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Ministry of Housing and Public Works
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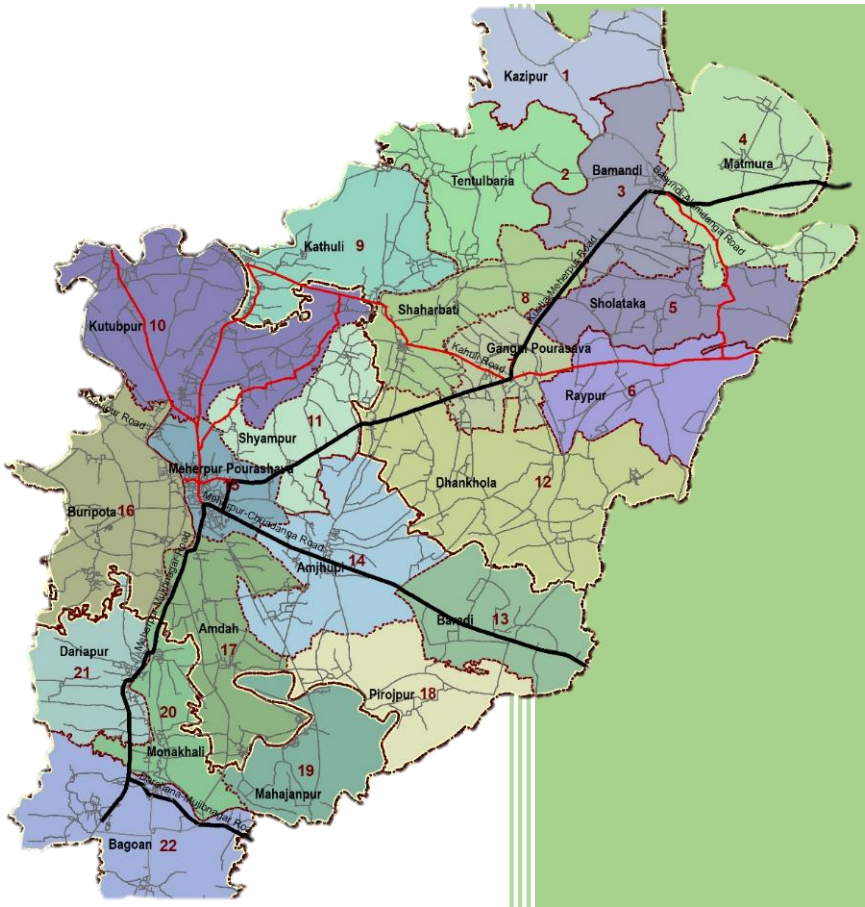
Preparation of the Development Plan for Meherpur Zilla

Assignment 02

Road Capacity and Traffic Impact coordination with land use



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2.3 Existing Conditions of Transportation Facilities

This chapter provides an in-depth assessment of the existing transportation system of **Meherpur Municipality** and **Gangni Municipality**, the two primary urban centers of Meherpur District. These municipalities serve as the core nodes of economic, administrative, and social activity, together accounting for the majority of the district's trip generation, attraction, and regional freight movement.

2.3.1 Overview of Transport System and Regional Connectivity

2.3.1.1 Regional Transport Linkages of Meherpur and Gangni

Meherpur and Gangni Paurashavas are the primary urban centers of a district defined by its rich agricultural output and its strategic location on thein southweste periphery ofrn Bangladesh. The economic vitality and functional roles are intrinsically tied to the regional transport a netwoys th connectsnk them divisional headquarters, national markets, andto the international border with West Bengal, India.

- **Meherpur Paurashava**, as the district headquarters, is t undisputed nexus of the regional network. It is anchored by key national and regional highways: the **Kushtia-Meherpur Highway (N704)** provides the primary northern linkage, while the **Chuadanga-Meherpur Highway** serves as the main southern corridor. Toe mo west, thevement of goods, services provides a vital connection, and p international border and the historic Mujibnagar complex. These arteries are the lifelines for administrative, commercial, and agricultural movements throughout the district.
- **Gangni Paurashava**, situated north of Meherpur town, is bisected by the crucial **Kushtia-Meherpur Highway**. This strategic position makes it a significant transit town and a vital secondary hub for commerce and logistics, particularly for the northern unions of the district.

A key function of this network is to support the district's high-value agricultural economy. Meherpur produces approximately **110,022 metric tons of vegetables annually**, valued at around Tk 500 crore. These regional highways are the primary conduits for transporting this produce from farm gates and local collection points to major consumption centers like Dhaka, Chattogram, and Khulna.

2.3.1.2 Functional Role of Each Paurashava in the Regional Context

Trip generation and attraction data from the 2025 survey clearly delineates a functional hierarchy between the two municipalities, defining their distinct roles within the district.

- **Meherpur Paurashava :**

  The Primary Trip Attractor. As the administrative and commercial heart of the district, Meherpur Paurashava attracts a significantly higher volume of trips than

it produces. **With a total trip attraction of over 80,000 trips compared to a production of approximately 38,000**, the municipality functions as the region's central magnet for employment, healthcare, high-order retail, and administrative services. The presence of the General Hospital, district administrative offices, and major colleges solidifies its status as the ultimate destination for a majority of the district's daily trips.

