
STRUCTURING URBAN TRAVEL DEMAND

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WE NEED TO RECOGNISE

Transportation Systems do more than moving people:

They provide access to employment, education, shopping, health, entertainment opportunities;

ACCESS is What we want

We want mobility only when it enhances ACCESSIBILITY

They affect:

- Income levels of people**
- Land values**
- Environment**

In essence they determine **quality of life in an area.**



Some Trends in Urban Growth

- **Cities are likely to (more than!) double in size**
 - **Both Population and Area**

We are probably building a city of a size at least as big as the one which exist today
- **How do we organise this growth over space?**

Distribution of activities over space
i.e Urban Structure - Landuse & Intensity
- **How to connect them with each other?**
Network Development, Mode

JOINT DECISIONS – To be done simultaneously



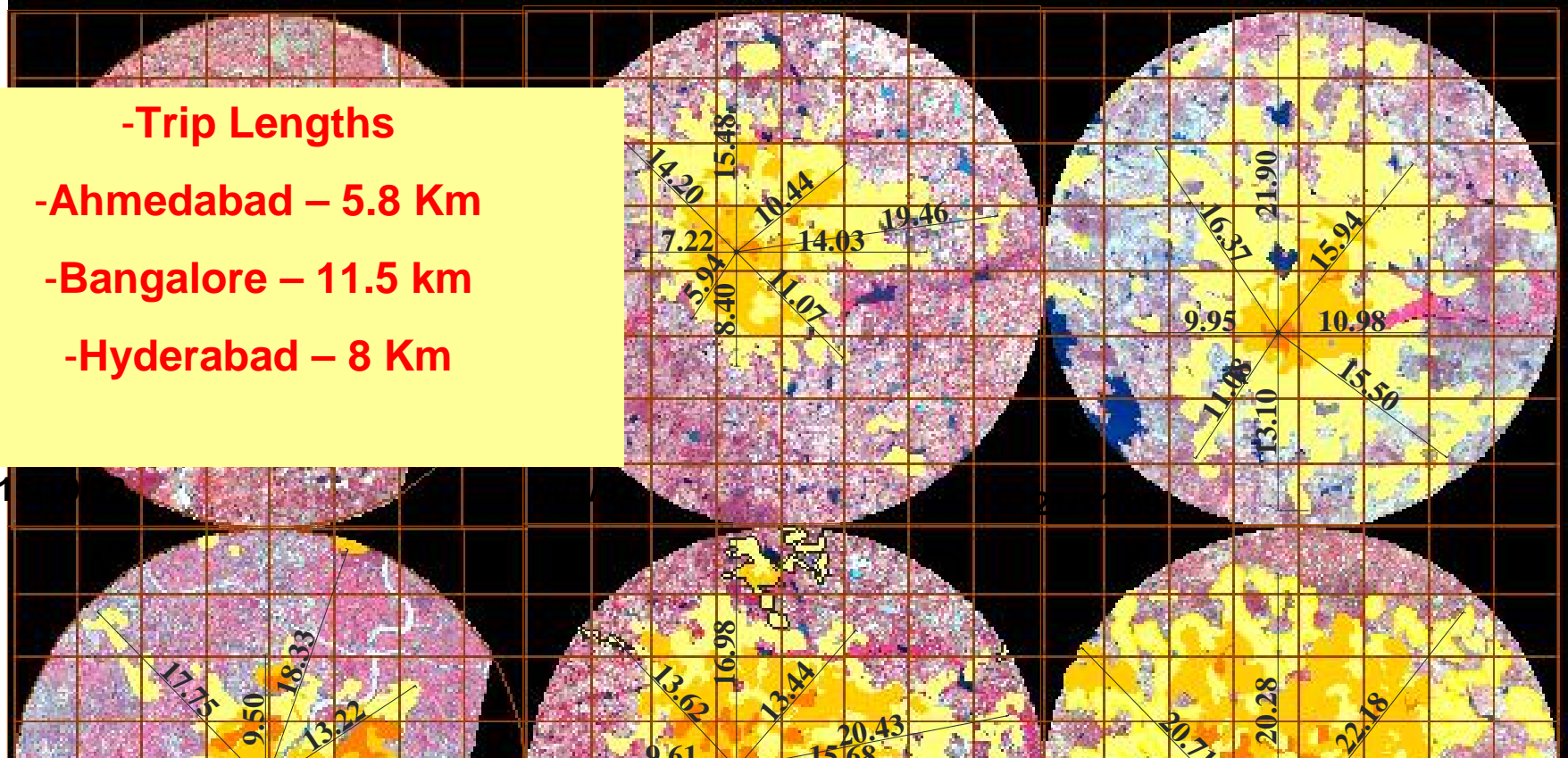
A Compact City

-Trip Lengths

-Ahmedabad – 5.8 Km

-Bangalore – 11.5 km

-Hyderabad – 8 Km



1. Indian Cities are generally high density ring radial form and with mixed landuses. Sprawl is beginning to set in

2. Short and Dispersed Trips; CAPACITY REQUIREMENTS-MODERATE; Friendly to two wheelers (quality is important & Travel Demand Management)

22/10/2000

Ahmedabad

Bangalore

Hyderabad

(4.5 Mill)

(5.6 Mill)

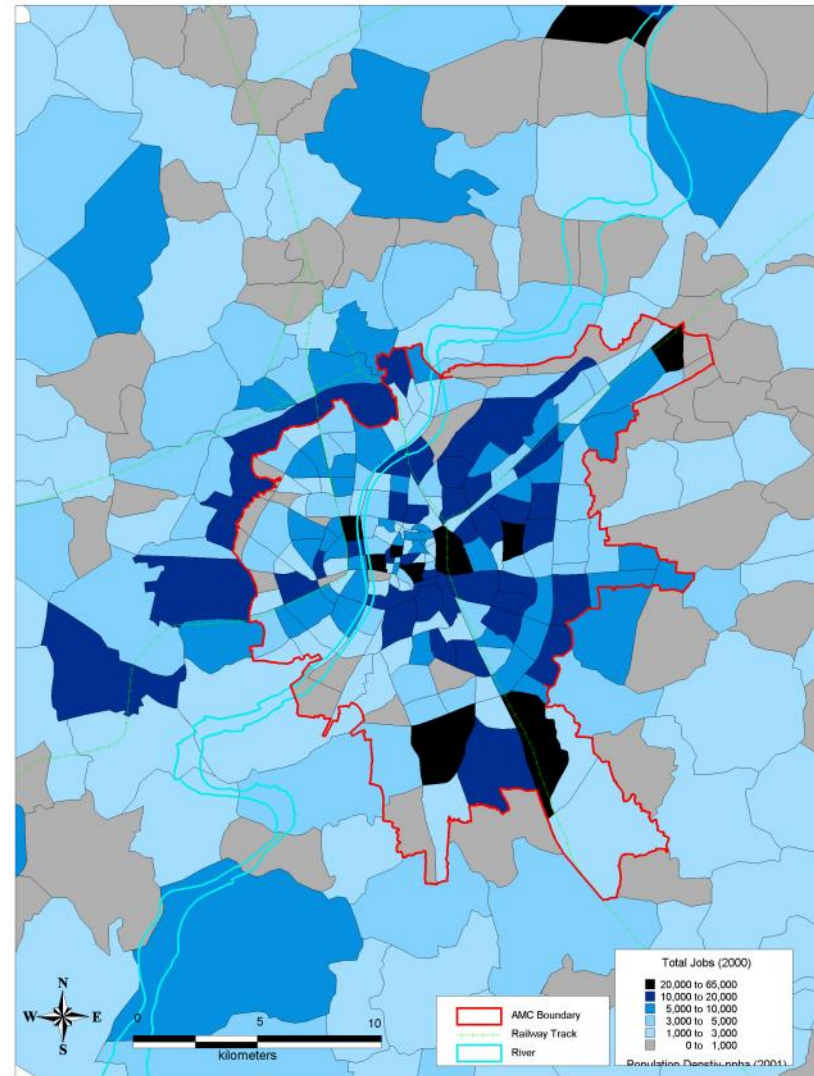
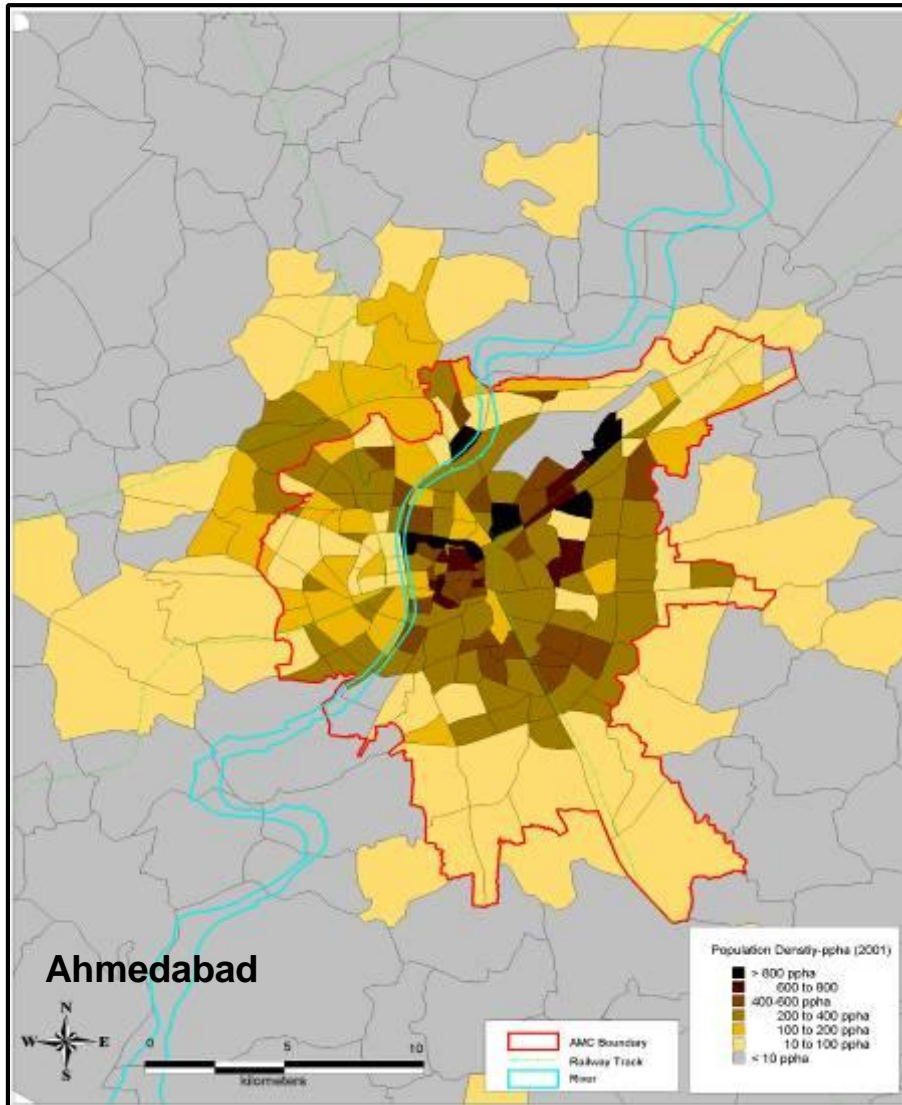
(5.5 Mill)

