

# Alternatives to the Automobile in the Indian City

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While automobiles contribute significantly to pollution and environmental degradation, and affect human health, the authorities who are supposed to understand the gravity and the urgency of the problem pay no attention to the alternatives. Two cases presented in this article demonstrate that activists and experts, even high court judges, cannot change the situation, if the authorities do not want to play ball.

For the past century, the automobile has captured the imagination of people around the globe and for many it still constitutes the ultimate symbol of middle-class status. According to a rapidly-growing number of academic studies, however, the automobile may have detrimental effects on human health and life quality, not least in cities where the concentration of automobiles contribute significantly to pollution, environmental degradation, social isolation, stress and physical inactivity.<sup>1</sup>

The following two cases from Bangalore and Chandigarh may not only provide inspiration for the creation of car-free environments in cities, but also reveal some of the difficulties in creating those environments.

## IISc Campus

Bangalore is one of the biggest and fastest-growing cities in India. It is also home to the Indian Institute of Science (IISc), which was founded by Jamsetji Tata in the early 20th century. Tata also founded what would later become India's largest industrial conglomerate, the Tata Group, which includes Tata Motors, the manufacturer of Tata buses and Tata trucks, which are major contributors to road accidents and traffic-related noise and air pollution in Indian cities.

Ironically, one of the few places in Bangalore where you would not find these vehicles is on the campus of the IISc. This is a very green campus with a healthy, honk-free environment. But as with the rest of the city, the number of cars and two-wheelers are rapidly increasing. To revert this trend, two different projects have been initiated.

**Bicycle Sharing:** In August 2012, the Namma Cycle<sup>2</sup> service was launched at the IISc campus. The idea was conceived 3-4 years earlier by an informal group of bicycle enthusiasts, including H R Murali,

who had been to Paris where he had seen the then newly launched *Vélib* (short for "bicycle freedom" in French) – a highly advanced bicycle sharing system with about 16,000 bicycles and 1,200 bicycle stations scattered across the city.

Initially, the group had thought of launching such a service at the Electronic City in Bangalore, but due to the chaotic traffic situation and lack of proper infrastructure, it was deemed unsafe there. Instead, it was launched at the IISc with a donation of 150 bicycles from the BSA bicycle manufacturer with the Center for Infrastructure Sustainable Transportation and Urban Planning acting as the local anchor.

The IISc had previously tried to implement a similar system, using the bicycles that students would leave behind when they graduated, but without proper management and maintenance, people would just abandon the bicycles because of a flat tyre or other technical problems and in no time the campus was littered with defunct bicycles. Today there are 75 Namma bicycles operating from five stations located at the busiest points on campus (the hostels, the canteen and the clusters of department buildings).

There are two ways of using the Namma Cycle service. One is as a registered user. Registrations can be made at the stations or online and cost Rs 100 per month. As a registered user you may use the bicycles as often as you like and each time you use one, you get the first half an hour for free. If you use it for longer periods of time you pay Rs 5 for the next half an hour, Rs 10 for the next hour, and so on. The other way to use the service is "pay as you go". In this option, you start paying Rs 5 for the first half an hour, Rs 10 for the first hour, and so on.

The progressive payment scheme is intended to encourage people to return the bicycle as soon as they are no longer using it. When asked about this, Murali says that the idea of bicycle-sharing is *sharing, not owning*. It is better to be used by more people since *Namma*, means "ours" in the Kannada language.

Lavanya Keshavamurthy, another member of the Namma Cycle team, says that, "the idea behind getting people to

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use and return a cycle within 30 minutes at zero cost, has its roots in our philosophy of holding onto resources only for the duration that we really need, thus, having enough for everyone with minimal resources".<sup>3</sup> "Cycling" may thus refer to both bicycling and recycling.

There are about 3,000 students, faculty members and staff at the IISc, and just before the summer vacation this year, there were 300 registered users of the Namma Cycle. The statistics show an upward trend over the past year in terms of the number of daily trips (from 2-3 trips per bicycle per day in December last year to around seven trips in May this year). In total, more than 7,000 trips have been made (by July 2013) by both registered and non-registered users, and 65% of these trips were of less than half an hour's duration.

It is hoped that the number of users and bicycles will steadily increase in a positive self-reinforcing cycle, but with fees and subscriptions accounting for only 5% of total revenue, the service is, like similar services elsewhere, heavily dependent on grants, sponsorships and advertising from both private and public sources.

