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International Conference 03 – 05 Feb 2017  
Department of Architecture & Planning, IIT Roorkee

# ADDRESSING RESILIENCE IN TRANSPORTATION IN FUTURISTIC CITIES

## A CASE OF AUROVILLE, TAMIL NADU



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# resilience

/rɪˈzɪliəns/ 

*noun*

1. the capacity to recover quickly from difficulties; toughness.  
"the often remarkable resilience of so many British institutions"
2. the ability of a substance or object to spring back into shape; elasticity.  
"nylon is excellent in wearability, abrasion resistance and resilience"  
*synonyms:* flexibility, pliability, suppleness, plasticity, elasticity, springiness, spring, give; [More](#)

## RESILIENCE ???



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# INTRODUCTION

## Transportation and Mobility

**"The car has become... an article of dress without which we feel uncertain, unclad, and incomplete."**

Marshall McLuhan, Understanding Media, 1964

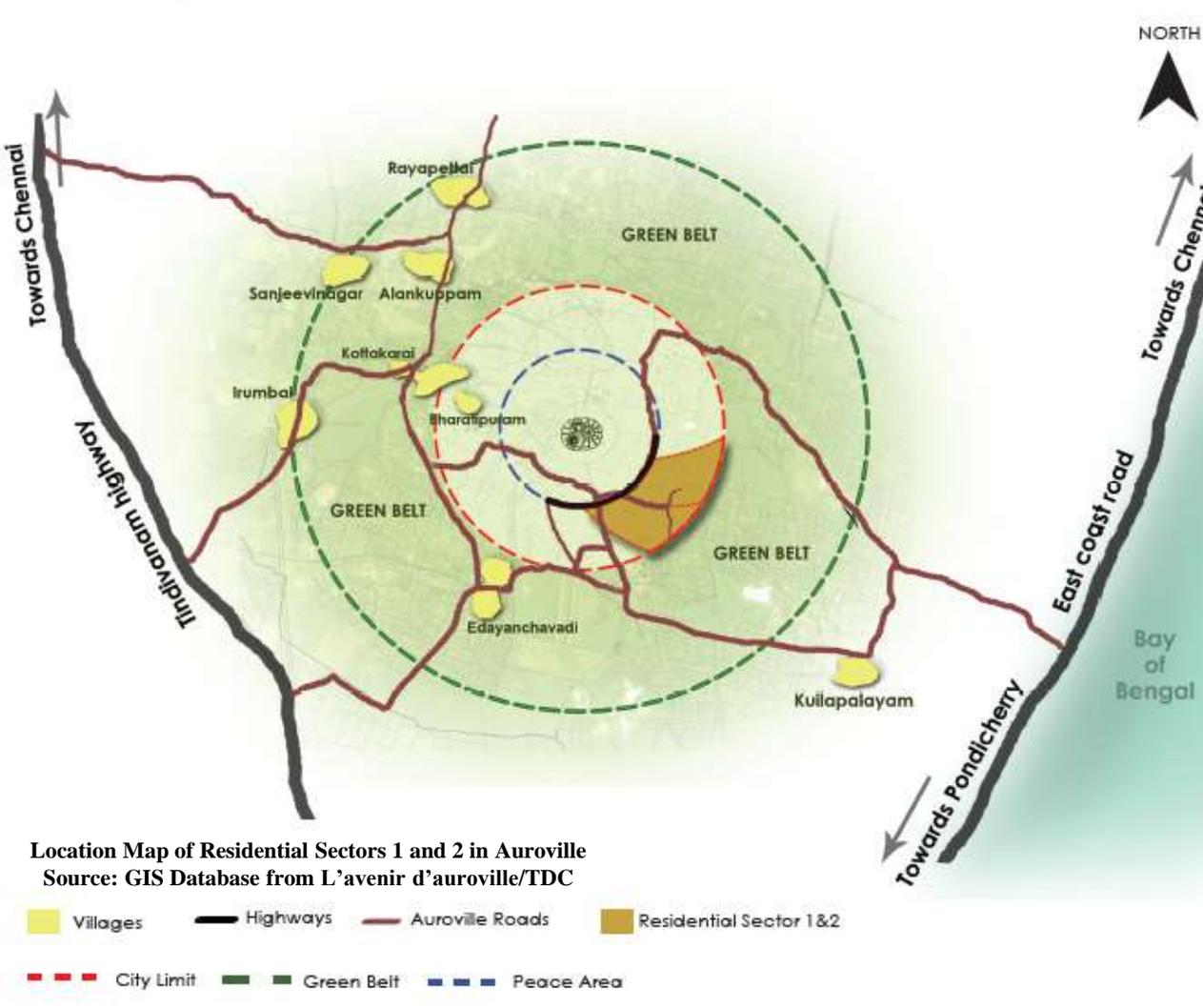
## Failure of Experimental cities of the Past: Radburn and Brasilia



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## Initial goals of Auroville:

- ❖ To provide alternative transportation strategies to suit the needs for peaceful conditions throughout the city area.
- ❖ **Motorized Transport will not be predominant.**



This paper ***addresses the ongoing issues of transportation and mobility*** and seeks to suggest some plausible solutions for the same by taking into account **two of the existing residential sectors of Auroville.**



# BACKGROUND

## History of Auroville

Auroville is an Experimental township founded in 1968 by Mira Alfassa, "The Mother".

"Auroville is meant to be a universal town where men and women of all countries are able to live in peace and progressive harmony, above all creeds, all politics and all nationalities.



