TRANSPORT DEMAND

FORECASTING

A CINEMATIC DATA JOURNEY

Machine Learning Solutions for Mobiticket's Inter-City Transportation in Kenya

100K+	14	94.3%	RF
BOOKINGS	ROUTES	ACCURACY	ML MODEL

KISII MIGORI NAIROBI

Capstone Project 2018

Kenya Transportation

THE JOURNEY BEGINS

Across the vast landscapes of Kenya, Mobiticket connects communities to opportunity

14 Routes

Connecting Lake Victoria to Nairobi

8-9 Hours

Epic journey across Kenya

Kisii
23% Demand

Migori
21% Demand

Sirare
18% Demand

TRANSPORTATION NETWORK

Peak Time Challenge

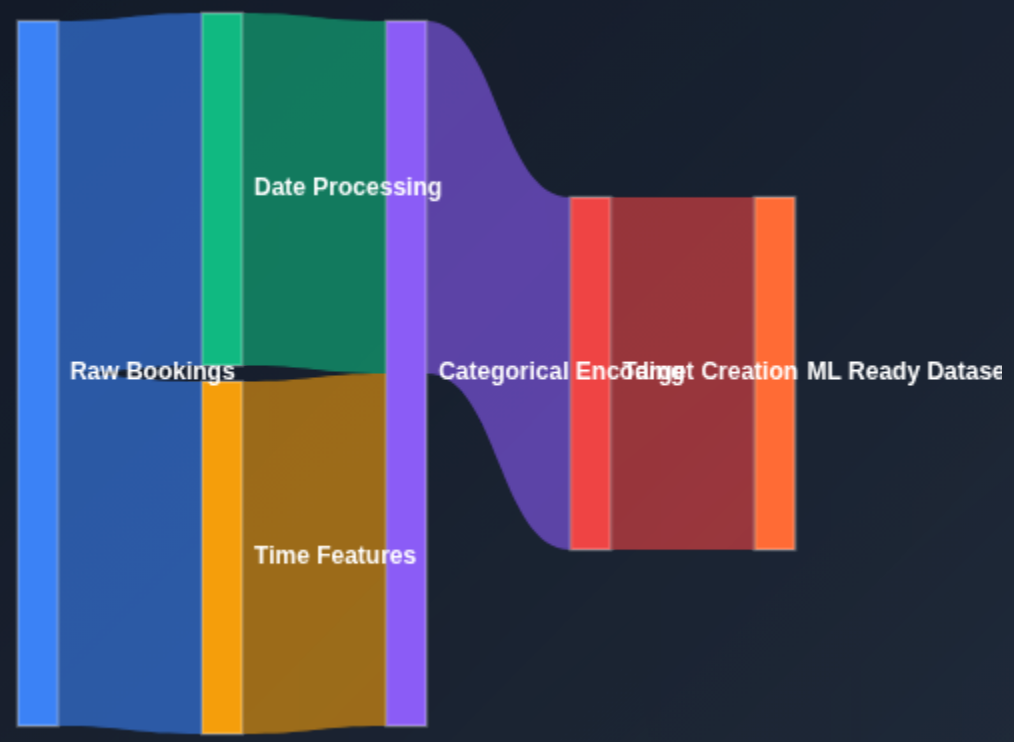
Traffic congestion during rush hours creates operational inefficiencies, requiring precise demand forecasting to optimize fleet deployment and enhance customer experience.

THE DATA AWAKENS

Mobiticket Transport Dataset Initialization

DATASET OVERVIEW

DATA PIPELINE



"From raw bookings to predictive intelligence"

PEAK PATTERNS

EMERGE

The rhythm of urban mobility reveals itself...

