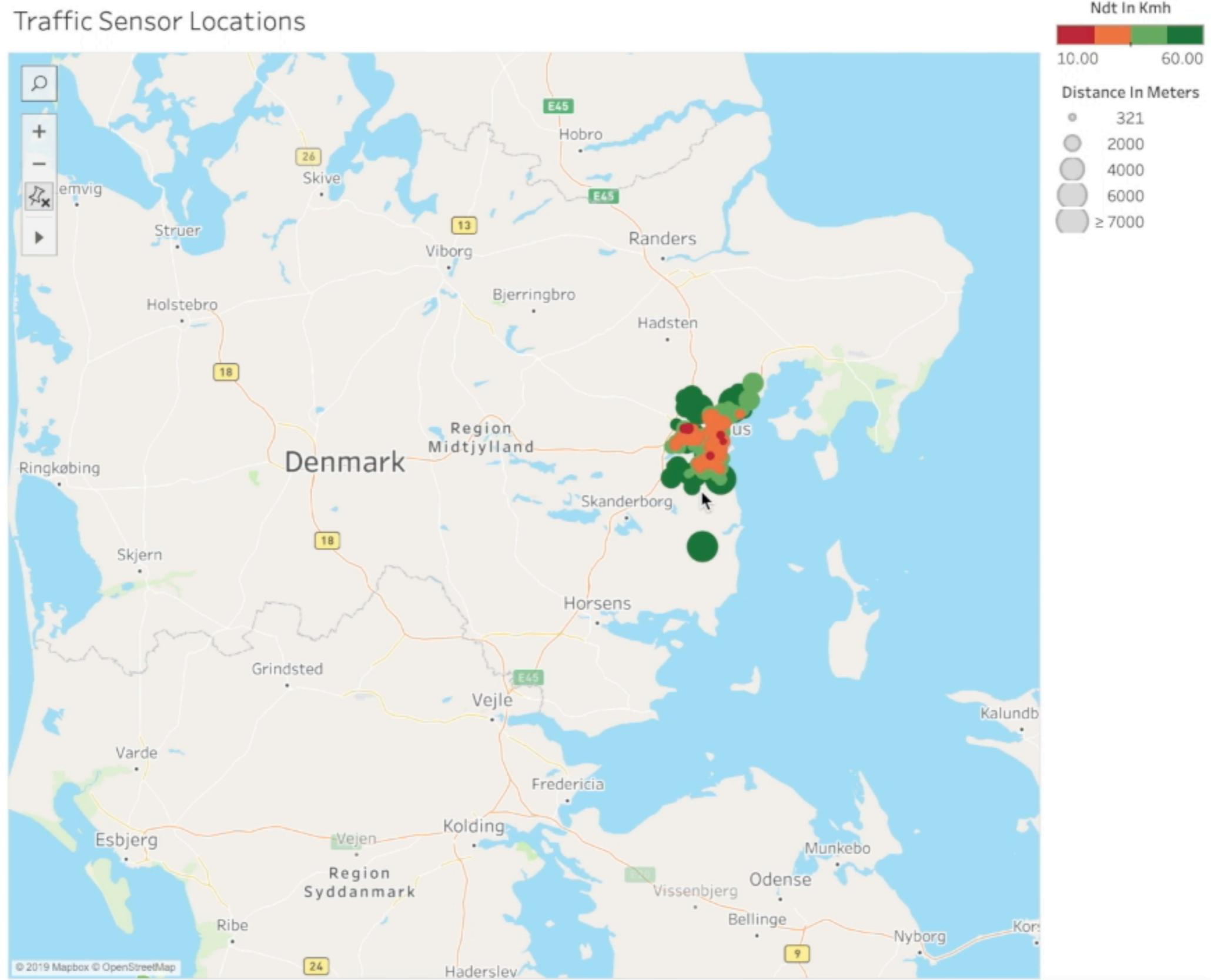




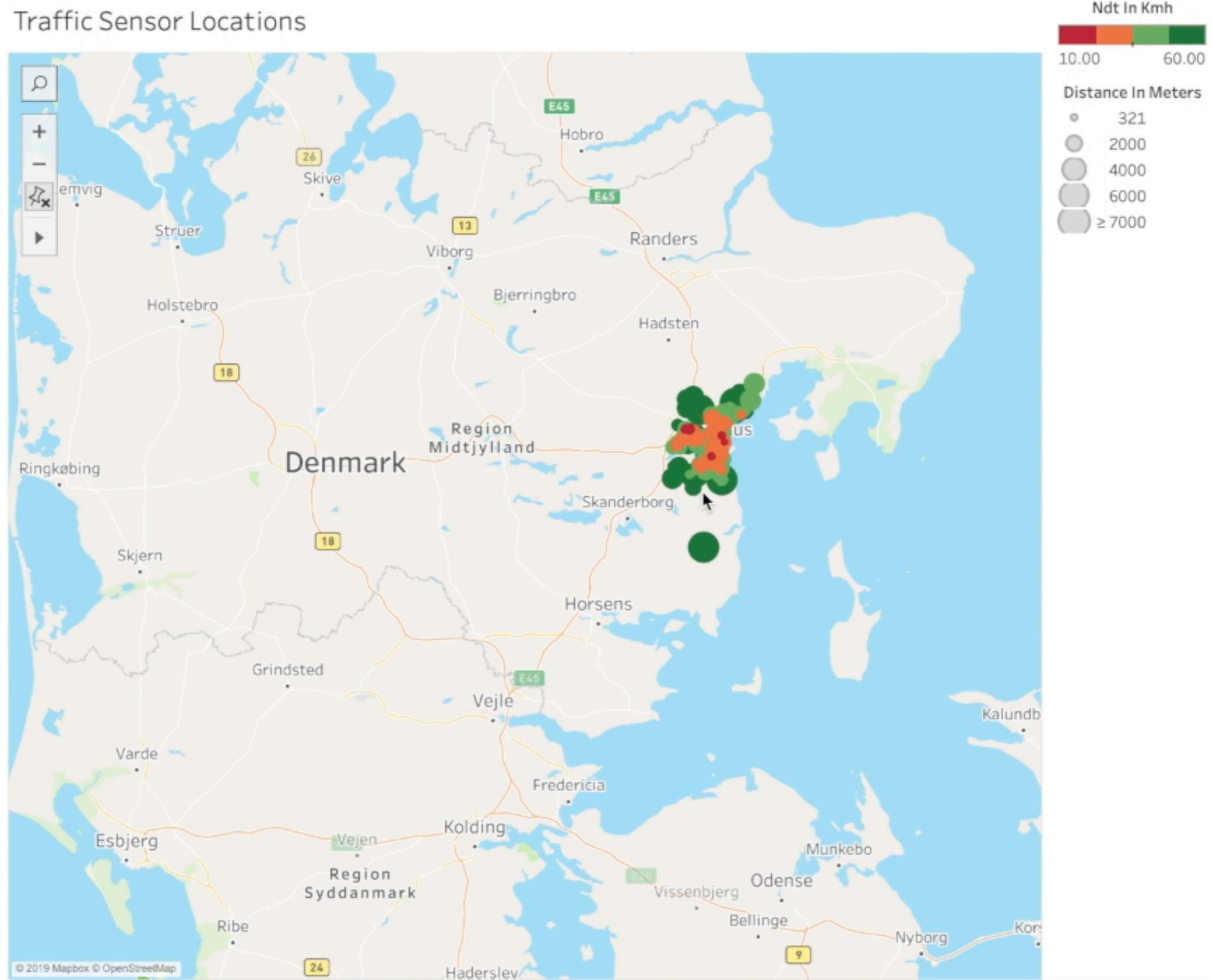
PREDICTING TRAFFIC CONGESTION

FARHAN SYED

Traffic Sensor Locations



Traffic Sensor Locations



DATA

- ▶ Ground Truth
 - ▶ Distance between Sensors
- ▶ Nominal Speed
- ▶ Measurements
 - ▶ Average Vehicle Speed
 - ▶ Average Traversal Time
 - ▶ Observations every 5 minutes
 - ▶ Over a 1.5 year period
 - ▶ ~2.5 million observations



