



4. STATION AND SUPPORT FACILITY DESIGN GUIDELINES

Station siting and station design guidelines should be considered collectively when making station and support facility design decisions for transitways. A transitway station is a place on a transitway where scheduled vehicles stop during every trip. Three types of transitway stations have been defined as described in Guideline 3.2. Transit Station Types. A transitway station may be included in one or more of the categories. For example, the I-394 Louisiana Avenue station is an inline station for inbound trips, but offline for outbound trips. All rail stations should be online stations. Online or inline stations are preferred for highway and arterial BRT. Hybrid inline-offline stations should be implemented for Highway BRT service where online stations are not feasible, with the inline configuration provided for the inbound direction of travel. For all modes, end of line stations may be offline.

Since the design of stations and support facilities is an engineering-intensive activity often directed by specific design practices, standards, and/or regulations, more specific detail behind these guidelines is provided in the Station and Support Facility Design Guidelines User Guide.

4.1. PRINCIPLES OF TRANSITWAY STATION AND SUPPORT FACILITY DESIGN

Transitway stations and support facilities should fit in with and enhance the neighborhoods surrounding them today and in the future. Transitway stations and support facilities should be functional, attractive, cost-effective, and generally consistent by transitway mode across the region. Station and facility designers should work to:

- **Provide an attractive, informative environment for passengers at stations that is consistent with local community context, transitway identity, and passenger waiting times**
- **Integrate with the surrounding land uses, which may include forming a nucleus for transit-oriented development at stations**
- **Promote a safe and secure environment by designing all elements to enhance passive security by maintaining visibility to and within the station and station area**
- **Implement an interdisciplinary approach to station and facility design that incorporates advancements in technology**
- **Achieve a functional, cost-effective outcome that balances aesthetics with funding availability**

All stations and station areas should be planned and designed using best practices for transit-oriented development and transit station design as described in the Metropolitan Council's Guide for Transit-Oriented Development and the principles of the Corridors of Opportunity initiative.

It is the intent of the Regional Transitway Guidelines to support better alignment of transit and land use planning. Information about the region's Corridors of Opportunity initiative, including its vision, principles, and the most up-to-date project deliverables, is available on the Council's website. The



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Regional Transitway Guidelines are also intended to support the U.S. Department of Housing and Urban Development's (HUD) six Livability Principles established through the Partnership for Sustainable Communities. More information about the Partnership for Sustainable Communities is available at <http://www.sustainablecommunities.gov/>.

Stations serving specialized facilities such as Union Depot in St. Paul, the Minneapolis Interchange, and major event and sports venues (e.g., the Capitol Complex, Target Field, Mall of America, University of Minnesota TCF Bank Stadium, Xcel Energy Center) require special considerations. National expertise or guidelines are likely most appropriate.

For all other stations, consistency across the transitway system includes such elements as system signs, maps, structural elements, materials, and power systems. Other elements that may be custom and responsive to site-specific conditions and neighborhood context may include kiosks, pavement patterns, handrails, bike racks, benches, and retaining walls.

Coordination with and engagement of local land use authorities in station planning and siting, as well as station design, is very important. Coordination with local land use authorities, partner implementation and affected agencies, stakeholders, and the general public are critical responsibilities of the organization leading transitway planning and design, including stations and support facilities, as identified in Guideline 10.2. Coordination of Agencies and Stakeholders.



4.2. TRANSITWAY STATION FACILITIES

One of the primary functions of transitway stations is providing passengers access to the transitway. To accomplish this function, all transitway stations should include:

- Facilities that support access for customers of all ages and abilities
- Facilities that support access for pedestrians and people using wheelchairs or bicycles, including providing bicycle parking
- Station platform(s)
- Waiting shelters for all public transit routes serving the station
- Provision for short-term pick-up/drop-off areas for transit passengers.

Some stations may also serve as transit transfer, transit layover, and/or park-and-ride locations. The major factors to consider when identifying these additional facilities to provide at each station are existing and future:

- Passenger demand
- Market needs
- Transit service plans (transitway and other public transit services)
- Capital and operating costs
- Available right-of-way
- Consistency with surrounding development and land use

Transitway station access is discussed in more detail in the **Station and Support Facility Design Guidelines User Guide**.

