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INTEGRATED TRAFFIC STUDY & SOLUTION FOR NAGAR ROAD

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Abstract: Traffic congestion is a severe problem in many modern cities around the world Traffic congestion has been causing many critical problems and challenges in the major and most populated cities. To travel to different places within the city is becoming more difficult for the travelers in traffic. Due to this congestion problems, people lose time, miss opportunities, and get frustrated. There are chances that people lose their lives in the ambulance itself, as it is stuck in a traffic jam. The fire brigade may not reach in time, thus leading in damage to life and property. The traffic congestion directly impacts the companies. Due to traffic congestions there is a loss in productivity from workers, trade opportunities are lost, delivery gets delayed, and there by the costs goes on increasing.

To solve these congestion problems, we have to build new facilities and infrastructure but at the same time make it smart. The only disadvantage of making new roads on facilities is that it makes the surroundings more congested. So for that reason we need to change the system rather than making new infrastructure twice. Thus there is a need for an intelligent traffic light system.

Keywords: *Traffic congestion, opportunities, fire brigade, companies, productivity, trade opportunities, facilities and infrastructure, intelligent traffic.*

I INTRODUCTION

1.1 TRAFFIC CONGESTION

Traffic congestion is the condition on roads that occurs due increased number of vehicles greater than the capacity of the road resulting in longer travel time, excessive fuel consumption, increased accidents, increasing air and noise pollution, etc. Traffic congestion is basically, when the vehicles travel slower than the design speed of the road.

1.2 GLOBAL SCENARIO

Increasing population and urbanisation is affecting the countries development because of reasons such as less availability of land, water, food, employability, traffic congestion, etc. Out of these traffic congestion is one of the major problems the developing countries such as India has to face. The traditional methods of traffic Congestion management is not helping in this new era, so to overcome this problem new and innovative ideas have to developed and implemented.

1.3 INDIAN SCENARIO

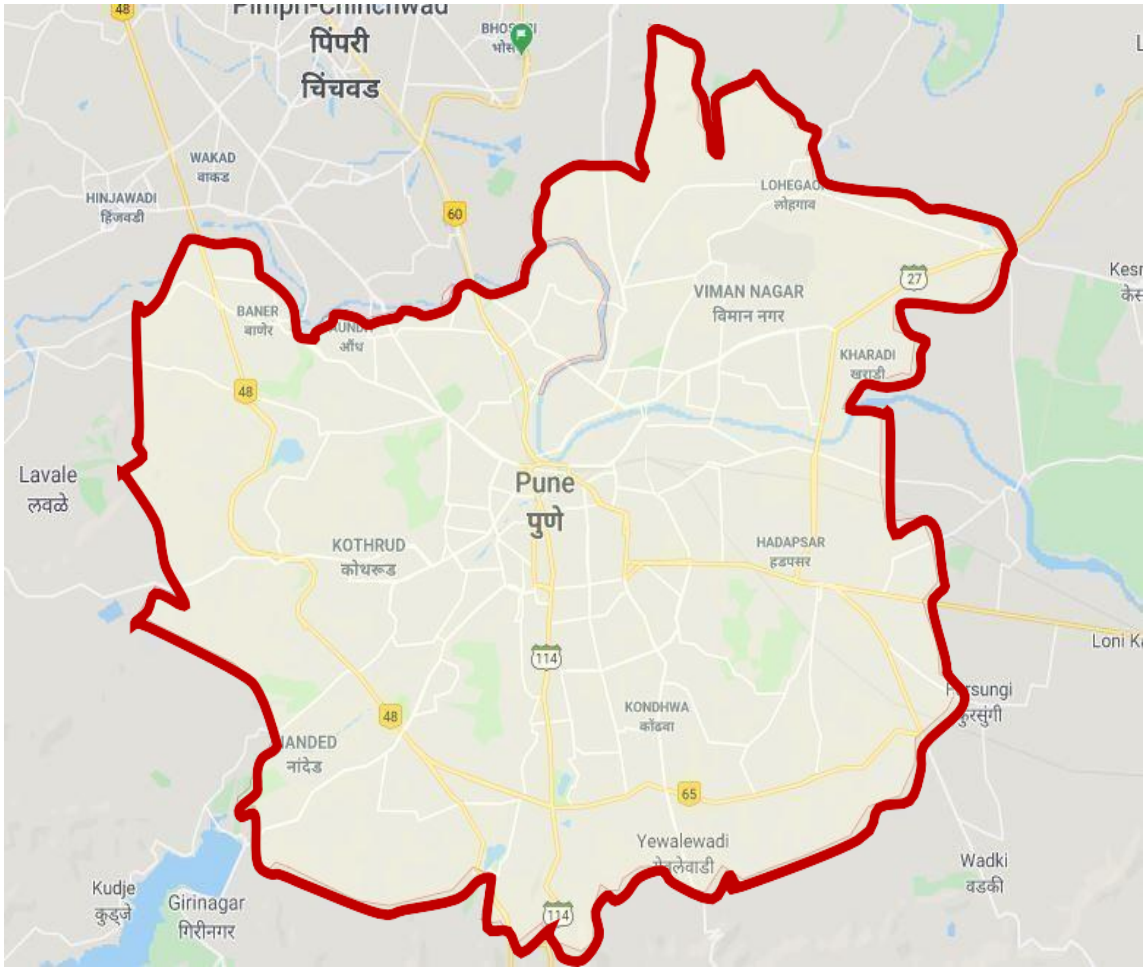
According to Census of 2011, the population of India is 1.21 Billion making India the second largest populous country in the world. Due to rapid increase in the population the vehicle density has increased extensively causing traffic congestion on the roads in India. Traffic congestion is one of the intolerable problem of urban areas emerging due to sudden increment in the private transport, affecting urban society, economy. Road traffic congestion poses a serious challenge. The average number of vehicles in India is growing at the rate of 10.16% annually [5], since a decade. Cities such as Mumbai, Pune, Hyderabad, Bangalore, Kolkata, etc. have to face heavy traffic issues

