UITP ADVANCING PUBLIC TRANSPORT

SMART & SUSTAINABLE PUBLIC TRANSPORTATION

Chinmay Pandit
KPIT Technologies Ltd

Supported by

Association of State Road Transport Undertakings

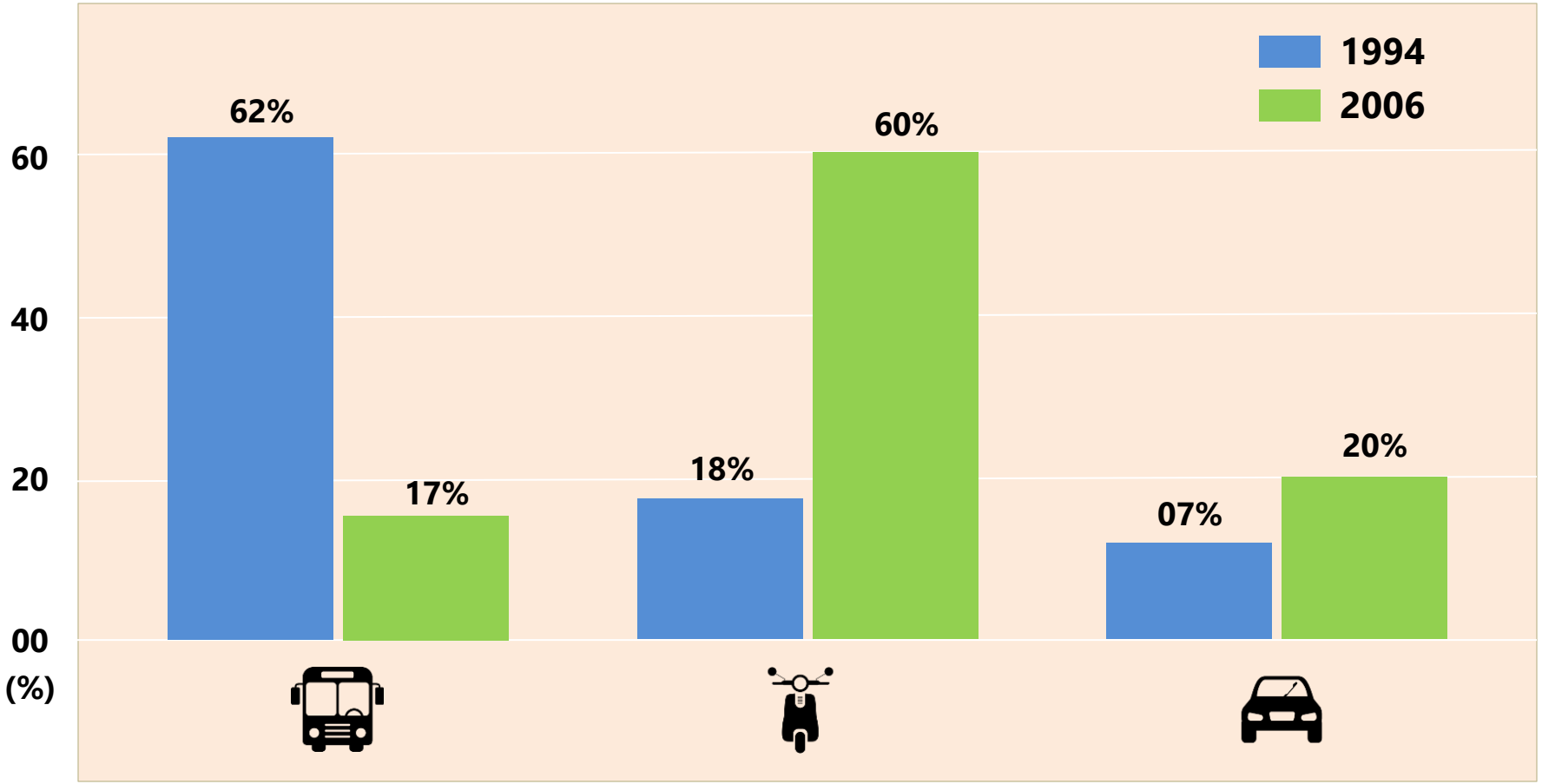
Local Host

DIMTS
We help people move

UITP INDIA

KPIT

BUS RIDERSHIP DOWN FROM 62% TO 17% IN 2 DECADES



Source:http://www.mckinsey.com/global-themes/urbanization/urban-awakening-in-india