- **Gangni Paurashava:**

  The Strong Secondary Hub. Gangni serves as a critical secondary urban center, attracting nearly **50,000 trips while producing around 27,000**. Its functional role is that of a sub-regional market town and logistics hub. It serves as the first point of aggregation for agricultural produce from surrounding rural unions like Bamundi and Kathuli and acts as a key terminal for regional transport services. Notably, Gangni also plays a role in international trade, with produce such as Chinese cabbage being exported from the area to markets in Southeast Asia via the Chattogram port.

2.3.1.3 Internal Connectivity and Spatial Movement Pattern

Both municipalities exhibit a radial spatial movement pattern, where traffic from outlying residential areas funnels into the central business districts (CBDs). This convergence is particularly acute during peak morning and evening hours. In Meherpur, traffic converges on key nodes like College Mor, Hotel Bazar More, and the area around the main market and hospital. In Gangni, a similar pattern is observed around the Bus Stand Mor and Thana Mor. This "funneling" effect is a primary contributor to internal traffic congestion, as the road network in the core is insufficient to handle the peak-hour volumes generated by these focused trip patterns. Also, the Household Interview Survey (HIS, 2024) indicates that **over 62% of internal trips** are within municipal boundaries, with the remaining 38% comprising inter-municipal or external movements toward regional markets.

2.3.2 Road Network Characteristics and Functional Classification

2.3.2.1 Major Road Corridors and Hierarchical Distribution

The road networks within both Paurashavas lack a formally defined and implemented functional hierarchy. In practice, a *de facto* system exists where a few major arterial roads are forced to perform multiple functions simultaneously—acting as regional through-routes, commercial high streets, and local access roads.

- In **Meherpur**, key corridors include **Hospital Road, Meherpur-Chuadanga Road (within the municipality), Borobazar Road, and College Road**. These roads carry the vast majority of traffic.
- In **Gangni**, the **Kushtia-Meherpur Highway** passing through the town serves as the primary spine.

The road hierarchy within Meherpur and Gangni follows a **three-tier functional system**—primary, secondary, and tertiary roads—each serving distinct urban and regional functions.

Road Class	Major Corridors	Functional Description	Average Width (m)
Primary	Kushtia–Meherpur Highway, Chuadanga–Meherpur Highway, Meherpur–Mujibnagar Road	Regional arterial routes connecting Meherpur to inter-district centers	12–18
Secondary	Hospital Road, Main Road, Gangni–Bamandi Road, Kahuli Road	Internal municipal roads linking neighborhoods and markets	8–12
Tertiary	Local access roads and connecting lanes	Serve intra-ward mobility and access to residential areas	3–6

A significant issue identified in both the Master Plans and PRA findings is the over-reliance on this small number of primary roads, coupled with an underdeveloped network of secondary and local roads. This forces all traffic, regardless of trip length or purpose, onto the same few corridors, leading to intense congestion.

2.3.2.2 Road Geometry, Pavement Type, and Condition Assessment

The physical condition of the road network presents a significant constraint. While most major corridors are paved (Bituminous Carpeting), many secondary and local roads are narrow, damaged, or unpaved (katcha).

- **Road Geometry:** Many internal roads, especially in older residential areas, are narrow (less than 6 meters), lacking shoulders and adequate turning radii at intersections. This geometry is unsuitable for the mixed traffic of rickshaws, motorcycles, and larger vehicles.
- **Pavement Condition:** Potholes, surface erosion, and broken edges are common, particularly on roads without adequate drainage. This poor condition reduces vehicle speeds, increases travel times, and contributes to vehicle wear and tear. The consistent demand for road repair (meramot) and paving (pacca-koron) in all community-level action plans underscores the severity of this issue.

Paurashava	Total Road Length (km)	Pucca (%)	Semi-Pucca (HBB) (%)	Katcha (%)
Meherpur	115.77	61%	21%	19%
Gangni	88.76	28%	41%	31%

Source: Meherpur Municipality Master Plan (2017-2037),; Masterplan Of Gangni, meherpur.

The majority of **katcha and semi-pucca roads** exist in peripheral wards and in Gangni's northern unions, constraining agricultural and freight mobility, especially during peak harvest seasons.

2.3.2.3 Key Intersections and Traffic Nodes

The major intersections in both towns are critical points of failure in the transport network.

- **Meherpur: College Mor, Hotel Bazar More, and Borobazar More** are un-signalized, multi-point junctions characterized by chaotic, unregulated movement. The mixing of high-volume through-traffic with local turning movements and pedestrian crossings creates severe delays and significant safety hazards.
- **Gangni:** The **Bus Stand Mor and Thana Mor** face similar challenges, exacerbated on market days by the influx of commercial vehicles and pedestrians.

These nodes function well below their potential capacity due to a lack of channelization, signal control, or modern roundabout design.