1.4 PUNE'S SCENARIO

Pune is the education as well as industrial and IT hub of Maharashtra. The number of people migrating here is increasing year by year. Increasing lifestyle of Pune causes the use of private vehicles more and more resulting in congestion at most of the junctions. Pune is set to become one of the largest city in India but its plans to solve traffic congestion aren't helping. Pune is amongst three Indian cities in the top ten list of worst traffic condition in the world. According to the recent data, the vehicle density of Pune is 753 vehicles per 1000 people [2]. In Pune, the main cause road traffic problem is due the slow growth of road infrastructure as compared to the increasing number of vehicles. As a result, there is increased travel time, increasing air and noise pollution, excessive fuel consumption, increased accidents rate, health issues, etc.

Increased number of industrial sectors in the city area and the district have increased the number of heavy vehicles. There are no alternative routes for transportation of these heavy vehicles so they have to travel through the city thus it causes traffic congestion.

Looking at the Public Transport in Pune, the PMPML has about 2097 buses including 697 buses on contract running throughout the city. Although Pune was the first city in the country to introduce the BRTS, poor execution meant that the service never took off in real sense. Due to this, planners diverted their idea to give priority to Pune Metro Project, which is expected to operate from 2021.



II NEED OF STUDY

Increasing number of population: Increasing population is one of the main cause of traffic congestion. Also as Pune is the education hub, the number of peoples migrating here is increasing year by year, causing congestion.

Improper Lane Management: Lane management is an important factor for traffic management in Pune. Due to people rushing to move forward the lane management is not followed causing congestion.

Illegal Parking: Insufficient parking space is the main cause of illegal parking resulting in traffic congestion. Illegal parking is the main cause of congestion in Pune city. Illegal parking are mostly done in front of shops, cinema halls, etc.

Encroaching of footpath: In Pune the footpaths are mainly used for parking and it does not serve the actual purpose of it. Due to this, the pedestrians make use of the road which affects the management causing congestion.

Heavy vehicle on narrow roads: Heavy vehicles passing through narrow roads block the whole road causing congestion for a longer time.

Accidents: Accidents are caused due to many reasons such as over speed, drink and drive, not following traffic rules, etc. sometimes causing loss to human life.

Irregular public transport: Irregularity of public transport encourages people to use private vehicles increasing density of vehicles on the roads causing congestion.

Street hawkers: The footpaths are mainly occupied by street hawkers and vendors, which in turn increases congestion cause the pedestrians have to use the roads.