The software used for registration and by station managers to keep track of the bicycles has been developed by Gubbi Labs and is intended as an open source software that can be used free of charge by similar services in other places. In fact, the initiative at the IISc can be seen as a pilot project, which may be implemented in other campuses and/or at a larger city-scale. But for such a service to work citywide, the authorities need to provide safe spaces for bicycling.

Bangalore city recently launched another bicycle sharing service with a few small stations located at the new metro stations, but as there are no safe bicycle lanes around the stations, and very few bicycle stations in the city, this service is hardly used at all. The result of implementing such a service without properly integrating it in the planning and management of the city may be the opposite of what was intended.

### E-vehicles

In addition to the Namma Cycle service, the Center for Infrastructure, Sustainable Transportation and Urban Planning has

also made a proposal for an "e-mobility" service based on extra large electric golf carts that would shuttle along designated routes on campus.

According to K V Gururaja, a member of the design group, the inspiration came from similar services at the historical city of Hampi and at the Infosys' hi-tech campus in Mysore. The proposal was made in response to growing concerns over the increasing numbers of motor vehicles entering campus each day. Today, motor vehicles account for about 50% of all trips on campus, while walking and bicycling make up the other 50%.

Surveys indicate that even though a significant number of campus trips (one-third) are made by non-campus residents, who enter through one of the four main gates of campus, most trips (2 out of 3) are made by campus residents, between the areas where students' hostels and staff quarters are located and certain clusters of department buildings and common facilities like the canteen and library. Peak hours are identified in the morning, around lunch and in the afternoon/evening.

The fact that demand is not equally distributed over space or time constitutes a classic dilemma of transport planning, and solutions will often result in either insufficient or excessive capacity. More complex operation schedules with differentiated frequency for different time slots and different routes, and integration of the bicycle-sharing service could help solve this dilemma.

Switching from (private) vehicles running on gasoline or diesel to (public) vehicles running on electricity would reduce both air and noise pollution on campus, which would be good, if for no other reason because it would have a positive effect on students' learning abilities. It would, however, not reduce overall greenhouse gas emissions, if the electricity comes from the national grid because most of the electricity in India is produced by coal, which makes electrical vehicles potentially even more harmful to the global environment than traditional motor vehicles. Therefore, it was hoped that solar panels would be installed on the roofs of the e-vehicles to make them self-sufficient with low emission electricity.

The aim of the E-Mobility project was to make the campus free of polluting vehicles within the next few years.<sup>4</sup> To achieve this, the E-Mobility and the Namma Cycle services would have to be seen as complementary rather than competing services and should ideally be planned and managed by the same entities. This could yield considerable operational benefits and make the services more user-friendly, while expanding reach and increasing connectivity. It could also help solve the capacity dilemma. Bicycles could, for instance, provide an alternative to e-vehicles during peak hours and be used to reach locations that are not served by E-Mobility, while the e-vehicles may be a convenient alternative to the bicycle when it rains or one is feeling lazy.

Surveys indicate that the majority of potential users are willing to pay the proposed fare of Rs 5 per trip, which should be enough to cover operational costs. Capital costs of which the investment in e-vehicles is by far the largest may be (partly) recuperated through sponsoring and income from advertising.

Parking facilities for motor vehicles would have to be constructed at the four main gates of campus, but this would happen in a later phase. In the first phase a single e-vehicle would be operated to test the system and provide user feedback.

The planning of the e-mobility routes would obviously have to be adapted to the existing situation but how these routes were planned would play an important role in how the campus develops in the future as new facilities and activities will probably try to locate close to this service. E-Mobility – if well-planned –

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could therefore not only help make campus “greener”, but also help preserve actual green spaces!

Namma Cycle stations and E-Mobility stops would have to be strategically placed around campus and parking lot should be in the immediate vicinity of the four main gates of campus. E-vehicles should be solar-powered and a pollution-free system for deliveries and garbage collection on campus would have to be invented.

With such an integrated solution, implemented in phases as an ongoing learning process (appropriate for a university!), the IISc campus could become a great example of how to create healthy urban environments for human development! Unfortunately, the plans for E-Mobility, that were developed by the institute’s own experts, have been trashed by the authorities of that same institute.

