



# SMARTURBS

Smart- Crossing Patented Design Solution

SMARTUrbs

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## About SmartUrbs LLP



SmartUrbs is a transportation design and traffic management consultancy that specializes in cost-effective and sustainable solutions to reduce congestion through its innovative design concept called **Smart Crossing**.



unthinkable

“Empowering Organizations with Data-Driven Software Engineering”

### Smart Crossing



Patented in 11+ countries

Reduce **Traffic Congestion**

Improve **Safety**

Reduce **Energy Consumption**

Enhance **Efficiency of Urban Systems**

## Problem Statement & Need



Rapid urbanization



Increasing vehicle ownership



Escalating traffic congestion

Due to 4 phase signal system



Long waiting time at junctions

Costlier and inefficient infrastructure

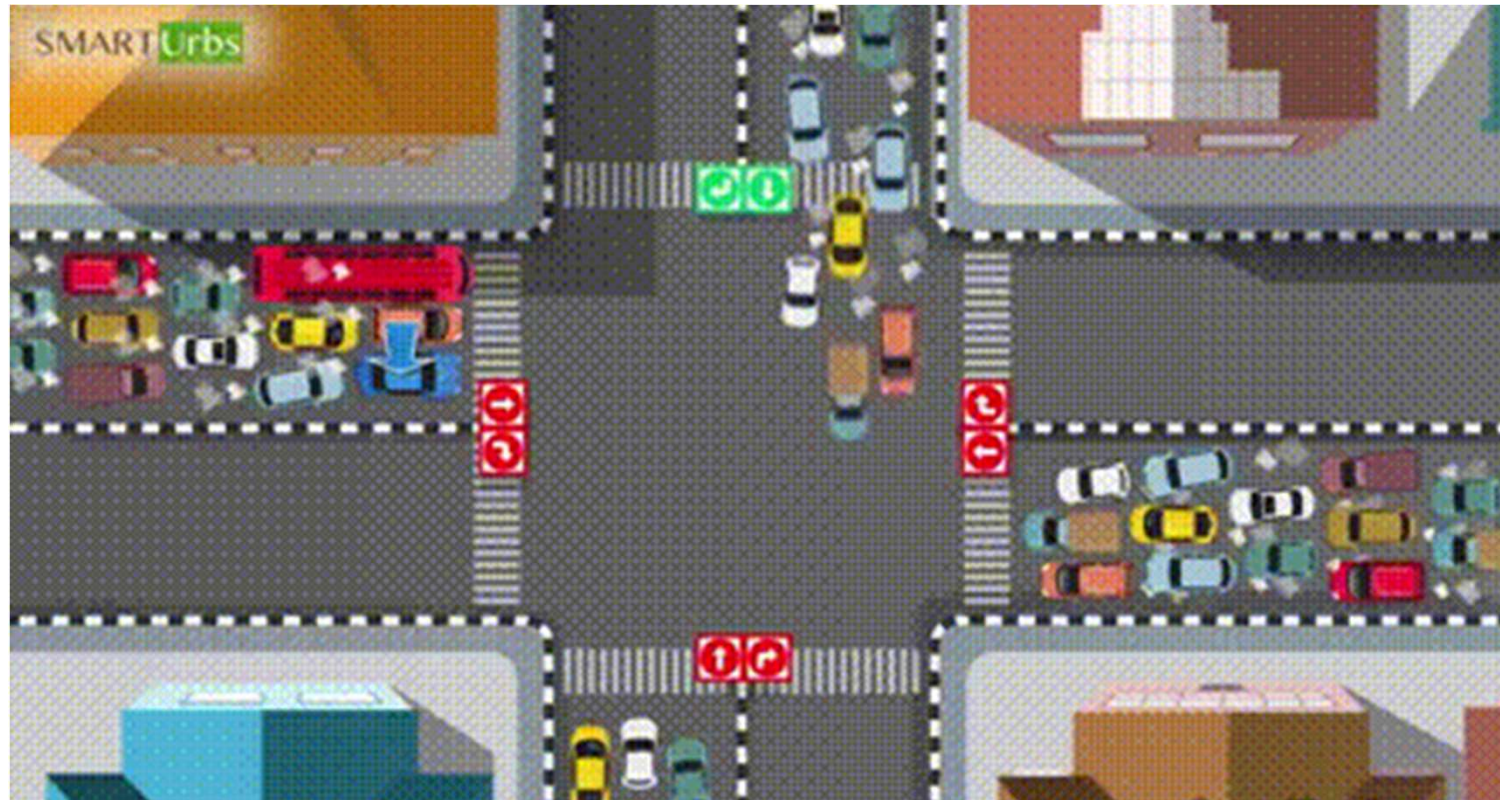


such: flyover

**Smart crossing solves decades old problem of the traffic crossing in an effective and efficient way**

# Traffic Crossing - Without Smart Crossing

A typical 4 phase traffic system



Direct right turns

Waits for a green signal and then turns

Only **25%** traffic able to move at a time

Traditional 4 phase crossing >>> wastes user time and infrastructure utilization



WAIT



# Traffic Crossing – With Smart Crossing

Smart Crossing in Action



Advantages over 4 phase traffic signal



Congestion saving

4 phase signal



2 phase signal



Reduction in waiting time up-to **60%** on each arms