2.3.3 Public Transport System and Operations

2.3.3.1 Bus, Tempo, and Shared Auto Services

Public transport in Meherpur and Gangni is almost entirely dominated by informal or semi-formal para-transit services. In Meherpur, around 38% of daily trips rely on shared auto or tempo services. Gangni exhibits a higher share of paratransit use (42%), primarily due to shorter average trip distances within the municipal boundary.

- **Buses:** Formal bus services are limited primarily to inter-district routes connecting to Kushtia, Chuadanga, and Dhaka. Local bus services within the Paurashavas are virtually non-existent.
- **Tempo and Shared Autos (Easy Bikes):** These are the workhorses of the public transport system. They operate on fixed or semi-flexible routes, connecting major market areas, transport hubs, and residential neighborhoods. Their operation is largely unregulated, with vehicles often being overcrowded and poorly maintained.

2.3.3.2 Route Coverage, Frequency, and Service Quality

While para-transit services offer high frequency and flexible route coverage, service quality is a major concern. There is a distinct lack of formal terminals, designated stops, or passenger shelters. As identified in the Bamundi and Raypur Union action plans,

passengers are forced to wait on the roadside in unsafe and exposed conditions. This lack of infrastructure contributes to haphazard stopping, which further disrupts traffic flow.

2.3.3.3 Inter-Paurashava Passenger Movement

Public transport coverage is limited by road width constraints. Major routes include:

- Meherpur–Mujibnagar Corridor
- Meherpur–Chuadanga Corridor
- Gangni–Bamandi–Meherpur Route

The **Meherpur-Gangni corridor** is the most significant axis for inter-Paurashava passenger movement. This route is primarily served by tempos and shared autos, which provide a vital link for commuters, students, and shoppers traveling between the two urban centers. The high demand on this corridor highlights its potential for being upgraded to a more formalized public transport route.

2.3.4 Non-Motorized Transport (NMT) and Pedestrian Infrastructure

2.3.4.1 Rickshaw, Van, and Bicycle Movement Pattern

NMT is the backbone of mobility for short-distance trips within both Meherpur and Gangni.

- Non-motorized modes remain essential for short-distance trips. HIS data show 32% of all trips within Meherpur Municipality and 35% within Gangni are made by rickshaw or van. However, these modes often compete for limited carriageway space with motorized traffic.
- Cycling is a common mode, particularly for students and commuters, due to its low cost. However, the lack of dedicated or safe cycling lanes forces cyclists to compete for space in mixed traffic, exposing them to significant safety risks.

2.3.4.2 Pedestrian Facilities and Footpath Condition

Safe, dedicated pedestrian infrastructure is largely absent. Where footpaths exist along major roads, they are often narrow, discontinuous, and in poor condition. A major issue, highlighted in the analysis of the Meherpur Municipal Complex area, is the **encroachment of footpaths by street vendors**, forcing pedestrians onto the main carriageway. This not only endangers pedestrians but also severely impedes vehicular traffic flow. Footpath coverage across both municipalities is below 25% of total urban roads.

2.3.4.3 Safety Issues and Conflict Zones

The lack of segregation between different modes of transport creates numerous conflict zones. Intersections, market areas, and school zones are particularly

hazardous, as slow-moving NMT, pedestrians, and fast-moving motorcycles and tempos all compete for the same limited road space.

2.3.5 Modal Share and Travel Behavior

2.3.5.1 Dominant Mode Share in Meherpur and Gangni

The cordon surveys reveal a highly motorcycle-dominated transport landscape, with motorcycles consistently accounting for between 40% and 60% of trips across most cordons. Alongside motorcycles, para-transit modes—particularly battery easy bikes, pedal/battery vans, and rickshaws—form the backbone of daily mobility.

Vehicular Mode	Percentage Share
Motorcycle	38.72%
Easy-Bike/Auto	34.51%
Rickshaw/Van	14.57%
Bicycle	4.11%
Others	8.09%

2.3.5.2 Trip Purpose, Frequency, and Distance Patterns

The primary trip purposes are overwhelmingly **Home-Based Work (HBW: 62.2%)** and **Home-Based Other (HBO: 27.7%)**, which includes shopping and social visits. **Home-Based Education (HBE: 8.6%)** also represents a significant share. The majority of trips are short-distance (less than 5 km) and occur frequently throughout the day, a pattern well-suited to NMT and para-transit services.

2.3.5.3 Comparative Travel Behavior Analysis between the Two Paurashavas

- **Meherpur Paurashava**, as the district headquarters, exhibits a higher proportion of administrative and service-related trips (HBW). It also handles more regional through-traffic, contributing to a more complex traffic mix.
- **Gangni Paurashava**, while also an employment center, shows a travel behavior pattern more strongly linked to local commerce and market activities. Its traffic composition is likely more dominated by local NMT and para-transit, with less inter-district freight and passenger flow compared to Meherpur.

