Multimodal Integration at MRTS- A Case Study

Sharat Sharma

Former Director Operations – Delhi metro Rail Corporation

Multimodal Integration

- In the last two decades India's urban population has grown by almost 3% per year, though the total population has grown by less than 2% per year on average.
- By 2026, 534 M Indians, 38% of total population will live in cities
- Against 377 M, 31% as per the 2011 census.

Multimodal Integration

- Industrialisation require people to travel between their residences and industrial areas in search of employment.
- Result in the unprecedented growth of transportation and towns and cities.

Multimodal Integration

“India’s Urban Awakening: Building Inclusive cities, sustaining economic growth” A report published by McKinsey Global Institute (MGI) in April 2010

“If India continues with its unplanned urbanization, the result would be sharp deterioration in the quality of life in its cities which will put even today’s rates of economic growth at risk,”.

Multimodal Integration

The report has projected that by 2030:

- 590 million people will be living in cities
- 70% of new net employment would be in cities
- 68 cities would have 1 million or more population (up from 42 today)
- Around 700-900 million SM of residential and commercial space would be required to be built.

Multimodal Integration

- To meet this demand 2.5 billion SM of roads would have to be paved, and 7,400 km of metros / subways would be required which is equal to 20 times the capacity added in the past ten years
- Unprecedented urbanisation is an opportunity for exhaustive planning and reengineering our cities to meet the growing travel demand.
- Demand needs to be managed in a sustainable manner through a combination of demand and supply management tools.
- **If we fail to plan, we plan to fail**

Multimodal Integration

- MMI relates to single trip consisting of combination of modes bus, metro, car, tram. OR
- Private/public Service modes between which the commuter has to make a shift .
- Transfer is an essential part of multimodal trip including change of modes at transfer nodes.
- Seamless travel is an important characteristic of the system.

Multimodal Integration

- It provides multiple choices to enable a trip to be performed in the most convenient manner.
- Most critical requirement of the whole system is integration.
- Attributes of the services - time, reliability, etc
- Information about the services influence travel choice behaviour.
- MRTS is the most viable solution for high density routes.

Multimodal Integration

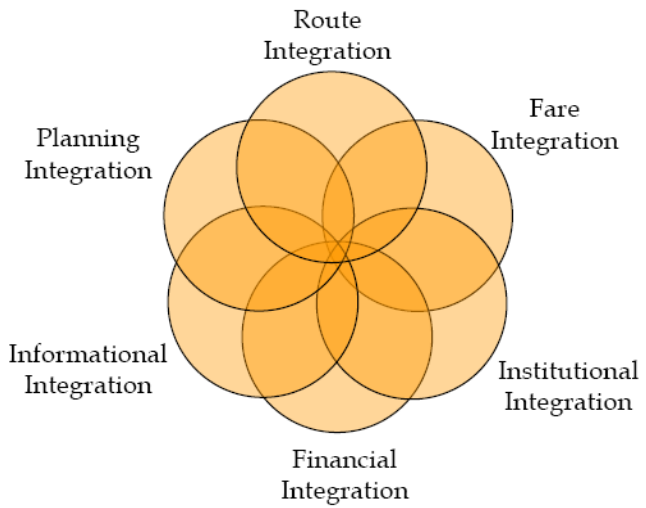
- Presence of MRT lines and feeder service boost up real estate development, commercial activities.
- To achieve spatial balance, development should take place according to new corridors of mass movement.
- Good high capacity \air-conditioned buses, etc connectivity needs to plan to a considerable extent in the form of feeder services.

Multimodal Integration

- Integration of non-motorized vehicles with MMTS has vital role to play.
- Park and ride facilities have to be developed to provide better connectivity and reduce parking problems on main arterial roads.
- It will encourage use of public transport.

