

*auroville
universal
township*

*integrated urban
rural landscaping
applied research*

INTEGRATED URBAN-RURAL LANDSCAPING

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Table of Contents

| | |
|---|----|
| | 3 |
| I. Introduction | 4 |
| II. Auroville Universal Township: | |
| Conditions, Problems, targets | 6 |
| III. The areas of work: | |
| Present situation and future developments | 7 |
| A. Present State of Landscaping in Auroville | 8 |
| B. City area | 8 |
| 1.) Matrimandir Gardens | 9 |
| 2.) Four Major Parks | 11 |
| 3.) Green Corridors and Green tunnels | 13 |
| 4.) Open space planning between the settlements | 15 |
| 5.) Roof and Courtyard gardening | 15 |
| 6.) Avenue planting | 17 |
| 7.) Parking and Service Nodes | 18 |
| C. Green Belt | 18 |
| 1.) Integration of city into Green Belt | 19 |
| 2.) Protection of countryside scenery in the Green Belt | 23 |
| 3.) Recreation area of Green Belt | 23 |
| 4.) Afforestation area of Green Belt | 24 |
| 5.) Agricultural area of Green Belt | 25 |
| IV. Program of action and implementation | 25 |
| A) Actions to be taken | 26 |
| B) Maintenance, care and development | 27 |
| V. Annexes | 27 |
| Bibliography | 27 |
| Addresses | 6 |
| Maps : | 8 |
| 1. City Green areas | 10 |
| 2. Matrimandir Gardens | 12 |
| 3. Four Major Parks | 14 |
| 4. Green Corridors | 17 |
| 5. Ground coverage and densities | 29 |
| 6. Road sections | |
| 7. Overall area with existing settlements and proposed zone uses | 30 |
| 8. Water and climate | 31 |
| 9. Habitat connections for wildlife | 32 |
| 10. Townscape and spatial elements | |

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I. Introduction

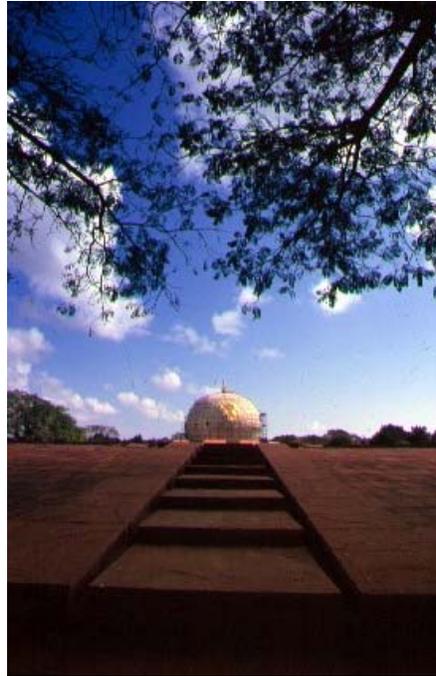
The universal township of Auroville was inaugurated in 1968 as a site for the manifestation of an actual human unity in diversity. As such, it offers itself as a testing ground and laboratory for the next step in human evolution. The Auroville Foundation Act of 1988 has provided statutory support for the preparation of a Master Plan for Auroville to ensure the orderly and planned development of the township.

With the completion of the Perspective Auroville Universal Township Master Plan in the year 2001, many different aspects of integrated town planning have had to be taken into close consideration. At the same time, Auroville is now participating in the city networking for sustainable development under the Asia Urbs programme of the European Commission, which provides an opportunity for sharing best practices in the field of sustainable urban management, increasing the capacity of interactions and networking between European and Indian cities, and the establishment of a system of information and exchange among them.

In ensuring harmonious growth of the city and providing a living background for settlement and infrastructure, landscaping will play a key role in a sustainable city system. Compared to most of today's cities and greater urban spaces, which only provide some unconnected, isolated gardens and parks as 'green pockets' in a desert of overcrowded building areas and ever increasing traffic, the approach to town landscaping in Auroville will be completely different: The whole township of Auroville will be connected by an interlinking network of green open spaces, comprising the Matrimandir Gardens in the central Peace area, green corridors throughout the whole city area, four major radial parks, and the surrounding Green Belt. Thus showing a modern and innovative example of creating a living framework for infrastructure and settlements, the city greenwork will act as a future model for healthy, ecological and sustainable city planning.

By creating this green network, the contrasts between 'urban' and 'rural' will soften and vanish more and more to become a continuum. Thus 'urban' and 'rural' settlements will be complemented by integral development for mutual benefit. This will be achieved by establishing strong urban-rural linkages before the background of the all-connecting green network.

Continuing this approach further on, the development plan deals with all green areas in and around the township, starting with the Matrimandir Gardens and including the parks, green corridors and all other green city areas plus the Green Belt, making them **one living green body**. As an important feature, the last chapter deals with implementing these objectives and gives some hints on maintenance, care and further development of the green areas. May this work help the vision grow and develop!



II. Auroville universal township: Conditions, Problems, Targets

The universal township of Auroville will consist of a city area of 2.5 kms radius, comprising an area of about 20 sq.kms, and a surrounding Green Belt of 140 sq.kms. The city area is envisaged to accommodate a population of 50,000 inhabitants, hopefully by as early as 2025, most of whom will dwell in the Residential Zone. The centre of the city will be the Peace area around the Matrimandir, comprising the Amphitheatre with urn, the big Banyan tree and the twelve Matrimandir Gardens, all surrounded by a lake. Further out from the lake there will be the Crown area, a service area located around the inner ring road, linking all the zones while acting as a separate zone within each zone, providing more densely settled service facilities.

The city area will comprise the four zones - Residential, Cultural, Industrial and International - which will be separated by the four major parks, being the connection to the surrounding Green Belt, widening as they move towards the Green Belt in a spiral movement. Between the parks there will be a network of green corridors throughout the zones, connecting the whole city.

The different zone uses will demand specific landscaping policies, as there are some differences in density and structure. In the Residential Zone there will be a wide range of densities and also architectural forms. The densities will increase westward from the first to the fifth sector. There will be no private land, as the aim is to encourage community living. Housing will differ from single family houses of 1-2 floors up to high rise apartments of 5-8 floors. The Industrial Zone will accommodate small and medium size non-polluting industries. The part of the zone lying inward from the Crown Road will serve as an administrative area. In the Cultural Zone there will be educational institutions, sports centres, and arts and crafts workshops. The International Zone will contain representative pavilions

for the different countries and cultures of the world, plus conference and exhibition halls and guest houses. The different garden themes should be adapted to represent each country or culture.

The city area will be surrounded by an outer ring road, which will be connected to the inner service road by some major radial roads. The city will be accessed by some major roads, coming from the coast road from Pondicherry to Chennai and from the road from Pondicherry to Tindivanam. At the main access roads there will be service nodes, where the traffic coming from outside can be regulated, and social and economic interaction between the town and visitors or surrounding villages can take place.

