RURAL MOBILITY IN APPALACHIA: CONTEMPORARY PUBLIC TRANSPORTATION PLANNING AND THE COMPLICATED LEGACY OF REGIONAL HIGHWAY NETWORKS

BY

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THESIS

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Abstract

Rural transportation systems provide vital options to residents of remote, sparsely populated, and shrinking areas. Though not a classic setting for studying public transit, Appalachia is an exciting case for many reasons. For fulfilling everyday travel needs in most of the United States, personal vehicles have remained the status quo for decades. Not surprisingly, our transportation infrastructure mirrors that status quo. But in Appalachia, efforts to establish any formalized transportation infrastructure at all have been arduous and are ongoing. And while other regions in the United States are now reaping the benefits of innovation in the public transportation planning space, Appalachia is still confronting the construction of its first complete highway network. Meanwhile, significant transit-dependent populations linger outside of the spotlight cast by the motor vehicle-oriented infrastructure.

This thesis examines the current characteristics of rural public transportation planning in Appalachia and the role that the Appalachian Development Highway System (ADHS) has played in shaping those characteristics. My findings provide new insights about the region-specific challenges that transportation practitioners in Appalachia face, community- and agency-based solutions to those challenges, and the influence of auto-oriented investments on the region’s capacity to plan for public transit. I draw primarily on historical and current evidence from the literature as well as qualitative data collected from a series of interviews with transportation practitioners in Appalachia. I conclude that the ADHS is among the many factors that have negatively impacted the region’s capacity to adequately maintain and enhance public transportation service, and that demand for increased service justifies a reevaluation of the paradigms that have historically guided rural planning.
Dedicated to Catherine Stapleton Allen
Acknowledgements

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I could not have completed this project without Kate Murdock and Dan Plyukhin, who provided me with infinite reasons to keep trying. Lastly, I would like to thank my parents for their constant love and company. You’re the very best.
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Chapter 1: Introduction

1.1 Research Problem and Justification

Discussions about the potential benefits of public transportation are often placed within the context of dense urban environments. Appalachia, a region known for its rugged terrain and rural landscapes, is not commonly considered a place with rich benefits to derive from transit. It is also not known as a region with high demand for transit. However, several indicators suggest that demand for transit is increasing alongside the potential economic and social benefits it could offer the region. Additionally, recent research on transit characteristics in other rural areas points to a handful of optimizations that could strengthen the quality of rural transportation service without the requirement of added infrastructure or funding (Bruzone et al., 2020, Coutinho et al., 2020., and Southworth et al., 2005).

Though not a classic setting for studying public transit, Appalachia is an exciting case for many reasons. For fulfilling everyday travel needs in most of the United States, personal vehicles have remained the status quo for at least half a century. And not surprisingly, our transportation infrastructure mirrors that status quo. But in Appalachia, and as I will outline in the following sections, efforts to establish any formalized transportation infrastructure at all have been arduous and are ongoing. And while other regions in the United States are now reaping the benefits of innovation in the public transit planning space, Appalachia is still undergoing the construction of its first complete motor vehicle infrastructure system. Meanwhile, significant transit-dependent populations linger outside the spotlight cast by the motor vehicle-oriented infrastructure. The following paragraphs will outline the history of the dominant motor vehicle-oriented infrastructure project in Appalachia.
In 1963, the President's Appalachian Regional Commission (PARC) was created by the Kennedy administration. Following his assassination, the Appalachian Regional Development Act (ARDA) was proposed in 1964. It designated counties in Alabama, Georgia, Kentucky, Maryland, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia, and West Virginia to receive $1.7 billion in federal grants (Jaworski and Kitchens, 2016). ARDA created the Appalachian Regional Commission (ARC) for the purpose of designing and administering “comprehensive plans and programs” for the economic and social development of Appalachia on a coordinated regional basis (Gauthier, 1973).

Along with forming ARC, the policy appropriated $1.7 billion over six years to alleviate the region’s high unemployment, low income, low educational attainment, and comparatively low standard of living. Of ARC’s total expenditure, 66 percent was earmarked for the construction of the Appalachian Development Highway System (ADHS), a proposed network of almost 3,000 miles of highways throughout Appalachia (Gauthier, 1973). Since then, 2,650.3 miles of the highway system have been constructed and are now operational, and roughly 10 percent of the system has yet to be paved. A more detailed breakdown reveals that of the remaining 10 percent, 2.5 percent is partially complete, 4.6 percent is projected to be complete within 10 years, 2.6 percent is projected to be complete in more than 10 years, and 4.5 percent is incomplete with an undetermined completion estimate (Future Outlook for the ADHS, 2020). The remaining miles of highway are among the most laborious and expensive to construct because of design and engineering challenges related to building structures on mountainous terrain.

In addition to wanting to investigate the role of public transit in a region where a basic vehicle infrastructure network is critically incomplete, this thesis project was motivated by a desire to understand the impacts of motor vehicle-oriented policy on public transportation planning
efforts. I seek to explore the potential links between ARC-backed projects and the state of mobility in average communities across the region, as seen through the perspective of transportation planning professionals at the local level. Another aim of this project is to question the lasting credibility of the ADHS rationale by exploring critical assessments of the project and relating them to current transit trends in the region. The insights derived from this research can serve as a standalone piece of research on the topic of public transit in rural Appalachia, or they can be used to supplement prior and future findings that may lack perspectives from critical sources and local transportation practitioners.

1.2 Outline

Following this introduction, Chapter 2 will summarize the current conditions of public transit in Appalachia and a few other sites with similar socioeconomic and geographical characteristics. Section 2.1 will also highlight some key findings from the literature regarding barriers to effective transit planning in the region, which can be compared with findings from the interviews that I conducted and that are discussed in Chapter 4. In Section 2.2 I will summarize some of the key assessments of the ADHS to date and identify the gaps in those evaluations.

Chapter 3 will review the scope and key assumptions that grounded my research. This chapter will also detail the research methodology that I used to conduct and analyze the interviews with transportation practitioners in the region. The first section of the chapter will introduce my qualitative data collection approach and its various steps. Next, I will provide justification for the methodology that I used by citing the key factors that influenced my design choices. Section 3.2 features a detailed timeline and description of the interview methodology that I followed. This section also addresses the limitations of that methodology and how future research could compensate for the areas that I wasn’t able to investigate in this exploration.
In Chapter 4, I will underscore the key findings from my interviews with transportation practitioners from across Appalachia. First, I will introduce my findings as a whole and reiterate some of the contextual information that was covered in previous chapters. Second, I will detail the findings from the qualitative interview portion of my research. This chapter also features tables that display the interview findings in a more visually digestible format.

Chapter 5 will present my analysis of the historical context and critical academic literature. This component served alongside the practitioner interviews as a second pillar of my research methodology, and it markedly informed the interview process. Section 5.1 is an elaboration on the fundamental histories of labor, environment, and economy in Appalachia, and how they relate to conversations about mobility and public transit. Section 5.2 will recount various modes of measuring the success of the AHDS by drawing on literature that investigates the impacts of the highway system on economy and mobility in Appalachia. I will conclude by summarizing the key findings in the literature, explaining how those findings contributed to my own interview procedures, and demonstrating how my research fills gaps in the discourse.

I will synthesize all of my findings in Chapter 6, as well as provide recommendations for transit providers and document several suggestions for future work.
Chapter 2: Rural Transit

2.1 Rural Transit in Appalachia

An overwhelming amount of funding for transportation infrastructure in Appalachia has gone to the ADHS. However, federal- and state-funded public transportation does exist in the region, and demand for it is strikingly high. This section explores some of the work that has been done to identify the current level of demand for transit in Appalachia. Because of the lack of cooperating government bodies in the region, it is difficult to get a comprehensive snapshot of the state of public transit in the region. ARC’s 2020 *Public Transportation in Appalachia: Inventory and Assessment Fact Sheet* provides a broad overview of current public transportation characteristics in the region. The following paragraphs will outline the characteristics reflected in ARC’s 2020 report. Later, I will compensate somewhat for the general lack of detail on public transit service in Appalachia by providing findings from local- and state-level reports from different sub-regions of the region.

According to the 2020 *Public Transportation in Appalachia: Inventory and Assessment Fact Sheet* compiled by Foursquare ITP for ARC, about 70 percent of ARC-designated Appalachian counties are served by bus service. However, only 42 percent of ARC-designated Appalachian counties are served by fixed route bus service; the rest are served by either public or restricted demand-response systems. Only 7 percent of rural Appalachian counties served by fixed route bus service offer evening service, and less than half of Appalachia’s zero-car households are located within a half-mile of fixed route service. These figures are displayed in Table 1.
Table 1. Transit service figures for Appalachia and the US (Appalachian Regional Commission, 2020)

<table>
<thead>
<tr>
<th></th>
<th>Appalachia</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counties served with bus service (fixed route or demand-response)</td>
<td>70%</td>
<td>N/A</td>
</tr>
<tr>
<td>Counties with fixed route service</td>
<td>42%</td>
<td>N/A</td>
</tr>
<tr>
<td>Fixed route with evening hours</td>
<td>7%</td>
<td>N/A</td>
</tr>
<tr>
<td>Zero-car households within half-mile of fixed route service</td>
<td>48%</td>
<td>72%</td>
</tr>
<tr>
<td>Jobs within a half-mile of fixed route service</td>
<td>46%</td>
<td>62%</td>
</tr>
</tbody>
</table>

ARC’s 2020 report exhibits severe disparities between basic public transit network characteristics in Appalachia and those in the United States at large. However, more localized reports and assessments provide deeper insights. West Virginia, the only state where every single county belongs to the ARC region, is home to only 11 public transit agencies in rural areas including the Potomac Valley Transit Authority, the Mountain Transit Authority, and the Buckwheat Express. A 2013 technical report from the Rahall Appalachian Transportation Institute examined public transit funding, rider demographics, service demand, and perspectives from local transit professionals in West Virginia. The report reveals that of the 55 counties in the state, some form of public transportation is available in 33. Additionally, in 2012, about 1 in 7 West Virginia transit riders were elderly (Long, et al., 2014).

The presence of zero-vehicle households and transit-dependent residents is an imperative reason why public transit must be prioritized. According to the Rahall report, the percentage of households without a vehicle is as high as 62 percent in some rural counties in western West Virginia. A critical finding is that, in rural counties with the highest percentage of zero-vehicle
households, public transit access is relatively low and, in some cases, nonexistent. The report recommends that “safe, efficient, and affordable transit will be essential in assisting the rural poor out of poverty by providing access to employment, education, and healthcare” (Long, et al., 2014). Adding to the potential of transit to change the economic and social landscape of Central Appalachia, Figure 1 shows the percentage of various kinds of economic and social institutions that are inaccessible by transit for the entire state of West Virginia. The state’s healthcare, education, and employment centers are especially inaccessible by transit, but low transit access proved to be prominent across all economic institutions that the report accounted for.

Figure 1. Transit Inaccessibility for Select Economic Institutions (Long, et al., 2014)

Because Appalachia is especially rural and rugged, vital services are often spread across a cluster of towns. Appalachian towns are separated by several miles and are not typically connected by walking or cycling infrastructure. Access to transportation that crosses municipality, county, and even state boundaries is vital to wellbeing in Appalachia. Findings from a public transportation
opinion survey deployed in ARC-designated counties in South Carolina showed that residents wanted expanded intercity transit connections. These findings call attention to the importance of transit service that defies local boundaries and suggests that a regionally managed transit system might serve residents’ needs better than a cluster of locally operated agencies. The survey results also showed that most respondents were in favor of expanding evening and night service to enable second and third shift workers to get to work easier (South Carolina Department of Transportation, 2014).

Transit demand levels in Appalachia may be unexpectedly high, but funding is still a constraint. Rural transit in Appalachia is funded heavily through Section 5311 of the MAP-21 Act. Section 5311 stipulates three sources of funding for rural areas. Part A of Section 5311 allocates Formula Grants for Rural Areas (FGRA). The FGRA funding formula is based on Vehicle Revenue Miles (VRM) and the population of low-income individuals living in non-urbanized areas. FGRA regulations stipulate that at least 15 percent of the funding must be used to develop and/or support intercity bus services. Part B of Section 5311 allocates the Rural Transportation Assistance Program (RTAP). RTAP funding includes a fixed amount for each state, plus additional funding based on the number of individuals living in non-urbanized areas. Part C of Section 5311 allocates funds to the Appalachian Development Public Transportation Assistance Program, which provides additional resources specifically for Appalachia. I discuss more particulars of Appalachian agencies’ funding sources and challenges in Chapter 4.

Funding for public transit, rather than extensive highway systems, is central to ameliorating the mobility of residents of Appalachia. However, it isn’t the only resource needed to strengthen transportation services. Stommes and Brown (2005) studied additional challenges faced by recipients of federal funding for rural transit. They gathered data from the Federal Transit
Administration, state DOTs, the Census Bureau, the Bureau of Economic Analysis, and individual agencies that were recipients of federal funding. Interviews were also conducted with transit professionals at individual recipient agencies in California, Illinois, Iowa, Maine, North Dakota, Pennsylvania, Tennessee, and Texas. The study counties were all non-urbanized areas, most with a population lower than 2,500 residents. Interview data and supplemental information revealed that many municipalities had trouble piecing together a transit system from scratch with the federal funding they had received. Barriers to assembling rural transit service, even with federal funding, included trouble collecting and reporting necessary data, general tech issues (e.g., internet connectivity), lack of familiarity with transit agency management procedures, challenges related to designing transit networks, low population density, and fare pricing. Barring the fact that my research probes for a connection between transit planning challenges and the ADHS, the interview data portion of my research is thematically similar to Stommes and Brown’s 2005 study.

### 2.2 Rural Transit Case Studies

So far, I’ve discussed literature that details historical context, current conditions of transit, demand and the potential role of transit, funding sources, and barriers to implementation. The following section will outline literature on the success of rural transit systems in places with similar characteristics to Appalachia. The literature featured in this section addresses ways to work around unfavorable conditions for transit in rural areas, including long distances, low densities, and expensive fares.

A recent transit network redesign project took place in the city of Velenje, Slovenia. Velenje has a population of about 30,000 residents and is located in a mountainous and rural region scattered with very small towns. Bruzzone et al. (2020) facilitated focus groups in which local residents discussed possible options for changing the current underutilized public transportation
system. The aim of the focus groups was to ideate a financially sustainable transit network that would best serve Velenje’s small surrounding settlements. The project determined that a semi-flexible demand-responsive transit system, supplemented by an e-bike program, was favored by urban and rural residents. This configuration addressed risks of service reduction due to low demand for fixed routes and increased the number of settlements with daily and frequent access to vital services only offered in the city. Over the course of the focus group sessions, researchers found that residents of the small surrounding settlements owned more cars than residents of Velenje, mainly due to the poor coverage and frequency of public transport in the peripheral areas. Respondents in the smaller areas noted a preference to switch to public transit. However, limitations of the existing system, such as low frequencies, misalignment between bus schedules and work hours, and inefficient routes, prevented it. The proposed semi-flexible demand-responsive system involved one “backbone” line, which would connect smaller settlements to Velenje and would run along the valley where most of the small settlements are located. The backbone line would operate as a fixed route line with 49 departures per day and a limited number of on-demand diversions to accommodate uphill residents. The proposed system also incorporated easy-to-remember headways and naming conventions. Bruzzone et al. (2020) found this system to use approximately the same amount of financial resources as the previous fixed route system.

A study of the benefits of rural transit service in Tennessee attempted to appraise the total value to the public of offering demand-responsive transit service in sparsely populated rural areas. Among the benefits were expanded user mobility, congestion mitigation, and improved safety, air quality, and transportation efficiency. Southworth et al. (2005) stated that “rural public transit operations in the State of Tennessee are more than paying for themselves at the statewide level, with additional benefits accruing to the local transit districts within which these transit services are
provided.” The study addresses criticisms of demand-responsive transit that claim the rate of foregone trips (dial-a-ride-style trips that are cancelled by the rider) renders such service a waste of taxpayer dollars. But by accounting for safety, health, environmental, and road efficiency benefits, the scholars listed an estimated $1.49 benefit per transit vehicle mile of service for demand-responsive rural transit. They also used state employment data and their valuations of transit-related efficiencies to estimate that 13.9 percent of Tennessee's annual averaged increment in economic growth in 1998 was attributable to transportation efficiencies resulting from rural public transit supply (Southworth et al., 2005).