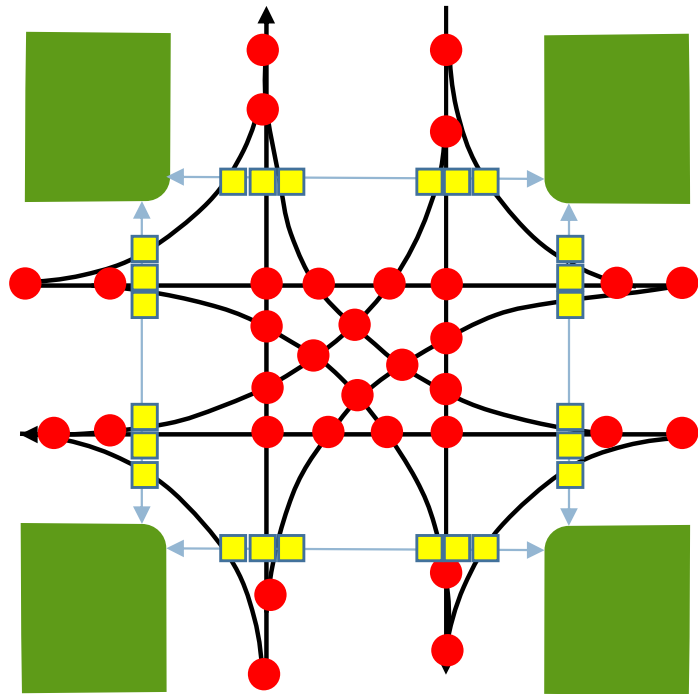


**50%** traffic move at a time



# Conflict Points - with or without Smart Crossing

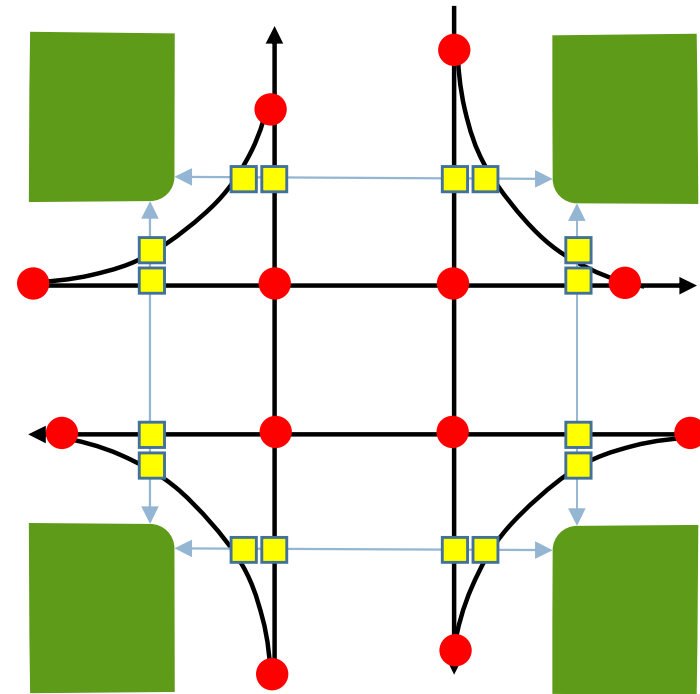
Without Smart Crossing



- 32 Vehicle Conflict Points
- 24 Pedestrian Conflict Points



With Smart Crossing



- 12 Vehicle Conflict Points
- 16 Pedestrian Conflict Points

## Comparison with Existing Solutions

*Considering a junction having Volume and Capacity ratio 1 at all legs:*

Features	Junction with no signal system	Junction with 4 phased signal system	Flyover/ underpass	Smart Crossing (Junction with 2 phased system)
Type of structure	At grade	At grade	Grade separated	At grade
Queue length	Packed	Significant	Zero at 2 arms, significant on other 2	Reduced upto <b>50-80%</b>
Waiting time	Packed	Significant	Zero at 2 arms, significant on other 2	Reduced upto <b>60%</b>
Emission at junction	Significant	Significant	Zero at 2 arms, significant on other 2	Reduced upto <b>50%</b>
Cost to implement	0.5x	x	150x	x
Safety consideration	No consideration	Low clearance time in cycle for pedestrian	N.A.	<b>Significant clearance time in cycle time for pedestrians</b>
Time to implement	Upto 3 month	Upto 5 month	Upto 2 year	Up to <b>5 month</b>



# Validations and Project Portfolio

## Ashirwad & Vardhman Chowk, Dwarka, New Delhi



### Location:

Ashirwad & Vardhman Chowk, Dwarka, New Delhi



### Problem:

The junctions had marginal right turning volume; and waiting time was up-to 8 minutes in peak hour.



