Draft Parking Management Strategy: Case of Kakinada

Implemented by

I·C·L·E·I
Local Governments
for Sustainability

Supported by

SHAKTI
SUSTAINABLE ENERGY
FOUNDATION

In Association with

SGArchitects

City Partner

Table of Contents

List of Figures

Introduction

Kakinada is in the north-eastern part of Andhra Pradesh. Listed as the 7th most populous city in the state with an urban agglomeration population of 325,985 (2011 Census), Kakinada shows a low decadal growth rate of 5.37 %[1]. The municipal area is spread over 31.69 sq. km while the urban agglomeration occupies 57.3 sq. km. Kakinada was one of the 109 cities selected for the Smart City Mission introduced by the Ministry of Urban Development in 2015. In 2016, Kakinada was selected as one of the first 20 smart cities from all over India.

The report highlights the summary of parking management strategy and an action plan developed for a pilot stretch in the Commercial Business District (CBD) area of Kakinada to deal with the problem of choked streets, junctions and informal activities. Based on the success of the pilot initiative, the strategy can be scaled up at city level.

Although the CBD of Kakinda has some marked parking locations, parking remains largely unregulated and poorly managed for most of the city. Most of the parking is done on street edges at will and no charges or even fines are collected for occupying road space.

The city at present does not have any organised public transport system. Most of the citizens use personal vehicles (mostly cars and motor bikes) or auto rickshaws to commute. As the city (with low density) expands laterally, commuting distances increase and citizens become more dependent on personal vehicles for their mobility needs.

The city is desirous of developing a public transport system in the long term and while that intention is welcome, the private vehicles already owned by the citizens will remain in use till their operating life and provisions will need to be made for them.

To tackle the growing congestion leading to unorganised and unregulated encroachment by parking on the road space, Kakinada proposed tackling the parking problem as one of the mobility interventions under the Smart City Proposal (SCP). The city, in its SCP, lists a multi-level car parking, an off-street parking lot and implementation of smart parking system at three locations. The project team comprising of ICLEI - Local Governments for Sustainability, South Asia, in association with SGA architects reviewed the SCP and recommended the need for developing a city level parking management plan consisting of a strategy document as well as a longer-term policy to guide the implementation of these individual projects and inform future scale up steps.

In conjunction with the city team, it was decided that the project team will review a selected area of the city and develop area level recommendations that can form the basis for developing a citywide parking management plan.

Identified Area for Detailed Analysis

Through the review of city-level documented data and conducting interviews of Municipal officials and traffic police officials, it was understood that the CBD area consisting of cinema road, main road and Temple Street would be ideal for this initial analysis. The three road stretches along CBD houses – majorly high end commercial activities – and witness a large proportion of traffic all day.

---

1. Census of India, 2011

Keeping in mind the expected demand for parking, two off-street parking projects have also been identified in the area that houses institutional complexes like police station, town hall, hospitals as well as few cinema halls and hotels. The main road also houses various shops selling clothes, household items, groceries and the Temple Street, as the name suggests, houses many temples, jewellery and cutlery shops.

Based on the discussions and on-ground situation analysis, the project team decided to take up these three roads for detailed study with the aim of developing a pilot parking management plan for this area which would help in developing a parking strategy for the entire city (Refer figure 1). The selected area covers the following three roads in the central business district of Kakinada:

- Main road – from Town Police Station II to Jaganathapuram Flyover
- Cinema Road – from Santhacheruvu to flyover approach
- Temple street – from Mahindra Complex (before Rice Mill) to Sivalayam Junction

Since there is no significant parking demand on a stretch from TTD junction to the Nookalamma temple junction, this stretch is not considered in the selected area.
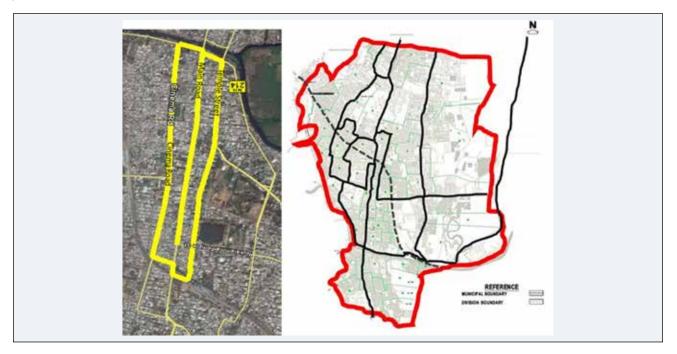

Figure 1.: Map Showing the Central Business District Area

The three roads of the selected area are connected through narrow sub arterial roads which have two-way traffic. Due to the commercial nature of CBD area, major traffic is witnessed during evening hours and these sub arterials connecting roads get clogged due to parked vehicles as well as vehicles attempting to move from one major road to another. The parking often spills over to the carriageway of the roads, thus worsening the situation.

