

BIKE SHARING: SMART SOLUTION FOR TRAFFIC CONGESTION



Chicago's traffic is getting progressively worse

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2019 CONGESTION RANK (2018)	URBAN AREA	HOURS LOST IN CONGESTION	2018-2019 CHANGE	2017-2018 CHANGE	INCIDENT IMPACT	COST PER DRIVER	TOTAL COST PER CITY	BIKE	TRANSIT	LAST MILE SPEED (MPH)
1 (1)	Boston, MA	149	-5%	3%		\$2,205	\$4.1B			12
2 (3)	Chicago, IL	145	4%	0%		\$2,146	\$7.6B			11
3 (5)	Philadelphia, PA	142	4%	5%		\$2,102	\$4.5B			10
4 (2)	New York City, NY	140	-4%	-3%		\$2,072	\$11B			11
5 (3)	Washington DC	124	-11%	4%		\$1,835	\$4.1B			10
6 (7)	Los Angeles, CA	103	4%	-8%		\$1,524	\$8.2B			16
7 (6)	San Francisco, CA	97	-8%	-4%		\$1,436	\$3B			10
8 (9)	Portland, OR	89	10%	-7%		\$1,317	\$1.2B			14
9 (11)	Baltimore, MD	84	5%	9%		\$1,243	\$1.3B			10
10 (12)	Atlanta, GA	82	9%	-3%		\$1,214	\$3.0B			12



Not all rideshare is equal...