### Stakeholders:

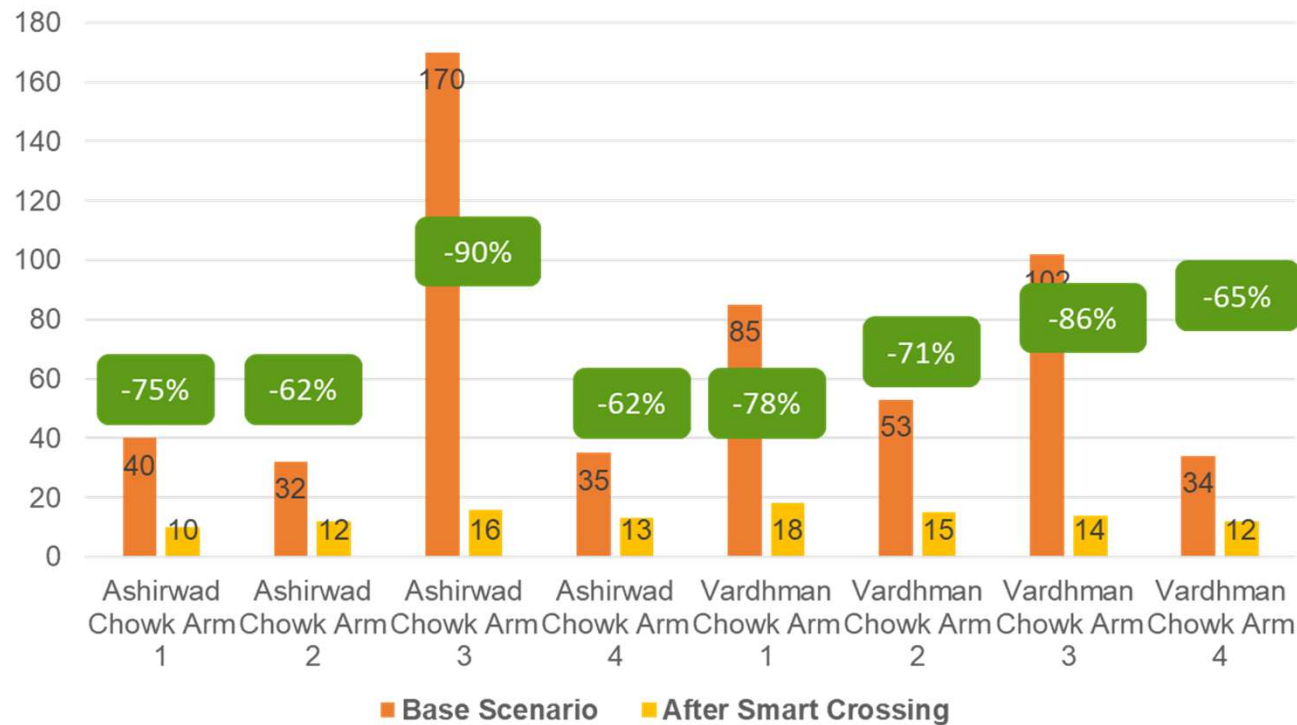
Delhi Traffic Police, and Delhi Development Authority



### Simulated Impact (PTV VISSIM):

The existing and changed geometry and traffic circulation scheme on this 4 way junction has reduced queue lengths and delays upto 60%.

Queue length comparison:  
(in meters for the two scenarios)



VISSIM Simulated impact of up to 90% on queue length and 60% on waiting time

# Validations and Project Portfolio

## Lotus Chowk, Noida



**Located:** Adjacent to NOIDA- Greater NOIDA Expressway near Lotus tower sector 28

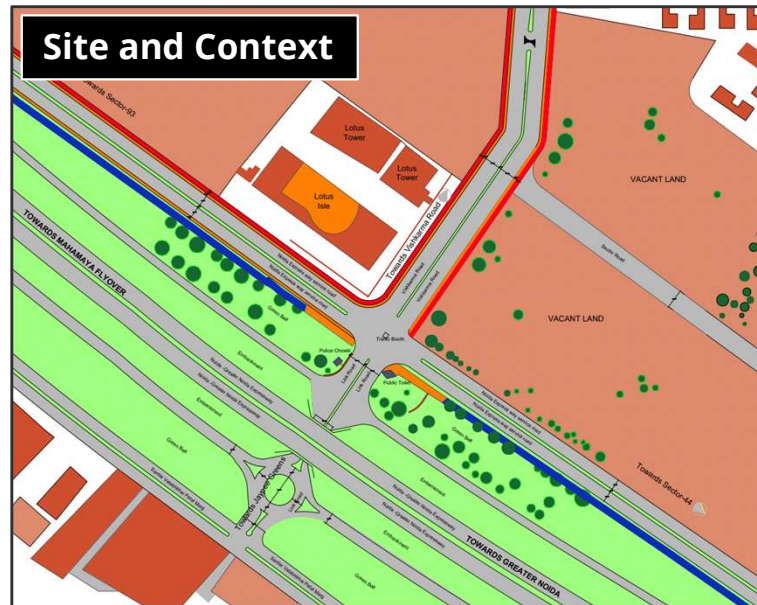
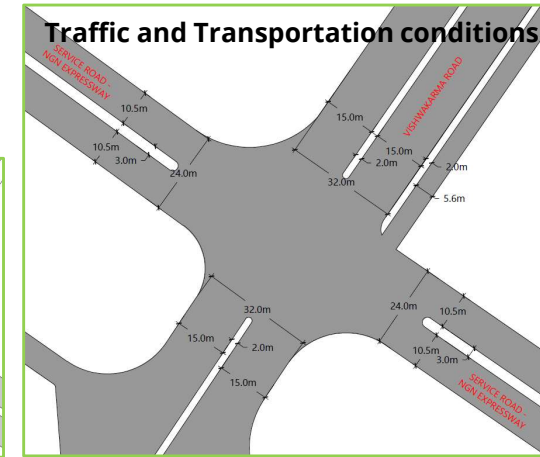
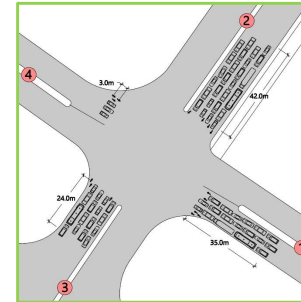
**Level of Services "F"** during peak hours



During peak hours **average delay** is **5-10** minutes at the junction.