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III OBJECTIVES

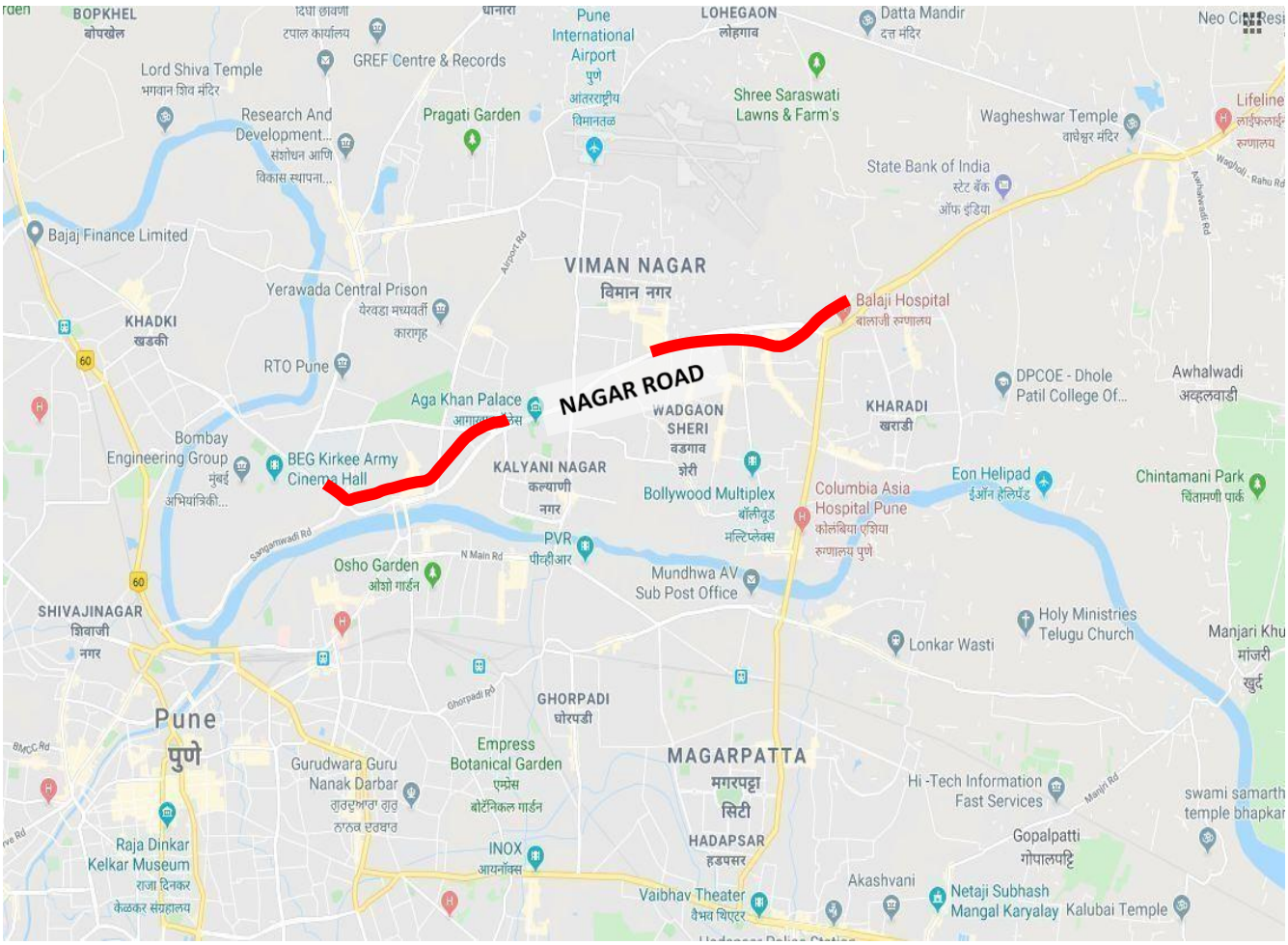
The main objective of the study is identification of the actual cause behind the traffic congestion and implement the possible solution for reduced traffic congestion.

Study Outline of Project:-

- Collection and study of traffic volume data.
- Study the flow pattern of vehicles.
- Analysis of traffic volume data collected.
- To determine the feasibility of the stretch of the road.
- Study of Public Transport System.
- To provide the possible solution for reduced traffic congestion.

IV STUDY AREA

Proposed study area for nagar road is from Thakre chowk to grant road intersection. nagar road is national highway NH753F which act as major arterial road in north east part of Pune. Nagar road highway is 60m wide DP road & available row varies from (60 to 40m) The nagar road currently carries more than 1.5 lakh vehicular traffic in both directions daily. The important areas around this road are Yerwada, Kalyani Nagar, Viman Nagar, Ramvadi, Vadgaon Sheri, Chandan Nagar, Kharadi. Also defence establishments are situated on the left side of Nagar roads. The Agakhan Palace, one of the notified national monuments is situated on right side of Nagar road @ 2 Km from Parnkuti Chowk. Nagar road is major connectivity to Airport.



AHEMAD NAGAR ROAD NAGAR ROAD	
Starting location	Thakre chowk
End location	Grant road intersection
Pedestrian crossing subway	2
Signalized intersection	11

AHEMAD NAGAR ROAD NAGAR ROAD	
Total Road length	8.57 km
Total number of intersections	13
Four arm intersections	3
Three arm intersections	7
Five arm intersection	1

V DATA COLLECTION

BRTS:

Corridor	length	Status
Ring Road BRTS	124 km	Proposed under CMP

HCMTR:

PCMC HCMTR has been partially completed.

PMC HCMTR alignment is yet to be finalized & under revision.

