INAUGURATION PROGRAM

Design Install Operate and Maintain (DIOM) Contract of
Intelligent Traffic System in Lalitpur
(Contract No. LMC/NCB/10/076/077)

Date: 16th Dec 2024

Project Background

- Project Modality: Design Build Operate and Maintenance
- Part 1: Detailed Design of 5 intersections and feasibility study of 50 additional intersections.
- Part 2: Supply and Installation of ITS Traffic Signal with necessary software and CCTV system
- Part 3: Operation and Maintenance for 5 years
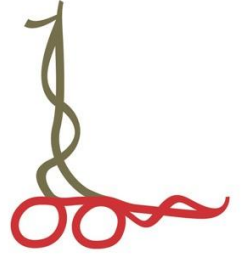
Project Cost

- Design and Feasibility Study:

   NPR 4,183,043.04

- Supply and Installation:

   NPR 49,613,664.37

- Operate and Maintenance for 5 years:

   NPR 11,807,614.08

*Including VAT

Installation of Intelligent Traffic Light System at 5 junctions

- Kandevatasthan Chowk
- Hariharbhawan Chowk
- Pulchowk North & South
- Damkal Chowk
- Jawalakhel
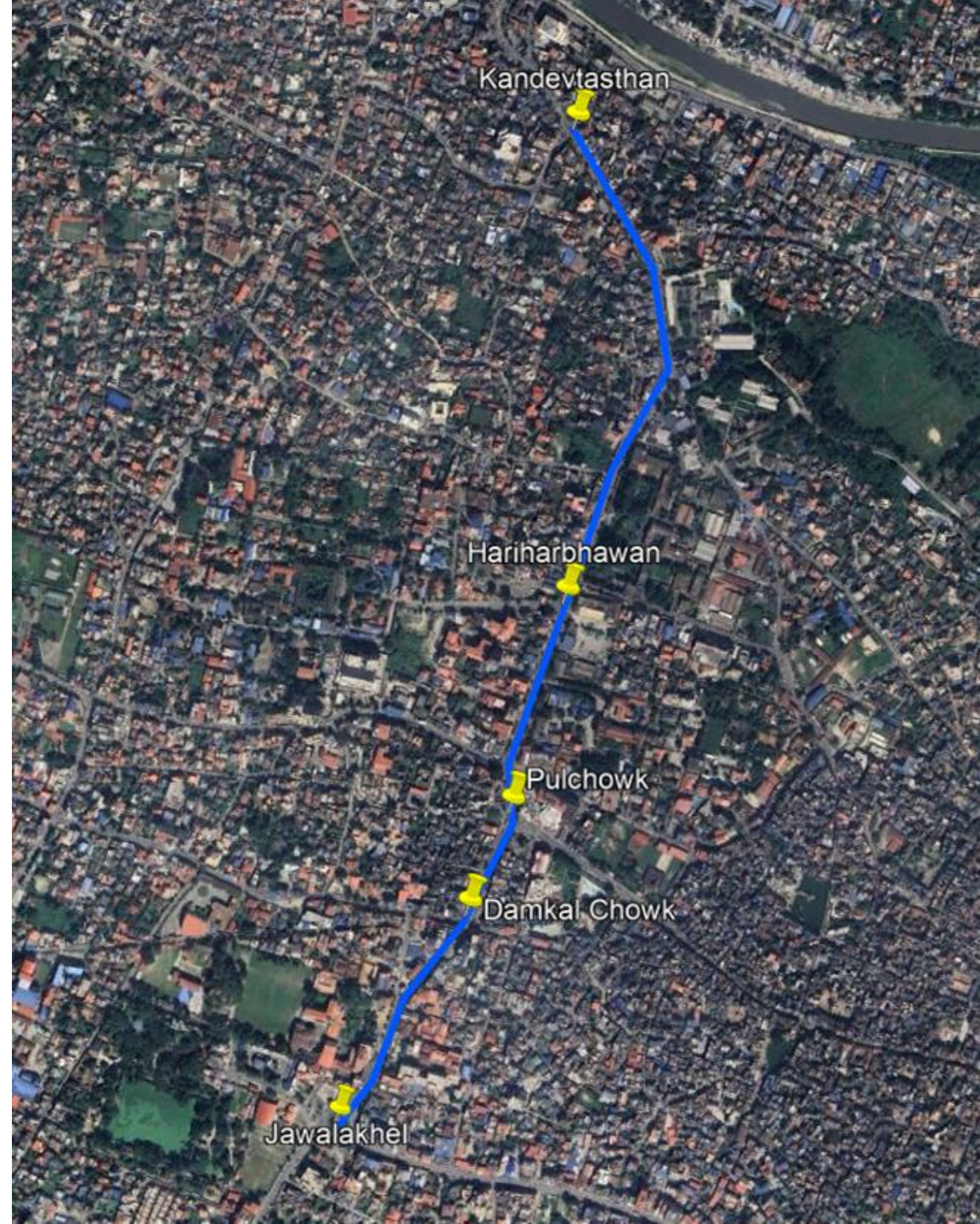
Intelligent Traffic Light System

- Intelligent Traffic Light System relies on good detection of current conditions in real-time in order to allow quick and effective response to any changes in current traffic situation.

- The system includes algorithms that adjusts:
  - Cycle Length
  - Phase Splits
  - Phase Offsets
  - Phase Sequence