Source: Desai Sowmya, Urban Spatial Structures & Land management Mechanisms

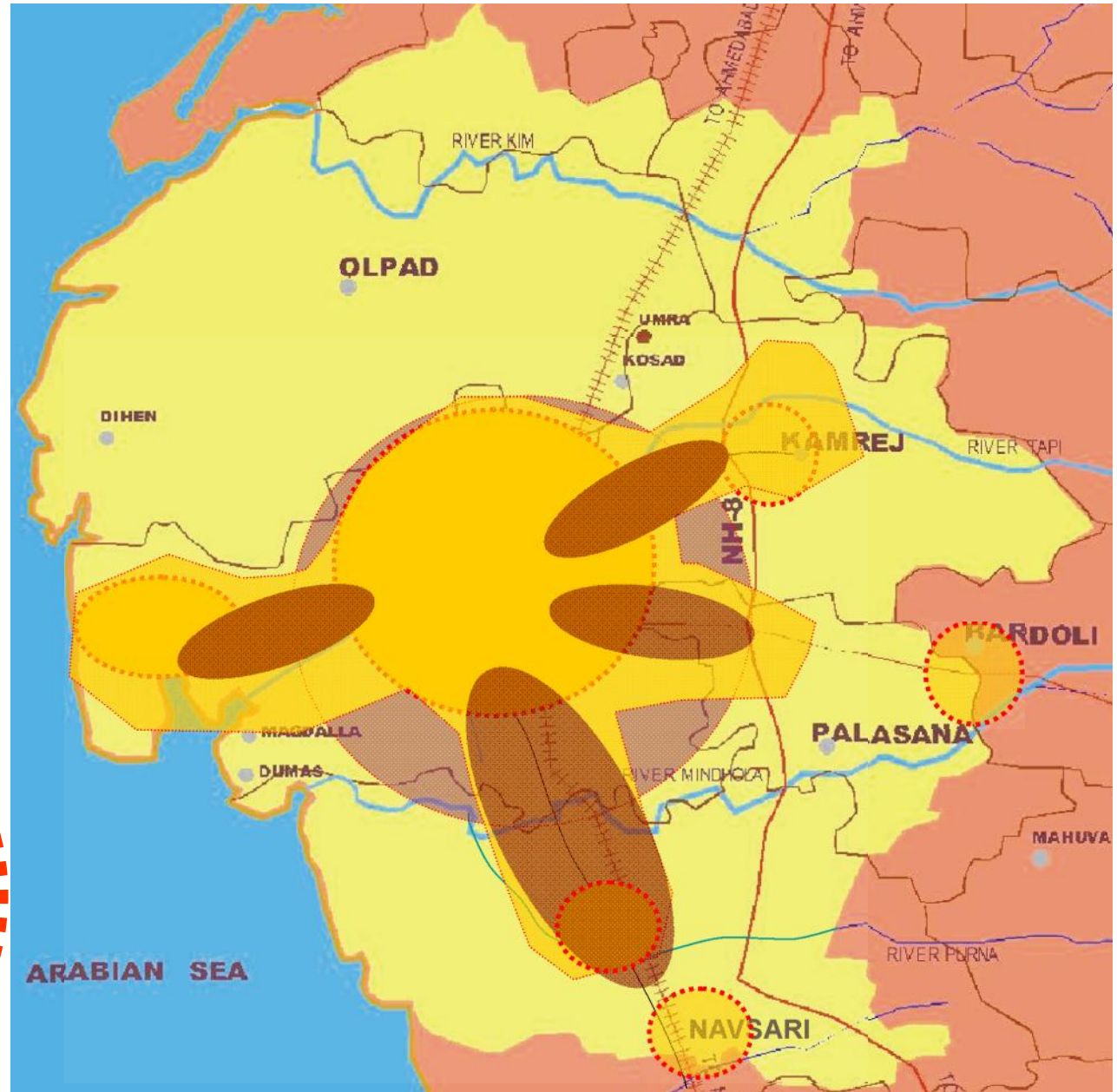
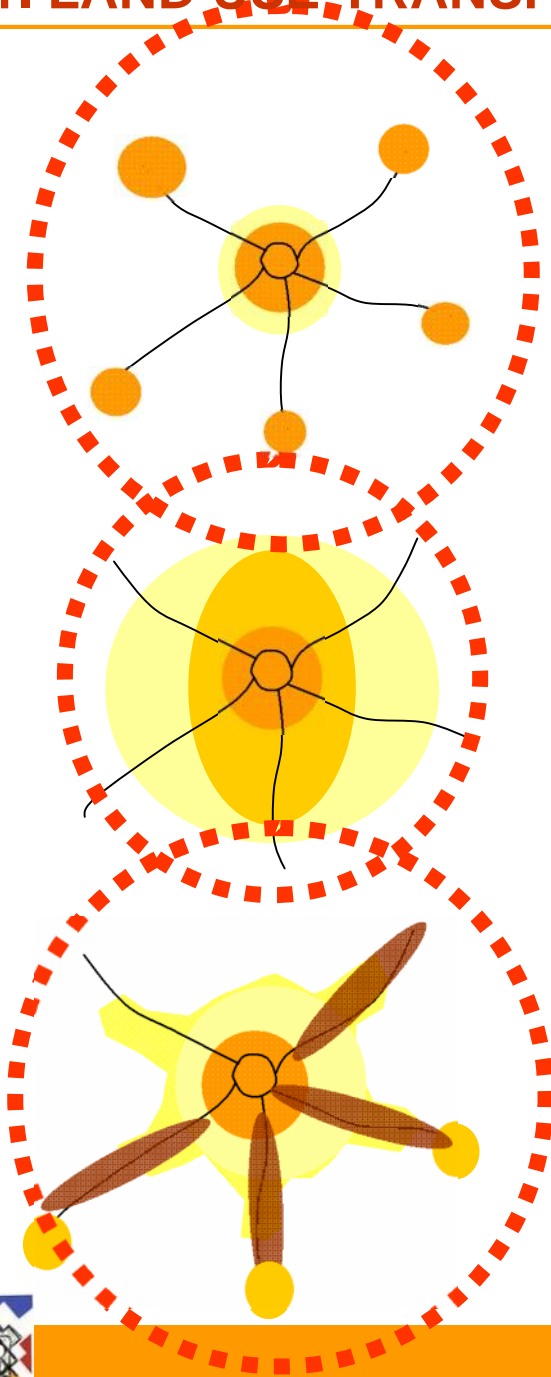
Source of Satellite images: www.gicf.com



Employment Distribution DECENTRALISED

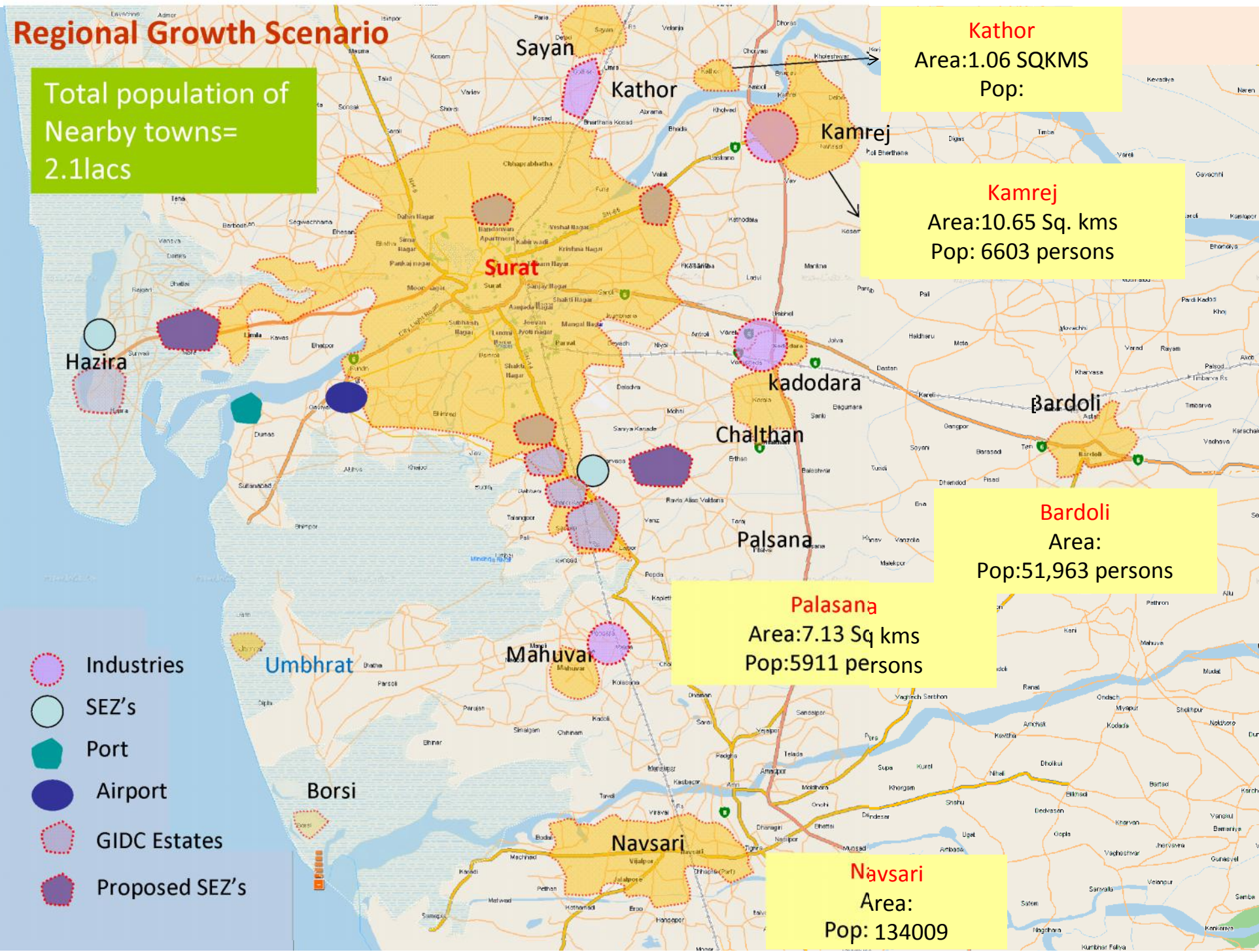


1. LAND USE-TRANSPORT INTEGRATION – Urban Structure



Regional Growth Scenario

Total population of Nearby towns= 2.1lacs



Kathor
Area:1.06 SQKMS
Pop:

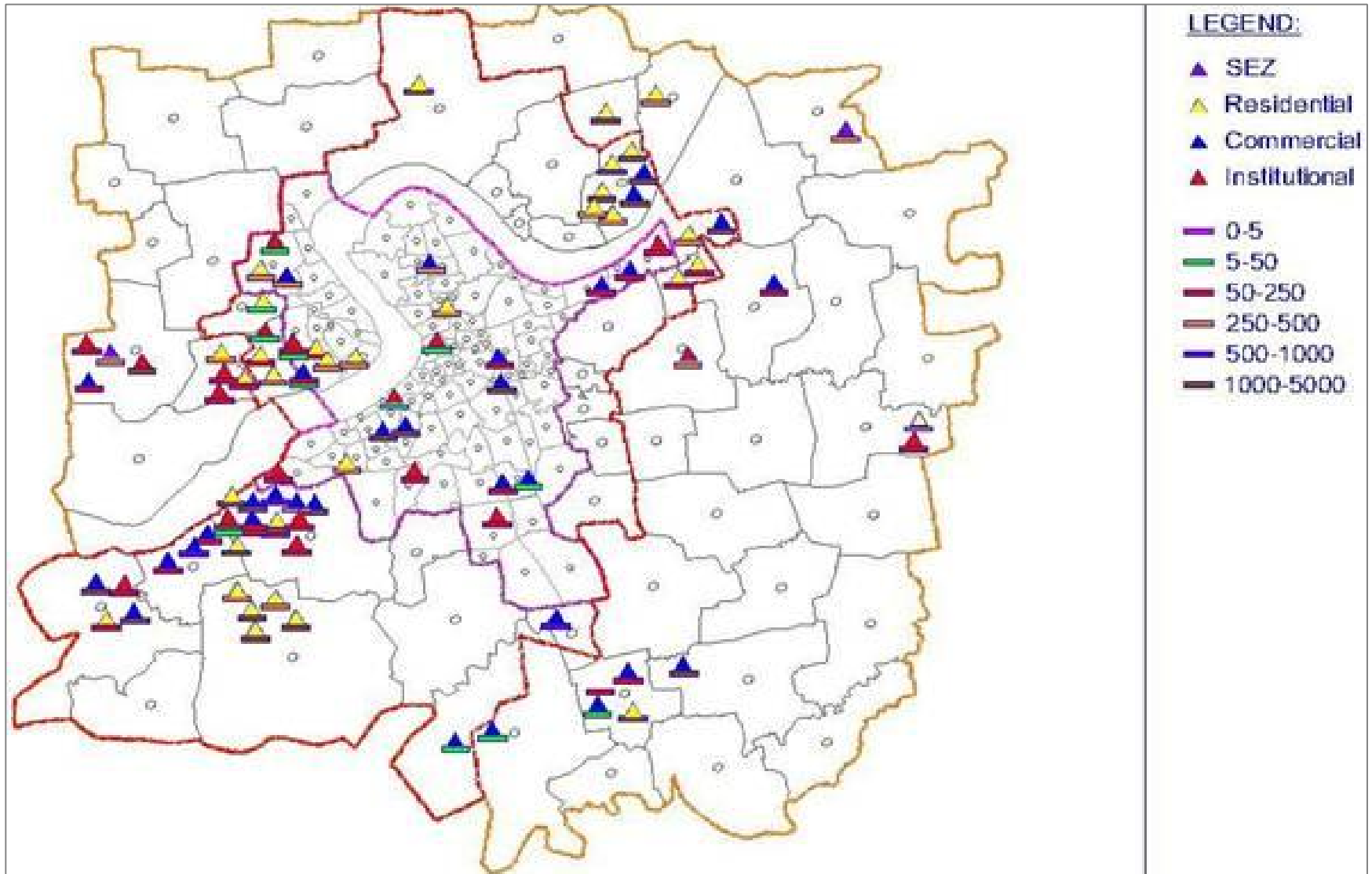
Kamrej
Area:10.65 Sq. kms
Pop: 6603 persons