0.4% OF TOTAL PUBLIC TRANSPORT BUSES CAUSE ~ 9% OF THE TOTAL VEHICULAR POLLUTION

Image credits: Google

~1$ BILLION WORTH CRUDE OIL IS USED BY EXISTING (35,000) DIESEL BUSES

Image credits: Google

65% POPULATION UNDER THE AGE OF 35, MIDDLE CLASS TO DOUBLE BY 2025 TO 547 MILLION

Image credits: Google

WE NEED

CLEAN	CONNECTED	COMFORTABLE	SAFE

PUBLIC TRANSPORT AT AN AFFORDABLE PRICE!

FEATURE-RICH ELECTRIC BUS CAN MAKE A BIG IMPACT

CLEAN	• Improve quality of life for citizens • Lower oil imports for Nation
CONNECTED	• Travel planning for passengers • Higher efficiency for operators
COMFORTABLE	• Superior ride experience • Stress-free driving
SAFE	• Advanced safety systems • Real time tracking

KPIT'S ELECTRIC BUS AT THE INDIAN PARLIAMENT

- Hon'ble Prime Minister of India- Mr. Narendra Modi flags off KPIT's Electric bus at the Indian Parliament in Dec 2015
- All certification tests passed

KPIT'S ELECTRIC BUS AT THE BANDIPUR TIGER RESERVE

- 42 days of trial
- 76 safaris completed with 683 tourists
- 2700 km covered with 99% terrain coverage

SMART ELECTRIC BUS WITH EICHER MOTORS

177 km
certified range

32 seats
9m bus size

36%
regeneration

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ELECTRIC BUSES POWERED BY REVOLO IN KOLKATA

Mr. Debashis Sen, Chairman, HIDCO, inaugurating the facility

3 Electric Buses with dedicated facilities operating in Kolkata from 1st May, 2018

FACTORS TO CONSIDER FOR ELECTRIC BUS DEPLOYMENT

LOCAL DECISIONS ARE BEST FIT FOR LOCAL CONDITIONS

Bigger bus = Larger battery = Higher cost

High traffic + pollution = Larger impact

More features = Better passenger experience

Expensive asset = Maximize utilization

Range selection = Avg. trip length in the city

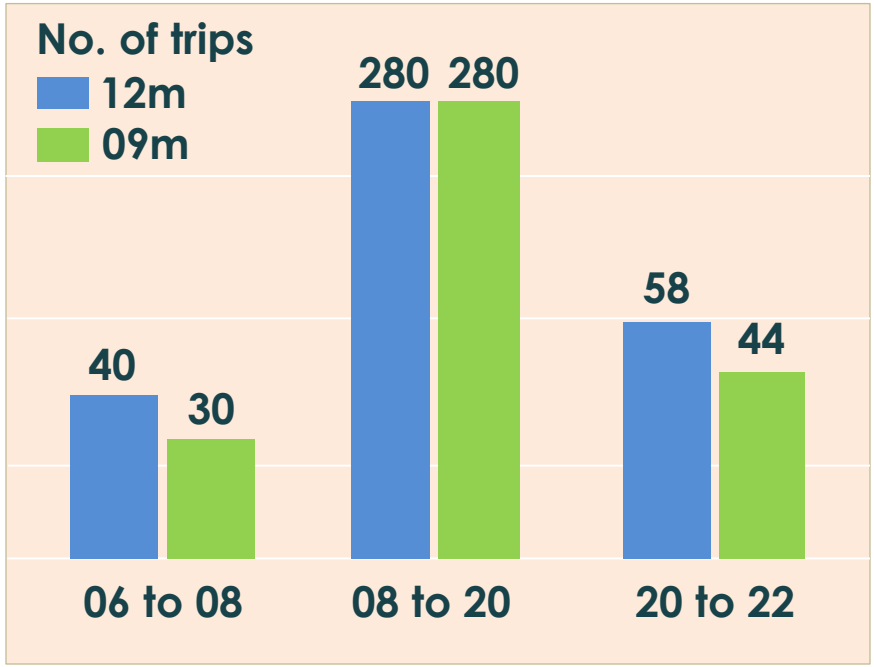
MIDI 9M ELECTRIC BUSES ARE MOST SUITABLE FOR INDIAN CITIES

(1/4)

