TRINITY METRO

Service Standards
Draft for Review and Comment Only

August 25, 2022
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INTRODUCTION

This document is intended to outline Service Standards for service operated by Trinity Metro. Trinity Metro’s mission is to connect people to jobs and communities by providing quality public transportation to the diverse and growing population of our community. The Service Standards lay out a framework for achieving this mission; they also provide a framework for a consistent and fair evaluation of both existing and proposed services.

By constructing an evaluation framework, Trinity Metro will be able to analyze the productivity of transit services. Service changes and requests can then be made based on data collected and reviewed according to established policy measures. These service standards include the performance goals and measures set by Trinity Metro that defines where transit service is performing at inadequate, adequate, or superb levels. By comparing the performance of individual routes to appropriate service standards, Trinity Metro staff can determine if a route is performing adequately or inadequately in some dimension of the service. This document is organized into the following sections:

- Definition of Service Categories
- Service Availability
  - Bus Stop Spacing
- Distribution of Amenities Standards
  - Bench & Shelter Placement
  - Bus Stop Layout
  - Park & Ride Stations
  - Commuter Rail Stations
- Service Quality:
  - Vehicle Load Standards
  - Vehicle Assignment
  - Service Frequency
  - Service Span
  - On-time Performance
  - Security
- Service Standards Monitoring Methods
- Route Improvement Plan
- Service Change Process
  - Major Service Change Policy
- Fare Change Process
- Title VI
  - Disparate Impact Policy
  - Disproportionate Burden Policy
- Public Input Process
- Appendix A – Title VI Service Change Equity Analysis
- Appendix B – Title VI Fare Change Equity Analysis
DEFINITION OF SERVICE CATEGORIES

Trinity Metro operates fixed route services, Mobility on Demand known as ZIPZONE and two Commuter Rails, TEXRail and Trinity Railway Express. In addition, the agency operates paratransit services, vanpool services and bike sharing.

Local fixed route service is defined as bus service that runs within shared public right of way along a specified path on a specified frequency. (The frequency varies from 15 minutes to 90 minutes.) Local fixed route service can also be classified into one of six categories.

- **High Frequency service** operates with buses passing each stop along the route every fifteen minutes on weekdays during normal business hours when most people are working, travelling to medical appointments or conducting other personal business as well as shopping and recreational activities.

- **Medium Peak Frequency service** operates with buses passing each stop along the route every 30 minutes on weekdays during the morning and evening rush when many people are commuting to work as well as travelling to medical appointments or conducting other personal business, shopping and recreational activities. Frequency is reduced to hourly during the middle of the workday and outside of normal business hours when fewer passengers are travelling.

- **Medium Frequency service** operates with buses passing each stop along the route every thirty minutes on weekdays during normal business hours when most people are working, travelling to medical appointments or conducting other personal business as well as shopping and recreational activities. Frequency may be reduced to hourly outside of normal business hours.

- **Low Frequency service** operates with buses passing each stop along the route every sixty minutes on weekdays.

- **Specialty Routes** serve unique geographical needs and are not classified by their frequency. These routes usually provide access to niche/specific markets such as universities, entertainment districts, business parks, airports, central business district or other attractions and typically contain variable and flexible service based on a unique situation.

- **Express service** typically attracts riders who prefer the modal transit option to a daily commute by automobile. It provides service with a limited number of stops and generally operates on freeways. Many only operate two or three trips at uneven intervals.

**Mobility on Demand** service branded ZIPZONE is designed to transport passengers to and from a point or station along a fixed route alignment, providing first and last mile service to passengers from an origin or destination beyond the ¼ mile walking distance of service within the service area using shared rides and smaller vehicles.

Trinity Metro jointly operates commuter rail service with Dallas Area Rapid Transit (DART) under
contract with Herzog. This service is branded as Trinity Railway Express (TRE).

Trinity Metro also operates TEXRail, a 27 mile commuter rail line that extends from downtown Fort Worth, across northeast Tarrant County, through North Richland Hills and Grapevine terminating at DFW International Airport’s Terminal B.

Federal law requires transit agencies to provide paratransit service within ¾ mile of a bus route in recognition of the difficulty that disabled people face in comparison to the average able-bodied person who could walk ¾ mile. Trinity Metro provides paratransit service well beyond this minimum, to the boundary of the taxing authority. Branded ACCESS, the agency provides wheelchair accessible vans door-to-door on pre-scheduled appointments.

Vanpool service is provided throughout the North Texas region for regular commute trips starting and/or ending in the Dallas/Fort Worth metropolitan area. Trinity Metro provides the vans, insurance, maintenance and fuel and the group riding together designate a driver and alternate driver among themselves.

Bike share provides bicycles available for check out from kiosks/stations situated next to and in the areas adjacent to train stations and transfer centers. This enables connections a little further than the traditional walkshed as well as quicker travel between points within a larger urban center.
Service Standards

The standards for the level and quality of service is developed using the following key components:

- Service Availability & Distribution of Transit Amenities
  - Route Coverage
  - Bus Stop & Distribution of Transit Amenities Standards
- Service Quality
  - Vehicle load factors
  - Vehicle Assignment
  - Service Frequency

The following details how these components are put to use.

SERVICE AVAILABILITY

Adequate service availability is determined by access to bus stops and rail stations. The most common way of measuring availability is to determine the population living within ¼ mile of bus stops, ½ mile of rail stations, or within a ZIPZONE, as this represents customers who would likely walk to access transit. This is a difficult calculation to make accurately and various estimation methods could be used. Trinity Metro subscribes to REMIX, an online transit planning tool which provides this basic function. Based on analysis in REMIX, at present, 529,591 people out of a service area population of 987,525 resides within those parameters, or 53.6%. The goal of the agency is to add service to increase these percentages as funding allows and to adjust service to prevent declines if populations should shift without increased funding.

Allocation of resources involves a choice between geographic coverage or service frequency. The service area could have close to 80% coverage with hourly frequency or 10% coverage with fifteen-minute frequency under the same budget. The allocation is based on analysis of transit need and population density. Corridors featuring affordable apartment units receive higher frequency while the majority of the service area, characterized by single-family homes and sparse development patterns receive only hourly service or no service at all depending on need. Mobility-on-Demand service is currently being piloted in five zones and is anticipated to become the solution for increasing coverage at a lower affordable budget.

Need is assessed through allegorical Census block group statistics including minority population, persons below poverty and persons who are less likely to drive alone such as youth aged 5 to 19, seniors aged 65 and over and persons in households without a car. An area may be determined to have people with these characteristics, but if there are only a small number of them and/or a bus would have to travel an unusually long distance to serve them, then service may not be cost-effective. Therefore, another statistic that is evaluated is population density.