Presently, 83 % of the city area is owned by Auroville (383 of 491 ha); 12% of the land is already being used for settlements, of which there are presently 95, some with up to 80 residential units. The rest is mainly afforested land, farm land, canyons and cashew topes. The land has been purchased bit by bit in the form of smaller areas which form an interrupted patchwork, so it is not always possible to start with the full layout of roads, parks and green corridors: only small strips and patches of them can be finished at the moment.

The Green Belt, which will mainly provide land for afforestation, farming and recreation around the city, actually includes five village areas, one of them immediately adjacent to the city area. There are about 8,000 people living in these villages, which are located in the western part of the Green Belt, an area envisaged for organic agriculture. The integrating of these neighbouring villages, and their further development as part of the Green Belt, will be a great challenge for future study work, necessitating some research into sustainable development and how to best serve their economic interests.

In the eastern part of the Green Belt, the land use will place emphasis on afforestation and land restoration, as already some work in this area has taken place, restoring the indigenous tropical dry evergreen forest (TDES). In the southern part, between Edayanchavadi and the road to Kuilapalayam, there will be the recreational area of the Green Belt, comprising the Botanical Garden with nursery and arboretum, some sports facilities, a cremation and burial site, and a network of walking and cycle paths.

III. The areas of work: Present situation and future developments

The different types of green area range from the very formal and decorative Matrimandir Gardens in the centre, where a maximum of detailed plant layout is required, across urban green areas, green corridors and major parks up to the very large scale planning of the Green Belt area. So all planning levels from garden design to open space planning and countryside management are needed.

In landscape planning of the past, too often there has been a narrow-minded separation between urban open space and object planning, which has only taken into consideration design matters, and landscape planning or countryside management on the other hand, which has only dealt with ecological values and scientific research, ignoring aesthetic and design matters.

In Auroville's green areas, there should be a new integral approach to all areas of landscaping, applying functional, aesthetic and ecological planning considerations to all kinds of landscaped in order to combine beauty and utility. Thus landscaping should serve the wholeness of culture and nature.

A. Present state of Landscaping in Auroville

The overall scenery shows a diversely structured green area consisting of afforested lands, cashew topes and open land with many scattered smaller or bigger settlements in between, continually growing together. Because Auroville consists of many settlements dispersed over the whole area, and because the land owned by Auroville is still a patchwork, landscaping until now has mainly taken place at community level. Many valuable examples of landscaping and planting in tropical climate, and the improvement of planting conditions in various ways, can be seen.

Some good examples of public landscaping can be seen in the Matrimandir surroundings, the surroundings of Bharat Nivas and the Visitors Centre, and in the community areas of Auromodele, Transformation, Gaia, Pitchandikulam and other sub-communities. These areas have been beautifully landscaped with some ornamental and indigenous plants, mostly available from the Matrimandir Nursery. There is a wide range of ornamental shrubs, climbers, succulents, flowers and ground coverings which can be used for more refined landscaping.

A number of nurseries in the Auroville area now provide a good stock of indigenous trees grown from cuttings or seedlings, and the Botanical Garden with arboretum is in process of being developed. Meanwhile many roads have been planted with avenue trees, which now provide good shade and comfortable microclimate. Also patches of the proposed Crown Road and outer ring road have been recently planted with avenue trees, and a network of cycle paths through the area has been started.

The first patches of the green corridor network will be realized now, wherever the land is available, and more avenue trees will be planted along the existing and proposed road tracks.

B. City Area

1.) The Matrimandir Gardens

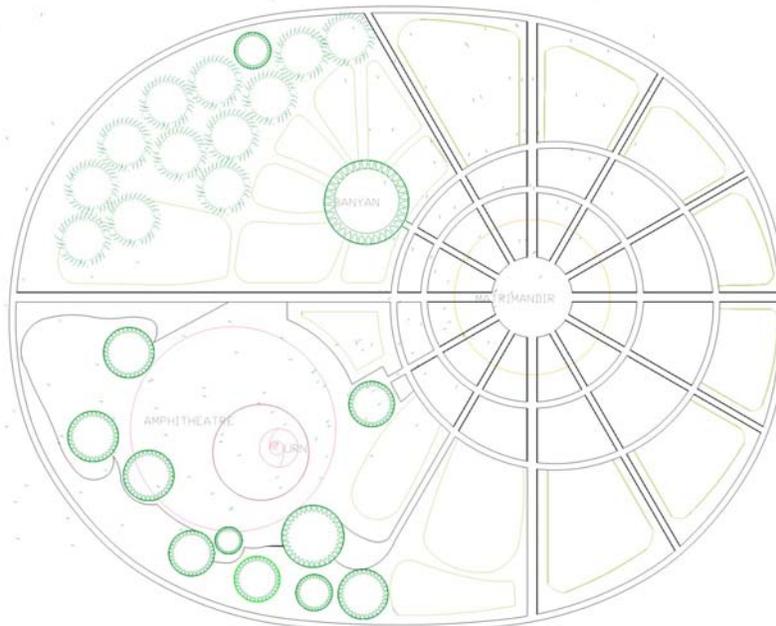
Surrounding the very centre of Auroville, the twelve Matrimandir gardens will be the green areas which will require the most elaborate and detailed planting designs, which in turn will require extra care when completed. They are located between the Matrimandir and the lake, each of them representing one theme of the supramental manifestation. Beginning from the western pillar and moving counter-clockwise they are:

| | | |
|---------------|---------|------------|
| Existence | Life | Progress |
| Consciousness | Power | Youth |
| Bliss | Wealth | Harmony |
| Light | Utility | Perfection |

In their choice of plants, these gardens will represent some qualities related to the overall theme through the meanings the Mother gave to certain flowers. So the entire planting will enhance the special garden theme.

More than in the outer parks and green corridors, there will be experimentation with a diversity of colours, textures and shapes within a very small area, the average area of the gardens being about 500 to 1300 sq.metres. Separated by radial paths between them, and closed up, they continue the twelve circle sectors and the radial lines of the Matrimandir itself. Together with the Banyan tree, the Amphitheatre and a rose garden they form the central Peace area with its surrounding lake.

There should be an atmosphere of tranquility and contemplation in this area, which cannot be disturbed by any busy traffic. In other words they will be a unique feature of the townscape, radiating their energy throughout the city area surroundings.



Map No. 2: Matrimandir Gardens

2.) The four major parks

The city area will be structured by four major parks, which will spread out from the centre to the Green Belt. They will divide the four functional zones of the city, spreading out between them in a spiral movement and widening towards the Green Belt. They will act as green lungs for the city, improving the city climate by air circulation, providing recreation areas for the residents, and connecting the city centre and Green Belt by cycle and pedestrian paths passing underneath the Crown Road. They will also provide open views up to the Matrimandir in the centre.