All transitway stations must serve people arriving or leaving by foot, in wheelchairs, on bicycles, and being dropped-off or picked-up by a car and the elements listed in this Guideline are essential to this role of a transitway station. All transitway stations should be ADA compliant. Some stations may also provide access for transit transfers, transit layover, and/or park-and-ride locations but the provision of additional facilities depends on the considerations listed above. Additional guidance relating to transfer locations, including boarding and wait times, is in Guideline 4.3. Enclosures at Transitway Station. Guidance on identifying parking need is in Guideline 3.3. Transportation Site Location Factors. Discussion of platform configurations (e.g., center, split, offset) as well as a hierarchy of station circulation and related elements is included in the Stations and Support Facility Design Guidelines User Guide.



4.3. ENCLOSURES AT TRANSITWAY STATIONS

All transitway stations should include sheltered waiting areas. Some transitway stations may also include one or more enclosures when justified. Enclosures should be reserved for high volume stations or when station equipment requires protection from the elements.

When making the decision between shelter or enclosure at high volume stations, the following should be considered:

- **Presence of circulation systems like elevators or escalators that provide access to transitway boarding platforms, such as at stations located in freeway medians**
- **Stations located within multiuse buildings, such as an airport terminal**
- **Transit transfer points with a total of 500 or more boardings per day**
- **Site conditions, including spatial constraints like available right-of-way**

Radiant heat and passive cooling should be used in all passenger waiting areas at transitway stations. Where heat and/or air conditioning is required for equipment operation, geo-thermal or other environmentally responsible options should be considered taking into account both capital and long-term operating and maintenance cost. Non-waiting spaces in enclosures such as stairways or overpasses should be vented but not heated or cooled.

Shelters are passenger waiting areas that are bolted or affixed to a concrete pad or have foundations. Figure 4-1 illustrates a sheltered passenger waiting area at a Hiawatha LRT station. Guidelines 4.2. Transitway Station Facilities, 4.4. Transitway Station Sizing, and 4.5. Transitway Station Design and Components address sheltered passenger waiting areas.

Enclosures are built on foundations. The Northstar stations and I-35W & 46th Street Station illustrated in Figure 4-2 are examples of stations that include sheltered and enclosed passenger waiting areas; the I-35W & 46th Street Station enclosure also protects stairs and elevators. Enclosures can provide passenger comfort but can also incur higher construction and operating and maintenance costs, especially when heated and cooled. Because most transitway services operate at high frequency (such as light rail and bus rapid transit services) or during short periods of the day (such as commuter rail), high volumes of passengers should use enclosed passenger waiting areas for them to yield significant benefits. Because shelters or enclosures with radiant heat and passive cooling are typically feasible, other kinds of enclosures may be provided as a local betterment.

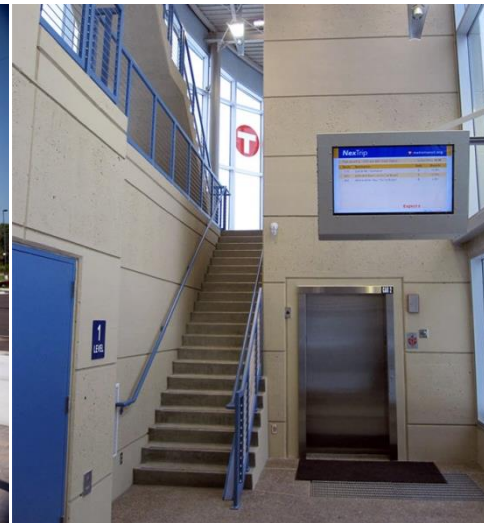


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Figure 4-1 – Sheltered Passenger Waiting Areas (Hiawatha LRT)



Figure 4-2 – Sheltered and Enclosed Passenger Waiting Areas (Northstar and I-35W & 46th Street Station)





4.4. TRANSITWAY STATION SIZING

Transitway station circulation systems, waiting areas, and queuing areas should be sized based on the projected number of patrons during peak 15-minute intervals in the year of opening. Parking capacity, sheltered space, and platform length should be sized based on other considerations as described below.