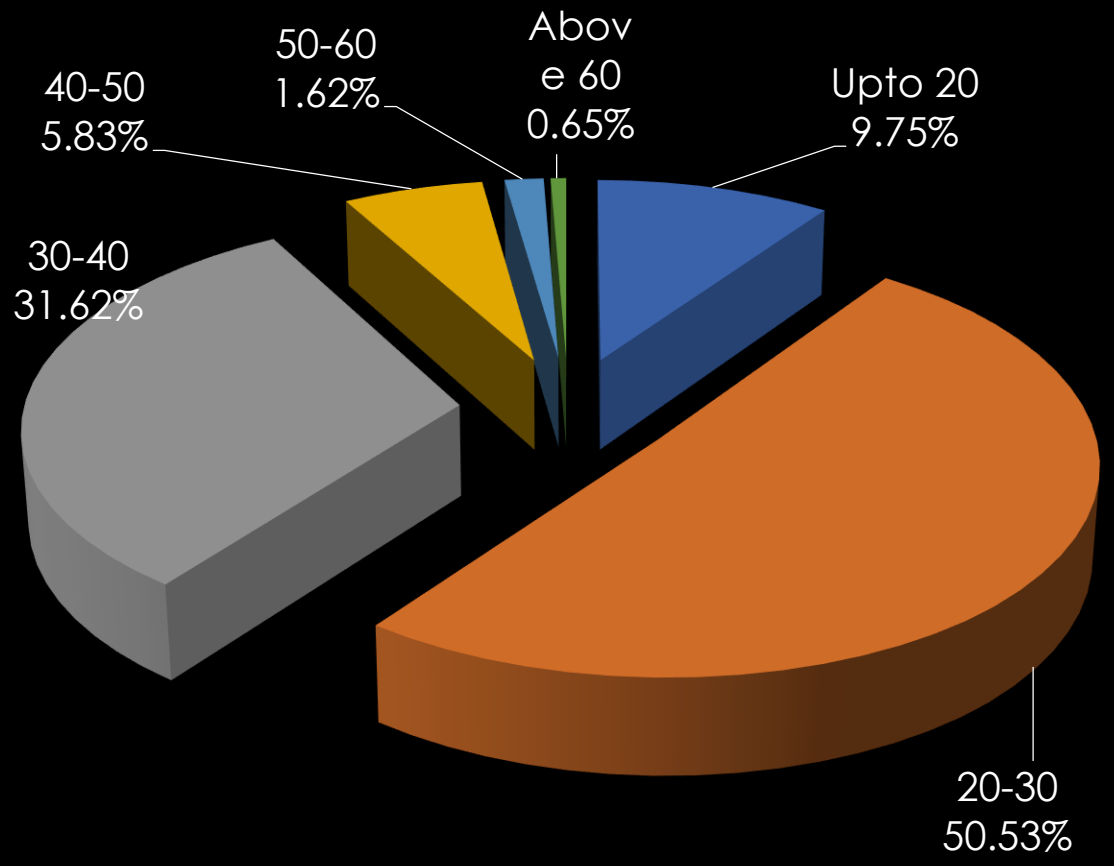
Multimodal Integration

Transport Integration Issues

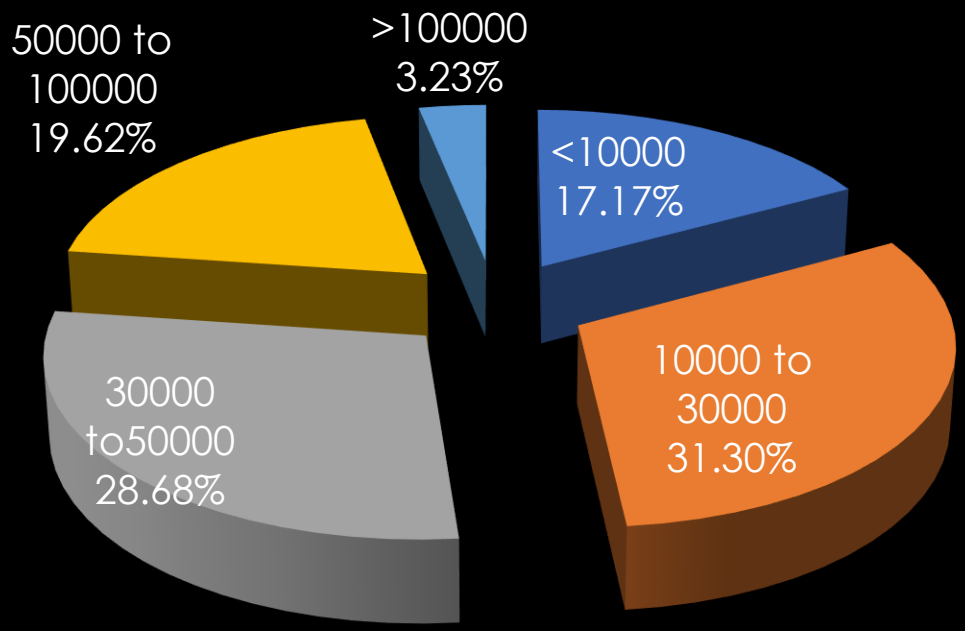


Integration is the key to sustainable and need responsive public transport

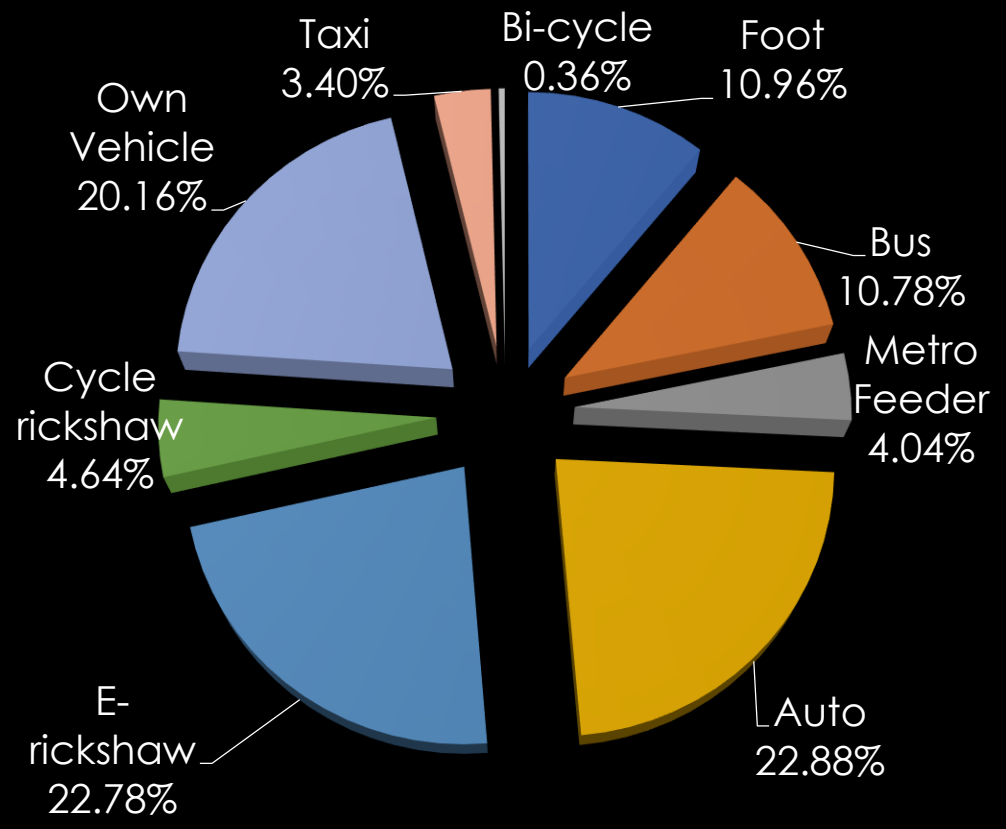
Commuter Profile – Age wise



Monthly Income per month in Rs



Last Mile Connectivity- MRTS



Last Mile Connectivity- MRTS

Leg of the trip	Average cost spent on different legs of a metro trip (Rs)	Average distance covered by a commuter on different legs of trip (km)	Per km cost incurred by a commuter on different legs of trip (Rs)
Metro	17.55	17.13	1.39
Access	10.20	2.83	3.15
Dispersal	7.46	2.15	2.74
Total (Metro + Access + Dispersal)	34.23	22.12	1.77

Multimodal Integration

- Access modes in order of priority – walk, bicycles, feeder services, etc.
- Size of interchange as per expected peak demand.
- Interchange facilities to be developed considering associated costs and benefits while implementing changes.

Multimodal Integration

- PAX wishes for “non stop-non transfer” journeys
- Transport Network is composed of buses, trains, moto-taxi, etc.
- Commuters transfer between different modes, with a feeling of “time loss” and “discomfort”.
- *“minimise the need to transfer but maximise the opportunity to transfer”*

Multimodal Integration

- Integrated planning- low PHPDT by bus, high PHPDT by MRTS
- Seamless interchange among different modes- station/stop planning
- Unified ticketing
- Adequate signages- information, pamphlets
- Complementary scheduling of services
- Fare concessions on using multiple modes

Multimodal Integration

- Therefore, Metro, Monorail, LRT etc. must be properly integrated.
- Multi modal transport system has two basic components:
  - Integration and
  - Interchange.
- Integration is an important key element in modern transport network and also a part of infrastructure which involves multi-modal activities.

