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# Expanding a Fixed Route Bus System with the Lower Anthracite Transit System

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**Expanding a Fixed Route Bus System with the Lower Anthracite Transit System**

Devin Johnson, Ben Shimer, and Kyle Crichton

ENST 411 - Prof. Wooden

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## Introduction

The Lower Anthracite Transit System (LATS) has recognized that there is a growing problem as poverty rates increase and populations gets older. There is a growing demand for transportation, as more people don't have access to cars. In Northumberland County there is an insufficient amount of public transportation. Additionally, towns are far apart, making it difficult for low-income or disabled community members to get outside their own city. Sustainability in transportation has been evidently more desirable by state and federal governments in recent years. National concerns with environmental justice and the environment as a whole have pushed the state Department of Transportation to have a greater focus on sustainability in transportation planning, and more specific considerations. Development of sustainable transportation has an increased emphasis on environmental considerations. While the US is advanced in research regarding sustainable transportation, policy is less strict on enforcing it in comparison to reference countries of Canada and the UK. Sustainability in transportation consists of how it can be envisioned in its implementation. LATS wants to see if they can expand the current Mount Carmel/Shamokin system into Sunbury. One aspect of the transportation system is the economic benefits, as riders don't have to pay for their own car or gas. Also, the transit system will promote economic growth to businesses in Sunbury. Our goal is to help LATS develop a route that serves the people of Sunbury, Mount Carmel, and Shamokin. This route is community-based, designed to meet the needs of as many people as possible. In order to do this, we conducted a survey to analyze demand for this route, and collect data on potential stop locations along the route.

## Background

LATS was established in 1982. The current director is Jack Spade who had taken on the role since 2023. LATS runs through Northumberland County between Shamokin and Mount Carmel. LATS has three permanent fixed-route bus routes and one seasonal route (*McMullen, 2023*). The system takes thousands of passengers annually through Mount Carmel and Shamokin (*McMullen, 2023*). Since Fall of 2023, the system has added two new buses and is adopting a new Avail system for bus tracking in Summer 2024 (*McMullen, 2023*).

Northumberland County, PA, has a total population of just about 90,000. The average commute in Northumberland is 24.8 minutes and the median age is 44.4 years old. The average

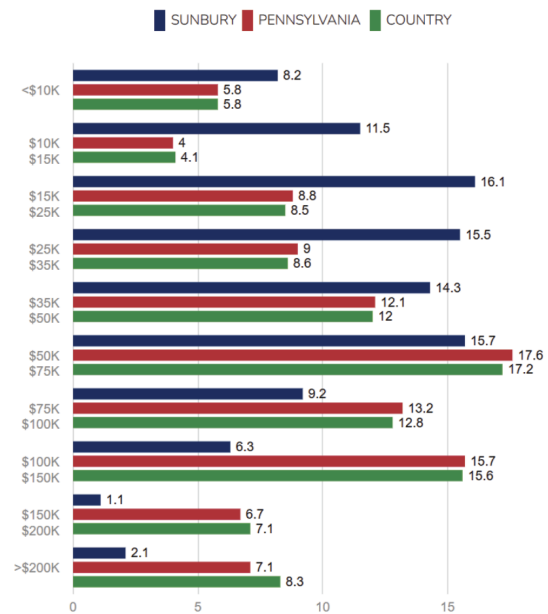


Figure 1: Household Income Rates in Sunbury compared to Pennsylvania and National rates



household in Northumberland has two cars. The average car ownership in Sunbury, PA was one car per household (*Data USA, 2021*). This is one reason why LATS hopes to expand into Sunbury. Another reason is it hopes to connect the eastern and western sides of Northumberland County. Sunbury has a population of 9,661 and an 8.7% decrease in population from 2000-2021 (*Biggest US Cities, 2024*). In Sunbury, 18.9% of residents have an income below the poverty line, and the child poverty rate is 25.5% (*Biggest US Cities, 2024*). Financial hardship is relatively common in the city as one in every five residents live below the poverty line (*Local Observer, 2022*). More than one in every twelve area households live on an income of less than \$10,000 a year (*Local Observer, 2022*). They hope to reach Weis Markets, Knoebels Amusement Resort, and the state government which are some of the top employers in Northumberland County (*Biggest US Cities, 2024*). The estimated per capita income is \$22,390 within Sunbury (*Biggest US Cities, 2024*).

### **Partner Goals**

After discussions with LATS director Jack Spade and advisor Shaunna Barnhart, the main goals for LATS through this project are:

- 1) Gauge interest into the new bus route into Sunbury
- 2) Finalize the stops and schedule for the new route
- 3) Increase online awareness of LATS through development of a webpage
- 4) Make case for funding for further improvements to LATS

To better understand how we can help LATS in achieving these goals, we conducted preliminary research to guide our plans for the semester. This targeted information on community-based surveys, rural and public transportation considerations, background information on the area, and more.

### **Literature Review**

#### **Rural Transportation**

Rural transportation is a key issue for our study, as current LATS routes operate in the Mount Carmel and Shamokin areas, both traditionally classified as rural communities. With the new route into Sunbury, a larger city than Shamokin, we must think about connecting both rural and urban transportation systems - thinking about various methodologies to accomplish this. The Center for Rural Pennsylvania defines rural counties as counties where the number of persons per square mile within the county or school district is less than 284, where urban counties have more than 284 persons per square mile (*The Center for Rural Pennsylvania, 2019; Dai et al., 2020*). Northumberland County, with 204 persons per square mile as the population density, is thus classified as rural - where we choose not to stretch this definition to the higher density cities

of Sunbury and Shamokin. Shoup and Homa explain this idea in their whitepaper on improving transportation options in rural communities, saying, “most counties, whether metropolitan or nonmetropolitan, contain a combination of urban and rural areas. Small towns and cities are urban clusters of at least 2,500 but less than 50,000 persons” (*Shoup and Homa 2010, 4*). Thus, this literature review will focus primarily on rural transportation systems and the challenges facing them, but take into account urban transit through the lens of a small city (smaller-scale). According to Schauer in his article on meeting the transportation needs of rural communities, we cannot think of rural transit simply as miniature urban transit. He explains that this practice “unfairly characterizes the differences between rural and urban communities and their transportation needs” (*Schauer 2020, 11*). This is tied to early rural transit advances, where advocates argued that rural transit funding was not equitable compared to urban transit, especially in regards to federal support (*Ibid.*). Funding differences continue to this day, and is a key challenge for rural transportation systems.

### *Demographics of Rural Communities*

Rural communities are characterized by rapidly changing demographics. Two key demographics of rural communities are age and disabilities, where traditionally, increased age and disability is reflected in an increased reliance on public transportation. In a paper on rural transportation equity in Pennsylvania, the authors explain, “Public transit is a critical need for rural residents unable to use personal automobiles, contributing to significant accessibility gaps for these residents” (*Dai et al. 2020, 18*). This comprises older residents, especially those over 75 years of age. As rural communities increasingly contain older and aging populations, there is clear transportation issues for these rural communities. In general, rural communities with older populations are less racially diverse, where rural U.S. counties are predominantly white, at 83 percent (*Twaddell and Emerine 2007, 7*). Counties with large elderly populations have a higher median household income than the average rural county, but experience below average rates of poverty, inadequate/unaffordable housing, low education, and low employment (*Ibid.*). Additionally, rural communities with elderly populations have increasingly elderly residents over time - where from 2006-2020, the percentage of rural residents who are 65 years or older increased from 13 to nearly 18% in Pennsylvania counties (*Dai et al. 2020, 18*). As elderly residents tend to create additional demand for public transit services, understanding this demographic is critical in thinking about future routes for public transportation such as LATS. On the other side of the spectrum, rural youth/young adults can also be thought of as a population in need of public transportation. The paper by Dai et al. explains, “In the U.S., young adults have increasingly lower rates of car ownership and driver’s licenses in the past three decades, resulting in challenges to access education, employment, and social opportunities” (*Ibid., 19*). This increases their need for public transportation as well. Overall, changing demographics in rural and small communities require an in-depth understanding of community systems. Higher proportions of older citizens, lower-income citizens, or citizens with disabilities,

can directly benefit from increased transportation options creating greater opportunities and mobility.

### *Challenges to Rural Communities*

Rural communities face many challenges due to their non-urban distinction. Shoup and Homa explain some of these challenges in their whitepaper, specifically referencing declining economic activity. They explain, “more remote communities face the challenges of declining economic activity and retaining residents who are seeking career opportunities or a post-secondary education in urban areas” (*Shoup and Homa 2010, 9*). This decline in economic activity is typical of rural communities, and often are followed by declines in populations. They explain, “many rural areas have experienced declines in population as particularly younger residents have migrated to urban centers to seek employment” (*Ibid., 8*). This lag behind urban centers is typical of rural communities, especially those in Pennsylvania. Additionally, rural communities often depend on economic drivers to support the overall community. This places a reliance on accessibility to these connections, an issue exacerbated by a lack of public transit options. This can be helped by small-scale, local transportation such as fixed-route bus services.

