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Analyzing the parking demand characteristics in cultural activity-oriented city

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Retraction

Retraction: Analyzing the parking demand characteristics in cultural activity-oriented city (*IOP Conf. Ser.: Mater. Sci. Eng.* **1145 012060)**

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[1] Cabanac G, Labbé C and Magazinov A 2021 arXiv:[2107.06751v1](#)

Retraction published: 23 February 2022



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Analyzing the parking demand characteristics in cultural activity-oriented city

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Abstract. Transportation sector is a backbone for the economic development of any country. The urbanization rapidly increasing and it's a challenge for the city planners to look into. The United Nations has projected that 67% of the global population lives in urban areas by 2050 compared to 50% in 2010 and a mere 10%-15% in the early 19th century. The factors for urban growth are the migration of the people from the rural areas to urban areas in search of jobs in industries, tourism, services, physical infrastructure facilities etc. Explosive urban growth leads to haphazard expansion of the city. The volume of motorized traffic is increasing in India which is expected to cross 130,000 billion passenger km and has potential in creating energy demand and carbon emissions from transport sector by 2050. The deceleration and acceleration of vehicle in the central business district causes emission and discomfort to the commuters. The width of the road is being occupied by the off-street parking of vehicle results in deceleration and acceleration of vehicle by the commuters which causes more congestion and delay along with emission in the temple city. Our study is to analyze the pattern of demand that arises in traffic dense area of Madurai to park the vehicles without causing any hindrance to the commuters travel in the road.

Key words: Infrastructures, Parking duration, Onsite parking, Offsite parking, Central business district

1. Introduction

The study area is located in the TamilNandu which is popularly known for its cultural heritage. The city has frequent tourism and that causes more commuters to enter into city. Here this plays a major challenge for the traffic designers to make to road efficient for both internal and external commuters and thus parking demand management is needed to be addressed. Figure 1 shows the Study Area – Madurai.



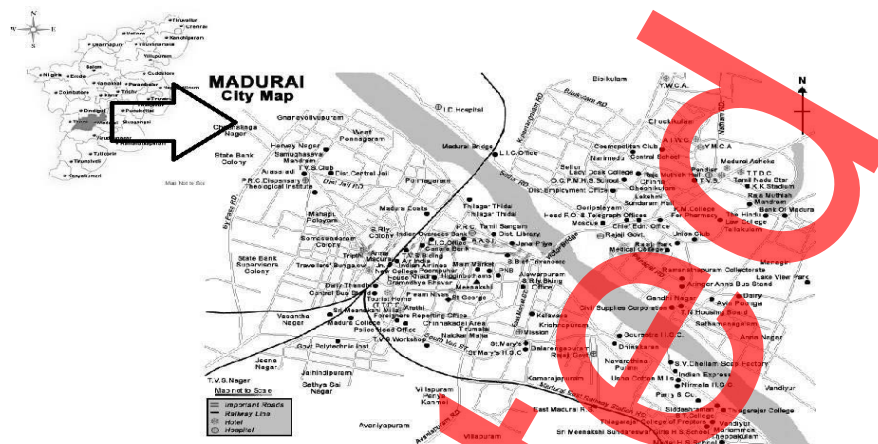


Figure 1. Study Area – Madurai

Travelling pattern of the commuters involves business, trade, education, tourism and that makes more vehicular inventory into the city.[2] The traffic flow towards the city is expected to cross more than 5 lakhs/ Traffic and transport system in Madurai day[14].

2. Traffic and transport system in Madurai

As the population of the city is increasing day by day in the banks of watercourse Vaigai and it's been a significant settlement for 2 millennia and is one among the oldest continuously occupied cities at intervals the earth. The prevailing street network in Madurai consists of vast roads, sub-arterial roads and native streets. [3-4] The whole length of highways, has totally different major roads in is concerning 532 km. However, most of the roads are slender and their geometrics and surface conditions aren't wonderful. Lane discipline of traffic seldom is that the norm [1]. Intersections are closely spaced and aren't properly designed. Vehicles of various size, shape and maneuverability share an equivalent right of way [5]. The non-observance of the lane concept and movement of quite one sort of vehicle through one lane may be a common phenomenon.