2.3.6 Traffic Volume and Performance Analysis

2.3.6.1 Classified Volume Count and Vehicle Composition

Traffic counts from all cordon points reveal a highly heterogeneous traffic mix. Motorcycles, rickshaws, and easy-bikes form the vast majority of vehicles. For example, on the Meherpur-Chuadanga Road (IC-09), motorcycles alone accounted for **46% (8,127 PCU)** of the total traffic volume of 17,614 PCU over a 24-hour period.

This chaotic mix of vehicles with different speeds is a primary cause of network inefficiency.

2.3.6.2 Level of Service (LOS) Assessment

The performance of the road network, measured by the Vehicle Capacity Ratio (VCR), indicates a dire situation on key corridors.

Road Name	VCR (Max)	Level of Service (LOS)	Status
Meherpur Hospital Road	**1.72**	**F**	Severely Congested
Meherpur Main Road	**1.61**	**F**	Severely Congested
Kahuli Road	**1.24**	**F**	Congested
Kustia-Meherpur Highway	**1.08**	**E**	Near Capacity

- **Critically Congested Routes:** Meherpur Hospital Road (VCR 1.72), Meherpur Main Road (VCR 1.61), and Kahuli Road (VCR 1.24) are operating at a **Level of Service (LOS) of 'F'**, meaning demand far exceeds capacity, resulting in forced flow and frequent gridlock.
- **Near-Capacity Routes:** The Kushtia-Meherpur Highway (VCR 1.08) and College Road (VCR 0.93) are operating at or near their capacity limits (LOS 'E'), where even minor incidents can trigger major delays.

2.3.6.3 Junction Delay and Congestion Mapping

Delay studies at major intersections confirm that these nodes are the primary sources of travel time unreliability. The un-signalized, chaotic nature of junctions like College Mor and Borobazar leads to long queues and stop-and-go conditions, particularly during peak hours. Congestion is spatially concentrated in the commercial cores of both Paurashavas.

2.3.7 Parking, Freight, and Loading Facilities

2.3.7.1 Existing Parking Practices and Space Utilization

Parking is predominantly **haphazard and on-street**. Commercial vehicles, private cars, and motorcycles park along the edges of major roads, effectively reducing the number of available traffic lanes and creating bottlenecks. There is a severe lack of designated off-street parking facilities in the commercial centers of both towns.

2.3.7.2 Freight Movement Routes and Loading/Unloading Points

Freight movement is a major contributor to congestion, especially during seasonal harvests. Lacking dedicated terminals, trucks and goods vans use the main arterial roads as informal loading and unloading zones. This practice, particularly prevalent at hotspots like WAPDA More and near the main markets, directly obstructs traffic flow for extended periods.

2.3.7.3 Parking Demand and Supply Assessment

A formal assessment reveals that in the central business districts, the **demand for parking far exceeds the available formal supply**. This deficit forces drivers to resort to illegal and disruptive on-street parking, exacerbating congestion and safety issues.

2.3.8 Safety, Signage, and Traffic Management Issues

2.3.8.1 Accident-Prone Locations and Causes

The most accident-prone locations are major intersections and market areas. The primary cause of accidents is the chaotic mixing of high-speed motorized traffic with slow-moving NMT and unpredictable pedestrian movements.

2.3.8.2 Traffic Control Devices and Signage Conditions

The existing traffic management infrastructure is minimal and often in poor condition.

- **Traffic Signals:** There are no functioning traffic signals at major intersections.
- **Signage:** Road signs are often inconsistent, poorly placed, or altogether absent. Lane markings, speed limit signs, and directional signs are not adequately provided, leading to driver confusion.
- **Enforcement:** Traffic rules are weakly enforced, leading to a culture of non-compliance.

2.3.8.3 Seasonal Traffic Pressure (Market Days, Festivals, Harvest)

The transport system is particularly vulnerable to seasonal pressures. The influx of vehicles and people during harvest seasons, major festivals, and weekly market days (like the Bamandi cattle market) regularly overwhelms the network, leading to gridlock that can last for hours.

2.3.9 Other Modes of Transport and Regional Access

2.3.9.1 Railway Connectivity Potential

There is currently no railway connectivity to Meherpur District. The nearest major railway station is in Chuadanga, requiring a significant road journey to access the national rail network. This represents a major gap in providing a low-cost, high-capacity alternative for long-distance passenger and freight transport.

2.3.9.2 Waterway Accessibility

The Bhairab River flows adjacent to Meherpur town, but it is not currently utilized for significant urban passenger or freight transport. Siltation and a lack of navigable infrastructure limit its use to small-scale, localized movements, representing an underutilized transport asset.

2.3.9.3 Linkages to Regional Air Transport Nodes

Meherpur has no local airport. The nearest domestic airport is in Jashore, which is approximately a 2.5 to 3-hour drive away. This limits the district's accessibility for business travel and time-sensitive cargo.

2.3.10 Environmental and Sustainability Aspects of Transport

2.3.10.1 Vehicular Emission and Air Quality Concerns

The high concentration of motorcycles (many of which are older, two-stroke models) and poorly maintained commercial vehicles contributes to localized air pollution in the congested urban cores. Stop-and-go traffic conditions further increase fuel consumption and emissions.