Another challenge rural communities can face is through transportation inequalities. With declining rural populations such as those in Shamokin and Mount Carmel, rural areas can be affected by adverse road conditions. Shoup and Homa detail this, where they explain a rural area can be “left with a mature road system that is a legacy from a time when there was a larger population” (*Ibid.*). They also say that approximately 40 percent of American county roads are not properly maintained (*Ibid.*). Finally, safety improvements on rural non-Interstate routes have lagged behind other routes. Shoup and Homa explain this, saying, “from 1990 to 2003, the fatality rate on all roads, excluding non-Interstate rural roads, decreased by 32 percent, while those on routes declined by only 21 percent” (*Ibid.*). This inequality shows declining road conditions with a reduced interest in fixing them, posing potential issues for the creation of a fixed-route bus system in Sunbury. Transportation inequalities can also appear through access to health care facilities. As rural public transportation systems are subject to volatile funding sources, limited service schedules, lower ridership densities, and longer travel times, there is a reduction in the accessibility of health care institutions to rural communities. This poses an issue for rural transportation systems - where care must be taken to integrate with health care facilities.

In general, there is a high level of difficulty in establishing transit service within and between rural communities. Planning for these kinds of services is difficult, primarily affected by the level of resources available for addressing problems which affect these rural communities. The Transportation Planning Handbook details several challenges with transportation planning; citing insufficient staffing levels, inadequate funding, and technical tools specific for rural communities (*Transportation Planning Handbook 2016, Chp. 20.4.2*). Assessment objectives are clearly

different for these kinds of communities, exacerbated by issues where the environment may not be as welcoming towards planning (*Ibid.*). Additionally, issues with funding are particularly tumultuous - often perceived as a high cost for a service reaching only a small population. Thus, transit services can be difficult to establish in rural areas due to these perceived high costs. Currently, nearly 40 percent of American rural residents live in communities with no local transit service (*Twaddell and Emerine 2007, 12*).

## **Public Engagement**

Additionally, our literature review would be remiss without a section on public engagement - where interactions with ideas from the public will shape our own research (community-based). The Transportation Planning Handbook explains the merits of focusing on public participation with regards to transportation planning, saying, “public participation is based on the belief that people whose lives are affected by transportation planning and investment decisions have a right to be involved in the decision-making process and influence choices that are made. Directly engaging citizens in this process promotes successful problem solving, yields diverse voices and new ideas, and gives the public a sense of ownership of the developed solutions” (*Transportation Planning Handbook 2016, Chp. 24.1*). By involving the community in bettering their community, there is a back and forth between researcher and community not seen in other research methods - arguably being more impactful. Shoup and Homa echo this idea of the merits of public engagement, saying, “with help from planners and designers, smaller communities can adopt policies and practices to integrate their land use and transportation goals while preserving the rural character and landscape of the region” (*Shoup and Homa 2010, 12*). Finally, Twaddell and Emerine also echo this sentiment, defining context-sensitive solutions to be the best practices to solving transportation problems. They explain, “context-sensitive solutions (CSS) is defined as “a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic, and environmental resources, while maintaining safety and mobility” (*Twaddell and Emerine 2007, 16*). This is an approach which meets the same goals as Shoup and Homa’s ideas, clearly expressing the benefits of involving a diverse range of stakeholders in creating transportation systems. Thus, it is clear that our methods must involve public participation from the town of Sunbury, to ensure needs are met.

## **Surveying and Community Mapping**

Surveys are an important tool for encouraging this high level of public participation, where community members have an opportunity to share their opinions through answers to questions. A study of rural transportation survey methodologies by Talpur et al. explains, “surveys are precise solutions to many problems, which can assist in collecting and gathering socio-economic data for the well-being of aloof rural regions” (*Talpur et al., 2012, 1*). Incredibly important in this process

is critical thinking about question development - asking concise, informative questions with insightful answers for the problem we are looking to address. Our problem is seeking input on opportunities for transportation development (demand survey), one of the broad categories for the purposes of rural transportation surveys explained by Fouracre in his work on rural transport survey techniques (*Fouracre, 2001, 2*). Demand-side survey types combine participatory methods with more traditional qualitative methods. Two options which could be particularly useful for our work are origin-destination surveys and stated preference surveys (*Ibid, 8*). Origin-destination surveys are surveys that seek to establish the nature of travel patterns in and around the area of enquiry, where qualitative and quantitative observations are used to identify popular destinations in a community (*Ibid, 8*). Stated preference surveys are structured in a way such that respondents are given the opportunity to make choices between proposed transport options. Incredibly important in these surveys is the selection of good questions. As best survey method selection varies with a wide range of factors (data requirement, population characteristics, suitability and location of study area, etc.), we must note the essentiality of preliminary planning and piloting - to ensure success of the survey (*Talpur et al., 2012, 8*).

Additionally, we can discuss methodology for collecting samples. In our case, where we are targeting certain demographics, we must choose a sampling technique which targets these demographics and maximizes response rate. Richardson's book, *Survey Methods for Transport Planning*, discusses a sampling type known as cluster sampling, detailing, "In this method, the total population is first divided into clusters of sampling units, usually on a geographic basis. These clusters are then sampled randomly and the units within the cluster are either selected in total or else sampled at a very high rate" (*Richardson, Ampt, and Meyburg, 1995, 92*). This sampling method increases sampling error through the high rate of sampling in clusters (such as high rises or elderly homes), but specifically targets demographics most in need of rural bus transportation. This could be a good method for increasing survey responses, as data from online surveys can be highly variable especially with higher proportions of elderly populations.

Finally, choice in questions and their associated answers must be considered. Richardson explains that the final selection of items in a questionnaire/survey will be the result of a trade-off between the expressed needs (i.e. the wish-list of questions to be covered), the survey resources (in terms of money, personnel and so on), and the effect of survey length on response rates and validity of responses (where increased survey length tends to decrease response rates) (*Ibid., 152*). These aspects must be considered in our survey design. Richardson also details information about aspects of good surveys, citing relevant and reasonable question design, clear and concise layouts, minimal writing in answers, and a short non-technical summary of survey aims (*Ibid., 161-162*). This is all information that we will include in our survey design, and care will be taken to address all of these aspects to improve the survey completion experience.

## **Project Goals**

Our project goals are as follows:

- 1) Identify community transportation needs in Shamokin, Sunbury, and Mount Carmel
- 2) Engage community members in planning Sunbury bus route and general LATS recommendations
- 3) Increase awareness of LATS and improve access to information on the bus service through a LATS dedicated website

The two larger projects to accomplish these goals include a community survey and the development of a LATS website. Community-based research into individuals' experiences with and suggestions for regional public transportation systems such as LATS will help guide our recommendations for the organization, and a website built in discussion with LATS director Jack Spade will provide the organization with an organized base of information for potential riders. Jack Spade also provided us with a map of the bus route and a schedule he proposed to the state in order to receive funding (Appendix A, Appendix B). He emphasized however that these were not the final versions and merely drafts he quickly put together.

Our group work has been predicated on communication within our group and community partners. As just our student group, we meet at least twice a week to coordinate our responsibilities, work together, and bounce ideas off of each other. Beyond that though, our meetings with Jack Spade and Shaunna Barnhart have varied between in person and digital communication such as zoom calls or phone calls depending on our group's agenda. For website design related meetings, we found it most beneficial to zoom as we discussed formatting, content, and digital images.

## **Transportation Survey**

### **IRB Proposal**

The first step in completing our survey was preparing an Institutional Review Board (IRB) proposal, which had to be approved by Bucknell University before we could conduct research with human participants. This included a general description of what our research entails including our methods and consent form (Appendix C). It also included the survey questions that we wished to pose to the Sunbury residents (Appendix D). We worked through many drafts with Professor Amanda Wooden in order to perfect our application. We finished this aspect and submitted it for review on March 1, 2024. It was approved by the university on our first application on March 21, 2024.

## **Survey Questions**

Our survey questions are designed to collect information on general transportation needs, specific interests in Sunbury, feedback/recommendations for LATS, and demographic information. Questions related to transportation needs gauge current transportation methods and frequency, difficulties they may have, and desires in public transportation systems. Additional transportation questions are designed to assess interest in the Sunbury route, as well as facilitate input for particular locations respondents would like to see on the route. LATS specific questions ask respondents what experiences they've had with LATS if any, and what reasons they have liked, disliked, or not used the bus system. Demographic information including income, age, disability, neighborhood, household composition, and gender is collected to help sort between different groups' desires in data analysis. These questions are all carefully phrased to be considerate of sensitive subjects, and responses are optional for those who prefer not to answer (Appendix D).