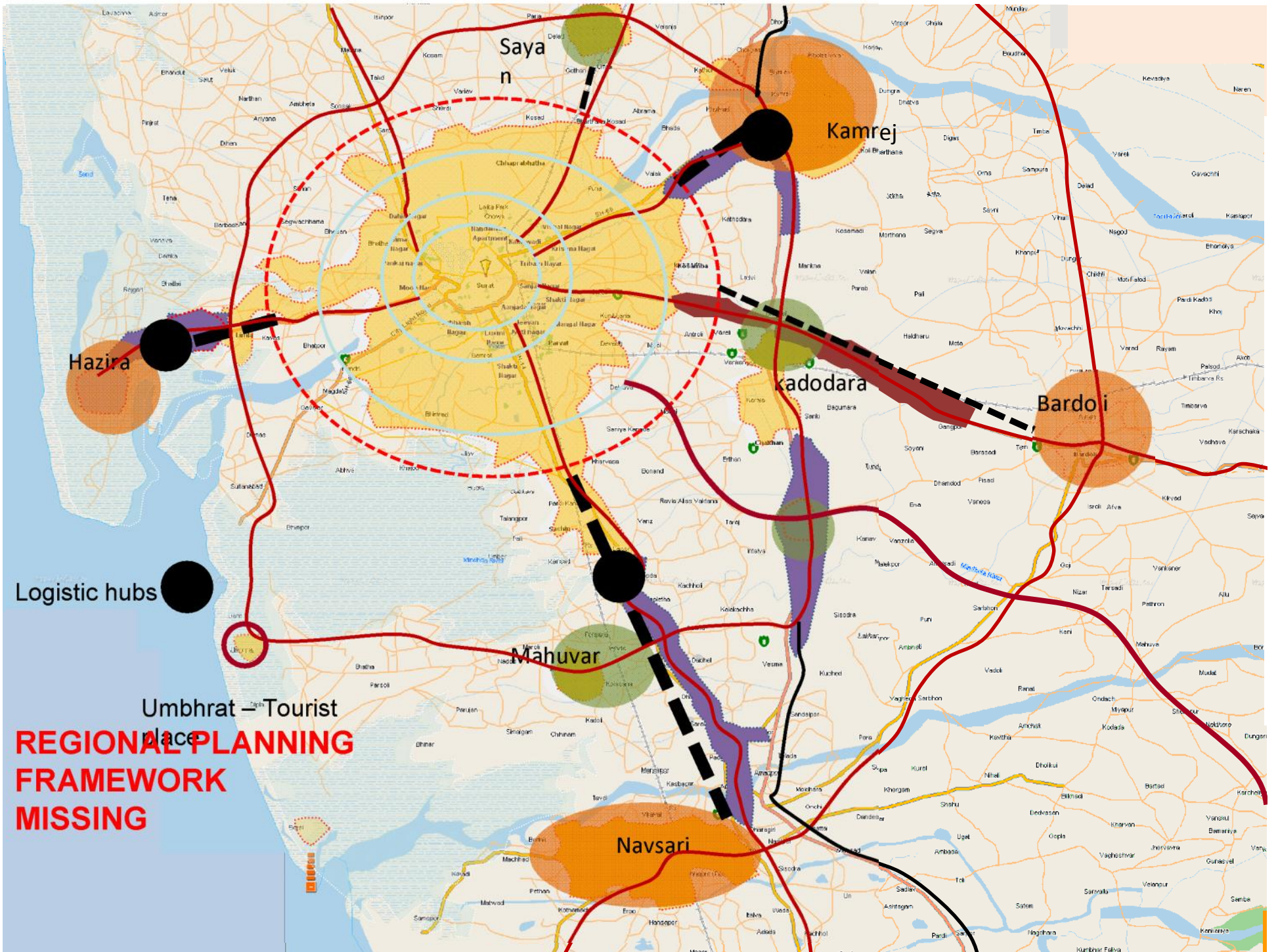
Bardoli
Area:
Pop:51,963 persons

Palasana
Area:7.13 Sq kms
Pop:5911 persons

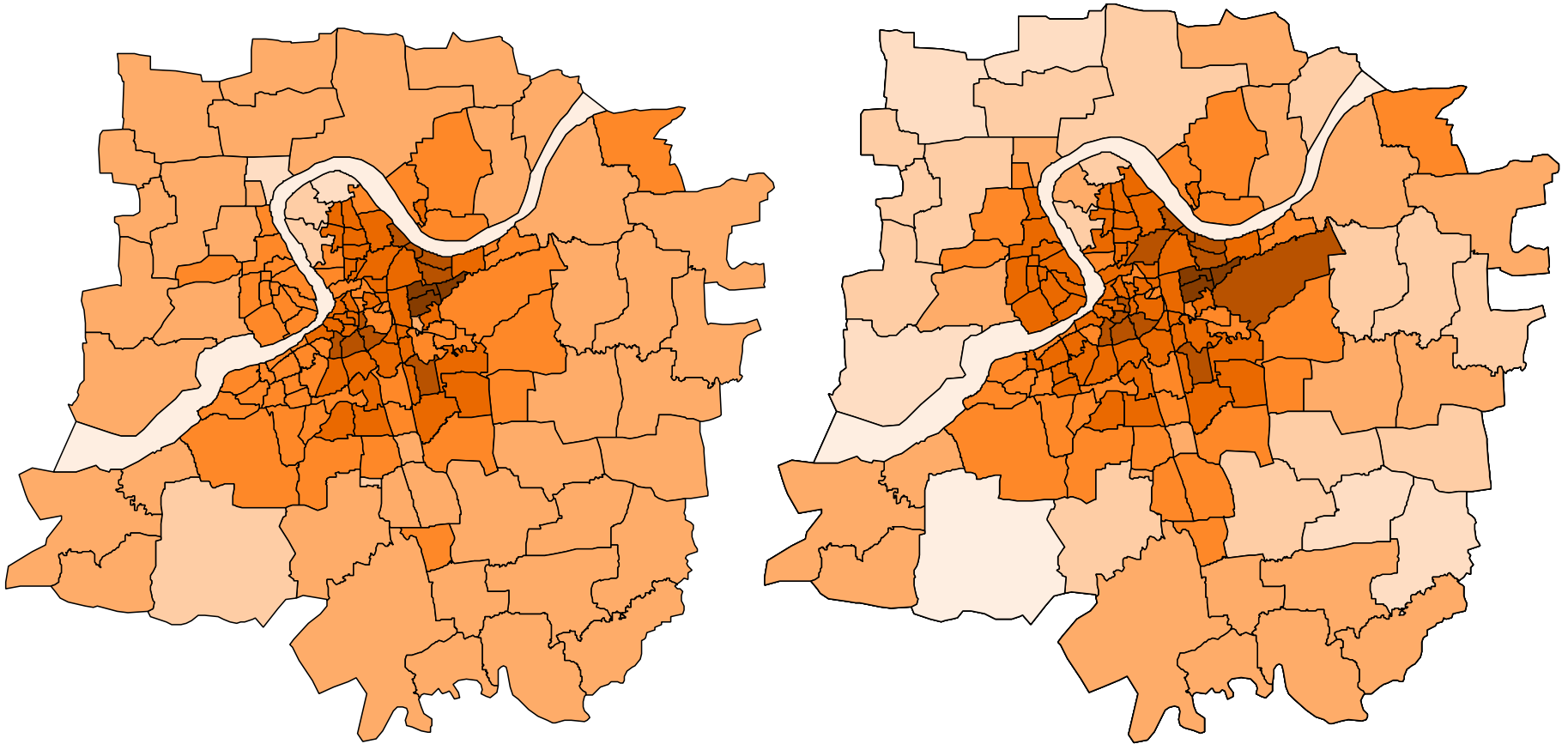
Navsari
Area:
Pop: 134009

-  Industries
-  SEZ's
-  Port
-  Airport
-  GIDC Estates
-  Proposed SEZ's





CONCENTRIC Versus Corridor Development

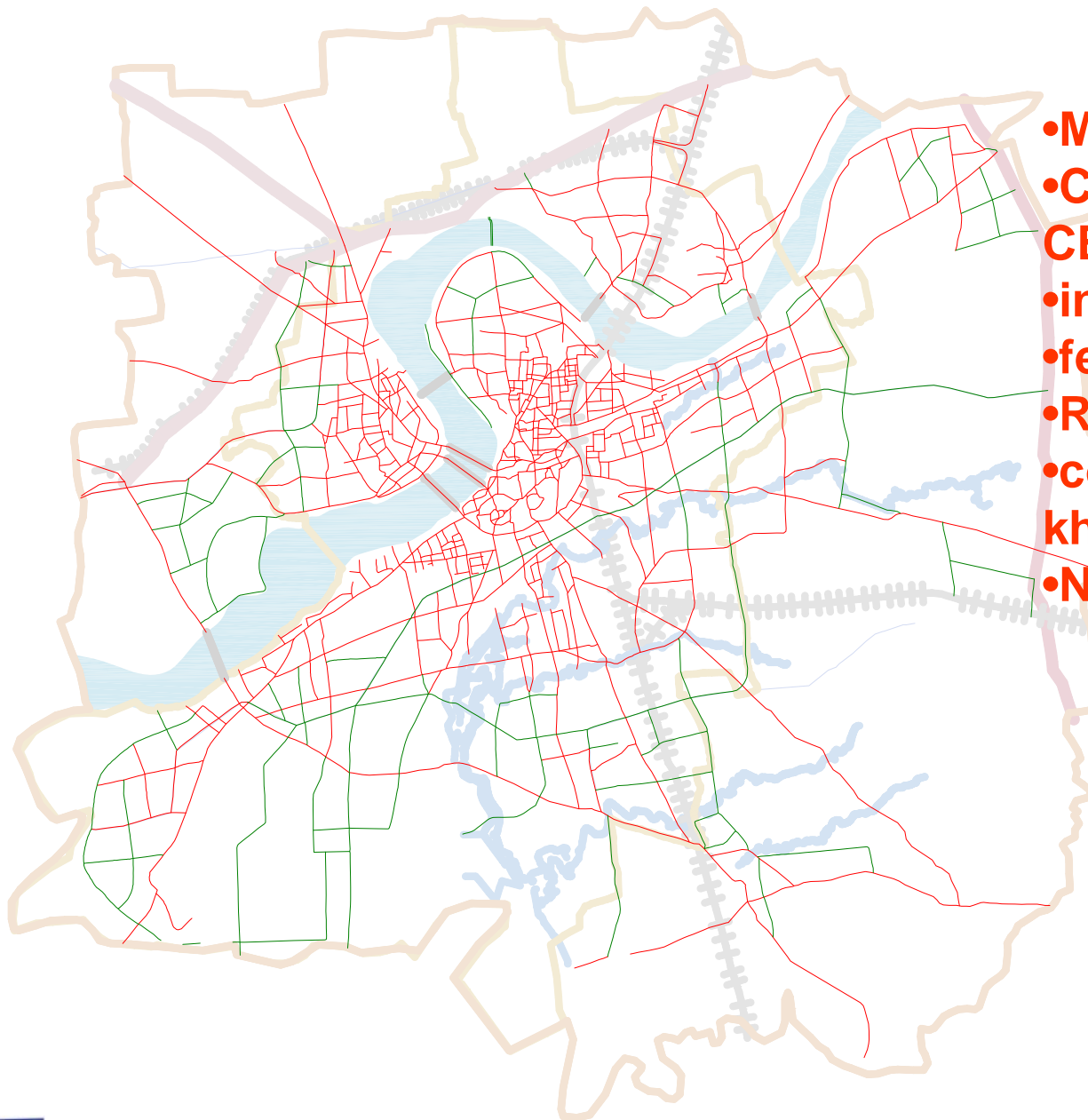


Scenario 1 & 2: Population Density 2035



TRANSPORT



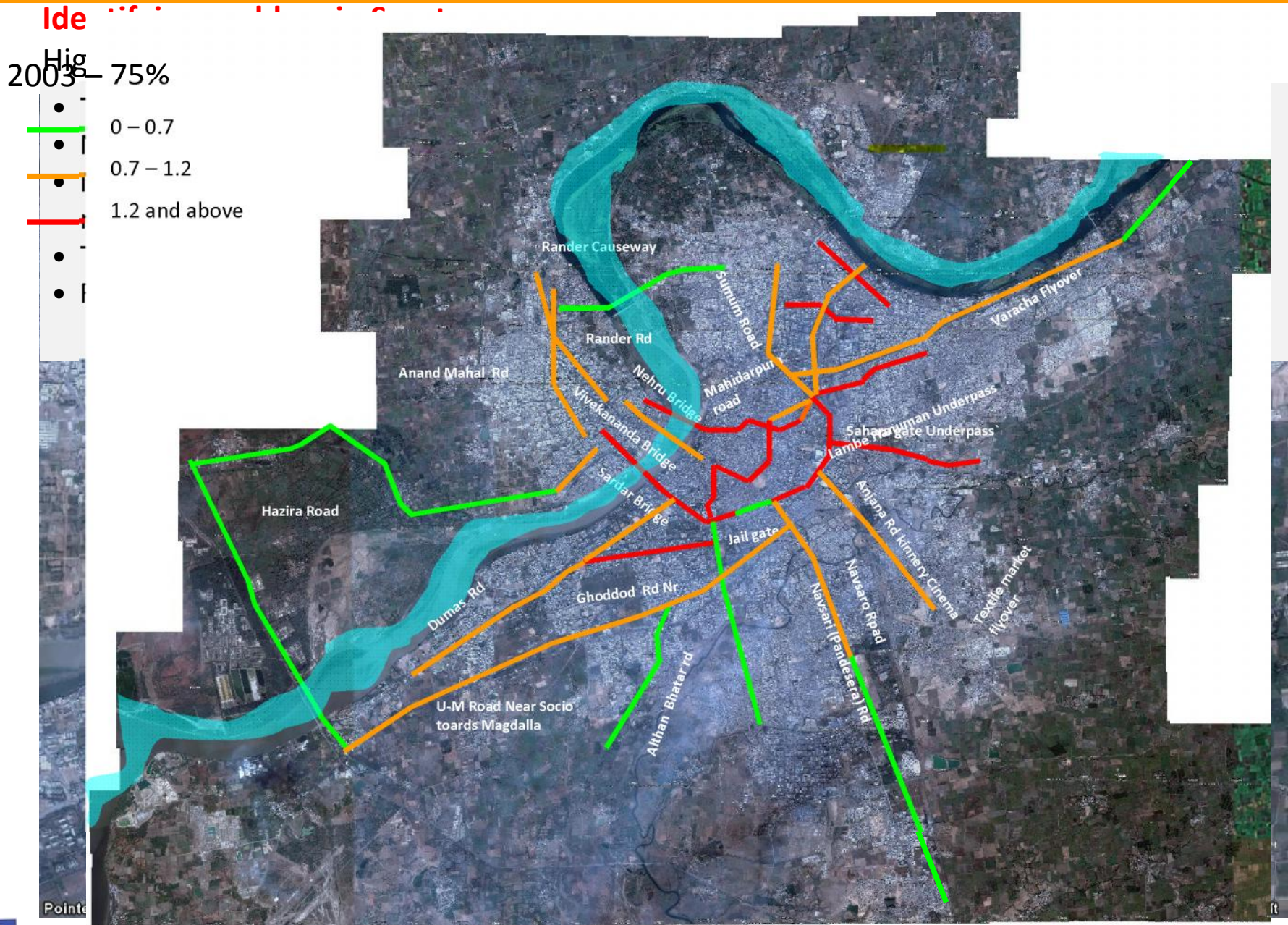


- Missing links
- Congested road network in CBD
- incomplete road network
- few major roads
- ROW not maintained
- constraints – river, canal, khadi
- Number of Flyovers

 Existing Roads

 Proposed Roads (In D.P)