By their very structure and imagery the parks will create continuity between the broad landscape outside in the Green Belt, and the town landscape. They will provide wildlife habitats and corridors in the city, from where - and through which - species can spread out without mobility barriers or habitat interruptions, keeping the connection to the Green Belt. They are named after four aspects of the Supreme Mother, their qualities being represented in the atmosphere of the parks through overall themes created by way of design, shapes, colour combinations and ornamental features. In the different areas of the parks there will be smaller gardens with special site themes to create a diversity of spaces within the park, yet all being connected harmoniously. There will be recreational facilities like playgrounds, resting places, jogging paths, fireplaces or picnic sites, and educational facilities like paths and places for nature education, arboretums, exhibition areas, greenhouses and other features, which will be preferably placed where the parks are crossing the Crown Road. The layout of smaller and bigger ponds will be essential as well as earth movements.

As there will be much excavated soil from the central lake, ground modeling should play an important role, adding a new dimension to the park and supporting water management and harvesting. Seasonal overflow areas as well as existing canyons can be beautifully landscaped with plants which tolerate a fluctuating water table. Besides the interesting land features, existing beautiful trees and areas of woodland should be included in the design. A balanced proportion of indigenous and ornamental plants should support the overall purpose. The plant use will happen according to basically required qualities like shade provision and drought resistance, ecological requirements and especially visual qualities. The latter are colour combinations, seasonal changes, volumes, shapes, space effects and textures.

To create visual effects on a larger scale, the design should consider open vistas and spatial effects which can be enhanced by night illumination. There should also be some art features like sculptures or carved stones.

The basically required utilities, which should be there in each park, are compost areas, pump houses, storerooms, watchmen's places, nurseries and public toilets.

Mahalakshmi Park

This park will be located between the Residential and Cultural Zone in the southeast of the city area. It starts near Centre Guest House and follows the movement of the Crown area, crossing the Crown to the north of Surrender and widening towards the Green Belt up to the outer ring road. The area covers also the existing community of Gaia, which will be included in the overall concept.

The theme qualities of the park, reflecting those of Goddess Lakshmi, will be beauty, wealth and harmony on a very refined level.

Mahakali Park

This park stretches out from the lake banks east of Peace area between the Cultural and Industrial Zone. It crosses the Crown area near Existence and goes straight northwards, widening up to the Green Belt. It is the widest of all the four parks, hitting the outer ring road at a width of 500 m. Its area includes the community of Revelation.

Mahakali is the aspect of the Supreme Goddess which represents qualities like power, strength and expression, all of which should be reflected in the park's design.

Mahasaraswati Park

Between the Industrial Zone and International Zone stretches the Mahasaraswati Park. It starts from the green strip north of the administrative and service area at the level of Sincerity, crosses the Crown Road near Darkali, and goes up to the outer ring road, where it joins the Green Belt near the water tank south of Kottakarai. Half way it is crossed by a canyon, which because it is not deep should be beautifully landscaped to become a part of the whole design.

Mahasaraswati is the aspect of the Goddess which represents qualities like order, perfection and thoroughness, all of which should be reflected in the park's design.

Maheswari Park

Lying between Residential zone and International zone, this park begins at the lake around Peace. Located between the Residential Zone and International Zone, this park begins at the lake around the Peace area west of Matrimandir. It goes down southwest, crossing the Crown Road near Savitri Bhavan. Between the Visitors Centre and Aurodam it crosses the Aurodam canyon, which in this area is already bridged by two check dams. These features should be included in the whole design, forming a beautiful landscape in drought times as well as in the rainy seasons. North of Edayanchavadi it hits the outer ring road and joins the Green Belt.

Qualities represented by this aspect of the Mother Goddess are calmness, majesty and serenity, which should be expressed through the design.



Map No. 3: The four major parks

3.) Green Corridors

Apart from the four major parks, which form the main green features of the city and divide the zones, the zones themselves are structured by green corridors, which form a unique green network throughout the whole city area. One goes around the whole city in a circular movement between the Crown and the outer ring road, crossing all the radial roads. Radial green corridors cross this circular green corridor or branch off from it to the sides. In the Residential Zone, there will be one radial green corridor going through each sector up to the outer ring road and then joining the Green Belt. In the Cultural Zone there will be a long green corridor going from Mahalakshmi Park through the whole zone, surrounding the sports area, joining the circular green corridor, and then going out to the outer ring road. In the International and Industrial Zones, the existing canyons should be treated as green corridors, as they form a unique landscape feature and are not suitable for building purposes. They should be accompanied by a protection area along their edges.

The network of the green corridors will provide connections for cycle and pedestrian paths throughout the city, apart from the main roads, making the whole city explorable to

non-polluting traffic. They will also provide the most proximate recreation areas for the residents, set in nice and pleasant surroundings. Like the four major parks, some radial green corridors will provide open views from outside to the Matrimandir.

The corridors will also provide a wide variety of structures for wildlife and ensure that their habitats are connected throughout the city. Small structures like hedges, clusters of shrubbery or densely planted areas, which are set close to one another, are good possibilities for wildlife to retreat into. Therefore, there should be the possibility of connecting the green corridors underneath the roads. This could be done by widely bridging the green corridors by roads, or by providing green tunnels i.e. subways suitable for wildlife connection, wide and light enough for the interchange of species. This has to be implemented wherever the green corridors are crossing the radial roads and, most importantly, where they go underneath the outer ring road into the Green Belt, so the urban biotopes are connected with the vast forest and canyon habitats outside. Where the green corridors go underneath the Crown Road, the densely built up Crown area, which has a diameter of 80 m, has to be gapped for a passage of the cycle and pedestrian paths, with accompanying greenery up to the very road body.

The Green corridors should be kept clear of any buildings, the recreational facilities being limited to small features like resting places, picnic sites, sandboxes, etc. Greater facilities will inhibit the function of the green corridor and take too much of the area which should be preserved for greenery. There will be no vehicle traffic on the tracks going through the green corridors.

The average width of the green corridors should be about 30 m. There will be no strict boundaries between them and the adjacent areas, so they will be harmoniously set into the urban environment.

The guidelines for the green corridors already exist; though they should be modified slightly where the area would infringe on existing communities or buildings. In case of already existing high density residential areas, the width can be narrowed to a minimum of 20 m.

The greenery will consist of different types of planting, including loosely connected tree and shrub plantings with forest-like structures. These densely planted areas are to fulfill different purposes: they will provide privacy for the adjacent settlements, screening them towards the corridor, and also will be ecologically important for species which require forest or forest-edge habitats. Finally they form a framework for the scenery. They can form a border along the approximate boundaries of the green corridor, gapped by open spaces to provide views into the surrounding area. They should mainly consist of indigenous tropical dry evergreen species, which are hardy and drought resistant and don't require much care or watering. Yet there should also be beautiful ornamental shrubs at some points. Smaller shrub plantings will screen the meeting places and other enclosed spaces together with some nice ground coverings and herbaceous borders, or form ornamental features around the catchment ponds. To provide some shade for the cycle and pedestrian traffic, it is important that the tracks within green corridors are planted with avenue trees where they are not framed by tree and shrub plantings.

