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# **QUAKERTOWN STONY CREEK PASSENGER RAIL RESTORATION BUSINESS PLAN**

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submitted to



Bucks County Transportation  
Management Association

submitted by



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# QUAKERTOWN-STONY CREEK BUSINESS PLAN

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### INTRODUCTION

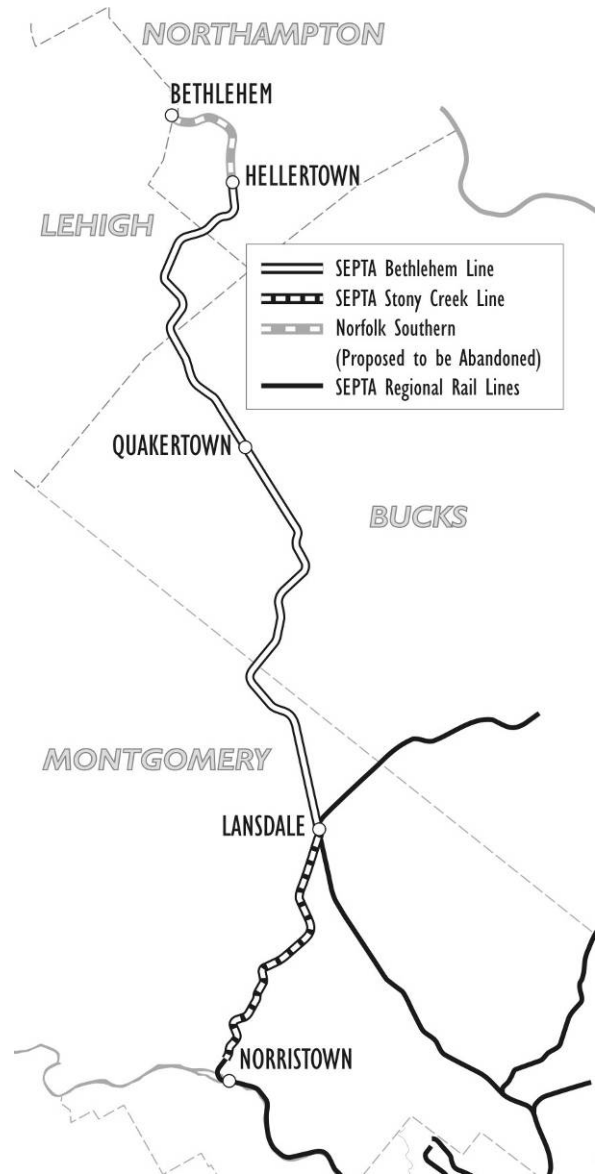
The Bucks County Transportation Management Association (BCTMA) anticipates continuing as the public sponsor for the restoration of Quakertown-Stony Creek passenger rail service. Federal authorization was recently received to develop plans and designs for the service. This business plan documents the project background, reviews requirements for federal grant recipients, and outlines an action plan of the steps necessary for the BCTMA to administer those funds as an approved public sponsor.

### PROJECT BACKGROUND

The Quakertown-Stony Creek Passenger Rail Restoration Project involves two SEPTA-owned railroad lines:

- **SEPTA Stony Creek Line**, an 11-mile former Reading Company line that extends from Norristown to Lansdale through Montgomery County. At the south end, the line connects to the SEPTA Norristown Line at “Elm” (immediately south of Elm Street Station). At the north, the line connects to the SEPTA Main Line at “Dale” (immediately south of Lansdale Station).
- **SEPTA Bethlehem Line**, a 28.1-mile former Reading Company line extending from Lansdale through Montgomery, Bucks, Northampton, and Lehigh Counties to Hellertown. At the south end, the line connects to the SEPTA Main Line, Doylestown Line and Stony Creek Lines at “Dale.”

At the north end, the Bethlehem Line extended another 4.4 miles to the Lehigh Valley. This segment was retained by the Consolidated Rail Corporation (Conrail) and ultimately conveyed to the Norfolk Southern Corporation (NS). It was designated by NS as the Saucon Running Track for a short distance between Hellertown and "Lehigh" (the connection with the Philadelphia, Bethlehem & New England Railroad), and as the Bethlehem Secondary Track between "Lehigh" and "CP Bethlehem" (the connection with the



NS Lehigh and Reading Lines in South Bethlehem). It was recently proposed to be abandoned by NS.

NS, CSX Transportation (CSXT), and the East Penn Railways Inc. (EPRI) presently operate freight train service over both portions of both lines as far north as California Road in Richland Township, Bucks County (north of Quakertown).

Intercity passenger rail service over the Bethlehem Line was discontinued in 1961. Commuter rail service was maintained between the Lehigh Valley and Philadelphia

under the auspices of the Southeastern Pennsylvania Transportation Authority (SEPTA) until July 1981, when PennDOT operating assistance for rail services outside of SEPTA's jurisdiction was withdrawn. Service was maintained between Quakertown (the last station within SEPTA's jurisdiction) and Lansdale until August 1981, when SEPTA abandoned all non-electrified commuter rail service over a work rules conflict with Conrail crews.

The Stony Creek Line, in contrast, saw limited passenger service and that was abandoned in 1936. Passenger traffic between Norristown and Lansdale primarily used the and more frequent competing rail service offered by the interurban trains of the Lehigh Valley Transit Company (LVT). LVT operated high-speed electric train service between Allentown and Upper Darby via Quakertown, Lansdale, and Norristown, closely paralleling the Stony Creek and Bethlehem Branch Lines. After interurban train service was abandoned in 1951, LVT and its successors operated bus service over the route through the early 1970s. SEPTA Route 96 and 132 buses have served the corridor as far north as Telford since 1978.

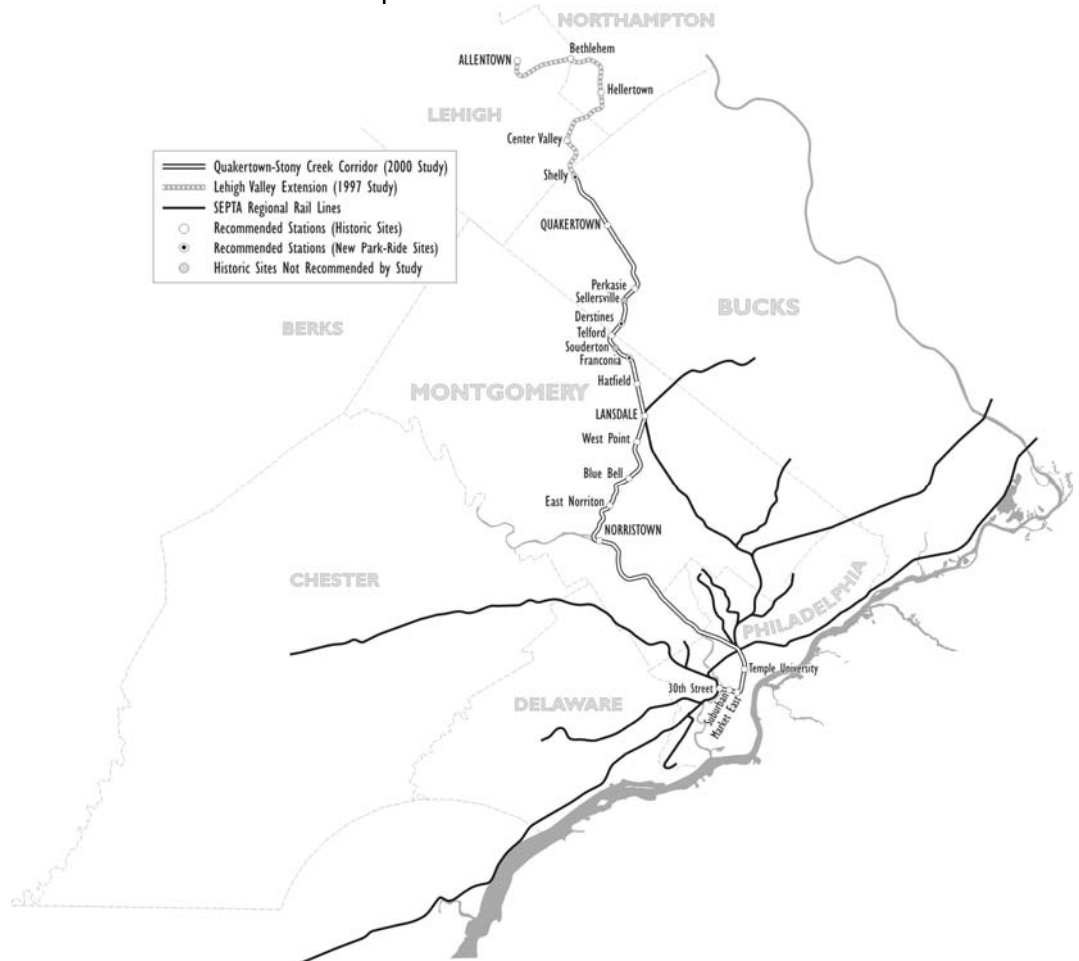
**PRIOR STUDIES**

Attempts were made to restore passenger rail service north of Lansdale almost as soon as it was abandoned. PennDOT, in conjunction with Bucks and Montgomery Counties, tried unsuccessfully to restore service under Act 10 in

1982. A succession of SEPTA's long range plans identified the need to restore passenger rail service between Lansdale and Quakertown starting in 1987.

In 1997, the Lehigh and Northampton Transportation Authority (LANTA) undertook the Amtrak Thruway Bus/Lehigh Valley Connections to Philadelphia Rail Service. It investigated the market feasibility of commuter rail service between Allentown and Philadelphia. The study concluded such would be cost effective.

The LANTA study was followed in 2000 by the Quakertown-Stony Creek Rail Restoration Study, undertaken by Bucks and Montgomery Counties in conjunction with the Delaware Valley Regional Planning Commission (DVRPC). That study recommended a commuter rail service starting from a park-ride lot alongside PA Route 309 in Shelly, Richland Township,



Bucks County (about 21 miles north of Lansdale). Commuter rail service would operate between Shelly and Center City Philadelphia through Bucks and Montgomery Counties via the SEPTA Bethlehem, Stony Creek and Norristown Lines.

Operating Quakertown trains via Norristown rather than the historic route via Jenkintown provides a new cross-county connection linking Upper Bucks and North Penn communities with the employment and commercial centers of the Norristown/King of Prussia area. Trains would operate non-stop between Norristown and Philadelphia, offering competitive travel time for Center City commuters.