- The number of bicycle parking spaces should be based on anticipated ridership and spatial constraints. Bicycle racks are preferred to lockers except where substantial space and bicycle demand exists.
- Waiting shelters shield transit customers from snow, wind, rain and sun and should be sized based on average peak hour, per-vehicle passenger volumes projected for the station and accounting for typical wait time. Shelters should provide 3.5- to 5-square feet per person. At Commuter Rail stations, a minimum of one shelter should be provided on each outbound platform, and a minimum of two shelters on each inbound platform.
- In general, LRT platforms should accommodate three-car trains (270 feet) and Commuter Rail platforms should accommodate five-car trains (425 feet) with expansion capability for longer trains (600 feet minimum, or longer to accommodate special service, as required by the railroad). Highway BRT platforms should be sized to accommodate two articulated buses or over the road coaches (120 feet). Arterial BRT platforms should accommodate one articulated or two standard buses (60 to 80 feet) depending on the vehicle to be used for the service. Platform sizing for all modes is discussed in more detail in the Station and Support Facility Design Guidelines User Guide.
- Where parking is identified as a need per Guideline 3.3, park-and-ride lots may be surface lots or multi-level structures. Surface lots are generally preferred for cost reasons, but the type, size, and footprint of the parking facility should be evaluated to achieve the best balance between available space, cost, and funding. As discussed in Guideline 3.3, the Metropolitan Council's Park-and-Ride Plan provides design guidance for park-and-ride lots; parking areas should be sized based on the market analysis methodology provided in Chapter 5 of the plan. In general, the amount of parking provided at stations is inverse to the density of surrounding land uses; i.e., less parking is provided at stations with higher surrounding population and employment densities.

The staged development of station facilities should be considered when planning, designing, and constructing stations. Staged development is discussed in more detail in Chapter 3. Station Spacing and Siting Guidelines.

Capacity standards for sizing facilities are discussed in Section 6 of the [Central Corridor Light Rail Transit \(CCLRT\) Design Criteria](#). This section states facilities should be sized to meet level of service C or better capacity standards projected for peak 15-minute intervals in the year of opening, gives recommended circulation system dimensions, and notes that "pedestrian paths, plazas, ramps, and queuing areas shall be sized in accordance with the level-of-service capacity standards contained in



Pedestrian Planning and Design by J. Fruin . . . site elements such as fare vending machines ... shall be located and sized so that queues or areas of congregation do not block pedestrian flow.”

4.5. TRANSITWAY STATION DESIGN AND COMPONENTS

Transitway stations, enclosures, and shelters should be consistent with accepted architectural and site design standards, including best practices for transit-oriented development. Standard components to be included at every transitway station include:

- **Lighting**
- **Heating**
- **Security features**
- **Blast-resistant litter receptacles**

Ticket vending machines or comparable technology should be provided at all rail stations, and all BRT stations should be constructed to support the inclusion of ticket vending machines.

Materials used in transitway stations, enclosures, and shelters should be attractive, sustainable, and cost-effective for the life of the investment. Cost considerations should include both the capital investment and life-cycle costs. All materials should be low-maintenance; easy to repair and replace; difficult to remove, deface, or damage; environmentally friendly and cost-effective.

Transit stations generally should not include public restrooms unless the station is part of a larger, multi-use building or a major transfer point requiring routine daytime wait times of one hour or more. Where public restrooms are provided, stations should be staffed for security and maintenance.

Other amenities, which may or may not be appropriate to provide, include:

- **Seating**
- **Concessions and newspaper vending**
- **Acoustic treatments**

Additional information on transitway station design and amenities is included in the Station and Support Facility Design Guidelines User Guide.

Some transit stations will serve both transitway passengers and passengers using interconnecting local bus routes. Facilities for both should be considered in the planning and design of the transit station and associated bus shelters and facilities. Both the local street level and the transitway platform level should be considered equally important when designing two-level stations.

Transitway station design and material selection need to consider on-going maintenance needs such as the ability to accommodate snow removal equipment and snow storage requirements. The provision of snow removal, litter removal, cleaning, and maintenance should be incorporated in early planning stages with agency roles and responsibilities clearly defined in interagency agreements to avoid complications once operational.