Uber and Lyft trips in Chicago increased

271%

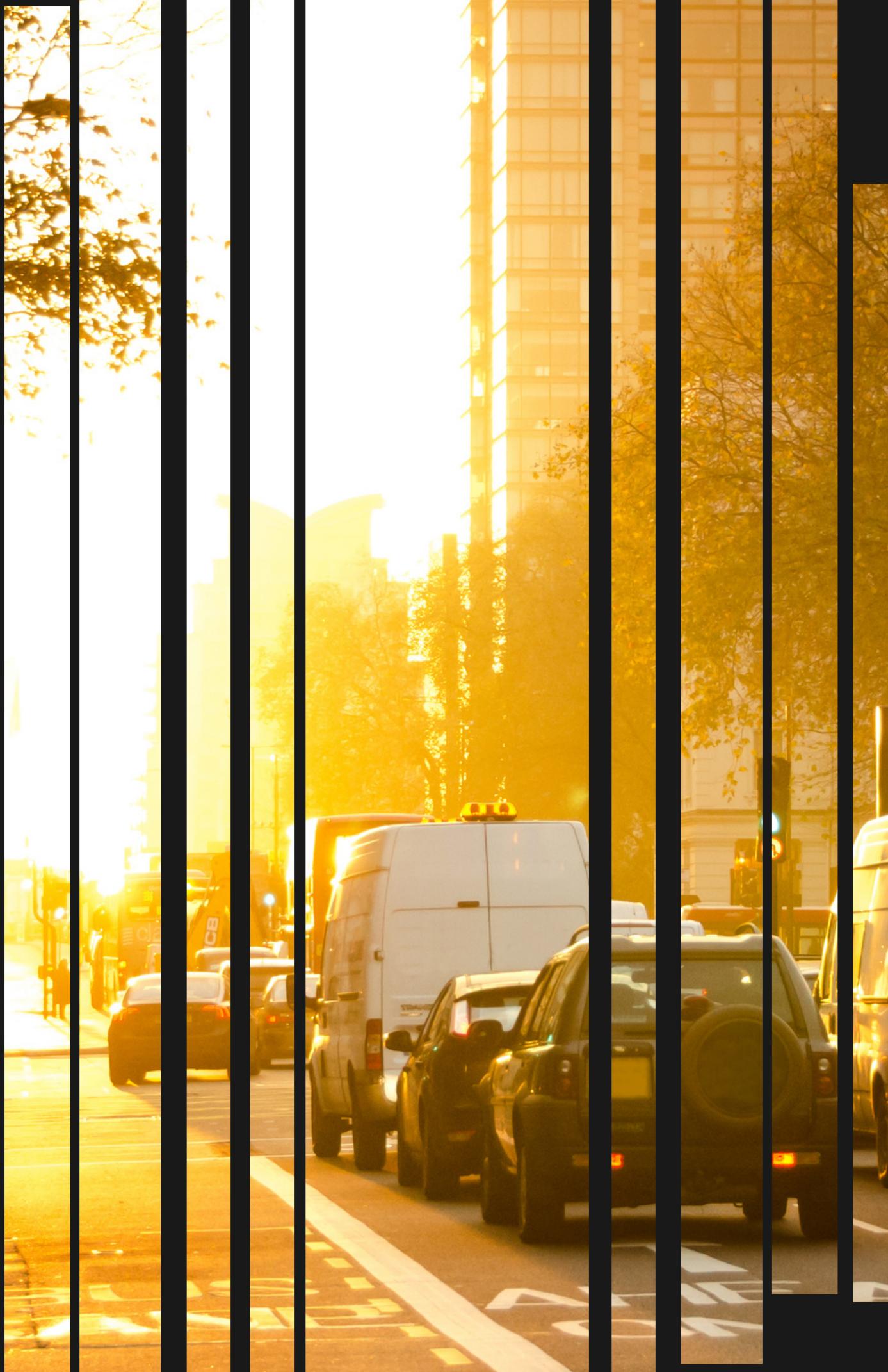
between 2015 to 2018



Chicago Car Trips broken down

51% < three miles

22% < one mile



Residents are paying the price

IN TIME AND WASTED ECONOMIC OPPORTUNITY



2ND Most congested city in the country	10TH Most congested city in the world	145 HRS Driving time spent in congestion in 2019	\$2,146 Cost of congestion per driver	11 MPH Inner city last mile speed
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Workflow



