

2.1 Density & Uses

Density and uses are key elements in development for TOD. When densely development and transit infrastructure is concentrated around transit nodes, more people in Dhaka are accessible by public transport such as MRT and bus to and from destinations and origins. If people can satisfy most of their needs within walking distance of a transit node, they choose the area as destination or origin. The integrated development and transit infrastructure will maximize transit use and boost revenues for transit agencies, municipalities, and other stakeholders investing in real estate at or near stations as well. The general guidelines are described here for density and uses, which are key elements in creating positive growth cycle that TOD brings about.

2.1.1 Direction

(1) Density

1) Develop Higher Floor Area Density

In general, floor area density around a station should be higher than the surrounding neighborhood and greatest in close proximity to the station, to maximize people's convenience, transit use and revenues of stakeholders. However, the density should be balanced with the existing context so as to not overwhelm the surrounding neighborhood. As a way to promote and control it, 0.5 of FAR bonus is provided within the TOD zone in Dhaka on the value of base FAR regulated in DAP 2022-2035¹. In addition to the bonus above for all stations, a system of additional FAR bonus varies according to the station typology in Dhaka should be considered.



Figure 2.2: Taller Buildings around a Station in Tokyo

2) Regulate Too Small Lot Size

Development on too small lot size should be regulated to prevent various elements from degrading the TOD environment. Several negative effects are anticipated when too small size is allowed, such as limiting use of the site because of the small flat space, making it difficult to develop high-rise and high-density building, and increasing low-quality buildings which deteriorates the surrounding environment in terms of disaster prevention and landscape with less open space.



Figure 2.3: Image of Regulation to Prevent Too Small Lot Size

¹ Section 2.1.1 of Detailed Area Plan 2022-2035 for Dhaka Metropolitan Region

(2) Uses**1) Develop Use for Relatively High Dense Population**

Uses that serve higher density population should be encouraged in station areas, such as commercial or institutional office, retail, housing complex, higher education, medical complex, major cultural facility, or sports venue. On the other hand, uses that result in lower density populations or generate large car trips without employment opportunity should be discouraged, such as large factory, large logistics center or car workshop.



Figure 2.4: A Station Surrounded by Office and Commercials in Tokyo

2) Develop Areas or Buildings with a Mix of Uses

TOD should include a mix of uses with an emphasis on creating places to live and work that are adjacent to transit, thereby reducing individual trips. Primarily residential uses should include complementary uses such as a café, small neighborhood-serving retail, beauty salons, or pharmacies. Primarily employment uses should include services useful to commuters, such as places to pick up necessities as well as sit-down and take-out lunches. Where a single, large existing use dominates a station area, such as a hospital or university, encourage the addition of convenience retail and support commercial and residential uses to round out the general mix of uses and to reduce automobile trips.



Figure 2.5: A Block with Retail Shops, Offices and Housings in Portland

3) Develop Horizontal or Vertical Mixedness

The mix of land uses may be horizontally or vertically integrated; that is, the mix of uses may be incorporated in multiple buildings across an area or found within a particular building. This provides a variety of uses within a compact, walkable station area and creates a synergy between the varying types of development.



Figure 2.6: Horizontal and Vertical Mixedness

4) Activate Ground Floor

Station approaches and key public space around transit stations should be surrounded by ground-level neighborhood-serving businesses such as restaurants or retail to attract commuters, residents, and other transit-inclined consumers. The highly visible atmosphere shared with many publics provided by the active ground floor can be also expected to build a feeling of safety and security in the area.



Figure 2.7: Buildings with Active Ground Floor in Tokyo

5) Allocate Open Space from Privately Owned Land

While buildings are being densely developed in Dhaka, allocating open spaces and walkway should be encouraged so that people can move and spend time in the area safely and comfortably. In brownfield areas that are already largely occupied by privately owned land and buildings, there is a limit to providing sufficient public space from space of roads and public land alone. Practical systems that promote allocating open space for public should be considered, such as a system that allow landowners in TOD zones to develop a portion of their land where the public is accessible in exchange for incentives to the landowners.