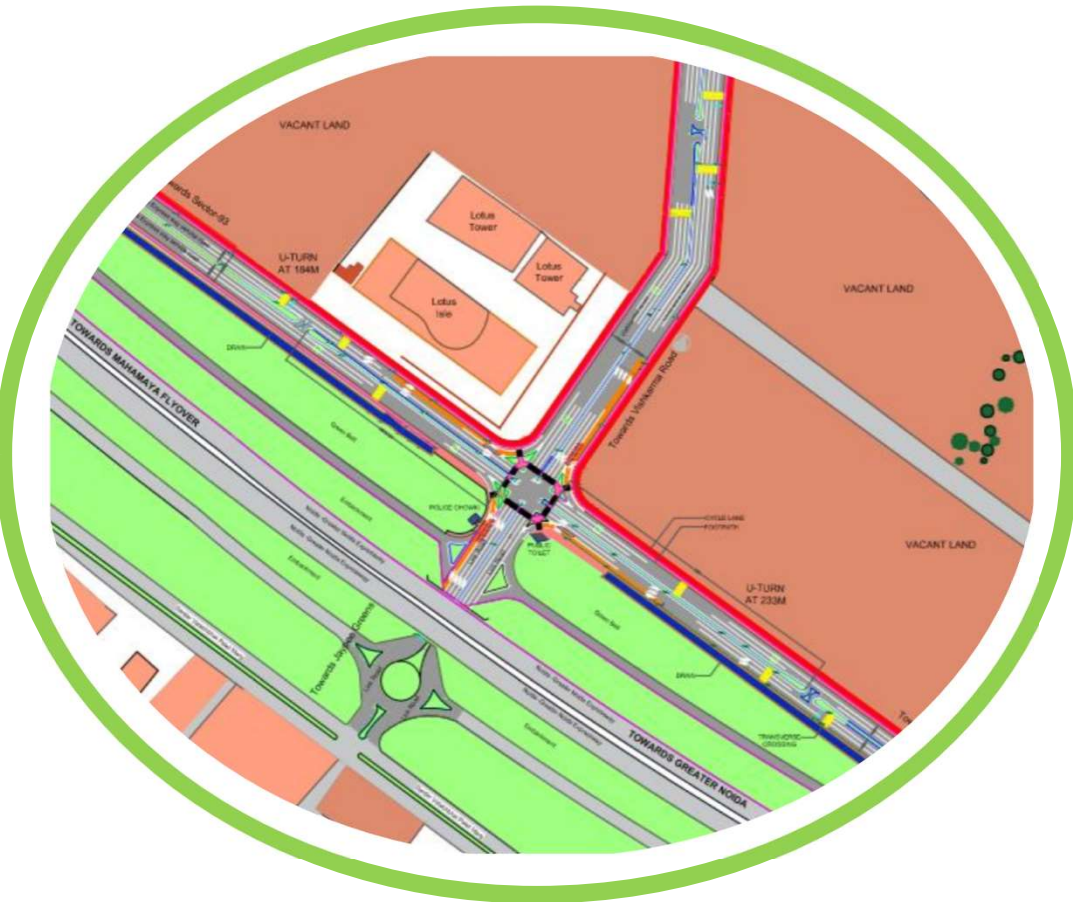


Average **right-turning traffic** volume is between **20-30%** on all legs, while **straight and left** moving is between **70-80%** resulting **long queue lengths**.