*Vehicle count survey 2003 - CRRI



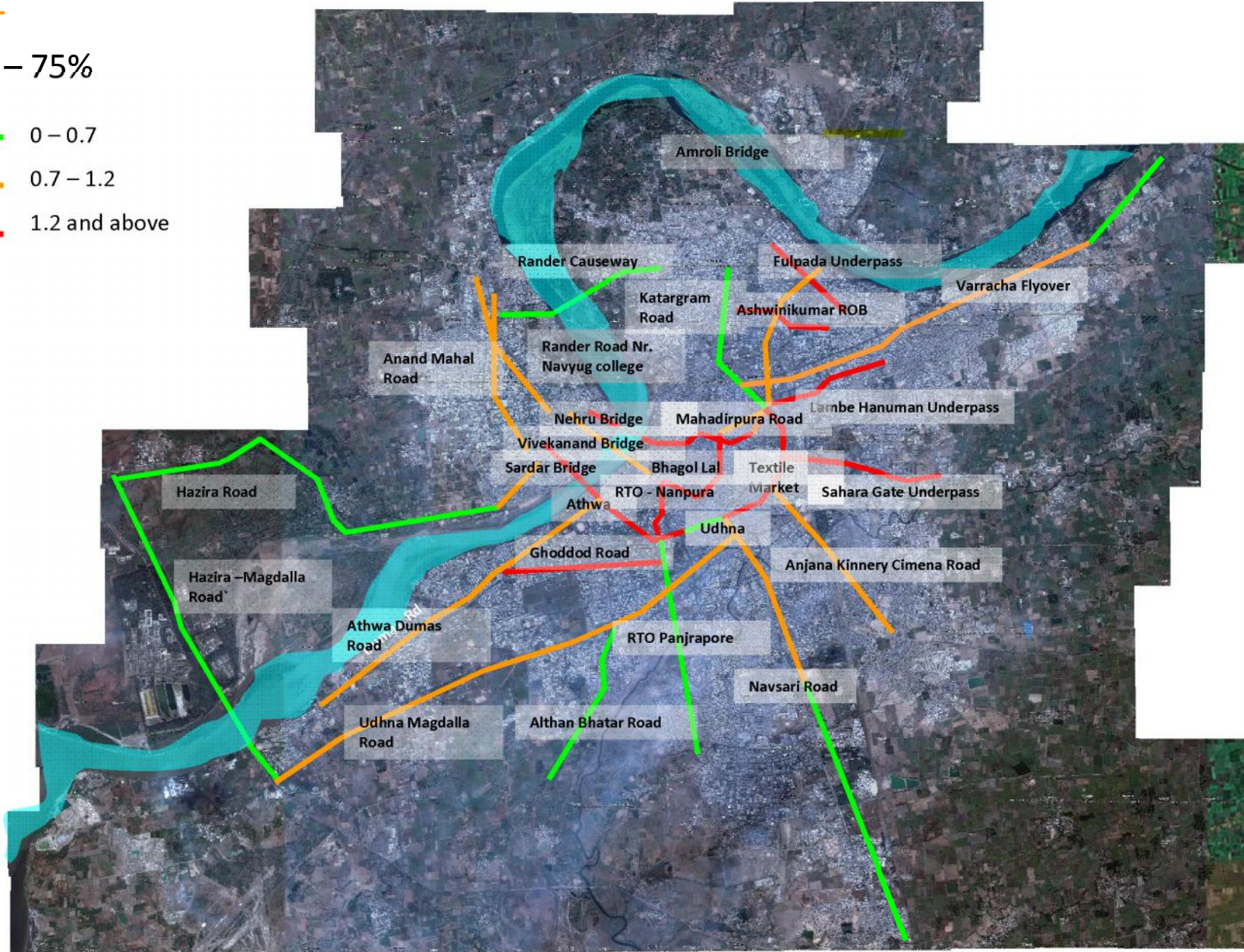
Solution Surat opted for

Elveyors – in Surat has been sought as an answer to congestion



2003 – 75%

- 0 – 0.7
- 0.7 – 1.2
- 1.2 and above



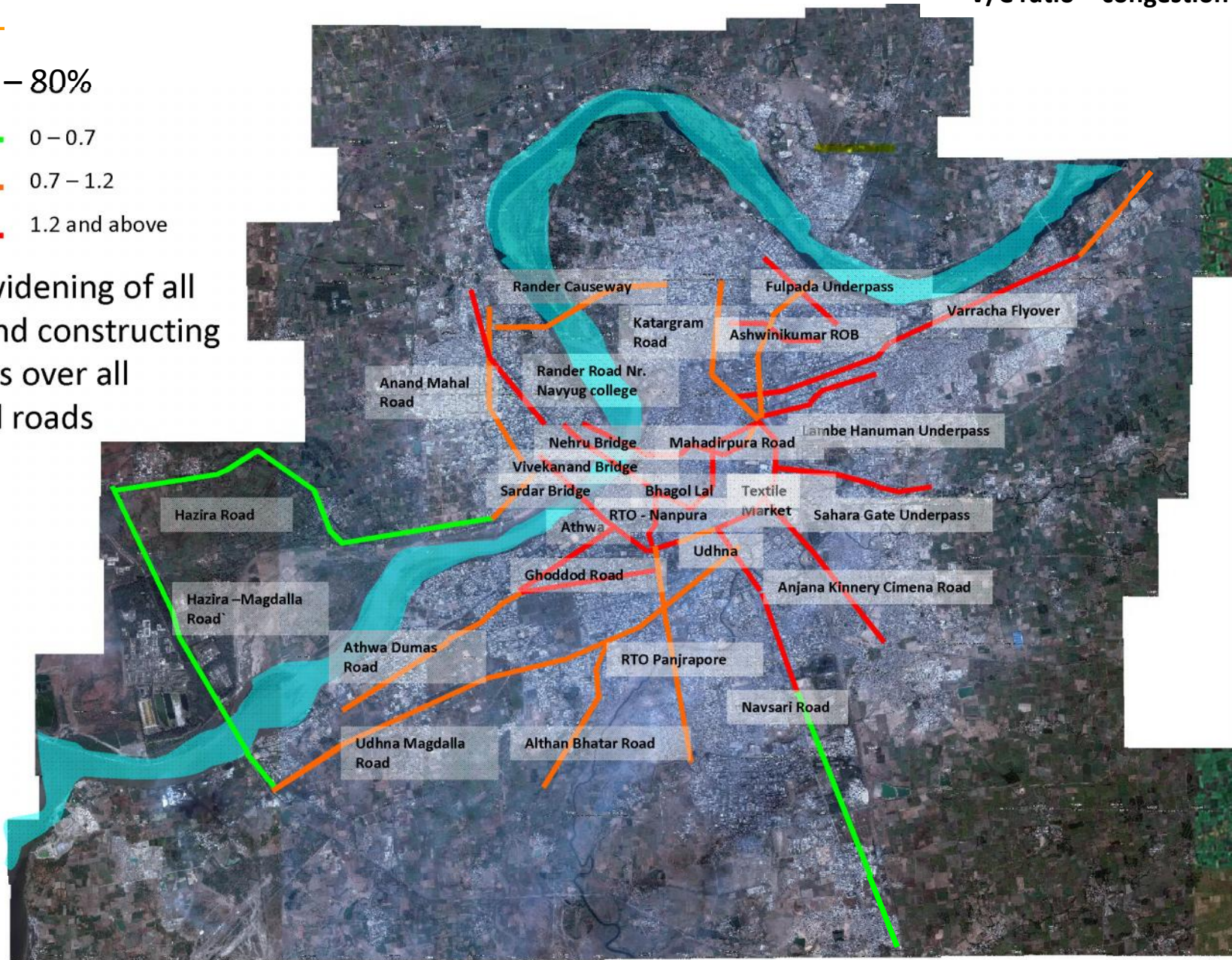
*Vehicle count survey 2003 - CRR



2006 – 80%

- 0 – 0.7
- 0.7 – 1.2
- 1.2 and above

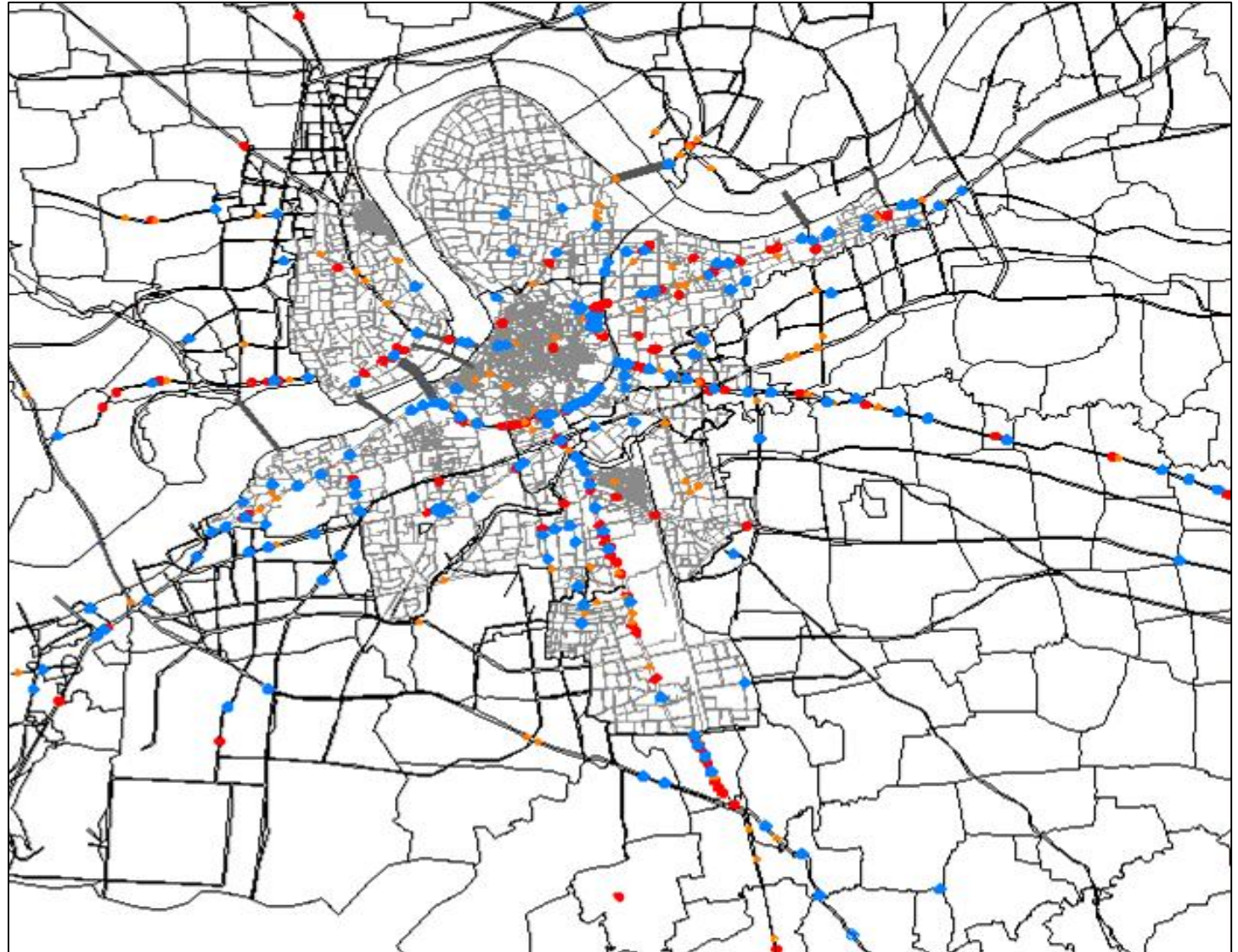
After widening of all road and constructing flyovers over all arterial roads



*Vehicle count survey 2006 - CES



Fatality Accidents (2004, 2005, 2006)



COMPARING PROPOSED NETWORK



- Compliments the city - existing road network
- Radials connects major activity areas – directly
- Forms more complete network



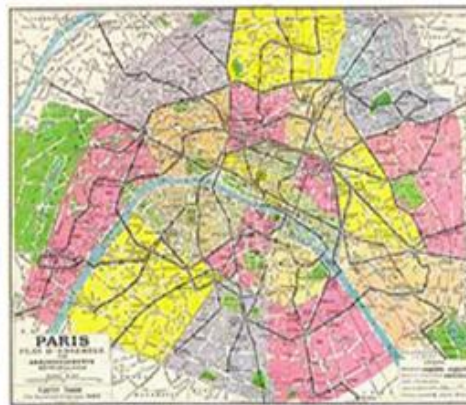
- More missing links
- Road density is more
- Mass transit route length would be more
- Increase travel time