Figure 2.8: Open Space on Privately Owned Land in Tokyo

6) Include Affordable Housing When Possible

A range of housing options in unit types and sizes, including affordable housing, should be part of the mix of uses at TOD destinations. Equitable TOD incorporates housing for the people who most need access to transit. It ensures that people who would otherwise be priced out due to high land values can live in close proximity to the transit asset that is critical to their ability to access employment, shopping, and other services. When people can use transit for all of their trips, they save money while the system grows stronger, ensuring sustainability. As the way to promote affordable housing, DAP provides an incentive that 0.75 of FAR bonus is provided for development with minimum 5 units of affordable housing. In addition to the bonus above for all areas, a system of additional FAR bonus within TOD zone in Dhaka should be considered.



Figure 2.9: Affordable Housings Near Station in Osaka

2.1.2 Approach

(1) Structure of Incentives and Conditions

Based on the directions outlined above, the TOD Guidelines propose to formulate TOD Station Area Plan for surrounding area of stations to guide proper urban development considering their local characteristics. Some station areas, however, will require a certain time until formulating the plan, because there is a number of stations in Dhaka. As an immediate measure, rules on TOD zone are established, which include incentives to increase upper limit of Floor Area Ratio (FAR), Maximum Ground Coverage (MGC), or non-residential use ratio for buildings on mixed-use area.

The rules provide basic incentives as well as additional incentives, depending on the level of achievement of conditions. There are two levels of conditions; 1) required conditions including location in a planned developed area and minimum plot size, and 2) evaluated conditions for contributing to the public and TOD. Those conditions for application are mentioned in the following section.

The incentives provided by the rules on TOD zones are minimum levels to prevent from encouraging inappropriate development without taking into consideration of the local conditions. Bigger incentives should be provided by TOD Station Area Plan, which will be formulated in the future considering local conditions.

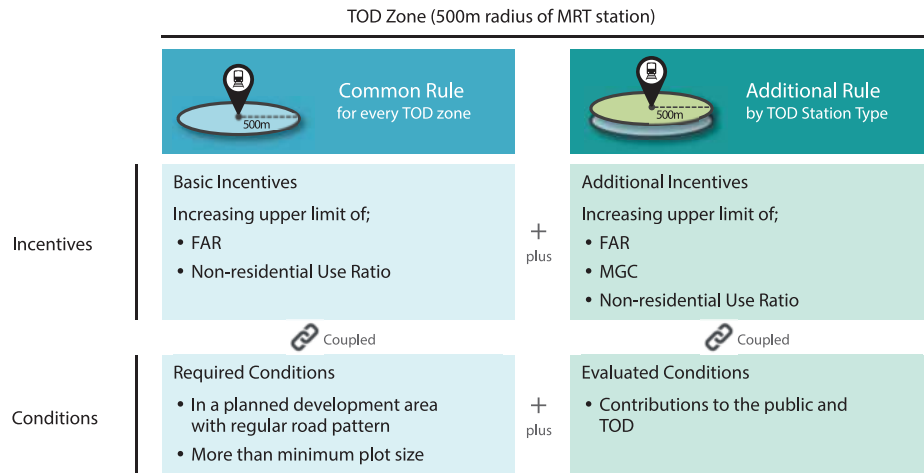


Figure 2.10: Relationship between Incentives and Conditions in TOD Zone

(2) Incentives

1) By Common Rule

- **Increasing Upper Limit of FAR:** Additional 0.5 of FAR is added to the maximum FAR limit for developments in TOD zone. In case of residential use, where the lower of Area-based FAR or Plot-based FAR is set as Base FAR and the higher is Maximum FAR, the additional FAR 0.5 is added to the Base FAR up to the Maximum FAR.
- **Increasing Upper Limit of Non-residential Use Ratio:** The upper limit of non-residential use ratio is increased for development in residential area within TOD zone. Specifically, the original maximum amount 10% for development on front road with 20-80 feet width is increased to 20% for 20-40 feet, 30% for 40-60 feet, and 40% for 60-80 feet. (Refer to the Table “Allowed Upper Limit of Non-residential Use Ratio”.)

2) By Additional Rule

- **Increasing Upper Limit of FAR**

- **Area-based FAR:** In case of residential use area, where Area-based FAR is applied, the upper limit of Area-based FAR can be raised according to TOD Station Typology where the development is located, if evaluated conditions are met for the development. The maximum allowable Area-based FAR for each TOD station type is mentioned in the following table. Each of the value is the highest Area-based FAR stipulated in DAP among the same TOD station type.

