

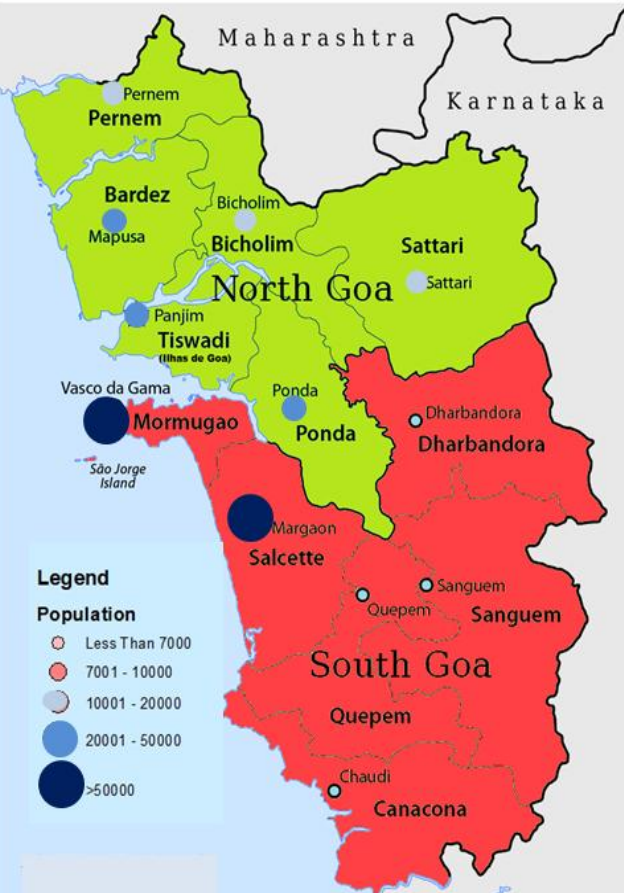
# Case Study

## Comprehensive Mobility Plan for Goa



By  
*N Seshadri*

# Goa State Profile | Demography



Smallest state with area **3702** sq.km



Population:

**14.58 Lakhs**

## Urban Population



India :  
31%

**2 X**



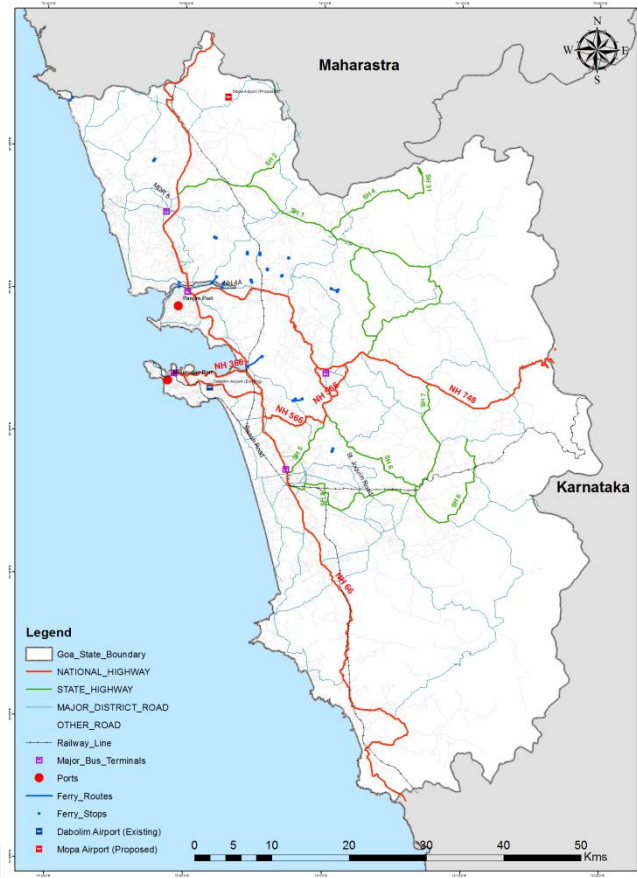
Goa :  
**62%**

- **56** Census Towns
- **13** Municipal Councils
- **1** Municipal Corporation
- **3** Urban Agglomerations

Source: Census, 2011

# Goa State Profile

# Transport Network



## Road Network

Total of 224 km of NH, 232 km of SH and 815 kilometers of MDR and ODR.

- NH-66 (ex NH-17)
- NH-4A.
- NH-366 (ex NH-17A)
- NH-566 (ex NH-17B)
- NH-768 (ex NH-4A)
- SH-1

## Railway Network

2 railway zones namely **the South Western Railway** and the **Konkan Railway**.

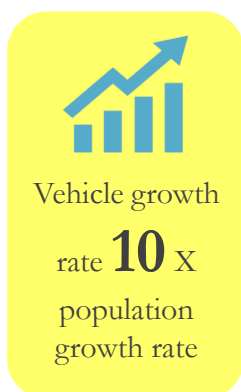
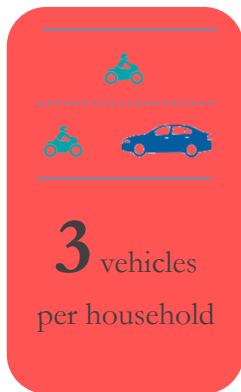
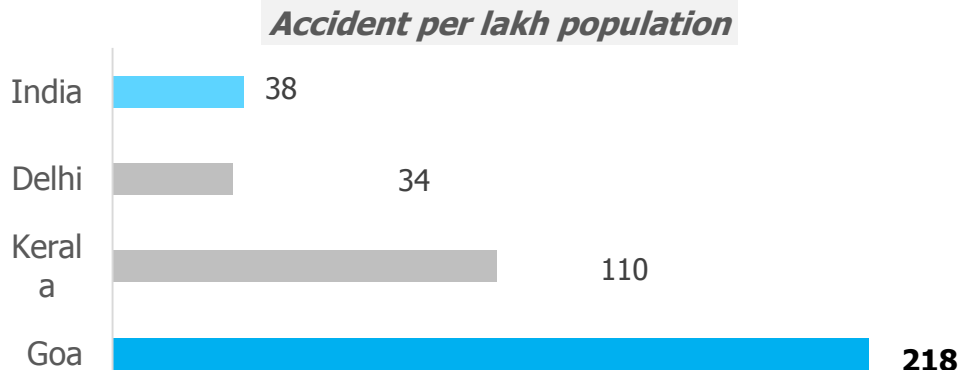
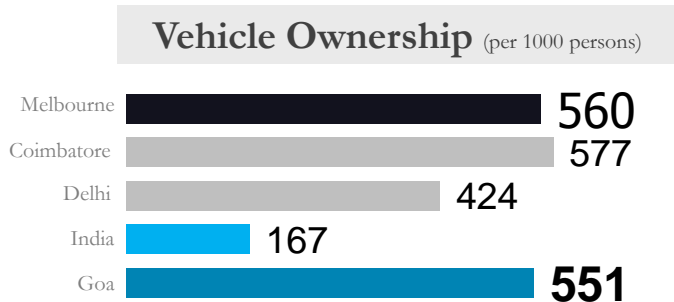
## Air Link

- Goa International Airport is a Naval airfield located at **Dabolim** near Vasco.
- The proposed greenfield **Mopa Airport** will be built at Mopa in Pernem taluka near Goa-Maharashtra Border.

## Sea Link

- The sea route service for passengers is unavailable since June 2004, but cargo traffic services for mineral ore, petroleum, coal, and international containers is operating successfully.
- **Mormugoa Harbor** handles the major cargo traffic.
- A minor port is also available in Panjim at the bank of river Mandovi.