Census data is useful in assessing the population density and needs of residents, but it only addresses the need at home. Jobs data from the Longitudinal Employer Household Dynamics survey is analyzed to determine where people work. Jobs per square mile is an effective allegory for transit need where there are both employees and customers traveling for goods and service.
BUS STOP SPACING

In general, bus stops should be located in the vicinity of demonstrated or potential ridership generators. A requested location that has a projection of a minimum of 5 boardings or alightings per day should be considered as a candidate for a bus stop. This is determined by considering the land use of the area and/or identifying if there are key ridership generators nearby.

To maintain an efficient flow of bus travel, spacing of bus stops is an important point to consider. In general, the land use development is the primary factor in determining the number of bus stops placed per given area. The following are general rules of thumb for spacing of bus stops:

<table>
<thead>
<tr>
<th>Environment</th>
<th>Spacing Range</th>
<th>Typical Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Core Areas of CBD’s</td>
<td>300 to 1000 feet</td>
<td>600 feet</td>
</tr>
<tr>
<td>Urban Areas</td>
<td>500 to 1200 feet</td>
<td>750 feet</td>
</tr>
<tr>
<td>Suburban Areas</td>
<td>600 to 1800 feet</td>
<td>1000 feet</td>
</tr>
</tbody>
</table>

If the route has bi-directional service, bus stops should be placed generally across the street from one another. The bus stop for the return trip should ideally be within sight of the stop where a passenger disembarks.

Far-side stops are preferred over near-side stops at signalized intersections because they allow buses to reenter traffic more easily, there is no pedestrian crossing in front of a bus, buses do not block traffic signals, and it is less likely for the rear-end of a bus to protrude onto adjacent lanes. Far-side bus stops are located immediately after an intersection, so the bus passes through the intersection before stopping. They are also preferred with the use of Transit Signal Priority.

STATION SPACING

Station spacing is important for efficient running time of the commuter rail which, as opposed to light rail technology, has longer acceleration and deceleration times. The average spacing along the TRE Commuter Rail line is 3.6 miles apart.

Initial placement of the stations was determined based upon ridership projections, site development suitability, potential for Transit Oriented Development, transit access and municipal financial participation.
The following are the existing spacing between the stations:

<table>
<thead>
<tr>
<th>Segment</th>
<th>Stations</th>
<th>Distance between Stations (in miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>T&amp;P Building to Fort Worth Central Station</td>
<td>0.75</td>
</tr>
<tr>
<td>2</td>
<td>Fort Worth Central Station to Richland Hills</td>
<td>7.10</td>
</tr>
<tr>
<td>3</td>
<td>Richland Hills to Hurst-Bell</td>
<td>3.96</td>
</tr>
<tr>
<td>4</td>
<td>Hurst-Bell to Centerport</td>
<td>6.16</td>
</tr>
<tr>
<td>5</td>
<td>Centerport to West Irving</td>
<td>2.56</td>
</tr>
<tr>
<td>6</td>
<td>West Irving to South Irving</td>
<td>3.50</td>
</tr>
<tr>
<td>7</td>
<td>South Irving to Medical/Market Center</td>
<td>6.30</td>
</tr>
<tr>
<td>8</td>
<td>Medical/Market Center to Victory</td>
<td>0.94</td>
</tr>
<tr>
<td>9</td>
<td>Victory to Union Station</td>
<td>1.35</td>
</tr>
<tr>
<td></td>
<td>Average Distance between Stations</td>
<td><strong>3.62</strong></td>
</tr>
<tr>
<td></td>
<td>Total Distance on Tracks</td>
<td><strong>32.62</strong></td>
</tr>
</tbody>
</table>

TEXRail Station spacing is largely determined by municipal financial participation as unlike TRE, a large proportion is outside the Trinity Metro service area. While all TRE stations were constructed within member cities, TEXRail participation is governed by long-term service contracts with Cities along the corridor. Grapevine and North Richland Hills currently participate.

<table>
<thead>
<tr>
<th>Segment</th>
<th>Stations</th>
<th>Distance between Stations (in miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>T&amp;P Building to Fort Worth Central Station</td>
<td>0.75</td>
</tr>
<tr>
<td>2</td>
<td>Fort Worth Central Station to North Side Station</td>
<td>3.41</td>
</tr>
<tr>
<td>3</td>
<td>North Side Station to Mercantile Center</td>
<td>3.39</td>
</tr>
<tr>
<td>4</td>
<td>Mercantile Center to Iron Horse Station</td>
<td>3.12</td>
</tr>
<tr>
<td>5</td>
<td>Iron Horse Station to Smithfield Station</td>
<td>2.65</td>
</tr>
<tr>
<td>6</td>
<td>Smithfield Station to Grapevine Main St</td>
<td>9.28</td>
</tr>
<tr>
<td>7</td>
<td>Grapevine Main St to DFW North Station</td>
<td>1.43</td>
</tr>
<tr>
<td>8</td>
<td>DFW North Station to Terminal B</td>
<td>2.14</td>
</tr>
<tr>
<td></td>
<td>Average Distance between Stations</td>
<td><strong>3.27</strong></td>
</tr>
<tr>
<td></td>
<td>Total Distance on Tracks</td>
<td><strong>26.18</strong></td>
</tr>
</tbody>
</table>

**DISTRIBUTION OF AMENITIES**

**SHELTER PLACEMENT**

Passenger shelters provide seating and protection from bad weather for customers and are particularly important to senior citizens, parents with small children, and persons with disabilities. Although shelters are a popular amenity option at bus stops, the associated costs of placement
and maintenance allows only a limited number of shelters possible throughout the service area. To identify locations and calculate a fair distribution method, a point system was established to prioritize and rank locations. Before implementing a shelter, it is assumed that all stops will be a future shelter location.

All shelter requests are ranked using the following point scoring. The qualification factors and corresponding points are listed below.

<table>
<thead>
<tr>
<th>Qualification Categories</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Daily Boardings</td>
<td>1 point for each boarding</td>
</tr>
<tr>
<td>Major activity/employment center</td>
<td>25</td>
</tr>
<tr>
<td>Hospital or Social Service Agency</td>
<td>25</td>
</tr>
<tr>
<td>Apartment complex</td>
<td>20</td>
</tr>
<tr>
<td>Elected Official Request</td>
<td>20</td>
</tr>
<tr>
<td>Schools</td>
<td>20</td>
</tr>
<tr>
<td>Minor Activity Center</td>
<td>15</td>
</tr>
<tr>
<td>Transfer Point</td>
<td>15</td>
</tr>
<tr>
<td>Joint participation (public/private)</td>
<td>15</td>
</tr>
<tr>
<td>Customer Request</td>
<td>1 per request</td>
</tr>
<tr>
<td>Limited Headway (midday greater than 55 minutes)</td>
<td>10</td>
</tr>
<tr>
<td>Property Owner Requests</td>
<td>8</td>
</tr>
</tbody>
</table>

As budget is allocated to purchase additional shelters and shelter maintenance, all bus stops are scored according to the criteria above. For example, if the budget for the upcoming fiscal year allows 20 new shelters, then the top 20 ranked bus stops are recommended for installation and submitted for further evaluation.