Table 2.2: Maximum Limit of Area-based FAR for Development which Meets Evaluated Conditions

TOD Station Type	Upper Limit of Area-based FAR	Maximum Density (ppa)
Regional Center	5.5	220
Urban Center	5.7	250
Urban Neighborhood	3.2	250
Institution	5.5	200
Suburban Center	4.6	200
Suburban Employment	3.6	150
Suburban Neighborhood	3.1	220

- **Plot-based FAR:** An increase in the maximum Plot-based FAR by 20% is permitted, if evaluated conditions are met for the development.

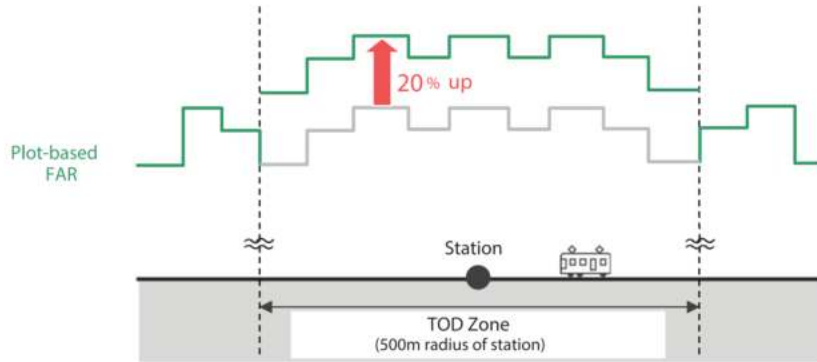


Figure 2.11: Image of Increasing Maximum Limit of Plot-based FAR for Development Which Meets Evaluated Conditions

- **Increasing Upper Limit of MGC**

Maximum Ground Coverage (MGC) is the ratio of building area to plot area. MGC should be lower in areas such as residential area where sunlight and ventilation as well as disaster prevention are particularly important by providing appropriate open space. On the other hand, MGC should be higher in areas around transit stations where non-residential areas predominate, because the higher MGC is expected to lead to active and diverse mixed use of the ground floor, which is easily accessible by pedestrians. Based on the points above, the upper limit of MGC is increased by 10% for development of commercial buildings with large plot sizes (more than 939 m² (14 Katha)) in Regional Center, Urban Center and Suburban Center types, which are classified as high-density and non-residential areas.

Table 2.3: Increased Upper Limit of MGC for Development which Meets Evaluated Conditions

TOD Station Type	Conditions		Increase in MGC
	Building Use	Plot Size	
- Regional Center - Urban Center - Suburban Center	Commercial Building	More than 939m ² (14 Katha)	10% Increase (Increased to 60%)*

*50% of MGC is provided for the development of commercial buildings over 939m² (14 Katha) by BCR (2008).

- Increasing Upper Limit of Non-residential Use Ratio**

Areas around station should have a higher percentage of mixed use than other areas because they are areas where many people intersect. Among the TOD station types, Regional Center, Institution, and Suburban Employment are provided with increased non-residential use ratio with the highest level, because they are the TOD station types with a high percentage of non-residential use. In addition, Urban Center and Suburban Center are allowed to increase the ratio with medium level, so that they have a strong mixed-use character. The increased upper limit of the percentage of non-residential use of them is described in the following table.

Table 2.4: Allowed Upper Limit of Non-residential Use Ratio

Mixed Use	Existing Road Width (feet)	Permitted Non-residential Use (%)				*Additional setback (m) against the permitted limit
		Original	Common Rule	TOD Zone		
				Additional Rule by TOD Station Type		
				• Urban Center • Suburban Center	• Regional Center • Institution • Suburban Employment	
Residential Area	80 <	100	100	100	100	1.0 (for ground floor only)
	60-80	10	40	40	100	
	40-60	10	30	30	70	
	20-40	10	20	20	60	
	< 20	10	10	10	45	
Mixed Use Area: Residential Main	80 <	100	100	100	100	
	60-80	50	50	100	100	
	40-60	30	30	70	70	
	20-40	20	20	60	60	
	< 20	10	10	45	45	
Mixed Use Area: Commercial Main or Industry Main	60 <	100	100	100	100	
	40-60	70	70	70	70	
	20-40	60	60	60	60	
	< 20	45	45	45	45	

*DAP set the regulation for setback as – “An additional setback will be 1.0 meter (for ground floor only) and the plot must be located on the side of the main road (inter-regional, internal regional or collector roads)”.