### Car-free Sector 19

Like Bangalore, Chandigarh used to be called a garden city. It was designed in the early 1950s by a team of Indian and foreign architects headed by Le Corbusier, one of the “fathers” of the modernist movement. The city consists of about 60 sectors, most of which have been planned according to the same principles of organisation: a market street and a green belt perpendicular to each other, dividing the sector into four equally large parts. Commercial activities are located around the market street, while public institutions and facilities are located around the green belt. Dwellings are divided into four subcategories located in each of the four “corners” of the sector and served by secondary streets.

Most sectors also have the same dimension, 800 × 1200 m, which is ideal for walking and cycling, while the “rational” grid of roads between the sectors is ideal for car driving though it would also be ideal for trams or a bus-rapid-transit system. But as it is, the bus system is malfunctioning, cyclists have to navigate some rather dangerous roundabouts, at each intersection of roads, and pedestrians are in many places prevented from crossing between sectors. Thus, with no other viable alternative

to provide transportation between the sectors, cars have proliferated, not only on the grid roads, where they have created congestion, but also within the sectors, where the environment is deteriorating and public space is converted into parking space.

The late Indian architect Aditya Prakash, who had been a member of the original design team for Chandigarh and later became the first principal of Chandigarh College of Architecture, said: “When I was young...we could still use the street for anything that we wanted including sleeping at night. We did not realise while planning urban space that the automobile would be the greatest devastator of a city.”

While Chandigarh was designed in the image of the “modern” European city without much consideration for the qualities of the traditional Indian city, many European cities are now adopting the image of the traditional Indian city that Aditya talked about, i.e., fewer cars and more human activities. And, maybe that is one of the great tragedies of our time, that despite all the means and opportunities, we are not very good at learning from each other – one way or the other.

I was invited to Chandigarh in October 2010 to give the Le Corbusier Memorial Lecture and decided to stay for six months teaching at the Chandigarh College of Architecture and working with

the students on some proposals for the new master plan of the city.<sup>5</sup> One of these proposals was to make Sector 19 car-free. Sector 19 was one of the first sectors to be developed and it was chosen because of its generic layout that would make the solutions developed here easily applicable to other sectors.

The idea was quite simple. The sector has four entrance points and we proposed to construct parking lots at each of these, two above the ground and two below the ground. Because the entrance points are diametrically located, two at either end of the market street and two at either end of the green belt, the maximum walking distance from the parking lot to the home would be about 300 m. For transportation of physically disabled people, deliveries, garbage collection, etc, we proposed to have a mix of cycle rickshaws and solar-powered rickshaws.

We also proposed to make bicycle lanes in the market street and through the green belt. These lanes would connect to the four entrance points, where there would be safe crossings for pedestrians and bicycles to the market street or the green belt of the next sector. The crossings would be equipped with traffic lights that would also make it possible to control traffic in the notoriously chaotic roundabouts (400 or 600 m away). At the crossings, there could be stops for trams or rapid buses, where people could conveniently get on and off.

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By removing all cars from the sector, a lot of space is liberated. It is estimated that about 25% of the total surface area of the sector is currently used by cars, either for driving or parking, and much of it is covered with asphalt. All of this asphalt, which contributes significantly to the overheating of the city, could be removed, and instead, eco-friendly pathways for pedestrians, bicycles, cycle- and solar-powered rickshaws could be constructed. These would be much narrower though, still providing sufficient space for emergency vehicles.

The liberated space could be used for communal activities, such as playgrounds, sports fields and community kitchen gardens. Some of it could also be used to accommodate the people who work in the sector but live in villages, slum areas and rehabilitation colonies on the outskirts of the city. If the car is not parked in front of the house, but a few hundred metres away in a parking lot, much more shopping, in fact, many more activities, would take place locally. This would help reinvigorate the decaying market street, which could be made much more bazaar-like. In fact, a lot of space, which is currently used for parking in the market street, could be leased out to commercial activities and this could pay for the new parking facilities at the four entrance points of the sector.

Our proposal to make Sector 19 car-free would, undoubtedly, be met with opposition from some citizens, perhaps not so much because they would have to walk a bit more, but because they would “lose” an important, perhaps *the* most important, status symbol. Or, as one of the students put it: “If the car is no longer parked in front of your house, why have a car at all?”

We submitted the proposal to the Master Plan Commission in December 2010, and then nothing happened. At least not until September 2011, when the High Court of Punjab and Haryana, while hearing a petition to introduce so-called eco-cabs and discussing the issues of traffic congestion and pollution in the city, directed the administration to declare one of its sectors vehicle-free as a test, suggesting that it could be Sector 17.<sup>6</sup> This is the commercial centre of the

city, and may therefore be the most obvious to start with as there are many successful examples of making shopping areas car-free from around the world, including, of course, the traditional north Indian bazaar. But because the organisational principle of this sector differs from that of all the other sectors, it may be difficult to use solutions from here in other sectors.