METRO:

Corridor	length	Status
Chandani chowk to Wagholi	25.99km	Vanaz to Ramwadi under construction
Wagholi-Pawar Wasti-Hinjewadi	35.23km	Proposed under CMP

RING ROAD:

Ring road is proposed by PMRDA in CMP.

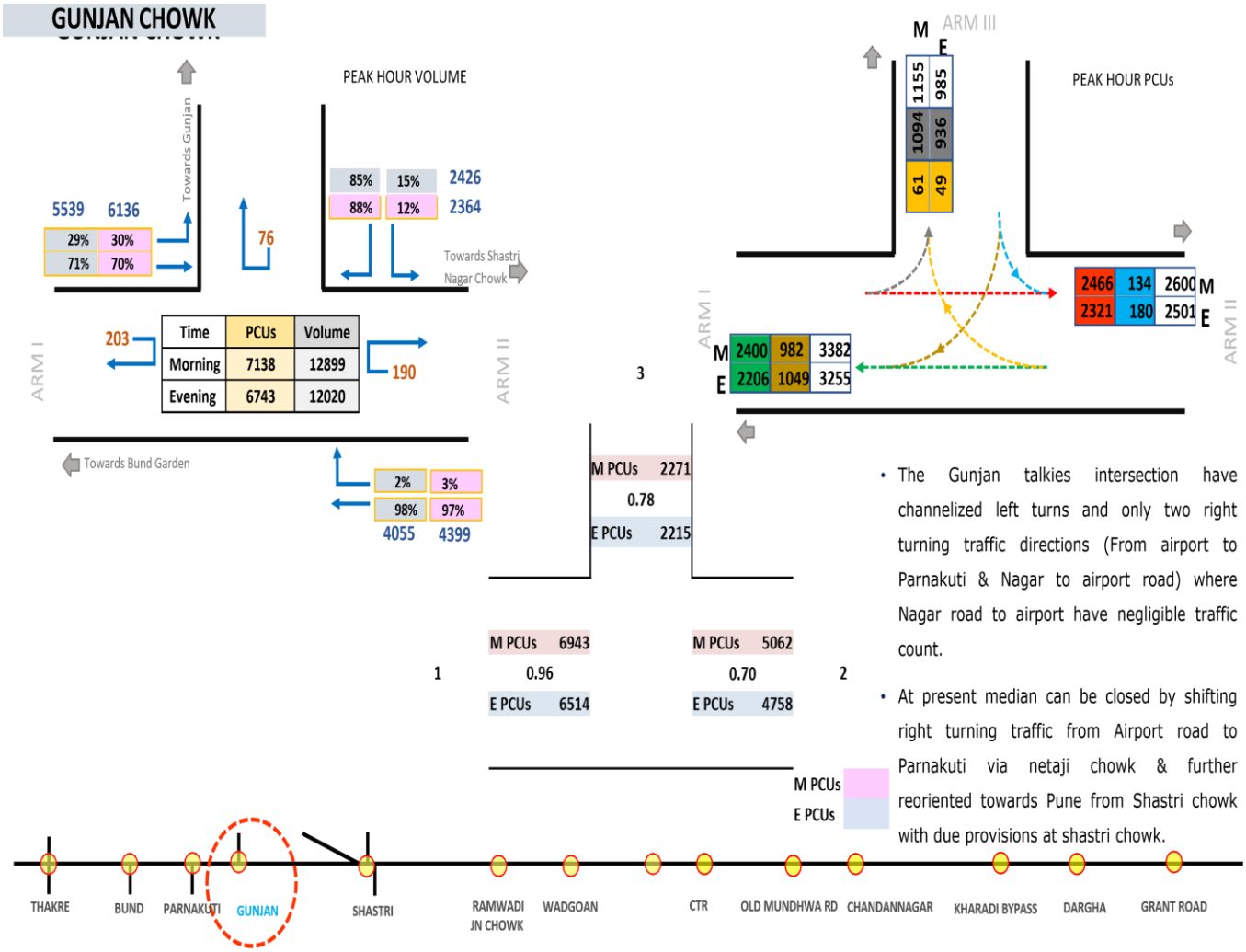
PURANDAR AIRPORT:

Purandar airport project is under land acquisition.