## **Research Ethics**

With our community-based project and the human involvement in the research, ethics are at the forefront of our considerations in our work. To be inclusive and accommodating to all survey participants, we created different survey formats to increase accessibility. We placed these in various locations so that more people might be able to include their voice and help shape the project implementation. We prepared statements to clearly inform respondents of all possible uses of their data, ensure anonymity in the data dissemination, and make some of the more sensitive demographic questions optional. Each question is phrased with the consideration of our prospective respondents in mind, as has the length of the survey itself. It is important for us that transportation decisions are made based on the wants and needs of the community, and our project ensures that their involvement is consensual, ethical, and influential in each step of the process.

## **Survey Goals/Information**

Our group's plan for data collection was predicated on distributing our surveys in physical and digital formats. With regard to our paper copies, we identified locations to reach out to, targeting demographics that already use or could see a more significant benefit from using LATS. These included elderly homes and highrises in Sunbury, Mount Carmel, and Shamokin and frequently visited public locations in the region such as libraries, community centers, and places of worship. In these locations we intended to leave paper copies of the survey, as well as QR codes and urls that link to our digital version. Our group set an ideal number of 100 responses collected through digital and paper surveys combined.

The survey begins with a brief description of LATS, the purpose and use of the collected data, and a confirmation of their consent to being engaged in this project before proceeding on with our questions. Respondents must also be over 18, and we made it clear that the survey may only be filled out one time for each participant, or else their data will no longer be considered.

## **Survey Fieldwork**

### *Preparing for Distribution*

Our team worked diligently to finalize our survey both online through Qualtrics and with a paper version. We tweaked it in order to make it more concise and inclusive to the community that we are targeting, with decisions guided by the pilot version of our online survey. This was distributed by sharing the link to friends, family, and classmates. We received nine responses and we took those responses into consideration as we finished our survey, adding more potential stop locations and more specific areas within Sunbury regarding where people lived. We also tweaked some of the wording on some of the questions in order to be more inclusive to our audience.

Thanks to a reference from our community partner Jack Spade, we were able to call and set up an in-person meeting with Sunbury government official Jeff Wojciechowski who expressed his enthusiasm with the route and provided great information about target populations for the survey, more city specific demographics, and potential bus stops of interest including National Beef and Orchard Hills Shopping Center. This conversation brought to light considerations that we couldn't find through our research, with the perspective of a Sunbury resident being extremely valuable. It guided our next steps, as we considered new locations for route stops, survey dissemination, and incorporated Jeff's assistance in promoting the survey and bus service itself.

For large residential buildings such as the highrises, we reached out to ask to schedule a presentation to bring interested individuals together to learn more about the bus system while promoting the survey. This presentation includes an overview of LATS, a description of the bus service, the routes they have in place, and an introduction to the route being considered for Sunbury. The goal of this is to spread awareness about the bus system and answer any questions community members might have before they might take our survey. We reached out to three highrises in Sunbury, Scott Tower, Chestnut Towers, and River Front Apartments. We received a response from the Scott Tower high rise, where they let us present information about the new proposed route and collect survey responses.

To prepare for interested parties to take our survey, we created a flier that we distributed to various public locations. Jeff Wojciechowski helped fund our group application for Peddling and Soliciting Permits. It didn't take long in order for these permits to be approved and we had a go ahead from the city to walk around and post fliers. Jeff wanted to help us anyway



he could as he was very excited about the project being introduced to Sunbury. He thought it was going to help a major problem in the residents of Sunbury's day-to-day life.

Our first flier contained a brief description of the LATS service, its affordability, contact information, and a QR code linking to the survey, while also sporting the colors and logo of the Lower Anthracite Transit System (Appendix E). Our flier distribution process initially began with door to door work with public spaces, and we were able to pin up fliers at a variety of local businesses and public spaces including the Squeeze-In, Original Italian Pizza, the Weis on Market St., the 7-Eleven on N 4th St., and more. This helped us get to know the city of Sunbury better as none of our group members were familiar with the area. By introducing ourselves to different businesses in the area we got to meet the people of Sunbury and explain our project to them. This was an important strategy to us as we felt distributing the survey strictly online wasn't going to give us the best feedback. Paper surveys were included along with our informative flier at the Sunbury city office as well as the Degenstein Library. Paper surveys were also distributed on LATS bus routes (Shamokin and Mount Carmel/Ashland routes), assessing interest in route expansion beyond the community of Sunbury. Our first flier was also posted to the Facebook accounts for Sunbury and the Lower Anthracite Transit System.

### *Initial Survey Responses*

After reviewing the responses from our first effort at survey distribution, we were underwhelmed initially with the digital responses that were prompted by the Facebook posts and flier QR codes, with just 27 responses by our April 2nd meeting with our community partners. This caused us to reanalyze our methods of distribution in our meeting, guiding shifts in our project that really enhanced survey responses. The first thing we noticed was that the Sunbury Facebook post, while advertising our survey through our flier and getting a lot of engagement in the comments, didn't actually lead to many responses from Sunbury residents, while the LATS post with less engagement generated a greater number of responses. As a group, we identified that in contrast to the LATS post, the Sunbury post didn't have a corresponding link to be clicked, and with many people perhaps using Facebook on their phone, the QR code attached to the flier pdf could have been a difficult way to access the survey.

Another potential issue we noticed was the large quantity of text on our flier, which in its initial purpose was to provide information about LATS to increase awareness of the service while guiding people to the survey. Our group agreed that revising the flier to be more oriented around the survey with far fewer words with more color in hope of attracting more respondents, especially considering the redundancy that exists as our digital survey has its own introduction to LATS included. We also included a user friendly link on the flier if any of the respondents were viewing the flier digitally. Our flier was placed in a few high traffic areas, we began to question how effective those would be in generating responses. However, we sent the revised survey to

our community partner Jack Spade and he posted the flier in local Mount Carmel Facebook groups. We also sent it to the Sunbury city clerk Jeff Wojciechowski, and he shared the fliers on the city website and Facebook page. On the pages we were able to gauge some response in the comment and many of them seemed excited and there was lots of interest.

It was also brought to our attention that many people living in Sunbury don't speak English with Spanish being their primary language. This was an issue we tried to address. Qualtrics offers translation services for research teams. We reached out via email in hopes of getting our survey translated but unfortunately after a bit of back and forth, the cost of the service was beyond our funding for the project. Ultimately we didn't get the survey translated which is important to note as there is a major demographic that we were unable to hit with the survey we had distributed.

### *Revised Survey Work*

After reviewing these potential issues with our distribution, we quickly worked to revise our distribution process from that point forward. The original flier was quickly reposted to the Sunbury Facebook with the original link, and Jack Spade recreated his original LATS post to different platforms in Mount Carmel and Shamokin. These included a local baseball Facebook account, the Mount Carmel Community Pool account, and other Facebook groups, with the intention of attracting the opinion of those who may not know of the service already present in their region. On the student end, we made sure to revise our flier to orient more around completing the survey, while creating a more user-friendly tiny url to accompany it. Our newly developed flier sported the colors of Sunbury, removed a majority of the text, and featured larger QR code accompanied with text encouraging survey participation (Appendix F). We were also able to collect responses from paper surveys distributed to LATS bus-riders, which were inputted manually by Jack Spade into Qualtrics.

We saw a huge increase in responses from this point forward, with 207 total responses in four weeks of survey analysis. Our work has effectively targeted a wide range of ages and locations. This provides a really strong number of responses to analyze interest in LATS expanding into Sunbury, what destinations within Sunbury would be most desired, general recommendations and interests relating to public transportation, and demographic information.

### *Data Management*

Our survey data was collected from the in person locations routinely, with the final paper collection date being April 23rd. Online data was collected through Qualtrics until April 24th. Digital results were initially analyzed through Qualtrics and then exported into an Excel sheet for further analysis. The purpose of the data is to inform decisions regarding the Lower Anthracite Transit System and its route in Sunbury. Perpetual access of the data has been given to Dr.

Shaunna Barnhart, Jack Spade, Prof. Amanda Wooden, and our student group. This is in case future studies are done and references to the survey data would be desirable for either Bucknell University or LATS.

### **Survey Results and Analysis**

After collecting data, our group sorted and analyzed the data to understand general response themes and better inform our recommendations to LATS. This includes organizing data by location, household composition, age, disability, and income to understand how different groups may have various transportation wants or needs with regard to the route into Sunbury and/or the bus service in general.

