

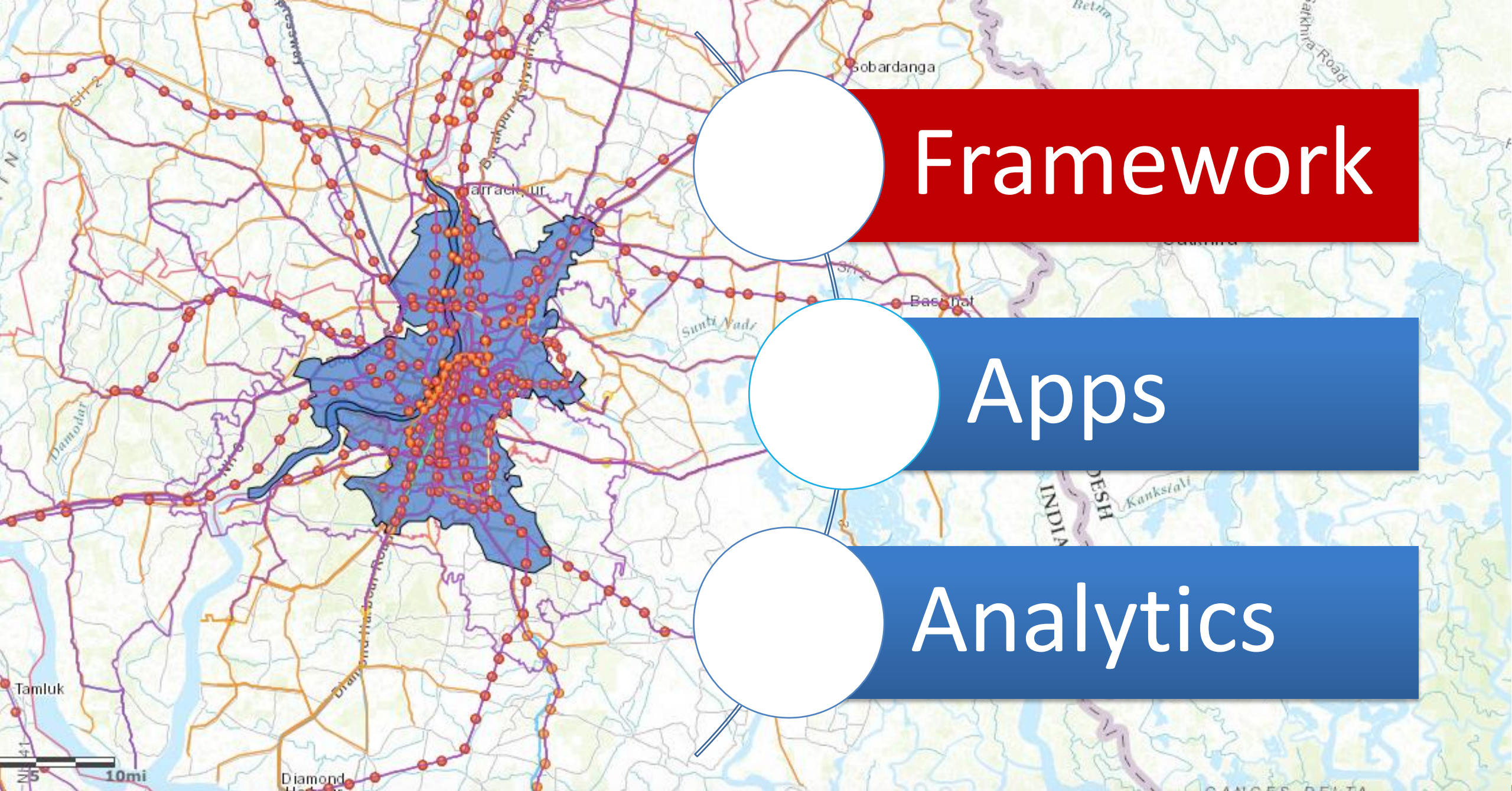
FRAMEWORK, APPS & ANALYTICS FOR SMART TRANSPORT – WBTC CASE STUDY

WORLD BANK SUPPORTS WEST BENGAL FOR BUSINESS-EASE & INTELLIGENT COMMUTING



Korea
Green Growth
Trust Fund



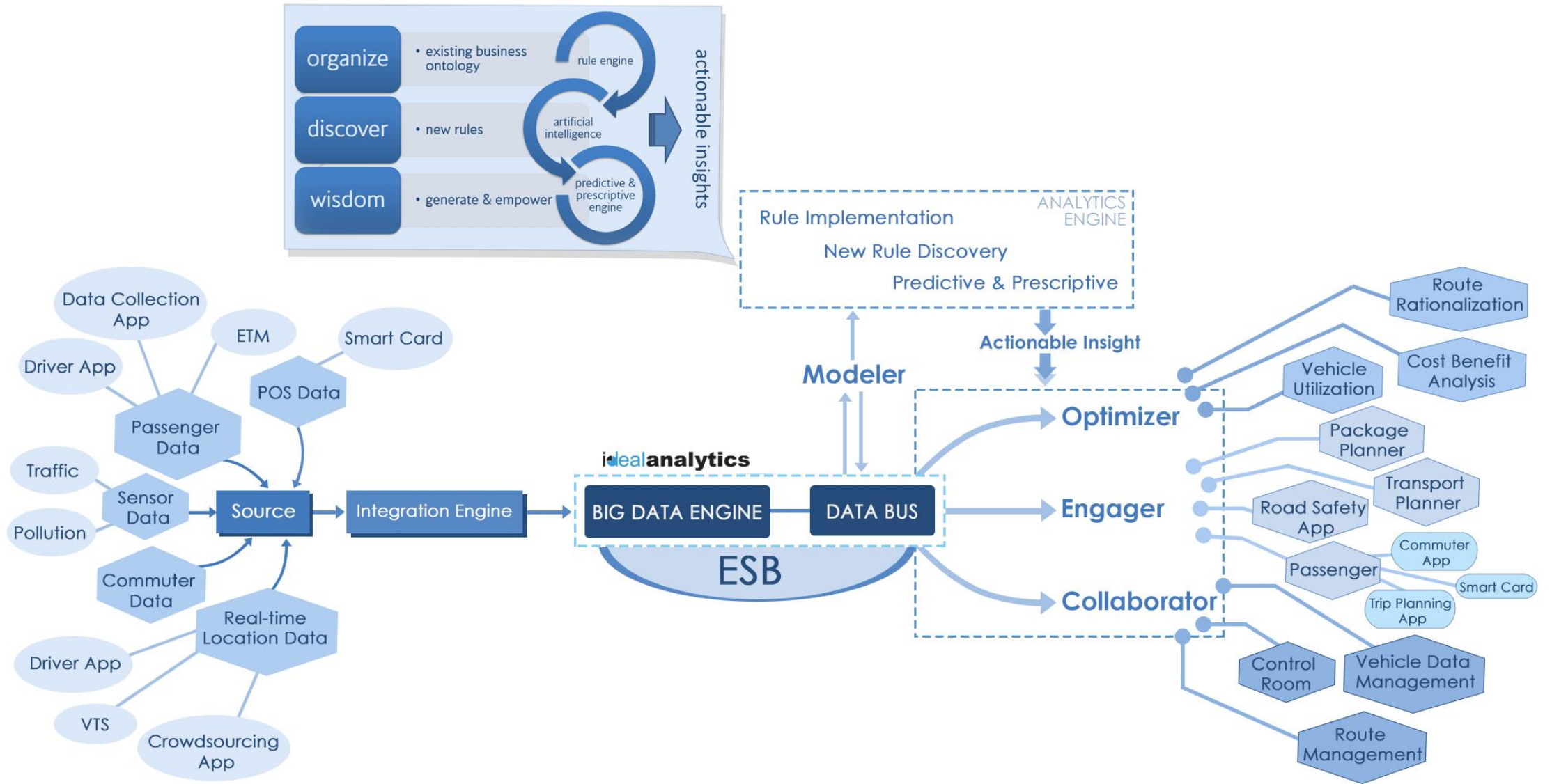


Framework

Apps

Analytics

Analytics Driven Framework

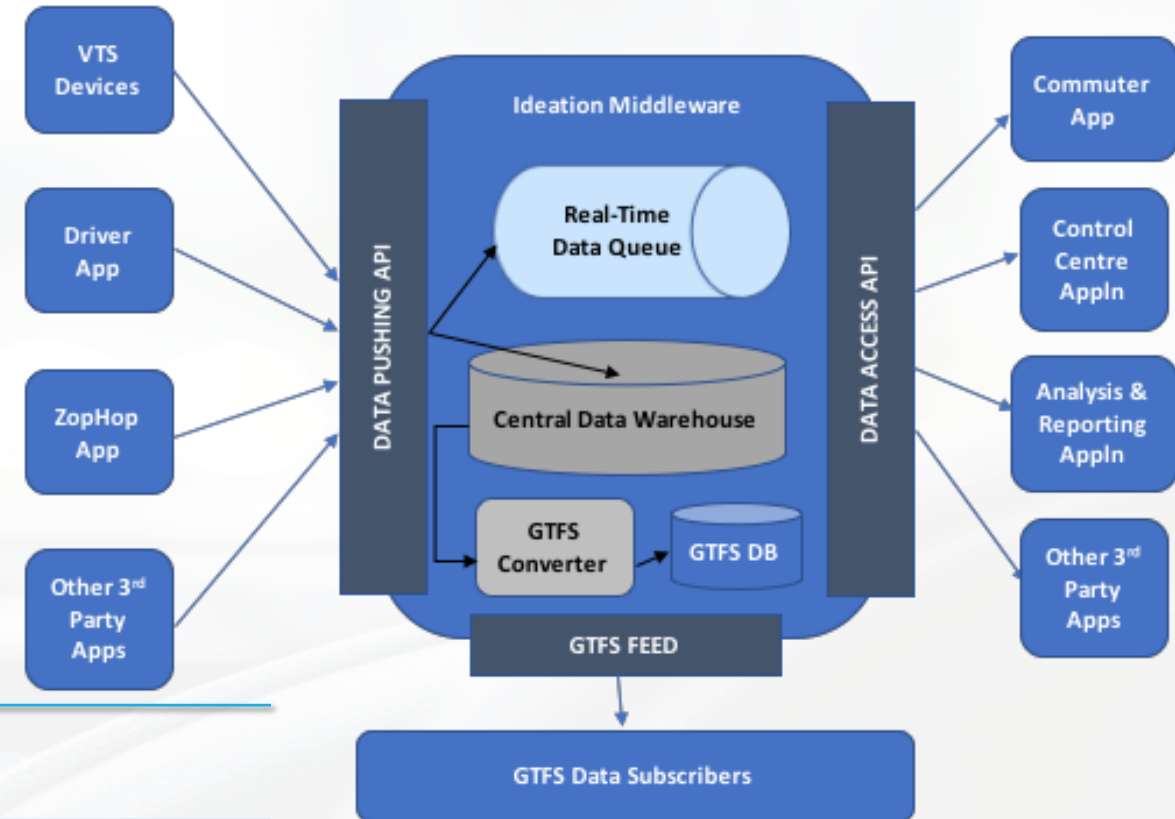


Control Room Application

Monitor and Manage
Alerts & Notifications
Incident Management

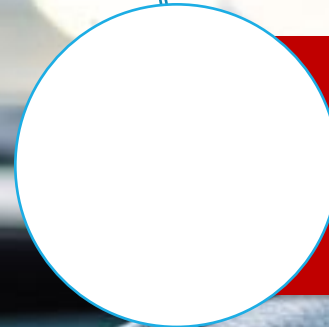
Smart Transport Middleware

Central Data Warehouse
Open Data Compliance (GTFS)
Standardization for 3rd Party Access
Big Data scalable





Framework



Apps



Analytics



Route Creation App

Automated Route, Stoppage creation
Capture OD with gender info
Works both online/offline mode
Re-usable, configurable on any location

Route MDM Quality Control

Route / Stoppage MDM
Reports & Analytics
Replay / Simulation

The screenshot displays two screens from the Route Creation App. The left screen, titled 'Route Amendment', shows a route from '1-D - Esplanade-Badhaghat' with a highlighted 'Howrah Station' and a 'Junction Stoppage' checkbox. The right screen, titled 'Route Review', shows a list of stops including Esplanade, Mission Row/Bentick Street, Tea Board/ Fairly Place, Burrabazar, Howrah Station, Golabari, Hooghly Dock, and Bandhaghat. Below these screens is a map view showing the route on a map of Kolkata, with a table of stoppage details at the bottom.