Intelligent Traffic Light System - Objectives

1

Minimize red time on arrivals

2

Optimize synchronization of green time

3

Minimize combinations of stops and delay

Misconceptions of Intelligent Traffic Light System

- The green time for vehicles coming from all directions
- All vehicles will get green time in all the junctions.
- The system considers the average time/speed between junctions so if there is some interference in between junctions chances of catching the next green cycle decrease.
- Example
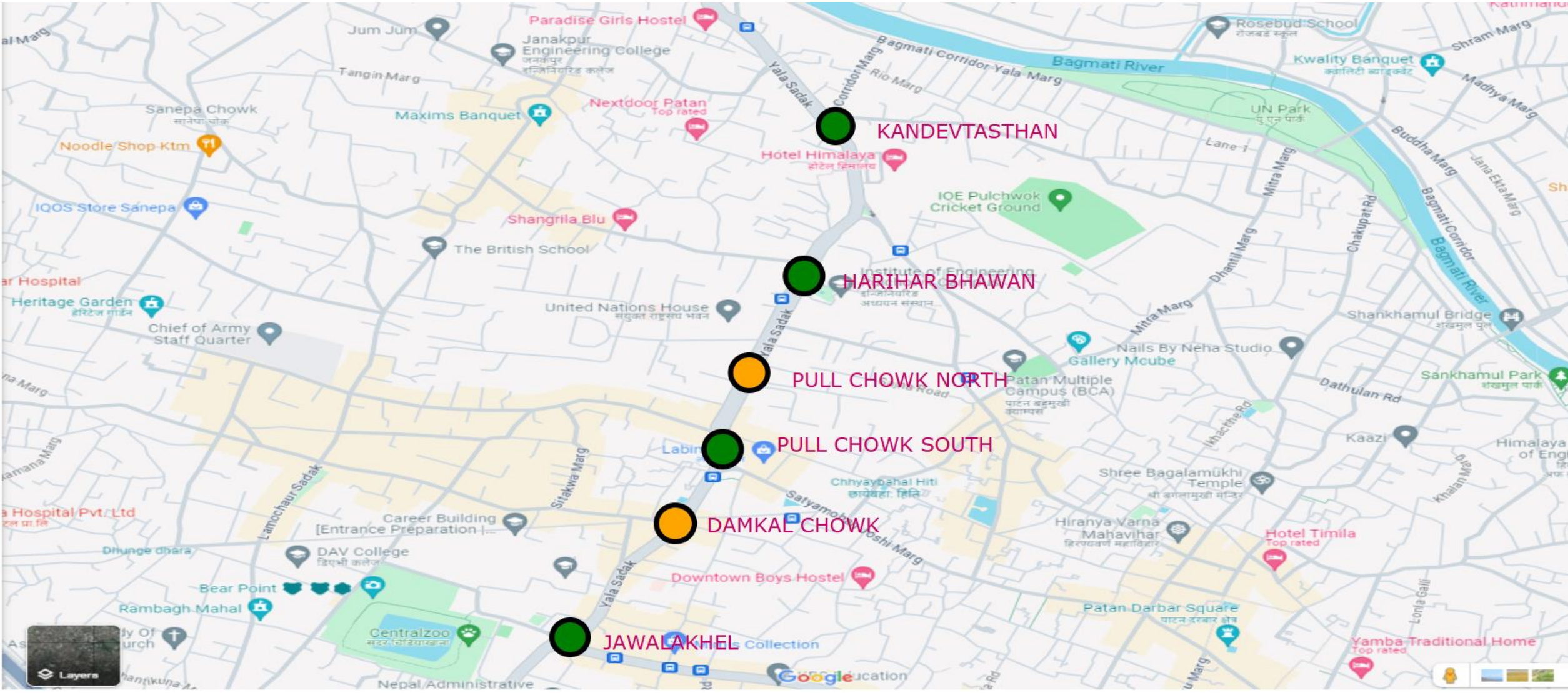 - Pulchowk South and Pulchowk North
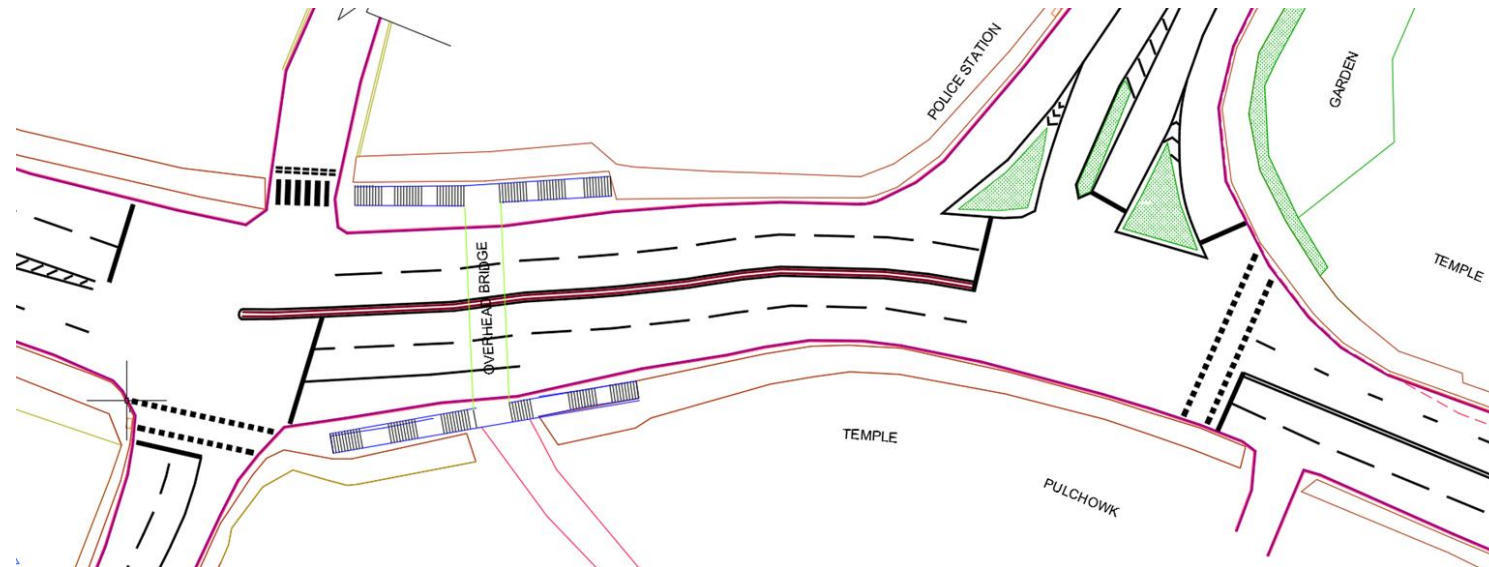
CoSiCoSt & TraMM

- Developed by CDAC (Centre for Development of Advanced Computing, India)
- Composite Signal Control Strategy (CoSiCoSt) - Optimizes weighted combination of delay and number of stops in real-time.
- Traffic Management and Monitoring (TraMM) - Graphic Interface to configure, visualize real traffic patterns and control traffic patterns and control the traffic signals remotely.
- Cities implemented
  - 95 junctions in Guwahati, Assam
  - 96 junctions in Hyderabad
  - 33 junctions in Srinagar
  - 50 junctions in Bhubaneshowr
  - 34 junctions in Jammu
- Software supports up to 250 junctions.

