

real-time traffic monitoring tool for effective and efficient decision making

the problem

\$22Bn

estimated cost of congestion in 2018*

source: NITI Aayog

9300

deaths, 25000 injuries due to potholes since 2015*

source: Ministry and National Highways Authority of India

149%

road congestion in indian cities during peak hours

source: BCG

24

km/h, average speed in indian cities

source: Ministry of Road Transport

*4 Indian metro cities : Delhi, Mumbai, Bengaluru, Kolkata

traffic congestion



live problems

vehicle
breakdowns

traffic signal
breakdowns

un-coordinated
signal timings

slow moving
vehicles

non-motorized
vehicles





static problems

no road
division

no traffic
signal

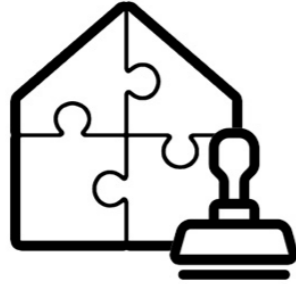
no pedestrian
pathway

encroachments

potholes

wrong parking

stakeholders



development
authority



municipal
corporation

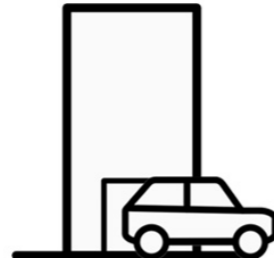


smart city
corporation

static related stakeholders



traffic police



regional
transport office



transport
authority



metro
corporation

live related stakeholders

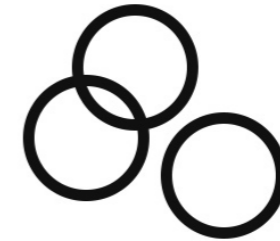
need for the tool



lack of data
availability



non-standardized
dataset



lack of common
platform



data in
silos



lack of
coordination



time consuming
process

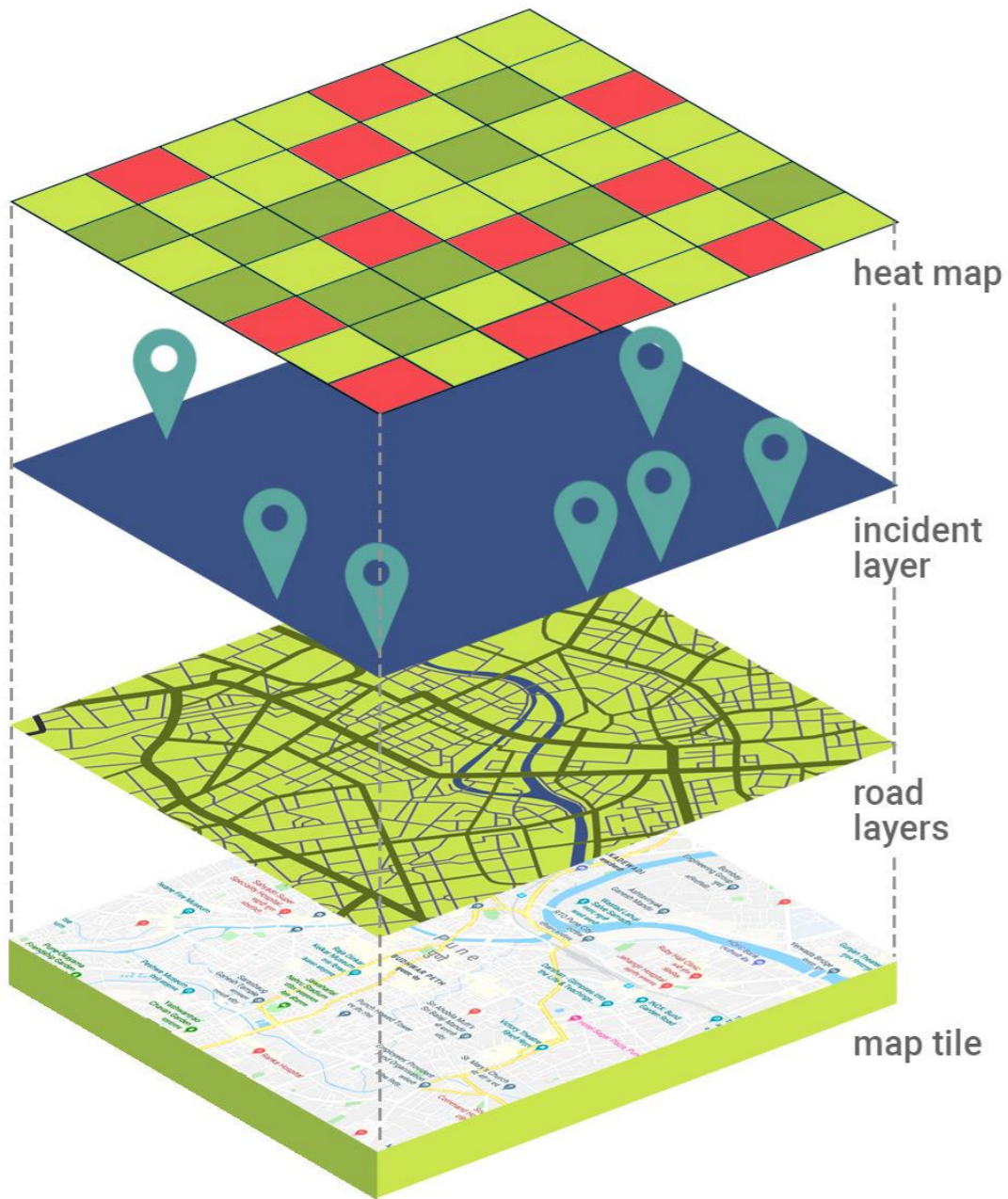


