

Availability of
Fire Stations and
Hospitals Near Factories
and Overcrowded Restaurant
Areas in **Dhaka City** Using
OpenStreetMap Data



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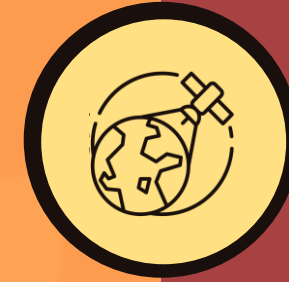
Introduction



- Rapid urbanization and increasing population escalates the demand by the public for fire stations and hospitals and other emergency service.
- Recent fires that occurred have shown the system failure of the authorities in monitoring and enforcement especially RAJUK, Fire Service and Civil Defence (Hasnat et al, 2018).
- **GIS allows locating best paths** for emergency services, a vital function to reduce system-wide response time in urban chokepoints (Hasnat et al., 2018).
- It helps to **identify high areas with less fire and medical service access**, required measures in emergency preparedness (Hasnat et al., 2018).

Objective

Risk Assessment



**Spatial Analysis of
Accessibility**



**To provide data-driven
insights for urban planners
and policymakers**

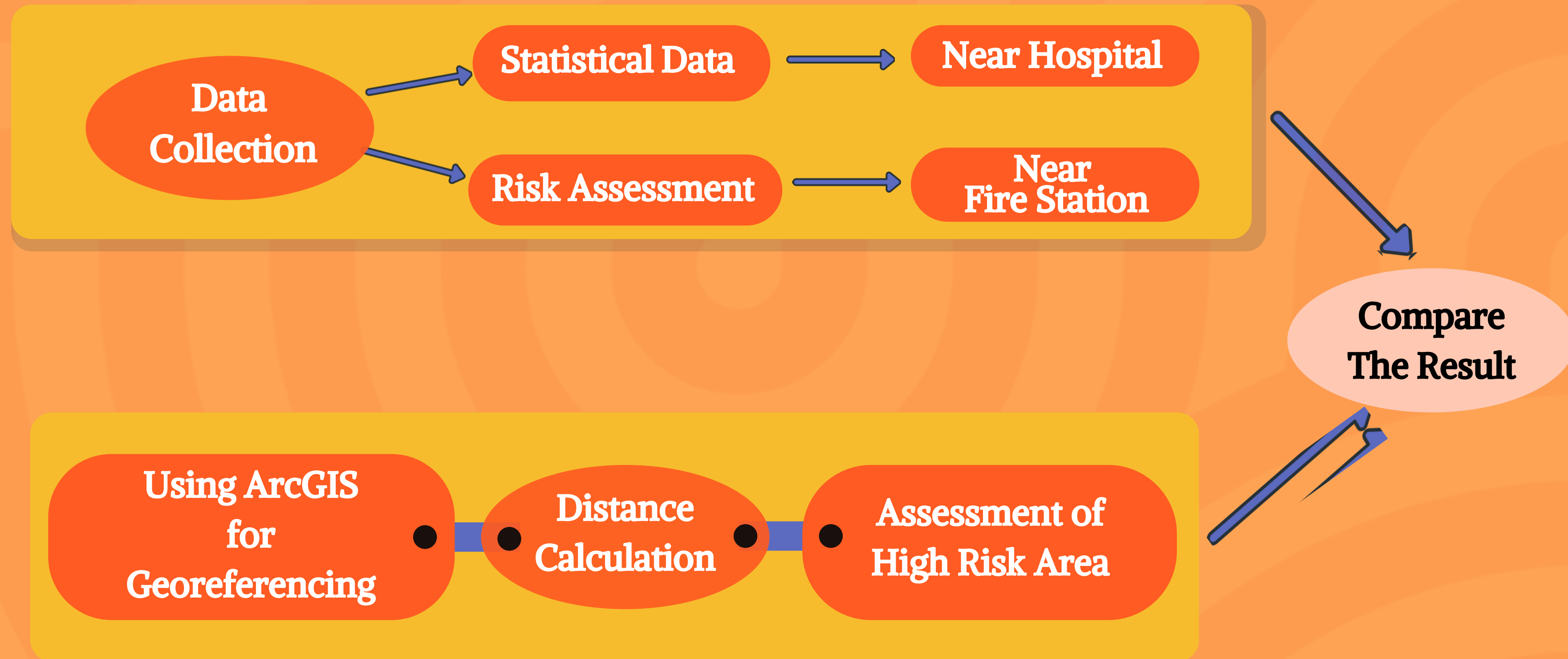
Sustainable Development Goals

11 SUSTAINABLE CITIES AND COMMUNITIES



The official mission of SDG 11 is to
"Make cities inclusive, safe,
resilient and sustainable"

Materials & Method



Data collection

Fire Station in Dhaka City and their coverage area



Continue

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Station name	Coverage Area
Siddique Bazar Fire Station	Central Dhaka,Gulistan, including parts of Motijheel and surrounding areas.
Tejgaon fire Station	Kawran Bazar and surrounding areas, including parts of Tejgaon, Farmgate, and Hatirpool
.....
.....
Palashi Barrack Fire Station	Dhanmondi, New Market, and nearby areas.
Headquarters of the Bangladesh Fire Service and Civil Defence	Gulistan, Paltan, Sadarghat,Bangabazar,Shakhari Bazar, Chawk Bazar and other areas in the historic old town

Continue

Risk Assessment

Tazreen Fashion Fire

Area: Ashulia

Year: 2012

Nearest Station: DEPZ Fire
Station

Nearest Hospitals: Abul
Hossain Hospital

New Market Fire

FR Tower Fire

Chawkbazar
Plastic factory fire

Bangabazar
Fire Incident

Science lab Explosion

Bailey Road Fire

Chawkbazar Fire

Gulistan Explosion

Continue

Tazreen Fashion Fire

Area: Old Dhaka

Science lab Explosion

Year: 2022

Nearest Station: Palashi Barrack
Fire Station

Bailey Road Fire

Nearest Hospitals: Sumona
Hospital, The Chankharpool

Chawkbazar Fire

General Hospital, Ahmed
Specialized Hospital, Millennium
Specialized Hospital

New Market Fire

FR Tower Fire

Chawkbazar
Plastic factory fire

Bangabazar
Fire Incident

Gulistan Explosion

Continue

Tazreen Fashion Fire

New Market Fire

Science lab Explosion

Area: Bailey Road

Year: 2024

FR Tower Fire

Bailey Road Fire

Nearest Station: headquarter

Nearest Hospitals: Dhaka

Chawkbazar
Plastic factory fire

Chawkbazar Fire

Community Medical College
and Hospital

Bangabazar
Fire Incident

Gulistan Explosion

Continue

Tazreen Fashion Fire

New Market Fire

Science lab Explosion

Area: Old Dhaka

Year: 2019

Nearest Station: Lalbag
Station

FR Tower Fire

Bailey Road Fire

Nearest Hospitals: Sumona
Hospital, The Chankharpool
General Hospital, Ahmed
Specialized
Hospital, Millennium
Specialized Hospital

Chawkbazar
Plastic factory fire

Chawkbazar Fire

Bangabazar
Fire Incident

Gulistan Explosion

Continue

Tazreen Fashion Fire

New Market Fire

Science lab Explosion

Area: Gulistan

Year: 2023

FR Tower Fire

Bailey Road Fire

Nearest Station: Siddique
Bazar Fire Station

Chawkbazar
Plastic factory fire

Chawkbazar Fire

Nearest Hospitals: Dhaka
Medical College and Hospital,
Sir Salimullah Medical College
Mitford Hospital, Birdem
General Hospital

Bangabazar
Fire Incident

Gulistan Explosion

Continue

Tazreen Fashion Fire

New Market Fire

Area: New Market

Science lab Explosion

Year: 2023

FR Tower Fire

Bailey Road Fire

Nearest Station: Palashi

Barrack Fire Station

Chawkbazar

Chawkbazar Fire

Nearest Hospitals: Dhaka

Plastic factory fire

Medical College Hospital,
LabAid Specialized Hospital

Bangabazar
Fire Incident

Gulistan Explosion

Continue

Tazreen Fashion Fire

New Market Fire

Science lab Explosion

Area: Banani

Year: 2019

FR Tower Fire

Bailey Road Fire

Nearest Station: Baridhara
station

Chawkbazar
Plastic factory fire

Chawkbazar Fire

Nearest Hospitals: Banani

Clinic Ltd., York Hospital
Ltd., Aalok Health Care Ltd.

