Service Design & Amenity Guidelines

UPDATED SEPTEMBER 2022

INTRODUCTION

The background to the formation of this document is that the “RTA in 2000 Committee” provided a final report recommending that the Greater Dayton Regional Transit Authority (RTA) "utilize specific quantifiable policy criteria for justifying both expansion and elimination of service." This recommendation was consistent with the RTA Board of Trustees resolution that the RTA adopt and implement uniform standards governing the design, evaluation, and adjustment of transit service. In June 1992, new service standards were implemented. Service standards are an important part of the RTA's policy structure and provide a guide to help balance the social benefits and equity of transit coverage against fiscal constraints.

RTA has in place Board of Trustees approved policies, and Chief Executive Officer approved monitoring procedures to ensure compliance with Title VI regulations which prohibits discrimination based on color, race or national origin and consider environmental justice issues involving low-income populations. Pertinent service standards and amenity guidelines are to be reviewed and updated as necessary to review past performance, recent trends, and reflect current Board of Trustees policy and direction.

The creation of the Service Design & Amenity Guidelines (“the manual”) is to provide a template for the RTA on route, schedule, and amenity design standards. These guideless align with related RTA policies and procedures.

This manual is comprised of two sections:

- **Section 1 – Service Design**
- **Section 2 – Amenities**
- **Section 3 – Conclusion**

This template provides a basic guideline of the types of services RTA provides as well as how the service will be delivered. The manual also provides guidelines on how to base decisions regarding the development of new service, the elimination or modification of current service, and in some cases to justify no modification where a request has been made to do so. The manual also serves as a template to measure fixed route operating performance.

SECTION 1: SERVICE DESIGN

1.1 ROUTE TYPES

There are five route types in the RTA system that may be operating at any one time:

- Local – Local routes make all stops and operate between ridership generators within the RTA service area. Local routes mainly serve the City of Dayton jurisdiction.

- Suburban – Suburban routes operate between ridership generators within the RTA service area. Suburban routes mainly serve suburban communities and townships.

- Crosstown – Crosstown routes operate between various jurisdictions and do not travel to or through the City of Dayton Central Business District (CBD).

- Express – Express routes operates a faster, line-haul service between two major passenger generators. This route type generally travels via a major Interstate or State Route and serves a park & ride facility.

- Feeder – Any route that circulates or "orbits" among a variety of neighboring jurisdictions or points of interest and connects to other routes or hubs for transfer opportunities. Feeder routes typically operate with a smaller vehicle.

1.2 FREQUENCY OF SERVICE (HEADWAYS)

The frequency of service on a particular route (i.e. headway, or time interval between successive buses) will be based on the existing or projected ridership and passenger loads (i.e. maximum number of passengers onboard a bus). However, on some routes during certain periods of low ridership, determining frequency of service based on ridership demand may lead to very infrequent service. So infrequent, in fact, that the service is no longer viewed by passengers as a reliable or convenient means of travel. Therefore minimum standards of service frequency may be applied to assure that a reliable, attractive level of service is available throughout the day. In cases where passenger demand does not exceed vehicle capacity the following headway standards generally apply. Clock headways (e.g. service frequency intervals 10, 15, 20, 30 and 60 minutes) should be maintained where possible. This makes the service easier to understand and more predictable to a rider which is particularly important during periods when the service is infrequent. Although clock headways are recommended, current funding levels and vehicle availability make this operating structure difficult to implement on a system-wide basis.

1.3 TIME PERIODS

Time periods are defined as follows:

AM Early	4:00 am – 6:30 am
AM Peak	6:30 am – 9:00 am
Midday	9:30 am – 3:00 pm
PM Peak	3:00 pm – 6:30 pm
PM Night	6:30 pm – 2:00 am

Time periods have been developed to properly and fairly evaluate the fluctuations in ridership that occur throughout the day.

1.4 ROUTE DIRECTNESS STANDARDS

RTA bus routes shall be designed to operate as directly as possible in order to minimize passenger travel time. Routes shall operate on major arterial streets as much as possible. However, there will be situations when a route may deviate from the shortest, most direct routing. Such situations include a mid-route deviation to serve a particular trip generator or an end-of-line terminal loop. Feeder routes, which are designed to collect and distribute people in a specified service area, are exempt from this standard.

When a deviation exists or is being considered, the gain in convenience to those passengers who are boarding or alighting during the deviation must be balanced against the additional travel time for the passengers traveling through. The following standards shall be applied to all route deviations and/or terminal loops:

1. To the extent possible, two-way service shall be provided on the same street.
2. Express service shall be routed in the most direct manner possible.
3. Deviations should not exceed five minutes (one-way).
4. Mid-route loops shall be avoided.
5. End-of-line terminal loops shall not exceed 25% of a route's total length.

1.5 ROUTE VARIATIONS

While not universally recommended as a service delivery practice, it is sometimes more efficient to provide service to a certain area with one route having several branches than to operate several different routes. In addition, some bus trips on a route may not need to always travel to the end of the line due to very low ridership in that area at a particular time of day (i.e. "turnback"). However, these actions can result in a system that is much more difficult for transit passengers to understand and utilize. Therefore, to provide a user friendly service and to encourage maximum use of the system by riders, the following standards for branches and turnbacks shall apply (and only if deemed necessary):

1. No route shall have more than two (2) distinct branches
2. No route shall have more than one turnback
3. Routes with turnbacks shall have a very specific and unique destination sign to clarify that particular route trip's final endpoint.

1.6 VEHICLE LOAD FACTORS

The intent of load standards is to balance passenger comfort and safety with operating costs. These standards define maximum passenger loads by vehicle type. A load factor is defined as the number of passengers on board a vehicle divided by the number of available seats at a maximum load point. Load factors help determine the operating efficiency, safety, and passenger comfort of individual trips in the RTA system. Although vehicle manufacturers state that vehicles can allow standees up to 50% of seated capacity, RTA's suggested maximum passenger loading standards are set by vehicle type. Passenger maximum loads will be evaluated throughout the year via, Automatic Passenger Counter (APC) data reports, on-board cameras, overcrowded trips reported by customers, and overcrowded trips reported by bus operators. Upon evaluation, these standards will apply.

1.7 TRANSFERS

Extensive passenger transfers on the RTA system can discourage users. Efforts to promote one-seat rides on the RTA system will be pursued through route extensions, route leg redesign. The overall percentage of cash riders requiring a transfer shall not exceed 15%.

1.8 COMMUNITY IMPACT REVIEW

Title VI of the Civil Rights Act of 1964 requires that the RTA assure that "services are made available and are equitably distributed without regard to race, color, or national origin." Executive Order 12898 which focuses on “environmental justice” extended Title VI’s assurance to include low-income populations. RTA condemns intentional discrimination in the design and operation of its services and fares. Therefore, recognizing these populations, a service evaluation and adjustment process based on measurements of market effectiveness, on-time performance and vehicle-loading standards help to assure the equitable provision of service. In addition, service design guidelines and standards for the placement of passenger amenities provide for an equitable distribution of transit service throughout the community. Every 3 years the RTA will conduct a passenger survey on routes surveying minority and non-minority routes. The survey will provide rider demographic information on:

- Age, race, national origin, gender, income base and zip code
- English proficiency, auto availability
- Travel patterns and opinions of service provided.
- Average peak hour travel time, number of transfers required, total cost of trips, and method of payment.