(3) Conditions

1) Required Conditions

Required conditions are established for the use of incentives provided by the common rule to prevent from encouraging unproper development that deteriorates the public including local economy, traffic, sanitation, disaster prevention. There are two conditions in terms of location and plot size respectively.

The first requirement is that the development site must be located in an area with designed regular road pattern. The purpose of this requirement is to prevent large developments in areas or sites with irregularly shaped roads or poor road connectivity from leading to traffic congestion and ineffective use of land. This requirement, however, can be skipped, if RAJUK determines that a local community has prepared basis to redevelop the unplanned area such as organizing town improvement meeting to formulate TOD Station Area Plan.

The second requirement is that the plot size of the development site must be more than 400m². When buildings are densely built on small sites, the environment, such as sunlight and ventilation, may deteriorate, and the risk of fire may increase. The purpose of this regulation is to prevent such small-scale development and to create or maintain a favorable urban environment. The figure of 400 m² is set with reference to the general existing plot size surrounded by regular shaped street around a MRT station in Dhaka.

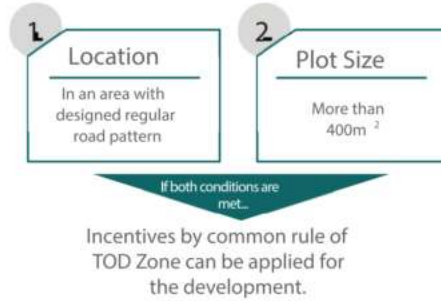


Figure 2.12: Required Conditions for Common Rule

2) Evaluated Conditions

In order to induce private development toward realization of TOD, the application of additional incentives has conditions for contribution to the public and realization of TOD. Development with contribution to walkable environment, multimodal connectivity, social welfare, and high intensity are evaluated and allowed to increase upper limit of FAR, MGC or non-residential use ratio for buildings on mixed-use area.

Type of Contribution	Example of Development
Walkable Environment	<ul style="list-style-type: none"> - Privately owned open space for public pedestrians - Providing partial frontage sites for important planned pedestrian network - Active ground floor, etc.
Multimodal Connectivity	<ul style="list-style-type: none"> - Space for drop-off - Bicycle parking for public - Bicycle share station, etc.
Local Social Welfare	<ul style="list-style-type: none"> - Kindergarten - Childcare facility - Affordable housing, etc.
Clean and Safe Urban Areas	<ul style="list-style-type: none"> - Large land area, including land amalgamation - Green building with LEED certification, etc.

Figure 2.13: Evaluated Conditions for Additional Rule

(4) Image of Incentive Utilization

When utilizing the incentives described above, how much of a restriction relaxation can be approved by what kinds of conditions also depends on where the plot is located. As an example, the following figure shows a case where the incentives are applied to a plot in the TOD zone around Uttara Center Station. In this case, if the conditions are met, Basic Incentives would increase the FAR by 0.5 and the Non-residential Use Ratio by 30%. In the case of utilizing Additional Incentives, the conditions will need to be investigated and determined, but a maximum of 1.0 additional FAR can be added to the Basic Incentives. In the case of the TOD Station Plan, the degree of restriction relaxation and conditions will be determined at the planning stage, but further relaxation of restrictions is expected. Common to all of these incentives is the principle that greater incentives require that greater conditions be met, particularly public contributions.

