SOUTH CENTRAL TRANSIT AUTHORITY

TRANSIT DEVELOPMENT PLAN UPDATE

FINAL REPORT

JULY 2018

SCTA SOUTH CENTRAL TRANSIT AUTHORITY

BARTA

RRTA RED ROSE TRANSIT AUTHORITY

NELSON NYGAARD

TABLE OF CONTENTS

APPENDICES

EXECUTIVE SUMMARY

Background

The South Central Transit Authority (SCTA) was established in 2014 to serve as a consolidated administrative authority for Berks Area Regional Transit Authority (BARTA) and Red Rose Transit Authority (RRTA). BARTA and RRTA provide service within Berks and Lancaster Counties, serving a number of key population and employment centers that are distributed (and often geographically isolated) across a region that has a mix of urban and rural areas. SCTA has undertaken a Transit Development Plan (TDP) of transit services in Berks and Lancaster Counties, the first such joint plan with both BARTA and RRTA.

SCTA has pursued service improvement and expansion in both systems, and has also pursued improvements like online pass sales, new electric hybrid vehicles, and new shared ride vehicles. While these changes have provided significant improvements, ridership has been on the decline, as has been the case for many transit authorities. The service design and level of service also fall short of the demand for service, particularly the level of service that could be supported by cities the size of Reading and Lancaster.

This TDP was performed to identify service improvements that would better serve existing riders, improve the overall efficiency of BARTA and RRTA service, and attract more riders. The proposed recommendations of the TDP are designed to address existing challenges, improve route productivity, better match service with demand, and grow ridership. The recommendations span the next 10 years and include immediate-term cost-neutral improvements, short-term service increases, and long-term improvements that include significant service enhancements and expansion. This phased approach accounts for the resource constraint of both systems and prioritizes cost neutral yet effective improvements that can be implemented right away.

Process and Goals

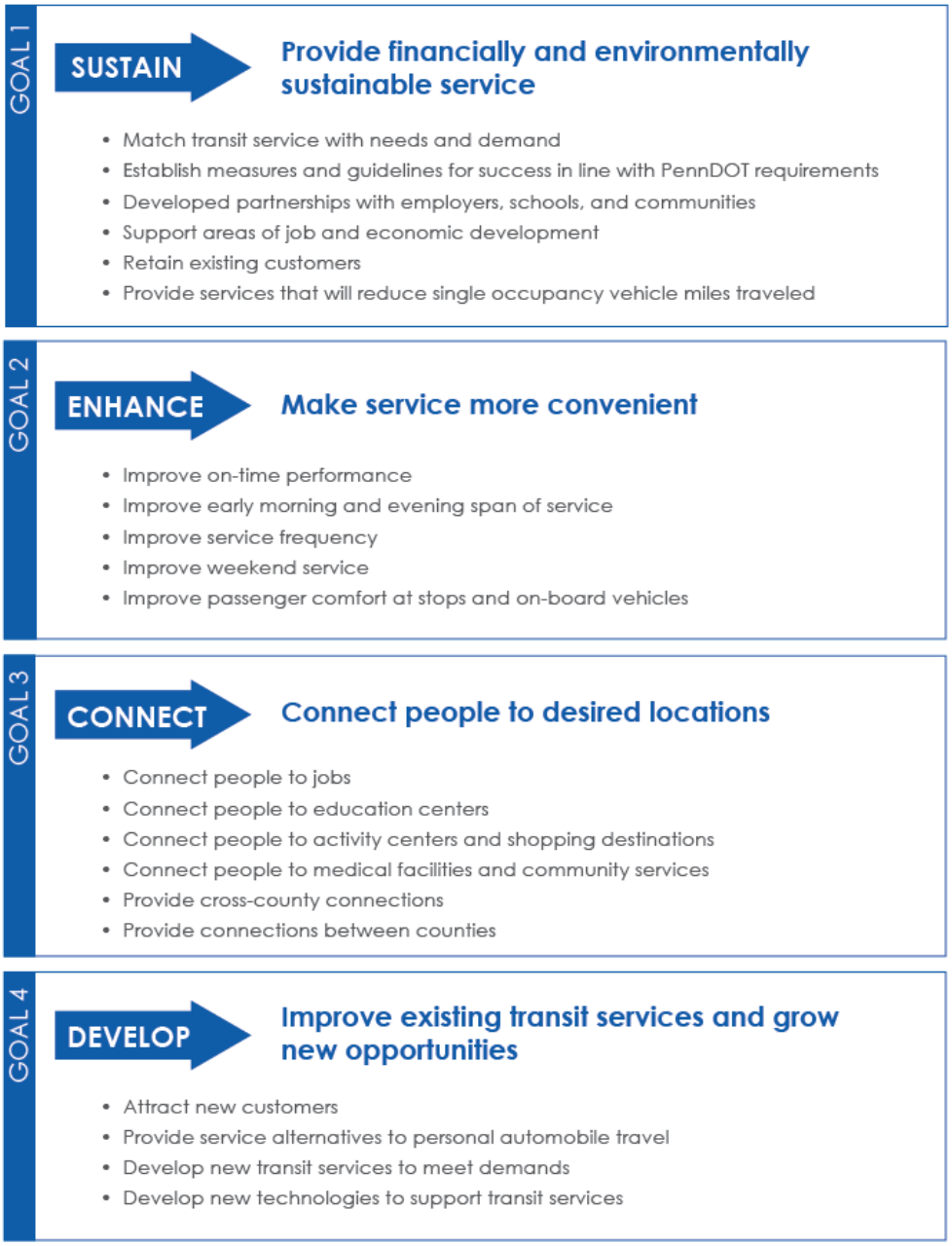
The SCTA Transit Development Plan consisted of several tasks:

- **Previous Studies:** A review of previous studies and planning documents that are relevant to transit service and opportunities in the SCTA service area.
- **Community Assessment:** An assessment of existing and potential demand for transit service based on population and employment density, socio-economic and demographic characteristics, and travel patterns across the service area.
- **Identification of Service Issues and Opportunities:** A detailed analysis of each route in both systems to evaluate service design, performance, and opportunities for improvement.
- **Development of Recommendations:** Using findings from the market and service analyses, as well as public input, the study team developed a set of recommendations designed to improve existing service and meet demand for new service.

Throughout the project, the study team solicited feedback from stakeholders and members of the public. A community survey was conducted both online and at outreach events to reach riders and non-riders. An onboard survey was also conducted among both BARTA and RRTA passengers to learn more about their travel needs and their experiences with existing transit services. Public meetings were held in during Fall 2017 solicit input on existing service, and again in Spring 2018 to share draft recommendations and receive public feedback. Interviews were conducted with several community stakeholders to shed light on some of the major issues and opportunities facing transit in SCTA's service area. The team also facilitated focus group-style workshops with representatives from human service agencies to learn more about the transportation needs of their clients. Project materials and public event announcements were shared on the project website, www.SCTAPA.com/Transit-Development-Plan-Update.

Four overarching goals were identified to guide the development of recommendations, based on input from agency staff, previous studies, survey responses to priority tradeoff questions, and public comments. The TDP was developed to achieve progress towards these larger goals by addressing more specific objectives that were defined for each goal, as shown in Figure 1.

Figure 1 | TDP Goals and Objectives



Service Improvements

Based on the technical analysis and stakeholder input, the study team developed a recommended service scenario that includes several improvements to existing service as well as opportunities for new services and capital investments. This recommended scenario consists of three phases, to be implemented over the course of the next 10 years and depending upon resource availability. Phase 1 includes a set of "cost neutral" improvements that can be implemented in the near term within the current operating budgets of BARTA and RRTA, focused on streamlining and improving existing routes and modest increases in service. Phase 2 includes additional service enhancements, focusing in increased service spans. Phase 3 represents long-term recommendations that build on the first two phases, including significant service increases and new service expansions, and can be implemented as resources become available.

The recommendations included in the recommended service scenario make several improvements that address the major issues and opportunities identified during the study process:

- **Streamlined Service:** Several routes that currently operate circuitous or indirect alignments would be redesigned to provide more direct, streamlined service. Some deviations to stops that generate few or no riders would be discontinued to ensure that service is faster and more reliable for existing riders. These changes would also make it easier to understand which corridors and destinations are served by each route, making transit service more attractive and easy to use for both current and potential riders.
- **Simplified Service:** Routes that currently operate multiple service patterns or serve different alignments on different trips make service confusing and inconvenient for riders. Recommended improvements would address this by making routes simpler, serving consistent alignments with predictable service patterns.
- **Improved Level of Service:** Several routes in both systems would have improved levels of service, including increased frequency during the day, later service hours into the evening, and the introduction or expansion of Saturday and Sunday service.
- **New Routes:** New crosstown service opportunities were identified in Reading and Lancaster. Express/limited-stop routes would also be introduced in both Berks and Lancaster Counties, and a new intercountry Reading-Lancaster Express route would provide connections between Reading, Lancaster, and employment opportunities in northern Lancaster County.
- **Transit Corridors:** On several key corridors in Reading and Lancaster, coordinated schedules among multiple routes serving the same corridor would result in very frequent transit service along these major corridors. Over the long-term, these corridors will provide a focus for transit-supportive capital investments, which could include transit priority treatments, dedicated bus lanes, stop consolidation, and enhanced passenger amenities. These capital investments would complement high-frequency transit service and reinforce the image of each corridor as an enhanced transit corridor.
- **Transfer Centers:** In Reading and Lancaster, as in many older cities, the road network – and as a result, the transit system – is radially oriented around downtown. This makes many crosstown trips very long and complicated by forcing riders to travel into downtown in order to transfer to another route and complete their trip. The designation of transfer centers at key destinations would provide more convenient connections between routes outside of downtown, especially for riders making crosstown trips. These transfer centers would have enhanced passenger facilities including shelters, benches, real-time arrival signage, and other amenities.
- **Demand-Response Zones:** New on-demand services are increasingly becoming part of public transit networks, particularly for serving times and places with lower demand. Where demand would not ordinarily justify a fixed-route service, including many outer areas of Berks and Lancaster Counties, modern on-demand services can serve these areas and connect people with the fixed-route network, in a more efficient or convenient manner than was available before recent technology innovations.

Capital Investments

In addition to service improvements, there are many opportunities for capital investments that support transit service and make it more attractive to existing and potential riders. The TDP includes the following capital investment recommendations:

- **Transfer Centers:** Smaller transfer centers outside of downtown can provide an opportunity to make crosstown trips more convenient by not forcing riders to travel into and back out of downtown to make a crosstown trip. Passenger amenities at these facilities would include seating, shelters, system maps and information, lighting, wayfinding, and real-time arrival signs.
- **Bus Stop Improvements:** Well-designed bus stops enhance the transit experience, decrease perceived wait times for transit services, and can contribute to increased ridership. Investing in high quality bus stops is often a low-cost, high-reward strategy for transit agencies.
- **Bus Stop Spacing and Consolidation:** The spacing and placement of stops greatly impact transit travel times and reliability, as well as the types of facilities and amenities that can be provided. Most riders want service that balances convenience and speed, and the number and location of stops is a key component of determining that balance. Transit systems that have pursued stop consolidation generally report significant operational improvements and increased service reliability, and several have been able to decrease scheduled running times on affected routes.
- **Park-and-Rides:** Park-and-ride facilities expand the catchment area of transit, especially in outer areas with lower densities where fewer people may live within walking distance of a stop. There are park-and-rides served by each system today, and the addition of new park-and-rides would increase access to existing service and potentially make it more attractive to new riders. The TDP recommendations include several locations/communities for new potential park-and-rides to expand access and capitalize on existing service.
- **Public Information:** For people to be able to use transit, they must first know that it is there and be able to understand how to use it. This means that it is extremely important for transit systems to provide clear and concise information on their available services. Recommendations to improve public information include revising route maps and

schedules in the ride guides, improving and updating system maps, and publishing General Transit Feed Service (GTFS) data through Google Transit.

- **Transit Technology:** The transit industry, like nearly every sector of the economy, has increasingly employed new technologies to improve service, management, and operations. Innovations in transit technology offer multiple benefits to operating agencies in terms of service planning, operating efficiency, and customer experience of transit. New transit technology opportunities for SCTA include the installation of automated passenger counters (APCs) on vehicles, participating in Google Transit, expanding the publication of real-time information, and adopting new fare payment technologies.

1 SUMMARY OF RECOMMENDATIONS

Background

A number of different ideas for improving the effectiveness of each individual BARTA and RRTA route were developed based on stakeholder outreach, the market analysis, and the service analysis performed at the outset of the study. The different concepts for each route also followed a set of transit service principles established for SCTA. A detailed evaluation for each of the existing RRTA and BARTA routes, including a description of alternative service opportunities considered, is included in Appendix G (BARTA) and Appendix H (RRTA).

Alternative service proposals were vetted internally and a comprehensive set of proposed improvements were brought to the public in April 2018. Several ideas for new routes and demand response services were also proposed. Based on rider public and SCTA feedback, a final set of service improvements was developed.

Service Improvements

Based on the technical analysis and stakeholder input, the study team developed a recommended service scenario that includes several improvements to existing service as well as opportunities for new services and capital investments. This recommended scenario consists of three phases, to be implemented over the course of the next 10 years and depending upon resource availability. Phase 1 includes a set of "cost neutral" improvements that can be implemented in the near term within the current operating budgets of BARTA and RRTA, focused on streamlining and improving existing routes and modest increases in service. Phase 2 includes additional service enhancements, focusing in increased service spans. Phase 3 represents long-term recommendations that build on the first two phases, including significant service increases and new service expansions, and can be implemented as resources become available.

The recommendations included in the recommended service scenario make several improvements that address the major issues and opportunities identified during the study process:

- **Streamlined Service:** Several routes that currently operate circuitous or indirect alignments would be redesigned to provide more direct, streamlined service. Some deviations to stops that generate few or no riders would be discontinued to ensure that service is faster and more reliable for existing riders. These changes would also make it easier to understand which corridors and destinations are served by each route, making transit service more attractive and easy to use for both current and potential riders.
- **Simplified Service:** Routes that currently operate multiple service patterns or serve different alignments on different trips make service confusing and inconvenient for riders. Recommended improvements would address this by making routes simpler, serving consistent alignments with predictable service patterns.

- **Improved Level of Service:** Several routes in both systems would have improved levels of service, including increased frequency during the day, later service hours into the evening, and the introduction or expansion of Saturday and Sunday service.
- **New Routes:** New crosstown service opportunities were identified in Reading and Lancaster. Express/limited-stop routes would also be introduced in both Berks and Lancaster Counties, and a new intercountry Reading-Lancaster Express route would provide connections between Reading, Lancaster, and employment opportunities in northern Lancaster County.
- **Transit Corridors:** On several key corridors in Reading and Lancaster, coordinated schedules among multiple routes serving the same corridor would result in very frequent transit service along these major corridors. Over the long-term, these corridors will provide a focus for transit-supportive capital investments, which could include transit priority treatments, dedicated bus lanes, stop consolidation, and enhanced passenger amenities. These capital investments would complement high-frequency transit service and reinforce the image of each corridor as an enhanced transit corridor.
- **Transfer Centers:** The designation of transfer centers at key destinations would provide more convenient connections between routes outside of downtown, especially for riders making crosstown trips. These transfer centers would have enhanced passenger facilities including shelters, benches, real-time arrival signage, and other amenities.
- **Park-and-Rides:** New park-and-ride facilities would expand the availability of service to commuter markets father outside of core urban areas. Park-and-rides could be sited at existing lots, such as through leases or other agreements with existing businesses or institutions, or at new facilities as warranted.
- **Demand-Response Zones:** New on-demand services are increasingly becoming part of public transit networks, particularly for serving times and places with lower demand. Where demand would not ordinarily justify a fixed-route service, including many outer areas of Berks and Lancaster Counties, modern on-demand services can serve these areas and connect people with the fixed-route network, in a more efficient or convenient manner than was available before recent technology innovations.

Phase-by-phase improvements for each route, including alignment, frequency, and service span changes, are detailed in the Implemented Plan presented in Chapter 5. However, Phase 1 will generally focus on redesigned route alignments, while increased frequency on many routes will be introduced in Phase 2, and increased spans of service will be included in Phase 3.

Maps presenting the complete recommended service scenario are shown below for Reading (Figure 2), Berks County (Figure 3), Lancaster (Figure 4), and Lancaster County (Figure 5).

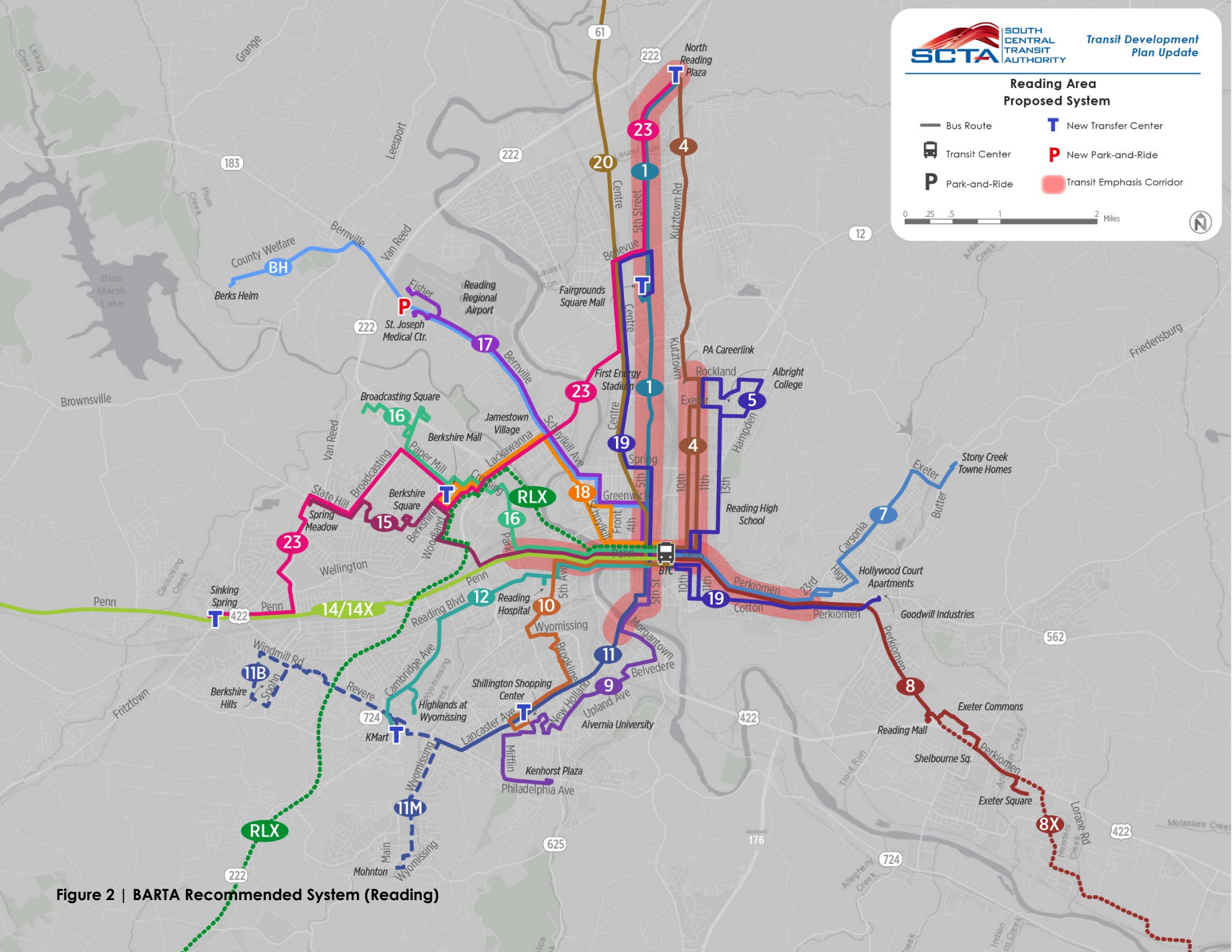


Figure 2 | BARTA Recommended System (Reading)

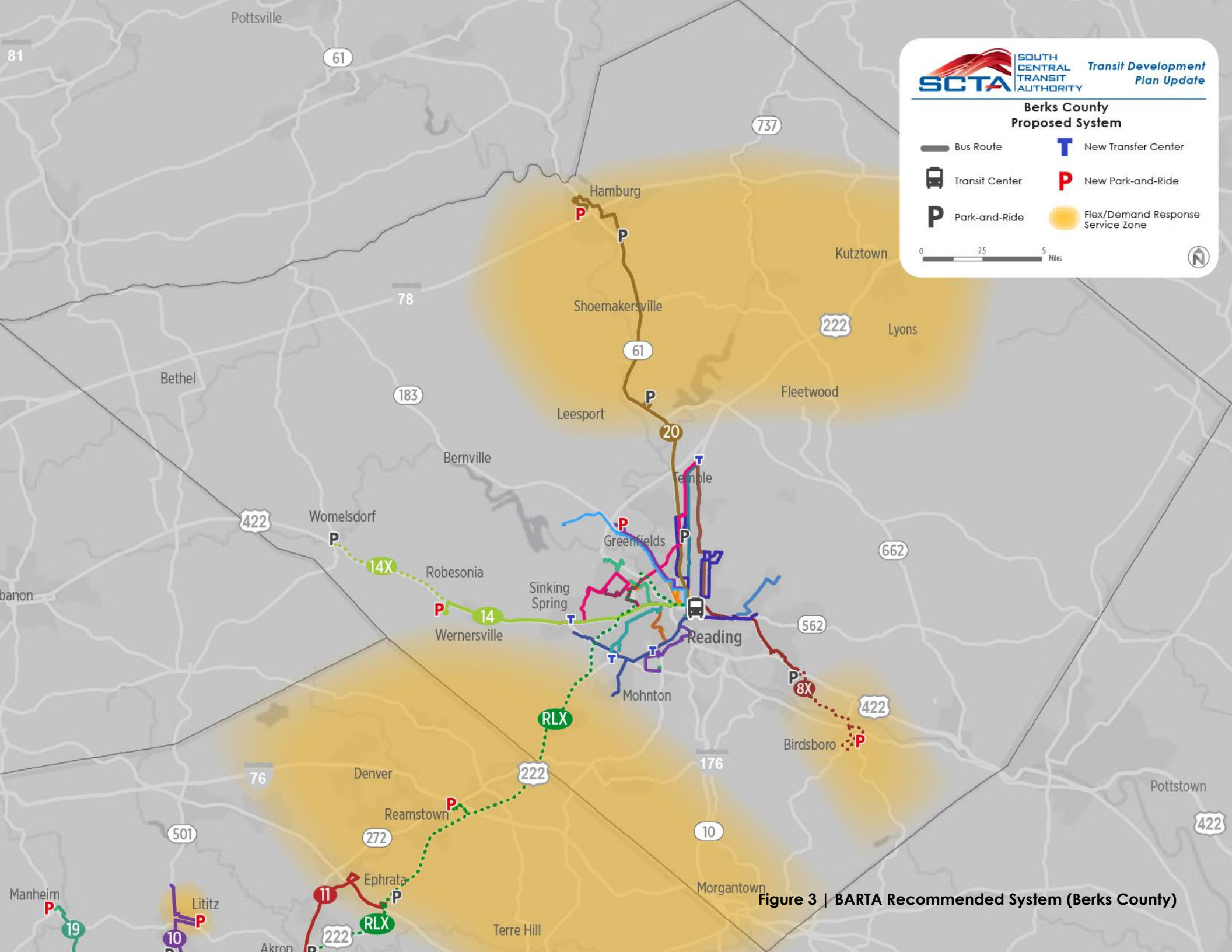


Figure 3 | BARTA Recommended System (Berks County)

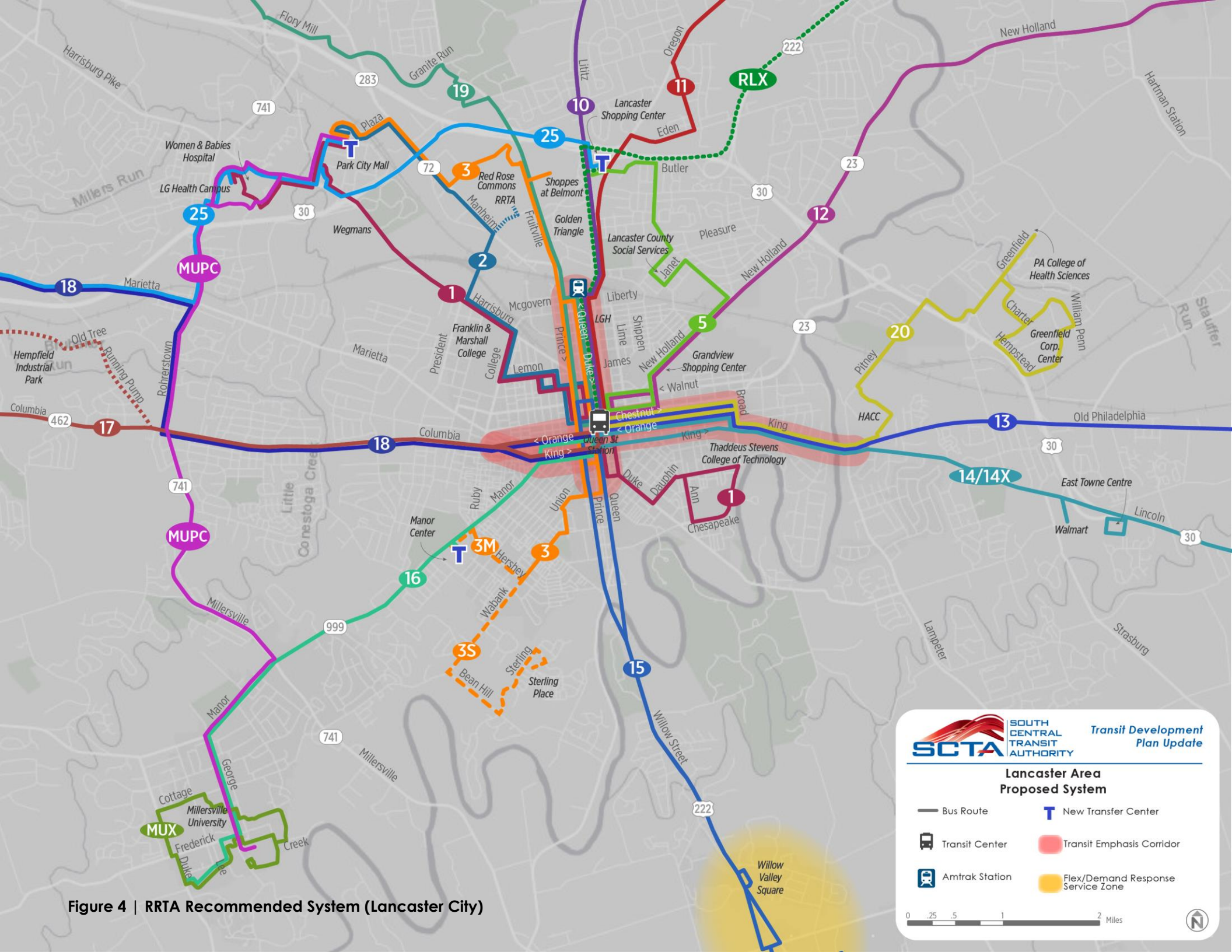


Figure 4 | RRTA Recommended System (Lancaster City)

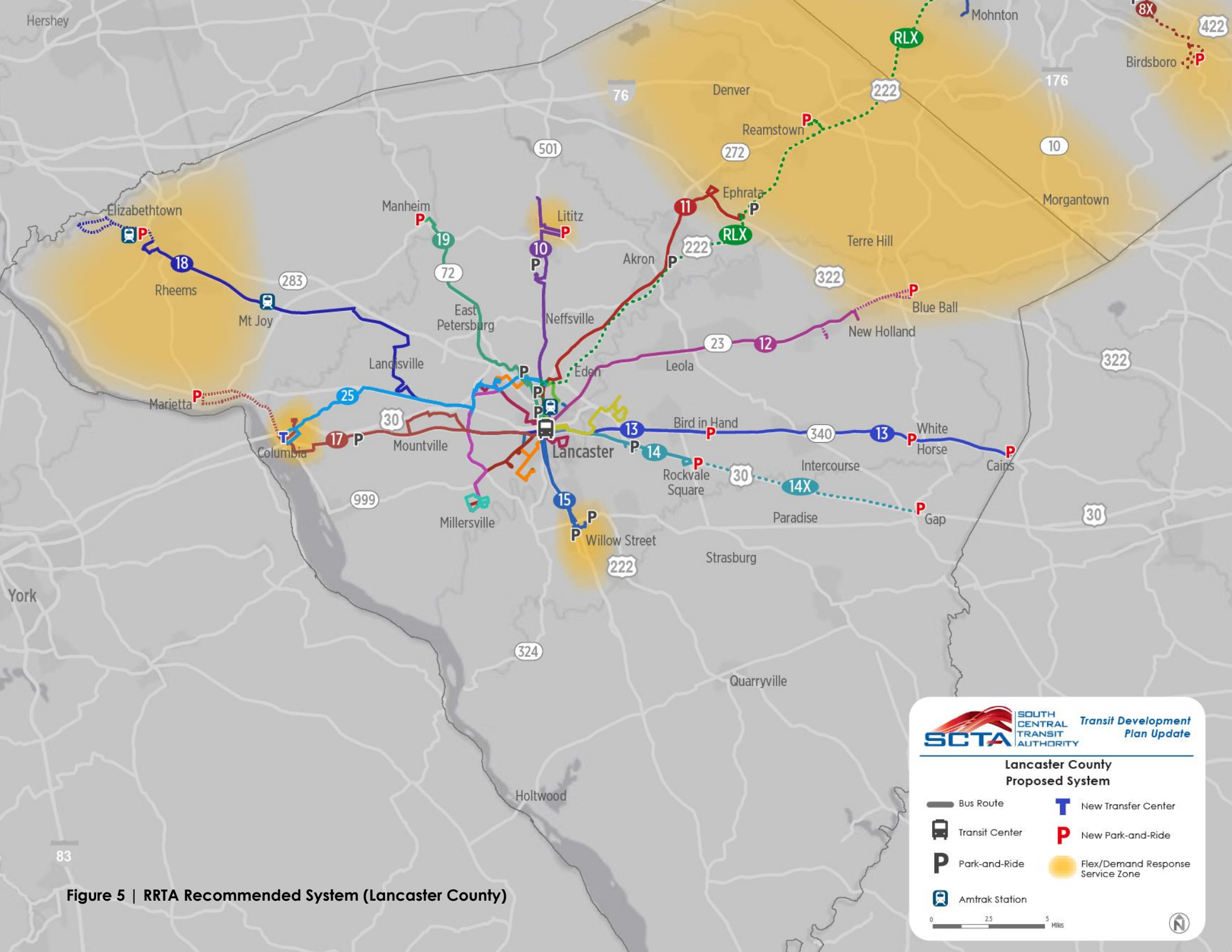


Figure 5 | RRTA Recommended System (Lancaster County)

Capital Investments

In addition to service improvements, there are many opportunities for capital investments that support transit service and make it more attractive to existing and potential riders. These include:

- **Transfer Centers:** In Reading and Lancaster, as in many older cities, the road network – and as a result, the transit system – is radially oriented around downtown. This makes many crosstown trips very long and complicated by forcing riders to travel into downtown in order to transfer to another route and complete their trip. Smaller transfer centers outside of downtown can provide an opportunity to make crosstown trips more convenient by not forcing riders to travel into and back out of downtown to make a crosstown trip. Passenger amenities at these facilities would include seating, shelters, system maps and information, lighting, wayfinding, and real-time arrival signs.
- **Bus Stop Improvements:** Waiting for the bus is a significant part of nearly every transit trip. Well-designed bus stops enhance the transit experience, decrease perceived wait times for transit services, and can contribute to increased ridership. Conversely, poorly designed bus stops can decrease customer satisfaction, make transit less attractive to potential new customers, and make waiting at stops unsafe for riders. Investing in high quality bus stops is often a low-cost, high-reward strategy for transit agencies.
- **Bus Stop Spacing and Consolidation:** The spacing and placement of stops greatly impact transit travel times and reliability, as well as the types of facilities and amenities that can be provided. Most riders want service that balances convenience and speed, and the number and location of stops is a key component of determining that balance. Transit systems that have pursued stop consolidation generally report significant operational improvements. Most agencies have seen increases in service reliability and several have been able to decrease scheduled running times on affected routes. SCTA's family of services is tailored toward serving different types of trips and needs, and therefore different types of fixed-route services would have different stop spacing guidelines.
- **Park-and-Rides:** Park-and-ride facilities expand the catchment area of transit, especially in outer areas with lower densities where fewer people may live within walking distance of a stop. This is especially true in Lancaster County, where RRTA operates several county/regional routes that travel long distances to and from downtown Lancaster. There are park-and-rides served by each system today, and the addition of new park-and-rides would increase access to existing service and potentially make it more attractive to new riders. The TDP recommendations include several locations/communities for new potential park-and-rides to expand access and capitalize on existing service.
- **Public Information:** For people to be able to use transit, they must first know that it is there and be able to understand how to use it. This means that it is extremely important for transit systems to provide clear and concise information on their available services. Since different people access, use, and process information in different ways, transit systems must deliver information in a number of different ways. The top recommendations for improving public information for BARTA and RRTA include revising route maps and schedules in the ride guides, improving and updating system maps, and publishing General Transit Feed Service (GTFS) data through Google Transit.
- **Transit Technology:** The transit industry, like nearly every sector of the economy, has increasingly employed new technologies to improve service, management, and operations. Innovations in transit technology offer multiple benefits to operating agencies in terms of service planning, operating efficiency, and customer experience of transit.

Nearly every facet of the transit industry benefits considerably from the use of advanced technologies, and several opportunities exist for BARTA and RRTA to adopt new technologies to improve service, streamline operations, and enhance the passenger experience. These include installation of automated passenger counters (APCs) on vehicles, participating in Google Transit, expanding the publication of real-time information, and adopting new fare payment technologies.

2 EXISTING SERVICE

Overview

The South Central Transit Authority (SCTA) administers and oversees two transit agencies, Berks Area Regional Transit Authority (BARTA) and Red Rose Transit Authority (RRTA) service. SCTA was introduced as the administering authority for the two agencies in 2014, although the agencies continue to operate as two independent transit systems.

BARTA provides fixed-route and demand-response transit services in Berks County, with most fixed routes operating local service focused in and around the City of Reading. Existing BARTA service in Reading and Berks County is shown in Figure 7 and Figure 8. RRTA provides fixed-route and demand-response transit services in Lancaster County, with most fixed-route service oriented toward the City of Lancaster. Existing RRTA service in the City of Lancaster and Lancaster County is shown in Figure 9 and Figure 10.

Figure 6 | Existing BARTA and RRTA Routes

BARTA	
1	Temple via 5th St
2	Fairgrounds Square Market
3	Temple via Kutztown Road
4	10th/11th Street
5	Albright College
7	Pennside
8	Reifftown / Shelbourne Square / Birdsboro
9	Grill via Kenhorst
10	Brookline
11	Mohnton via Shillington
12	Lincoln Park via Reading Hospital
14	Wernersville via Sinking Spring
15	Berkshire Mall
16	Broadcasting Square
17	Glenside / Airport / Berks Heim
18	Schuylkill Avenue
19	Riverside / First Energy / Cotton Street
20	Route 61 / Hamburg
22	Lyon Station / East Penn-Deka

RRTA	
1	Park City A - Southeast
2	Park City B - 6th Ward
3	Park City C - 8th Ward
5	Grandview / Rossmere
10	Lititz
11	Ephrata
12	New Holland
13	White Horse
14	Rockvale Square
15	Willow Street
16	Millersville
17	Columbia
18	Elizabethtown
19	Manheim
20	Greenfield
21	Gap
-	Historic Downtown Trolley
-	MU Park City Xpress
-	MU Xpress

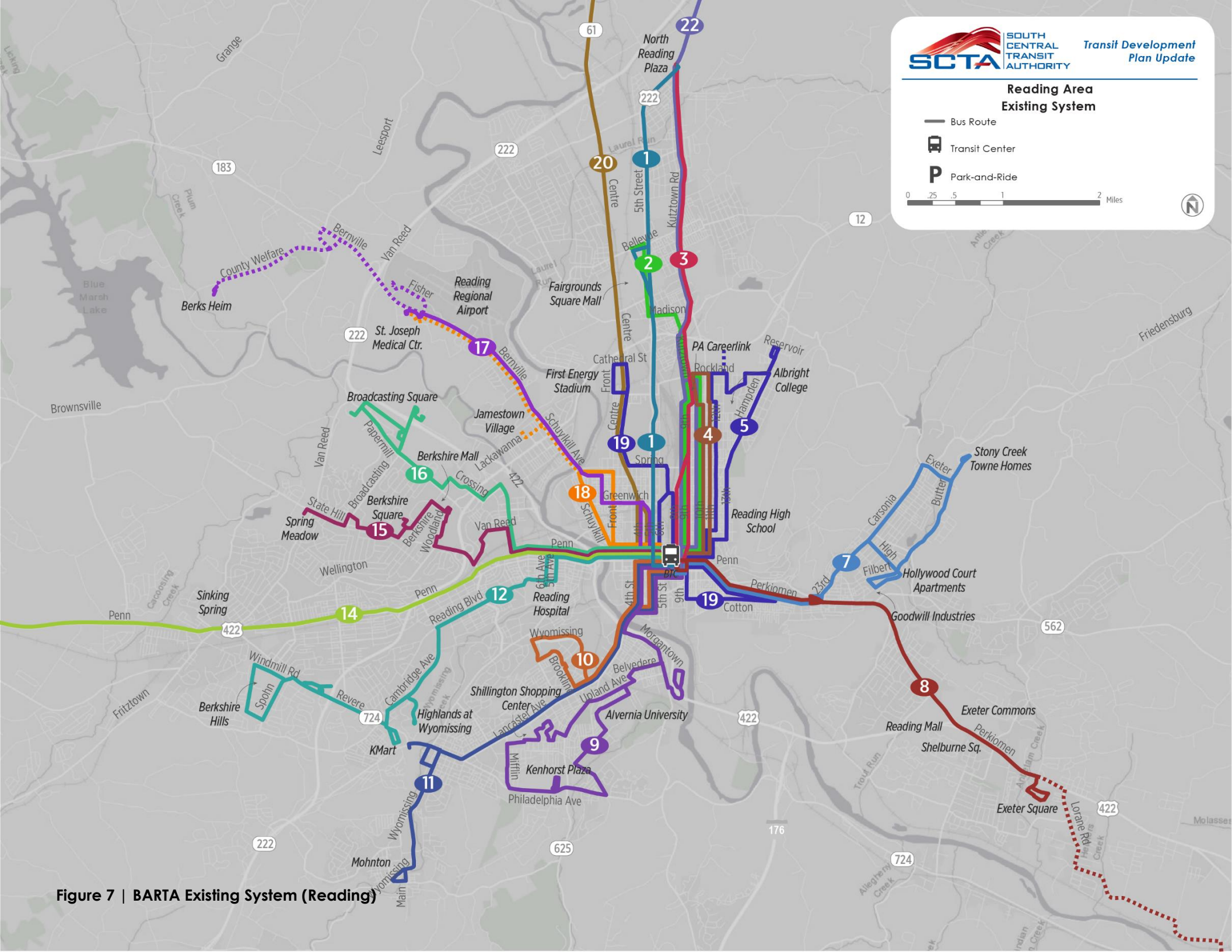


Figure 7 | BARTA Existing System (Reading)

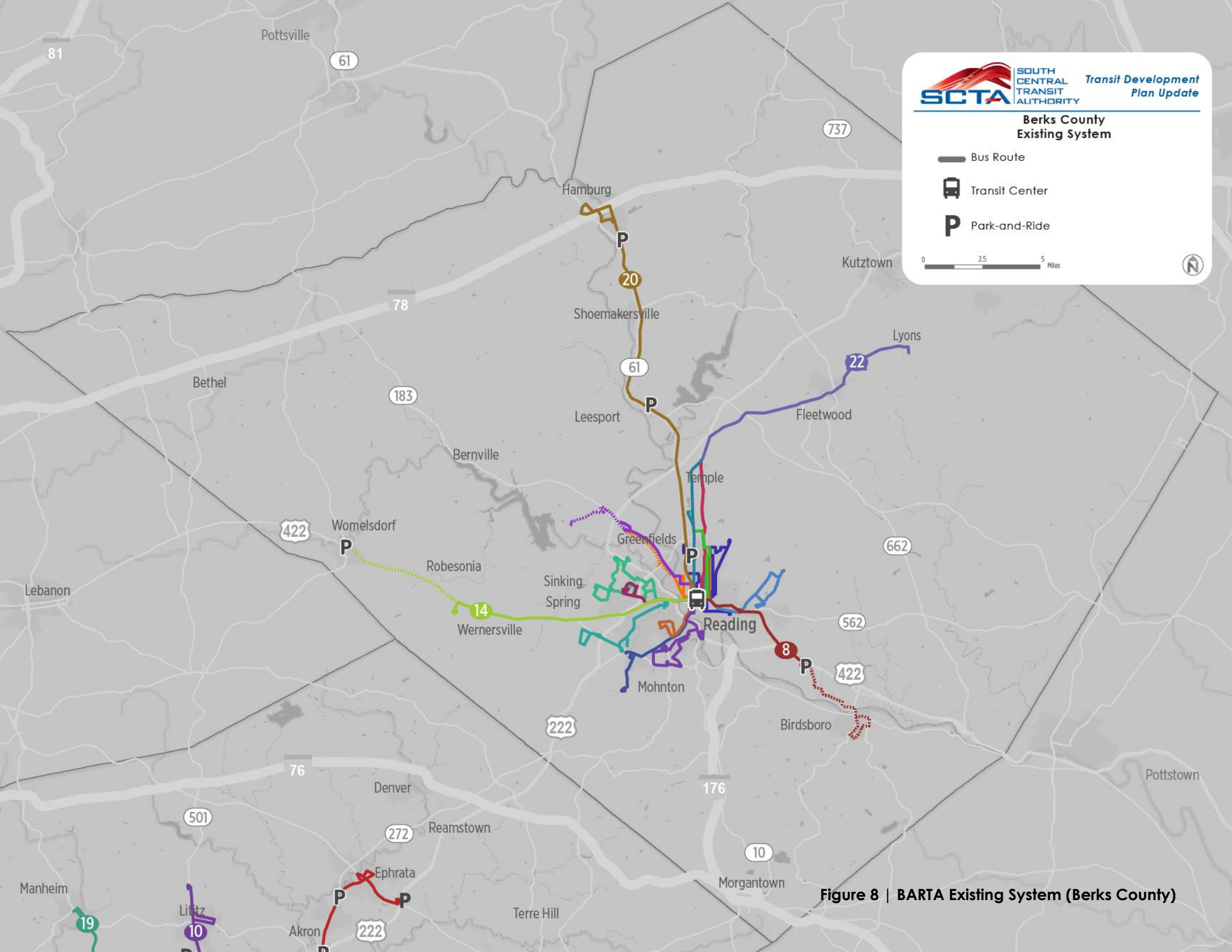


Figure 8 | BARTA Existing System (Berks County)