The survey will compare the quality of services and amenities to minority and non-minority routes and provide results to take action on the disparities. This review will include load factors.

1.9 VEHICLE ASSIGNMENT POLICY

The RTA in compliance with applicable Federal Requirements under Title VI of the Civil Rights Act of 1964, including 49 CFR Section 21 and FTA Circular FTA C 4702.1B, has a Board of Trustees approved policy for the assignment of automated passenger counter (APC) vehicles. The policy ensures that vehicles are assigned in an equitable manner without regard to race, color or national origin.

1.10 ANNUAL SERVICE PLANNING

The RTA has developed a tentative timeline for performing tasks that assist with the overall evaluation of current and future service planning. The typical framework of the service planning efforts incorporates direct meetings with jurisdictions to discuss community needs, summarizing community needs and desires, the gathering of data for a passenger per hour study called a “Service Effectiveness Review” (SER), and balancing service needs with RTA objectives and Board direction.

RTA Annual Service Planning Cycle
Sample Guideline for Service Evaluation and Adjustment Process

Suggested Time Period	Activity
September-December	• Neighborhood needs process and review
	• Solicit jurisdiction requests
	• Review August service adjustments and
	revise as necessary
	• Meet with all jurisdictions to identify
	upcoming road construction projects
October-November	• Review past ridership checks and on-time performance trends
November-January	• Review and report any Title VI or Environmental Justice issues.
	• Evaluation of community service requests
	• Review ridership patterns and on-time Performance of APC data collected
	• Complete the SER passenger per hour process
January-March	• Develop preliminary service suggestion package
	• Conduct public hearings for citizen review and comment – if necessary
	• Modify suggestions as needed
April	• Review service suggestion package with RTA Board Committees if major changes are proposed and modify as needed
	• Road Construction Summary Report finalized and distributed
May	• Seek RTA Board approval on any major service suggestion package (if required)
August	• Implement approved service adjustments

The factors that are reviewed during the course of the Service Evaluation and Adjustment Process are as follows:

A. Passengers per Revenue Hour
B. On Time Performance
C. Community-Based Service Needs

1.11 FACTOR A - PASSENGERS PER REVENUE HOUR

"Passengers per revenue hour" is an important measurement of a route's market effectiveness. Revenue hours are the amount of time that the bus runs while picking up passengers. A threshold has been established that targets routes with a productivity rate that falls below 75% of the respective route type average. For instance, if the average passengers per hour for the local route system is 20, then local routes that have less than 15 passengers per hour shall be subject to remedial action (15/20 = .75). Routes falling below this .75 threshold are considered "poor performers". Based on the latest RTA system-wide passenger count, minimum thresholds are established.

To facilitate the service planning process, the RTA Staff completes an internal Service Effectiveness Review (SER), after each service period in which routes are analyzed on a route segment basis from APC data collected during the year. Daily averages are reported from accepted APC survey data collected to ensure an accurate ridership count for every RTA trip. With the ridership count, passengers per revenue hour (i.e.: market effectiveness) can be calculated for each route, route type and time period. These calculations are then evaluated by using the criteria established for the SER process. Routes that are deemed "Poor Performers" are then subject to remedial action ranging from route elimination, modification, or reinvestment of more service through better frequencies new extensions, etc.

Performance of existing transit routes must be reviewed to ensure resources are appropriately distributed or re-allocated and, at the same time, customers are adequately served. As demand most generally exceeds available resources, it is important to adhere to these established standards as much as possible.

Suggested Minimum Standards - Passengers per Revenue Hour

Route Type	AM Peak	Midday	PM Peak	Night	Sat	Sat Night	Sun	Sun Night
Local	24	30	24	19	17	16	18	12
Suburban	19	23	16	13	18	15	15	12
Cross-town	12	10	13	9	12	7	10	7
Express	14	23	21	23	25	17	22	17
Feeder	9	7	7	5	5	4	7	4

1.12 Factor B – On Time Performance

To ensure transit riders have confidence that RTA service will perform reliably and in accordance with the public timetables, on-time performance standards have been established. Each route has an on-time performance standard of 90%. A vehicle is considered "on-time" when its departure is zero to 5 minutes after the scheduled time at a specified time point. A vehicle is scheduled late when it arrives 5 minutes and 1 second after the scheduled time at a specified time point. No vehicles should arrive at a scheduled time point early. Each month, a route-by-route summary report will be developed by Operations outlining on-time performance statistics.

This will include the percentage early, late, and on-time. An annual report will also be produced. Any route that is consistently not meeting the on-time performance criteria will be evaluated through staff ride checks, operator interviews, and evaluation of AVL location data. After schedule evaluations are completed, the need for remedial action such as recommending additional vehicles, schedule headway adjustment, or bus operator performance review will be determined.

1.13 Factor C - Community-Based Service Needs

The annual meetings with jurisdictions, customers and the community in the RTA service area are a critical step in the annual service evaluation process. Maintaining relevance, being considered a vital community asset, and providing essential mobility options for our region are important goals of the RTA. Service access will also be considered if an employer commits to programs such as fare subsidies, auto parking surcharges, and priority bus entry onto the employment site property. Minimum service coverage will be maintained, if at all possible, to assist with the maintenance of the public health, safety, and quality of life of our community.

1.14 Existing Route and New Service Evaluation

The service evaluation and adjustment process for evaluating existing routes and new service requests are conducting regularly. Trips are reviewed to determine if they meet standards for vehicle passengers per hour and on-time performance. Trips that are not up to standard are reviewed for remedial action. If the remedy requires an increase in vehicle hours of service, then the action enters into the comparative evaluation step of the process.

1.15 Route Evaluation Process

RTA routes are reviewed annually to determine if they meet RTA standards for market effectiveness (i.e.: passengers per platform hour), on-time performance, and/or community-based service needs. In order to perform the annual review, all RTA routes and stops are surveyed with APC vehicles throughout the year to obtain multiple trip samples. Data is also collected, as required by the Federal Transit Administration (FTA) under the National Transit Database requirements. Through this effort, RTA staff surveys trips, collecting in-person information on ridership and on-time performance. Information from these surveys is compared to APC data and is reported to the FTA

At a minimum, all stops on trips within the RTA system will be evaluated each year. Existing services are divided into categories based on route type, time of day, and day of week. Existing services are ranked in descending order on the basis of passenger boarding per platform hour. This ranking is then compared to the minimum standard for each route type by time period and day of week. Any service that falls below the minimum standard which is 75% of average is considered a poor performer with respect to effectiveness. "Poor performers" will be reviewed to determine whether or not it is reasonable to expect a significant increase in patronage within the next year. The review could include an assessment of promotional opportunities, route changes, or schedule adjustments to increase patronage. In addition, remedial action, such as a reduction in vehicle hours or a change to an alternative service type will be considered.