#### *Proposed Route*

To inform our proposed route, we analyzed the responses on particular Qualtrics questions based on bus usage and route suggestions, and looked at trends that we thought had some significance in the decision process of where to put the stops for the route. We found that the top five most requested stops were the Walmart in Selinsgrove, Susquehanna Valley Mall, Northumberland County Court House, Weis Market on Market St, and Aldi in that order. Furthermore, in our informal conversations with Jack Spade and Jeff Wojciechowski, we learned that National Beef was a popular employer for low-income residents in Sunbury that struggle to travel all the way across the bridge. The information gathered from our survey and involvement in community discussions were very important in our decision making process.

With that data we created a proposed Sunbury bus route and presented it to the LATS team and the city of Sunbury (Appendix M). After submitting this, our student group met up with Jack Spade and Bill Milbrand, and took the opportunity to actually test our proposed route using one of the LATS buses. This informed us of certain aspects of planning a route that can't be done with just maps and survey data, as one way streets, tight turns, and parking considerations add to our route considerations. Some small adjustments were made to the route itself, in order to ensure that at high rises the bus would be in convenient locations for pick-up as well as to prevent constant looping. Our final recommendation for the Sunbury bus route has been finished, and barring any issues in its implementation, it should go into effect in August 2024 (Appendix N). This route begins in Mount Carmel, meets up with the Shamokin bus, and enters into the Sunbury community. We made it a priority to make a residential loop as to be sure that this doesn't just serve Mount Carmel and Shamokin area residents who need to get to Sunbury, but also addresses the identified issues of transportation insecurity within Sunbury itself. It proceeds to stop at a variety of government, employment, and shopping services, and continues on this loop around three times before making the long journey back to the central hub for the LATS buses.

### Survey Data Analysis

After closing our survey on April 24th, we began to analyze our data through Qualtrics results and analysis methods. At this point, we collected 207 total responses which far surpassed our initial goal of 100 responses. We were able to reach a wide range of individuals in terms of location, age range, and income. To gather financial information while respecting sensitivity about conversations of income, our data was collected on how financially secure people felt they were with respect to a comfortable standard of living. The majority of respondents felt as though they were at least slightly below a comfortable standard of living, with 52% answering either “slightly below”, “moderately below”, or “significantly below.” While senior citizens were our most popular age range, there were also significant populations in the other age brackets, steadily decreasing the younger the bracket. Our five most significant locations that respondents resided in were Sunbury at 85 responses,



Figure 2: Distribution of financial security in relation to a comfortable standard of living

Shamokin at 30 responses, Mount Carmel Borough at 25 responses, Coal Township at 15 responses, and Mount Carmel Township at 12 responses. With respect to travel methods, under half of respondents considered driving a car their primary method of transportation at 46.67% of respondents. The next most common methods were riding a bus and walking.

Another success of ours was to target both current riders while also reaching out to those who may not have been familiar with LATS before or for a variety of reasons have not ridden the LATS bus before. Of our respondents, 59.13% said they hadn’t used LATS before, with many saying that reason was due to it not having service in their area, which was expected for many Sunbury residents. Other main reasons were a lack of awareness of the service in the first place, or a general lack of individual need. Many of the latter group were still supportive of the route for family or community members they knew would benefit from it. Furthermore, 31.28% of respondents identified as having disability or limited mobility.

Rank	Location	Percentage	Count
1	Mount Carmel Borough	12.56%	25
2	Mount Carmel Township	6.03%	12
3	Shamokin	15.08%	30
4	Elysburg	0.50%	1
5	Paxinos	1.51%	3
6	Sunbury	42.71%	85
7	Coal Township	7.54%	15
8	Northumberland	5.03%	10
9	Snydertown	0.50%	1
10	Kulpmont	2.51%	5
11	Other:	4.52%	9
12	Memorial Acres	1.01%	2

Figure 3: Distribution of residential Locations for respondents

Discussing general takeaways beyond our population demographics, we were able to gather that there was overwhelmingly positive support for expanding into Sunbury across all regions, with 94.2% of all respondents saying they would be in favor of LATS

dedicating a route into and around Sunbury. The percentages across demographics closely resemble this figure as well. There were also a number of comments making passionate claims for this service to extend to Sunbury, with one respondent saying “fight hard and bring the community a service that many pray for.” We also collected a lot of data unrelated to the potential Sunbury expansion that we thought could be useful to inform Jack Spade on existing rider feedback and potential new ridership’s desires. Furthermore, we collected information on financial and transportation insecurities faced in the region to further emphasize the importance of this service in presentations to the state of Pennsylvania and other potential funding opportunities.

### **LATS Website**

To increase access to information on LATS and improve its digital presence, we created a website for the Lower Anthracite Transit System. There is a clear need for a greater LATS internet presence beyond their Facebook page in order to increase awareness and accessibility of information about the transit system. We built a website on the platform Wix which allows for multiple collaborators and has a very user friendly interface. Funding for a subscription giving us our desired domain and maintenance for the first two years will be provided by Bucknell University’s Environmental Studies and Sciences department, and beyond that LATS has the funding to carry that payment for the coming years. Ownership of the website will be transferred to Jack Spade upon publication of the website.

Our priorities in this website included making it user friendly, providing detailed description about routes and stops, relevant contact information, a link to our survey, and a consistent place for feedback about the system. Specific design considerations that underscored our work on the website include a mobile-friendly interface, as it is likely that users will be away from a desktop or laptop. The website is also designed around the white and red colorway that is featured on the buses and in their logo.

We were able to complete a lot of work on the LATS website throughout the semester. Our initial draft prioritized laying out the home page, drafting out how different sections of the website would look, and what information they would contain. Addressing our focus of accessible information about LATS as an organization, we added a specific subsection to the website called “About Us”, where we detail information about LATS that we have gathered through many conversations with Jack Spade. This includes contact information, a bit about the history of LATS, future plans/ongoing projects, and the organization mission and objectives. This has been developed in collaboration with Jack Spade, and focuses on providing detailed and accessible information for all users or potential users of the system.

Other sections will be focused on bus features, pricing, and ADA accessibility. These sections have again been developed through collaborations with Jack Spade. The main focus of the

website, on the home page, will be the integration of the AVAIL bus tracking system, allowing users to know exactly where the bus is along the route. This can be cross-referenced with bus timetables. A key consideration is making this mobile-friendly, again to improve accessibility for users away from a laptop. Another important feature for us will be the link to the survey and a location for consistent feedback about LATS. This helps support our goals of encouraging and making accessible more community input to allow for continuous improvement of the system.

A goal for this project was to develop updated and standalone maps and timetables, which have been completed using ArcGIS Online and will be compatible with the AVAIL system. This process began by evaluating route maps sent over by Jack Spade that were submitted for the implementation of the AVAIL system, and while detailed in the specifications of the route, some clutter and a lack of a key of the stops led us to redesign them through ArcGIS Online (Appendix G, Appendix H). We initially used a tool that created routes through the software after inputting the addresses of each stop (Appendix I, Appendix J). We provided a corresponding key, using letters in alphabetical order to signal the order of each stop, and an area of text at the bottom of each map identifying what each stop corresponded to (Appendix K, Appendix L).

After reviewing the first draft using these methods, we identified some issues with our produced maps. First, the symbology using the route tool was difficult to adjust, with the route lines being quite thick and not easily definable when overlap occurred. Our second issue upon comparing our map with the original one created by Jack Spade was that while we had the correct stops, the route itself did not follow the same streets as the LATS buses do. This led us to revise these maps in a more tedious manner, but one that was worth the extra time and effort in the long run to create a clean and legible map, increasing accessibility and accommodating those who may not prefer the AVAIL system. Our second and final draft of maps continued to use ArcGIS Online but instead used a manual drawing tool to trace the route provided by Jack Spade's initial maps (Appendix K, Appendix L). The initial work with the directional tool was still a good reference for stops, which were replaced with circles personally designed on the map. An added text layer over top of these circles marked the stop with its corresponding description in the key. The final layer was a line feature following the route submitted to AVAIL, connecting each stop this time with an accurate representation of the exact route the bus follows. These maps were crafted for the existing routes in Shamokin and Mount Carmel, with no map yet created for Sunbury due to the uncertainty of the route design and pending state approval. The map layers have been made publicly available on ArcGIS Online for editing/viewing purposes.

After locating all of the content available and relevant to our website and initially formatting it, we worked to reorganize the website into multiple pages accessible through tabs. While the first draft did clearly separate the various sections through headers and section formatting, our revised approach provides easier navigation between topics of interest, and a more organized feel than one long page of information. The encompassing pages accessible through the main tabs are the

home page, about us, services and schedules, and announcements. Each tab/page has the following subtabs/sections:

Home – N/A

About Us – Contact Us, Passenger Policy, History of LATS, Mission Statement

Announcements – LATS Projects, Sunbury Route Survey

Services and Schedules – Mount Carmel, Shamokin, Service Calendar, Fares

Finally, we have decided on the domain name of [loweranthracitetransit.com](http://loweranthracitetransit.com), opting for a shorter version of LATS without compromising information contained in the name. We published the website on April 26 upon approval of funding for our Wix subscription. The site can be visited at [loweranthracitetransit.com](http://loweranthracitetransit.com). By designing a functional, mobile-friendly, and eye-catching website, we have achieved our goal to increase the online presence of LATS.