Bangabazar
Fire Incident

Gulistan Explosion

Continue

Tazreen Fashion Fire

Area: Old Dhaka

Year: 2022

Science lab Explosion

Nearest Station: Lalbag
Station

Bailey Road Fire

Nearest Hospitals: Sumona
Hospital, The Chankharpool
General Hospital, Ahmed
Specialized
Hospital, Millennium
Specialized Hospital

Chawkbazar Fire

New Market Fire

FR Tower Fire

**Chawkbazar
Plastic factory fire**

Gulistan Explosion

Bangabazar
Fire Incident

Continue

Tazreen Fashion Fire

New Market Fire

Science lab Explosion

Area: Bangabazar

Year: 2023

FR Tower Fire

Nearest Station: Head Quarter

Bailey Road Fire

Nearest Hospitals: Dhaka

Chawkbazar

Medical College Hospital, Sir

Plastic factory fire

Chawkbazar Fire

Salimullah Medical College

Mitford Hospital, National

**Bangabazar
Fire Incident**

Gulistan Explosion

Medical College Hospital

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HIGH RISK AREA



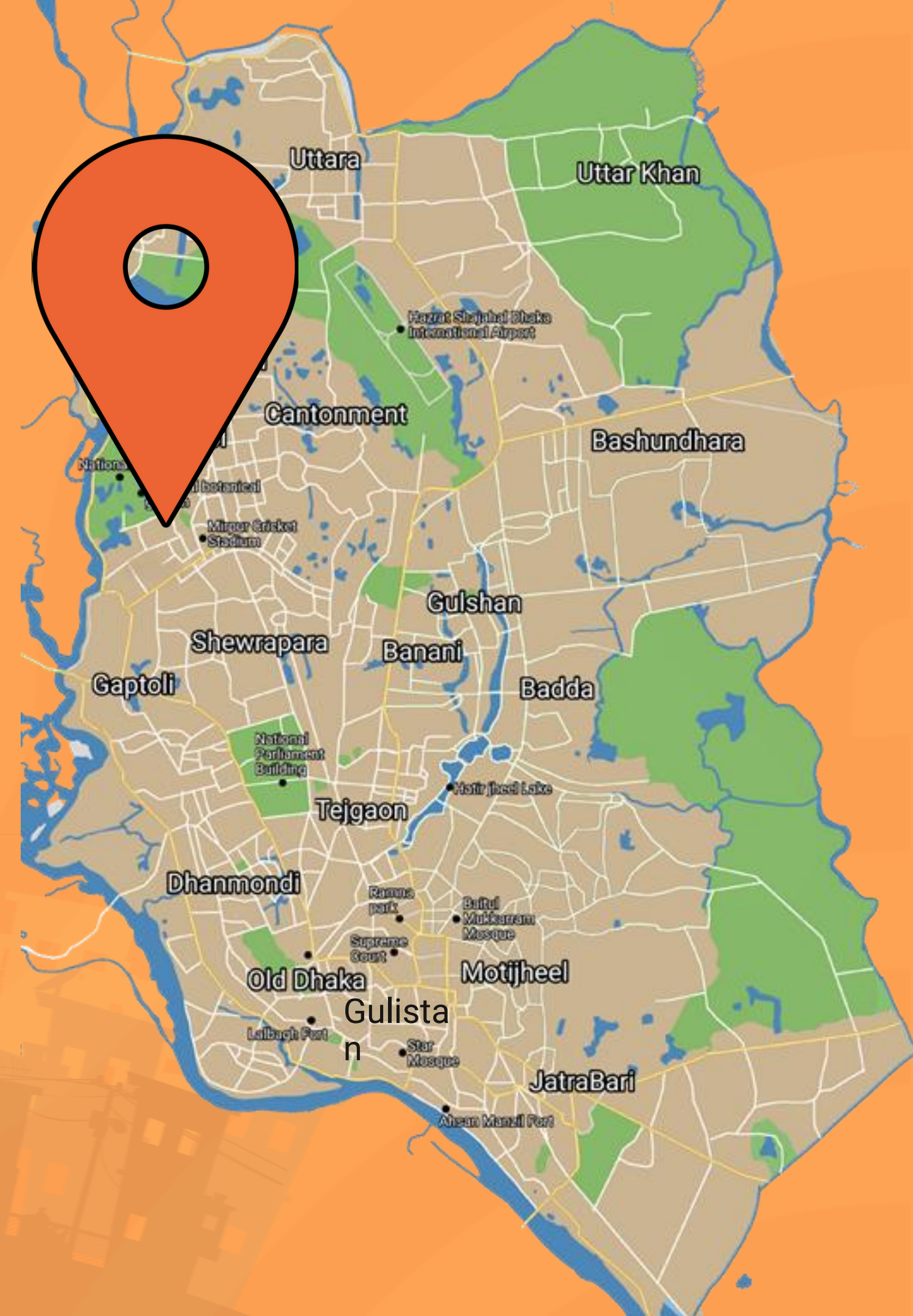
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MIRPUR



Nearest Station: Mirpur Fire
Station

Nearest Hospitals: Kingston
Hospital, Delta Health Care
Mirpur Ltd., Islami Bank
Hospital Mirpur