Modes of operation

- Fixed Time
  - System operates as per set phase times and day plans
- Police Manual Mode.
  - Police can operate the phase times manually from the control panel as per required.
- Vehicle Actuated
  - The system detects the vehicles and controls the phase time until road is cleared.
- Synchronized (Synchronize Green Time)
  - All the corridor control panels are synchronized, the green phase of multiple junctions are synchronized as per the distance between junctions and speed/travel time for the **selected priority route**.
- Adaptive Traffic Control System (ATCS) (Minimize red time)
  - All the corridor control panels work together to minimize the red time for the vehicle travelling in the priority route. For example morning priority route is from Jawalakhel to Kandevtasthan and evening priority route is from Kandevtasthan to Jawalakhel

Junction Name: PULCHOWKSOUTH_CHOWK ▸▸

Kupondole

Patan

Jawalakhel

PULCHOWKSOUTH_CHOWK:ATCS

Junction Parameters

SeqNo	Stage	Split	Status	Mode	CycleNo	ICT (sec)	ACT (sec)	Volume (veh/hr)
2	2	1	JUNCTION-ON	ATCS	3	123	130	1176

Stage Parameters

SeqNo	StageNo	Allocated	Available	Utilized
*1	1	70	70	70
2	2	26	26	
3	3	34	34	27

Saturation & Control Status

Saturation		Control Status	
Saturated	>=95 %	Junction State	NORMAL
Normal	>70 < 95 %	CoSiCoSt Status	ACTIVE
UnderSaturated	<=70 %	Corridor-Mode	NORMAL-MODE

Remote Administration

Normal	Flash	--Select HurryCall-- ▾	Hurrycall	Lamp OFF/ON ON

Junction Name: HARIHARBHAWAN_CHOWK ⏩

Kupondole

UN House

Jawalakhel

HARIHARBHAWAN_CHOWK:FixedTime

Junction Parameters

SeqNo	Stage	Split	Status	Mode	CycleNo	ICT (sec)	ACT (sec)	Volume (veh/hr)
2	2	3	JUNCTION-ON	FixedTime	3	115	115	1273

Stage Parameters

SeqNo	StageNo	Allocated	Available	Utilized
1	1	70	70	70
2	2	20	20	
3	3	25	25	25

Saturation & Control Status

Saturation		Control Status	
Saturated	>=95 %	Junction State	NORMAL
Normal	>70 < 95 %	CoSiCoSt Status	ACTIVE
UnderSaturated	<=70 %	Corridor-Mode	NORMAL-MODE

Remote Administration

Normal	Flash	--Select HurryCall--	Hurrycall	Lamp OFF/ON

System Analysis Reports

History:	☐ Restored Data
Select Type:	INTERSECTION ⌄	Corridor-1
Select Names:	Select ⌄
Report Category:	Select ⌄
Report names:	Select ⌄
Report Format:	HTML ⌄
From Date:	11/11/2024 📅	**From Time [HH]:**	00 🕐
To Date:	11/11/2024 📅	**To Time [HH]:**	23 🕐

Submit

Historic Timespace Diagram - YALA_SADAK_CORRIDOR

DISTANCE (m)

1742.000000000002

JAWALAKHELCHOWK - 1642

1393.6000000000001 DAMODARCHOWK_CHOWK - 1325

215 315 415 155   215 315 415 155   215 315 415 153   215 315 415 155

PULCHOWKSOUTH_CHOWK - 1148

PULCHOWKNORTH_NORTH - 1071

212 331 1197   212 331

1045.2

236 1204   236 1204

HARIHARBHAWAN_CHOWK - 812

696.800000000001

1147   232 361   1147   232 361

348.40000000000003

KANDEVTASTHAN_CHOWK - 0

253 318 1169   253 318 1169

0   100   200   300   400   500
15:56:40   15:58:20   16:0:0   16:1:40   16:3:20   16:5:0

TIME(sec)