In a rural region northeast of Amsterdam, Netherlands, Coutinho, et al. (2020) investigated variances in VMT, ridership, costs, greenhouse gas emissions, and public perception of demand-responsive systems compared to entirely fixed route systems. The results showed that implementation of demand-responsive systems reduced mileage and other efficiency measures, but they also induced a drop in ridership to under 28 percent of the previous level with a regular fixed route system. This is likely due to the inconvenience of having to call ahead to request a ride. Another possible issue with demand-responsive systems is that most involve requesting a ride via a smartphone-based interface. This involves a level of digital literacy that is less common in areas with a high need for demand-responsive service (namely rural areas, which have larger aging populations and lower rates of digital literacy). The paper also emphasizes how in Europe, most demand-responsive services are privatized and thus are more difficult to regulate than standard fixed route systems. Lastly, it is mentioned that demand-responsive systems tend to be more costly than fixed route systems if they’re being used daily, so they should only be implemented in areas where fixed route service is not an absolute necessity (Coutinho, et al., 2020).

The need for transit in Appalachia becomes even clearer when looking at trends in mobility
disparities. A South Carolina Multimodal Transportation Plan from 2014 measured differences in travel behavior between households with ample mobility and households with limited mobility. The plan utilizes a metric called the mobility gap, which uses a household’s access to a personal vehicle as a proxy for mobility. Mobility differences between urban and rural residents were also addressed. The mobility gap metric shows the amount of transit service needed to allow equal mobility between households with zero vehicles and households with one or more vehicles. In other words, it’s the additional trips that might be taken by households without a vehicle if an additional mode of transportation were provided. Table 2 shows how mobility disparities relating to vehicle ownership are intensified among people aged 65 and older.

**Table 2. South Carolina Mobility Gap Data (South Carolina Department of Transportation, 2014)**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Person-Trip Rates</th>
<th>Mobility Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rural</td>
<td>Urban</td>
</tr>
<tr>
<td>0-Vehicle</td>
<td>1+Vehicles</td>
<td>0-Vehicle</td>
</tr>
<tr>
<td>Age 15-64</td>
<td>4.09</td>
<td>10.09</td>
</tr>
<tr>
<td>Age 65+</td>
<td>1.76</td>
<td>7.64</td>
</tr>
</tbody>
</table>

Assessments of the ADHS are critical to understanding the economic and social conditions of Appalachia today. These conditions give us clues about the current transportation needs of Appalachian residents and the ways that public transit could benefit the region in the future. Evidence from local agencies and state DOTs indicates that there is demand for transit in Appalachia, and that transit has a role to play in narrowing social and economic disparities.

Additional research needs to be done on the benefits of regionally managed transit systems.
over clustered locally controlled agencies. Also, gathering qualitative data from planners in the region who have had to navigate the ramifications of the ADHS could further contextualize the current state of public transit relative to the region’s auto- and industry-centric history. Lastly, the review could be strengthened with more evidence that transit can spawn economic change from the bottom-up. It’s clear that infrastructure is a necessary part of the foundation of economic and social development, but there’s still a need to thoroughly explore the role that infrastructure should play in facilitating bottom-up development.

After conducting this review of rural transit in Appalachia and other rural regions, I concluded that my contribution to research in the topic must include qualitative data and must directly address perceptions of the impacts regional transportation policy on the current state of mobility in the region. The findings that I outline in the following section were collected and analyzed based on existing context and literature that I will review in Chapter 5.
Chapter 3: Methodology

3.1 Justification for Paradigm and Methodology

ARC recently released a report titled *Public Transportation in Appalachia: Inventory and Assessment* (2020), which explores trends, best practices, challenges, and recommendations for public transit in Appalachia. This report draws primarily on past ARC studies rather than on critical literature, and still lists the completion of the ADHS as one of the primary objectives of ARC, despite enormous shifts and innovations in the mobility landscape over recent decades. Further, the report relies heavily on quantitative data which may obfuscate critical nuances that help explain current transit conditions. Though the themes of this thesis project are quite similar to those addressed in the 2020 report from ARC, this exploration differs by drawing on critical academic sources as well as qualitative data from practitioners who navigate Appalachia’s mobility landscape firsthand.

By analyzing a combination of critical academic literature and interview data, this thesis identifies the basic characteristics of existing transportation networks in Appalachia and investigates how the ADHS has impacted mobility and transit planning in the region. This chapter will address the research procedure that I followed in order to collect and analyze primary source data. The research questions that I explored are: What are the current public transit conditions in Appalachia? What role did the ADHS play in the formation of those conditions? How do current transportation planners in Appalachia regard the ADHS? How are agencies responding to the current conditions? Ultimately, what is the role of public transit in Appalachia?

I began to investigate these questions by conducting a careful review of academic literature and historical documents pertaining to the ADHS, rural transit in Appalachia, and rural transit elsewhere. This exploration of secondary sources is documented in Chapter 5 and strongly
influenced the design of the primary source portion of the research process. The primary source collection and analysis process entailed a series of interviews with transportation planning practitioners from across Appalachia. This chapter outlines the methodology used to conduct the interviews and derive meaning from them.

After conducting the thorough literature review documented in Chapter 5 of this thesis, it became clear that input from Appalachians themselves have been largely absent from the body of work on this topic. Once I decided to pursue this topic for my thesis research, I knew that I wanted the project to include the voices of people who live and work in Appalachia. This thesis project began in earnest during the beginning of 2020, a month or two before COVID-19 lockdowns took effect. My initial strategy for gathering qualitative data was to establish contact with a few community organizers in Central Appalachia, travel to the region either later that spring or during the summer of 2020 and use those contacts to establish relationships with planners and residents once I was on-site.

I hoped to focus the bulk of my qualitative data collection efforts on Central Appalachia because the subregion has personal significance to me and, based on the preliminary research I had done, it bears the brunt of the adverse impacts of ARC policies on mobility. From there, my plan was to organize focus groups and lead conversations about participants’ perceptions of the ADHS, the conditions of public transportation in the region, and possible links between the two. Post-fieldwork was slated to involve separating comments from planners and residents to probe for thematic differences between the two groups.

When COVID-19 lockdowns went into effect in early March of 2020, I began to adjust my data collection procedures to ensure that all interviews could be conducted via phone or video conferencing app. This adjustment came with a few tradeoffs. First, it wedged even more barriers
between me and potential interlocutors, specifically residents of Central Appalachia. Without the ability to be present in communities in-person, I was unlikely to gain access to gatherings where I could approach residents and introduce them to my project. Conveniently, though, my pool of potential interlocutors was narrowed down to a small, specific few with little effort.

My adjusted plan was to collect data from practitioners only, since they would be easier to establish contact with and were more likely to be accustomed to virtual meetings. In addition to my plans to collect data in focus group setting were further complicated. With the pandemic increasingly stirring up uncertainty about work schedules and home lives, it seemed greatly improbable that a group of residents and practitioners would be able to gather with me concurrently in a virtual space. Thus, I opted for one-on-one interviews. A third impact of the pandemic was that it limited my ability to target a specific sub-region of Appalachia, namely Central Appalachia. I quickly found that, by limiting interview invitations solely to practitioners in this subregion, I was also limiting my exploration to a very narrow breadth of perspective and expertise. Because other key features of my data collection process were necessarily constrained as a result of the pandemic, I compensated by expanding the boundaries of my study.

Once those constraints were established, I began to think about what kinds of practitioners I wanted to engage with. In an effort to diversify the body of work that explores the role and characteristics of public transit in the region, I chose to limit my engagement solely to interlocutors who work at local- and MPO-level planning agencies, as well as transportation researchers at public universities. ARC’s projects, positions, and interests are publicly available online. Additionally, various critiques and assessments of ARC’s work have already been carried out by transportation researchers and historians. Given the project constraints, I felt that the most
meaningful way to contribute to discourse on the topic would be to explore it from the perspective of practitioners who plan for public transit in the shadow of ARC’s massive highway project.

3.2 Research Procedures

The resulting qualitative data collection methodology is a function of constraints due to the COVID-19 pandemic as well as being hundreds of miles from the focus region. Collecting qualitative data during the COVID-19 pandemic proved to be very difficult. I started probing for interlocutors first by reaching out community organizations in the region, including the Housing Development Alliance and the Appalachian Council of Governments. After establishing connections with a couple of community organizations, I then expanded my search to include transportation professionals. Having connections with community organizations helped build my credibility when sending interview invitations to planning practitioners. Once I became acquainted with practitioners who were open to being interviewed, I used those links to expand my network of potential interlocutors. I made sure to select interlocutors who either had experience working with ARC funding, were able to speak to the influence of the ADHS on planning efforts or had knowledge of the trends and challenges of public transit operations in Appalachia.

I conducted interviews with a series of transportation researchers and planning practitioners who live and work in Appalachian counties. During the interviews, subjects answered questions about systemic barriers to mobility in Appalachia, whether they sense a causal relationship between the ADHS and those barriers, and their ideas about how to address the region’s transit deficits. The interviews were conversational, and I omitted questions from my script if I felt they weren’t relevant to the interlocutor’s particular role or if it would create redundancy in the conversation. I also added questions on an ad hoc basis if I needed to clarify a statement or if the interlocutor said something that I felt could lead to a relevant finding.
The interview guide that I designed (see Appendix A) listed questions about the ADHS, whether and how interlocutors perceived it to have led to current public transportation conditions in Appalachia, and what interlocutors felt were barriers to expanding public transportation infrastructure in the region. The guide served more as a loose framework for conversation than a strict script. Interviews typically lasted for 1 hour and were held via Zoom. I asked the following questions to each interlocutor:

- What is your role?
- What do you understand as the intent of the Appalachian Development Highway System?
- What have been the effects of the Appalachian Development Highway System on public transportation planning in Appalachia?
- What is the role of public transportation in Appalachia?
- Should public transportation be a tool for economic development?
- What are some innovative things currently happening in Appalachia related to transportation?
- What are the barriers to maintaining and/or expanding transit and mobility in Appalachia?

I used ATLAS.ti to code the interview data and draw conclusions from variables mentioned by interlocutors. During data coding, I devised eight codes to categorize key interview excerpts. Some of the codes were derived from an inductive approach wherein I compiled common threads while reading over the interview transcripts. One example of a code I derived using the inductive approach is Economic Trends. I didn’t ask the interlocutors any direct questions about economic trends that had impacted public transit planning. Instead, after conducting a handful of interviews,
I began to notice that many interlocutors mentioned the demise of the coal industry and the growth of e-commerce in their answers. Oftentimes, these trends weren’t mentioned as hindrances to maintenance and/or expansion of transit. In other words, they weren’t cited as direct answers to my questions. Rather, they were mentioned as contextual information. This was an indication to me that these economic trends were especially pertinent to some transportation practitioners. Thus, I created a new code based on that observation.

Other codes were pre-set according to specific questions that I made sure to ask all interlocutors. For example, the code *ADHS Intent* was pre-set to track interlocutors’ perceptions of the intended purpose of the highway system. Since this question is a central research query of mine, I made sure to ask every interlocutor what they thought the intent of the ADHS was. I coded their answers using the *ADHS Intent* code so that I could compare answers across subregions and roles. The *Role of Transit, Barriers, ADHS Effect, and Role* codes were also pre-set since all interlocutors were asked the same corresponding questions.

The first interview of the project was conducted with a transportation researcher from the Virginia Tech Transportation Institute, who passed along the contact information of a handful of transportation practitioners in Virginia. The next wave of interlocutors came from Southern Appalachia via an early-established link with a transportation practitioner at the Appalachian Council of Governments. One of them had a contact in western Maryland, which opened up a series of interviews with practitioners in Northern Appalachia. Collectively, my interlocutors serve all roles involved in maintaining and expanding public transportation services. I spoke with city planners, transportation planners, MPO-level planners, MPO directors, and transportation researchers with specialties in rural transit. I also took care to ensure that no Appalachian subregion was over- or underrepresented in my research. ARC divides Appalachia into five subregions:
Northern, North Central, Central, South Central, and Southern (see Figure 2). The interlocutors I interviewed represent all five ARC-designated subregions.

Figure 2. Map of Appalachian Subregions (Appalachian Regional Commission, 2009. https://www.arc.gov/map/subregions-in-appalachia)
Chapter 4: Findings from Practitioner Interviews

4.1 Qualitative Data Findings

In this section, I will highlight findings from my research. First, I will discuss the results of my interviews with transportation professionals from around Appalachia. As was described in the previous section, I conducted interviews with transportation planning practitioners and coded the transcripts according to the information I’m probing for in my research inquiry. The interview results are displayed in a series of tables and each table has accompanying narration. Next, I will outline the conclusions I’ve drawn from analyses of various data sources. The main purpose of this section will be to probe the level of demand for transit in Appalachia versus the provision of public transit service. These results will also be displayed in a series of tables. Finally, I will conclude by stating the key findings from the qualitative inquiry. My research was conducted under the assumption that my interlocutors had professional knowledge about the ADHS and would give honest and truthful responses to interview questions.

Table 3 displays, in the leftmost column, the seven most common themes that surfaced in my conversations with interlocutors. The middle column displays the frequency that each of the themes was mentioned by all interlocutors combined. The column on the right displays the number of interlocutors that mentioned the corresponding theme. Some themes are the result of direct questions that I asked and are thus the result of a deductive approach. For example, I asked every interlocutor the question “what are the barriers to maintaining and/or expanding transit in your region?”, so data from each interlocutor is represented in the Barriers section. Other themes, such as Solutions arose more inductively. I created the Solutions theme because several interlocutors, without provocation, mentioned their agency or region’s solutions to certain transit problems that surfaced in the conversation. I found this information to be useful during the data analysis phase.
because it further contextualized my understanding of how current transportation planners are responding to the current transit conditions in the region and what kinds of solutions might not be viable there.

Table 3. Interview Data Themes

<table>
<thead>
<tr>
<th>Theme</th>
<th>Mentions</th>
<th>Interlocutors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barriers*</td>
<td>52</td>
<td>8</td>
</tr>
<tr>
<td>Role of Transit*</td>
<td>32</td>
<td>8</td>
</tr>
<tr>
<td>Agency-Specific</td>
<td>23</td>
<td>5</td>
</tr>
<tr>
<td>Solutions</td>
<td>27</td>
<td>8</td>
</tr>
<tr>
<td>Effects*</td>
<td>21</td>
<td>8</td>
</tr>
<tr>
<td>Intent*</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Economic Trends</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

*Indicates direct question was asked

The Barriers theme tracks factors that, according to interlocutors, are a hinderance to proper maintenance and/or expansion of public transit services in the region. The most common barriers are management issues at the agency level, low funding, rugged topography, jurisdictional precedents that have led to car dependence, negative stigmas against public transit, the aging population of the region, and economic trends.

Management-related barriers included lack of cooperation between adjoining jurisdictions, necessity of travel across jurisdictional boundaries, and political gridlock at the local and subregional levels. These issues were cited by interlocutors spanning the entire region. One interlocutor from the Northern Appalachia subregion said that “there are issues with agreements and liability in how transit providers can cross state lines. Until there are interstate agreements for
crossing state lines and insurance policies in place, some types of out-of-state travel are not permissible at that time.” Another interlocutor was apprehensive about the ability of a regional management to alleviate these issues, explaining that “regional systems are all well and good but when you go over state lines, it could be very challenging.” Table 4 displays all sub-themes mentioned as barriers to maintaining and/or expanding public transit in Appalachia.

Table 4. Sub-Theme: Barriers

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Mentions</th>
<th>Interlocutors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>Funding</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>Geography</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Precedent</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Stigma/culture</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Aging</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Economics/industry</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

As I’ve discussed in previous sections, economic trends in Appalachia can be predictors of public attitudes towards investment in public transit. This is true on a broader scale as well. For example, several interlocutors mentioned the expansion of e-commerce-induced freight activity as a barrier to offering more robust public transit service. One interlocutor, an MPO director, explained that two Amazon facilities were recently established within the MPO boundaries. “If you’re a driver with a commercial driver’s license, you can go make a ton of money working for Amazon, UPS, or FedEx. All these distribution centers keep popping up along the interstates and along the ADHS.” The interlocutor identified a conflict between public transit and e-commerce,
since both activities require licensed drivers. “In West Virginia, they’ve had to suspend service on a number of their fixed routes simply because they do not have enough drivers. They have drivers doing 60 or 70 hours per week just to try to keep their service” the interlocutor said. He went on to explain the connection between the growth of the e-commerce industry and funding shortages at the MPO and agency levels and questioned, “how do you have a competitive salary and benefits package as a public transit agency versus a private sector position?”