Divvy Rideshare data

DivvyBikes.com
22 million rides
675 bike docks
2013-2018



Traffic Congestion data

Chicago Data Portal
19 million traffic records
29 regions
2013-2018

ARIMA

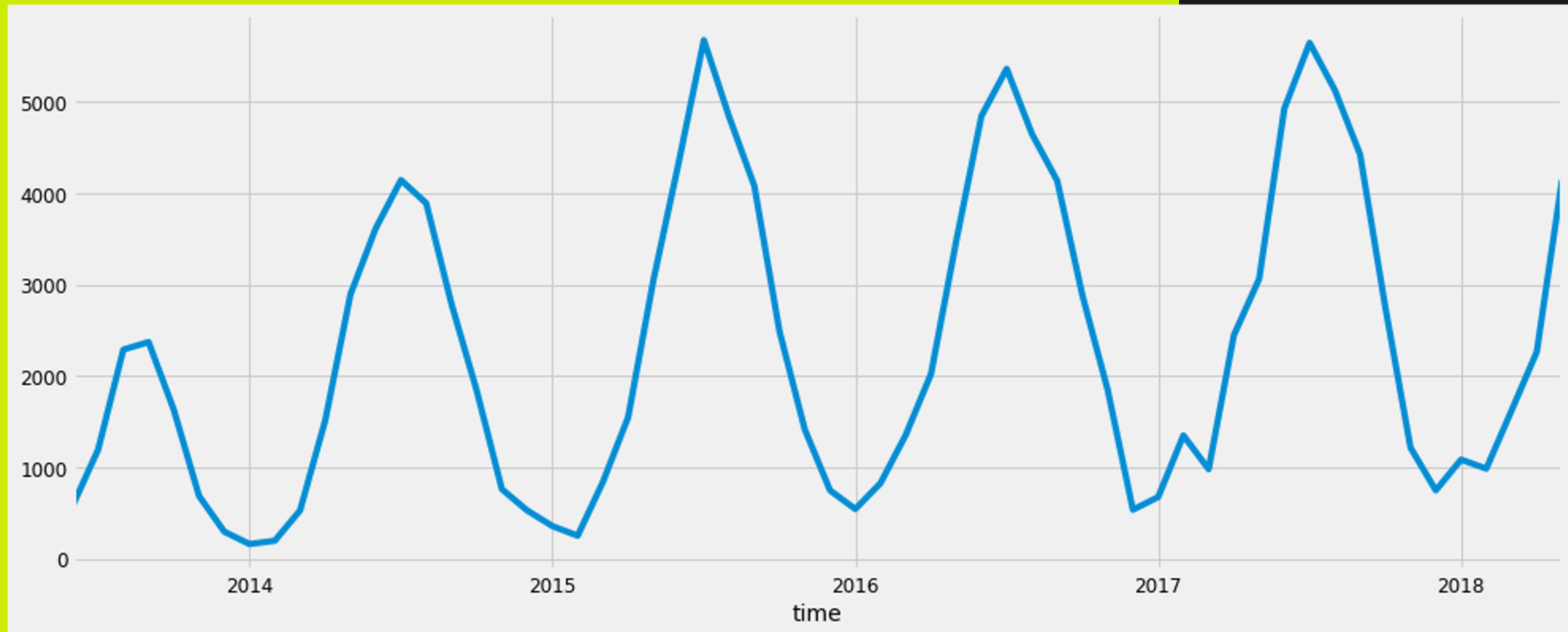