# Validations and Project Portfolio

## Lotus Chowk, Noida



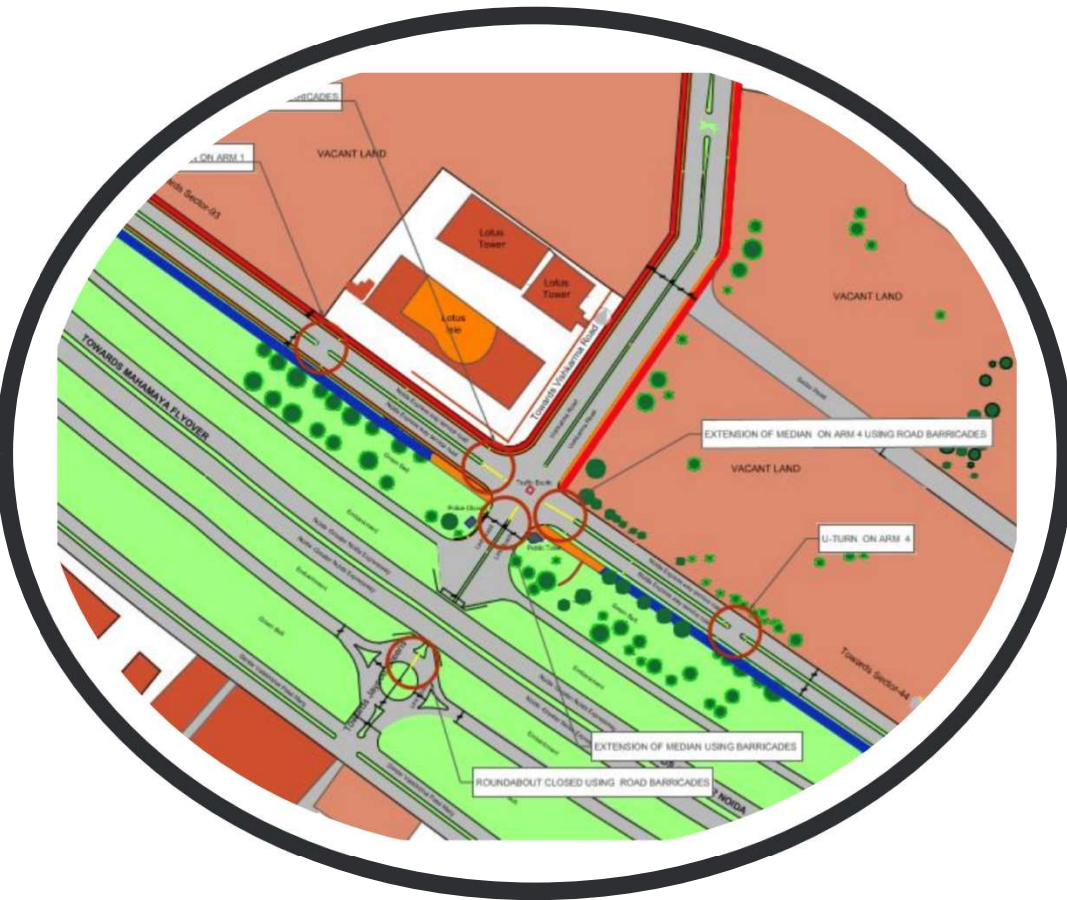
Minimum intervention drawing



- Temporary Marking and signage are provided
- Bollards, Barricades, and cones -to channelize traffic
- Temporary median openings- for C-turning of the vehicles
- Traffic islands are suggested to be made from chains and cones
- Providing "No parking and No halting" zone minimum 100m

# Validations and Project Portfolio

## Lotus Chowk, Noida



Smart Junction layout plan



Appropriate traffic markings and zebra crossings for enhanced and guided movement of vehicle and Pedestrian safety



No parking and advertisement restriction-enforced up to 50m



Side walk of minimum 1.8m is provided on all arms



Property access shall be regulated through ramps (as per UTTIPEC guidelines)



Table top crossing - for safer and efficient pedestrian movement

# Validations and Project Portfolio

## Lotus Chowk, Noida



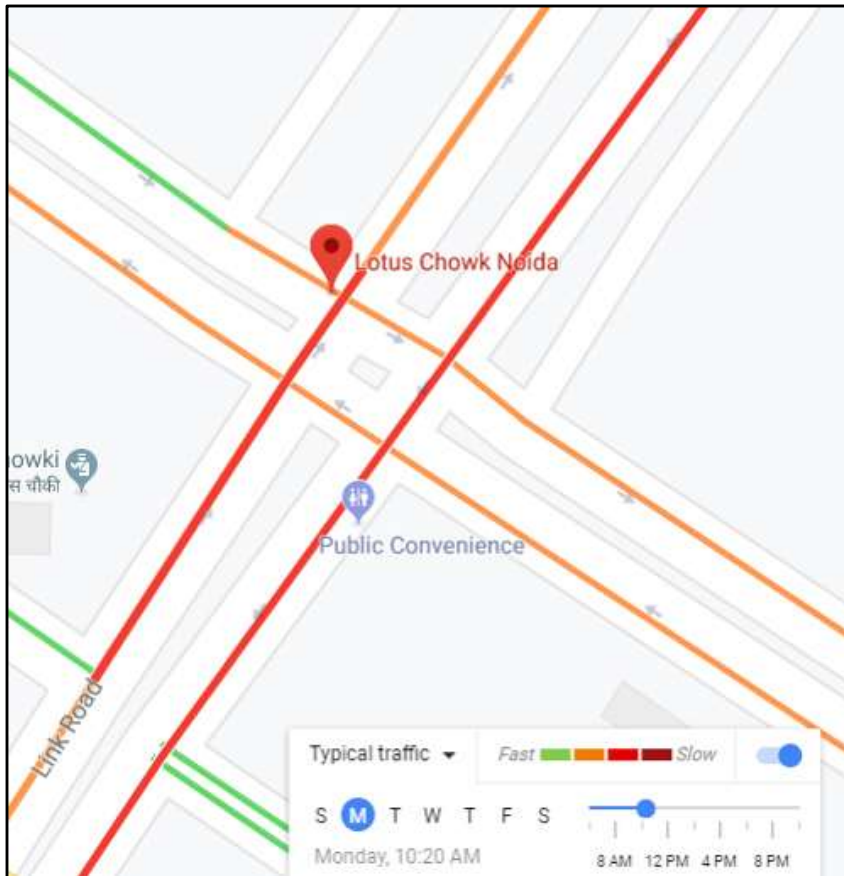
Signage Plan



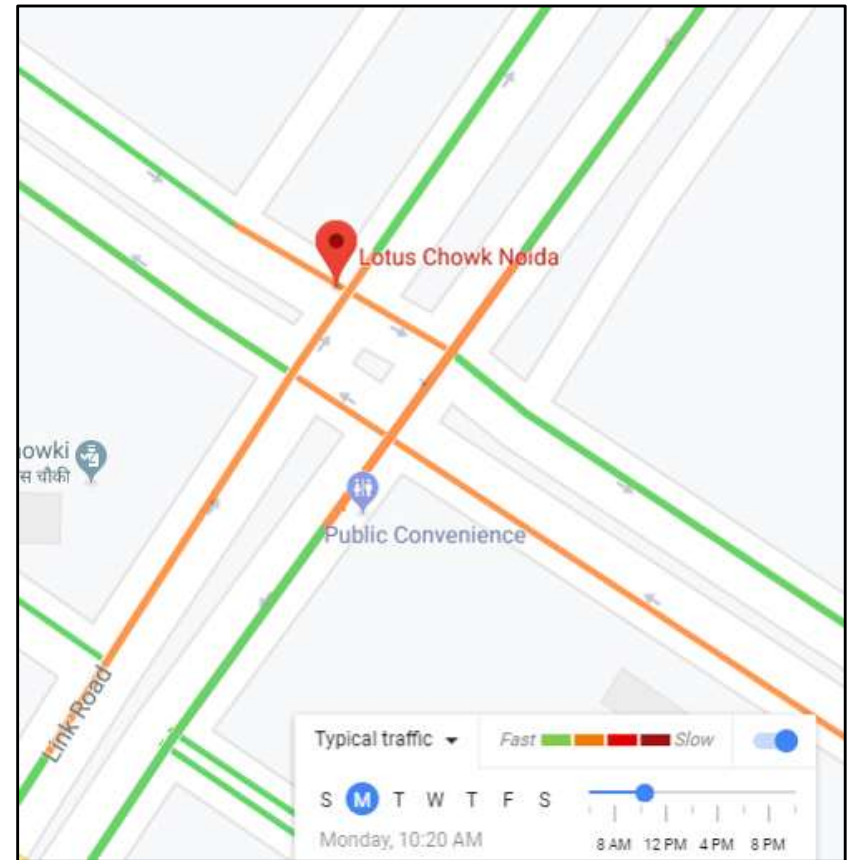
Transverse bar markings, chevron marking are proposed