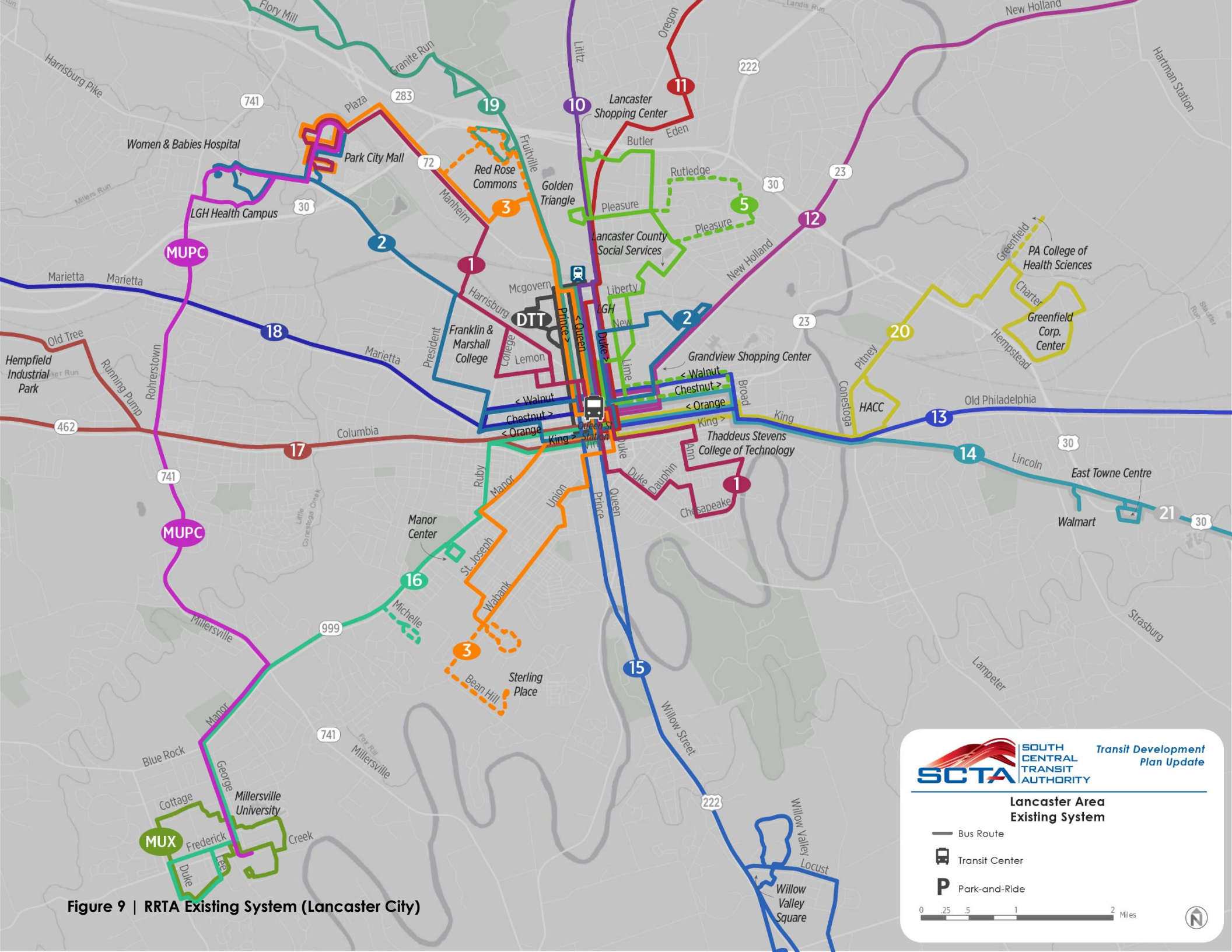


Figure 9 | RRTA Existing System (Lancaster City)

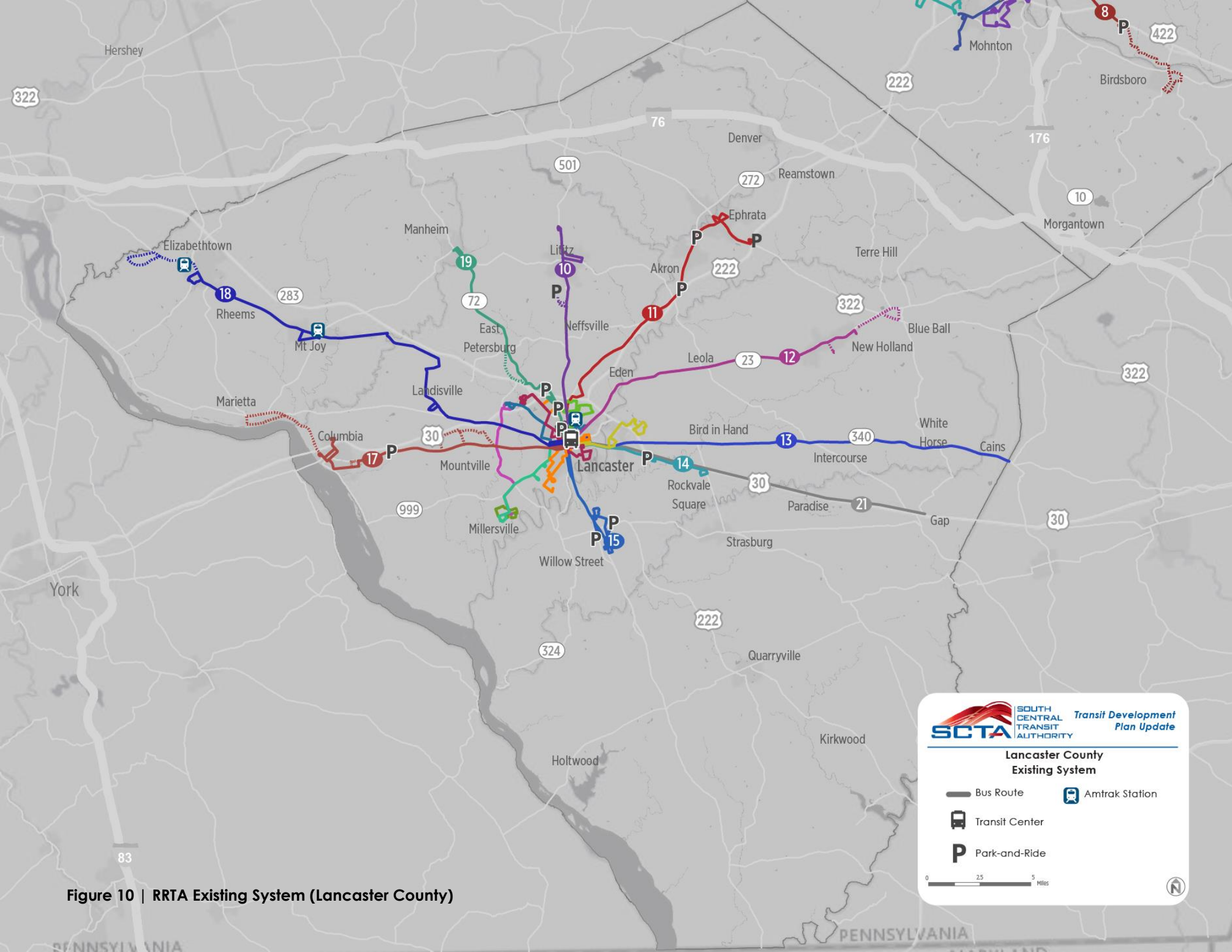


Figure 10 | RRTA Existing System (Lancaster County)

Service Analysis

The effectiveness of transit service can be judged both quantitatively and qualitatively. Service measures such as ridership and productivity are key indicators of service performance and are often a function of service qualities like frequency, span of service, and service reliability. These qualities contribute to the appeal of a transit service. Average weekday ridership is presented below for both BARTA (Figure 11) and RRTA (Figure 13).

BARTA and RRTA aim to use their resources effectively. Ridership trends are a good indicator of system performance, but to evaluate overall productivity it is also critical to understand how efficiently each route generates ridership. One key measure of productivity is Passengers per Revenue Vehicle Hour, which calculates the ratio of ridership to the amount of service provided (i.e. revenue hours of service). Service effectiveness for BARTA and RRTA routes are shown in Figure 12 and Figure 14.

Figure 11 | BARTA Average Weekday Ridership by Route

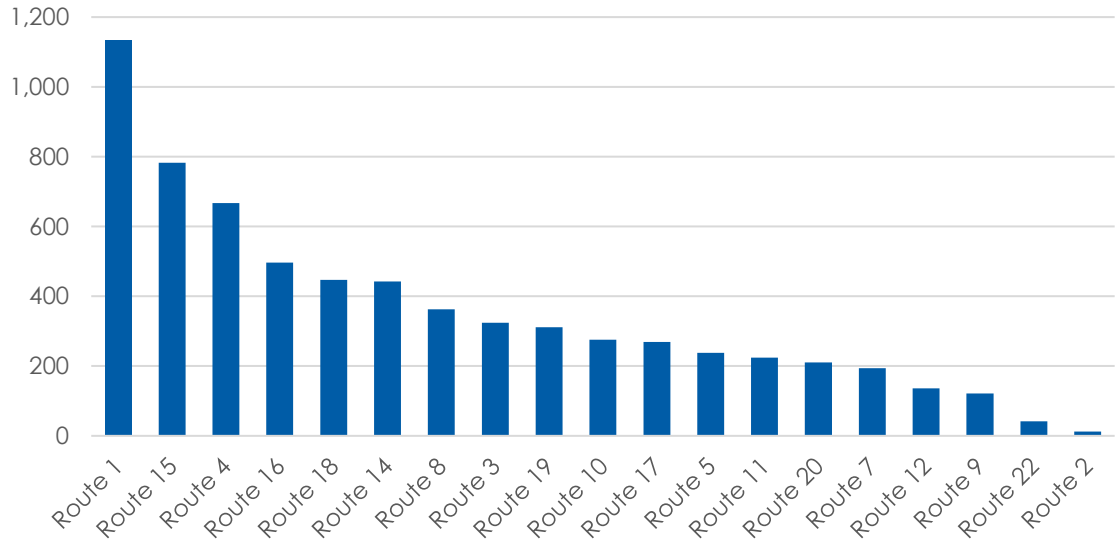
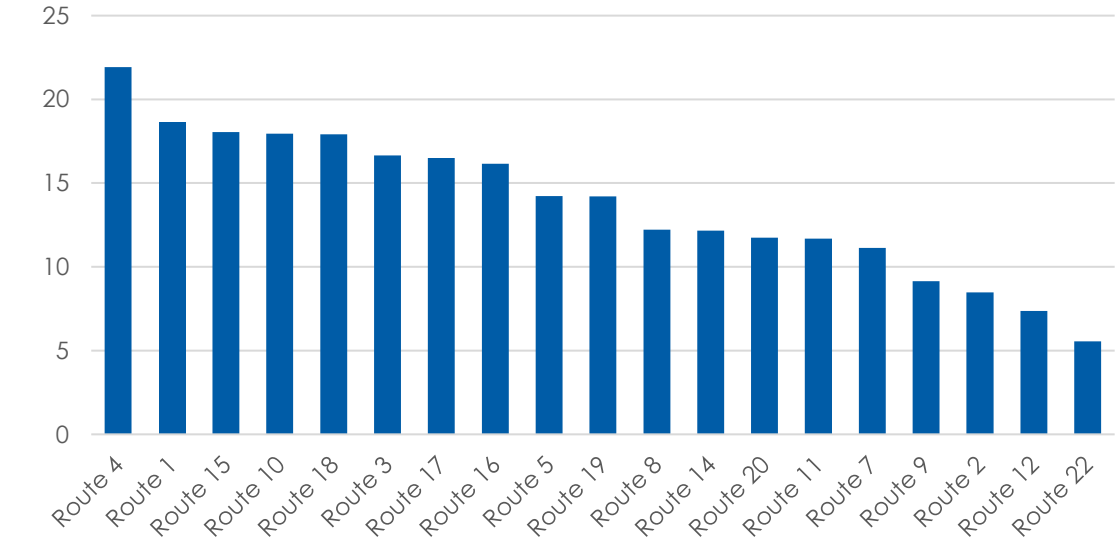


Figure 12 | BARTA Average Weekday Ridership per Revenue Hour by Route



For each route operated by BARTA and RRTA, the study team developed a detailed route profile to assess both the quantitative and qualitative characteristics of each route. Each profile includes the following elements:

- An overview of the route, service type, and major markets served
- Service and operational characteristics, including frequency and span of service
- Ridership characteristics, including ridership by stop and ridership by trip
- Productivity and performance characteristics
- An initial list and descriptions of potential service improvements

At the conclusion of each route profile is a list of potential service improvement options for the route. The service improvement options are based on the technical findings of the route profiles (e.g., low ridership at a specific stop or high ridership demand on certain trips), as well as the set of guiding principles described in Chapter 4, Service Recommendations. The complete set of route profiles is included as Appendix G (BARTA) and Appendix H (RRTA) to this report.

Figure 13 | RRTA Average Daily Ridership by Route

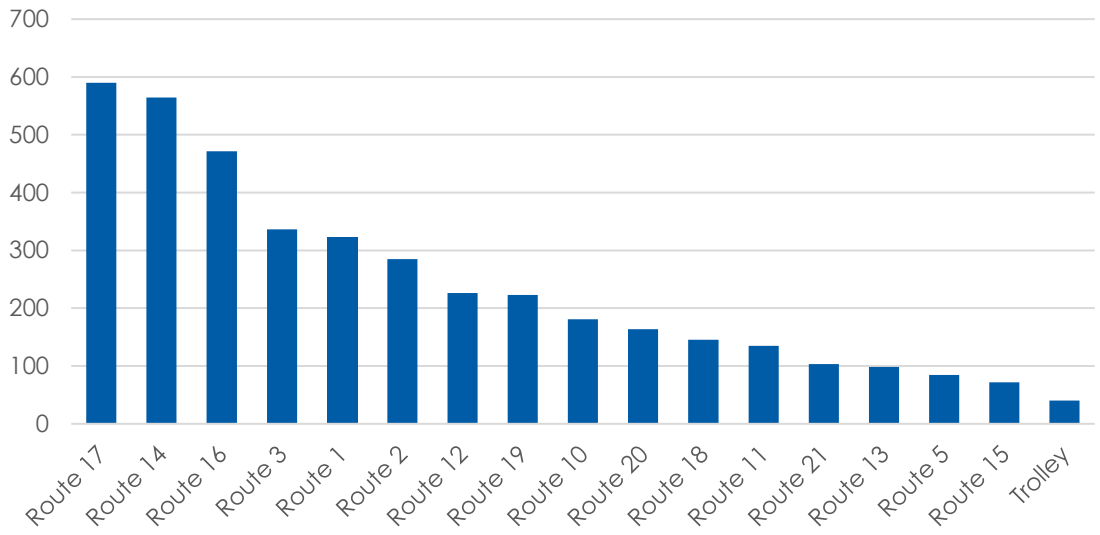
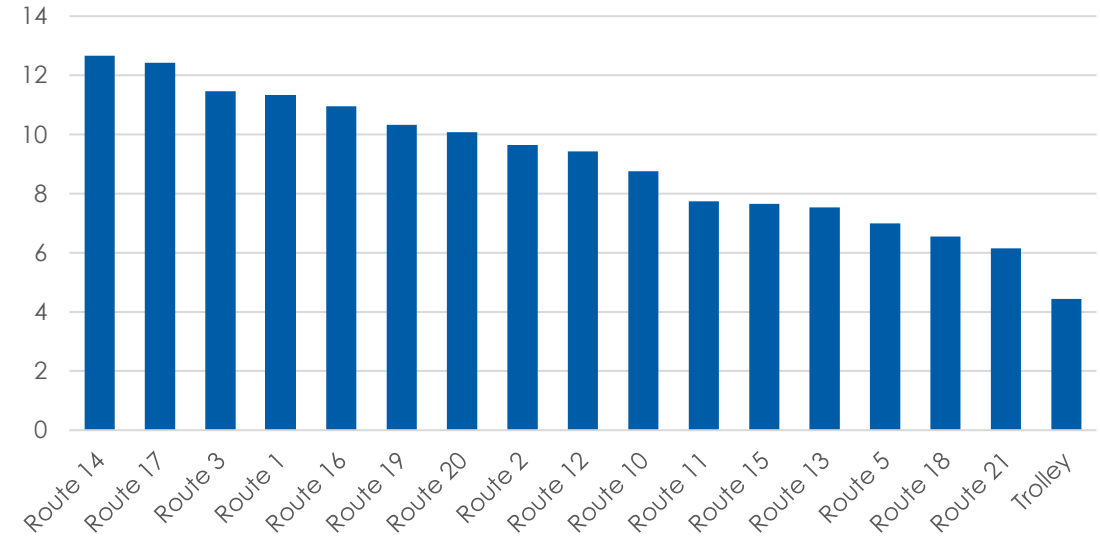


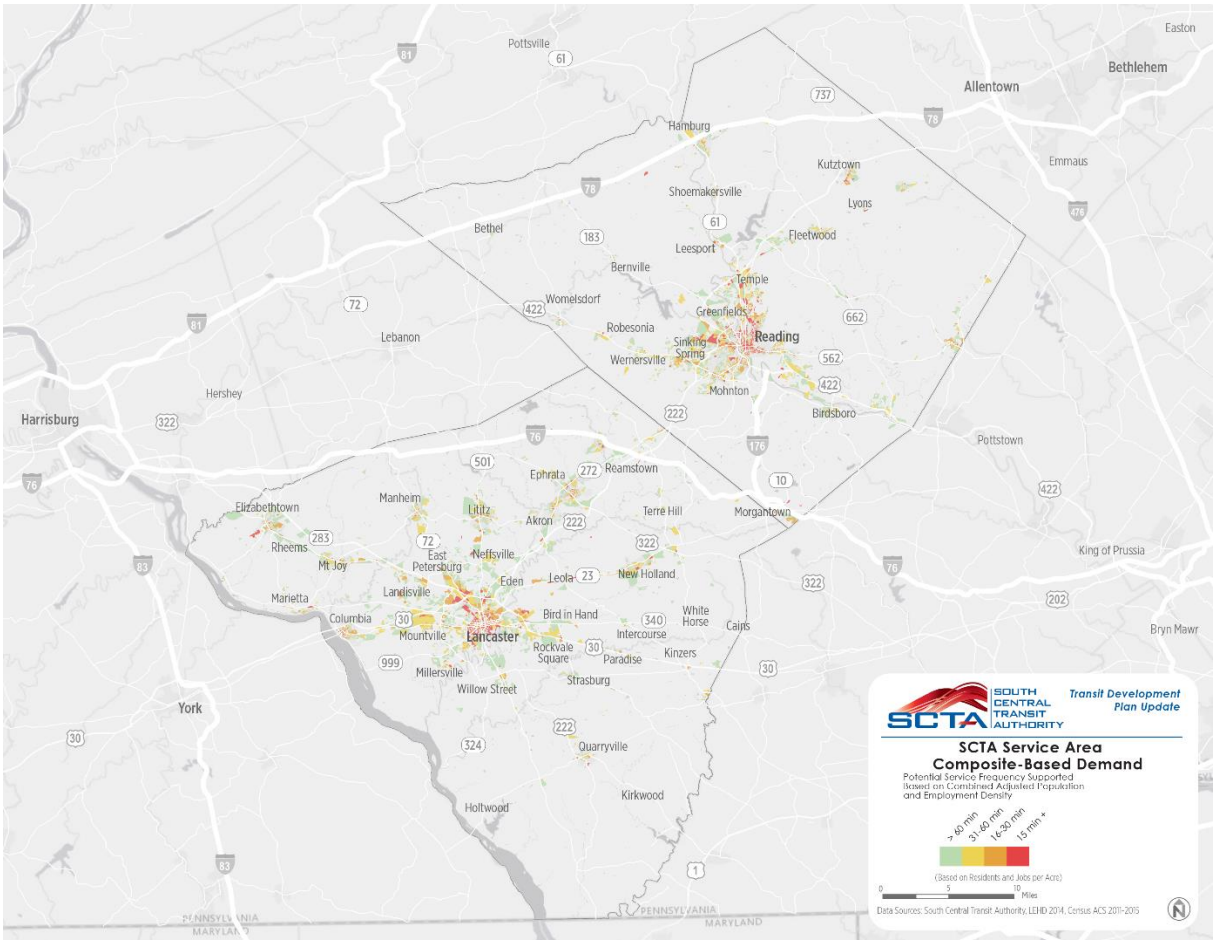
Figure 14 | RRTA Average Daily Ridership per Revenue Hour by Route



Community Assessment

To complement the analysis of existing service, a Community Assessment was conducted to analyze transit demand across SCTA's service area. The success of transit service is determined as much by the environment in which the service operates as by the design of the service itself. SCTA's service area includes Berks and Lancaster Counties, which together have nearly one million residents and over 400,000 jobs. The density of both people and jobs are fairly concentrated in the major urban areas of Reading and Lancaster, indicating a high underlying demand for transit service within these areas, while other areas of both counties are more rural with much lower densities that are more difficult to serve with transit.

Figure 15 | Composite Transit Demand, Berks County and Lancaster County



In both counties, population-based transit demand is highly focused in the core urban areas of Reading and Lancaster, with few other concentrations of demand. This is based on both population density and the location of groups with high propensity to use transit. In Berks County, there are some areas just outside of Reading, especially to the north, west, and southwest of the city, that indicate moderate population-based demand for transit. In contrast, population-based demand in Lancaster County falls off sharply outside the city boundaries of Lancaster.

Similarly, employment-based transit demand is concentrated in the core areas of Reading and Lancaster. There are also concentrations of employment along major corridors such as US Route 30 west of Lancaster, PA Route 72 northwest of Lancaster, US Route 222 north and south of Reading, and US 422 west of Reading.

The community assessment focused on factors that are strongly correlated with transit demand including population and job densities; major activity centers; socioeconomic characteristics; and regional travel flows. The Community Assessment report is included as Appendix A.

Public Outreach

Throughout the SCTA TDP, a high priority was to give the community an opportunity to participate. The project team provided as many opportunities to provide input and feedback, allowing people to share ideas and comments in whatever way was most convenient and comfortable for them. Through a variety of online and in-person activities, there were multiple ways for BARTA and RRTA bus riders and other community members to express their ideas and communicate their feedback. Summary reports of these efforts are provided in Appendices C through F.

Participation by the Numbers

- 4 Public Meetings
- 2 Agency Workshops
- 50 Stakeholder Interviews
- 159 Community Survey Responses
- 1,239 BARTA Onboard Surveys
- 783 RRTA Onboard Surveys
- 168 BARTA Special Service Surveys
- 203 RRTA Special Service Surveys
- 3 SCTA Board Presentations

Public Meetings: Four public meetings were held during the course of the study, with two each in Reading and Lancaster. The meetings were held from 4:00pm to 7:00pm and followed an open house format. Meeting attendees were given an opportunity to review presentation boards and provide input on existing and future SCTA services. Publicity for the meetings included a press release, letters and flyers sent to SCTA partners, and flyers posted on BARTA and RRTA buses (in both English and Spanish).

Surveys: During the course of the TDP riders, community members, and business leaders were engaged in the process through four survey efforts. An onboard survey was conducted to collect input from current fixed-route riders. Special Services riders in both counties were surveyed through a postage-paid mailing survey. An online community survey was hosted to engage the border community, including non-riders. An email survey was provided to Reading and Lancaster businesses though the local chamber of commerce.

Website and online engagement: The SCTA TDP website (www.sctapa.com/transit-development-plan-update) provided easy access to information about the study and its progress, and served as a convenient way for the community to share written feedback. Announcements about public events were announced and project materials were posted for download.

Stakeholder Interviews: A series of stakeholder interviews were conducted during the early phases of the study to better understand how members of the community perceive BARTA and RRTA service. Interviews were conducted with 50 key stakeholders and community leaders with knowledge and interest in BARTA or RRTA services.

Agency Workshops: Two focus group-style workshops were held with representatives of human service agencies and service providers to learn more about the transportation needs of their clients. One workshop was held in Reading to meet with service providers from across Berks County, whose clients use BARTA Special Services, and one workshop was held in Lancaster with representatives from across Lancaster County, whose clients use Red Rose Special Services.

SCTA Board Presentations: The SCTA Board received two presentations about the TDP effort. Board members were engaged for feedback and on existing and future SCTA services. The Board received a briefing on the overall planning effort and the final recommendations presented in this report.

Through the project team's public engagement efforts, five **key themes** were identified:

1. *Service does not operate late enough*
2. *There is not enough weekend service*
3. *Bus schedules are unreliable*
4. *Service information is hard to find and understand*
5. *Routes should be more direct*

These key themes were critical to shaping the development of the recommended service improvements for the BARTA and RRTA systems.

3 PREVIOUS STUDIES

These prior plans provide the background that will inform the public outreach process and will create the basis for service recommendations. While several of these recommendations have already been implemented in Berks and Lancaster Counties, many of the changes are still relevant to the needs of the community.

The following planning documents are included in this evaluation:

- Transit Development Plan: Phase I and II Final Report and Recommended Plan *(Berks Area Regional Transportation Authority)*
- Transit Development Plan Update: Executive Summary and Final Report *(Red Rose Transit Authority)*
- Reading Area Transportation Study: FFY 2017-2040 Long Range Transportation Plan *(Berks County Planning Commission)*
- Connections 2040: 2016 Update *(Lancaster County Transportation Coordinating Committee)*

Transit Development Plan: Phase I and II Final Report and Recommended Plan

Berks Area Regional Transportation Authority

Existing Service

In 2012 the Berks Area Regional Transportation Authority (BARTA) operated 21 distinct fixed-route bus lines within Berks County, all of which operated as a hub-and-spoke system focused on connecting Reading and adjacent communities. All routes with the exception of one crosstown (Route 6) operated through the BARTA Transportation Center (BTC) in downtown Reading. Of the 20 routes that served the BTC, all but one (Route 19) terminated at the BTC. BARTA services were primarily aligned in a north-south orientation, with 14 routes generally operated north-south compared to only seven that were generally aligned east-west.

Figure 16 | BARTA Routes in 2012

Route		
Route 1 - Temple	Route 8 - Reiffton/Birdsboro	Route 16 - Broadcasting Square
Route 2 - Fairgrounds Square	Route 9 - Grill Via Kenhorst	Route 17 - Glenside
Route 3 - Kutztown Road	Route 10 - Brookline	Route 18 - Schuylkill Avenue
Route 4 -10th & 11th Street	Route 11 - Mohnton Via Shillington	Route 19 - Riverside/Cotton St.
Route 5 - Albright College	Route 12 - Lincoln Park Via Reading Hosp.	Route 20 - Hamburg
Route 6- Crosstown	Route 14 - Wernersville	Route 21 - Morgantown
Route 7 - Pennside	Route 15 - Berkshire Mall	Route 22 - East Penn

Many BARTA routes ran 30-minute frequencies or better during the AM and PM peak periods on weekdays, with some maintaining this frequency of service throughout the day, and others operating every 60 minutes during the off-peak hours. A few routes operated every 45-60 minutes or more during peak hours, and some as infrequently as every 90 minutes duringon off-peak hours. A few regional/express routes ran only sporadic trips during the day. Saturday service levels were generally similar in frequency to weekday off-peak service. No Sunday service was provided at the time.

Service Recommendations

Existing Routes

Most of the existing routes in the BARTA system (13 of the 21 routes) received a recommendation to change route alignment, service characteristics, or both (see Figure 1). Notable recommended changes included the following:

- Route 12: Split into two routes with separate service characteristics
- Routes 15: Convert into an express service, redesign Route 16 to serve the former local stops of Route 15, and introduce a new shuttle to serve the commercial areas
- Route 19: Shorten the alignment by removing the portion of the route east of the BTC

Figure 17 | Alignment and Service Change Recommendations for Existing BARTA Routes

Route	Alignment Changes	Service Changes
Route 2 - Fairgrounds Square	▪ None	▪ Add additional morning and afternoon trips ▪ Add additional weekdays, if needed
Route 3 - Kutztown Road	▪ Extend route to the Fairgrounds Square Mall and the North Reading Plaza/Walmart	▪ None
Route 5 - Albright College	▪ Minor realignments to bypass most of Hampden Blvd, and removing service from Reservoir Rd.	▪ Later evening hours
Route 6 - Crosstown	▪ Minor realignments to provide service on Hampden Blvd between Spring St and Reservoir Rd.	▪ Increase the span and frequency of service
Route 7 - Pennside	▪ Operate bi-directionally on Cotton Street, between 10th Street and 19th Street	▪ Operate at 60 minute headway all day on weekdays
Route 9 - Grill Via Kenhorst	▪ Realign several of the sections of the route to offer better service to users	▪ Eliminate service from disenfranchised stops
Route 11 - Mohnton Via Shillington	▪ Extend route to the Kmart off of Revere Boulevard ▪ Increase the footprint in Mohnton to serve more people	▪ Operate at 60 minute headway all day on weekdays

Route	Alignment Changes	Service Changes
Route 12 - Lincoln Park Via Reading Hospital	▪ Split into two routes: ▪ One serving Lincoln Park on a limited basis (with same alignment as current route) ▪ One serving Penn Street, the BTC, Reading Hospital, Berkshire Heights and the Berkshire Mall (with altered alignment)	▪ Lincoln Park route: Same span as current with 180 minute headway ▪ New route: 5:30am-6:30pm span (6:30am-6:30pm on Saturdays) with 60min headway
Route 14 - Wernersville	▪ None, but a new express service between Reading and Lebanon is recommended	▪ None
Route 15 - Berkshire Mall **Route 16 - Broadcasting Square**	▪ Route 15: Create an express service to the Broadcasting Square and Berkshire Mall area ▪ Route 16: Create the local route option to the Berkshire Mall and Broadcasting Square area ▪ Keep current alignment Downtown, then extend to Berkshire Mall, Berkshire Square, and Broadcasting Square ▪ Create a new shuttle route to provide continual service to commercial areas	▪ Route 15: New express service, Mon-Sat, 10am-8pm with 45min headway ▪ Route 16: same as current, except service to Berks Campus would not be offered after the 515pm trip from the BTC ▪ New shuttle service: 5:30am-6:30pm span (8am-8pm on Saturdays) with 30min headway
Route 19 - Riverside/ Cotton St.	▪ Truncate route to operate only between the BTC and Tuckerton	▪ 5:30am-7pm span (6:30am-6:30pm on Saturdays) with 30min peak headways and 60min off-peak (and Saturday) headways
Route 20 - Hamburg	▪ None	▪ Adjust frequency in order to better meet potential demand

Proposed Routes

In addition to the alignment and service adjustments listed above, the plan recommended adding four new routes to the BARTA network. Recommended new routes included:

- BTC to Kenhorst Plaza via Berkshire Mall
- BTC to Fairgrounds Square Mall via Berkshire Mall
- BTC to Kutztown
- BTC to Boyertown

Other Recommendations

Recommendations included greater consideration for services that facilitate transfers to other regional fixed-route service providers, such as the Schuylkill Transportation System in nearby Schuylkill County.

The addition of Sunday service was also explored based on Saturday/weekday ridership and farebox recovery value. Routes 1, 4, 8, 10, 15, 16, and 18 were deemed worthy of Sunday service based on the evaluation criteria, and Routes 2, 3, 5, 14, 17, and 19 deemed potentially worthy. However, it was determined that the costs of adding Sunday services would be better spent on expanding existing services and exploring new markets.

Transit Development Plan Update: Executive Summary and Final Report

Red Rose Transit Authority

Existing Service

At the time of the Transit Development Plan Update, RRTA operated a hub-and-spoke service from Queen Street Station, Lancaster's downtown transit center. The system consisted of 19 fixed routes, which operated from approximately 5 a.m. to 11 p.m., Monday through Friday, with limited Saturday and Sunday service on select routes.

Figure 18 | RRTA Routes

Service Area/Type	Route	Service Area/Type	Route
Lancaster City	Route 1 – Park City/Southeast	Lancaster County	Route 10 – Lititz
	Route 2 – Park City B/6th Ward		Route 11 – Ephrata
	Route 3 – Park City C/8th Ward		Route 12 – New Holland
	Route 4 – Elm Avenue/Parkside		Route 13 – White Horse
	Route 5 – Grandview/Rossmere		Route 14 – Rockvale Square
	Trolley		Route 15 – Millersville
Circulator/Shuttle	MXU Xpress		Route 16 – Willow Street
	MU Park City Xpress		Route 17 – Columbia
Metro Region	Route 20 – Greenfield		Route 18 – Elizabethtown
			Route 19 – Manheim

Existing services were analyzed and scored based on passengers per hour, revenues to expense, subsidy per passenger, and subsidy per passenger mile. Based on these criteria, routes 4, 18, 15, 6, 13, and 5 were determined to be the worst performing.

Recommended Service Alternatives

Alternatives were developed to be achieved over a 10-year time span, and were phased into short-term and long-term projects. The short-term (1-5 year) alternatives were developed to maximize service efficiency and productivity using existing resources to allow for expeditious implementation. Short-term alternatives included:

- Increase base revenue hours by 5%
- Eliminate Route 4 - Elm Avenue/Parkside
- Eliminate the Downtown Trolley
- Modify Route 15 - Willow Street to focuses on high activity commercial areas and employment opportunities
- Implement Elizabethtown Express Route
- Implement Gap Express Route
- Add Bus to Route 14 - Rockvale Square/Paradise
- Add Bus to Route 17 - Columbia

Long-term (6-10 year) alternatives were also developed, but are dependent upon future funding availability. The identified long-term alternatives included the following:

- Increased frequency of service
- Explore the North Lancaster Regional Route
- Explore a Downtown Shuttle service
- Begin implementation of Rapid Transit planning
- Implement the Regional Harrisburg/Lancaster service
- Implement the Columbia Local service
- Increase service on Saturdays
- Implement regional service to Denver Borough

Fare Structure Recommendations

The following recommendations were developed to simplify RRTA's fare structure, maintain similar levels of farebox revenue, and account for increases in future operating costs:

- The current zone system should be eliminated and replaced with two base fares:
  - City routes: Base fare of $1.70 per one-way trip for years 1-3, $1.75 in years 4-10
  - County routes: Base fare of $2.50 per one-way trip in years 1-3, $2.75 in years 4-10
- Free transfers valid for two hours, requiring a ticket
- Discounted all-day and 31-day passes remain available

Reading Area Transportation Study: FFY 2017-2040 Long Range Transportation Plan

Berks County Planning Commission

BARTA Ridership Characteristics

Between 2010 and 2015, ridership on BARTA routes increased but 4%, bolstered by an 8.4% growth in fare-paying riders over that time span. However, the numbers of both senior citizen riders and medical assistance riders have dropped significantly over that time span, with senior citizen ridership decreasing 10.7% and medical assistance ridership decreasing 32%. The highest ridership route was Route 1 - Temple, which serves 5th Street between Reading and Muhlenberg Township.

Figure 19 | BARTA Fixed-Route Ridership

Customer Type	2010	2011	2012	2013	2014	2015	Change	
							#	%
Fare-paying	2,259,607	2,425,463	2,496,962	2,507,398	2,562,745	2,449,131	189,524	8.4
Senior Citizens	462,628	452,387	469,391	465,485	455,012	413,238	-49,390	-10.7
Transfer	122,270	125,743	133,886	132,375	135,101	128,859	6,589	5.4
Other-MATP (Medical Assistance)	64,258	64,258	52,577	40,641	44,763	43,724	-20,534	-32
Total Passengers	**2,908,763**	**3,067,851**	**3,152,816**	**3,145,899**	**3,197,621**	**3,034,952**	**126,189**	**4.3**

Figure 20 | BARTA Routes by Ridership 2014-2015

Route	Ridership	Route	Ridership
Route 1 – Temple	470,604	Route 11 - Mohnton Via Shillington	109,517
Route 4 -10th & 11th Street	354,891	Route 20 - Hamburg	93,407
Route 16 - Broadcasting Square	321,153	Route 7 - Pennside	89,995
Route 15 - Berkshire Mall	236,105	Route 5 - Albright College	88,522
Route 14 - Wernersville	230,105	Route 12 - Lincoln Park Via Reading Hospital	64,354
Route 18 - Schuylkill Avenue	198,907	Route 9 - Grill Via Kenhorst	52,090
Route 10 - Brookline	149,860	Route 22 - East Penn	24,703
Route 19 - Riverside/Cotton St.	142,825	Route 6 - Crosstown	10,125
Route 8 - Reiffton/Birdsboro	132,566	Route 2 - Fairgrounds Square	5,967
Route 3 - Kutztown Road	128,591	Route 21 - Morgantown	5,632
Route 17 - Glenside	120,905		

Transit Recommendations

There were no specific service recommendations in the plan. Transit recommendations consist of vehicle procurement targets based on a general target of replacing transit buses on a 12-year cycle, and replacing paratransit vans on a five-year cycle.

Figure 21 | Vehicle Procurement Targets

Short Range	Mid-Range	Long Range
Purchase of 25 Transit Buses	Purchase of 40 Transit Buses	Purchase of 72 Transit Buses
Purchase of 2 Paratransit Vans	Purchase of 82 Paratransit Vans	Purchase of 118 Paratransit Vans

Connections 2040: 2016 Update

Lancaster County Transportation Coordinating Committee

RRTA Ridership Characteristics

RRTA carried 2.3 million passenger trips in the 2005 fiscal year. However, by 2014, RRTA's ridership had decreased to about 2.2 million trips. In 2014, there were 1.89 million trips taken on fixed-route services and 300,833 trips taken on Red Rose Access, RRTA's paratransit service. Both of these figures were notably lower than the levels seen in 2012.

Figure 22 | RRTA Ridership FY 2012 – FY 2014

Fiscal Year	Fixed Route	Red Rose Access	Total Ridership
2012	1,924,770	335,732	2,260,502
2013	1,886,115	311,467	2,197,582
2014	1,887,846	300,833	2,188,679

Goals and Objectives

Each of the planning documents included in this evaluation also included a robust set of goals and objectives for transit, and sometimes other transportation or development related issues, within their respective spheres of jurisdiction and influence, with some further presenting strategies and performance measures for each goal or objective. These goals, objectives, and supporting strategies and performance metrics, as shown in the sections that follow, can be used to formulate relevant area-wide goals and objectives for the South Central Transit Authority (SCTA) Transit Development Plan (TDP) Update.

Figure 23 | TDP: Phase I&II – Goals and Objectives

Goals	Objectives
Rationalize Existing Service	▪ Identify poorly performing routes and route segments and further examine for potential elimination or service reduction ▪ Retiming of current routes to improve the on-time performance
Improve Existing and Create New Connection Opportunities	▪ Plans to address particular travel patterns should incorporate the needs of as many travel pattern options as possible ▪ Routes that do not operate to the BTC should be explored to make it possible to transfer between services at more locations than just the BTC
Improve Access to Reading from Outlying Areas	▪ Plans to address particular travel patterns should incorporate the needs of as many travel pattern options as possible ▪ Routes that do not operate to the BTC should be explored to make it possible to transfer between services at more locations than just the BTC
Directness	▪ A balance needs to be achieved between attracting riders and not discouraging new riders because of lengthy travel times due to circuitous routing
Coverage	▪ Bus routes should attempt to maximize penetration within communities in Berks County that appear to warrant bus service ▪ Proposals should try and serve the same streets and corridors, although there may be changes in route alignments
Support Local Development/ Redevelopment Plans	▪ Participating in identified development and redevelopment priorities earlier rather than later presents opportunities for partnering with local communities or private sector entities to improve or add new access via public transit
Supply and Demand Balance	▪ Transit resources should be allocated to where there are current riders or the potential to attract new riders
Identify any Potential New Transit Center Locations	▪ An additional transit hub that could support new transfer movements at a location outside of the central business district will allow some passengers to complete their trip without traveling into the city

Figure 24 | TDP Update – Goals and Objectives

Goal	Objectives
Safety and Security	▪ Integrate safety and security elements into the transit system to reduce risk and enhance emergency procedures ▪ Deter and detect criminal and terrorist activity
Public Outreach	▪ Develop partnerships
Financial	▪ Maintain and enhance fiscal responsibility ▪ Provide a transportation system that is efficient, cost effective and affordable
Bus Service	▪ Increase transit ridership ▪ Improve Service in Core Bus Corridors ▪ Strengthen cost-effectiveness of the bus network ▪ Monitor market conditions and developments ▪ Explore regional inter-connectivity with surrounding transit systems
System Accessibility	▪ Enhance vehicle and facility accessibility for persons with disabilities and the general public ▪ Ensure that there is information available in both visual and audio forms for persons with disabilities ▪ Coordinate RRTA accessible transit services with those operated by other public transit and human service providers
Transportation System Management (TSM)	▪ Strengthen TSM program
Intelligent Transportation Systems (ITS)	▪ Enhance the transit trip making experience through extensive use of ITS
Bicycle/ Pedestrian	▪ Accommodate bicycle and pedestrian needs into transit system
Service Planning	▪ Ensure that services meets the needs of the County residents ▪ Investigate the appropriateness of other transportation opportunities ▪ Re-evaluate and expand current policy regarding on the street amenities

Figure 25 | LRTP 2017-2040 – Goals and Objectives

Goal	Objective
Maintenance	▪ Maintain and improve the transportation system and services we enjoy today where financially feasible
Safety	▪ Keep travelers safe and secure, no matter the mode of transportation
Economic Development	▪ Invest in projects that strengthen the ability of Berks County commerce to access national and international trade markets, and support regional economic development and tourism opportunities
Improved Connections and Choices	▪ Give travelers a variety of well-designed transportation choices that are in good condition.
Environmental Sustainability	▪ Enhance the performance of the county transportation system in environmentally sustainable ways that increase resiliency to both climate change and vulnerability to natural disaster.