# Goa State Profile | Vehicle Ownership



# Goa State Profile | Public Transport

85%



## Private Buses

- 11327 Buses
- Multiple Operators
- Competing Bus Services

15%



## Kadamba Transport Corporation Ltd.

- 565 Buses



18 Routes  
30 Ferries



19698  
Hired Taxis



27073  
Motorcycles  
on hire

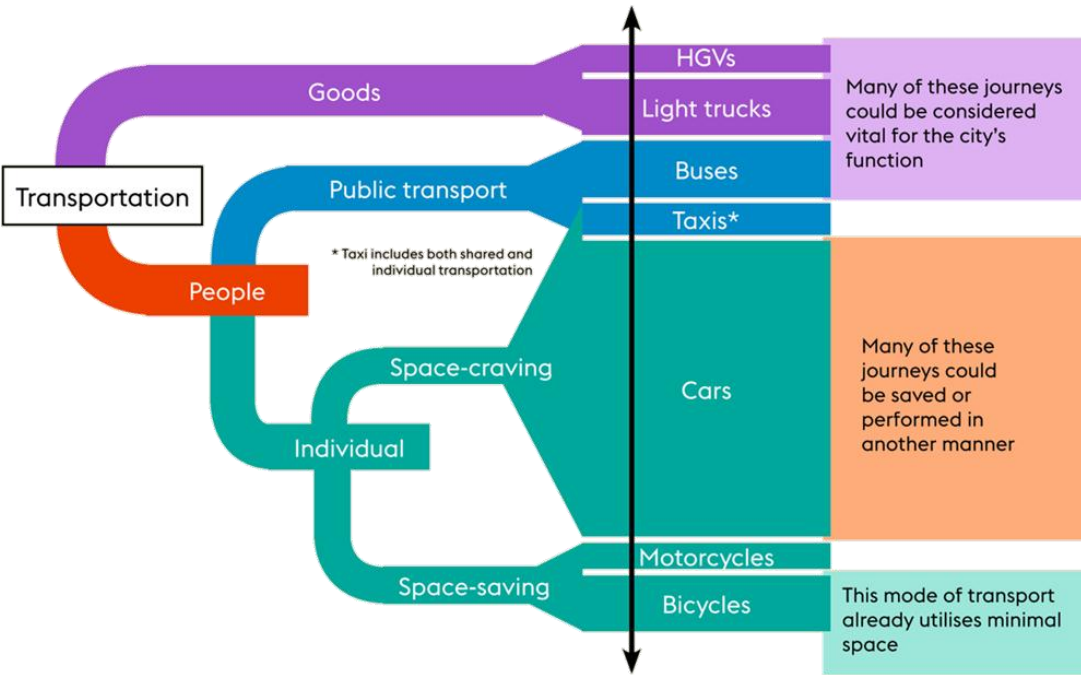


4411  
Auto  
Rickshaws

- **Higher dependency** on private vehicle modes
- Public transport (buses) constitute only **1%**

*Source: Directorate of Transport-Goa, Goa Economic Survey, 2017*

# CMP.... A Sustainable Approach



Over time, achieving greater sustainability in transport means by investing in schemes and initiatives that improve accessibility and mobility for **people**.

Sustainable transport refers to any means of transport with low impact on the environment. It includes **walking** and **cycling**, using **public transport**, as well as **technology** to move people, goods, and information in ways that reduce its impact on the environment, the economy, and the society



**GOA**

**Mobility  
Vision 2040**

Safe | Sustainable | Smart

# Goa CMP Vision

Safe | Sustainable | Smart

## Goals

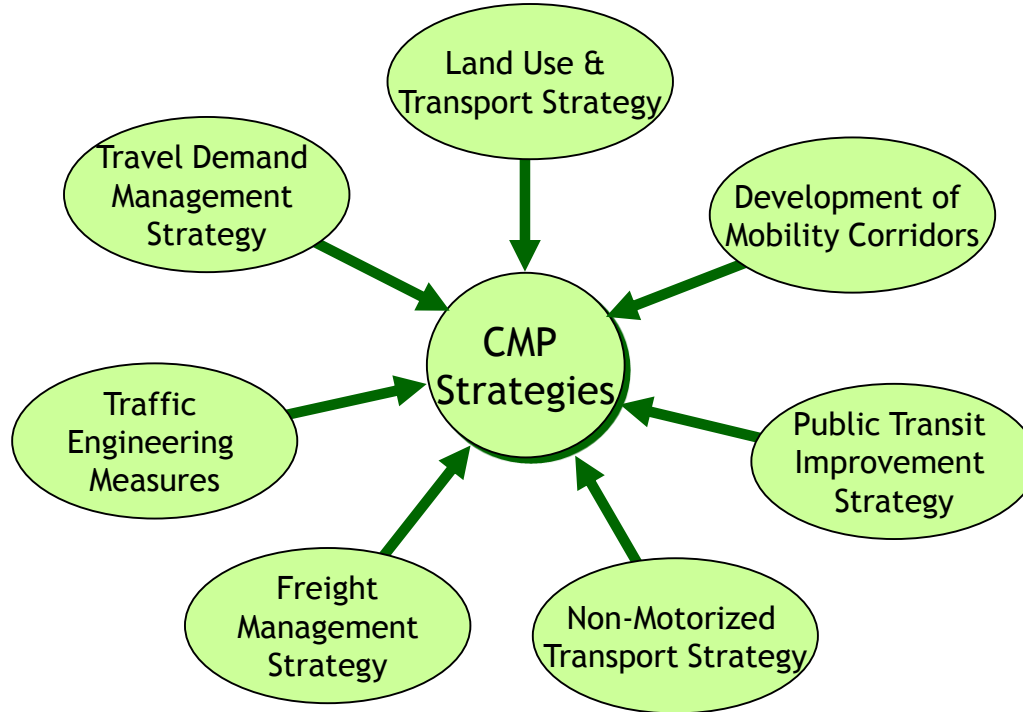
- 1 *Ensure that the urban road structure is organized and suited to the land use*
- 2 *Public transport that is accessible, economical, efficient and effective*
- 3 *Sustainable plan that promotes NMT and ensures clean environment and livable towns*
- 4 *Traffic management and engineering solutions that increase safety and optimize the efficiency of the network*
- 5 *Goods movement that is organized and doesn't interfere with passenger movement*
- 6 *A parking policy and parking master plan that is sustainable and smart*



# Steps involved in the preparation of Goa CMP



# CMP Strategies



Solutions for complex transport improvements can't be achieved by a single strategy

The strategies should work in tandem for achieving the goals and objectives set



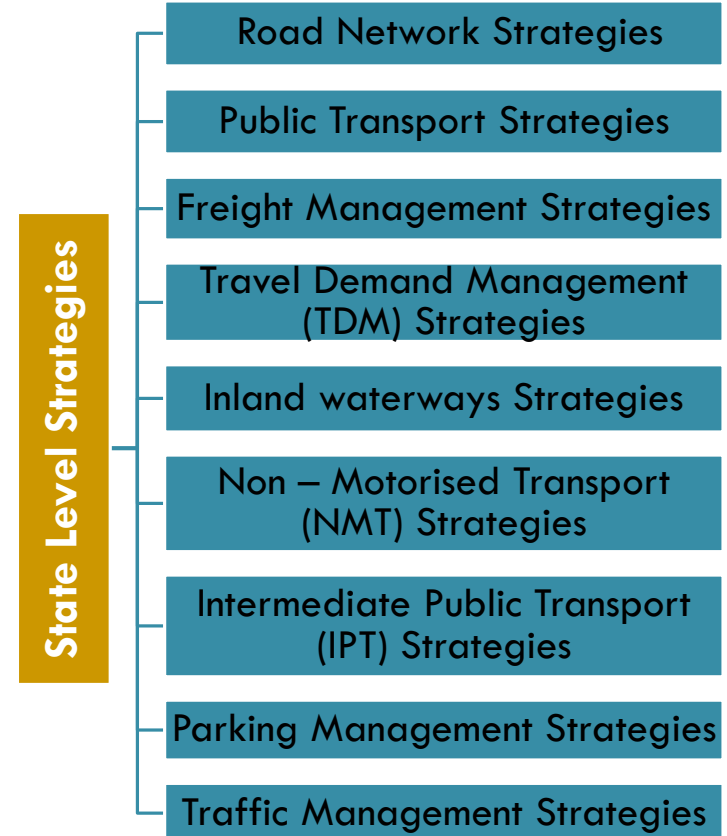
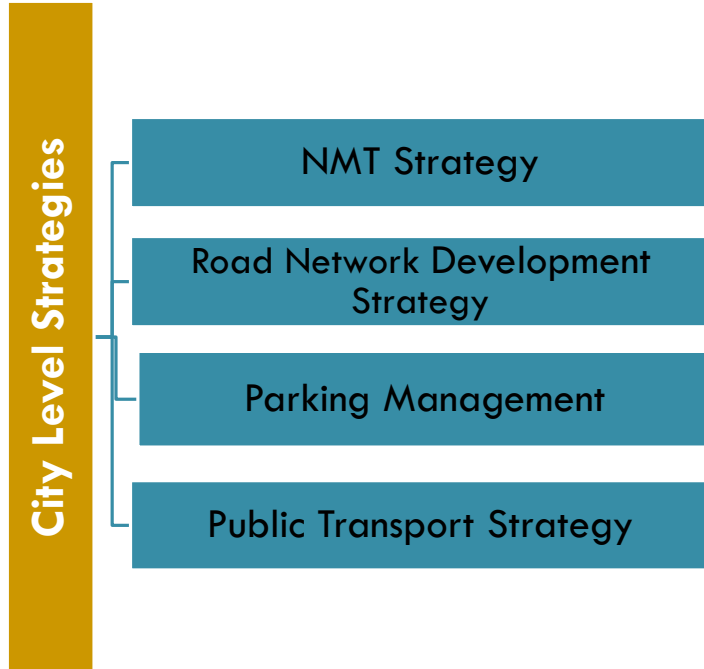
# Urban Mobility Plan