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A number of accepted policies exist for use in station design including, but not limited to:

- Americans with Disabilities Act (ADA)
- National Environmental Policy Act (NEPA)
- Title VI of the Civil Rights Act of 1964
- FRA, FTA and AREMA regulations
- State and local regulations and guidance including the [Minnesota Manual on Uniform Traffic Control Devices \(MnMUTCD\)](#)
- Metropolitan Council's Park-and-ride Plan
- Metropolitan Council's Guide for Transit-Oriented Development

Access to restrooms should be provided for transit operators at stations which function as layover facilities and at terminal stations. Where stations are located within a multi-use building or qualify as an assembly area according to the State Building Code, public restrooms may be provided. Evaluation criteria include the number of passengers and routine wait times of one hour or more. Public restrooms may be considered as a local betterment at any transit station.

4.6. LANDSCAPING, STREETSCAPING, AND PUBLIC ART

Landscaping (plant materials), streetscaping (hardscape), and/or public art should be provided at transitway stations to create quality public spaces and complement the surrounding area. In addition to meeting the guideline regarding station design and components, landscaping, streetscaping and public art design should:

- **Provide clear sight lines which do not impede visibility for waiting transit passengers, transit vehicles in the runningway, or other transportation modes intersecting the transit runningway**
- **Avoid creating areas of concealment**
- **Avoid interference with pedestrians, bicycle, bus, and auto paths – this should include integrating all public art into functional station elements to avoid creating unanticipated physical obstacles in station areas**

Consistent with Federal Highway Administration (FHWA) guidelines, the cost of landscaping and streetscaping should be no more than five percent of the above-ground construction cost (i.e., the percentage should not be associated with the cost of underground utility relocation). Consistent with FTA guidelines, the cost of public art included at stations and in all other areas of a project should be within one-half percent to five percent of the project construction budget, depending on the funding source, with larger percentages typically associated with lower cost projects.

Additional information on transitway station landscaping, streetscaping, and public art is included in the Station and Support Facility Design Guidelines User Guide.

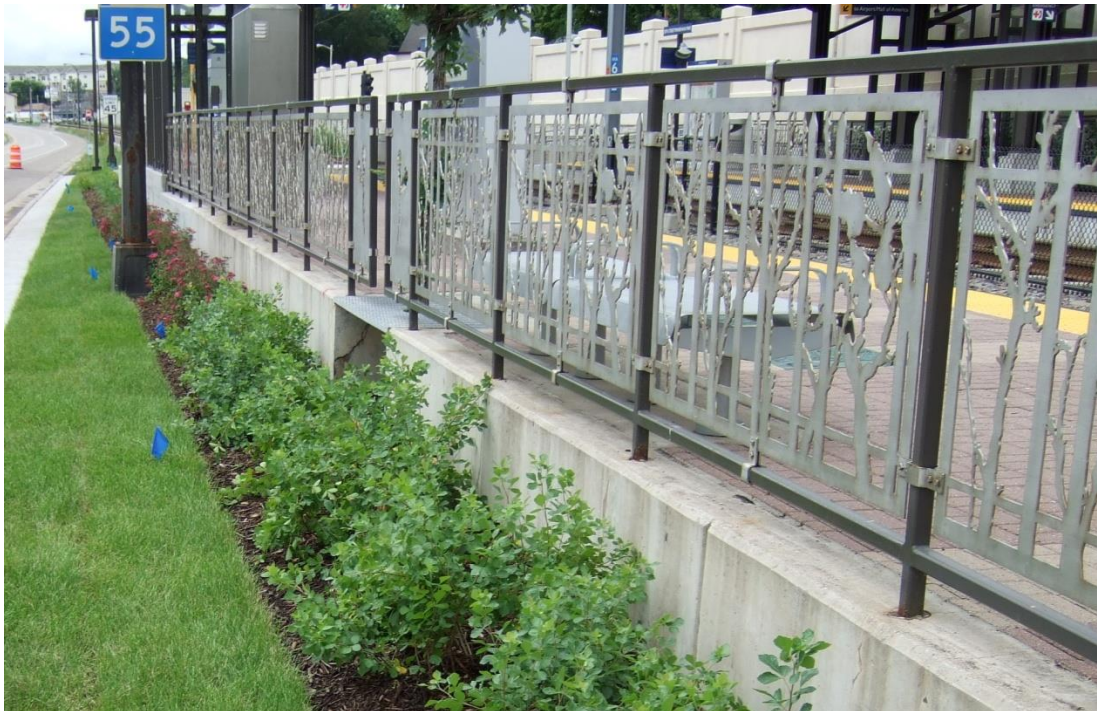


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This guidance is consistent with the region’s Corridors of Opportunity initiative to “create distinctive places and strengthen local assets.”