Figure 26 | LRTP 2017-2040 – Strategic Performance Measures

	Strategic Performance Measures
Maintenance	▪ Improve and maintain pavement quality from the 2014 baseline report with positive progress towards the regional long-range goals for all networks specified by PennDOT. ▪ Reduce the number of structurally deficient bridges from the 2014 baseline report with positive progress towards the regional long-range goals for all networks specified by PennDOT. ▪ Improve LOS on congested corridors and intersections from the 2016 Berks County CMP report with positive progress towards removing congested corridors with intersection and corridor specific programming and projects.
Safety	▪ Continue the positive reduction in the 5-year average of fatality, major-injury and pedestrian/bicycle crashes, with a goal of a 5 percent decrease in the number of crashes in each category between 2014 and 2021. ▪ Work towards a 50 percent reduction in both fatal and major injury crashes in Berks County by 2034 concurrent with the goals of the 2014 Pennsylvania Strategic Highway Safety Plan to reduce such crashes 50 percent over a twenty-year period. ▪ Address the safety needs in the top five (5) high crash corridors and have them removed from the list by 2021. ▪ Improve the safety of work zones by collaborating with PennDOT and local and state police to reduce work zone crashes by 5% between 2014 and 2021. ▪ Implement at least two projects to add to or improve the ITS infrastructure by 2021. ▪ Better publicize evacuation and emergency routes in the event of a man-made or natural disaster by 2021. ▪ Collaborate with PennDOT and the Berks County Department of Emergency Services to plan corridor redundancy around major roads (e.g. Interstate 78, Route 222) in times of inclement weather or emergencies.
Economic Development	▪ Reduce the number of high crash corridors that are located on the freight network identified by PennDOT. ▪ Improve LOS on congested corridors and intersections from 2016 Berks County CMP report that are on the freight network.
Improved Connections and Choices	▪ Conduct a public opinion survey by 2018 to gauge overall public satisfaction with the existing transportation system with a comparison survey in 2021. ▪ Expand the county trail and sidewalk network each by 5 percent by 2021. ▪ Increase the miles of dedicated bicycle facilities and signed bike routes in the County by 5% by 2021. ▪ Increase BARTA's fixed route fare-paying ridership 5 percent by 2021 and the special services ridership by 3 percent by 2021.
Environmental Sustainability	▪ Maintain the county's attainment status for both ozone and fine particulates (PM 2.5). ▪ Work with all local, regional, state, and federal organizations and agencies to avoid, minimize, or mitigate impacts from TIP and LRTP projects using the LPN system. ▪ Assist in identification of potential environmental mitigation issues by acquiring, creating, and updating, as needed, geographic information system data layers for use by the implementing agencies and disseminating them in a readily accessible format to municipalities. ▪ Work with PennDOT to implement best management practices and mitigation strategies on transportation projects. ▪ Continue coordination with appropriate agencies to protect the critical transportation infrastructure against disaster by identifying vulnerable assets and prevention strategies through an updated, current hazard mitigation plan.

Figure 27 | Connections 2040 – Goals, Objectives, and Supporting Strategies

Goal	Objective	Strategies
A	Target transportation investments to support the Lancaster County Comprehensive Plan Vision and Goals, and the county's Growth Management Plan.	▪ A-1: Refine a transportation investment prioritization process to support land use goals. ▪ A-2: Target transportation investments to support appropriate growth and development of Urban Growth Areas (UGAs). ▪ A-3: Ensure that transportation projects and programs in Designated Rural Areas support rural land uses, safety and mobility. ▪ A-4: Encourage transit-oriented development. ▪ A-5: Continue to implement a Lancaster County Smart Growth Transportation Program.
B	Maintain and improve the county's multimodal infrastructure and services to provide an acceptable level of service.	▪ B-1: Maintain and improve highways and bridges on a regular maintenance cycle. ▪ B-2: Plan for strategic capacity improvements that support economic development and system connectivity. ▪ B-3: Improve transit services and programs through support of RRTA's long-range plan. ▪ B-4: Improve intermodal connections between highway, transit, air, rail and non-motorized modes. ▪ B-5: Support improvements to the county's passenger and freight rail and airport infrastructure.
C	Improve safety and security for all users of the transportation system.	▪ C-1: Reduce the number of crashes and fatalities. ▪ C-2: Improve and maintain shoulders on the county's road network to accommodate all users. ▪ C-3: Support safety education programs for all transportation modes. ▪ C-4: Work with PennDOT and emergency responders to make the transportation system safer and improve response time. ▪ C-5: Develop safe and convenient bicycle and pedestrian facilities and infrastructure.
D	Manage and operate the transportation system to reduce congestion.	▪ D-1: Implement the Regional Operations Plan and implement Intelligent Transportation Systems (ITS) technologies. ▪ D-2: Improve the operation of highway intersections through the addition of turning lanes, geometric and traffic signalization improvements. ▪ D-3: Plan for, implement and promote alternatives to single-occupant vehicle use.
E	Ensure that transportation investments address protection of the county's agricultural, natural, historic, and cultural resources and environmental quality.	▪ E-1: Apply transportation design standards that incorporate context-sensitive solutions into projects. ▪ E-2: Meet federal air quality conformity standards with updated LRTPs and TIPs. ▪ E-3: Further incorporate the NEPA process into project planning and design for early awareness of potential impacts and under-standing of issues. ▪ E-4: Coordinate transportation planning and investment with preservation and conservation of heritage resources in the county comprehensive plan.

4 SERVICE RECOMMENDATIONS

A number of different ideas for improving the effectiveness of each individual BARTA and RRTA route were developed based on stakeholder outreach, the market analysis, and the service analysis performed at the outset of the study. The different concepts for each route also followed a set of transit service principles established for SCTA. A detailed evaluation for each of the existing RRTA and BARTA routes, including a description of alternative service opportunities considered, is included in Appendix G (BARTA) and Appendix H (RRTA).

Alternative service proposals were vetted internally and a comprehensive set of proposed improvements were brought to the public in April 2018. Several ideas for new routes and demand response services were also proposed. Based on rider public and SCTA feedback, a final set of service improvements was developed.

This chapter describes the established SCTA service design principles and shows proposed changes by individual BARTA and RRTA route. A set of Service Guidelines was also developed for SCTA describing these service design principles as well as establishing guidelines for service performance and productivity. The Service Guidelines are presented in Appendix B.

Service Design Principles

SCTA works to serve as many residents, workers, and visitors as it can within its available resources. This involves many trade-offs as some service attributes that attract one type of rider will deter other riders – for example, meandering services designed to minimize walk distances are attractive to those who are not time-sensitive, but unattractive to those who are. SCTA's family of services attempts to balance these competing demands to develop a network that meets the greatest public good. At the same time, there are also certain service design principles that will improve service for nearly all riders.

Service Should be Simple

To encourage people to use transit, service should be designed so that it is easy to understand. In this way, current and potential riders can grasp and use the transportation options available to take them where and when they want to go with ease. Most of the guidelines in this section are aimed at making service intuitive, logical, and easy to understand.

Routes Should Operate Along a Direct Path

Passengers and potential passengers alike prefer faster, more direct transit services. In order to remain competitive with the automobile, special attention should be placed on designing routes to operate as directly as possible to maximize average speed for the bus and minimize travel time for passengers while maintaining access to service. Routes should not deviate from the most direct alignment unless there is a compelling reason to do so.

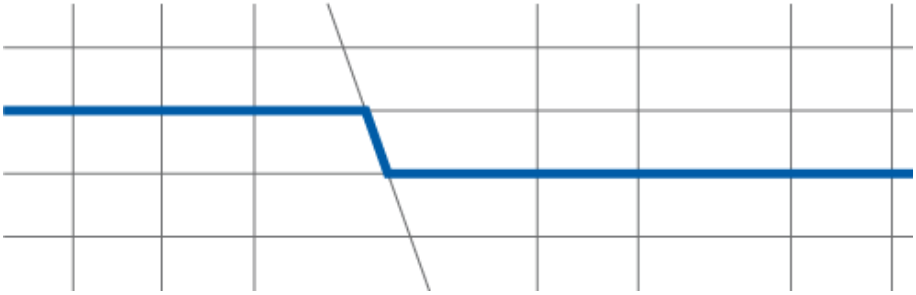
Most riders prefer straighter and more direct service to circuitous service

Route Deviations Should be Minimized

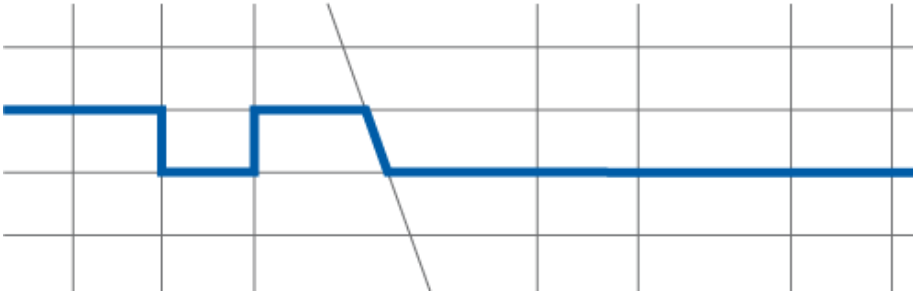
As described above, service should be relatively direct. The use of route deviations—travelling off the most direct route—should be minimized.

Serving different locations on different trips makes service complicated and inconveniences most riders

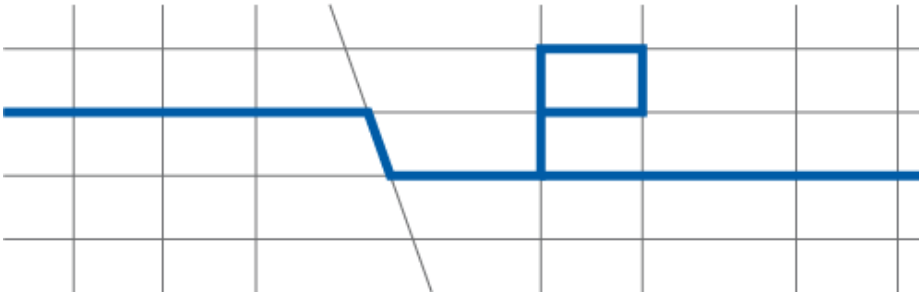
Main Route



8:43 AM Trip



2:23 PM Trip



There are instances when the deviation of service off of the most direct route is appropriate, for example to avoid a bottleneck or to provide service to major shopping centers, employment sites, schools, etc. In these cases, the benefits of operating the route off of the main route must be weighed against the inconvenience caused to passengers already on board. Route deviations should be considered only under the following conditions:

1. The deviation will result in an increase in overall route productivity
2. The number of new passengers that would be served is equal to or greater than 25% of the number of passengers who would be inconvenienced by the additional travel time on any particular deviated trip
3. The deviation would not interfere with the provision of regular frequencies and/or the provision of coordinated service with other routes operating in the same corridor

In most cases where route deviations are provided, they should be provided on an all-day basis. Exceptions are during times when the sites that the route deviations serve have no activity—for example, route deviations to shopping centers do not need to serve those locations early in the morning before employees start commuting to work.

Fixed Routes Should Operate Along Arterials Where Possible

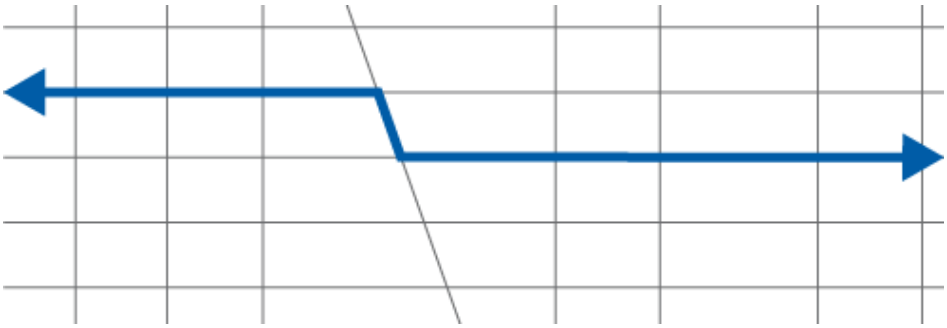
Major Local, Local, and Regional routes should operate on major roadways and should avoid deviations to provide local circulation. Riders and potential transit users typically have a general knowledge of an area's arterial road system and use that knowledge for geographic points of reference. The operation of bus service along arterials makes transit service faster and easier for riders to understand and use.

Routes Should be Symmetrical

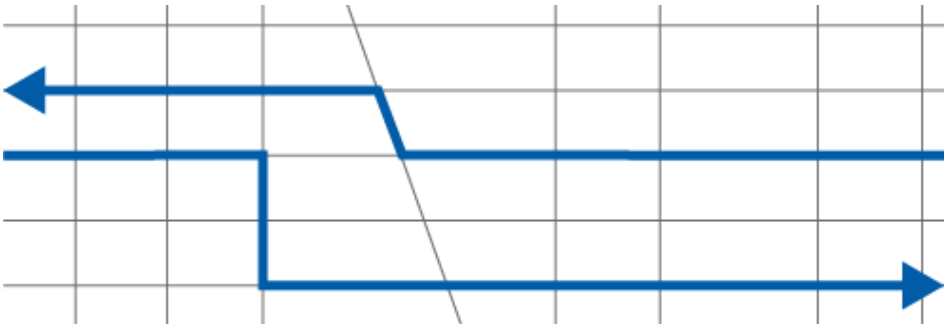
Routes should operate along the same alignment in both directions to make it easy for riders to know how to make their return trip. When a route operates in a one-way loop, offering service in only one direction, passengers are forced to travel out of their way on at least one segment of their round trip. Exceptions can be made in cases where such operation is not possible due to one-way streets or turn restrictions. In those cases, routes should be designed so that the opposite directions parallel each other as closely as possible.

Operating service along the same alignment in both directions makes it easier for riders to understand service and find their return trip

Symmetrical



Non-Symmetrical



Service Should Serve Well-Defined Markets

To make service easy to understand and to eliminate service duplication, service should be developed to serve well-defined markets; in other words, every route should serve a clear purpose. Ideally, corridors should be served by only one route of each route type outside of the downtown area—for example, one Regional route and one Local route, and not by multiple Regional routes and multiple Local routes. Exceptions can be made when multiple routes should logically operate through the same corridor to unique destinations such as commercial centers or in downtown areas. Especially where routes would operate along parallel corridors within high-demand areas, operating multiple routes along a single high-demand corridor maximizes resources to provide the high level of frequency needed to support the transit demand.

Service Should Operate with Consistent Schedules

Routes should be scheduled to operate at regular intervals (headways). People can easily remember repeating patterns but have difficulty remembering irregular ones. For example, routes that provide four trips an hour should depart from their terminals every 15 minutes. Limited exceptions can be made in cases where demand spikes during a short period in order to eliminate or reduce crowding on individual trips.

People can remember repeating patterns much more easily than non-repeating ones

Departures with Clockface Headways: 8:00, 8:15, 8:30, 8:45, 9:00, 9:15, 9:30, etc.

Departures with Inconsistent Frequencies: 8:00, 8:17, 8:32, 8:44, 9:01, 9:13, 9:30, etc.

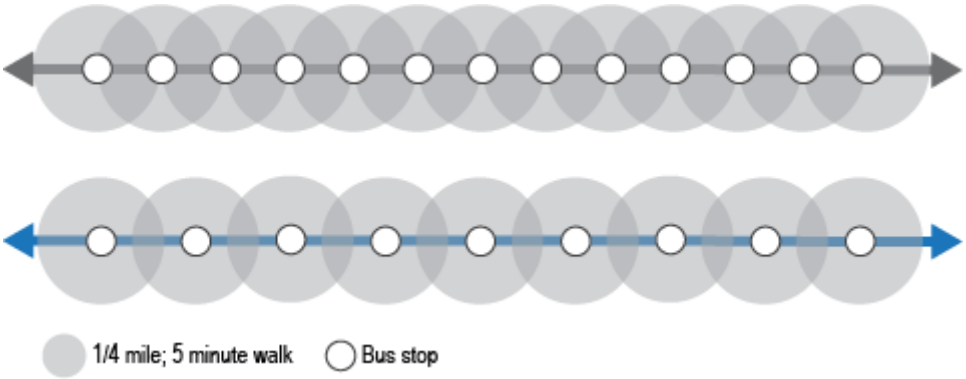
Services Should be Well Coordinated

Where routes connect and provide a transfer opportunity for riders, schedules should be coordinated to the greatest extent possible to minimize wait times for the predominant transfer flows. This includes pulsing at transfer locations when possible. Additionally, routes that operate along the same corridor should be scheduled to provide the highest level of frequency possible. For example, on a corridor with two routes operating at 30-minute frequencies, the routes should be scheduled to alternate trips, resulting in a frequency of 15 minutes on the shared corridor.

Stops Should be Spaced Appropriately

The distance between stops significantly impacts travel times. More closely spaced stops provide customers with more convenient access, as they are likely to experience a shorter walk to the nearest bus stop. However, they also increase travel times and are the major reason that transit is slower than automobile travel. Each additional stop requires the bus to decelerate, come to a complete stop, load and unload riders, and then accelerate and re-merge into traffic. Most riders want service that balances convenience and speed, and the number and location of stops is a key component of determining that balance.

Too many stops can make a service unacceptably slow for many potential riders



SCTA's family of services is tailored toward serving different types of trips and needs, and therefore fixed-route services have different stop spacing guidelines. In general, Major Local services, designed to serve a dense areas with relatively high frequency, should have fewer stops. Local services, which emphasize accessibility, should have more frequent stops. Regional services should have one to two stops per mile in the low-density regions they serve outside of urban core areas, but increase stop frequency closer to downtowns. Express services should only have stops at the major transfer centers they connect.

Guidelines for minimum stop spacing and maximum stops per mile are shown in Figure 28. Exceptions to these guidelines can and should be made in locations where walking conditions are poor (which is the case along many rural routes) or there are other significant considerations.

Figure 28 | Bus Stop Spacing Guidelines

	Major Local	Local	Regional	Express	Demand-Response
Minimum Stop Spacing (feet)	1,300	800	1,300 (within urban areas) 2,000 (outside of urban areas)	2,600	—
Maximum Stops per Mile	4	4-6	4 (within urban areas 1-2 (outside of urban areas)	1	—

Service Design Should Maximize Service

The distance and travel time of a route determine how efficiently a bus can operate. The length of the route and the time it takes to make each trip impact how long of a layover is required at each end and how many buses are needed to provide the service. Service should be designed to maximize the time a vehicle is in service and minimize the amount of time it is out of service. Often, it may be more efficient to extend a route to pick up a few more passengers and limit the amount of layover time.

Proposed Service Improvements

Based on the technical analysis and stakeholder input, as well as the service design principles described above and the project's goals and objectives, the study team developed a recommended service scenario that includes several improvements to existing service as well as opportunities for new services and capital investments. This recommended scenario consists of three phases, to be implemented over the course of the next 10 years and depending upon resource availability. Phase 1 includes a set of "cost neutral" improvements that can be implemented in the near term within the current operating budgets of BARTA and RRTA, focused on streamlining and improving existing routes and modest increases in service. Phase 2 includes additional service enhancements, focusing in increased service spans. Phase 3 represents long-term recommendations that build on the first two phases, including significant service increases and new service expansions, and can be implemented as resources become available.

The recommendations included in the recommended service scenario make several improvements that address the major issues and opportunities identified during the study process:

- **Streamlined Service:** Several routes that currently operate circuitous or indirect alignments would be redesigned to provide more direct, streamlined service. Some deviations to stops that generate few or no riders would be discontinued to ensure that service is faster and more reliable for existing riders. These changes would also make it easier to understand which corridors and destinations are served by each route, making transit service more attractive and easy to use for both current and potential riders.
- **Simplified Service:** Routes that currently operate multiple service patterns or serve different alignments on different trips make service confusing and inconvenient for riders. Recommended improvements would address this by making routes simpler, serving consistent alignments with predictable service patterns.

- **Improved Level of Service:** Several routes in both systems would have improved levels of service, including increased frequency during the day, later service hours into the evening, and the introduction or expansion of Saturday and Sunday service.
- **New Routes:** New crosstown service opportunities were identified in Reading and Lancaster. Express/limited-stop routes would also be introduced in both Berks and Lancaster Counties, and a new intercountry Reading-Lancaster Express route would provide connections between Reading, Lancaster, and employment opportunities in northern Lancaster County.
- **Transit Corridors:** On several key corridors in Reading and Lancaster, coordinated schedules among multiple routes serving the same corridor would result in very frequent transit service along these major corridors. Over the long-term, these corridors will provide a focus for transit-supportive capital investments, which could include transit priority treatments, dedicated bus lanes, stop consolidation, and enhanced passenger amenities. These capital investments would complement high-frequency transit service and reinforce the image of each corridor as an enhanced transit corridor.
- **Transfer Centers:** The designation of transfer centers at key destinations would provide more convenient connections between routes outside of downtown, especially for riders making crosstown trips. These transfer centers would have enhanced passenger facilities including shelters, benches, real-time arrival signage, and other amenities.
- **Park-and-Rides:** New park-and-ride facilities would expand the availability of service to commuter markets farther outside of core urban areas. Park-and-rides could be sited at existing lots, such as through leases or other agreements with existing businesses or institutions, or at new facilities as warranted.
- **Demand-Response Zones:** New on-demand services are increasingly becoming part of public transit networks, particularly for serving times and places with lower demand. Where demand would not ordinarily justify a fixed-route service, including many outer areas of Berks and Lancaster Counties, modern on-demand services can serve these areas and connect people with the fixed-route network, in a more efficient or convenient manner than was available before recent technology innovations.

Alignment changes are recommended for each route in the BARTA and RRTA system. These improvements are intended to make each route more attractive to riders by adopting best practices in transit service design. New routes and new demand response services are also proposed to serve areas with identified transit demand not well served today, or to connect key activity centers.

The complete recommended service scenario is presented below for Reading (Figure 29), Berks County (Figure 30), Lancaster (Figure 31), and Lancaster County (Figure 32). The following pages present a side-by-side comparison of existing BARTA and RRTA routes with proposed alignment and service improvements and potential new services.

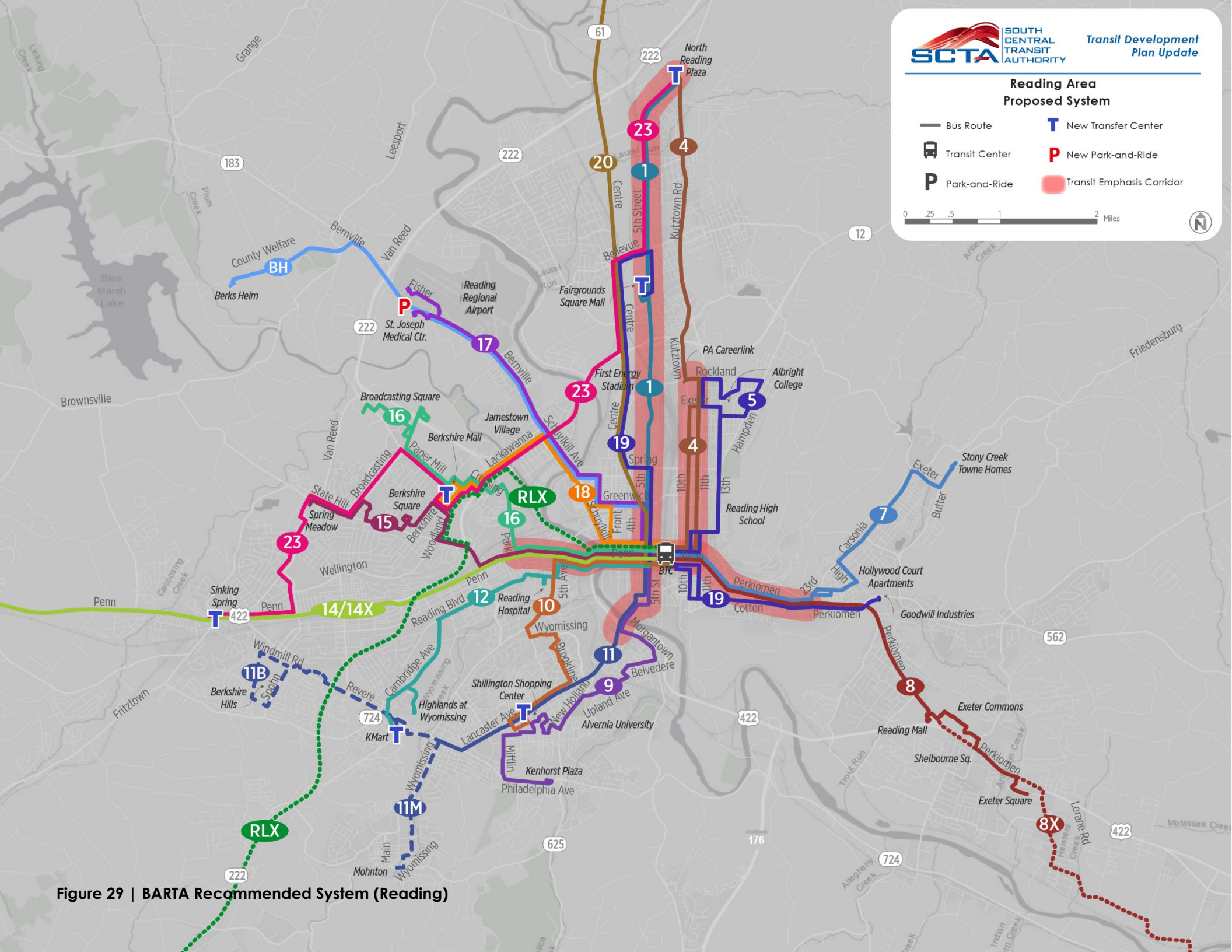


Figure 29 | BARTA Recommended System (Reading)

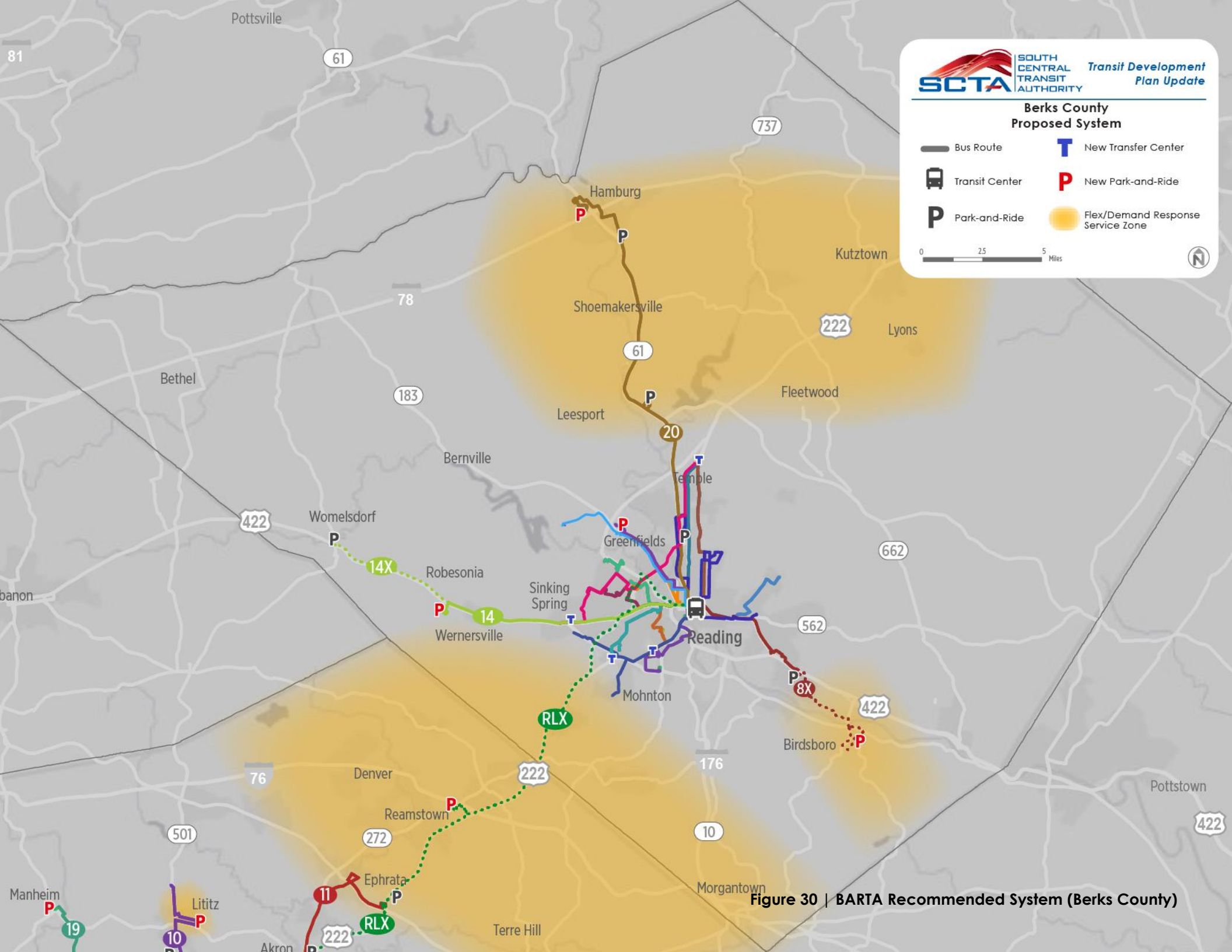


Figure 30 | BARTA Recommended System (Berks County)

SOUTH CENTRAL TRANSIT AUTHORITY

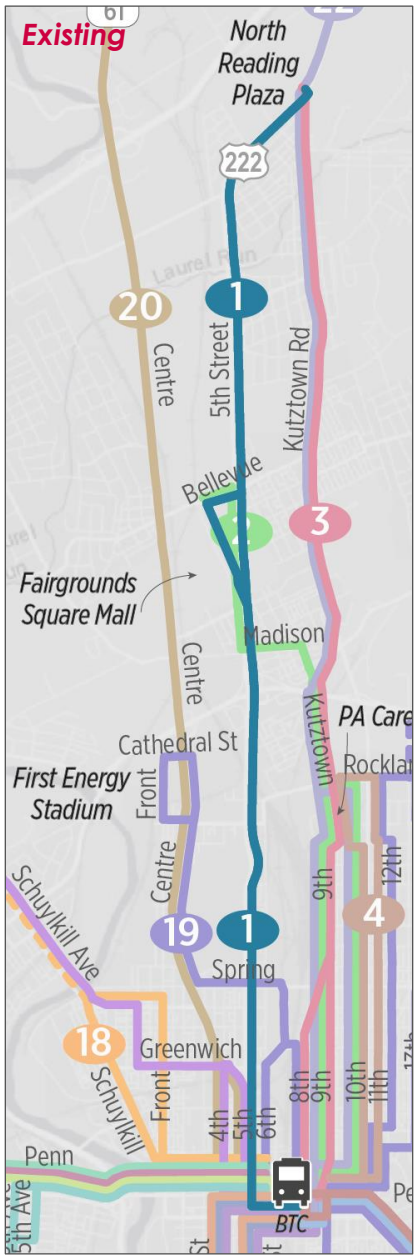
BARTA

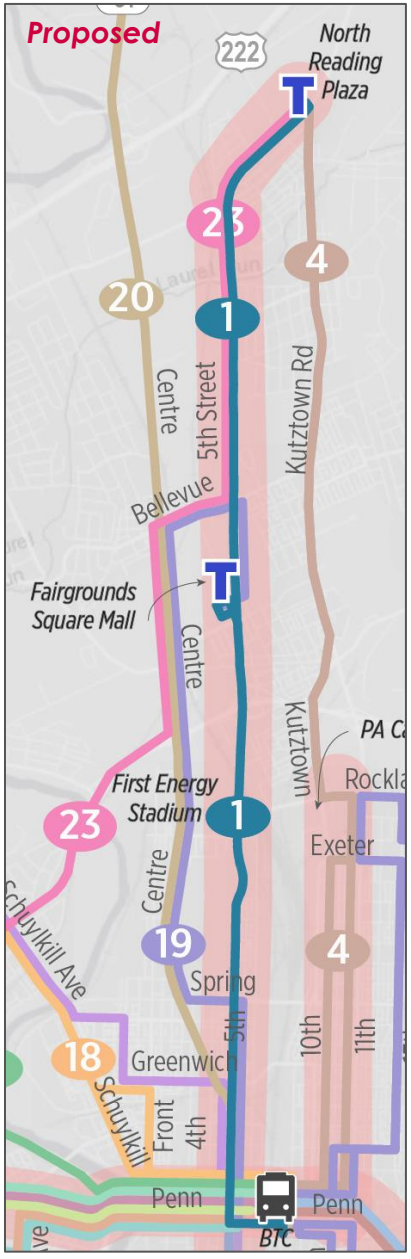
Route 1 Temple via 5th Street

Overview of Proposed Changes

- No changes made to the existing alignment
- Operate as a Major Local route
- Increase weekday service frequency to every 15 minutes during peak and midday hours
- Increase Saturday service frequency to every 15 minutes during the day
- Increase Sunday service frequency to every 30 minutes and extend span of service

	Existing Service Levels	Proposed Service Levels
Weekdays	**5:30 AM – 12:00 AM**	**5:30 AM – 12:00 AM**
Early	30	30
AM Peak	20-30	15
Midday	20	15
PM Peak	20	15
Evening	20-30	30
Saturday	**6:30 AM – 12:00 AM**	**6:30 AM – 12:00 AM**
Day	20-30	15
Evening	20-30	30
Sunday	**11:00 AM – 7:00 PM**	**8:00 AM – 8:00 PM**
All Day	60	30





SCTA SOUTH CENTRAL TRANSIT AUTHORITY

BARTA

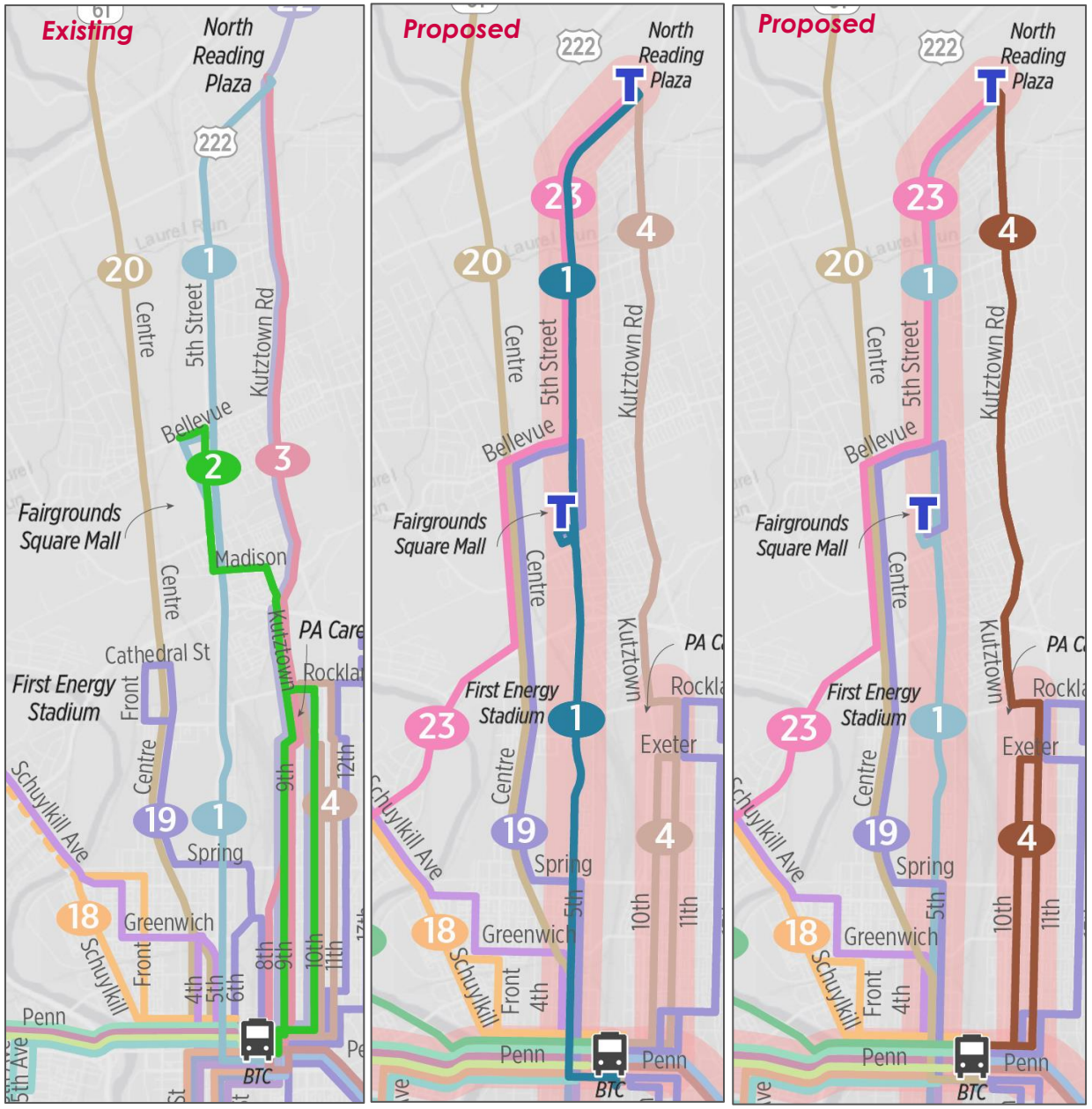
Route 2 Fairgrounds Square Market

Overview of Proposed Changes

- Discontinue service and reinvest resources elsewhere in the system
- Serve riders with frequent Route 4 service along 10th/11th Streets (15-30 minutes on weekdays and every 30 minutes all weekend)
- Daily service to Fairgrounds Square Mall and the farmers market via Route 1 and redesigned Route 19

	Existing Service Levels	Proposed Service Levels
Weekdays	**10:30 AM – 2:30 PM***	—
Early	—	—
AM Peak	—	—
Midday	8 one-way trips*	—
PM Peak	—	—
Evening	—	—
Saturday	**10:30 AM – 2:30 PM**	—
Day	8 one-way trips	—
Evening	—	—
Sunday	—	—
All Day	—	—

** Route operates on Friday & Saturday only*



SCTA SOUTH CENTRAL TRANSIT AUTHORITY

BARTA

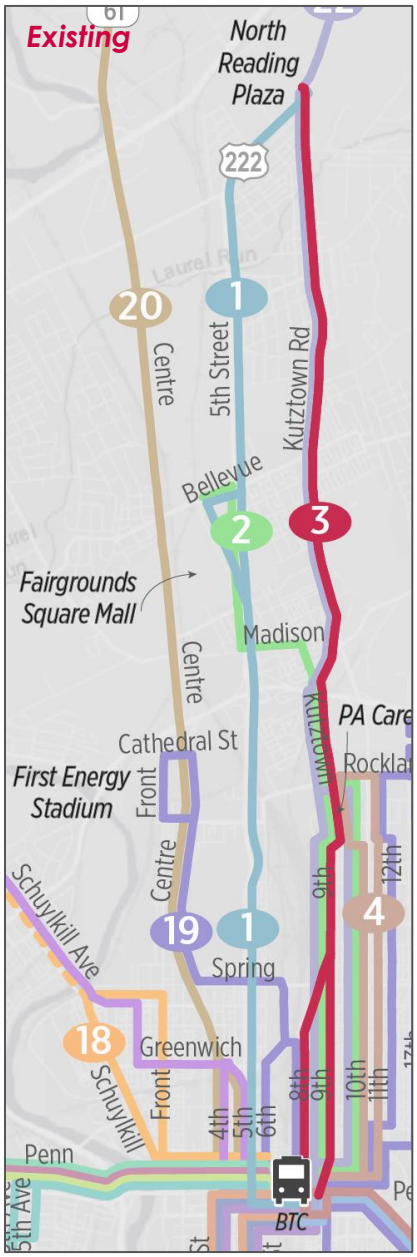
BARTA RRTA RED ROSE TRANSIT AUTHORITY

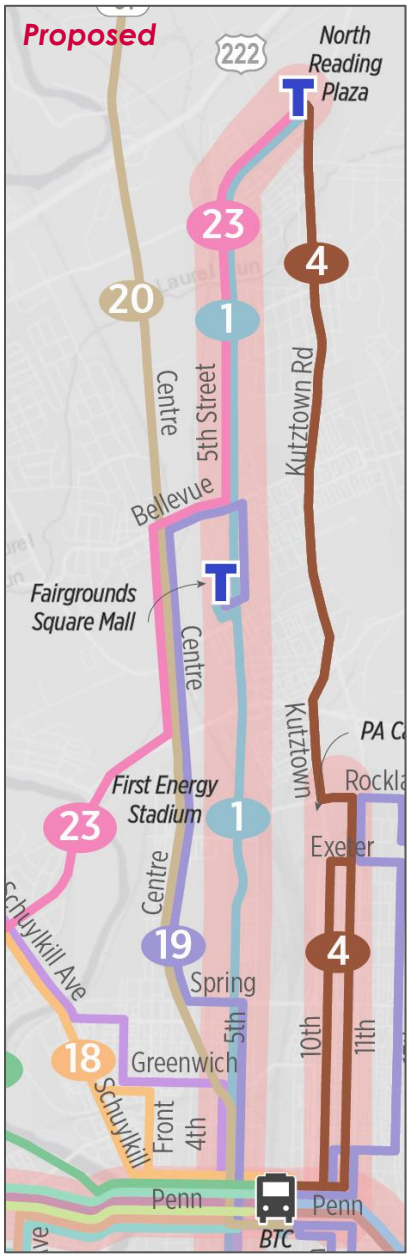
Route 3 Temple via Kutztown Road

Overview of Proposed Changes

- Consolidate with Route 4 and reinvest resources to increase frequency and service span along the 10th Street/11th Street corridor and Kutztown Road

	Existing Service Levels	Proposed Service Levels
Weekdays	**5:15 AM – 6:45 AM**	***See Route 4***
Early	30	—
AM Peak	30	—
Midday	60	—
PM Peak	30	—
Evening	—	—
Saturday	**6:15 AM – 6:15 PM**	***See Route 4***
Day	60	—
Evening	—	—
Sunday	—	***See Route 4***
All Day	—	—