lack of
capacity

enable

visualize and analyze

idea of tool



Questionnaire

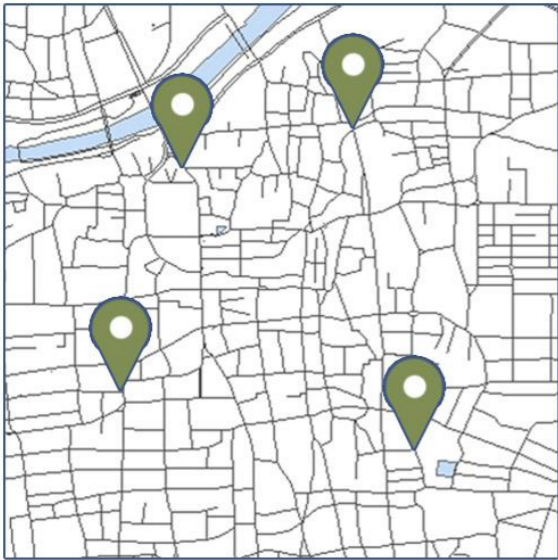
- ☰ Frequent road accident
- ☰ Encroachment due to hawkers on street
- ☰ Encroachment due to on-street parking
- ☰ Potholes
- ☰ Narrow roads
- ☰ Road digging
- ☰ Frequent processions
- ☰ High car volume
- ☰ High commercial vehicle volume
- ☰ Wrong Side Driving

Weightages

	1	2	3	4	5	6	7	8	9	10	TOTAL	SCORE
▼ Frequent processions	0.00% 0	0.00% 0	4.35% 1	13.04% 3	8.70% 2	4.35% 1	13.04% 3	4.35% 1	21.74% 5	30.43% 7	23	3.39
▼ Wrong Side Driving	10.53% 2	5.26% 1	0.00% 0	5.26% 1	21.05% 4	5.26% 1	5.26% 1	5.26% 1	15.79% 3	26.32% 5	19	4.37
▼ Road digging	0.00% 0	8.70% 2	8.70% 2	4.35% 1	17.39% 4	17.39% 4	4.35% 1	34.78% 8	4.35% 1	0.00% 0	23	5.00
▼ Frequent road accident	4.35% 1	8.70% 2	17.39% 4	13.04% 3	4.35% 1	4.35% 1	21.74% 5	4.35% 1	8.70% 2	13.04% 3	23	5.30
▼ Encroachment due to hawkers on street	13.04% 3	0.00% 0	4.35% 1	21.74% 5	4.35% 1	17.39% 4	17.39% 4	13.04% 3	4.35% 1	4.35% 1	23	5.52

w = weight of ranked position
x = response count for answer choice

$$\frac{X_1W_1 + X_2W_2 + X_3W_3 \dots X_nW_n}{\text{Total response count}}$$



incidents

no. of encroachments
(weighted score:4.75)

TOTAL

4

1

21.55

frequent road accidents
(weighted score: 2.2)

no. of wrong side driving
(weighted score: 8.5)