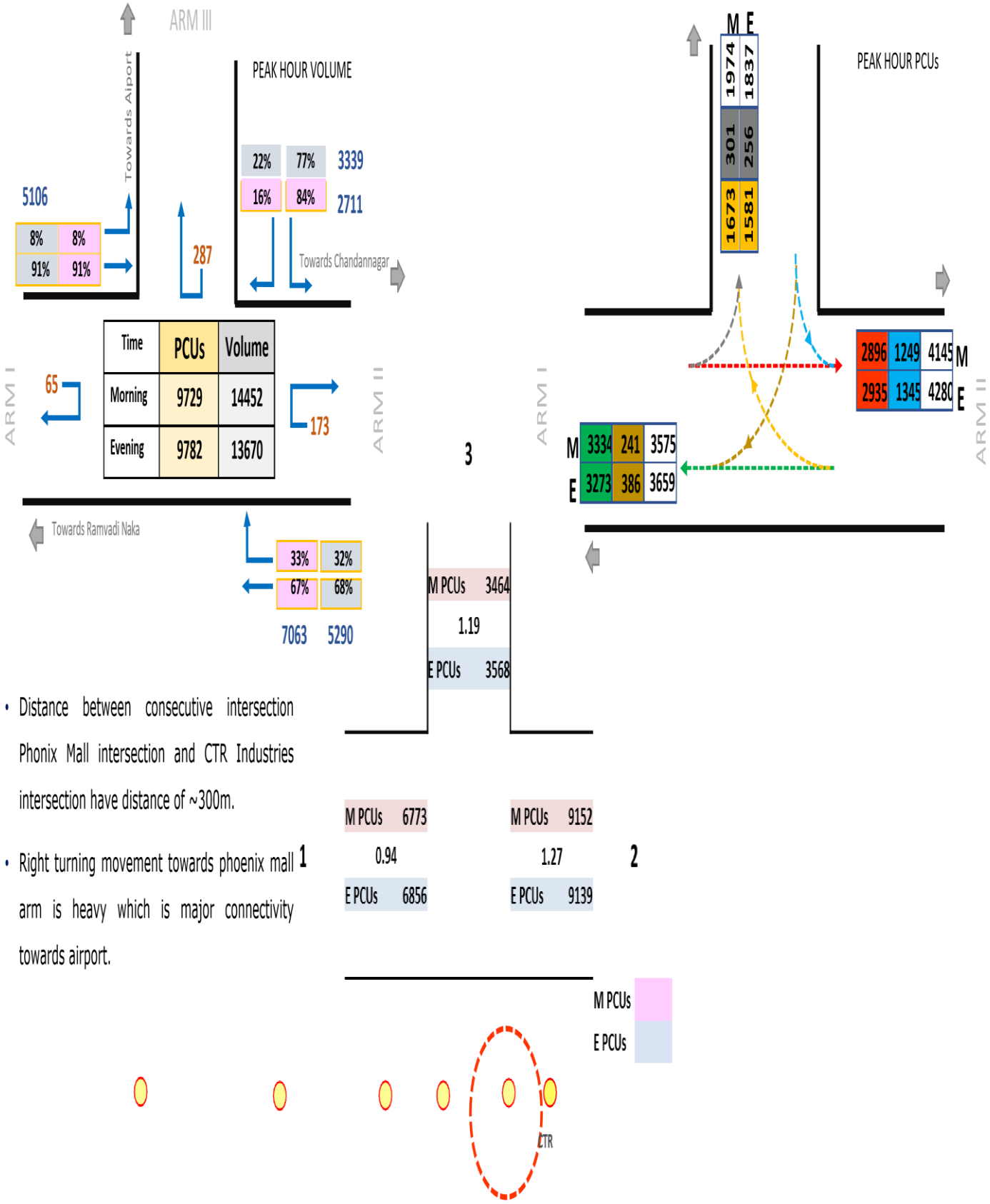
During Morning & Evening peak hours speed & delay survey were calculated using GPS & GIS enabled mobile application with multiple modes in both direction on study area stretch.

Distance: 8.57km Average Speed observed: 16.5km/Hr Average Time required: 31Min 09 sec.

VI MANNAGAR CHOWK (PHEONIX SQUARE):



- The Gunjan talkies intersection have channelized left turns and only two right turning traffic directions (From airport to Parnakuti & Nagar to airport road) where Nagar road to airport have negligible traffic count.
- At present median can be closed by shifting right turning traffic from Airport road to Parnakuti via netaji chowk & further reoriented towards Pune from Shastri chowk with due provisions at shastri chowk.



- Distance between consecutive intersection Phonix Mall intersection and CTR Industries intersection have distance of ~300m.
- Right turning movement towards phoenix mall arm is heavy which is major connectivity towards airport.