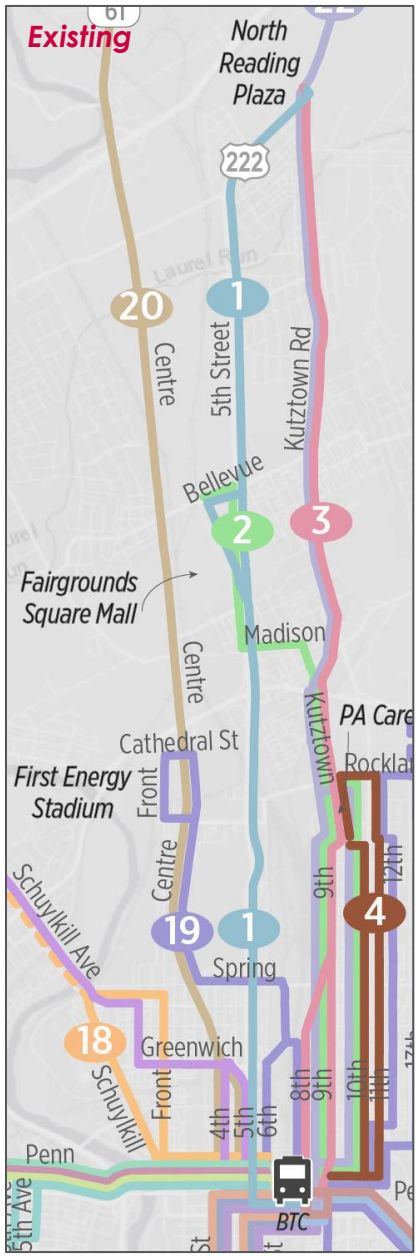
BARTA

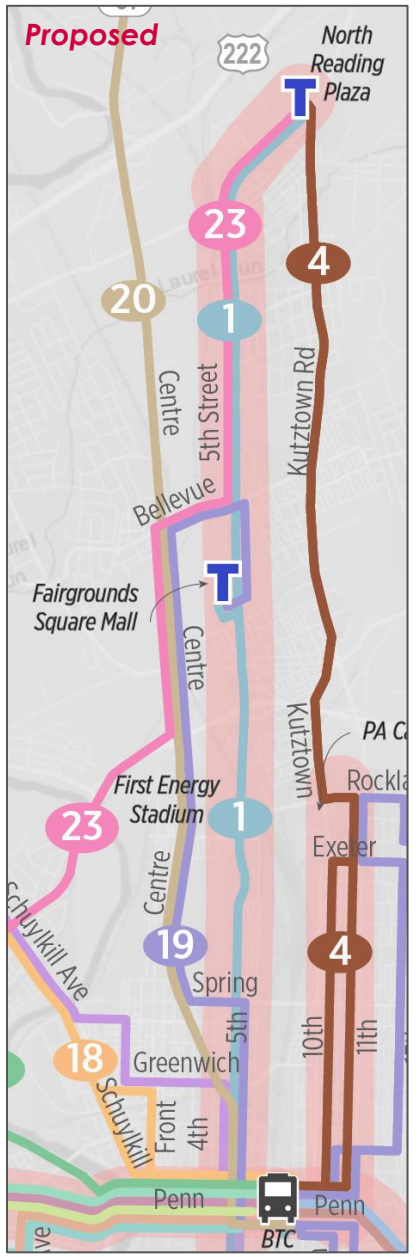
Route 4 10th/11th Street

Overview of Proposed Changes

- Consolidate with Route 3
- Operate as a Major Local route
- In Reading, operate along 10th and 11th Streets
- North of Rockland Street, operate along Kutztown Road to North Reading Plaza as Route 3 does today
- Increase weekday service frequency to every 15 minutes during the day and every 30 minutes in the evening
- Increase Saturday frequency to every 30 minutes throughout the day and evening
- Extend Sunday service span and increase frequency to every 30 minutes all day

	Existing Service Levels	Proposed Service Levels
Weekdays	**4:45 AM – 11:00 PM**	**4:45 AM – 11:00 PM**
Early	20	30
AM Peak	30	15
Midday	30	15
PM Peak	30	15
Evening	40	30
Saturday	**4:45 AM – 10:40 AM**	**4:45 AM – 11:00 PM**
Day	40	30
Evening	40	30
Sunday	**11:15 AM – 6:30 PM**	**8:00 AM – 8:00 PM**
All Day	60	30



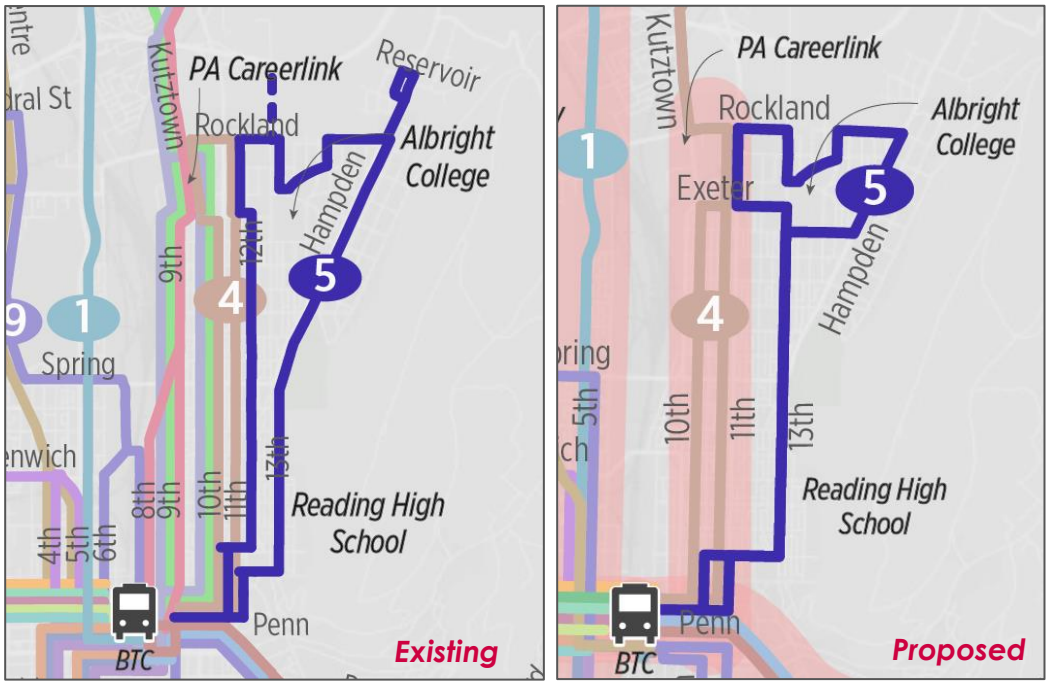


Route 5 Albright College

Overview of Proposed Changes

- Operate as a Local route
- Redesign alignment to operate along 13th Street in both inbound and outbound directions between Elm Street and Union Street
- Redesign northern alignment to discontinue service north of Rockland to Reservoir, operate a terminal loop that serves Rockland street, Albright College, and Exeter Street
- Discontinue deviations on select trips into Elite Sportswear as it is within a short walk of the main route
- Add evening service on weekdays and Saturdays
- Add new service on Sunday

	Existing Service Levels	Proposed Service Levels
Weekdays	**5:20 AM – 6:20 PM**	**5:30 AM – 7:00 PM**
Early	45	30
AM Peak	45	30
Midday	45	60
PM Peak	30	30
Evening	—	60
Saturday	**6:15 AM – 6:15 PM**	**7:00 AM – 7:00 PM**
Day	45	60
Evening	—	60
Sunday	**—**	**11:00 AM – 6:00 PM**
All Day	—	60

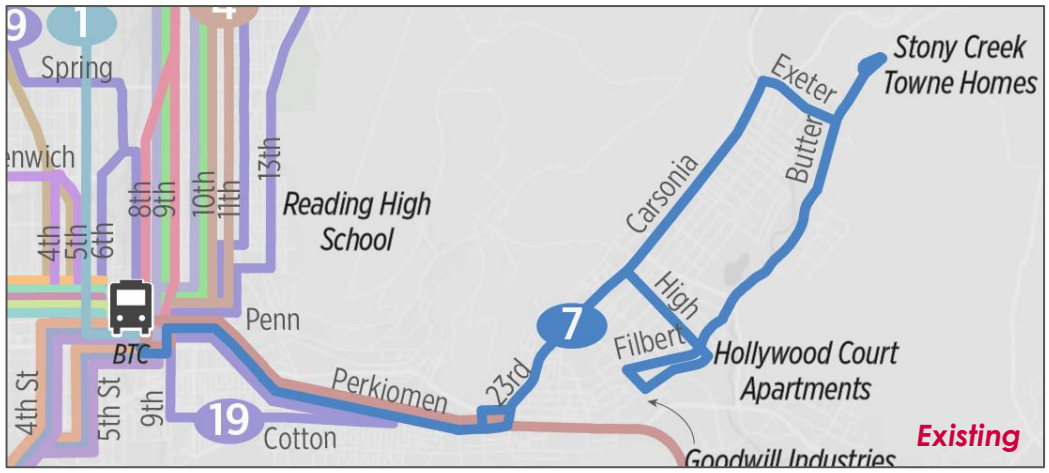


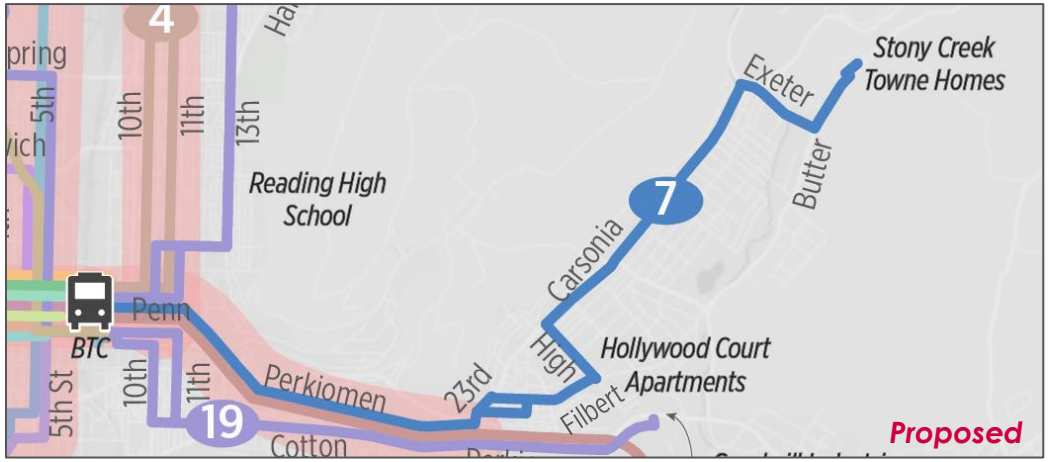
Route 7 Pennside

Overview of Proposed Changes

- Operate as a Local route
- Redesign alignment east of Howard Boulevard/ 23rd Street to operate bidirectional service, reducing out-of-direction travel for riders and providing more direct service
- Extend weekday span of service
- Add new Sunday service

	Existing Service Levels	Proposed Service Levels
Weekdays	**5:30 AM – 6:30 PM**	**5:30 AM – 7:00 PM**
Early	30	30
AM Peak	30	30
Midday	60	60
PM Peak	30	30
Evening	—	60
Saturday	**6:30 AM – 6:30 PM**	**7:00 AM – 7:00 PM**
Day	60	60
Evening	60	60
Sunday	**—**	**11:00 AM – 6:00 PM**
All Day	—	60





SCTA SOUTH CENTRAL TRANSIT AUTHORITY

BARTA

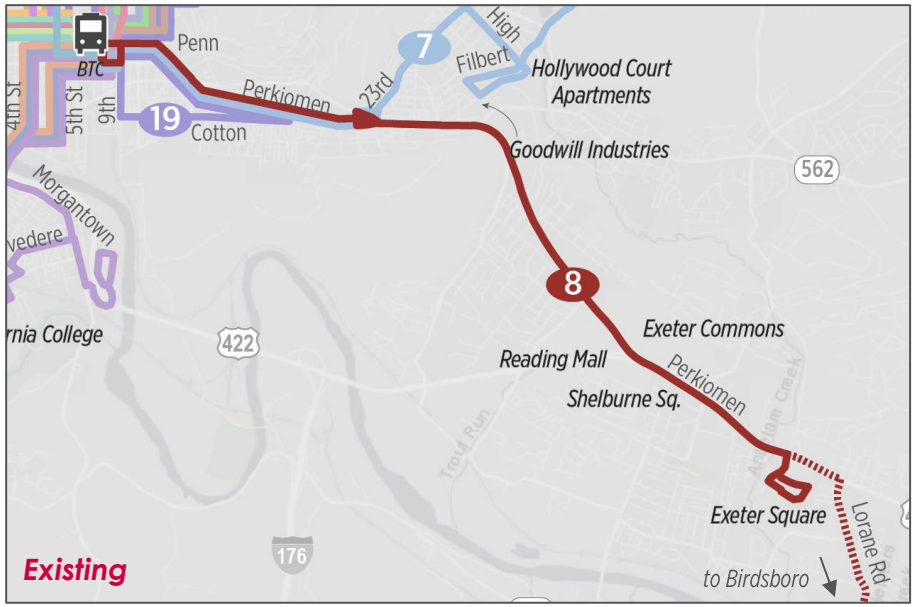
BARTA RRTA RED ROSE TRANSIT AUTHORITY

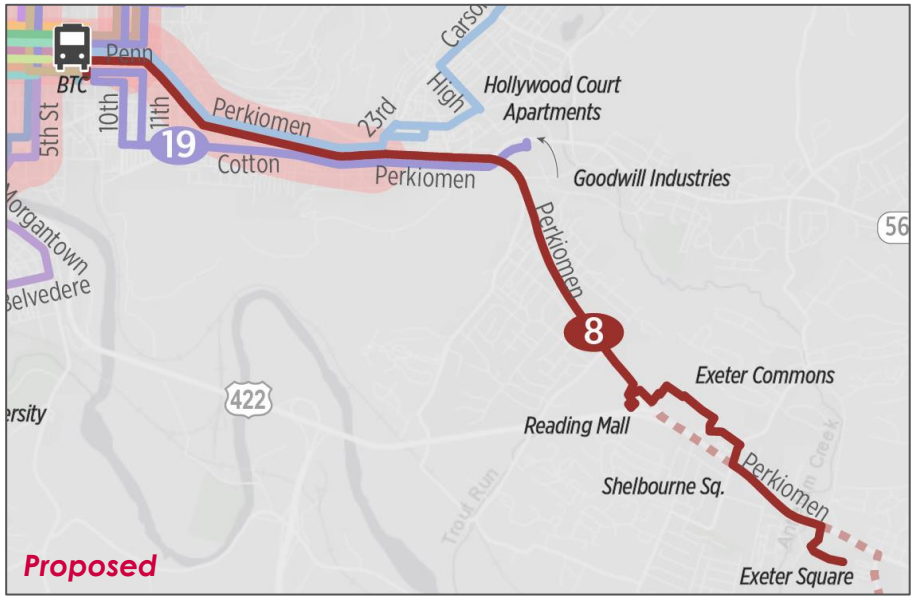
Route 8 Reifftown/Shelbourne Square

Overview of Proposed Changes

- Operate as a Local route
- Continue to operate along existing core alignment on Perkiomen Avenue; terminate all trips at Exeter Square
- Operate a new Route 8X to provide limited-stop express service between Reading and Birdsboro via Perkiomen Avenue and Lincoln Road
- Increase AM and PM peak service frequencies to every 30 minutes
- Increase service frequency to every 60 minutes during weekday midday hours and during weekday and Saturday evening hours

	Existing Service Levels	Proposed Service Levels
Weekdays	**5:00 AM – 11:00 PM**	**5:00 AM – 11:00 PM**
Early	60	60
AM Peak	60	30
Midday	45-75	60
PM Peak	30-60	30
Evening	80	60
Saturday	**7:00 AM – 11:00 PM**	**7:00 AM – 11:00 PM**
Day	60	60
Evening	80	60
Sunday	**11:00 AM – 7:00 PM**	**11:00 AM – 7:00 PM**
All Day	60	60





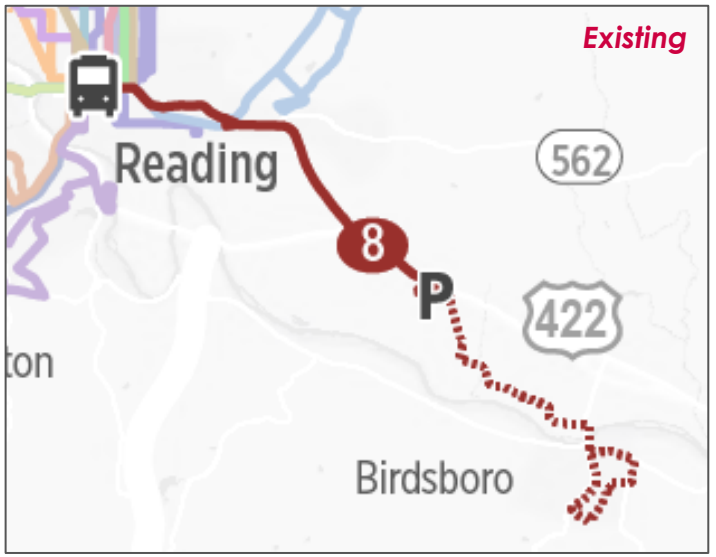
Route 8X Birdsboro via Shelbourne Square (new route)

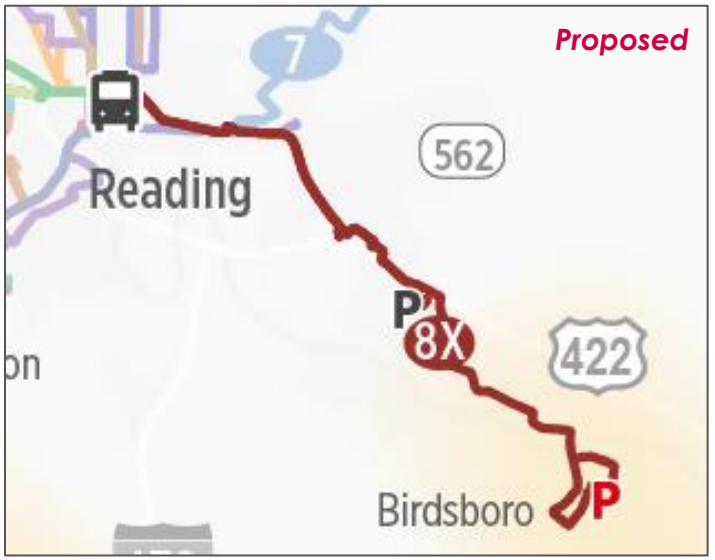
Overview of Proposed Changes

- New express route to operate faster long-distance service between Reading and Birdsboro via Perkiomen Avenue and Lincoln Road
- Operate as an Express route with limited-stop, peak-period service to key destinations between Birdsboro and Reading
- Discontinue existing midday round trip due to very low ridership and reinvest resources into additional AM peak trips

	Existing Service Levels*	Proposed Service Levels
Weekdays	**5:00 AM – 7:00 PM**	**5:00 AM – 6:00 PM**
Early	2 one-way trips	2 one-way trips
AM Peak	4 one-way trips	6 one-way trips
Midday	2 one-way trips	—
PM Peak	6 one-way trips	6 one-way trips
Evening	—	—
Saturday	**—**	**—**
Day	—	—
Evening	—	—
Sunday	**—**	**—**
All Day	—	—

** Based on existing Route 8 trips serving Birdsboro*

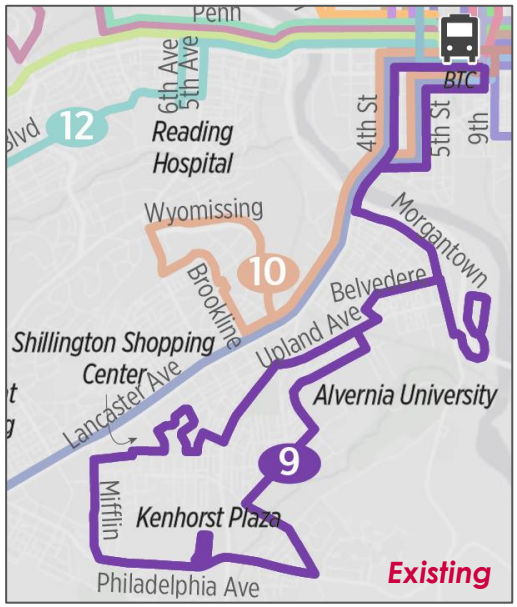


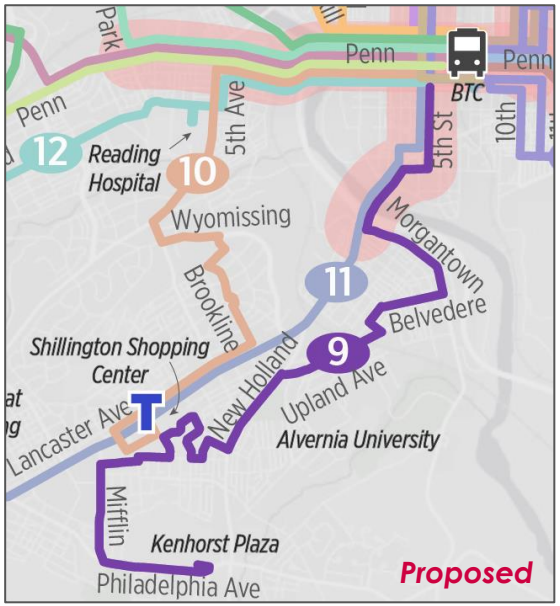


Route 9 Grill via Kenhorst

Overview of Proposed Changes

- Operate as a Local route
- Redesign alignment to provide bidirectional service between Kenhorst Plaza and BTC
  - South of Upland Avenue, operate service via Upland Ave, New Holland Rd, Harding Ave, Shillington Commons, Mifflin Blvd, and Philadelphia Ave in both inbound and outbound directions
  - North of Laurel Street, operate along 5th Street in both directions
- Increase weekday AM and PM peak period frequency to every 30 minutes
- Add new Sunday service



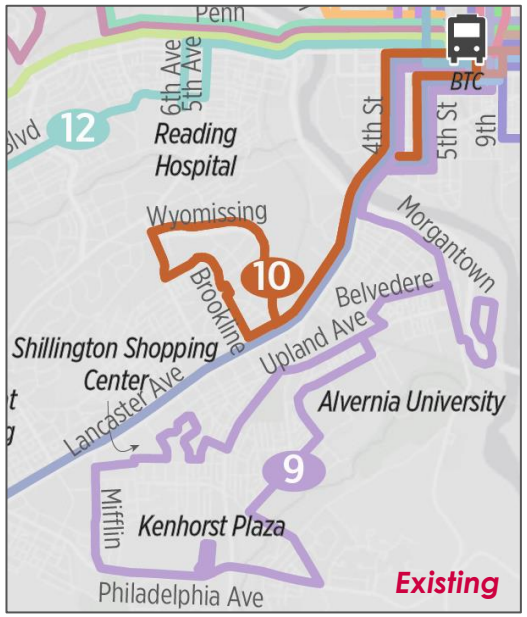


	Existing Service Levels	Proposed Service Levels
Weekdays	**5:45 AM – 6:45 PM**	**5:45 AM – 7:00 PM**
Early	60	60
AM Peak	60	30
Midday	60	60
PM Peak	60	30
Evening	—	60
Saturday	**6:45 AM – 6:45 PM**	**7:00 AM – 7:00 PM**
Day	60	60
Evening	—	60
Sunday	**—**	**11:00 AM – 6:00 PM**
All Day	—	60

Route 10 Brookline via Reading Hospital

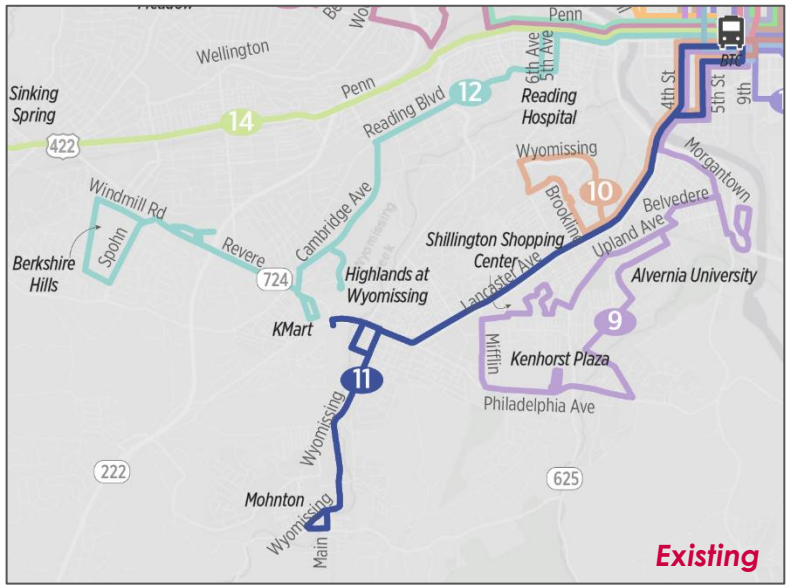
Overview of Proposed Changes

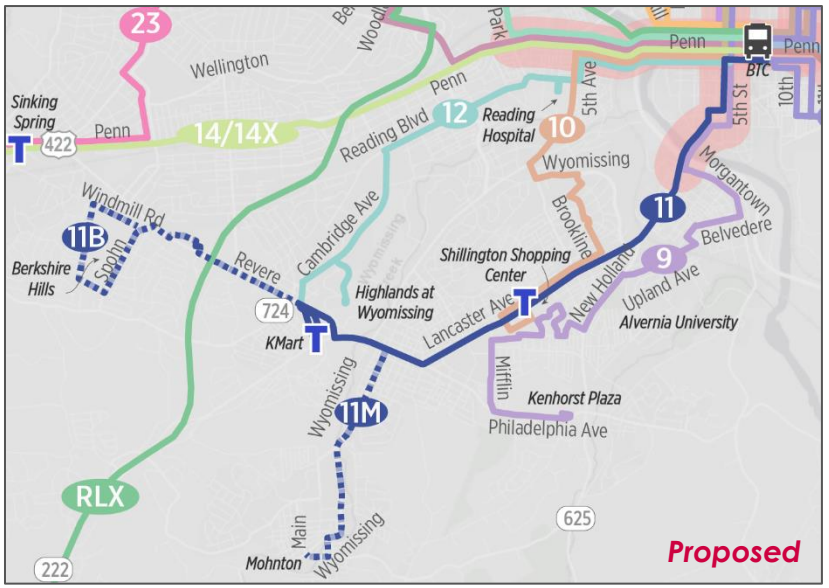
- Operate as a Local route
- Redesign route to provide crosstown service connecting BTC and Shillington Shopping Center via Penn Avenue, Reading Hospital, Museum Road, Kenhorst Boulevard, Pershing Boulevard Brookline Plaza, and Lancaster Avenue
- Increase weekday daytime frequencies to every 30 minutes



	Existing Service Levels	Proposed Service Levels
Weekdays	**5:30 AM – 10:10 PM**	**5:30 AM – 10:10 PM**
Early	30	30
AM Peak	30-45	30
Midday	45	30
PM Peak	30-45	30
Evening	60	60
Saturday	**6:30 AM – 10:10 PM**	**6:30 AM – 10:10 PM**
Day	30	30
Evening	60	60
Sunday	**11:30 AM – 7:00 PM**	**11:00 AM – 7:00 PM**
All Day	60	60

Route 11 Mohnton/Berkshire Hills via Shillington





	Existing Service Levels	Proposed Service Levels for Route 11	*Proposed Service Levels for Branch 11M*	*Proposed Service Levels for Branch 11B*
Weekdays	**5:30 AM – 6:45 PM**	**5:30 AM – 7:00 PM**	*5:30 AM – 6:30 PM*	*6:00 AM – 7:00 PM*
Early	30	30	*60*	*60*
AM Peak	30	30	*60*	*60*
Midday	45-75	30	*60*	*60*
PM Peak	30-45	30	*60*	*60*
Evening	—	30	*60*	*60*
Saturday	**6:30 AM – 6:30 PM**	**6:30 AM – 6:30 PM**	*6:30 AM – 6:30 PM*	*7:00 AM – 6:00 PM*
Day	60	30	*60*	*60*
Evening	—	60	*60*	—
Sunday	—	**11:00 AM – 6:00 PM**	*11:00 AM – 6:00 PM*	—
All Day	—	60	*60*	—

Overview of Proposed Changes

- Operate as Local service
- Serve Lincoln Plaza/Kmart instead of Ollie's Outlet Mall on both branches in both directions
- Serve branches on alternate trips: Mohnton (Route 11 today) and Berkshire Hills (Route 12 today)
  - Branch 11M: After serving Kmart, serve existing Route 11 alignment to Mohnton
  - Branch 11B: Serve Spring Towne Center and Berkshire Hills as Route 12 does today
- Operate 30-minute service all day weekdays and Saturdays along Lancaster Avenue
- Add new Sunday service (Mohnton branch)

SCTA SOUTH CENTRAL TRANSIT AUTHORITY

BARTA

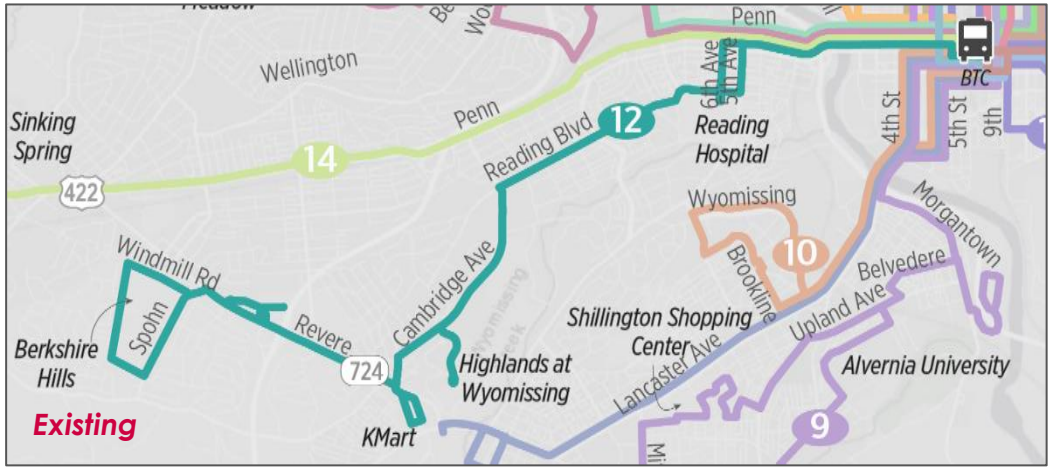
BARTA RRTA RED ROSE TRANSIT AUTHORITY

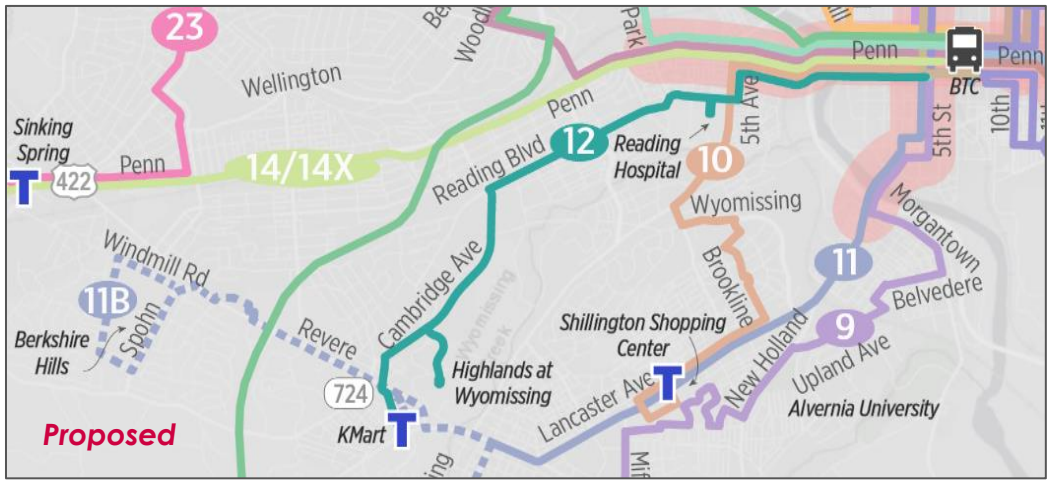
Route 12 Lincoln Plaza via Reading Hospital

Overview of Proposed Changes

- Operate as a Local route
- Operate along 5th Avenue in both directions between Spruce Street (Reading Hospital) and Penn Avenue
- Terminate at Lincoln Plaza Shopping Center (Kmart); serve areas west of Lincoln Plaza with new branch of Route 11
- Increase weekday AM and PM peak frequencies
- Add new Saturday evening and Sunday service

	Existing Service Levels	Proposed Service Levels
Weekdays	**5:45 AM – 7:00 PM**	**6:00 AM – 7:00 PM**
Early	45	—
AM Peak	45	30
Midday	90	60
PM Peak	45	30
Evening	—	60
Saturday	**6:45 AM – 6:45 PM**	**7:00 AM – 7:00 PM**
Day	90	60
Evening	—	60
Sunday	**—**	**11:00 AM – 6:00 PM**
All Day	—	60





SCTA SOUTH CENTRAL TRANSIT AUTHORITY

BARTA

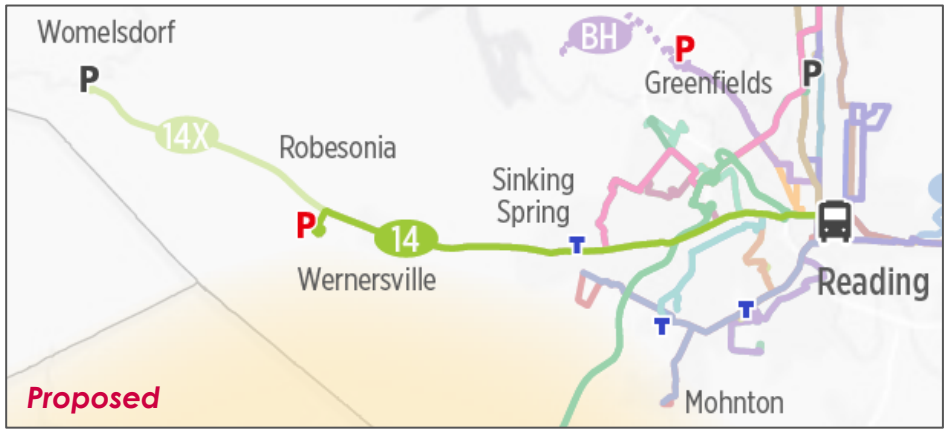
RRTA RED ROSE TRANSIT AUTHORITY

Route 14 Wernersville via Sinking Spring

Overview of Proposed Changes

- Operate as Regional service
- Terminate all trips at Wernersville State Hospital
- In addition to Route 14, operate a new Route 14X to provide limited-stop express service from Reading to Robesonia and Womelsdorf via Penn Avenue, Sinking Spring, and Wernersville
- Extend weekday span of service and increase midday service frequency
- Increase Saturday service frequency
- Add new Sunday service

	Existing Service Levels	Proposed Service Levels
Weekdays	**5:00 AM – 8:00 PM**	**5:00 AM – 10:00 PM**
Early	30	60
AM Peak	30	60
Midday	60-90	60
PM Peak	30	60
Evening	60	60
Saturday	**6:30 AM – 7:00 PM**	**7:00 AM – 7:00 PM**
Day	30-60	30
Evening	60	60
Sunday	—	**11:00 AM – 6:00 PM**
All Day	—	60



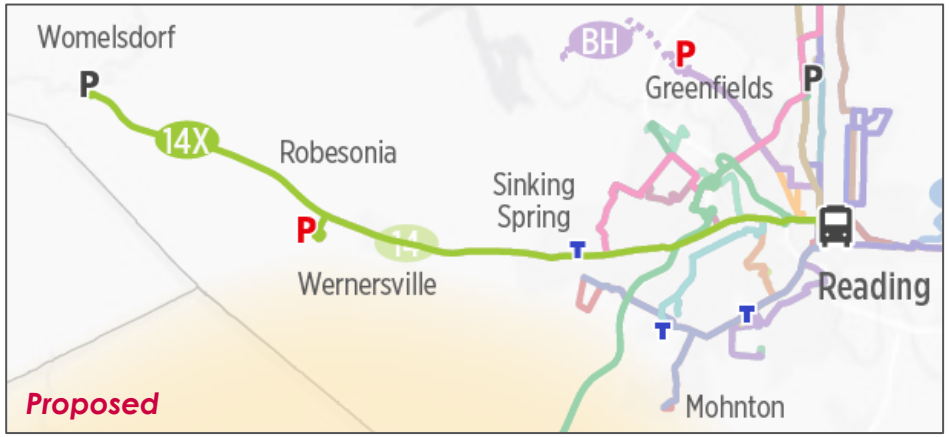
Route 14X Womelsdorf via Wernersville (new route)

Overview of Proposed Changes

- New express route to operate faster long-distance service between Reading and Womelsdorf via Wernersville
- Operate as an Express route
- Serve limited stops between Reading and Womelsdorf via Sinking Spring, Wernersville State Hospital, and Robesonia
- Discontinue Saturday trips to Womelsdorf due to extremely low ridership

	Existing Service Levels*	Proposed Service Levels
Weekdays	**5:00 AM – 8:00 PM**	**5:30 AM – 7:00 PM**
Early	1 one-way trip	1 one-way trip
AM Peak	5 one-way trips	5 one-way trips
Midday	2 one-way trips	—
PM Peak	6 one-way trips	6 one-way trips
Evening	2 one-way trips	—
Saturday	**7:00 AM – 7:00 PM**	**—**
Day	5 one-way trips	—
Evening	1 one-way trips	—
Sunday	**—**	**—**
All Day	—	—

** Based on existing Route 14 trips that extend to Womelsdorf*



SCTA SOUTH CENTRAL TRANSIT AUTHORITY

BARTA

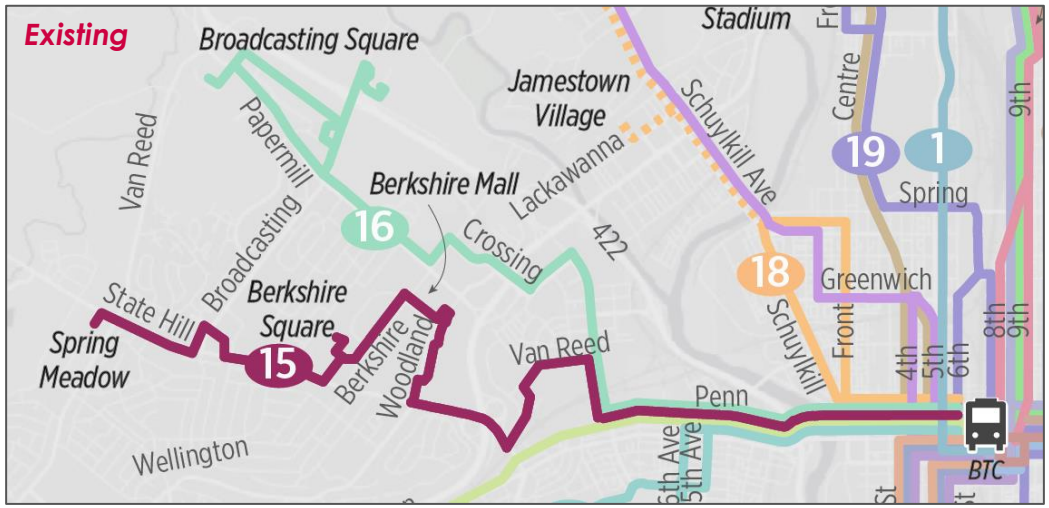
BARTA RRTA RED ROSE TRANSIT AUTHORITY

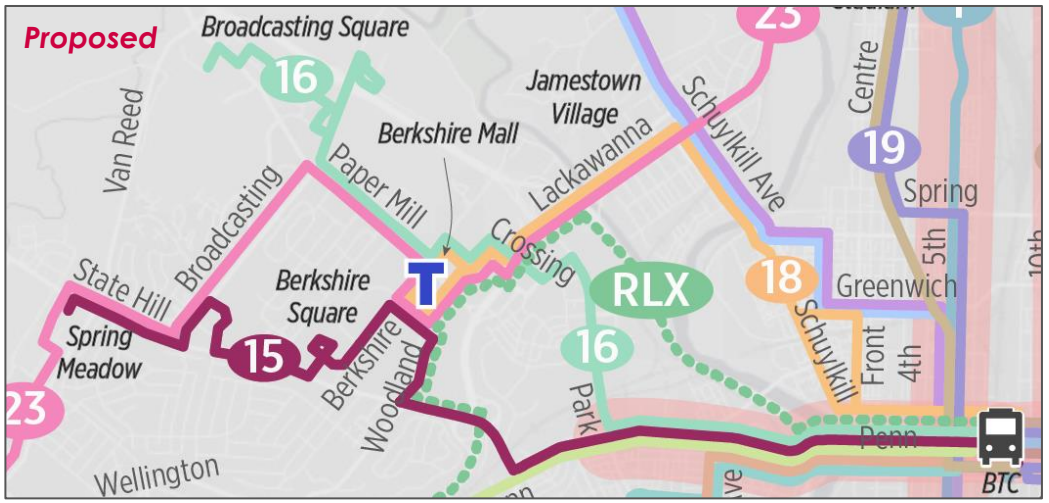
Route 15 Berkshire Mall

Overview of Proposed Changes

- Operate as a Major Local route
- Between Berkshire Mall and West Reading, serve Penn Avenue and State Hill Road instead of Park Road and Van Reed Road
- Increase weekday service frequencies to every 15 minutes during the day and every 30 minutes in the evening
- Increase Saturday service frequency to every 30 minutes all day
- Extend Sunday span of service and increase service frequency to every 30 minutes all day

	Existing Service Levels	Proposed Service Levels
Weekdays	**5:30 AM – 11:00 PM**	**5:30 AM– 11:00 PM**
Early	30	30
AM Peak	30	15
Midday	30	15
PM Peak	30	15
Evening	60	30
Saturday	**5:30 AM – 11:00 PM**	**5:30 AM – 11:00 PM**
Day	30	30
Evening	60	30
Sunday	**10:30 AM – 6:30 PM**	**8:00 AM – 8:00 PM**
All Day	60	30