A second phase visits each candidate bus stop location and evaluates for feasibility of installation. The presence of street trees, utility poles, retaining walls, slopes or other physical features may inhibit the installation of a shelter or be cost-prohibitive. The location of the proposed shelter in relation to driveways and intersections may also impair sight-distance for motorists. If a candidate bus stop location must be eliminated for any reason, the next highest ranking bus stop on the list is evaluated. This process continues until there are 20 feasible candidate locations.

The third phase is engineering. The list of 20 locations is then submitted to an engineering firm for survey and design. The engineering firm may discover unseen feasibility issues such as the presence of underground utilities below the site or the location of private property lines. If a candidate site must be eliminated during the engineering phase, the next top ranking bus stop from the list is added. The final designs for 20 feasible shelter locations are then drawn in a Computer Aided Drafting (CAD) program, printed and submitted to the City and in some cases Texas Department of Transportation (TXDOT) for permitting.

The fourth phase is permitting. The City and TXDOT review the engineer’s drawings and either approve or deny a building/construction permit. The engineer will work with the authorities to remedy any deficiencies in the design to obtain the permit. If a candidate bus stop must be eliminated during the permitting phase, the next top ranking bus stop is selected from the ranked list. The final 20 permitted shelter locations are then packaged and bids are solicited for construction.
The fifth phase is construction and assembly. A local concrete contractor is selected to construct the foundation and any additional infrastructure necessary for an ADA accessible shelter. Very often, the sidewalks, curbs, ramps and even the street itself may require modification in addition to the shelter foundation. Once the concrete work is complete, it is inspected by a Registered Accessibility Specialist and any deficiencies are corrected by the contractor. Once all 20 sites are approved as completed, the shelter vendor will assemble and erect the shelters.

**BENCH PLACEMENT**

Trinity Metro provides benches for the added convenience of its passengers. Benches are recommended at frequently used stops and often in locations where shelter installation was not feasible. An overall goal is to have benches placed strategically to allow equal availability throughout the system.

The selection of candidate bench locations uses the same ranked criteria but is not as involved as shelter locations because construction may not be required. As budget is allocated to the purchase of benches, the top ranked bus stops that do not have a shelter and are not being evaluated as a candidate shelter site are recommended for bench placement. For example, if the budget for the upcoming fiscal year allows 20 new benches, then the top 20 ranked bus stops are recommended for placement and submitted for further evaluation. At this time, 20 benches will be purchased from a previously approved bench vendor. Candidate bus stops are visited and evaluated for available space, accessibility and safety. If any bus stop must be eliminated at this phase, the next highest ranking candidate bus stop is evaluated until a list of 20 bus stops is finalized and the bench contractor is notified to place all 20 benches.

In most cases, there are existing benches where shelters are being installed. The existing benches are relocated by the same method as described above before purchasing new benches.

**BUS STOP LAYOUT**

Bus stops must be designed to accommodate both disabled passengers and pedestrians. Shelters, benches, signs, trash cans (if provided), lighting, information kiosks, landscaping and street furniture shall not block access to the bus or passage along the street for any person regardless of disability. It is the policy of Trinity Metro when erecting a bus passenger shelter to remove any accessibility barriers between the shelter pad and the nearest street corner. This may include installing or repairing sidewalk, installing or repairing a curb ramp, corrective grading of slopes, utility relocations or removal of other obstructions. The placement of the shelter and other features should consider the free flow of wheelchair passengers along the street. Wherever possible, wheelchair passengers should be able to continue along the sidewalk in a straight line, however, in most locations the right of way is too narrow, therefore the concrete pad shall be of sufficient dimensions to allow passage around the facilities. Budget and cost of such improvements may be prevent installation of a shelter in some locations.

Bus operators are trained to stop with the front of the bus aligned with the bus stop sign post, therefore, all bus stop features should be placed to the right of the sign post as if viewed from the center of the street. All bus stops regardless of amenities must have a flat, clear zone of at least five feet wide (along the curb) by eight feet deep (measured from back of curb).
immediately to the right of the sign post for the bus to deploy its wheelchair ramp and for wheelchair passengers to roll off unobstructed.

Pads shall be sized appropriately for the style of shelter being installed. Slope shall be no more than 2% toward the street. The standard Tolar brand shelter is 8’ 6” wide by 5’ 10 ¼” deep with a footprint of 47 3/4” x 95 3/8”. Pads shall be a minimum of six inches thick 3,000psi concrete with #4 rebar on twelve inch centers. Sidewalk shall be four inches thick with #3 rebar on eighteen inch centers. Pads should be sized such that the center of the footings can be placed twelve inches from the edge of pavement to minimize cracking and provide work surface for maintenance crews. Illustrations below give typical layouts and dimensions for a shelter pad based on sidewalk placement. Sidewalks set back away from the curb typically require a larger pad to allow passage of wheelchairs around the shelter. Sidewalks adjacent the curb may allow the passage of wheelchairs in front of the shelter.

Typical Bus Shelter Layout – sidewalk set back from curb

Typical Bus Shelter Layout – sidewalk adjacent curb
Deviation from typical is expected under unique circumstances. Below is an example of fitting a shelter on a narrow pad. The key is to provide accessibility for both disabled passengers and pedestrians while maintaining aesthetics and meeting engineering requirements.

Alternative Bus Shelter Layout – narrow pad with access through back of shelter

Where space allows along radial and crosstown routes, bus stop layout should consider the potential for sixty foot articulated buses which have a wider spacing between doors or a third door. The dimensions in the illustration below accommodate articulated buses.