Foundation of Auroville on 28th February 1968

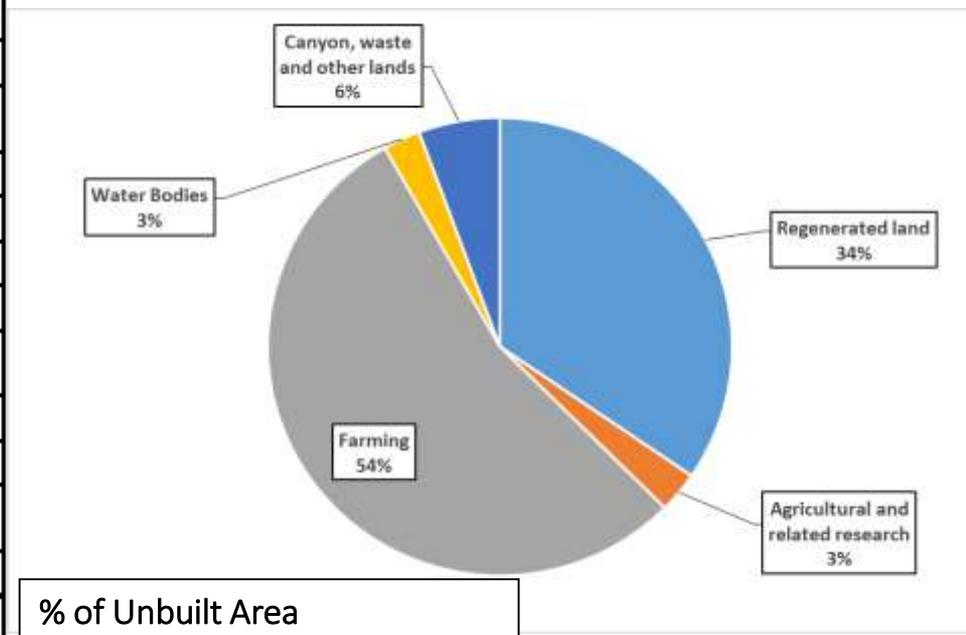
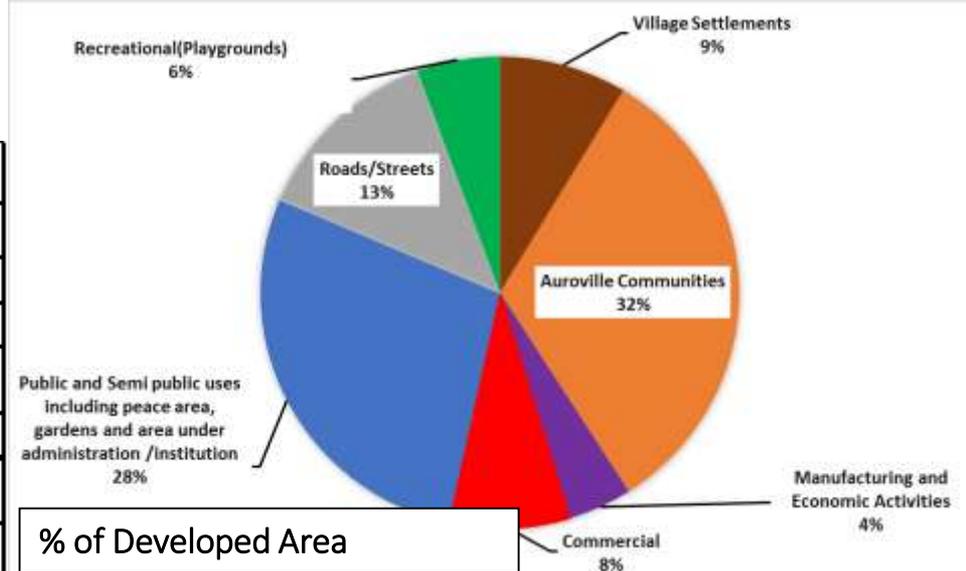
People from 124 countries dropped a handful of earth in an urn, as a testimony of Human Unity



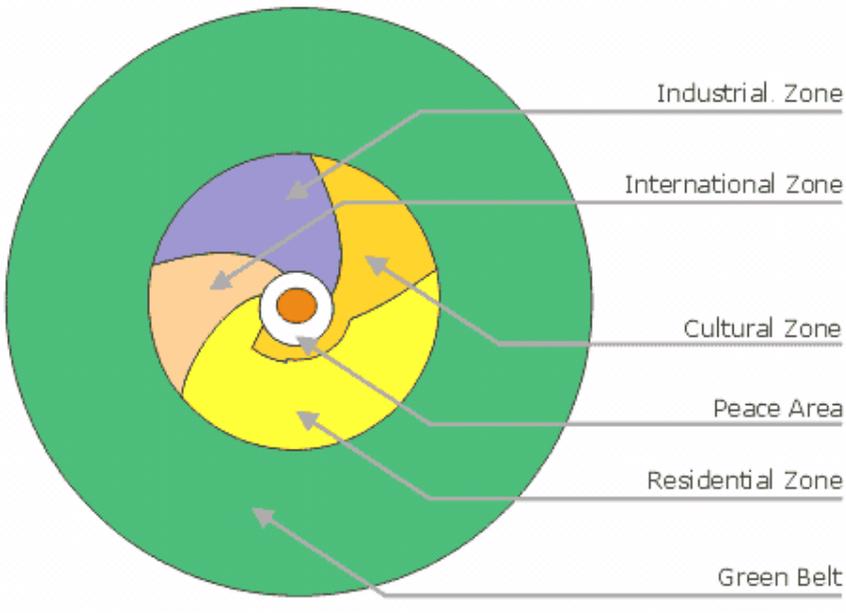
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# EXISTING LANDUSE

Land Use	Extent (ha)	Percentage
<b>A. Developed Area</b>		
1. Residential	95	40.9
a) Village settlements	20	
b) Auroville communities	75	
2. Commercial	19	8.2
3. Manufacturing & Economic activities	10	4.3
4. Public & Semi-Public uses including peace area, gardens and area under administration / institution.	65	28
5. Roads / streets	30	13
6. Recreational (playgrounds)	13	5.6
Sub-total	232	100
<b>B. Unbuilt Area</b>		
1. Regenerated land	598	34.5
2. Agriculture		
a) Agricultural & related research	50	2.9
b) Farming	940	54.3
3. Water bodies	45	2.6
4. Canyon, waste and other lands	98	5.7
Sub-total	1731	100
<b>Grand Total</b>	<b>1963</b>	



Peace Area, City Zones & Green Belt



Source: Auroville Master Plan

THE CITY AREA WITH A RADIUS OF 1.25 KM.

- PEACE ZONE
- INDUSTRIAL ZONE
- INTERNATIONAL ZONE
- CULTURAL ZONE
- GREEN BELT



GOALS:

SUSTAINABILITY IN ALL ASPECTS

SELF-SUFFICIENCY

MODEL FOR HUMAN UNITY

HARMONY & COMMUNITY LIFE

AUROVILLE BELONGS TO NO ONE, IT BELONGS TO HUMANITY AS A WHOLE



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# OBJECTIVES OF THE STUDY: AN OVERVIEW

Analysis & comparison of existing and proposed road hierarchy

Analysis of pedestrian paths (including cycle paths)

Analysis of parking spaces

Analysis of crown road (main ring road of Auroville)