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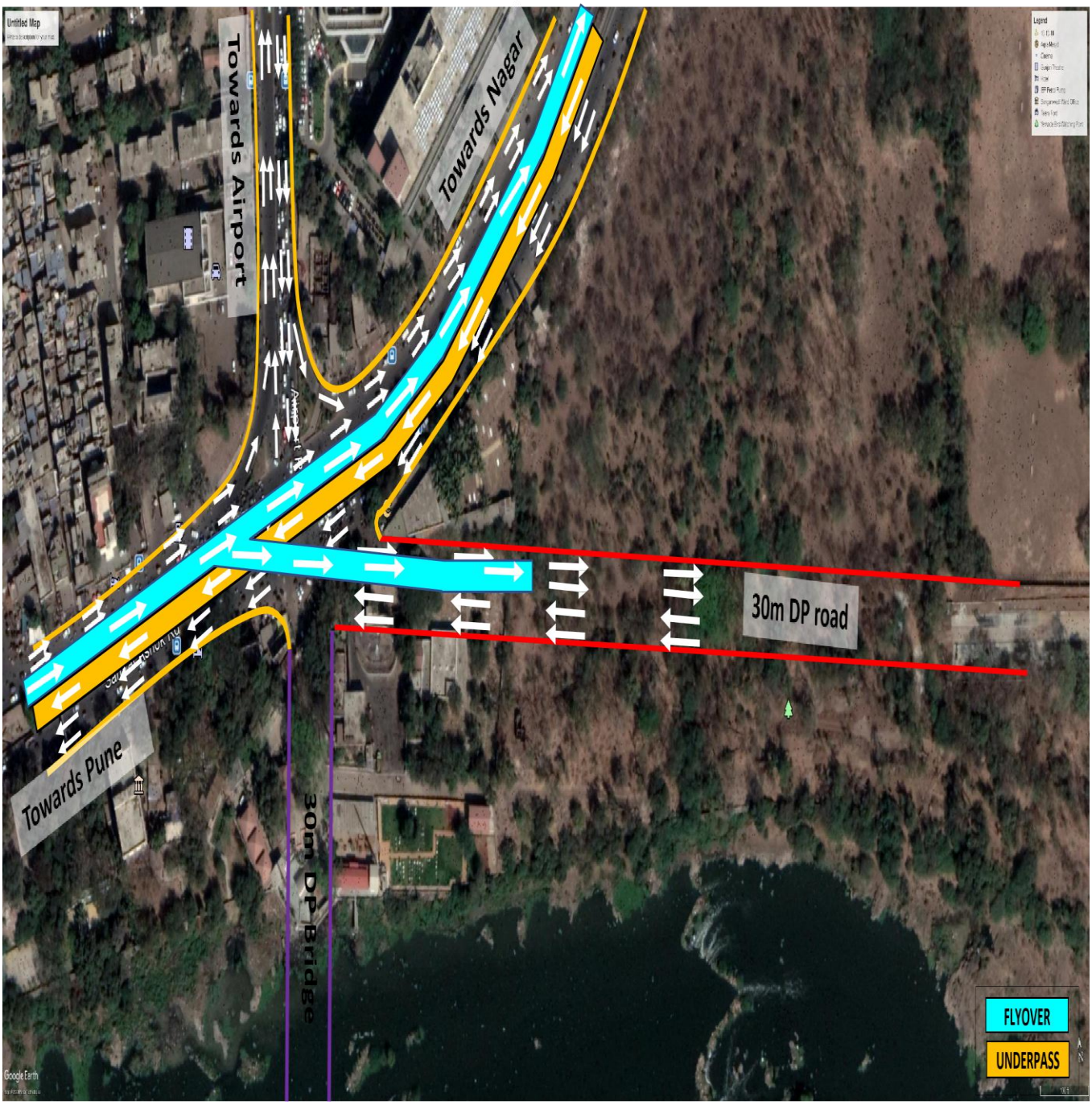
Road Inventory Survey:

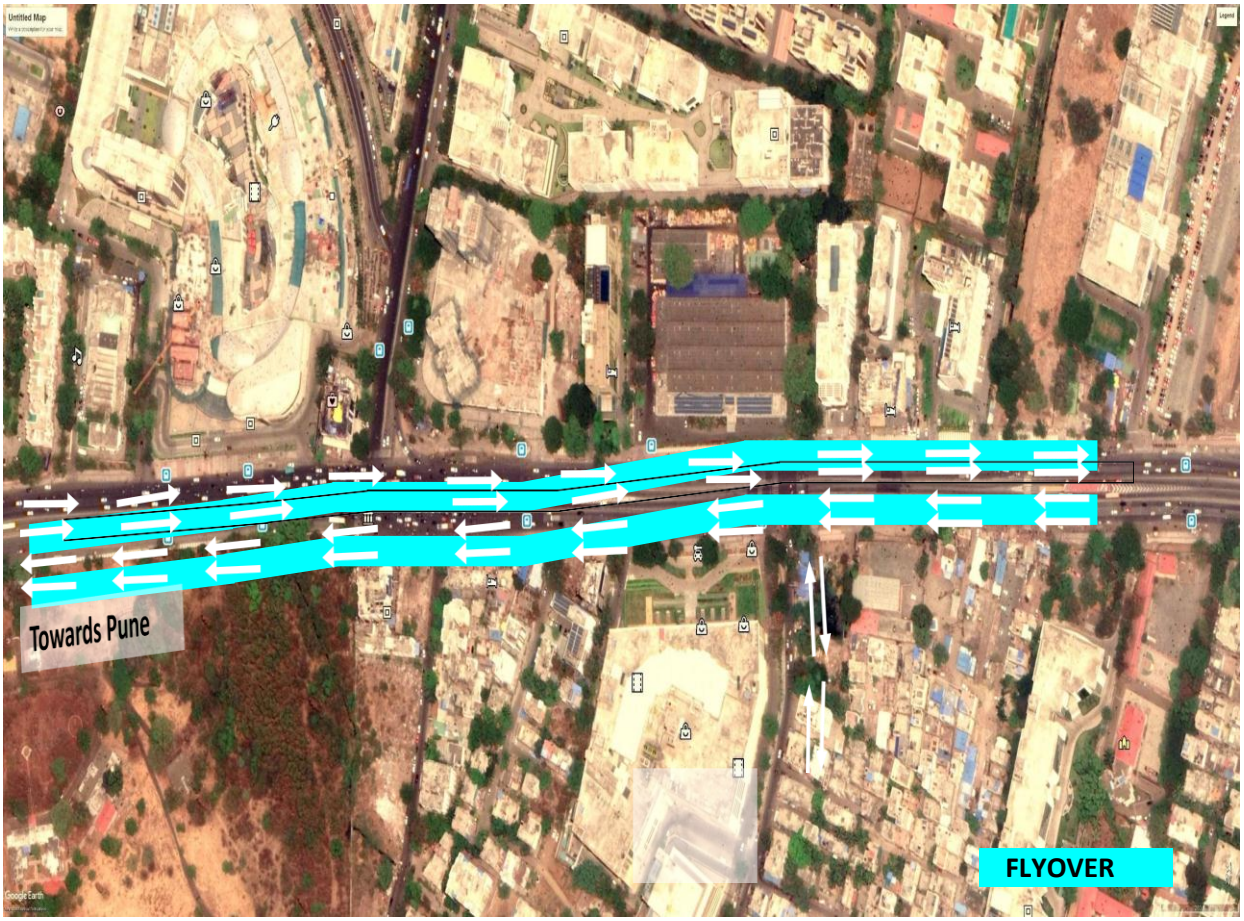
NO.	Junction Nae	AR No.	LHS					edian	RHS					
			Footpath	Cycle Track	Shoulder	Carriage way	BRT		BRT	Carriage way	Shoulder	Cycle Track	Footpath	
1	Balasaheb Thakare Chowk	1. Towards Deccan College	4.4	2.1	0	13.6	5.3	0	4.9	7.6	0	0	4.8	42.7
		2. Towards Gunjan Theatre Chowk	2.8	0	0.6	7.2	0	0.4	0	6.9	0	0	0	17.9
		3. Towards Sangawadi	3.4	0	0.5	7	3.5	0	3.5	6.4	0.4	0	3.7	28.4
		4. Towards Abedkar Chowk	2.2	0	0	7.5	0	0.7	0	7.8	0	0	1.8	20
2	Bund Garden Chowk	1. Towards Deccan College	0.5	0	0	10.7	0	0.3	0	9.7	0	0	3.7	24.9
		2. Towards Gunjan Theatre Chowk	4.7	0	0			20.8					5	30.5
		3. Towards Bund Garden	2.1	0	0.6	7.5	0	0.3	0	7.5	0.6	0	2.8	21.4
3	Parnakuti Chowk	1. Towards Deccan College	4.7	0	0			20.8					5	30.5
		2. Towards Gunjan Theatre Chowk	1.9	0	0	7.1		10.6		12.4	0	0	2	34
		3. Towards Koregaon Park	2.5	0	0	7.2	0	1.3	0	7.3	0	0	2.7	21
4	Gunjan Theatre Chowk	1. Towards Deccan College	1.9	0	0	7.1		10.6		12.4	0	0	2	34
		2. Towards Shastri Nagar	1.9	0	0	7.1		10.6		12.4	0	0	2	34
		3. Towards Gunjan Theatre	2.5	0	0	7.2	0	1.3	0	7.3	0	0	2.7	21
5	Shastri Nagar Y Junction	1. Towards Gunjan Theatre	1.9	0	0	7.1		10.6		12.4	0	0	2	34
		2. Towards Ravadi Jakat Naka	2.2	0	3.1	22.1	0	3.6	0	22.2	0	0	4.1	57.3
		3. Towards Netaji Chowk	2.2	0	0	9.7	0	1.9	0	8.4	0	0	2	24.2
6	Ramvadi Jakat Naka	1. Towards Shastri Nagar	0	0	0	12.3	4.1	2.5	5	15	0	0	0	38.9
		2. Wadgaon Sheri Chowk	0	0	0	12.3	4.1	2.5	5	15	0	0	0	38.9
		3. Towards Kalyani Nagar	No Data											0
		4. Towards Airport	1.3	0	0	5.8	0	1.2	0	8.1	0	0	3.5	19.9
7	Wadgaon Sheri Chowk	1. Towards Ravadi Jakat Naka	3.1	2.6	0	15		15.1		11.2	0	0	0	47
		2. Towards Phoenix Mall	2.9	3	0.4	13.4		16.1		16.2	0	0	2.1	54.1
		3. Towards Wadgaon Sheri	0	0	0	4	0	0	0	4	0	0	0	8
		4. Towards Airport	2.2	0	0	7	0	1.7	0	6.2	0	0	0	17.1
8	Phoenix Mall Chowk	1. Wadgaon Sheri Chowk	2.9	3	0.4	13.4		16.1		16.2	0	0	2.1	54.1
		2. Towards CTR Industries	5.6	0	0	15.1	4.4	0	4.3	14.5	0	2.9	2.8	49.6
		3. Towards Airport	2.4	0	1.7	11.6	0	1.4	0	9.2	2.6	0	2.3	31.2
9	CTR Industries Chowk	1. Towards Phoenix Mall	5.6	0	0	15.1	4.4	0	4.3	14.5	0	2.9	2.8	49.6
		2. Towards Kharadi Byepass	4.9	0	0	15.3	4	0	4	17.9	0	0	3	49.1
		3. Towards Inorbit all	0	0	0	3.8	0	0	0	3.7	0	0	1.9	9.4