But a concern from another interlocutor demonstrates that this trend might have inconsistent impacts on Appalachia depending on the subregion in question. The interlocutor worried that e-commerce transfer points and distribution centers “have bypassed parts of West Virginia and other parts of Appalachia again”, an occurrence reminiscent of other industries and services that have spread across the rest of the United States but skipped over Central Appalachia.

Another economic trend, with layers of social and environmental injustice and struggle embedded in its history, is the decreasing intensity of the extractive mining and logging industries. This trend is viewed positively by the interlocutor who mentioned it. An interlocutor who conducts research on sustainable transportation said that “at some point, if they’re not hauling coal, timber, or other minerals out of the mountains, the railroad companies may have to look into passenger rail to shore up their finances. It’s very restrictive and problematic now but as our energy future changes, there may be some opportunities there.”

I also asked interlocutors a direct question about the impacts of the ADHS on their capacity to maintain and expand public transit service. I divided their answers into two groups, negative effects and positive effects. Negative effects of the AHDS included extensive car dependency, low population density, and increased freight activity to the detriment of local industries and intra-regional movement. There was a widespread consensus among the interlocutors that the ADHS
helped to connect Appalachia with the global economy. However, several interlocutors stated that this was not a positive benefit for Appalachian residents, readily noting the drawbacks of that connection. One transportation researcher explained that “something that provides access to transit or provides access for people in this part of the world to connect with each other or to connect outside of Appalachia also connects extraction to the rest of the world.” By mentioning extraction, this interviewee was alluding to the mining and logging industries, as well as the destruction that those industries have wrought on the environment and social fabric of the region. These industries, and their implications for contemporary mobility characteristics in Appalachia, are discussed in more detail in Chapter 5. Overall, interlocutors acknowledged that the ADHS had succeeded in connecting Appalachia with surrounding and distant regions. However, they also readily expressed skepticism regarding whether that connection actually counts as a success, especially from a mobility perspective.

Some interlocutors asserted that the ADHS and its accompanying freight movement have negatively impacted mobility, namely for transit-dependent Appalachians. The ADHS “is more for improving freight access and truck access for the movement of goods. I think it has hurt mobility of pedestrians and bicycles. It’s improved access for a few people but mainly people that use a vehicle,” said one interlocutor. Again, this finding is supported by older assessments of the ADHS and regional historical context that is further considered in Chapter 5.

Positive effects of the ADHS amounted to the raw benefits of having more paved roads in the region. The public transportation that already exists in the region is made possible by paved roads and expensive construction engineering technologies that allow highways to be built on steep grades and to withstand extreme temperatures and inclement weather. One interlocutor noted that “any infrastructure improvements you make will facilitate better operation and mobility and can
only help to improve things like access to healthcare, businesses, and jobs.” Another interlocutor had observed that a lot of businesses came to their area since the completion of Corridor G of the ADHS. “People that do have a car are able to get to larger shopping centers because of the ADHS. I see it as good and bad; progress for progress’ sake isn’t always that good.” Table 5 displays the breakdown of positive and negative effects of the ADHS mentioned by interlocutors.

<table>
<thead>
<tr>
<th>Effects of ADHS</th>
<th>Mentions</th>
<th>Interlocutors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Positive</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

I also asked interlocutors what they understood to be the intent of the ADHS. Many outlined the history of ARC and the ADHS, noting that the two originated from the Kennedy administration’s aim to improve economic conditions in Appalachia by linking the region with the rest of the country. “The ADHS was born out of this desire to connect the difficult topographic region of Appalachia to other areas, like the eastern seaboard, the Midwest, and the north,” one interlocutor commented. A couple of diverging histories emerged from there. First, that the intent of the ADHS was in fact to amplify mobility and accessibility for Appalachian residents, by “helping the rural communities have access to a transportation network.” Second, that the focus was actually on facilitating commerce and business development without much consideration for transit. “I can’t really see where much consideration has been given to the transit side of things” said one interlocutor of the ADHS. Others said they hadn’t given the history or intent of the highway system much thought.
Still other interlocutors felt that the original intent of the AHDS may no longer be relevant in today’s mobility landscape. “Sometimes I think they may be stubbornly doing these things just so they can check it off the list. I get the feeling sometimes that maybe ARC needs to update its needs and revisit the needs of the ADHS and make sure they’re still on track to do what’s best with the money they have” one interlocutor said. Concerns like these point to a need for transit providers and ARC to regularly update and exchange their long-term mobility and sustainability goals for the region based on transit trends and social needs. Table 6 displays the three possible intents of the ADHS according to interlocutors.

Table 6. Sub-Theme: Intent of ADHS

<table>
<thead>
<tr>
<th>Intent of ADHS</th>
<th>Mentions</th>
<th>Interlocutors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobility</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Economy</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Connect</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Each interlocutor was asked what they consider to be the role of public transit in Appalachia. Most addressed the question by emphasizing that public transit is a necessary public service because it provides a “bare minimum” amount of mobility to those who don’t have licenses, don’t want to drive, or can’t drive. “Even if it was twice a week, at least it’d be something that people could get to,” answered one interlocutor. Another interlocutor phrased the role of public transit as “access to quality of life”. There was an overwhelming consensus that public transit is an essential service.

Most interlocutors also noted the existence of a significant transit-dependent population in Appalachia and connected this to the role of public transit. The transit-dependent group is
comprised primarily of seniors and people with health problems. Among transit-dependent riders, one interlocutor said trip purposes in their agency are made up of an “even split between doctor’s appointments and employment.” Some interlocutors cited the region’s aging population as a reason for increased ridership at the agency level; seniors often have limited mobility due to health-related driving restrictions. But other interlocutors said the aging population is likely contributing to ridership decreases in their agency. “Part of it is the aging population of the county. Everything has been and continues to be on a downward trend,” an interlocutor from Central Appalachia said. Table 7 displays all sub-themes mentioned in response to the “role of transit” question.

Table 7. Sub-Theme: Role of Transit

<table>
<thead>
<tr>
<th>Role of Transit</th>
<th>Mentions</th>
<th>Interlocutors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential/Bare Minimum</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Transit-Dependent</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Economy</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Mobility</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

As was mentioned in the introduction of this section, many interlocutors mentioned their region’s solutions to transit-related issues even though it wasn’t a question on the interview script. The most common sub-themes for solutions were technology, deviated fixed route, centralization of transit service management, partnerships with third-party ride hailing services, informal transit, and the salvaging of infrastructure. Since this input wasn’t directly in response to one of my questions, this section contains solutions to several different problems. Some agencies struggle with technology because the bulk of their riders are elderly and not accustomed to scheduling rides
on apps and websites. Other agencies mentioned outdated yet unique pieces of infrastructure in their areas that they’ve been able to salvage to enhance the public transit services they provide.

One MPO director from Central Appalachia mentioned their research into the use of informal park and ride lots as rural bus stops. “If people could get down the gravel roads to the paved two-lane that feeds into the four-lane divided road, the gravel turn-offs could hold two to ten vehicles. People were frequently meeting at those spots and sharing rides to the employment centers in towns around the region,” he explained. The MPO looked into formalizing some of those trips and incorporating them into routes that were part of bus agencies that operated within the MPO boundaries. Ultimately the MPO found that there wasn’t enough demand to justify spending money on incorporating those stops. Additionally, incorporating the stops would have involved an inconvenient amount of intergovernmental coordination since the routes crossed several jurisdictional boundaries.

Another interlocutor also spoke of the use of informal transit to bridge gaps in formal transit networks in Appalachia, citing vanpooling as the main mode. “There’s been many promises of economic growth not tied to the extraction industries, but many of those have floundered. The level of trust is pretty low in Appalachia, especially trust in government. You’ll see a lot more informal transit than you would in other parts of the country.”

The Technology sub-theme includes software updates and the expansion of online platforms where riders can access agency information. One interlocutor from Central Appalachia talked about how adding auto-scheduling software to their scheduling system has enhanced the efficiency of their demand-response service. The software automates routing procedures so that an individual employee no longer has to manually compute the order of each shuttle’s daily stops. Individual employees still check over the auto-scheduler’s suggestions, but they’re now able to
devote more time to other tasks that can’t be automated. Table 8 displays all sub-themes mentioned as solutions to public transit challenges in Appalachia.

Table 8. Sub-Theme: Solutions

<table>
<thead>
<tr>
<th>Solutions</th>
<th>Mentions</th>
<th>Interlocutors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Deviated Fixed Route</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Centralization</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Partnerships</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Informal</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Salvage</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>
Chapter 5: The Legacy of the ADHS and Mobility in Appalachia

5.1 History

The second component of my research is an analysis of secondary sources on Appalachian history, mobility, and the ADHS in particular. This chapter’s investigation of both historical and contemporary contexts serves as a backdrop for my subsequent exploration of primary data. In this chapter I will first outline the history of the ADHS by drawing on a variety of academic and historical sources. Next, I will explore the history and ramifications of disinvestment in Appalachia to emphasize the link between policies like the ADHS and individuals. In the chapter’s final section, I will discuss literature that outlines the impacts and effectiveness of ARC and the ADHS at various points in time.

The overall body of work that takes a critical look at the effectiveness of the ADHS is small compared to assessments of transportation initiatives in more wealthy and populous regions. But even so, there has been a handful of different modes of assessing the ADHS. Among sources separate from ARC, the highway system has not lived up to expectations. I surveyed accounts of the success of the ADHS and adjacent topics from a wide range of perspectives. Publishing dates spanned from 1969 to 2016. Some accounts involved a specific subregion of Appalachia and others explored the region more broadly. Economic, geographical, humanistic, and policy-based lenses were used to investigate the region. I found an overall deficiency of data and analysis concerning the Appalachian region, especially recent data.

The US Interstate Highway System (IHS) was authorized in 1956, slightly earlier than the establishment of funds for the ADHS. Appalachia was excluded from IHS plans because cost-benefit analyses showed that building highways through the region wouldn’t be cost-effective. The basic demographic and geographical characteristics of the region — few large cities, relatively
minimal traffic, lots of mountainous terrain — made it an undesirable area for road development. While construction on the IHS began across most parts of the US, Appalachian towns were either completely isolated or connected to other municipalities only by dirt and gravel roads. The ADHS was intended to accompany the expansion of the IHS by extending connections to major cities outside the Appalachian region. A PARC report from 1964 explained the following:

Developmental activity in Appalachia cannot proceed until the regional isolation has been overcome. Its cities and towns, its areas of natural wealth, and its areas of recreation and industrial potential must be penetrated by a transportation network which provides access to and from the rest of the nation and within the region itself (Appalachian Regional Commission, 1964).

Plans for development of the ADHS signified an attempt to end Appalachia’s isolation and economic stagnation in one sweeping gesture. The infrastructural objective of the ADHS was to transform the region’s sloped, zigzagging, unpaved two-lane roads into highways complete with a straight alignment, low grade, additional lanes, and average travel speeds of at least 50 miles per hour (Jaworsky and Kitchens, 2016). Because of its aim to trigger economic revitalization with extensive highway construction and not much else, some describe the style of the ADHS as one of “induced growth”. Such a tactic is known to prompt immediate impacts but isn’t always able to sustain them in the long term. In their description of the process of induced growth, Lein and Day (2008) describe induced growth as a cycle that persists until costs greatly outweigh benefits:

Transit systems leading away from the urban core create a demand for highways which in turn attract industry. Upswings in the regional economy draw industry to inexpensive outlets and create pressures on the current highway network. This demand necessitates increased highway capacity in order to reach resource markets, resulting in a net shift of
people toward the highway, but not necessarily within the developed area. Transportation acts to encourage a “spill over” or “growth fallout” from the developing centers to the adjacent underdeveloped area. Hence, a cycle of induced growth begins and continues until associated costs overwhelm the benefits of the system. (Lein and Day, 2008)

For decades, transportation infrastructure in Central Appalachia has been dominated by projects associated with the ADHS. Many ADHS corridors are four lanes each way, engineered to facilitate traffic from freightliner semi-trucks loaded with coal and timber. Planning for the ADHS was predicated on the idea that an extensive highway system would spawn top-down economic development by ramping up key regional industries, like mining and logging. As demand for these industries has declined, the lasting purpose of the ADHS has come into question. Some critical assessments of the highway system have argued that it was never beneficial to actual residents of the region. Other assessments project a rapidly declining level of utility as new forms of energy replace coal power and Appalachian residents themselves increasingly amplify demands for independence from the mining industry (Rice and Burke, 2018).

Rural transit in Central Appalachia can’t be discussed without referencing the harsh economic and social conditions that have plagued the area for centuries. Billions of dollars have been poured into road and rail infrastructure projects with the hopes of generating economic growth and development. But still today, the region remains one of the poorest in the country. Given the strong relationship between transportation infrastructure and economic development, especially in the case of Appalachia, it is crucial to draw on assessments of past attempts to leverage such infrastructure to alleviate social problems. In this region, the primary mode of achieving this has been through the construction of the Appalachian Development Highway System.
Notions of autonomy and solidarity throughout Appalachia have culminated in a social and economic climate that is highly conducive to the expansion of public transit. This topic is also critical to the work of contextualizing the ADHS within the region’s layered histories. In the following paragraphs, my aim is to further the case that public transit has a place in Appalachia and in other rural and oft-overlooked regions. When interpreted as a source of mobility, public transit fits squarely into a suite of elements that are critical to building regional autonomy. The following paragraphs will summarize the recent history of autonomous governance in Appalachia.

Appalachia has a long history of grassroots organizing. Beginning with labor unions whose aim was to advocate for better working conditions in coal mines, a new variety of organizing has now swept the region. The new wave encompasses a range of economic and environmental issues and is led by a young and diverse cohort of activists. Appalachia faces a set of deep-seated problems, but at the core of every organization’s narrative is a desire to reclaim and redirect power to build a more autonomous society. Tackling more specific issues is a means to that end. Take, for example, The Stay Project, a grassroots organization of Appalachian youth. Its focus is on generating collective imaginations of alternative futures for Appalachia to grow interest in long-term residence and improve population retention. The Stay Project uses collective imagination as a tool to reclaim Appalachia from the corporations that have exploited the region’s labor and environment and swiftly morphed it into a place that youth want to escape.

Organizing for autonomy in Appalachia has taken various forms. The region’s rich ecological landscape has long been the impetus for serious environmental exploitation. Harvesting of the region’s environmental resources, namely coal and timber, has been orchestrated via a suite of neoliberal policies and practices. The timeline of environmental and economic struggles in Appalachia has followed a process which economic geographer David Harvey termed
accumulation by dispossession. In the iteration of this process that has unraveled in Appalachia, resources and local labor were first harnessed by national and international conglomerates. The region’s raw extracts were transferred elsewhere for processing and distribution, which then spawned capital accumulation. Locals were left reliant on meager labor opportunities afforded by this system, while regional infrastructure was upgraded to facilitate a new level of industrialization. Work opportunities provided increasingly vital wages to locals and industry-focused infrastructure enclosed residents, further limiting their opportunities for intra-regional and upward mobility (Smith, 2015).

Because the machine of environmental exploitation in Appalachia has been heavily reliant on low-wage, high-risk, and local labor, unions coalesced to address issues affecting workers’ rights. The region’s labor unions were largely one-sided, resulting in the surfacing of pro-coal and male-only worker narratives. In response to labor unions’ hyper-focused trajectories, environmental movements emerged to address the perils of a pro-coal agenda. The new wave of Appalachian grassroots organizing is a response to the tension between past movements that calls for the dismantling of the primacy of resource extraction industries to reclaim and restore regional autonomy.