Streetscaping (hardscape) and/or public art is an acceptable alternative to landscaping (plant materials) in many circumstances. It is best to integrate all landscaping, streetscaping, and public art into the functional elements of the station where possible. The station railing at the 50th Street LRT station on the Hiawatha line (see Figure 4-3) is an example of effective public art as an integral station element. Landscaping that assists in passive cooling or wind blockage is another example.

Figure 4-3 – Decorative Railing at 50th Street Hiawatha LRT Station



Where plant materials are used, those appropriate to Minnesota climate and soil conditions, including tolerance to sand/salt used to clear paths during winter, are preferred. Plantings that require no additional irrigation other than rainfall once the material is established are also preferred. Short- and long-term irrigation needs for all natural plant materials should be considered. Irrigation, an alternate engineered irrigation system, or an interagency agreement regarding watering is required where irrigation is essential to the life of the plants.

The region currently spends between one-half and one percent of a station’s cost on public art. Funds spent on landscaping, streetscaping, and/or public art should be appropriate to the overall costs of the transit project and adequate to meaningfully benefit the station area. Above the stipulated level provided in the project funding agreements, additional landscaping, streetscaping, and/or public art will likely be considered a local betterment.



4.7. TRANSITWAY PASSENGER INFORMATION

One of the primary functions of transitway stations is the provision of transit information. Transit information and wayfinding information within and to stations should be provided at all transitway stations. Signage should seamlessly guide passengers to and through the station and its functions, including passengers who are not familiar with the transit system, who have disabilities, who are non-English speakers, and/or who are non-readers. Wayfinding information to major, permanent civic attractions should also be provided at all transitway stations.

Transitway station signage should incorporate the transitway branding scheme (see Chapter 9. Identity and Branding Guidelines). Placement and general content of information should be consistent within station areas when possible.

Real-time schedule information should be provided at high-volume stations whenever site conditions allow.

Transit information elements include weatherproof transitway route maps, schedule information, and rider alerts for all transit routes serving the station. Types of signage include static, variable, or real-time.

Station areas should include wayfinding information to platform entrances and exits, bicycle parking areas, bus drop off, short-term pick-up/drop-off, and, where provided, park-and-ride facilities. Station areas may also include wayfinding signs directing passengers to nearby public facilities that are major, permanent civic attractions in proximity to the station. Examples include city halls, the State Capitol, museums, and other nearby transit facilities. Where budget permits, wayfinding signs may also include other major civic attractions such as parks, recreational trails, stadiums, and public event centers close to the station. Wayfinding within the station area to businesses or other types of attractions may be included as a local betterment.



4.8. PEDESTRIAN AND BICYCLE ACCESS

Special attention should be given to providing convenient and safe bicycle and pedestrian access to and through transitway stations including improved bicycle and pedestrian facilities and roadway modifications where appropriate. Pedestrian and bicycle paths should be designed to provide the most direct route, paved, clearly marked, lighted, and buffered to improve bicycle and pedestrian experiences and discourage people from crossing tracks or roadways in other than designated areas. Mid-block crossings between stations and street intersections should be avoided. At-grade crossing should be utilized where feasible.

Grade-separated bicycle/pedestrian crossings may be considered where there is no technically feasible at-grade crossing option, the benefits to the broader transportation system are shown to be significant, or the grade-separation is required by the runningway's owning entity (e.g., railroad). Evaluation criteria should include:

- High pedestrian volumes
- High number of pedestrian or bicycle crashes
- Long pedestrian crossing distances
- Presence of poor sight distance to see crossing transit patrons
- Roadway average daily traffic volumes of more than 35,000 and 80th percentile speeds documented at more than 40 mph
- Distance of greater than 600 feet to the nearest alternative safe crossing (i.e., controlled intersection or existing under/overpass)
- Potential to coordinate with adjacent facilities such as a bike trail or sidewalk system