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MOHAMMADPUR



Nearest Station: Mohammadpur

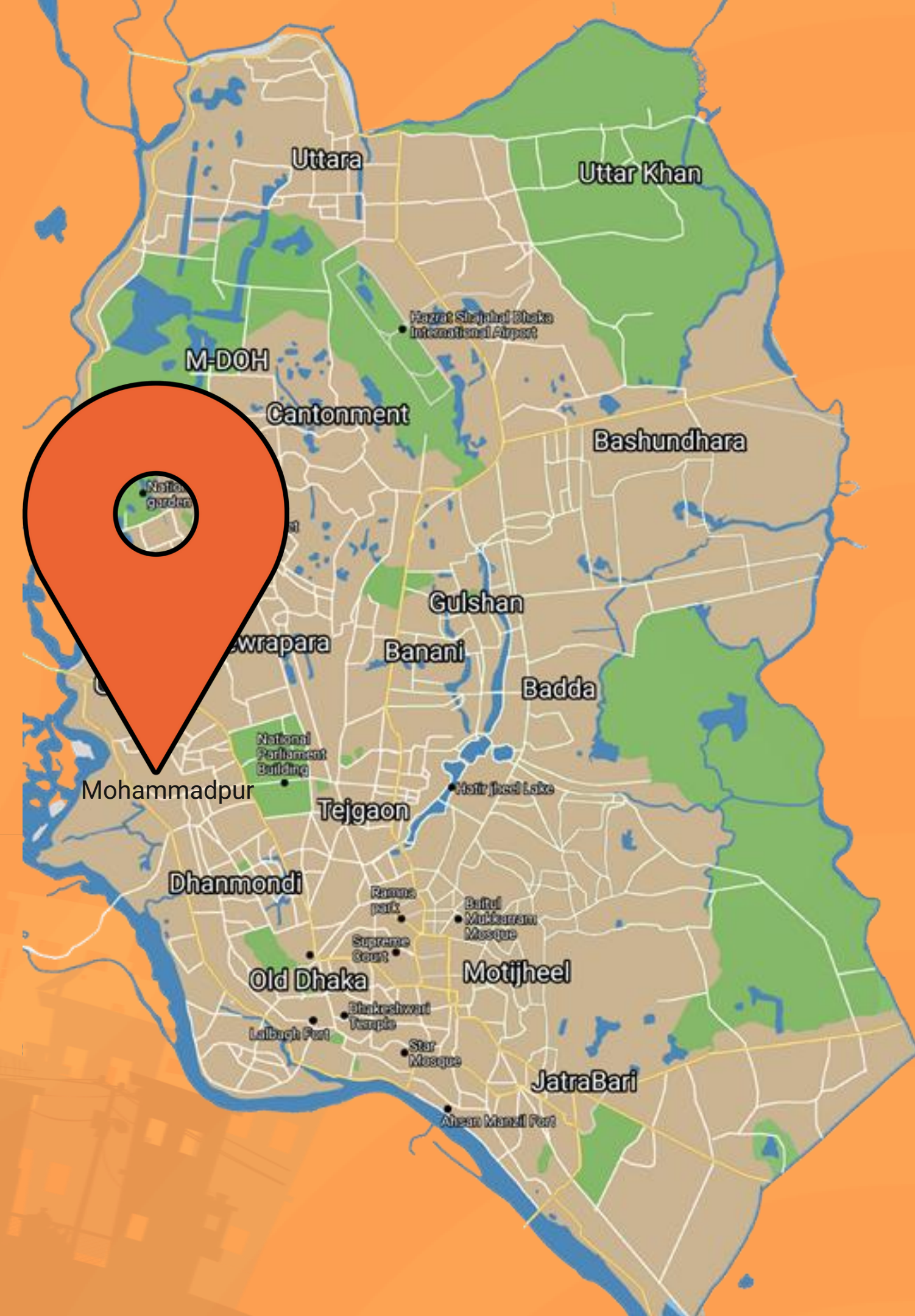
Fire Station

Nearest Hospitals: CARe

Hospital Mohammadpur, City

Hospital Limited, Anwer Khan

Modern Medical College Hospital



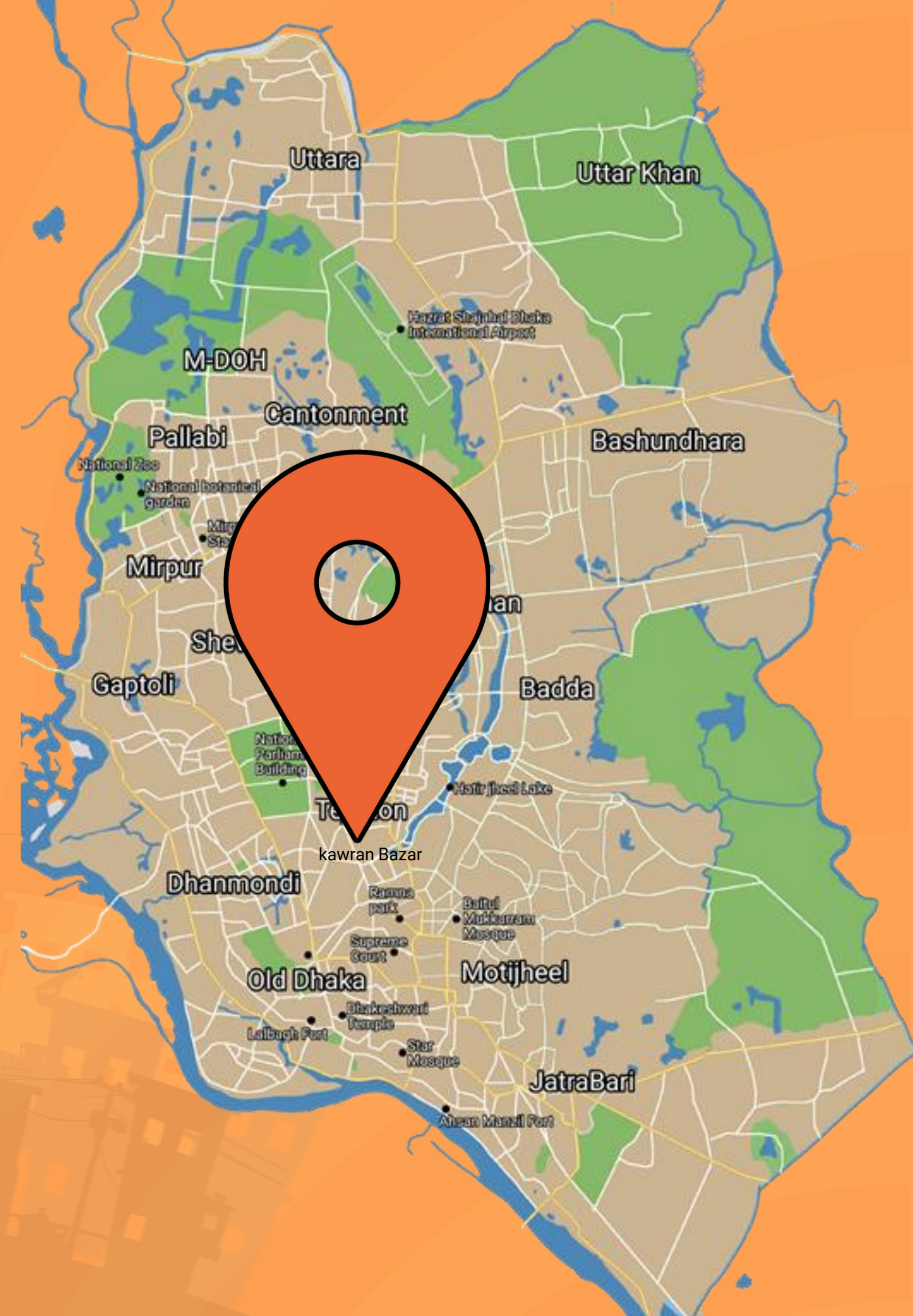
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KAWRAN BAZAR



Nearest Station: Tejgaon Fire station

Nearest Hospitals: Square Hospital, Green Life Hospital



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DHANMONDI



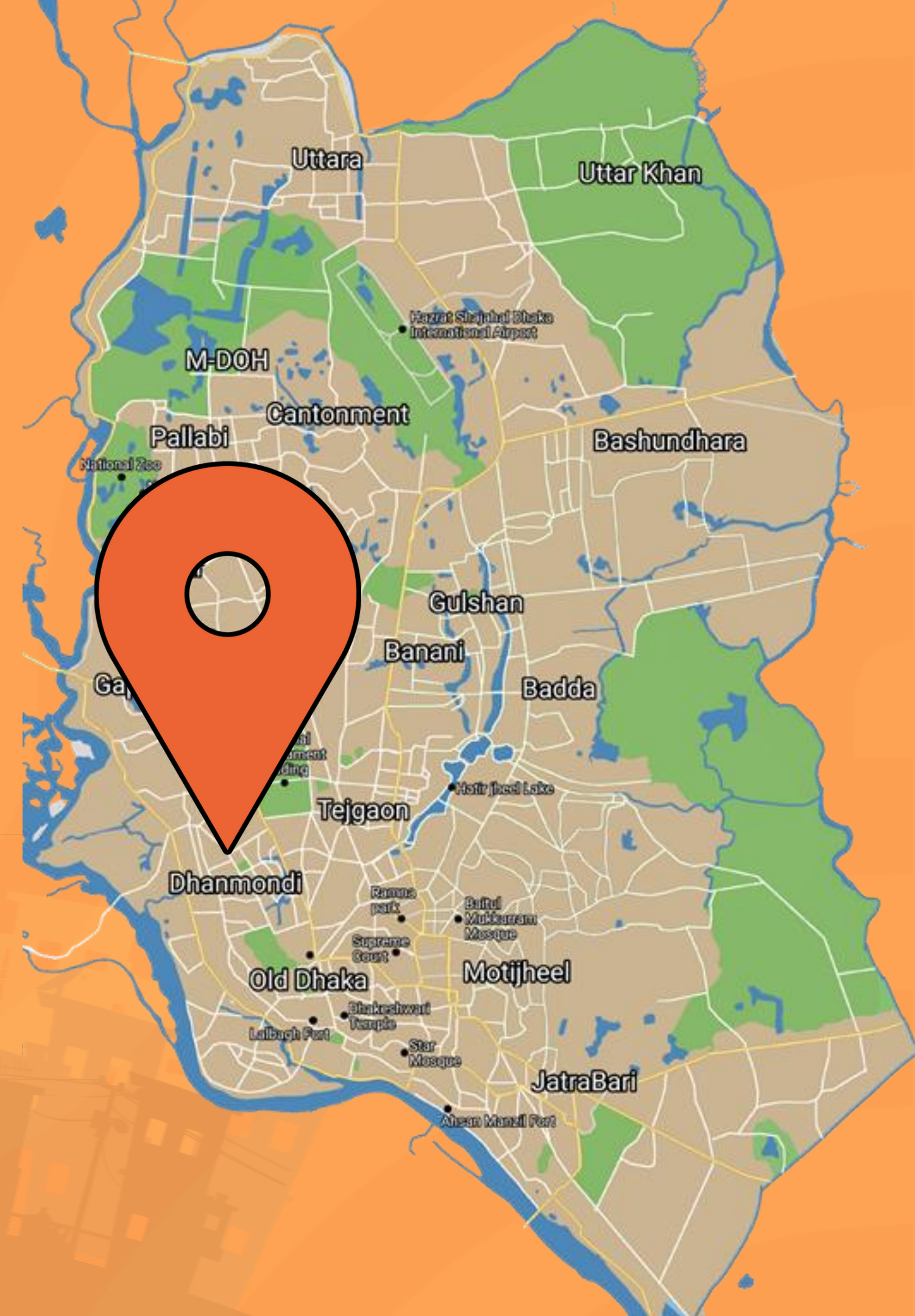
Nearest Station:

Mohammadpur Fire Station

Nearest Hospitals: LabAid

Specialized Hospital, Ibn Sina

Specialized Hospital



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NEW MARKET



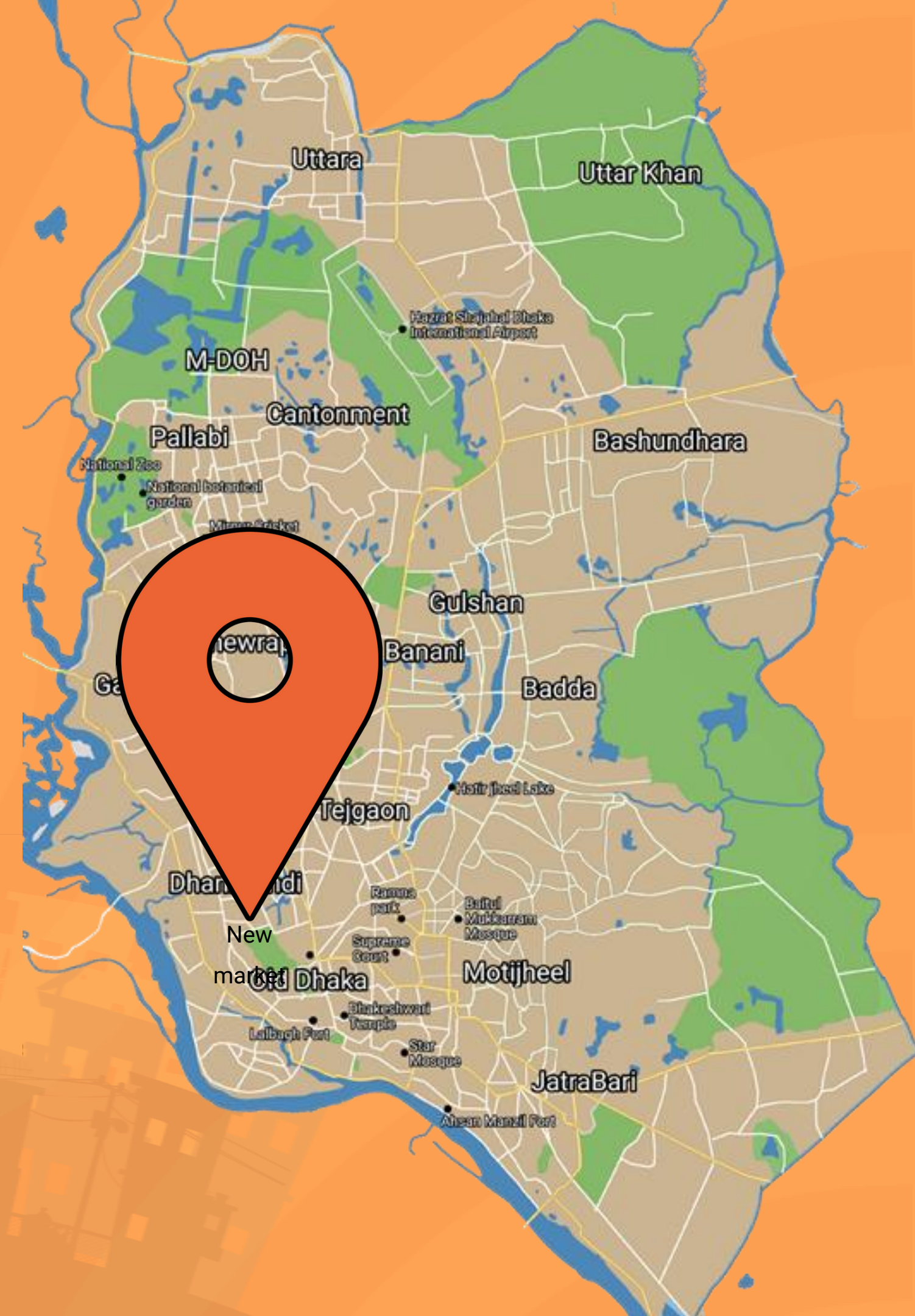
Nearest Station: Palashi

Barrack Fire Station

Nearest Hospitals: Dhaka

Medical College Hospital,

LabAid Specialized Hospital



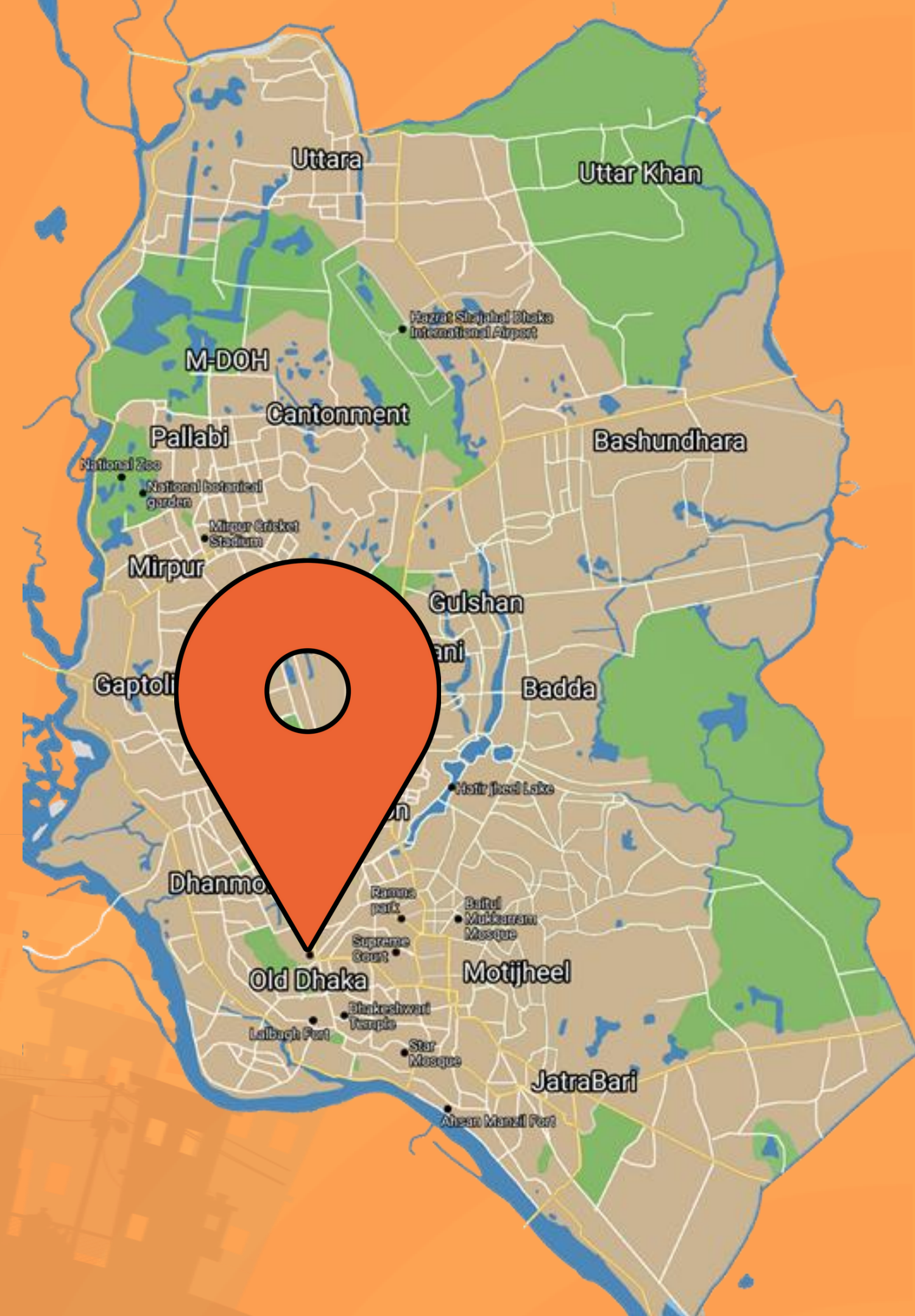
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OLD DHAKA