Typical Bus Shelter Layout – 60’ Articulated Buses

**PARK AND RIDE FACILITIES**

Trinity Metro owned Park-and-Ride facilities are treated with passenger amenities including canopies/shelters, benches/seating, lighting, trash receptacles, security cameras, attractive landscaping, route maps and schedule information.
COMMUTER RAIL FACILITIES

There are 10 rail stations along the Trinity Railway Express commuter rail corridor, six of which are in Tarrant County and maintained by Trinity Metro and five in Dallas County maintained by Dallas Area Rapid Transit. TEXRail has seven stations and shares two stations in downtown Fort Worth with the TRE. All TEXRail stations are in Tarrant County. All TRE stations have low-level boarding with high-blocks for mobility-impaired passengers and TEXRail stations have level boarding. The TRE stations at a minimum can accommodate four passenger cars. Other key features of stations are:

- Platform with textured warning strip at edge;
- High-block platform with ramps at east end of each platform to permit high-level boarding by wheelchair users and mobility-impaired passenger;
- Ticket vending machines;
- Canopies;
- Benches/Seating;
- Lighting
- Trash receptacles
- Security cameras
- Pedestrian track crosswalks as appropriate;
- Landscaping features such as planters and trees;
- Telephones;
- Shared Ride Pick-up and Drop-off facilities;
- Park-and-ride facilities at all stations excluding Fort Worth Central Station, Medical Market and DFW Terminal B stations which are “destination” locations.

SERVICE QUALITY

Trinity Metro will evaluate the level of service and quality of service by analyzing vehicle loads, considering vehicle assignments and reviewing service frequencies. TRE and TexRail service indicators are addressed in the Herzog Operations and Maintenance contract.

VEHICLE LOADS

The expectation of scheduled transit service is to operate buses with a full seated load of passengers (100% of vehicle seated capacity). During peak periods, when demand is greatest, it is acceptable to have standees. 65% of trips are actually short trips to destinations along the same route. In such instances, the load factors (expressed as a percentage of seated capacity for a given bus) for fixed route service should not exceed the following guidelines:
### Route Class

<table>
<thead>
<tr>
<th>Route Class</th>
<th>Peak Hours</th>
<th>Off-Peak Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Frequency</td>
<td>125%</td>
<td>100%</td>
</tr>
<tr>
<td>Medium Peak</td>
<td>125%</td>
<td>100%</td>
</tr>
<tr>
<td>Medium Frequency</td>
<td>125%</td>
<td>100%</td>
</tr>
<tr>
<td>Low Frequency</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Express</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Specialty Routes</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>ZIPZONE</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Commuter Rail</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

**VEHICLE ASSIGNMENTS**

It is Trinity Metro’s policy to comply with 49 CFR Section 21.5(b) (2) and 49 CFR Section 21.5(b) (7), Appendix C to 49 CFR part 21 regarding Title VI compliancy in our assignment of vehicles. In that regard, Trinity Metro considers several factors when assigning vehicles or commuter rail to service. For fixed route buses it includes spare ratio, load factors, service frequency, type of service, and vehicle fuel capacity. There is no disparity regarding the amenities of Trinity Metro vehicles.

**ASSIGNMENT OF FIXED ROUTE BUSES**

All buses are wheelchair passenger accessible and air-conditioning equipped. Most of the fleet is CNG fueled, however six new electric buses operate on a new urban circulator route branded as The Dash and twelve smaller 10-passenger gasoline powered vans are being used on some Low-Frequency service. The size of the peak load in relation to frequency determine what size vehicle is assigned to the route. Large buses may be seen to be sparsely seated during the middle of the day but would likely have been assigned to have ample capacity during the AM rush. The goal of vehicle assignment is to provide comfort and maintain the minimum seated capacity shown above.

Other criteria impacting vehicle assignments:

- **Spare Ratio** (for all vehicle categories) – Trinity Metro operates a fleet of six different categories of vehicles when considering size and style. Trinity Metro utilizes a 20% spare ratio of vehicles per category to ensure service continuity and passenger capacity. Scheduling must maintain the 10% minimum to ensure available spares within the category.

- **Fuel/Battery Capacity** – Bus assignment is governed by length of run, range of vehicle and refueling or recharging requirements. CNG vehicles are assigned as follows: runs of less than 12 hours; any vehicle based entirely upon load factors. Runs of over 12 hours are assigned 40’ buses due to fuel capacity. Six electric buses were added to the fleet, can operate up to 10 hours on a charge and are not assigned to longer runs.
o **Type of Service** - The type of service is another factor in determining assignments. Express, Mobility on Demand, or circulator service typically may use specialized vehicles optimized for the type of service. For example, express service may use vehicles equipped with single doors for greater seating capacity and high ratio differentials for more fuel-efficient highway speeds, circulators may use vehicles configured as rubber-tired trolleys or electric buses configured with perimeter seating for faster boarding and alighting. These routes are inspected by supervisors and are addressed by adding additional vehicles based on visual demand.

**ASSIGNMENT OF COMMUTER RAIL VEHICLES**

Trinity Metro provides modern, reliable and comfortable coaches, equipped with full climate control, air-conditioning and other amenities for its commuter rail facility. All are accessible to passengers with disabilities. Each of the two rail systems operates a unique type of vehicle and there is no interchange of vehicles between them. Following are the description of the cars or coaches that are assigned and their key service standards:

- Trinity Railway Express operates 17 Bi-Level cars, having a seating capacity of 120 to 142 seats per car. The built dates of these cars range from 1976 to 2000 and the average age of these cars is 15.76 years. Many have been completely overhauled in recent years.

- TEXRail operates 8 Diesel Multiple Unit (DMU) Vehicles having a seating capacity of 225 seats. The build dates of these cars range from 2018 to 2019 and the average age is less than six months.
**VEHICLE HEADWAY**

Headway or time between buses on a given route should be developed to provide a sufficient number of vehicles at the maximum load point to accommodate the passenger demand. Minimum headways are recommended to allow baseline accessibility to service. Whenever possible, frequencies should be set at regular clock-face intervals such as every 15, 30, or 60 minutes for simplicity and schedules optimized to improve transfer movements.

Minimum and maximum service headways by route category are recommended as follows:

<table>
<thead>
<tr>
<th>Route Type</th>
<th>Peak</th>
<th>Midday</th>
<th>Early/Late</th>
<th>Saturday</th>
<th>Sunday</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Frequency</td>
<td>15</td>
<td>30</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Medium Peak</td>
<td>30</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Medium Frequency</td>
<td>30</td>
<td>30</td>
<td>60</td>
<td>30</td>
<td>60</td>
</tr>
<tr>
<td>Low Frequency</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Express</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Specialty Routes</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>ZIPZONE</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Commuter Rail TEXRail TRE</td>
<td>30</td>
<td>60</td>
<td>60</td>
<td>30/60</td>
<td>30/60</td>
</tr>
</tbody>
</table>

Midday = 9am – 3pm
SERVICE SPAN

The time between the first and last trip operated on a route is the span of service on that route. It is Trinity Metro’s goal to have a consistent span of service for all routes within a frequency category to maximize the opportunities for passengers to avail themselves of the connectivity of Trinity Metro’s bus service.