### **Media Coverage**

Throughout this project, this project was featured in three different news articles. This contributed to our goal of increasing awareness for LATS and increasing awareness for the implementation of the Sunbury route. The first two articles were in the Daily Item (local Sunbury newspaper), where the articles focused on getting more survey responses for us and LATS (Scarcella 2024; The Daily Item 2024). The third article was in the News Item (local Shamokin newspaper), where this article gave more information about our work and updated Shamokin residents on progress on the Sunbury bus route (Deklinski 2024). It also provided information about the on-going expansion of the LATS fleet.

### **Future Recommendations**

Our work with LATS throughout this semester has afforded us the unique opportunity to offer recommendations to the LATS organization and/or future ENST 411 students working with LATS. Of course, our main goals of this project were addressed through the creation of a community-based survey, informing the creation of a proposed bus route through Sunbury, and through the creation of a website to increase the online presence of LATS. Overall, our survey responses indicate that current public transportation systems are insufficient for the needs of the local residents throughout Northumberland County. Future work can expand on our work through expansion of LATS fixed-routes into nearby and surrounding townships, continuing to expand the fleet and their service into all of Northumberland County. This would greatly expand public transportation options in Central Pennsylvania. Especially when thinking about our future and changing climates, sustainable, public transportation can be important in reducing the area's carbon footprint along with providing life-enhancing transportation services. Finally, future work by Bucknell students could monitor the implementation of the new Sunbury route, to correct issues that we were not aware of in the planning process. This could involve a follow-up survey to riders of the route, and use similar questions for comparison.

## **Conclusions**

Through conversations with Jack Spade, Jeff Wojciechowski, and further feedback from community members and mentors, we are very pleased with what we were able to accomplish this semester, and feel as though our project will make a meaningful difference in providing cheap and sustainable transportation for communities in need. In just one semester, we successfully prepared and conducted a survey gauging interest in the Sunbury bus route while learning more about general transportation desires through the collection of 207 responses. One of the main takeaways from this work was the 94% approval rate for the expansion of LATS into Sunbury. Using information from this survey and the overwhelming positive feedback, we created a proposed route for this expansion, and ensured that the route was driveable by bus in partnership with LATS.

In our efforts to increase accessibility and awareness of LATS services, our group created a webpage for the organization, increasing online presence in conjunction with LATS's establishment of the AVAIL bus tracking system to improve passenger experience. This included maps that we were able to develop of the existing routes that are now available through the website to view, download, and print. Finally, our survey responses, in addition to guiding our work for the semester, are hugely beneficial for LATS, allowing them to understand what aspects of their transportation services work well and what can be improved on. This can help with future cases for funding, and state approvals. Altogether, our work presents a practical and efficient solution to address transportation needs within the town of Sunbury. Continued collaboration between LATS and community members, even after our work on this project is complete, is critical in finalizing a fixed-route bus service that meets the diverse needs of the populations of Mount Carmel, Shamokin, and Sunbury. By carefully considering factors such as passenger demand and route feasibility, LATS can create a system that enhances accessibility, reduces traffic congestion, and promotes sustainability.

## **Acknowledgements**

We would like to thank our community partners Jack Spade and Shaunna Barnhart. They helped tremendously in guiding us through the steps of this project, but also giving us the freedom to tackle this project the way we wanted to. We would also like to thank Jeff Wojciechowski who helped distribute our survey within Sunbury, where we wouldn't have been able to get nearly as many survey responses without him. We'd also like to thank the Environmental Studies and Sciences department of Bucknell for the funding they were able to provide for our project. Lastly, we would like to thank Professor Amanda Wooden for fantastic mentorship throughout our project.

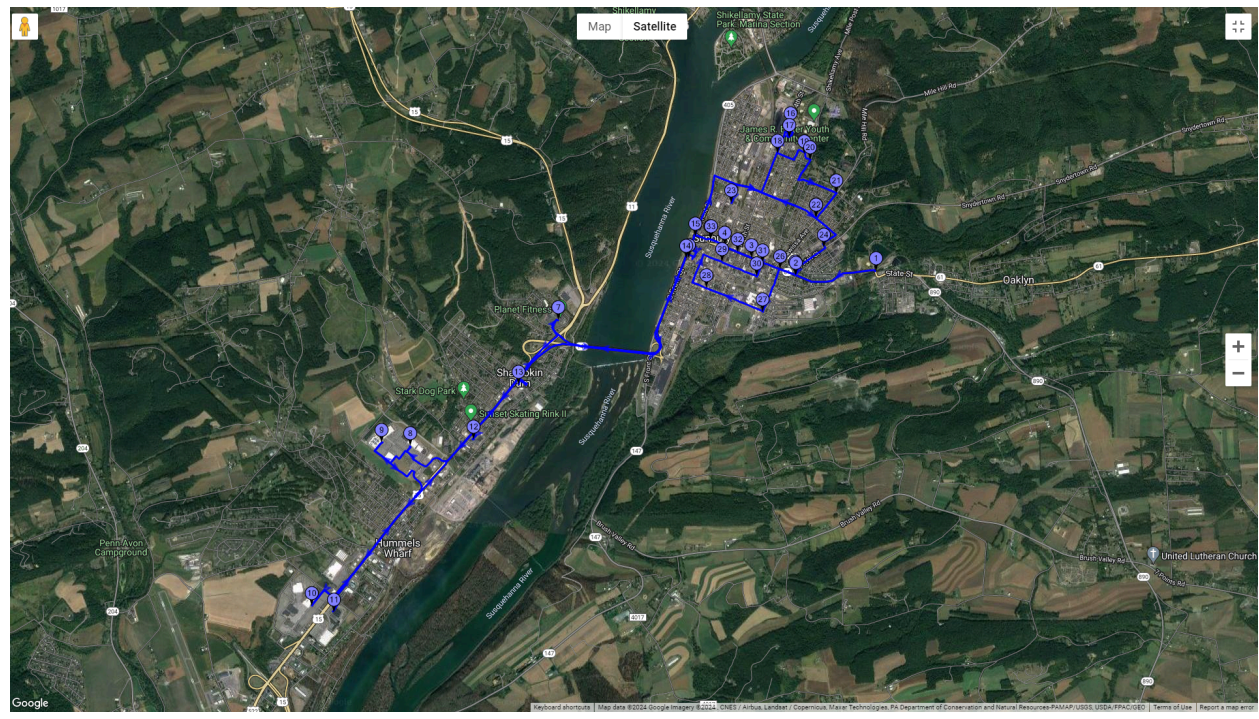


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**Appendices**  
**Appendix A**



**Map of potential version of the Sunbury LATS route**

## Appendix B Proposed Sunbury Schedule 2023

### Monday-Saturday (arrive times)

Walmart Coal Twp	9:00					3:02
Elysburg Sheetz	9:17					
Knights Inn Paxinos	9:20					
Market and 11 <sup>th</sup> , 5 <sup>th</sup> , 3 <sup>rd</sup> , 2 <sup>nd</sup> /Court House	9:39					
River Front Apartments	9:40	10:47	11:43	12:43	1:43	
Planet Fitness	9:45	10:50	11:45	12:45	1:45	
Giant	9:50	10:52	11:50	12:50	1:50	
Target	9:54	10:56	11:54	12:54	1:54	
Susquehanna Valley Mall	10:00	11:00	12:00	1:00	2:00	
Community Aid Thrift Store	10:04	11:04	12:04	1:04	2:04	
China House Buffet	10:07	11:07	12:07	1:07	2:07	
ALDI	10:10	11:10	12:10	1:10	2:10	
River Front Apartments	10:15	11:12	12:12	1:12	2:12	
Front St. & Market	10:16	11:13	12:13	1:13	2:13	
Weis Market & 4th	10:19	11:16	12:16	1:16	2:17	
4 <sup>th</sup> & Lincoln	10:21	11:18	12:18	1:18	2:18	
Lincoln & Eisenhower Dr.	10:22	11:19	12:19	1:19	2:19	
Eisenhower Dr. & Memorial Dr.	10:24	11:21	12:21	1:21	2:21	
Packer St. Catawissa Ave	10:26	11:23	12:23	1:23	2:23	
Catawissa Ave & Reagon	10:32	11:27	12:27	1:27	2:27	
Northumberland Probation	10:34	11:29	12:29	1:29	2:29	
Line St. & 11th	10:36	11:35	12:31	1:31	2:34	
Market & 10th	10:38	11:37	12:33	1:33		
10 <sup>th</sup> & Walnut	10:40	11:38	12:35	1:35		
Walnut & 3rd	10:41	11:39	12:37	1:37		
3 <sup>rd</sup> & Chestnut Ass. Office	10:42	11:40	12:38	1:38		
Chestnut & 7th	10:44	11:41	12:39	1:39		
Market & 10 <sup>th</sup> , 4 <sup>th</sup> , Court	10:46	11:42	12:40	1:40		

## Appendix C

### Consent Form

#### LATS Sunbury Route Survey

We are Bucknell students [say interviewers' names] conducting a survey for the Lower Anthracite Transit System, to know more about the transportation needs of the Sunbury, Mount Carmel, and Shamokin communities. The Lower Anthracite Transit System is a fixed-route bus service currently servicing the Borough of Mount Carmel, city of Shamokin, and Coal Township. They offer service Mondays through Saturdays with ADA service. Senior Citizens over the age of 65 ride free with a LATS ID card.