The open spaces, which are as important for the scenery as for climatic and wildlife purposes, will mainly consist of extensive areas of grass able to survive without much

watering. These grass areas become even more important, as the water flow from the surrounding settlement areas will be affected by buildings and covered surfaces, and will need areas where it can be slowed down, to soak away or drain into the catchment ponds, which preferably should be dug at the lowest points. In addition to using slope conditions and bunding, the water management and water harvesting should also be helped by defining overflow areas in the green corridor, lying between the catchment ponds and slightly excavated to guide the water flow through the green corridor. They can be interesting landscape features, which in the rainy seasons can act as ponds, and in drought times add a new dimension to the scenery. Besides grassed areas, they can be nicely planted with some plants which tolerate fluctuating water tables, usually found in the canyons.



Map No.4: Green Corridors

4.) Open space-planning between the settlements

Since 55% of the city area will be of permeable surface, the built up area between the parks and green corridors will be structured, and accompanied by plantings and gardens. The importance of this has been already pointed out in chapter II, so the open spaces in town should not become a concrete desert or overcrowded area like in so many towns of the world.

The landscaping of the zones will depend on the zone use or purpose of the site. Green areas and playgrounds will be there on every social infrastructural level. In the Residential Zone, there will be recreation and service areas on sector level which should be set in a beautiful environment, providing facilities like playgrounds, resting places, meeting places, smaller sports areas and exhibition areas, all acting as the features of an overall landscape. The planting of trees and shrubbery between the communities and buildings can be an important feature to create privacy and harmony. The planting types there will vary in size and structure, since there will be a wide range of densities and architectural forms. Likewise the communities of the low-density sector I. will be closely interwoven with plantings around single family or low rise apartment houses. In the high density sector V. with its huge Line of Force buildings up to 8 floors, the focus will be more on sheltering and framing the buildings with large fast-growing trees, and on terrace and courtyard gardening which will be dealt with in the next chapter.

In the Cultural Zone, there will be a university, other educational institutions and various sports facilities. These uses require generous public green areas as settings, widely arranged and campus-like, not too densely structured.

Breaking the monotony of large manufacturing units and factories should be one basic aim of landscaping in the Industrial Zone. This can be done by landscaping which forms a contrast to large-scale formal buildings.

As the International Zone will accommodate pavilions, conference and exhibition halls and the already existing Visitors Centre, the landscaping in between should be of a representative nature. Around the pavilions and plazas of the different countries the gardens and green areas should reflect the soul of the represented country or continent, as far as is possible, through the available plants and features.

Map No. 5: Ground Coverage and densities

5.) Roof and Courtyard Gardening

There is a long tradition of courtyard gardening in India, since the hot climate requires forms of dwelling where there are cool, shady areas with sources of coolness like small water basins and plants, providing recreation areas to the inhabitants. They are supportive of air circulation and help to ensure a healthy microclimate. Pot planting is also a useful feature to provide greenery in courtyards where there are covered surfaces between built up areas.

There is no experience of roof gardening in Auroville, as yet, but it should become an important feature all over the city to make the houses more habitable, to provide areas for slow drainage, and to reduce the large scale heating up of surfaces and thereby prevent the houses from becoming uncomfortably hot inside. It will contribute towards making Auroville appear as a green city when viewed from above. As pointed out in Chapter V, the plants chosen for roof greening - like succulents, aloe and cacti - should be extremely drought resistant as they are exposed to the full sun.

There should be a proper drainage layer, capable of catching large amounts of rain in the monsoon season and also slowing down the run-off. The substrate should also have a good water holding capacity. As far as shady roof areas are concerned, the concrete surface planting technique, which has proved successful at Aurobrindavan, could be applied, with trees and flowers planted in a thin layer of occasionally watered leaf compost on the plain concrete surface in a shady area.

Roof and courtyard gardening should be applied all over the city area, but particularly in the more densely settled parts of the town, where there is less greenery around, and the need for adjacent recreation becomes more urgent. The Line of Force buildings will be a proper field of exercise for roof and terrace gardening, and should become a model for green living spaces. Also the bigger buildings of the manufacturing estates in the Industrial Zone should be nicely covered with 'green' roofs to break the monotony of large building mass. In many fields, a lot of experimenting and research on ecological housing could be done in this area, and will be required as the city grows.

6.) Avenue planting

In hot countries, the need for avenue planting becomes very evident. The planting of trees along the roads is essential, specially for pedestrian traffic, which otherwise would be fully exposed to the hot sun. This applies to all kinds of roads and tracks, from the small cycle and pedestrian tracks to the outer ring road and the access roads. Besides giving a pleasant perspective, such planting can also help improve the town climate. The provision of shelter becomes even more important on roads which go in east-west direction and are therefore fully exposed to the noon sun from the side. Apart from that, the trees do a lot of air filtering, decreasing the dust production on the traffic ways and the impact of heavy storms or cyclones. Further important aspects have been pointed out in chapter V.A about the species suitable for avenue planting. Care should be taken for some safety aspects of the traffic, and the distance between road body and trees should not be too small, to ensure further growth and development of the trees. It would be unsuitable to choose trees which have strong roots growing close to the surface, as by the time they mature they would be likely to lift up the road surface. Trees should also be avoided which are prone to wind damage, and could threaten the traffic or pedestrians by branches cracking down. The trees should have a

growing habit with long bole and high branching to provide a light road profile space underneath, of at least 4m for vehicles.

All the roads in the city area will be provided with a cycle and pedestrian path. On the bigger ones, it is recommended to separate the cycle path from the pedestrian path and have some plantings in between.

Pedestrian and cycle paths

These will be everywhere throughout the parks, green corridors and residential areas, and should have some smaller trees planted alongside, with limited growth, at distances of 10–12 m on both sides, where there is no denser planting along the paths.

Minor roads

These are mainly for vehicle access to certain areas of the zones, and so there should be medium-sized avenue trees at distances of at least 12 m.