Nearest Station: Lalbag fire station

Nearest Hospitals: Sir Salimullah Medical College & Mitford Hospital, Ibn Sina Hospital
Lalbagh



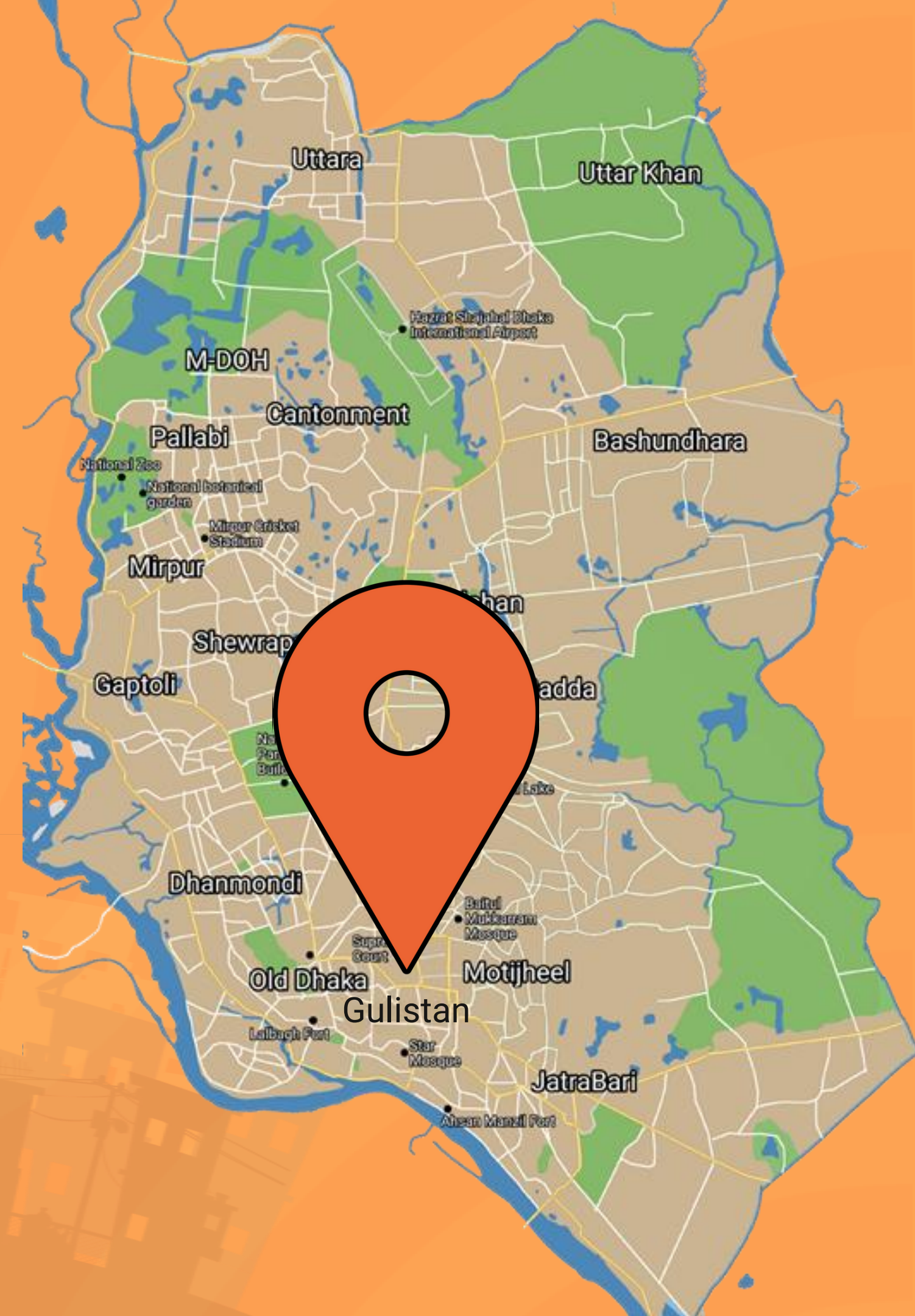
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GULISTAN



Nearest Station: Siddique Bazar Fire Station

Nearest Hospitals: Dhaka Medical College and Hospital, Sir Salimullah Medical College Mitford Hospital, Birdem General Hospital



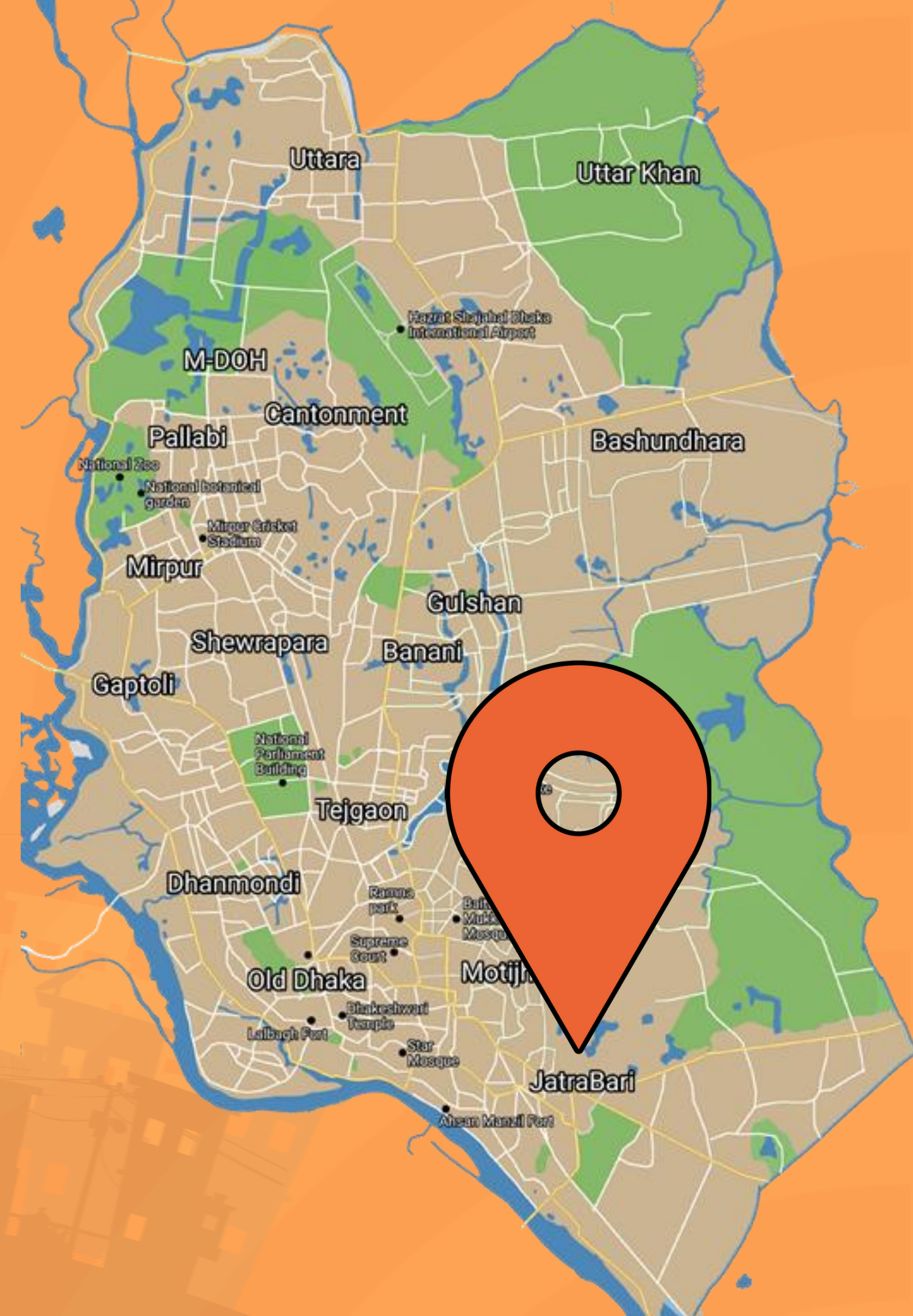
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JATRA BARI