1.16 New or Modified Service Requests

Requests for new or modified services are generated by RTA customers, RTA Staff, local jurisdictions, area employers, and the public in general. Staff-originated proposals can be generated based on observations and ongoing analysis of the system, through market research, input from RTA bus operators, input from RTA Customer Service, regional planning efforts, and requests received from individuals or groups. Generally, major new service proposals are planned for an August implementation, but this is not a requirement.

The Planning and Service Development Department will keep a log of requests, research each, follow-up with the requesting individual or entity, and address the requests promptly. Requests for new services, extended periods of operation, and frequency improvements are evaluated with respect to the design guidelines. Only proposals that are consistent with RTA's service design guidelines are further considered. The proposals are also evaluated in terms of market effectiveness. Those proposals that fall below the minimum standards are eliminated from further consideration, unless the request meets the following:

- The service request can be accommodated without adding additional operating expenses.
- Other RTA services can be reduced to help reallocate hours to accommodate the specific request without increasing expenses.
- The service will provide a critical community service need such as to medical facilities or vital social service agencies.

1.17 COMPARATIVE EVALUATION PROCESS

The comparative evaluation is used to determine how well existing services meet Board objectives, and to evaluate the desirability and economic feasibility of proposed new services. It provides a consistent process for comparing the performance of different services.

If no change in poorly-performing existing services can be identified that would result in satisfactory performance, then the service enters the comparative evaluation step of the process. In addition, new service requests which are determined to exceed the minimum effectiveness standards also enter the comparative evaluation step of the process.

In the comparative evaluation, poorly-performing services may be recommended for cancellation in order to reallocate their hours to non-poorly-performing lines which fail to meet the maximum vehicle loading or on-time performance standards, and/or to new services which are projected to be more effective.

A systematic assessment of community factors is undertaken for the poorly-performing services, any otherwise substandard service, and any proposed new services. The assessment includes rider characteristics, a discussion of transit dependency, attitudinal and awareness levels, political issues, social benefits and consideration of the census tract data. This information is then combined with information on effectiveness (the degree to which a particular service is able to attract riders) to rank each service or proposal in order of merit. After routes with substandard vehicle loadings (i.e. overcrowding) and on-time performance have been brought up to standard, new services may be recommended for implementation subject to operating revenue availability, starting with the highest ranked services and proceeding down the list until the available vehicle hours have been exhausted.

If a proposed new service or expansion in service is ranked above an existing poorly-performing service, then the latter may be recommended for elimination. In the event that it is practical to expand the overall level of service, new services may be implemented even if poorly-performing services are not eliminated. Regardless, major service adjustments, typically considered as changing a route alignment or hours by 25% or deemed to have a significant community impact, must go through a public hearing process.

2 AMENITIES

2.1 INTRODUCTION

The Greater Dayton Regional Transit Authority (RTA) recognizes the importance of customer amenities in providing comfortable and quality service to system users as well as attracting new riders. This program will place shelters, benches, trash receptacles, schedule holders, concrete pads, bus pads and bus stop signs at bus stops. RTA will maintain an accurate inventory of all passenger amenities.

The placement of amenities will be distributed equitably across the system to ensure Title VI requirements are met. An analysis of the placement of amenities will take place at least every three years and will be implemented by mapping existing and planned amenities and facilities to evaluate equal distribution. The maps will be included as part of RTA's Title VI Program.

2.2 GUIDELINES FOR THE PLACEMENT AND DESIGN OF AMENITIES

To effectively implement the RTA Amenity Program, ridership counts and operational characteristics at bus stops will be monitored to determine which stops warrant shelters, benches, and other amenities. The Chief Executive Officer reserves the right to determine the placement of customer amenities beyond this program upon rational examination of the benefits to the community and/or RTA operations. It will be the goal of the RTA to provide amenities to the riding public wherever possible, within the Board-approved budget and operating policies of the RTA. An amenity as defined for RTA purposes is "any physical improvement made to a bus stop or transit facility that contributes to a rider's comfort, access and/or safety while either waiting to board, boarding or alighting any RTA bus."

This section summarizes the recommended guidelines for amenity (such as a bus stop sign, shelter, trash can, bench, etc.) placement and design in the Greater Dayton Regional Transit Authority (RTA) Service Area. The guidelines are intended to provide RTA and its stakeholders physical design specifications that are recommended to be integrated with local comprehensive plan policies, land use ordinances, pedestrian plans, and street design guidelines.

These guidelines should be referred to when planning access improvements to transit facilities. Developers or builders who are interested in designing transit friendly projects may also make use of these design guidelines. The general public may find these guidelines useful in understanding the current practices for the placement of transit amenities.

These guidelines, developed by RTA take into consideration the operational needs, the requirements of the Americans with Disabilities Act (ADA), other federal and state accessibility mandates, and public safety. The purpose of these guidelines is to:

- Promote consistency in bus stop placement and design;
- Encourage developers to design clean and attractive bus stops that meet the operational requirements of our system;
- Encourage members of the community to use public transit through the provision of safe, comfortable, convenient, and consistent bus stops.

To the extent any of a portion of these guidelines is inconsistent with the ADA or any other federal, state, or local laws or regulations, the applicable law or regulation shall control. Developers, design professionals, engineers, contractors, and other persons who utilize these guidelines shall be responsible for complying with all applicable laws.

It is RTA's intent to establish consistent and systematic guidelines and procedures for the review of proposed amenity and amenity revisions. These guidelines and procedures specify the process for making decisions, developing transit plans and reviewing projects that may affect transit operations. These policies and procedures ensure that the amenities receive the proper assessment and technical review before amenities are moved or constructed.

Requests for new bus stop locations, other amenities or concerns regarding existing stops may originate from any number of sources including RTA staff, bus operators, the public, developers, and stakeholders. These requests may include issues such as requests to add, move, or remove bus stops or amenities; or may be operational and/or safety issues related to the stop location. Pursuant of RTA's procedures, bus stop requests may be made directly to RTA or through an RTA stakeholder.

All amenity requests will be reviewed by RTA Planning and Service Development Department Staff. If the stakeholder receives the request, it will be forwarded to RTA staff for action. The Planning and Service Development Department will evaluate the potential impacts on customers, residents, businesses in the surrounding area as well as RTA operations. A site visit by both RTA staff and stakeholder may be scheduled at the discretion of RTA to determine whether the request is feasible.

Amenities will be placed, where feasible and within RTA's annual operating and capital budget, according to the following suggested criteria:

Bus Signage: Each bus stop will be clearly marked with a bus stop sign. Most signs display the route number(s) and name of route(s), which serve that bus stop.

Concrete Pads: Bus stops which have boardings of (20) or more passengers per day can be provided with a concrete pad.

Benches: Bus stops which have boardings of (20) or more passengers per day can be provided with a bench. Benches will only be placed on existing concrete pads or in conjunction with the installation of a new pad.

Shelters: Bus stops that have boardings of (40) or more passengers per day can be provided an open shelter. If an enclosed shelter is desired, the request must be submitted by a political jurisdiction through the Community Grants Program.