Stoppage Name	Latitude	Longitude	Geocoding Datetime	GetOff Count	GetOff Male Count	GetOn Count	GetOn Male Count	Sound Clip Name
KARUNAMAYEE STAN	22.590254	88.418240	27-09-2016 11:14:46	0	0	25	18	
KALICHARAN	22.583385	88.418500	27-09-2016 11:24:01	0	0	2	2	
CENTRAL PARK	22.583757	88.416060	27-09-2016 11:24:29	2	0	2	0	
STADIUM ISLAND	22.578697	88.414185	27-09-2016 11:25:58	0	0	1	1	
AMRI HOSPITAL	22.576336	88.413635	27-09-2016 11:26:54	0	0	2	2	
BIG BAZAR	22.573030	88.412735	27-09-2016 11:28:23	0	0	0	0	

Driver App

Uber-like App for Driver

Avoid potential 'bunching'

Input Crowdedness

Capture 'demand' in real-time

Commuter App



Real-time trip planning

Real-time tracking with crowdedness

ETA

Capture 'demand' in real-time

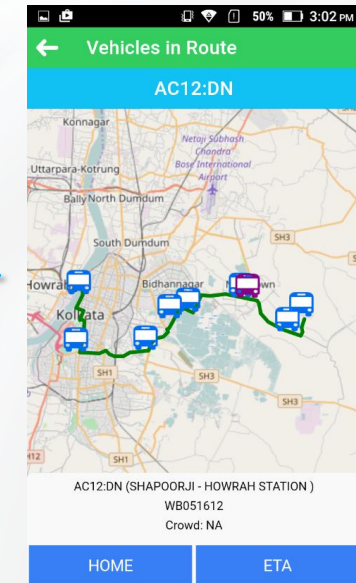
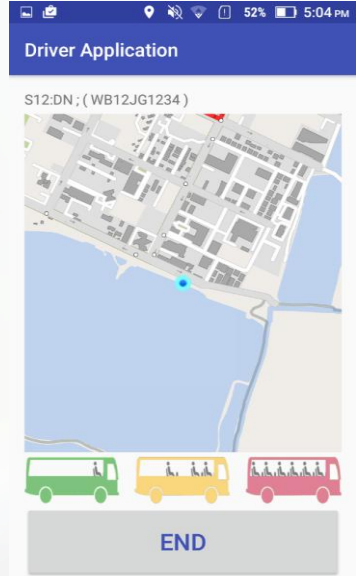
Ride Sharing

Crowd Sourcing App

Community Building

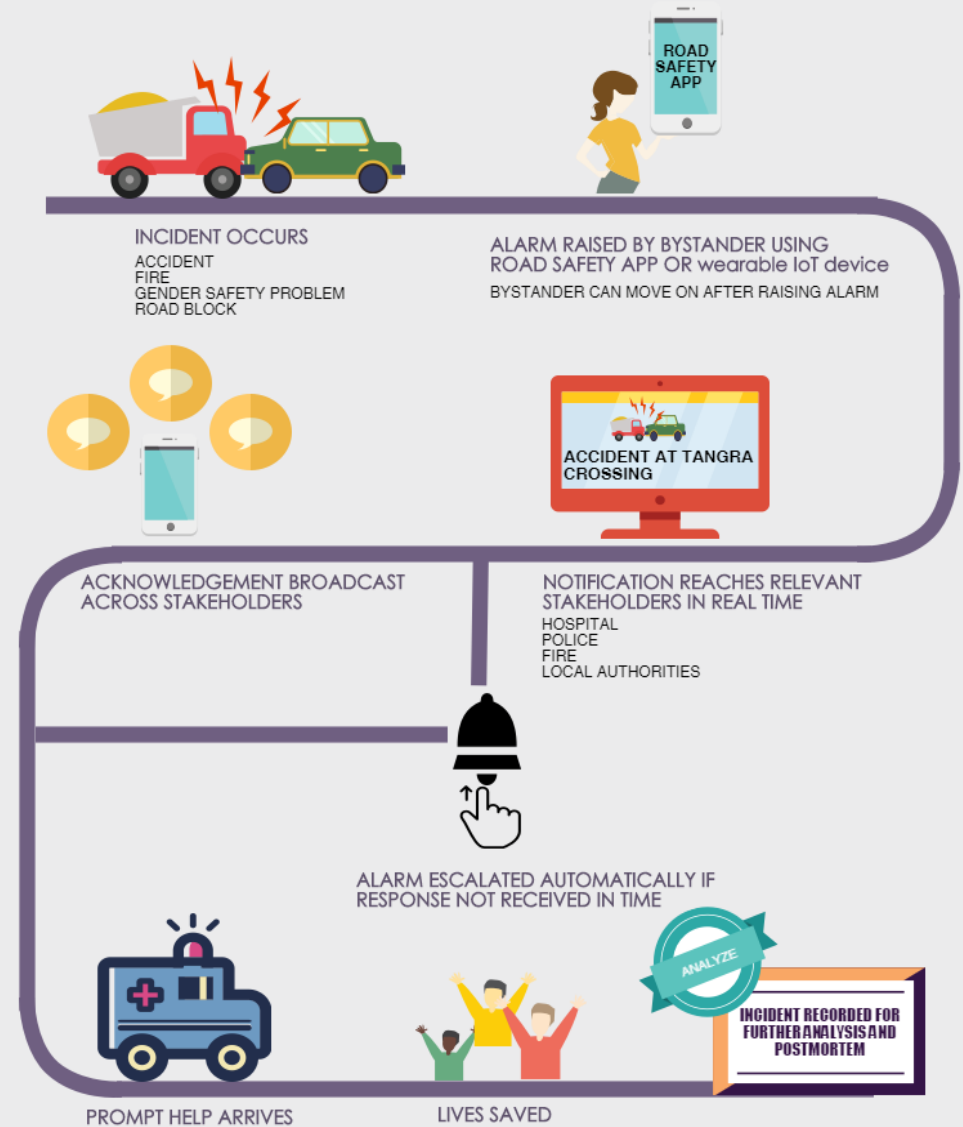
Capturing Sentiments of Commuters

Enriching Driver & Commuter App



Overview	Accidents or Incidents on Road will be immediately informed to the
	Traffic police
	Crime police
	Nearby Hospitals
	Control room of the transportation dept.
	Depots Nearby
	Fire fighters
	Break down service centers
	Commuter apps
	Driver app

ROAD SAFETY App Process Flow



Overview

An Internet of Things (IoT) based Mobile Air Pollution measurement device which will be connected to any Smartphone as an IoT Gateway via Bluetooth low Energy to send accurate and reliable data to the cloud server, where all the data about pollutants will go under further analysis.