Radial roads

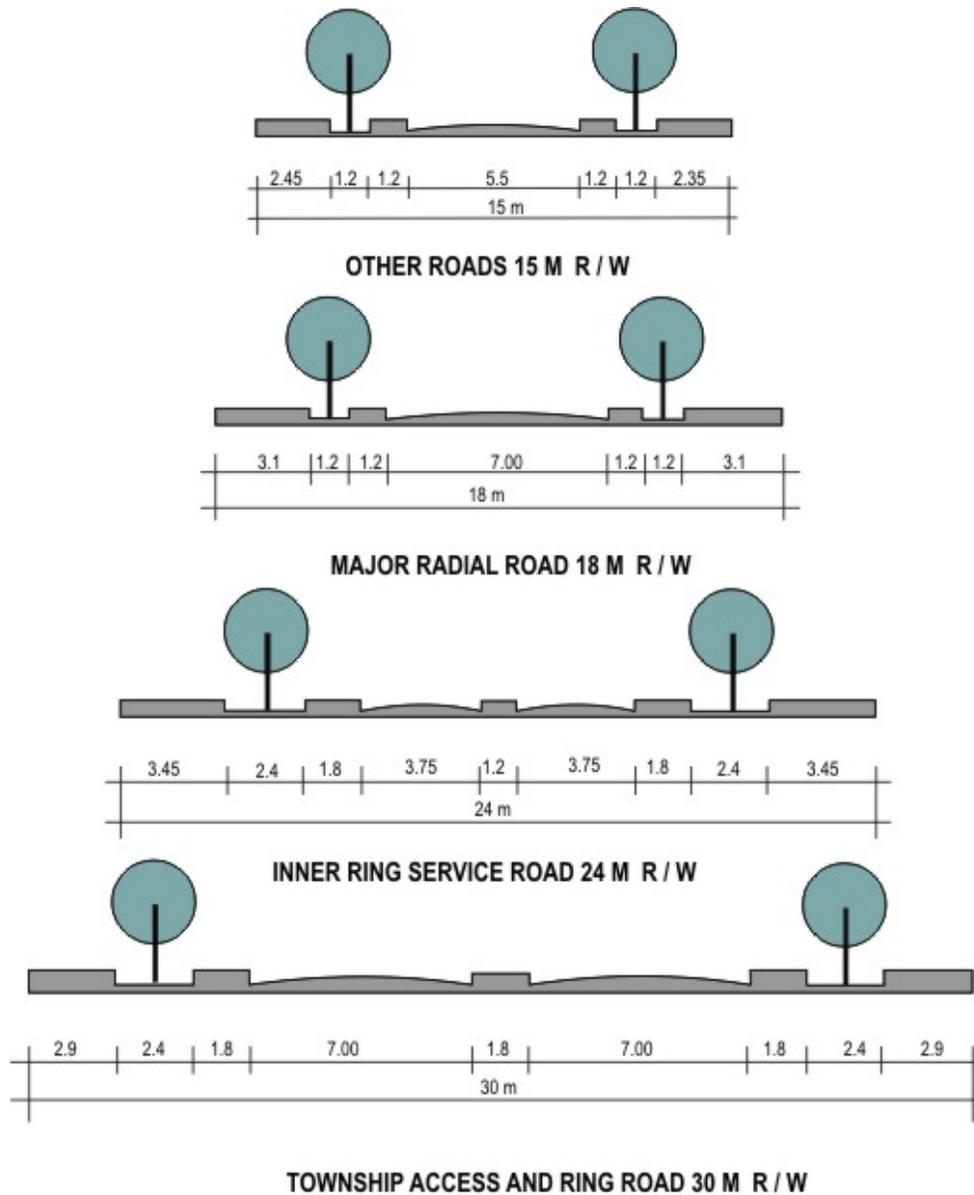
These are two-track roads with a width of at least 6 m. They are provided with cycle and pedestrian tracks on both sides, so the avenue trees should be large and shady enough to protect the enlarged surface, including the cycle and pedestrian paths. For this, medium to tall trees with a wide spreading habit are needed.

Crown road

The area on both sides of the Crown Road will be of a representative kind, as for shopping malls. On the outer side of the Crown Road there will be a kind of continuous boulevard, where the trees will be planted in an area of covered surface. As this is the service road, preferably trees like *pelthaforum ferrugium* should be planted, which were given the name ‘Service ‘ by the Mother.

Outer ring road and access roads

These will be the widest roads, with two tracks and a width of 27 m. They should be planted with very large avenue trees sited at greater distances than normal. Yet as some of the suitable species take quite a long time to grow and reach their ultimate size, for the time being the gaps should be filled with faster growing species of shorter life period to provide shady avenues from early on. Later on these trees can be removed to create space for the final avenue trees, like *samanea saman*, which has already been planted along some patches of the proposed track of the ring road. The road margins can be widened for magnificent trees like the Banyan, which over the years would develop a huge, wide-spreading habit and otherwise inhibit the traffic on the road. There should be ribbons of shrubbery from the TDEF species between the cycle and pedestrian paths to give additional shade, apart from the shelter of the avenue trees.



ROAD SECTIONS

Map No. 6: Road sections

7.) Parking and service nodes

To meet a city of 50,000 inhabitants' infrastructure requirements, there is an essential need for appropriate parking facilities all over the city area. These can facilitate keeping up the population's mobility, both in the near future as also in later stages of city development, by non-polluting vehicles.

The number of ways through the city area by residents will be already reduced to a reasonable amount by the decentralized provision of physical and social infrastructure facilities at sector level. These can be reached by cycle and pedestrian paths, yet there

will also be some traffic across the city area to reach the working places in the Industrial Zone, the educational and cultural facilities in the Cultural Zone, and the city centre in the Crown area.

As there should be only non-polluting traffic in the city area, there will be eight *service nodes* outside the city area, in the Green Belt, on the four access roads coming from the two national highways, allowing a change-over to non-polluting vehicles. They will provide appropriate parking facilities, and will be places of interaction between Auroville and the surrounding villages. Apart from the parking and transport facilities they will also provide public amenities and recreational facilities.

As the service nodes are to be located in the Green Belt, and quite often in the area of afforested land, the existing trees should be retained and included wherever possible, to provide greenery over the whole service node area and set them in pleasant and representative surroundings. The shade of trees is essential not only for the parking and bus stops but also for all the public areas. There could be nicely landscaped exhibition areas, small playgrounds and resting places.

The primary service nodes will be on the outer border of the Green Belt where the access roads enter the Auroville area. They would regulate most of the visitor traffic. The secondary nodes, located at the crossings between the four access roads and the outer ring road, can act as channeling nodes up to which visitors can bring their vehicles. They will be developed first.

Parking facilities will also be provided everywhere inside the city area. They will be there in the Residential Zone at community level, in the International Zone in the form of a big parking area at Visitors Centre, in the Industrial Zone as spaces adjacent to the producing units, and in the Cultural Zone between the cultural and educational facilities. A major importance exists for the parking lots at the Crown area, where a huge amount of the city's traffic will be concentrated.

All the parking lots should be easily accessible and located in greenery, like hedges, shrub plantings, groups of trees, etc. There should be appropriate trees with long bole and wide higher branching for shade between every two parking rows.

C. Green Belt

1.) Integration of city into Green Belt

Since the Green Belt and green city areas should be seen as one living green body, the city should be harmoniously and organically integrated into the surrounding green landscape. The green areas form a framework, in which the settlements, urban and rural, are placed. Though the functional uses of city area and Green Belt are segregated, there will be no rigid and abstract boundaries between the areas. Both areas will be spaces for sustainable development, which time after time will soften the contrast between 'urban' and 'rural' in many ways.

Where the parks and green corridors join the Green Belt, they will open and widen more and more, with the plantings becoming more extensive and featuring indigenous species and open spaces, as they adjust to the landscape image in the Green Belt.

In the less densely built-up areas of the International and Cultural Zones, the tuning to outer landscape will already happen at the city margins. Likewise the Green Belt areas will be not only 'rural', in the sense that they will accommodate more than just agriculture-related projects and village settlements. There are already some larger communities in the Green Belt like Certitude, Dana and Samasti, which show how collective housing settlements can be integrated into a rural setting.