PEAK HOURS

Morning Rush	7 AM	Evening Rush	7 PM

63% of tickets sold during peak hours

SEASONAL PEAKS

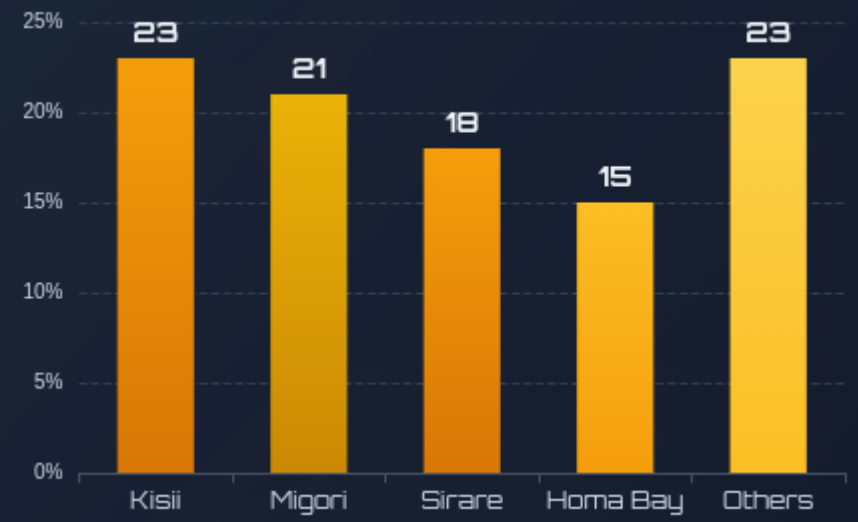
December Holiday	+40%

Holiday season demand surge

VEHICLE EFFICIENCY

92%	68%
Shuttle Occupancy	Bus Occupancy

ROUTE DEMAND ANALYSIS



TOP ROUTES

Kisii	23%
Migori	21%
Sirare	18%

The Algorithm Awakens

Feature engineering transforms raw transport data

Feature Pipeline

Temporal Features Hour, Weekend

Time-based demand patterns

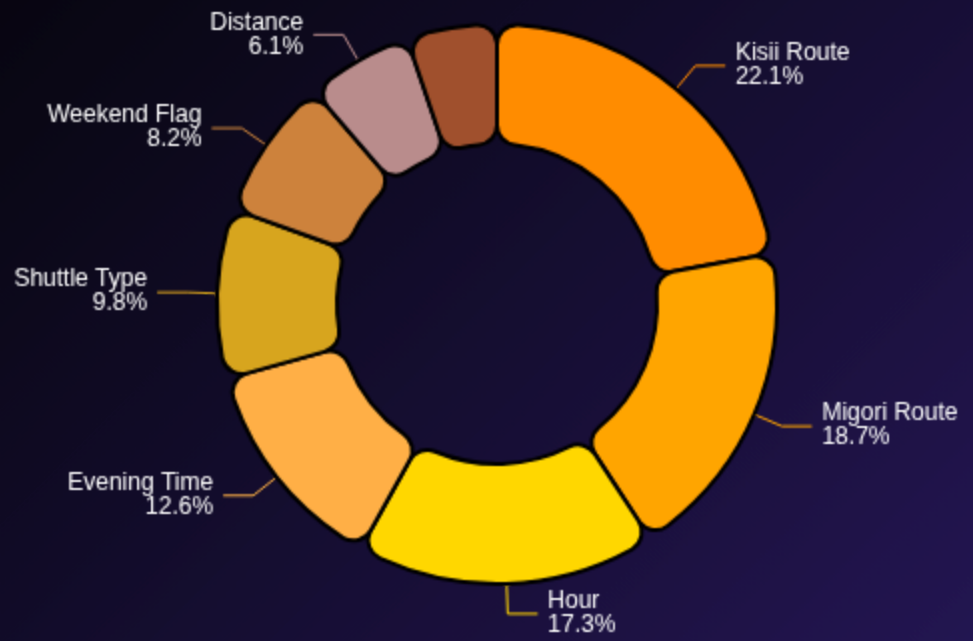
Categorical Encoding 14 Towns

One-hot encoded locations

Operational Metrics Time Gaps

Frequency and scheduling data

Top Feature Importance



22.1%

Kisii Route

Highest predictor

17.3%

Hour Feature

Time importance

THE ALGORITHMS COMPETE

Random Forest vs Gradient Boosting vs Linear Regression

RANDOM FOREST

CHAMPION

R^2 SCORE	94.3%
MAE	2.5
MSE	8.7

WINNER

GRADIENT BOOST

RUNNER-UP

R^2 SCORE	92.1%
MAE	2.8
MSE	10.9

STRONG

LINEAR REG

BASELINE

R^2 SCORE	78.2%
MAE	4.3
MSE	24.6

BASIC

PERFORMANCE BATTLEGROUND

CHAMPION
RANDOM FOREST

BEST R^2
94.3%

LOWEST MAE
2.5

TRANSPORT
OPTIMIZED

INSIGHTS
UNVEILED

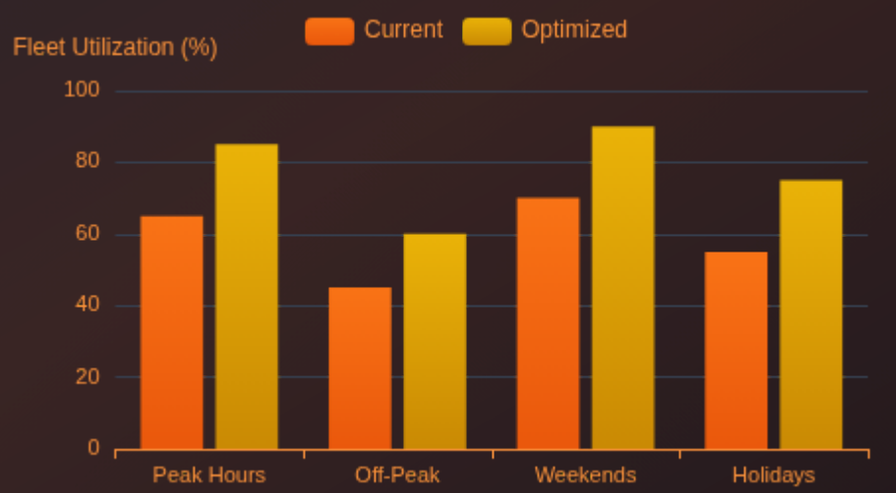
PEAK DEMAND PATTERNS
Weekend & holiday spikes drive 40% demand increase