# Validations and Project Portfolio

## Lotus Chowk, Noida



**Before: 4 phased**



**After: 2 phased**

# Validations and Project Portfolio

## August Kranti Marg, New Delhi

### Evaluation of Custom turns for improving traffic flow efficiency at four phased four arm Junction



#### Location:

August Kranti Marg, New Delhi



#### Objective:

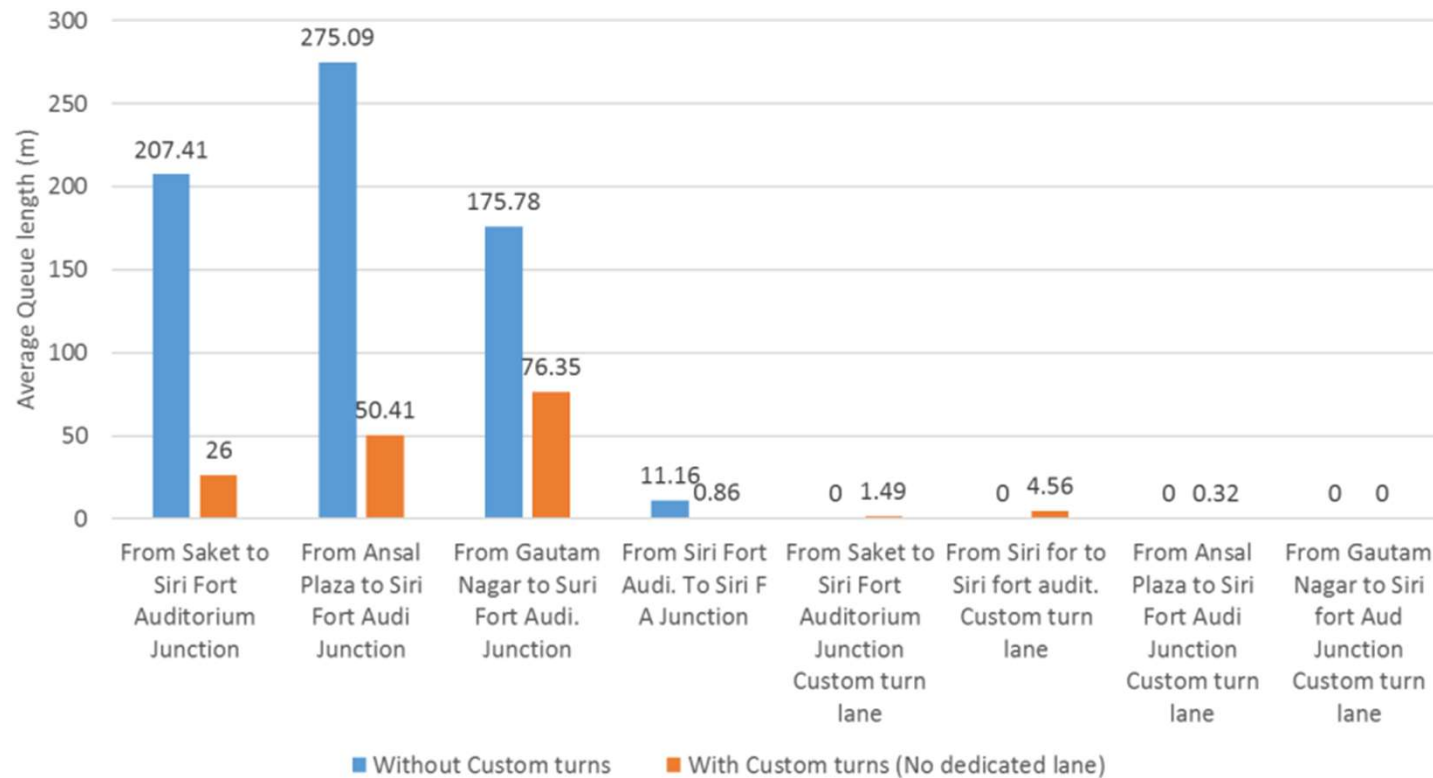
- To quantify the impact of changing the geometry and traffic circulation scheme of a 4-way junction using the Custom Turns on traffic performance measures such as delays and queue lengths on junctions using micro simulation model.
- To estimate the capacity of the junction with and without the Custom Turn scheme using micro simulation model.
- To identify scenarios best suited to implementation of Custom Turns in terms of traffic flow parameters such as volume, geometry of road.