City centers and IT park areas have high traffic and narrow roads where its difficult to move large 12m buses

 Image credits: Google

MIDI 9M ELECTRIC BUSES ARE MOST SUITABLE FOR INDIAN CITIES



(2/4)

Same or better operational efficiency is achieved by replacing 12m buses with 9m buses*

* Sample analysis of one route in Pune (Swargate to Pune Station)

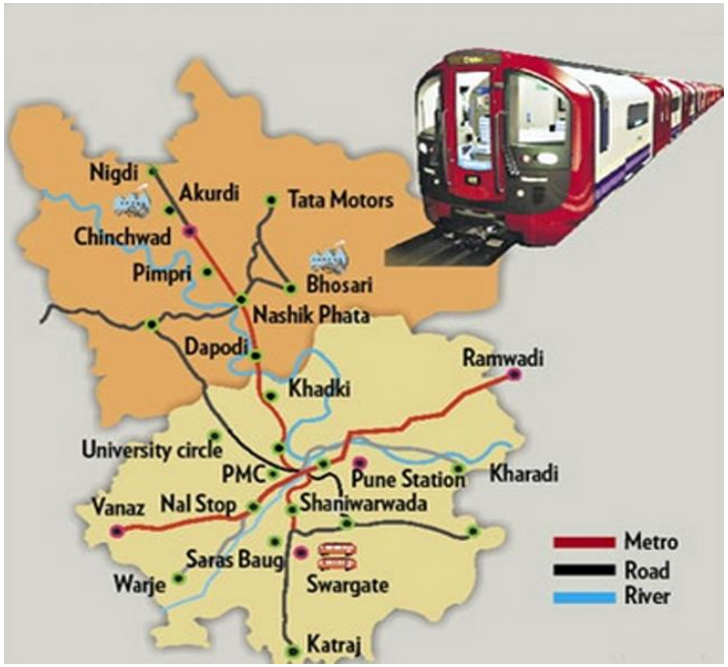
MIDI 9M ELECTRIC BUSES ARE MOST SUITABLE FOR INDIAN CITIES

(3/4)

9m buses with higher frequency will improve passenger convenience and increase asset utilization

 Image credits: Google

MIDI 9M ELECTRIC BUSES ARE MOST SUITABLE FOR INDIAN CITIES



(4/4)

9m feeder buses improves last mile connectivity from major junctions and metros stations (in future)

 Image credits: Google

MODULAR BATTERY ARCHITECTURE IS IMPORTANT

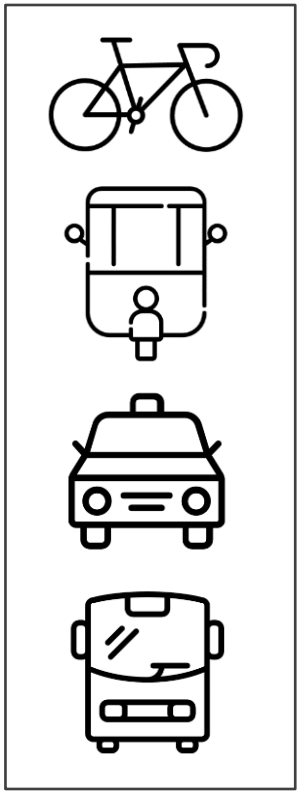
- Cities are looking at 7+ years of contract signing
- Since the spread and density of cities are expanding
- What we think is appropriate today becomes irrelevant for tomorrow
- Modular battery design will help reconfigure the requirements for future