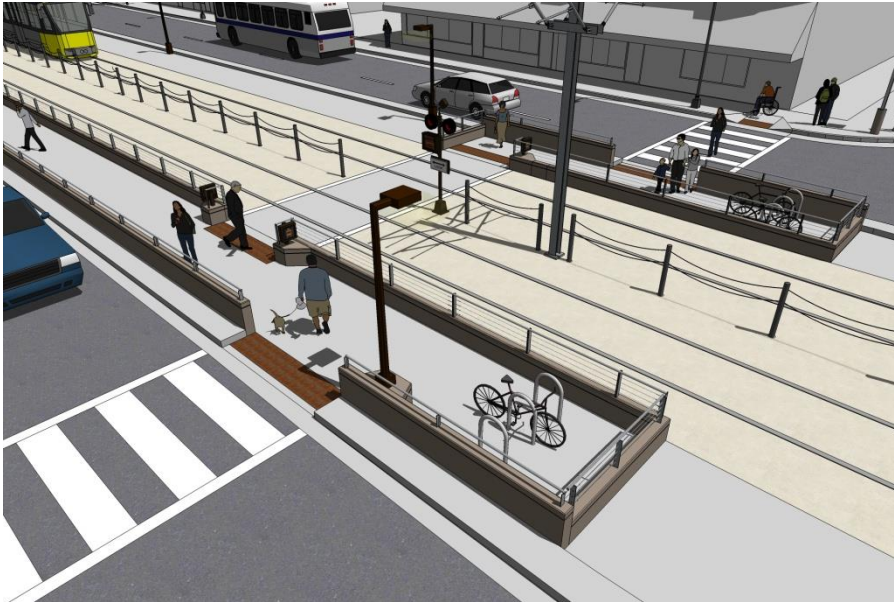
Additional information on pedestrian and bicycle access, including grade-separated crossings, is included in the Station and Support Facility Design Guidelines User Guide.

The provision of high quality, safe and convenient pedestrian and bicycle facilities at transitway stations and connecting stations to surrounding land uses is a critical element of station design and transit-oriented development. Pedestrian and bicycle facilities should be given a high priority during the planning and design of transit stations and surrounding land uses. Safe and convenient pedestrian and bicycle access also should be given a high priority when planning and designing all roadways in the vicinity of a transit station.

Improved bicycle and pedestrian facilities include features such as more visible crossings using pavement treatments, colors, or markings; pedestrian refuge medians; roadway curb extensions; intersection countdown timers; or passive crossing control (e.g., “z-type” crossings on University Avenue as illustrated in Figure 4-4). Roadway modifications include features such as adjusted intersection traffic signal timings to accommodate bicycles/pedestrians; additional traffic signals; elimination of conflicting turn movements such as free-right turn movements; and intersection modifications to provide more convenient and safer bicycle and/or pedestrian crossings.



Figure 4-4 "Z-type" Pedestrian Crossing at Unsignalized Intersection



Source: CCLRT Project Office

Pedestrian/bicycle overpasses/underpasses will typically be open during transitway service hours only unless the overpass/underpass is part of a multiuse facility (e.g., trail, sidewalk system, or building). Special conditions will apply when an overpass/underpass connects to a building as buildings may be locked during non-business hours, which may restrict the availability of any overpass/underpass for transit patrons. Overpass/underpass hours of availability should be considered early in the transitway design process.

Overpasses should be constructed with protective guardrails and fencing. In determining whether an overpass should be covered or enclosed, factors to consider include the following:

- Volume of use
- Snow removal requirements and constraints (e.g., requirements to carry snow off an overpass rather than plow it off)
- Length and climate conditions of the facility to be overpassed (e.g., wind shear over a river or freeway)

Per Guideline 4.3. Enclosures at Transitway Station, enclosed overpasses should be vented but not heated or cooled. Overpasses and underpasses should include lighting that achieves required illumination levels for the safety and comfort of station users.

If an at-grade crossing is feasible or where functional and maintenance needs do not indicate a cover or enclosure is necessary, provision of a grade-separated crossing or enhancement with a cover or enclosure may be a local betterment.