Google Cloud Platform
27 Total datasets

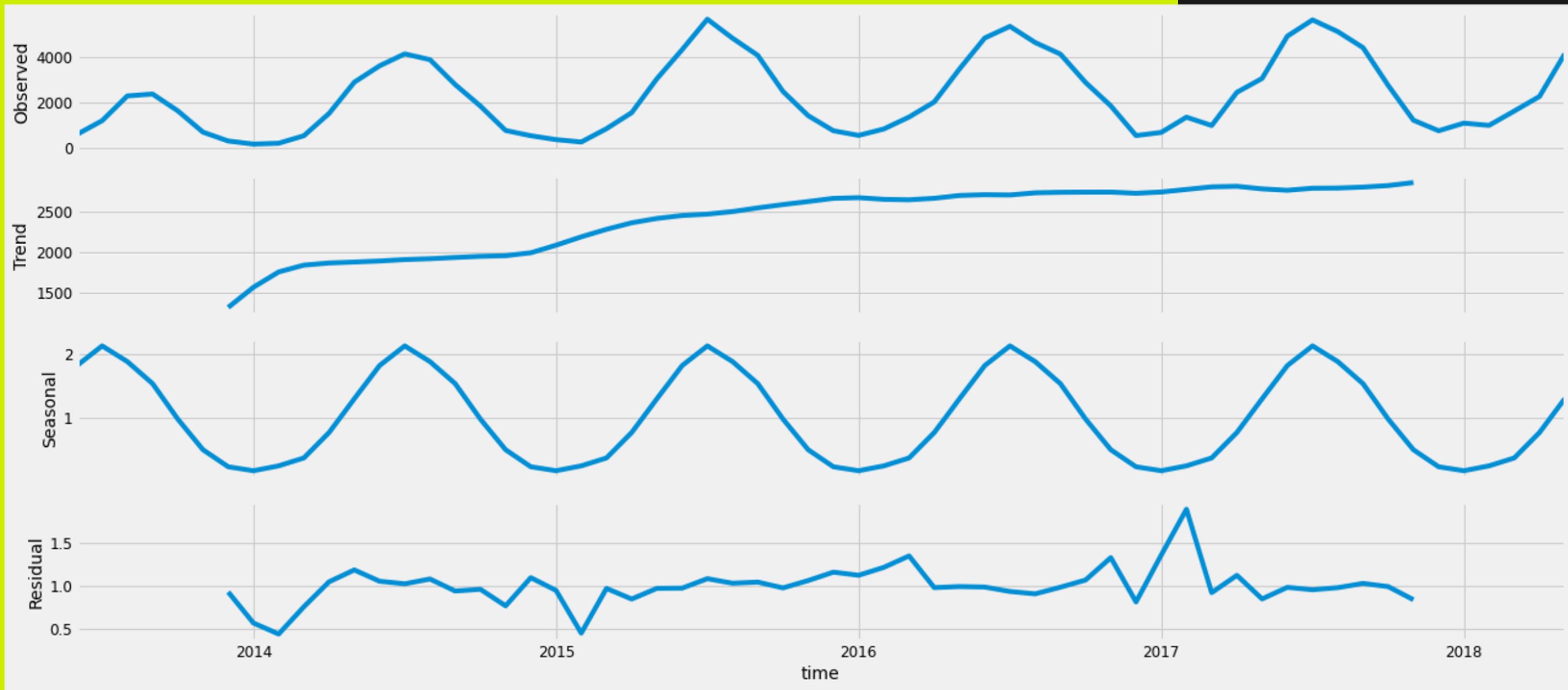
Facebook Prophet

Tableau

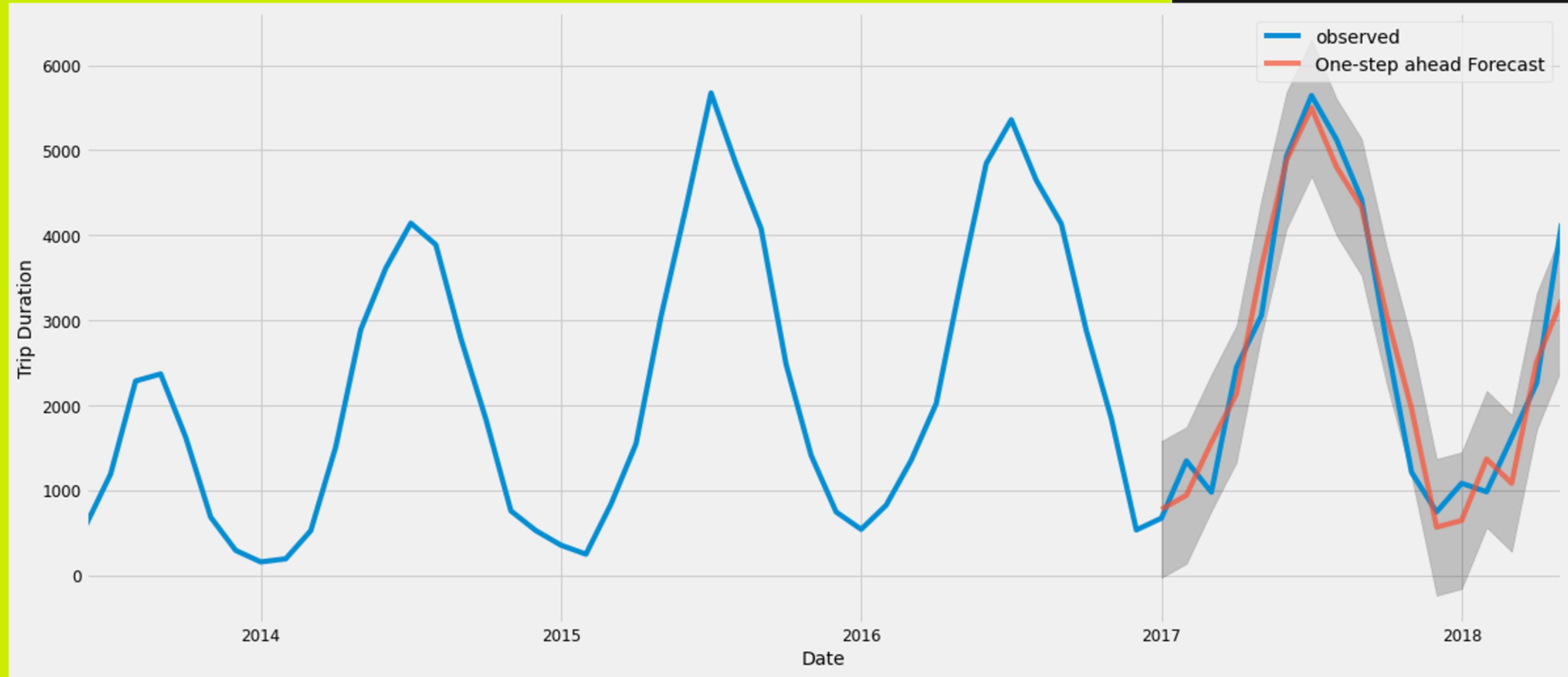
Divvy time-series has clear seasonality pattern