2.3.10.2 Noise Pollution and Traffic-Induced Discomfort

The combination of dense, mixed traffic and the frequent use of horns creates significant noise pollution in commercial and residential areas adjacent to major roads, reducing the quality of urban life.

2.3.10.3 Green Mobility Opportunities

Despite the challenges, the existing high modal share of NMT (walking, cycling, rickshaws) represents a significant sustainability asset. This provides a strong foundation for building a "Green Mobility" strategy focused on improving the safety and convenience of these modes, rather than solely focusing on motorized transport. The potential for introducing Electric Vehicles (EVs), particularly in the para-transit sector, also presents a major opportunity to reduce emissions.

2.3.11 Summary of Identified Issues and Constraints

2.3.11.1 Infrastructure Gaps

- Lack of a clear, functional road hierarchy.
- Insufficient road capacity and poor pavement condition on key corridors.
- Absence of dedicated terminals for buses and freight.
- Severe deficit of safe and continuous infrastructure for pedestrians and NMT.
- Inadequate and poorly designed intersections.
- Missing regional connectivity links (rail, waterway).

2.3.11.2 Operational Inefficiencies

- Chaotic, mixed-traffic conditions leading to low speeds and high conflict rates.
- Haphazard on-street parking and loading/unloading practices.
- Unregulated and poor-quality public transport (para-transit) services.
- Ineffective traffic management and weak enforcement of rules.

- Extreme network vulnerability to seasonal and periodic demand peaks.

2.3.11.3 Institutional and Policy Barriers

- Lack of coordination between different agencies responsible for transport (e.g., RHD, LGED, Paurashava, Traffic Police).
- Absence of a comprehensive urban transport policy at the Paurashava level.
- Insufficient funding allocated for regular maintenance and network upgrades.

Category	Key Issues
Infrastructure Gaps	Narrow carriageways, lack of bypasses, poor footpath coverage
Operational Inefficiencies	Mixed traffic flow, unregulated paratransit, on-street parking
Institutional and Policy Barriers	Lack of coordination among RHD, LGED, and municipalities

Chapter 4 — Transportation and Traffic Management Plan

4.2.1 Vision, Goals, and Policy Framework

4.2.1.1 Vision for Sustainable Mobility in Meherpur and Gangni

The transport vision for Meherpur and Gangni frames mobility as an enabler of inclusive economic growth, resilience, and quality of life. It commits the municipalities to develop an integrated, multimodal system that (a) reduces congestion and travel time, (b) improves road safety for the most vulnerable users, (c) accommodates the logistics needs of an intensifying agricultural economy, and (d) supports compact, transit-oriented urban growth around new institutional and transport investments (university, terminals, proposed rail stations). Practically, the vision is expressed as:

“An accessible, safe, and low-carbon mobility network linking Meherpur and Gangni’s people, institutions and markets — managed for efficient passenger movement and reliable freight flows while prioritizing non-motorized mobility and public transport.”

This vision recognizes the municipalities’ complementary roles — Meherpur as the administrative and service core (high trip attraction) and Gangni as the region’s agro-commercial hub (high production and freight importance) — and sets the stage for interventions that re-balance travel demand spatially and modal-wise.

4.2.1.2 Strategic Objectives and Targets

Objectives derive directly from observed problems (high VCR on central spines, inadequate NMT infrastructure, fragmented freight facilities) and the strategic opportunities created by planned investments (circular road, university, potential rail). Key targets for the planning horizon (to 2035 with outlook to 2045) are summarized below:

Table 4.1 — Strategic Transport Targets (selected)

Objective	Measurable Target (by 2035)
Reduce peak VCR on municipal spines	VCR ≤ 1.0 on Hospital Rd / Main Rd (short-term target: ≤1.3)
Modal rebalancing toward PT/NMT	Public+NMT share ≥ 60% of intra-municipal trips
Freight organization	100% of major market loading moved to designated hubs
Road safety	50% reduction in severe injury crashes in municipal cores
Accessibility	90% of residents within 1,000 m walk of a primary public transport stop

Targets are ambitious but grounded: they reflect the required scale-change to mitigate current stress (e.g., Meherpur Hospital Road VCR 1.72) and are contingent on coordinated investments (ring road, terminals, enforcement and NMT infrastructure).

4.2.1.3 Policy Alignment with RHD, LGED, and DTCA

The plan is aligned with national and sectoral policies: it supports RHD's role in maintaining and upgrading regional arterials (Kushtia–Meherpur, Chuadanga–Meherpur), builds on LGED's remit for local access and rural connectivity (upgrading katcha/semi-pucca roads that feed markets), and follows urban mobility principles advocated by development partners (integrated networks, TOD around interchanges). Institutional coordination is required: RHD must reserve uninterrupted cross-section for through-traffic, LGED must prioritize connecting farm-to-market links to freight hubs, and municipal authorities must manage parking, vendor regulation and street-level NMT infrastructure.