Nearest Station: Postagola Fire Station

Nearest Hospitals: Popular Diagnostic Centre, Jatrabari, Medinova Medical Services



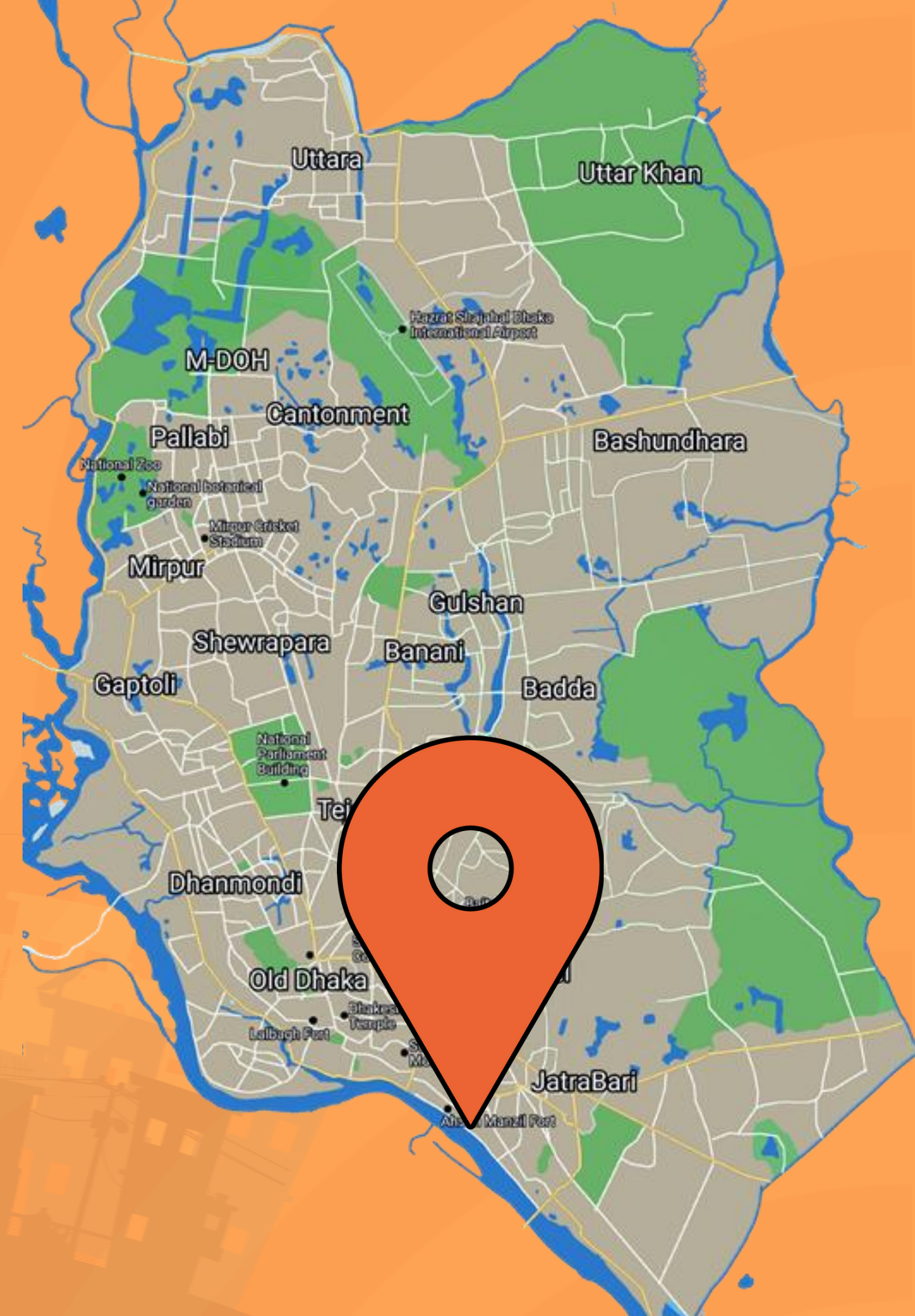
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SADAR GHAT