# Approach to Goa CMP

The vision of CMP will be structured based on the concept of Safe, Smart and Sustainable Mobility.

To achieve this vision, each strategy will be dealt:

- **City Level approach**
- **State level approach**



Traffic Management Strategies

# What does Goa need?

## Transport Strategies

*Intercity Strategies*

- Mass Rapid Transit
- Inland Waterways
- Freight Management
- Multi Modal Integration
- Mobility Corridors
- Road Network

*Intra-city strategies*

- First and last mile connectivity
- Parking Management and regulation
- NMT Infrastructure
- PT Infrastructure
- Traffic Management
- Demand Management

INSTITUTIONAL FRAMEWORK



# STATE LEVEL STRATEGIES

# What does Goa need?

State Level Needs

1

## Mass Rapid Transit System

connecting the urban centers and regional transport hubs

Few Options

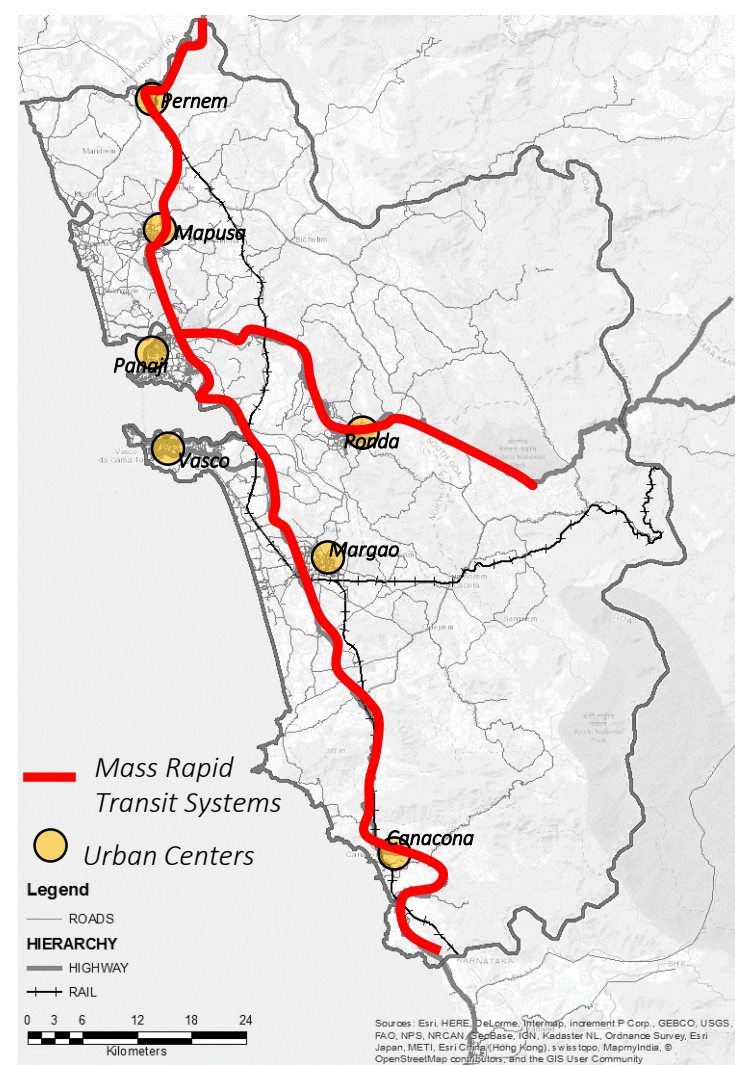
Metro Rail



LRT/ Tram



Bus Rapid Transit (BRT)



# What does Goa need?

## State Level Needs

2

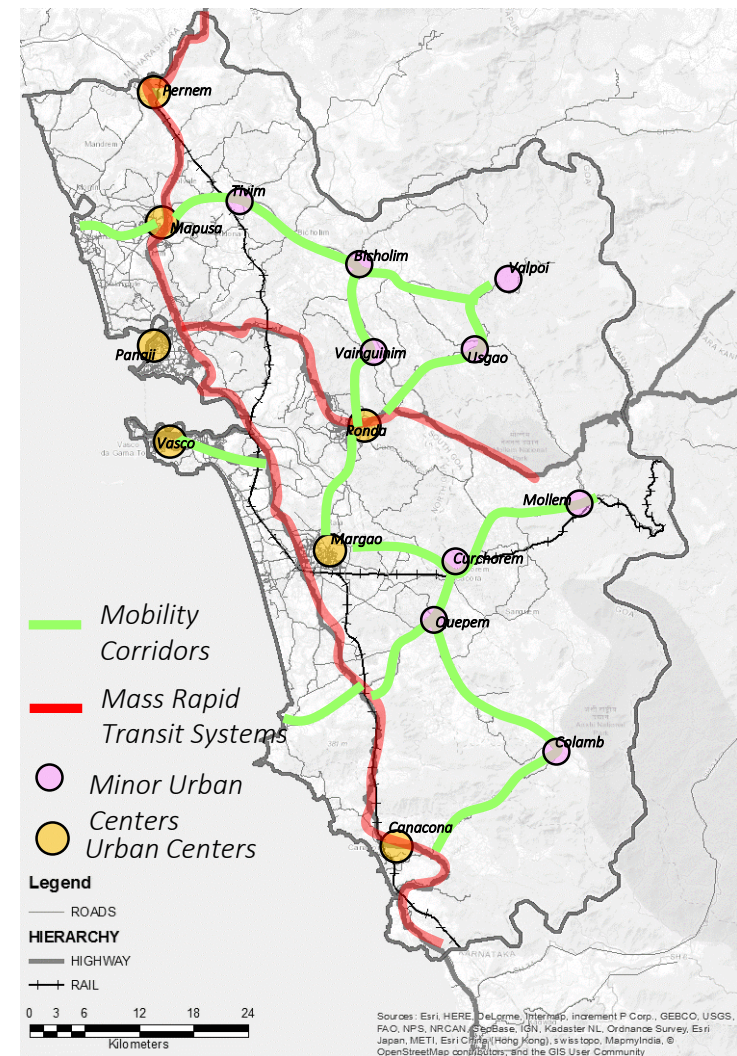
### Upgradation of bus transport system

to a comfortable public transport choice and connecting minor urban centers and tourist locations