The *Quakertown-Stony Creek Rail Restoration Study* concluded that a commuter rail service to Center City Philadelphia through Norristown would attract between 4,200 to 6,800 weekday passenger trips, 47 percent of whom would be new transit riders (2,000 to 3,200 weekday passenger trips). Capital costs associated with implementing this service were estimated to be about \$211 million<sup>1</sup> in 2000 dollars. The service was projected to recover between 67 percent of its operating costs and incur an annual operating deficit of about \$1.9 million.

**RECENT DEVELOPMENTS**

Subsequent to the completion of the 2000 study, BCTMA has coordinated a number of regional and local forums to refine and advance the Quakertown-Stony Creek Rail Restoration Project in concert with Bucks and Montgomery Counties, DVRPC and SEPTA.

BCTMA is a non-profit corporation organized in compliance with Section 501(c) (4) of the Internal Revenue Code to provide leadership for transportation issues in Bucks County, utilizing the combined resources of the public and private sectors. The Association improves

<sup>1</sup> About \$30 million of the capital cost estimate is associated with improvements to provide Center City access via the SEPTA Norristown Line. In April 2005, the *Schuylkill Valley Rail Assessment Final Report* to PennDOT recommended similar improvements as a means of "right sizing" SEPTA's Schuylkill Valley Metro project. If those improvements were implemented, the cost of the Quakertown-Stony Creek project would be reduced.

mobility within and around the Bucks County area by managing transportation demand, assisting in the improvement of the existing transportation infrastructure, and positively affecting the development of a transportation network.

**FEDERAL FUNDING AUTHORIZATION**

In August 2005, President Bush signed the *Safe, Accountable, Flexible, and Efficient Transportation Act – A Legacy for Users* (SAFETEA-LU) authorizing the federal transportation program for the next six years. Section 3043 (*Project Authorizations for New Fixed Guideway Capital Projects*) of the Act authorized preliminary engineering for Quakertown-Stony Creek (PA) Rail Restoration among 264 other projects nationwide in Fiscal Years 2005 through 2009 under paragraphs (1)(A) and (2)(A) of Section 5309(m) of Title 49, United States Code.<sup>2</sup>

The latter reference is to a section of the federal transportation statute commonly known as "Section 5309 New Starts" (49 USC 5309). It is comprised of rules governing funding eligibility as well as a listing of projects for which funding may be sought.

**REVISED PROJECT DESCRIPTION**

One modification proposed to the Quakertown-Stony Creek rail restoration concept as a result of the BCTMA forums was to pursue passenger rail in three successive stages:

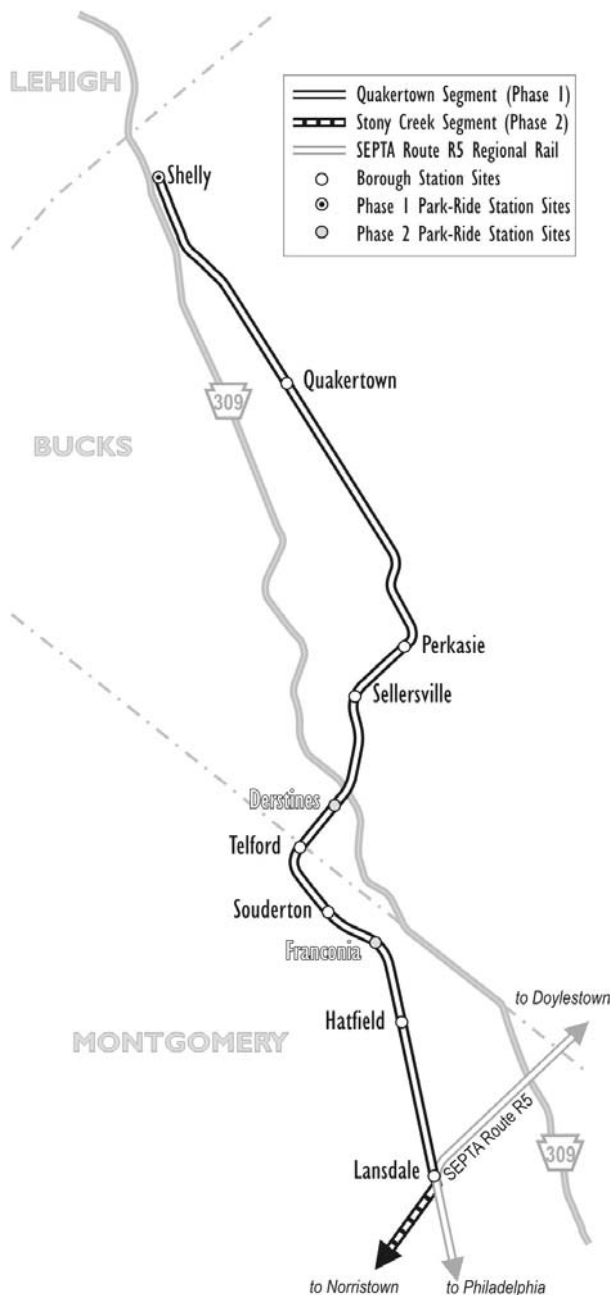
1. **Quakertown Segment.** Initiate service between Shelly and Lansdale (21 miles) as a shuttle linking together communities in Bucks and Montgomery Counties and connecting with SEPTA Route R5 trains in Lansdale.
2. **Stony Creek Segment.** Extend service between Lansdale and the Norristown Transportation Center (11 miles) as a shuttle linking the Phase 1 service

<sup>2</sup> SAFETEA-LU Conference Report, Section 3043: Project Authorizations for New Fixed Guideway Capital Projects



with the Montgomery County Seat and King of Prussia employment and commercial centers. Connections are available at Norristown to local and intercity buses and SEPTA Route R6 trains.

3. **Center City Segment.** Extend service ultimately over the SEPTA Norristown Line to Center City Philadelphia (18 miles).



The Phase 1 Quakertown Segment is illustrated in the diagram to the left. Given the importance of reinforcing transit-oriented land uses, it is proposed to restore all six of the former stations that form the center of North Penn and Upper Bucks boroughs. One new park-ride station would be developed in Phase 1 at a site adjacent to PA Route 309 at Shelly. The two other park-ride stations recommended by the *Quakertown-Stony Creek Rail Restoration Study* (Derstines and Franconia) are proposed to be deferred until Phase 2 as both are considered to be too close to the shuttle's Phase 1 southern terminal at Lansdale to be effective.

Pursuing the restoration of passenger rail service in stages would significantly reduce the expense and complexity of initial service start-up. Initiating service with shuttle trains operating initially over the Quakertown Segment between Shelly and Lansdale, then over the Stony Creek Segment to Norristown, permits deferring some infrastructure, systems, and rolling stock investments that are only needed to operate direct service to Center City Philadelphia in Phase 3.

**PROPOSED SERVICE**

The timetable for the Quakertown Shuttle would be dependent on a number of factors, including market, SEPTA and freight operating schedules and funding. These factors need to be investigated in detail through a market analysis and operational simulation conducted in conjunction with SEPTA, CSXT, and EPRY.

A sample service schedule is provided at the top of the following page for discussion purposes. In this example, Quakertown Shuttle service is scheduled to operate an hourly base service, seven days a week, with additional service in both directions during weekday peak periods for the convenience of commuters. The schedule would operate 21 round trips between Shelly and Lansdale on weekdays and 17 round trips on weekends and major holidays, reflecting SEPTA days of service.



**WEEKDAY SKETCH SCHEDULE**

		Train Number																				
		6512	514	516	520	534	542	546	550	554	558	562	566	570	6576	6598	582	584	588	592	594	596
SEPTA Route R5	PENN CENTER	5:37A	6:10A	6:44A	7:11A	8:20A	9:27A	10:20A	11:20A	12:20P	1:20P	2:20P	3:20P	4:20P	5:17P	5:38P	6:22P	6:50P	7:50P	8:50P	9:50P	10:50P
	LANSDALE	6:34A	7:03A	7:40A	8:12A	9:14A	10:17A	11:14A	12:14P	1:14P	2:14P	3:14P	4:12P	5:13P	6:03P	6:25P	7:14P	7:42P	8:42P	9:42P	10:42P	11:40P
Quaker- town Shuttle	LANSDALE	6:39A	7:08A	7:45A	8:17A	9:19A	10:22A	11:19A	12:19P	1:19P	2:19P	3:19P	4:17P	5:18P	6:08P	6:30P	7:19P	7:47P	8:47P	9:47P	10:47P	11:45P
	SHELLY	7:13A	7:42A	8:19A	8:51A	9:53A	10:56A	11:53A	12:53P	1:53P	2:53P	3:53P	4:51P	5:52P	6:42P	7:04P	7:53P	8:21P	9:21P	10:21P	11:21P	12:19A
	SHELLY	5:39A	6:04A	6:34A	7:37A	8:39A	9:39A	10:39A	11:39A	12:39P	1:39P	2:39P	3:35P	4:36P	5:21P	5:38P	6:10P	7:07P	7:35P	8:39P	9:39P	10:39P
	LANSDALE	6:13A	6:38A	7:08A	8:11A	9:13A	10:13A	11:13A	12:13P	1:13P	2:13P	3:13P	4:09P	5:10P	5:55P	6:12P	6:44P	7:41P	8:09P	9:13P	10:13P	11:13P
		Train Number																				
		505	509	513	517	521	525	529	533	537	541	549	4253	573	4157	577	579	583	585	587	589	591
SEPTA Route R5	LANSDALE	6:21A	6:46A	7:16A	8:19A	9:21A	10:21A	11:21A	12:21P	1:21P	2:21P	3:21P	4:17P	5:18P	6:03P	6:20P	6:52P	7:52P	8:21P	9:21P	10:21P	11:21P
	PENN CENTER	7:15A	7:42A	8:12A	9:15A	10:15A	11:15A	12:15P	1:15P	2:15P	3:15P	4:15P	5:14P	6:12P	7:00P	7:15P	7:45P	8:45P	9:15P	10:15P	11:15P	12:15A