4.2.2 Travel Demand Forecasting and Future Transport Scenario

4.2.2.1 Methodology for Forecasting up to 2045

Forecasts combine observed baseline behavior (HIS and cordon counts), demographic projections, and scenario-based adjustments for planned infrastructure and land-use change. Key steps:

1. **Population/Employment baseline and projection:** Using census trend-adjusted CAGR, population by TAZ is projected (TAZ-level projections available to 2045).
2. **Trip generation model:** Household regression (HIS) uses household size, income, motorcycle and bicycle ownership to predict trips — $R^2 \approx 0.53$ in the regression summary.
3. **Trip distribution and modal split:** Baseline OD matrix scaled by population and land-use change; modal split adjusted using elasticity with income and service level improvements (transport supply scenarios).
4. **Network-assignment & VCR projection:** Peak PCU volumes distributed onto the hierarchical network; VCR computed using capacity parameters per link and iterated with induced demand factors (short-term smaller, medium/long-term larger).
5. **Scenario analysis:** (A) Business-as-usual (no ring, slow PT improvements), (B) Planned-investment (circular road + freight hubs + university access management), (C) High-investment (B + rail + aggressive PT/NMT). Results reported primarily for scenario B.

4.2.2.2 Projected Passenger and Freight Volumes

Applying the model and scenario B assumptions (circular road + terminals + initial PT upgrades), the following district-wide projections emerge:

Table 4.2 — Projected Key Transport Metrics

Metric	Baseline (2024)	Mid-term (2035)	Long-term (2045)
Daily passenger trips	198,000	245,000	295,000
Daily freight trips (vehicle movements)	8,700	12,500	17,300
Peak-hour PCU (aggregate municipal network)	11,000	14,200	17,800
Average trip rate (trips/person/day)	0.87	0.94	1.02

Freight growth is driven by farm productivity increases and stronger regional market linkages (vegetable export flows through Darshana and Jessore). Under scenario B, freight rerouting to peripheral hubs reduces truck volume on central streets by an estimated 35–45% during peak market periods.

4.2.2.3 Correlation with Land Use and Growth Centers

Projected demand concentrates around four growth nodes:

- **Meherpur core (Borobazar–College Mor–Hospital Rd):** high attraction due to administration, health and commerce. Without intervention, VCRs remain high.
- **Moyamari/University corridor:** new university will generate significant daily inbound/outbound flows — student, faculty and service trips — necessitating Moyamari Road widening and direct connector to the circular road.
- **Gangni–Bamandi market axis:** persistent freight and market-related daily draws; the hub's growth amplifies peak loading events.
- **Ring-road adjacent parcels (Ujalpur corridor):** expected to become logistics/residential spillover areas; managed zoning should channel appropriate land-use types.

The key planning insight is that road investments (e.g., circular road) will alter trip distribution — easing inner-core VCR but increasing periphery trip generation — therefore land-use controls and access management must be co-implemented to avoid replicating inner-core congestion on the ring.

4.2.3 Road Network Development Plan

4.2.3.1 Hierarchical Classification: Primary, Secondary, and Tertiary Roads

A clarified hierarchy is adopted to allocate functions, capacity and design standards:

- **Primary (Regional arterial / ring):** carry inter-municipal, freight and through-traffic. Design standard: 2-lane/4-lane carriageway depending on expected PCU, dedicated shoulders, limited direct access. Examples: Kushtia–Meherpur, Chuadanga–Meherpur, new Circular Road.
- **Secondary (Urban distributor):** channel traffic from primary roads into municipal grids; provide access to markets and institutions. Design standard: 8–12 m carriageway with segregated NMT/footpaths where demand is high (Hospital Rd, Main Rd).
- **Tertiary (Local access):** residential streets and local lanes; priority: pedestrian safety and low-speed design.

This reclassification should be formalized in the municipal development plan to guide road upgrades, rights-of-way protection and access policy.

4.2.3.2 Improvement of Existing Road Network

Improvement works follow a performance-first approach: widen and structurally strengthen the most overloaded links (Hospital Road, Main Road, Meherpur–Chuadanga arterials), repair pavement and drainage on semi-pucca roads to restore year-round reliability, and introduce continuous pedestrian facilities in commercial corridors. Specific actions:

- **Moyamari Road:** widen from current 12 ft to a minimum of 6.5 m carriageway with 1.8 m footpaths each side; integrate bus/van bays and controlled access to university gates.
- **Hospital Road & Main Road:** implement segregation — 3.0 m kerbside NMT lanes + 6.5 m motor traffic lanes; remove on-street parking where possible and provide controlled loading bays.
- **Gangni–Bamandi corridor:** strengthen pavement to 10–12 tonne axle capacity; design peripheral truck lay-bys to contain seasonal queues.

Investment prioritization should use VCR and OD-weighted metrics; links with VCR >1.2 and high trip-attraction should be first-tier upgrades.

4.2.3.3 Proposed New Links, Bypasses, and Connector Roads

The Circular Road is the single most transformational new link; its design must ensure continuity for freight while providing limited, controlled access to prevent strip development. The ring should also provide linkages to freight hubs at Ujalpur and Bamandi.