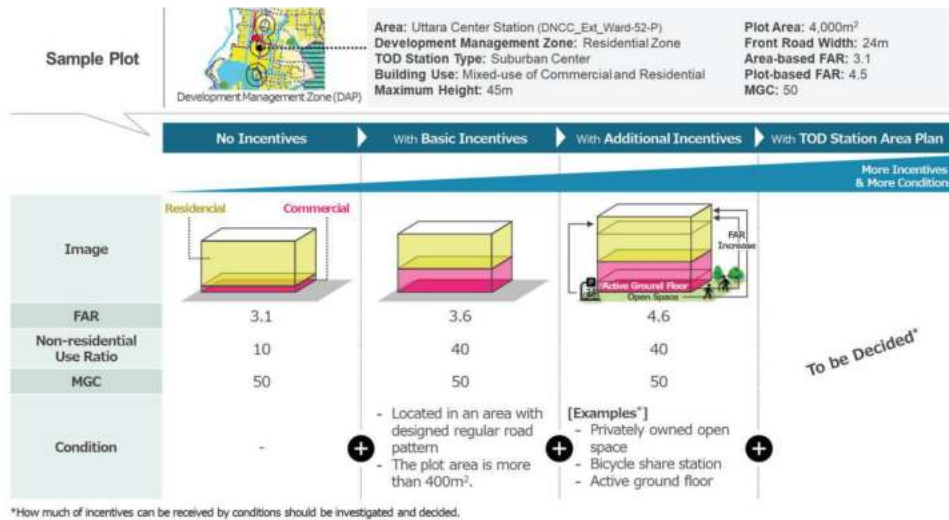


Figure 2.14: An Image of Incentive Utilization - a Sample Plot in the TOD Zone around Uttara Center Station -

2.2 Multimodal Connectivity

The success of TOD relies upon people's ability to access the station and destination via their mode of choice. In general, many trips in the TOD, particularly to and from the station, will be walking trips. In Dhaka, another portion will be made by bicycle, bus, and rickshaw, and additional trips will be made by car or motorcycle. Many people arriving by car will want to drop-off or park on site.

These modes of transport should be connected to the stations and other nearby destinations in a safe, convenient, and comfortable way. The easier access to the stations promotes a modal shift from private vehicle use to public transport. This section elaborates on how to integrate the full range of transport modes into TOD.

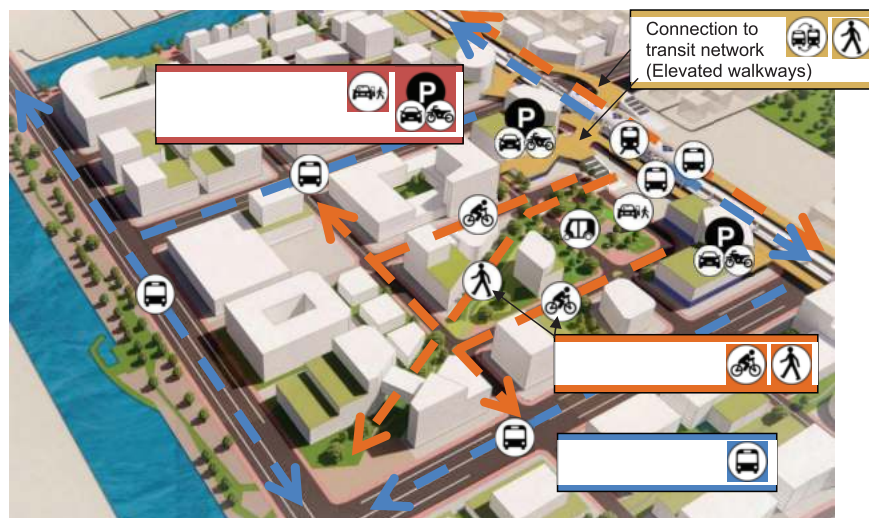


Figure 2.15: Multimodal Connectivity in a Station Area

2.2.1 Direction

(1) Transit Function Priority

When TOD is present, it usually occupies the space between public streets and transit stations. Because there is often limited space around a transit station in Dhaka, the transit function priority and resulting design of a TOD is critical to ensuring multimodal access to the station. Tough decisions have to be made with regard to how access is organized.

People must be able to easily get where they need or want to go, and in whichever way they prefer. To facilitate connectivity, the TOD Guidelines use transit function priority to guide the best use of limited station space. Modes bringing the greatest number of people relative to the space they require and preserving the safety and quality of the pedestrian experience should receive greater priority over others.

- **Walking & Cycling:** Since every transit using public transport begins and ends with walking, pedestrians are the top priority in station areas. Safe, direct and attractive pathways are a few key elements of walkable communities. More details are available in the Walkability section of the TOD Guidelines. In addition to walking, cycling should be highly prioritized with regard to mode access to stations. On their own bicycles, or using the bicycle share system, many transit passengers cycle for the first and last miles of their trips. With the option to store

bicycles at stations, bike connections and amenities require significantly less space and infrastructure than other mode options. Although the demand for large bicycle parking spaces is not high in Dhaka because the share of bicycle use is not yet high, it is necessary to consider bicycle parking space development in anticipation of increased usage.