The project team reviewed secondary information to document the existing situation, along with primary data collection through photo documentation, day-long activity surveys and questionnaire-based user surveys. The user surveys were carried out for three days on each road to understand the activities that have an impact on the road in the selected area. The Main Road has the major parking demand due to commercial land-use along the road. The ROW of Main road varies between 18m-24m. Many unorganised street vending activities along the main road also encroach the road space, thus leading to congestion. The ROW for other two roads i.e. Cinema Road and Temple Street varies between 12- 20 m.

Figure 2.: On Street Parking of Cars and Two Wheelers in the Peak Hours on Main Road

Cinema road is named so due to the many theatres present there. The road is one way until Kalpana Centre and thereafter merges with two-way traffic. Additional land users on this road section are restaurants and vehicular service centres. Vendors, primarilly selling food items during the evening peak hours, are also seen along the road. The road has direct access to Santhachervu Market where congestion is observed during morning peak hours. The ROW for Cinema road varies from 12m-18m.

Street vending activities in the narrow road of Temple Street add to the difficulty in movement of traffic. The street observes major vehicle movement, with expected on street parking along temple locations at specific times. The street has uniform 1m ROW, with traffic movement in a south to north direction. As the ROW is comparatively lower than the main road, most of the parking of Temple Street is done on the main road, thus exerting parking pressure on the main road. Being one of the oldest streets in the city, it houses important temples. It also acts as a commercial street with jewellery shops and local vending activities include sale of flowers, fruits, coconuts and eateries. The street witnesses most traffic of temple goers in early hours of day and evening but the local vending activities, parked vehicles, together with numerous sub arterial road linkages, do not allow for easy movement. Ironically, for a street where many temples are situated, one observes no pedestrian infrastructure along its length.

Figure 3.: Temple Street Showing the Absence of Pedestrian Infrastructure

Survey Methodology

To analyse the existing scenario of parking in the selected area more objectively, it was necessary to conduct surveys. Two types of surveys were carried out for all the three roads to understand the existing demand. These are:

1. **Activity survey** was carried out to understand the existence of Pedestrian infrastructure, usage of road space by different users. The survey also helped to understand that it is necessary to provide spaces for unorganised activities. Along with this, a traffic volume count survey was carried out in both peak and non-peak hours to calculate the parking demand.
2. **User survey** on a sample of 400 users was carried out to understand the travelling behaviour and purpose of travel to the market. This also included willingness to pay for future pricing of parking for the city.

Pressure for Parking Places

On street parking pressure, has become compelling in the CBD area. Presently, the main road has 880 marked designated locations with 558 spots for two wheeler parking and 326 for car parking on one side of the road. Additionally, a designated parking space is given on the opposite side of the road which can accommodate upto 800 two wheelers on-street. About 2600 vehicles are daily parked during the evening peak hours on the main road. Cars are mostly parked on the left-hand side of the road and the other side of the road is majorly occupied by two wheelers and street vendors. This on street parking is free and enforcement is absent throughout the city, leading to unorganised and unregulated parking. The type of vehicle that is parked depends on land utilization. While one observes two wheelers are parked on all three roads, four wheelers are mostly confined to the main road and cinema road, due to wider ROW.

During the evening peak, on-street parking stretches throughout the main road commercial area from town police station-II to the Jaganathapuram flyover. About 40-50 percent of the road stretch is covered with parking during evening peak. Although the number of available parking lots is large (1600), enforcement and management is needed.

Figure 4.: On Street Parking at Masjid Centre with no Safety for Bicycle Users (Main Road)

Survey Results

Where do People Come from and How Do They Commute?

Majority of the car users come from the suburbs of Kakinada, and the average parking duration was 45 minutes within the study area. The analysis for the user survey shows that due to high car parking demand during evening peak hours, the car users tend to walk up to 800m from the parking location. Due to poor regulation, most of the car parking spaces are pre-occupied by two wheelers in the evening peak hours.

Parking Duration

Response analysis of activity survey and user survey showed that four wheelers tend to occupy the parking lots for more than one hour and during peak hours it is difficult to find a car parking space on the main road. Surveys at Temple Street highlighted that all the two wheelers are being parked for an average of 40 minutes in the available spaces, whereas most four wheelers tend to park in the adjacent sub arterial roads connecting the Temple Street. On the Main Road, the parking duration for two wheelers is 50 minutes whereas for the four wheelers it is one hour, with most of them parked in the available marked spaces.