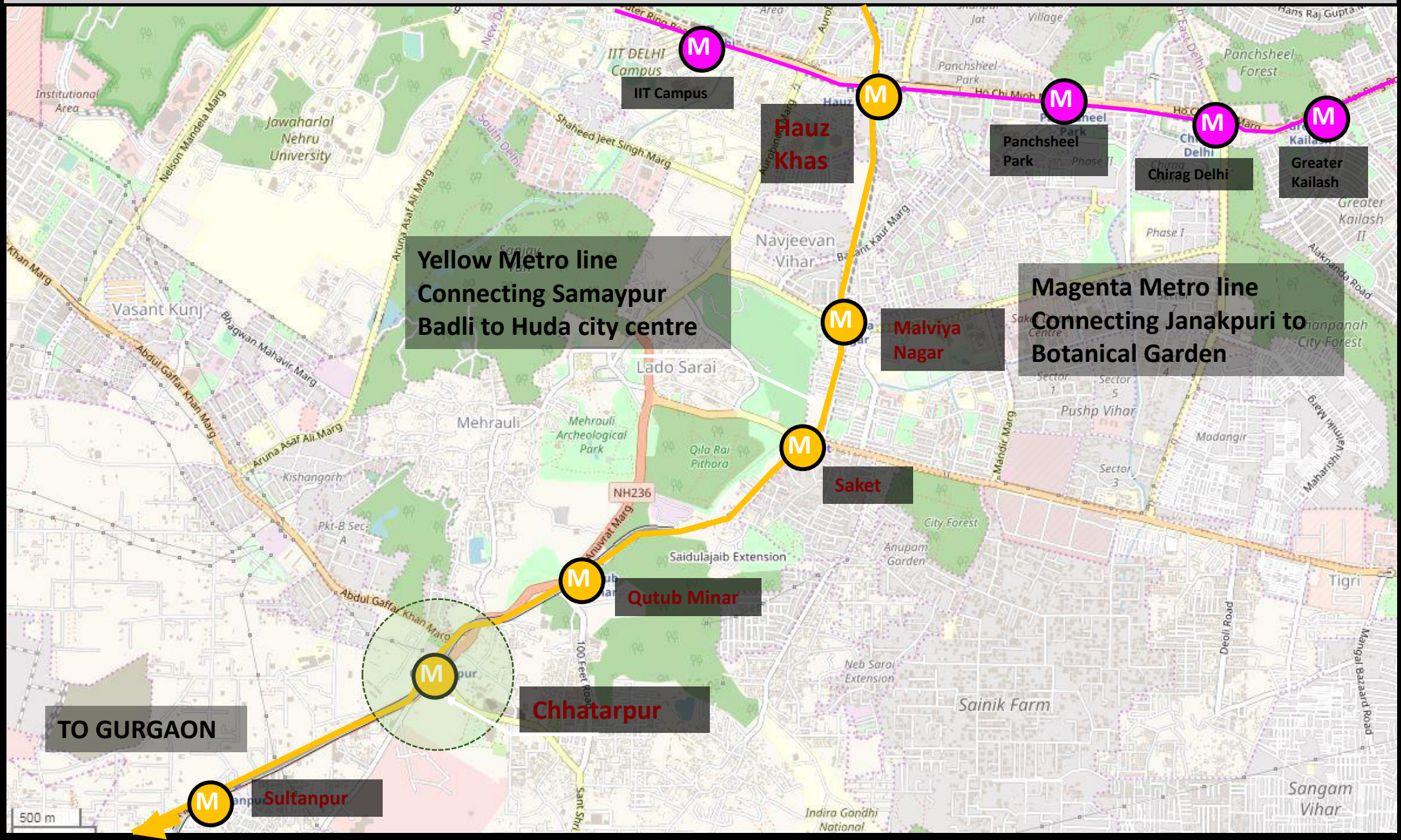
Multimodal Integration

- The TRANSPORT SYSTEM of a city is the SUM of ALL MEANS of TRANSPORT
- Different MODES should be COMPLEMENTARY, not competitors.
- Integration to be
  - Rational
  - Cost-effective
  - Efficient Public Transport System=Integrated & Optimized Modes
  - But also Improving the passenger's experience in Public Transport

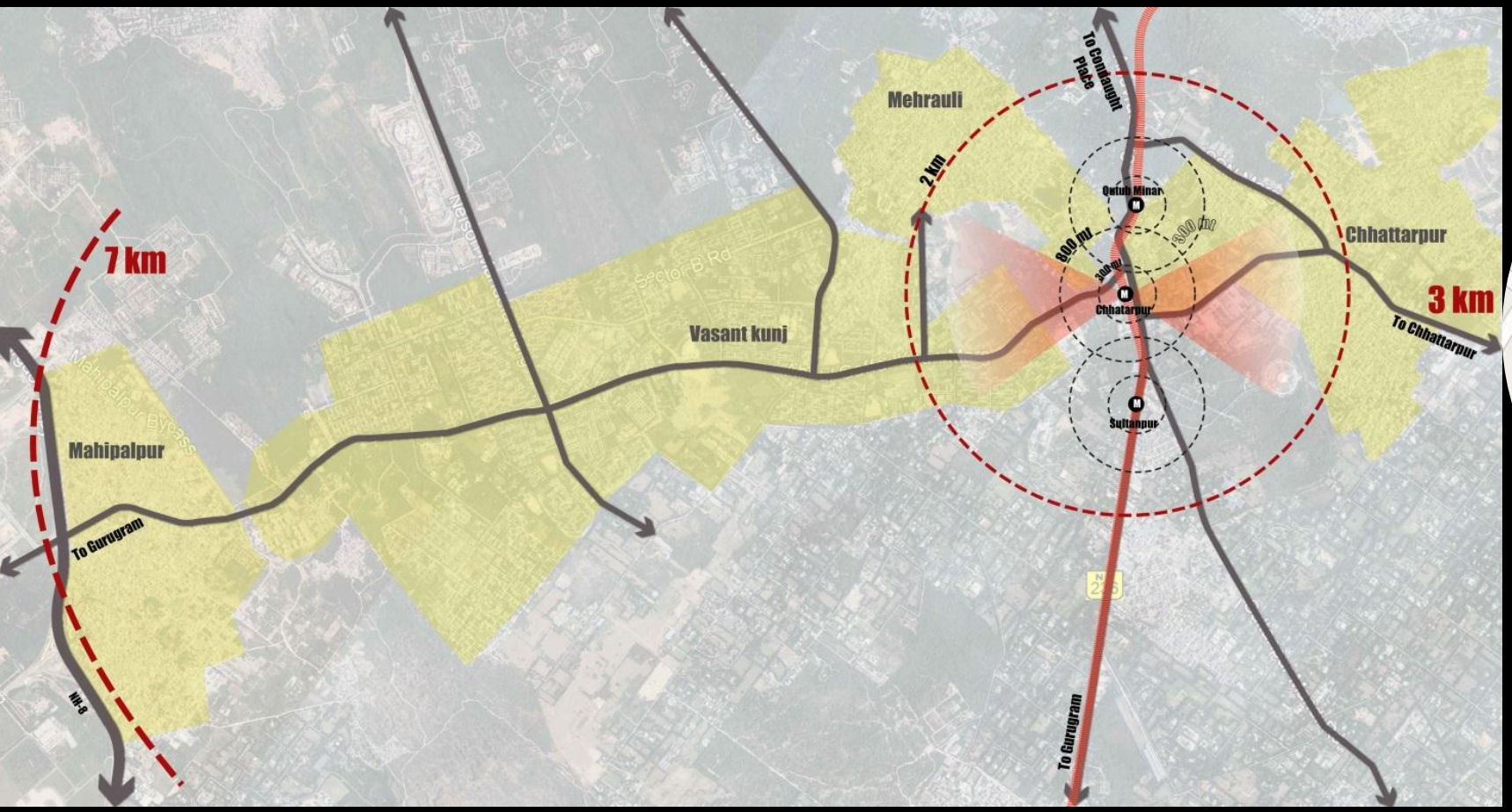
Multimodal Integration

- Position of interchange in transport network to fulfil its transport function.
- Layout for seamless transfer.
- Location of interchange on existing line where there is efficient access to existing transport network.
- Improvement or construction of existing or new roads.