3. Core Business District

Whereas boulevards of the district must provide the basic elements like expansive range of properties, space for the interruption of vehicles each quick- and slow vehicles on a large scale. The movement of vehicle in the district determined based on the economic development that happens in the city. Hence, the facility system that the planners providing must meet the future demand or growth of the city. [6]. The number of vehicles especially two wheeler registration in the city crossed more than 6 lakhs and this further requires space for parking.[15] The parking survey was conducted in eighteen road extends and recognized the demand for parking in and around the Meenakshi amman temple.[11] The road systems encompassing the Meenakshi capital of Jordan sanctuary, to be specific Avani Moola Road, Masi Boulevards, Marat boulevards, Cloak boulevards, web hajji street, city passageway street. Stopping of vehicles posture a real risk to the street and road users particularly inside the core business district.[7-10]. Figure 2 shows the Core Business Districts of the study area



Figure 2. Core Business Districts of the study area

4. Methodology

The methodology adopted for the study was highlighted in the Figure 3.

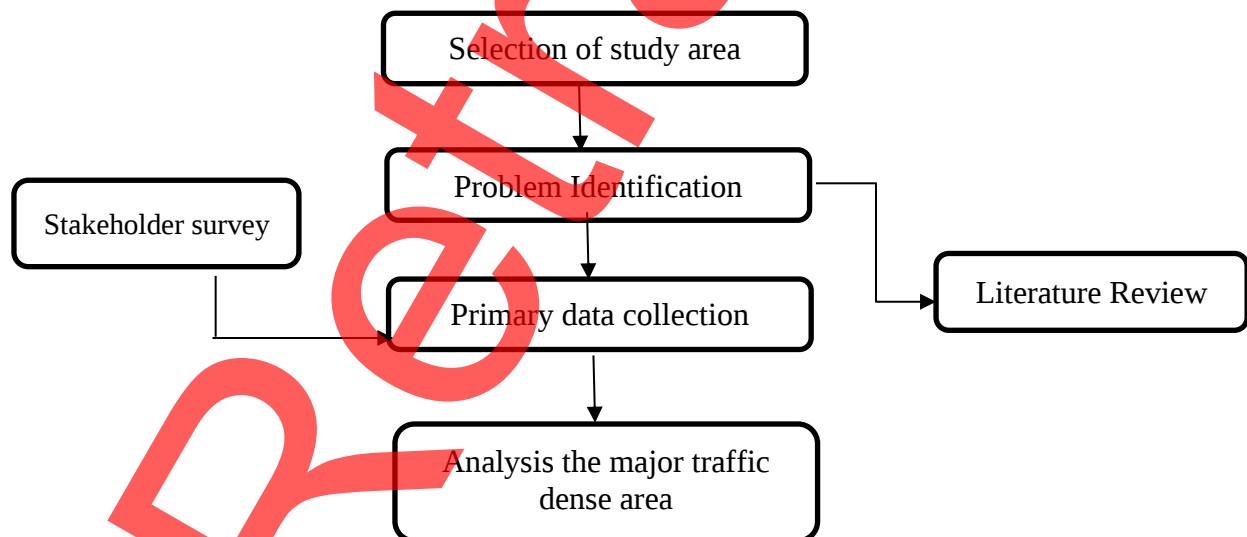


Figure 3. Methodology

5. Study area data collection

Stopping study was administrated to produce information on stopping request, degree of utilization of stopping workplace and accessibility of stopping house.[13-15] inside the show have faith in, stopping study at twenty one extends was conducted to survey stopping request characteristics in terms of stopping assortment, stopping term and composition of stopped vehicles. [12] Stopping study was

made on Veli roads, Marrat Road, Masi roads, Avani Moola roads, city lobby street, Nethaji street, Scott street, Chithirai lanes, Muni salai road, Amman sannathi of madurai, Kamarajar Road of madurai and Royal residence street[7]. Figure 4 shows the Roads identified for the study



Figure 4. Roads identified for the study

6. Parked Vehicle characteristics

Vehicle peak hour halting assortment, structure of halted vehicle land length along with various road of the

zones are showed up in taking after zone.[16] [17]

6.1 Veli street

The traffic density in the veli street form the uttermost ring within the city zone is analyzed. The vehicles on the path of veli is 785 overwhelming on East Veli Road. This tends to increase the peak halting accumulating shifts on hundred thirty-five vehicles at North Veli Road (Sakthi Sivam Intersection to Narasus espresso). The height hour timeframe for creating a visit and large happens between 10:00 – 19:00 hrs which can be seen in Figure 5 appears in the foremost limit halting gathering at varied territories within the casing of a bar chart below.