Mobility analysis of existing transportation infrastructure

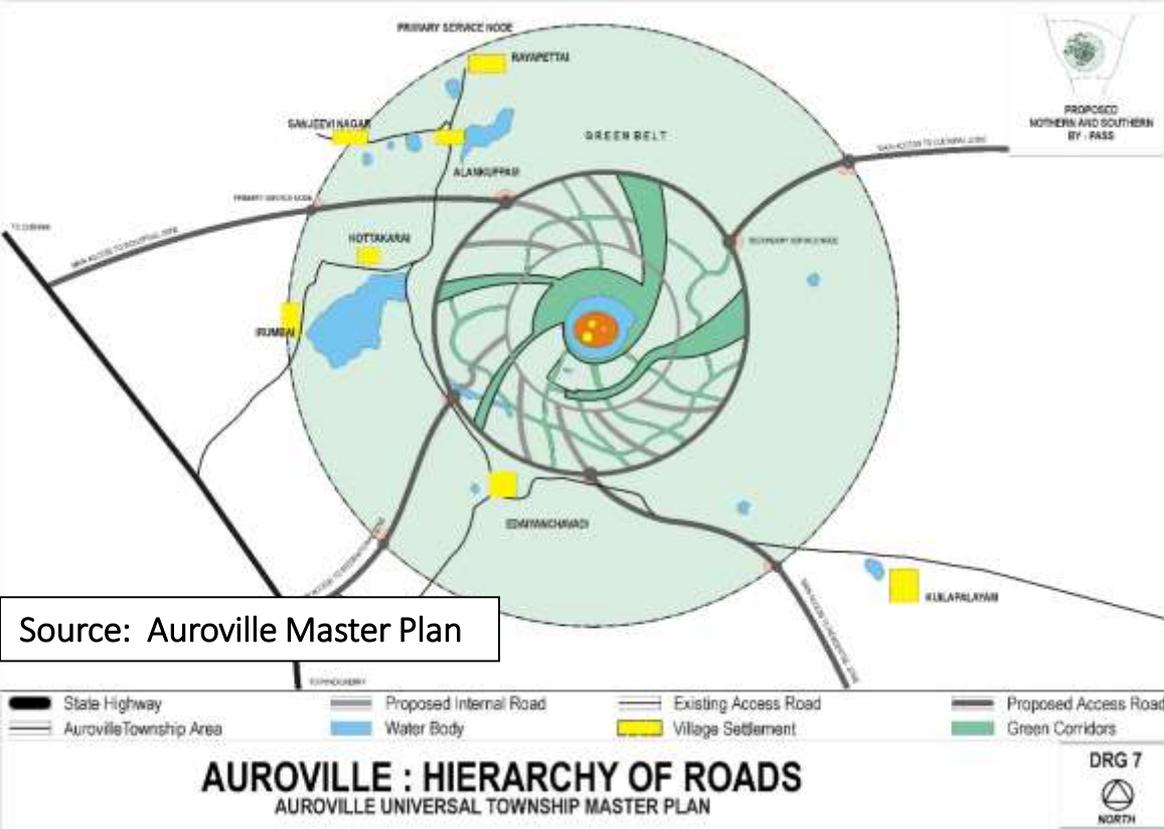


# PRINCIPLES OF CIRCULATION IN AUROVILLE

Intended Advantages of the Galaxy Plan:

- ❖ Reducing transport time;
- ❖ Better interaction between the residents;
- ❖ The **Crown** brings together the prominent activities specific to each zone;
- ❖ The pedestrian is freed from the pressure of traffic the closer one comes to the Matrimandir;

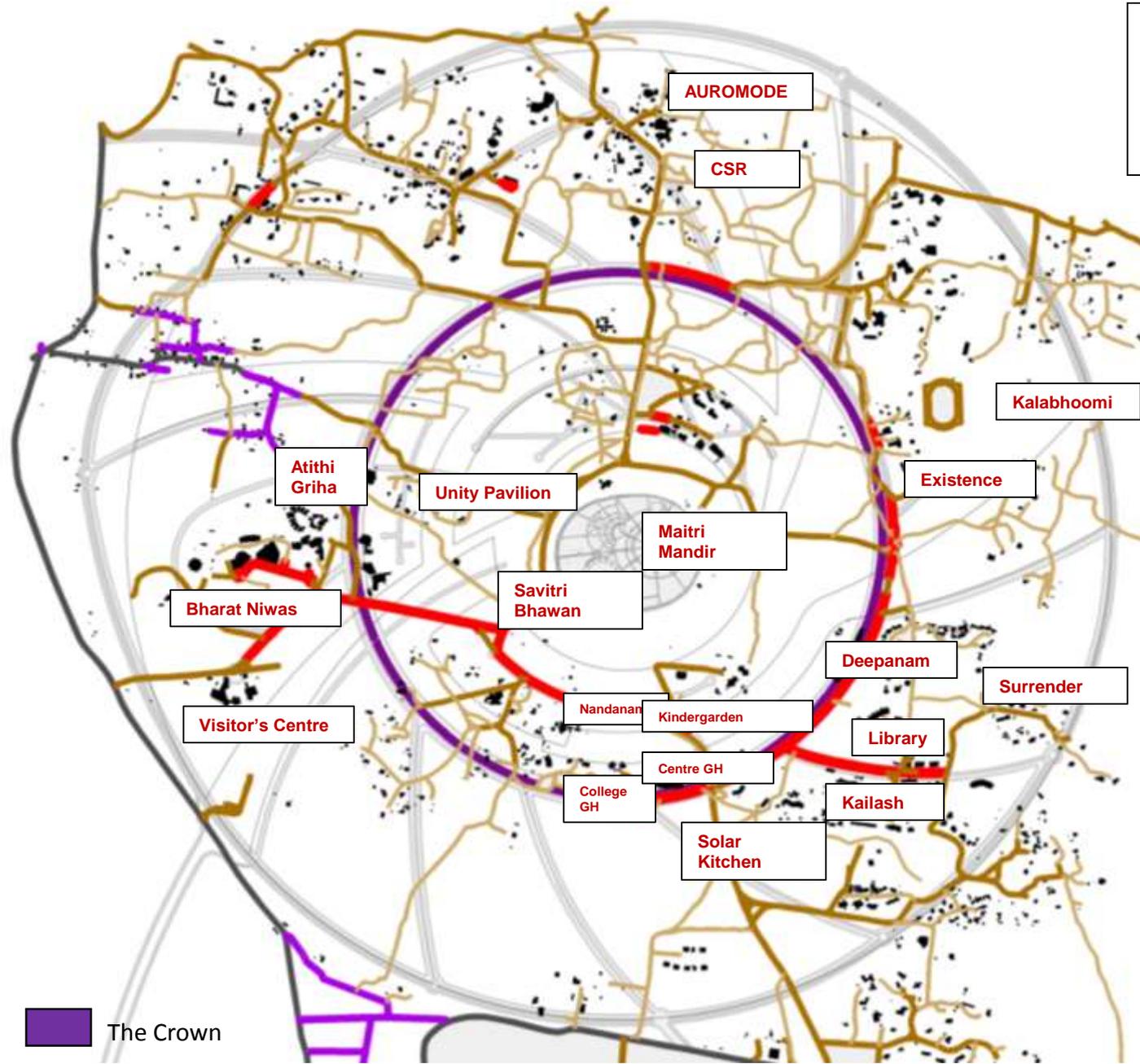
The layout of Auroville is intended to develop a pedestrian-friendly city.



- ❖ The indications given by the Mother (four zones in the form of a rosary) has been translated into the **concept of the Galaxy**.
- ❖ The 12 Radials, connecting **the Crown Road to the Outer Ring Road**, are the dynamic representation of the Mother's symbol.