Appalachian labor unions were active long before the heyday of company towns in Central Appalachia in the 1920s. Coal worker union membership and organizing peaked alongside the national height of Appalachia-mined coal consumption in the 1990s (Schifflett, 1991). Labor unions secured wage and retirement protections for miners as the industry mechanized. They also advocated for a safer and healthier workplace in response to the Coal Workers’ Pneumoconiosis (commonly known as “black lung disease”) epidemic, which still plagues the region today. Grassroots organizations, like Kentuckians for the Commonwealth (KFTC), have complemented
the work of organized laborers by broadening their narratives to include all members of the region, not just employed miners who tend to be young, white, and male. The ways that grassroots groups have supplemented organized laborers’ narratives in Central Appalachia is a clear sign of the catalytic potential of grassroots organizing and the region’s desire for autonomy. Smith (2015) highlights this potential in her account of gendered resistance to the coal industry in Central Appalachia. Coal workers’ labor movements have historically been one-sided, focusing only on securing protections for miners. Smith (2015) describes this shortcoming in more detail:

Exclusion of women from underground mining, coupled with extremely limited employment opportunities elsewhere in this monoeconomy, exaggerated gendered divisions of labor, space and identity. This historical imbrication of gender and class facilitated working-class solidarity and resistance, but its legacy today carries quite different political implications. (Smith p.570)

Smith’s characterization of the work of miners and their unions introduces a gendered dimension to the story. In Appalachia, class solidarity has been built by and for members of “the brotherhood of mining”. It wasn’t until recently that more inclusive narratives have taken center stage. The work of Central Appalachian miner unions has without a doubt translated to significant wins for laborers around the country. But separate grassroots organizing has ditched the hypermasculine themes embraced and promoted by the labor unions and begun conversations about how to pivot away from coal.

To accomplish this, some Appalachian grassroots groups sought collaboration with counterparts in the Global South. Smith outlines an example of how KFTC has exchanged knowledge with indigenous groups in mining regions in Colombia. “KFTC members’ travels to
Colombia have exposed them to potent political alliances between radical trade unionists and indigenous people who contest the coal industry’s power”, Smith writes. Building an alliance across diverging scales is an approach to change-making termed by scholars as situated solidarity. Rice and Burke (2018) describe one iteration of situated solidarity in which cosmopolitan-based anti-fracking groups turned to environmental activists in western North Carolina for movement-building inspiration. Smith describes situated solidarity as an instance of “exchange between two distant sites of struggle against the corporate power of the global coal industry in order to enable the creation of a countertopography.” By using a transnational and inclusive approach to thread the needle between labor rights, health, and environment, grassroots organizing in Appalachia has advanced conversations and expanded opportunities for regional autonomy.

Another crucial feature in the constellation of organizing in Appalachia is the region’s environmental movement. Appalachia’s environmental movement is often portrayed as standing in opposition to the region’s organized labor groups. As I explained earlier, mine worker union narratives have often failed to advocate for whole-community and whole-region benefits of improved labor conditions. Additionally, they’ve formed bold demands aimed at preserving the coal industry. Despite some evidence of cooperation between unions and anti-mountaintop removal activists in the past, the coal industry’s economic control over the region has put environmental goals at odds with the prospect for economic prosperity under the status quo system.

The Ohio Valley Environmental Coalition (OVEC) is an example of a grassroots environmental group whose potential to heal Appalachian land has been minimized because of the coal industry’s fabrication of a false dichotomy between economy and environment. By emphasizing their opposition to mountaintop removal coal mining and advocating for renewable energy to replace coal, OVEC has established itself as one of the premier environmental advocacy
groups in Central Appalachia. However, the neoliberal economic policies of recent decades have instigated a dichotomy between authentic environmentalism and economic success, which has rendered the goals of OVEC incompatible with those of Appalachian labor unions. These groups demonstrate how autonomy-focused narratives have successfully bridged the gap between the plight of coal workers and the goals of environmental movements in Appalachia.

Rice and Burke (2018), who conducted a longitudinal participatory-action project in Southern Appalachia, describe the region’s relationship with land as a commons environmentalism. However, they point out that the meaning of this relationship to Appalachian residents might differ from a more cosmopolitan-environmentalist interpretation by explaining that “the disenfranchisement of people in Appalachia is deeply tied to place-based politics of extraction, exploitation, neglect, and stigmatization. Put simply, we argue that the mainstream environmental community must work harder to reach marginalized communities with very different political orientations” (Rice and Burke, 2018).

Rice and Burke make the questionable assumption that knowledge flows primarily from cosmopolitan and mainstream centers to rural regions or, more specifically, regions with pressing economic and environmental tensions such as Southern or Central Appalachia. But the overarching theme of their argument, that characteristics and priorities of environmental advocacy solidarities differ based on the social and geographical contexts in which they’re situated, is insightful and can inform future efforts to build alliances between diverging rural localities. As globalization intensifies, there’s a growing need to draw connections between solidarities of varying scales and settings. Contemporary environmental organizing in the region is evidence that “Appalachian exceptionalism” is not the right lens through which to approach environmental advocacy.
The work of the Highlander Research and Education Center exemplifies how success can emerge from comparing and connecting solidarities across scales and settings. Highlander’s ‘Beautiful Solutions’ project, which grew into a gallery, lab space, and an upcoming book, creates a channel for knowledge exchange between collectives in Central Appalachia, cosmopolitan and mainstream political movements, and grassroots cooperatives in the Global South. This work also exemplifies Appalachian residents’ familiarity with and openness to more just economic and environmental governance systems. By articulating and demanding the power of autonomy, these groups are dismantling the precedent of incompatibility of economy and environment.

The emergence of these groups — and collaboration between them — is evidence of a new organizing ideology in Central Appalachia. These groups have built upon the work and struggles of previous regional movements. They also have the flexibility to scale solidarities between varying settings and exchange knowledge between rural and cosmopolitan, Global North and Global South. By incorporating environmentalism and economic success in an anti-capitalist framework, these groups’ narratives are resistant to the fractioning effect that neoliberal forces have imposed on the Appalachian grassroots in the past.

The intent of this section was to contextualize the ADHS within the broader social and political climate and history of Appalachia. Additionally, this section was meant to serve as framing and as a reference for the remainder of the thesis. For example, Chapter 2 summarizes the conditions of rural transportation and mobility in Appalachia, and the history of those conditions harkens back to social and economic problems in the region that ARC aimed to address. Another example is Chapter 4, which features interview quotes and data that commonly reference the historical events and dynamics reviewed in this section. With this essential contextual information
now addressed, the rest of this chapter will be focused more narrowly on the topic of public transportation in Appalachia.

### 5.2 Assessments of the ADHS

A critical realm for early research on the ADHS was pinpointing the intent and vision of the project. If, as Gauthier (1973) understood the policy, the ADHS was to be an instrument for the redistribution of income and the basis for providing social services to those areas least able to finance them, it is logical to expect a linear relationship between per capita highway funds and per capita income in the region benefitting from those funds. But the results of Gauthier’s analysis of the early performance of the ADHS were inconsistent with that expectation.

More recent ledgers of state-by-state ADHS funding are hard to find and provide only vague insights. A running total of approved miles for the construction of local access road projects with ADHS money from 2019 reveals that the Central Appalachian states of Kentucky, North Carolina, and West Virginia had a strikingly low share of the total, especially when compared to the number of Appalachian counties in those (Local Access Road Projects Approved Miles, 2019). Gauthier (1973) stressed the likelihood that regional inequities would emerge under the ADHS funding model:

> Contrary to the commission’s objective, this traditional allocative procedure bears little relation to the redistribution of income to rural areas or to the provision of social services in depressed districts. It may be that the matching-funds concept of federal-aid programs encourages a geographical pattern of investment that increases, rather than decreases, regional inequities. (Gauthier, 1973)
In addition to the mode of funding distribution, critics of ARC have found faults with the actual projects that funding is allocated to. At its inception, ARC was mandated to consider human resource programs equally alongside infrastructure as an integral part of overall regional planning. In a 1973 study of the six-year planning development period for ADHS, Gauthier found that less than 8 percent of its authorized expenses were designated for health facilities and vocational training programs, despite previous attention given to critical underinvestment in educational programs and inadequate health facilities.

Gauthier (1973) composed an assessment of ARC’s adherence to and advancement of the goals of policies designed to generate success in Appalachia. The assessment takes a critical stance towards ARC, specifically regarding the funding breakdown of the highway program and budget adherence. To analyze the financial stakes of ARC programs, Gauthier (1973) utilized data from the Government Accountability Office. The conclusion of the assessment was that, as of the end of the six-year ADHS development planning period in 1973, there existed serious contradictions between the original objectives of the ADHS, the costs it had accrued, and the results it had produced.

Among the report’s sparse evaluations of the impacts of already-constructed ADHS segments was the finding that over 65 percent of benefits from freight flows through Appalachia are outside of the ARC region. This finding reflects the long-distance nature of much of the traffic along the ADHS as well as the system’s importance to national supply chains. Overall, the report focused very little on the effectiveness of the ADHS in achieving the humanistic objectives advocated for in early ARC documents. A major problem with the report’s calculations is their factoring of the assumption that the ADHS would reach completion in 2020. As of FY 2019, only
90.9 percent of the ADHS was either under construction or open to traffic (ADHS Status Report, 2019).

An evaluation of the ADHS by Munro (1969) also criticized the system’s planning. Though the analysis is over 50 years old, its account of the initial planning stages of the ADHS are still germane to conversations about how the infrastructure has impacted the region over time. Early planning paved the way for subsequent expansions of the system, both financially and on the ground. The 1969 evaluation asserts that faulty and sometimes absent planning attempts resulted in misplaced corridor segments, flawed cost estimates, and an altogether erroneous attribution of Appalachia’s stagnation to an inadequate highway system. Early ADHS documents and commodity transportation and governmental finances data from the United States Department of Commerce and the Census Bureau were adopted by Munro to argue that Appalachia’s major manufacturing industries had not faced shortcomings severe enough to inhibit them from using the region’s existing highway infrastructure. Munro concluded that highways do not address the basic reasons for Appalachia’s lack of growth.

Like Gauthier and Munro, other earlier scholars also sought to uncover hidden objectives of the project. In doing so, the true intent was only obfuscated further. A solely historical analysis could spend more time analyzing the dated and speculative papers dedicated to pinpointing ARC’s intent with the ADHS. However, the approach of this thesis is equally concerned, if not more so, with the ADHS-induced plights of contemporary transportation planners and impacts on regional mobility. All we can confidently say about the intent of the ADHS is that its aim, in true 1960s fashion, was to trigger some form of regional revitalization through extensive highway construction. Gauthier described this approach as one of induced growth, and the development of
spatial and computational research methods has allowed contemporary scholars to more definitively measure its impacts.

Spatial analyses have been employed to better understand how effective the ADHS has been in fulfilling its objective to revitalize Appalachia. Lein and Day (2008) explored the efficacy of the induced growth concept embodied by early ADHS policy through an examination of land use changes in southern Ohio. Using Landsat images from 1976 to 2002, the examination revealed slight, yet significant, levels of urban expansion within a 10-kilometer corridor along the ADHS. With this finding, it is important to mention that, according to approved miles data from ARC, Ohio is among the states that receive the greatest share of ADHS funds relative to the total state area that Appalachian counties account for. Gauging ADHS success in more impoverished and less-funded states is a domain in which future research is needed.

To explore a more humanistic perspective on mobility trends in Appalachia, I turned to a study of place attachment and migration in eastern Kentucky. Barcus and Brunn (2009) used survey results from attendees of family reunions as their primary data source. Responses led to the formulation of three types of mobility, each comprising a distinct set of demographic characteristics. The research found that lack of migration away from a home county does not necessarily indicate strong place attachments. Instead, lack of migration in the study region was found to be associated with negative perceptions of a home county, low income and educational attainment, and an inability to leave. The study doesn’t directly address the ADHS or the general impact of transportation infrastructure on mobility in Appalachia, but its data are still valuable because they show how place-specific attitudes and mobility trends in Central Appalachia share the same systemic causes as problems that the ADHS seeks to resolve.
Situating the timeline of the ADHS within cultural and historical context is critical to understanding the varied impacts of the highway system on the region. It is common knowledge that the population of Appalachia, and especially that of Central Appalachia, is growing at a slower rate than the rest of the United States. Some subregions of Appalachia are even facing population decline. Barcus and Brunn (2009) noted that the large outflows of migrants from Appalachia have often been complemented by migrants returning to the region. While outmigration is attributed to changing economic circumstances and cycles of employment opportunities in neighboring regions, return-migration is associated with individual characteristics, including place attachment, family ties and economic opportunities. Though circular and return migration, as well as place attachment, are widely chronicled features of Appalachian culture and demographics, Barcus and Brunn (2009) speculate that return migration probably only comprises a small percentage of total migration in the region.

In exploring possible motives behind migration patterns typical of Appalachia, Barcus and Brunn (2009) conceptualized three types of place attachment and mobility couplings: Rooted in Place, Tied to Place, and Mobile but Attached. Rooted in Place respondents were lifelong residents of their home county or an adjacent county, expected to spend the remainder of their lives in that county, and indicated that they had the choice to leave Appalachia but desired to stay. Among Tied to Place respondents, most had never moved beyond their home county or adjacent counties. This group was generally lower-income and indicated having little choice in moving. They list reasons for moving that include family dissolution, inability to pay rent, and other personal economic, social, or health crises. These individuals reflect the high levels of mobility characteristic of impoverished rural households.
Tied to Place respondents were the least positive in describing their home county, with only about half of respondents using positive words to describe their home county. Members of this group have very weak place attachments; instead of the positive emotional bond that the idea of place attachment captures, Tied to Place respondents’ personal circumstances and family obligations confined them to place. Respondents from this group indicated a desire to move elsewhere, namely to larger US cities outside of Appalachia. Mobile but Attached respondents were born in a Central Appalachian county but had since moved to take advantage of an economic opportunity. Respondents in this group had somewhat higher incomes than the regional average and reflected the most positive view of their home county, with more than 82 percent describing it in positive terms. In a summary of their findings, Barcus and Brunn stated that:

Long-term immobility is chosen by a few respondents, but imposed, either economically or socially, on many others. For those who are Tied to Place, weaker place attachments seem less important to determining migration behavior than individual social, economic, and housing circumstances. Similarly, for those who are Mobile but Attached, economic status and educational attainment allow them freedom to migrate while maintaining strong place attachments. Strong place attachments do not prohibit migration nor do weak place attachments facilitate greater mobility. (Barcus and Brunn, 2009)

Overall, place attachment is found more among higher-income, opportunity-rich populations from the region. Being Tied to Place, a state of obligatory immobility, is associated with lower-income and less-educated residents of Central Appalachia. Residents who are tied to place also describe their home more negatively than residents with less obligatory bonds to the region. Though this study didn’t explicitly mention the role of the ADHS in facilitating mobility among people with bonds to Central Appalachia, respondents’ insights are surely influenced by the system, since it is
the primary means of transportation within the region and one of the few routes of egress. Additionally, according to the objectives of the ADHS, its construction should have alleviated factors that tied to place respondents expressed as reasons for their obligatory bonds to the region.

The concept of place attachment is commonly referenced in accounts of immobility in Appalachia. Immobility is a key physical and cultural feature of the region, and one that the ADHS has purportedly been designed to reduce. After almost 50 years of ADHS progress at the time of this study, a speculative relationship can be formed between respondents’ answers and ADHS impacts. Future work could entail conducting a survey that more straightforwardly addresses perceptions of the ADHS among Appalachian residents.

A handful of methodologies have been employed to measure whether the ADHS has lived up to its promise of improving economic and social outcomes on a regional scale. In this section I will highlight those methodologies and the specific findings they produced. One approach involved a Cobb-Douglas production function, a model used in microeconomics, to measure the impacts of ADHS Corridor G. This four-lane corridor passes through northern West Virginia and northern Kentucky and connects coalfields in those sub-regions with IHS corridors leading to larger, coal power-consuming urban areas. According to the research, Corridor G was selected for analysis because it was an “ideal example of the type of location intended to benefit from the construction of the ADHS”.

Hicks (2014) used data from 1978 to 2000 and selected years of education per capita and real construction income (a proxy for physical capital) as dependent variables. Independent variables were dummy variables that represented the construction and completion of Corridor G. The results of the production function model showed no evidence of increased economic activity among small businesses in counties adjacent to ADHS corridors. Additionally, the model “yields
estimates which reject a finding that Corridor G’s construction has added net economic activity to the region”. The paper stresses that the impacts of water, sewer, gas, and electricity could have impacted the region’s development as much as or more than highway construction (Hicks, 2014).

Another study isolated Corridor D of the ADHS, which runs through southern Ohio. This approach involved using NASA’s Landsat satellite to track changes in land use along the corridor. Lein and Day (2008) used remote sensing data from the satellite to recover information about land use and land cover changes along the corridor between 1976 and 2006. Data revealed a “macro-pattern” of land use conversion along Corridor D. Land use conversion mainly constituted intensifications from agricultural land to low-density urban areas. The degree to which urban change could be attributed to the highway system was considered through a series of spatial models implemented using GIS. The spatial models revealed that the highway was likely the cause for intensifying land use, but that “the rate of expansion is low, and the region remains an Appalachian landscape with physical, economic, and cultural barriers that prove hard to remove” (Lein and Day, 2008). It is important to note that upward shifts in land use intensity do not necessarily correspond to improvements in economic and social outcomes. In fact, many researchers have documented how the industrialization of Appalachia has resulted in exploitation of labor and land (Nesbitt, 2019; Smith, 2015).