- **Transit Connections:** Seamless and smooth transit is the second priority mode in station areas. Riders arriving at MRT stations need to easily access and connect with on-street bus service, where it is available, and vice versa. When people need to transfer to complete transit trips, making connections as easy as possible helps riders and sustains ridership for the agency; this is a function of good pedestrian and multimodal connections. In TOD planning and design, consideration should be given to how transit and paratransit services can deliver riders to convenient locations in accessible proximity with the station. Consideration should also be given to how TOD plans impact transit operations.
- **Drop-off:** Drop-off locations, areas near stations where private vehicles dispense or collect a passenger, are a convenient option for multimodal households and a great use of space for station and TOD planners. As the third-highest priority in the mode hierarchy, drop-off areas should be given sufficient space.
- **Park and Ride:** Park and Ride facilities provide a convenient transit access point for people living in communities without good connections including walking and transit to transit routes. Park and Rides are particularly valuable in suburban locations where car ownership is high and local bus service is impractical.

This transit function hierarchy is a guide and should be considered in the context of each station area. The modes are not exclusive and the first three should be possible to accommodate in all station areas.

Table 2.5: Transit Function Priority

1 st	Walking & Cycling
2 nd	Transit Connections
3 rd	Drop-off
4 th	Park and Ride

Note:

- This transit function hierarchy is a guide and should be considered in the context of each station area.
- The mode priorities are not necessarily exclusive and the first three should be accommodated in all cases.

2.2.2 Approach

(1) Connect Roads in a Hierarchical Manner

Directly connecting access roads from arterial roads to residential areas would cause traffic on arterial roads to concentrate in residential areas. This would increase traffic congestion and the risk of traffic accidents in the station area. To prevent this, traffic should be dispersed by connecting roads in a hierarchical manner. Future development should be considered when designing road network.

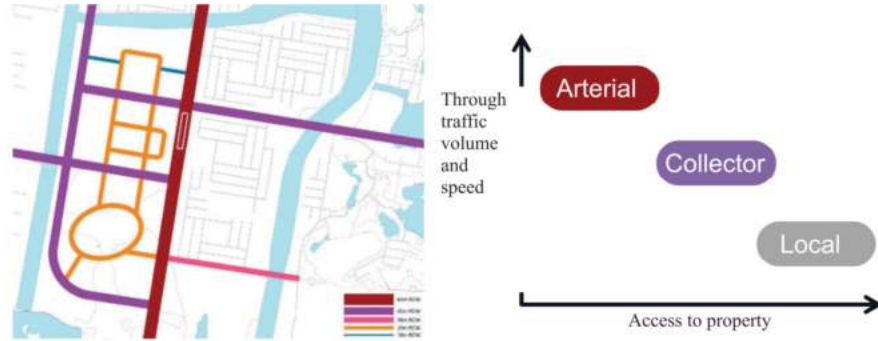


Figure 2.16: Road Hierarchy

(2) Connect Transit Network

Connections between transit routes are important for many people to get to their destination. When it is integrated with MRT stations, TOD should facilitate pedestrian connections between the MRT station and multimodal mode, such as bus service (existing bus route, shuttle bus service). Connections to transit can be strengthened through infrastructure improvements, wayfinding, service coordination, and strategic routing. Collaboration on everything from new or improved pedestrian pathways to effective paratransit drop-off locations will lead to TOD design that makes it easier and more appealing to access and utilize transit stations.



Figure 2.17: Connect to Transit Network around MRT Station

1) Strategic Routing

At each MRT Line 6 station, feeder transport such as buses and rickshaws are waiting for you when you exit the MRT station ticket gate and go down the stairs. Thus, by setting up a transfer route that takes the shortest time to reach the feeder transport after using the MRT, users can minimize the time required for transferring.