Use of sustainable technology like electric mobility

Create a better image for bus services

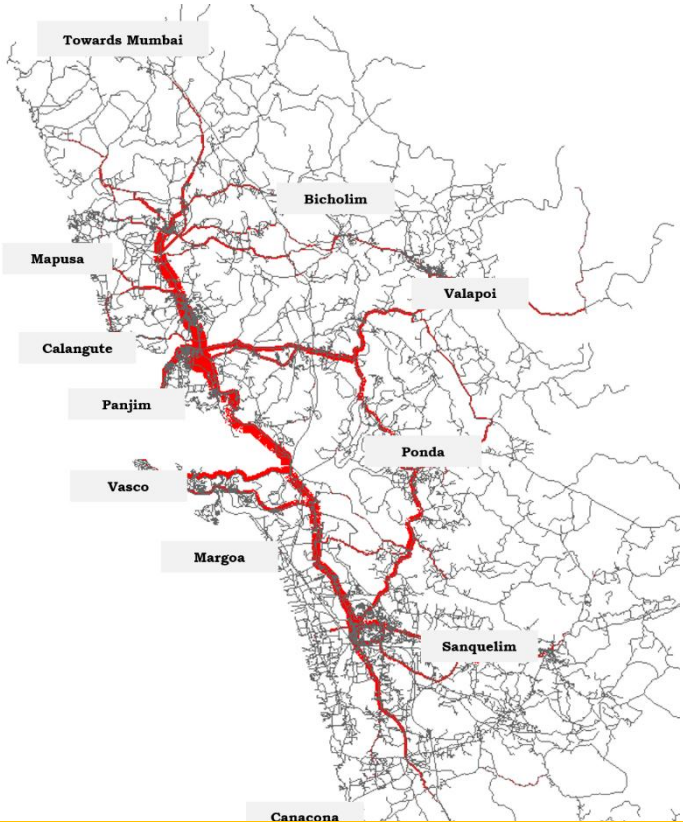
Improve the access to bus services and availability of public transport within 5 min walk





# Selection of Mass Rapid Transit Choice

## Estimated Travel Demand along Major Mobility Corridors



Route no	From	To	Route Length (km)	2038	Estimated MRT PHPDT
6	Panjim	Ponda	31.5	Organized Bus Services	1055
7	Panjim	Valpoi	43.5	Organized Bus Services	1055
8	Ponda	Valpoi	27.1	Organized Bus Services	
9	Margoa	Sanguem	21.8	Organized Bus Services	1095
10	Ponda	Mollem	30.8	Organized Bus Services	
11	Mapusa	Valpoi	44.4	Organized Bus Services	870

**Peak Hour Public Transport Demand – 2038.**

# Trunk and Feeder Bus Routes



Trunk Bus Routes (A) – **33 Routes**

Feeder Bus Routes (B) – **49 Routes**

Total No. of Bus Routes ( A+B) - **82 Routes**

# Third Order Mass Transit System - IPT

## Electric Feeder Routes in Goa



Sl. No.	City	Origin	Destination	Distance (km)
11	Margoan	Gogol bus stand near St.Joaquim	Camorlim	5
12	Margoan	Power House Bus Stand	Mainae Bus Stop	6
13	Churchorem	Churchorem Railway Station	Quepem Garden Bus Stop	7
14	Churchorem	Churchorem Railway Station	Sanquelim	7
15	Pernem	Mandrem	Chopdem	7
16	Pernem	Chopdem	Siolim	4
17	Calangute	Betim	Arpora	12
18	Vasco	NH17A	Bogda	3
19	Vasco	Baina	Zuari Road	3
20	Vasco	Vaddem Lake	Zuari Road	2