A fourth approach to measuring the economic impacts of the ADHS combined qualitative data from interviews, on-the-ground observation, and Census data. The study paired each Appalachian county with a “twin” county elsewhere in the US that had similar economic and demographic characteristics. Data from 1965 to 1991 about Appalachian counties and their twins were compared in order to determine which set grew faster. Findings showed that Appalachian counties grew significantly faster than twin counties, but not necessarily because of the ADHS or
other economic growth policies implemented in Appalachia. For example, the researchers noted that counties in southern Appalachia were the main cause for the entire region’s overall faster growth. The researchers wrote that “perhaps the Sun Belt-Snow Belt phenomenon played itself out within Appalachia with sufficient strength that the southern states produced positive effects for all of Appalachia”. However, many counties in the control group were also in the Sun Belt. When controlling for this phenomenon, Isserman and Rephann (1995) found that Appalachian counties benefitting from ARC funding grew faster than their twins, but that ADHS construction alone was not a determining factor. They concluded that social services funding for the region was more integral to economic development than highway construction (Isserman and Rephann, 1995).

In June 2008, a report of an economic impact study of the ADHS was published by a consulting firm as a deliverable for ARC. Even though close to 90 percent of the ADHS was complete at the time the study was conducted, the report focused largely on forecasting outcomes of total ADHS completion for the entire Appalachian region. To do this, the consulting firms utilized regional economic data and a cost-benefit analysis framework. The report estimated that, upon full completion of the system, travel times will be reduced for personal, business, and long-distance freight trips. Also forecasted was a significant increase in traffic along largely rural interstates and expressways, and benefits for distribution, manufacturing, and mining and utilities businesses (Cambridge Systematics 2008).

The report also stressed the success of the ADHS in reinforcing intra- and inter-regional freight shipping. It speculated significant growth in extractive industries upon completion of the ADHS which, according to this report, was scheduled to occur in 2020. The only mention of ADHS-derived success for individual residents of the region was in projected reductions in travel time to airports. However, the report speculated that overall traffic would increase significantly
with the eventual addition of yet-to-be-completed segments of the system (Cambridge Systematics, 2008). Clarifying the existing and expected changes to traffic levels caused by the ADHS is an important task for future research. See Figure 3 for a map of completed ADHS corridors.

Though the Cambridge Systematics (2008) report did little to describe existing effects of the ADHS or ramifications for individual residents of Appalachia, it did highlight some findings regarding commerce and travel. Over 65 percent of benefits to freight flows were external to the ARC region, reflecting the long-distance nature of the shipments affected and the national importance of completing the ADHS to facilitate goods movement into, out of, and through the ARC region. Projecting the importance of Appalachia as a national corridor, the report asserted that over half of the travel efficiency benefits are expected to accrue to business-related travel, namely commodity-based freight truck trips, local non-freight truck trips, and business (on-the-clock) automobile trips.

The report speculated that industries in the ARC region that will benefit most directly from ADHS completion include warehousing and distribution, manufacturing, and mining and utilities. It is uncomplicated to conjecture that an improved highway system will result in more efficient movement of goods through a region. Though the report does assert that goods will move more efficiently through Appalachia as a result of the AHDS, it fails to elaborate on the potential consequences on Appalachia’s residents, public services, and local job markets. The ongoing execution of such an expensive and purportedly lucrative project requires continuous and comprehensive gauging of success for more than just regional and national commerce.

When examining peer-reviewed assessments of the ADHS, it becomes clear that the results of the project haven’t met standards set by ARC over 50 years ago. The logic of the ADHS equates
regional success with infrastructure-induced economic output rather than improved housing, health, and educational outcomes. Some older literature even suggests the idea that transportation infrastructure could act as economic development was flawed to begin with — that “transportation investment has not been found to be a good initiator of economic redevelopment in depressed regions” (Munro, 1969). The latter claim has been contradicted by more recent literature that highlights how “the highly transactional and service-oriented functions of many transport activities underline the complex relationship between its physical and human capital needs” (Rodrigue, 2020). Despite the possibly numerous levels of failure of the ADHS, we must acknowledge that paved roads are critical to reliable public transit service. Even though the highway system was essentially established to intensify harmful and extractive practices like mining and logging, as my interview findings showed, the infrastructure can be repurposed to better serve public transit.
Figure 3. Map of Appalachia with ADHS corridors highlighted (Appalachian Regional Commission, https://www.arc.gov/appalachian-development-highway-system).

In examining the history, planning, and effects of the ADHS, I made several key findings and identified some problems for future research to address. My first finding was that evaluations of ADHS success are inconsistent and often conflict with each other. Lein and Day (2008) mention
that the degree to which the ADHS has contributed to growth remains uncertain and that comparatively little is known concerning the extent that land use change may be attributed to the long-disputed program. Despite this, their study of Landsat images was able to establish the formation of slight, yet significant, levels of urban expansion within a 10-kilometer corridor along the path of the ADHS in southern Ohio. The examination concluded that the rate of urban expansion in the region is low, and that the region remains an Appalachian landscape within physical, economic, and cultural barriers that prove difficult to remove. Jaworsky and Kitchens’ (2016) economic evaluation concluded that significant, yet very subtle, increases in market access and employment, as well as decreases in travel time, are attributable to the ADHS.

When factoring in time elapsed since the establishment of the ADHS and nationwide economic trends, the evaluation conjectured that today, the region’s performance, as compared to national averages, hasn’t shifted from its position in the 1960s. Despite substantial investment in transportation and some gains in income per capita, the region continues to lag behind the rest of the country. This trend was elaborated upon by a series of findings, including that a 1 percent increase in predicted travel time decreased market access by nearly 2 percent, that market access was targeted to high income or high growth locations, and that a 1 percent increase in market access led to a 0.8 percent increase in total income.

While improvements in market access have occurred in Appalachia, the employment gains have been slower than in the rest of the country and the region has benefitted less from transportation and trade-based employment (Jaworski and Kitchens, 2016). Findings that ADHS-induced growth is detectable but very slight were furthered by claims that growth inducement may constitute an adverse impact if it is not consistent with, or accommodated by, the plans or policies
of the affected area (Lein and Day, 2008). Jaworski and Kitchens (2016) deduced that the economic impact of the ADHS was smaller than that of the Interstate Highway System (IHS).

In addition to improving outcomes for commerce, ARC was charged with the responsibility of improving the wellbeing of Appalachian residents. Cost and benefit analyses of the ADHS have become redundant and uninformative because they consistently yield the same result, that highway expansion improves logistical efficacy for industry. There is still little clarity regarding the specific impacts of highway transportation (or lack thereof) on the stunted success of Appalachia. In exploring the reasons for the region’s hardships, some research points to reasons apart from transportation. Other research attributes only a barely significant amount of development to regional investments in highway infrastructure. And in still other cases, Appalachia’s success rests entirely upon furthering ADHS expenditures. The wide range of assessments exposes a gap in the literature that I aimed to fill by collecting qualitative interview data from transportation practitioners in the region.

In this section, I explored the breadth of perspectives on the effectiveness of the ADHS in meeting ARC’s objectives. The literature on the ADHS, though little of it is devoted to this topic, debunks the merits espoused by ARC and ARC stakeholders, expresses criticisms, and only occasionally finds slight benefits of the system. In some cases, wide-ranging perspectives incite clarity. But in the case of the ADHS, the array of stances and findings only raises further questions that prompt a need for perspectives from planning practitioners on Appalachia.

My exploration of the ADHS and its overlapping and adjoining histories yielded direction for my subsequent collection and analysis of primary data. First and foremost, I discovered that it is imperative to collect more data from Appalachia, namely data that is specific to the effects of this decades-long highway network construction project. Quantitative and spatial data are
necessary for verifying the strategic placement of ADHS segments and evaluating the economic effects of the network. However, I found that humanistic data must be a key pillar of my own investigation because neither qualitative nor ethnographic approaches have been used in existing examinations of ARC’s policies. Further, place attachment data cannot serve as a proxy for measuring individuals’ satisfaction with the ADHS because it is too speculative a substitution. Using up-to-date data, future work must also clearly establish the degree to which the ADHS and other ARC policies have positively or negatively impacted quality of life for residents of the Appalachian region.
Chapter 6: Future Work, Recommendations, and Conclusion

6.1 Future Work

Future work in this realm should build upon findings from critical academic sources, agency- and MPO-level reports, and the interview data compiled in this project. One direction for a future exploration is to test practitioners’ claims against population density and car dependence rates across the region. Interview data has revealed that population and car dependence are both factors that hinder practitioners’ capacity to plan for more effective public transit service, but it’s unclear whether these factors are related to each other or how they might be related to the ADHS. Some interlocutors cited both factors as effects of the ADHS, others said they were both barriers to improving mobility, and some interlocutors said the factors were both effects and barriers.

Another potential lens through which future researchers or practitioners could approach this topic is spatial analysis. Drawing on Lein and Day’s (2008) inquiry into land use changes along ADHS corridors in southern Ohio, spatial analyses rather definitively reveal patterns in human behavior. The USDA Food Access Research Atlas database tracks zero-vehicle households at the census tract level, which could be used as a proxy for transit-dependence. Other features in the database could aid in the creation of spatial measures of accessibility to essential services, such as grocery stores, schools, and healthcare. Landsat images could help measure changes in population density over time in ADHS-adjacent areas. Spatial analysis will be integral to the work of examining practitioners’ claims and pinpointing causality.

One final suggestion for future work is to expand qualitative interview data collection to residents who are able to share their experiences with either the ADHS, a public transit agency, or a grassroots organization in Appalachia. A loose plan for an ethnographic approach to this topic was discussed in Chapter 3. With ethnographic field data from residents and public transit users,
researchers and practitioners could glean insights regarding policy and transit design options, as well as better understand the impacts of the ADHS on the region’s capacity for public transportation planning. For example, ethnographic findings could aid in a comparison of the problem-solving approaches of grassroots organizations and those of ARC.

6.2 Recommendations

Aside from the obvious exhortation to devote more funding to public transportation, the results of this project have revealed three clear recommendations for transit agencies in Appalachia and for ARC. The first recommendation is to begin taking steps towards building a regional transit coordinating body. A common and debilitating problem mentioned by interlocutors was the lack of inter-agency coordination. In some instances, this problem contributed to route duplication, unnecessary traffic, and confusion for operators and riders. In other instances, a lack of inter-agency coordination was the culprit behind inconvenient and abrupt network coverage boundaries and gratuitously long wait times at transfer points. Because essential services are scattered across Appalachia’s low-density landscape, travel across county and state boundaries is especially common there. Jurisdictional boundaries that individual agencies must adhere to don’t always align with commute flows and other trip patterns. A regional coordinating body consisting of representatives from across Appalachia would work towards dissolving those boundaries for transit agencies and would harmonize route networks to mitigate route duplication and unnecessary service partitions.

Another recommendation for Appalachian public transit agencies and ARC to explore based on this research is to further investigate the role that informal transportation plays in regional mobility. Despite Appalachia’s trend of informal transportation that was mentioned by several
interlocutors, ARC’s 2020 Public Transportation in Appalachia Inventory and Assessment report, on which this project is loosely based, doesn’t mention the phenomenon at all. However, it does state that ARC has opportunities to fund “studies for local public transportation providers to identify unmet needs for public transportation services with an emphasis on those relating to workforce transportation and exploring various solutions (e.g., fixed route service, vanpools/carpools, demand response, microtransit, etc.) for meeting those needs.” Interlocutors observed that informal transportation may be filling gaps that current public transit networks either can’t account for or can’t address. If agencies had more data regarding these gaps, they could explore ways to better facilitate mobility for residents who use or could benefit from informal transportation. As Rodriguez et al. (2017) showed, reforming informal transportation services is especially challenging in regions where trust in government and public services is low. These scholars recommended “incremental, flexible reform” as a viable way to bolster mobility by formalizing transportation in such areas.

After more focus has been placed on regional coordination and exploring informal transit trends, transit providers and ARC should probe for ways to scale the region’s demand response networks up to deviated fixed route networks. Such a transition would likely involve extensive regional coordination and scrutiny of existing mobility patterns, including an inquiry into the role of informal transportation. Section 2.2 exhibited the merits of deviated fixed route networks in other rural and precipitous regions across the United States and Europe. Advantages included increased system efficiency in terms of VRM, increased financial efficiency for the transit provider, increased system legibility for riders, and lower costs and wait times for riders. Interview data from this research revealed that rural transit providers in Appalachia tend to struggle with all of these factors.
6.3 Conclusion

The original hypothesis, that ARC’s efforts to enrich Appalachia by investing in motor vehicle and freight transportation have negatively impacted the region’s capacity to plan for and maintain effectual public transportation systems, remains tenable after conducting this research. Though my exploration of the research questions was limited by a handful of factors, I was able to glean valuable insights about the topic by exploring a variety of critical sources and engaging directly with a group of stakeholders that is rarely represented in the literature. This section will summarize the chapters of this thesis and recount the key findings from the qualitative interview data and the literature.

In the Literature Review section, I sought to explore various accounts of the current public transit conditions in Appalachia, including ridership, supply, demand, best practices, and challenges. I revisited these conditions in the interviews that I conducted and, in the Findings section, addressed each condition individually. Interlocutors attested to the necessity of the services provided by their agencies, stating that as much as “60 to 70 percent of the current ridership” is composed of transit-dependent riders. But the data also revealed the challenges that practitioners face when working to maintain and expand the service. Management difficulties, low funding, and negative social stigmas towards public transit and services in general were among the barriers most widely noted by practitioners.

This exploration also addressed some of the influences that practitioners indicated played a role in the formation of the current conditions in the region. I found conflicting interpretations of the impacts that the ADHS has had on public transit in Appalachia. On one hand, some interlocutors felt that a cohesive network of paved roads could not have been established without support from ARC. Other interlocutors expressed that the ADHS isn’t actually a cohesive network
and that their own state- or locally funded roads provided a more effective mobility system. Several
interlocutors also asserted that the ADHS was at least one major cause for the negative aspects of
public transit planning in Appalachia. The powers behind the highway project were blamed for
inducing car dependency and fixating on network completion to the detriment of other transit
modes that may be more pertinent in today’s mobility landscape. Environmental factors, namely
the region’s rugged topography, were also mentioned by interlocutors as having influenced the
current transit conditions.

This research also revealed how agencies in Appalachia are responding to current public
transit conditions. The majority of agency adaptations fell under the Technology category, which
included the development and implementation of bus tracking apps, ride reminders, and automatic
on-demand service scheduling. The topic of informal transportation also surfaced in some
conversations, with some practitioners noting that informal solutions are especially common in the
Appalachian region. Tangential to informal transportation is the practice of salvaging
infrastructure, which was also mentioned by some interlocutors. Examples of infrastructure
salvaging include the repurposing of freight truck stops into park-and-ride lots, and the
transformation of freight rail lines into passenger and commuter lines. The emergence of these
solutions prompts a need for future work that formally explores the best practices and challenges
of informal transportation and infrastructure salvaging in Appalachia.

My final research question sought to explore the role of public transit in Appalachia
according to transportation practitioners in the region. I found that, above all, practitioners see
public transit as an imperative service even in the most rural communities. Interlocutors readily
acknowledged the presence of transit-dependent individuals and groups in their communities and
mentioned this in relation to the necessity of offering transit as a service.
Overall, this research underscores the trends, challenges, and best practices associated with public transportation planning in Appalachia and brings us a step closer to understanding the role that auto-centric policies and infrastructure have played in shaping the region’s mobility landscape. This project addressed a gap in the literature by synthesizing findings from critical academic sources and engaging with transportation planning practitioners in Appalachia to precisely address the likelihood of a cause-and-effect relationship between the ADHS and present-day conditions of public transit in the region.

Further research is still needed to either prove or disprove such a causal relationship. However, the qualitative interview data collection and analysis revealed clear indications that the ADHS has facilitated freight movement more than residents’ mobility, and that there is ample room for agency-level improvement of current public transportation in Appalachia. One such indication is the existence of substantial, and possibly growing, transit-dependence among current public transit users in the region. Another indication is the finding that transportation planning practitioners from all five Appalachian subregions feel they are limited by funding and could provide more effective service otherwise.
Works Cited


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Appendix A. Interview Script

What is your role?