**SATURDAY SKETCH SCHEDULE**

		Train Number																
		6522	1526	1530	1534	1538	1542	1546	1550	1554	1558	1562	1566	1570	1572	1574	1576	
SEPTA Route R5	PENN CENTER		7:20A	8:20A	9:20A	10:20A	11:20A	12:20P	1:20P	2:20P	3:20P	4:20P	5:20P	6:20P	7:20P	8:20P	9:20P	10:20P
	LANSDALE		8:14A	9:14A	10:14A	11:14A	12:14P	1:14P	2:14P	3:14P	4:14P	5:14P	6:14P	7:14P	8:14P	9:14P	10:11P	11:14P
Quaker- town Shuttle	LANSDALE	7:19A	8:19A	9:19A	10:19A	11:19A	12:19P	1:19P	2:19P	3:19P	4:19P	5:19P	6:19P	7:19P	8:19P	9:19P	10:16P	11:19P
	SHELLY	7:53A	8:53A	9:53A	10:53A	11:53A	12:53P	1:53P	2:53P	3:53P	4:53P	5:53P	6:53P	7:53P	8:53P	9:53P	10:50P	11:53P
	SHELLY	6:09A	7:09A	8:09A	9:09A	10:09A	11:09A	12:09P	1:09P	2:09P	3:09P	4:09P	5:09P	6:09P	7:09P	8:09P	9:09P	10:39P
	LANSDALE	6:43A	7:43A	8:43A	9:43A	10:43A	11:43A	12:43P	1:43P	2:43P	3:43P	4:43P	5:43P	6:43P	7:43P	8:43P	9:43P	11:13P
		Train Number																
		1511	1515	1519	1523	1527	1531	1535	1539	1543	1547	1551	1555	1559	1563	1567	1571	1575
SEPTA Route R5	LANSDALE	6:51A	7:51A	8:51A	9:51A	10:51A	11:51A	12:51P	1:51P	2:51P	3:51P	4:51P	5:51P	6:51P	7:51P	8:51P	9:51P	11:21P
	PENN CENTER	7:45A	8:45A	9:45A	10:45A	11:45A	12:45P	1:45P	2:45P	3:45P	4:45P	5:45P	6:45P	7:45P	8:45P	9:45P	10:45P	12:15A

**SUNDAY SKETCH SCHEDULE**

		Train Number																
		2522	2526	2530	2534	2538	2542	2546	2550	2554	2558	2562	2566	2570	2572	2574	2576	
SEPTA Route R5	PENN CENTER		7:20A	8:20A	9:20A	10:20A	11:20A	12:20P	1:20P	2:20P	3:20P	4:20P	5:20P	6:20P	7:20P	8:20P	9:20P	10:20P
	LANSDALE		8:14A	9:14A	10:14A	11:14A	12:14P	1:14P	2:14P	3:14P	4:14P	5:14P	6:14P	7:14P	8:14P	9:14P	10:11P	11:14P
Quaker- town Shuttle	LANSDALE	7:19A	8:19A	9:19A	10:19A	11:19A	12:19P	1:19P	2:19P	3:19P	4:19P	5:19P	6:19P	7:19P	8:19P	9:19P	10:16P	11:19P
	SHELLY	7:53A	8:53A	9:53A	10:53A	11:53A	12:53P	1:53P	2:53P	3:53P	4:53P	5:53P	6:53P	7:53P	8:53P	9:53P	10:50P	11:53P
	SHELLY	6:09A	7:09A	8:09A	9:09A	10:09A	11:09A	12:09P	1:09P	2:09P	3:09P	4:09P	5:09P	6:09P	7:09P	8:09P	9:09P	10:39P
	LANSDALE	6:43A	7:43A	8:43A	9:43A	10:43A	11:43A	12:43P	1:43P	2:43P	3:43P	4:43P	5:43P	6:43P	7:43P	8:43P	9:43P	11:13P
		Train Number																
		2511	2515	2519	2523	2527	2531	2535	2539	2543	2547	2551	2555	2559	2563	2567	2571	2575
SEPTA Route R5	LANSDALE	6:51A	7:51A	8:51A	9:51A	10:51A	11:51A	12:51P	1:51P	2:51P	3:51P	4:51P	5:51P	6:51P	7:51P	8:51P	9:51P	11:21P
	PENN CENTER	7:45A	8:45A	9:45A	10:45A	11:45A	12:45P	1:45P	2:45P	3:45P	4:45P	5:45P	6:45P	7:45P	8:45P	9:45P	10:45P	12:15A

Quakertown Shuttle trains are scheduled to provide reliable, enforced connections with SEPTA Route R5 trains to and from Center City Philadelphia at Lansdale. When possible, the majority of recovery time in the schedule cycle is conserved at the north end of each trip in Shelly, in order to allow northbound shuttle trains to wait for delayed SEPTA trains coming from Philadelphia.

**PATRONAGE & REVENUE FORECASTING**

A detailed analysis of the travel demand potential was conducted during the *Quakertown-Stony Creek Rail Restoration Study* for three alternatives. Analysis was based on DVRPC model output with enhancements to improve its sensitivity to service frequencies and varying station access characteristics. DVRPC prepared the input

data and performed 1997 and 2020 No-Build runs to ensure reliable model operation under the supervision of the consultant team. DVRPC prepared revisions to Transportation Analysis Zones (TAZs) and to highway and transit links in the model network to focus the level of detail within the study corridor.

Existing TAZs in the corridor were disaggregated to provide a finer mesh for analysis and access evaluation. Existing zones were split and the centroid connectors and modified highway and transit links were recoded where needed to provide the desired level of detail. DVRPC provided revised 1995 demographic and employment data for the split TAZs, based on aerial photographs and maps. The infrastructure changes associated with each alternative were coded into the networks. Relevant new development was identified and reflected in the runs of the Build Alternatives.

DVRPC reviewed the 1995 simulation, data, and models, and ran and calibrated the 1995 simulation, then prepared and ran the 2020 No-Build alternative. They provided the simulation model, trip tables, other supporting data including TAZ data, highway and transit networks, and all computer files needed to run the simulation for the corridor.

The model output expresses patronage forecasts in terms of passenger productions and attractions by station (the first two shaded columns). A production represents the origin end of a passenger's round trip, while an attraction represents the destination end of a passenger's round trip. For example, one production at Quakertown Station would represent two weekday passenger trips (one trip to a destination and one trip back).

The modeling process expressed patronage forecasts in terms of a range. QSC Alternative 2, which is the closest in service characteristics to the Quakertown Shuttle concept, was forecasted to generate between 1.5 and 2.4 million annual passenger trips, (between 2,620 and 4,267 weekday passenger trips). About 55 percent of all productions and three percent of all attractions were at

Bethlehem Line stations north of Lansdale. About 15 percent of all attractions were to destinations other than Center City Philadelphia or Bethlehem Line stations (i.e.: destinations that would not be served by the proposed Quakertown Shuttle).

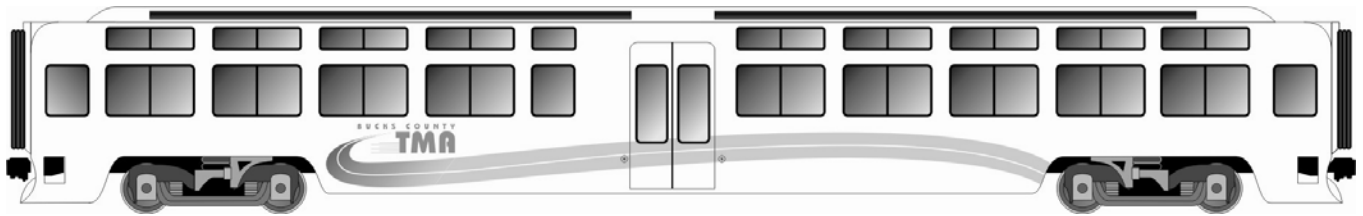
Adjusting the patronage forecasts from the prior study to account for the differences in service characteristic, ridership for the Quakertown Shuttle would range between 377,000 and 613,000 annual passenger trips (between 1,200 and 2,000 weekday passenger trips. Note that this is a rough estimate sufficient only to provide an "order of magnitude" for discussion purposes. A revised patronage forecast needs to be generated based on service characteristics and present-day corridor conditions specific to the Quakertown Shuttle proposal.

The revenue resulting from the ridership associated with the Quakertown Shuttle was calculated based on extension of the existing SEPTA fare structure. Based on the previous discussion of patronage forecasting, the Quakertown Shuttle could conceivably generate between \$2.5 and \$4.0 million in fare revenues annually.

### **ROLLING STOCK**

The service pattern outlined above for the Quakertown Shuttle would require three train sets to operate. The patronage forecast suggests that two-car trains may be required to accommodate peak period passenger demand, assuming about 100 passengers per car. This would suggest four two-car trainsets would be needed to initiate service (three trainsets to meet peak service demand and a fourth in reserve as a maintenance spare).

The *Quakertown-Stony Creek Rail Restoration Study* recommended using single-level push-pull coaches and dual-powered locomotives capable of operating in non-electrified territory as well as through the Center City Commuter Connector. This was necessary to provide Quakertown and Stony Creek Line passengers a one-seat ride through to 30th Street Station in Philadelphia (as contemplated for Phase 3).



In contrast, the Quakertown and Stony Creek Shuttles (Phase 1 and 2) remain in open air and will try to offset the inconvenience of an enroute transfer for passengers by offering more frequent, convenient service. This level of service requires equipment capable of operating effectively and safely in small consists (i.e., one or two cars) and quick turn-arounds at each terminal. Furthermore, DMUs distribute tractive effort throughout a trainset proportional to consist length, in contrast to concentrating all tractive effort in a single prime mover as is the case with a locomotive-hauled trainset. This results in the superior acceleration characteristics in smaller consists, as is expected for Phase 1, and does not require cars be added for the purpose of preserving safe braking distance.

Self-propelled diesel railcars (i.e., diesel multiple-unit trains or "DMUs") operating singularly or in trainsets would be operationally suitable for Phase 1 and 2 shuttle services. DMUs in the form of Budd Rail Diesel Cars (RDCs) were the mainstay of Bethlehem Branch service from their introduction on the Reading Company in 1962 through abandonment in 1981. Rehabilitated RDCs are still operating in regular revenue service. Dallas Area Regional Transit used 13 RDCs to start its highly successful Trinity Railway Express service between Dallas and Fort Worth TX.

Modern DMUs are also being manufactured in the United States. Colorado Railcar Manufacturing has recently built single and bi-level DMUs for the South Florida Regional Rail Authority (Tri-Rail) service based in Miami FL (the single-level car is illustrated above). The Triangle Transit Authority in Raleigh-Durham NC has contracted with United Transit Systems (a domestic

partnership of the Japanese-based Sojitz Corporation and the Rotem Company, a Korean railcar manufacturer) to provide a new DMU.

All of the aforementioned rolling stock is compliant with Federal Railroad Administration (FRA) regulations governing joint use operations with other commuter rail and freight trains. FRA regulations set standards for structural strength and other factors pertaining to railcars so that they may safely commingle with other trains operating on the General System of Railroads throughout the United States.

Some new rail operations have chosen to use non-compliant railcars (i.e., rolling stock that does not entirely conform to FRA regulations). NJ Transit's new RiverLine between Camden and Trenton and a new commuter rail service in Austin TX have chosen an alternative approach using non-compliant DMUs from European manufacturers. While this approach to rolling stock can yield potential economies and enhance operating flexibility, it carries a heavy regulatory burden, however, including a requirement for temporal (in fact, diurnal) separation of passenger and freight trains.