Nearest Station: Sutrapur Fire station

Nearest Hospitals: Sir Salimullah Medical College & Mitford Hospital



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BASHUNDHARA



Nearest Station: Baridhara

Fire Station

Nearest Hospitals: Evercare

Hospital Dhaka, Apollo

Diagnostic Centre



Continue

BANANI



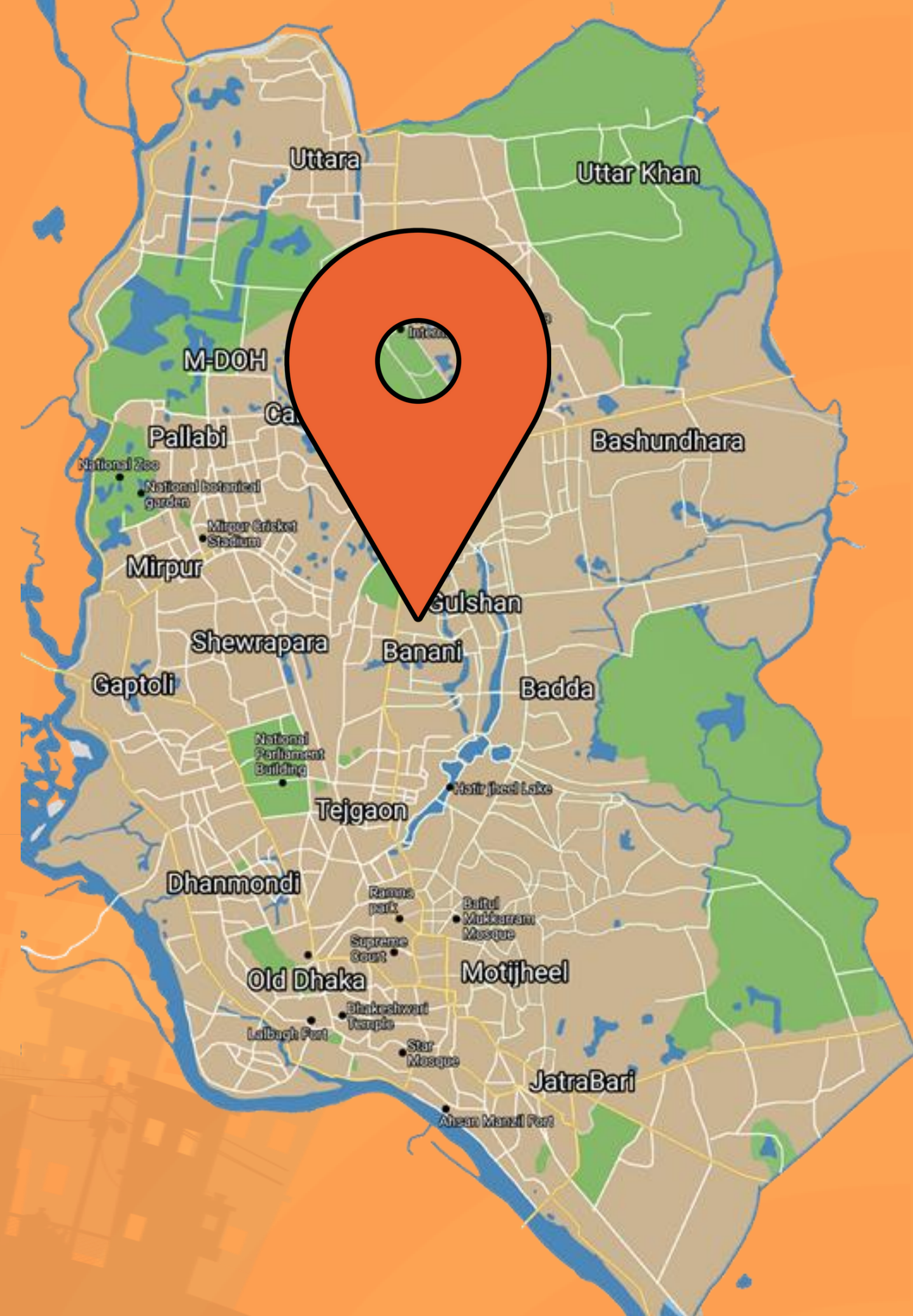
Nearest Station: Baridhara

Fire Station

Nearest Hospitals: Banani

Clinic Ltd., York Hospital

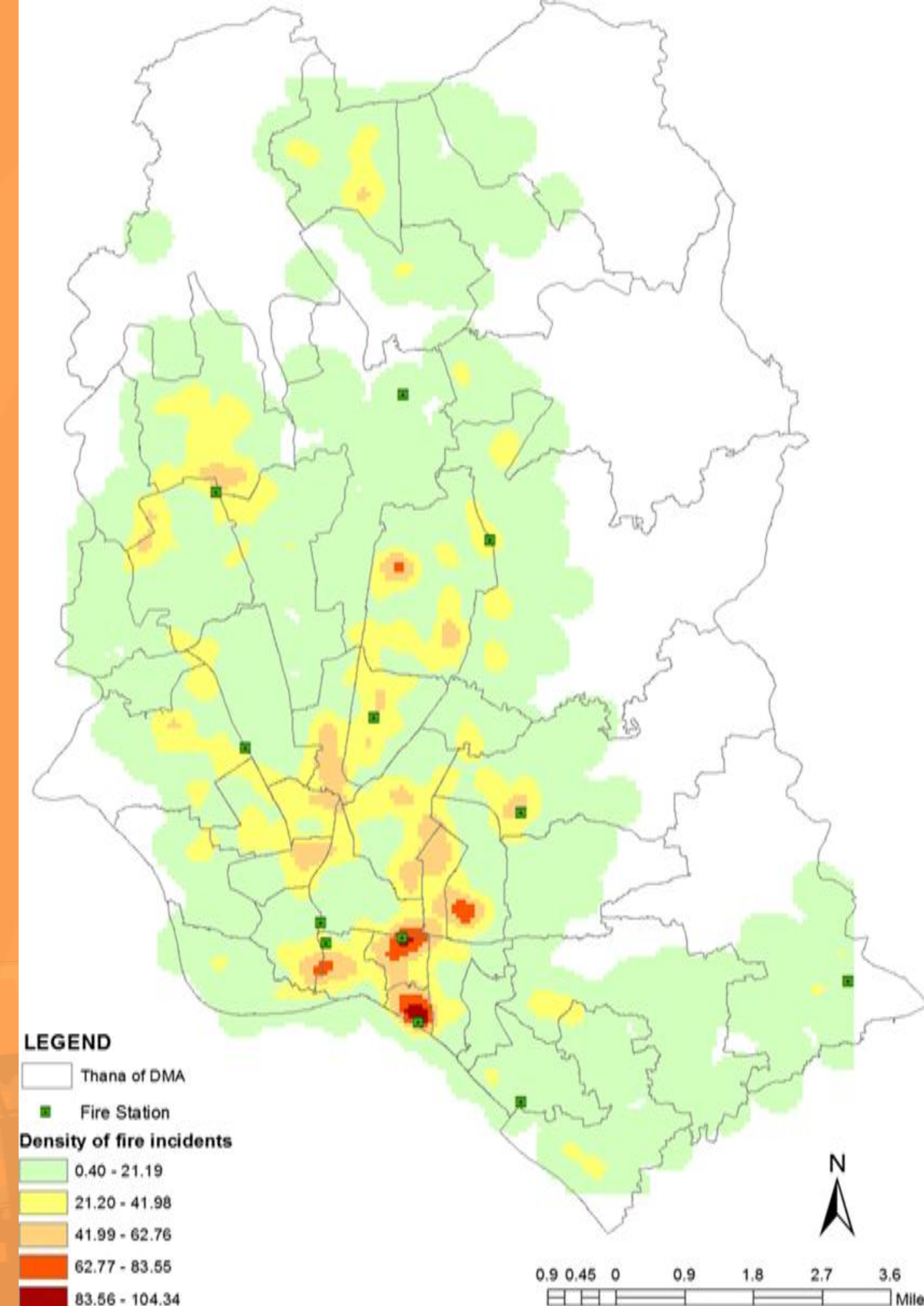
Ltd., Aalok Health Care Ltd.



Result

Nearest Fire Station Distance of High Risk Areas

Bangabazar	Headquarter	0.5km
Gulistan	Siddique Bazar Station	1 km
Sadarghat	Sutrapur Station	1km
Old Dhaka	Lalbag Fire Station	1.2km
New Market	Palashi Barrack Station	1.3km
Banani	Baridhara station	2.4km
Jatra Bari	Postogola Station	2.6 km
Bailey Road	Headquarter	3.4km
Science Lab	Mohammadpur Station	4.1 km
Ashulia	DEPZ Fire Station	10km



(Tanjiba et al,2018)

Continue



Nearest Hospitals Distance from **High Risk Areas**

Resturant/Factory area name	Hospitals	Hospitals Distance
Mirpur	Kingston Hospital, Delta Health Care Mirpur Ltd., Islami Bank Hospital Mirpur	1.5km, 3km, 1.3km
Gulistan market	Dhaka Medical College and Hospital, Sir Salimullah Medical College Mitford Hospital, Birdem General Hospital	1.5km, 2km, 3km
Mohammadpur street food	CARe Hospital Mohammadpur, City Hospital Limited, Anwer Khan Modern Medical College Hospital	1km, 1.2km, 2 km
New market	Dhaka Medical College Hospital, LabAid Specialized Hospital	3km, 3.5km
Kawran Bazar	Square Hospital, Green Life Hospital,	2.5km, 2km

Continue



Nearest Hospitals Distance from **High Risk Areas**

Restaurant/Factor y area name	Hospitals	Hospitals Distance
Old Dhaka	Sir Salimullah Medical College & Mitford Hospital, Ibn Sina Hospital Lalbagh	2km, 3km
Dhanmondi	LabAid Specialized Hospital, Ibn Sina Specialized Hospital	1.4km, 450m.
Jatrabari	Popular Diagnostic Centre, Jatrabari, Medinova Medical Services	1km, 750m
Bashundhora	Evercare Hospital Dhaka, Apollo Diagnostic Centre	1.2km,
Sadarghat	Sir Salimullah Medical College & Mitford Hospital	2km

Continue



Nearest **Fire Stations** in **High Risk** places

Resturant/Factor y area name	Hospitals	Hospitals Distance
Mirpur 12	Kingston Hospital, Delta Health Care Mirpur Ltd.,Islami Bank Hospital Mirpur	1.5km,3km,1.3km
Gulistan market	Dhaka Medical College and Hospital, Sir Salimullah Medical College Mitford Hospital, Birdem General Hospital	1.5km,2km,3km
Mohammadpur street food	CARe Hospital Mohammadpur, City Hospital Limited, Anwer Khan Modern Medical College Hospital	1km,1.2km,2 km
New market	Dhaka Medical College Hospital, LabAid Specialized Hospital	3km,3.5km