SCTA SOUTH CENTRAL TRANSIT AUTHORITY

BARTA

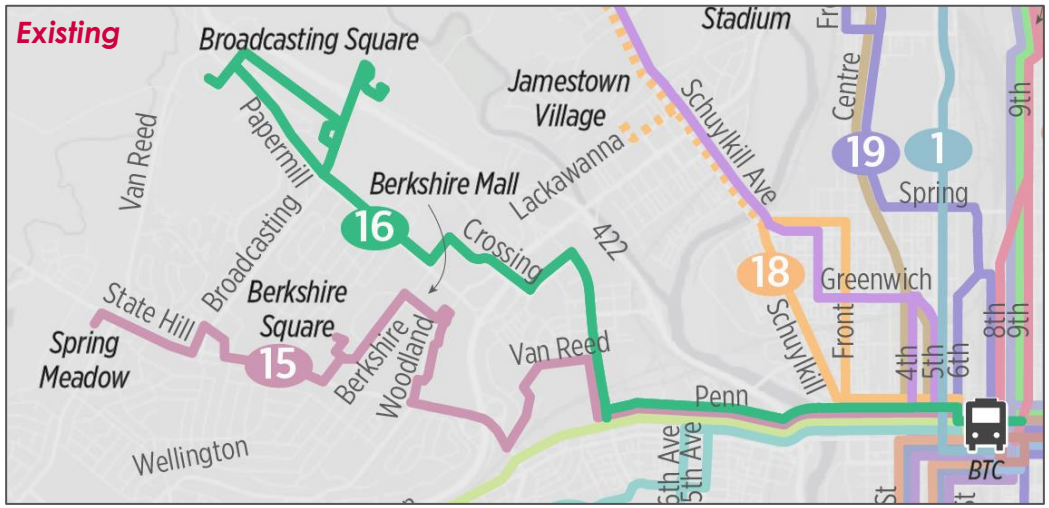
BARTA RRTA RED ROSE TRANSIT AUTHORITY

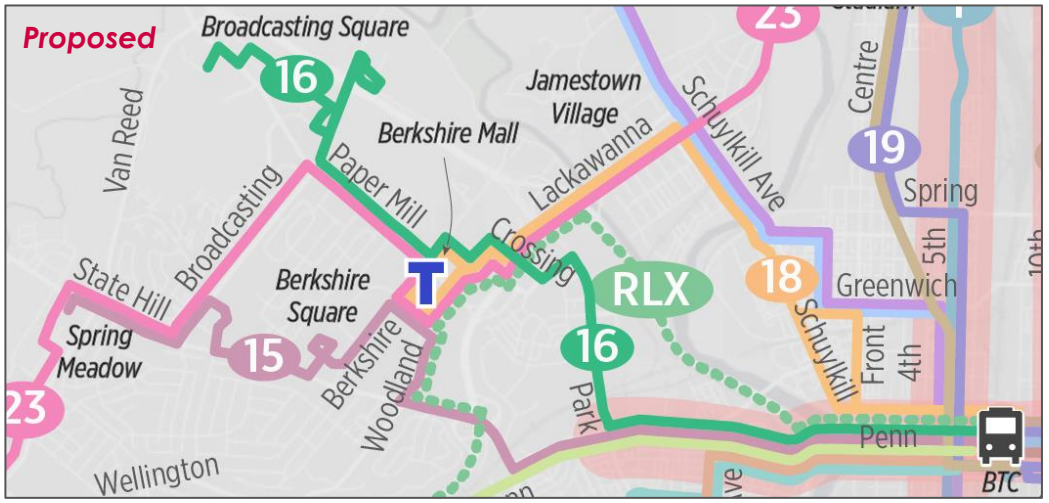
Route 16 Broadcasting Square

Overview of Proposed Changes

- Operate as Major Local route
- Serve Broadcasting Square in both outbound and inbound directions instead of the existing terminal loop
- Increase weekday service frequencies to every 15 minutes during the day and every 30 minutes in the evening
- Extend Saturday span of service and increase service frequencies to every 15 minutes during the day and every 30 minutes in the evening
- Extend Sunday span of service and increase service frequency to every 30 minutes all day

	Existing Service Levels	Proposed Service Levels
Weekdays	**5:45 AM – 11:15 PM**	**5:45 AM – 11:15 PM**
Early	30	30
AM Peak	30	15
Midday	30	15
PM Peak	30	15
Evening	60	30
Saturday	**5:45 AM – 11:15 PM**	**5:45 AM – 11:15 PM**
Day	30	15
Evening	60	30
Sunday	**11:00 AM – 7:00 PM**	**8:00 AM – 8:00 PM**
All Day	60	30





SCTA SOUTH CENTRAL TRANSIT AUTHORITY

BARTA

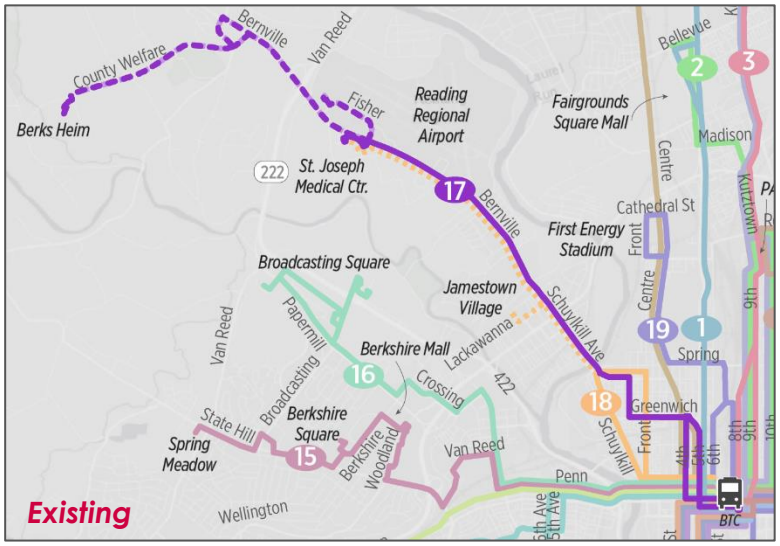
BARTA RRTA RED ROSE TRANSIT AUTHORITY

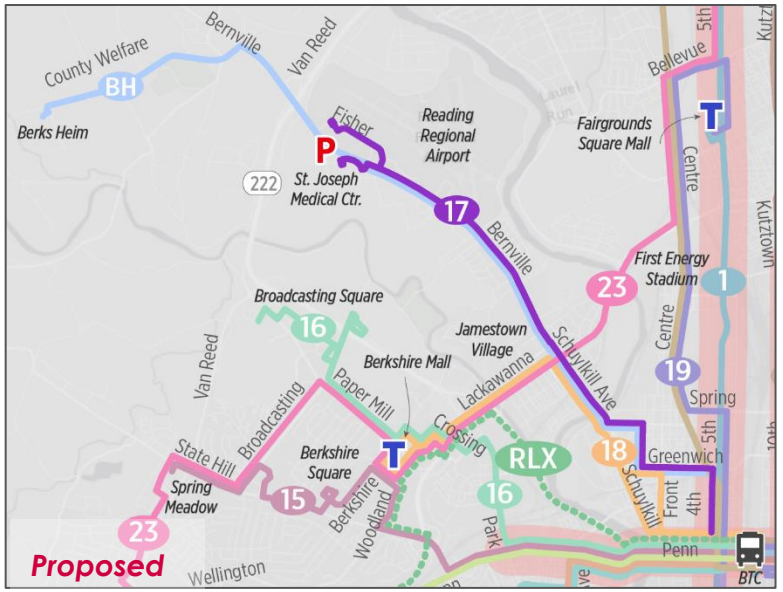
Route 17 Glenside/Airport/Berks Heim

Overview of Proposed Changes

- Operate as a Local route
- Within Reading, operate via 5th Street, Greenwich Street, and Weiser Street in both directions
- Discontinue outbound deviations to Hensler Homes, serve these riders at stops on Schuylkill Avenue in both directions (will also be served by Route 18)
- Terminate at St. Joseph Medical Center on all trips
- Extend weekday span of service and increase service frequency to 15 minutes during AM and PM peak periods and 30 minutes in the evening
- Extend span of service on Saturday
- Add new Sunday service
- Rebrand Route 17 variant to Berks Heim as "Airport/Berks-Heim Shuttle"

	Existing Service Levels	Proposed Service Levels
Weekdays	**5:45 AM – 6:45 PM**	**5:45 AM – 11:00 PM**
Early	30	60
AM Peak	30-60	30
Midday	60	60
PM Peak	60	30
Evening	—	60
Saturday	**6:15 AM – 6:45 PM**	**6:15 AM – 11:00 PM**
Day	60	60
Evening	60	60
Sunday	**—**	**11:00 AM – 6:00 PM**
All Day	—	60





SCTA SOUTH CENTRAL TRANSIT AUTHORITY

BARTA

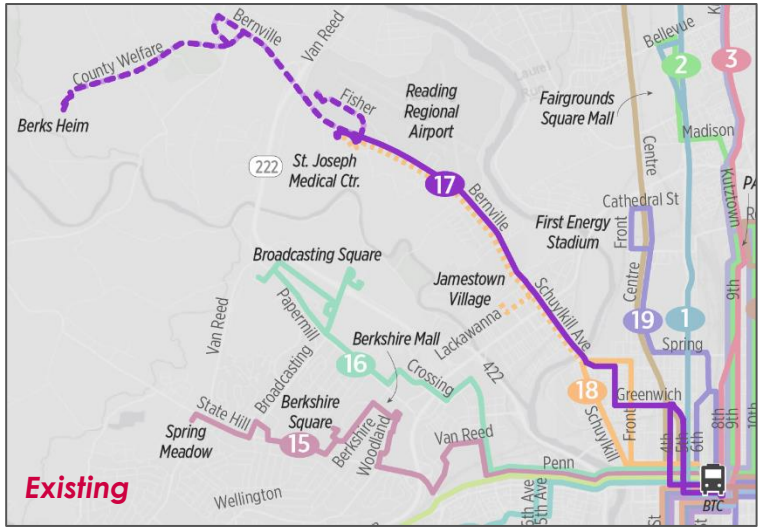
BARTA RRTA RED ROSE TRANSIT AUTHORITY

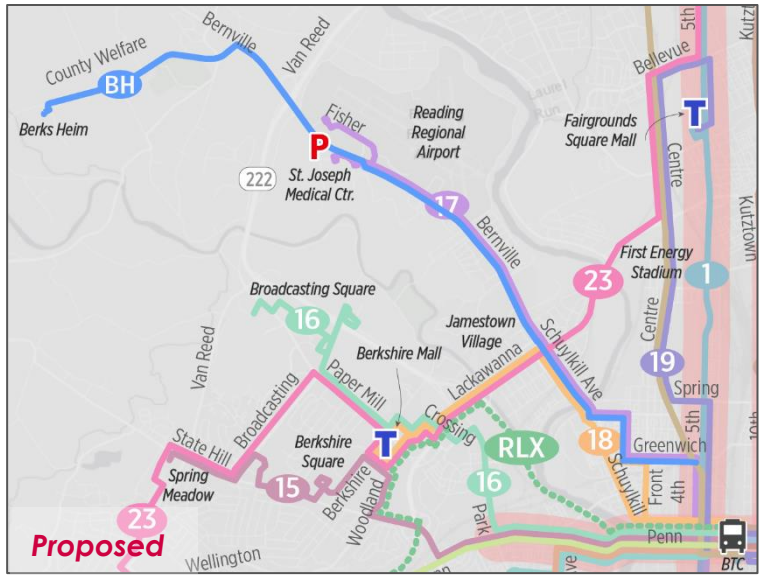
Route BH Airport/Berks-Heim Shuttle (new route)

Overview of Proposed Changes

- New route to provide dedicated shuttle service between downtown Reading and Berks Heim
- Route 17 will operate between downtown Reading and St. Joseph Medical Center on all trips

	Existing Service Levels *(Route 17 Variant)*	Proposed Service Levels
Weekdays	**6:15 AM – 6:45 PM**	**6:15 AM – 6:45 PM**
Early	—	—
AM Peak	2 one-way trips	2 one-way trips
Midday	2 one-way trips	2 one-way trips
PM Peak	2 one-way trips	2 one-way trips
Evening	—	—
Saturday	**6:50 AM – 3:45 PM**	**6:50 AM – 3:45 PM**
Day	4 one-way trips	4 one-way trips
Evening	—	—
Sunday	**—**	**—**
All Day	—	—



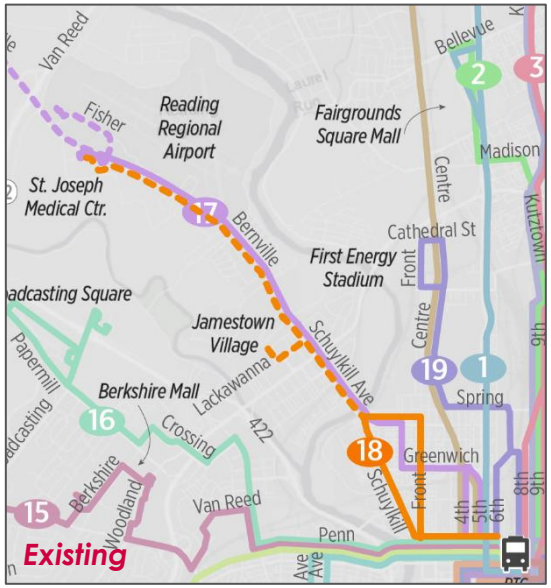


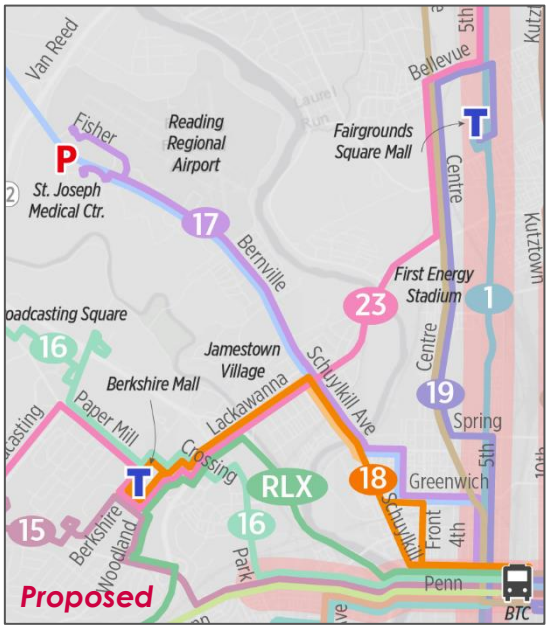
Route 18 Schuylkill Avenue/Berkshire Mall

Overview of Proposed Changes

- Operate as a Local route
- Redesign outbound alignment between BTC and Schuylkill Avenue to operate west via Greenwich Street instead of Windsor Street
- Extend route to serve Berkshire Mall via Schuylkill Avenue and Jamestown Mall, providing crosstown service to Berkshire Mall and connections with Routes 15, 16, 23, and RLX
- Discontinue evening trips to St. Joseph Medical Center and serve with Route 17 all day

	Existing Service Levels	Proposed Service Levels
Weekdays	**5:40 AM – 11:10 PM**	**5:40 AM – 10:00 PM**
Early	30	30
AM Peak	30	30
Midday	20	30
PM Peak	30	30
Evening	60	30
Saturday	**6:40 AM – 11:10 PM**	**6:40 AM – 10:00 PM**
Day	30	30
Evening	60	60
Sunday	**11:00 AM – 6:30 PM**	**11:00 AM – 6:30 PM**
All Day	60	60





SCTA SOUTH CENTRAL TRANSIT AUTHORITY

BARTA

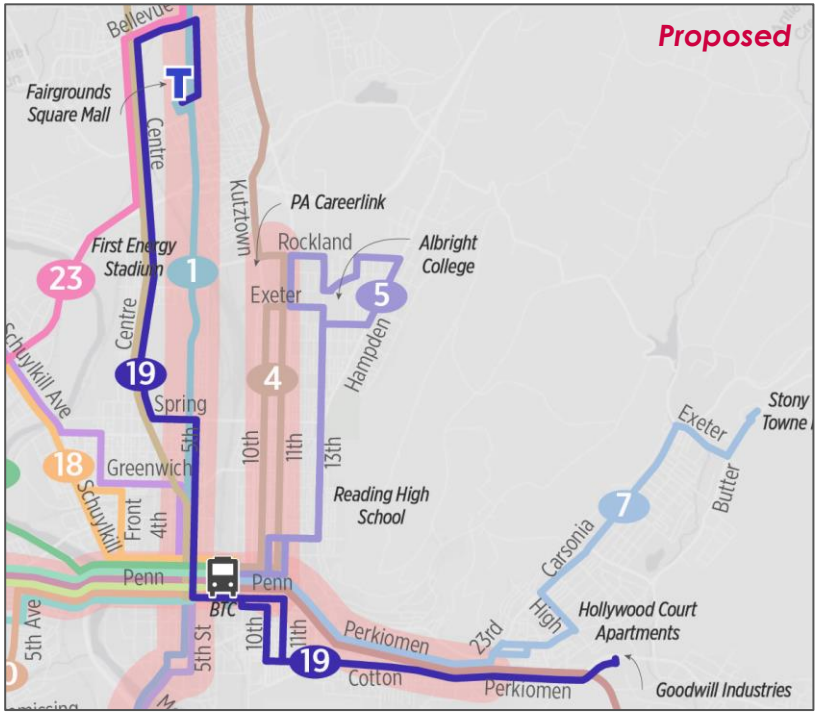
BARTA RRTA RED ROSE TRANSIT AUTHORITY

Route 19 Riverside-Fairgrounds Sq / Cotton Street

Overview of Proposed Changes

- Operate as a Local route
- Operate both northern and southern segments of Route 19 throughout the service day
- North of BTC, operate along 5th street in both directions, and extend the route north to serve Fairgrounds Square Mall
- South of BTC, operate along Cotton Street in both directions, and extend the route east to serve Goodwill Industries via Perkiomen Avenue and St. Lawrence Avenue
- Increase weekday midday service frequency to every 30 minutes

	Existing Service Levels	Proposed Service Levels
Weekdays	**5:30 AM – 9:40 PM**	**5:30 AM – 10:00 PM**
Early	30	30
AM Peak	30	30
Midday	60	30
PM Peak	30	30
Evening	60	60
Saturday	**6:30 AM – 9:45 PM**	**6:30 AM – 10:00 PM**
Day	60	60
Evening	60	60
Sunday	**11:30 AM – 6:55 PM**	**11:00 AM – 7:00 PM**
All Day	60	60

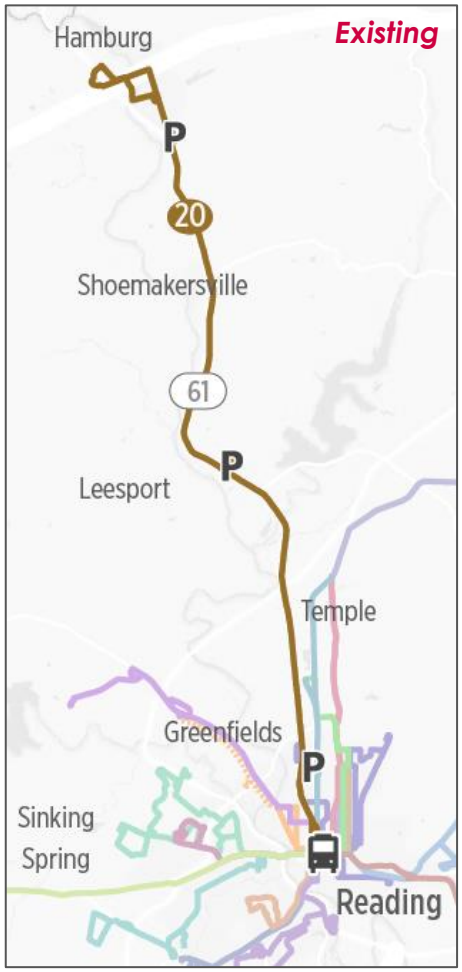


Route 20 Route 61 / Hamburg

Overview of Proposed Changes

- Operate as a Regional route
- Redesign alignment within Hamburg to serve Industrial Drive, State Street/Old Route 22, 4th Street in both inbound and outbound directions
- Adjust scheduled travel time to account for traffic during PM peak and improve on-time performance
- Discontinue the 10:05 PM outbound trip and 11:05 PM inbound trip on Saturdays due to extremely low ridership

	Existing Service Levels	Proposed Service Levels
Weekdays	**5:00 AM – 12:00 AM**	**5:00 AM – 11:00 PM**
Early	1 one-way trip	2 one-way trips
AM Peak	4 one-way trips	6 one-way trips
Midday	6 one-way trips	4 one-way trips
PM Peak	5 one-way trips	6 one-way trips
Evening	2 one-way trips	2 one-way trips
Saturday	**5:00 AM – 12:00 AM**	**5:00 AM – 7:00 PM**
Day	16 one-way trips	16 one-way trips
Evening	2 one-way trips	—
Sunday	**—**	**—**
All Day	—	—



BARTA

Route 22 Lyon Station / East Penn-Deka

Overview of Proposed Changes

- Discontinue route (all-day service to Temple is already provided by Route 3; ridership north of Temple is very low)
  - Employers north of Temple can be served by specialized vanpool or rideshare that better matches demand and accommodates employee shift times

	Existing Service Levels	Proposed Service Levels
Weekdays	**5:15 AM – 12:05 AM**	**—**
Early	1 one-way trip	—
AM Peak	1 one-way trip	—
Midday	2 one-way trips	—
PM Peak	—	—
Evening	2 one-way trips	—
Saturday	**—**	**—**
Day	—	—
Evening	—	—
Sunday	**—**	**—**
All Day	—	—

SCTA SOUTH CENTRAL TRANSIT AUTHORITY

BARTA

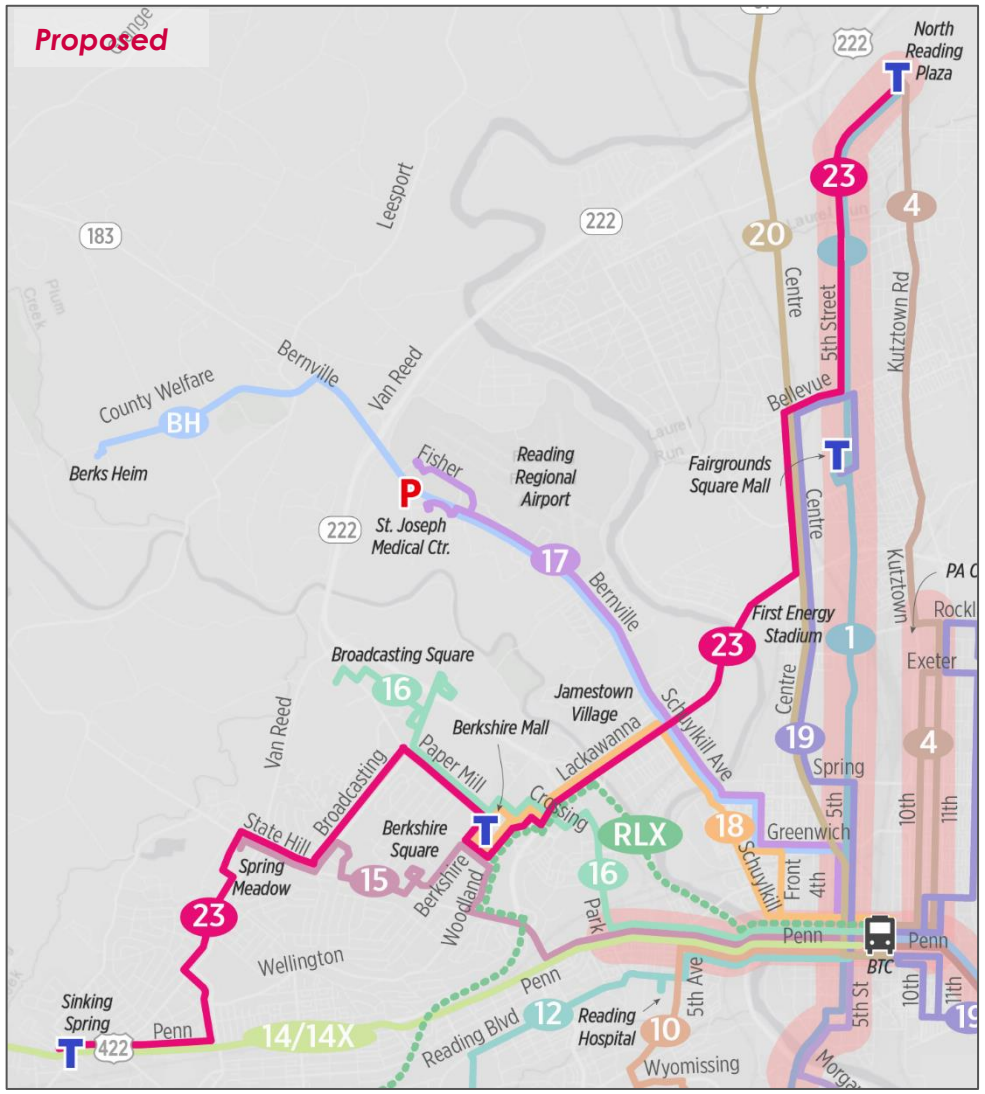
BARTA RRTA RED ROSE TRANSIT AUTHORITY

Route 23 Sinking Spring / Temple via Berkshire Mall (new route)

Overview of Proposed Changes

- New crosstown route connecting Sinking Spring, Whitfield Walmart, Berkshire Mall, Centre Avenue, 5th Street/Route 222 corridor, and North Reading Plaza
- Operate as a Regional route

	Existing Service Levels	Proposed Service Levels
Weekdays	—	**6:00 AM – 6:00 PM**
Early	—	—
AM Peak	—	6 one-way trips
Midday	—	4 one-way trips
PM Peak	—	6 one-way trips
Evening	—	—
Saturday	—	**7:00 AM – 7:00 PM**
Day	—	12 one-way trips
Evening	—	—
Sunday	—	**11:00 AM – 6:00 PM**
All Day	—	8 one-way trips



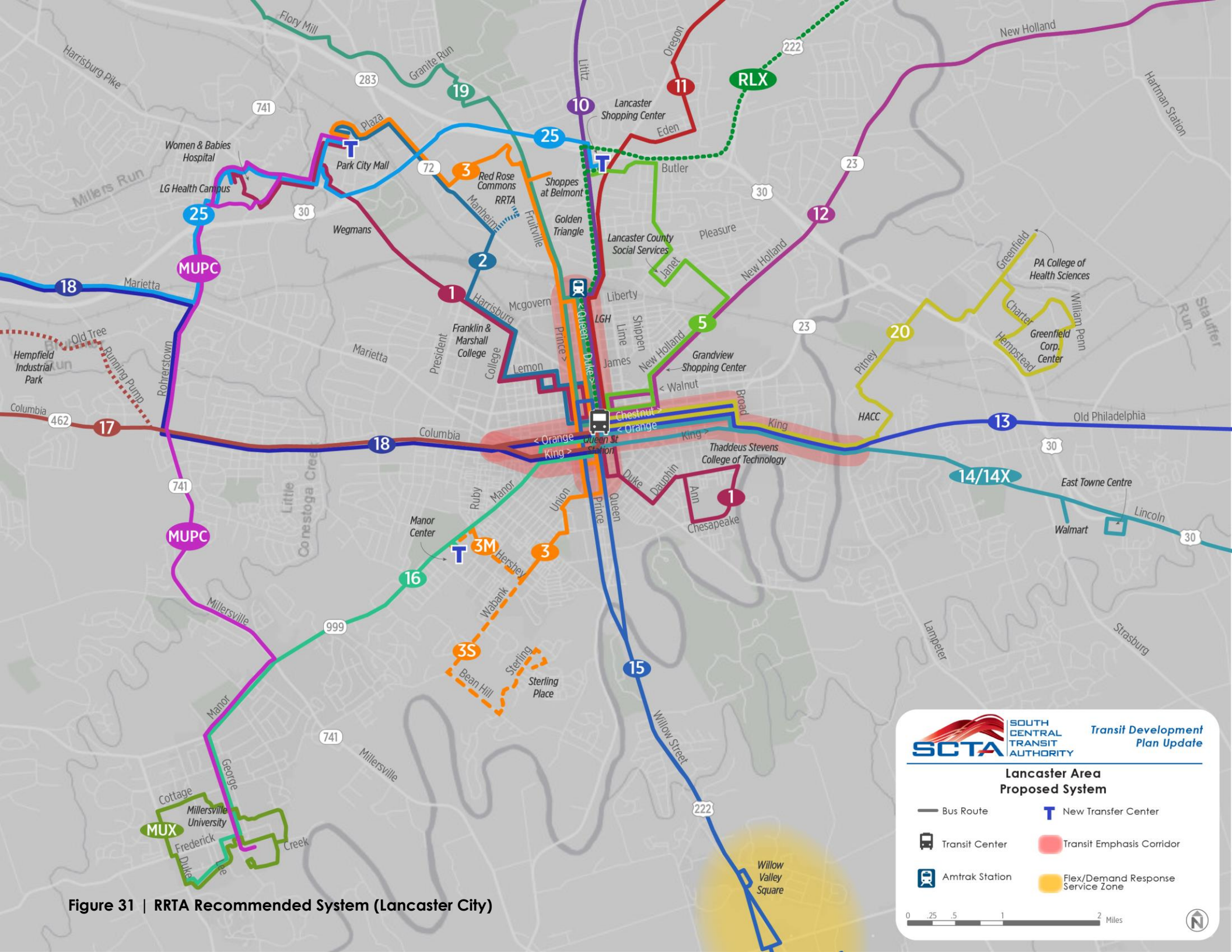


Figure 31 | RRTA Recommended System (Lancaster City)

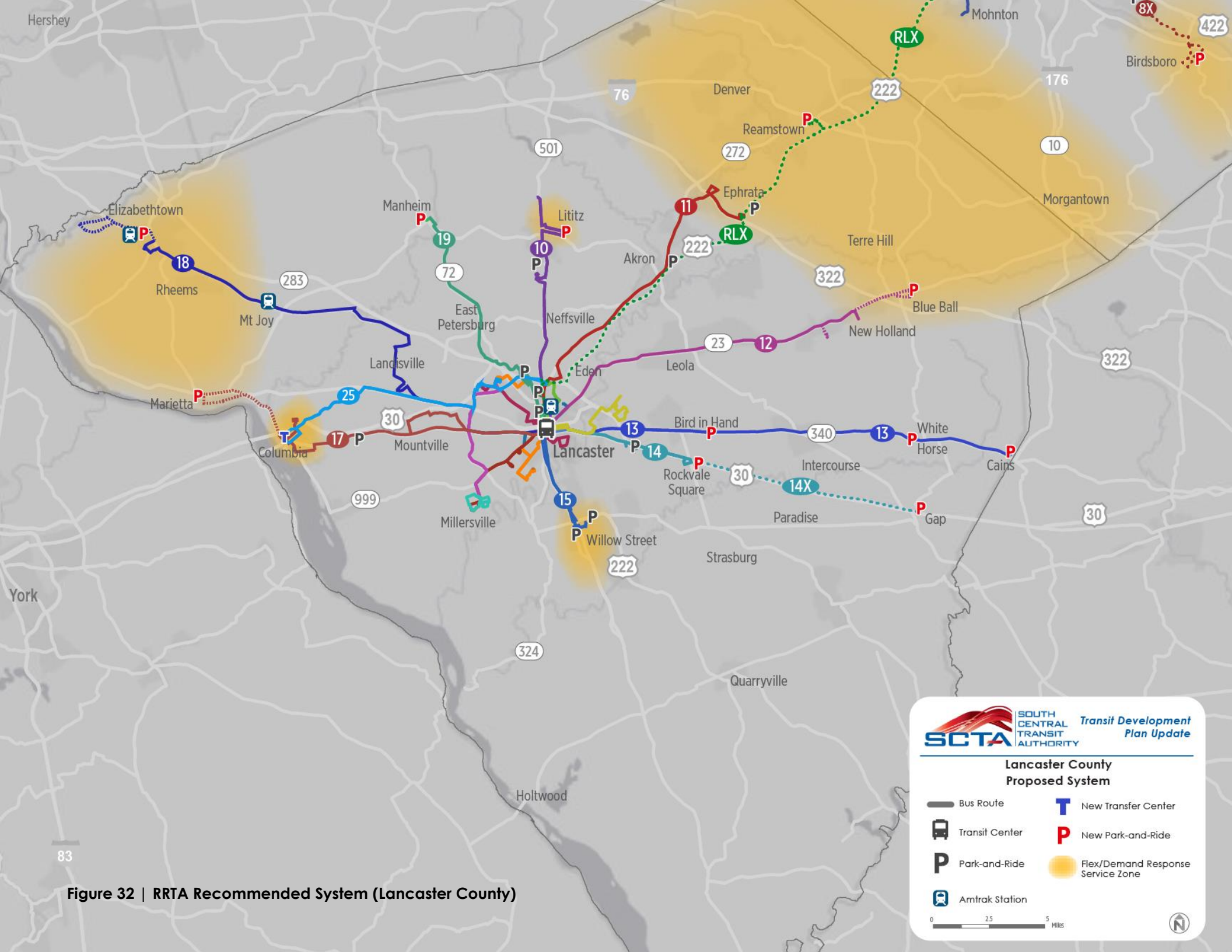


Figure 32 | RRTA Recommended System (Lancaster County)

SCTA SOUTH CENTRAL TRANSIT AUTHORITY

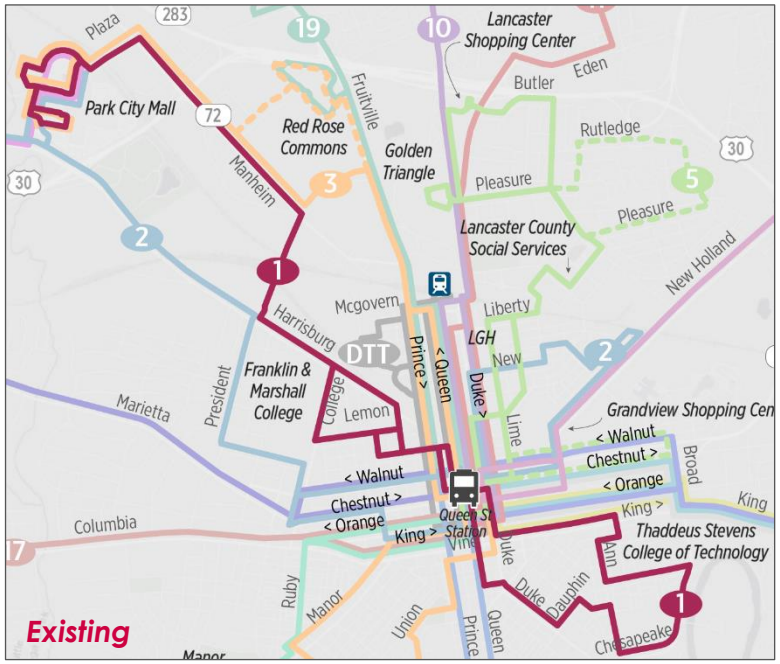
RRTA

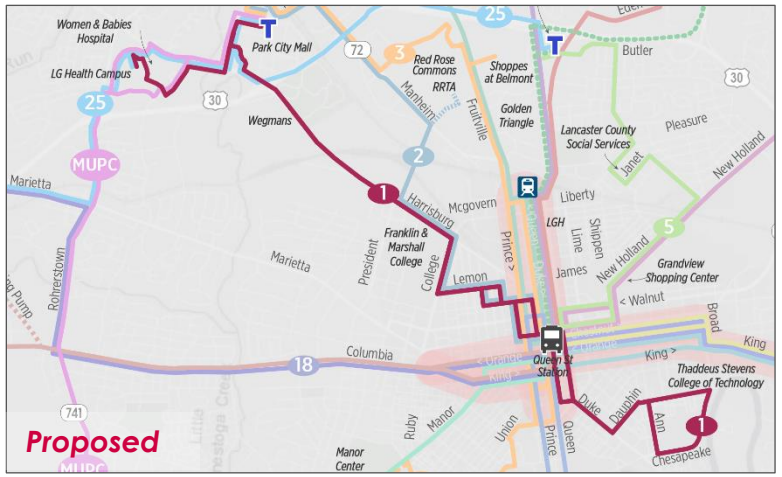
Route 1 Park City – Southeast

Overview of Proposed Changes

- Operate as a Local Route
- Increased service frequencies on weekdays, Saturdays, and Sundays with consistent headways
- Streamlined alignment north of downtown Lancaster to stay on Harrisburg Pike between Park City Mall and Franklin & Marshall College
- Route extended west to serve LGH Women & Babies Hospital
- Streamlined alignment south of downtown Lancaster to serve Duke Street and Dauphin Street both inbound and outbound

	Existing Service Levels	Proposed Service Levels
Weekdays	**6:05 AM – 10:35 PM**	**6:05 AM – 10:35 PM**
Early	—	—
AM Peak	30	30
Midday	30-40	30
PM Peak	30-45	30
Evening	50-70	60
Saturday	**6:50 AM – 10:35 PM**	**6:50 AM – 10:35 PM**
Day	30-40	30
Evening	35-60	60
Sunday	**11:10 AM – 6:40 PM**	**11:10 AM – 6:40 PM**
All Day	60-75	60



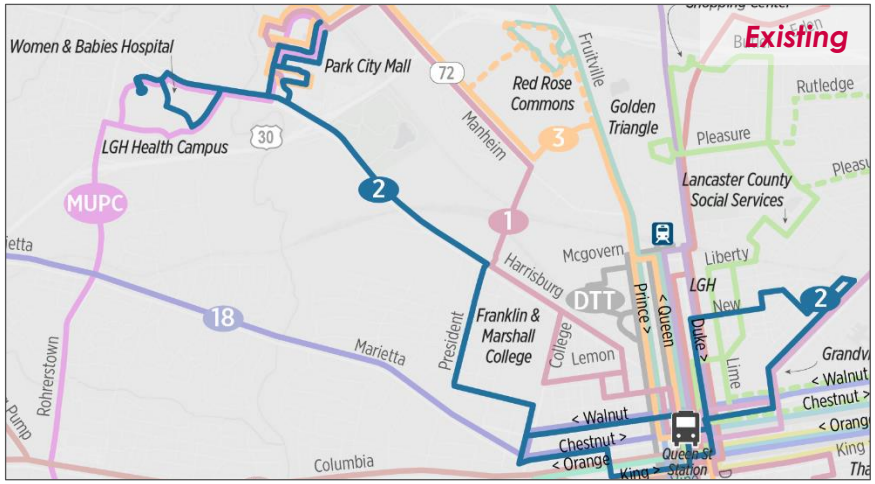


Route 2 Manor Avenue – 6th Ward

Overview of Proposed Changes

- Operate as a Local Route
- Increased service frequencies on weekdays and Saturdays, with consistent headways on all days
- Discontinue alignment east of downtown, to be served by a redesigned Route 5 Rossmere
- Redesigned alignment west of downtown:
  - Serve Park City via Harrisburg Pike, Dillerville Road, and Manheim Pike
  - Route will serve RRTA administrative offices on Erick Road via Harrisburg Pike and Manheim Pike

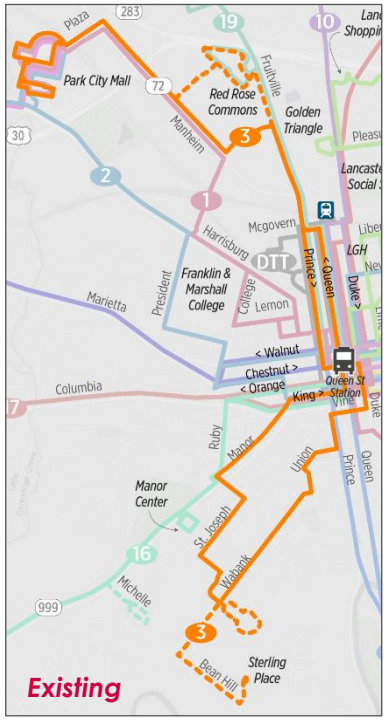
	Existing Service Levels	Proposed Service Levels
Weekdays	**6:17 AM – 10:35 PM**	**6:00 AM – 10:35 PM**
Early	—	—
AM Peak	35-40	30
Midday	30-45	30
PM Peak	30-60	30
Evening	60	60
Saturday	**6:50 AM – 10:35 PM**	**6:50 AM – 10:35 PM**
Day	35-40	30
Evening	45-60	60
Sunday	**11:10 AM – 6:40 PM**	**11:10 AM – 6:40 PM**
All Day	55-65	60

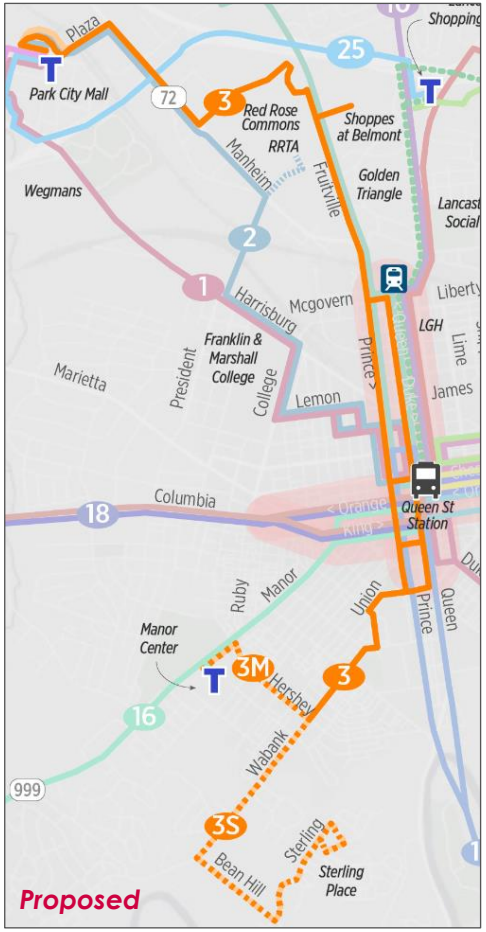


Route 3 Park City – 8th Ward

Overview of Proposed Changes

- Operate as a Local Route
- Increased service frequencies on weekdays and Saturdays, with consistent headways on all days
- Streamlined alignment north of downtown to serve Red Rose Commons on all trips, both directions
- Serve the Shoppes at Belmont
- Streamlined alignment south of downtown to serve Wabank Street both inbound and outbound
- Two branches served on alternate trips, providing 30-minute service along the route's core alignment:
  - Branch 3M to Manor Center, with connections to Route 2 and Route 16 (hourly service at all times)
  - Branch 3S to Sterling Place via Wabank (hourly service during the day weekdays and Saturdays)