● Completed Stage ○ Priority Stage ● Jn Off/N/w Fail ● Flashing

Live Stream Camera : FROM DAMKAL

15/12/2024 11:20:58

Loop L-1: Ne

PKS DAMKAL (14.68)
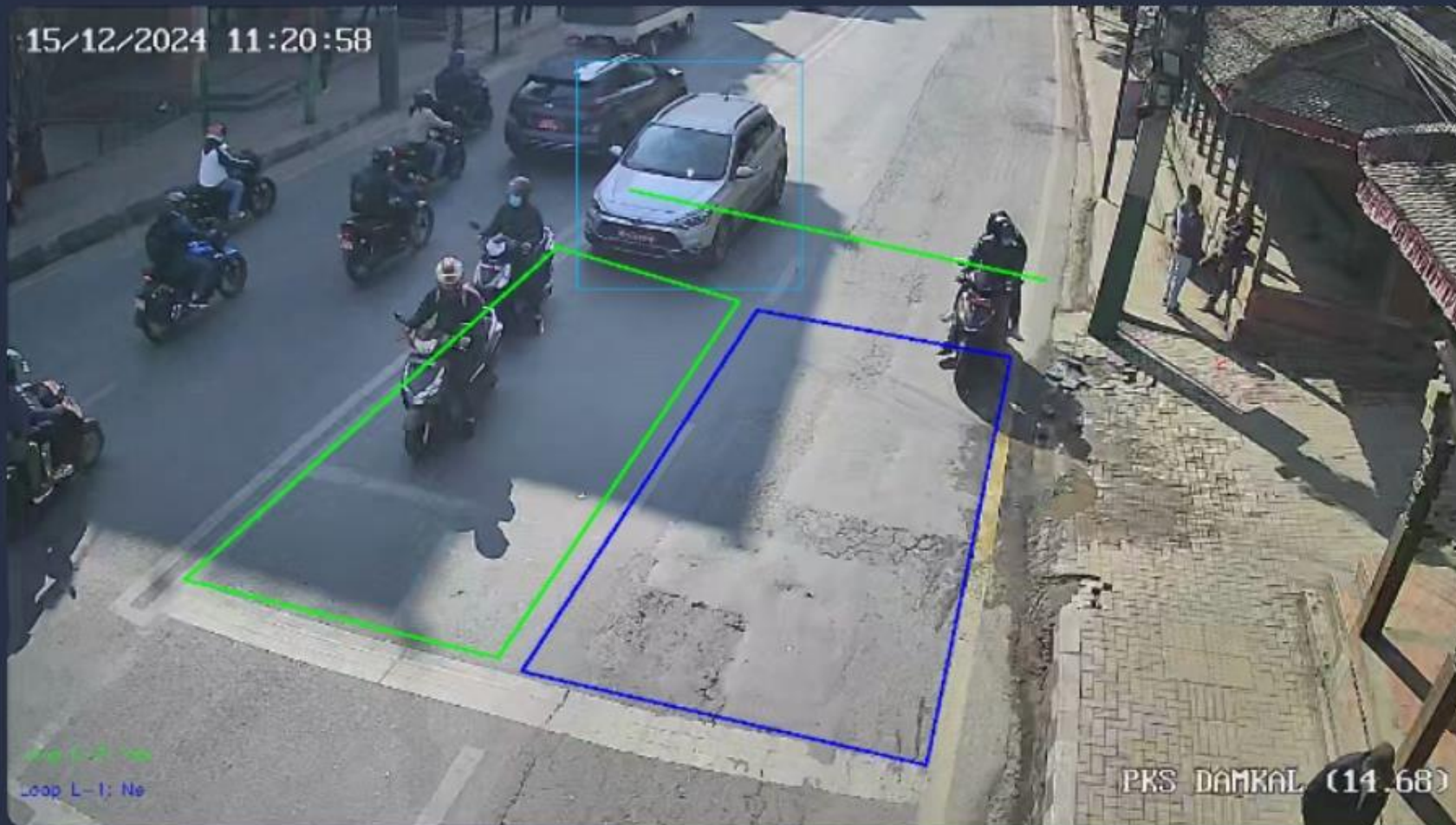
Direction UP

Motorcycle: 4

Direction Down

Time	Motorcycle	Car	Auto	Bicycle	Bus	Truck	Fire Truck	Person	Tractor	Ambulance
2024-10-31										
00:00	3	266	4	1	3	1	0	23	0	3
2024-11-01										
00:00	5365	3677	84	95	228	122	0	79	0	50
2024-11-02										
00:00	5615	4033	89	79	191	84	0	77	0	58
2024-11-03										
00:00	5117	4468	71	48	141	76	0	51	0	26