With the integration of canyons as ecologically sensitive areas, there is a further landscape link between city and Green Belt. They have their offspring in the city area, where they act as green corridors, sloping down from the Matrimandir to the borders, widening and joining the eris to the west of the area or going down to the sea.

There are five villages in the Green Belt: Rayapettai, Irumbai, Alankuppam, Kottakarai and Edayanchavadi. The latter two are located next to the city area, and their development and environmental improvement will be closely inter-related with the city's development.

The service nodes in the Green Belt area mentioned above are useful means of integrating as well, preventing the traffic from queuing at city access points, and providing a relaxed traffic situation in and outside the city.

A network of inter-related cycle paths going from the city green areas out into the Green Belt will favour the recreational use of proximate green areas around the city. These cycle paths will go from the parks and green corridors underneath the outer ring road out into the Green Belt, and should be accompanied by shade-providing greenery. They should ideally be traced along beautiful landscape features such as canyons, eris, and stretches of regenerated forest.

All these interrelated uses require making the purchase of lands in the Green Belt a priority task; as still two thirds of the 1472 ha. have yet to be purchased.

2.) Protection of Countryside scenery in the Green Belt

Since the area was first settled, the landscape has been turned from a barren semi desert into a diversely structured and multifaceted countryside, which has become characteristic of the Auroville area. It was the interaction between natural conditions of the land, and man shaping the land according to different uses - the traditional agriculture of the villages as well as the afforestation and land restoration work of the early Aurovilians - which created these diverse landscape features.

As development in the Green Belt goes on, it is a major task to set up policies to protect these characteristic features, ensuring beauty, uniqueness and diversity of the Auroville countryside. There are some significant landscape types spread out over different areas of the Green Belt, as follows.

Dense forests

This landscape type is found largely in the eastern and northern parts of the Green Belt, the assigned afforestation area, where the planting of indigenous species took place from the very beginning, and where in some places the forest has reached already a high successional stage in its development towards becoming fully mature tropical dry evergreen forest, accommodating a considerable number of wildlife species. Such significant forests can be found for example around the communities of Pitchandikulam, Fertile and Nine Palms. Typical features are:

- Tall trees (Eucalyptus, work tree and various indigenous species)
- Dense shrubbery
- Dense ground coverings and ground shrubs
- Thick leaf cover
- Curving mud roads
- Roadside bunds planted with agave and cacti.

Dawn in the forest

Cashew topes and orchards

Cashew topes are a significant feature of the Auroville landscape, and are widely spread over the whole area, though with increased concentration in the south and east of the Green Belt. With their sculptural growth and round canopy they enrich the scenery, though at the same time their monocultural nature inhibits diversity of wildlife, specially where excessive spraying of pesticides occurs. In these areas, also mango orchards and banana plantations are found, as in Aurogreen. Since the soil is ploughed, open red ground is characteristic of these lands. Typical features are:

- Cashew trees
- Mango and other fruit trees
- Red ploughed soil
- Fences (living fences/ dry thorny branches)
- Dense tree and shrub hedges
- Curved mud roads
- Roadside bunds planted with agave and cacti.

Open arable land

In the western part of the Green Belt, where the land is plain and even, the scenery grows open, and land use turns towards more intensive agriculture. In this area, the villages of Edayanchavadi, Irumbai, Kottakarai, Rayapettai and Alankuppam are located, where traditional farming practices like rice cultivation are pursued. There are lots of seasonal water bodies in this area, and the lands are structured by a network of small bunds. There are some Casuarina plantations, and in the wide open space some long boled Palmyra and Coconut palms stretch out against the sky. Typical features are:

- Flat open fields with small bunds
- Open grass land
- Large seasonal water bodies
- Casuarina plantations
- Single palm trees / avenues.



Seasonal water body near Irumbai

Barren lands

These remnants of the eroded overgrazed landscape, which once covered the whole area, give us an impression of what the first Auroville settlers found here. Apart from their museal value, they provide scenery of silence and serenity. Some patches of this landscape are found in the southern Green Belt near the Botanical Garden and in the afforested area to the east. Extensive cattle browsing is the only land use, thus the sensitive grass turf is often interspersed with patches of bare red soil. Typical features are:

- hardy, dry grasses and thorny ground creepers
- thorny bushes
- single Palmyra trees
- patches of bare soil
- patches of bushy grass.

-



Barren land in the beginning

Canyons

Canyons are definitely the most outstanding hypsographical features in the Auroville area. With their rough and bizarre shapes, they form a significant contrast to the soft green landscape of forest and plantations, sloping down from the central plateau to the sea, and more gently to the western plains. Their scarce vegetation is adapted to the fluctuating water table, and the change of grass vegetation at their bottom indicates different degrees of ground moisture. The rushing water has painted the canyons with pebble banks in harmonious, picturesque shapes. Typical features are:

- Bizarre shapes
- Pebble banks
- Seasonal water table
- Alternating grass vegetation at the bottom
- Thorny bushes
- Check dams planted with aloe / agave.



Canyon near Bommaiypalayam

Village surroundings

The Tamil villages in the western Green Belt area are as much a part of the Green Belt countryside as they are a part of Auroville. Having grown with the landscape and been built with local materials, they reflect the rural lifestyle of the region. Thus they should be integrated, and their characteristic rural features preserved during further development, though their infrastructure and tidiness should be improved. Around the villages, one often finds a diversity of small scale structures like family fields and fenced gardens, shrubberies, old Banyan trees, small shrines, cremation sites and water holding 'tanks' (Eris), the latter usually seasonally dry. Typical features are:

- Houses and shelters with Keet roofs
- Keet fences
- Living fences
- Eris
- Palm, Banyan and Neem trees
- Shrubbery with climbers
- Cremation sites

3.) Recreation area of Green Belt

In the south of the Green Belt, an area of 250 ha is envisaged for recreational and settlement related uses. This area is located between the village of Edayanchavidi and the main access road to the Residential Zone, coming from Kuilapalayam.

This area, comprising the existing communities of Adventure, Acceptance, Evergreen, Slancio and New Lands, at the moment consists of afforested land, cashew topes and barren, open land. There is already the Botanical Garden south of Adventure, which is growing continuously, accommodating a wide range of species. The layout of an arboretum will start this year. In this landscaped area all the species will be shown in their natural habit. Thus it will serve to encourage the environmental education of the residents and visitors.

Other open air recreational facilities could include larger sports grounds or play areas on open lawn, adventure playgrounds, jogging tracks, nature education pathways, exhibition areas, wildlife research areas, etc. This whole area will be also the location for a large cremation and burial site, big enough to serve the whole city population.

All these facilities should be beautifully landscaped and harmoniously included in the afforested areas, so the whole will appear as a big landscape-park, including all the different functions as well as agricultural uses. Here special attention should be given to the layout of an appropriate network of cycle paths linking up with the other parts of the Green Belt and the Residential Zone of the city area, where the main access will come from the fourth sector's radial green corridor.

The Line-of-Force buildings of the Residential Zone also reach out to the Green Belt border, where the residents can directly access the recreational area.