# EXISTING ROAD HIERARCHY OF AUROVILLE



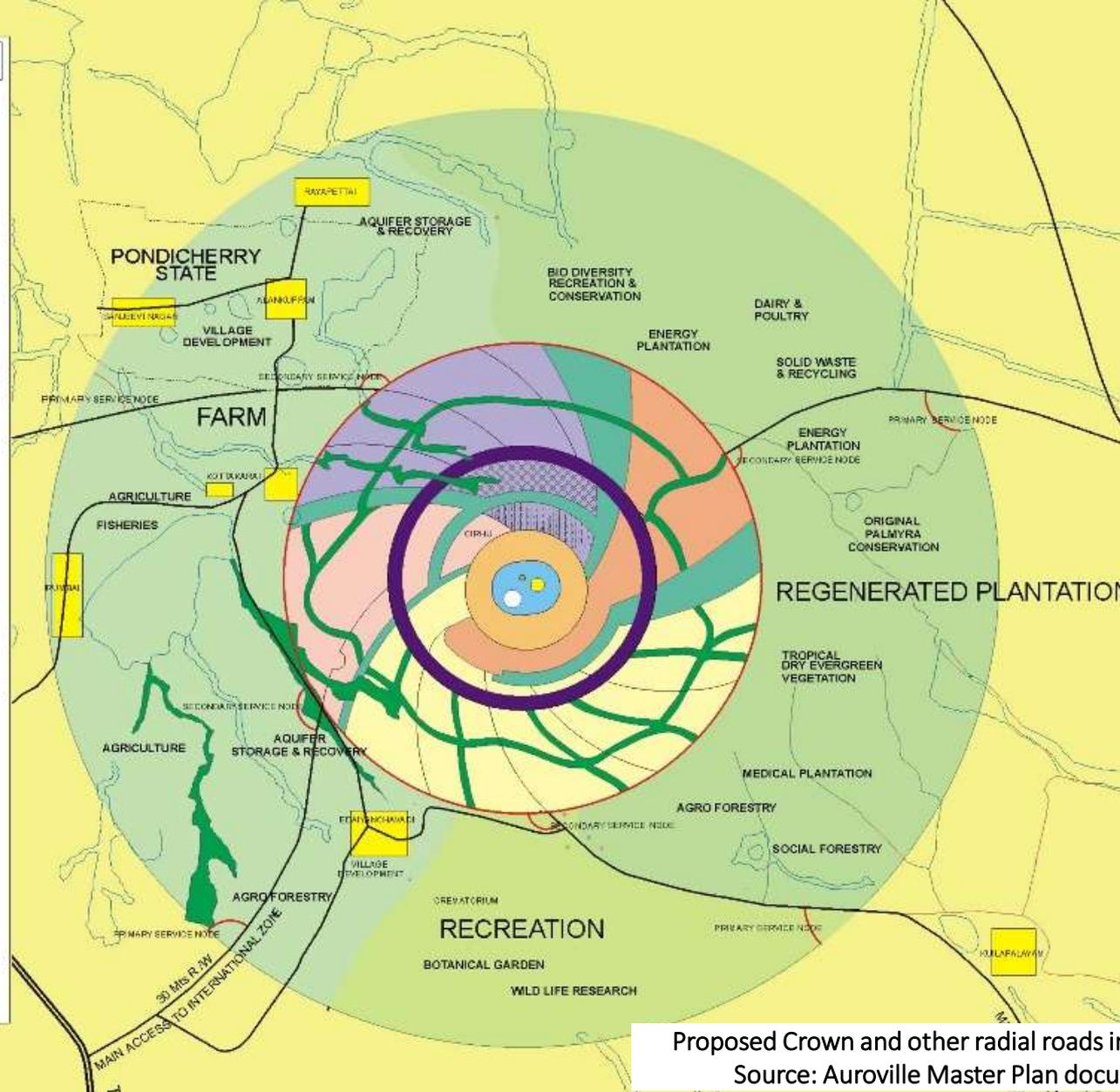
 The Crown

 Proposed Road  
  Building Footprint  
  Cement Paver block Road  
  Cement Road  
  Tar Road  
  Mud Road  
  Cycle Track  
  Path way

Source: GIS Data, TDC Auroville

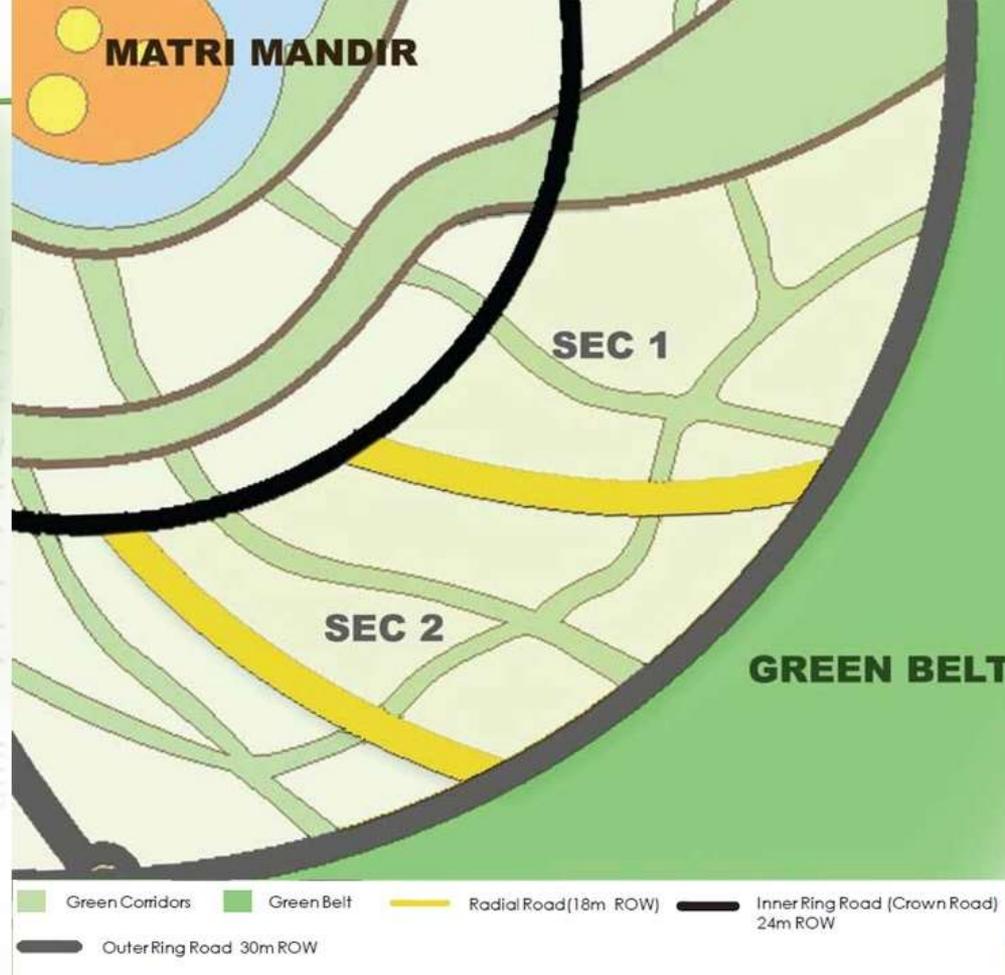
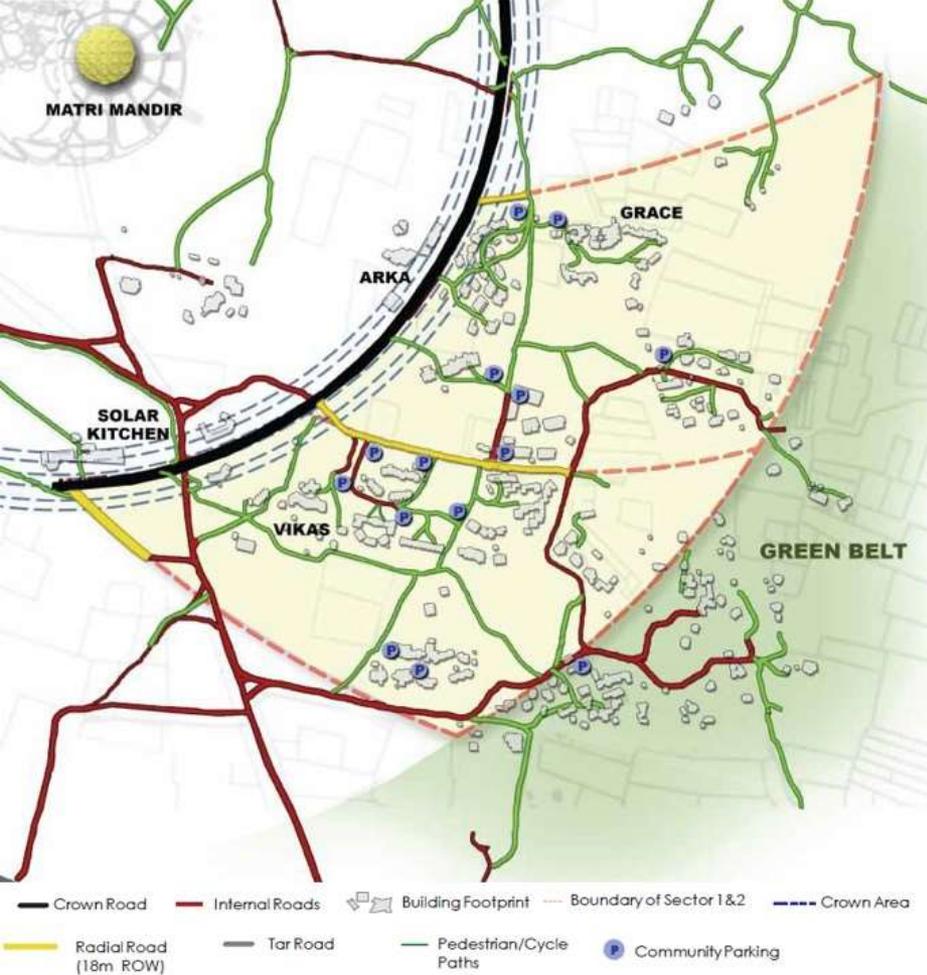
# LEGEND