The standard for span of service for each type of Trinity Metro fixed-route service is illustrated by the following chart, which illustrates the latest start time and earliest stop time:

<table>
<thead>
<tr>
<th>Route Type</th>
<th>Weekday</th>
<th>Saturday</th>
<th>Sunday</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Start</td>
<td>End</td>
<td>Start</td>
</tr>
<tr>
<td>High Frequency</td>
<td>5:00 AM</td>
<td>11:00 PM</td>
<td>6:00 AM</td>
</tr>
<tr>
<td>Medium Peak</td>
<td>6:00 AM</td>
<td>11:00 PM</td>
<td>6:30 AM</td>
</tr>
<tr>
<td>Medium Frequency</td>
<td>6:00 AM</td>
<td>10:30 PM</td>
<td>6:30 AM</td>
</tr>
<tr>
<td>Low Frequency</td>
<td>6:00 AM</td>
<td>10:30 PM</td>
<td>6:30 AM</td>
</tr>
<tr>
<td>Express</td>
<td>6:00 AM</td>
<td>6:00 PM</td>
<td>N/A</td>
</tr>
<tr>
<td>Specialty Routes</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>ZIPZONE</td>
<td>7:00 AM</td>
<td>7:00 PM</td>
<td>N/A</td>
</tr>
<tr>
<td>Commuter Rail TEXRail TRE</td>
<td>3:00 AM 2:00 AM 12:30 AM</td>
<td>3:00 AM 2:00 AM 1:30 AM</td>
<td>3:00 AM N/A</td>
</tr>
</tbody>
</table>

Due to the nuances of route scheduling, these are not hard stops, rather it should be considered to begin or end a route or service at around these times.
ON-TIME PERFORMANCE

On-time performance (OTP) is a measure of runs completed as scheduled. Trinity Metro’s definition of “on-time” for fixed route is any bus that arrives at the posted time point within ten minutes of the scheduled time and does not depart early. Access Paratransit is pre-scheduled with passengers advised to be ready to depart within a 30 minute window, therefore, “on-time” is 15 minutes either way of the middle of the pickup window. ZIPZONE services function similarly to ACCESS, just with more spontaneous scheduling through a smartphone application. Therefore ZIPZONE has a lower threshold at 10 minutes either way of the middle of the pickup window. Additionally, the TRE and TEXRail definition of “on-time” is any train arrival within five-minutes of the posted time on the schedule and does not depart early. The goal is to achieve 90% OTP on all fixed route and paratransit services and 97% on all rail services. Care is taken to set achievable schedules and corrective measures are taken when a service falls below the goal.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Early</th>
<th>Late</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Route Bus</td>
<td>0 min</td>
<td>10 min</td>
<td>90%</td>
</tr>
<tr>
<td>ACCESS Paratransit</td>
<td>15 min</td>
<td>15 min</td>
<td>91%</td>
</tr>
<tr>
<td>ZIPZONE</td>
<td>10 min</td>
<td>10 min</td>
<td>88%</td>
</tr>
<tr>
<td>Commuter Rail</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRE</td>
<td>0 min</td>
<td>5 min</td>
<td>97%</td>
</tr>
<tr>
<td>TEXRail</td>
<td>0 min</td>
<td>5 min</td>
<td>98%</td>
</tr>
</tbody>
</table>
SECURITY

Trinity Metro currently operates its transit security policy through the implementation of a **System Security and Emergency Preparedness Plan (SSEP)**. The SSEP outlines roles and responsibilities of all agency employees, as well as contracted security personnel. In addition to contracted physical security at the agency’s critical facilities, off-duty police officers are hired to provide security at our transportation/transfer centers, on buses, and on the agency’s commuter rail line.

The agency also provides 24-hour video surveillance at all commuter rail stations. Primary duties of off-duty police officers are to provide police presence, respond to criminal activity or disturbances as needed, and target areas with higher levels of criminal activity. Contracted physical security provided at certain facilities and is used as an on-site deterrent; respond to incidents as needed, monitor video surveillance system, as well as assisting passengers with transportation inquiries.

Security training programs have been implemented during new-hire orientations, as well as annual refresher training for all employees. Security awareness information is available to our passengers on all fixed route buses, and at all major transportation facilities. The training programs and awareness information serves to educate all employees and passengers on observing, documenting, and reporting suspicious behavior or activity.

Trinity Metro will comply with 49 CFR Section 21.5(b)(2) and 49 CFR Section 21.5(b)(7), Appendix C to 49 CFR part 21 to supply a transit policy leading to secure and safe transit system without regard to race, color, or national origin. Security deployment of Transit Security Officers (off-duty police) generally details random and targeted riding of the commuter rail lines throughout operation, patrolling all transportation/transfer centers, and responding to calls for assistance -on buses or at bus stops- received through the bus operations communication center. Our deployment of these officers also entails addressing specific areas with higher levels of criminal activity. This is determined through incident reports received from bus operators and supervisors. Targeting specific areas will sometimes increase security presence at the intended area, while decreasing a presence at other areas with little or no activity.

Contracted security personnel are permanently assigned to two of our eleven commuter rail stations. The Fort Worth Central and T&P Stations provide an array of business amenities (public events, food services, other transportation needs, etc.) and, therefore, are more likely to be a greater terrorist risk than the other stations which provide ‘park-n-ride’ only services. As a result, physical security at these locations are operated full time, 24-hours a day.
SERVICE STANDARDS MONITORING METHODS

Various Trinity Metro Departments, TRE and TEXRail Staff are responsible for monitoring and evaluating the quality and level of service on an on-going basis to assess adherence to documented service standards. The following inputs are considered.

PERFORMANCE REPORT

A Monthly Performance Report will be generated by the Accounting department using data obtained from fare boxes. This report identifies ridership levels for all modes and reports Key Performance Indicators (KPI), including Subsidy per Passenger, Passengers per Hour, Passengers per Mile. On-time Performance is determined using Automatic Vehicle Locator (AVL) systems. Trinity Metro staff, including Planning, Operations and Accounting departments, review this information to help determine general route performance and to identify routes which are developing vehicle loading concerns in need of more thorough investigation.

CUSTOMER COMMENTS

Trinity Metro customer care representatives will record and track comments and suggestions which will be forwarded to appropriate department for response or resolution. Title VI complaints will be forwarded to the Title VI compliance officer. Comments such as vehicle loading complaints or on-time performance will be forwarded to the Operation department. Complaints regarding vehicle condition are to be forwarded to the Maintenance department. Expansion, service frequencies or stop requests will be forwarded to the Planning department.

The planning and marketing staff utilizes public outreach such as public meetings, community meetings, neighborhood association meetings and open forums to gather comments on the existing service or recommended improvements. Trinity Metro also uses a public comment line where customers can leave messages providing recommendations or comment. Additionally, beginning in FY2020, Trinity Metro will conduct monthly customer surveys onboard vehicles, targeting four routes per month, reaching all routes within a year, to ascertain general customer satisfaction.