A non-compliant railcar is not be a realistic option for Quakertown-Stony Creek service, however. In Phase 1, it would require that CSXT and East Penn freight operations be relegated into narrow service windows between Midnight and 5:00 AM when passenger trains do not operating. Special design and operational procedures would be needed in the Lansdale terminal area to positively separate Quakertown Shuttle movements from SEPTA Route R5 trains and freight train activity, which would likely reduce operational flexibility for all four carriers.

The challenges associated with using a non-compliant railcar would be exacerbated in Phase 2. Passenger trains would need to be temporally separated from CSXT and NS freight train operations. It would be impossible for a non-compliant vehicle to share the existing SEPTA Norristown Line track with Route R6 trains in order to access the Norristown Transportation Center.

For these reasons, a non-compliant rolling stock strategy is not recommended. The estimated capital cost for eight compliant DMUs is about \$23.9 million.

## INFRASTRUCTURE

The infrastructure investments recommended for the Bethlehem Line in the *Quakertown-Stony Creek Rail Restoration Study* were based on an operational plan that anticipated through-trains scheduled and running relatively independent of other SEPTA regional rail operations. In contrast, the Quakertown Shuttle proposed for Phase 1 would be heavily influenced by the schedule and reliability of SEPTA Route R5 connections in Lansdale. The underlying premises associated with past infrastructure recommendations need to be revisited in light of the proposed three-stage service implementation strategy. The following sections represent a cursory review of past concepts.

## TRACKWAY

The Bethlehem Line is a double-track alignment with the exception of a short single-track segment through the Perkasio Tunnel. Track condition has progressively deteriorated in the quarter century since the abandonment of passenger rail. CSXT and EPRY presently maintain a single main line track in service from Lansdale to California Road, north of Quakertown.

The prior study recommended restoring a single track between Lansdale and Shelly with passing sidings at strategic locations based upon scheduled meeting points for north and southbound trains. Running times were based on restoring line and profile to a condition compatible with FRA Class 3 standards for maintenance, permitting 60

mph operation for passenger trains and 40 mph operation for freight trains.

A 1999 condition assessment indicated that a complete tie replacement and rehabilitation of the underlying track bed and drainage systems was needed between Lansdale and Shelly, but much of the existing rail could be reused. Rail, ties and roadbed would all be needed between California Road and the end of track at Shelly.

Operating a single-track passenger railroad with passing sidings requires excellent schedule adherence. This is an unrealistic expectation for a frequent shuttle service as proposed for the Quakertown Shuttle in Phase 1. Waiting for a delayed connecting train in Lansdale, a northbound shuttle would affect southbound movements that need to stay on-time to make their own connections in Lansdale. The result would be a cascading series of delays that would extend throughout the service day.

The alternative approach proposed would be to restore both tracks to operating condition so that the reliability of northbound and southbound trains is operationally uncoupled. This approach would also reduce the number of signal interlockings needed on the alignment, which would represent a significant investment in special trackwork and signal systems.

Track-related capital costs were estimated to be about \$35.3 million based on this approach. This includes four intermediate, trailing crossovers to support freight operations and to enhance flexibility during extraordinary operating conditions. Judicious use of trailing point spring switches would reduce or possibly eliminate the need for remote operation of switches.

A North Penn shippers' association is presently working in conjunction with PennDOT, DVRPC, CSXT, EPRY and SEPTA to upgrade the condition of the Bethlehem Line to at least a condition compatible with FRA Class 2 standards for maintenance. Such capital investments should be encouraged, coordinated and documented, as:

- Improvements should be designed not to preclude the restoration of passenger rail service; and
- Private and public investments that improve Bethlehem Line track conditions might be eligible as local match for federal funding purposes.

**STRUCTURES**

No specific structural improvements were identified as needed for the Quakertown Segment in previous studies. Past difficulties with assigning responsibility for overhead "orphan" bridges have been resolved with PennDOT and the municipalities and most have been replaced in recent years. Undergrade bridges remain the railroad's responsibility and the condition of these bridges and culverts will need to be confirmed in greater detail in order to determine the continuing sufficiency of structures along the line and/or the cost of mitigating maintenance. The condition of the Perkasio Tunnel will require a similar assessment.

**TRAIN CONTROL SYSTEMS**

The Bethlehem Line was once signalized in its entirety, but train control appliances were removed soon after the abandonment of passenger service in 1981. The line is presently unsignalized "dark territory" beyond the northern limits of Dale Interlocking in Lansdale. CSXT and EPRY train movements are manually dispatched in accordance with NORAC rules (Rules 97 and 98).

The prior study recommended resignaling the line in conjunction with restoring a single track between Lansdale and Shelly with passing sidings at strategic locations. However, the alternate approach described earlier in the Trackway section suggested restoring both tracks in order to maintain service reliability. Given the operational flexibility of this approach and the limited level of service anticipated under Phase 1, a sophisticated train control system may not be required as an initial investment.

Under this approach, the Bethlehem Line would remain dark territory and train movements would be safely dispatched under NORAC rules governing manual train

control. This is the approach undertaken by the new commuter rail service presently under construction in Austin TX.

Capital cost for train control systems were estimated to be about \$1.1 million based on this approach. It was assumed that the single-track section of track through the Perkasio Tunnel either would be bi-directionally signaled (Rule 261) or protected in some other positive manner. Facing point switches in dark territory would be protected by electric locks.

**HIGHWAY GRADE CROSSINGS**

There are 34 highway grade crossings on the Bethlehem Line between Lansdale and Shelly, 29 of which are public crossings. These crossings and the crossing protection currently in effect are itemized in the table on the following page.

Most of the public crossings (25) are equipped with automatic flashers and bells but only nine are also equipped with gates. One active public crossing is only signed with crossbucks and three north of the end of active track are out of service.

Capital costs for highway grade crossing improvements were estimated assuming that all public crossings would be upgraded to full flashers, bells and gates. This is consistent with current industry practice with respect to new passenger rail services. The cost of such improvements is estimated to be about \$1.7 million.

One of the five private crossings on the line are equipped with flashers, bells and gates (although its gate arm blades were noted as missing during a January 2006 inspection). All private crossings should be upgraded to flashers, bells and gates upon the restoration of passenger rail service or eliminated. Responsibility for upgrading private crossings should reside with the property owner, but that needs to be confirmed through review of crossing agreements currently in effect with SEPTA.

ACTIVE CROSSINGS

Crossing	Municipality	Milepost	Signs	Flashers	Gates	Private
Broad St	Lansdale Borough	MP24.2	■	■	■	
Main St	Lansdale Borough	MP24.4	■	■	■	
Cannon Av	Lansdale Borough	MP24.9	■	■		
Eighth St	Lansdale Borough	MP25.1	■	■		
Private	Hatfield Township	MP25.6	■			■
Schwab Rd	Hatfield Township	MP26.0	■	■		
Orvilla Rd	Hatfield Township	MP26.1	■	■		
Vine St	Hatfield Borough	MP26.5	■	■		
Main St	Hatfield Borough	MP26.7	■	■	■	
Union St	Hatfield Borough	MP27.4	■	■	■	
Bergey Rd	Hatfield Township	MP28.0	■	■		
Township Line Rd	Hatfield Township	MP28.7	■	■		
Broad St	Souderton Borough	MP29.6	■	■	■	
Central Av	Souderton Borough	MP29.9	■	■		
Reliance Rd	Souderton Borough	MP30.2	■	■		
Third St	Telford Borough	MP30.5	■	■		
Main St	Telford Borough	MP30.9	■	■	■	
Washington St	Telford Borough	MP31.1	■			
Meetinghouse Rd	West Rockhill Township	MP32.1	■	■		
Clymers Av	Sellersville Borough	MP33.1	■	■		
Park Av	Perkasie Borough	MP34.6	■	■		
Market St	Perkasie Borough	MP35.0	■	■	■	
Rockhill Quarry	West Rockhill Township	MP37.3	■	■	■	■
Private	West Rockhill Township	MP38.1	■			■
Paletown Rd	Richland Township	MP38.8	■	■		
Private	Richland Township	MP39.5	■			■
Fairview Rd	Quakertown Borough	MP39.9	■	■		
Hellertown Rd	Quakertown Borough	MP40.0	■	■	■	
Broad St	Quakertown Borough	MP40.4	■	■	■	
Mill St	Quakertown Borough	MP40.8	■	■		
California Rd	Richland Township	MP42.4				
Cherry Rd	Richland Township	MP43.7				
Mine Rd	Springfield Township	MP44.5				
Private	Springfield Township	MP44.6				■
TOTALS:		34	30	26	10	5

PASSENGER STATIONS

Eight passenger rail stations are proposed under Phase 1 of the Quakertown-Stony Creek service restoration project, as identified in the following table. These include six former stations at the core of North Penn and Upper Bucks boroughs and one new park-ride station at Shelly, adjacent to PA Route 309.

Station	Municipality	Milepost	Existing	Former	New
Lansdale	Lansdale Borough	MP24.2	■		
Hatfield	Hatfield Borough	MP27.1		■	
Souderton	Souderton Borough	MP29.6		■	
Telford	Telford Borough	MP30.9		■	
Sellersville	Sellersville Borough	MP33.6		■	
Perkasie	Perkasie Borough	MP35.0		■	
Quakertown	Quakertown Borough	MP40.2		■	
Shelly	Richland Township	MP44.5			■
TOTALS:			1	6	1

All stations will be compliant with the requirements of the Americans with Disability Act of 1990, which mandates that at least one car per commuter rail train will be fully accessible. All Phase 1 trains would consist of a single car except during peak periods, when two-car consists would operate. For simplicity during Phase 1, all passengers will board and alight via a mini-high block platform.

- Each **Borough Station (6)** would be furnished two mini-high block platforms, one for each direction.
- The north terminal at **Shelly** would also be furnished two mini-high block platforms arrayed in tandem on the northbound track (permitting two trainsets to terminate simultaneously under extraordinary operating conditions).
- The south terminal at **Lansdale** would be furnished with one mini-high on the westernmost platform adjacent to Main Line Track #1 (Bethlehem Industrial Track) and another on the center

platform between Main Line Tracks #1 and #2 (Bethlehem Running Track). The latter would be configured to permit southbound passengers to transfer directly from a Quakertown Shuttle to a SEPTA Route R5 train without descending to platform level.

- Provisions will be made for platform canopies, windscreens, improved lighting and other passenger amenities at all eight stations. Most of the former passenger stations have been converted to commercial uses. There is no intention of recovering and reusing former passenger stations except for Quakertown, if available, which has been restored for use as a community center.

Capital costs for stations, assuming this approach, were estimated to be about \$3.5 million.