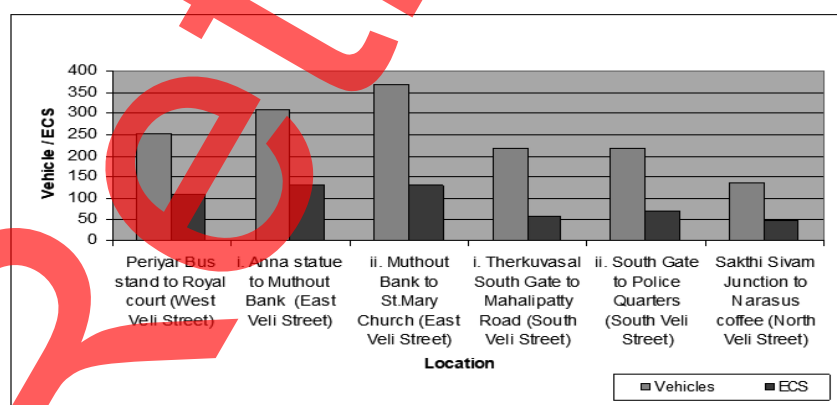


Figure 5. Parking accumulation of Veli Street at four main streets

6.1.1 Composition of parked vehicles

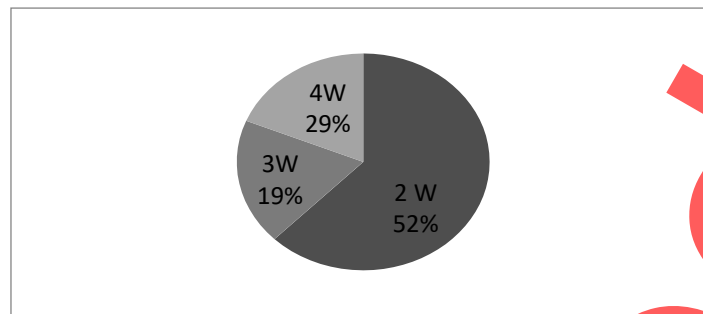


Figure 6. Vehicle composition from bus depot at periyar to royal court

Generally, bike represents a suggestion moving from 52% at periyar transport stay to imperial court reach out on West Veli street of Madurai. Other vehicles were less halted at periyar compared to 2-wheeler. Figure 6 shows the Vehicle composition from bus depot at periyar to royal court

6.1.2 Parking duration

The ordinary halting term for bicycles is 25 min. at bus depot in periyar to imperial through west veli road in 95 min. The parking duration from south door of theruvasal and mahalipatty street through south veli road of madurai is recorded as 61 min.

6.2 Marret street

Marret roads is the second largest network territory of the core district area. Comparing to south, East Marret Street of Madurai has a huge demand in parking. It tends to be seen that pinnacle effort assortment fluctuates between 506 vehicles (from divinity exchanges – Yanikal intersection) to Kamarajar increases. The peak hour timeframe of stopping by happens between 12:30 – 13.00. Figure 7 shows the most effective stopping aggregation at utterly completely different areas as a bar graph.