Trash Receptacles: Bus stops that have a RTA shelter will be provided with a trash receptacle. At bus stops without a shelter, a trash receptacle will be installed if a request has been made, the bus stop has boardings of (20) or more passengers per day and, the jurisdiction, business, or property owner agrees to empty the receptacle weekly. RTA Planning and Service Development Department will document new agreements for emptying trash receptacles.

Bus Pads: New layover locations will be inspected for any necessary concrete bus support, dependent upon the conditions and layout of the roadbed, which it will operate.

Schedule Information: Bus stops where it is deemed necessary to provide clearer scheduling information, may be eligible for a schedule holder, system map, or digital sign equipment

Lighting: Bus stops that do not provide adequate lighting will be programmed for a solar light at locations where physically possible to place.

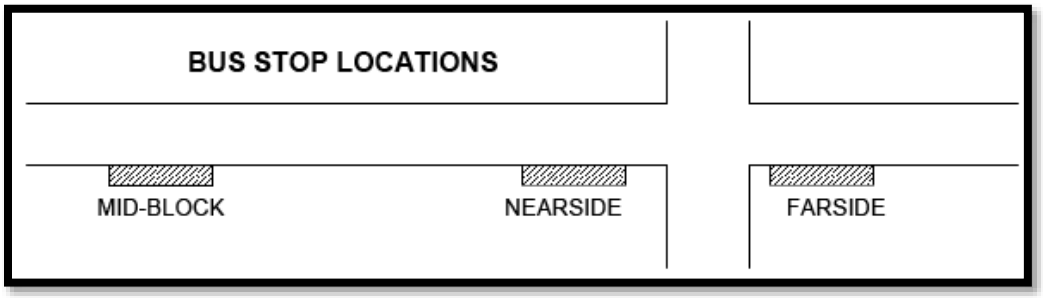
Park-n-Rides: RTA will seek locations along RTA routes where RTA customers can park their automobiles and conveniently board a bus.

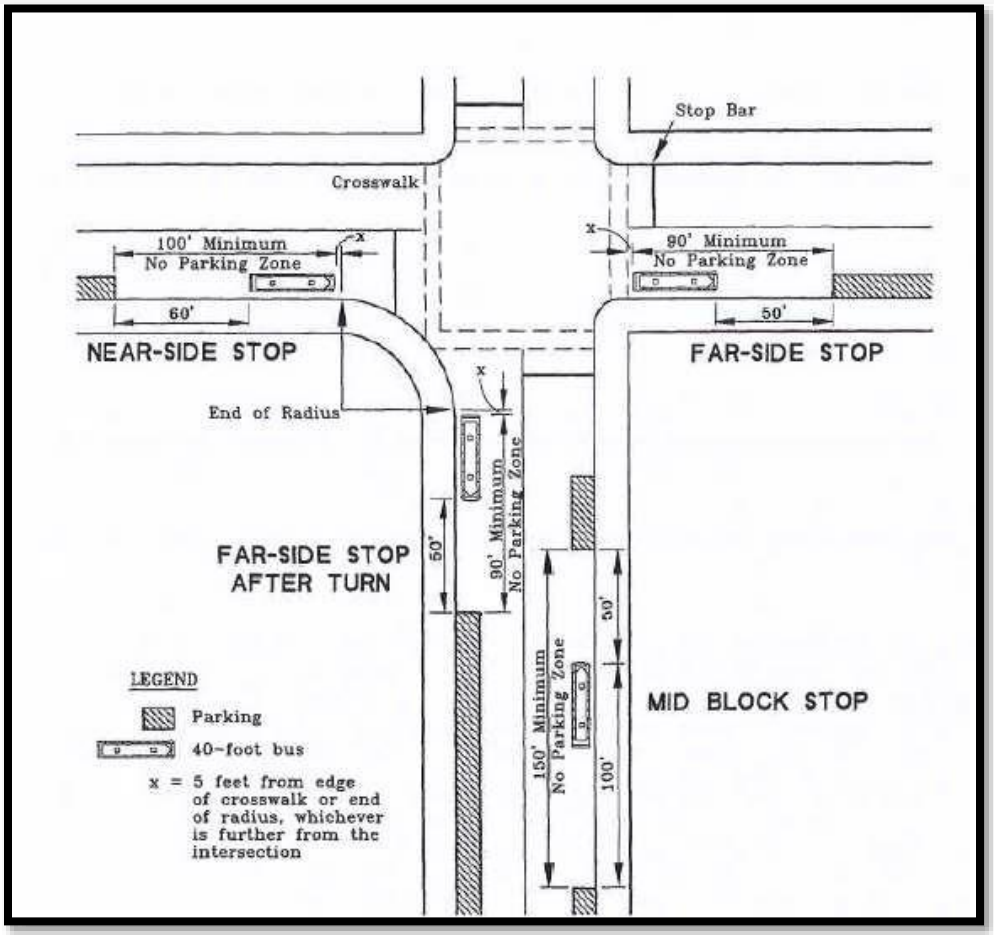
Special Considerations: In placing or relocating customer amenities, the following will also be given consideration: traffic patterns affecting vehicle operations and/or public safety, the location of other near-by amenities, the effect on cost of maintaining amenities, RTA identity in rural areas, the span of time between buses (frequency of service), and local ordinances or regulations governing the location and placement of amenities. Special consideration for additional amenities will be given to bus stops located near senior housing, senior centers, independent/assisted living centers, hospitals or other senior/health-related facilities. New transit-friendly developments where ridership is expected but not as yet determined will also receive the same consideration.

Bus Stop Placement

Bus stops should be placed in an adequate location with length to allow the coach to clear crosswalks and not obstruct traffic. An excerpt from the Transit Cooperative Research Program (TCRP) Report 19, Chapter 3 Street-side Factors denotes several types of placements and proper distances for each. In the case of each of the three primary placements "No Parking Zones" should be established with a minimum required length as follows; far-side 90', nearside 100' and mid-block of 150'.