COMPREHENSIVE APPROACH WILL HELP CITIES OPTIMIZE OPERATIONS

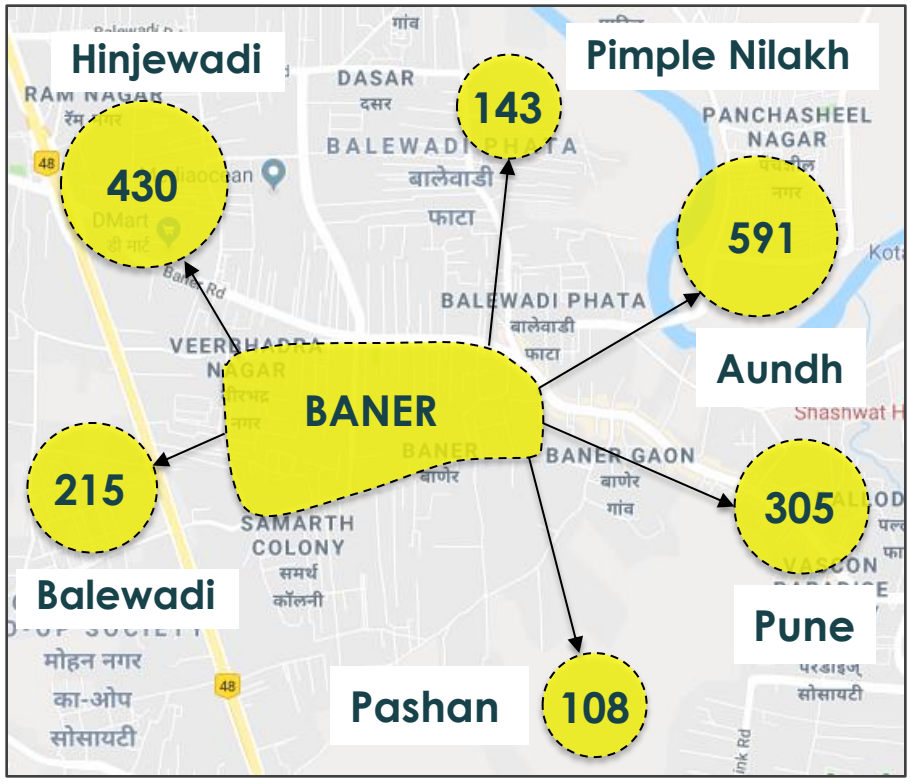
SHARED PUBLIC TRANSPORT PLATFORM FOR A CITY

SOFTWARE PLATFORM

- Integration of existing cab hailing solutions
- Connectivity to existing public transportation
- Subscription based services
- Dynamic scheduling