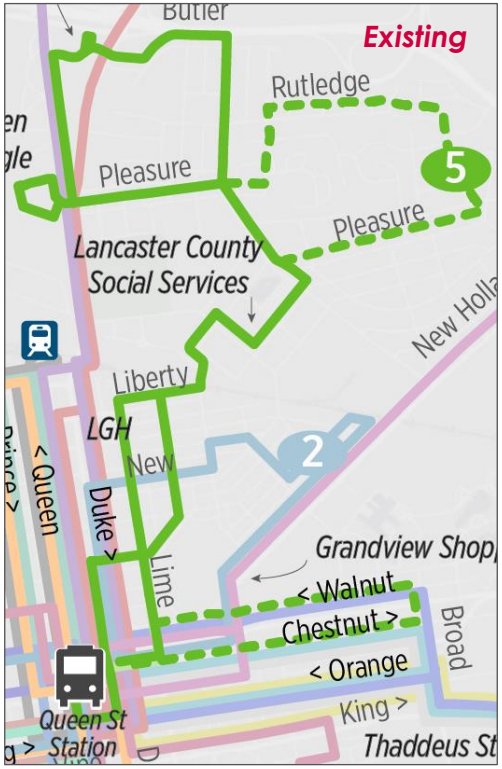
	Existing Service Levels	Proposed Service Levels	*Branch 3M*	*Branch 3S*
Weekdays	**6:05 AM – 10:35 PM**	**6:00 AM – 10:35 PM**	*6:00 AM – 10:35 PM*	*6:30 AM – 6:00 PM*
Early	—	—	—	—
AM Peak	35-40	30	60	60
Midday	40-45	30	60	60
PM Peak	35-45	30	60	60
Evening	40-80	60	60	—
Saturday	**6:50 AM – 10:35 PM**	**6:50 AM – 10:35 PM**	*6:50 AM – 10:35 PM*	*7:20 AM – 7:00 PM*
Day	45-40	30	60	60
Evening	40-80	60	60	—
Sunday	**11:10 AM – 6:40 PM**	**11:10 AM – 6:40 PM**	*11:10 AM – 6:40 PM*	—
All Day	60-65	60	60	—

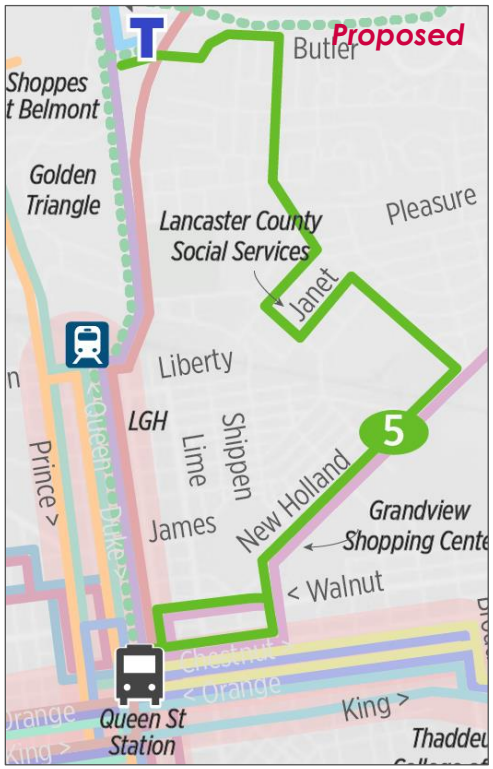
Route 5 Rossmere

Overview of Proposed Changes

- Operate as a Local Route
- Increased service frequencies during weekday peak hours and Saturdays, with consistent headways at all times
- Addition of weekday evening, Saturday evening, and Sunday service
- Discontinue service along Walnut Street and Chestnut Street east of Plum Street (to be served by redesigned Route 20 and Routes 13/13X)
- Discontinue peak-hour deviation trips to Rutledge Avenue/Oregon Boulevard/Pleasure Road
- Streamlined northern alignment to operate bidirectional service to Golden Triangle

	Existing Service Levels	Proposed Service Levels
Weekdays	**6:30 AM – 5:20 PM**	**6:00 AM – 10:35 PM**
Early	—	—
AM Peak	35-40	30
Midday	45	60
PM Peak	45-50	30
Evening	—	60
Saturday	**8:35 AM – 6:00 PM**	**6:50 AM – 10:35 PM**
Day	5 trips	60
Evening	—	60
Sunday	**—**	**11:00 AM – 6:40 PM**
All Day	—	60



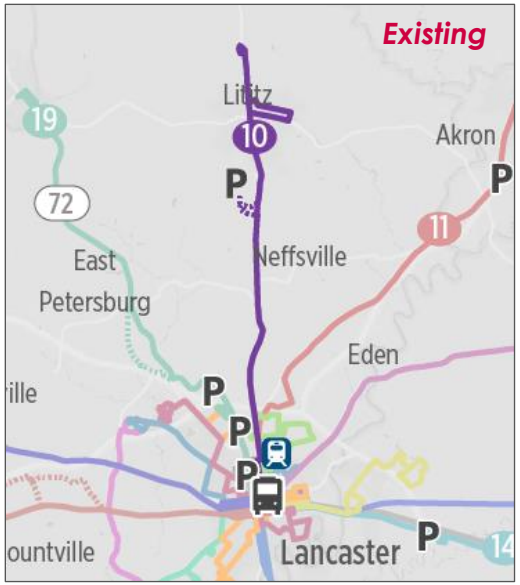


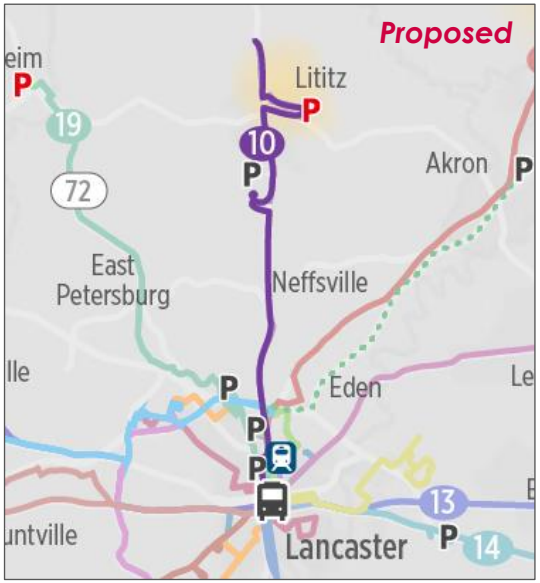
RRTA

Route 10 Lititz

Overview of Proposed Changes

- Operate as a Regional Route
- Extended service on Saturday until 7:00 PM
- Circulation through Lititz in both inbound and outbound directions
- Service to Shoppes at Kissel Hill/Stauffer's on all trips
- Coordinated schedule with Route 11 Ephrata to maximize corridor frequency along Duke/Queen Streets in downtown Lancaster



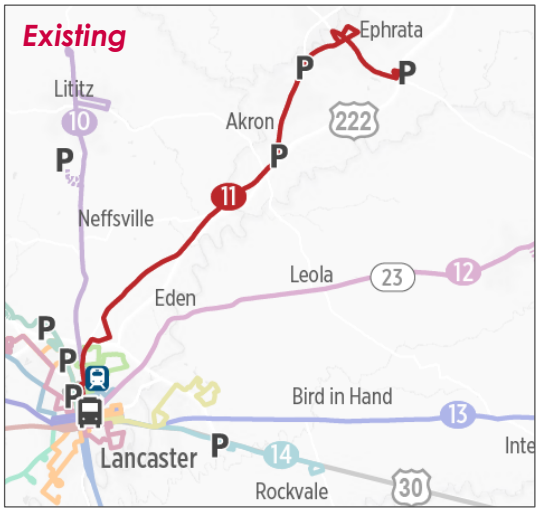


	Existing Service Levels	Proposed Service Levels
Weekdays	**5:15 AM – 6:35 PM**	**5:15 AM – 6:00 PM**
Early	2 one-way trips	2 one-way trips
AM Peak	5 one-way trips	6 one-way trips
Midday	16 one-way trips	10 one-way trips
PM Peak	5 one-way trips	6 one-way trips
Evening	—	—
Saturday	**6:50 AM – 5:20 PM**	**7:00 AM – 7:00 PM**
Day	16 one-way trips	16 one-way trips
Evening	—	—
Sunday	**—**	**—**
All Day	—	—

Route 11 Ephrata

Overview of Proposed Changes

- Operate as a Regional Route
- Increased service during AM and PM peak periods
- Service to Walmart on all trips
- Service to EARS on all trips
- Coordinated schedule with Route 10 Lititz to maximize corridor frequency along Duke/Queen Streets in downtown Lancaster
- Connections to new RLX Reading-Lancaster Express route



	Existing Service Levels	Proposed Service Levels
Weekdays	**5:15 AM – 6:50 PM**	**5:15 AM – 7:00 PM**
Early	2 one-way trips	2 one-way trips
AM Peak	4 one-way trips	6 one-way trips
Midday	12 one-way trips	10 one-way trips
PM Peak	2 one-way trips	6 one-way trips
Evening	2 one-way trips	2 one-way trips
Saturday	**7:50 AM – 6:45 PM**	**7:00 AM – 7:00 PM**
Day	10 one-way trips	10 one-way trips
Evening	—	—
Sunday	**—**	**—**
All Day	—	—

SCTA SOUTH CENTRAL TRANSIT AUTHORITY

RRTA

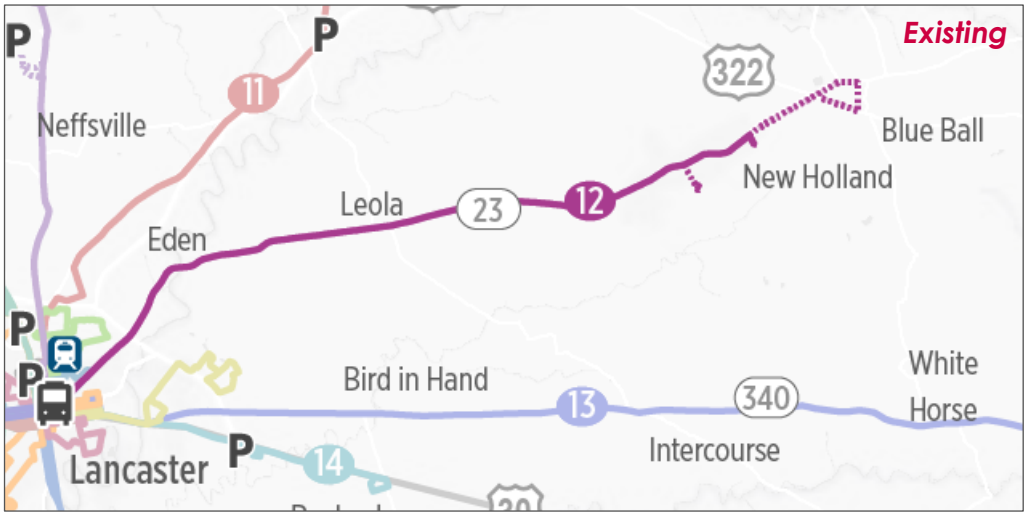
BARTA

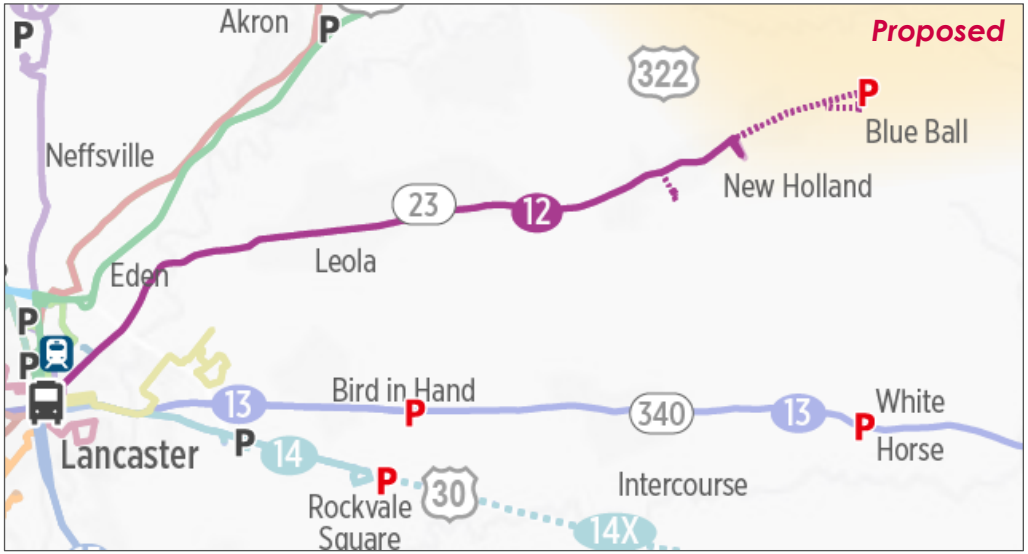
RRTA RED ROSE TRANSIT AUTHORITY

Route 12 New Holland

Overview of Proposed Changes

- Operate as a Regional Route
- No changes to existing alignment
- Increased service during AM and PM peak periods



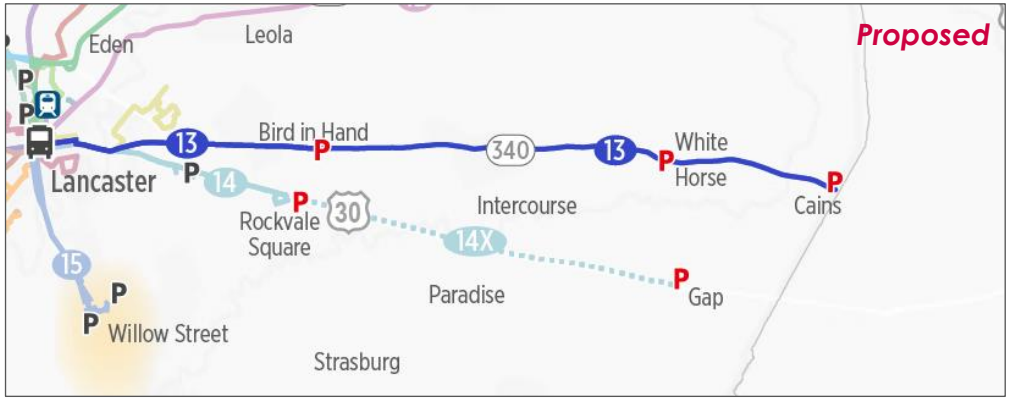


	Existing Service Levels	Proposed Service Levels
Weekdays	**5:05 AM – 7:00 PM**	**5:05 AM – 7:00 PM**
Early	3 one-way trips	4 one-way trips
AM Peak	4 one-way trips	6 one-way trips
Midday	14 one-way trips	8 one-way trips
PM Peak	6 one-way trips	6 one-way trips
Evening	1 one-way trips	—
Saturday	**6:15 AM – 6:55 PM**	**6:00 AM – 7:00 PM**
Day	10 one-way trips	10 one-way trips
Evening	—	—
Sunday	**—**	**—**
All Day	—	—

Route 13 White Horse/Cains

Overview of Proposed Changes

- Operate as a Regional Route
- Increase service during early morning, AM peak, and PM peak periods
- Extend span of service on Saturdays
- No changes to existing alignment



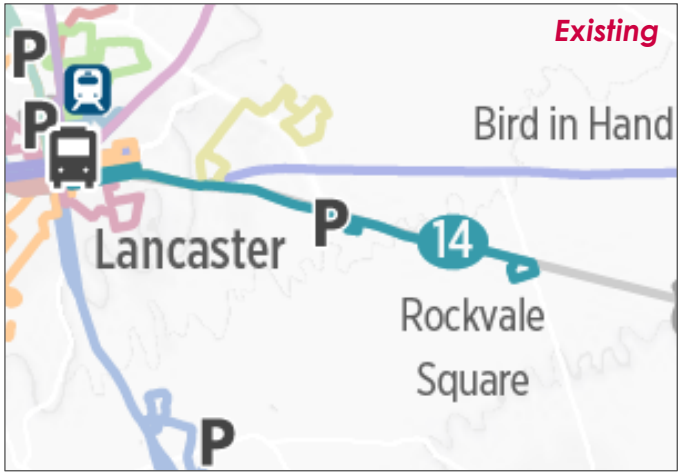
	Existing Service Levels	Proposed Service Levels
Weekdays	**5:30 AM – 6:35 PM**	**5:30 AM – 6:35 PM**
Early	1 one-way trip	2 one-way trips
AM Peak	3 one-way trips	6 one-way trips
Midday	8 one-way trips	6 one-way trips
PM Peak	3 one-way trips	6 one-way trips
Evening	1 one-way trip	—
Saturday	**6:30 AM – 5:15 PM**	**5:30 AM – 6:00 PM**
Day	6 one-way trips	8 one-way trips
Evening	—	—
Sunday	**—**	**—**
All Day	—	—

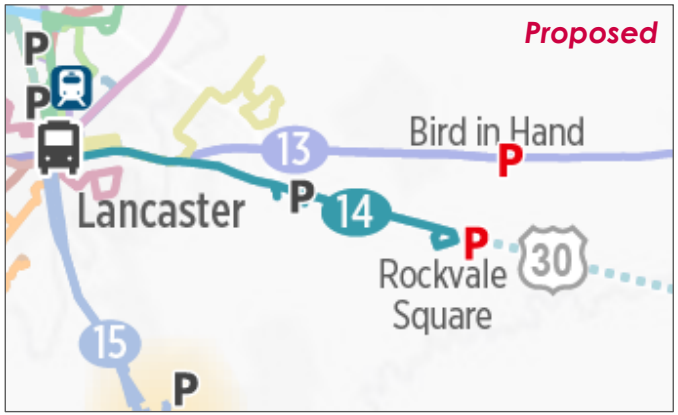
Route 14 Rockvale Square

Overview of Proposed Changes

- Operate as a Major Local Route
- No changes to existing alignment
- Increase service frequency to every 15 minutes during weekday peak and midday periods and Saturday daytime
- Increase weekday and Saturday evening service frequency to every 30 minutes
- Increase Sunday service frequency to every 30 minutes all day
- Expand span of service on Saturday and Sunday

	Existing Service Levels	Proposed Service Levels
Weekdays	**5:40 AM – 10:40 PM**	**5:40 AM – 11:00 PM**
Early	30	30
AM Peak	20-30	15
Midday	20-25	15
PM Peak	20-30	15
Evening	35-70	30
Saturday	**6:30 AM – 10:40 PM**	**5:40 AM – 11:00 PM**
Day	20-30	15
Evening	35-70	30
Sunday	**7:20 AM – 6:45 PM**	**7:20 AM – 8:00 PM**
All Day	35-70	30



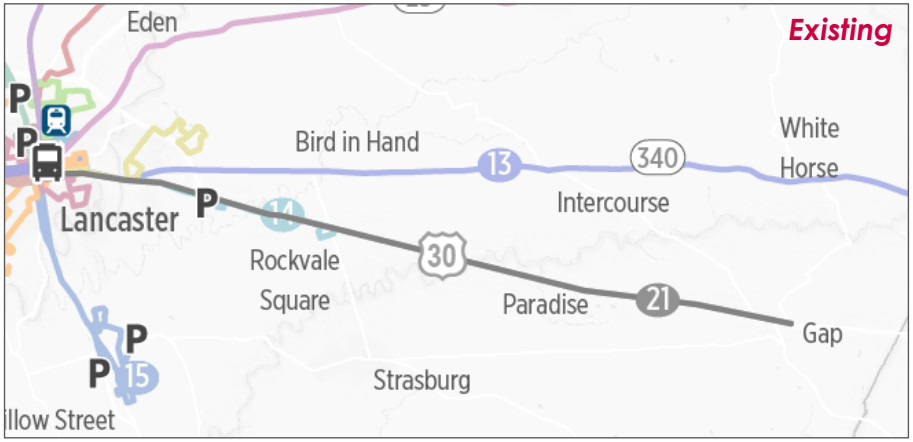


Route 14X Gap via Rockvale Square (formerly Route 21 Gap)

Overview of Proposed Changes

- Operate as an Express Route with limited stops to provide faster, more direct long-distance service
- Re-brand as 14X to reflect that the routes serve the same corridor and have overlapping service
- No changes to existing alignment

	Existing Service Levels	Proposed Service Levels
Weekdays	**5:05 AM – 6:35 PM**	**5:00 AM – 6:35 PM**
Early	2 one-way trips	2 one-way trips
AM Peak	5 one-way trips	6 one-way trips
Midday	8 one-way trips	6 one-way trips
PM Peak	3 one-way trips	6 one-way trips
Evening	—	—
Saturday	**6:00 AM – 6:35 PM**	**6:00 AM – 6:35 PM**
Day	16 one-way trips	16 one-way trips
Evening	—	—
Sunday	**—**	**—**
All Day	—	—

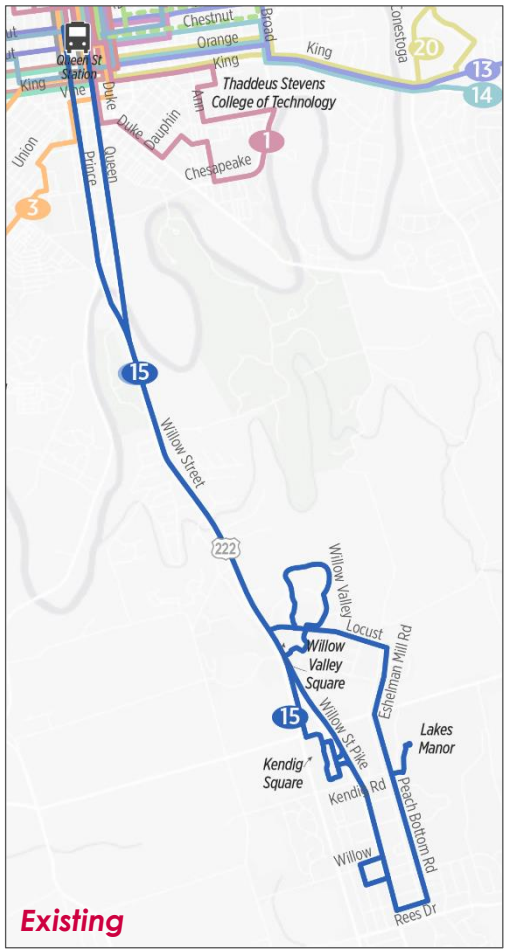


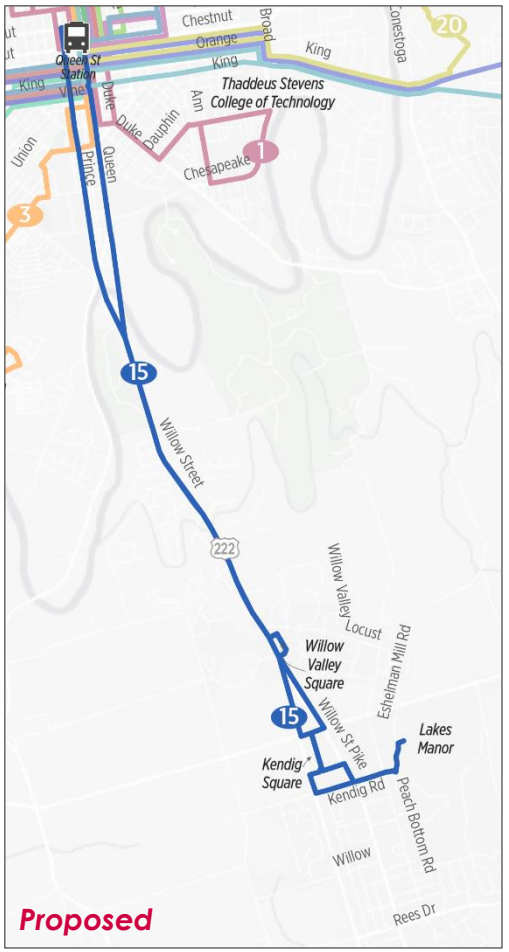
Route 15 Willow Street

Overview of Proposed Changes

- Operate as a Regional Route
- Serve Kendig Square on all trips traveling both inbound and outbound
- Streamline alignment within Willow Street to provide more direct, bidirectional service to and from downtown Lancaster
  - Discontinue service south of Kendig Road, along Eshelman Mill Road and Locust Lane, and to Willow Valley Manor
- Serve the greater Willow Street area with a flex/demand response service with direct connections to Route 15 to and from downtown Lancaster
- Increase service during PM peak and evening

	Existing Service Levels	Proposed Service Levels
Weekdays	**5:50 AM – 6:10 PM**	**5:50 AM – 7:00 PM**
Early	—	—
AM Peak	6 one-way trips	6 one-way trips
Midday	10 one-way trips	6 one-way trips
PM Peak	4 one-way trips	6 one-way trips
Evening	—	2 one-way trips
Saturday	**8:20 AM – 4:20 PM**	**8:20 AM – 6:20 PM**
Day	12 one-way trips	14 one-way trips
Evening	—	—
Sunday	**—**	**—**
All Day	—	—

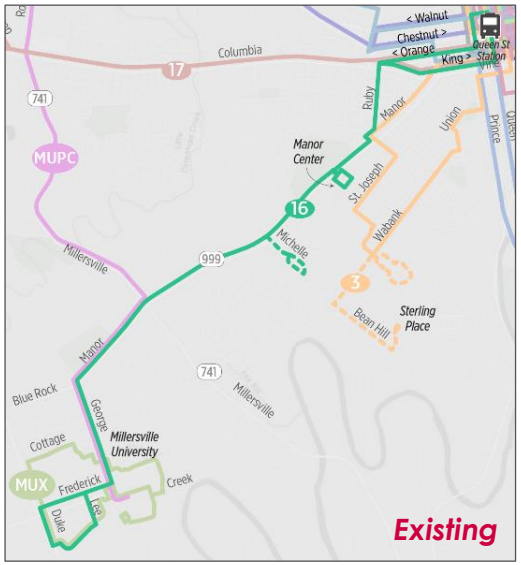


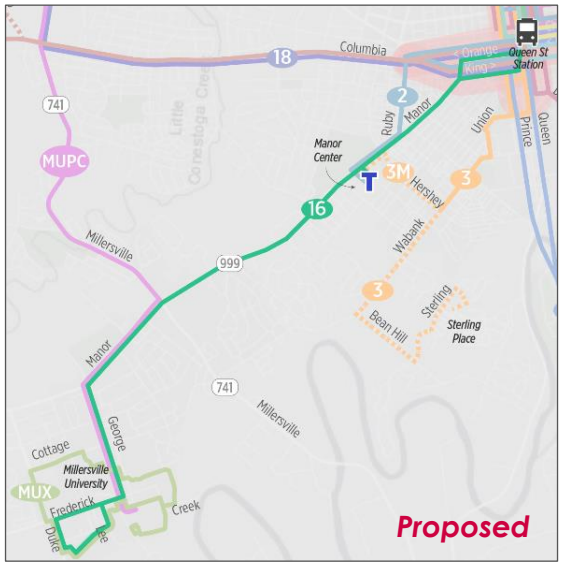


Route 16 Millersville

Overview of Proposed Changes

- Operate as a Local Route
- Discontinue service along Ruby Street and operate along Manor Avenue/Millersville Pike between Orange/King Streets and Manor Center
- Improve service frequency to every 30 minutes all day on weekdays and every 60 minutes weekday evenings, Saturdays, and Sundays, with consistent headways at all times
- Adjust evening schedule to better match class schedule at Millersville University Ware campus in downtown Lancaster





	Existing Service Levels	Proposed Service Levels
Weekdays	**5:40 AM – 11:10 PM**	**5:40 AM – 11:10 PM**
Early	20-50	30
AM Peak	25-35	30
Midday	30-40	30
PM Peak	40-60	30
Evening	55-65	60
Saturday	**7:20 AM – 11:10 PM**	**7:00 AM – 11:10 PM**
Day	60-70	60
Evening	55-65	60
Sunday	**11:15 AM – 6:50 PM**	**11:00 AM – 6:00 PM**
All Day	5 trips	60

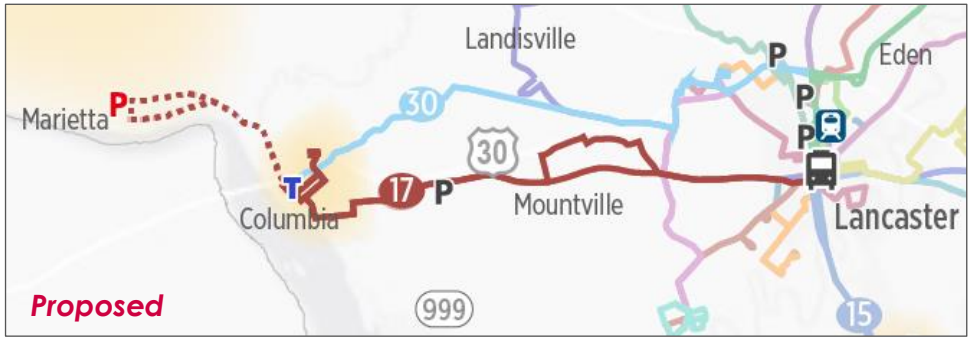
RRTA

Route 17 Columbia

Overview of Proposed Changes

- Operate as a Regional Route
- Operate all service in Columbia via 14th Street and Manor Street
- Streamline alignment within Columbia
- On trips that serve Marietta, operate terminal loop in reverse directions on AM and PM peak trips to reduce out-of-direction travel for riders
- Improve service frequency to every 30 minutes all day on weekdays and every 60 minutes weekday evenings, Saturday daytime, and Sunday, with consistent headways at all times

	Existing Service Levels	Proposed Service Levels
Weekdays	**4:50 AM – 10:05 PM**	**4:30 AM – 10:05 PM**
Early	25-45	30
AM Peak	35-45	30
Midday	30-50	30
PM Peak	25-30	30
Evening	60-85	60
Saturday	**6:15 AM – 7:05 PM**	**6:15 AM – 7:05 PM**
Day	45-70	60
Evening	—	—
Sunday	**11:00 AM – 6:30 PM**	**11:00 AM – 6:30 PM**
All Day	10 trips	60



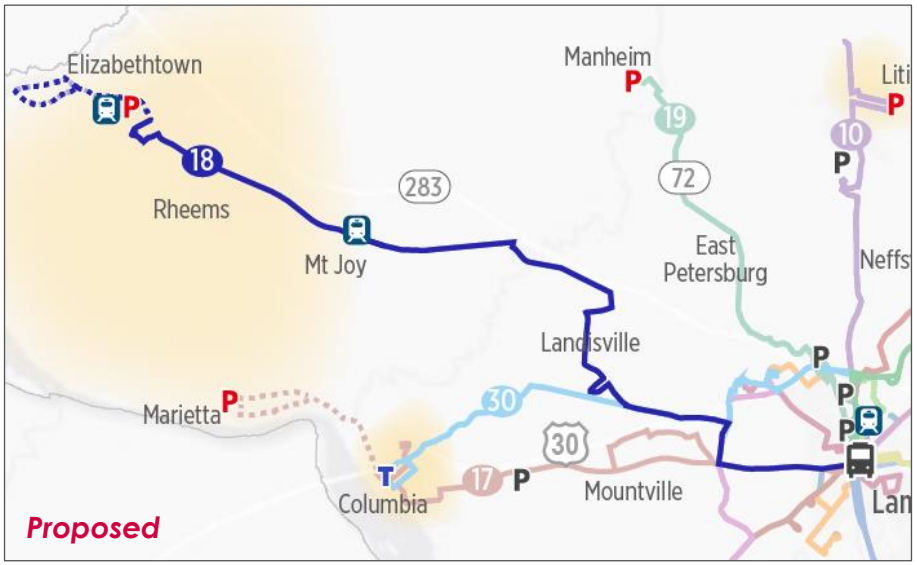
RRTA

Route 18 Elizabethtown

Overview of Proposed Changes

- Operate as a Regional Route
- Redesign alignment to operate service along Columbia Road between downtown Lancaster and Rohrerstown Road, and serve Rohrerstown Road between Columbia Road and Marietta Avenue
- Serve Main Street/Route 230 in both inbound and outbound directions on all trips
- Increase service during AM and PM peak periods
- Increase Saturday service from 4 to 8 daily trips

	Existing Service Levels	Proposed Service Levels
Weekdays	**4:55 AM – 7:15 PM**	**4:55 AM – 7:15 PM**
Early	2 one-way trips	2 one-way trips
AM Peak	4 one-way trips	6 one-way trips
Midday	11 one-way trips	6 one-way trips
PM Peak	2 one-way trips	6 one-way trips
Evening	1 one-way trip	—
Saturday	**6:30 AM – 3:10 PM**	**6:30 AM – 6:00 PM**
Day	4 one-way trips	8 one-way trips
Evening	—	—
Sunday	**—**	**—**
All Day	—	—

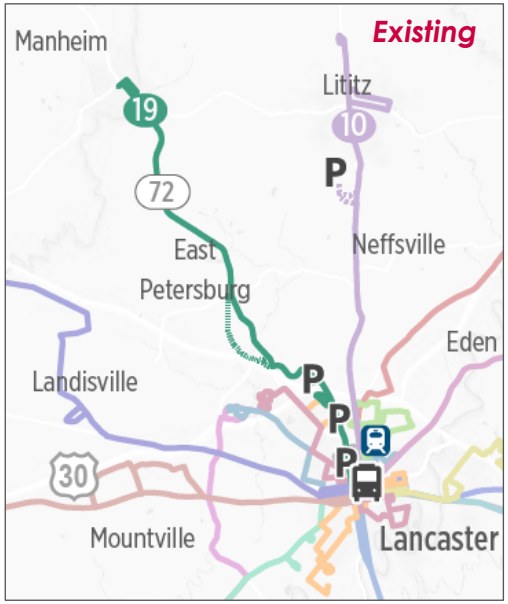


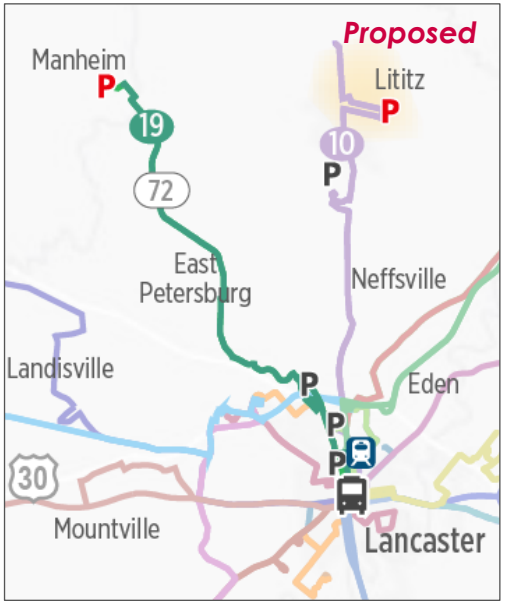
RRTA

Route 19 Manheim

Overview of Proposed Changes

- Operate as a Regional Route
- Serve Commerce Drive/Flory Mill Road/ Rohrerstown Road in both inbound and outbound directions on all trips
- Operate along Queen/Duke Streets within downtown Lancaster
- Serve Hawthorne Plaza on all trips
- Discontinue deviation into Red Rose Commons
- Increase service during early morning, AM peak, and PM peak periods





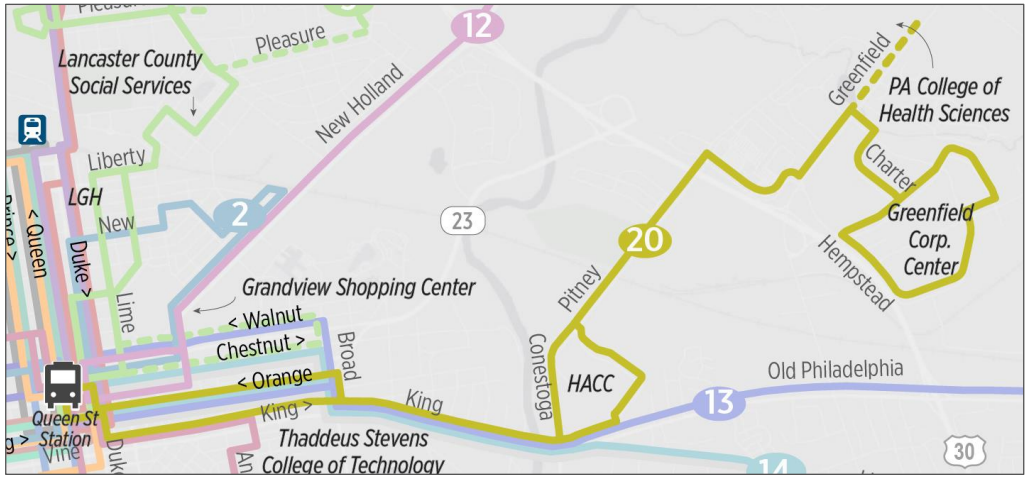
	Existing Service Levels	Proposed Service Levels
Weekdays	**5:15 AM – 6:50 PM**	**5:15 AM – 6:50 PM**
Early	3 one-way trips	4 one-way trips
AM Peak	4 one-way trips	6 one-way trips
Midday	16 one-way trips	10 one-way trips
PM Peak	5 one-way trips	6 one-way trips
Evening	—	—
Saturday	**7:45 AM – 6:50 PM**	**7:45 AM – 6:50 PM**
Day	14 one-way trips	14 one-way trips
Evening	—	—
Sunday	**—**	**—**
All Day	—	—

Route 20 Greenfield

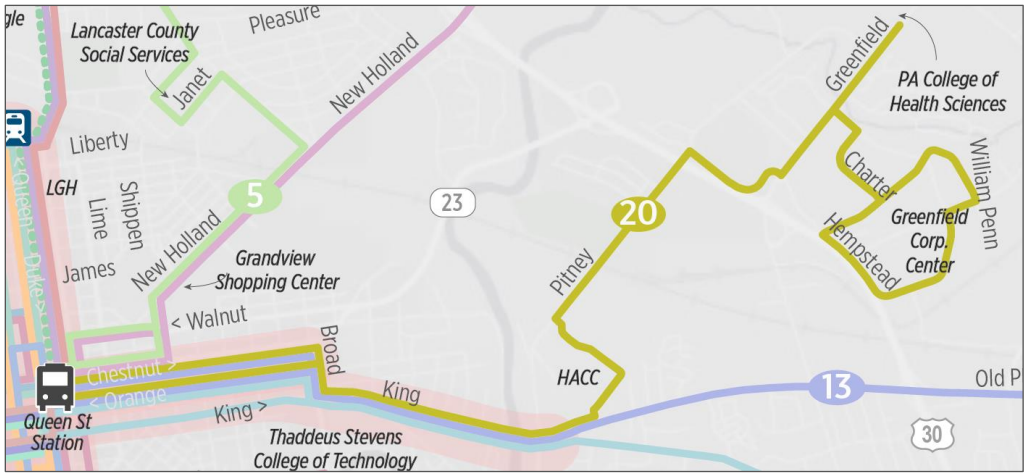
Overview of Proposed Changes

- Operate as a Local Route
- Operate service along Chestnut Street and Orange Street between Broad Street and downtown Lancaster
- Serve HACC/Millennium Drive on all trips
- Continue to skip Greenfield Corporate Center on evening trips
- Add service on Saturday and Sunday
- Increase service frequency during AM and PM peak periods and operate consistent headways throughout the day

	Existing Service Levels	Proposed Service Levels
Weekdays	**5:20 AM – 9:40 PM**	**5:20 AM – 10:00 PM**
Early	45-70	60
AM Peak	45-50	30
Midday	50-65	60
PM Peak	50-65	30
Evening	40-45	60
Saturday	**—**	**7:00 AM – 7:00 PM**
Day	—	60
Evening	—	60
Sunday	**—**	**11:00 AM – 6:00 PM**
All Day	—	60



Existing



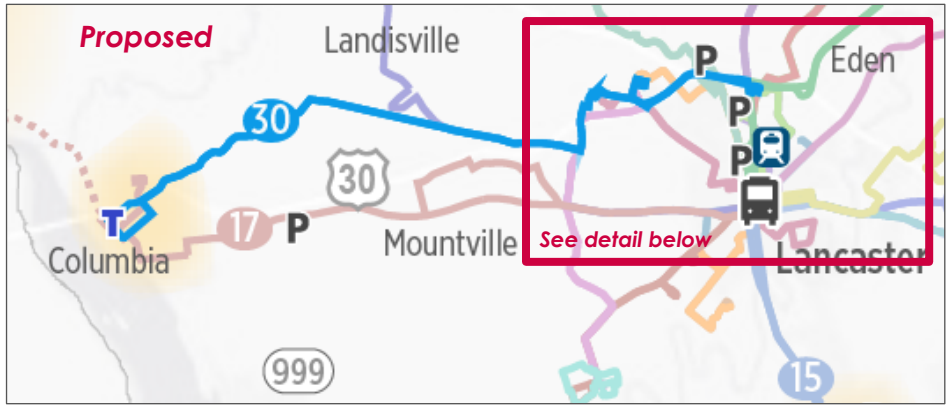
Proposed

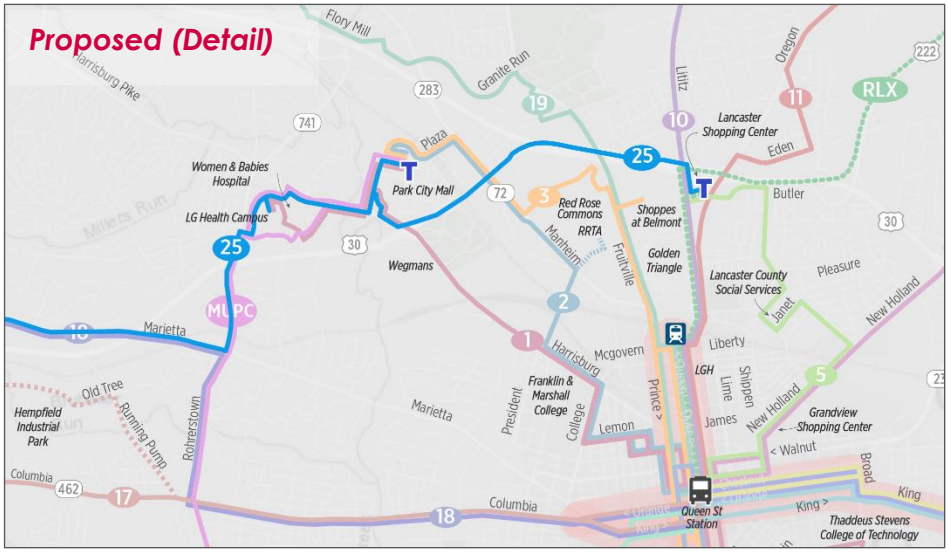
Route 25 Columbia/Park City/Lititz Pike (New route)

Overview of Proposed Changes

- New crosstown route connecting Columbia, Silver Spring, Rohrerstown, Park City Mall, and Lancaster Shopping Center
- Operate as a Regional route
- Operate daytime service on weekdays and Saturdays

	Existing Service Levels	Proposed Service Levels
Weekdays	—	**6:00 AM – 6:00 PM**
Early	—	—
AM Peak	—	6 one-way trips
Midday	—	4 one-way trips
PM Peak	—	6 one-way trips
Evening	—	—
Saturday	—	**7:00 AM – 7:00 PM**
Day	—	8 one-way trips
Evening	—	—
Sunday	—	—
All Day	—	—