Case Study of Chhatarpur – MMI

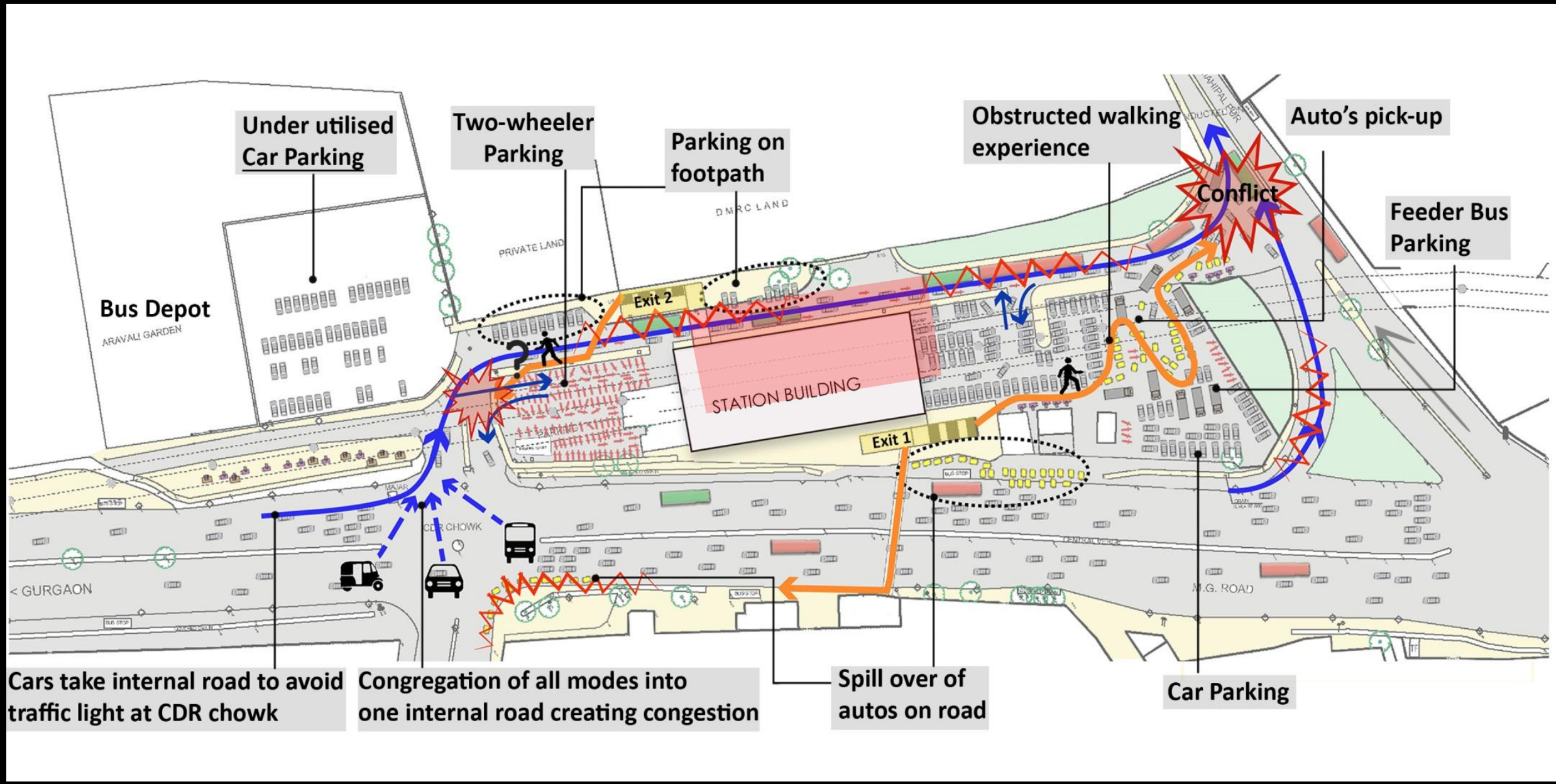


CATCHMENT AREA OF THE STATION

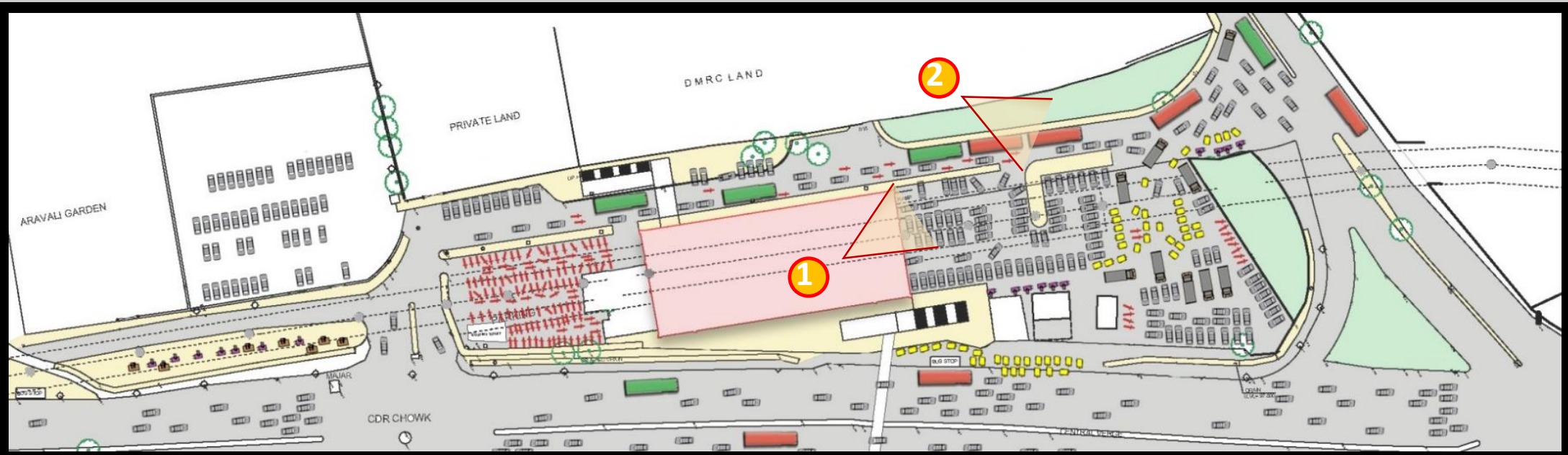


- Chattarpur Metro Station's catchment extends up to approximately 7 km with a daily footfall of approx. 60,000 people,
- People using different modes like feeder buses, auto rickshaws, gramin seva, city buses, taxis, etc. to complete their travel trips.