-  CITY AREA LIMITS
-  NATIONAL HIGHWAY
-  STATE HIGHWAY
-  APPROACH ROADS
-  VOCATIONAL TRAINING CENTRE
-  ADMISIDTRATION
-  PEACE AREA
-  CROWN
-  RADIAL ROADS
-  PARKS & GARDENS
-  CULTURAL ZONE
-  RESIDENTIAL ZONE
-  INDUSTRIAL ZONE
-  INTERNATIONAL ZONE
-  PARKS & GARDENS
-  GREEN CORRIDORS
-  EXISTING VILLAGES
-  GREEN BELT AREAS



Proposed Crown and other radial roads in Auroville,  
Source: Auroville Master Plan document





## Existing and Proposed road hierarchy in Residential Sectors 1 and 2 in Auroville

Source: Auroville GIS data and Auroville Master Plan document



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## THE ISSUE ??

Auroville was intended to be sustainable in terms of Transportation and Mobility, stressing more on non-motorised forms of transportation and on the usage of Electric vehicles, but ironically, it has failed to achieve this objective, with increasing number of motor vehicles and people barely using the integrated cycle path networks.

### Positives

- An integrated cycle path network
- A Scheme for a public bus
- Paid parking system,
- Bicycle renting system
- From the visitor centre, people are supposed to walk till Matri Mandir, which is one of the main attractions.
- There is an **Auroville Mobility concept for future**, intending on banning vehicles in the central zone of the city.

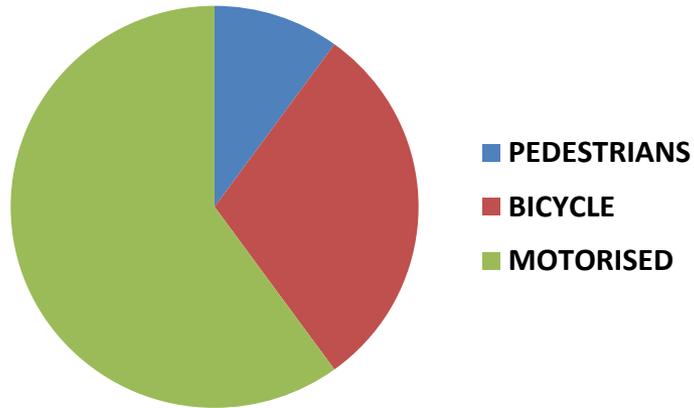
### Negatives

- Motorised traffic is sharply growing estimated at 20-30% per year
- The dominant mode of traffic in Auroville is the motorised two-wheeler – TVS or motorcycle.
- The share of cars is on the rise.
- **No coordinated traffic planning authority for Auroville.**
- **IT IS ILLUSIONARY THAT THE TRAFFIC BEHAVIOUR IN THE FUTURE WILL SUDDENLY CHANGE TO A NEW SYSTEM, WHEN ALMOST EVERYBODY IS ALREADY ADDICTED TO THE USAGE OF PRIVATE MOTORVEHICLE**





A RED ARROW POINTS TO A BOX CONTAINING THE TEXT: A REASON TO WORRY.....



## WHAT WAS PROPOSED ? AN ECO-FRIENDLY MOBILITY

**Auroville Townplan - Basic Distances :**  
(In metres and minutes walking time)

	<i>metres</i>	<i>minutes</i>
Crown Road	Rad. 700	10
	Dia. 1400	20
	Cir. 4400	63
Outer Ring Road	Rad. 1250	18
	Dia. 2500	36
	Cir. 8000	114
Green Belt Limit	Rad. 2500	36
	Dia. 5000	71
	Cir. 16000	228
Peace Area - Crown Road	350	5
Crown Road - Outer Ring Road	550	8
Outer Ring Road - Green Belt Limit	1280	18
Outer Ring Road Diagonal	2800	36
Green Belt Limit Diagonal	5000	71