**Cost:** \$2 for a one-way trip, \$1 for a bus transfer, \$40 for a monthly pass.

Data collected will be used for the eventual creation of a bus route in Sunbury. The survey is designed to be around 10 minutes, your participation in this study is completely voluntary, and you may stop at any time. All information will be kept anonymous, no names are asked.

By indicating below, you indicate that you have read the above description, agree to participate in the research, and that you are at least 18 years of age.

I agree to participate in this study. I understand the study and agree to the terms.

**Questions or Concerns:** You are welcome to ask any questions at any time about the study and its procedures. Our student research team is composed of Kyle Crichton, Ben Shimer, and Devin Johnson. With any questions about the research procedures, please contact Professor Amanda Wooden (Phone: 570-577-3464 or email: [aw021@bucknell.edu](mailto:aw021@bucknell.edu)).

For general questions regarding the rights of human subjects in research, you may contact Bucknell's Institutional Review Board. Bucknell's chair of the Institutional Review Board, Eric Kennedy, can be reached at 570-577-2013 or [irbchair@bucknell.edu](mailto:irbchair@bucknell.edu).

## Appendix D

### LATS Paper Survey

#### LATS Sunbury Route Survey

We are Bucknell students conducting a survey for the Lower Anthracite Transit System, to know more about the transportation needs of the Sunbury, Mount Carmel, and Shamokin communities. The Lower Anthracite Transit System is a fixed-route bus service currently servicing the Borough of Mount Carmel, city of Shamokin, and Coal Township. They offer service Mondays through Saturdays with ADA service. Senior Citizens over the age of 65 ride free with a LATS ID card.

**Cost:** \$2 for a one-way trip, \$1 for a bus transfer, \$40 for a monthly pass.

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Phone: 570-577-3464 or  
Email: [aw021@bucknell.edu](mailto:aw021@bucknell.edu)).

For general questions regarding the rights of human subjects in research, you may contact Bucknell's Institutional Review Board. Bucknell's chair of the Institutional Review Board, Eric Kennedy, can be reached at 570-577-2013 or [irbchair@bucknell.edu](mailto:irbchair@bucknell.edu).

The symbol \* indicates optional questions.

**Are you in favor of having a dedicated LATS Sunbury bus route?**

Yes

No

**Please circle how you primarily travel:**

Bus                      Bike                      Drive a car

Walk                      Paratransit                      Ride in a car

Taxi                      Mobility Devices                      Ride-sharing

Other: \_\_\_\_\_

**Circle how often you travel weekly, on average:**

Not at all

Once a day

Once a week

Multiple times a day

Multiple times a week

**Do you feel like your transportation needs are currently met?**

1

2

3

4

5

(Disagree)

(Neutral)

(Agree)

**Have you used the Lower Anthracite Transit System (LATS) before?**

Never

In the last 5 years

In the last month

In the last 10 years

In the last year

*If you have used LATS, what have you liked or disliked about LATS?*

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**How important are bus shelters to you as you wait at each stop?**

1

2

3

4

5

(Not at all)

(Neutral)

(Very important)

**What locations do you think are most important for the proposed Sunbury bus route?**

**Check all that apply.**

- Northumberland County Courthouse
- Susquehanna Valley Mall / AMC Movies
- Northumberland Probation Center
- Weis Markets on Market St.
- Shikellamy High School



- Chestnut Towers
  - River Front Apartments
  - Walmart in Selinsgrove
  - Sunbury Community Hospital
  - Planet Fitness       Ollie's
  - Degenstein Library       National Beef
  - Memorial Acres       Memorial Park
  - Aldi       Target
  - Other: \_\_\_\_\_
- 

**For what purposes do you see yourself using LATS in your everyday life? Check all that apply.**

- Shopping       Groceries
- Medical services       Haircuts
- Entertainment (festivals, events, etc.)
- Access to county facilities and offices
- General transportation
- Visiting friends and family
- Other: \_\_\_\_\_

**How often do you see yourself using LATS for these purposes?**

- |         |                |             |         |          |
|---------|----------------|-------------|---------|----------|
| 1       | 2              | 3           | 4       | 5        |
| (Never) |                | (Sometimes) |         | (Always) |
|         | (Occasionally) |             | (Often) |          |

**Which of the following are important to you in a bus system?**

- Cleanliness       Being on time
- Bike racks       Atmosphere
- Bus shelters       Safe driving
- Disability Accommodations
- Other: \_\_\_\_\_

**Do you have any other recommendations for LATS services? \***

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**How old are you?**

- Under 18     18-24     25-34     35-44     45-54     55-64
- 65+

**Where do you reside?**

- Sunbury

If checked, do you live within one block  
of Susquehanna Avenue?



Yes       No

- Mount Carmel Borough
- Mount Carmel Township
- Shamokin
- Shamokin Dam
- Elysburg
- Paxinos
- Sunbury
- Coal Township
- Northumberland
- Snyderstown
- Kulpmont
- Other: \_\_\_\_\_

**Do you identify as someone who has a disability or chronic condition in which your mobility may be limited? \***

- Yes       No       Prefer not to say

**How does your household income compare to what you believe to be a comfortable standard of living? \***

- 1 (significantly below)
- 2 (moderately below)
- 3 (slightly below)
- 4 (neutral)
- 5 (slightly above)
- 6 (moderately above)
- 7 (significantly above)

**What gender do you identify with?**

- Male       Female       Nonbinary
- Other: \_\_\_\_\_

**Including yourself, how many people live in your household?**

\_\_\_\_\_

*Of those in your household, how many people are under 18?*

\_\_\_\_\_

## Appendix E LATS Flier 1



# LATS

## Lower Anthracite Transit System

### About Us

LATS is a public bus system that operates along fixed routes of travel on specific time schedules. The stops shown on the schedule are designed to help customers plan when they should be at a particular location in order to catch their bus. LATS riders can flag down an LATS bus along the travel route where it is safe to do so. Citizens age 65+ and children aged four or under ride free, children between 5 and 10 ride for 50 cents, and our standard fare is \$1 per trip.

### Areas of Service

LATS has three permanent routes and one seasonal route that take thousands of passengers annually through Mount Carmel and Shamokin. In the Spring of 2024, we plan to expand to create a Sunbury Route bringing passengers from Mount Carmel and Shamokin into Sunbury.

### Contact Info

50 West Third Street  
Mount Carmel, PA 17851  
Phone: 570-339-3956

E-mail: [lats@mountcarmelborough.org](mailto:lats@mountcarmelborough.org)

Contact us with your questions, comments, or suggestions!

### You Can Help!

We are always looking to improve LATS services. If you would like to help improve LATS or have suggested stops for a new route in Sunbury, please scan the QR code below and complete our anonymous survey.