What do you understand as the intent of the ADHS? (Probe for increased resident mobility versus intensification of industry)

What have been the effects of the ADHS on public transportation planning in Appalachia?

What is the role of public transportation in Appalachia?

Should public transportation be a tool for economic development?

What are some innovative things happening in Appalachia relating to transportation?

What barriers to implementing and/or expanding transit in the region?

Are there any resources or contacts you can recommend?
Appendix B. Interview 1 Transcript

Emily: What is your role?

Interlocutor: I am the director of transportation for [redacted].

Emily: What do you understand as the intent of the ADHS?

Interlocutor: From what I understand, if you’re familiar with Corridor H, it was a combination of both. Probably if you had to pick one or the other as a leading reason for doing it, it would be the commerce and business development sides of it. When you don’t have a good route or interstate to do it, it discourages travel. The more personal side for residents is that it makes it easier to travel somewhere. I know that from being here in [redacted] County. We do have the east-west interstate but it’s in the northern part of our county, so it takes you about a half hour to get to the interstate. We always joke that the worst part of the trip is the first half hour of the trip until you get there on the interstate. I would say it’s probably the residential side of it as well, but I always think of the business and commerce side as the main reason.

Emily: What has been the effect of ADHS on public transit planning in Appalachia, from your experience? How has this impact compared to the impact of funding sources like Section 5311? What other federal funding sources do you work with?

Interlocutor: That’s where, on a [redacted] County Transit side, we don't utilize Corridor H very often. If we needed to get to an area, being in West Virginia limits that too. Most of our transportation is done locally and in-county, so we don’t use the highway much. Corridor H and the rural highway system helps us more personally than it helps [redacted] County Transit, just because of the area we’re in. [redacted] County
Transit is about as far as we go in West Virginia, but we don’t use Corridor H and the new highway system very much.

Emily: What funding sources do you work with?

Interlocutor: Most of our funding for public transportation is through the Section 5311 program through the FTA and through the SSTAP with the FTA. That’s about an 80 percent split there. 10 percent is through the Maryland Transportation Administration, and 10 percent is local through our county. So, it’s an 80-10-10 split.

Emily: What do you think is the role of public transportation in Appalachia?

Interlocutor: I feel two things. First, the fact that not everyone has a vehicle or driver’s license. It’s shocking if you see the numbers of adults and some elderly that don’t have their license and never have. First question you think of is “how do they get places?” It’s not easy for some people to just jump in a car and go. For some reason people didn’t get their licenses to start with and may never. A lot of times public transportation is their only means to get somewhere, whether it be a doctor’s appointment or a simple trip to Walmart. In our area especially, the weather is a big thing too. We hardly ever shut down in the winter. We get 6 or 7 months of snow and a lot of people who do have vehicles don’t want to get out and drive in the bad weather. They would rather have us drive them. Those two things — the availability of transportation and the weather — are two factors. One more thing that I just thought of is the cost of it. They tell a funny story here in the County that our social services department director used [redacted] County Transit for years because he bought a new pickup but didn’t want to drive it every day because of gas and wear and tear. He had the transit service set up to pick him up at 7am for years. They joke that he
could have afforded to drive to work, but why do it when he paid 6 dollars round trip every day and it was cheaper than driving his new truck? You may have a vehicle available, but you might prefer to just ride and let someone else burn the gas. These are the things I keep in my mind every day when I earn income here and do my work. All of [redacted] County Transit is demand-response. We’re one of two agencies in the state that does that. Over the years we’ve tried different things. People come up with new ideas for transit in our 5-year transportation development plan through the state (MTA) and we put out surveys and talk to riders. We get lots of ideas for new things like fixed routes. We’ve tried stuff like that, but the County doesn’t have a lot of sidewalks and good places for bus stops and sidewalks and a fixed route system and everything that it needs to work well. There just aren’t enough cities with enough people. Everything is demand-response. They call us, preferably 24 hours in advance, and we’ll pick you up at your door and take you back home. Some people say, “why won’t you pick up a bunch of people at a housing development and take them to work?” We try that but people can’t get to the central pickup location. We always say “we can do better than that, we’ll just pick you up at your door! You don’t have to worry about getting to a central meeting point.” Our scheduler works on the next day’s schedule and the driver knows the evening before what their schedule will be like the next day.

Emily: Do you notice any demographic trends in your riders, like who they are and what their trip purposes tend to be?

Interlocutor: Yeah, we keep all of that in our software program. We keep the numbers, age groups, and ride purpose. Most of our riders are seniors and a lot of that is due to
some of the reasons I've already said, plus the age of the County is older. A lot of younger people, after high school or college, move on somewhere else because jobs aren’t really plentiful around here and there aren't a lot of careers to get into so the younger people don’t stay. They may come back later after they’ve been somewhere. But the age of the county is getting higher as we move along. Most of our riders are elderly. It’s probably a pretty even split between doctor’s appointments and employment, getting people to jobs. A lot of the stuff that we do deals with seniors. We deliver a lot of the Meals on Wheels program for County Community Action. About five of our drivers are utilized just for that. We also take people to get their hair done, go to Walmart, and general errands. Doctors’ appointments would probably be the leading purpose for most of the trips.

Emily: How has ridership been lately?

Interlocutor: Overall, the trend even before COVID-19 was trending down and dropping off. Before I started here, we had always had the medical contract for Medicaid through the state and the health department. If they had Medicaid, they didn't pay anything for transportation. They would schedule it through the health department, we would drive them, then we would bill the health department at the State for that. That dropped a year ago, which dropped ridership down in the middle of COVID-19, which had already made it drop. The last 15 months has significantly dropped compared to 15 months before that. We noticed that ridership had even dropped earlier. We used to take people to a substance abuse treatment center about 6 days a week. About 6 years ago, we had a waiting list for that bus. Since I've been here, we've run only 1 or 2 people down for that. Now we don’t go there at all, not even
at the end of the medical contract. You might wonder where those people are now. They’ve opened some substance abuse clinics locally, so people don’t need the bus. Now most folks are in a nursing home, so they don’t utilize our services as much. They either get transported by ambulance or the nursing home transports them. So, part of it is the medical contract ending, part of it is COVID-19, part of it is the aging population of the County. Everything has been and continues to be on a downward trend. The COVID-19 part of it is starting to come back a little bit, but they’re not back to pre-COVID-19 levels by any means yet.

Emily: What are some innovative things happening in Appalachia relating to transportation?

Interlocutor: As I said with COVID-19, we’ve close to doubled the Meals on Wheels program and that’s been a thing because the senior centers are closed. That’s their only form of communication with people. To pick up that difference, the Aging and Nutrition Department at County Community Action increased the number of meals that we’re delivering. That’s one thing that makes us feel good, and the drivers all like that. The drivers take it on themselves to help out the seniors with other things, too, because that might be the only thing that seniors see all day. The drivers will do little favors for the seniors and it might take a couple extra minutes to do a favor or just talk to someone. We’re proud of that here lately. We also added a couple modules to our software program. First, an auto-scheduler that helps our scheduler or our dispatchers when they’re creating the schedules. It makes it all more efficient. We also added a passenger call system that’s tied into the software. When the scheduler makes the daily schedule, everybody that’s scheduled to ride
tomorrow will get a reminder phone call or text telling them what their pickup time will be. Then, the next morning, the riders will get a text or call 15 minutes prior to the bus arriving at their door. That has helped people remember their rides and be ready to come out when our drivers arrive. Before, when people would forget their rides more often, our whole schedule would get behind for the day. That’s moved people along a bit and helps get them ready for their trip. Another thing is that we added cameras to all of our buses. That’s been a big thing. It’s audio and visual. Before those were installed, we’d get calls that one of our buses was speeding or something else happened on a bus or at a bike rack. I’d always have to hear two sides of the story and talk to the drivers about it. Now all I have to do is get the bus number and time and I just pull the camera up. That’s helped out; it may help the driver or hurt the driver.

Emily: What are some of the other barriers to implementing and expanding transit in the region?

Interlocutor: The fact that we get ideas all the time that people want to expand the hours of service. People in the transportation development plan said they wanted evening and weekend service, and we’ve tried those, and it started out with 8 or 10 riders and the next time there were just 5 or 6 and the next time it was the same 2 or 3 that would just ride around to have something to do because it was 3 dollars to ride all day. Financially it just doesn’t make sense to do the stuff that people ask us to look into. We will try, but usually it doesn’t work out because of the rural nature of the County. That’s a big barrier because there’s just not enough business, like industrial parks or factories, that justifies running commuter buses. Weather is also another
issue. For the most part, we can get people where they need to go with our demand-response system. Very seldom do we ever say, “we can’t get you there”. Also, everybody has problems with funding. If we wanted to add new buses and drivers or stay open later and on weekends, how would we pay for it? We still get the same funding amount from the state and federal government for 10 years. If we add a bunch of services, the funding wouldn’t be there to support it. When you’re funded by government funding, you can’t make profit and you have to spend everything they give you in the year.
Appendix C. Interview 2 Transcript

Emily: What is your role?

Interlocutor: I was formerly with the MPO as planning director for [blank], West Virginia. I then switched to planning director in Charleston, West Virginia. I am now the director of planning, grants, and compliance at the [blank] Regional Transportation Authority. What I do is I make sure that any federal regulations that apply to transit and small bus transit agencies, I make sure we’re following those regulations and I also apply for our federal grants and make sure we’re using our 5307 and 5309 money appropriately.

Emily: What do you understand as the intent of the ADHS?

Interlocutor: I used to work with the MPO in [blank], West Virginia and I dealt with the ADHS a lot more then because we were also an organization that was funded through ARC. So, I had a lot more to do with it back then and I was more involved in those projects. My understanding of the system was that it was supposed to better connect Appalachian communities and encourage economic growth. My interaction now as part of the transit authority is a lot less because we have one highway that’s part of the ADHS in Charleston and it’s Corridor G. We have a transit route that goes out there because there was economic development that sprung up, and now that’s a destination for people who ride there to go to work or go shopping. I’ll say the ADHS started way before my time as a planner, so I wasn’t around for its actual intent. I can see what’s actually happened is it’s more for improving freight access and truck access for the movement of goods. I think it has hurt mobility of pedestrians and bicycles. It’s improved access for a few people but mainly people
that use a vehicle. It developed these great big wide highways with a high speed and people don’t want bicycles on highways with high speeds. And if you’re a new or novice bicyclist you feel uncomfortable on a big wide highway. Right now, we’ve got a couple of construction projects going on Corridor G and they’re restricting access in some areas and we’ve asked for them to add bike lanes or areas for pedestrians, and we’ve documented cases where “hey, even on Google Maps Street View there’s a pedestrian or bicyclist” and the Division of Highways is kind of like “no, we’re not providing a bike lane because speeds are too fast, the hills are too high for a bicyclist to use this.” It has kind of split communities in some ways because of this. When the Division of Highways was holding their public information sessions, we had a pedestrian and bicycle advisory committee, and they all attended the meeting and said, “we’d like to have a bike lane and a designated shared use path” and the Division of Highways just said no.

Emily: How has Corridor G impacted peoples’ travel behavior in the region?

Interlocutor: It’s definitely made people more car-dependent. For folks who don’t have a car, that area is kind of blocked off for them now. But people that do have a car are able to get to larger shopping centers and we’ve had a lot of businesses come into the area because of that highway there. I see it as good and bad, but progress for progress’ sake isn’t always that good.

Emily: As a planner, does the ADHS feel like a barrier to you advocating for the kinds of things you want to see in your community?

Interlocutor: I’d like to say it gets in the way, but in reality, it’s the mountains and the terrain that really gets in the way of having a fully connected community. Not everybody
wants to walk up a hill to get to a store. Not everyone wants to ride a bike up a hill to go to the stores. That’s the true barrier there.

Emily: What do you think is the role of public transportation in Appalachia?

Interlocutor: Just to get people to work and get people to the places they want to be. We want to not only serve the population that doesn't have a car but serve the population that doesn’t want to drive their car or wants to use an environmentally friendly option.

Emily: Would you say there is a significant transit-dependent population in your region?

Interlocutor: I wouldn’t say there’s a significant transit-dependent population, but we are aware of the percentage of folks that don’t have a vehicle and where those pockets are, like which census tracts and blocks are the zero-car households. We’ve seen a lot of growth in our paratransit service that we offer. If you can’t use our regular fixed route service, we’ll try to accommodate you. The paratransit service has been slower growth since we implemented it. But since COVID-19 it seems like there are even more people using it.

Emily: Can public transit be a tool for economic development? Is that the wrong approach?

Interlocutor: I think so. Probably not the only way to think about it, but yeah. We try to take that approach, but you’re always going to have that developer who has the perfect development site for 100 apartments, and they get them all built and they’re all full and then the residents realize they’re not on a bus route and then they want us to provide service to that area. They should've come to us before then or looked at property along a bus route, but that’s kind of up to the developer.
Emily: What are some innovative things happening in Appalachia relating to transportation?

Interlocutor: I mentioned the construction out on Corridor G. Right now, they’re implementing an RCUT, which is a restricted crossing U-turn. That’s about as innovative as we get here in West Virginia, and that’s not really related to transit. Something that we’re looking at for transit is, we’ve been playing with the idea of partnering with Uber a little bit and doing some more demand-response trips. We haven’t got anything nailed down and are still researching our options, but I think we would subsidize their Uber trip. That’s what I’ve seen a few other transit providers do, and that seems to work.

Emily: How do you think a deviated fixed route system would work in your area?

Interlocutor: We’ve looked at doing something like a deviated fixed route several years ago but I can’t remember why they decided not to go with that. Maybe it wasn’t financially viable, or they just thought that if it’s only sometimes service people won’t use it. We do right now offer an express bus and it interlines with an already-existing route that takes longer. And we have an express route to get you there and back. Other than that, we don’t have any deviated routes and there’s not really any push to do that unless it would be something like a demand-response kind of thing. If the need was there randomly then we would provide that service. It would surprise me if a regionally managed system worked because you’d get a lot of “this is the way we do it here” or “this is not the way we do things in our city, so it wouldn’t work out in that way, but I really don’t have any opinion on that.

Emily: What are some other barriers to implementing or expanding transit in the region?
Interlocutor: I’ve tackled the natural barriers that we face, just the hills and the curves and the narrow streets in our area. We’ve got an older population here in and in all of West Virginia, so a barrier to that is we want to have newer technology because it helps us and increases and attracts new and younger riders, but then our older riders have trouble using it. And they still like to call in and find out when their bus is coming even though we have an app for that now. One other thing is we’d like to go cashless, but that creates a barrier to people using the system. You have to get a card and that’s a hassle. We’d like to be able to somehow load money on your phone and just tap your phone or a card. Touchless and cashless. But then again that’s a barrier to people who want to pay with cash. And then if you have two different farebox systems that’s a whole nightmare in and of itself. Also, another barrier is the negative stigma that public transit gives. Right now, we’re in the middle of renovating our transit mall. We used to have all of our buses stopping in at the transit mall, but right now that’s closed for renovations. We had to shift over one block, which has created a whole host of other problems with the businesses on that side. The businesses don’t want public transit riders sitting there, they don’t want them loitering or waiting for a bus, we can’t put bus shelters because the city doesn’t want us to, and nobody wants us around. They’ve got that negative stigma.

Emily: Are there communication barriers with other agencies and organizations in the area?

Interlocutor: We serve pretty much all of the small cities within County. We go pretty far into rural County. We have a really good relationship with the city, but for some reason they didn’t want to let us put bus shelters down one week. The next
week it was fine, so maybe they realized the problem. But that initial “no” and that initial barrier was frustrating. We work pretty well with all the small cities. A lot of them would like more frequent service, but they also realize that they’re rural and they’re just thankful to have the service that they’ve got. I know that County has wanted service for a long time, but our agency is funded through a County levy, and County people don’t want to pay for transit service in County, and some of the County residents want transit but they don’t want to pay for it. There’s also a lot of people in County that don’t want public transit riders in their area. They have that negative idea of public transit, too.
Appendix D. Interview 3 Transcript

Emily: What is your role?

Interlocutor: I’m the executive director of the Metropolitan Planning Organization. We are the MPO designated for Counties in West Virginia, as well as County in Maryland. As part of the MPO we are required, under the National Highway Act, to perform long-range transportation planning. We also develop a four-year TIP. Any projects, regardless of mode of transportation, that require federal funding have to be put into our TIP. We also put together an annual work program. We also do a lot of special studies on the side.