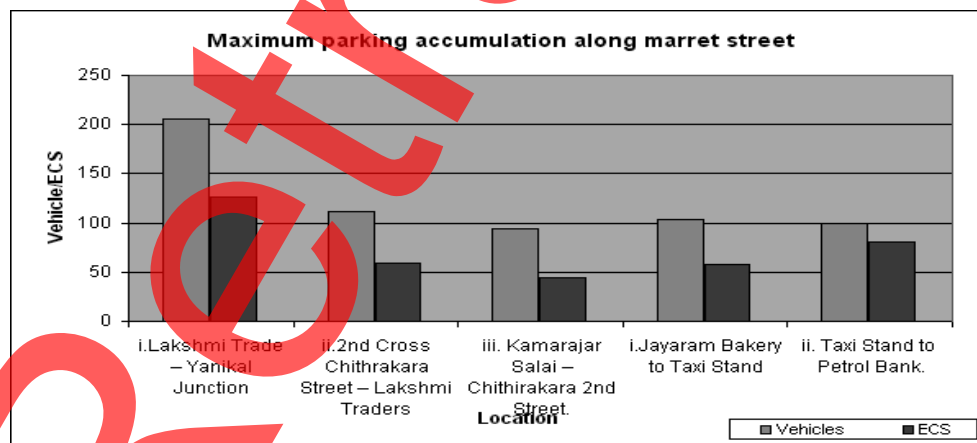


Figure 7. Accumulation of parking at Streets of Marret Street

6.2.1 Vehicle parking composition

The parked 2 wheeler from taxi stand to petrol bank road is recorded as 55 % along the street of west marret to Kamarajar– Chithirakara second Street of East Marret Street. Most distinguished vehicles recorded from Jayaram store to taxi stand road is 40 %, whereas 20 % on West Marret Street of madurai. Figure 8 shows the Vehicle composition from taxi stand to petrol bank

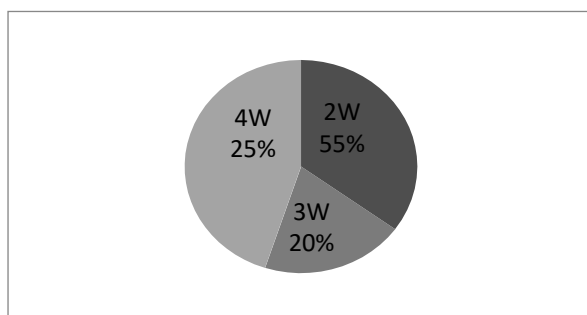


Figure 8. Vehicle composition from taxi stand to petrol bank

6.2.2 Parking duration

The normal stopping length for bikes changes from fifty-two min. in jayaram shop to taxi stand located nearby Street west marret and 70 min. from Hindu deity trades – Yanikal Junction nearby street of east marret. Also, vehicles from second Cross Chithrakara Street – Hindu deity trades nearby street of east marret is recorded as 112 min. Figure 7 recommends the stopping length attributes through unique areas.

6.3 Masi Street

The road of masi shapes the subsequent street of marret tends to be seen that primarily aggregation is on veeraiya perumal kovil of South Masi road adding up 400 vehicles and hour angles from most extreme leaving collection along the South Masi to arya bhavan with 257 vehicles. The Figure 9 gives the subtleties of most extreme stopping aggregation along Masi roads. The pinnacle hour time span for stopping has been changing for the distinctive Masi roads, in view of the kind of movement engaged with those stretches.

6.3.1 Composition of parked vehicle

The piece accomplishes most limit rate (100%) for bicycles in City earthenware to arasamaram pillaiyar kovil road of masi north Street with its least (52%) on om muruga sarees street to amman sanathi corner along Masi east Street.

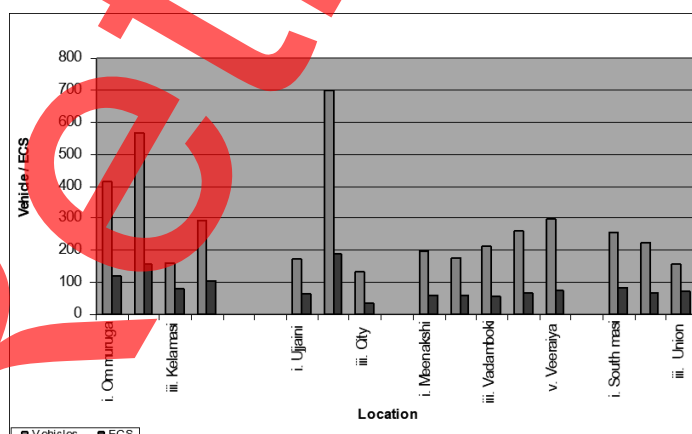


Figure 9. Accumulation of parking at Masi Street

Three wheelers have more degree of around 1% - 9% resulting congestion in Masi Streets. The figure 9 shows the plan of left vehicles along Masi streets.