The Device can measure the exact concentration major air pollutants like

Particulate Matters (PM2.5 and PM10)

Ozone (O3)

Carbon Mono Oxide (CO)

Nitrogen Di Oxide (NO2)

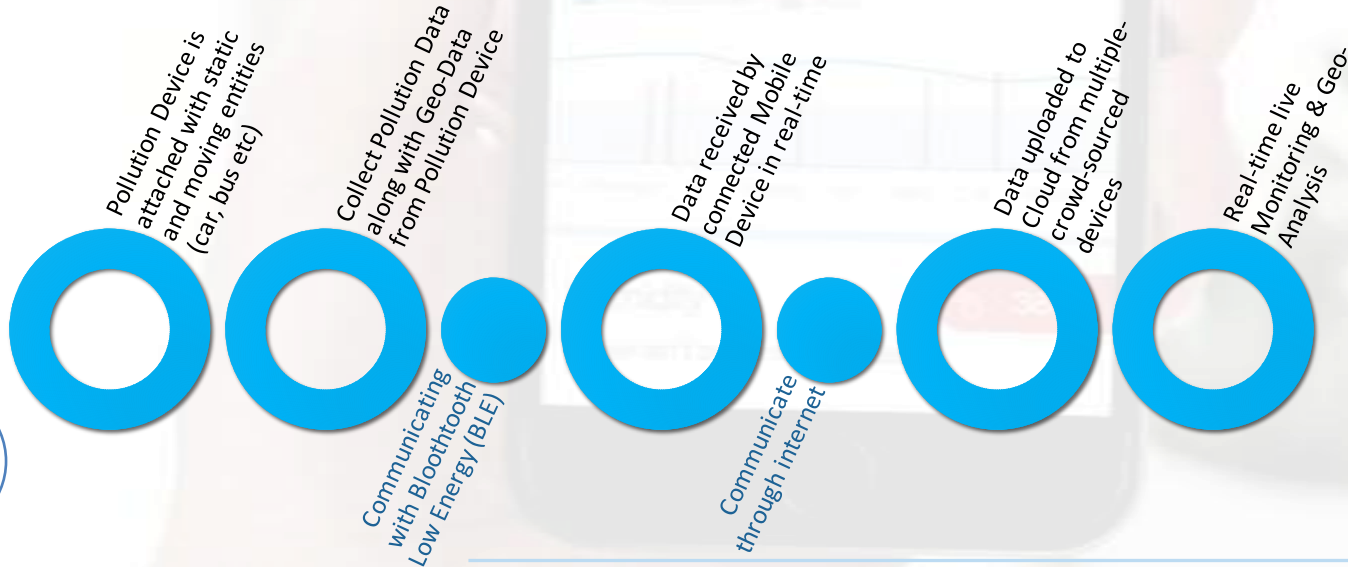
Sulphur Di Oxide (SO2)

Carbon Di Oxide (CO2)

Ammonia (NH3)

Methene, LPG /Propene

Temp, Pressure, Humidity

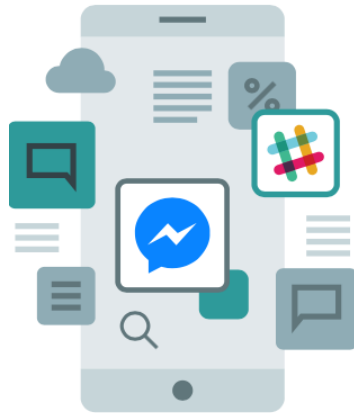


Transport CHATBOT

Intelligent FAQ

Real-Time ETA and Location Information

Trip Planner



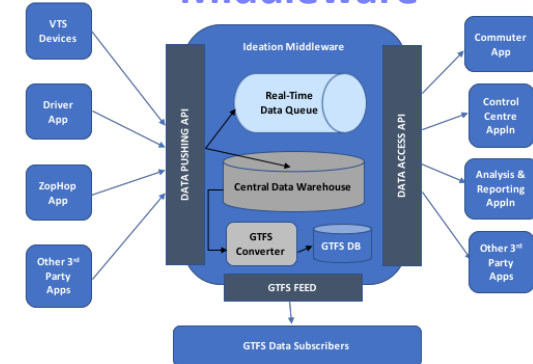
User interacts with existing popular messenger apps like Facebook Messenger / Twitter etc.



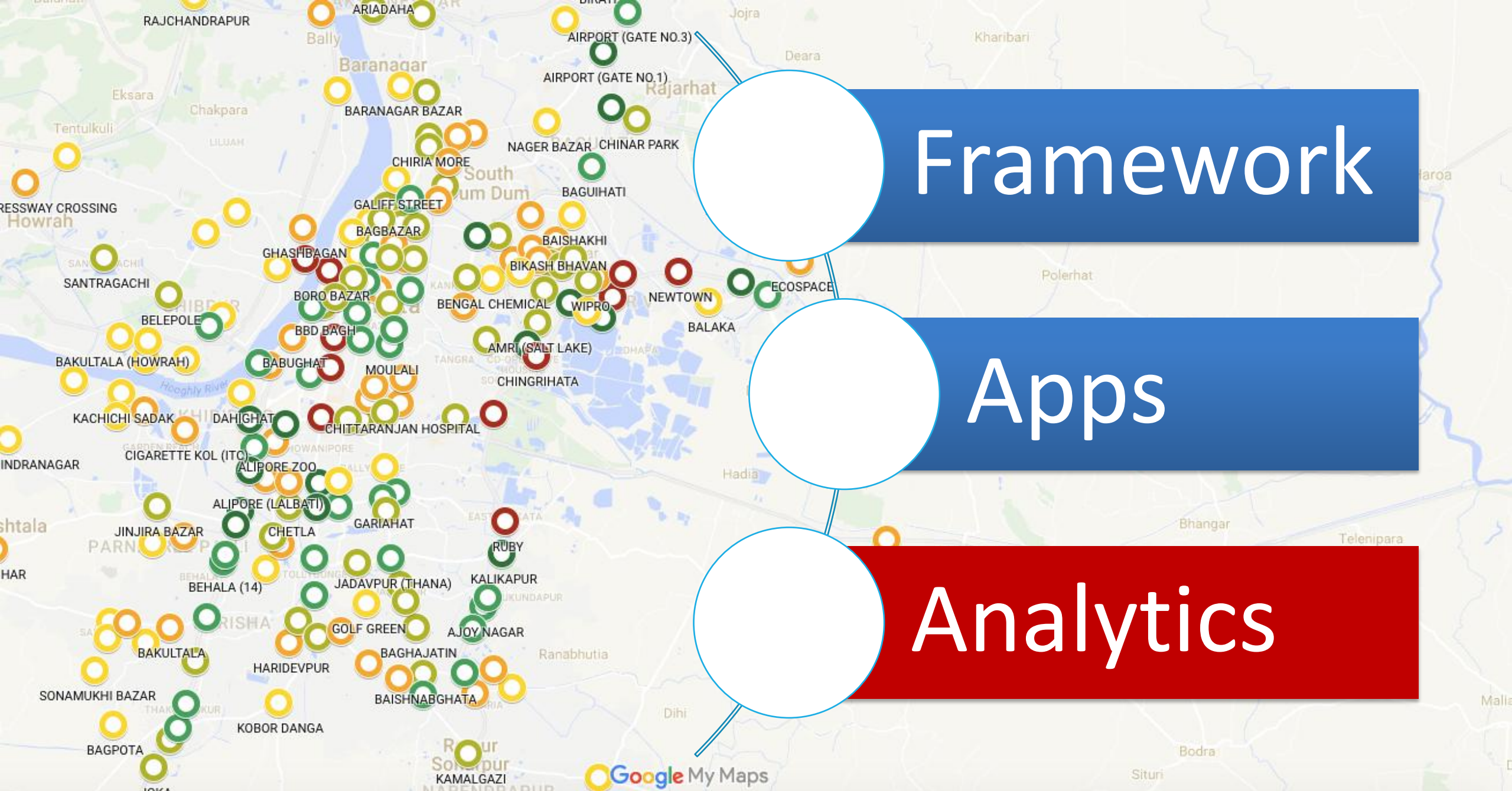
Translate to API and fetches response in real-time