DEFINING TRAFFIC CONGESTION

OBSERVED SPEED

NOMINAL SPEED

<

0.85

AND

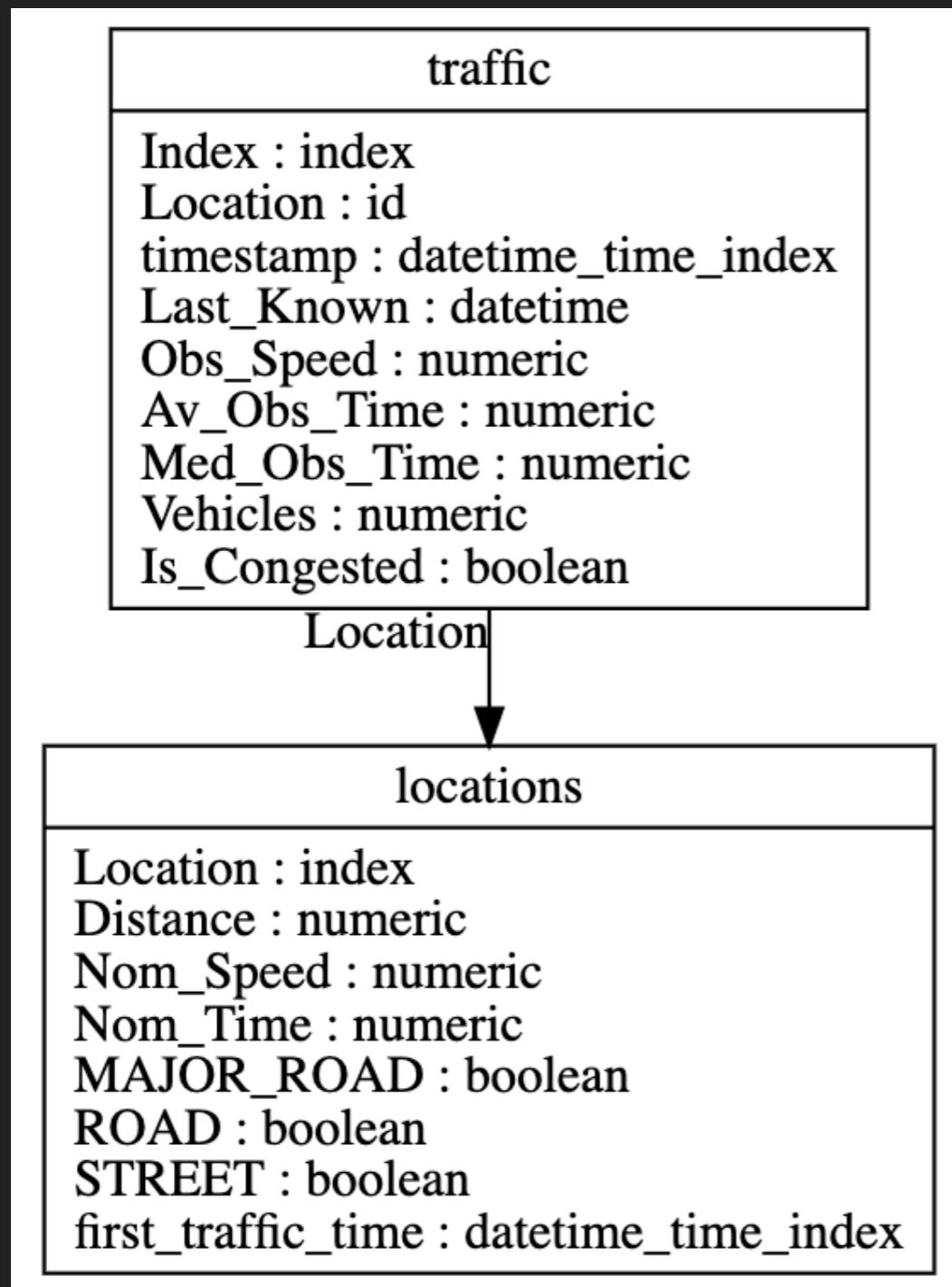
OBSERVED TRAVERSAL TIME

NOMINAL TRAVERSAL TIME