4.) Afforestation area of Green belt

The eastern Green Belt area is envisaged for afforestation and land restoration uses. This will be an area of 560 ha between the access road to the Residential Zone coming from Kulilapalayam, going in a half circle around the city area up to the village of Rayapettai in the north. It comprises the existing communities of Certitude, Samasti, Pitchandikulam, Sharnga, Sangha, Samriddhi, Dana, Fertile, Aurogreen and Two Banyans. From some of these communities, a lot of afforestation work has already been done during the last three decades, so there is a major area of land already covered by forests and plantations. Apart from that there are Cashew and Coconut plantations, barren lands and canyons.

This part of the Green Belt was chosen to be the afforestation area because of its location on the slopes between the city and the coast, where it can form a barrier against strong winds from the sea and protect the coastal ridge from soil erosion. Also the soil on these steeper slopes is rather poor, and not so suitable for agriculture and farming, like in the eastern part of the Green Belt.

Already established here is the Bio-Resource Centre of Pitchandikulam with its seed bank and plantation of indigenous medicinal plants, which is of special environmental and educational use. Around there, and in many areas of this part of the Green Belt, the tropical dry evergreen forest has reached already a high successional stage, though it is still a long way off reaching the state of the original forest vegetation.

The Palmyra grove between Gaia and Two Banyans should remain as a conservation area - as also many other ecologically sensitive areas, especially in the northern Green Belt - free from buildings, traffic and other uses that would inhibit its ecological function.

Another aspect of the afforestation work to be done in this area will be energy plantation. This will mean planting hardy, quick growing plants of high energy value to enhance the city's development towards the use of renewable energies. In this area, near Fertile, will also be the site for solid waste management and recycling.

Large scale wastewater treatment systems can be located here as well as agroforestry projects. From the city, this area is adjacent to the Cultural and Residential Zones. Green connection is provided by Mahalakshmi Park and Mahakali Park, which widen towards the Green Belt and act as openings of the city towards the forest, providing access and exchange facilities for wildlife.

5.) Agricultural area of Green Belt

The western part of the Green Belt will be reserved for agriculture and farming uses. This area of approximately 500 ha will stretch from Edayanchavadi to Rayapettai in the north. It includes the villages of Edayanchavidi, Kottakarai, Irumbai, Alankuppam and Rayapettai plus the existing Auroville communities of Nine Palms, Discipline and Isaiambalam. In this area, intensive agricultural development will take place, which will include village development and the setting up of prototype farms for growing crops in varying geographical conditions. The existing agricultural uses of the land include rice cultivation, Cashew topes and Casuarina plantation.

Most of the canyons and water bodies are located in this area, sloping down towards the northwest, so there will be appropriate water harvesting technologies to utilize the water of canyons and eris for agricultural uses. Also the soil conditions are more favourable to farming usage than in other parts of the township, thanks to the gentle slope of the land. The Irumbai eri, being the largest of the water bodies in the area, can - apart from being a major landscape feature - also be used for fisheries. Thus in the whole area an optimization of agro-economic potential will take place.

Development should be guided towards organic farming, which provides sustainable land use and countryside management, ensuring the balance of agro-ecosystems. That means among other things diversity of crops, avoidance of large scale monocultures, no spraying of pesticides, and the inclusion of small structures like hedges, shrubberies, solitary trees, smaller canyons, and catchment ponds to provide habitats for wildlife while also aesthetically enriching the countryside.

IV. Program of actions and implementing

In the framework of the Auroville Universal Township Master Plan with perspective of 2025, there will be 5-year detailed Development Plans followed by Annual Plans and Layout Plans / detailed schemes. While the planning group is responsible for overall coordination and monitoring, a special implementation group within the planning group is concerned with the projects, and cooperates closely with the several project groups.

A.) Actions to be taken / phasing model

1) Securing of lands

A major precondition for implementing landscaping projects will be the further securing of land that is not yet owned by Auroville, to facilitate development of larger continuous areas. There are different ways of securing land, apart from direct purchase, like land exchange, lease of land and land pooling arrangements. Therefore, the remaining land not yet under Auroville ownership is to be preserved from non-conforming uses or from being purchased by speculators. The price of land is already increasing dramatically, so the need for funding to pursue land acquisition becomes more and more urgent.

2) Identification of sites and situation assessment

Where the land is purchased, and there is agreement about the usage and extensions of the site or area, an assessment of the site has to be made. This means identifying features to be retained or removed, like vegetation, water bodies, physiographical features, tracks, existing settlements, fences, etc.

3) Preparation of the sites

Depending on whether existing trees or other vegetation should be retained entirely, partly, or completely removed, any clearing should take place now. This will apply mainly to the Cashew topes, but also for some afforested lands, where trees that can grow in the open should be retained. In this phase, also the removing of fences and hedges will take place.

4) Earthworks

This phase usually takes a lot of time, and includes the digging of catchment ponds and the modeling of the surface with the excavated soil, the bunding work for water management and harvesting, and the preparation, leveling and surfacing of tracks and places, or for other constructional elements.

5) Planting

Since the growth of trees takes a long time, the planting of avenue trees along the pedestrian and cycle tracks should be done prior to other tree planting, to provide shade for the use of the tracks as soon as possible. The planting of trees and shrubs for cluster plantings, shrubberies, hedges, etc, will follow to form a framework. After that, the planting of lawns, ground coverings, herbaceous borders and other ornamental plantings can take place.

B.) Maintenance, care and development

1) Administration

Once the work area is identified and implementation is in process, there will be caretakers for the area, skilled and knowledgeable people concerned with maintenance and care of the site, who will cooperate with the planning group, forming a network of decentralized responsibilities.

2) Maintenance cost

There will be regular contributions from the community to maintain the green areas, with running costs occurring mainly for:

- repair
- plant & material supply
- wages
- equipment.

3) Working employees

Training, work experience and job creation in green area management, countryside management, landscaping and nursery work can be provided in course of maintaining the green features. Though a certain amount of care always will be needed, the policy should go towards less labour intensive work. As far as the Green Belt countryside management is concerned, farmers, foresters and growers should be involved in the maintenance, and should be given responsibilities, since they know their land best.

4) Main works to be done for maintenance

- watering / irrigation system

- pruning of trees, shrubs and hedges
- lawn trimming / mowing
- clearing of existing plantings / planting of new species
- weeding
- propagation of new plants, nursery work
- pathway cleaning

5) Material supply

There are already a number of nurseries in and around Auroville providing the green areas with various species of trees, shrubs, climbers and ornamental plants. Their number and range of species should be increased to cater for the growing need for plant supply. The four major parks should set up their own nurseries to meet the plant requirements of their special garden themes.