# Validations and Project Portfolio

## August Kranti Marg, New Delhi

Comparison of average queue length for with/ without Custom Turns Scenario



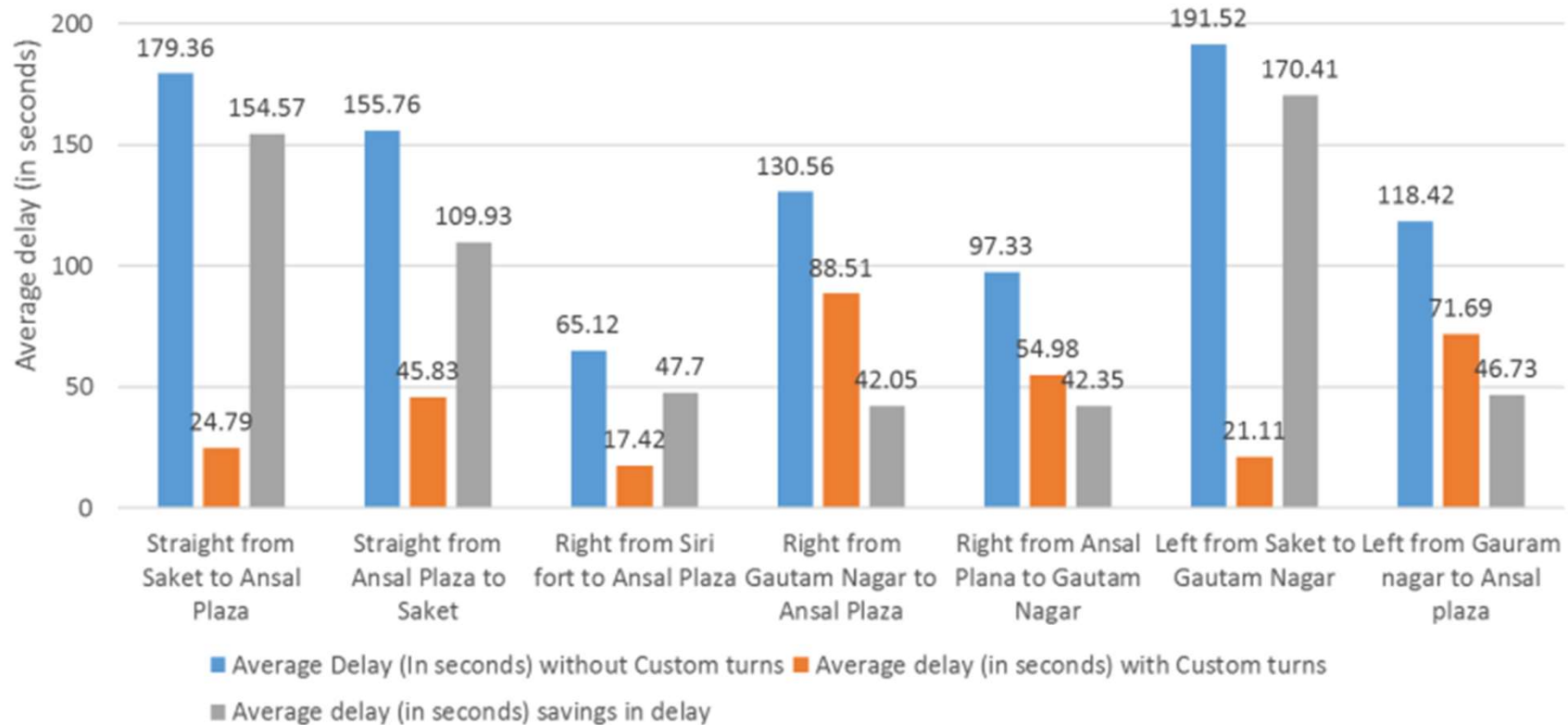
VISSIM Simulated impact on queue lengths reduce from 50- 80% for all directions of flow