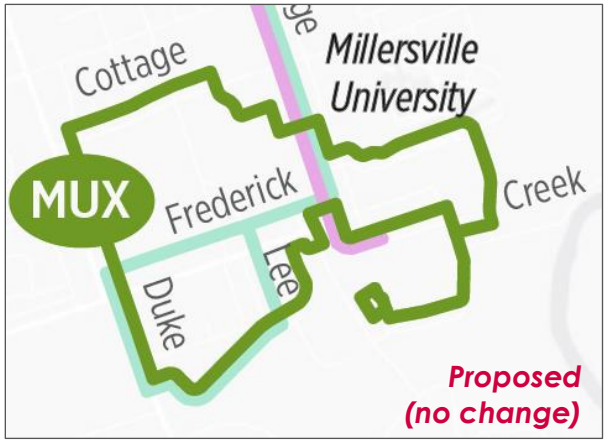
Route MU Shuttle (formerly MU Xpress)

Overview of Proposed Changes

- No changes to existing alignment
- Continue to operate the same level of service as today in partnership with Millersville University
- Re-brand the service as a Shuttle instead of Xpress, since this better reflects the type of service that the route provides and avoids confusion with the MU Park City Xpress

	Existing Service Levels	Proposed Service Levels
Weekdays	**7:30 AM – 9:50 PM***	**7:30 AM – 9:50 PM***
Early	—	—
AM Peak	20	20
Midday	20	20
PM Peak	20	20
Evening	20	20
Saturday	**—**	**—**
Day	—	—
Evening	—	—
Sunday	**—**	**—**
All Day	—	—

** Route operates only when Millersville University is in session.*



RRTA

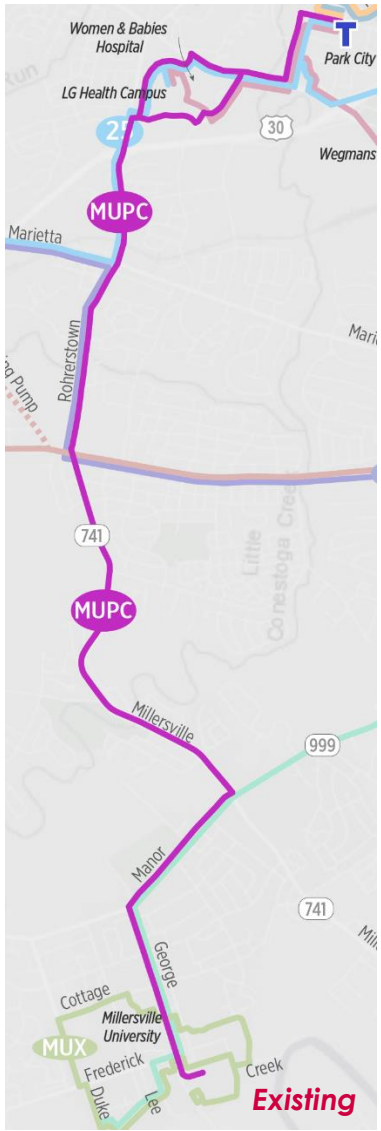
Route MU Park City Xpress

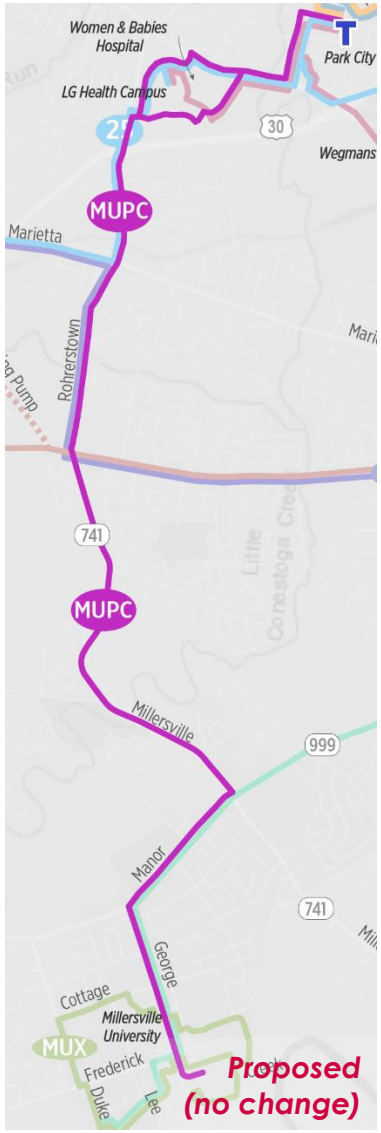
Overview of Proposed Changes

- Continue to operate the same level of service as today in partnership with Millersville University
- Operate an additional trip in the evening due to high ridership on the last trip (9:25 PM)

	Existing Service Levels	Proposed Service Levels
Weekdays	**2:05 PM – 10:15 PM***	**2:05 PM – 10:15 PM***
Early	—	—
AM Peak	—	—
Midday	55	55
PM Peak	55	55
Evening	55	55
Saturday	**2:05 PM – 10:15 PM**	**2:05 PM – 10:15 PM**
Day	55	55
Evening	55	55
Sunday	**1:10 PM – 6:35 PM**	**1:10 PM – 6:35 PM**
All Day	55	55

** Route operates only when Millersville University is in session.*





Historic Downtown Trolley

Overview of Proposed Changes

- Discontinue service due to redundancy with local routes that operate all-day service along the same downtown corridors
- Appendix J of this report provides additional information about the Historic Downtown Trolley, including a peer review and service analysis

	Existing Service Levels	Proposed Service Levels
Weekdays	**5:20 AM – 6:10 PM***	**—**
Early	20	—
AM Peak	20-30	—
Midday	—*	—
PM Peak	25-30	—
Evening	—	—
Saturday	**—**	**—**
Day	—	—
Evening	—	—
Sunday	**—**	**—**
All Day	—	—

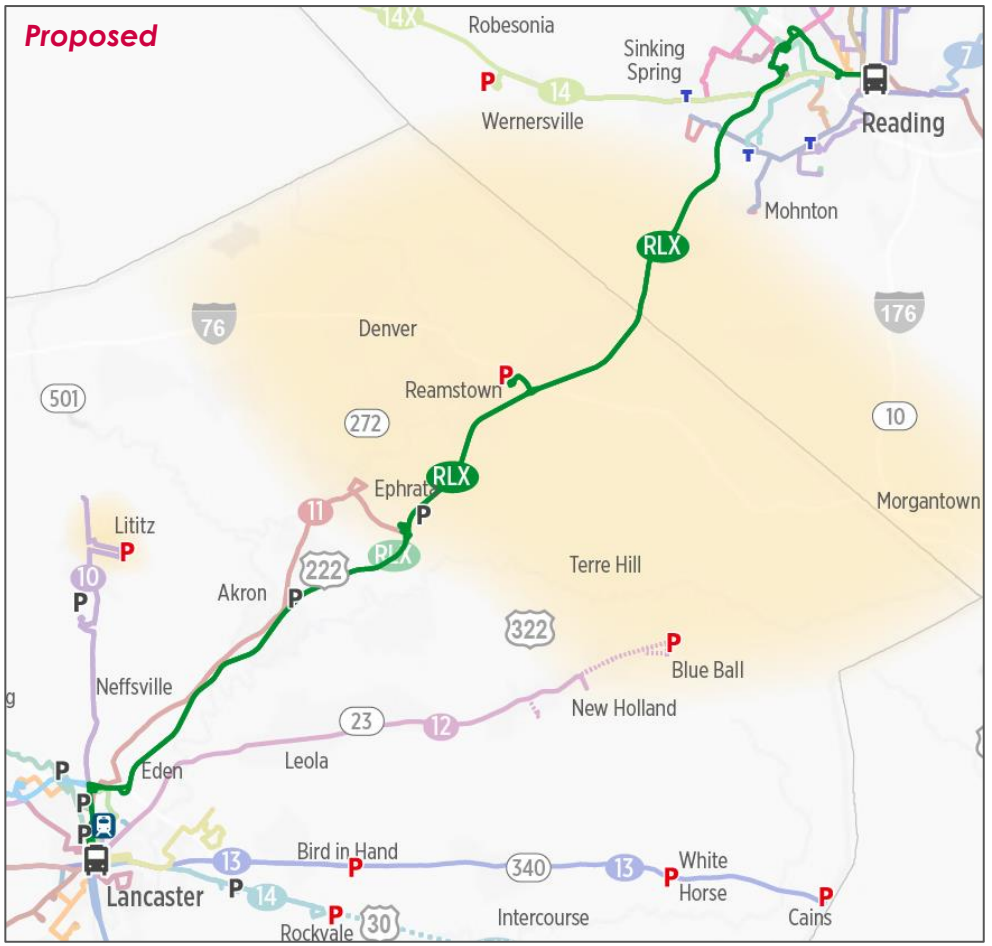
** Route operates 5:20 AM – 10:10 AM and 2:00 PM – 6:10 PM only.*

RLX Reading-Lancaster Express (new route)

Overview of Proposed Changes

- New inter-county express route connecting Reading and Lancaster
- Operate as an Express route with limited-stop, peak-hour service
- Fast and direct service between Lancaster, Ephrata, Reamstown, and Reading

	Existing Service Levels	Proposed Service Levels
Weekdays	—	**5:00 AM – 7:00 PM**
Early	—	2 one-way trips
AM Peak	—	6 one-way trips
Midday	—	2 one-way trips
PM Peak	—	6 one-way trips
Evening	—	2 one-way trips
Saturday	—	—
Day	—	—
Evening	—	—
Sunday	—	—
All Day	—	—



Flex/Demand-Response Service Zones

New on-demand services are increasingly becoming part of public transit networks, particularly for serving times and places with lower demand. Where demand would not ordinarily justify a fixed-route service, modern on-demand services can serve these areas and connect people with the fixed-route network, in a more optimized manner than was available before recent technology innovations. While areas of lower density will always be challenging and expensive to serve, recent software innovations can make on-demand service more efficient. Additionally, new technologies allow people to take advantage of the inherent flexibility of on-demand service.

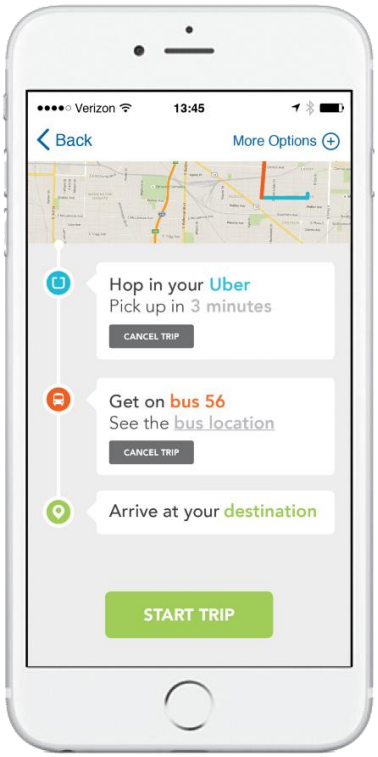
These on-demand services are designed to be fully part of the transit system and have the following characteristics:

- Agency-operated or contracted
- Also called Microtransit
- Can be curb-to-curb or have designated pickup and dropoff locations
- Shared rides and quick response times (typically 15-30 minutes or less)
- Trips within a zone or to connect with fixed-route service
- Can be combined with scheduled trips at certain times of day if needed

Such services are often introduced as a pilot program and can be a good way to test demand. If the pilot service cannot meet the demand at certain times, then scheduled trips can be added at those times (perhaps with a larger vehicle if needed).

For areas where a fixed route would be low-performing due to lower demand, modern on-demand service can be somewhat cheaper to operate and more flexible for both the agency and customers. As travel patterns become apparent, the program parameters can be easily changed (service area, program rules, response time, fares/subsidy, etc.), as compared to a fixed route. During the pilot period, caps on subsidies or number of trips offered can be instituted in order to minimize the risk of costs exceeding the budget.

Figure 33 | TransLoc Rider App



Wherever the on-demand service would be used as a feeder to fixed routes, every effort should be made to minimize customer waiting times, and provide a comfortable, accessible place for pickups and dropoffs.

Besides potential contracts with providers like Uber and Lyft, there are also many software vendors who can support transit agencies offering on-demand service with in-house vehicles and operators. If the service is provided by the agency itself, it may or may not be combined with ADA paratransit services. Two examples of software platforms are Via and TransLoc.

When negotiating with software vendors, SCTA should use as much open-source material as possible, and own as much of the service and customer information generated as possible. This is especially important in the technology sector, since vendors turn over rapidly due to competition and rapidly changing market conditions. Despite these risks, this trend toward increasing use of on-demand services is expected to continue, even if the specific providers change.

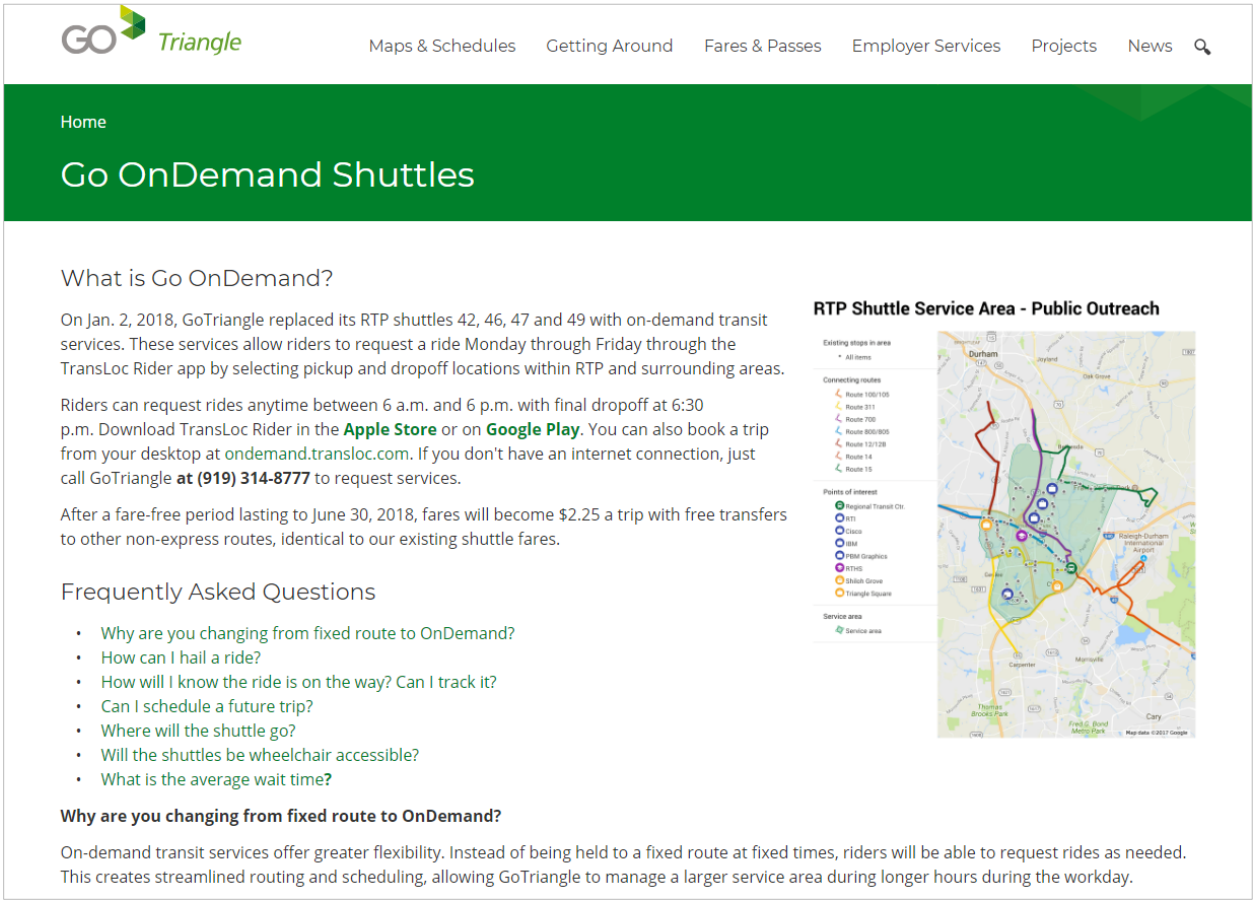
While on-demand service can offer significant benefits due to its flexibility, it is important to make sure that all potential customers are able to use it. This means that service for those who need a wheelchair-accessible vehicle must be provided. And even if most payments are made via a phone app, some option for paying cash must be provided.

Many of the places where these modernized on-demand services are being tried have instituted the pilot programs only recently, and so it is difficult to draw definitive conclusions at this time. The following places are examples of those integrating on-demand services into the transit network:

- Sacramento
- Kansas City
- Tampa
- St. Petersburg
- Austin
- Research Triangle Park
- Arlington (TX)

Exact requirements for on-demand service to meet FTA regulations is not yet known. Any service offering would need to meet all FTA requirements.

Figure 34 | Fixed Route Converted to On-Demand Service in 2018 (Research Triangle Park)



Shared Ride Service Recommendations

In addition to fixed-route service, BARTA and RRTA both operate shared ride-style services (BARTA Special Services and Red Rose Access) that serve customers through paratransit, job access, and other human service transportation programs. Conversations with human services agencies, service providers, and shared ride service customers revealed several potential opportunities to improve and expand shared ride services.

There are also opportunities to expand and capitalize on these shared ride-style services, particularly to improve employment access and cross-county travel. Large employers and clusters of employers are emerging outside of the core urban areas, particularly for warehousing, logistics, and distribution jobs. These are growing job centers, but they are widely dispersed geographically, and they are often sited with large setbacks or on larger campuses far from major corridors, making them difficult to serve with traditional fixed-route transit. Shared ride service models can help to better meet this demand for service.

Pickup Notification System

When customers make a reservations, they are given an approximate time window for their pickup. However, many respondents expressed that there is significant worry over missing their ride if they do not know it has arrived. Drivers are inconsistent about whether they honk or knock when they arrive; customers who live in apartments or away from the street may not have a place to comfortably wait for the duration of the reservation window. Notification calls could be placed to customers in advance of their pickup to confirm that the vehicle is on its way, or if it will be early or late, which would ease some of the unpredictability of the experience and give people enough time to get ready without missing their ride.

App-based Vehicle Tracking

Similar to real-time vehicle tracking available for BARTA and RRTA fixed-route services, a real-time app for the shared ride service would be useful for customers and their caregivers alike. Shared ride vehicles are currently equipped with GPS technology and are tracked by BARTA and RRTA, but an app could share this information with customers as well, allowing them to track their vehicle and estimate pickup and dropoff times. Such an app could also allow family members, caregivers, or agencies to track the customer's vehicle and know where they are during their trip.

Fare Payment and Billing

Shared ride service customers must pay their fare with exact change. However, it can be especially difficult for the customers using these services to access a bank or other facility to make sure they always have exact change on them, and some feel unsafe carrying larger amounts of cash. Additional fare payment options would make it easier and more convenient for customers to use shared ride services, depending upon individual billing arrangements and subsidy programs. Opportunities could include pre-paid ride cards, reloadable smartcards, and automatic billing.

Certification and Reservation Processes

Feedback described the processes for both receiving ADA paratransit certification and reserving ADA paratransit trips as inconvenient and cumbersome. The use of fax technology is inconvenient, as many organizations and individuals alike do not use fax machines anymore, and often leads to lost requests and dropped information. The use of email to send completed forms or to share reservation details would be more convenient and maintain accountability in communications.

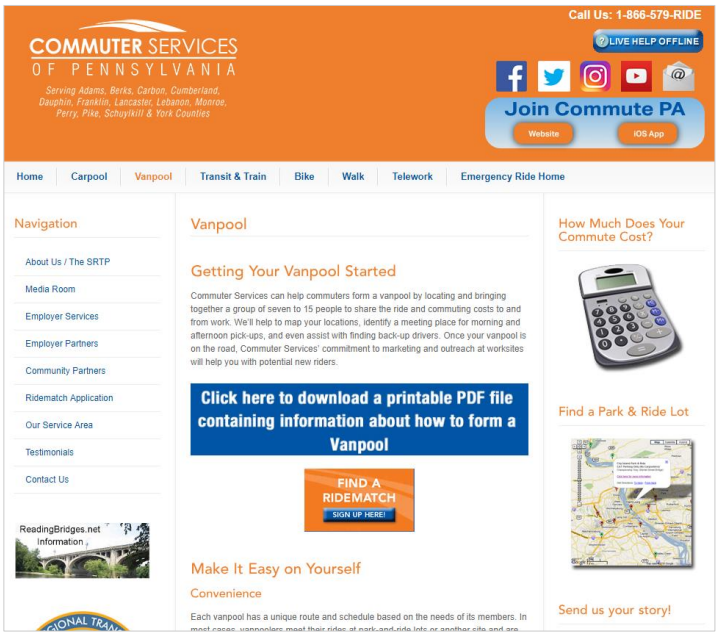
Vanpools

Vanpools consist of groups of commuters traveling to the same worksite or area using a shared passenger van. Similar to carpooling, a designated member of the vanpool picks up participants at their doors each morning and drops everyone off at their place of work or in a central location. For suburban neighborhoods and job sites outside the urban core, vanpools provide a form of transit that is well-matched to lower density communities. They are also a good solution for groups of employees who may work the same shift times, especially if they occur at a time when transit service is infrequent or not operating. In all cases, the flexibility and scale of vanpool allows it to match demand for service that is not easily met by fixed-route service.

Commuter Services of Pennsylvania currently works with commuters to help them join or form a vanpool, providing assistance with coordination, trip logistics, and worksite marketing to recruit additional riders. More active promotion to regional employers would increase awareness of this existing vanpool program and its capacity to meet job access needs at difficult-to-serve worksites.

Figure 35 | Vanpool in State College, PA

Figure 36 | PA Commuter Services Website



Public/Private Partnerships

Shared ride services are particularly conducive to public/private partnerships because demand can be met with smaller vehicles and trips can often be grouped by purpose. Examples of shared ride public/private partnerships include:

- **Employer shuttles:** Employer shuttles typically focus on providing connections between transit stations and jobs. They operate during key shift times and may provide access to one employer or an employment center.

- **Community shuttles:** Many cities and towns operate community shuttles that are designed to provide connections with the regional public transit services. Service may be focused on local residents, tourism, or a combination of both.
- **Transportation Network Company (TNC) rideshare:** Private rideshare companies and their services, especially those like UberPool and Lyft Line, provide the potential for transit systems to expand transit services to lower demand areas through partnerships rather than through the provision of direct service. While the development of these types of partnerships is still in its very early stages, they offer the potential to start service more quickly, provide service at lower costs, and better tie expenditures to utilization levels.
- **Transportation Management Association (TMA) service:** As explained below, TMAs are non-profit organizations formed to increase access and mobility in specific areas or for specific populations. TMAs frequently provide shuttle services between transit stations and employment centers and other major destinations.
- **Guaranteed Ride Home:** Many transit agencies offer guaranteed ride home programs. These programs provide alternative transit service to customers who do not have access to off peak service, such as express routes. Services are often provided by taxis or TNCs, and provide alternative transportation in the event of a personal or family emergency, illness or unexpected employment-related delay, such as unscheduled overtime.
- **Car Share:** Transit agencies are beginning to partner with car share companies such as ZipCar and Car2Go to improve first mile/last mile connections around transit stations and high-ridership transit stops. These partnerships make cars available at the outer ends of trips where a car is needed or where other forms of transportation are not available. Traditional car rentals are also available at many large transit stations.

Transportation Management Association (TMA) Opportunities

Transportation Management Associations (TMAs) are member-controlled organizations that provide transportation services in a particular area, such as a commercial district, mall, medical center, or industrial park. They are often a key element of first mile/last mile services, and generally consist of area businesses and organizations that group together to provide transportation-related services including:

- Shuttles to transit stations and centers
- Discounted transit passes
- Ridesharing programs
- Guaranteed Ride Home programs
- Marketing and promotion of commute alternatives
- Parking management and coordination

Of all of the programs provided by TMAs, perhaps the most important from a transit perspective are first mile/last mile shuttles to work locations that cannot support traditional transit. In parts of the SCTA service area that have a growing number of job sites but are difficult to directly serve with fixed-route transit, TMAs present an opportunity to pool resources and better match transit service with the travel and timing needs of employees. SCTA and TMAs can work together to coordinate service needs and identify connection opportunities between buses and first mile/last mile services.

Additional Advertising

The existing BARTA and RRTA shared ride services serve a variety of customers and destinations. At the same time, a shared ride model is particularly well suited to most parts of Berks and Lancaster

Counties that are very low density and difficult to serve with traditional fixed-route service, yet still experience significant transportation and access needs. Additional marketing of the existing service would help raise awareness that this service exists and that there are transportation options available beyond fixed-route services.

Advertising of the existing Commuter Services of Pennsylvania programs for vanpools and other commuter options would also increase awareness of these complementary transportation options.

Additional Improvements

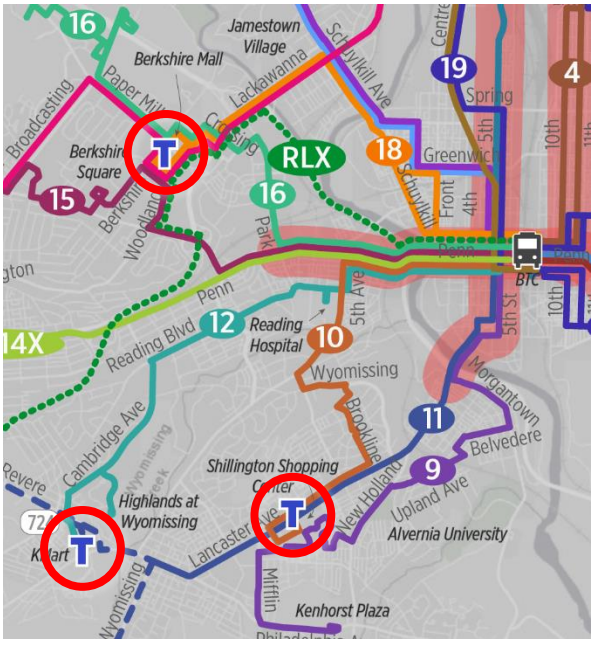
In addition to service improvements, there are many opportunities for capital investments that support transit service and make it more attractive to existing and potential riders. This section provides an overview of transit-supportive capital improvements, including:

- Transfer Centers
- Bus Stop Improvements
- Bus Stop Spacing and Consolidation
- Park-and-Rides
- Public Information
- Transit Technology

Transfer Centers

In Reading and Lancaster, as in many older cities, the road network – and as a result, the transit system – is radially oriented around downtown. Although this allows for coordinated transfers between all routes, it makes many crosstown trips very long and complicated by forcing riders to travel into downtown in order to transfer to another route and complete their trip. Smaller transfer centers outside of downtown can provide an opportunity to make crosstown trips more convenient by not forcing riders to travel into and back out of downtown to make a crosstown trip.

Figure 37 | Potential BARTA Transfer Centers



Beyond the transit service that is provided, transit centers can be thought of as a place where people make transit connections. The major difference between outlying transfer centers and regular bus stops is that a much larger proportion of trips involve connections rather than origins or destinations, and thus transferring passengers make up a significant volume of ridership. As a result, passenger amenities are particularly important at these locations, including seating, shelters, system maps and information, lighting, and real-time arrival signs. Transfer centers also present an opportunity for placemaking, with prominent signage and wayfinding that makes the stop visible and easy to find, and also helps advertise the presence of transit service. Based on passenger volumes and the availability of resources, transfer centers can also be prioritized for the location of purpose-built facilities with enclosed and climate controlled waiting areas, restrooms, and a wider range of amenities.

Bus Stop Improvements

Waiting for the bus is a significant part of nearly every transit trip. Well-designed bus stops enhance the transit experience, decrease perceived wait times for transit services, and can contribute to increased ridership. Conversely, poorly designed bus stops can decrease customer satisfaction, make transit less attractive to potential new customers, and make waiting at stops unsafe for riders. Investing in high quality bus stops is often a low-cost, high-reward strategy for transit agencies.

Certain key bus stop design characteristics are essential for ensuring a high quality transit experience. While it is not possible for every stop to be perfectly designed, there are a number of principles for good bus stop design and locations:

- **Convenient, Comfortable, and Safe Locations:** Bus stops should be located in places where passengers will feel comfortable and safe waiting for transit service. Stop locations should be well lit, offset from fast moving traffic, and away from undesirable places to wait (such as gas stations) when possible. Transit customers often view stops conveniently located near major activity centers, such as shops, schools, or places of work, as the most attractive and safe.
- **Visible and Easily Identifiable:** Bus stops should be located in places where passengers can easily find them. Passengers waiting for the bus should also be easily visible to bus drivers. Bus stops should present a strong brand identity, through signage and other amenities, which helps customers identify stop locations and available services.

Figure 38 | RRTA and BARTA Bus Stop Sign (Lancaster, PA and Reading, PA)

Figure 39 | Bus Stop Sign (Austin, TX)

- **Information on Available Services:** All bus riders and potential riders need certain basic information to use a transit service: Can I get to where I want to go from this stop? Is the route running at this time of day? When will the next bus arrive? While much of this information can now be accessed using a smart phone, transit riders continue to value basic route and schedule information at each bus stop. Such information helps reduce confusion about transit service and can act as low-cost advertising to potential new transit customers.
- **Amenities that Make the Wait Comfortable:** The provision of amenities at stops can make using transit more convenient and comfortable. Well-designed bus stops can actually decrease the amount of time customers perceive they have been waiting for the bus.

Figure 40 | Bus Stop Shelter (Boston, MA); Shelter with System Map (Baltimore, MD)

- **Pedestrian and Bicycle Access:** Nearly all transit riders are pedestrians or bicyclists at some point in their journey. Therefore, it is important that each bus stop have a safe and defined pathway to and from local destinations that is accessible to riders of all abilities. Most stops should have accessible and safe sidewalk access and be located near a crosswalk. Ideally, this pedestrian infrastructure should extend far beyond the stop location, ensuring that riders can safely travel to their destination.
- **Integration with Surrounding Development:** Bus stops are most effective when actively integrated with surrounding development. Well-placed stops can enhance the transit experience and attract new riders, while poorly placed stops can hinder bus operations and decrease customer safety. Developers and planners should consider bus stop location early in the design process of a new project, rather than placing stops at later stages of construction, with considerations for pedestrian access, existing bus operations, and potential stop facilities. Similarly, planners should consider how road and sidewalk reconstruction and new bicycle infrastructure could affect stop quality and transit operations.

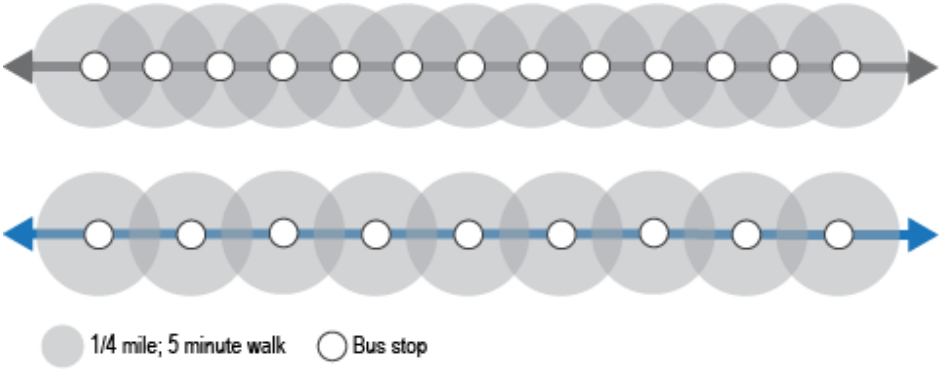
For a number of reasons—particularly cost—it is not practical to provide all amenities at all stops. Typically, more extensive amenities are provided at the busiest locations (for example, transit centers or hubs), and only basic amenities (such as bus stop signs) are provided at low volume stops. A common approach is to develop a hierarchy of stops and to define the types of amenities that should be provided based on those classifications.

Bus Stop Spacing and Consolidation

The spacing and placement of stops greatly impact transit travel times and reliability, as well as the types of facilities and amenities that can be provided. Most riders want service that balances convenience and speed, and the number and location of stops is a key component of

determining that balance. Moreover, as the success with Bus Rapid Transit (BRT) and other forms of enhanced bus service have shown, most passengers prefer a greater emphasis on faster service rather than shorter walks. Stop consolidation done right makes service faster and more attractive while maintaining convenient access.

Figure 41 | Area within a Five-Minute Walk (Eight Stops per Mile versus Five Stops per Mile)



Benefits of stop consolidation include:

- **Faster Service:** On average, it takes a bus about 20 seconds to slow down, stop and pick up a passenger, and accelerate back up to speed. Thus, a consolidation from eight stops per mile to five can save one minute per mile, or five minutes on a five-mile trip.
- **More Reliable Service:** As the number of stops on a transit route increases, the probability that the bus will pick up passengers at a given stop decreases. On some trips, a bus might pick up passengers at 90% of stops. On another trip, a bus on that same route might stop at only 60% of stops. As a result, the addition of stops makes travel times more variable, while the consolidation of stops makes service more consistent and reliable.
- **More Comfortable Service:** Stop-and-go operation, no matter the mode, is frustrating and uncomfortable. More stops make service less comfortable. More stops often also produce the perception that transit is slower than it is. Conversely, fewer stops make the ride more comfortable.
- **Additional Service:** When travel times vary significantly, transit systems must pad schedules to account for the variability, and in some cases, this requires that an additional bus be deployed on a route. With less variable travel times, that bus can instead be used to provide more frequent service or to provide service elsewhere.
- **Better Stop Facilities and Amenities:** The need to be fiscally responsible means that transit systems cannot afford to provide high quality facilities and amenities at low ridership stops. Consolidating stops also means consolidating passengers, and in doing so, transit systems can more easily provide high quality facilities and amenities at a fewer number of stops.
- **Better Accessibility:** Similarly, when there are fewer stops that serve more passengers, transit systems have a greater ability to work with local jurisdictions to make accessibility improvements that go beyond the immediate stop area, such as providing sidewalks and safe crossings within several blocks of a major transit stop or providing an accessible access point to a local bus stop. Reducing the number of stops can expand the reach of pedestrian improvements and can help to provide convenient and accessible connections to more transit stops and their surrounding areas.

Most transit systems that have undertaken stop consolidation efforts start with the development of guidelines that are based on distance to the next stop and boarding levels. Then, when two stops are spaced too closely, one of stops will be eliminated or the two stops will be consolidated to a

new location that best serves the existing riders of the original stops. Most agencies also use additional criteria related to considerations such as special needs and safety.

Transit systems that have pursued stop consolidation generally report significant operational improvements. Drivers are more consistently able to meet schedules and find that they are able to provide a smoother ride for passengers. Most agencies have seen increases in service reliability and several have been able to decrease scheduled running times on affected routes. Despite initial concerns that riders would respond negatively to stop consolidation, most agencies have not had to reinstate removed stops due to customer complaints.

SCTA's family of services is tailored toward serving different types of trips and needs, and therefore fixed-route services have different stop spacing guidelines. In general, Major Local services, designed to serve a dense areas with relatively high frequency, should have fewer stops. Local services, which emphasize accessibility, should have more frequent stops. Regional services should have one to two stops per mile in the low-density regions they serve outside of urban core areas, but increase stop frequency closer to downtowns. Express services should only have stops at the major transfer centers they connect.

Guidelines for minimum stop spacing and maximum stops per mile are defined in the SCTA Service Guidelines document and shown in Figure 42. Exceptions to these guidelines can and should be made in locations where walking conditions are poor (which is the case along many rural routes) or there are other significant considerations.

Figure 42 | Bus Stop Spacing Guidelines

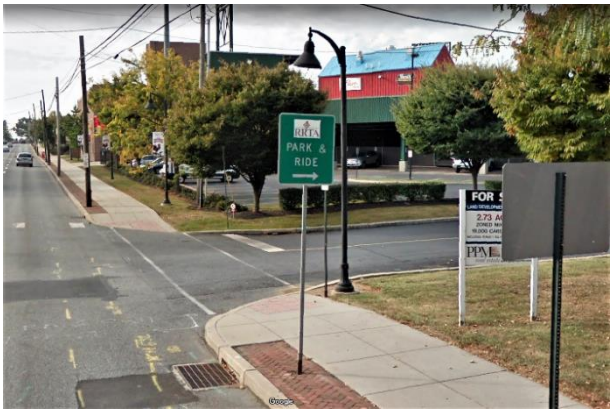
	Major Local	Local	Regional	Express	Demand-Response
Minimum Stop Spacing (feet)	1,300	800	1,300 (within urban areas) 2,000 (outside of urban areas)	2,600	—
Maximum Stops per Mile	4	4-6	4 (within urban areas 1-2 (outside of urban areas)	1	—

Park-and-Rides

Park-and-rides expand the catchment area of transit, especially in outer areas with lower densities where fewer people may live within walking distance of a stop. This is especially true in Lancaster County, where RRTA operates several county/regional routes that travel long distances to and from downtown Lancaster. There are park-and-rides served by each system today, and the addition of new park-and-rides would increase access to existing service and potentially make it more attractive to new riders. The TDP recommendations include several locations/communities for new potential park-and-rides to expand access and capitalize on existing service.

New park-and-ride facilities can be established through partnerships with existing businesses and institutions, particularly those that may have fewer visitors during traditional work hours, such as churches or movie theaters, and major shopping centers that may have large amounts of existing parking. However, park-and-rides should ideally be conveniently located as close as possible to a route's major corridor, minimizing the amount of time it takes to access and serve the park-and-ride and resume travel.

Figure 43 | Park-and-Ride Signage in Lancaster; Minneapolis Area Park-and-Ride Facility



New park-and-ride facilities could be also constructed based on demand and as resources become available. Facilities should include adequate parking, seating, shelters, service information, and wayfinding and signage that make sure the facility is visible and easy to find. Signage for a park-and-ride can also help advertise the existence of transit service and potentially attract new riders.

Public Information

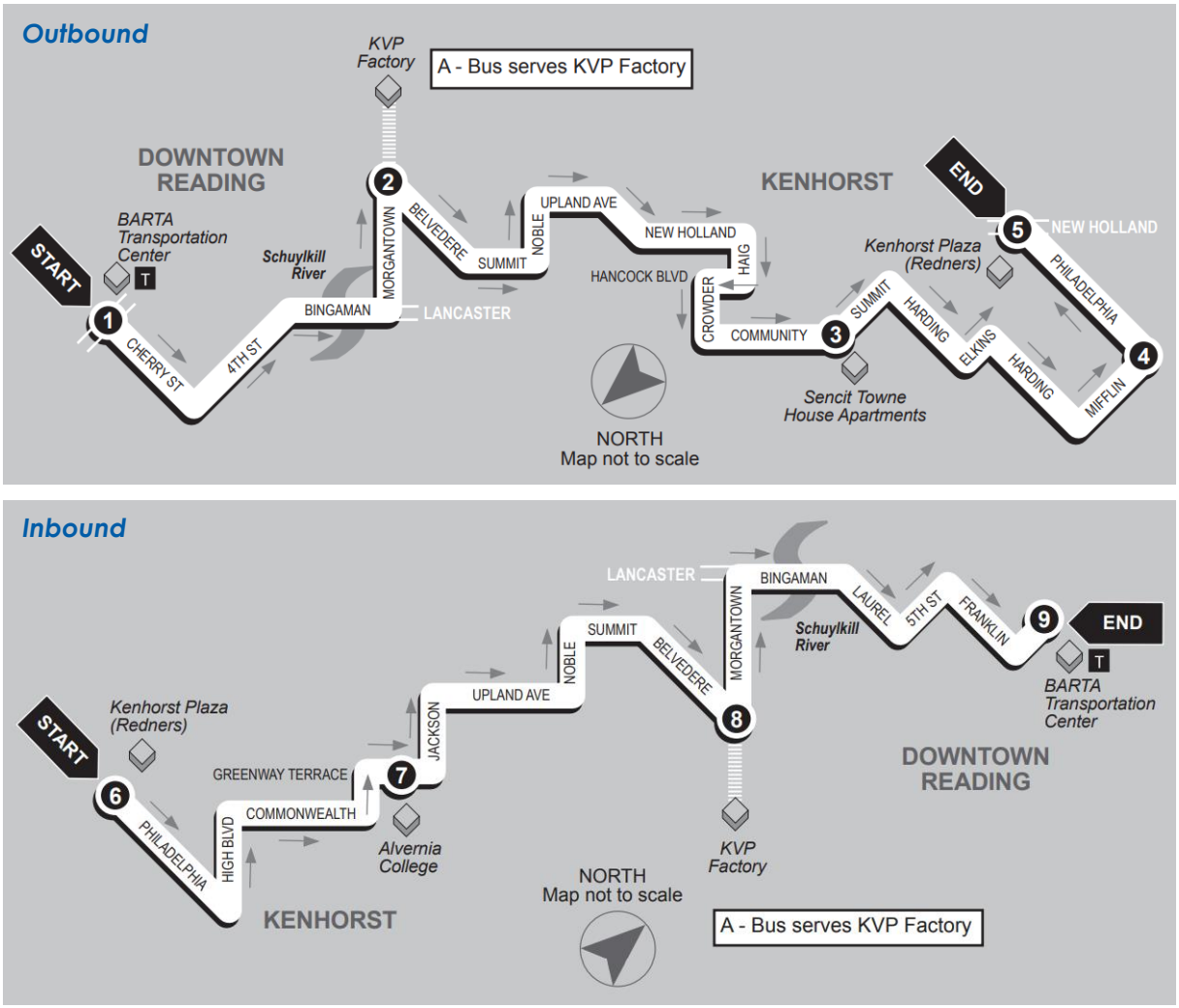
For people to be able to use transit, they must first know that it is there and be able to understand how to use it. This means that it is extremely important for transit systems to provide clear and concise information on their available services. Since different people access, use, and process information in different ways, transit systems must deliver information in a number of different ways. For example, some individuals may not be web-literate or may have limited internet access, and thus the provision of information via the web will not reach many of them. However, it is becoming increasingly common for people to rely primarily on the internet to access information, and as smartphones continue to become commonplace, people are more likely to use mobile devices to identify their transportation options. Transit information provided by third parties is also expanding rapidly, which is creating many new ways to share information.

Potential opportunities to improve public information include revising route maps and schedules in the ride guides, improving and updating system maps, and publishing General Transit Feed Service (GTFS) data through Google Transit.

Improve Route Schedules and Maps: BARTA and RRTA produce schedule brochures that include general rider information, schedule for each route, and maps for most but not all routes. These brochures generally provide useful information, but individual route maps are presented in a manner that makes them difficult to interpret. A different route map is shown for each direction (inbound and outbound, for example), with each map oriented in a different direction. They are also often oriented so that north is not up, and inbound and outbound map are oriented differently. This makes it challenging for riders to orient themselves to where the route goes, especially when trying to plan a return trip using a separate map with a different orientation.