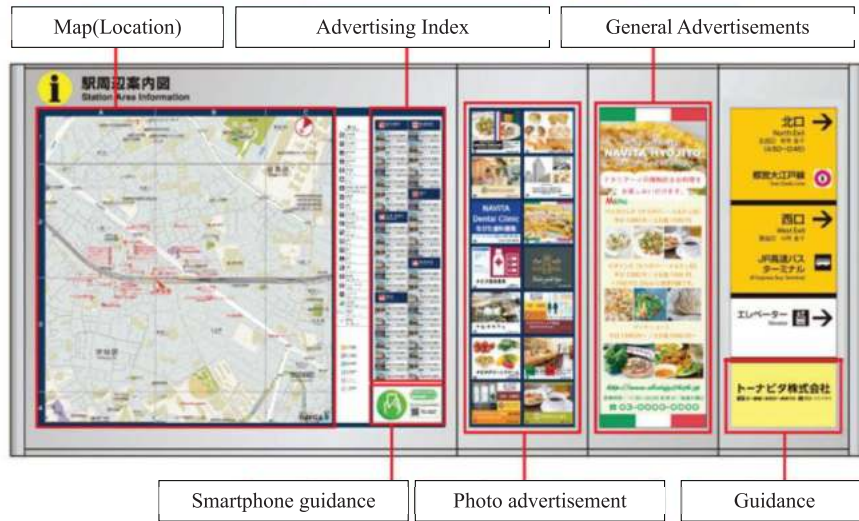


Figure 2.18: Example of Agargaon Station

In addition, roofs and handrails can be installed on the routes for transfers to provide more comfortable travel space.

2) Wayfinding

It is necessary to provide information on transfers due to all users to travel comfortably and smoothly. It is important to provide not only information on the boarding points for each mode of transport, but also more detailed information such as the direction of major buildings in the surrounding area that could be the user's destination and bus stops by destination (route) in an easy-to-understand manner.



Source: <https://www.hyojito.co.jp/business/navita/station/>

Figure 2.19: Connect to Transit Network around MRT Station

(3) Connect Bus Network

Excessive traffic concentration at MRT stations is expected when the number of MRT users increases in the future. Therefore, providing public transport services and discouraging the use of private vehicles

will provide comfortable and safe travel within station area. Here, public transport services should be feeder buses to support last mile travel within station area.

For areas outside the walking or rickshaw range (1 km or more), it is necessary to expand the station catchment area by forming a public feeder transport network with buses and other public transports capable of transporting multiple passengers. As for the bus network, it is necessary to optimize the bus routes based on coordination with DTCA's RSTP, BRT, BRTC, and other bus operators on the premise of an urban rail network.

- **Feeder Bus Service Matching with MRT Schedule for Last Mile:** To make the feeder bus service convenient for railway passengers, it should provide routes and frequencies that match the needs of passengers and be operated to match with the MRT schedule.
- **Feeder Bus Service to Expand Station Catchment Area:** To make feeder bus network that connects the surrounding residence development and MRT station to expand station catchment area to increase MRT passengers.

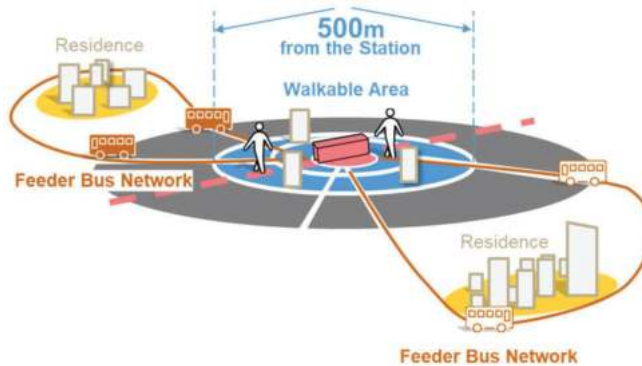


Figure 2.20: Feeder Bus Service When Station Area is under Development



Source: The Original Tour London

Figure 2.21: Image of Expansion of Station Catchment Area with Public Feeder Transport Network

(4) Provide Space for Drop-off / Pick-up

Drop-off activity can be difficult to control as drivers seek the most convenient position relative to the station. Spreading out this activity is ideal. By providing easy access from as many directions as possible, drop-off/pick-up locations can provide a more efficient vehicle access than parking by allowing many vehicle loads throughout the day. These drop-off locations should be arranged with sufficient distance from the station to ensure that non-motorized transport is prioritized. Drop-offs should be positioned to ensure that they don't create barriers to station access for other transit modes. Incorporating pull-off areas can also decrease the traffic congestion and confusion that would occur as drivers stop and wait, to pick-up/drop-off riders.

(5) Limit Parking Space

In order to promote TOD, it is necessary to encourage a shift from automobile-oriented development to one that is centered on walking and public transportation. Parking policies play an important role in this process. In particular, policies should be implemented to limit the number of parking spaces and encourage the use of public transportation in order to reduce dependence on automobiles.