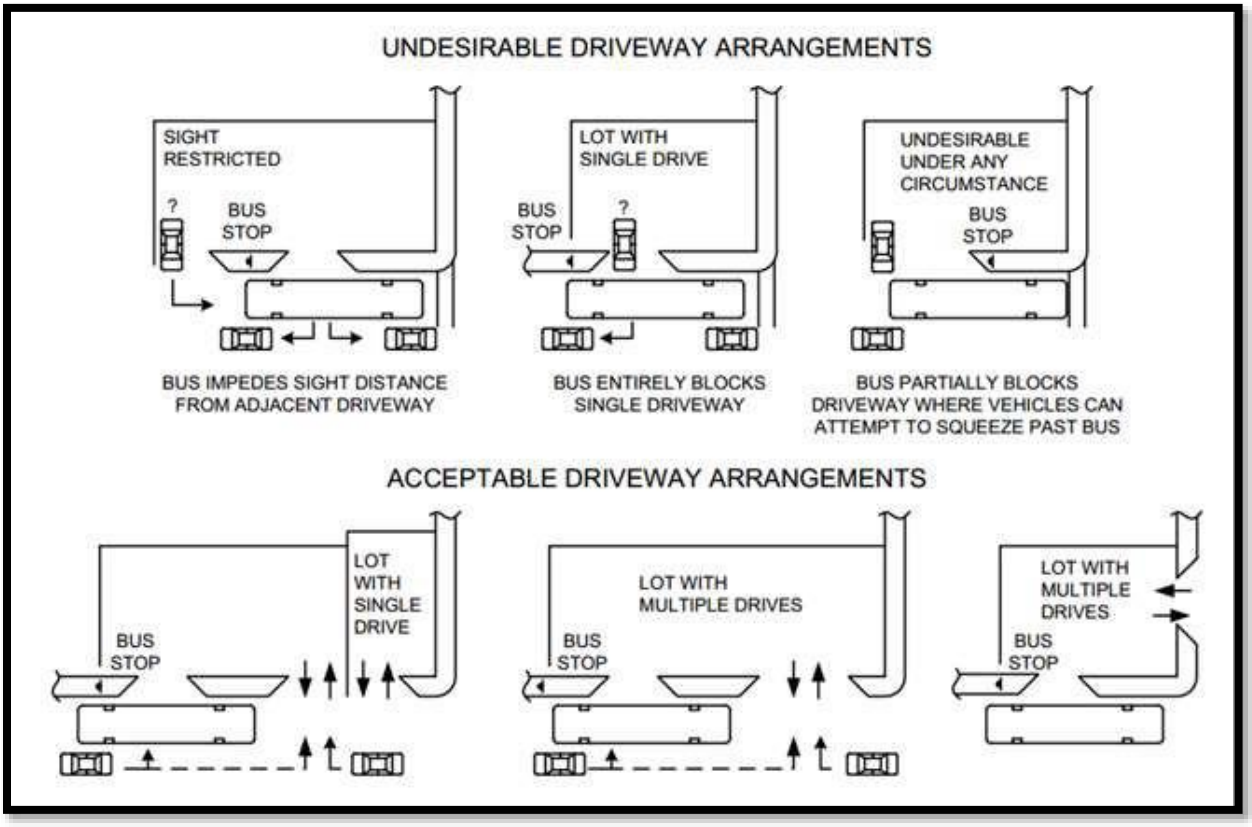
Many of the current bus stops in the system have been placed near-side. Whenever possible it is preferred that bus stops be located on the far side of a street intersection to reduce the space required for the bus stop and to minimize conflicts between buses re-entering the traffic stream and vehicles making right turns onto cross streets. The Planning and Service Development Department is responsible for identifying the proper placement (near, far side or mid) of any new bus stop. Any bus stop that is being replaced or relocated must also be brought to the attention of the Planning and Service Development Department for proper placement.





Location Related to Intersection	Advantages	Disadvantages	Where Recommended
Far-side	• Minimizes conflicts between right turning vehicles and buses • Provides additional right turn capacity by making curb lane available for traffic • Minimizes sight distance problems on approaches to intersection • Encourages pedestrians to cross behind the bus • Creates shorter deceleration distances for buses • Results in bus drivers taking advantage of gaps in traffic flow created at traffic signals	• May result in intersections being blocked during peak periods by parked buses • May obscure sight distance for crossing vehicles • May increase sight distance problems for pedestrians • Can cause a bus to stop far-side after stopping for a red light • May increase number of rear-end accidents since drivers do not expect buses to stop again after a red light • Could result in traffic queued into intersection	• There is a high volume of turns • Route alignment requires left turn • Complex intersections with multi-phase signals or dual turn lanes • Traffic is heavier on the near-side • Existing pedestrian conditions are better on far-side • Traffic conditions and signals may cause delays if near-side • Intersections have transit signal priority treatments
Near-side	• Minimizes interference when traffic is heavy on the far side of the intersection • Allows passengers to access buses closest to the crosswalk • Results in the width of the intersection being available for the driver to pull away from the curb • Eliminates double stopping • Allows passengers to board and alight while the bus is stopped at a red light • Provides driver with opportunity to look for oncoming traffic	• Increases conflicts with right-turning vehicles • May result in stopped buses obscuring curbside traffic control devices and crossing pedestrians • May cause sight distance to be obscured for cross vehicles stopped to the right of the bus • May block the through lane during peak period with queuing buses • Increases sight distance problems for crossing pedestrians	• Traffic is heavier on the far-side • Existing pedestrian conditions are better than on the far-side • Pedestrian movements are safer on near-side • Bus route continues straight through the intersection
Mid-block	• Minimizes sight distance problems for vehicles and pedestrians • May result in passenger waiting areas experiencing less pedestrian congestion	• Requires additional distance for no-parking restrictions • Encourages jaywalking • Increase walking distance for patrons crossing intersections	• When the route alignment requires a right turn and curb radius is short • Problematic traffic conditions at the intersection • Passenger traffic generator is located mid-block • Compatible with corridor or district plan

If a bus stop must be placed near a driveway, it is best to place it on the farside of the driveway where it will not impede with entering and exiting traffic. If blocking a driveway is unavoidable, special design considerations shall be given in order to prevent vehicles from attempting to squeeze by the bus in a situation with reduced sight distance. When there are two driveways to a parcel on the same street, it is better to block the upstream driveway forcing vehicles to turn behind the bus to access the driveway.



Bus Stop Spacing

Spacing of a bus stop should be a minimum distance of 1/10 of a mile, but a preferred distance between bus stops is 2/10 of a mile or a separation of 2 city blocks (average 1056 feet). A separation of ¼ mile should be the standard in a suburban or rural area. The spacing of bus stops is in the intent of having 4-5 bus stops per route mile in local business service and 2-3 bus stops per route mile in much less dense areas of ridership. Exceptions may be warranted when major collection points exist such as medical, disability, senior citizens / youth facilities or medium / large density residential complexes. Another factor may be bus stops located on both sides of a major intersection that has a distance too great for timely transition.

In addition, it is agreed with the City of Dayton that bus stops will not be placed in within a two-block radius of Wright Stop Plaza to promote the use of Wright Stop Plaza as a major collection point and minimize congestion of bus traffic within the main intersections of the central business district. To evaluate a new route and build ridership, placement of bus stops may initially depart from the above standards.

Bus Stop Design

The physical location of any bus stop, generally sized for a 40' bus, will be primarily determined by the following standards: maximizing safety, operational efficiency, and minimizing impacts to adjacent property. Maintaining adequate separation between driveways/intersections and bus stops, pull-outs and bulb-outs can increase the safety and efficiency of both the roadway and transit service. Coordination of any new stop location or a request to relocate a bus stop needs to be addressed with RTA for an internal assessment of bus stop requests.

Bus Stop Signage

Bus stop signs should be located a minimum of 2' and generally no further than 4' from the curb as to not protrude into traffic. This will allow a safety zone away from traffic designating where to stand and remain visible to an approaching bus operator. Acceptable mounting can be accomplished by application to a free-standing preferred square channel (minimum of u-channel) metal standard, existing utility pole, or on a shelter mounted bracket.