2024-11-04										
00:00	4377	4341	84	57	205	92	1	54	0	39
2024-										

Intersections

Cameras

Pins Setup

Report

Pins

🟢 1 🔴 2 🟢 3 🟢 4 🔴 5 🔴 6 🔴 7 🔴 8 🔴 9 🔴 10 🔴 11 🔴 12 🔴 13 🔴 14 🔴 15 🔴 16

Traffic Counting
Last 15 days
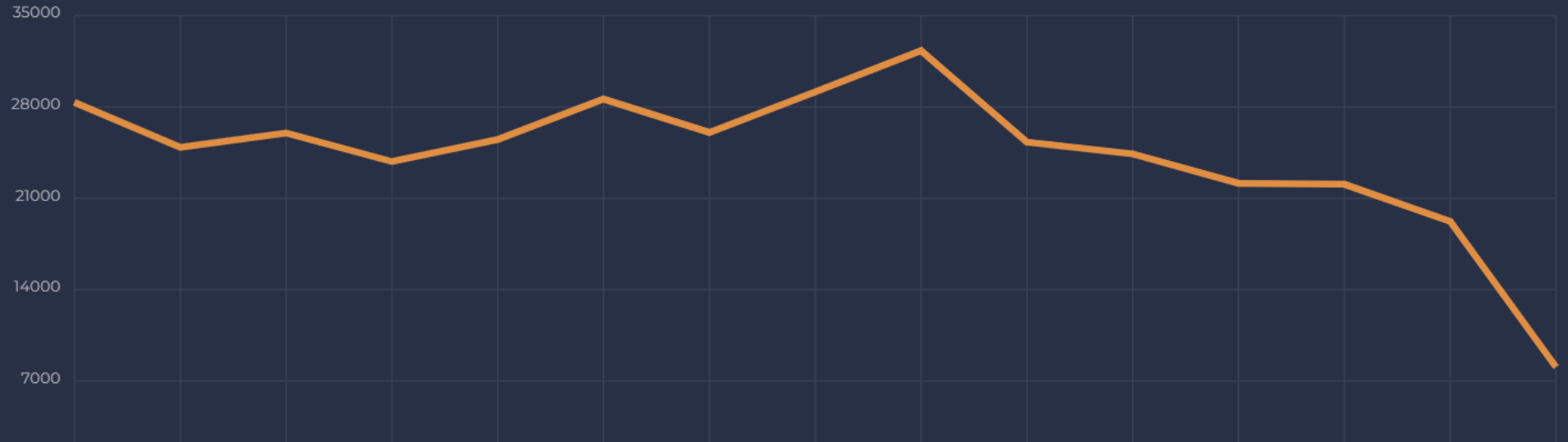
Feasibility Study
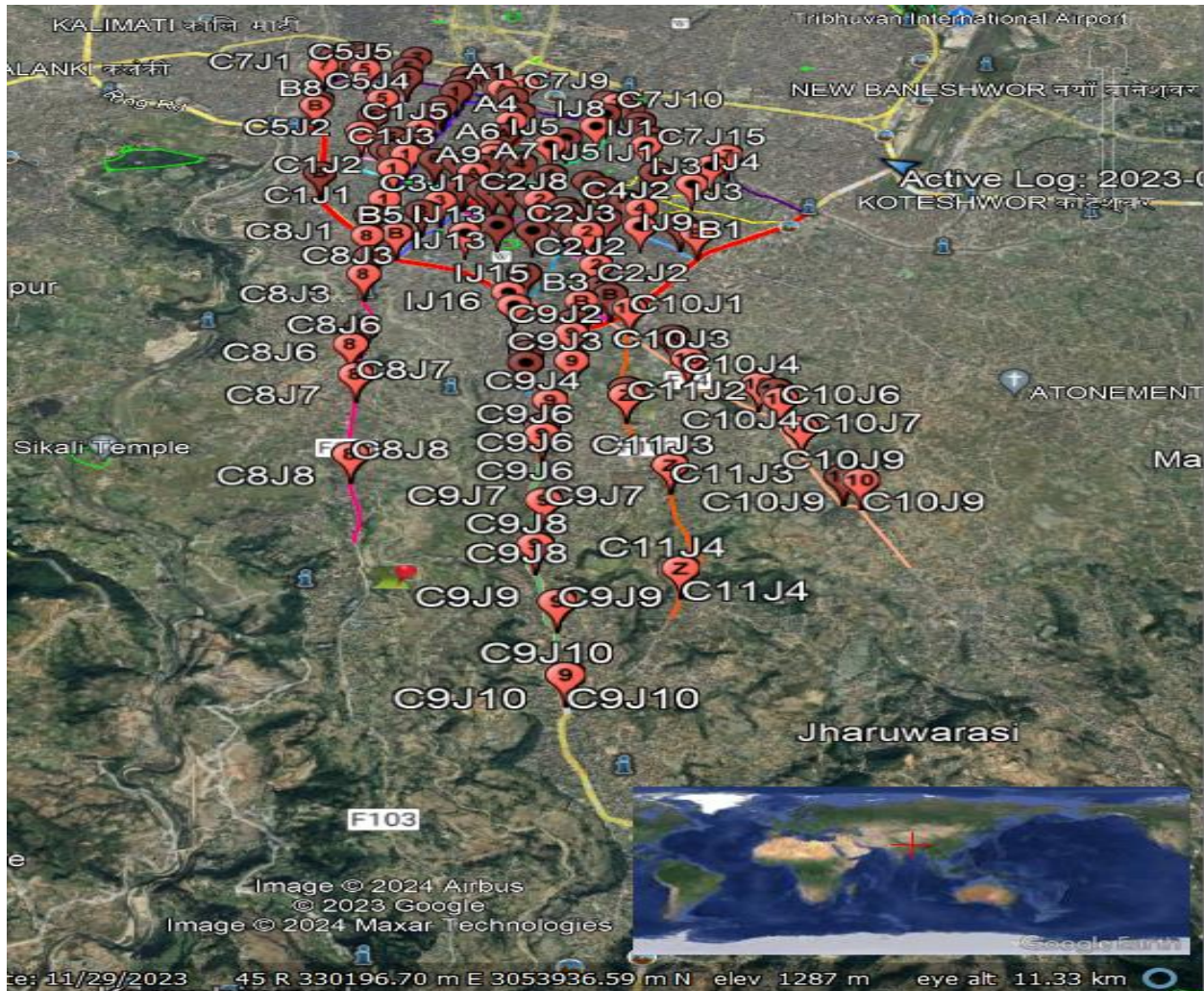
- 117 intersections considered
- Count data
- Primary counts at 5 junctions
- Secondary data
- Developed network traffic
- Feasibility based on signal warrant – US MUTCD 2023
- Signals feasible at 63 intersections