CHHATARPUR METRO STATION – ACTIVITY MAPPING



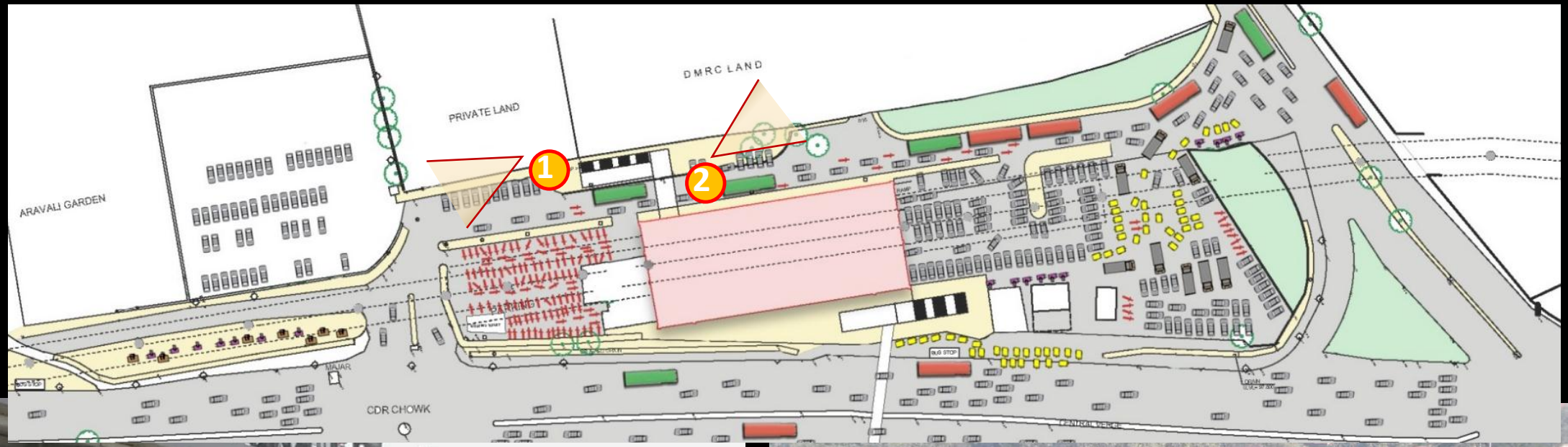
CHHATARPUR METRO STATION –SCENERIO BEFORE



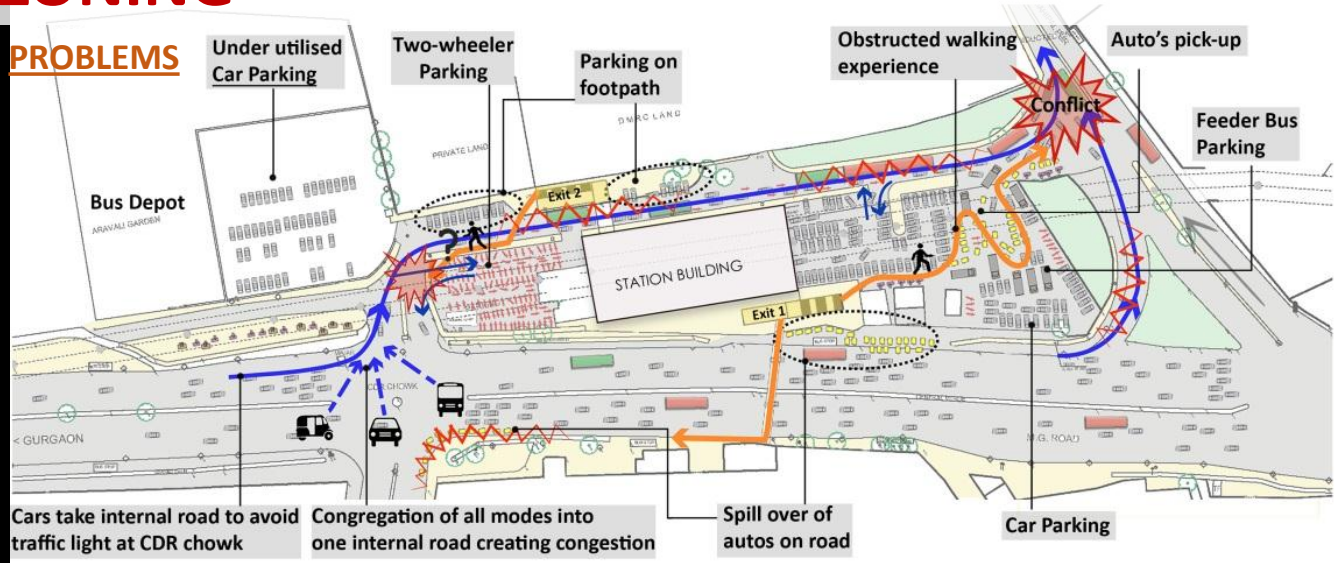
CAR PARKING FOR 100 CARS – 58000 FOOTFALL