4.9. TRANSITWAY STATION SAFETY AND SECURITY

Transitway stations should be designed to promote a safe, secure, and comfortable environment for patrons. The design process should include:

- **Consideration of the application of the principles of crime prevention through environmental design**
- **Conducting a design review and hazard, threat, and vulnerability analysis**
- **Provision of surveillance and communications equipment for both deterrence and emergency response**

The lead agency should also coordinate transitway emergency response planning, including maintenance of access to transitway stations.

More information on the design and function of safety and security elements is included in the Station and Support Facility Design Guidelines User Guide.

Important elements of safety for consideration at stations include:

- The use of slip-resistant materials to account for rainy or snowy conditions
- The use of tactile warning strips along the platform's boarding edge

The principles of crime prevention through environmental design include natural surveillance (transparent design, lighting and location near positive activities), natural access control (design of entry points and flow), natural territorial reinforcement (site and landscape design), and maintenance.

During the station design process, an evaluation should be conducted to identify any elements which might inadvertently compromise the overall safety and security of the station area. Consistent with the requirements of both FTA and FRA, the evaluation should be completed by the transit operator and should include a detailed risk assessment to pinpoint the possibility of hazards and potential areas of vulnerability within the station. The methodology should identify potential hazards related to persons (employees, passengers, pedestrians, and members of the general public), trains, buses, equipment, autos, and first responder vehicles.

Station surveillance and communications equipment should include public address systems, closed circuit television, and emergency telephones. Public address systems include both speakers and signs able to convey information to persons with disabilities in compliance with ADA requirements. Closed circuit television cameras should record activity on platforms and at ticket vending machines. Emergency telephones should be provided on or near platforms and near elevators on every level of structured parking for communication with the central operations center and emergency services. Public telephones should not be provided at stations.

Emergency response coordination should be established and maintained by the lead agency using a documented plan developed with the concurrence of all agencies with jurisdiction over facilities adjacent to or connecting with transitway stations.



4.10. TRANSITWAY SUPPORT FACILITIES

The need for transitway support facilities should be identified during planning and design to ensure that adequate facilities are provided. Support facilities should address daily vehicle storage and cleaning, major vehicle maintenance, central system control, and/or runningway maintenance. Exterior materials should be selected based on attractiveness, durability, and low-maintenance needs. Interior material selection should focus on durability and low-maintenance needs. Acoustics should be carefully considered and designed to ensure the facility is buffered from surrounding, non-industrial land uses including residential and commercial areas.

The size and functions of transitway support facilities will be determined by the specific program identified for each support facility. Other elements of transitway runningways, including power substations and traffic signals, are discussed in the Chapter 5. Runningway Guidelines.

4.11. LOCAL BETTERMENTS

Transitway station and support facility enhancements beyond the base elements described will likely be considered local betterments that require a local commitment of funding for capital, operations, and maintenance. Local betterments may be included in the transitway project when the enhancement is consistent with and complements the station or support facility's community context, adds to passenger comfort and/or interest, and funding of its added costs, including, construction/installation, operation, maintenance, repair, and refurbishment/replacement, has been negotiated and implemented through an interagency agreement.

The base elements described in the Transitway Guidelines are intended to meet the basic functional and aesthetic needs of transit users in a regionally consistent manner so that users know what to expect wherever they are travelling in the region. The Transitway Guidelines provide flexibility for additional station elements to meet unique community or corridor needs. The funding of these elements is subject to negotiation with the funding agencies.

Local betterments are improvements to typical transitway designs that a local community desires which go beyond the necessary functions of the transitway facility and typical level of amenities provided at transitway stations and add significant capital, operating, and/or maintenance cost. Examples of local betterments may include public restrooms at stations and park-and-rides; enhanced landscaping, streetscape, or public art; enhanced wayfinding to business or other attractions outside the station area; grade-separated bicycle/pedestrian crossings where an at-grade crossing is feasible; or enhanced components, materials, and/or finishes at stations.

The desire for these kinds of improvements, whether requested by local communities or required by local zoning and design requirements, should be acknowledged by the lead organization and reflected early in the station design process. Early coordination should include a local commitment to fund the added cost of design, construction, ongoing maintenance and repair, and periodic refurbishment and/or replacement of the betterment. Cost participation for betterments should be negotiated during



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the design process and implemented through interagency agreement. Early coordination with local land authorities regarding station siting and design issues is very important.