1) Parking Minimization

Minimize parking space for private vehicles in new development projects near stations. Parking should be greatly reduced, especially in areas within 500 meters of MRT stations. It is recommended that fringe parking be established in the area beyond 500m from the station and that no extra vehicle enter the TOD zone.

Table 2.6: Parking Space Installation Requirements

TOD Circle Zone	Distance from Station	Parking Space Installation Requirements	
		Private Vehicle	NMT
TOD Core Zone	Within 200m	No parking (Drop-off location only)	Pedestrian / NMT priority zone and constructed for multi-modal interchange.
TOD Zone	Within 500 m	Allow 20% to 50% reduction in the number of parking spaces over the existing requirement.	Provide parking to meet NMT demand.
TOD Influence Area	Within 800m	Fringe Parking (Integration of parking spaces including the ones that were previously within 500m from station)	-

2) Setting Parking Fees

Set parking rates based on supply and demand, and raise rates during peak hours to reduce parking demand. Furthermore, to control long-hour parking, higher rates are set for long-hour parking to encourage short-hour parking.

3) Improving the Efficiency of Parking Use

Improve the efficiency of parking lot usage by allowing residents and visitors to share parking spaces in commercial and office buildings. Introducing a parking reservation system to facilitate the identification and reservation of available parking spaces will also improve the efficiency of parking use.

4) Providing Park and Ride when Appropriate

Park and Ride means a transit system that people drive their personal vehicle from their point of departure, park it at a parking lot adjacent to a public transport station, and use public transport to go to their destinations. By increasing the convenience of transit from private vehicles to public transport only in necessary areas such as suburbs, it will contribute to promoting public transport use and decreasing parking space demands in the city center of Dhaka.

The amount of parking appropriate at a transit station depends largely on the context in which that station is located. As communities along a transit line become more dense and walkable, the station area is better used to connect and attract those who walk, cycle and transfer through TOD that also provides amenities. Parking lots should be limited to station areas where car access to the transit station dominates, either due to lack of density and walkability or the station being uniquely positioned for it (e.g. end of the MRT line). In today's Dhaka, the provision of Park lot space should be considered for the purpose of promoting public transport in Suburban Neighborhood and Suburban Employment-type and at MRT line terminal stations, in case land is available for parking.

(6) Control Excessive Demand for Rickshaws

Over 1 million rickshaws in Dhaka as of 2024 are used as a low-cost and convenient means of transport for citizens. City Cooperations, the official licensing authority for rickshaw registration, is attempting to control the number of registered rickshaws. However, abrupt restrictions without offering alternatives are unacceptable to both rickshaw drivers and users. This is evidenced by the massive protests that occurred when the DNCC banned rickshaws on three major roads in 2019.

Rickshaws are considered a contributing factor to traffic congestion in Dhaka due to their large number and speed, which is the main reason for limiting the number of rickshaws and banning their entry. However, from a TOD perspective, rickshaws provide a last-mile function for rail users beyond the walking distance from the station to their destination, and there is no problem with getting into the station area itself, as long as the controlled and appropriate number of vehicles and appropriate waiting and running rules are respected. Therefore, banning rickshaws into station areas without providing a last mile alternative mode of transport is not always desirable from a TOD perspective.

In station areas, the following initiatives will be promoted to ensure that passengers have access to their destinations on the basis of the use of railways.

- Provision of medium-distance feeder transport networks such as buses. [operators: BRTC and private bus operators]
- Provision of shuttle bus services inside a designated area such as apartment complexes, new towns, large private developments, etc. [Operators are on a case-by-case basis and maybe not only public agencies but private developers may provide a shuttle service to residents.]
- Development of comfortable pedestrian walkways: from railway stations and bus stops to within walking distance (approximately 500 m to 1,000 m), comfortable walking walkways should be developed so that people can reach to their destinations on foot.

Even if the above feeder transport and walking environment improvement initiatives provide access from stations to destinations, there is still a need for a certain number of paratransit services such as taxis and rickshaws for travelers going to inaccessible areas and those who have disadvantage of walking to their destinations. Rickshaw can be considered as the sub mode only to be benefitted with inter-connection of modes by managing the schedule with proper integration.