CHAOTIC MMI

CHHATARPUR METRO STATION –SCENERIO BEFORE

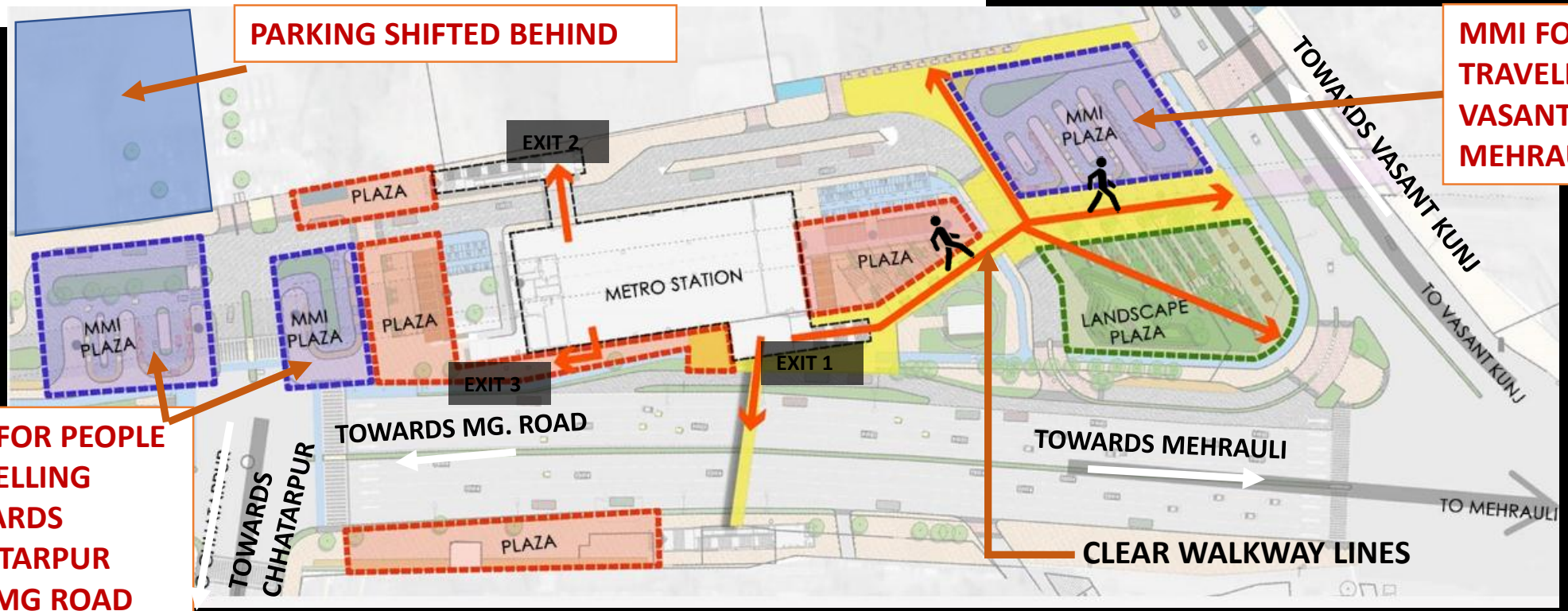


ZONING

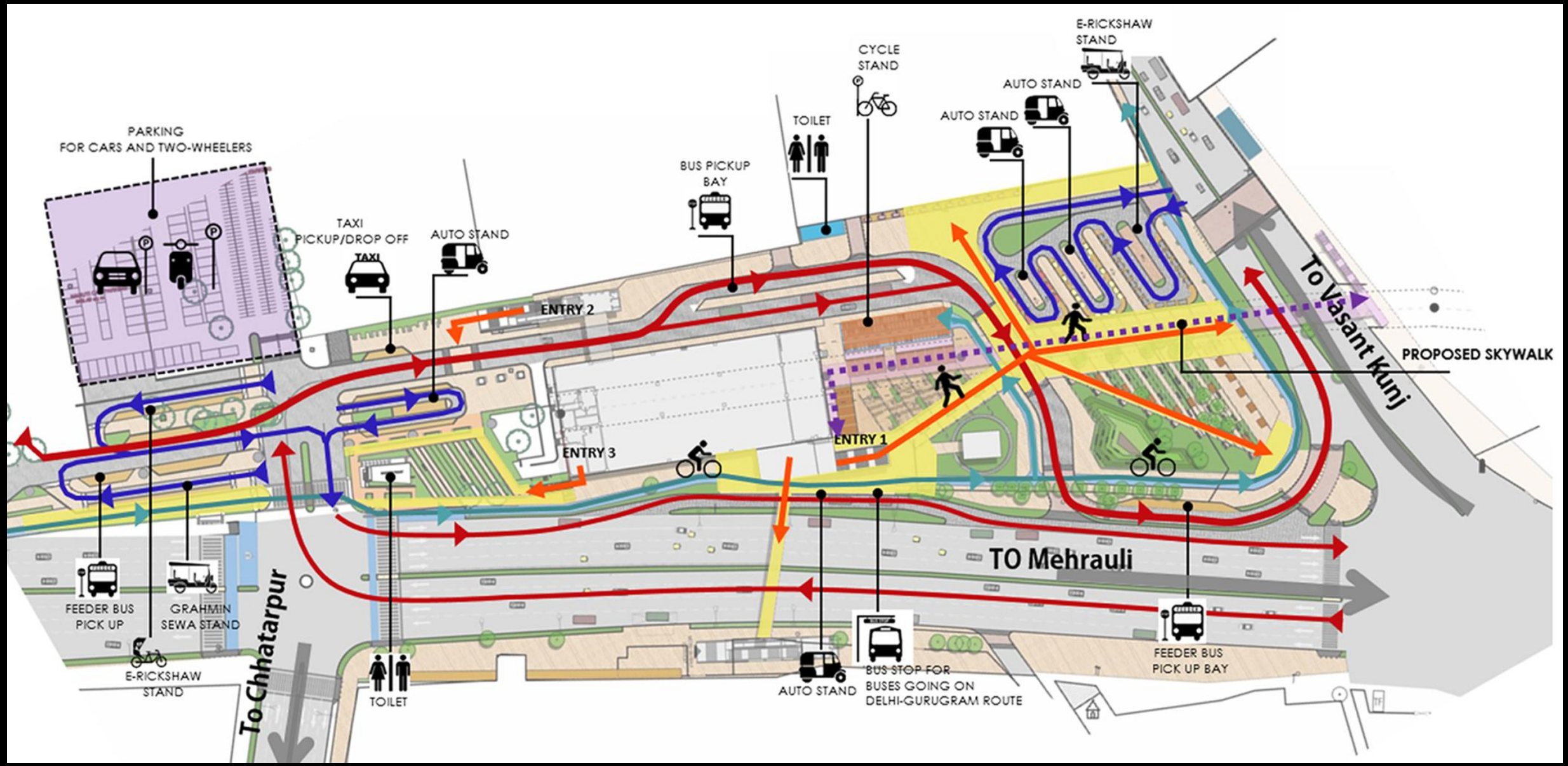


CREATE CLEAR ACCESS FOR USERS TO MMI

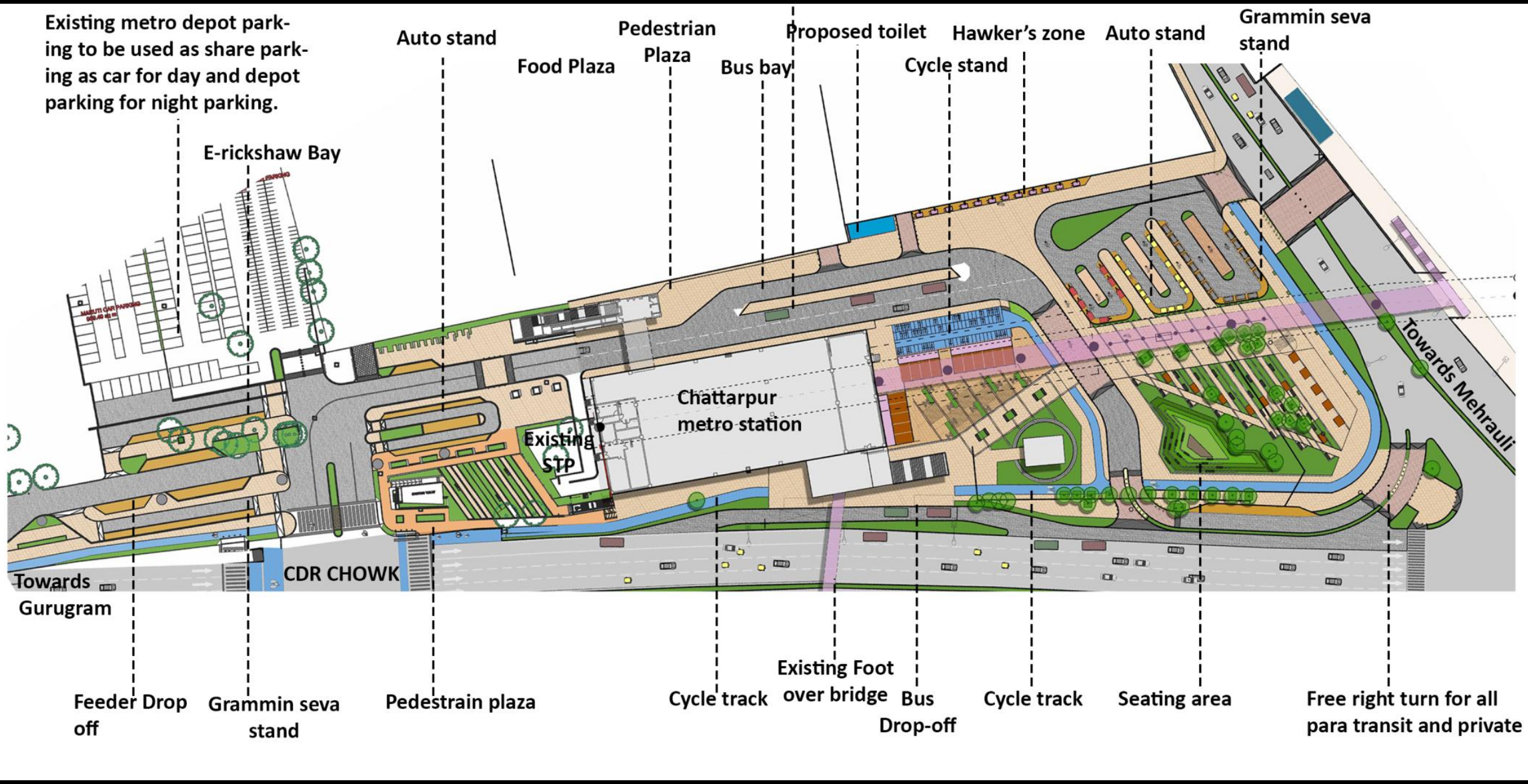
DISPERSE USERS DIRECTLY TO THEIR REQUIRED DESTINATIONS



PLANNING


PARKING
FOR CARS AND TWO-WHEELERS
TAXI
PICKUP/DROP OFF
TAXI
AUTO STAND
BUS PICKUP
BAY
TOILET
CYCLE
STAND
E-RICKSHAW
STAND
AUTO STAND
AUTO STAND
ENTRY 2
ENTRY 3
ENTRY 1
To Vasant Kunj
PROPOSED SKYWALK
TO Mehrauli
FEEDER BUS
PICK UP
GRAHMIN
SEWA STAND
E-RICKSHAW
STAND
To Chhatarpur
TOILET
AUTO STAND
BUS STOP FOR