10	Old Mundhwa Road Chowk	1. Towards Phoenix Mall	2.3	0	0	15.1	5.2	0	5.1	14.9	0	0	5.6	48.2
		2. Towards Kharadi Byepass	6.2	0	0	15.2	6.4	0	6.4	14.3	0	0	2	50.5
		3. Towards Mundhwa	0	0	0	7.4	0	0.8	0	6	0	0	0	14.2
11	Chandan Nagar Chowk	1. Towards Phoenix Mall	2.2	0	0	22.2	3.5	0	3.6	14.8	0	0	7.3	53.6
		2. Towards Kharadi Byepass	7.2	0	0	10.2	5.5	0	5.6	11	0	0	0	39.5
		3. Towards Chandan Nagar	0	0	0	3.5	0	0	0	3.5	0	0	0	7
12	Kharadi Byepass Chowk	1. Towards Phoenix Mall	6.6	0	0	13.6	6.5	0	6.5	16.4	0	0	3.2	52.8
		2. Towards Wagholi	4.1	0	0	16.4	3.8	0	3.8	9.3	0	0	5.9	43.3
		3. Towards Hadapsar	3.8	0	0	17.2	0	1.6	0	18.3	0	0	4.5	45.4
13	Janak Baba Dargah Chowk	1. Towards Kharadi Byepass	4	0	0	16.2	4.2	0	4.1	15.4	0	0	0	43.9
		2. Towards Wagholi	0	0	0	22.3	0	1	0	15.6	0	0	5.9	44.8
		3. Towards Fountain Road	2.7	0	3	11.1	0	3	0	10.7	3	0	2.6	36.1
14	Grant Road Chowk	1. Towards Kharadi Byepass	0	0	0	22.3	0	1	0	15.6	0	0	5.9	44.8
		2. Towards Wagholi	0	0	0	8.1	0	0	0	8.1	0	0	0	16.2
		3. Towards EON IT Park	0	0	0	5.1	0	0	0	5.1	0	0	0	10.2



SOLUTION FOR GUNJAN CHOWK:

- From the analysis done by us it is concluded that Flyover should be provided towards nagar and towards Shivane kharadi DP road; underpass should be provided towards pune.

SOLUTION FOR VIMANNAGAR CHOWK (PHEONIX SQUARE):



- From the analysis done by us it is concluded that Flyover should be provided towards nagar and towards pune.
- Elimination of BRTs is also a solution that can be implemented as it adds an extra lane for the vehicles that can maintain the free flow of traffic up to certain extent.
- Diversion of traffic is also recommended but is difficult to implement as it takes long route but the traffic flow is less.

VII CONCLUSION

■ From the analysis done by us and after the feasibility check the it is concluded that underpass should be provided from Ahmednagar -Pune road towards Viman Nagar.

■ Elimination of BRTs is also a solution that can be implemented as it adds an extra lane for the vehicles that can maintain the free flow of traffic up to certain extent.

■ Diversion of traffic is also recommended but is difficult to implement as it takes long route but the traffic flow is less.

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