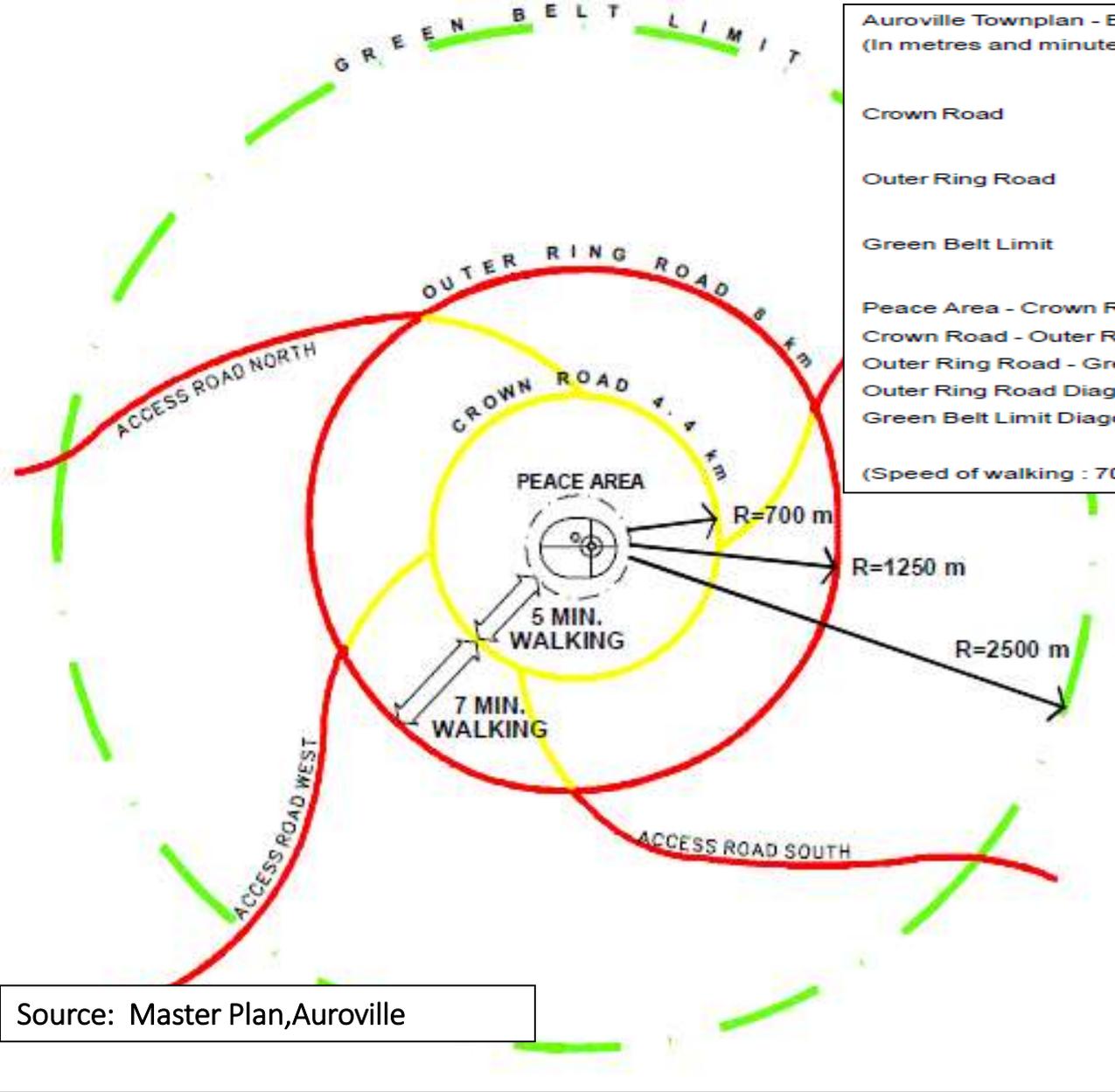
(Speed of walking : 70 m per min.)

Source: Billingers Mobilty Report



Source: Master Plan,Auroville





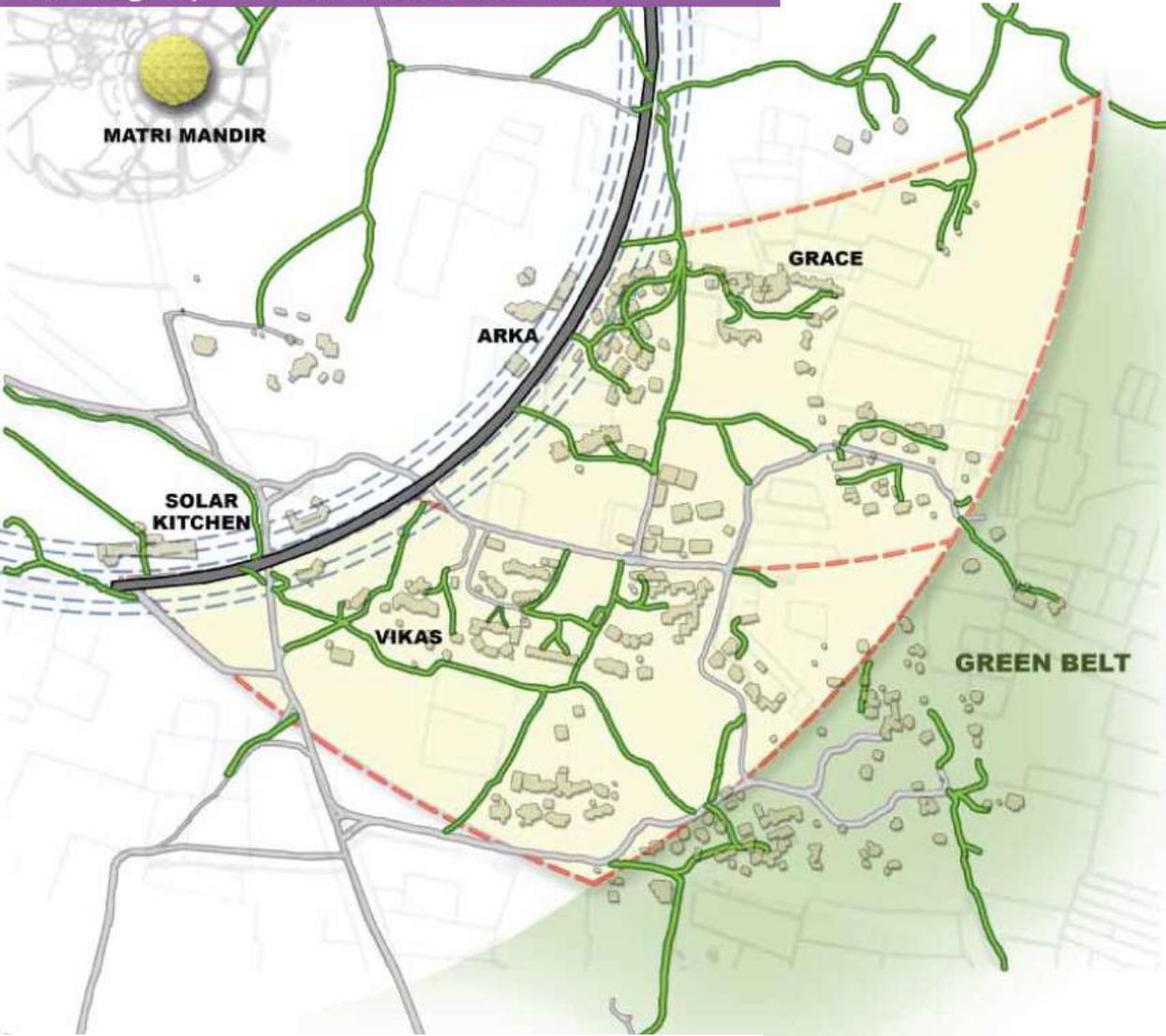
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Source: Master Plan, Auroville