The current schedule brochures put the burden on the customer to decipher what the route does and where it goes, rather than making sense of the service by presenting the information in an understandable way. In some cases, this information does not fully communicate what a route actually does; in other cases, the route maps make the service appear more complicated than it actually is. Not only does this make service more confusing for customers, but it also dissuades potential customers from trying transit in the first place. Ride guides should be revised so that each route has only one route map, ideally oriented north whenever possible, as well as additional contextual information such as major roads and transfer points.

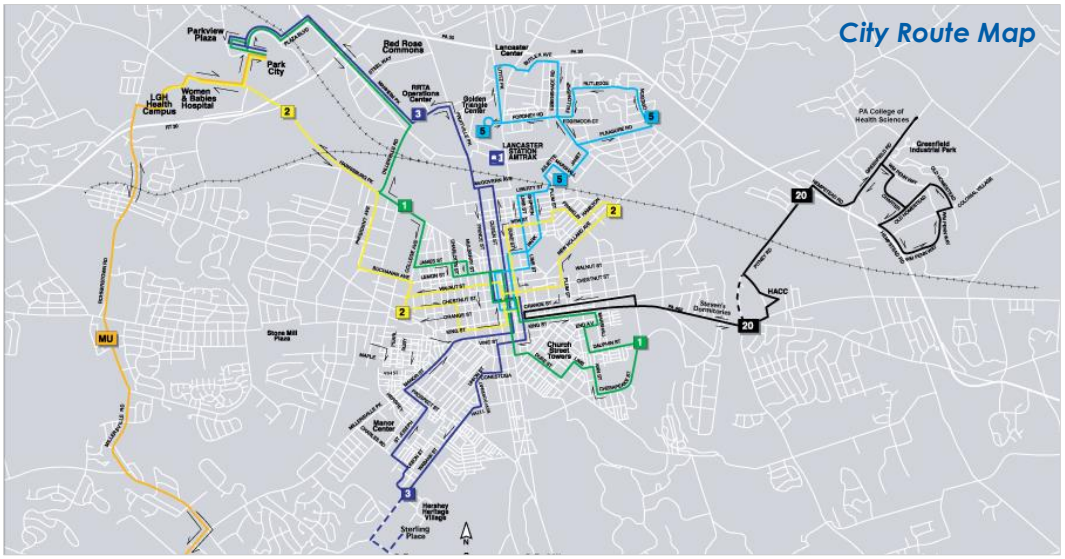
Figure 44 | BARTA Route 9 Ride Guide Maps, Outbound and Inbound

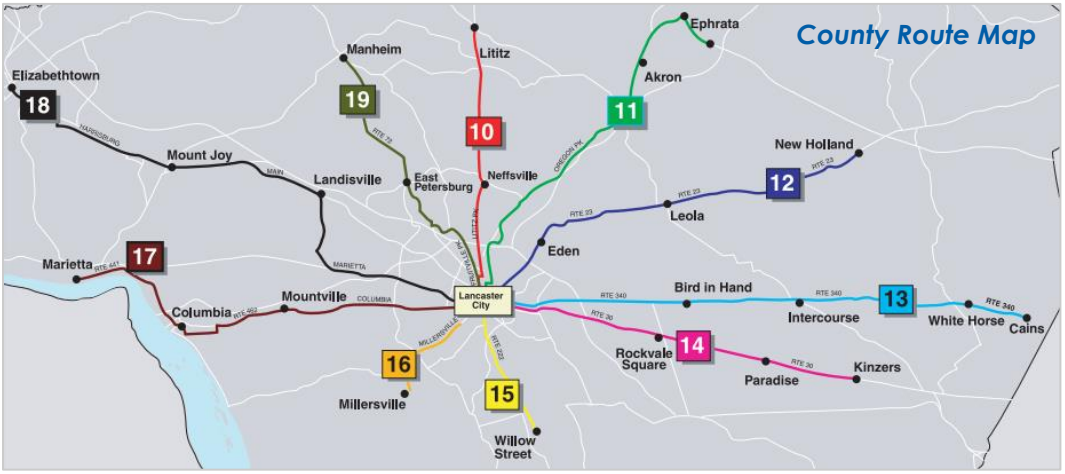


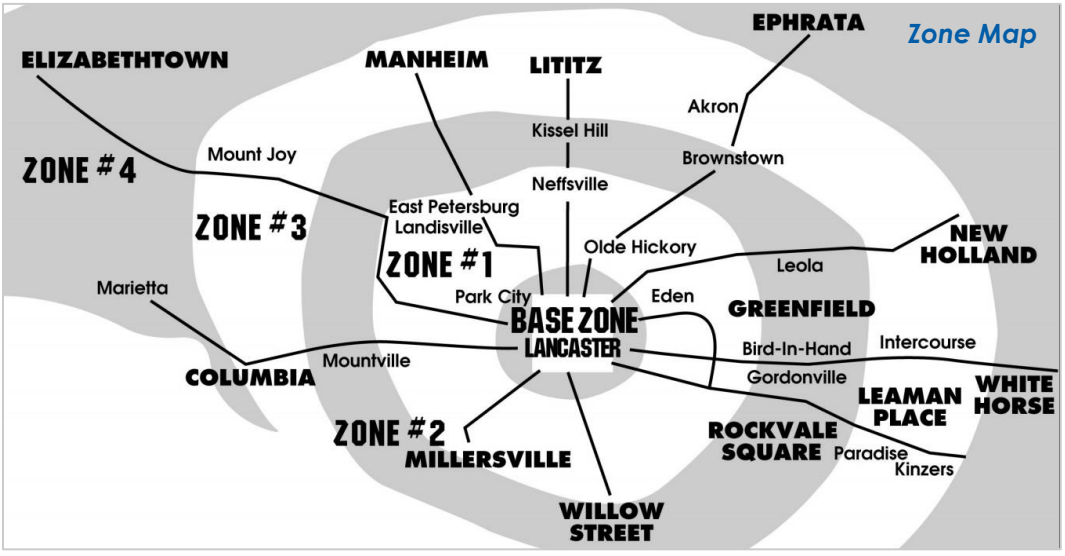
BARTA Route 9 Grill via Kenhorst, shown above, technically operates as a large one-way loop, but the separate inbound and outbound maps, oriented in opposite directions, do not convey to riders how the route actually operates and make service harder to understand.

Update and Improve System Maps: The most recent system map available on the BARTA website is from 2006, and includes outdated service patterns and some routes that have not operated for several years. There is also a separate fare zone map for Berks County, but BARTA routes are not presented on that map. RRTA has two separate system maps, one for local routes and one for county routes, in addition to a third map that presents the system's fare zones (see Figure 45). The local route map only shows routes that operate within Lancaster but does not show any regional routes at all, and provides little in the way of identifying context, such as major landmarks or street labels beyond the existing routes. The regional map shows the regional route network at the county level, but provides no identifying context such as other roads or cities not served by the routes. Although there is a zone fare system in place for county routes, the map does not show where zones begin or end; instead, this is shown in a third map altogether. Both systems have an opportunity to publish up-to-date system maps that present all of their respective services in one map, and should include contextual information such as street networks, transfer centers, and major landmarks.

Figure 45 | RRTA System Maps: City Routes, County Routes, and Fare Zones







Publish Route and Schedule Data to Google Transit: As part of providing information online, most large and many small transit systems now offer route and schedule information through Google Transit. Google Transit integrates transit routes, stops, and schedules within Google Maps, and it

allows users to plan transit trips from within Google Maps. Google Transit can easily be accessed via smartphones, making it a widely available and accessible source of transit service information. In addition, Google Maps is often the first place that people will look to plan a trip, including current transit users and non-users alike. More about publishing service data to Google Transit is described in the following section on Transit Technology.

Transit Technology

The transit industry, like nearly every sector of the economy, has increasingly employed new technologies to improve service, management, and operations. Innovations in transit technology offer multiple benefits to operating agencies in terms of service planning, operating efficiency, and customer experience of transit.

Nearly every facet of the transit industry benefits considerably from the use of advanced technologies, including:

- Improved service operations and management
- More accurate reporting
- Increased productivity of vehicle and driver scheduling, deployment, and dispatch
- Safer and more reliable fare collection systems
- Clearer and easier to use information systems

Several opportunities exist for BARTA and RRTA to adopt new technologies to improve service, streamline operations, and enhance the passenger experience, which are described below.

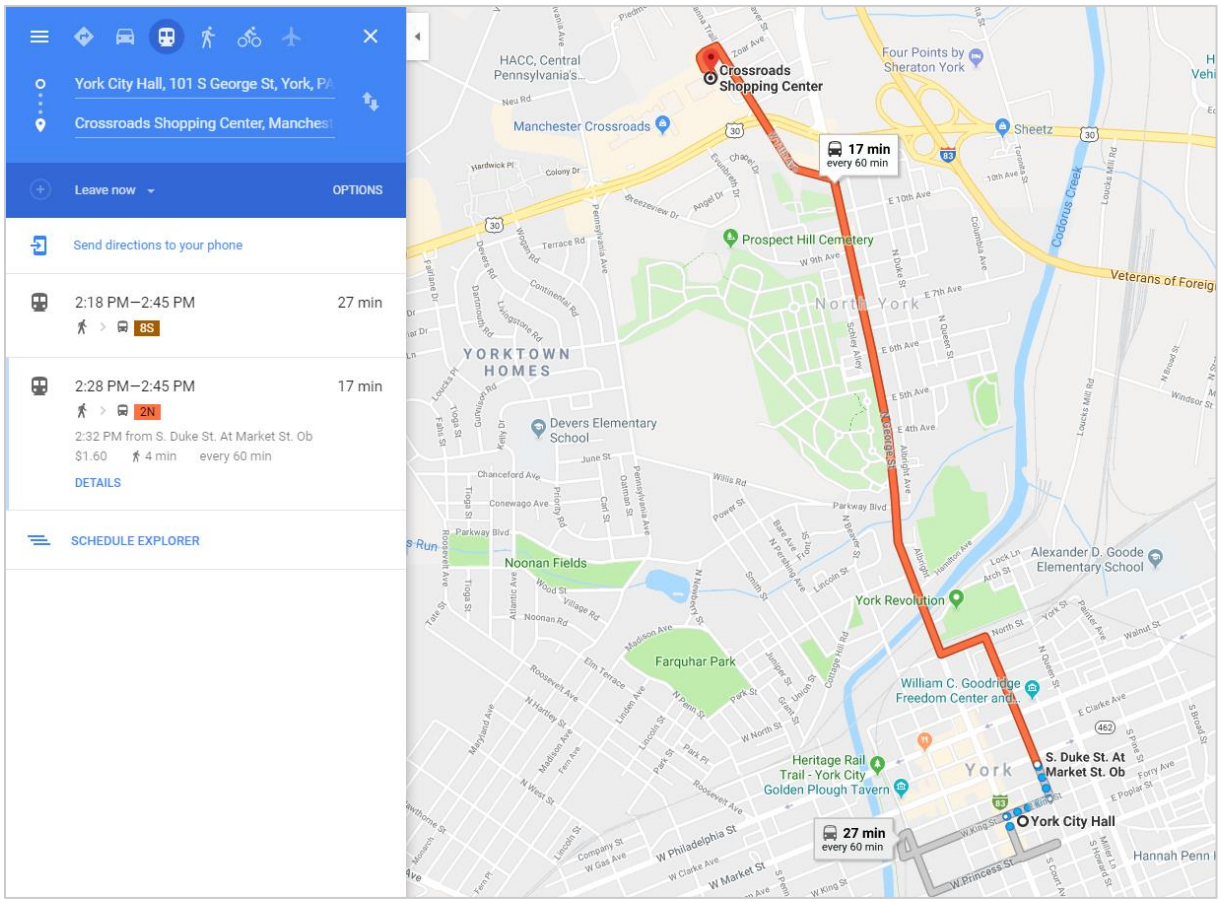
Automated Passenger Counters (APCs)

APC systems are machines that use electronic sensors to automatically count the number of passengers that board and disembark at each bus stop. When implemented together with an AVL system, a transit agency can track the number of riders by stop, by trip, and by time of day. This provides detailed, standardized information about how riders use the system and is an excellent tool for transit service planning. APC data can also be used for mandatory ridership and performance reporting to the National Transit Database, saving time and expense that would otherwise be necessary to perform labor-intensive manual counts.

Google Transit

Trip planners provide riders the ability to enter their origin, destination, and desired departure time to find their best transit options. Many transit systems embed a trip planner within their website or provide links to third-party trip planners, the best known of which is Google's integration of transit routes, stop, and schedule information within Google Maps. Google Transit is also often the best source of information for trips that require use of services provided by different transit systems, since it is not tied to any individual system. The use of Google Transit has become increasingly common, and it is often the first place that younger riders will go to find transit information. It is now generally expected that transit systems will publish transit schedule information on Google Maps.

Figure 46 | Transit Trip Directions using Google Transit



Google Transit can easily be accessed via smartphones, making it a widely available and accessible source of transit service information. In addition, Google Maps is often the first place that people will look to plan a trip, including current transit users and non-users alike, and an agency's participation in Google Transit can serve to inform travelers that there is a transit option available for their trip, essentially advertising the system to people who may not otherwise be familiar with local transit options.

While participation in the Google Transit program is free, participating agencies must provide Google with service data in a specialized General Transit Feed Specification (GTFS) format on an ongoing basis. Therefore, it does require staff time to participate in the program and offer this service.

Real-Time Information

Most large transit operators now provide real-time passenger information that gives details about when a bus will arrive at a particular stop. Real-time arrival information decreases the uncertainty related to service delays and allows riders to spend less time waiting at a stop. Most agencies have also made this arrival information open source and allowed software developers to make applications that track buses using a smart phone.

Real-Time Signs at Stops: Some transit operators have installed digital signage with arrival information directly at bus stops. These boards are useful for riders who do not own a smart phone and can increase the perception of a bus stop as a permanent piece of infrastructure. Real-time signage also increases awareness of available transit service and may contribute to increased ridership.

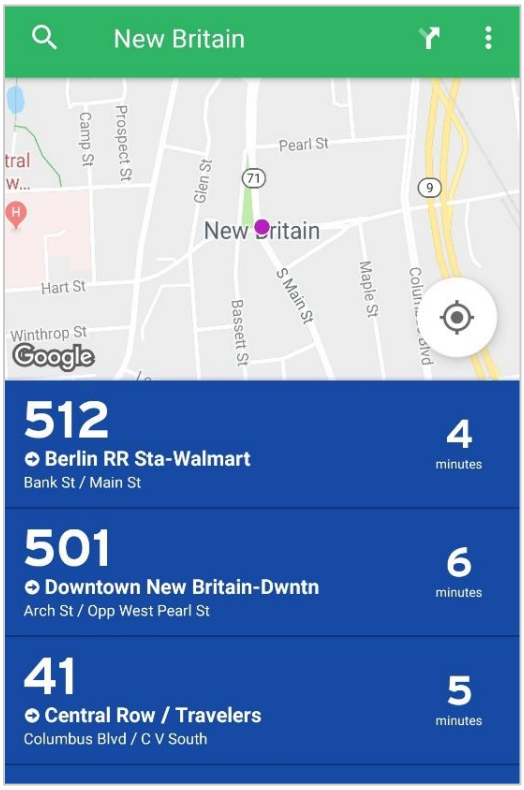
Today, real-time arrival signs are located at the BARTA Transportation Center in downtown Reading and Queen Street Station in downtown Lancaster. These signs show the estimated arrival time in minutes for the next few arriving buses. Similar real-time signage should also be posted at additional major stops, such as the transfer centers identified in the TDP recommendations, and high-ridership that warrant additional passenger amenities.

Web-Based and Smartphone Apps: As the use of smartphones becomes more commonplace, and because people using transit are on the move, the use of smartphones to access schedule information continues to increase rapidly. BARTA and RRTA real-time information is currently provided through each agency's website and through the myStop app, which includes real-time vehicle location and arrival times. To use the app, riders select which system they are using and then look up their specific route and find a specific stop, or look up a specific stop, to find real-time arrival information. The app is a useful addition for riders, but still presents challenges for people who may be less familiar with the system, since users must know the name of a particular stop to look-up arrival information, or already be familiar with a route to know where to look.

In most cases, transit systems make the GTFS data that they produce for Google Maps publicly available for use by third-party developers. Some developers produce system-specific smartphone apps, while others produce apps that provide transit information for systems throughout the country, such as Transit or Citymapper. These apps may include more sophisticated trip-planning capabilities, easy-to-navigate interface for users, and the ability to see information for more than one route at a time. Many apps will automatically pull up information based on the user's location, providing real-time arrival information for the closest bus stops without needing to know in advance the name or location of specific

Figure 47 | Real-Time Arrival Display at BARTA Transportation Center

Figure 48 | Transit App



stops. Beyond the ongoing provision of GTFS data, the development of these apps does not require any involvement by the transit agencies, and transit riders choose their favorite app.

Fare Payment

New fare payment technologies can yield value for passengers and transit agencies alike. Faster boarding, stored value options, and streamlined transfers all improve the passenger experience. Transit agencies benefit from reduced dwell time, lower volumes of passes to process, more reliable equipment, and more flexible pass pricing options.

A fare analysis was conducted as part of the SCTA Transit Development Plan, which evaluated the existing BARTA and RRTA fare structures and identified potential recommendations to improve and restructure fare systems. That analysis is provided in Appendix I. A discussion of fare technology opportunities is presented below.

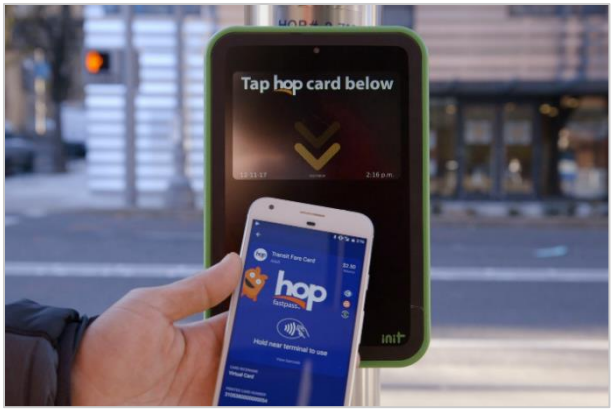
Smartcards: Electronic contactless smartcards — a more durable, hard plastic card — have become common at many transit agencies. The most significant customer advantage of smartcards compared to magnetic cards is their durability; they can last for several years without replacement. Smartcards can be reloaded with stored cash value or passes and offer the opportunity to provide balance protection, increasing security. In addition, the use of smartcards allows more flexible pricing options, since zones and transfer costs can be automatically calculated.

Figure 49 | Smartcard Payment in Boston

From an operational perspective, payment with smartcards is faster than both magnetic stripe payment and cash payment. In addition, since the validation and encoding of a smartcard do not require any mechanical action at the farebox, smartcard systems are frequently more reliable (fewer breakdowns) compared with magnetic strip fare collection systems.

Mobile Payment: Mobile fare payment using a smartphone offers an increase in customer convenience over paper or smartcard payment as well as potential operational savings. Smartphone payments eliminate the need for customers to buy and carry a separate card, may reduce delay in fare payment by reducing the use of cash, and may lower maintenance costs by reducing the volume of passes that must be processed.

Figure 50 | Mobile Fare Payment in Portland, OR



Unlike other fare technology options, smartphone payments require a person to have a linked credit card or banking account, which means that smartphone payment is not an option for customers who rely on cash. Smartphone payment options can serve as a supplement to an existing fare collection system until smartphone ownership is standard.

5 IMPLEMENTATION PLAN

Figure 51 and Figure 52 present the recommended operating improvements for each route, broken out by implementation phase[1]. Phase 1 includes "cost neutral" improvements that can be implemented in the near term (2018 to 2019) within the current operating budgets of BARTA and RRTA. These improvements focus on streamlining and simplifying existing routes, with modest increases to service frequency. Phase 2 (2020 to 2023) includes additional service enhancements, focusing on enhancing key routes that provide the backbone of the BARTA and RRTA system. Phase 3 (2024 to 2027) represents long-term recommendations that build on the first two phases, including significant service increases and new service expansions that can be implemented as resources become available. Figure 53 also presents one of these Phase 3 service expansions, a new SCTA inter-county route that would connect Berks and Lancaster Counties.

In addition to the route improvements, Figure 54 and Figure 55 present recommended capital improvements. These are broken out by implementation phase and follow the same Phase 1 through Phase 3 timeline as the operating implementation plan. These capital improvements are designed to support the route improvements and have been phased accordingly.

[1] All costs are presented in 2017 dollars.

Operating Implementation Plan

Figure 51 | Implementation Plan – BARTA

Route	Phase	Alignment	Frequency	Span	Cost
BARTA					
1 Temple via 5th Street	Phase 1:	No alignment change	Increase weekday and Saturday service to every 15 minutes during the peaks and midday, provide 30 minute frequency in the early and evening service periods	Extend Sunday service to 8:00 PM	$1,141,000
	Phase 2:	No alignment change	No frequency change	No span change	$1,141,000
	Phase 3:	No alignment change	No frequency change	No span change	$1,141,000
2 Fairgrounds Square	Phase 1:	Discontinue route			$ —
	Phase 2:	—			$ —
	Phase 3:	—			$ —
3 Temple via Kutztown	Phase 1:	Discontinue route			$ —
	Phase 2:	—			$ —
	Phase 3:	—			$ —

Route	Phase	Alignment	Frequency	Span	Cost
4 10th/11th Streets	Phase 1:	Consolidate with Route 3, extend service to North Reading Plaza	Increase weekday service to every 15 minutes during the peaks and midday, provide 30 minute frequency at all other times	Extend Saturday service to 11:00 PM and Sunday service to 8:00 PM	$1,727,000
	Phase 2:	No alignment change	No frequency change	No span change	$1,727,000
	Phase 3:	No alignment change	No frequency change	No span change	$1,727,000
5 Albright College	Phase 1:	Operate bidirectional service on 13th Street and discontinue service to Reservoir	No frequency change	No span change	$380,000
	Phase 2:	No alignment change	No frequency change	No span change	$380,000
	Phase 3:	No alignment change	Operate service every 30 minutes in the early and peak time periods, and every 60 minutes at all other times	Restructure span on weekdays from 5:30 AM to 7:00 PM, Saturdays from 7:00 AM to 7:00 PM. Add Sunday service from 11:00 AM to 6:00 PM	$494,000
7 Pennside	Phase 1:	Operate bidirectional service on Carsonia Avenue and discontinue service on Butler Lane	No frequency change	No span change	$383,000
	Phase 2:	No alignment change	No frequency change	No span change	$383,000
	Phase 3:	No alignment change	Add 60 minute frequency on weekday evenings and all day on Sunday	Extend weekday and Saturday service to 7:00 PM, and add Sunday service form 11:00 AM to 6:00 PM	$435,000

Route	Phase	Alignment	Frequency	Span	Cost
8 Reifftown/ Shelbourne Square	Phase 1:	Terminate all trips at Exeter Square and add new limited stop service (Route 8X) between Reading and Birdsboro	No frequency change	No span change	$558,000
	Phase 2:	No alignment change	No frequency change	No span change	$558,000
	Phase 3:	No alignment change	Operate service every 30 minutes during peak periods and every 60 minutes at all other times	No span change	$934,000
8X Birdsboro via Shelbourne Square	Phase 1:	New limited stop service between Reading and Birdsboro	Operate 14 trips per day	Operate from 5:00 AM to 6:00 PM	$331,000
	Phase 2:	No alignment change	No frequency change	No span change	$331,000
	Phase 3:	No alignment change	No frequency change	No span change	$331,000
9 Grill via Kenhorst	Phase 1:	Operate bidirectional service between Kenhorst Plaza and Reading and discontinue service along Mountain View Road	No frequency change	No span change	$270,000
	Phase 2:	No alignment change	No frequency change	No span change	$270,000
	Phase 3:	No alignment change	Operate service every 30 minutes during peak periods and every 60 minutes at all other times	Extend weekday services to 7:00 PM, adjust Saturday service to start at 7:00 AM and end at 7:00 PM, and add Sunday service from 11:00 AM to 6:00 PM	$385,000

Route	Phase	Alignment	Frequency	Span	Cost
10 Brookline via Reading Hospital	Phase 1:	Redesign route to provide crosstown service, connecting Shillington Shopping Center, Reading Hospital, and Downtown Reading	Operate weekday service every 30 minutes during the day and every 60 minutes in the evenings	No span change	$649,000
	Phase 2:	No alignment change	No frequency change	No span change	$649,000
	Phase 3:	No alignment change	No frequency change	No span change	$649,000
11 Mohnton/ Berkshire Hills via Shillington	Phase 1:	Operate branched service from Downtown Reading, serving Mohnton and Berkshire Hills in place of the Route 12	Operate service every 30 minutes on weekdays, every 30 minutes on Saturday day and every 60 minutes on Saturday evenings and on Sundays	Extend weekday service until 7:00 PM	$623,000
	Phase 2:	No alignment change	No frequency change	No span change	$623,000
	Phase 3:	No alignment change	No frequency change	Add Sunday service from 11:00 AM to 6:00 PM	$677,000
12 Lincoln Plaza via Reading Hospital	Phase 1:	Terminate service at Lincoln Plaza Shopping Center	No frequency change	No span change	$358,000
	Phase 2:	No alignment change	No frequency change	No span change	$358,000
	Phase 3:	No alignment change	Operate service every 30 minutes during peak periods and every 60 minutes at all other times	Start weekday service at 6:00 AM, Saturday service at 7:00 AM and add Sunday service from 11:00 AM to 6:00 PM	$735,000

Route	Phase	Alignment	Frequency	Span	Cost
14 Wernersville via Sinking Spring	Phase 1:	Terminate service at Wernersville State Hospital and add new limited stop service (Route 14X) between Reading and Womelsdorf	No frequency change	No span change	$628,000
	Phase 2:	No alignment change	No frequency change	No span change	$628,000
	Phase 3:	No alignment change	Operate service every 60 minutes at all times except on Saturdays, operate every 30 minutes	Extend weekday service to 10:00 PM, operate Saturday service form 7:00 AM to 7:00 PM, and Sunday service form 11:00 AM to 6:00 PM	$1,012,000
14X Womelsdorf via Wernersville	Phase 1:	New limited stop service between Reading and Womelsdorf	Operate 12 weekday trips	Operate service from 5:30 AM to 7:00 PM	$209,000
	Phase 2:	No alignment change	No frequency change	No span change	$209,000
	Phase 3:	No alignment change	No frequency change	No span change	$209,000
15 Berkshire Mall	Phase 1:	Streamline service along State Hill Road and discontinue service along Van Reed	No frequency change	No span change	$985,000
	Phase 2:	No alignment change	Operate service every 30 minutes during peak periods midday on weekdays, operate every 60 minutes at all other times	Operate Saturday service form 6:30 AM to 11:00 PM and Sunday 8:00 AM to 8:00 PM	$1,728,000
	Phase 3:	No alignment change	No frequency change	No span change	$1,728,000

Route	Phase	Alignment	Frequency	Span	Cost
16 Broadcasting Square	Phase 1:	Operate bidirectional, serving Broadcasting Square in both directions, and discontinue the terminal loop	No frequency change	No span change	$682,000
	Phase 2:	No alignment change	Operate service every 15 minutes on weekday peak periods, during the midday, and Saturday days, operate service every 30 minutes at all other times	Adjust Sunday service to operate 8:00 AM to 8:00 PM	$1,382,000
	Phase 3:	No alignment change	No frequency change	No span change	$1,382,000
17 Glenside/Airport	Phase 1:	Discontinue service to Berks Helm, terminating all trips at St. Joseph Medical Center and streamline service Downtown along 4th Street	No frequency change	No span change	$321,000
	Phase 2:	No alignment change	No frequency change	No span change	$321,000
	Phase 3:	No alignment change	Operate service every 30 minutes during peak periods and every 60 minutes at all other times	Adjust weekday service to operate from 6:00 AM to 11:00 PM, Saturday from 7:00 AM to 11:00 PM, and add Sunday service from 11:00 AM to 6:00 PM	$552,000

Route	Phase	Alignment	Frequency	Span	Cost
18 Schuylkill Avenue/Berkshire Mall	Phase 1:	Streamline downtown routing and extend service to Berkshire Mall and discontinue service to St. Joseph Medical Centers	Operate service every 60 minutes on Saturday evenings, Sunday, and every 30 minutes al all other times	Adjust service to end at 10:00 PM	$348,000
	Phase 2:	No alignment change	No frequency change	No span change	$348,000
	Phase 3:	No alignment change	No frequency change	No span change	$348,000
19 Riverside-Fairgrounds Square/Cotton Street	Phase 1:	Extend service to Foreground Square Mall to the north and streamline service along Cotton Street to the south and extend to Goodwill Industries	No frequency change	No span change	$460,000
	Phase 2:	No alignment change	No frequency change	No span change	$460,000
	Phase 3:	No alignment change	Operate service every 60 minutes on weekday evenings and weekends, and every 30 minutes at all other times	Extend service to 10:00 PM on weekdays and Saturdays, operate Sunday service form 1:00 AM to 6:00 PM on Sundays	$614,000

Route	Phase	Alignment	Frequency	Span	Cost
20 Route 61/Hamburg	Phase 1:	Redesign service to serve Industrial Drive, State Street, and 4th Street in both the inbound and outbound direction.	No frequency change	No span change	$579,000
	Phase 2:	No alignment change	No frequency change	No span change	$579,000
	Phase 3:	No alignment change	Add one weekday trips and 2 Saturday trips	End weekday service at 11:00 PM and operate Saturday service form 6:30 AM to 7:00 PM	$620,000
22 Lyon Station/East Penn-Deka	Phase 1:	No alignment change	No frequency change	No span change	$307,000
	Phase 2:	Discontinue service			$ —
	Phase 3:	—			$ —
23 Sinking Spring/Temple via Berkshire Mall	Phase 1:	—			$ —
	Phase 2:	—			$ —
	Phase 3:	New crosstown connecting Sinking Springs, Whitefield Walmart, Berkshire Mall, Route 222 corridor, and North Reading Plaza	Operate 16 weekday trips, 12 Saturday trips, and 8 Sunday trips	Operate service on weekdays from 6:00 Am to 6:00 Pm, Saturday from 7:00 AM to 7:00 PM, and Sundays 11:00 AM to 6:00 PM	$459,000

Route	Phase	Alignment	Frequency	Span	Cost
BH Berks Heim Shuttle	Phase 1:	New route serving Berks Helm direct to downtown Reading	Operate 6 weekday trips and 4 Saturday trips	Operate weekdays from 6:15 AM to 6:45 PM and Saturdays from 6:50 AM to 3:45 PM	$57,000
	Phase 2:	No alignment change	No frequency change	No span change	$57,000
	Phase 3:	No alignment change	No frequency change	No span change	$57,000
Demand Response Service	Phase 1:	—			$ —
	Phase 2:	Implement demand response zones			$250,000
	Phase 3:	Increase demand response service to match demand			$500,000
BARTA System Total				**Phase 1:**	**$10,996,000**
				Phase 2:	**$12,382,000**
				Phase 3:	**$14,989,000**

Figure 52 | Implementation Plan – RRTA

Route	Phase	Alignment	Frequency	Span	Cost
RRTA					
1 Park City – Southeast	Phase 1:	Operate service along Harrisburg Pike and discontinue service along Manheim, to provide bidirectional service on Duke and Dauphin Streets	Increase service frequencies on weekdays, Saturdays, and Sundays with consistent headways	No span change	$1,079,000
	Phase 2:	No alignment change	No frequency change	No span change	$1,079,000
	Phase 3:	No alignment change	No frequency change	No span change	$1,079,000
2 Manor Avenue – 6th Ward	Phase 1:	Discontinue service east of downtown, operate to Park City via Harrisburg Pike, Dillerville Road, and Manheim Pike	Operate every 60 minutes at all times	No span change	$404,000
	Phase 2:	No alignment change	Increase service frequencies on weekdays, Saturdays, and Sundays with consistent headways	No span change	$676,000
	Phase 3:	No alignment change	No frequency change	No span change	$676,000
3 Park City – 8th Ward	Phase 1:	Streamline the northern part of the route to serve Red Rose Commons on all trips, serve the Shoppes at Belmont, and reconfigure the southern loop into two alternating branches serving Manor Center and Sterling Place	Operate every 30 minutes during the day on weekdays and Saturdays, every 60 minutes at all other times	No span change	$1,328,000
	Phase 2:	No alignment change	No frequency change	No span change	$1,328,000
	Phase 3:	No alignment change	No frequency change	No span change	$1,328,000

Route	Phase	Alignment	Frequency	Span	Cost
5 Rossmere	Phase 1:	Operate a streamlined alignment to Lancaster Shopping Center via New Holland Avenue, Fountain Road, and Esbenshade Road	No frequency change	No span change	$403,000
	Phase 2:	No alignment change	Operate 30-minute service during AM and PM peak periods, 60-minute service at all other times	Operate weekdays from 6:00 AM to 10:35 PM, Saturdays from 6:50 AM to 10:35 PM, and Sundays from 11:00 AM to 6:40 PM	$509,000
	Phase 3:	No alignment change	No frequency change	No span change	$509,000
10 Lititz	Phase 1:	Provide service to Lititz in the inbound and outbound direction	Operate 24 weekday trips	Extended service on Saturday until 7:00 PM	$466,000
	Phase 2:	No alignment change	No frequency change	No span change	$466,000
	Phase 3:	No alignment change	No frequency change	No span change	$466,000
11 Ephrata	Phase 1:	Provide service to Walmart and EARS on all trips	Increased service during AM and PM peak periods and add one evening trip on weekdays and weekends	Extended service on weekdays and Saturday until 7:00 PM	$717,000
	Phase 2:	No alignment change	No frequency change	No span change	$717,000
	Phase 3:	No alignment change	No frequency change	No span change	$717,000

Route	Phase	Alignment	Frequency	Span	Cost
12 New Holland	Phase 1:	No alignment change	Increased service during AM and PM peak periods	No span change	$652,000
	Phase 2:	No alignment change	No frequency change	No span change	$652,000
	Phase 3:	No alignment change	No frequency change	No span change	$652,000
13 White Horse/Cains	Phase 1:	No alignment change	Increase service during early morning, AM peak, and PM peak periods, and add two Saturday trips	Expand Saturday service to operate from 5:30 AM to 6:00 PM	$381,000
	Phase 2:	No alignment change	No frequency change	No span change	$381,000
	Phase 3:	No alignment change	No frequency change	No span change	$381,000
14 Rockvale Square	Phase 1:	No alignment change	No frequency change	No span change	$1,201,000
	Phase 2:	No alignment change	Increase frequency to every 15 minutes during weekday peak and midday periods and Saturday daytime and operate every 30 minutes at other times	Expand span of service on Saturday and Sunday	$1,992,000
	Phase 3:	No alignment change	No frequency change	No span change	$1,992,000

Route	Phase	Alignment	Frequency	Span	Cost
14X Gap via Rockvale Square	Phase 1:	New limited stop service between downtown Lancaster and Gap to replace Route 21	Operate 18 peak trips on weekdays, 16 trips on Saturday	5:00 AM to 6:35 on weekdays and Saturdays	$513,000
	Phase 2:	No alignment change	Add two daily trips on weekdays.	No span change	$560,000
	Phase 3:	No alignment change	No frequency change	No span change	$560,000
15 Willow Street	Phase 1:	Terminate service at Kendig Road and streamline service by discontinuing service on Eshelman Mill Road, Locust Street, Willow Valley	Operate two additional Saturday trips	No span change	$500,000
	Phase 2:	No alignment change	No frequency change	No span change	$500,000
	Phase 3:	No alignment change	No frequency change	No span change	$500,000
16 Millersville	Phase 1:	Discontinue service along Ruby Street and provide direct service along Manor Street/Millersville Pike	No frequency change	No span change	$643,000
	Phase 2:	No alignment change	Improve service frequency to every 30 minutes all day on weekdays and every 60 minutes weekday evenings, Saturdays, and Sundays	No span change	$682,000
	Phase 3:	No alignment change	No frequency change	No span change	$682,000

Route	Phase	Alignment	Frequency	Span	Cost
17 Columbia	Phase 1:	Streamline service by operating all service via 14th Street and Manor, operate the terminal loop in reverse directions in the AM and PM peak	Improve service frequency to every 30 minutes all day on weekdays and every 60 minutes weekday evenings, Saturday daytime, and Sunday	No span change	$764,000
	Phase 2:	No alignment change	No frequency change	No span change	$764,000
	Phase 3:	No alignment change	No frequency change	No span change	$764,000
18 Elizabethtown	Phase 1:	Operate service along Columbia Road between downtown Lancaster and Rohrerstown Road, and serve Rohrerstown Road between Columbia Road and Marietta Avenue	Adjust scheduled trip times on weekdays	No span change	$516,000
	Phase 2:	No alignment change	No frequency change	No span change	$516,000
	Phase 3:	No alignment change	Operate four additional trips on Saturday	Extend Saturday service to 6:00 PM	$538,000
19 Manheim	Phase 1:	Serve Commerce Drive/Flory Mill Road/ Rohrerstown Road in both inbound and outbound directions on all trips and Operate along Queen/Duke Streets within downtown Lancaster	Adjust scheduled trip times	No span change	$486,000
	Phase 2:	No alignment change	No frequency change	No span change	$486,000
	Phase 3:	No alignment change	No frequency change	No span change	$486,000

Route	Phase	Alignment	Frequency	Span	Cost
20 Greenfield	Phase 1:	Serve Commerce Drive/Flory Mill Road/ Rohrerstown Road in both inbound and outbound and operate along Queen and Duke Street in downtown Lancaster and serve HACC/Millennium Drive on all trips	No frequency change	No span change	$489,000
	Phase 2:	No alignment change	Increase frequency to every 30 minutes during peak and every 60 minutes off peak	Add service on Saturday and Sunday	$518,000
	Phase 3:	No alignment change	No frequency change	No span change	$518,000
25 Columbia/Park City/Lititz Pike	Phase 1:	—	—	—	$ —
	Phase 2:	—	—	—	$ —
	Phase 3:	New crosstown route connecting Columbia, Silver Spring, Rohrerstown, Park City Mall, and Lancaster Shopping Center	Operate 16 weekday trips and 8 Saturday trips	6:00 AM to 6:00 PM on weekdays and 7:00 AM to 7:00 PM on Sundays	$375,000
Historic Downtown Trolley	Phase 1:	No alignment change	No frequency change	No span change	$199,000
	Phase 2:	Discontinue service	—	—	$ —
	Phase 3:	—	—	—	$ —
Demand Response Service	Phase 1:	—	—	—	$ —
	Phase 2:	Implements demand response zones	—	—	$250,000
	Phase 3:	Increase demand response service to match demand	—	—	$500,000
RTA System Total				**Phase 1:**	**$10,741,000**
				Phase 2:	**$12,076,000**
				Phase 3:	**$12,723,000**

Figure 53 | Implementation Plan – SCTA Route RLX

Route	Phase	Alignment	Frequency	Span	Cost
SCTA					
RLX Reading-Lancaster Express	Phase 1:		—	—	$ —
	Phase 2:		—	—	$ —
	Phase 3:	New inter-county route connecting Berks and Lancaster Counties	Operate 18 weekday trips	5:00 AM to 7:00 PM	$735,000

Capital Implementation Plan

Figure 54 | Capital Implementation Plan – BARTA

Capital Improvement	Phase	Quantity [1]	Unit Cost[1]	Total Cost
BARTA				
Transit Emphasis Corridor	Phase 1:	0	$150,000	$ —
	Phase 2:	22.4	$150,000	$3,360,000
	Phase 3:	0	$150,000	$ —
Fixed Route Bus New	Phase 1:	0	$670,000	$ —
	Phase 2:	10	$670,000	$6,700,000
	Phase 3:	12	$670,000	$8,040,000
Shared Ride Bus New	Phase 1:	0	$60,000	$ —
	Phase 2:	5	$60,000	$300,000
	Phase 3:	10	$60,000	$600,000
Fixed Route Bus Replacement	Phase 1:	26	$670,000	$17,420,000
	Phase 2:	19	$670,000	$12,730,000
	Phase 3:	3	$670,000	$2,010,000
Shared Ride Bus Replacement	Phase 1:	31	$60,000	$1,860,000
	Phase 2:	19	$60,000	$1,140,000
	Phase 3:	0	$60,000	$ —
Transit Centers	Phase 1:	2	$500,000	$1,000,000
	Phase 2:	0	$500,000	$ —
	Phase 3:	2	$500,000	$1,000,000
Park-and-Rides	Phase 1:	2	$500,000	$1,000,000
	Phase 2:	2	$500,000	$1,000,000
	Phase 3:	0	$500,000	$ —
BARTA System Total	**Phase 1:**			**$21,280,000**
	Phase 2:			**$25,230,000**
	Phase 3:			**$11,650,000**

1: Transit Emphasis Corridor quantity is in miles; Corridor unit cost is cost per mile.

Figure 55 | Capital Implementation Plan – RRTA

Capital Improvement	Phase	Quantity [1]	Unit Cost[1]	Total Cost
RRTA				
Transit Emphasis Corridor	Phase 1:	0	$150,000	$ —
	Phase 2:	10.6	$150,000	$1,590,000
	Phase 3:	0	$150,000	$ —
Fixed Route Bus New	Phase 1:	0	$165,000	$ —
	Phase 2:	3	$165,000	$495,000
	Phase 3:	11[2]	$165,000	$1,815,000
Shared Ride Bus New	Phase 1:	0	$60,000	$ —
	Phase 2:	5	$60,000	$300,000
	Phase 3:	10	$60,000	$600,000
Fixed Route Bus Replacement	Phase 1:	11	$670,000	$7,370,000
	Phase 2:	4	$670,000	$2,680,000
	Phase 3:	15	$670,000	$10,050,000
Shared Ride Bus Replacement	Phase 1:	0	$60,000	$ —
	Phase 2:	31	$60,000	$ 1,860,000
	Phase 3:	40	$60,000	$ 2,400,000
Transit Centers	Phase 1:	3	$500,000	$1,500,000
	Phase 2:	0	$500,000	$ —
	Phase 3:	1	$500,000	$500,000
Park-and-Rides	Phase 1:	3	$500,000	$1,500,000
	Phase 2:	4	$500,000	$2,000,000
	Phase 3:	4	$500,000	$2,000,000
RRTA System Total	**Phase 1:**			**$10,370,000**
	Phase 2:			**$8,925,000**
	Phase 3:			**$17,365,000**

1: Transit Emphasis Corridor quantity is in miles; Corridor unit cost is cost per mile.

2: This includes new Route RLX.