However, in a strange act of rebellion, the administration in March 2012 decided to chop down 60 grand old trees in Sector 17 to facilitate the construction of an overpass for motor transport in the middle of the sector!<sup>7</sup> This came only days after the same administration had told the high court that it had decided to make Sector 17 a vehicle-free zone – in phases (!) – and asked for more time to prepare plans for this.<sup>8</sup> Then in July 2012, the administration told the high court that it will not be feasible to convert Sector 17 into a vehicle-free zone.<sup>9</sup> A year later, in July 2013, a draft for the new master plan of Chandigarh 2031 was released. It does not make a single mention about making Sector 17 – or any other sector for that matter – car-free. Though it does adapt our idea of having bicycle lanes through the green belts, but not across through the market streets, so cyclists will, presumably, only travel straight forward.<sup>10</sup> As for Sector 19, the municipal corporation decided to construct a small jogging path in the park there.<sup>11</sup>

### Conclusions

The distinguished British architect Lord Rogers recently predicted that: “There will be a widespread ban on cars in London within the next 20 years”.<sup>12</sup> Over the past hundred years, more and more cars have been added to the streets of European cities, but because it has happened over such a relatively long span of time, drivers, planners and authorities have had time to adapt and adjust.

In contrast to this, many Chinese cities have witnessed explosive growth of private motorised transportation over a much shorter period of time, which has forced authorities to react in a kind of emergency. Thus, a growing number of Chinese cities are now

introducing a vehicles quota “as public anger grows over worsening congestion and air pollution”.<sup>13</sup>

Regardless of the different political systems, in both Europe and China, it is concerned citizens, activists and experts who push the authorities to act. In many Indian cities, private motorised transportation is growing even faster than in China and the problems are in no way less severe. Several initiatives are being taken to revert this trend, but in too many cases they are met with resistance rather than with support from relevant authorities.

As the cases here demonstrate, activists and experts, even high court judges, cannot change the situation if the authorities do not want to play ball. The lessons from both the East and the West are that citizens have to actively push the authorities to act. For citizens to react, however, against something that most of them see as an important symbol of status, they have to understand the gravity and the urgency of the problem, what the alternatives are and how they may be implemented. In that respect, what activists, experts and others are doing is extremely important, even if the immediate effects seem limited.

### NOTES

- 1 <http://henrikvaleur.wordpress.com/2013/03/26/the-horrendous-costs-of-motorized-transportation-in-indian-cities/>
- 2 <http://www.nammacycle.in/>
- 3 <http://thealternative.in/environment/nammacycle-hop-on-hop-off-when-need-to/>
- 4 *IISc E-Mobility Project: Preliminary Service & Operations Plan*; CiSTUP and EMBARQ; 2012.
- 5 <http://henrikvaleur.wordpress.com/2012/02/19/chandigarh-an-indian-adventure/>
- 6 [http://articles.timesofindia.indiatimes.com/2011-09-24/chandigarh/30197843\\_1\\_vehicle-free-ut-bench](http://articles.timesofindia.indiatimes.com/2011-09-24/chandigarh/30197843_1_vehicle-free-ut-bench)
- 7 <http://www.dailypostindia.com/news/14219-ut-admn-punishes-activists-for-preventing-tree-felling-in-sec-17.html> (11 March 2012).
- 8 <http://m.indianexpress.com/news/%22ut-to-make-sector-17-vehiclefree%22/921535/> (8 March 2012).
- 9 <http://m.indianexpress.com/news/%22not-feasible-to-turn-sector-17-into-vehiclefree-zone-ut-to-hc%22/971310/> (7 July 2012).
- 10 [http://chandigarh.gov.in/cmp\\_2031.htm](http://chandigarh.gov.in/cmp_2031.htm)
- 11 <http://timesofindia.indiatimes.com/city/chandigarh/Sector-19-to-get-jogging-track-soon/articleshow/19762205.cms>
- 12 <http://www.thetimes.co.uk/tto/public/cycle-safety/article3816510.ece>
- 13 <http://www.bloomberg.com/news/2013-07-10/china-to-widen-car-purchase-curbs-to-fight-pollution-group-says.html>