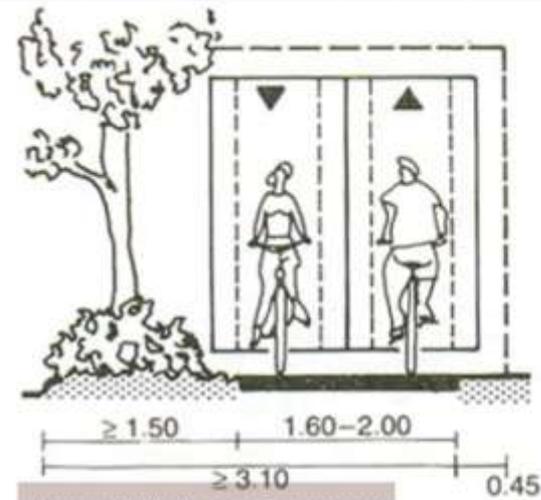
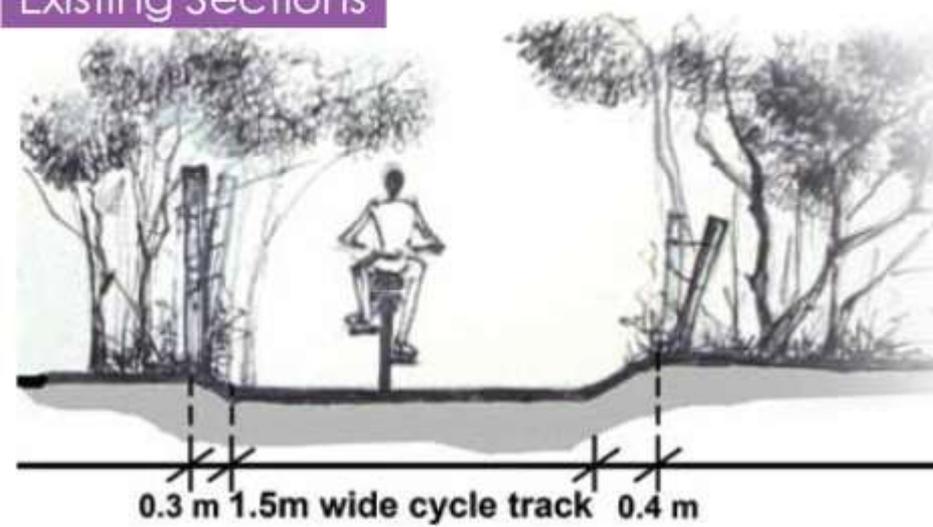


**EXISTING CYCLE  
PATH NETWORK IN  
RESIDENTIAL  
SECTORS 1 AND 2**

-  Crown Area
-  Crown Road
-  Tar Road
-  Internal Roads
-  Building Footprint
-  Boundary of Sector 1&2
-  Pedestrian/Cycle Paths

**Existing Cycle paths in sector 1 and 2**  
Source: Roger & Auroville GIS data





Source: Study on Crownways

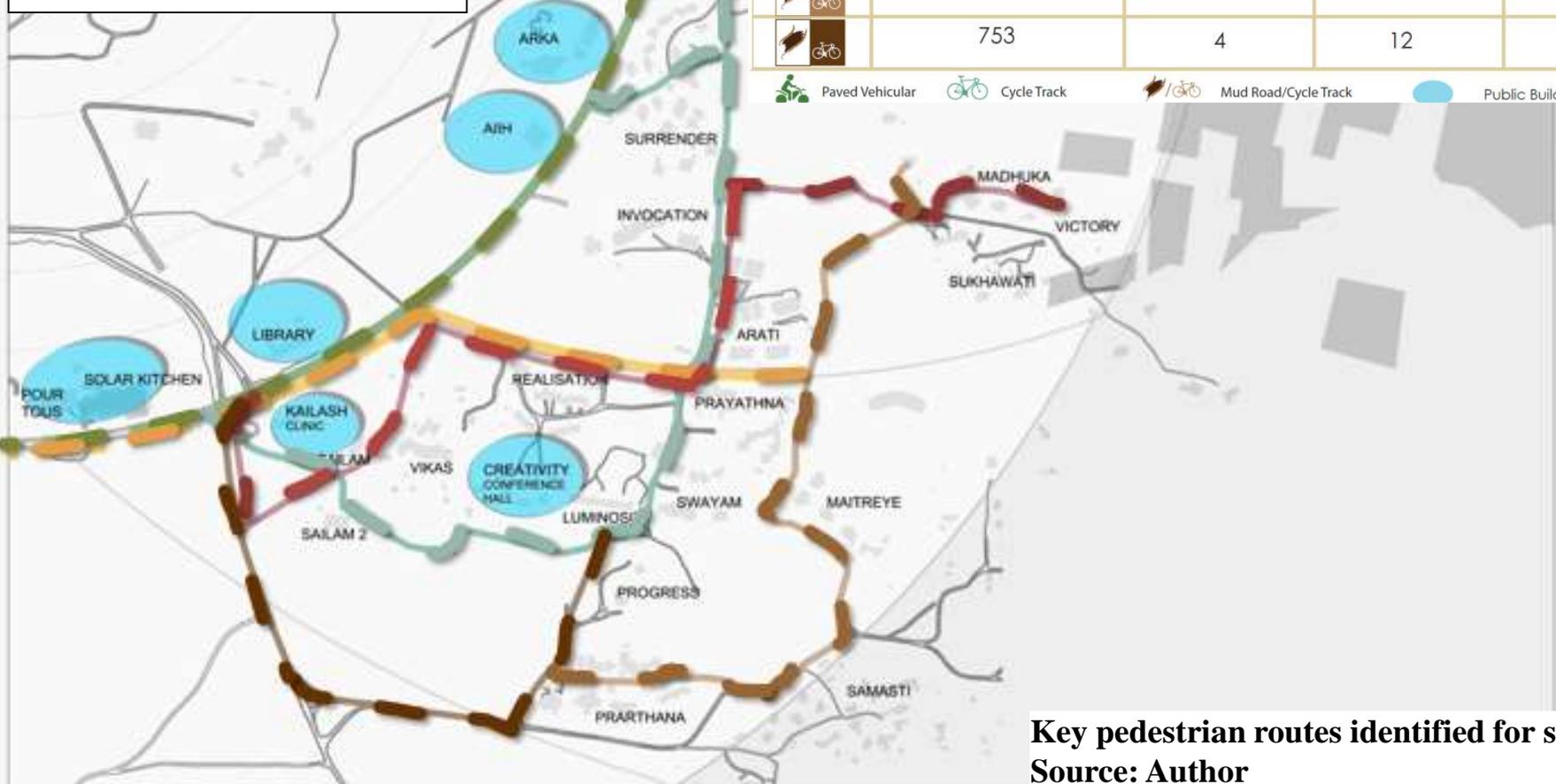
1. The network is not thorough, there are many missing/broken links in cycle paths that need to be finished for unobstructed pedestrian movement
2. At places, cycle paths are too narrow less than 1.5m (prescribed standard), hence two people cannot pass simultaneously.
3. Better maintenance has to be done for the cycle paths.



# MOBILITY STUDY CONDUCTED IN RESIDENTIAL SECTORS 1 AND 2

Road Type	Length of route (in metres)	Cycling Time (in minutes)	Walking Time (in minutes)	Right of Way (in metres)
	879	5	15	13
	1214	6	18	2.2
	892	5	13	7
	1328	6	20	2.2
	953	5	15	5 & 2.2
	753	4	12	5 & 2.2

 Paved Vehicular   
  Cycle Track   
  Mud Road/Cycle Track   
  Public Buildings



**Key pedestrian routes identified for study**  
Source: Author



A mobility study of Sectors 1 & 2 was carried out in order to analyze the ease of movement pertaining to Walking and Cycling, taking certain routes as samples, and the time taken to traverse them by walking and cycling.