# What does Goa need?

## State Level Needs

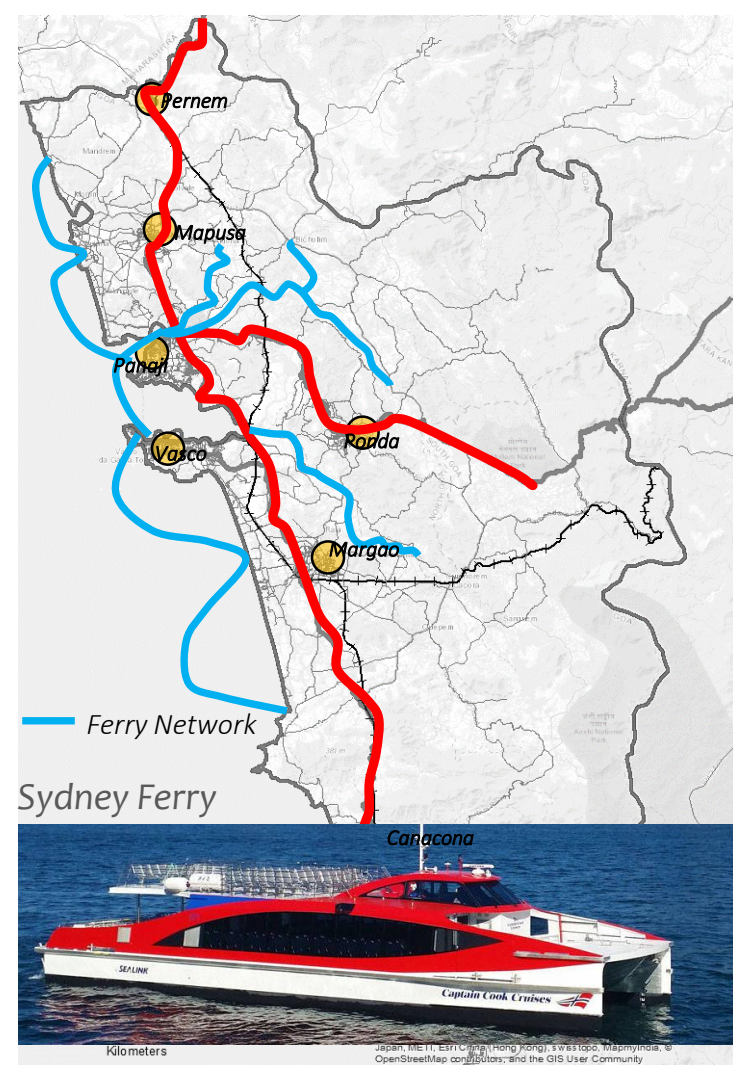
3

Use of Coast and rivers for sustainable  
**Inland waterways and  
navigation**

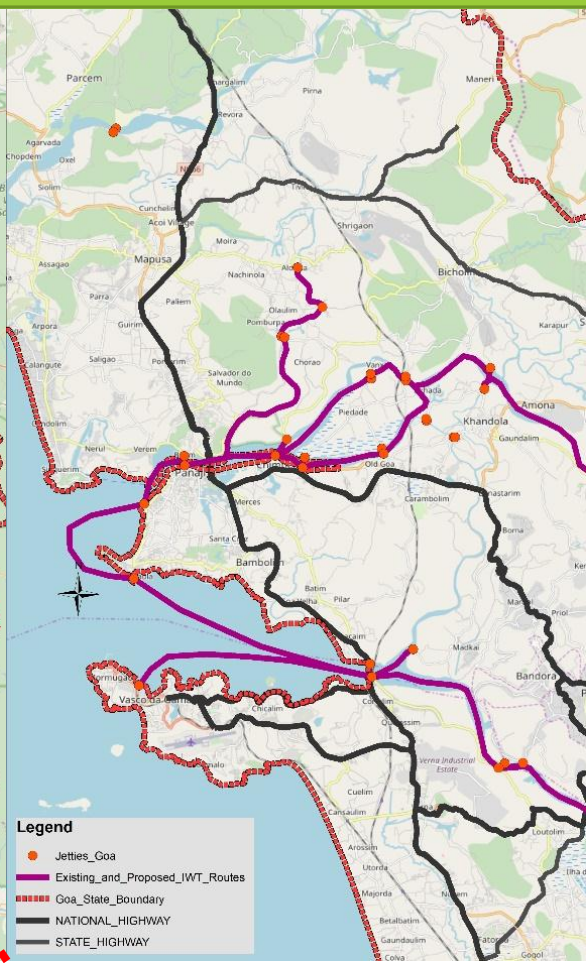
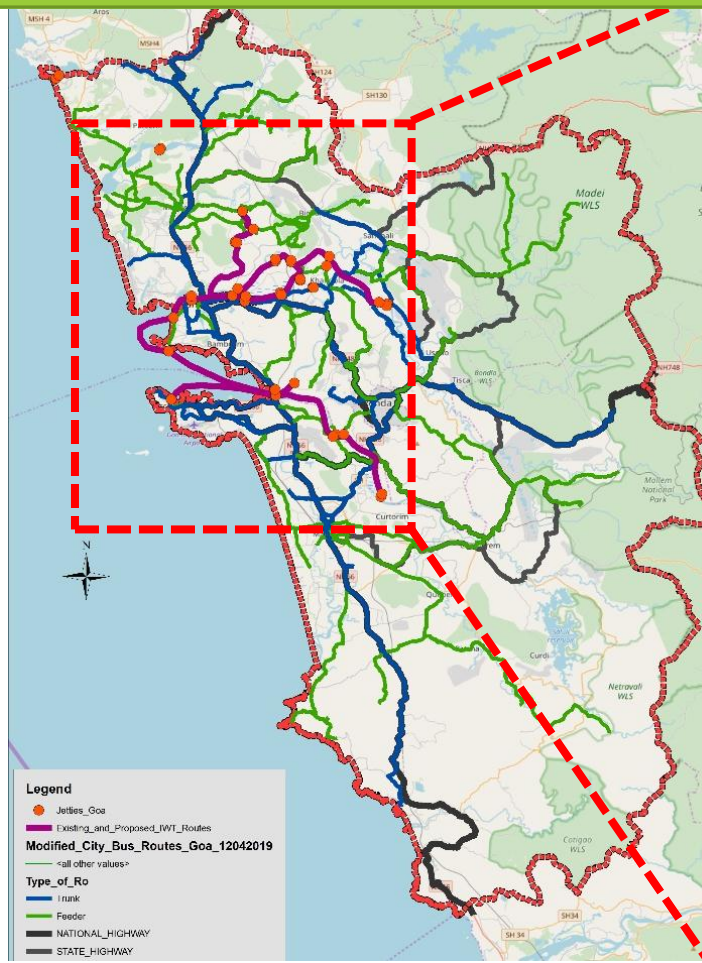
*Development of jetties for world class standards*

*Electric and hybrid ferries integrated with other transport choices*

*First and last mile connectivity from ferry stations*



# Inland Waterways



Sl. No.	Route	Route Length (Kms)
12	Sarmanas - Tonca	1.15
13	Cumbarjua – Gaundalin	0.07
14	Cortlim – Madkai	2.42
15	Rai – Shiroda	0.33
16	Rassaim – Dhurbhat	1.23
17	Adpai – Rassaim	0.38
18	Volvoi - Maine	1.09
19	Panjim - Volvoi	27.8
20	Panjim - Cortalim	24.2
21	Mormagao - Shiroda	30.1
22	Panjim - Aldona	15.7
23	Panjim – Diwar – Vanxim - Panjim	22.8
	<b>TOTAL</b>	<b>131 km</b>

# Hop On Hop Off Ferry Service

- ❑ Hop on and Hop off service can be provided in Goa because lots of tourists come to Goa.
- ❑ The Hop-on and Hop-off service can connect some of the tourist locations in and around Goa like **Dona Paula, Miramar Beach, Churches in Old Goa, Divar Island, Chorao Sanctuary, Salim Ali Bird Sanctuary** etc.,
- ❑ There are some existing jetties and also proposed jetties on the route which may be used by ferries for transportation of tourists/Regular commuters.



Image of Hopon/Hopoff Ferry



Hop-on and Hop-off Ferry Service Route

# What does Goa need?

State Level Needs

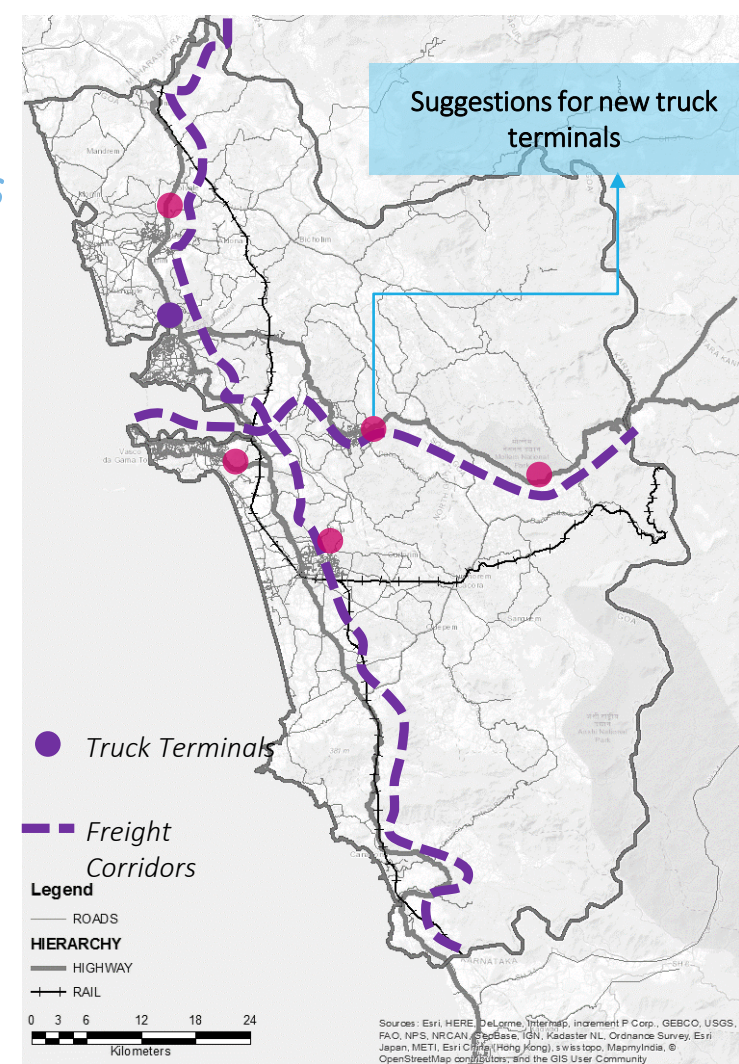
4

State of the art **Corridors for Cargo Movement** along with truck terminals

Corridors separated from passenger movement

Use of geographical advantage for cargo movement

Truck terminals with intelligent transport facilities



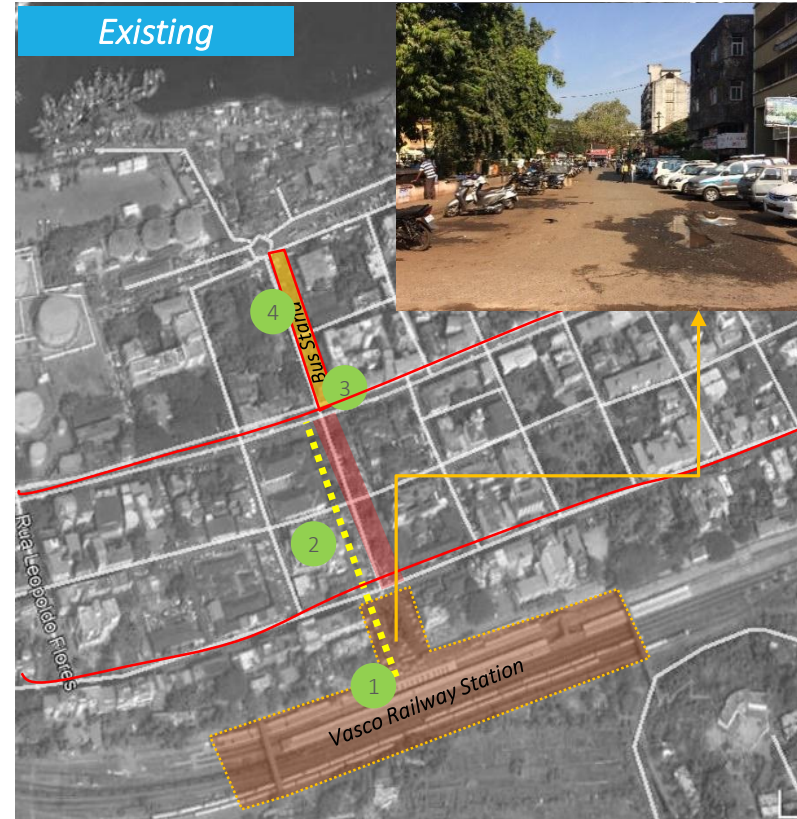
# What does Goa need? *State Level Needs*