Continue



Nearest **Fire Stations** in **High Risk** places

Resturant/Factory area name	Hospitals	Hospitals Distance
Kawran Bazar	Square Hospital, Green Life Hospital	2.5km, 2km
Old Dhaka	Sir Salimullah Medical College & Mitford Hospital, Ibn Sina Hospital Lalbagh	2km, 3km
Dhanmondi	LabAid Specialized Hospital, Ibn Sina Specialized Hospital	1.4km, 450m
Jatrabari	Popular Diagnostic Centre, Jatrabari, Medinova Medical Services	1km, 750m
Bashundhora	Evercare Hospital Dhaka, Apollo Diagnostic Centre	1.2km,
Sadarghat	Sir Salimullah Medical College & Mitford Hospital	2km

Risk Assessment

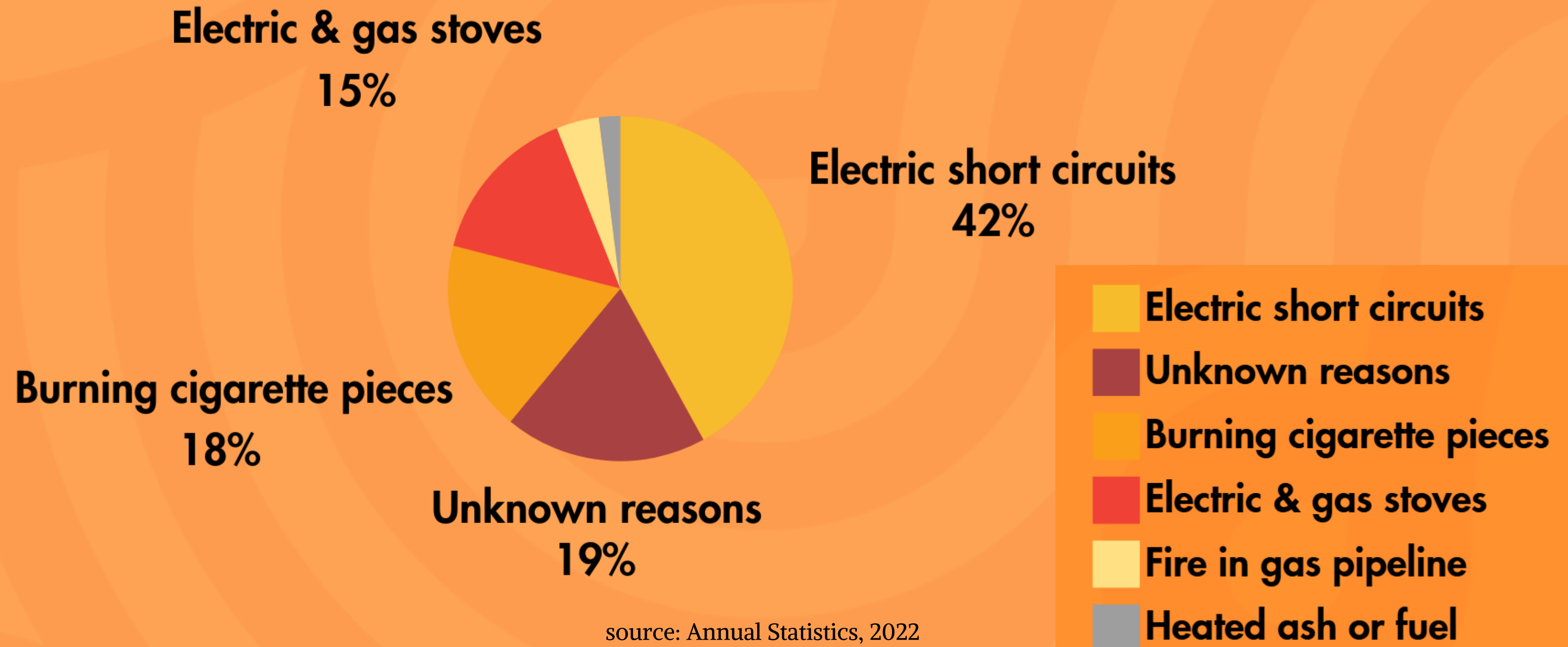


Incident Name	Area	Nearest station	Nearest station distance
Bangabazar Fire Incident	Bangabazar	Bangladesh Fire Service and Civil Defense Head Quarter, 38-46 Kazi Alauddin Road, Fulbaria Rd, Dhaka 1000	0.5 km
Gulistan Explosion	Gulistan	Siddique Bazar Fire Station.	1km
Chawkbazar Fire	Old Dhaka	Lalbag Station	1.2km
New market fire	New Market	Palashi Barrack Fire Station	1.3km

Risk Assessment

Incident Name	Area	Nearest station	Nearest station distance
Chawkbazar Plastic factory fire	Old Dhaka	Palashi Barrack Fire Station	2km
FR Tower Fire	Banani	Baridhara station	2.4km
bailey Road Fire	Bailey Road	headquarters of the Fire Service and Civil Defense Department	3.4km
Science lab Explosion	Science Lab	Bangladesh Fire Service and Civil Defense, Mohammadpur, Mirpur Rd	4.1km
Tazreen Fashion Fire	Ashulia	DEPZ Fire Station	10km

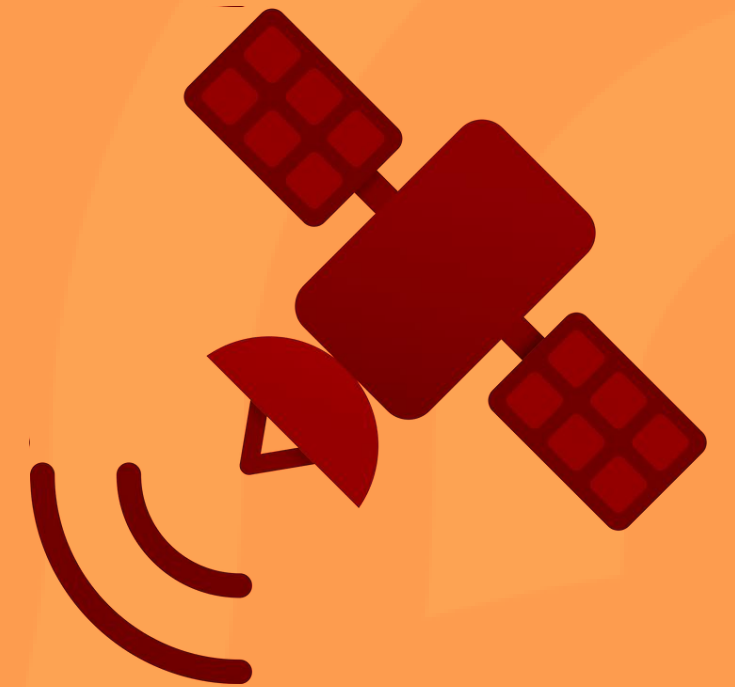
Causes of Fire Incidents



source: Annual Statistics, 2022
Bangladesh Fire Service & Civil defence

How can we mitigate fire accident using GIS

- 🔥 Implement live data integration, and GIS dashboards for temperature, smoke, and risk tracking.
- 🔥 Use GIS to plan and simulate evacuation routes for high-risk communities.
- 🔥 Identify the shortest paths for fire trucks.
- 🔥 To optimize the placement of fire stations, hydrants, and resources.
- 🔥 Use GIS to provide fire brigades with the fastest and most efficient routes to incident locations, considering traffic and road conditions.



Expected Outcomes

**Awarness of
high risk
zones**

**Collaboration
with urban
planning**

**Real time
monitoring**

**Reduce incident
frequency and
severity**

**Economically
secure
environment**

**Predictive
analytics &
targeted
prediction**



**High-risk zones
highlighted for
immediate action.**

**Correlation between
high-risk areas and
service availability.**

**Possible
Results**

**Data-driven
proposals for facility
placement.**

**Gaps in emergency
service coverage
identified**

**Incomplete or
outdated
OpenStreetMap
data**

**Limited integration of
real-time traffic and
service data**

Limitations

**Challenges in
defining factory-
restaurant clusters.**

**Exclusion of
unregistered
establishments**

Conclusion

- Significant gaps were identified
- The study emphasizes the need for strategic placement of emergency facilities
- OSM offers a cost-effective solution
- Significant gaps identified in fire station and hospital zones



Thank You
For your time and patience
Do you have any query?