**PARKING FACILITIES**

Parking is assumed to be the mode of access for up to 90 percent of Quakertown Shuttle passengers. If correct, that assumption suggests that a minimum of 900 parking spaces would be needed along the Quakertown Segment to meet Phase 1 ridership demand.

There are currently about 544 parking spaces available at former borough stations, consisting of:

- 214 newly improved spaces are already available at Telford, Sellersville and Perkasie Stations.
- 330 spaces are available in various states of repair at five stations.
- Developable area for 110 new spaces is also available at Souderton and Sellersville.

Another 250 new parking spaces can be constructed at a new park-ride station adjacent to PA Route 309 at Shelly.

The capital costs for developing these 690 unimproved and new parking spaces are estimated to be about \$1.3 million.

**MAINTENANCE FACILITIES**

A maintenance facility is planned adjacent to the northern terminal at Shelly. It would need to support storage, servicing, routine maintenance and inspection cycles for the eight DMUs proposed for Phase 1. It is anticipated that heavy repairs and component maintenance will be handled under contract by off-site vendors whenever possible to keep the size of the facility and staff to a minimum, manageable size.

Based on these expectations, the capital costs for the maintenance facilities are estimated to be about \$2.9 million.

		P A R K I N G   S P A C E S			
Station	Municipality	Improved	Unimproved	New	Total
Lansdale	Lansdale Borough		<i>Not Applicable</i>		
Hatfield	Hatfield Borough		75		75
Souderton	Souderton Borough		70	60	130
Telford	Telford Borough	111			111
Sellersville	Sellersville Borough	58	20	50	128
Perkasie	Perkasie Borough	45	15		60
Quakertown	Quakertown Borough		150		150
Shelly	Richland Township			250	250
TOTALS:		214	330	360	904

**RIGHT OF WAY**

Right of Way acquisition requirements are limited as most Phase 1 infrastructure improvements are confined to SEPTA property. New property will be required, however, for the new park-ride station and maintenance facility at Shelly. Minor property acquisition may possibly be required at other locations as well. A placeholder \$1.5 million for right of way acquisition was included in the capital cost estimate until requirements are determined in more specific detail.

**REVENUE COLLECTION**

As noted earlier, it is anticipated that the fare structure on the Quakertown Shuttle will be consistent with SEPTA's in order to provide for seamless connections to and from SEPTA Route R5 trains and the whole of the regional transit network. For that reason, SEPTA fare instruments will be employed for the Quakertown Shuttle.

It is proposed to mount a fare vending machine for single trip rides aboard each DMU. Under this approach, fare vending machines will last longer and be more reliable when kept protected from inclement weather. They can be serviced in the controlled and secure of environment of the maintenance facility. It is desirous to spare on-board employees the distraction and risk of handling the cash.

The estimated capital costs for fare vending machines are estimated to be about \$700,000.

**ENGINEERING & ENVIRONMENTAL SOFT COSTS**

Standard factors were applied to the above rolling stock and infrastructural costs to account for the anticipated "soft costs" associated with project development, including:

- Contractor Mobilization
- Design Engineering
- Environmental Assessment
- Construction Management
- Contingency

About \$23.7 million in "soft costs" were identified in this manner.

**SUMMARY**

The following table summarizes the estimated capital costs for the start-up of the Quakertown Shuttle service.

Trackway	\$ 35,100,000
Train Control Systems	\$ 1,082,000
Highway Grade Crossings	\$ 1,736,000
Passenger Facilities	\$ 3,467,000
Station Parking	\$ 1,314,000
Maintenance Facilities	\$ 2,892,000
Utility Allowance	\$ 85,000
Rolling Stock & Fare Equipment	\$ 24,596,000
Right of Way	\$ 1,500,000
<b>SUBTOTAL:</b>	<b>\$ 71,772,000</b>
Engineering/Environmental Soft Costs	\$ 23,610,000
<b>TOTAL:</b>	<b>\$ 95,382,000</b>



**OPERATING COSTS**

An order of magnitude estimate of Quakertown Shuttle operations and maintenance (O&M) costs was developed based on the operating schedules that are presented elsewhere in this report. The following table provides pertinent operating statistics drawn from the proposed schedules.

	Weekdays	Saturday	Sunday	Annual
Train Trips	42	17	17	12,655
Vehicle Trips	58	17	17	16,783
Train Miles	1,726	699	699	520,121
Vehicle Miles	2,384	699	699	689,781
Revenue Train Hours	40	33	33	13,883
Revenue Vehicle Hours	53	33	33	17,146

O&M costs would vary depending upon the method ultimately selected for service delivery. Direct operation—the approach taken by SEPTA, NJ Transit, and the New York Metropolitan Transportation Authority—is not the preferred service delivery approach taken by most commuter rail agencies. Most North American commuter rail services are operated under contract either by an independent freight railroad carrier or a third-party, private contractor, such as Hertzog and Connex. There is a further trend in the industry to parse operating and maintenance contracts, with the vehicle supplier (such as Bombardier) often filling that role.

Contracting would be a rational service delivery approach for BCTMA. The pool of potential contractors could include:

- Private, third-party contractors (e.g.: Hertzog or Connex);
- Freight railroad carriers (e.g., East Penn Railways or CSXT); and
- Public entities that contract for service (e.g.: SEPTA or Amtrak).

An O&M cost model was based on National Transit Database cost information from diesel commuter rail operating agencies in the Northeastern United States. Data included the Massachusetts Bay Transportation Authority, the Maryland Mass Transit Administration (MARC), the Connecticut Department of Transportation (Shore Line East), and Virginia Railway Express. All of the selected systems are East Coast commuter rail services operated under contract to a third-party, private contractor.

A simple O&M model was based solely on revenue vehicle-hours of service, which is a reasonable basis for producing O&M cost estimates at a conceptual planning level. The historical data was inflated to current year dollars to yield a value of \$250.57 per revenue vehicle-hour (adjusted for one-man operation), which was multiplied against the revenue vehicle-hours of service described in the operating schedule, to produce O&M cost estimates for the Quakertown Shuttle service.

The annual O&M cost estimates are summarized on the following table. The cost estimates were compared to the range of revenue estimates discussed earlier in this report, the results of which are also summarized below.

Annual Operating Cost		\$ 4,296,000
Annual Fare Revenue (Range)	\$ 2,471,000	\$ 4,024,000
Annual Deficit (Range)	\$ 1,825,000	\$ 272,000
Operating Ratio	58%	94%

## FEDERAL ELIGIBILITY REQUIREMENTS FOR FTA-ADMINISTERED GRANTS

Use of federal New Starts funding entails compliance with the requirements set forth in Section 5309 New Starts criteria (49 USC 5309) by a public agency designated by the Federal Transit Administration (FTA) as a grant recipient. In order to receive grants administered by FTA, potential grantees must comply with FTA's Master Agreement.<sup>3</sup> Compliance includes submission of documents to attest that applicants are in compliance with the most-recent Certifications and Assurances regulations published annually in the Federal Register.<sup>4</sup>

### CERTIFICATIONS AND ASSURANCES

In order to receive federal funding, potential recipients must provide certain certifications and assurances that represent FTA's current expectations concerning the capabilities and responsibilities of grant recipients. The FTA list of certifications and assurances is updated annually and all recipients must recertify each year.

FTA identifies 16 potential areas of compliance; although not each area is applicable to every recipient. Signatures from the applicant, as well as from an attorney, are the standard method of attesting compliance with certification and assurances. Applicants may also record their certifications and assurances electronically via FTA's Transportation Electronic Award Management (TEAM) grant management interface.

The most recent 16 areas of certification and assurances are as follows.

#### 1. **OMB Certification and Assurances**

**Compliance:** Recipients must certify compliance attesting to their overall eligibility to receive federal funds developed by the Office of Management and Budget but edited for FTA use. There are nineteen identified subcomponents dealing with legal

authority and financial capacity, openness of books, safeguards against conflicts of interest, compliance with Civil Rights Act and other nondiscrimination statutes, compliance with real property acquisition policies, Davis-Bacon Act, flood insurance program, comply with FTA requirements for engineering, drafting, NEPA, Clean Air Act, Endangered Species Act, and other relevant statutes.

2. **Lobbying:** Federal funds may not be used for lobbying or related activities.
3. **Private Mass Transportation Companies:** Recipients must clarify how the proposed service will impact any privately-owned pre-existing service within the vicinity.
4. **Public Hearing:** A process must be in place to ensure that the public is provided an adequate opportunity to comment on the proposed project and is consistent with existing planning and development goals.
5. **Acquisition of Rolling Stock:** Applicants must comply with 49 USC 5323 concerning the acquisition of rolling stock.
6. **Bus Testing:** All buses acquired must comply with federal procedures and be tested at an FTA-approved testing facility.
7. **Charter Service Agreement:** Recipients who plan to operate, or contract out operations, of charter service must comply with FTA's Charter Service Agreement.
8. **School Transportation Agreement.** FTA-funded services may not compete with or supplement school services.
9. **Demand Responsive Service.** Provision of demand responsive service to persons with disabilities must be equivalent to the level and

<sup>3</sup> 49 U.S.C. 5323(n)

<sup>4</sup> [http://www.fta.dot.gov/legal/federal\\_register/2004/12174\\_16165\\_ENG\\_HTML.htm](http://www.fta.dot.gov/legal/federal_register/2004/12174_16165_ENG_HTML.htm)

quality of service provided to persons without disabilities.

- 10. **Alcohol Misuse and Prohibited Drug Use.** Applicant is required to demonstrate compliance with FTA’s Drug and Alcohol rules for transit operators.
- 11. **Interest and Other Financing Costs.** Applicant must certify that they will comply with rules governing interest and other costs related to any financing they receive.
- 12. **Intelligent Transportation Systems.** Recipients must certify that any ITS investment must support the National ITS Architecture and FTA’s “National ITS Architecture Policy on Transit Projects.”
- 13. **Urbanized Area, JARC and Clean Fuels Program.** Recipients must comply with rules concerning reporting requirements for projects in these funding categories.
- 14. **Elderly & Disabled Program.** Applicant must comply with rules governing projects financed using this FTA funding category.
- 15. **Non-Urbanized Area Formula Program.** Applicant must comply with rules governing projects financed using this FTA funding category.
- 16. **State Infrastructure Bank Program.** Applicant must provide State certification of sufficient documentation regarding the use of State Infrastructure Bank funds.

**NEW STARTS CRITERIA**

While compliance with Certifications and Assurances ensures that the recipient is eligible, New Starts criteria are a separate set of guidelines that governs how new transit “guideway” projects are planned, implemented and operated.