1

2



incidents

no. of encroachments
(weighted score:3.75)

TOTAL

4

1

30

no. of wrong side driving
(weighted score: 8.5)

3



Analyse the real time layers and take necessary steps accordingly



1 day



15 days



Analyse the historic data and understand the pattern for traffic congestion



30 days



90 days

data sources

static data

road layers
(shape file)

- ROW
- traffic volume (CMP, '18)
- reported accidents
- pot holes data, PMC
- NOCs
- encroachment data (PMC, '18)



live data

map tile ——— traffic flow

- stationery traffic
- queuing traffic
- slow traffic



incident data

incident data ——— PMC greivances
(from twitter, calls)

- wrong/illegal parking
- pot holes
- wrong side driving
- accidents
- faulty signals



real time

accident data
(from FIR)

NOCs

- accident geo location - time
- NOC geo location - time



challenges

जा.क्र.पो.नि./मिचो/ /१९
 पाहलुक नियंत्रण शाखा, पुणे राहण
 दिनांक - /०७/२०१९

Sr. No.	Token No.	Token Date	Complaint From	Description	Complaint Category	Completion Date
1	T455	18-07-2019 07:10	Reception:Reception	@PuneCityTraffic @PMCPune राहलनगर ते करीभा रोडवर अगदी NoParking फलकाशेजारीच दोन चारचाकी अाता सं.६:१५वाजता	Traffic - Wrong Parking	21-07-2019 12:52
2	N112	16-07-2019 03:44	Reception:Reception	PARKING MADHE DUKANE, RASTYAVAR VAHANE	Traffic - Traffic Congestion	20-07-2019 10:19
3	N125	16-07-2019 05:26	Reception:Reception	VAHTUK KONDI NITYACHICH	Traffic - Traffic Congestion	20-07-2019 10:13
4	N123	16-07-2019 04:54	Reception:Reception	SIGNAL SURU KARAVA	Traffic - Signals not fuctioning	20-07-2019 10:09
5	T435	17-07-2019 02:45	Reception:Reception	Please remove the old bus stop in front of Shakti Sports Nagar Road. It is no longer used after BRTS started but causes lot of traffic congestion in evenings. That section is blocked in evenings.	Suggestions - Specific Suggestions	20-07-2019 10:07
6	T437	17-07-2019 02:51	Reception:Reception	Thanks sir n lmore reqst everyday in evening there's huge traffic frm Aaple Ghar BRT bus stop to Hotel Kanchan,khandve nagar.Request u 2 pls pls look into this as it's hardly and 500m distance but it take nearly 15min.due to heavy traffic on Nagar Highway.	Traffic - Traffic Congestion	20-07-2019 10:04
7	T445	17-07-2019 03:28	Reception:Reception	नगर रस्त्यावर सायंकाळी अनेक ट्रेक्लस उभ्या राहतात त्यामुळे वाहतूक खोळंबा होतो. वाहतूक खोळंबा करणाऱ्या बस चालकांचा वाहन चालविण्याचा परवाना रद्द करण्याची कार्यवाही पोलीस खात्याकडून झाली तरच याला आळा बसू शकेल असे वाटते.	Traffic - Traffic Congestion	20-07-2019 09:59
8	T450	18-07-2019 11:03	Reception:Reception	@PuneCityTraffic फ्रीनिक्स मॉल विमाननगर च्या पाठी माघे रोज ट्रेफिक होतो ऑटी रिक्शा आणि ट्रिस्ट केब मुळे. पन ट्रेफिक हवलदार *जयवंत श्रीरामे* आणि त्यांचे सहकारी फक्त प्राइवेट कार्स आणि टू व्हीलर चाल्याणा धरतात आणि फाइन मारतात. आज 4 दिवस झाले मी त्यांना रोज बघतो.	Other - Policeman not doing their duty	20-07-2019 09:52

प्रति,
 कार्यकारी अनियंता, (फय)
 पुणे महाागरपालिका.

विषय :- पुणे सहरात वॉटर नॉर्गिंग ठिकाणाबाबत.

उपरोक्त विषयाभयं सविषय सादर ळी, रस्त्यावरील खड्डे व नादुरुस्त घेंदरमुळे पावसाचे पाणी रस्त्यावर सादून राहत असल्याने खालील ठिकाणी वॉटर नॉर्गिंग होत असते.