The sign is preferred to be visible from both sides to assist those with physical limitations having to encounter further difficulty of accessing printed information. The sign will have a minimum clearance of 7', but have a preferred height less than 9'. This will allow an adequate view of design elements for route designations, real-time text instructions, and contact information. This height may also tend to deter vandalism. The bus stop sign should in no way detract from the visibility of any regulatory sign and should have prior approval when placed in conjunction with any regulatory sign. A bus stop sign should not be placed in conjunction with a regulatory sign (such as a stop or yield sign).

The standard signs with appropriate dimensions, branded in 2010 and modified in 2015, are set here in example. Each bus stop will have a Marquee style sign displaying the RTA logo, website address and general phone number. In addition to the Marquee sign there will be placed a route numeral sign (small or large) with a comprehensive list of all routes served by the bus stop, an individual bus stop identification number with "Real-time" information text instructions, and a message requesting customers "Please No Smoking". The small numeral signs will be used for listing 1 - 6 routes and the large numeral signs used for listing 7 – 12 routes.

Marquee

Small

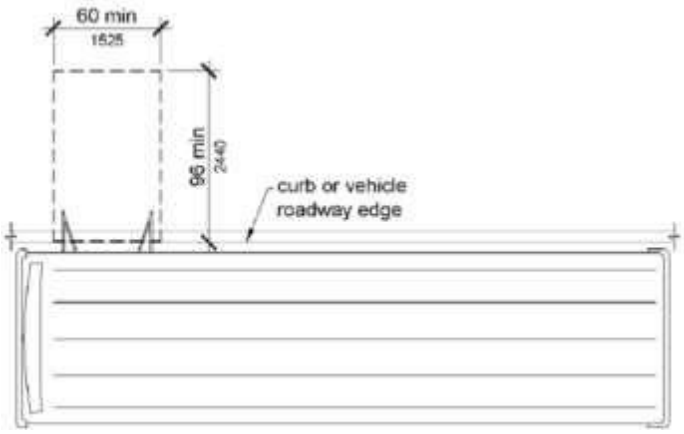
Large

Passenger Boarding and Alighting Pad (landing pads)

A level and paved waiting areas with adequate space provide greater access to transit service for wheelchair users, the elderly, and other encumbered riders such as parents with strollers. Establishing a bus stop with just a post and sign does not automatically trigger the need for a Passenger Boarding and Alighting Pad unless other improvements such as shelters are constructed. However, to further increase access to transit services to all, it is recommended that the landing pads should be installed to the extent possible. Stops that cannot be rendered accessible obligates the transit provider to offer ADA complementary paratransit for customers who could otherwise use the accessible bus stop.

Per the Department of Transportation (DOT) 2006 ADA Standards for Transportation Facilities, where landing pads are provided they must be:

- Firm and stable. RTA has a preference of using concrete, but other durable materials may be accepted by the local jurisdiction and permissible with section 302 of the DOT ADA Standards
- Clear of obstructions, and be at least 96 inches (8 feet) perpendicular from the curb/roadway and at least 60 inches (5 feet) parallel to the roadway (see exhibit 4). A landing area of this size or larger is necessary for deployment of the transit vehicle's ramp or lift and for a customer using a wheelchair to maneuver on and off the ramp or lift. It is permissible that where a shelter is provided the bus pad may extend into the clear floor space of the shelter. However, it is crucial that the landing pad is not blocked by any obstacles such as newspaper stands, trash receptacles, bike racks, or flower pots, etc.
- It shall provide connection to streets, sidewalks, or pedestrian paths by an accessible route. Any local requirements above ADA for accessible routes must also be met.
- Sloped (parallel to the roadway, i.e. running slope) the same as the roadway, to the maximum extent practicable. Perpendicular to the roadway (cross slope), the slope of the landing area shall not be steeper than 2.08 % (1" rise over 48" run).



Specifications of the benches will be as follows; Dimensions: 72" L X 32" T X 27" D, Seating Surface will be ¼" X 1 ½" solid steel flat bar. These will be ornamental vertical straps in a straight-back style. Horizontal cross bars will be 2 3/8" O.D. steel pipe, and Bench Ends will be cast iron. The Finishing on all components will be an electro-statically top-coated Triglycidyl Isocyanurate (TGIC) polyester powder coat. Each shelter placed for public transit use shall have a bench component located within the shelter and may be of a different specification than the standard.

Benches should be placed on a firm level surface (preference of concrete) and anchored at a minimum of two points to inhibit tipping during a patron's use or unauthorized movement. A minimum setback from the curb of 32 inches to allow an acceptable access of the seat shall be maintained. The bench shall not be placed within the area of the Passenger Boarding and Alighting Pad.

Shelters

Passenger shelters for RTA sites will be designed to engineering standards approved by RTA and the local jurisdiction. This includes shelters that are transparent for passenger visibility and safety, sight distance for approaching vehicles, protection from the elements, and reasonably vandal-resistant for easy maintenance. Additional passenger amenities or service features at these stops are subject to change.

RTA standard passenger shelter designs will include a bench component. Shelters are purchased directly by RTA for any designated public bus stop with adequate public space or accomplished within a private easement requiring a passenger shelter. These shelters are the property of RTA unless designated otherwise by prior agreement. An alternate shelter design will be considered based upon approval by the jurisdiction and RTA and constructed and maintained by the proposer or their designated party.

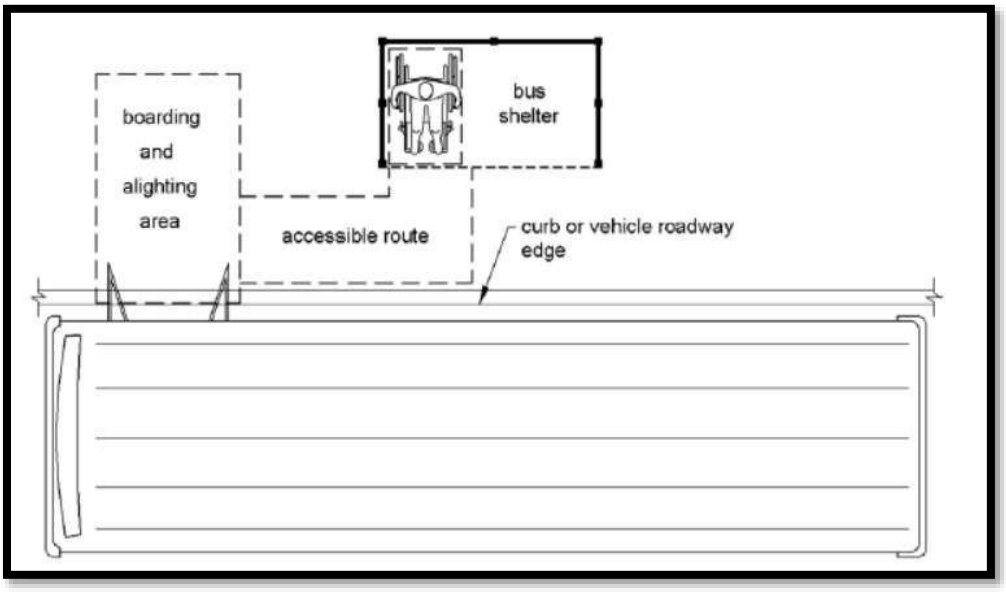
Only RTA approved shelters will be maintained by the RTA. Community Grant (projects partially or fully funded by other public or private entities) bus stop and shelters are covered by a separate agreement with a local jurisdiction or private entity. However, regardless of maintaining responsibilities, any immediate safety, vandalism or cleanliness issue must be addressed by RTA immediately and then report to the local jurisdiction or private entity as follow up. Shelter size will be appropriate to anticipated service and use. The size of the RTA shelter will be determined by RTA and the local jurisdiction.