Banyan Nursery at Aurobrindavan

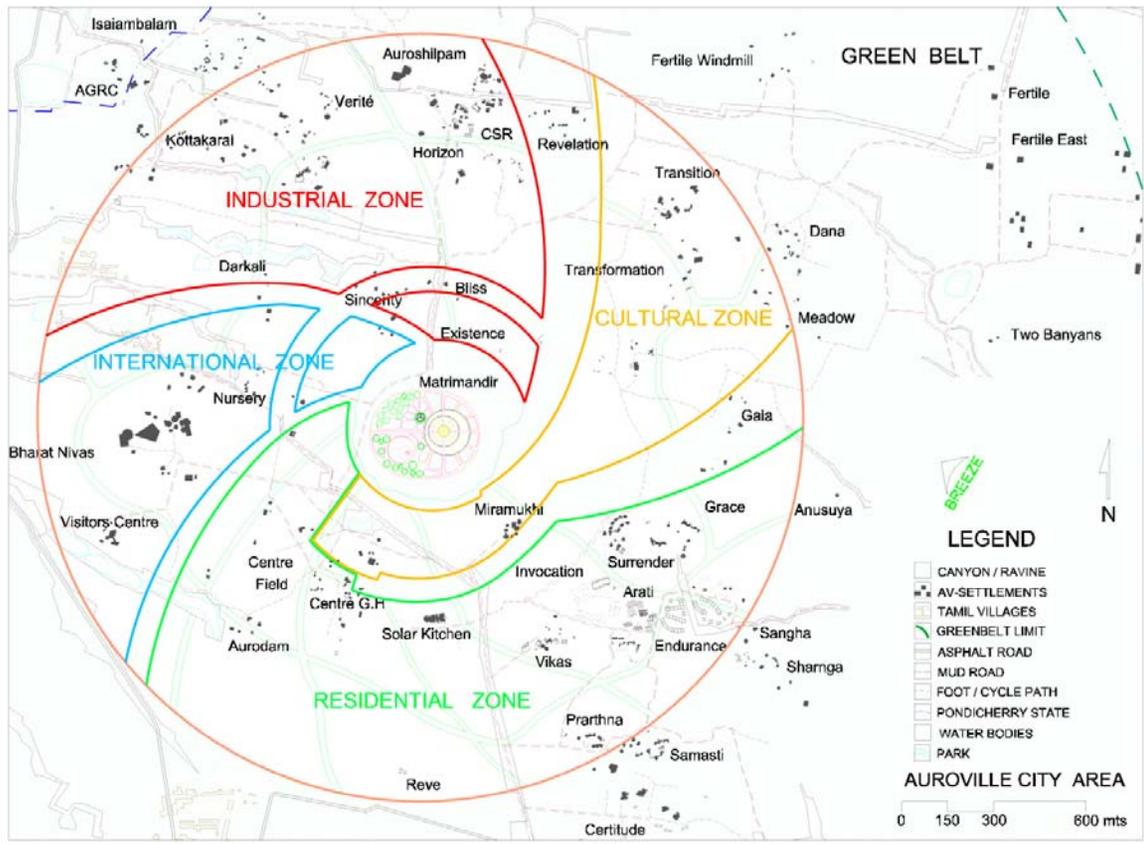
V. Annexes

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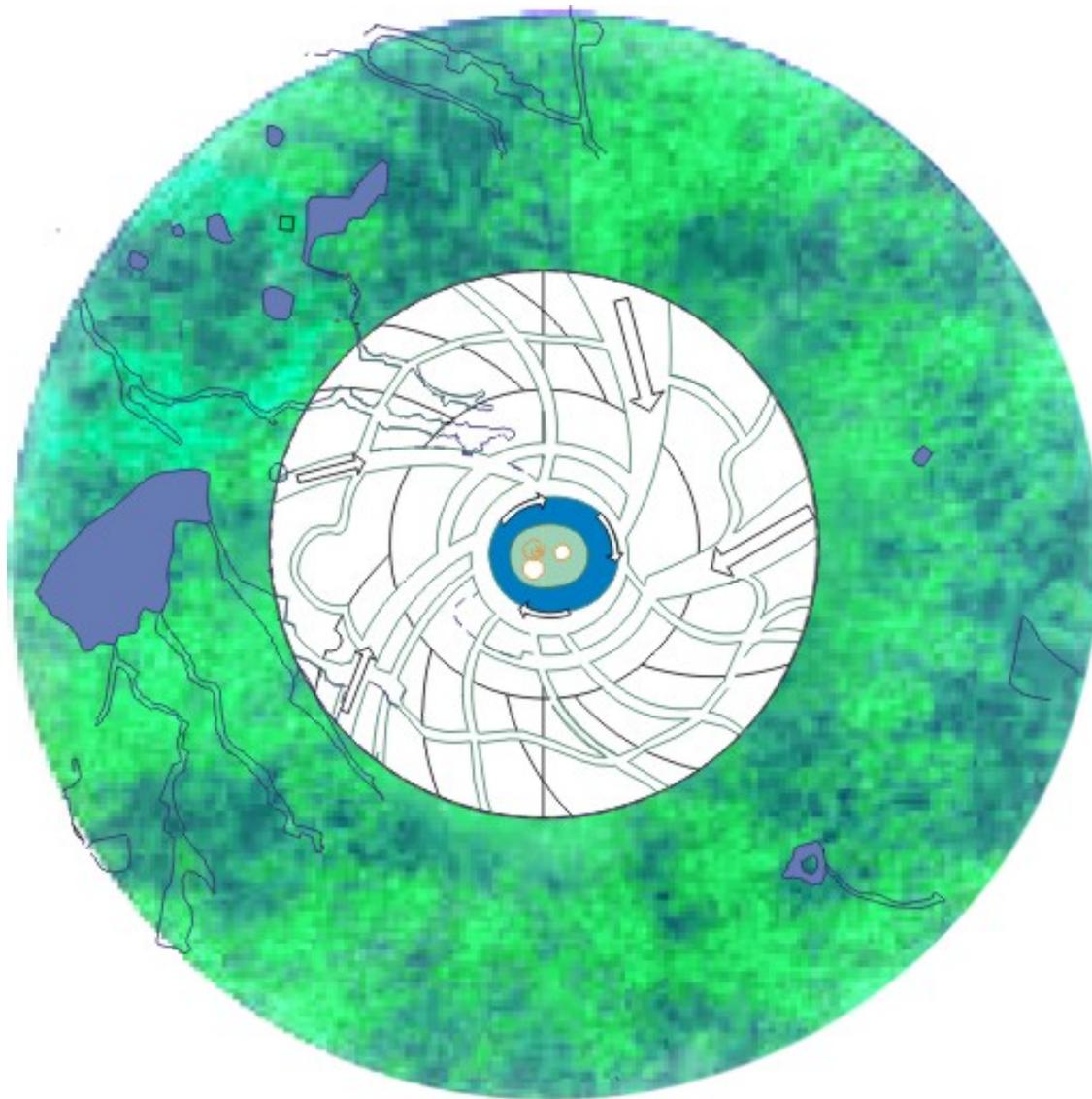
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Map No. 7: Overall area with existing settlements and proposed zone uses



| LEGEND | |
|---|--------------|
|  | Water Bodies |
|  | Canyons |
|  | Air movement |

Map No. 8: Water and Climate

Map No. 10: Townscape and spatial elements