Road Type	Length of route (in metres)	Cycling Time (in minutes)	Walking Time (in minutes)	Right of Way (in metres)
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 Paved Vehicular    
  Cycle Track    
  Mud Road/Cycle Track    
  Public Buildings

### Assumptions

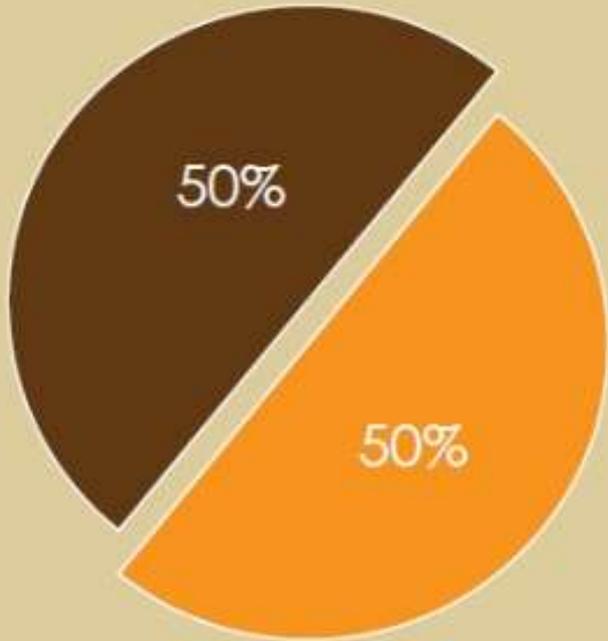
Source: Beifinger's Mobility Concept

- 1.The cycling speed is taken as 15km/hr.
- 2.The walking speed is taken as 4.2km/hr.
- 3.This is applicable only for pedestrians.
- 4.These are selective routes regardless of the origin and the destination of the commuter.



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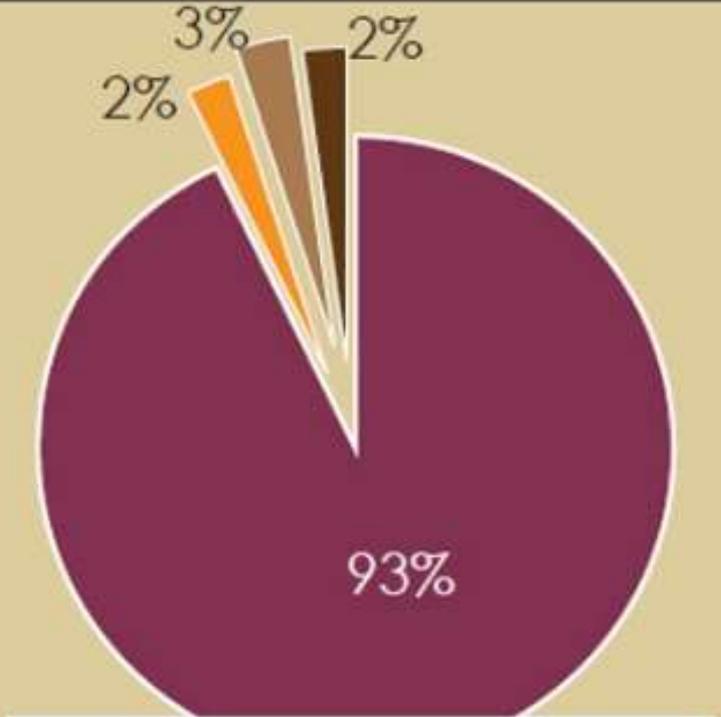
## Percentages of Areas: Motorised vs Pedestrian Ways



Motorised Roadways

Pedestrian Pathways

## Total area compared to Building Footprint and Transportation



Pedestrian Pathways

Total Ground Coverage

Motorised Roadways

Total Area of Sector 1&2

**Comparative pie charts for motorized and pedestrian pathways and total area utilized for transportation**

**Source: Author and Auroville TDC team.**



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# Land use planning and Mobility

- land use planners and traffic planners should work together, from the beginning
- Manage individual mobility
- UNDERSTAND USER NEEDS

# AWARENESS CAMPAIGN

- General information on mobility – **what is going on, what mobility options are available, what impact do they have on life in Auroville**

## PROMOTION OF ELECTRIC VEHICLES



TARGETS

MONITORING

EVALUATION

HOW SHOULD PEOPLE COME AND GO TO THESE PLACES?

WHAT OPTIONS WILL BE AVAILABLE?

WHAT SORT OF PARKING SHOULD BE PROVIDED?

HOW WILL THIS INFLUENCE THEIR TRAFFIC BEHAVIOUR?



## SUGGESTIONS:

### Prioritisation:

- ✓ The first priority should be shifted to walking and cycling.
- ✓ Second priority is given to public transport and other collective modes like carsharing, carpooling, on demand services.
- ✓ **The car has only the third priority.**

### Why Should You Bike?



PUT THE ACTIVE TRANSPORT MODES LIKE **WALKING AND CYCLING** IN FIRST, IN FUNDING

### WHY CYCLING HAS THE POTENTIAL TO BE PROMOTED AS FIRST PRIORITY?

1. **THE DISTANCES ARE RIGHT**, The average pedestrians distance of cycle trips is around 2.5 km, which is same as the radius of the Auroville township.
2. **CYCLING IS EFFECTIVE, ECOLOGICAL AND EMISSION FREE, ITS HEALTHY.**
3. There is already supporting infrastructure in place **THE CYCLE PATHS**

1. **Cycles are comparatively cheaper in India.**

1. **BICYCLE MAINTANENCE CENTRE CAN BE SETUP**
2. **EXTEND THE CYCLE PATH NETWORK**
3. **INFORMATION ON HOW TO RENT BICYCLES SHOULD BE READILY AVAILABLE**
4. **CARSHARING AND PUBLIC TRANSPORT SHOULD BE ENCOURAGED FOR LONG TRAVELS**
5. **AN EFFECTIVE PUBLIC TRANSPORTATION SYSTEM**

# Other Steps And Measures To Consider While Preparing For A Mobility Or A Traffic Management Plan

- ❖ Maintenance of pedestrian pathways to encourage walking and cycling.
- ❖ Mobility plan considering the broken links in pedestrian network.
  - ❖ Crown is not meant to take motorized transportation.
    - ❖ Distribution of parking spaces in a better way.
    - ❖ Improvement of street infrastructure.
- ❖ Upgradation of Physical Infrastructure to support sustainable transportation.



# Acknowledgement

The study was conducted at *Town Development Council (TDC La Venir), Auroville between May 2013 to July 2013*, and the author focused on the transportation part of the research.

TDC team provided insight and expertise that greatly assisted the research, although they may not agree with all of the interpretations/conclusions of this paper.

I would like to thank all the members of TDC, Auroville for giving me an opportunity to conduct this research and I would like to express my heartfelt gratitude towards them.



# References:

## Main Reference:

Town Development Council: TDC La Venir Auroville, (2013). *Existing Conditions Analysis Report of Residential Zone Sector 1 & 2*

## Other References:

Auroville's Future. (2005). *Auroville Mobility-Planning Policy and Design Criteria For movement, traffic and Roads*

*Auroville and Mobility: Observations and Suggestions from a Traffic Planner*. Retrieved from <http://wiki.auroville.org.in/wiki/Mobility>

Planungsbüro Billinger, Verkehrsplaner & Auroville Associate Architects, (2001). *Auroville Mobility concept*

Auroville Foundation,(2001). *Auroville Master Plan Document 2001*

Posch, Karl Heinz. (2010). *Essay on Auroville Mobility*