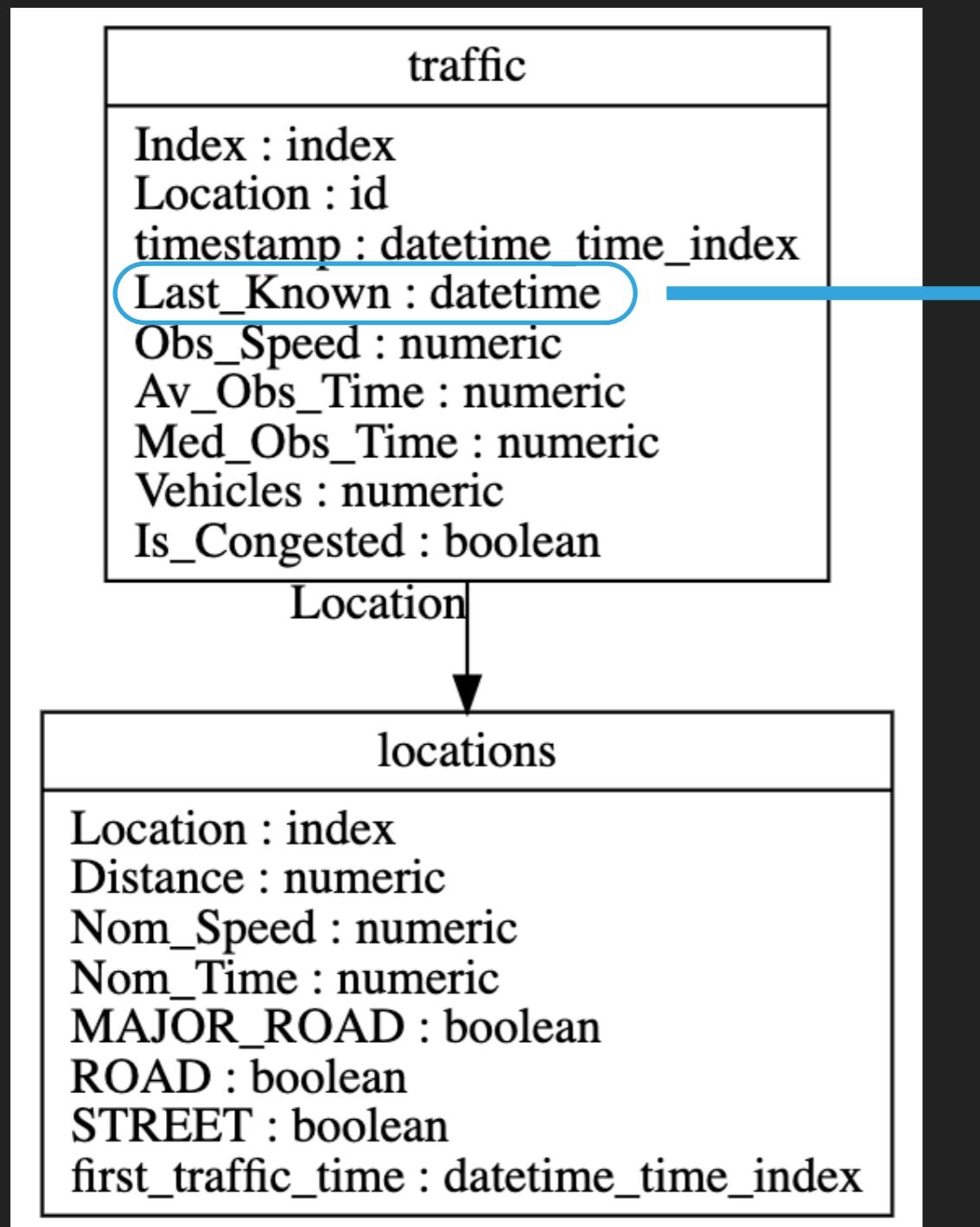
>

1.15

AUTOMATED FEATURE ENGINEERING



AUTOMATED FEATURE ENGINEERING



CUTOFF TIME

=

OBS. TIME – 20 MIN.

AUTOMATED FEATURE ENGINEERING...