RTA owns and maintains several different styles of shelters. They generally consist of enclosed units (partially enclosed and fully enclosed), old style cap-n-bench units (canopy with attached bench), and a newer style cap-n-bench (larger canopy with detached bench). The cap-n-bench styles by design lend themselves to allowing the passenger boarding and alighting pad to extend into them and allow accessibility to pedestrian pathways to the rear.

RTA Enclosed Shelters

RTA Caps with Benches

Pursuant to ADA requirements in section 810.3 bus stop shelters shall provide a minimum clear floor or ground space complying with 305 entirely within the shelter. Bus shelter shall be connected by an accessible route complying with 402 to a boarding and alighting area complying with 810.2 (See Exhibit 6)



Trash Receptacles

Trash receptacles can help to control litter and maintain a bus stop's cleanliness. Trash receptacles may be placed at any bus stop where service can be established by the jurisdiction, private entity, business or individual. Trash receptacles should be provided at bus stops with high levels of ridership or those that have a problem with litter due to proximity to fast food or convenient stores.

Trash receptacles at bus stop locations may be served by the jurisdiction or by private contractor or in conjunction of both should need require. Those bus stops that have a RTA shelter will be serviced by a minimum of a private contractor.

Physical location of the trash receptacle should not interfere with the accessibility of the bus stop and its amenities or adjacent sidewalks. Trash receptacles at bus stops should resemble other publicly owned and maintained trash receptacles along the corridor.

RTA owns and maintains different styles of trash receptacles. The more common types are a 40-gallon black steel, and Big Belly Solar powered trash compactor.

Each are fitted with a liner that receives the trash and can be easily removed to discard trash. Examples of the typical trash receptacles are pictured to the right.

The installation of each trash receptacle requires that the receptacle be anchored to the extent possible. In the application of concrete trash receptacles on concrete, construction adhesive can be used to avoid tipping and unauthorized movement. As bus stop improvements are made, cement receptacles should be replaced with steel or Big Belly solar compacting trash receptacles. As for the steel and Big Belly trash receptacles, they are to be mounted to a cement base by the appropriate bolts and brackets specified by the supplier.

In addition to these RTA owned trash cans, many jurisdictions have their own cans deployed at bus stop. The design of these cans is at the sole discretion of the jurisdiction. If these trash cans are located at a bus stop serviced by the RTA's private contractor, they will be cleaned in coordination with those bus stops on the appropriate day of service.

Trash cans may also be placed at a bus stop that does not have service by the jurisdiction or by RTA private contractor. The document will specify the location and require a minimum frequency of weekly service on a designated day of the week.

Concrete Bus Pads

For heavily used bus stop areas a rigid pavement design is strongly recommended due to the loads and shear forces applied to pavement surfaces during bus starting and stopping movements. The installation of concrete bus pads is discretionary of the local jurisdiction. The locations of recommended concrete pads will be influenced by bus frequency, speed and existing pavement conditions. Concrete bus pads should be installed to be the width of the curb lane and the length of the appropriate bus stop area, approximately 120 feet.

Schedule Information

At high volume bus stops (i.e. Transit Hubs and the Job Center) or at bus stops where the local jurisdiction has mandated that schedule information be placed, there will be an accommodation for the display of schedule information. Typically, there will be digital display boards depicting "Real-time" schedule information at the Transit Hubs. Where applicable, printed route schedules can be requested by the public and schedule boards will be provided in shelters that have display cases such as those in Beavercreek and the Job Center. Each individual bus stop has "text" instructions to access "Real-time" information via phone, as well as contact information to access public transit time tables. Each bus stop has been GPS located to assure accuracy of information of approaching buses. RTA adheres to ADA reasonable accommodations requests related to schedule information.

Lighting

Adequate lighting at the bus stop allows bus drivers and approaching traffic to see waiting passenger at night. Lighting also provides added security for those waiting at the bus stop. Lighting can be provided by a nearby streetlight, ambient light from adjacent businesses, lighting equipment installed within a shelter, or by a stand-alone light pole. Bus stops without shelter lighting, should be located within 50 feet of an overhead light source. Bus stop light fixtures or shelter illumination should be between 1.5 and 2.0 foot-candles. Lighting should be to a low enough level to not create a spotlight effect that makes it difficult for passengers waiting on the inside of the shelter to see outside.

Physical location of the solar lighting should not interfere with the accessibility of the bus stop and its amenities or adjacent sidewalks. RTA supports two styles of Solar lighting throughout its system. These are the shelter mount style and stand-alone, pole-mount style pictured here. Each style must be mounted in such a way to be unobstructed by trees to receive adequate sunlight for charging. Regular periodic checks should be made to assure functionality of the light and to assure no obstructions of tree growth have hindered sunlight.

Park-n-Ride Facilities

A Park-n-Ride facility is an area at or near a bus stop, where an individual may use a motor vehicle to arrive at that access point to board public transit and leave their vehicle for the duration of their trip. There are Park-n-ride facilities that support the RTA system, along with the four major Transit Hubs are directly maintained by RTA. The other locations are areas in which private ownership exists and by agreement the facilities are used for RTA customers. Each individual Park-n-Ride location has its own unique agreement. The agreement should specify parking areas to be used and any maintenance stipulations if required.

Where applicable a survey of the Park-n-Ride facilities will be made to gauge a level of use and by what counties the vehicles originate from. There is no minimum of use required as RTA does not directly maintain these facilities, but the survey may tend to highlight what counties could be promoted for additional use and increased ridership.

2.3 MAINTENANCE

Emergency Maintenance Issues

When an Emergency Maintenance Issue arises requiring maintenance of any amenity, the general protocol will be as immediate as possible, report to the scene of the incident, as thoroughly as possible document the existing conditions including photos (strongly recommended), remove any safety issue for the prevention of injury to RTA customers and citizens in general (i.e. sharp objects, tripping hazards, obstruction to paths of travel including roadways and sidewalks, etc.). Notify the Planning and Service Development Department.

The Planning and Service Development Department representative will notify the jurisdiction of the maintenance issue. The jurisdictional leader and the Planning and Service Development Department representative will then determine the best course of action to be taken to repair, replace or remove the amenity. A work request ticket will be entered in the RTA system for tracking purposes by the Planning and Service Development Department.

Non-Emergency Maintenance Issues

When a non-emergency issue arises requiring maintenance of any amenity, the general protocol will be to notify the Planning and Service Development Department. The Planning and Service Development Department representative will notify the jurisdiction of the maintenance issue. A work request ticket will be entered in the RTA system for tracking purposes by the Planning and Service Development Department representative. The work request will be provided to the external entity or Maintenance Department for scheduling of the required maintenance. For internal maintenance items, a reasonable level of inventory must be maintained to address potential maintenance issues (i.e. sign, standards, temporary bus signs, trash receptacles, benches, shelters, solar lighting – batteries or whole units, etc.).