Additionally, small bypass connectors around College Mor and Gangni Market will re-route heavy vehicles; these connectors are short (0.5–2 km) but high impact — they reduce conflict points and preserve core streets for local activity.

4.2.3.4 Roadside Land Use Control and Corridor Beautification

Corridor management is essential to preserve road function. Actions include mandatory setbacks for new development, prohibition of roadside storage/loading on primary corridors, landscaping strips to calm speeds, and standardized street furniture and lighting to uplift pedestrian amenity. In particular, the ring should be established with zoning that channels logistics and light industrial uses to limited access plots rather than allowing unplanned retail frontage.

4.2.4 Public and Non-Motorized Transport Improvement Plan

4.2.4.1 Public Transport Service Enhancement and Terminal Upgradation

Formalizing public transport implies three linked interventions: a) rationalize routes to reduce overlapping and excessive dead mileage, b) improve terminals to remove on-street operations, and c) introduce service standards and scheduling to improve reliability.

- **Terminal Upgrades:** Meherpur requires an off-street terminal near Borobazar / College Mor with segregated bays for inter-municipal buses, tempos and para-transit. Gangni's Bus Stand Mor should be expanded as a structured terminal with freight separation to avoid mixed-use conflict.
- **Service Restructuring:** introduce scheduled inter-municipal shuttles (e.g., Meherpur↔Gangni↔Mujibnagar) with 10–15 minute peak frequencies and feeder auto routes operating on fixed loops, integrated with terminal timetables.
- **Regulatory Measures:** licensing of operators to reduce harmful competition and enforce designated stops.

These reforms will improve passenger comfort, reduce random stoppages, and enable a modal shift from private motorcycles to shared modes if timetabled and affordable.

4.2.4.2 Integrated NMT Infrastructure (Rickshaw/Bicycle/Pedestrian)

NMT remains the mobility backbone — especially for short trips and lower-income residents. The plan prescribes a hierarchy of NMT interventions: continuous sidewalks on secondary corridors, protected bicycle lanes where right-of-way permits (especially on ring feeders and Moyamari Road), and formal rickshaw stands and pedestrianized streets in market precincts. Market-day design solutions (flexible kerbside allocation, timing controls for loading) must be deployed so vendors and pedestrians can coexist without forcing NMT users into carriageways.

4.2.4.3 School and Market Accessibility Enhancement

School-related peak surges require immediate management: designate school-drop-off/pick-up zones, implement staggered timing for institutions within core precincts, and deploy trained marshals during peak windows. Market precincts need designated vendor spaces and off-street loading to prevent midday blockages that cascade through the network. These measures are low-cost but high-impact for safety and capacity.

4.2.5 Inter-Paurashava and Regional Transport Integration

4.2.5.1 Meherpur–Gangni Mobility Corridor Concept

The Meherpur–Gangni corridor will be developed as a coordinated mobility axis: a primary regional road with managed access, freight segregation, and multimodal nodes. Corridor planning will combine cross-section improvements (lane widening, geometric corrections), junction rationalization (roundabouts at key intersect), and insertion of multimodal transfer hubs where regional buses, local shuttles and NMT converge. The corridor is the priority for ITS monitoring, permitting dynamic traffic management and pre-emptive incident response to maintain throughput.

4.2.5.2 Integration with Regional Road Network and Bus Routes

Integration requires active coordination with RHD to time upgrades so junctions where regional highways meet municipal streets are provided with grade-level improvements and slip lanes for heavy goods vehicles. Bus route redesign should connect Meherpur and Gangni to regional bus termini (Kushtia, Chuadanga) while avoiding duplicative local stops; integrated timetables will improve connectivity and reduce unnecessary stop/start cycles that reduce arterial capacity.

4.2.5.3 Potential Rail or Waterway Interface

The proposed Darshana–Mujibnagar–Monakhali rail introduces an alternative for freight and longer-distance passenger flows. The plan identifies TOD opportunities around Monakhali station (TAZ 20) and Mujibnagar terminal (TAZ 22): first/last mile links (feeder buses, rickshaw stands), warehousing sites for aggregate agricultural loads, and regulated land-use to prevent chaotic development. Waterway options are limited but seasonal channels should be inventoried for potential niche cargo movement — revival would be longer-term and conditional on economic feasibility.

4.2.6 Parking, Freight, and Terminal Development Plan

4.2.6.1 Designation of Parking Areas and Loading Bays

A network of off-street parking and loading facilities is required to replace ad-hoc on-street practices:

Table 4.3 — Proposed Freight & Parking Facilities

Site	Function	Key Features
Ujalpur Freight Hub	Consolidated loading/unloading	20–30 truck bays, holding yard, short-term transfer area
Bamandi Peripheral Yard	Livestock staging & parking	holding pens, veterinary kiosk, controlled access
College Mor Parking	Passenger and 2-wheeler park	Multi-level motorcycle parking, tempo layover
Gangni Bus Terminal upgrade	Bus and tempo segregation	Off-street bays, ticketing & passenger facilities

These facilities should be strategically located on the ring or at peripheral locations to minimize heavy vehicle penetration into cores.