Smart Transport Middleware



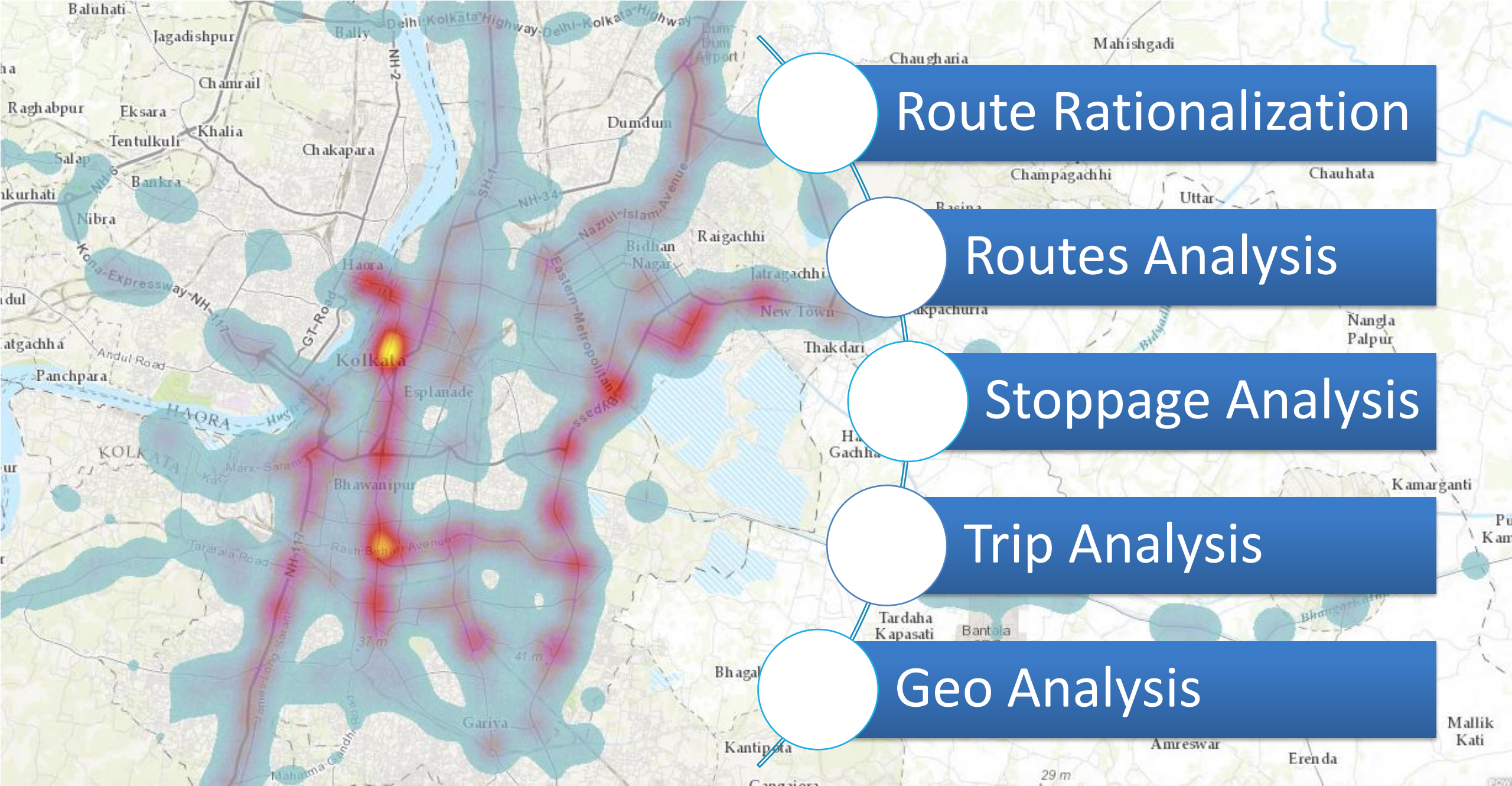
Execute the query and prepare response



Framework

Apps

Analytics



Overview

Network definition

Identification of route properties

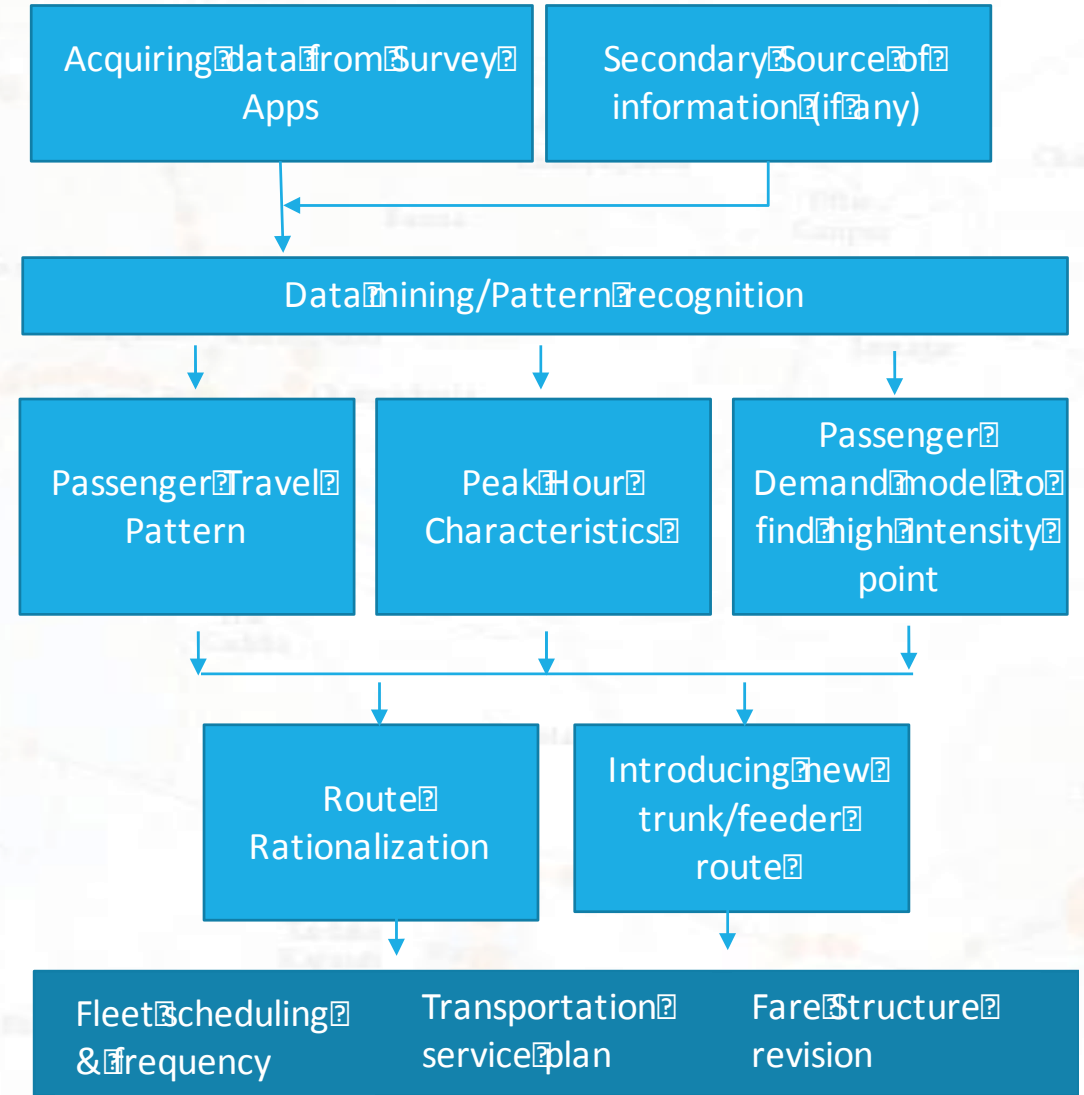
Defining an objective function and constraints

Identification of edit candidates

Eliminating and scoring candidates

