

# DEMAND SENSE

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AN AI-BACKED DRIVER NUDGE  
SYSTEM FOR DEMAND-AWARE  
REPOSITIONING



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## TEAM 7

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# DRIVER NUDGE SYSTEM

Data-driven insights. Smarter driving. Better outcomes.



## THE PROBLEM



### Driver Idle Time

Drivers wait in the wrong zones losing earnings while riders wait elsewhere



### Zero Visibility

No data or reasoning behind dispatch, drivers can't make informed decisions



### Lost Revenue

Supply-demand mismatches mean longer wait times and fewer completed rides

## DEMAND INTELLIGENCE PIPELINE

From raw trip data to actionable nudges and validated insights



### 1 INGEST

Load raw TLC trip data

Apache Spark  
Databricks



### 2 CLEAN

Handle nulls, outliers, and timestamps

Apache Spark  
Databricks



### 3 AGGREGATE

Aggregate trips by  
**ZONE × DAY × DAYPART**

Apache Spark  
Delta Lake



### 4 SCORE

Score demand relative to city average

Apache Spark



### 5 RANK

Select Top-N zones per time window

Apache Spark



### 6 LLM NUDGE GENERATION

Convert ranked insights into clear, actionable driver messages

OpenAI API | Databricks



### 7 VALIDATION

Evaluate predictions using March holdout data

Apache Spark | Matplotlib

## KEY IMPACT

- ✓ Reduce driver idle time by guiding them to high-demand zones
- ✓ Increase completed rides and reduce passenger wait times
- ✓ Improve driver earnings through data-driven recommendations
- ✓ Deliver explainable nudges backed by holdout validation



## TECH STACK

Spark  
Apache Spark

Databricks

Delta Lake

OpenAI API

Matplotlib