5

## Multi-modal Integration of the systems

- 1 No information at railway station for buses/ferries
- 2 Walking time of 8-10 min to reach bus station – Cross two main roads, No foot paths , Parking of vehicles on both sides
- 3 No information or facilities at bus station
- 4 Multiple buses, different fares

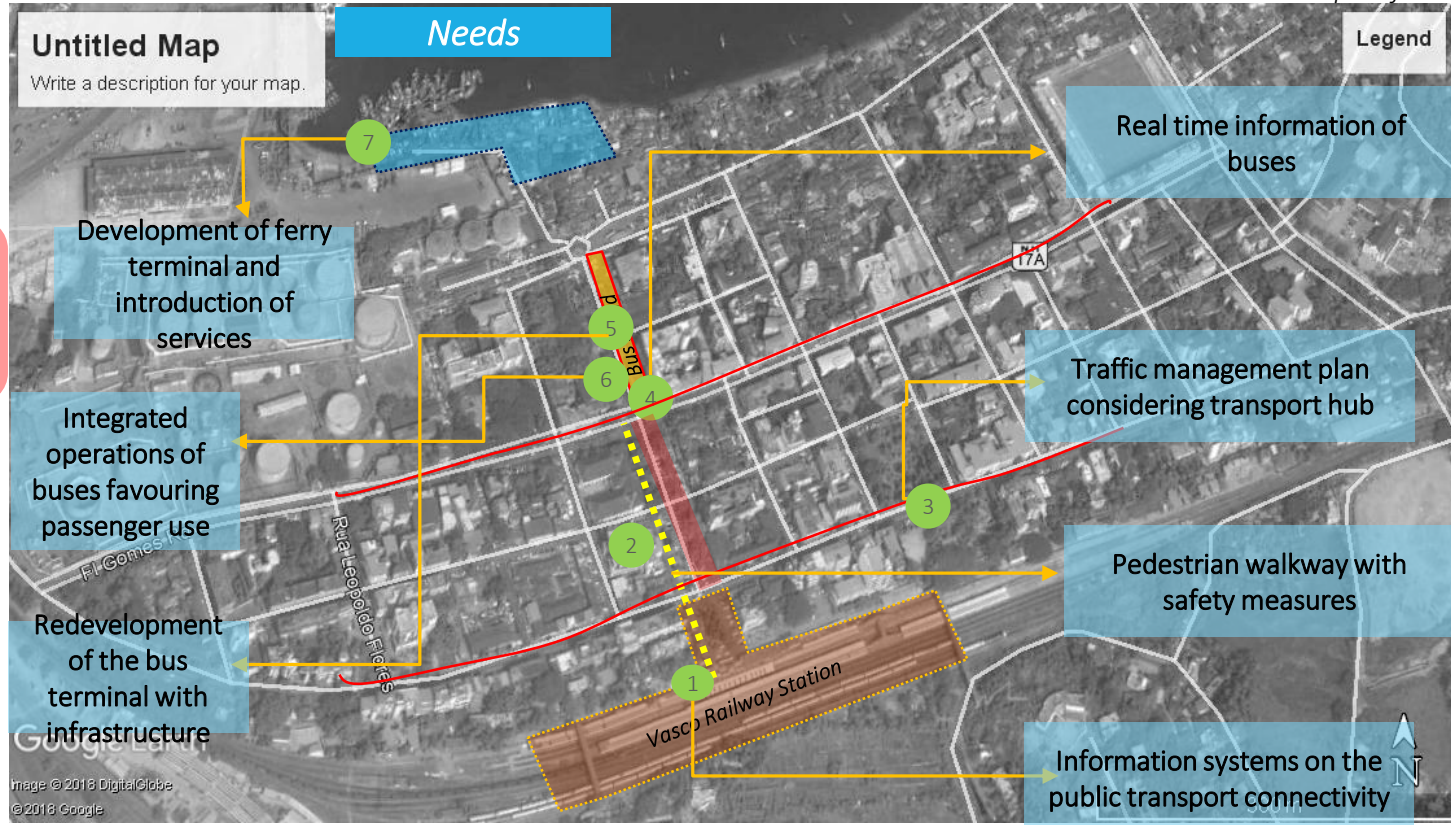
Example of Vasco





# What does Goa need? *State Level Needs*

Example of Vasco



Multi-modal  
Integration of the  
systems

Redevelopment of  
entire area as a  
transport hub

# CITY LEVEL STRATEGIES



welcome to Goa.

# What does Goa Need? *City Level Needs*

1

Improved pedestrian facilities

- Footpath development
- Safe pedestrian crossing infrastructure
- Traffic calming elements

Example of Panaji

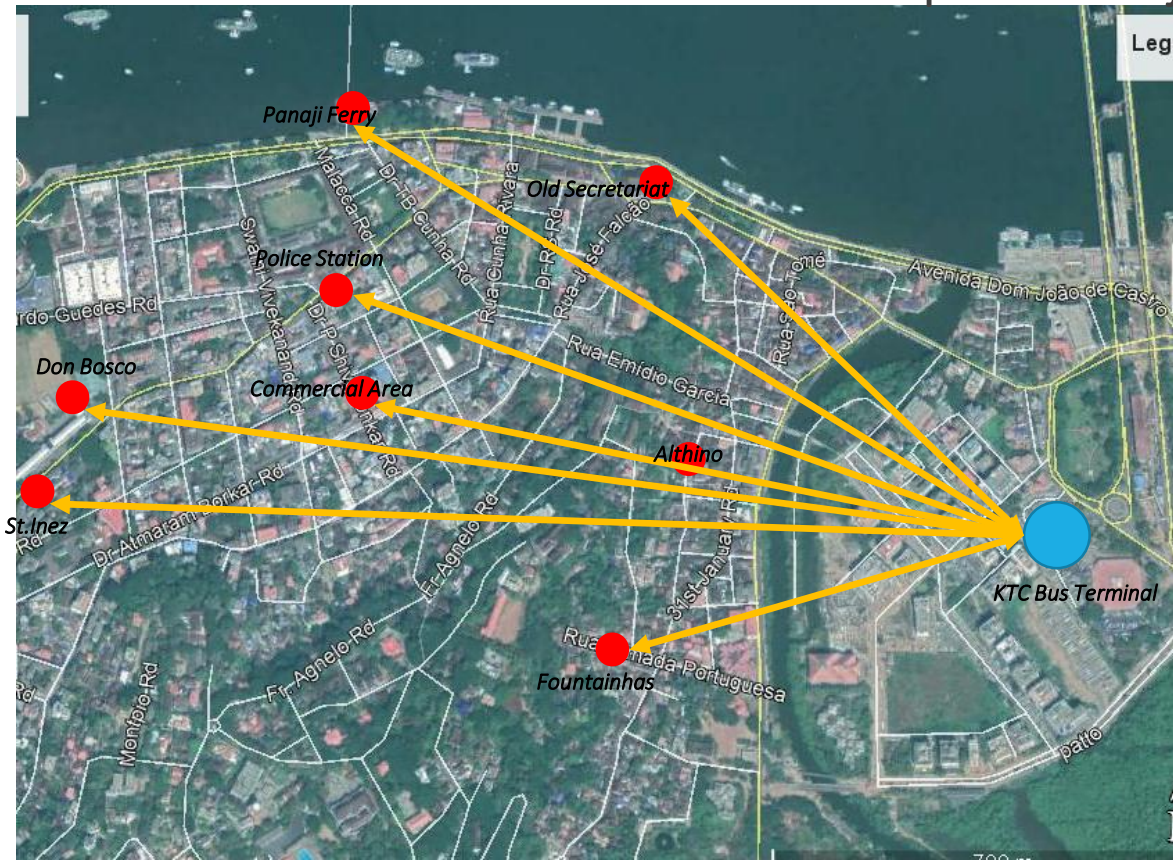


# What does Goa Need? *City Level Needs*

Example of Panaji

2

**First and last mile connectivity**



- Public Transport to major nodes
- Use of small and electric systems with increased coverage
- Development of walkways and cycle tracks

# What does Goa Need? *City Level Needs*

3

## Pedestrian Only Zones

- ❑ Panaji Waterfront Development.
- ❑ Upper Bazaar Road, Ponda.
- ❑ Mapusa Market, Mapusa.
- ❑ Vasco Taxi Stand, Vasco.
- ❑ Universal Walkways (Ongoing-IPSCDL).
- ❑ Raibandar Wharf (Ongoing-IPSCDL).
- ❑ Café Bhoshle, Panaji (Ongoing-IPSCDL).
- ❑ Beautification of beach front promenade at MIRAMAR (Ongoing –IPSCDL).
- ❑ Dona Paulo, Panaji.