Sample Output:

	CTC:ORD-1A	CSTC:O-12N	MERGED	
Distance(KM)	28	19	31	
Time(Mins)	78	56	84	
Buses	2	2	4	
Trips/Bus/Day	3	3	2	
Passengers	383	1000		
Trips/Day	6	6	8	67%
Passengers/Trip/Day	64	167		

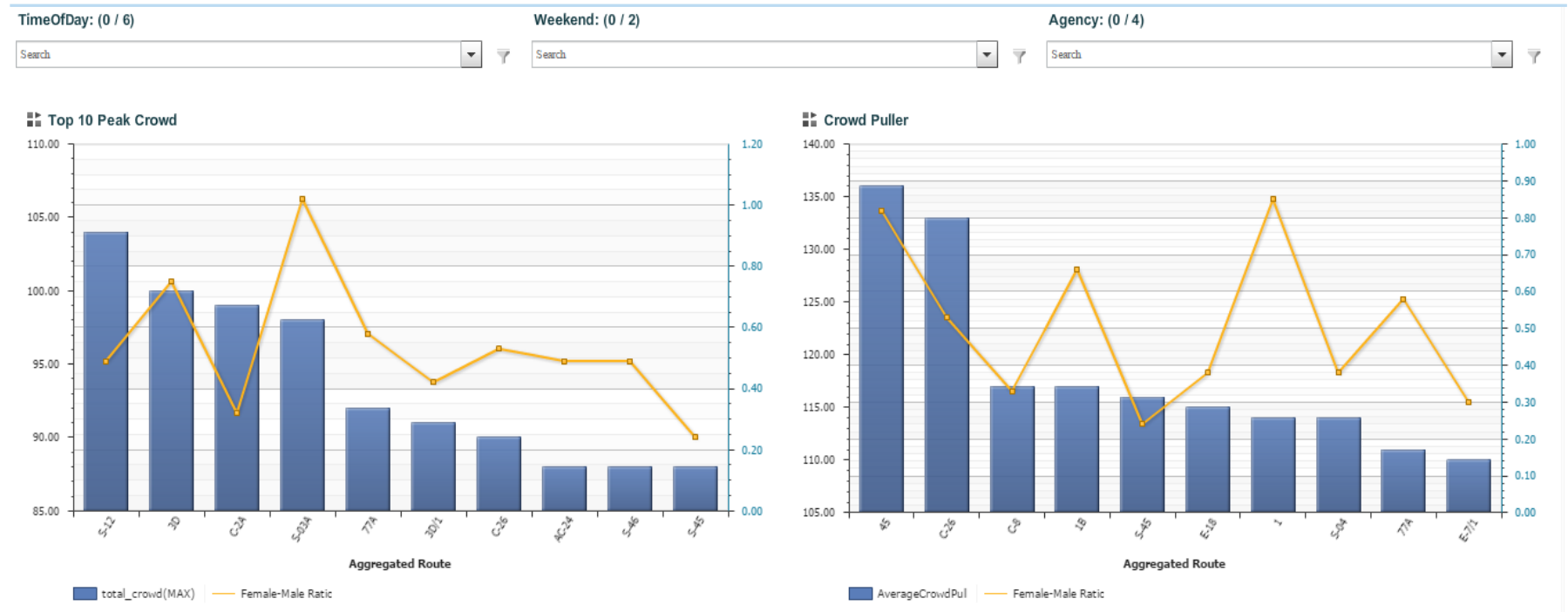


Route Analysis

Peak crowd – Shows the top 10 routes having maximum number of passengers in a given journey.