For all pre-planned amenity work, such as service or mid-pick changes, work orders must be sent at a minimum two (2) weeks in advance of when the work is to be completed. It is most important that the RTA staff be on guard to provide preventive maintenance of our vast transit system and report non-emergency issues in a timely manner. By continuing to seek out areas of concern, we can deliver premier service for our customers and the communities that we serve.

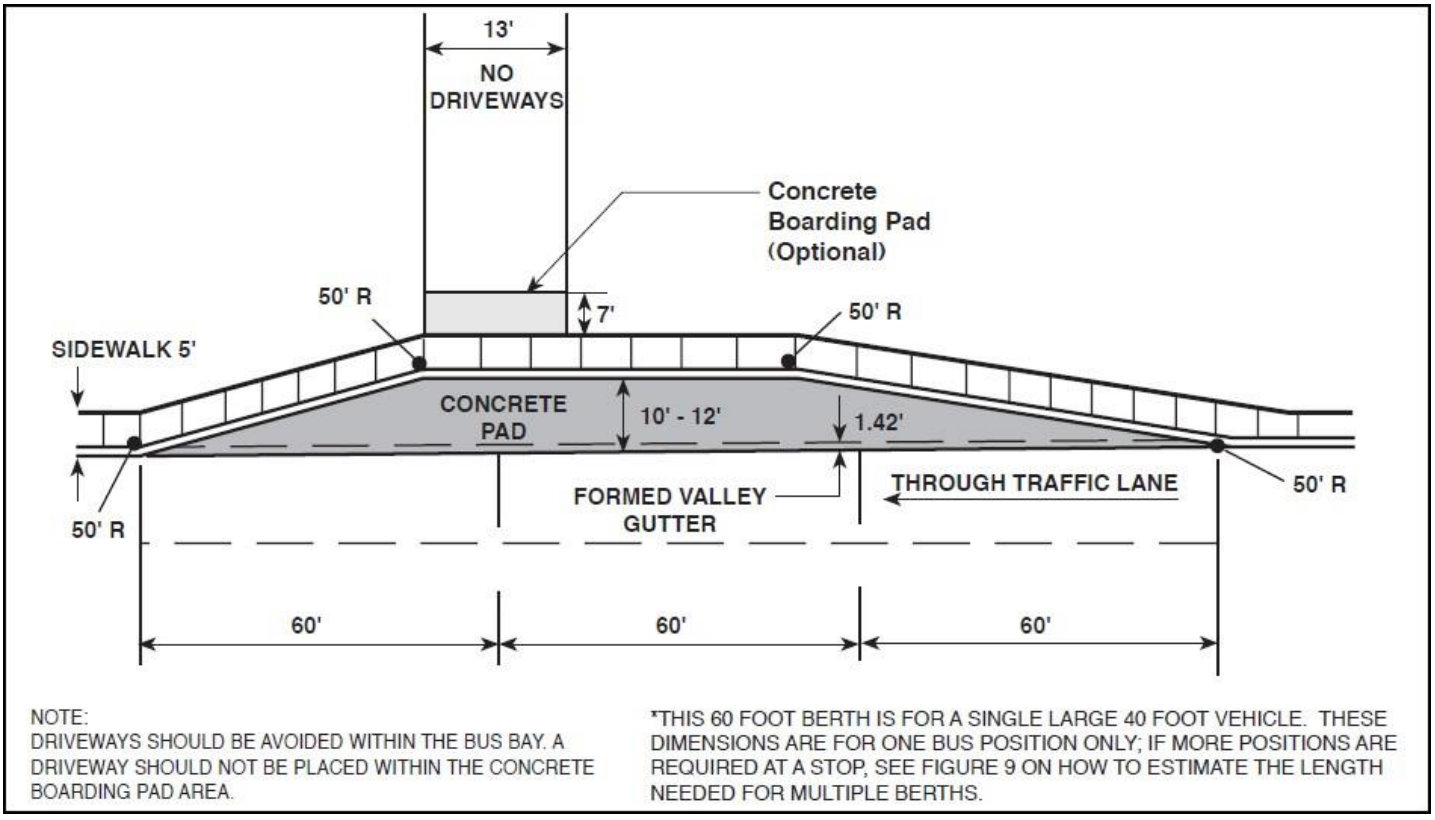
Non-emergency issues notifications can come from many other sources such as; RTA customers, jurisdictional leaders or concerned citizens. It is key for good stakeholder relations to provide valuable two-way communication with the reporting party to identify that the report was received, that a course of action and timeline has been established and that the issue was rectified. This can be accomplished efficiently with timely delivery of repairs, report of their completion by the Maintenance Department, and constant outreach from the Planning and Service Development Department to the reporting party.

Planned Maintenance by an External Entity

Jurisdictions, private contractors, developers from time to time have need to disrupt operations of a bus route, a bus stop, or pathways leading into the transit system. A road construction report is being compiled to show those effects on the RTA transit system. Advance knowledge of these disruptions in operation will allow RTA to plan for how the customer will be best served. This service will entail any notice of reroute, bus stop closures, schedule delays, or in some cases elimination of service. In all cases, the Planning and Service Development Department will remain in constant contact with the jurisdiction, contractors and / or developers.

Proper documentation of target start and completion dates, update phases of work, areas effected, and changes in modes of service will be the focus of the construction report. This information should be readily available to the Customer and Business Development, Transportation and Maintenance Departments. The Communications and Community Relations Department should alert passengers of any disruption of service. The Maintenance Department can be better prepared with required fleet. The Transportation Department can inform operators of routes and bus stops that are effected.

During discussions of road construction or other developments, RTA should address the need for bus pull-offs for roadways with speeds of 35 mph or greater. This type of bus bay design, described in the Transit Cooperative Research Program Report 19, is well suited for higher-speed, higher-volume roadways where long entrance and exit tapers should be provided so that the bus can achieve both deceleration and acceleration outside of the through-traffic lane. These bus bays are designed to provide minimal interruption to through-traffic on a busy road, and the dimensions vary with the speed limit of the roadway. While bus bays often decrease potential bus/vehicle conflicts, they can also pose great difficulty for bus operators when attempting to re-enter the traffic stream. Minimal design specification should be followed.



Unplanned Maintenance by an External Entity

When unplanned disruptions occur immediate notification should be given to the Transportation Department to allow for expedient adjustment of service. The Transportation department should then immediately inform the Maintenance and the Planning and Service Development Department so that appropriate courses of action can be taken to assign fleet needs and to alert customers of temporary changes to service.

3 CONCLUSION

This manual offers RTA staff and the general public an opportunity to review and utilize a basic template for decision-making concerning current service and evaluating new service requests. It also helps inform decision-makers who may not have a background in the transit industry about functional transit practices. Although it is not always feasible to utilize this document to the exact “letter” due to various items beyond staff control such as the economy, political desires, or community initiatives, it certainly provides an objective basis to assist with annual service planning evaluation and implementation.