Federal guidance categorizes the New Starts criteria into three broad areas:

- **FTA Project Development Process.** FTA requires recipients of New Starts funding to follow a prescribed project development process, which is described in greater detail in the following section.
- **Project Justification.** FTA requires recipients of New Starts funding to develop justifications for the proposed project through the application of a set of criteria. Most of the criteria are quantifiable and relate to air quality and mobility benefit.
- **Local Financial Commitment.** FTA requires recipients of New Start funding to identify the level and sources of local funding to support capital and on-going operating costs and to ensure they will be in place for the project. Normally the local commitment speaks to the financial condition of the sponsor and how the system will be operated and maintained once service initiates.

**FTA PROJECT DEVELOPMENT PROCESS**

Projects seeking federal New Starts funding must emerge from a locally-driven, multimodal corridor planning process. There are three phases in the planning and project development process for projects:

- Alternatives Analysis
- Preliminary Engineering
- Final Design

The steps are illustrated in the chart on the next page and described in the following paragraphs.

Note that there are faster, alternate approaches to project development that BCTMA may choose to pursue. Choices include:

- **FTA Small Starts Process.** This is a simplified process for projects no more that \$250 million and requiring less than \$75 million in federal funding (as currently conceived, the \$95 million Quakertown Shuttle start up would fit in this category).

- Eschewing Federal Funds.** This is was the approach taken by NJ Transit for the RiverLine, which was implemented entirely with state funding. This approach would relieve the project of complying with FTA and NEPA project processes. It would be unrealistic to pursue, however, given the current state of transit funding in the Commonwealth of Pennsylvania.

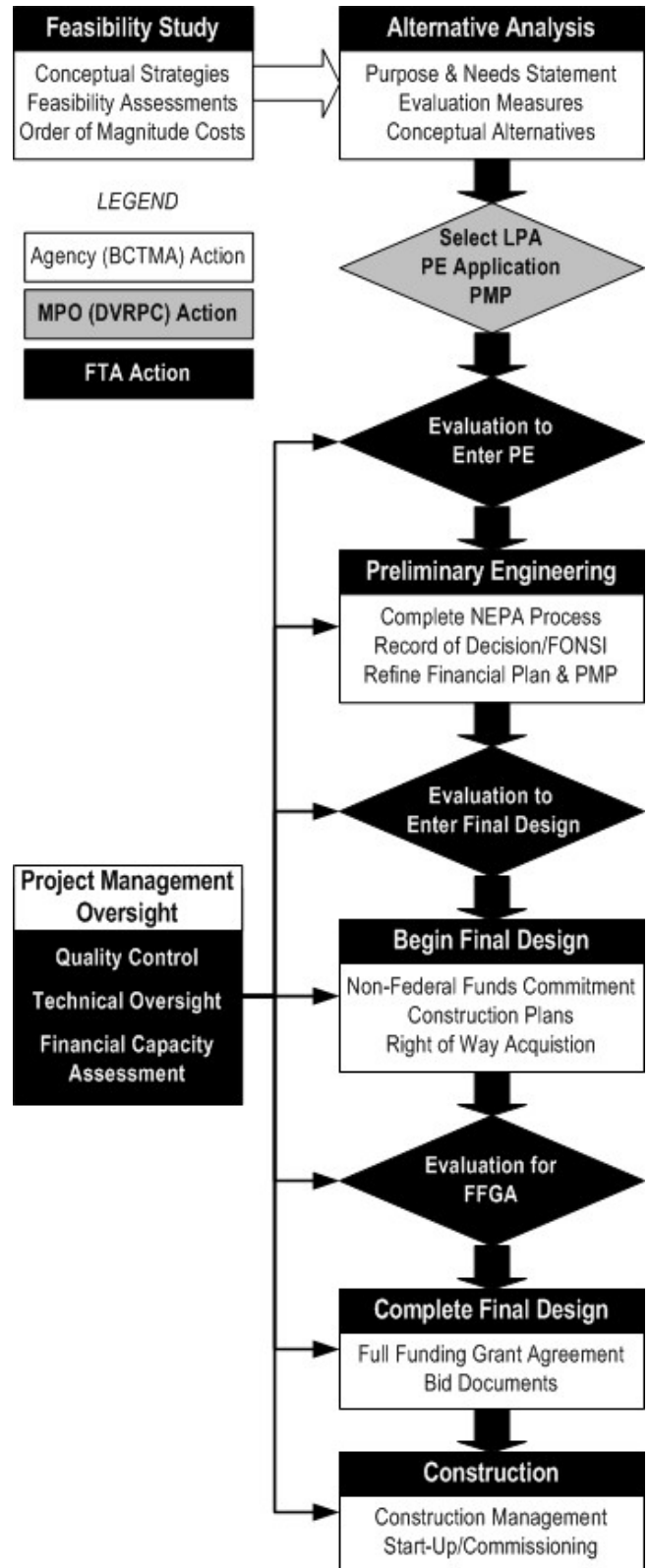
Such choices are typically made at the end of the alternatives analysis, based on overall project costs, the availability of state and local funding, and the magnitude of federal funding requirements.

**ALTERNATIVES ANALYSIS**

To specifically qualify for Section 5309 New Starts funding, candidate projects must have resulted from an alternatives analysis (also known as major investment study or multimodal corridor analysis) study which evaluates appropriate modal and alignment options for addressing mobility needs in a given corridor.

Alternatives analysis can be viewed as a bridge between systems planning, which identifies regional travel patterns and transportation corridors in need of improvements, and project development, where a project’s design is refined sufficiently to complete the processes required under the National Environmental Policy Act of 1969 (NEPA). The alternatives analysis study is intended to provide information to local officials on the benefits, costs, and impacts of alternative transportation investments developed to address the purpose and need for an improvement in the corridor.

Potential local funding sources for implementing and operating the alternatives should be identified and studied, and New Starts criteria should be developed. At local discretion, the alternatives analysis may include the undertaking of a Draft Environmental Impact Statement (DEIS). Involvement of a wide range of stakeholders (including the general public) in the alternative analysis study process is strongly encouraged.



Alternatives analysis is considered complete when a locally preferred alternative (LPA) is selected by local and regional decision-makers and adopted by the metropolitan planning organization (MPO) into the financially-constrained metropolitan transportation plan. At this point, the local project sponsor may submit to FTA the LPA’s New Starts project justification and local financial commitment criteria and request FTA’s approval to enter into the preliminary engineering phase of project development.

*Two feasibility studies have been completed for Quakertown-Stony Creek rail restoration, but additional work is needed to complete required elements of the alternatives analysis phase of project development and identify a Local Preferred Alternative (LPA) through DVRPC before FTA will approve entry into Preliminary Engineering.*

**PRELIMINARY ENGINEERING**

During the preliminary engineering phase of project development, local project sponsors refine the design of the proposal, taking into consideration all reasonable design alternatives. Preliminary engineering results in estimates of project costs, benefits, and impacts at a level of detail necessary to complete the NEPA process. The proposed project’s New Starts criteria are similarly refined in the preliminary engineering phase of development; project management plans are updated; and local funding sources are committed to the project (if not previously committed).

FTA typically assigns project management oversight contractors to projects undergoing PE to ensure that the engineering effort progresses in accordance with FTA requirements, and that the project sponsor is adequately preparing for the final design stage of development. Preliminary engineering for a New Starts project is considered complete when FTA has issued a Record of Decision (ROD) or Finding of No Significant Impact (FONSI), as required by NEPA. Projects which complete preliminary engineering and whose sponsors are

determined by FTA to have the technical capability to advance further in the project development process must request FTA approval to enter final design (and submit updated New Starts criteria for evaluation).

**FINAL DESIGN**

Final design is the last phase of project development, and includes right-of-way acquisition, utility relocation, and the preparation of final construction plans (including construction management plans), detailed specifications, construction cost estimates, and bid documents. The project’s financial plan is finalized, and a plan for the collection and analysis of data needed to undertake a Before and After Study (which is required of all projects seeking an Full Funding Grant Agreement) is developed.

**PROJECT GOVERNANCE**

Generally, Section 5309 New Start funds are available to designated recipients that must be public bodies (i.e. states, counties, cities, towns, regional governments, transit authorities) with the legal authority to receive and dispense Federal funds. In the Philadelphia area, past recipients include PennDOT, the Delaware Valley Regional Planning Commission, the Southeastern Pennsylvania Transportation Authority, the Delaware River Port Authority, New Jersey Department of Transportation and New Jersey Transit. States and other public bodies may apply for funds on behalf of a private nonprofit, provided they public body acts as a pass-through agency and public sponsor.

SEPTA is a designated FTA grant recipient and participated in the 1997 and 2000 studies, but has declined to take a leadership role in the restoration of Quakertown-Stony Creek passenger rail service. Bucks and Montgomery Counties are also designated FTA grant recipients, but have delegated the leadership in these matters to BCTMA.

BCTMA is not a designated FTA grant recipient. The approval process for a new grant recipient can take up to a year to complete, however, and the restoration of



Quakertown-Stony Creek rail service would be in hiatus until the matter was resolved. It would likely also require significant changes in the organization and governance of BCTMA that may conflict or interfere with some of the other responsibilities of the TMA.

As an alternative approach, BCTMA could partner with one or more public bodies in order to access federal funds, manage planning and design tasks, and provide for construction and operations through third-party contractors. FTA can be expected to insist that an existing public body serve as the public sponsor for this grant. Because of the local benefits of the project, Bucks and Montgomery Counties would be ideal choices to serve as designated public bodies, provided they would agree to perform this function.

An administrative process joining the BCTMA to the two counties would be required. The terms of this process must be specified through the use of a memorandum of understanding (MOU) between BCTMA and the Counties. The purpose of the MOU would be:

- Identify the relationship and responsibilities of each party;
- Describe the process by which the entities involved will comply with FTA rules and regulations for potential grant recipients, including Certifications and Assurances and grant administration;
- Define the method for distributing grant funding; and
- Identify the scope and period of the agreement.

In order to be effective, the MOU also should be developed in consultation with FTA Region 3 and approved by their Regional Counsel.

Compliance with FTA rules concerning Certifications and Assurances and execution of a FTA Master Agreement likely would be eased if a new nonprofit corporation was created, associated with but functionally independent of BCTMA. This action would provide a dedicated organizational unit focused on implementation of rail

service restoration. Furthermore, it would help indemnify BCTMA from any liabilities arising from the Quakertown-Stony Creek service and separate funds dedicated to the rail restoration project from BCTMA’s general funds derived from public and private sources.

The creation of the new non-profit organization and related organizational changes are discussed in the next section.