Top 10 routes having highest number of average passengers.

These two analyses further drilled down to see the pattern on weekends and weekdays level/if the pattern varies between different agencies /what are the impact of the different journey times.



Crowding

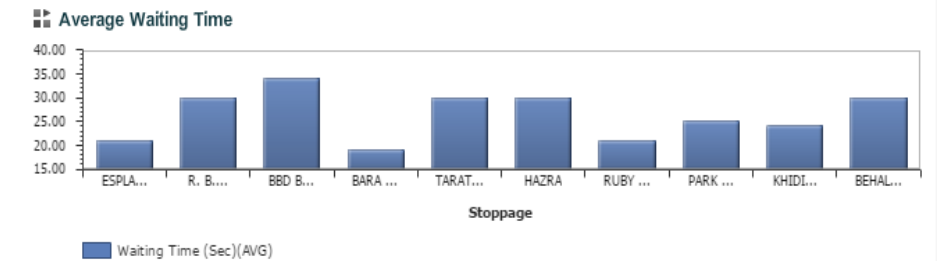
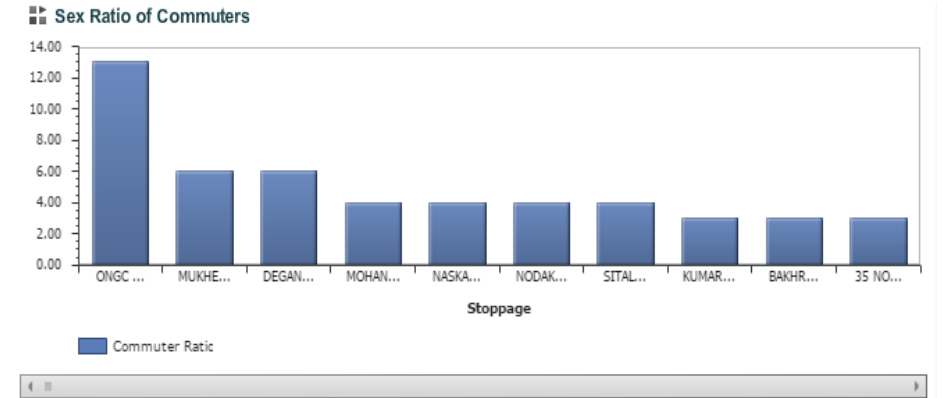
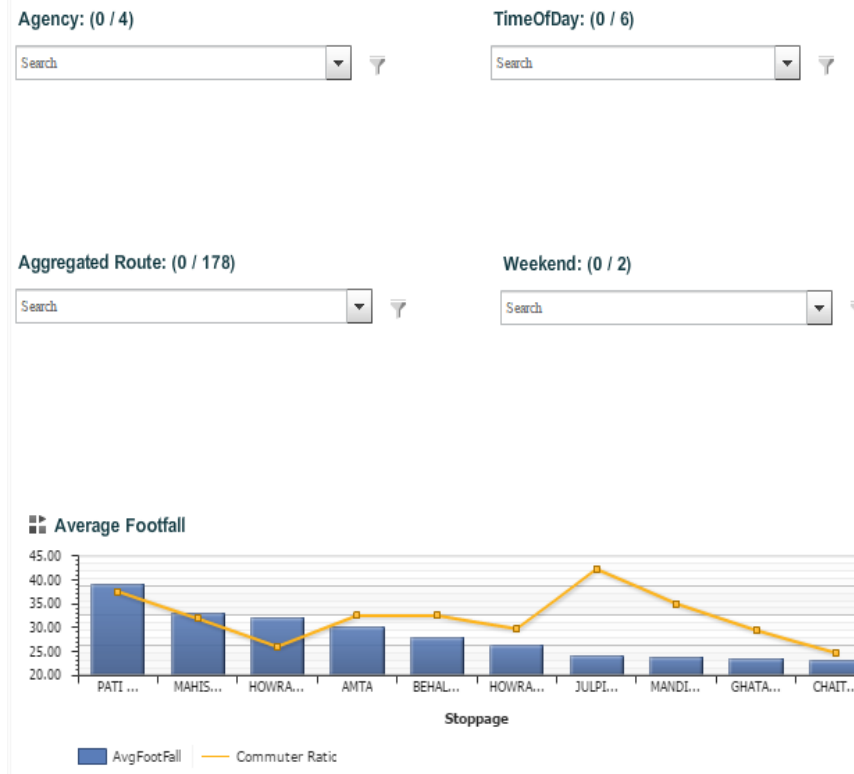
Average footfall