# What does Goa Need? *City Level Needs*

4

**Public Bike sharing and cycle track development**

Development of cycle track network

Public Bike Sharing infrastructure

Example of Panaji



# ONE PEDAL AT A TIME, IT'S TIME FOR CYCLISTS TO RECLAIM THE STREETS

The inaugural run of the Cycle4change was conducted with an enthusiastic response from cyclists in the city and surrounding areas. The aim is to be able to create a separate path for cyclists to enable them to make cycling, the preferred form of their daily commute

Ajit John [ajit@herald-goa.com](mailto:ajit@herald-goa.com)

It was a clear October morning.

The wind was still and the traffic on the road was intermittent. However there were a number of cyclists cycling towards the Dona Paula Circle. There were a few people looking on with some curiosity as a few cyclists were filling air in their tires and others were making last-minute adjustments. This was after all the starting point to give the residents of Perjam and its surrounding areas a safe zone to cycle. The path was marked with cones over a distance of 0.5 kms between Dona Paula circle up to Ribandar Merces junction.

For many of the cyclists it was a welcome development. Cyclists came from areas as far as Margao to be part of the inaugural run. There were families cycling as well as individuals. The youngest cyclist was a mere five years old.

Vishal Mandekar has been cycling for a year and does it to keep fit and ensures he is able to play cricket. Employed with the fire department he felt it was a

very good initiative and hoped it would motivate others to take up cycling. His colleague Sujanwani Ganes exercises everyday and cycling is part of his routine. Dipi Chodankar, who also cycles daily from Perjam to Ribandar and felt the separate path was a very good initiative because cycling on the roads of Goa was not always safe. She said, "A lot of cars drive at speed and it is unsafe to cycle alongside them."

Shubham Bhosale cycled all lanes were much needed because the way drive their cars were at times quite scary. The presence of potholes did not help matters and this initiative was very helpful.

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the way from Porvorim to be part of the initiative. Said he was just continuing from his cycling in Mumbai. He said "It is good to see efforts being made to encourage cycling in the state. I will try to

is safer to cycle in Goa than in Mumbai. I have observed here very few cyclists wear helmets whereas in Mumbai it is compulsory. Most of the accident here involving cyclists takes place because they are not

visible or have not switched on their lights. It is very risky. I hope with this initiative people will learn the importance of right clothing, the importance of lights. I have been cycling for ten years and it has been great fun."

Sharmilee Bhosale has been cycling for six months. Now working in Pune, she came over to Goa to be with her parents during the lockdown and took up cycling. She said "I am enjoying it and my father who is in his sixties cycles much more than us. My brother and my father are my motivators and I took up cycling."

Anni Waale welcomed this initiative wholeheartedly. He said "There are no tracks in Goa and that is a problem. We have to promote cycling, it will make people healthier. My brother is here from Mumbai and has picked up a new cycle and he is coming along with us". He added that since no one cares about cyclists in this country, it was important that an initiative like this was planned.

MD and CEO Imagine Panaji Smart City Development Ltd/let the response was very encouraging with many cyclists coming in after the journey commenced through the city. He said "Cycle4Change is a people driven movement with many people coming together for it. We are talking about equitable streets, safe zones and the only way to do it is to ensure it is for everybody. This is three km stretch on the Ribandar roadway had the entire administration coming together and they blocked it to ensure it was only for cyclists".

The idea to start with a Sunday father today's exercise on a public holiday and gauge the response and there would like to get into the other days as well. He admitted infrastructure was a problem and that was something they would like to build up on and once the Sunday's became successful, people would request they would need more infrastructure for cycling.

One can only hope that day's not too far away.

One can only hope that day's not too far away.



Sujanwani Ganes



TIMELY INITIATIVE: The cyclists of Perjam and its surrounding areas now have a cycle lane available to them on Sundays and their response will decide if it ought to be continued and perhaps even extended to other days.

herald, Edition

10/4/2020

Cyclists give thumbs-up for pop-up cycle lanes - The Times Of India - Goa, 10/4/2020

## Cyclists give thumbs-up for pop-up cycle lanes

TIMES NEWS NETWORK

Panaji: Though close to 70% of the cyclists sit on the saddle for exercise, over 50% of the respondents survey conducted in Panaji said that they will cycle for work and other purposes if a public bike sharing system is implemented in the state capital. Cyclists said that basic improvement of roads and repairs of potholes can encourage the culture of cycling not just in Panaji, but in Goa too.

Imagine Panaji Smart City Development Ltd (IPSCDL) conducted a survey to gauge the interest in cycling with close to 200 people giving their



Over 80% said if Panaji had dedicated lanes, they would cycle more often

response. Over 80% of the respondents said that if the city had dedicated cycle lanes they would cycle more often. They said that speeding vehicles,

potholes and open drains and stray dogs are the biggest barriers for cyclists.

The survey was conducted as a precursor to the first ever pop-up cycle lane in the state

capital, which received a good response with close to 150 cyclists participating. Cyclists from Porvorim, Bambolim and other neighbouring areas joined in and suggested that such initiatives can help improve safety of cyclists.

Cyclists said that the Goa government should encourage cycling tracks so that the culture of cycling as a means of transport catches on.

"Cycling culture, which can be seen in other states should also start in a tourist destination like Goa. When we see more cyclists on the road is when we will see better infrastructure," said one of the

cyclists Shashank Bhosale. Just 4% of the survey respondents said that they cycle to work. Many cyclists said that if the basic condition of the roads is improved more people will take up cycling.

IPSCDL chief executive officer and managing director Swayandipta Pal Chaudhuri said that the city would continue to encourage cycling in the run up to the India cycles4change challenge.

"We would like to carry it forward. We are talking about equitable streets, safe streets and the only way to ensure it is to make sure that it is open," said Chaudhuri.

# Cycling happening in Panaji !

## Gearing up for change

The #Cycles4Change challenge that flags off from Dona Paula on October 2 aims to promote cycling in cities. NT BUZZ learns more

NT BUZZ

An initiative #Cycles4Change (C4C) challenge by the Smart City Mission, Ministry of Housing and Urban Affairs and Government of India intends to inspire Indian citizens to adopt cycling in their cities. The event will take place on October 2 from 8 a.m. to 11 a.m. Thereafter the challenge will be held every Sunday till October end.

The aim is to cover a 9.6-kilometre track starting from Dona Paula to Ribandar. There is no criterion to participate besides following basic COVID protocol such as maintaining physical distance.

The COVID-19 global health crisis has brought the movement of people to a standstill. The #Cycles4Change encourages cities to implement quick cycling-friendly interventions and increasingly advance towards concrete actions that will facilitate and promote cycling in cities.

#Cycles4Change challenge and Panaji

- > Do not participate in the cycling event.
- > Regularly and thoroughly clean your hands with an alcohol-based hand sanitizer or wash them with soap and water.
- > Maintain at least 1 metre (3 feet) distance between yourself and others.
- > Wear a mask or face cover that covers your nose and mouth.
- > Avoid touching eyes, nose and mouth.
- > It is advised to take a shower or thoroughly wash your hands with soap when you return home after cycling.