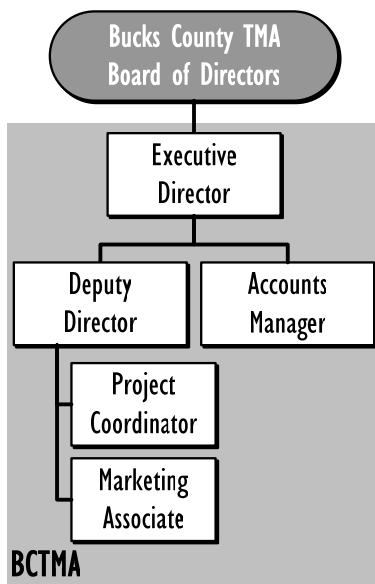


## ORGANIZATIONAL CHANGES

### EXISTING ORGANIZATION

BCTMA was chartered as a non-profit corporation organized in compliance with Section 501(c)(4) of the Internal Revenue Code to provide leadership for transportation issues in Bucks County, utilizing the combined resources of the public and private sectors. The Association improves mobility within and around the Bucks County area by managing transportation demand, assisting in the improvement of the existing transportation infrastructure, and positively affecting the development of a transportation network.

BCTMA staff currently consists of five positions. BCTMA activities are overseen by the BCTMA Board of Directors. A chart of the current organizational structure of the BCTMA is below.



A major focus of BCTMA activities to date has been extending SEPTA regional rail system in Bucks County through a series of shuttles (the Warminster, Street Road, Newtown and Bristol Rushes and the Doylestown Dart) designed and operated in response to local community needs. Functionally, the proposed Quakertown Shuttle represents another community-based extension of regional

rail, albeit steel-wheeled rather than rubber-tired. Therefore, BCTMA is a logical agency to manage the development and operation of that service.

However, the Quakertown Shuttle is also considerably different than BCTMA's bus shuttles in terms of scale and scope:

- It is considerably more dependent upon built infrastructure that must be designed and maintained in accordance with specific operational requirements.
- It requires more intensive and on-going coordination of operations with the other rail users (SEPTA, CSXT and EPRY).
- It would represent a disproportional share of the total BCTMA budget, a disparity that will increase as the project advances towards implementation.
- It serves communities in Montgomery County as well as Bucks County.

A rail project the magnitude of the Quakertown-Stony Creek rail restoration project requires a focused approach to its management. It is therefore prudent to evaluate the organizational structure of the Association in light of the requirements of the Quakertown Shuttle as the project progresses through planning, design and construction to implementation.

### NEW NONPROFIT CORPORATION

Creation of a new nonprofit corporation, associated with but functionally independent of BCTMA, was suggested in order to:

- Provide focused management of the Quakertown-Stony Creek rail restoration efforts.
- Help indemnify BCTMA from any liabilities arising from the Quakertown-Stony Creek rail restoration project or ensuing service.
- Separate funds dedicated to the rail restoration project from BCTMA's general funds derived from

various public and private sources for specific purposes.

## PURPOSE

Nonprofit corporations are typically organized for the purpose of serving a public or mutual benefit other than the pursuit of profit. Nonprofit corporations are tax-exempt and function in accordance with specific requirements and limitations enforced by the Internal Revenue Service (IRS).

In this instance, the nonprofit organization would be one recognized as tax-exempt under IRS 501(c)(4). Organizations recognized as 501(c)(4) nonprofit corporations have no “charitable” obligation (as opposed to the more common 501(c)(3) organization). A legal opinion will be necessary to identify the precise type of nonprofit organization to be established.

The purpose of the new nonprofit corporation (referred to herein as the "Quakertown-Stony Creek Rail Association" or "QSCRA") would initially be to manage project development of the Quakertown-Stony Creek rail restoration in compliance with FTA Section 5309 New Starts criteria. As the project advances from planning to construction and operations, QSCRA ultimately would be responsible for managing the operation of commuter rail service through a third-party contractor.

## ORGANIZATION

The organization of QSCRA is proposed to reflect that of BCTMA. QSCRA would be headed by an Executive Director and governed by a Board of Directors. The need for the two organizations to be associated but functionally independent of each other is proposed to be addressed through sharing a common Board of Directors. The BCTMA Executive Director would report to the QSCRA Board in an advisory capacity while maintaining regular work assignments to operate the transportation management association.

This approach has been employed by other transportation organizations with similar coordination needs, such as the

relationship between the New York Metropolitan Transportation Authority (MTA) and the MTA operating authorities (MTA NYC Transit, MTA Bus, MTA Long Island Railroad, MTA Metro-North, and MTA Capital) and locally between the Delaware River Port Authority and the Port Authority Transit Corporation.

The BCTMA Board of Directors plays a key role ensuring policy continuity and coordination between the activities of BCTMA and QSCRA. The proposed governance mechanism for this would be the Quakertown-Stony Creek Rail Committee (QSCRC), which would be established as a standing committee of the BCTMA Board. QSCRC membership should reflect equal representation of the three public entities with fiduciary interest in QSCRA — BCTMA, Bucks County and Montgomery County — advised by non-voting ex-officio members with a direct interest in the commuter rail project.

Ex-officio QSCRC members would possibly include representatives from both County Planning Commissions, FTA Region 3, DVRPC, PennDOT, SEPTA, CSXT, EPRY, municipalities and local shippers. As noted earlier, the BCTMA Executive Director would also participate in QSCRC in an advisory capacity.

To avoid redundancy, minimize overhead, and maintain economies of scale, BCTMA is proposed to continue to provide administrative, payroll and accounting functions for QSCRA and other logical services, such as marketing coordination and communications. A MOU should be executed between the two organizations to delineate these functions and identify a schedule of fees for such services.

## STAFFING

QSCRA staffing requirements would vary depending upon the current phase of project development and the methods selected for design, construction and service delivery. The overall goal proposed for staffing the organization, however, is to minimize overhead and long-term obligations by keeping a small permanent staff augmented through judicious use of consultants and other temporary



staffing strategies. This approach reflects a current industry trend demonstrated by several New Start rail projects around the country.

For example, Portland Streetcar, Inc., (PSI), the organization responsible for design, construction and operation of the local Portland OR street railway system (differentiated from Tri-Met, the regional transit agency responsible for the more extensive light rail transit system). PSI, in fact, has been labeled a "virtual organization" with no permanent staff. The CEO and marketing positions are filled by consultants from the firm that provides design services to PSI (the CEO is only needed about 40 hours a month). Operations and maintenance managers are seconded City employees, whose service represents an in-kind contribution toward the "local match" provided by the City of Portland for state and federal grants. Operating and maintenance employees are provided by Tri-Met under contract to PSI and extraordinary maintenance requirements (such as repairs to track or overhead power wires) are performed by Tri-Met employees under a defined schedule of hourly costs.

Another similar example is the new Music City Star (MCS) commuter rail service starting up in Nashville TN. MCS design, construction and operations are being conducted under the auspices of the Metropolitan Planning Organization (MPO, the local equivalent of DVRPC). The effort is led by the MCS Commuter Rail Direction, whose services are supplied through a transit consulting firm. Design and construction is provided through consultants and other contractors. Rail operations are provided by a third-party contractor.

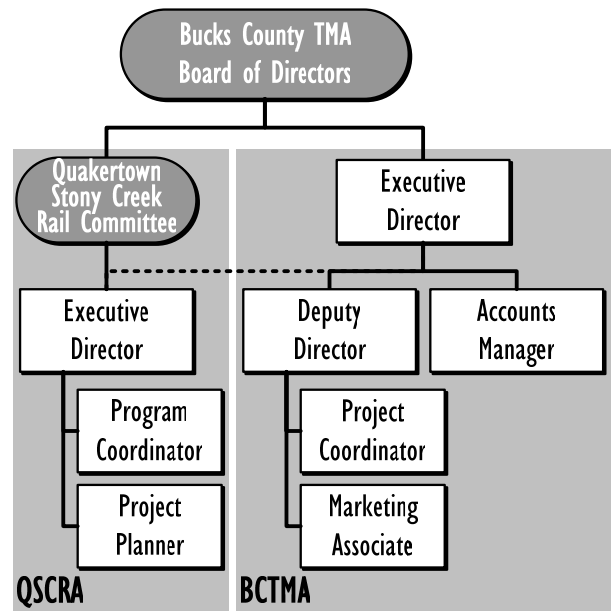
These strategies are particularly pertinent to a project in development phase, typified by a "stop and go" nature with periods of extreme activity punctuated by long hiatuses waiting for oversight reviews, third-party approvals, and re-initiation of funding streams. Maintaining a permanent staff throughout the "downtime" would represent a significant overhead burden. Contracting for key positions

is a flexible and cost-effective strategy for a relatively small organization to:

- Afford experienced, seasoned project leadership;
- Maintain project continuity through "downtimes" in project development; and
- Access specialty skills and disciplines not required on an on-going basis.

**PLANNING PHASE**

The following diagram outlines the staffing requirements for QSCRA proposed during the initial planning phases of project development.



QSCRA activities in this phase would typically consist of coordination with the counties, municipalities and rail carriers, developing funding options through PennDOT, DVRPC and other potential sources, managing consultants during the Alternative Analysis and related studies. Three staff positions are recommended to support this level of activity, balancing the need for technical proficiency with the economic realities of small organization dynamics:

- **Executive Director** providing overall management, administration and policy direction

of the QSCRA organization in conjunction with the QSCRA Board of Directors (which is also the BCTMA Board's QSCRC).

- **Program Coordinator** providing day-to-day management of the Quakertown-Stony Creek rail restoration efforts, including local coordination, developing funding options, and managing consultants.
- **Project Planner** providing administrative and analytic support to Quakertown-Stony Creek rail restoration efforts under the direction of the Rail Program Coordinator.

The appropriate mix of full-time and consultant staff that will best manage costs and support the goals and objectives of the QSCRA Board of Directors will need to be determined.

The Program Coordinator position is envisioned as full-time permanent staff position throughout the planning phase of project development. This individual would provide a continuing point-of-contact for the Quakertown-Stony Creek rail restoration efforts on a daily basis. In contrast, the services of the Executive Director and, to a lesser degree, Project Planner likely would not be needed on a daily basis and may be more cost-effectively supplied through an on-call services agreement with a full service consulting firm.