Intersection Civil Design – Approach & Methodology

- Physical design -photos, inspection and Google Earth®
- Design elements considered for intersection analysis
  - Turning traffic –peak hour (AM & PM)
  - Approach lanes – nos & width within existing space
  - Turning radius, channel island (where applicable)
  - Kerb-ramp crossings with tactile
  - Road markings:
    - Signalised pedestrian crossing & STOP lines
    - Edge, centre and lane-lines
    - Chevron marking at int. with wide throat (entry)
    - Motorcycle storage zone
    - Lane direction arrows (LT/TH, TH/RT, RT)
- Signal timing design by SIDRA INTERSECTION 8.0 PLUS

Network selection:
- **No criteria by LMC**
- **Contractor chose per TOR**
- **Criteria adopted**
  - Int. intercepting LMC MTMP 2017 roads
  - Strategic intersections
  - Under the LMC jurisdiction
  - Potential int. warranting signalisation, and
  - Are the missing int. linking with existing and P2 signals
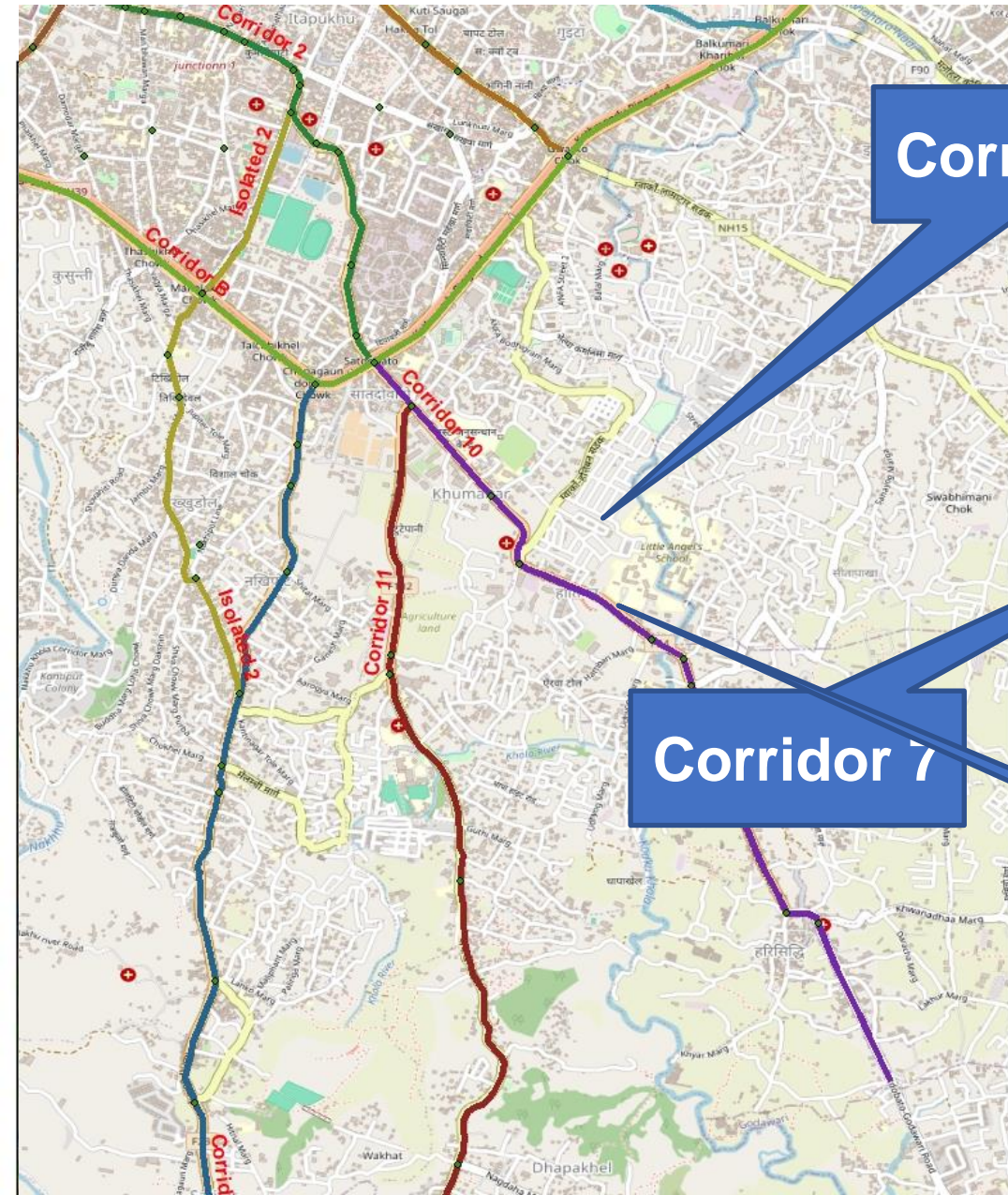
PART 1 SIGNALISATION RECOMMENDED 2025- 2030
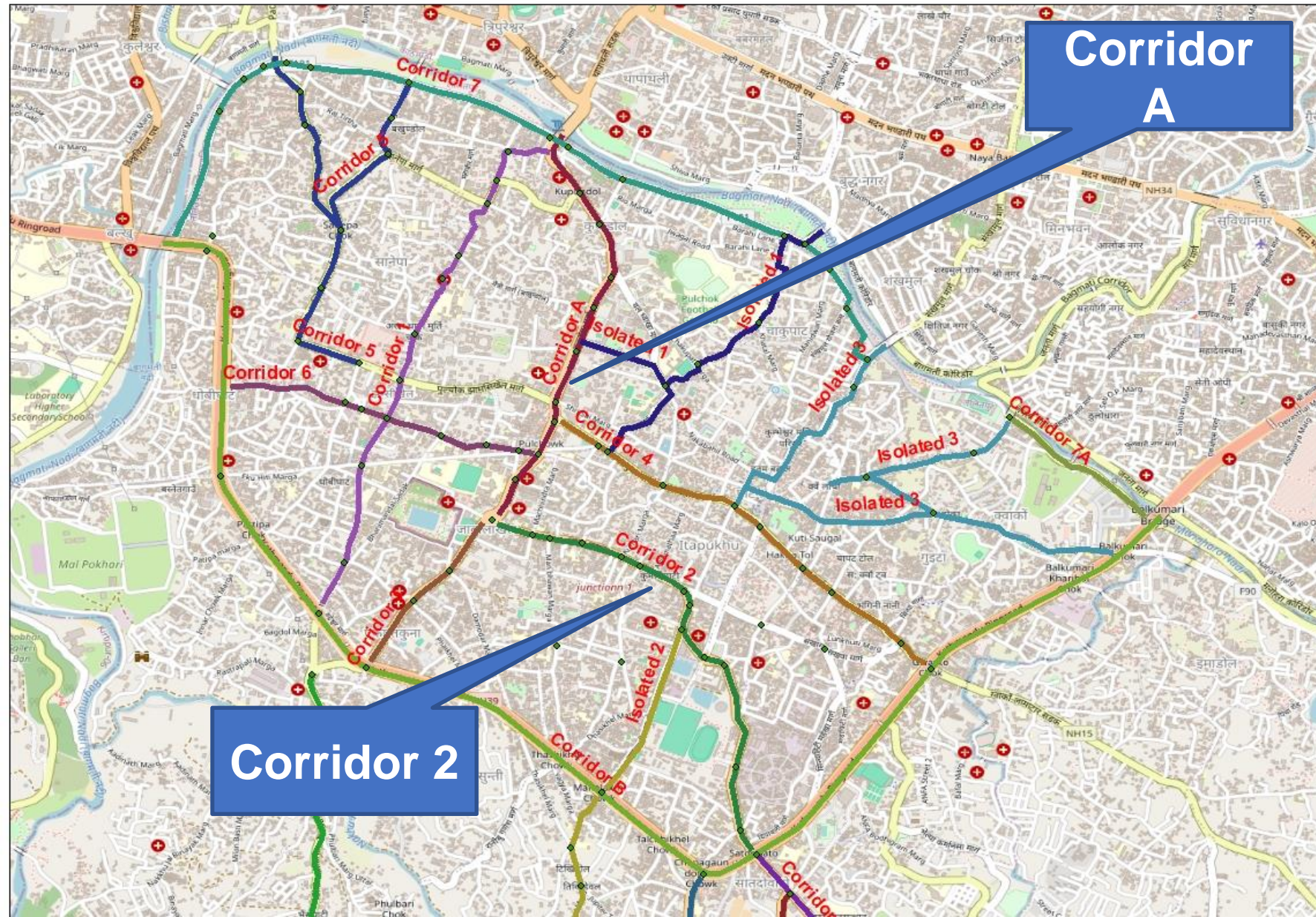
- **22 intersections**
- **Improve traffic mobility & safety @ Corr. A & 2**
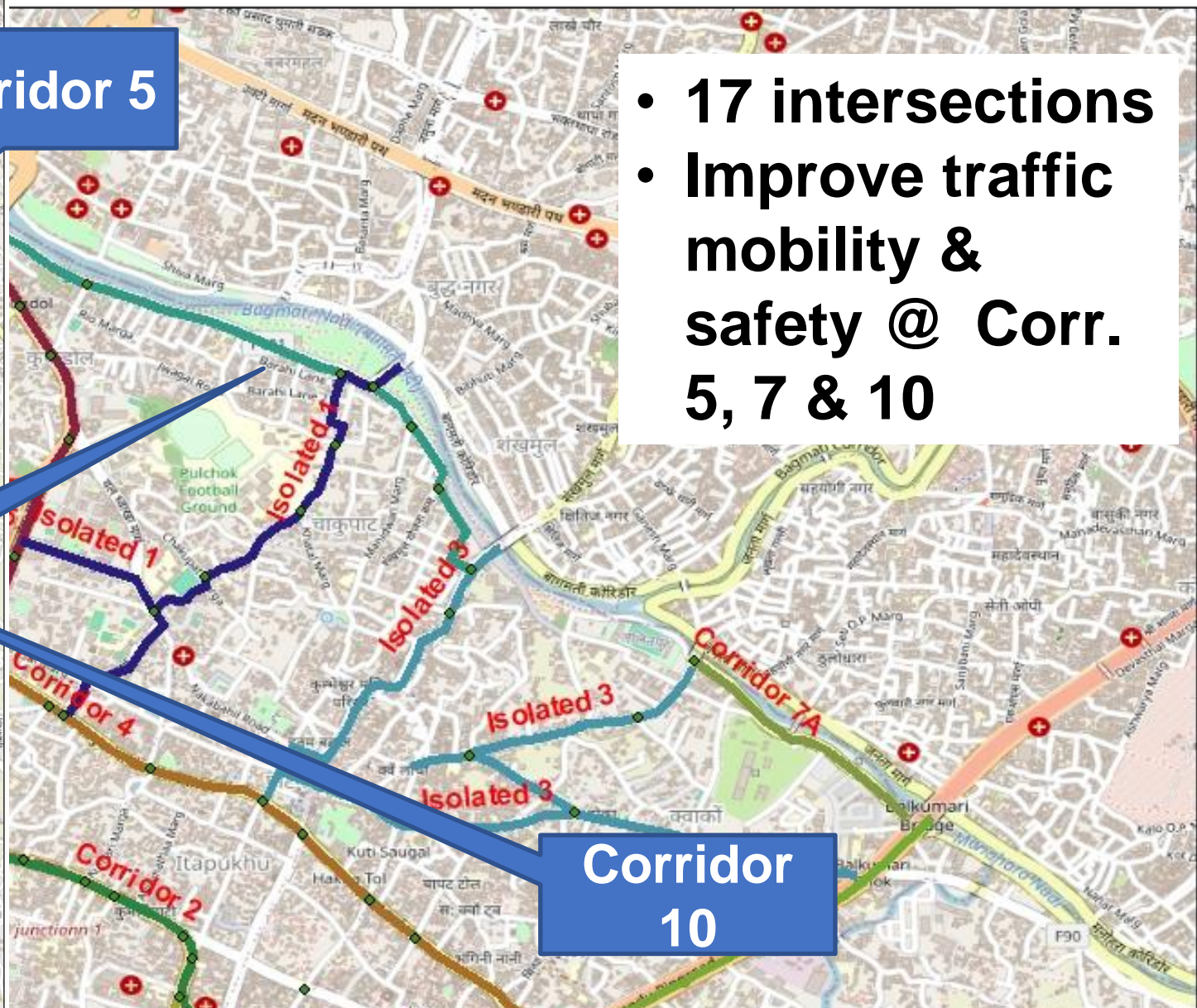
PART 1 SIGNALISATION RECOMMENDED 2030- 2035
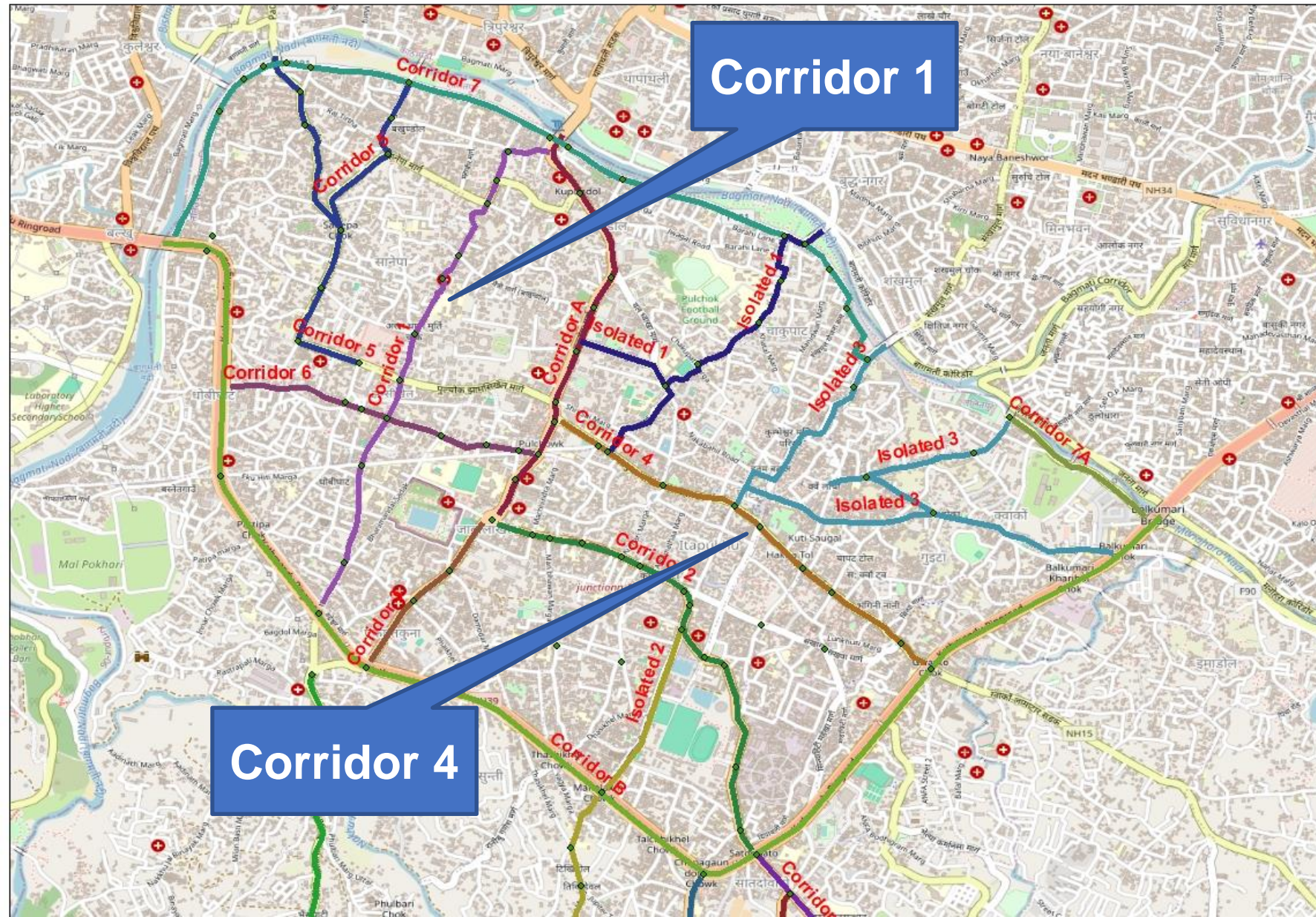
Corridor 1