Road Network Pattern - Ring Radial Cities world over



Beijing 747 Sq Km



Paris 2723 Sq Km



London 1579 Sq Km



Ahmedabad 450 Sq Km



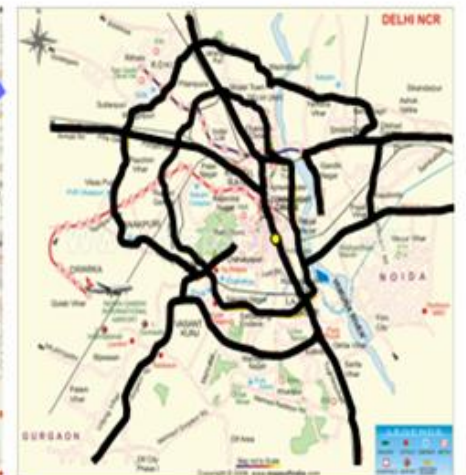
Madrid 600 Sq Km



Moscow 1081 Sq Km



Frankfurt 248 Sq Km



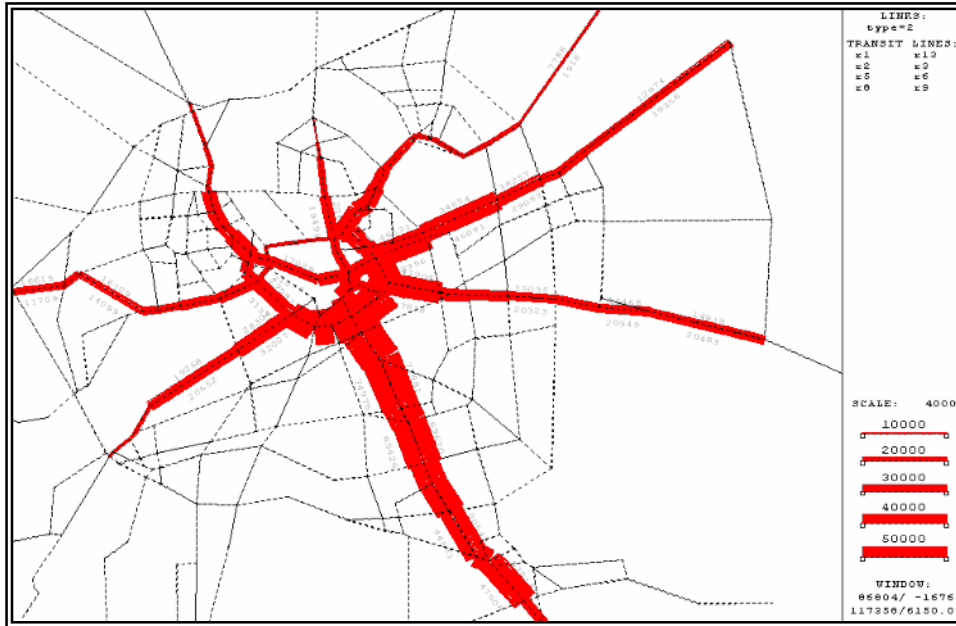
Delhi 1400 Sq Km



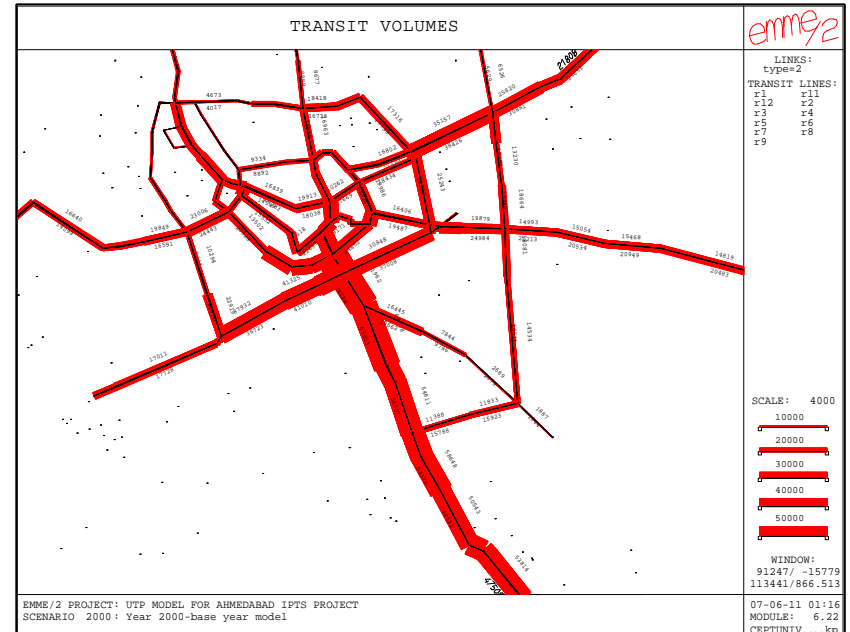


NETWORK LOADING

Existing Network

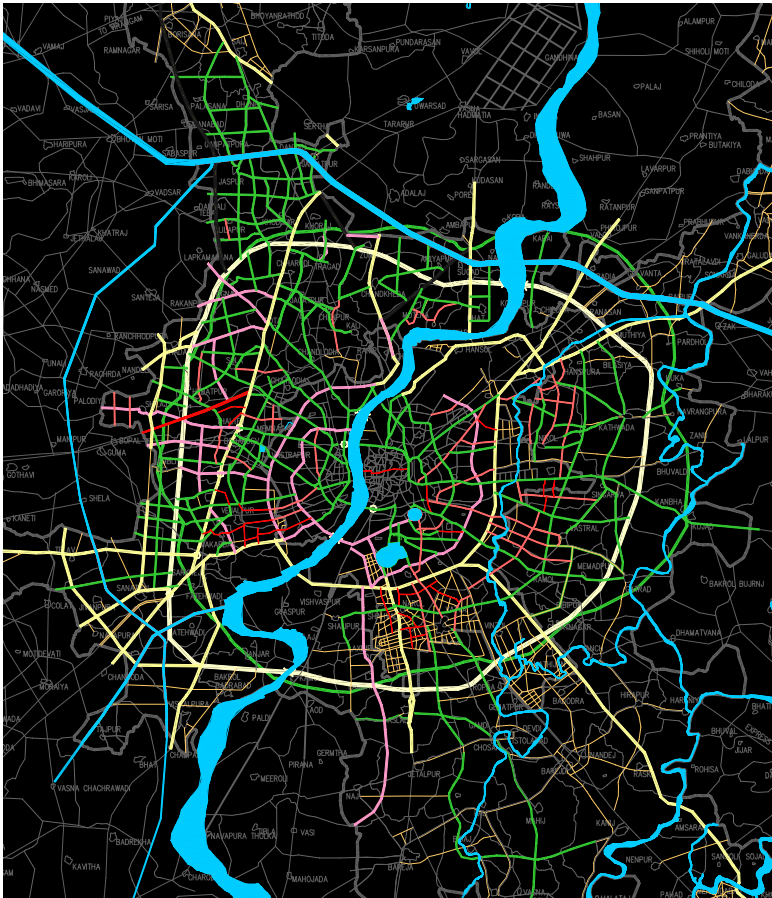


Modified Network

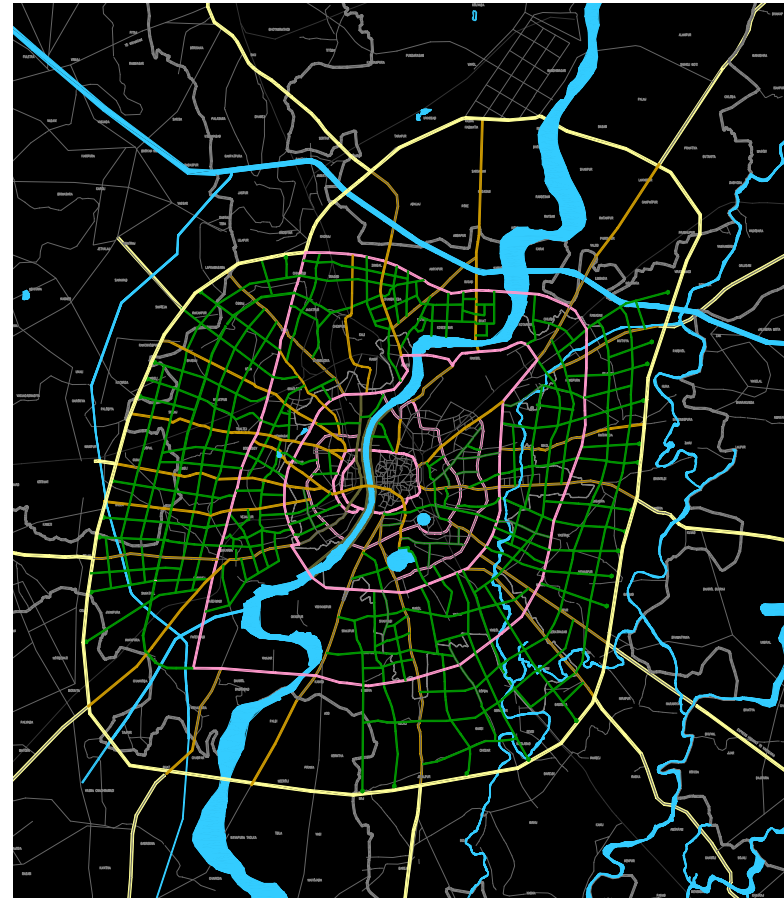


NETWORK DEVELOPMENT

**AHMEDABAD ROAD NETWORK
YEAR : 1987**



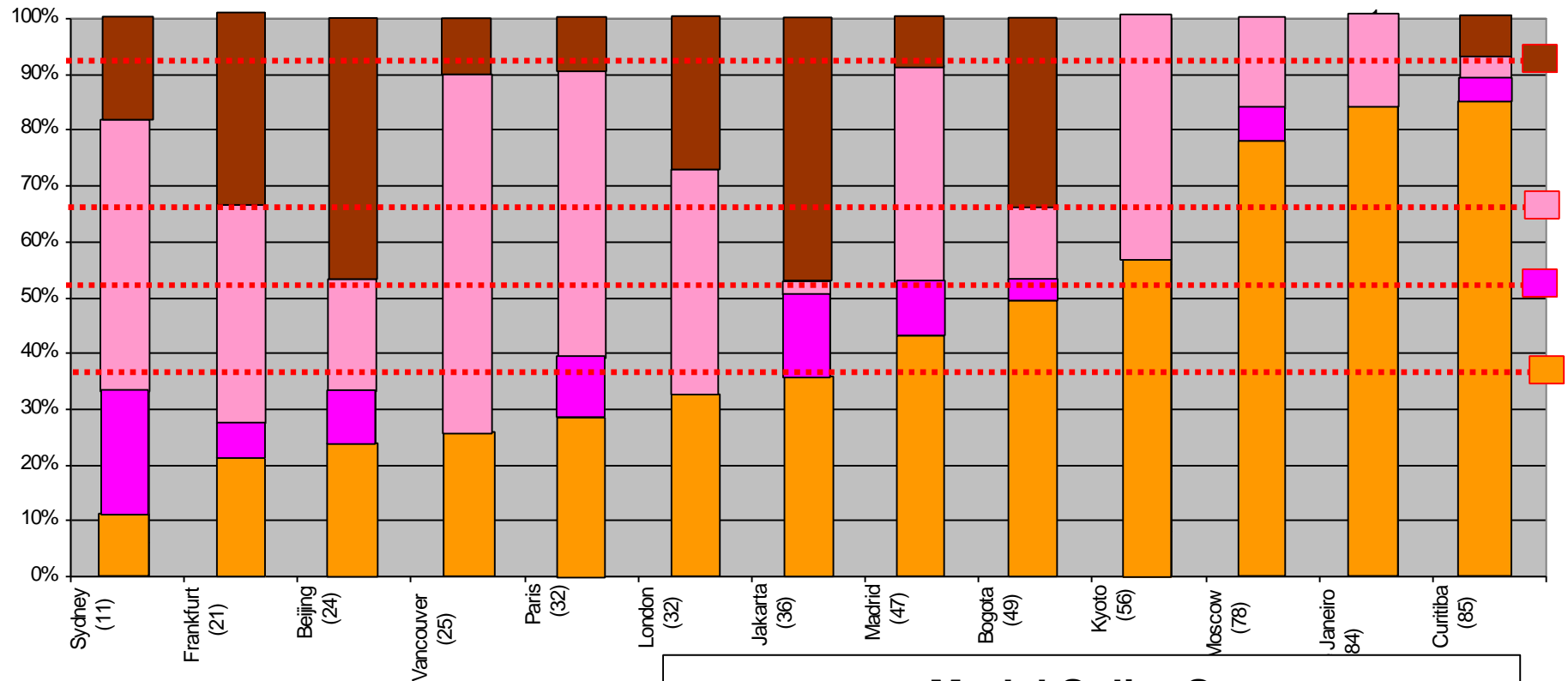
**AHMEDABAD ROAD NETWORK
YEAR : 1997**



PUBLIC TRANSIT



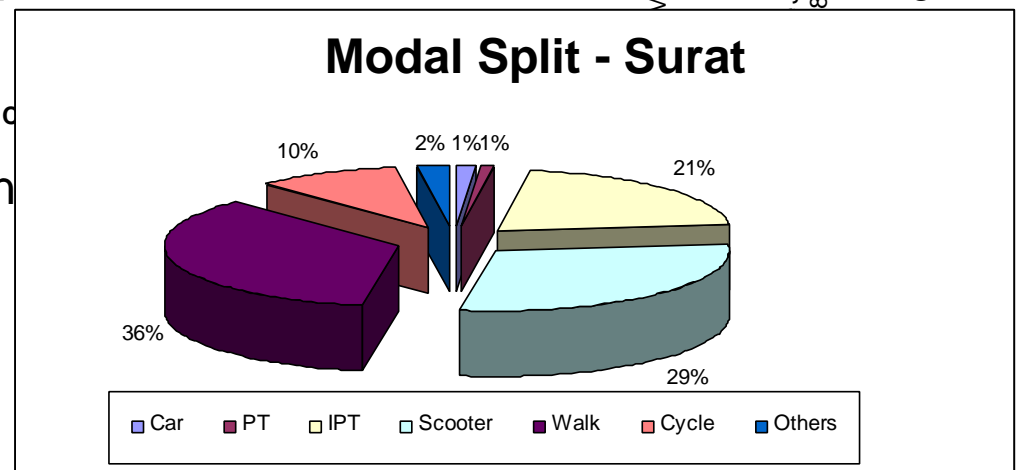
MODAL SPLIT



Developing cities have more depend

DESIRABLE COMPOSITION


- PUBLIC MODE 40 %
- IPT MODE 10 %
- PRIVATE MODE 25 %
- NMV MODE 25 %



CAPACITY?? (PPHPD)



Total Vehicles-66826
Total Cycles-5927
AKHBARNAGAR JUNCTION
TIME: 10.15 A.M.