**ENGINEERING & CONSTRUCTION PHASE**

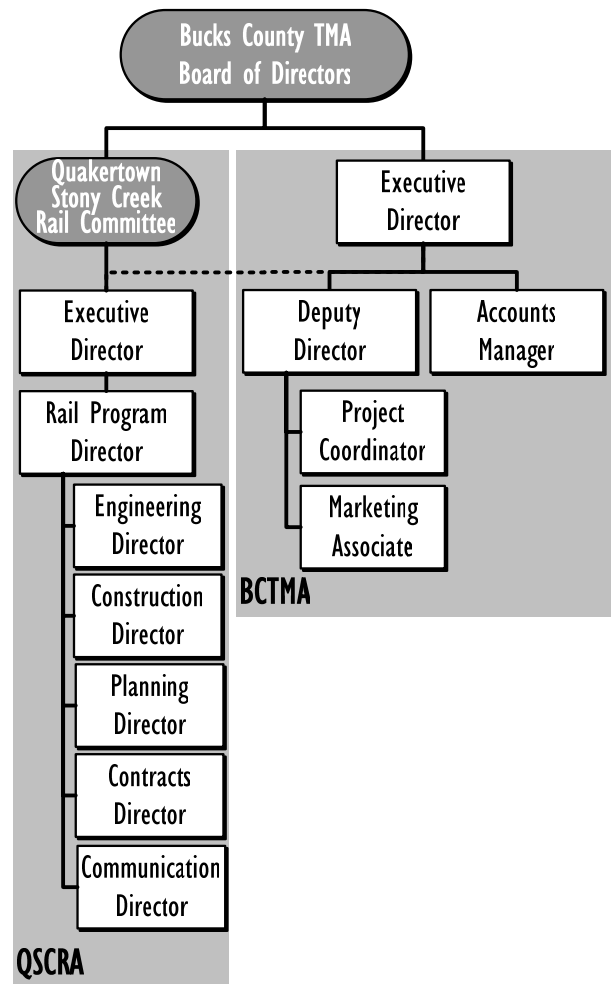
QSCRA staffing requirements would increase during the engineering and construction phases of project development. However, the magnitude and direction of those increases would vary considerably depending on the approaches selected to project engineering and construction (e.g.: design-build vs. design-bid-build).

The following chart illustrates a typical organization structure for the engineering phase of project development under a design-build approach (additional staff positions under the directorial level are not shown). Intensive and diverse staff resources are needed to manage preliminary

and final engineering activities by consultants, assemble design-bid documents, solicit a design-bid contractor, coordinate operations and station area planning with local interests and conduct public outreach efforts (the latter especially if NEPA project assessments are also being conducted during this stage of development).

Again, the appropriate mix of full-time and consultant staff will need to be determined that will best manage costs and support the goals and objectives of the QSCRC Board of Directors.

During this phase, the Executive Director and Rail Program Director positions would likely be needed on a daily basis and may be warranted as full-time, permanent staff (the latter possibly representing a logical advancement



for the Program Coordinator from the planning phase). The subordinate directorial posts all warrant a full-time commitment during the engineering and, to a lesser degree, construction phases of the project, but will not be needed after the start of revenue service. Therefore, these may best be filled by seconded contractual staff supplied under an on-call services agreement with a full-service consulting firm.

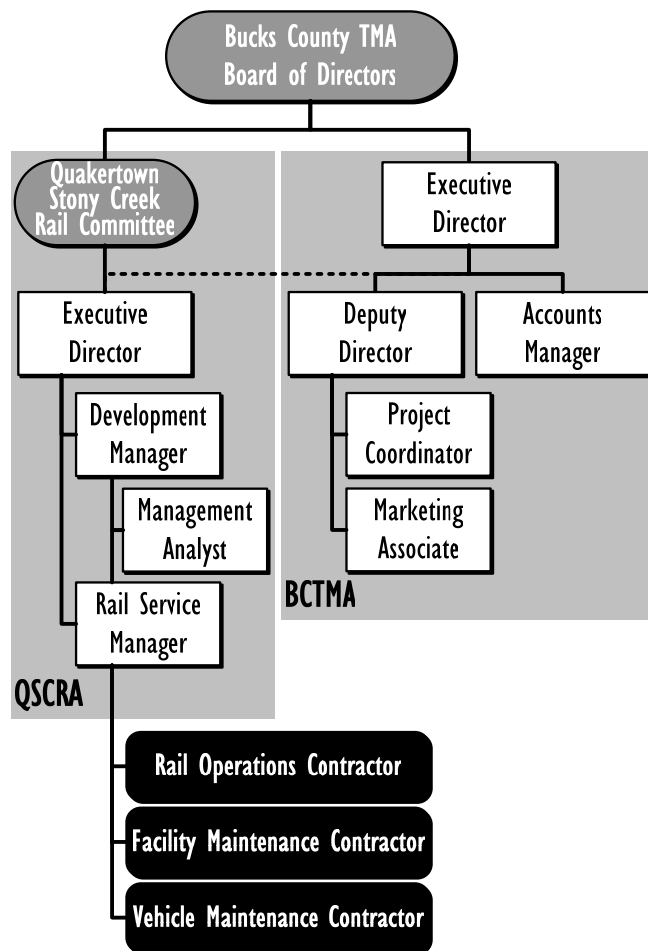
**OPERATING PHASE**

QSCRA staffing requirements would ultimately decrease for the operations phase of project development. The magnitude and disciplinary requirements of the permanent staff would vary considerably depending on the approach selected to service delivery ("turnkey" contracted service, direct operation, or an amalgam such as the PSI "virtual

organization"). Assuming that direct operation is an unreasonable assumption, the following chart illustrates a typical organization structure for rail operations by a small agency under the other two approaches.

Four staff positions are expected to be required at this phase of a project assuming a contracted service option:

- **Executive Director** providing overall management, administration and policy direction of the QSCRA organization in conjunction with the QSCRA Board of Directors (which is also the BCTMA Board's QSCRC).
- **Rail Service Manager** providing day-to-day management of the Phase 1 operations and maintenance through third-party contractors, service planning, and customer service.
- **Development Manager**, providing day-to-day management of the development of subsequent phases of Quakertown-Stony Creek rail restoration efforts.
- **Management Analyst** providing administrative and analytic support to Quakertown-Stony Creek rail operations and restoration efforts under the joint direction of the Rail Service and Development Managers.



The appropriate mix of full-time and consultant staff will need to be determined that will best manage costs and support the goals and objectives of the QSCRC Board of Directors.

The Management Analyst, Rail Service and Development Manager positions should be full-time permanent staff positions. The Executive Director likely would not be needed on a daily basis and may be more cost-effectively supplied through an on-call services agreement with a full service consulting firm.

**START-UP PROCEDURE FOR NONPROFIT**

The laws and regulations that govern the formation of nonprofit are administered by the Pennsylvania

Department of State's Corporation Bureau and the Internal Revenue Service. A start-up action plan is listed below:

- **Identify the purpose of the organization:** Define the organization's propose, goals, and mission statement and make this available to the public and all individuals that could potentially be involved.
- **Identify the structure of the organization:** Determine what type of organization will be established and delegate who or what group of people will be responsible for elements of the organization.
- **Form a Board of Directors:** Delegate a group of individuals that will help guide the organization toward its goals through assistance in development, strategizing, and fund raising.
- **File articles of incorporation with PA Department of State:** Obtain recognition of the organization from the Commonwealth, its intents, and structure so that the organization can function as an incorporated entity under state law.
- **Write by-laws:** Construct a set of regulations that will guide the organization toward accomplishing its goals and fulfill its mission. The presence of an attorney is suggested.
- **Write a code of ethics:** As a potential FTA grantee, this could be important to further certify the organization's financial independence from Bucks County TMA and can address FTA's lobbying restriction.
- **Develop a strategic plan:** Develop a plan of tangible and well defined actions to achieve the organization's purpose, designate staff responsibilities in completing these tasks, and identify and prioritize the actions of the organization.
- **Establish a record-keeping system:** Document and preserve all elements of the organization.
- **Establish an accounting system:** Designate and record all spending and monetary transactions to meet current and potential spending needs.
- **Obtain a Taxpayer ID number from the IRS:** This number will be used to file returns and withhold income tax for the organization.
- **File for tax-exempt status from the IRS:** Apply for exemptions in accordance with federal law.
- **File for PA tax-exempt status from PA Dept. of Revenue:** Apply for exemptions in accordance with state law.
- **Establish personnel policies:** To maintain the integrity and proficiency of the organization, guidelines regarding personnel should be defined and enforced.
- **Register for unemployment compensation with PA Office of Employment Security:** All nonprofit organizations must participate in establishing a source of compensation in case of unemployment.
- **Obtain liability insurance.**

**NEXT STEPS**

This section presents a "first cut" of the next steps necessary within the year for the restoration of Quakertown-Stony Creek rail service in a timely manner. The highest priority should be accorded the first two bullets under Organizational Steps so that proposed goals and objectives for the program and its component phases may be formally deliberated and acted upon by a public body. The first act of said body should be to review and revise this list of next steps.

**ORGANIZATIONAL STEPS**

- Seek approval from BCTMA Board for BCTMA staff to assume the leadership role in the restoration of Quakertown-Stony Creek rail service, in coordination with Bucks and Montgomery Counties, SEPTA and DVRPC.
- Establish the QSCRC as a standing committee of the BCTMA Board with membership comprised of BCTMA board members and ex-officio representation from both County Planning Commissions, FTA Region 3, PennDOT, SEPTA, CSXT, EPRY, municipalities and local shipper associations.
- Charter a new nonprofit corporation associated with but independent of BCTMA, along the lines of those proposed herein for QSCRA.
- Hire a part-time QSCRA Executive Director through an on-call services contract.
- Execute a MOU between BCTMA and QSCRA governing administrative and resource management.
- As project activities increase, hire a full-time rail program manager and project analyst either directly or through an on-call services contract.

**PROJECT DEVELOPMENT STEPS**

- Work with the Counties and DVRPC to add the full extent of the Quakertown-Stony Creek rail

restoration program (Shelly to Center City Philadelphia) to the regional transportation improvement plan (TIP).

- Execute a MOU between QSCRA and the Counties establishing QSCRA as the Counties' agent in exercising their rights and responsibilities as FTA grant recipients with respect to the Quakertown-Stony Creek rail restoration program.
- Apply to FTA for funds to conduct an Alternatives Analysis for the Quakertown-Stony Creek rail restoration program.
- Hire a consultant to produce an Alternatives Analysis and recommendations for a LPA, under the direction of QSCRA.
- Work with the Counties, FTA Region 3, and DVRPC to gain approval of the recommended LPA.
- Apply to FTA for funds to enter the Preliminary Engineering phase of project development.

**COORDINATION STEPS**

- Work with the Counties and SEPTA to coordinate transit service planning in the Quakertown-Stony Creek corridor.
- Work with the Counties and SEPTA to establish long-term strategies for the maintenance and management of the Bethlehem and Stony Creek Lines assets through QSCRA.
- Work with the Counties, SEPTA NS, CSXT and EPRY, in conjunction with local shippers associations, PennDOT and DVRPC, to coordinate short term funding and design strategies to improve track conditions on the Bethlehem and Stony Creek Lines.