BUSES GOING ON
DELHI-GURUGRAM ROUTE
FEEDER BUS
PICK UP BAY

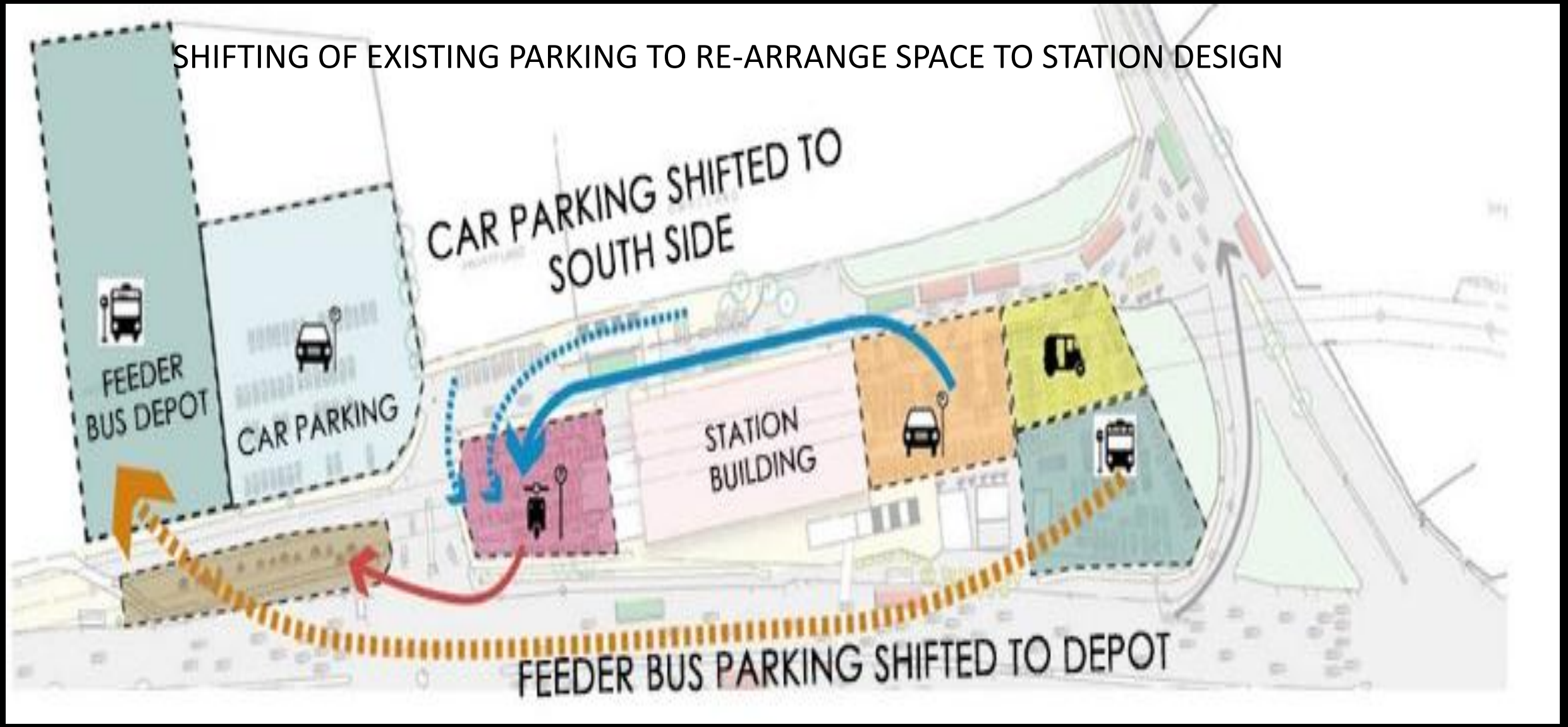
MASTER PLAN


Existing metro depot parking to be used as share parking as car for day and depot parking for night parking.
E-rickshaw Bay
Auto stand
Food Plaza
Pedestrian Plaza
Bus bay
Proposed toilet
Cycle stand
Hawker's zone
Auto stand
Grammin seva stand
Towards Mehrauli
Chattarpur metro station
Existing STP
CDR CHOWK
Towards Gurugram
Feeder Drop off
Grammin seva stand
Pedestrain plaza
Cycle track
Existing Foot over bridge
Bus Drop-off
Cycle track
Seating area
Free right turn for all para transit and private