Aggregation Primitives

- ▶ Count, Mean, Sum, Max
- ▶ Percent_True

Transformation Primitives

- ▶ Is_Weekend
- ▶ Weekday
- ▶ Day, Month, Weak
- ▶ Cum_Sum

FEATURE SELECTION

98 FEATURES

RANDOM FOREST
CLASSIFIER

RECURSIVE FEATURE
ELIMINATION

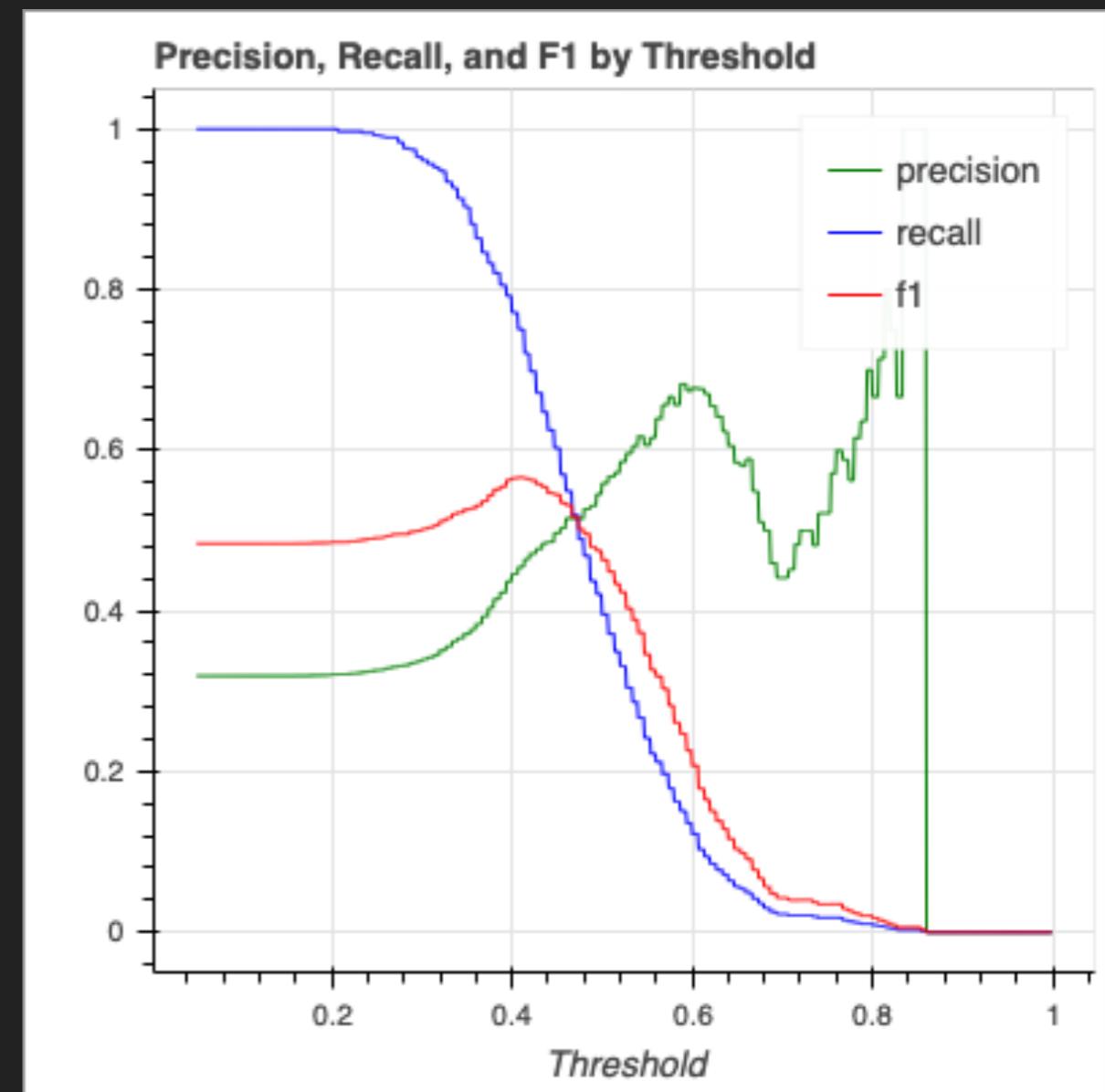
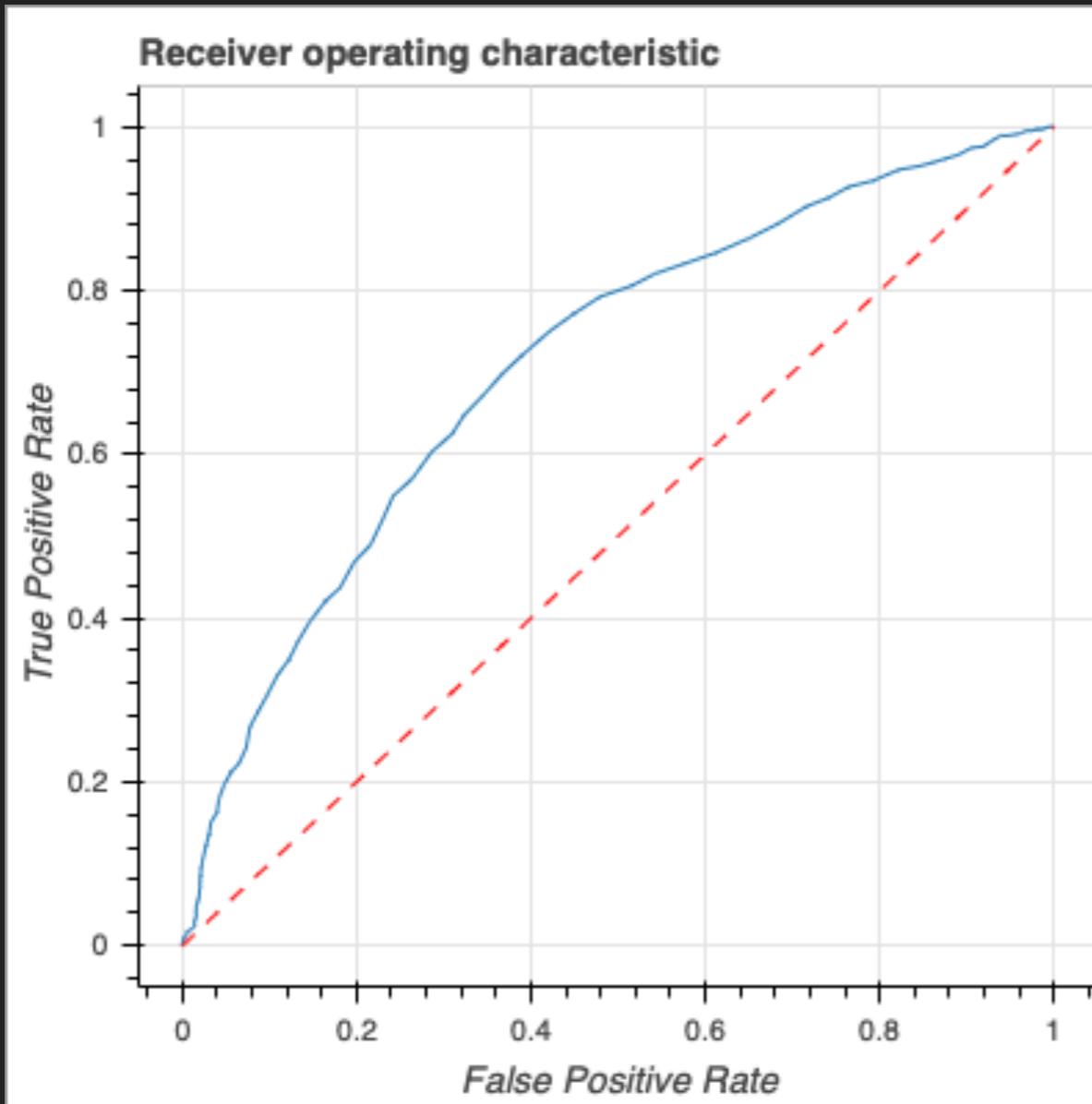
5 FEATURES

1. PERCENT_TRUE (IS_CONGESTED)
2. LOCATION
3. MEAN (OBS_SPEED)
4. NOMINAL TRAVERSAL TIME
5. DISTANCE

MODEL TRAINING

RANDOM FOREST CLASSIFIER

AUC = 0.70 (TEST DATA)



Enter some information about where you're headed, and I'll predict whether you're going to hit traffic or not

Historically, how often is this route congested (%)?

Which location are you going to?

Historically, what is the average speed on this route, in km/h?

What is the nominal amount of time it takes to travel this route, in seconds?

What is the length of this route, in meters?

Congested or Not?

Enter some information about where you're headed, and I'll predict whether you're going to hit traffic or not

Historically, how often is this route congested (%)?

Which location are you going to?

Historically, what is the average speed on this route, in km/h?

What is the nominal amount of time it takes to travel this route, in seconds?

What is the length of this route, in meters?

Congested or Not?

QUESTIONS?

THANK YOU