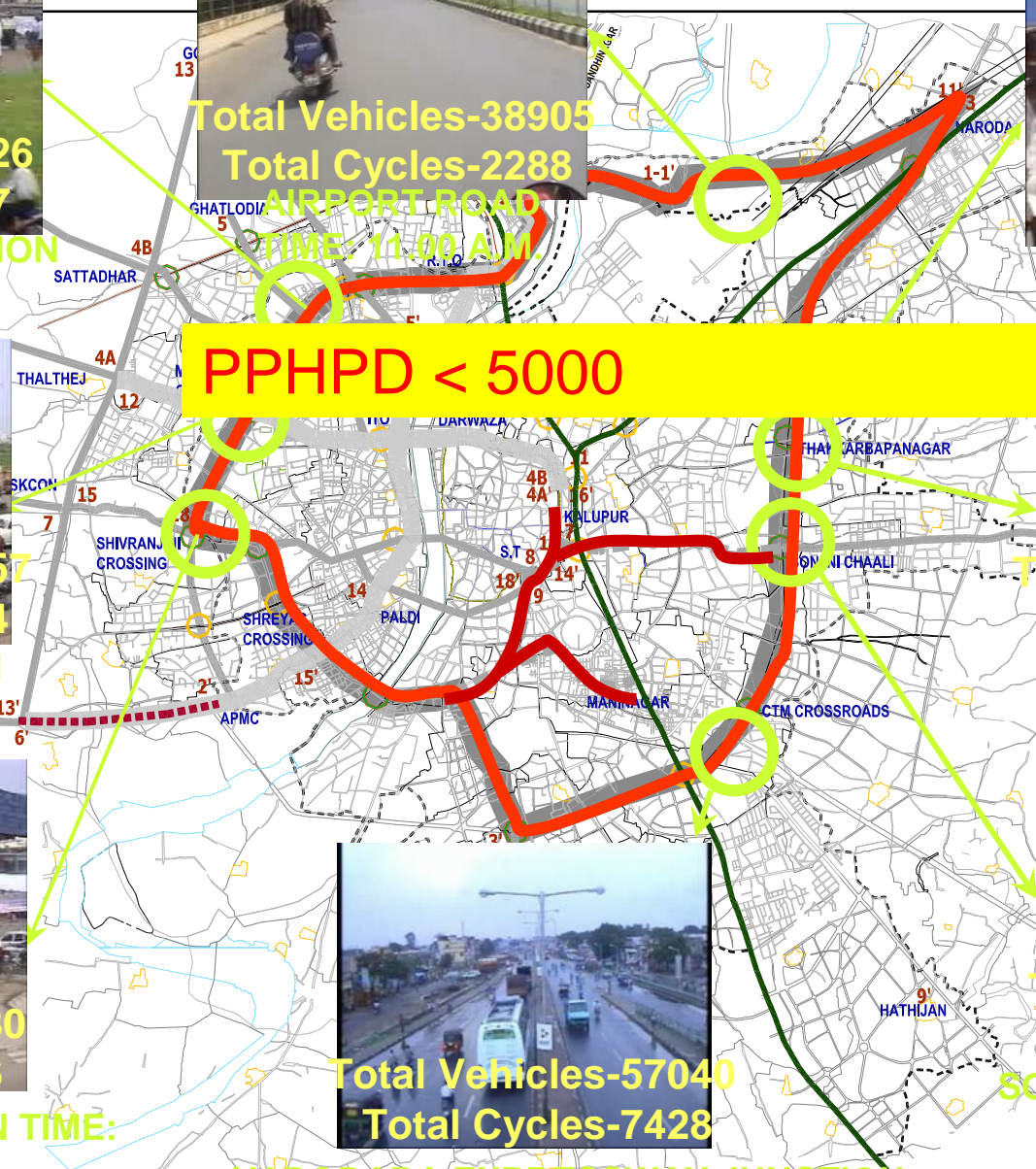
Total Vehicles-38905
Total Cycles-2288
AIRPORT ROAD
TIME: 11.00 A.M.



THAKKARNAGAR
TIME: 12.30 P.M.



Total Vehicles-67057
Total Cycles-6634
HELMET JUNCTION
TIME: 10.00 A.M.




Total Vehicles-53676
Total Cycles-9468
THAKKARNAGAR
TIME: 6.30 P.M.



Total Vehicles-66380
Total Cycles-5566
SHIVRANJANI JUNCTION
TIME: 9:30 A.M.



Total Vehicles-57040
Total Cycles-7428
VADODARA EXPRESSWAY JUNCTION
TIME: 7.00 P.M.



Total Vehicles-67278
Total Cycles-13354
SONI NI CHALI JUNCTION
TIME: 6.45 P.M.



High Capacity – Real Need or Myth!!

Scenario	No of Pass/ day	No of Pass/Hour	PPHPD	Mass Transit PPHPD (Assuming 50% shift)
I	120680	14481	7241	3621
II	155610	18673	9337	4669
III	194300	23316	11658	5829

Scenario – 1: A Bus every 20 Min

Scenario – 2: A Bus every 2 Minute

Scenario – 3: A Bus every Minute

1 Lakh Vehicles per day; 12% Peak factor



PPHPD....

Scenario (Assuming 1 Lakh Vehicles/day)	Assumed Modal Share					
	Bicycle	Car	IPT	2-wheeler	Bus	Total
Scenario-1	10	16	30	42	2	100
Scenario-2	10	10	20	35	25	100
Scenario-3	10	15	10	25	40	100
Scenario (Assuming 1 Lakh Vehicles/day)	Number of Vehicles/ Day on the Link					
	Bicycle	Car	IPT	2-wheeler	Bus	Total
Scenario-1	10000	17900	30000	42000	100	100000
Scenario-2	10000	17900	29600	41500	1000	100000
Scenario-3	5000	30000	20000	43000	2000	100000
	Number of Passengers/ Day on the Link					
	Bicycle(1)	Car(1.2)	IPT(1.3)	2-wheeler(1.1)	Bus(40)	Total
Scenario-1	10000	21480	39000	46200	4000	120680
Scenario-2	10000	21480	38480	45650	40000	155610
Scenario-3	5000	36000	26000	47300	80000	194300
<i>Numbers in parenthesis indicate the occupancy of the mode</i>						



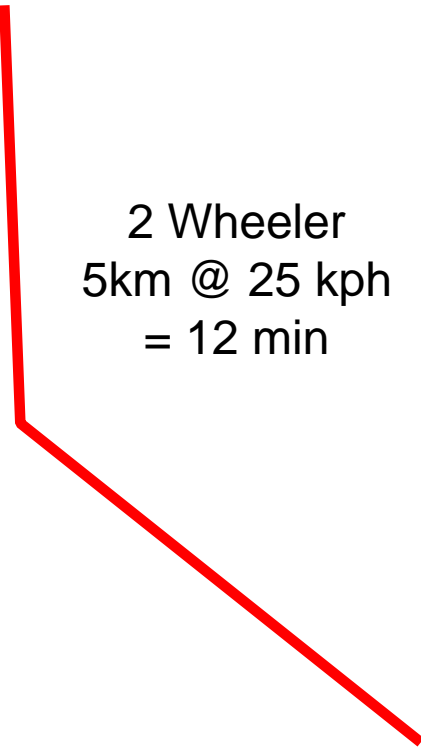
Transit Passengers per hour per direction	Type of BRT solution
Less than 2,000	Simple bus priority, normally without physical segregation, possible part-time bus lane.
2,000 to 8,000	Segregated bus way used by direct services reducing the need to transfer.
8,000 to 12,000	Segregated central busway using direct services with fast boarding and operating speeds. Good priority at junctions
12,000 to 20,000	Segregated central bus way, with overtaking at stops; possible use of express and stopping services, some grade separated junctions, possible shifting to trunk and feeder service, others with good priority
20,000 to 40,000	Segregated central bus way with overtaking stops, trunk and feeder system, express and stopping services, priority at intersections, multiple stopping bays per station.
Over 40,000	This level of demand is very rare on existing bus systems. It is possible, however, to design a BRT system that would serve up to even 50,000 passengers per hour and direction. This can be achieved with full segregation, double bus way, a high proportion of express services and multiple stops. Consider also spreading the load through two or more close corridors