Corridor 4

- **22 intersections**
- **Improve traffic mobility & safety @ Corr. 1 & 4**

Corridor 5

Corridor 7

Corridor 10

- **17 intersections**
- **Improve traffic mobility & safety @ Corr. 5, 7 & 10**

CCTV positioning at C7J11: UN Park Jn.

C5J4: Sanepa Ch.: (i) S & SE approach (ii) CCTV positioning at N approach

C8J1: Nakkhu Machindra Nath Ch.: (i) SB view; (ii) With CCTV positioned

C10J9: Harrisiddhi/Kanikhwyo Ch: (i) E Kanikhwo app; (ii) N app w/ CCTV

YELLOW BOX MARKING - F28

It prohibits a vehicle to enter the box if the vehicle is forced to stop inside due to the presence of a stationary or oncoming vehicle inside or outside the box.
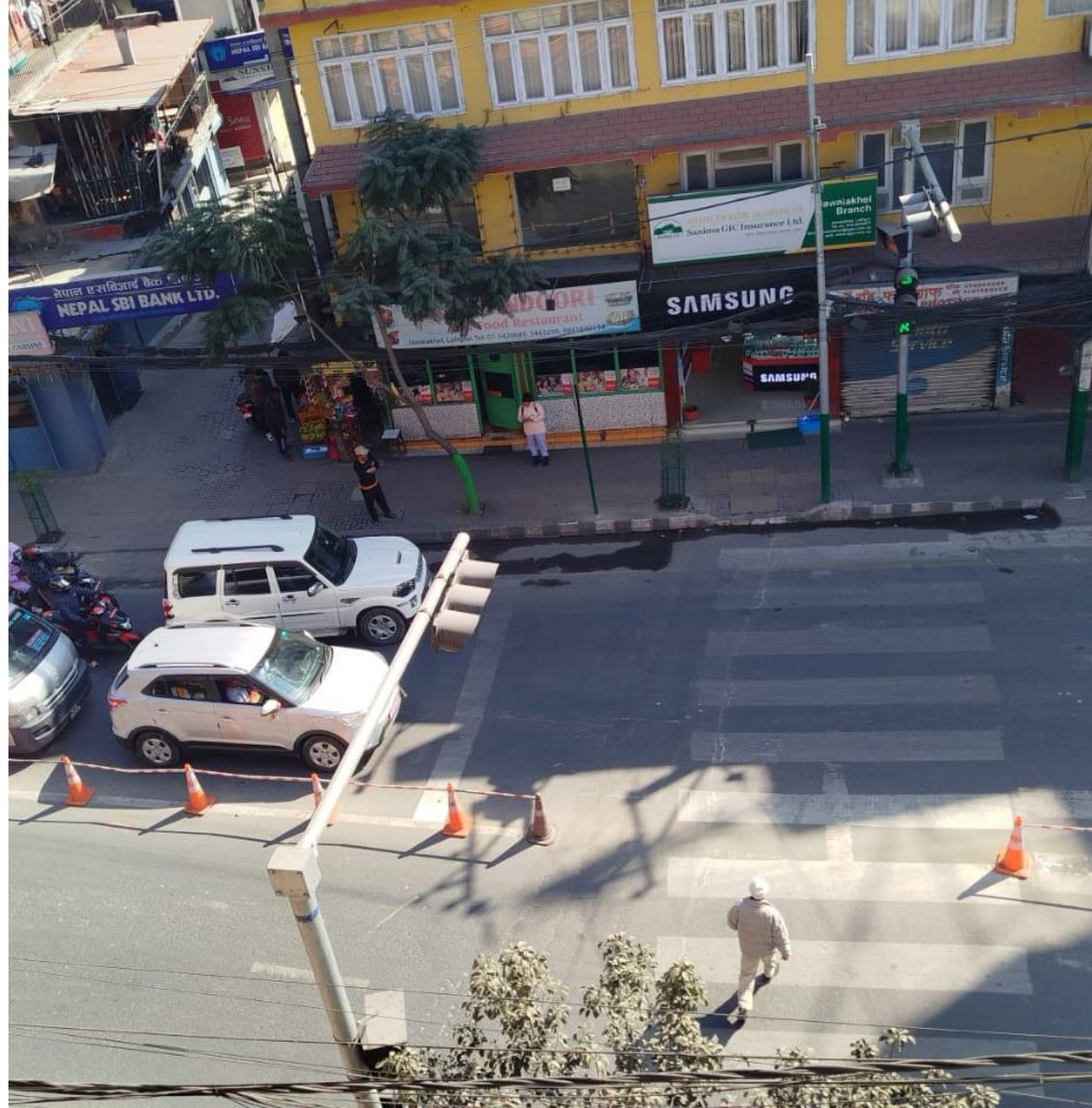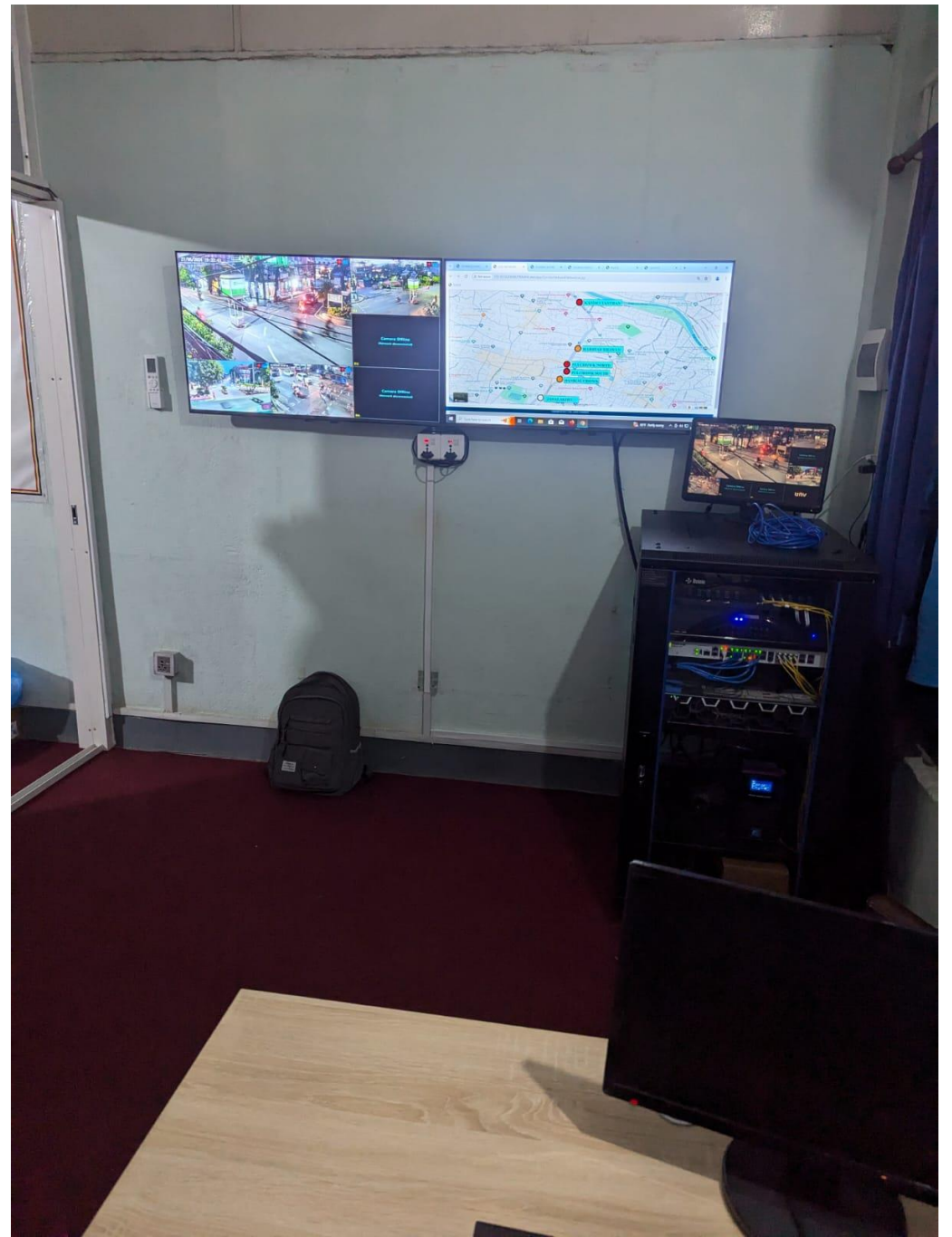
THANK YOU