6.3.2 Parking duration

The ordinary preventing term for bicycles contrasts from 52 min. at City Ceramics - arasamaram

pillaiyar kovil. Figure 10 shows the Composition of vehicles-melakopuravasal to junction

6.4 Avani moola road

The Avani Moola Street offers organization to the CBD district, near Masi Street. It will in general be seen that apex leaving assortment changes of convergence in Avani Mola veethi to three hundred fifty-seven vehicles at amman sannathi to jadamuni kovil road along Avani east Mola veethi. Figure 11 gives the nuances of most noteworthy halting social affair along Avani Moola Streets from 10:00 – 19:00.

6.4.1 Composition of parked vehicles

Overall bicycle addresses an offer moving from seventy five percent at melakopuravasal to crossing point (North and West Avani Moola Veethi) along West Avani Moola road of 58% at M.M.S Jewelry. Most limit vehicles are 3 wheelers in melakopuravasal to convergence (North and West Avani Moola Veethi) Avani Moola street. Figure 11 shows the design of left vehicles along Avani Moola street.

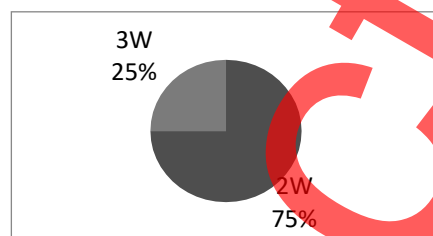


Figure 10. Composition of vehicles-melakopuravasal to junction

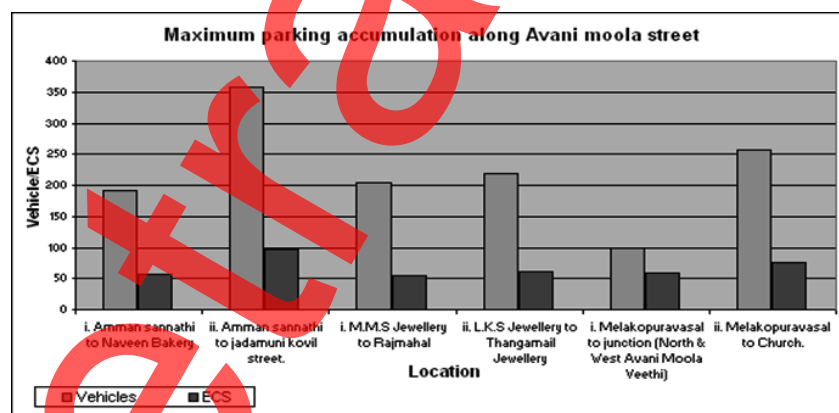


Figure 11. Maximum parking accumulation at Avani moola Street

6.4.2 Parking duration

The normal stopping term for bikes differs from 60 min. at M.M.S Jewelry - Avani plectognath fish Veethi at 154 min. departure span for vehicles changes from thirty one min. Avani plectognath fish Veethi to 109 min. and Amman sannathi - Jadamuni Kovil Street to East Avani Mola Veethi. Figure 11 shows the stopping span qualities across various areas.

6.5 Scott road traffic

Streets located in chithirai shapes the prompt of sanctuary zone. The street associated with Veli Street to Tamil Sangam Road of Madurai with 13 subtleties of greatest stopping aggregation on government building street, Nethaji street, Scott street and South Chithirai Street. The head hour time span for stopping by happens between 11:00 – 11:30 hrs as shown in figure 12, the most extreme stopping collection at different areas indicated as a bar outline.

6.5.1 Composition of left vehicles

All around bicycle addresses a proposal as high as ninety-four at Meenakshi Bazaar to Tamil Sangam stretch Scott Road to seventy-four at Police quarters (South East) to Archana's outlets (South West) stretch South Chithirai Street of madurai city. Most limit vehicles (21%) area unit found on Police quarters (South East) to Archana's outlets (South West) stretch South Chithirai Street whereas car trucks (8%) were left at Arya Bhavan to YMCA advanced stretch Nethaji Road of madurai and veli west street (Railway station) to West masi street (Sharp electronic) stretch government building road. Figure 12 shows the piece of left vehicles on government building road of madurai city.