Source: Adopted from ITDP with improvisation



A-B 5km

B



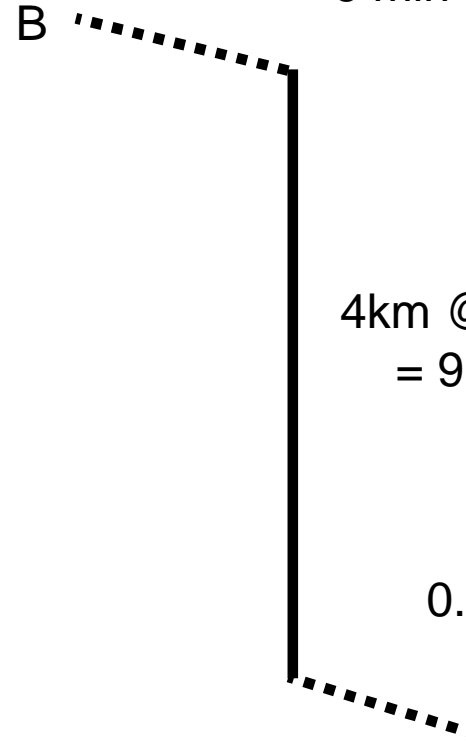
2 Wheeler
5km @ 25 kph
= 12 min

Bicycle
5km @ 12kph
= 25 min

Trip 5 km
PT 25 kph

Walk
0.5km @ 5 kph
= 6 min

B



PT
4km @ 25 kph
= 9.5 min

Walk
0.5km @ 6 kph
= 6 min

A

Total PT+Walk
= 21.5 min
Excludes Wait Time



A-B 10m

B

2 Wheeler
10km @ 25 kph
= 24 min

Bicycle
10m @ 12kph
= 50 min

A

Trip 10 km
PT 25 kph

Walk
0.5km @ 5 kph
= 6 min

B

PT
9km @ 25 kph
= 21.5 min

Walk
0.5km @ 5 kph
= 6 min

A

Total PT+Walk
= 33 min
Excludes Wait Time



A-B 10m

B

2 Wheeler
10km @ 25 kph
= 24 min

Bicycle
10m @ 12kph
= 50 min

A

Trip 10 km
PT 20 kph

Walk
0.5km @ 5 kph
= 6 min

B

PT
9km @ 20kph
= 27 min

Walk
0.5km @ 5 kph
= 6 min

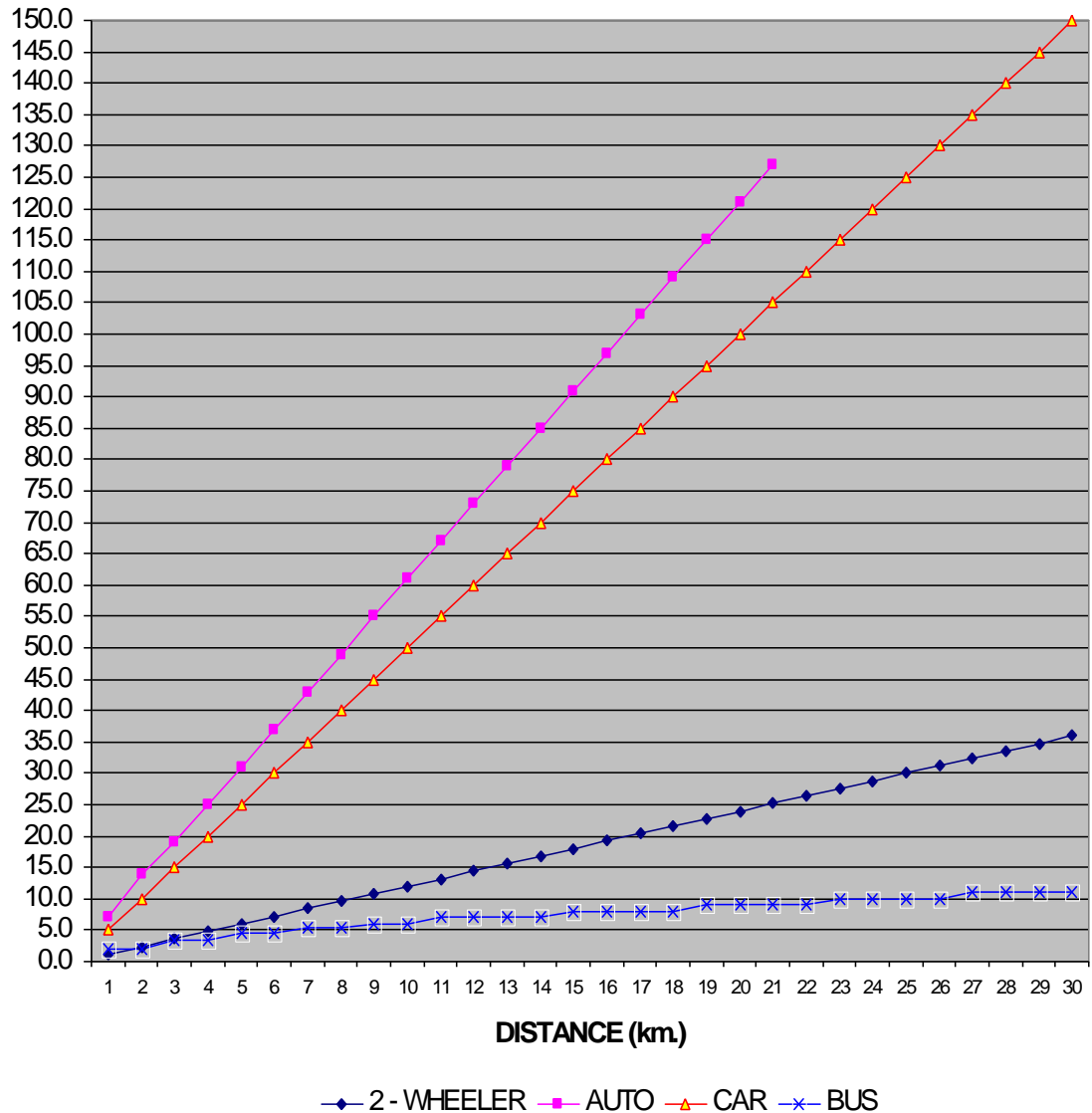
A

Total PT+Walk
= 39 min
Excludes Wait Time

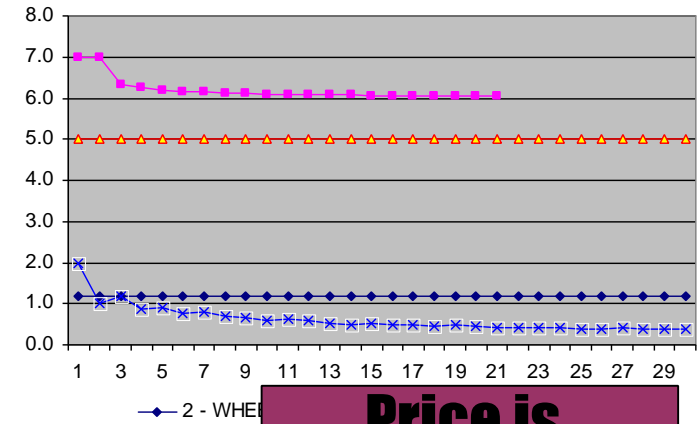


COST PER MODE IN AHMEDABAD

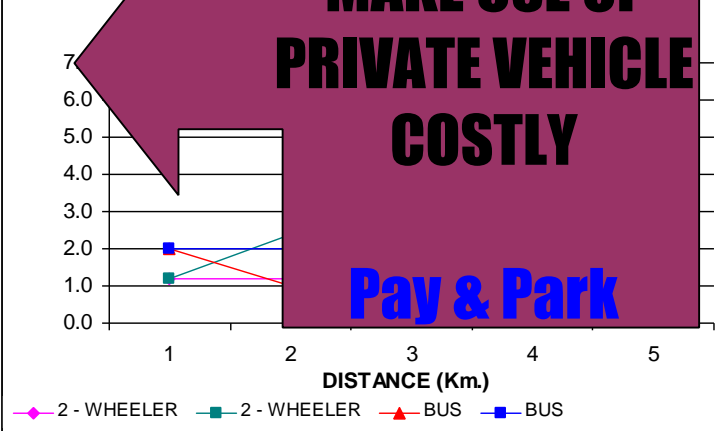
TRAVEL COST BY DIFFERENT MODES



MARGINAL TRAVEL COST BY DIFFERENT MODES



COMPARING MARGINAL COST



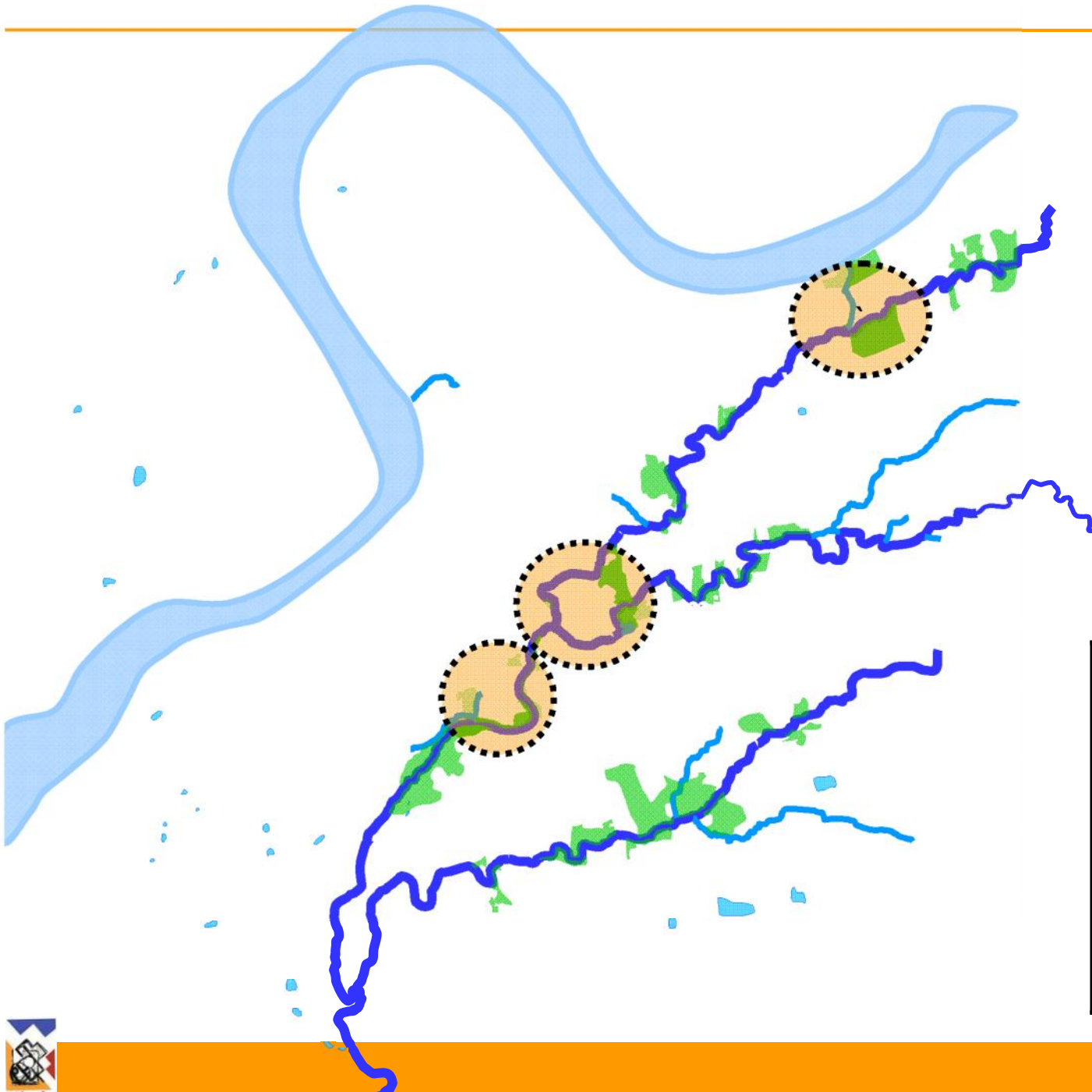
**Price is Important
MAKE USE OF
PRIVATE VEHICLE
COSTLY
Pay & Park**



URBAN POOR & TRANSPORT



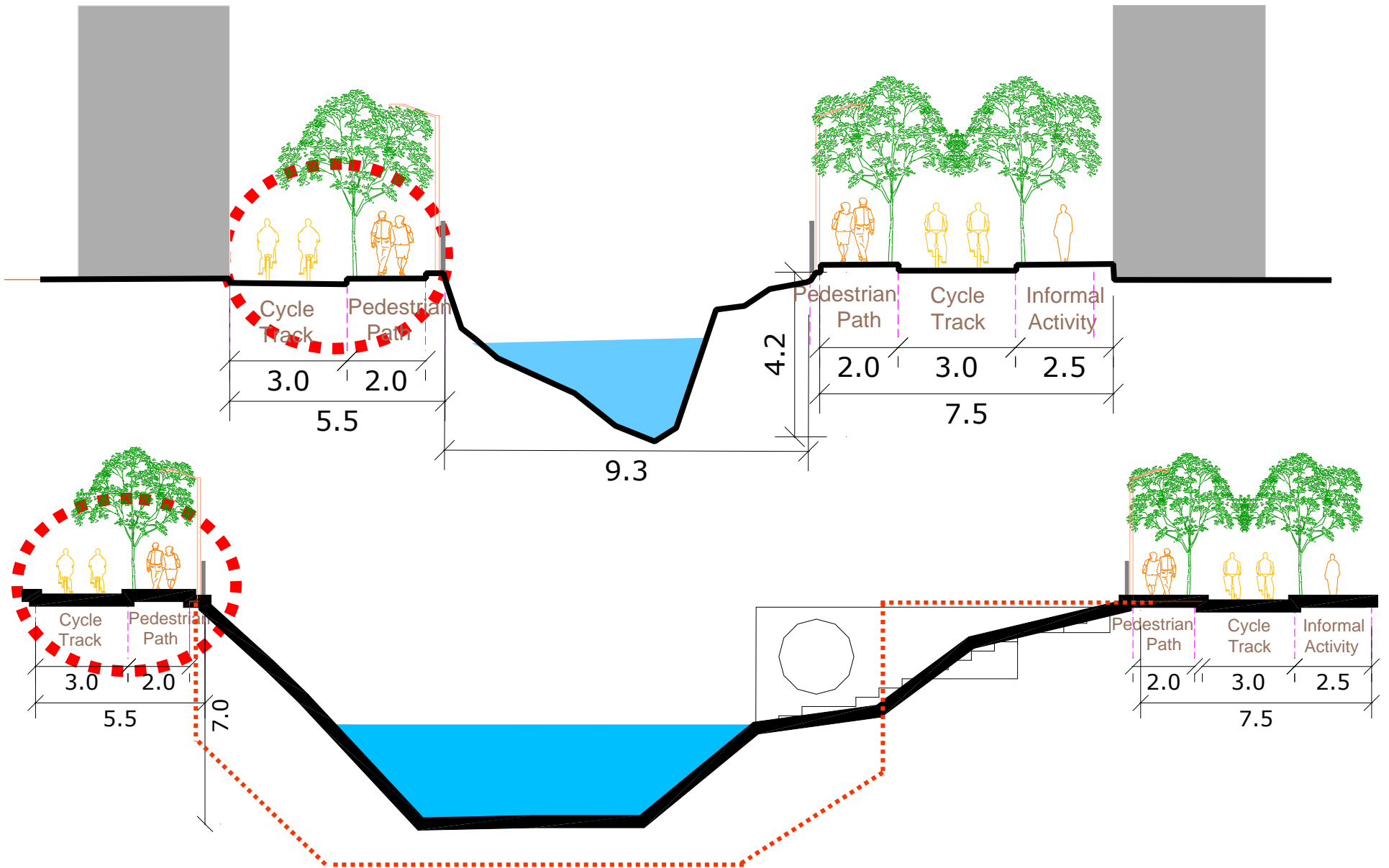
Identifying Creeks – to Integrate NMV



Name of khadi	Length in Km
koyali	8.30
mithi	51
kakra	60
bhedwad	15
varachha	26.51



Khadi detail Sections



Thank You