Emily: What do you understand as the intent of the ADHS?

Interlocutor: So, as I understand it, the ADHS was born out of John F. Kennedy’s campaigning in West Virginia and rural Appalachia when he was running, I think, for his Democratic bid and his national bid as president in the early 1960s. He was shocked by the conditions, lack of access to resources, and the isolation that many Appalachian communities have. So, the ADHS was born out of his desire to connect the difficult topographic region of Appalachia to other areas like the eastern seaboard, the Midwest, and the north. And that was accomplished through various series of corridors that have taken on the form of interstates or something similar throughout the Appalachian region. I think last time I heard, maybe 90, 91, or 92 percent was complete. And I know that the definition of what is considered Appalachia expanded to further points southwest and to parts of Mississippi and Alabama that don’t necessarily contain the Appalachian Mountain range. But, from a socioeconomic and demographic perspective they are quite similar to a lot of folks
in Appalachia. And then there've been a lot of questions about “is it worth the last 8 percent?” Typically, that’s considered the hardest, right? I know that ARC, a few years ago, had a lot of discussion about, as they have been focused on building these highways and fulfilling the original mission of the ADHS, the rise of inland ports, transfer distribution centers, and transfer points that seem to have bypassed parts of West Virginia and parts of Appalachia again. I don’t know if you’re familiar with the Prichard Project [Prichard Intermodal Development Site Project], which is near Huntington, West Virginia. It was a project that received a major TIGER grant from the feds. And I don’t know, even with all that investment, that that’s gotten up and going. I think they have sold that to a private investor. But that was one of the attempts by the feds and ARC to try to create an intermodal facility and surmount some of the return-on-investment issues that private investors have with building intermodal facilities in West Virginia and Appalachia. And that could conclude Norfolk Southern, CSX, and other folks like that.

Emily: Do a lot of riders in your region travel across county borders? How does that impact transit planning at your organization?

Interlocutor: County borders West Virginia to the south, Pennsylvania to the immediate north, and then just 30 miles south of County, on the other side of West Virginia, and Virginia. So, in 40 minutes on Interstate 81 you can be in 4 different states. As far as coordination, I wouldn’t say there’s a huge lack of folks talking. I can point to a lot of projects where coordination has been pretty good. For example, Interstate 81 is completing a 5-year widening project of approximately 5 miles that included replacing and widening two sets of bridges over the Potomac River.
between Maryland and West Virginia. That project was done completely in partnership and involved the Harpers Ferry National Historic Park, and that worked well. There are issues with agreements and liability in how transit providers can cross state lines. That has been an issue as we’ve talked about how to join the eastern panhandle system, which is EPTA, or the Eastern Panhandle Transit Authority, with County Transit. Until there’s interstate agreements for crossing state lines and insurance policies in place, some types of out-of-state travel are not permissible at this time. That I do see as kind of a roadblock.

Emily: What has been the effect of ADHS on public transit planning in Appalachia, from your experience?

Interlocutor: I guess the only portion of that that actually touches Washington County would be the part of I-68 at the very edge of where, Maryland is. So, right now while that facility has been fantastic to connect Western Maryland to Morgantown, West Virginia where West Virginia University, is and provide an avenue to Pittsburgh and points further west, there is no public transit that runs out there right now. So, County Transit does not run to Hancock. The Maryland Transit Administration does not have commuter bus service that goes that far west in Maryland, and the Maryland area regional commuter, the MARC, the passenger commuter rail, does not go that far west either. In Cumberland, Maryland and areas like that, certainly I-68 has helped them be able to get closer. But unless the transit that’s being provided is private at this time, I wouldn’t necessarily say that it has aided much in getting folks where they need to go. I guess if I-68 helps people in Hancock drive to areas where they can pick up transit further east, then yes it the
ADHS has aided in that way. I guess that would probably be the extent of it. I guess I’d have to see a good comparative analysis to comment on how the ADHS has impacted mobility, because if you look at straight operating costs and we talk about the demand and who the captive riders are, it’s not cheap to run transit in an urban area. On-demand and fixed route are both expensive. I’d like to see how public transit grew in areas that are similar to Appalachia at that time. If they did, I would have to assume that somehow the local communities made public transit a priority. There are federal allocations from FTA or from the state are dependent on your population, your VRM, your directional route miles, so the funding would have to be supplemented from somewhere else, both operating and capital. So again, if the rural areas prioritized public transit, then absolutely, I could see that happening. But often times, while they would like to support public transit, they may not have all the resources that are necessary to realize a full vision for an entire rural community. Or there could be partnerships too. Maybe if there’s a lot of partnerships in an area with a lot of 5310 recipients that are folks with disabilities, if they link up well with their local transit providers, yeah that could be a good way to bridge some of that gap. It’s always tough though, because every time there’s a transfer between systems or between vehicles, someone is less likely to consistently take public transit.

Emily: What do you think is the role of public transit in Appalachia?

Interlocutor: Well, the role of public transit in Appalachia would be for captive or choice riders to be able to access goods and services that they would otherwise be unable to. Whether you are elderly or have a disability or that’s your choice or you don’t have
access to resources, public transit is probably your only option if you don’t have access to a vehicle. It would be your only option to do the things you need to do, to live life. Every time someone steps on a bus, they’re going to make money or spend money. Public transit is access to quality of life.

Emily: Can it be a tool for economic development? Is that the wrong approach?

Interlocutor: Absolutely, for sure. Even though we are, in West Virginia and Maryland, my particular region feels disenfranchised. In County due to the proximity to Annapolis, and in West Virginia due to the proximity to Charleston, public transit is a box that developers want to check off. If they need to get shift workers there, or if you’re a hospital and you need patients to be able to get to where they need to go, public transit can absolutely be an economic development tool.

Emily: What are some innovative things happening in Appalachia relating to transportation?

Interlocutor: In our region, there’s a number of different things that are happening. It seems old hat to larger systems but both County and EPTA now have some sort of bus tracking app and some sort of way to pay remotely whether it’s Token Transit or ShareMyRide. They have real-time information on where your bus is. We’re almost able to get both systems into the GTFS feed so they will be part of Google Maps. We’re trying to get on-time performance dashboards created for the transit folks so they can review things and know how their system is performing. We are developing transit development plans, or TDPs. In the West Virginia portion of our area, we are developing, for the first time, a wayfinding system that actually has bus stop signs with phone numbers or QR codes where people can find information,
so people can know where bus stops are. If you’re not familiar with the system you just wouldn’t know where to go. In West Virginia, we have two big projects that are going on. One is that we’re getting ready to bid for a new transit center that would be in downtown Martinsburg, West Virginia. It would be a relocation of EPTA’s existing admin services and the garage as well as building a new transfer center. That’s an 11-million-dollar project. And then we’re also on the cusp of being able to develop a commuter bus service that would run from West Virginia to the Ashburn station, which is the new station that’s being built as part of the metro silver line extension, right next to Dulles Airport in northern Virginia just outside of DC. That would be a direct route to Tysons Corner, to Dulles, and to Amazon HQ2 down in Crystal City. So those are some of the things we’re working on. In Maryland, I know that Governor Hogan just signed a bill that’s going to require the Maryland DOT to investigate the feasibility of extending the MARC service all the way west to Cumberland, which would go west to Washington County. That would give access to commuter rail that would head into DC and Baltimore and all those major points east.

Emily: What are some of the barriers to implementing/expanding transit in the region?

Interlocutor: Funding, funding, funding. In Maryland, it’s a little different because of the presence of Baltimore and the role that the Maryland Transit Administration plays. They provide a lot of service and support to their local systems. They helped put together the TDPs. That being said, there can be some difficulties in having everything, if you’re a smaller local transit agency, every procurement and every request has to be processed by someone out of office. That’s a barrier. How transit
agencies can be funded can vary. You can probably have a combination for every transit system that exists. In Washington County, even though the majority of the service is conducted in the city of Hagerstown, a city of about 40,000 folks, the city doesn’t put a penny into the system. How it was originally set up was almost as if it’s a county department. It’s all county founding to serve the city who pays nothing, which always comes up as a funding issue. For most of your West Virginia transit providers, the bigger ones are able to expand because of levies that were passed. Anything above what you can match from your federal allocation has to come from a local source. In my area, we do not have a levy. EPTA is consistently asking local governments for more funding every budget year, they’re constantly trying to make the business case for why they need additional work, they’re out soliciting contracts from the Harpers Ferry National Historic Park, and from Shepherd University, to try to find money to help match federal allocation. For farebox recovery, if you get 30 percent, you do alright. That’s a tough business mode. Funding, oversight, and administrative processes are probably the biggest barriers. I guess staffing, too. They can’t really pay anybody anything because of the funding issue. The transit agencies are constantly poaching each other. With Amazon now, there are two Amazon facilities within 20 miles of County Transit. If you’re a driver you can go make a ton of money working for Amazon, UPS, or FedEx, and all these distribution centers keep popping up along the interstates and along the ADHS. I guess that could be considered a bit of a conflict. In West Virginia, they’ve had to suspend service on a number of their fixed routes simply because they do not have enough drivers. They have drivers driving 60 or 70 hours per week just to try to
keep their service. Funding tied to staffing is a huge issue. How do you have a competitive salary and benefits package as a public transit agency versus a private sector position? And it doesn’t help in the business case that ridership is already down due to COVID-19. Now the bus is one of the few places where a fully vaccinated person has to keep wearing a mask. People have compressed work schedules and work-from-home options. And it’s only getting more expensive because the value of the dollar is decreasing. Another type of service is transit to detox centers and rehab facilities for drug addiction issues. That also impacts the ability to find drug-free drivers.
Appendix E. Interview 4 Transcript

Emily: What is your role?

Interlocutor: I’m a researcher at the Transportation Institute. I work in a variety of different areas. I also serve a dual role in that I lead the I-81 Corridor Coalition, which is a collaboration among the states of Tennessee, Virginia, West Virginia, Maryland, Pennsylvania, and New York, to try to improve some of the safety and quality of life and other issues that face Interstate 81. It has a really large truck and freight movement along it, and it’s very rural, so it has a lot of issues with a lot of crashes and a lot of congestion and things like that. Those are the two things I do right now. There is no focus from our coalition on transit. Any work that I’ve done on transit is based on my second role as a researcher, which just looks at sustainable transit.

Emily: What do you understand as the intent of the ADHS? And what has been the effect of ADHS on public transit planning in Appalachia, from your experience?

Interlocutor: I can’t really see where much consideration has been given to the transit side of things for the ADHS. Obviously, you have some of the ADHS corridors that link into some of the more urban areas where existing transit may operate. I really don’t think much thought was given to that. I think this was all started with the Johnson administration back in the 60s and they might say that at that point we were considering transit. Greyhound buses actually operate on these roads, but that’s motorcoach. It’s not really what we think of as transit now. I don’t really think there’s ever been much thought of how transit should be incorporated into the ADHS. Although, if you look at the wider definition of transit where you might
Consider transit for health and doctor’s visits and carpooling, then I can see where somebody could have intended for that to take place on the ADHS. Obviously, any infrastructure improvements you make, that will facilitate better operation and mobility, can only help to improve things like access to healthcare, businesses, and jobs. Appalachia tends to be a region where it’s very expensive to build roads in. I’ve seen some areas in West Virginia where they’re just finishing up one of the corridors. I looked at the roadway they’re building from one of the older roads, and my mind just immediately thought how expensive that must’ve been because they were doing so much cut-and-fill on the mountainsides. I think, when you look at the total cost of the project, people have to consider that the cost per lane mile in Appalachian Mountains is very high. Your return on investment is going to be lower in general because the initial capital costs are so high. But that doesn’t diminish the advantage of having those paved roads there.

Emily: How has Interstate 81 impacted the completion of the ADHS along Corridor H?

Interlocutor: ARC is very narrowly focused on completing the ADHS. And I would say that to some degree I don’t know whether they’ve modified their plans to account for other changes. I know that along Corridor H, which should intersect with I-81 except it hasn’t been completed, there is a nearby parallel roadway that was put in by one of the states that does what Corridor H was proposed to do, but ARC still moves forward with the idea of completing Corridor H. Sometimes I think they may be stubbornly doing these things just so they can check it off the list. I get the feeling sometimes that maybe ARC needs to update its needs and revisit the needs of the
ADHS and make sure they’re still on track to do what’s best with the money they have.

Emily: How much of the ADHS is an artifact of the dominant planning theory of the time, that auto infrastructure was a more worthy investment than public transit?

Interlocutor: The 60s were very much a time of tires and internal combustion engines on roads, and there wasn’t a lot of thought about expanding passenger rail and similar modes. I will say that, when you get into the ADHS area, opportunities for rail expansion are very restricted. All the rights-of-way were given or sold to the railroad companies in the 1800s and because of the terrain, you might be passing between two mountains and both sides of it have rail ROWs already there. There’s no room for expansion unless you have the full cooperation of the railroads, which are private corporations. We have some really deeply embedded problems here when you talk about trying to tap into passenger rail. I honestly feel that there’s going to be some extreme solutions or measures that are going to have to be taken to ever tap into passenger rail. Something along the lines of imminent domain or recension of leases or some kind of deal that’s worked out with the railroad companies. For years, they've kept the rail busy by hauling coal and things out of the mountains. Now that they’re not doing that as much anymore — coal isn’t moving like it used to — there may be more opportunities for that. At some point, if they’re not hauling coal, timber, or other minerals out of the mountains, the railroads may have to look into passenger rail to shore up their finances. It’s very restrictive and problematic now but as our energy future changes there may be some opportunities there. Most of the passenger rail currently in the ARC region is along the eastern seaboard.
Emily: What do you think is the role of public transit in Appalachia?

Interlocutor: Wow. Obviously, it’s to serve those people that may have mobility or financial challenges. Not everybody can own a car, not everybody can drive, and so that is the role of public transportation. Although, there are others that may have the ability to drive or own cars but may seek to use something that’s more environmentally responsible. There are a couple different areas where transit can be useful. ARC just published a report on mobility in Appalachia, primarily looking at how people get back and forth to doctor’s appointments.

Emily: Can it be a tool for economic development?

Interlocutor: Definitely. One of the rules I know is that, at least on the eastern seaboard, if you build it, they will come. If you take things like light rail transit and you build those routes, that kind of transit really drives economic development around the corridor.

Emily: What are some innovative things happening in Appalachia relating to transportation?

Interlocutor: Uber and Lyft services. There was one transit agency that decided to stop running their buses and move totally to Lyft and Uber. They did it for a year and it was interesting. At the end of the year, they decided it was too expensive to do, but it’s an interesting idea. I think that having these big diesel-powered buses driving around in urban areas might be a little outdated. Maybe we should start looking at a full spectrum of options from sharing small vehicles, including dedicated transit vehicles like those used for paratransit, being more flexible with how you move people around, and looking at integrating with other modes. Also, making service more responsive to real-time demands and being more responsive to bicycling.
Now, bicycling is up because people are concerned about being in buses with others that may be infected with COVID-19. So, on one hand, it may be good that people are getting on bikes but on the other hand, bus use is down.

Emily: Is there a bike network in Appalachia?

Interlocutor: There aren’t many. Primary roads — interstates, paved, two-lane — don’t allow bikes. It’s against the law because it’s a safety issue. To that degree, most bicycling gains have been in urban areas. Most areas now are progressive enough that they have bike lanes. When you’re talking about older people that might have sensory or cognitive problems, probably the last thing you want is for them to jump on a bicycle. So, bicycling won’t solve the whole problem that transit faces now.

Emily: What do you think about the potential of deviated fixed route systems in rural areas like Appalachia?

Interlocutor: There’s a lack of cooperation between adjoining jurisdictions, and that’s a common problem. One of the recommendations that came out of a recent initiative was to create a regional transfer center where one could plan on transferring from one line or one mode to another. Of course, that gets problematic because it requires bus drivers and operators to leave their jurisdictions to deliver people at the transfer center. Coordinating all of that is really tough. I would say that, based on the work I’ve done with transit and routing, I honestly believe that fixed routes are still only going to be effective in areas where we have sufficient population density and ridership. Looking at some sort of ad hoc routing in more rural areas is probably going to be more effective. With that said, if you had a fixed route that was following primary roads within a jurisdiction, and then you wanted to link it up, the
diversion part would become problematic because of the timing. The timing on fixed route lines is super tight. It causes problems when you ask them to deviate from their route. But if you had some other method of maybe a hybrid system, with a larger route that is very dependable and didn’t diverge, and then you had a more flexible service that could get people to a connecting point, that might be much more effective in the end.