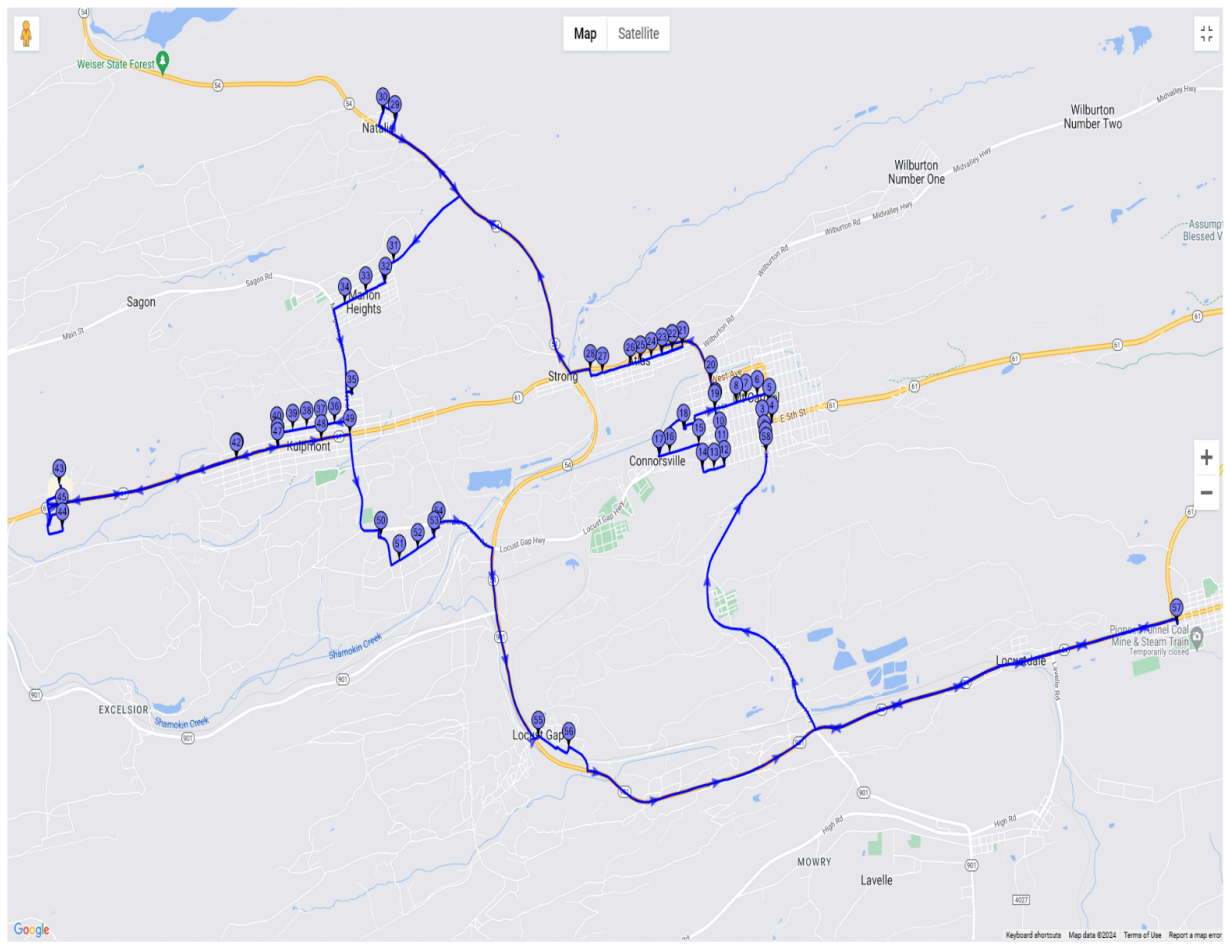
# L.A.T.S. SUNBURY BUS ROUTE SURVEY



Or use our link: <https://tinyurl.com/yc342hvn>

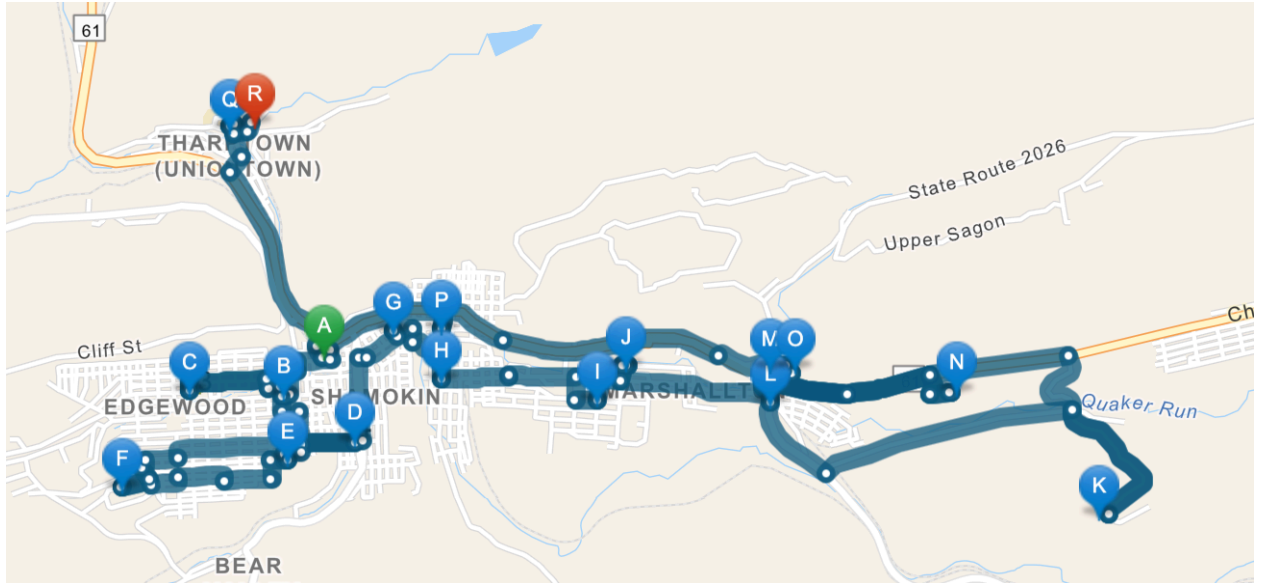
 Contact Lower Anthracite Transit System:  
[lats@mountcarmelborough.org](mailto:lats@mountcarmelborough.org) with questions