Gender ratio of the commuters

Average Waiting Time

Time variant analysis

Strategic decisions for Gender

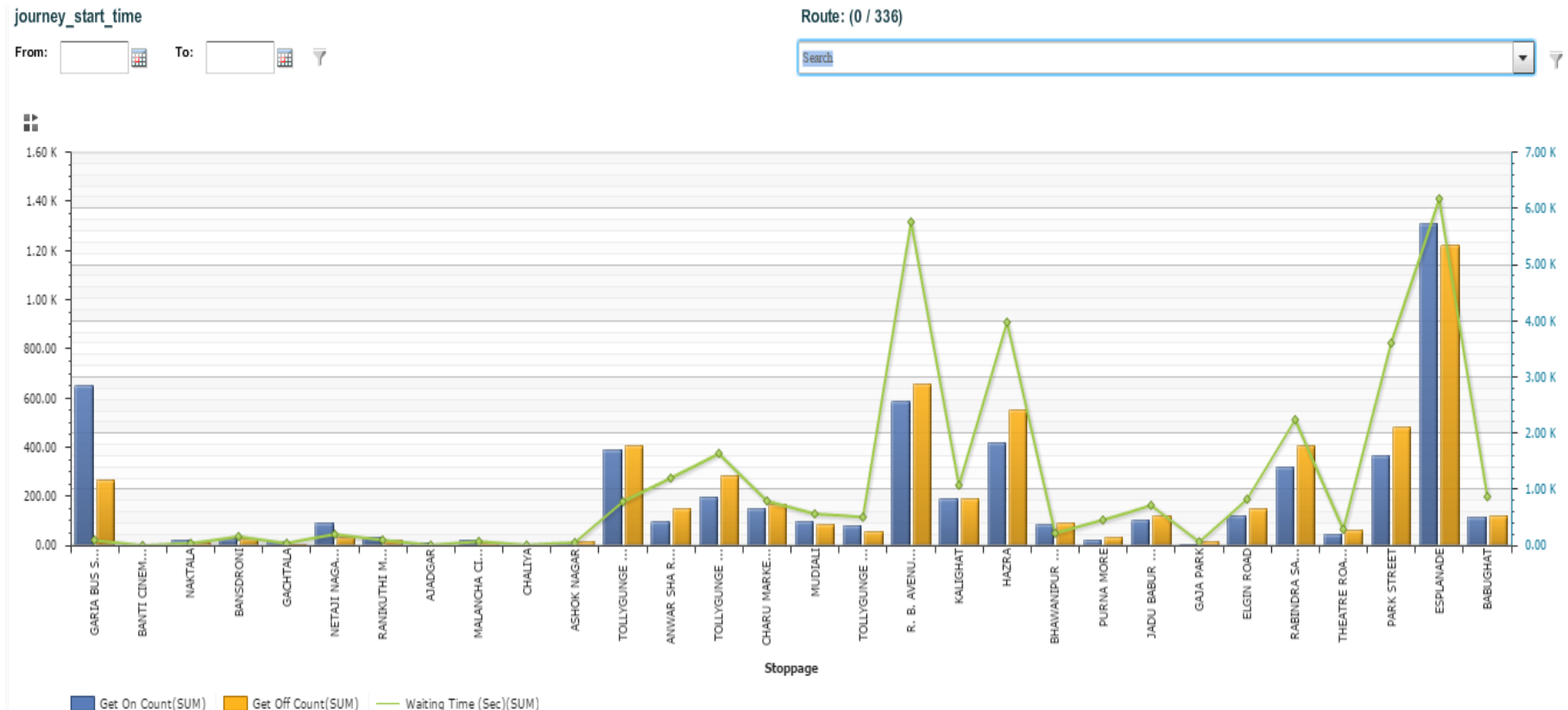


Trip Analysis

Trip Analysis – Shows Number of passengers getting off & getting on for a given stoppage along with passenger waiting time.

Time variant analysis

This exercise can show if any non-stop or limited stoppage services can be introduced for a specific journey time.

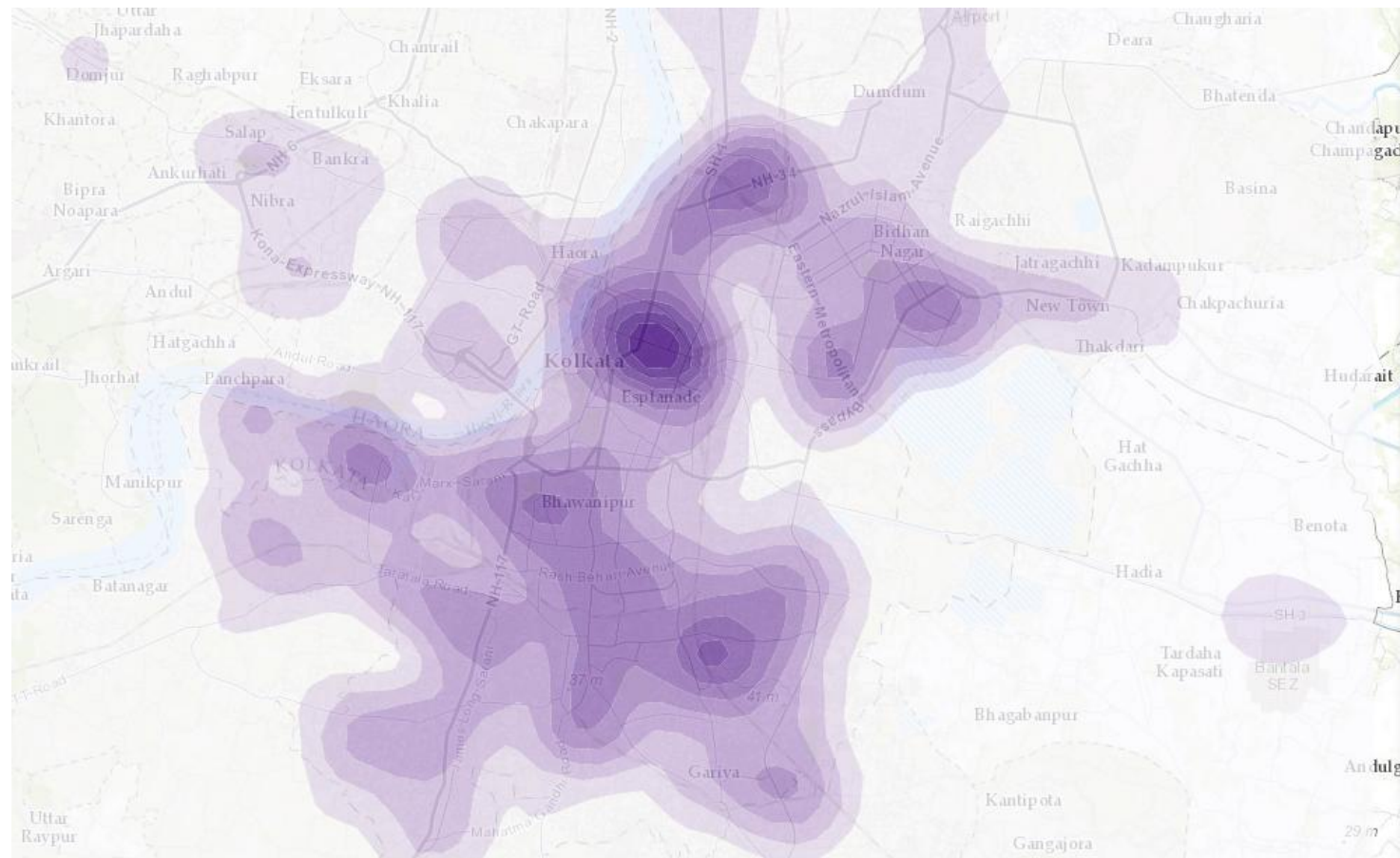


Geo Analysis

Stoppage Density

Categorized On-Boarding / Alighting Density

Geo temporal Analysis



Operational Layers

- ☐ Stoppage Density
- ☐ Avg. Get ON-OFF Density
- ☒ Avg. Get ON-OFF - Female Density
- ☐ Avg. Get ON/OFF
- ☐ Avg. Get ON/OFF - Female

THANK YOU



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