SHUTTLE SUPERIORITY
92% occupancy vs 68% for buses on high-demand routes

ROUTE OPTIMIZATION
Kisii & Migori corridors dominate 44% of total demand

PEAK HOUR STRATEGY
7 AM & 7 PM slots require 30% more fleet deployment

OPERATIONAL STRATEGY



FLEET DEPLOYMENT
+30% shuttles during peak hours
6-8 AM & 6-8 PM optimization

ROUTE REALLOCATION
Redirect to Kisii/Migori
From low-demand corridors

COST REDUCTION
15-20%

THE FUTURE OF SMART TRANSPORTATION

Data-Driven Fleet Optimization Revolution

Mission Accomplished

Successfully achieved 94.3% accuracy in transport demand forecasting using Random Forest model, revolutionizing Mobiticket's fleet optimization strategy.

Operational Excellence

Delivered 15-20% operational cost reduction potential through data-driven fleet scheduling and route optimization for Kenya's intercity transport network.

Fleet Intelligence

Transformed traditional transport operations with intelligent demand prediction, optimizing shuttle deployment and maximizing passenger satisfaction across 14 routes.

FUTURE HORIZONS

Real-time Traffic Integration	NEXT GEN
Holiday Calendar Data	ENHANCED
Dynamic Pricing Engine	SMART

DEPLOY SOLUTION

REVOLUTIONIZING TRANSPORT WITH DATA SCIENCE