FIELD CHECKS

Trinity Metro’s Quality Assurance Program (QAP) encourages staff to become proactive in riding Trinity Metro’s buses and rail vehicles. This Program helps key decision makers to interact with transit users and operators and therefore creating a better understanding of our customer’s experiences and conditions. The Program also improves communications between staff and operators. Each member of staff is required to ride at least one route each month and provide a report of his or her observations.

As operational concerns surface—through information from the Performance Report, customer comments or visual inspections—a supervisor field check will be conducted. For example, if vehicle loads are being identified at excessive, an operations supervisor will be requested to conduct a load check and/or On-Time Performance to inspect the quality of operating service. Excessively over loaded routes will be relieved by placing a larger capacity bus on the route or eventually by increasing service frequency.
BOARDING AND ALIGHTING DATA

A Boarding and Alighting Study has been periodically conducted by a private contractor which provided a comprehensive and systematic review of Trinity Metro's passenger loads and a stop-by-stop review of Trinity Metro's system. Beginning in 2017, automatic vehicle locating (AVL) and automatic passenger counter (APC) systems were installed on 97% of the fixed route fleet to provide this information. Work is ongoing to certify the APC system for use in National Transit Database reporting. TRE is also equipped with AVL and APC systems and supplemented with manual counts by the conductor. TEXRail data is currently collected by the conductors. Conclusions arising from analysis of this data may warrant consideration of service changes.

ORIGIN-DESTINATION SURVEY

The North Central Texas Council of Governments conducts a regional onboard survey every five to six years as a requirement for data collection to update the regional travel model for air quality impact assessment of proposed transportation projects. A statistically significant sample of riders is surveyed on every mode throughout the entire service span and results in a comprehensive database of passenger travel pattern information. Trinity Metro participates in the cost of this survey. Conclusions arising from analysis of this data may warrant consideration of service changes.

KEY PERFORMANCE INDICATORS

Key performance indicators are measured for each fixed bus route on a monthly basis. These are passengers per revenue hour, passengers per revenue mile and subsidy per passenger. The systemwide averages for FY 2019 are as follows:

<table>
<thead>
<tr>
<th>Category</th>
<th>Avg</th>
<th>Std Dv</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passengers per Mile</td>
<td>0.94</td>
<td>0.30</td>
</tr>
<tr>
<td>Passengers per Hour</td>
<td>12.93</td>
<td>5.57</td>
</tr>
<tr>
<td>Subsidy per Passenger</td>
<td>$6.90</td>
<td>$20.61</td>
</tr>
</tbody>
</table>

New routes are given a minimum of twelve months to develop before evaluation. Performance of individual routes varies significantly due to the demographic and economic characteristics of the area served and the type of route, therefore no minimum performance levels are established which would automatically dictate the elimination of service. Each route is evaluated on its own merits. Once mature, any route that falls to less than one standard deviation of the system averages may be considered for modification. Routes that perform significantly worse than one standard deviation may be eliminated but only in response to declining revenues/increasing operating costs (to address a budget deficit) or to free up resources for improvements to other routes. Routes that are subsidized through public-private partnerships will not be modified or eliminated without the consent of the funding partner.
Route Improvement Plan

The following are possible actions to be included in a Route Improvement Plan on targeted low performing routes:

- Targeted marketing
- Service frequency and span changes
- Service period and service day adjustments
- Rerouting
- Rescheduling
- Elimination of nonproductive route segments
- Consolidation of segments into other routes

After implementation of a Route Improvement Plan, the route will be given twelve (12) months to move toward meeting minimal expectations. Any routes that do not achieve this performance shall be targeted for additional curtailment or elimination. In some instances, positive ridership growth trends will be sufficient to classify the route as meeting improved performance requirements.
SERVICE CHANGE PROCESS

In order to comply with 49 CFR Section 21.5(b)(2), 49 CFR Section 21.5(b)(7) and Appendix C to 49 CFR part 21, Trinity Metro shall evaluate significant system-wide service changes and proposed improvements at the planning and programming stages to determine whether those changes have a discriminatory impact.

In order to assure consistency and proper planning for changes within the service area, the following steps are utilized for fixed-route service changes at Trinity Metro. Each service change takes approximately six months to complete.

1) Planning Review Proposals for Changes
   a. Planning and Development reviews input from Operations, Customer Care, community, and passengers throughout the year. At this stage of the process each request will be evaluated as to feasibility, efficiency, and necessity.
2) Conduct Title VI analysis for major service changes (See description of process below)
3) Prepare Draft Proposals
   a. Maps
   b. Schedules
   c. Cost Estimates
4) Interdepartmental Staff Coordination Meeting
   a. Operations, Planning, Scheduling, Marketing and Finance meet bi-weekly to review proposals
   b. Senior management approves proposals
5) Conduct Field Checks
   a. Safety and Operations evaluation for turns and maneuvers.
   b. Scheduling tests runtimes for schedule/timepoint verification.
6) Hold Community and, or Public Hearings, if necessary for major changes.
7) Board Approval, if necessary for major changes
8) Route Implementation Orders distributed to staff
9) Finalize Schedules (six week process)
   a. Scheduler builds schedules in scheduling software.
   b. Scheduler blocks bus assignments
   c. Scheduler creates runs and rosters of work assignments for bus operators
10) Operator Sign Up
    a. Rosters are posted for bus operators consideration
    b. Operators choose their work assignments based on order of seniority.
11) Operator Route Guides updated
12) Operator Training initiated
13) Bus Stop Placement/Removal Procedures initiated
14) Brief Customer Service Representatives
15) Public Notice of Changes
    a. Notice Posted to Web Site and onboard vehicles two to three weeks in advance
    b. New schedule brochures distributed a week in advance.
    c. Some major changes may need additional public outreach. Trinity Metro Staff may distribute information to customers at key boarding locations the week before, on or after implementation.
16) Implement Service Change
MAJOR SERVICE CHANGE POLICY

This policy establishes a threshold for when a proposed service increase or decrease is “major,” and thus must be subject to a Title VI Equity Analysis and a public hearing held. The initial 12 months following implementation of a new route or a change to a route are automatically considered a pilot and the new route may be discontinued or the change reversed between 12 and 24 months if it fails to meet expectations. After 24 months, a route or change to a route is considered permanent and is subject to the Major Service Change Policy.