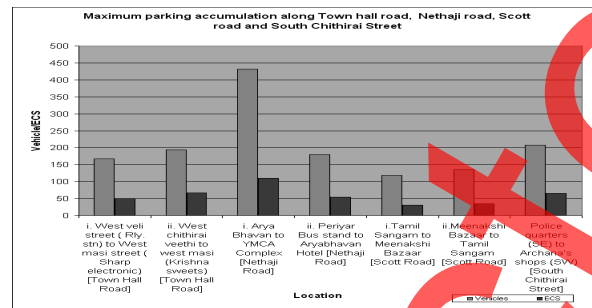


Figure 12. Maximum stopping aggregation at different areas along Town corridor street, Nethaji street, Scott street and South Chithirai Street

6.5.2 Parking duration

The furthest points in stopping span for bikes recorded as 90 mins and 50 mins for 3 wheelers. The length of the vehicles shifts from thirty to seventy-six min at Nethaji street. each the furthest points of high and low stopping term area unit seen in Nethaji Road of madurai city. Figure 12 shows the stopping term attributes across various areas.

6.6 Muni Salai

The study has been experimentally observed and recorded in Kamarajar road which has been shown in figure 13 which provides the subtleties of most extreme stopping aggregation on Munisalai road, Palace street, national capital sanathi and Kamarajar road. The top hour period for stopping by and large accumulation happens in the early evening time.

6.6.1 Composition of left vehicles

The accumulation of vehicle especially 2 wheelers around 36% happens in the Kamarajar road whereas 4 wheelers are dominating at Munisalai Road with 200 and above. The Figure 13 shows the arrangement of left vehicles on Muni incense tree, Amman sanathi, Kamarajar salai and Palace street.

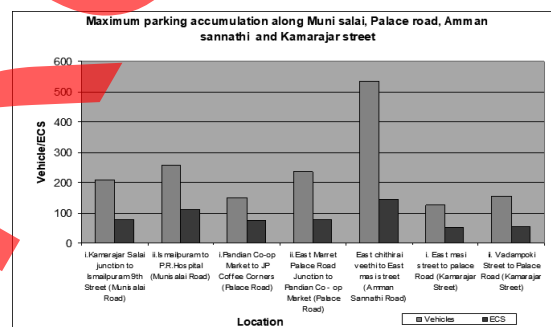


Figure 13. Maximum parking accumulation in Palace road, Amman sanathi

6.6.2 Parking duration

Average on -street parking made by two wheelers is recorded as fifty-nine min in palace road to 166 min. in capital of Jordan Sannathi Road. The road capacity is not sufficient for the cars parked more than 50 min. in Palace Road and 45 min. in Kamarajar road. Three wheelers from twenty-six min in Munisalai to eighty-four min. in capital of Jordan Sannathi Road as shown in Figure 13

7. Vehicle Off Street Parking facilities

7.1 Railway Station

The marked area is around 470 sqm which has no road marking but operated by public vehicles. The peak hour of traffic occurs from morning 10 to evening 10. The major commuters in these roads are two wheeler and four wheeler.

7.2 Central Market area

The marked points in the figure 14 gives an information about the parking facility needed in order to reduce the occupancy of vehicles in the commuting road.



Figure 14. Off street parking facilities inside CBD area

8. Conclusion

The examination expresses that all streets enveloping the asylum are being used for halting erratically with no described space for halting. The larger part of the road area is used as a departure, therefore the rest of vehicles nearby used by community people prefer to walk and park. On varied streets, the open individual by walking means is unimportant by virtue of encroachment by the city planners. Stopping charges is assembled at level rate premise, Rs.20 for 2 wheelers, Rs.60 for vehicles freed from the length of departure. This charge will make the people aware about the parking time and space importance. Personal shops and traders area unit loads are aware of the importance of halting arrangement. There aren't any sign sheets provocative halting workplace where within the CBD region and unlawful halting rules and approvals area unit finished by the town planners and city police. when these obstructions, there comes the state of acquisition halting the chief's methodologies that was thus powerful and promising for town, that has a very broad add heritage. Overabundance stock and knowledge diffusion alone cannot settle the problems within the CBD zone of town. Educating the public regarding proper vehicle parking system and road planners to give space for the parking with marked sign is the utmost duty for the town planners

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