PHASING IMPLEMENTATION

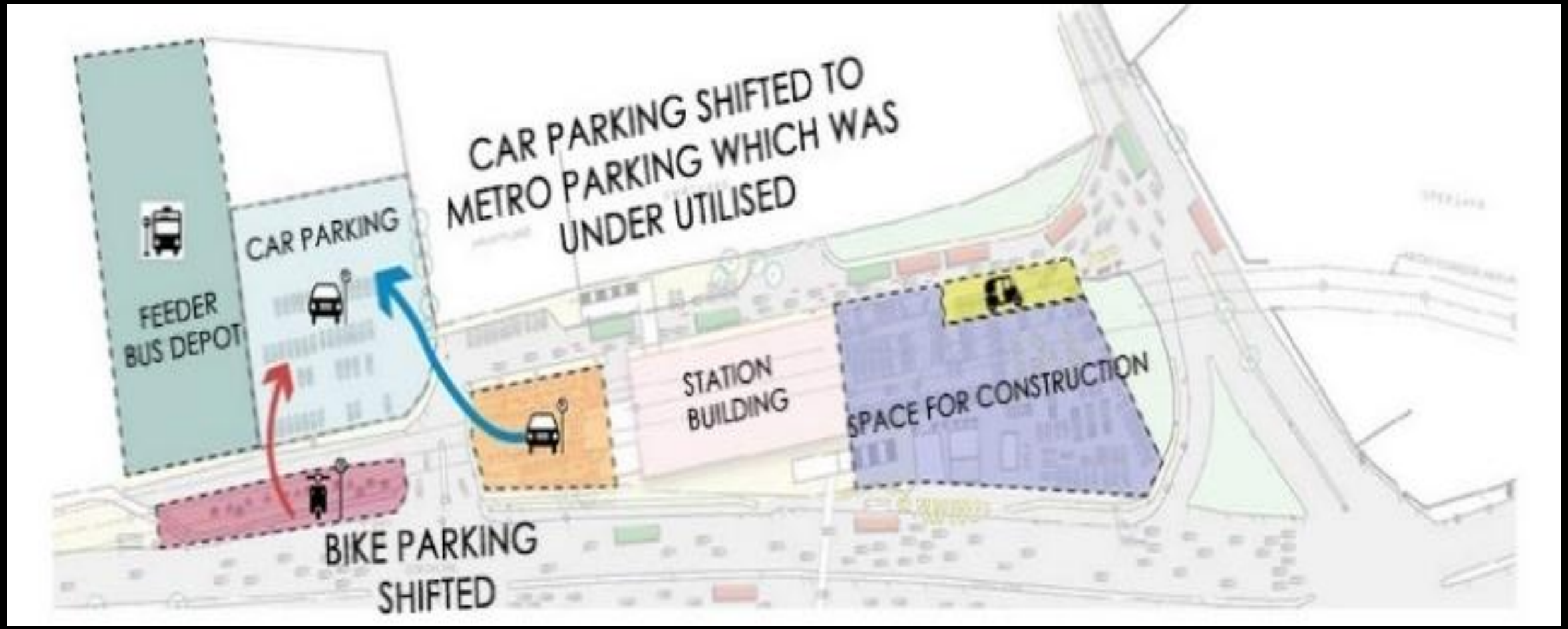
PHASE-1

SHIFTING OF EXISTING PARKING TO RE-ARRANGE SPACE TO STATION DESIGN



PHASE-2

STARTING PREPARATIONS ON THE VASANT KUNJ JUNCTION, AND PREPARE SHIFT THE REST OF THE PARKING TO AVAILABLE LAND NEAR THE BUS PARKING



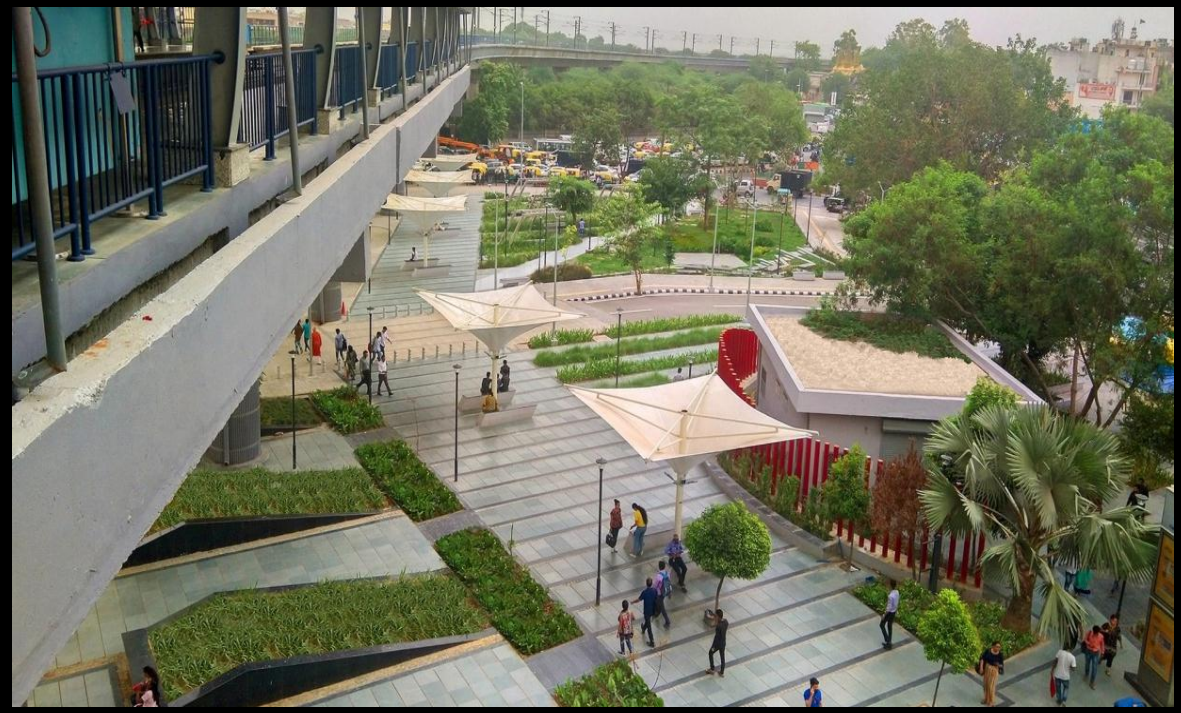
PHASE-3

COMPREHENSIVE PARKING AT BACKSIDE, LEAVING THE FRONT OF THE STATION FOR REGULATED MMI DESIGNING ALONG WITH PLAZA AND PEDESTRIAN FRIENDLY LANDSCAPES

CHHATARPUR METRO STATION

Before

Now



CHHATARPUR METRO STATION

Before

Now

CHHATARPUR METRO STATION – NOW

CHHATARPUR METRO STATION – NOW

CHHATARPUR METRO STATION – NOW

CHHATARPUR METRO STATION – NOW

CHHATARPUR METRO STATION – NOW

CHHATARPUR METRO STATION – NOW

Conclusion

- Integration should be in such a way that most of commuters do not walk more than 500 mt. to reach public transport,
- In mixed land use areas and intensive development zone, there is need to prepare integrated land use transport plan as per availability and operation of constituent modes of MMTS.
- Fare policy and unified ticketing system for MMTS must be based on affordability and socio-economic characteristics of mass users.

Conclusion

- Intermediate Para Transit such as minibus, vans, auto-rickshaws, shared taxi, etc. should be encouraged for collection and distribution of trips to feed metro.
- Feeder bus service to pick up and drop the passengers from MMT stations to CBD/major work centre.
- There has been a rise in the number of middle class and urge to own personalized mode.

Conclusion

- Automobile Co. are coming up with new models.
- Modal shift in favour of public transport may take some time.
- Integration provide convenient, pleasant, safe mobility to commuters & reduce travel distance;
- Encourage change the mode of travel to public transport for long journey.

Conclusion

- Three agencies have been involved for implementation of MMI
  - Delhi Metro rail Corporation
  - PWD
  - MCD / NDMC

Conclusion

- 96 Metro stations have been identified for implementation of MMI.
- The conceptual plan for 60 stations of phase-III have been approved by UTTIPEC
- Tenders for 60 stations in 3 packages have been floated.
- Soon face of Delhi will change
- Other cities to follow closely.

Thank You