COVID-19 has disrupted life in Panaji. With increasing health concerns and restrictions on public transport and movement, reimagining mobility has become a key priority for cities. Compact in nature, Panaji has the scope to adopt cycling as a mode of travel not just to adapt to a post-pandemic world but in the interest of moving towards a more sustainable way of living.

According to the organisers, the #Cycles4Change challenge will allow them to assess the level of interest in cycling in Panaji, and reevaluate its existing infrastructure to make it a cycling friendly city. The advantages of moving towards a culture of cycling for a city like Panaji includes reducing its citizens' dependency on cars, reducing our carbon emissions and promoting sustainable mobility. Depending on the success received in October, it will be decided whether to carry the challenge forward.



(The #Cycles4Change challenge will be held on October 2 from 8 a.m. to 11 a.m. Open to all. Details: <https://reclaimtheroads.in/>)

## Pop-up cycle lane from Dona Paula to Ribandar junction every Sunday

TIMES NEWS NETWORK

Panaji: The state government has permitted the creation of a cycling lane from Dona Paula circle to the Ribandar-Merces junction on Gandhi Jayanti and on every Sunday in the month of October as part of an initiative to encourage cycling in the state capital.

The North Goa collectorate has granted permission for a pop-up cycling lane for cycling events from 8am to 11am on October 2, 4, 11, 18 and 25. The cycle lane is from Dona Paula circle to Miramar and then along D B Road right up to Divja circle and along the Ribandar causeway to the Ribandar Merces junction.



The lane will be functional from 8am to 11am on Oct 2, 4, 11, 18 and 25

"The normal flow of vehicular traffic on the parallel and surrounding roads should not be obstructed," said additional district magistrate Vandana Rao. The order says that all cyclists must wear helmets and cannot perform stunts during the cycling event.

Imagine Panaji Smart City Development Limited (IPSCDL) plans to organise the pop-up cycling lanes in the capital as part of the India Cycles4Change challenge. The challenge, which is open to all Smart Cities, state capitals, and cities with a population of over 5 lakh,

aims to promote cycle-friendly interventions in cities in the wake of the Covid-19 pandemic. Of the 14 eligible cities, the top 11 cities will be granted Rs 1 crore each to promote cycling.

IPSCDL will deploy traffic marshals along the way to ensure that traffic flow is not disrupted.

"The organiser should ensure that no clustering of cyclists and participants takes place at one point and all participants obey the guidelines in view of Covid-19 pandemic," stated Rao in the order.

Parking of vehicles along the route is also prohibited since it could affect traffic flow and impede emergency vehicles.

# What does Goa Need? *City Level Needs*

5

**Traffic Management Measures**

- Redesign of junctions along with signalization
- Traffic movement plan for urban centers
- Signages and way finding for urban centers

Example of Margao





# Parking Management Measures

- Provide footpath of 1.5 m minimum before making provision for on-street parking.
- Provide parallel parking on major corridors.
- Parking fee should be levied for on-street parking.
  - Dynamic pricing may be adopted.
- Allocate parking spaces for: Differently-abled, Cyclist, IPT, Electric Mobility and Pickup and Drop off Zone (if applicable).
- Use smart technology
  - ❖ Monitoring,
  - ❖ Fee Collection etc.,
- Parking management cell to be set up.
- Strict enforcement on illegal parking.
- The design should be self-enforcing.
- The parking spaces should be designed as per the guidelines mentioned in IRC: SP:12-2015.



# Impact of Proposals

## Transport Strategies

*Intercity planning*



Increased Mobility

Reduction in private vehicles



Promoting public transport  
Seamless journey experience  
Cleaner environment

*Intracity planning*



Reduction in Congestion

Reduction in pollution  
Creation of public spaces  
Livable Towns

Increase in Safety



# OVERALL PROJECTS EVOLVED IN CMP

1. Freight Corridor
2. Multimodal Logistic Hub

FREIGHT  
TRANSPORTATION



Proposed fleet of 1548 for the Yr 2038  
(428 buses in immediate term)

PUBLIC TRANSPORT  
ENHANCEMENT



HIGH CAPACITY  
TRANSIT SYSTEM



Based on the PHPDT values, a  
High Capacity Bus Transport  
System has been proposed.

1. Infrastructure for Inland Waterways.
2. Routes for HopOn & HopOff Services.
3. 4 no. of Ferry Boats.

INLAND WATER  
TRANSPORTATION



A Multi -  
pronged  
Urban  
Transport  
Strategy for  
CMP- GOA

TRAFFIC  
ENGINEERING



1. Removing encroachments
2. Widening where there is a dire need.
3. 240 kms of better road signs & markings.
4. 41 no of Junctions identified for Improvements

PARKING



Multi-storied off-street parking lots either of concrete structures or steel structures or mechanical parking lots at Panjim, Margoa, Mapusa, Vasco, Calangute and Ponda

PEDESTRIAN

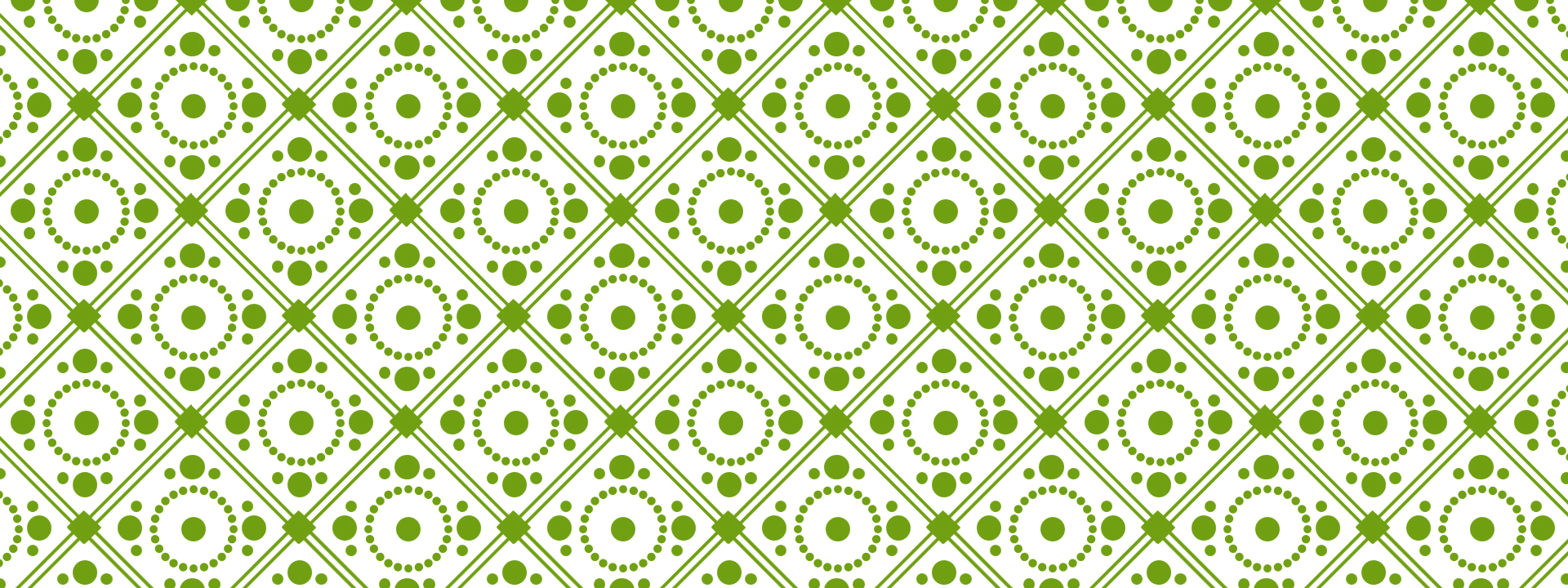


Provision of new footpath for 384 kms &  
Upgradation of existing footpath facilities across  
250 km of road stretch.

NEW BUS TERMINALS



Up gradation of 4 Existing  
Bus Terminals at Panjim,  
Madgao, Vasco and  
Mapusa.



**Urban Mass Transit Company Limited**

**Thank You**