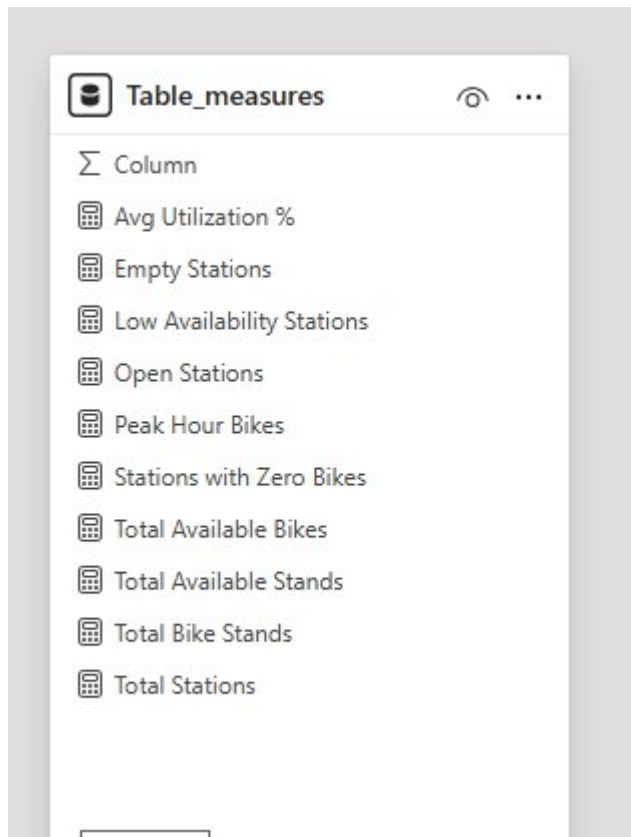


4. DAX Measures & Calculated Columns

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

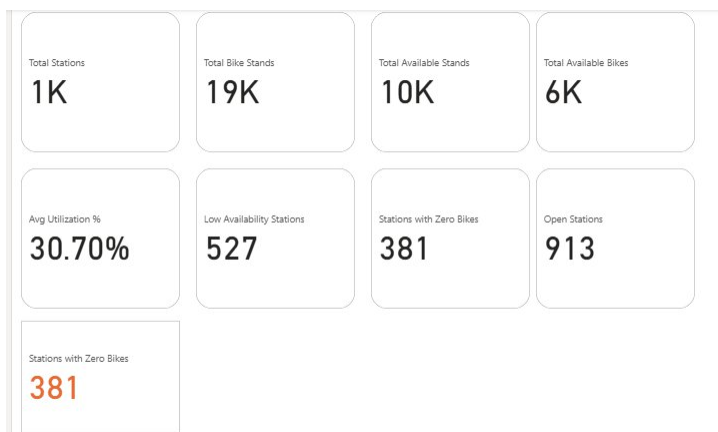


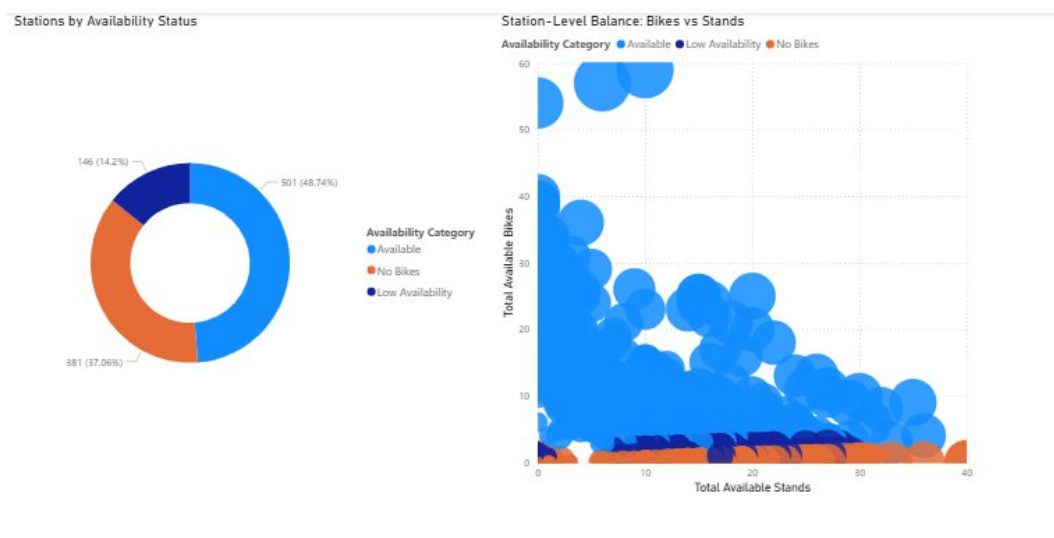
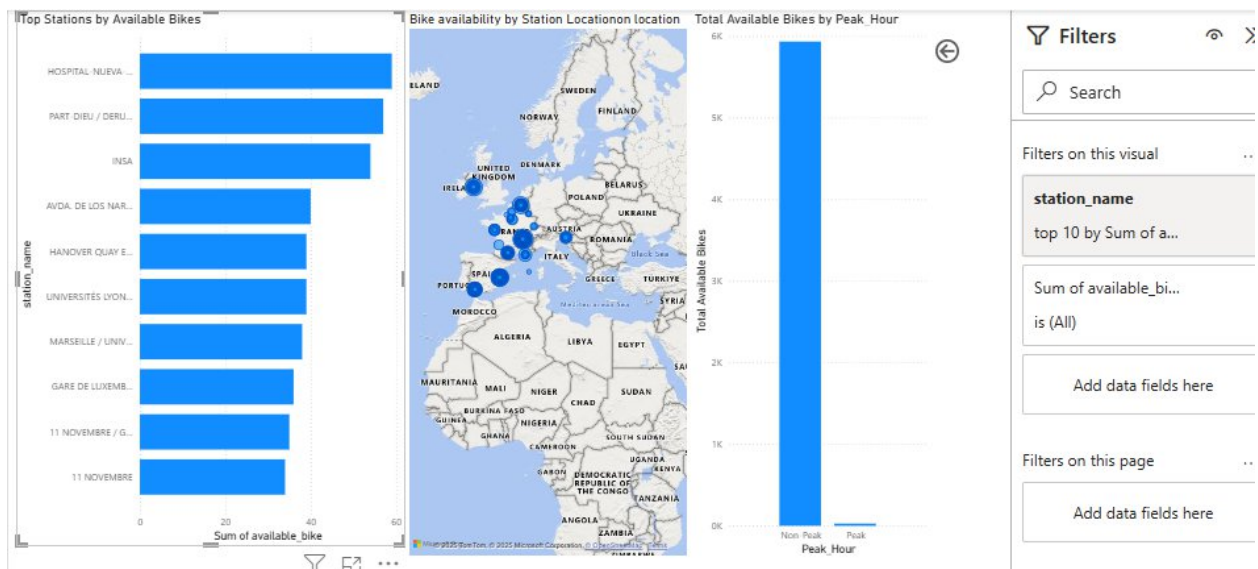
Calculated Columns

- **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	Low Availability
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	valid	Low Availability
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.