Only services which are fully funded by Trinity Metro member cities or federal grants are subject to the Major Service Change Policy. Services which are funded wholly or in part by Tarrant County, non-member cities, other government agencies, non-profit entities or private entities are not subject to the Major Service Change Policy and may be modified or eliminated based on the terms of the contract or interlocal agreement. They may also be eliminated for non-payment or other breach of the terms of the contract or interlocal agreement. Such changes may be subject to a public hearing by the funding partner depending on the funding partner’s charter or governing regulations.

Trinity Metro defines a major service change as:

1. A decrease or increase of 25% or more of the number of transit revenue vehicle miles of a transit route, computed daily, for the day of the week for which the change is made.
2. A decrease or increase of 25% or more of the number of transit revenue vehicle hours of a transit route, computed daily, for the day of the week for which the change is made.
3. A modification of the path of a transit route involving 25% or more of the existing linear one-way miles.
4. The elimination of an existing transit route.
5. The establishment of a new transit route along streets which are not currently being served.

Mobility on Demand services are not measured in terms of revenue vehicle miles or hours. Instead, a major change will be defined as:

1. A 25% or more decrease or increase in the geographic area (square miles) served.
2. A 25% or more decrease or increase in the span of service (ending time minus start time) for the day of the week for which the change is made.
3. A modification of the boundaries involving 25% or more of the existing geographic area served.
4. The elimination of an existing Mobility on Demand service.
5. The establishment of a Mobility on Demand service in a geographic area which is not currently being served.
FARE CHANGE EVALUATION PROCESS

In order to comply with 49 CFR Section 21.5(b)(2), 49 CFR Section 21.5(b)(7) and Appendix C to 49 CFR part 21, Trinity Metro shall evaluate proposed fare changes at the planning and programming stages to determine whether those changes have a discriminatory impact.

In order to assure consistency and proper planning for changes within the service area, the following are the steps to be utilized for evaluating potential impacts to fare changes.

1) Describe the nature of the change, the bases or rationale for the change, the modes of service impacted, and the communities affected by the change.

2) Describe what are the impacts of the fare change on minority and/or low-income communities.

3) Describe what are the transit alternatives available for riders who would be impacted by proposed fare changes
   a. Describe what, if any, measures Trinity Metro will take to avoid, minimize, or mitigate any adverse effects of the fare change on minority populations and/or low-income populations?
   b. Describe what, if any, enhancements or offsetting benefits Trinity Metro would implement in conjunction with the fare change

4) Determine if the proposed fare change will have a disproportionately high and adverse effect on minority populations and/or low-income populations.

5) Describe what steps Trinity Metro will undertake to seek out and consider the viewpoints of minority and low-income populations in the course of conducting public outreach and involvement activities.

6) Determine if it is necessary to disseminate information on the fare increases that is accessible to Limited English Proficient persons. If so, describe what steps to provide information in languages other than English are proposed.
TITLE VI

Trinity Metro is committed to ensuring that no person is excluded or denied benefits of services based on race, color or nation origin and, as such, Trinity Metro’s service standards meet the requirements of 49 CFR Section 21.5. The following Disparate Impact and Disproportionate Burden policies are established for analysis and consideration of major service changes.

DISPARATE IMPACT POLICY

The Disparate Impact Policy establishes a threshold for determining whether proposed fare or major service changes have a disproportionally adverse effect on minority populations relative to non-minority populations on the basis of race, ethnicity or national origin.

The threshold is the difference between the burdens borne by, or benefits experienced by, minority populations compared to non-minority populations. Exceeding the threshold means either that a fare or major service change negatively impacts minority populations more than non-minority populations or that the change benefits non-minority populations more than minority populations. A change with disparate impacts that exceed the threshold may be adopted (a) if there is substantial legitimate justification for the change, (b) if no other alternatives exist that would serve the same legitimate objectives but with less disproportionate effects on the basis of race, color or national origin or c) if the prescribed analysis methodology (which is based entirely on adjacent residential population characteristics) omits critical information about the benefits to minority passengers.

Trinity Metro establishes that a fare change, major service change or other policy has a disparate impact if the minority populations will experience 20% more of the cumulative burden, or experience 20% less of the cumulative benefit, relative to the non-minority populations, unless (a) there is substantial legitimate justification for the change, (b) no other alternatives exist that would serve the same legitimate objectives but with less disparate effects or c) additional benefits to minority passengers can be documented that are not considered in the prescribed analysis methodology.

DISPROPORTIONATE BURDEN POLICY

The Disproportionate Burden Policy establishes a threshold for determining whether proposed fare or major service changes have a disproportionately adverse effect on low-income populations relative to non-low-income populations.

The threshold is the difference between the burdens borne by, and benefits experienced by, low-income populations compared to non-low-income populations. Exceeding the threshold means either that a fare or service change negatively impacts low-income populations, or that the change benefits non-low-income populations more than low-income populations. If the threshold is exceeded, Trinity Metro must avoid, minimize or mitigate impacts where practicable.

Trinity Metro establishes that a fare change, major service change or other policy has a disproportionate burden if low-income populations will experience 20% more of the cumulative burden, or experience 20% less of the cumulative benefit, relative to non-low-income populations unless (a) there is substantial legitimate justification for the change, (b) no other
alternatives exist that would serve the same legitimate objectives but with less disproportionate effects or c) additional benefits to low-income passengers can be documented that are not considered in the prescribed analysis methodology.
PUBLIC INPUT

BACKGROUND

Public input is a requirement of the Federal Transit Administration (FTA) for all fare increases or major service reductions. Grantees must have a written process for how public comment is solicited and considered prior to raising fares or implementing major service reductions. Trinity Metro shall develop a separate public outreach plan that details how minority and low income individuals are encouraged to participate, however, this section shall detail the minimum actions to be taken by Trinity Metro.

PROCESS

The public will have the opportunity to make verbal or written comments anytime Trinity Metro proposes a fare increase or major service reduction. Minimally, Trinity Metro will hold one public hearing in order to meet this requirement. In addition to holding a hearing, Trinity Metro will also notify the public of an address to which written comments may be submitted, along with other agency contact information, such as an e-mail address or phone number to be used for making a public comment. Public comment periods will commence at the time it is advertised and will be at least 10 days in length. Copies of public advertisements will be retained as part of a record of the public input process.

PUBLIC HEARING

Trinity Metro will hold a public hearing on (i) any fare change; (ii) any service change that qualifies as a major service change under the Major Service Change Policy herein. At two weeks before the date of a public hearing under the paragraph below, Trinity Metro will provide notice of the meeting time, date and location. A public hearing shall be advertised in a way that reaches the greatest number of affected parties, within reason. Examples would be postings on transit vehicles and transfer centers, email distribution for services in which Trinity Metro retains the email addresses of users, on the agency’s website and via social media channels.