OPTIMIZE THE ROUTES WITH TRAFFIC DEMAND ANALYSIS

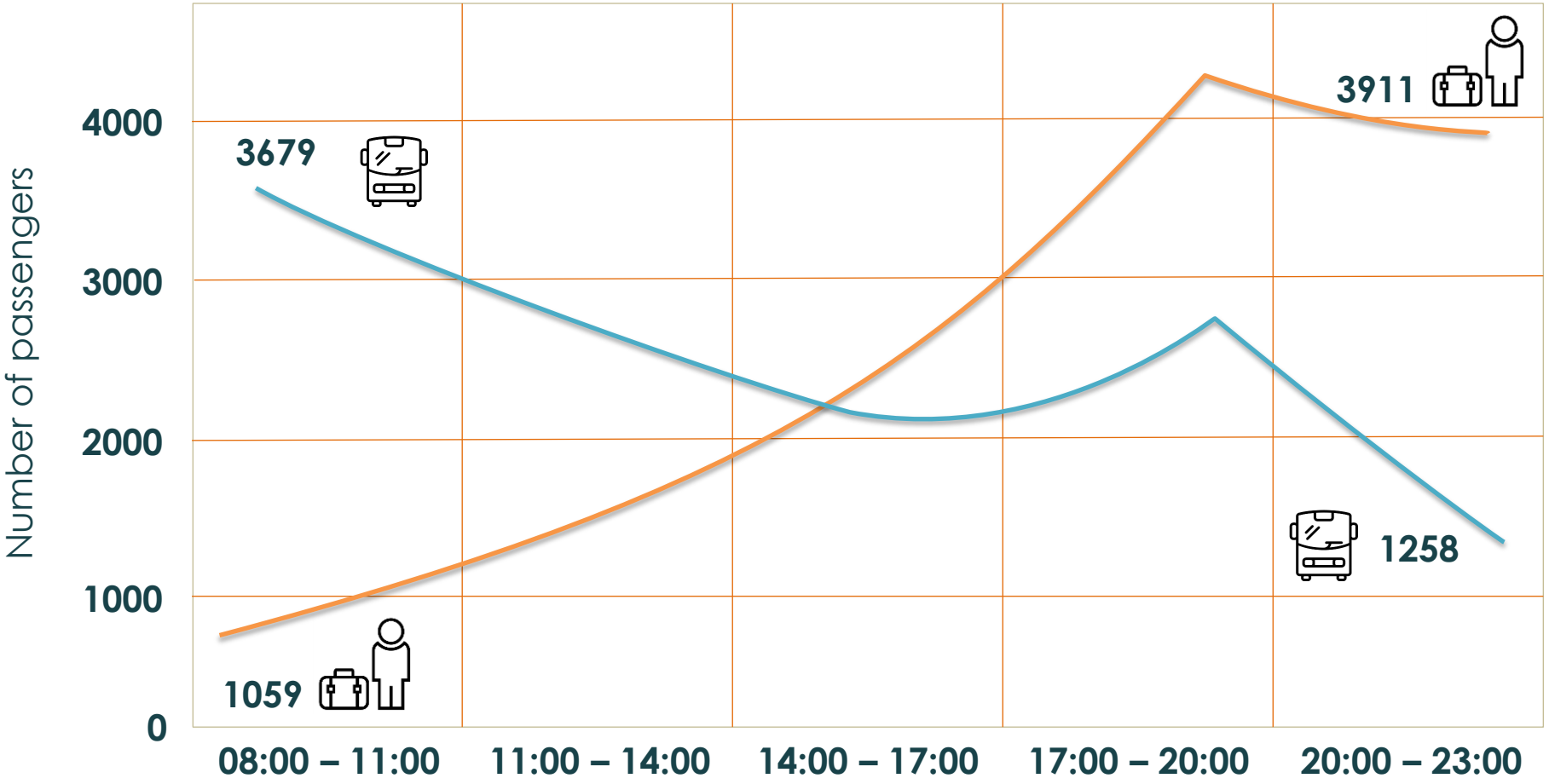


Study of top destinations of people leaving from one zone to another

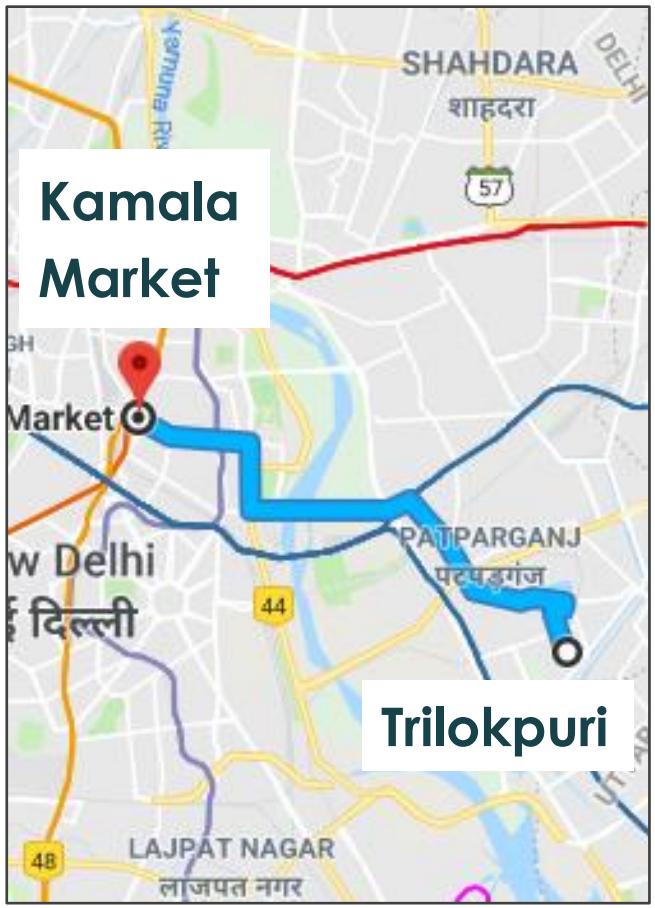
Study for 'Optimized Transport planning' helps in,

- Understand real time view of public movement
- Schedule adequate public transport
- Future proof city planning