Decomposition Plot - Trend, Seasonality and Cycles



Visualizing the accuracy of the forecasts





437.39

RMSE

22.94%

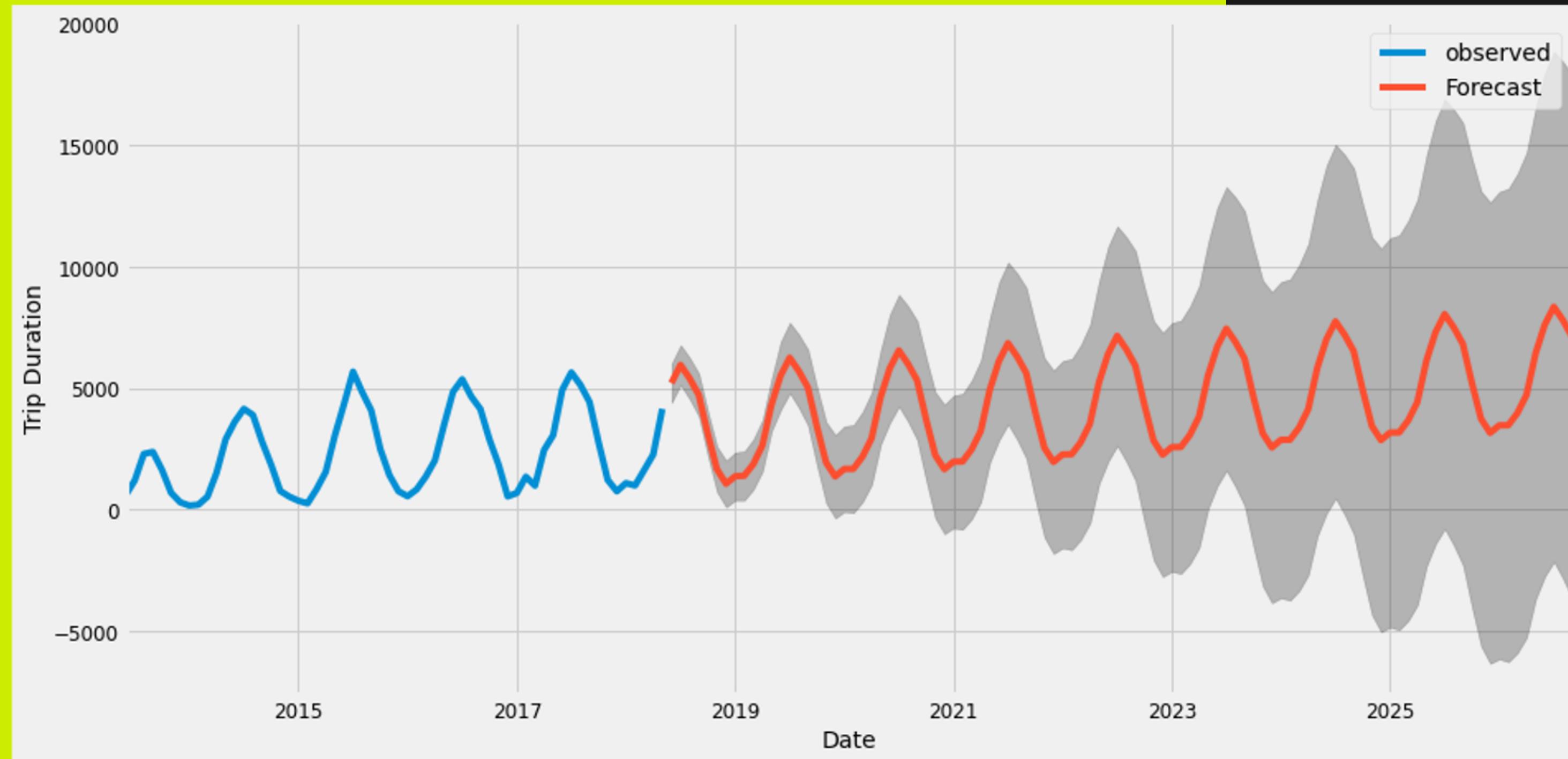
MAPE

Measuring
the
accuracy
of forecast



5-Year Forecast

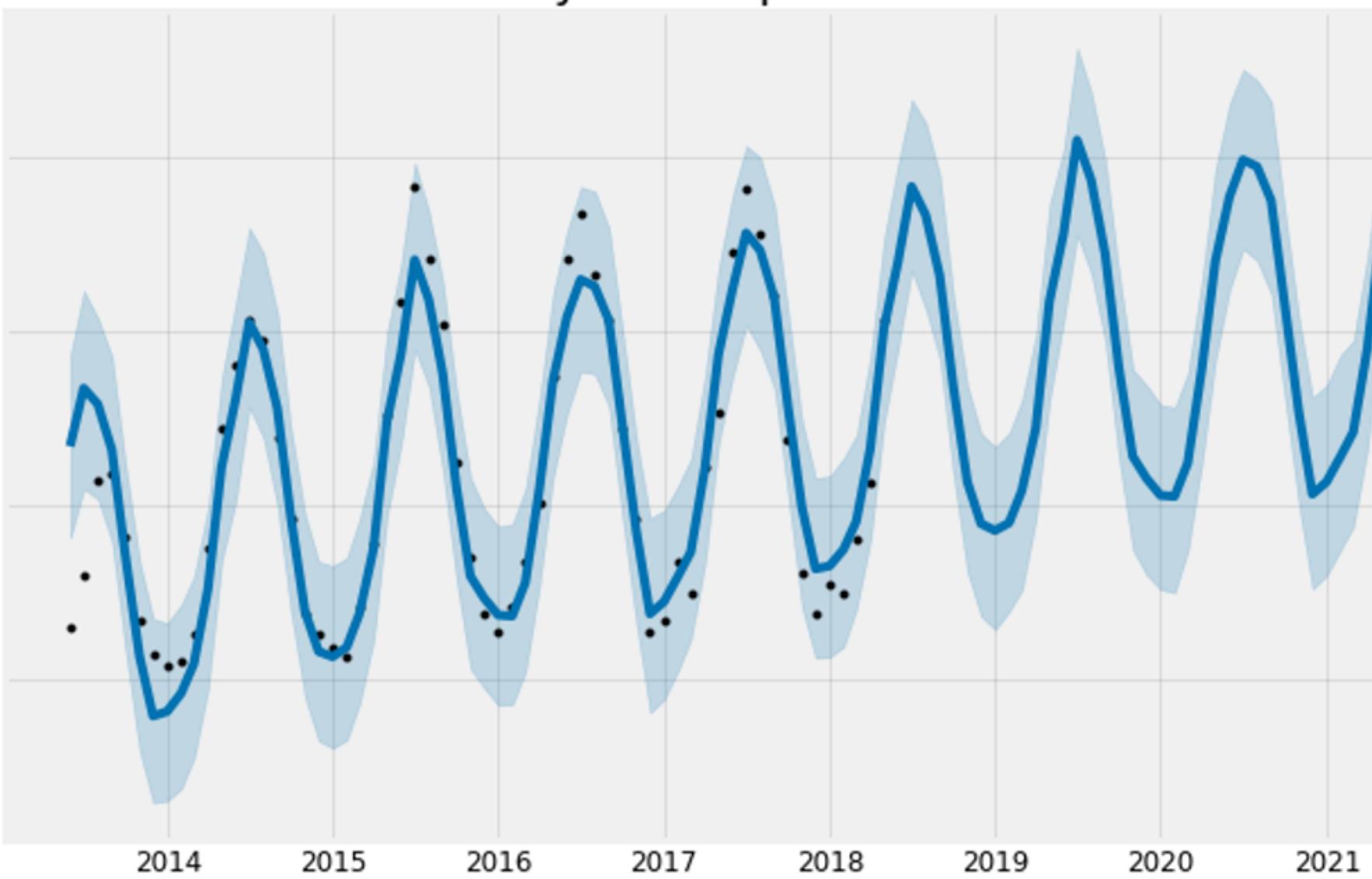