Parking at Cinema Road stretch is low, compared to the other two roads. However, as the road is partially one way, major potential of parking is observed near the Santhacheruvu market location during evening peak hours. Two wheelers tend to park their vehicle for 40 minutes on an average during evening peak hours.
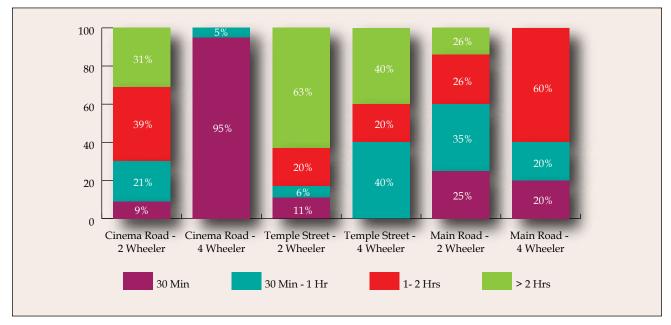

Figure 5.: Parking Duration in the Study Area - Kakinada

On Street Parking Trend

An analysis was conducted to document on street parking demand in the selected area and understand the duration of parking, parking pattern and vehicle composition. The output of this demand survey of on-street parking is provided below (refer Figure 6). While maximum congestion and floating traffic was observed on the main road, the hourly variation of parking was analysed to understand the hourly parking demand in the city. It is observed that maximum number of vehicles are being parked during the evening peak.
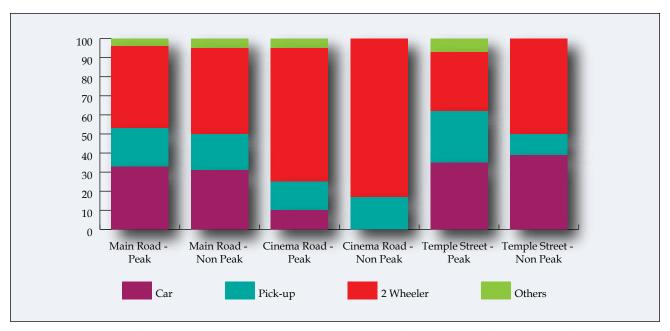
Figure 6.: Parking Composition in the Study Area in Peak and Non-peak Hours - Kakinada

About 2200 two wheelers and 400 four wheelers are being parked on street during the evening peak at the Main Road. The above comparative graph (Figure 7) shows parking load being the least at Temple Street.
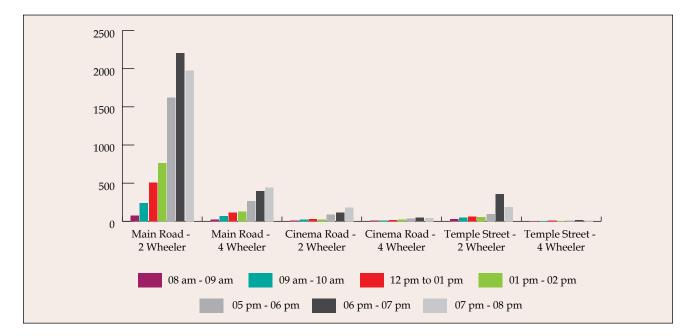

Figure 7.: Hourly Variation of Parking in the Study Area

Willingness to Pay

The following graph (Figure 8) shows that the respondents are willing to pay about Rs. 5-10 per hour respectively for two wheelers and four wheelers. Being the commercial hub in the city attracting many privately owned vehicles from the surrounding suburbs of Kakinada, major concern shown by vehicle owners were assured space and security. The owners were agreeable to pay more for supervision of the vehicle and showed willingness to walk more than 800m from the parking destination as they were currently doing.
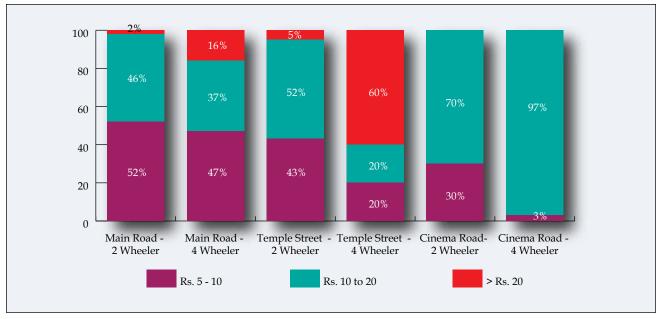
Figure 8.: Willing to Pay Per Hour in the Study Area

Even though cinema road attracts comparatively lesser parking demand, the respondents showed willingness to pay between Rs. 10-20 per hour due to the nature of land uses along the road stretch. Temple Street being religious hub and centre for jewellery shops in the city, attracts all type of vehicle users. Survey results show that parking demand in this stretch is as equal to that of main road. Currently most car users tend to park in the adjacent sub-arterial roads and over sixty per cent are willing to pay over Rs. 20 per hour for safe and organised parking.

Overall majority of the two-wheeler commuters agreed to pay between Rs. 5- 10 per hour and car users agreed to pay over Rs. 10. The common concern observed across all respondents was security.