4.2.6.2 Truck and Goods Vehicle Management

A combination of physical (satellite yards, designated loading bays) and regulatory (time-window restrictions, permit controls) measures will manage freight. Time-windowing—restricting heavy vehicle access to certain core roads during daytime peaks—and establishing formal holding areas will mitigate episodic market-related gridlock (e.g., Bamandi hut inflows).

4.2.6.3 Bus and Tempo Terminal Redevelopment

Terminals should be re-designed around user flow and vehicle circulation to minimize dwell time and queue spillback. Design features include ingress/egress loops, separated pedestrian flows, designated bay numbering, sheltered waiting areas, and integrated information displays. Redevelopment can be financed with PPP models where private operators invest against long-term concession agreements.

4.2.7 Traffic System Management (TSM) and Road Safety Strategy

4.2.7.1 Signalization, One-Way Systems, and Roundabout Design

TSM measures must address intersection inefficiencies and disperse turning conflicts. At College Mor and Borobazar, adaptive signals with priority phasing for buses/tempos reduce queue lengths and signal cycle losses. Where geometric constraints prevent signalization, mini-roundabouts or one-way circulation loops can increase effective capacity and reduce conflict points.

4.2.7.2 Speed Control and Safety Zone Designation

Designating high pedestrian areas (markets, school clusters, hospital frontage) as 20–30 km/h safety zones with physical calming elements (raised tables, textured paving)

will reduce conflict severity. Enforcement (speed cameras, fines) should accompany physical measures to ensure compliance.

4.2.7.3 Signage, Lighting, and Intelligent Transport Systems (ITS)

Clear, reflective signage, LED street lighting and well-marked pedestrian crossings are immediate low-cost safety investments. A phased ITS rollout — starting with CCTV and a municipal traffic operations center to monitor key corridors (Meherpur Hospital Rd, Main Rd, Meherpur–Chuadanga) — will enable evidence-based operations, incident detection and performance monitoring.

4.2.8 Sustainable and Smart Mobility Initiatives

4.2.8.1 Electric Mobility Infrastructure and Charging Points

A policy to incentivize electric auto-rickshaws and two-wheelers should be integrated with infrastructure rollout. Initial EV charging priority sites: Meherpur Bus Terminal, University precinct and Gangni Bus Stand. Financial incentives (reduced permit fees, concessional charging tariffs) could encourage conversion of the para-transit fleet.

4.2.8.2 Green Streets and Climate-Responsive Transport Planning

Road designs must integrate stormwater management and urban greening. Tree-lined sidewalks on secondary corridors improve microclimate and encourage walking. Permeable pavement in secondary streets reduces run-off, supporting climate resilience for transport infrastructure.

4.2.8.3 Awareness and Community Participation Programs

Behavioral change is critical: vendor associations, school communities and transport unions should be engaged early in planning to co-design relocation sites, terminal rules and school-drop arrangements. Participatory trials (temporary pedestrianization, market layout pilots) will inform scalable measures.

4.2.9 Implementation, Phasing, and Institutional Framework

4.2.9.1 Short-, Medium-, and Long-Term Implementation Schedule

Table 4.4 — Implementation Phasing (summary)

Timeframe	Priority Actions
Short (2025–2028)	Moyamari Rd widening; pilot rickshaw/parking stands; vendor reallocation; footpath construction; improved signage & lighting; feasibility & route finalization for Circular Road

Medium (2028–2035)	Construct Circular Road sections; Ujalpur freight hub; Meherpur & Gangni terminal redevelopments; rail station site works; adaptive signalization rollout
Long (2035–2045)	Complete ring; rail operation and TOD begin; EV network scaled; ITS fully operational and integration with regional network

Short-term measures focus on low-to-medium cost interventions that immediately relieve the most acute bottlenecks and prepare corridors for larger upgrades.

4.2.9.2 Coordination among RHD, LGED, Paurashava, and Local Stakeholders

Implementation requires a standing **Municipal Transport Coordination Committee (MTCC)** chaired jointly by municipal CEO and district RHD representative, with LGED, police, market committee, university authority and transport union membership. MTCC is tasked with project sequencing, enforcing vendor relocation, issuing freight time windows, and coordinating tendering and PPP opportunities.

4.2.9.3 Financing and PPP Opportunities

Financing will be blended: central government allocations for highways, LGED grants for rural links, municipal budgets for pedestrian and NMT work, and donor/IFI funds for climate-resilient corridors and ITS pilots. PPP models suit terminal redevelopment and multi-level parking (concession-based revenue streams) and can accelerate the delivery of higher-cost components.

4.2.9.4 Monitoring, Evaluation, and Plan Update Mechanism

A performance framework with clear KPIs (VCR by corridor, average travel speed, modal share, crash rates, freight queue lengths at hubs) will be adopted. MTCC will publish semi-annual implementation reports and mandate a formal plan update every five years, aligning transport deliverables with evolving land use and population outcomes.