11



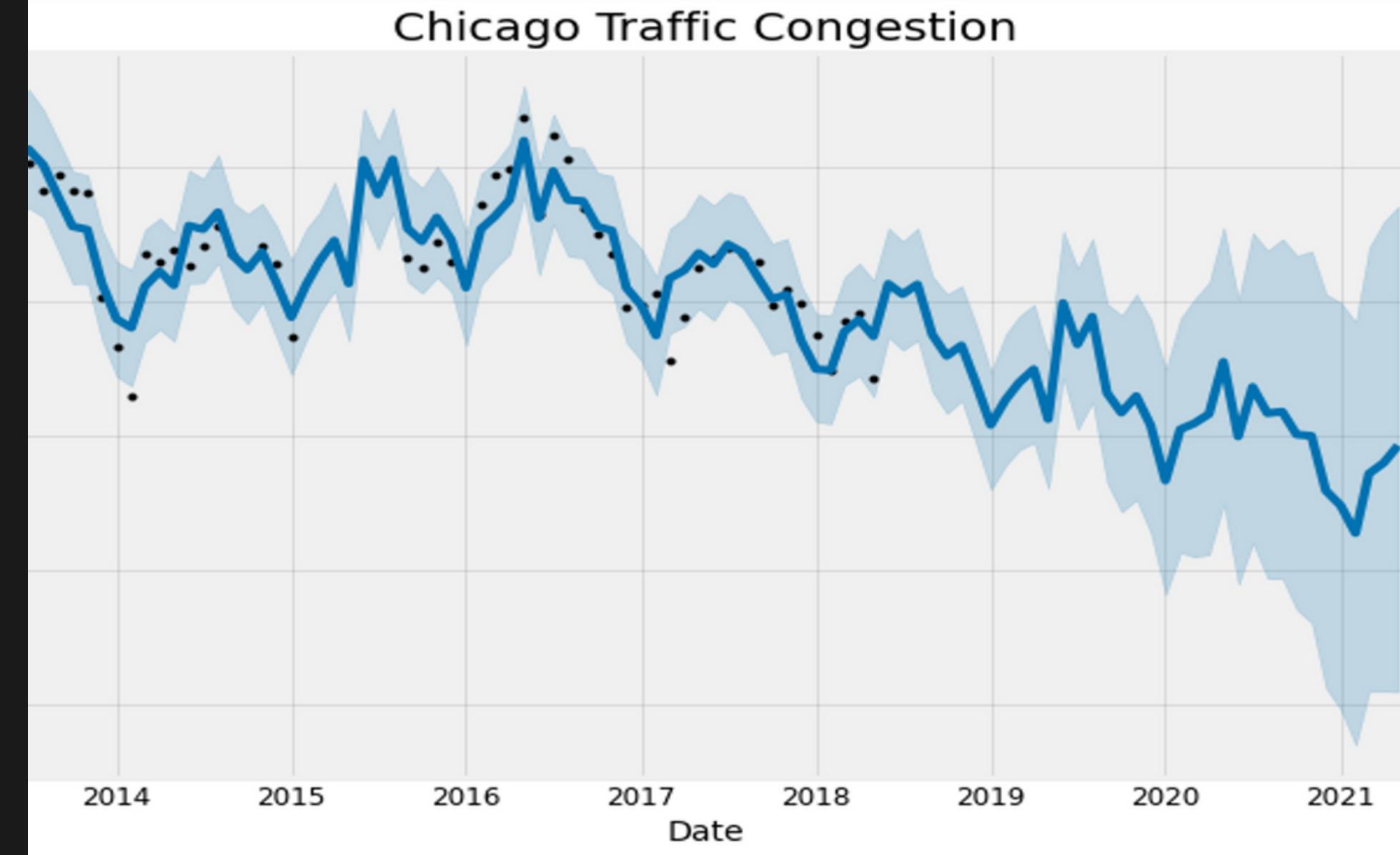
Times Series Modeling with Prophet

12

Divvy Bike Trip Duration



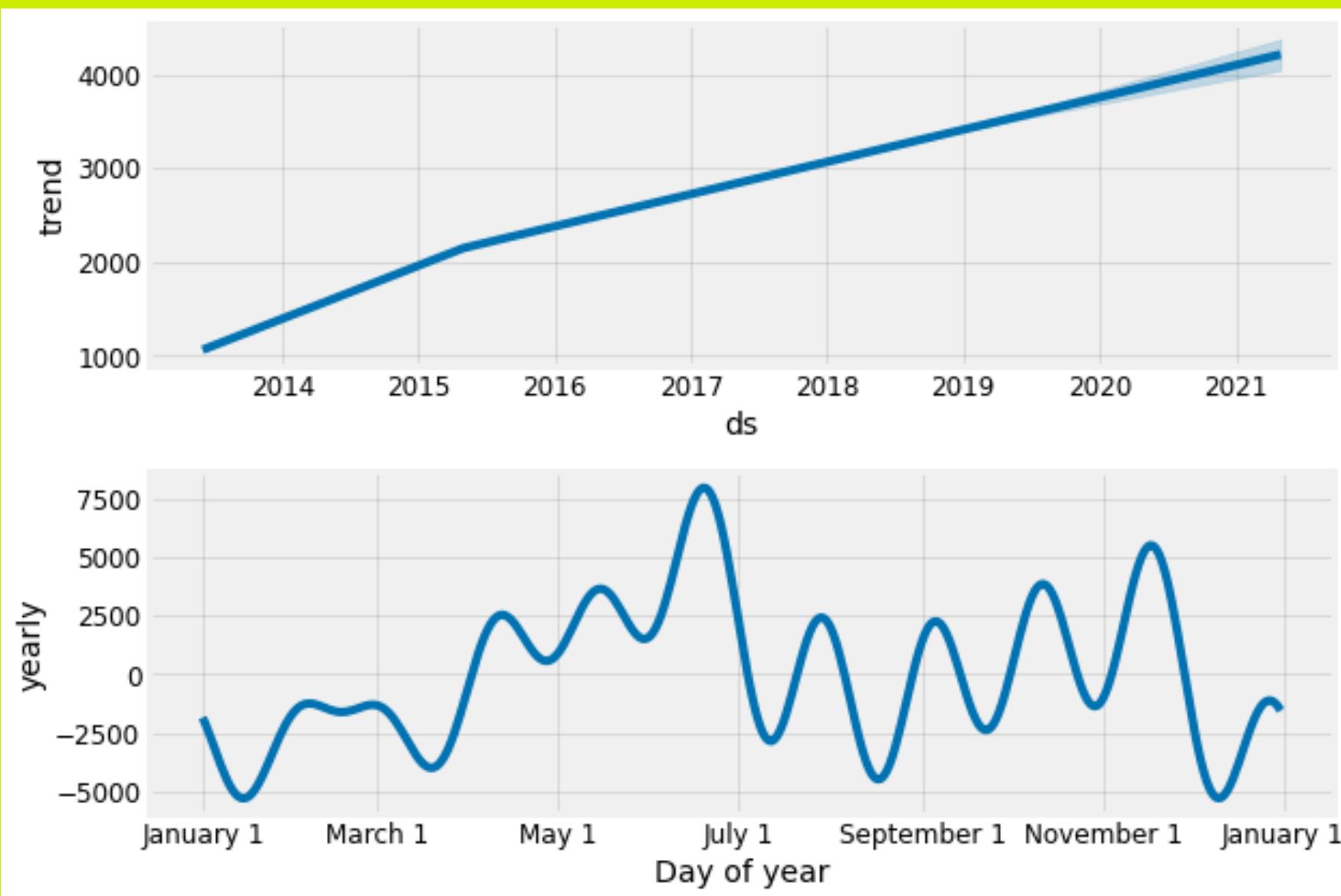
Chicago Traffic Congestion



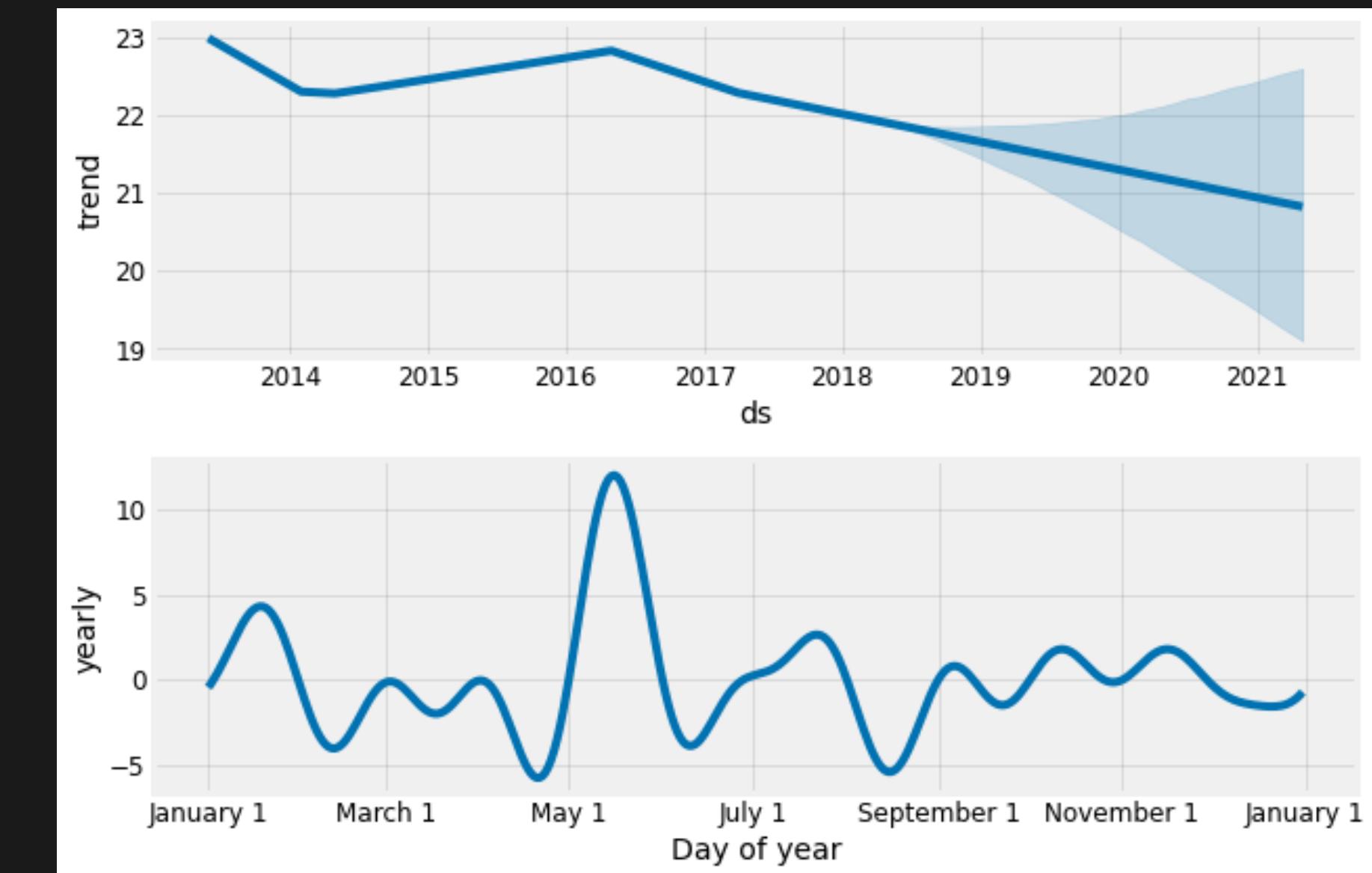
Facebook Prophet Trends and Patterns

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Divvy Bike Share



Chicago Traffic Congestion



Big Data to the rescue!

Applying big data to create intelligent transportation systems is key to solving urban mobility problems

Data and Analytics on traffic and population movement help city planners and engineers make data-based decisions to **prioritize spending** in order to **maximize benefits and reduce costs** now and for the future

THANK YOU