विनागाचे नाव	अ.नं.	वॉटर नॉर्गिंग ठिकाणे
खडक	१	गवा पिष्णु चौक
	२	एस्त पी चौक
शिवाजीनगर	३	सिमला चौक
स्वारगेट	४	सेफन लफ्ज चौक
मा.विद्या	५	दत्तनगर नुयारी रोड
बंडगार्डन	६	साधु दासवाणी
	७	आर टी ओ चौक
	८	अलंकार चौक
	९	अल्पबघत नयन चौक
कोरेगाव पार्क	१०	लेग नं २ व ७
लफ्कर	११	लफ्कर पोलीस स्टेशन चौक
	१२	दोराबजी चौक
	१३	नेहरु नमोरियल चौक
कोथरुड	१४	गळ स्टॉप चौक
	१५	मंडळदे गॅरेज चौक
	१६	होदिरा पिंटर कथरा
पारजे	१७	पारजे जंक्शन
दत्तवाडी	१८	सायफर चौक
	१९	दांडेकर चौक
खडकी	२०	घर्ष चौक अंडरपास
	२१	पोलडी अंडरपास
	२२	दोपोडी अंडरपास
यंरपडा	२३	टिंगरे नगर
	२४	प्रतिक नगर
	२५	शास्त्री नगर

क्र.सं.	विवरण	दिनांक	स्थान	विवरण	स्थान
१	कोरेगाव	२५/०७/१९	२२/०७/१९	दि. २५/०७/१९	पुणे
२	कोरेगाव	२५/०७/१९	२५/०७/१९	दि. २५/०७/१९	पुणे
३	कोरेगाव	२५/०७/१९	२५/०७/१९	दि. २५/०७/१९	पुणे
४	कोरेगाव	२५/०७/१९	२५/०७/१९	दि. २५/०७/१९	पुणे
५	कोरेगाव	२५/०७/१९	२५/०७/१९	दि. २५/०७/१९	पुणे
६	कोरेगाव	२५/०७/१९	२५/०७/१९	दि. २५/०७/१९	पुणे
७	कोरेगाव	२५/०७/१९	२५/०७/१९	दि. २५/०७/१९	पुणे
८	कोरेगाव	२५/०७/१९	२५/०७/१९	दि. २५/०७/१९	पुणे
९	कोरेगाव	२५/०७/१९	२५/०७/१९	दि. २५/०७/१९	पुणे
१०	कोरेगाव	२५/०७/१९	२५/०७/१९	दि. २५/०७/१९	पुणे