# Appendix G Mount Carmel Map Submitted to AVAIL

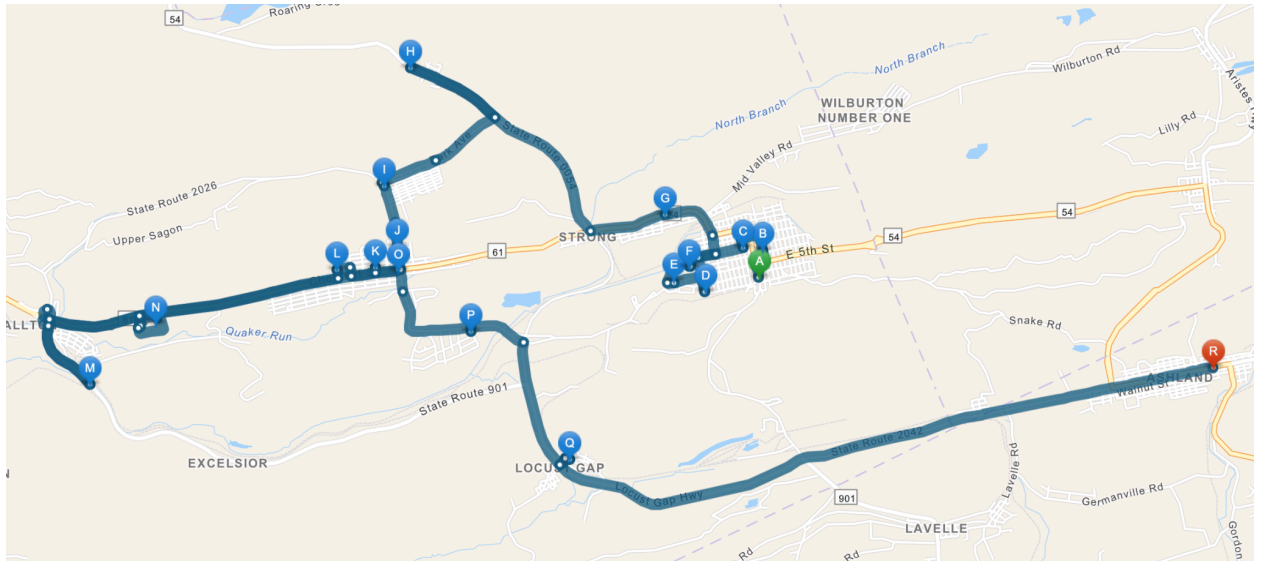




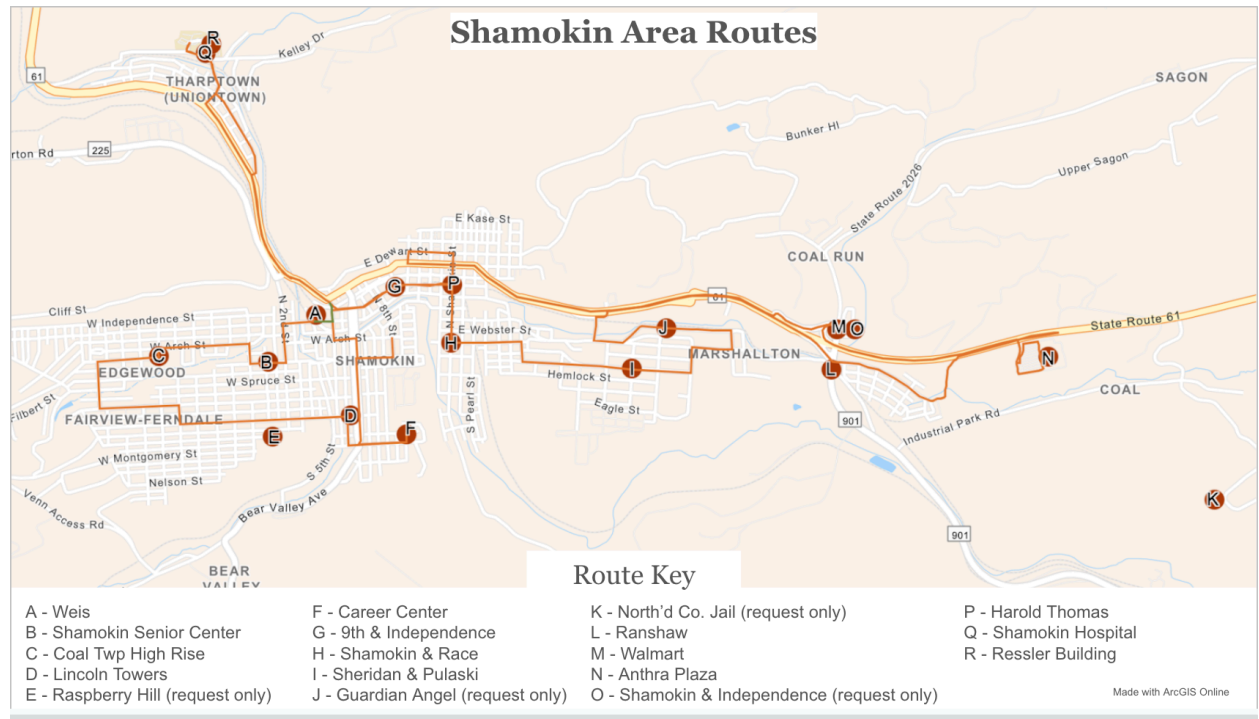
**Appendix I  
Shamokin Map 1 (Without Key)**



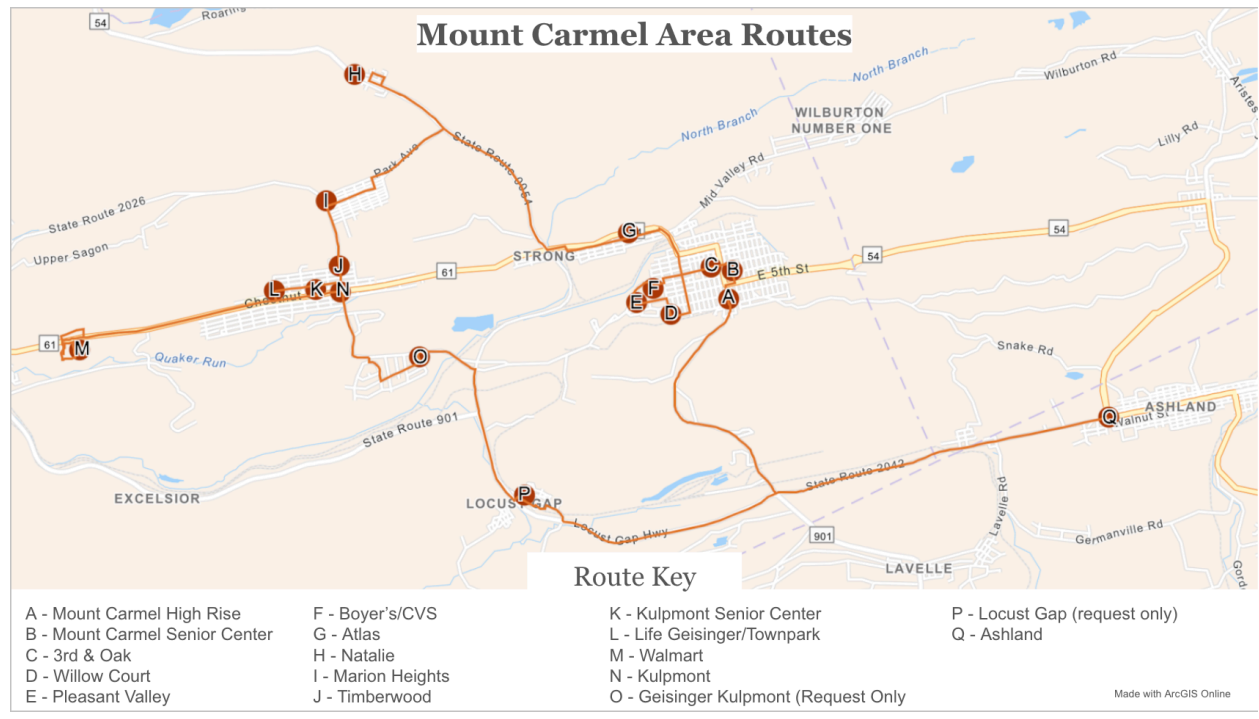
**Appendix J  
Mount Carmel Map 1 (Without Key)**



**Appendix K  
Shamokin Map 2**



**Appendix L  
Mount Carmel Map 2**





**Appendix M**  
**Proposed Schedule for Sunbury Route April 2024**

Monday-Saturday (arrive times)

Walmart Coal Twp	9:00				3:02
Elysburg Sheetz	9:17				
Knights Inn Paxinos	9:20				
Market and 11 <sup>th</sup> , 5 <sup>th</sup> , 3 <sup>rd</sup> , 2 <sup>nd</sup> /Court House	9:41	11:05	12:29	1:53	
Northumberland County Adult Probation	9:45	11:09	12:33	1:57	
Rescue Hose Co	9:48	11:12	12:36	2:00	
Weis on 4 <sup>th</sup> Street	9:52	11:16	12:40	2:04	
4 <sup>th</sup> and Greensboro St	9:55	11:19	12:43	2:07	
Fourth St Laundromat	9:58	11:22	12:46	2:10	
Riverview Apartments	10:01	11:25	12:49	2:13	
Sunbury City Church	10:05	11:29	12:53	2:17	
Chestnut Tower	10:09	11:33	12:57	2:21	
Degenstein Library	10:13	11:37	1:01	2:25	
Riverfront Apartments	10:18	11:42	1:06	2:30	
Orchard Hills Shopping Center	10:24	11:48	1:12		
Aldi	10:29	11:53	1:17		
National Beef	10:36	12:00	1:24		
Walmart Selinsgrove	10:41	12:05	1:29		
Susquehanna Valley Mall	10:45	12:09	1:33		
Target	10:52	12:16	1:40		



**Appendix N**  
**Final Schedule for LATS Sunbury Route**

Monday-Saturday (arrive times)

Walmart Coal Twp	9:00					2:56
Elysburg Sheetz	9:17					
Knights Inn Paxinos	9:20					
Market and 11 <sup>th</sup> , 5 <sup>th</sup> , 3 <sup>rd</sup> , 2 <sup>nd</sup> /Court House	9:39	10:44	11:49	12:54	2:00	
Northumberland County Adult Probation	9:40	10:45	11:50	12:55	2:01	
Rescue Hose Co	9:42	10:47	11:52	12:57	2:03	
Weis on 4th	9:44	10:49	11:54	12:59	2:05	
YMCA	9:44	10:49	11:54	12:59	2:05	
Sunbury Community pool	9:46	10:51	11:56	1:01	2:07	
Memorial Acres (6 <sup>th</sup> and Lincoln)	9:47	10:52	11:57	1:02	2:08	
Riverview Apartments (8 <sup>th</sup> and Greenough)	9:49	10:54	11:59	1:04	2:10	
Sunbury City Church	9:51	10:56	12:01	1:06	2:12	
Catawissa and Market	9:53	10:58	12:03	1:08	2:14	
Scott Tower	9:54	10:59	12:04	1:09	2:15	
Degenstein Library	9:56	11:01	12:06	1:11	2:17	
Chestnut Tower	9:56	11:01	12:06	1:11	2:17	
Northumberland County Administration Center	9:59	11:04	12:09	1:14	2:20	
Riverfront Apartments	10:01	11:06	12:11	1:16	2:22	
Northumberland County Assistance Office	10:03	11:08	12:13	1:18	2:24	
Orchard Hills	10:09	11:14	12:19	1:24		
Target	10:17	11:22	12:27	1:32		
Susquehanna Valley Mall	10:24	11:29	12:34	1:39		
Community Aid	10:29	11:34	12:39	1:44		
Walmart	10:32	11:37	12:42	1:47		
National Beef	10:34	11:39	12:44	1:49		
China House Buffet	10:38	11:43	12:48	1:54		
Aldi	10:39	11:44	12:49	1:55		
Riverfront Apartments	10:43	11:48	12:53	1:59		