For public hearings, the following procedures will be followed:

- The hearing will be recorded and transcribed by staff members of Trinity Metro
- The presentation will be streamed live over the internet or posted for subsequent viewing.
- Participants will be greeted upon arrival and will be asked to provide name and contact information for the record
- The purpose of the meeting shall be stated at the beginning of the meeting
- Staff may supply further background on why the fare or service change is being considered
- Staff shall provide instructions on procedures for making a comment at the hearing as well as providing information on how comments will be provided to decision makers
- An adequate period shall be reserved to ensure participants a reasonable opportunity to make their comments heard
- Participants shall be reminded prior to the meeting conclusion on alternative means of commenting such as in writing, by phone or at other public hearings scheduled
CONSIDERATION

Prior to the consideration of a proposed fare increase or major service reduction, applicable decision makers shall receive a document listing all public comments received, whether written comments or verbal comments. These comments shall be considered in making a decision on the proposed fare increase or major service reduction. Additionally, Board members should be encouraged, though not required, to be in attendance at all public hearings or other public meetings addressing the topic. Finally, staff recommendations for raising fares or implementing a major service reduction should consider public comment received and—if feasible, reasonable and viable—be amended as a result.
APPENDIX A

TITLE VI SERVICE CHANGE ANALYSIS METHODOLOGY

Beginning with the August 2018 service change, Trinity Metro uses REMIX cloud-based computing for Title VI service change equity analysis. REMIX generates a Title VI report (based on Census data) by comparing existing service to a set of proposed changes. The following methodology and data sources are used when generating this report as of this writing.

Data sources
- Census data is provided by the US American Community Survey five-year estimates.
- Population is coded by table B03002, field B03002001.
- Low income status is set at 100% of the US poverty level. This is coded by the appropriate fields in table C17002.
- Minority status is coded by table B03002, by subtracting the white, non-Hispanic population (B03002003) from the total population (B03002001).

Methodology

1. Determine affected population, including low income and minority percentage.
   - For each route, build a shape that represents the area within quarter mile of any of its stops.
   - Intersect the catchment area with ACS Census data. Get a list of block groups and the percentage overlap with each.
   - For each block group, take the percentage of overlap and multiply it by the block group's statistics.
   - Get the population, minority population, and low income population for each group and sum them together. This is the total population a route could serve.

2. Compare the number of people-trips, before and after.
   - Multiply the population near a route times the number of trips it makes (per year) to get “people-trips”.
   - Repeat for low-income and minority populations to get “low income people-trips” and “minority people trips”.
   - Compare these numbers between the before and after versions of the route, to get a set of people-trip differences. REMIX matches before and after using routes that have the same name.

3. Get the total difference in people-trips across the transit system.
   - Repeat the process above for every route in the transit system.
   - Sum together the difference in people trips. This will return three numbers: total difference in people-trips, total difference in low-income people-trips, and total difference in minority people trips.

4. Calculate the change borne by low-income and minority populations.
   - Divide the total difference in low-income people trips by the total difference in people-trips to get the percentage of change borne by those with low incomes.
   - Repeat for minority people-trips.
5. Compare the percentage change to the average in the service area.
   - Calculate the average percentage of low-income and minority populations across the entire service area.
   - Subtract from the change borne by those populations.
   - Get two final numbers: the delta between the impact this set of transit changes had on low income and minority populations compared to any average change.

Table 1 below shows the minority and low-income population for Trinity Metro’s service area for comparison. The Board of Directors adopted a threshold of 20% above or below the system average for determination of adverse impact.

<table>
<thead>
<tr>
<th>Table 1 – Trinity Metro Service Area Population Data¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Population of Service Area</td>
</tr>
<tr>
<td>----------------------------------</td>
</tr>
<tr>
<td>987,275</td>
</tr>
</tbody>
</table>

¹ Total population estimated by REMIX based on block groups intersecting the service area. May not match other published statistics.
APPENDIX B

TITLE VI FARE CHANGE ANALYSIS METHODOLOGY

Trinity Metro does not regularly collect information on the type of fare payment used by minority and/or low-income populations. The necessary data to derive this information is normally collected in the North Central Texas Regional On-Board Transit Survey coordinated by North Central Texas Council of Governments (NCTCOG), last conducted in 2014. Supplemental surveys may be conducted as necessary to determine users of fare categories that may have been created subsequent to the last Regional On-Board Transit Survey.

The On-Board Transit Survey is used to develop Average Fare for existing ridership and to analyze the impact to riders. The major categories presented in the survey are:

1. Travel characteristics
2. Pass/Payment characteristics
3. Household demographics and
4. Rider demographics

Trinity Metro analyzes the information generated from the survey in the follow method:

1. Review fares to compare rates before and after proposed change.
2. Query the data to determine the number of passengers who are travelling on each existing fare media at each existing price level.
   a. Minority purchasers
   b. Non-minority purchasers
   c. Low-Income purchasers
   d. Non Low-Income purchasers
3. Calculate the average fare change borne by each of the four groups and the average fare change borne by all passengers.
4. Compare the increase or decrease among the groups and to the overall.

The average fare change is determined by multiplying each population group by the proposed fare change in each fare media category. Then, all average fare changes for each population group and fare media are summed and divided by the total population for the population group.

\[ A = \frac{\sum_n (M \times F)}{M} \]

Where:
\( A \) – Average Minority Fare Impact
\( M \) – Minority Purchasers
\( F \) – Proposed Fare Increase
\( n \) – Fare Media at each price point

The table below shows the results for the last proposed fare change and how the comparison is made. The proposed fare change had almost exactly the same impact to all population groups within Trinity Metro’s service area.
<table>
<thead>
<tr>
<th></th>
<th>Low-Income</th>
<th>Non Low-Income</th>
<th>Minority</th>
<th>Non-Minority</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Weekday Fares</td>
<td>$7,553.79</td>
<td>$32,202.99</td>
<td>$26,947.68</td>
<td>$12,809.11</td>
<td>$39,756.79</td>
</tr>
<tr>
<td>Total Weekday Riders</td>
<td>6,363</td>
<td>24,996</td>
<td>21,221</td>
<td>10,138</td>
<td>31,359</td>
</tr>
<tr>
<td>Average Daily Fare increase</td>
<td>$1.19</td>
<td>$1.29</td>
<td>$1.27</td>
<td>$1.26</td>
<td>$1.27</td>
</tr>
<tr>
<td>Difference from Overall</td>
<td>-6.72%</td>
<td>1.55%</td>
<td>0%</td>
<td>-0.79%</td>
<td></td>
</tr>
</tbody>
</table>

There was No Disparate Impact or Disproportionate burden for Minority or Low-Income riders as all percentages were well within the 20% threshold.