IDENTIFY SUPPLY-DEMAND GAP BETWEEN TWO ZONES



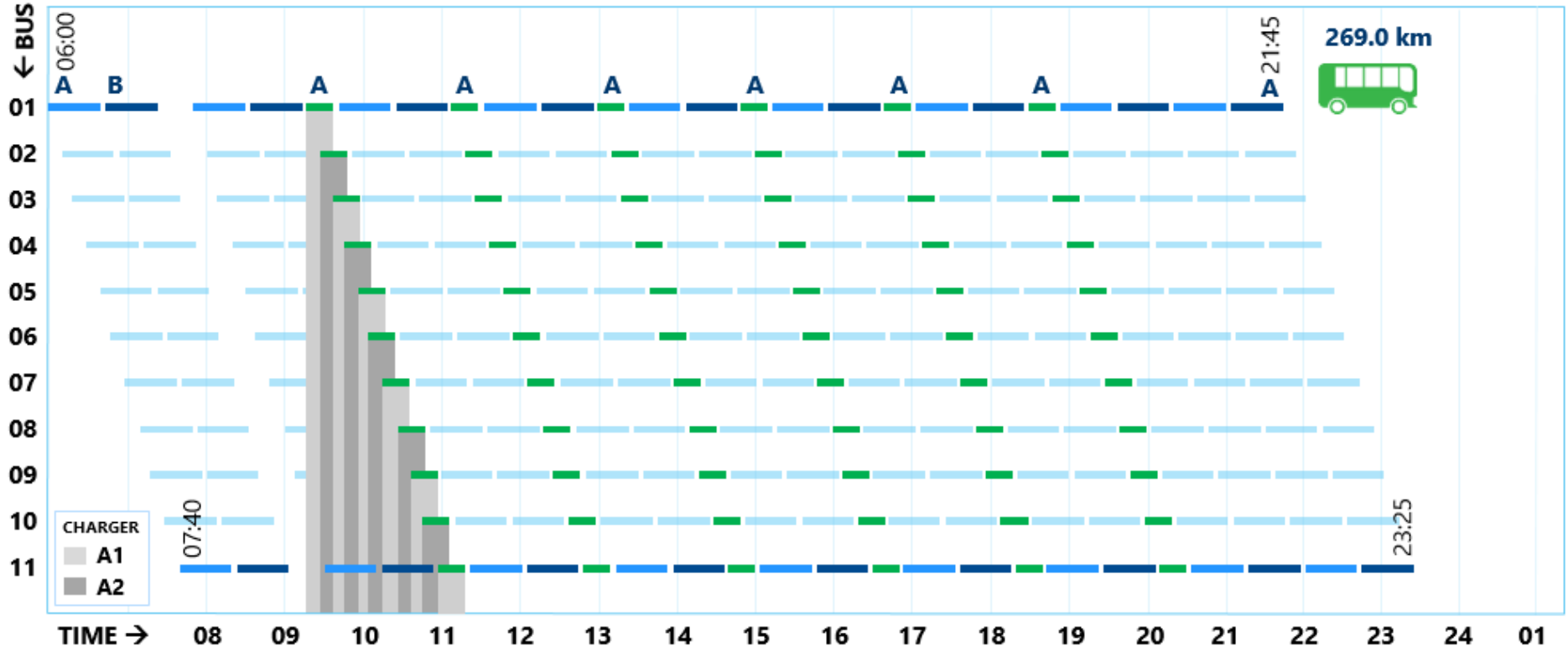
DTC: ROUTE 307 OVERVIEW



Trilok puri to Kamala Market

13.8 km one way	**11** 177 km range
41 min trip time	**02** intraday chargers
20 km/h avg. speed	**11** overnight chargers
10 min bus frequency	**269 km** avg./day/bus
13 bus stops	**02:00 hrs.** intraday charging

DTC: INTRADAY CHARGING SIMULATION FOR ROUTE FREQUENCY OF 10 MIN



A: Trilok puri, B: Kamala Market

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DTC: ASSET COMPARISON

13.8 km one way
13.8 km trip time
20 km/h avg. speed
10 min bus frequency
13 bus stops

Bus range (km)	**80**	**120**	**177**	**250**
Buses required	**12**	**12**	**11**	**11**
intraday chargers	**03**	**03**	**02**	**02**
utilization (km)	**244**	**244**	**269**	**269**

THANK YOU!!

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Flavors of the work we do at KPIT…

Pilot of **Revolo** electric bus at **Bandipur Tiger Reserve, Karnataka**

K-SAR AUTOSAR BSW Platform on LAF/KSAR epitome in **Mercedes Benz S500's** maiden **autonomous drive**.

Control Algorithms for **Autonomous Tractor** for IFE Manufacturer