Parking Strategy for the Area Analyzed

Parking strategy for the selected area was developed considering the short term and long term demands of the city. The major agenda of developing the strategy was to integrate the on-street parking management with the off-street parking in the city and to introduce pricing strategy that helps to generate revenue for maintenance and development of parking infrastructure in future.

The aim of this parking strategy is "To provide easily accessible, regulated, paid parking slots on streets and promote park and ride system, enabling free flow of traffic towards improving the economy of the city."

To support the above aim, a strategy with a set of goals was developed. These goals were further categorised as short term and long term goals.

Short Term Goals
1. On-street, paid parking
2. On-street parking management and enforcement

Long Term Goals
1. Development of an off-street parking lot
2. Introduce park and ride system

3. Introduce zone-based parking pricing
4. To handover the monitoring and maintenance of on street and off street parking to third party

The Kakinada Municipal Corporation aims to implement a modern Parking System to improve parking operations, optimize usage of the available parking supply, and enhance the overall functioning of streets in the city. The new Parking System will employ an Information Technology (IT) backbone to facilitate greater transparency and efficiency in the collection of parking fees and enforcement operations.

A draft smart parking management Request for Proposal (RFP) document submitted by a third-party consultant was shared with ICLEI-SA for reviewing and included the necessary additional information. The document covered the procedure of smart parking management, including collection, through a real time mobile based application in the city. The document only proposed to implement the smart parking measure in the selected locations (YSR Flyover Vents, Main road from town police station to Jaganathapuram flyover and under the vents of Mallupudi Sri Rama Sanjeeva Rao Varidhi). ICLEI-SA project team provided inputs on the parking management RFP, suggesting the requirement to develop it under a citywide management plan for the entire city, rather than focusing on designated areas.

Development of Off Street Parking

As a part of the SCP, the municipal corporation has finalised the location for off-street parking in the city (see Figure 9). Multi-level car parking has been finalised at Santhacheruvu (Figure 9, showing blue shaded region-1) and on ground off street parking at MC Lauren high school (Figure 9, showing the blue shaded region -2). The distance of both the locations from the CBD area is 500 m. Currently, the city officials are planning to open the on ground off street parking location in the peak hours to curb the parking load in the commercial locations. Details of capacity of the ground which can accommodate is provided below:

● Total area designated for parking space: 24,281 sq.m
● Total capacity of the parking area: 2,428 cars and 12,148 two wheelers

Pricing Strategy

The pricing strategy was recommended considering the overall parking scenario of the city. User survey shows that both two-wheeler as well as four-wheeler users are willing to pay between Rs. 5-10 per hour. A pilot enforcement plan will be initiated in the three selected locations initially and based on observed outcomes, will be implemented in other areas of the city which have a high demand about parking facilities. It is observed that major composition of parking in the study area is comprised of two wheelers, most of the two-wheeler parking duration is between 40 minutes to one hour. The recommended strategy was to encourage short term parking on street and encourage the long-term parking to shift to the nearest off street parking lots. The parking pricing strategy proposed for the city is as following as shown in Table 1:

Table 1.: Pricing Strategy Proposed for the Study Area

S. No.	Type of Vehicle	Duration	Price ₹
1.	Two-wheeler	1st 30 min	-
		30 min - 60 min	Rs.5
		60 min - 120 min	Rs.10
		> 120 min	Rs.20

S. No.	Type of Vehicle	Duration	Price ₹
2.	Four-Wheeler	1st 30 min	-
		30 min - 60 min	Rs.10
		60 min - 120 min	Rs.15
		> 120 min	Rs.25

Way Forward

Congestion in the selected demonstration area has already reached high levels. If the business as usual continues, the situation will worsen further, leading to greater chaos. Making cosmetic and partial changes will not help. The pricing strategy can be implemented and ICLEI-SA has developed a parking management time line for implementing multi-level car parking and parking regulations.
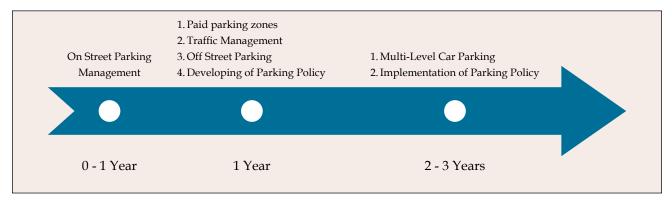

Figure 9.: Kakinada Parking Management Strategy

ICLEI-SA will be providing a detailed parking management plan for the selected area in the next phase of the project. The overall strategy is to introduce parking pricing for on-street parking and then regulate the parking towards off-street parking locations (Refer Figure 10). The parking areas need to be well regulated with different parking pricing strategies for both on-street and off-street parking locations.