collector tool

eⁿable

Data Collection Tool



Traffic Police



PMC

Supported By :-



<http://51.158.179.237/media/index.html#/>



Data Collection Tool



Traffic Police

Report Accident

Choose Traffic Division ▼

Choose Type of Accident ▼

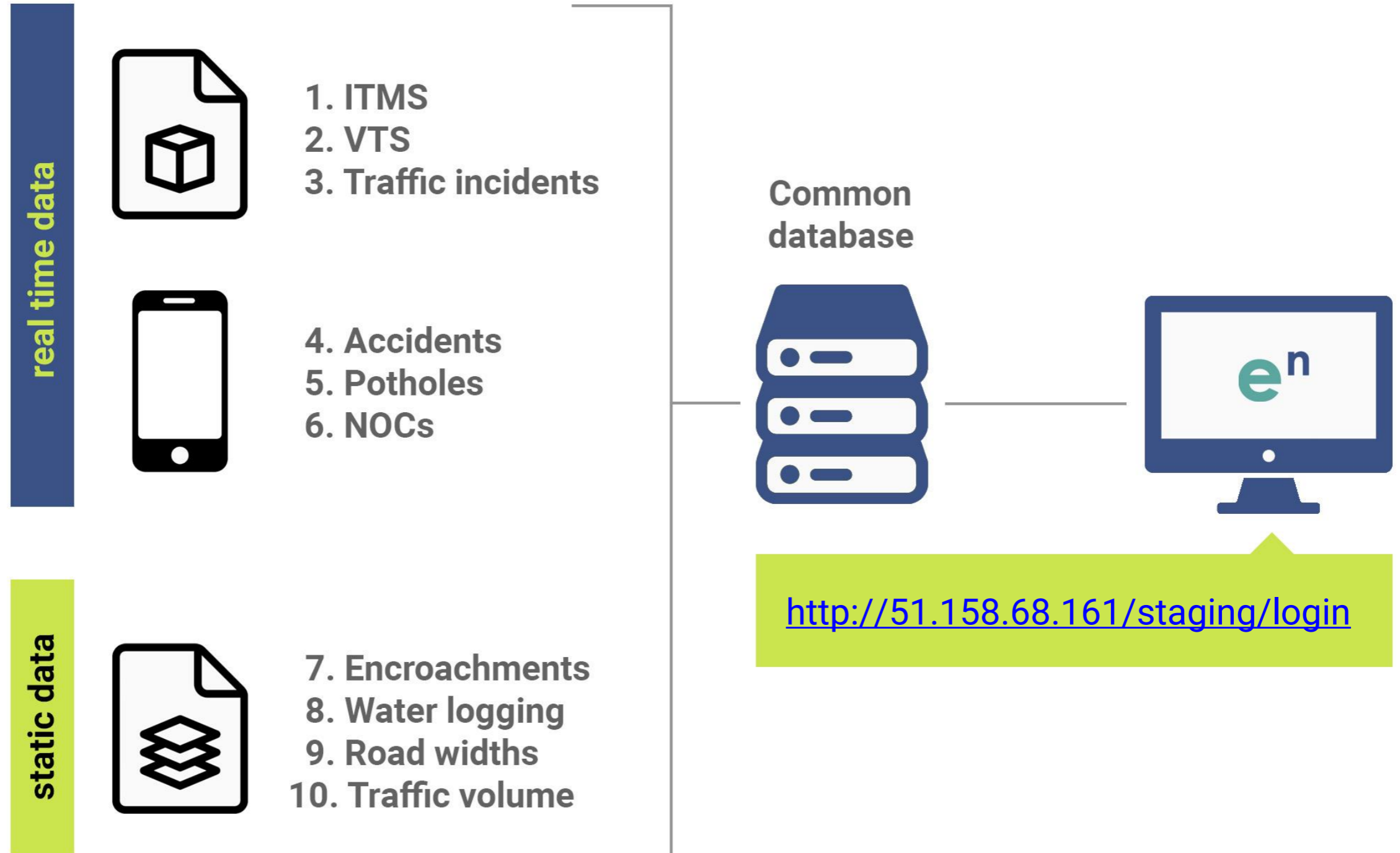
Choose Reason of Accident ▼

Date and Time of Accident

Location

Submit

tool mechanism



benefits

Breaking Silos- Data sharing among stakeholders

Data standardisation

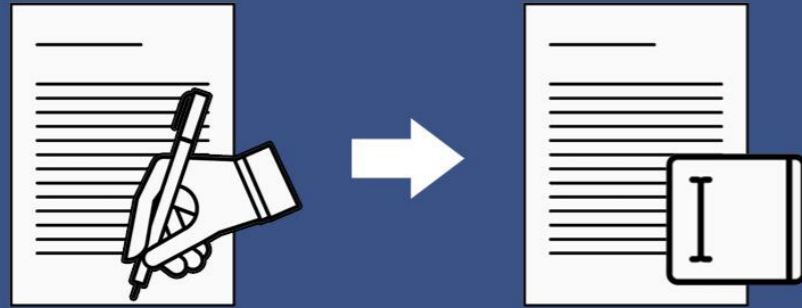
Data visualization and analytical tool

Live data for day-to-day decisions

Historical data for long term decision making

An aid to develop mobility plan for the city

challenges identified and corrective measures



Hand written data in respective languages

Developed the web-app that would help city authorities to feed in data.

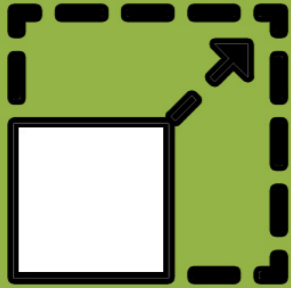
Fed data will be geo-tagged to ensure visualization on map.



Lack of live traffic volume data

Referred to city mobility plan for PCU (passenger car unit) count for traffic volume.

scalability



- Need for map provider: *TomTom, HERE, Google*
- Digital datasets
- Capacity building
- Collaboration with other departments

way forward



Incorporate artificial intelligence in phase 2 to develop a predictive modelling tool which can forecast incidents and can suggest solutions.

thank you



teamPLAN with Mentor Prof. Bimal Patel, and Experts Dr. Shalini Sinha and Dr. Shaily Gandhi (CEPT University)