# Validations and Project Portfolio

## August Kranti Marg, New Delhi

Comparison of average delay (in seconds) for with/ without Custom Turns Scenario

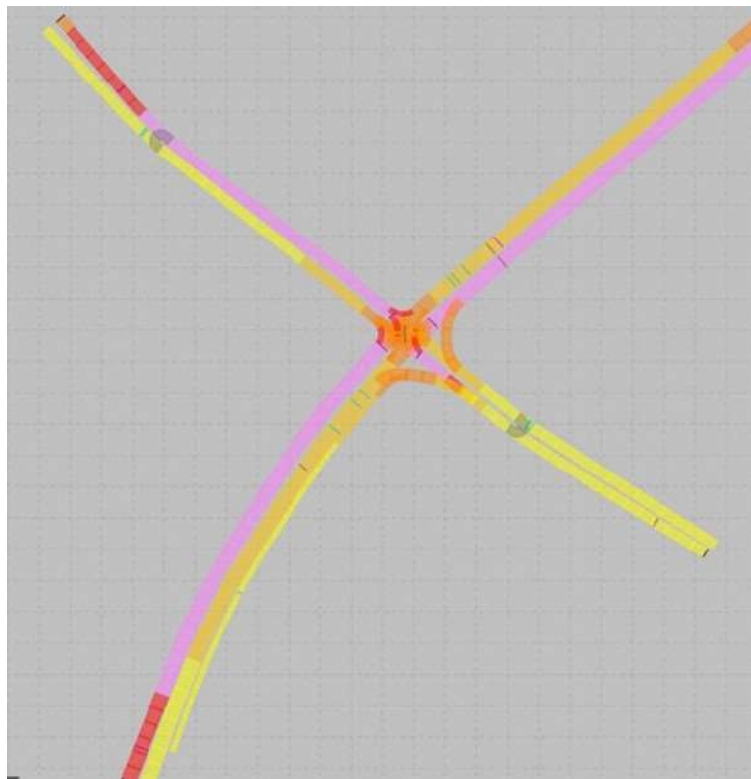


**VISSIM Simulated impact of 60% on average delay**

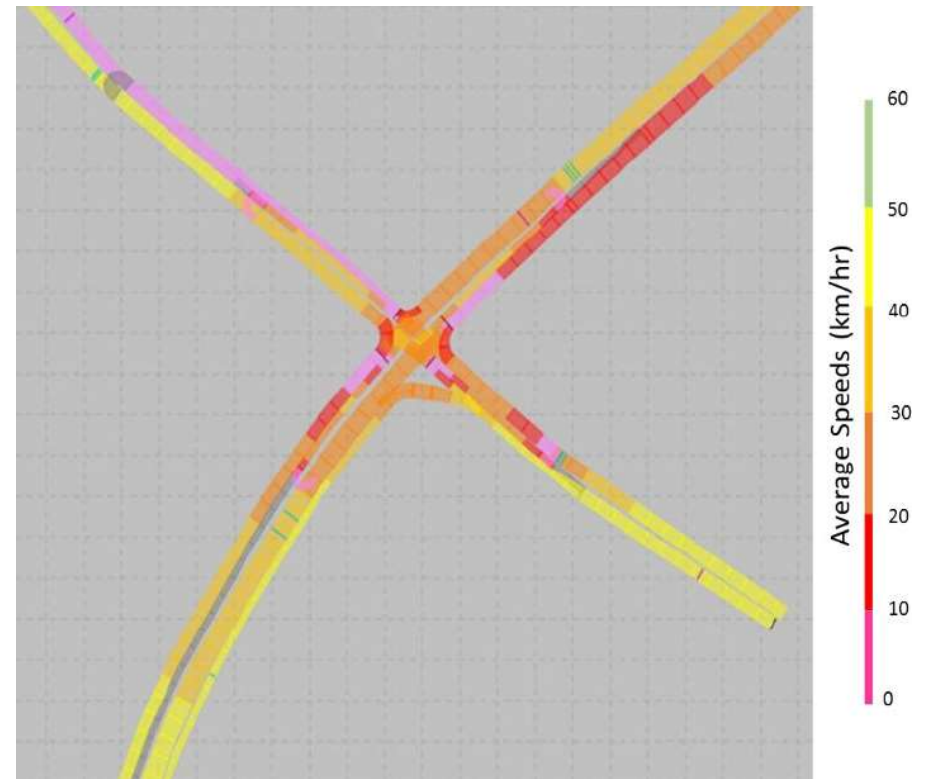
# Validations and Project Portfolio

## August Kranti Marg, New Delhi

Level of service at Evening Peak hours



(i) Current



(ii) After Custom turns

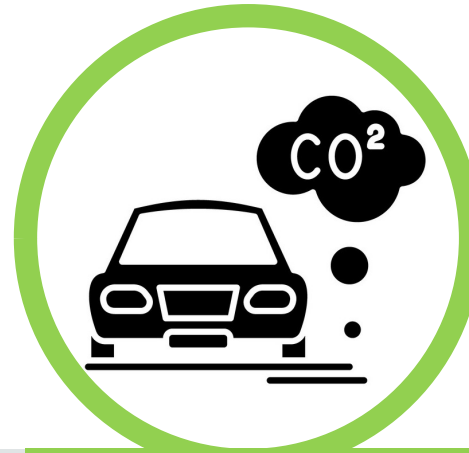
## Benefits of Smart Crossing

50-80% Reduction

66% Saving

50% Saving

50% Increase



50-80% reduction in  
Queue Length

Up to 66% savings in  
Waiting time

More than 50% savings  
in emission  
(CO<sub>2</sub>, NO<sub>x</sub>, PM<sub>2.5</sub>)

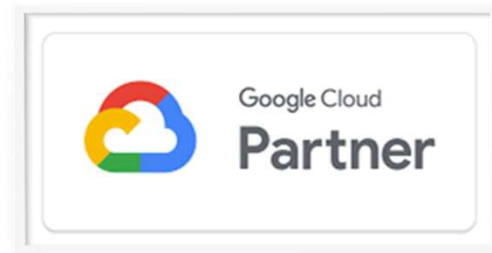
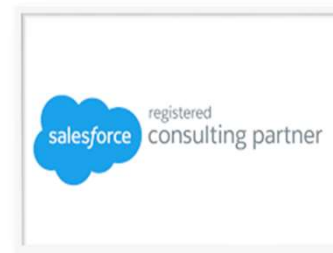
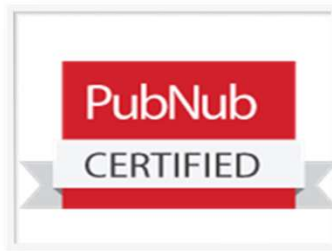
Up to 50% More Green  
Time

## Design Validations / Patents

Country	Patent Name	Patent No.
India	Traffic diversion signaling System and Method	288,778
USA	Traffic diversion signaling system and method	10,140,860
Morocco	Traffic diversion signaling system and method	41,081
Japan	Traffic diversion signalling system and method	2017-546899
New Zealand	Traffic diversion signalling system and method	735802
ARIPO	Traffic diversion signalling system and method	AP/P/2017/010166
Israel	Traffic diversion signalling system and method	254,231
Malaysia	Traffic diversion signalling system and method	MY-187273-A
Sri Lanka	Traffic diversion signalling system and method	19,500
Chile	Traffic diversion signalling system and method	CL No. 59.795
Thailand	Traffic diversion signalling system and method	81,060



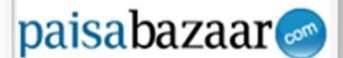
## Awards, Certifications & Partnership

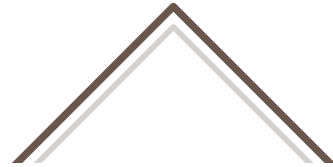


## Few of our Group Clients in India



SAMSUNG





# THANK YOU

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