Emily: What are some barriers to implementing/expanding transit in the region?

Interlocutor: Stigma. People don’t want to see transit, especially in non-college towns. There’s no problem on college campuses, but when you get into larger cities that aren’t focused on higher education, there’s a lot of stigma that goes along with bus stops in front of people’s houses and having buses driving around. Another problem is that people don’t agree with environmental sustainability. When you look at the cost per person mile that transit provides, it is very expensive. It’s more expensive to put people on most bus services than it is to put them in cars, just because the ridership is so low in many places. When you look at the amount of power and the costs expended, it’s basically an assistance system for those that can’t afford their own transportation. There are some that look at that as another form of welfare, and they’re not particularly fond of that. Once you get past a certain ridership level, public transit makes all the sense in the world. But getting to that point is tough. Also, some aren’t comfortable with sharing a bus/sharing space with others.
Appendix F. Interview 5 Transcript

Emily: What is your role?

Interlocutor: I’m the director of the [xxx] Regional Commission, which is a council of governments, created in 1969, that provides tech assistance on a wide variety of topics, including transportation planning, broadband, and secure state and federal funds. Kentucky is highly structured with planning development districts. Appalachia has a really strong network of planning development districts. Of the project balance, about a third of our projects are planning-oriented projects.

Emily: What do you understand as the intent of the ADHS?

Interlocutor: To help communities have access to a road network for economic development purposes and help with health and well-being in communities that have historically been isolated.

Emily: How much of the ADHS is an artifact of the dominant planning theory of the 50s and 60s? And how much do you think it has served the extractive industries that operate heavily in the region?

Interlocutor: It’s interesting to think back because the investments in our area from the ADHS were 20-plus years ago and other parts of Appalachia are still keenly focused on some of those transportation projects. I would say that in our area it wasn’t as much about extractive industries. It was more about helping the rural communities have access to a transportation network. It certainly benefitted broadly economic development; I wouldn’t say it was solely extractive industries.

Emily: What do you think is the role of public transportation in Appalachia?
Interlocutor:  Now, it’s one of our greatest barriers when we do our community health assessments. Any hospital that’s classified as a non-profit, they have to do a community health needs assessment, and in those assessments, transportation is often the number one barrier to providing medical services in communities. And as a result, a lot of our health outcomes in Appalachia have not progressed as quickly as they have in more urbanized areas. So, we’ve done a lot of work in our rural communities in trying to figure out how transit systems could be redesigned and reimagined to allow for greater access to employment and healthcare services. The main factors are aging population and consolidation of medical services, plus very few independent practitioners because they’re all part of a medical group now. I think about some of our outlying communities and it’s easily a 30-45-minute drive to a hospital facility. I wouldn’t say that most people using transit are seniors trying to get to health services, though. Certainly, it’s going to be low-income people that do not have reliable transportation. One thing we’ve looked at over a number of years is that, more often than not, the people that live outside of town limits have lower incomes because it’s typically a little bit more expensive to live in town. And when you compound the cost of living outside of town limits with the transportation requirements, then it really puts somebody in a challenging situation, whether they’re trying to get to a job or to a medical appointment. It’s been over 10 years now, but we did a study called the Employment Mobility Study. It was trying to figure out ways that we could do either a deviated fixed route or a fixed route off of some of our arterial roads and utilizing informal park-and-ride lots as rural bus stops. If people could get down the gravel roads to the paved two-lane that then
feeds into the four-lane divided, so many of the intersections along that route have gravel turn-offs that could hold two to ten vehicles. And people were frequently meeting at those gravel turn-offs and sharing rides to the employment centers in towns around the region. So, as a part of this study, we put hang tags on cars and asked people to fill out a survey on whether or not they would be interested in optimizing their transportation with what we call Ride Solutions, which is a program that does carpool matching. Ultimately, we were trying to figure out whether to run a fixed route with a smaller vehicle along that corridor to get people to employment centers. For example, we had 800 people a day going from one of our rural counties to Virginia Tech to work each day. So, we’re thinking, “800 people a day, many of them are grounds and kitchen folks coming in super early in the morning, could we do anything to help offset their housing and transportation costs?” So yeah, it never proved out to have the demand to do it, but it was certainly a concept that we looked at significantly.

Emily: Have you done any studies on informal transit?

Interlocutor: No, we haven’t done any studies on that. I’d say that we are probably aware of who those folks may be regularly providing informal transit service to workers. There are certainly some rural coalitions of nonprofits and service providers that are aware of those kinds of folks. A Ride Solutions program is something we push out there broadly so that people are aware that if they need a ride, they can put in their origination and destination point. It used to be set up to where it was more of an employer outreach program and riders would work through their employers. Now it’s gone almost as just any informal ridesharing would. It’s gotten that flexible
because of the platform that we’re using. The software platform is almost like an Uber arrangement but you’re just able to match up with other riders or drivers who are going to the same locations.

Emily: Can public transit be a tool for economic development?

Interlocutor: Absolutely it’s a component of economic development. Employers see value in it because it helps the stability of their operations. I think when employers are looking in an area, it’s certainly one of the questions they’re asking. They’re asking, “Is transit nearby? Is it available?” It’s not one of the first few questions that they’re asking, but it’s on their list of questions. So, it does make a difference.

Emily: What are some innovative things happening in Appalachia relating to transportation?

Interlocutor: I think we’ve seen a shift that is less about traditional transportation projects that would provide for safety improvements or capacity expansion, because there’s not state and federal money out there to do that work. So, this shift has gone toward more trail development and increasing access to amenities in rural areas. What people are seeing as tourism opportunities has been a lot of fun to work on. Right now, we’re in the concept planning phase of what we call the Valley-to-Valley Trail, and it connects the __________ Valley where we are to our adjoining region to the east, the __________ Valley. That would connect into the __________ State Park, which is a linear pathway that was an old railroad, and it has over a million visitors a year. The transportation there is innovative because people really want to visit these assets in Appalachia. As we’re developing that trail concept of the ---- Valley, we’re first identifying what the tourism destinations are and making sure the trail goes by
as much as possible. So, there’s somewhat of a de-emphasis on the major, really expensive transportation projects into more of an asset-based economic development. That’s a lot of fun to work on because I think we all believe in what we have to offer and want to share that with other people. We just have to have some more infrastructure to be able to do it.

Emily: How do you think a regionally-managed deviated fixed route system would function in your area?

Interlocutor: We’ve done a lot of work in this space. We have three different transit providers in our region. We have [redacted] Transit which is the most robust by far, one of the largest systems in the state in terms of ridership because of Virginia Tech. And then there’s [redacted] Transit which serves [redacted] University and the community around it, and they are a fixed route as well. And the third is [redacted] Area Transit, and that’s a fixed route and deviated fixed route. All three of those, we’ve done work on what we call the Transit Coordinating Council. We pull them together at least twice a year to talk about their operations and we did analysis about their routes and trying to figure out how to optimize their routes. So, somebody in the western side of the region could connect with the different transit providers and ultimately get a ride to the airport in Roanoke. So theoretically, you can take public transit about 75 miles to be able to get into the airport. But yeah, we’ve done a lot of coordination between the service providers so that people can move between systems.

Emily: Can you describe the process of getting people from different agencies on the same page about those regional decisions that you just mentioned?
Interlocutor: Yeah, it started as more of a formalized study of the routes. We were working with the service providers pretty regularly. Then we figured out a couple of routes that could benefit from small schedule changes by looking at ridership. We found out that by making a minor modification, people could spend less time waiting between transit providers. They were all very open to working on it together. They are all in it for the same thing, which is trying to increase ridership. It was a lot of willingness to talk through what the options might be. I think a deviated fixed route makes so much sense in the rural areas. A fixed route is just — you’re not going to generate the ridership that you need. With that deviated, you’re able to do more of an on-demand basis. Deviation is great because people have a sense in the community of “OK, well that’s a typical bus route, and then this is the ultimate service area that they can provide.” So yeah, I think it’s a great model.

Emily: What are some of the barriers to implementing and expanding transit in your region?

Interlocutor: I’d just say that traditional large-scale transportation projects like roadway-building have been de-emphasized because there hasn’t been as much money available. If anything, the ridership has picked up. Transit launched about 10 years ago now and are relatively new effort and they’ve been consistent. It’s hard to believe that they didn’t really have much of a formal transit system around a college campus, but that’s been a real benefit. I’d say that the communities are constantly evaluating ways that they can provide more routes to more people and connect them into retail and employment.
Appendix G. Interview 6 Transcript

Emily: What is your role?

Interlocutor: I am a professor of civil and environmental engineering at [unclear] University. I teach classes in highway operations, transportation planning, and public transit.

And I do research in all 3 of those areas as well.

Emily: What do you understand as the intent of the ADHS?

Interlocutor: I think it has both. Certainly, it’s not extensive enough to provide real mobility to all residents of Appalachia, but it did facilitate economic activity and a lot of the economic activity it facilitated was the extraction of coal. Certainly, if you look at transportation in Appalachia, it’s both the rail and the highway systems that have aided extraction as well. The density of the population in Appalachia makes serving everyone with high-quality transportation options very difficult. These routes provided access, but did they provide enough access for individuals that lived in somewhat remote and also fairly inhospitable places to build roads? If you look at some of the routes that go from Virginia to West Virginia, they turn into gravel roads as you go over the mountains, which is quite challenging. Having mostly a rural area combined with the topology of the mountains makes serving transportation fairly difficult in this part of the world.

Emily: What has been the effect of ADHS on public transit planning in Appalachia, from your experience?

Interlocutor: I think the ADHS has made regions fairly car-dependent. As you build the ADHS, the Interstate Highway System, and the US highway system in general, these were all things that made areas very car-dependent. If you live in these areas in
Appalachia, you need to have a car. There are very few places within Appalachia where there is high-quality public transportation. Part of that is because of the low population density. If you look at West Virginia for example, Lewisburg is seen as a major city, but it only has 3,700 people. Population density in this part of the world is very small unless you have a university or are a state capital. When you don’t have population density, it makes high-quality transit really difficult because people live far apart, they have large amounts of land in some places, and providing high-quality service when you’re covering a large area, but a small number of people is quite challenging. Public transportation really thrives on density. If you can move a lot of people that go to similar places, that’s why college towns do well, because you have a compact area where people work and go to school, and the areas where people live are fairly compact as well. You just don’t see that type of density when you’re going into these small towns in Appalachia. But the challenge is, when you build this highway system, you don’t encourage any more density because you’re setting up a car-dependent society. Having access to an automobile provides you with a high level of mobility here.

Emily: Are you familiar with ARC and what they fund?

Interlocutor: Yeah, we are working with ARC on cataloging transit in Appalachia. There’s a project that’s ongoing that we helped shape a little bit. I don’t think it’s complete yet. What we’ve seen in Appalachia is that places that have some density have transit but for the most part it’s infrequent, and it’s not that helpful for people that don’t have cars. It’s really for people that have mobility issues, like paratransit and that type. That’s a lot of what you see up and down Appalachia. Certainly, in
Central Appalachia you have a little bit less because you don’t have many cities. When you’re dealing with a lot of rural areas, there’s a real challenge. I think what ARC is trying to do is to find best practices in transit in Appalachia. We think about transit as buses and trains, but there is also informal transit here. It’s really made by people helping others, especially if there’s people that have mobility impairments and may be elderly. That informal transit provides an opportunity for people to be able to help others. One thing about Appalachia is that many parts of the community are skeptical of people coming in from the outside and imposing things. There’s been many promises of economic growth not tied to the extraction industries, but many of those have floundered. Part of it is because the extraction industries are so powerful and there’s been so much money in it that any new types of economic development have been stifled or money has been diverted to other causes that were meant for providing alternatives to extraction. The level of trust is pretty low in Appalachia, especially trust in government. You’ll see a lot more informal transit here than you would in other parts of the county.

Emily: Can you elaborate on the informal transit?

Interlocutor: It’s kind of live informal vanpooling, that sort of thing. It’s not publicly funded at all. I think research about this was in the purview of some of the ARC research that Foursquare ITP has been doing for them.

Emily: What do you think is the role of public transportation in Appalachia?

Interlocutor: Right now, public transit is mostly catered towards people that don't have cars. A lot of it is catering to or serving clientele that have mobility challenges, so your more paratransit-type applications. Bus service is just not used very well because
of the density in the rural areas. Where would you put these bus lines in order to have enough people to use it that it would be a good investment? The ADHS is a basic network, it’s not a superhighway. In some areas, the ADHS is the only way you’d be able to get around. So, I think it could facilitate transit but it’s complicated. Something that provides access for transit or provides access for people in this part of the world to connect with each other or to connect outside of Appalachia also connects extraction to the rest of the world. That’s just complicated. You could say that maybe it’s not a good thing, or you could make the argument that it’s not a bad thing either. But probably the answer is just that it’s complicated. There’s also been a huge brain drain from those areas because not everyone sees it as idyllic. The people that stay think it’s idyllic and there are many people that just see no opportunity there and leave. And then there are people that see there’s limited opportunity but stay and try and make it better. And then there are people that are like “it’s fine the way it is.” Take a look at the population in these areas over time and I think it’s clear that there’s not people migrating to these areas. There’s a very interesting story about how this is really complicated and how maybe this all changes in years to come. The question I have is, you have people that stayed, people that say they like it the way it is, but when those people move on, what does that leave these areas with? If people aren’t being replaced, what becomes of these towns? Do they just wither up and become one-stoplight towns?

Emily: What are some innovative things happening in Appalachia relating to transportation?
Interlocutor: The rail has been taken over completely for freight, but you could utilize some of it for passenger rail. You could also leverage technology once you get into the towns and then run major lines along the highway system.
Appendix H. Interview 7 Transcript

Emily: What is your role?

Interlocutor 1: I’m a transportation planner for Transit. I work three-fourths of the time for the MPO, and 25 percent for Virginia Tech-specific projects. In the early days when the MPO started almost 20 years ago, Transit was the only game in town. My original role was 100 percent Transit and working with the MPO on bicycle projects and pedestrian projects, stuff like that. Now we have Transit, which is not huge, and they have a deviated fixed route in their town. And Transit is pretty big, they have close to 7 routes now and we have 14. They run the university system in University and the surrounding area. My role has expanded somewhat. I do still help with Transit, as far as transit goes, but I do help coordinate plans amongst all 3 agencies. And then we also have the commuter bus, which connects Valley to Valley, and that’s where the airport is, and there’s a big hospital and medical school there. It has funding from multiple partners and goes about 40 miles each way. That’s been around about 11 or 12 years, too, and it’s doing quite well. We do rural stuff mostly with and, which is somewhat rural.

Interlocutor 2: I have been director for MPO director for 18 years. Before that I was with VDOT. I was responsible for 3 counties at VDOT, which was 1,500 miles of road to maintain and build. With the MPO it’s strictly planning, and we branch out a little with transit, alternative transportation, and roadway planning. As with any MPO, any federal funding that’s spent within the boundaries has to be approved
and outlined within the MPO plan. That’s about all I can tell you about my history.

I did work with some ARC funding. We can talk about that later.

Emily: What do you understand as the intent of the ADHS?

Interlocutor 2: Everything that I know anything about in regard to ARC was all characterized as ARC funding. It did some pretty major work here and it “four-laned” Route 460, which is a major highway from Interstate 81 to the West Virginia line, and I’m sure it was ARC money that expanded it over there. It was originally a 2-lane road, and you’re talking about 50 miles. It certainly opened up and provided access to County. A lot of that had been done when I came here in 1978. We did a lot of projects to help finish it up, like a couple large bridges. Also did some on Route 100. Route 460 went from the area through County to West Virginia. Route 100 came from the area and intersected 460. We got through a good part of that, got about 90 percent of it four-laned, and there’s still a little 20-lane section in the middle that hasn’t been done and they stopped funding for it. Making Highway 460 four lanes has been a big effort. The last section that we did on Route 100 was going over a mountain. We went up and down a mountain. Basically, who’s receiving the benefits of all the freight movement in the area, it’s some of both. We’re partly using County’s website, so sometimes stuff is difficult to find. I don’t like it and we’re working on getting a standalone website right now. But there is a freight plan that we did for this area and it’s a little dated, but I think it’s still pretty accurate and you might want to look at that to see the freight flows, where stuff is coming from, and where it’s going to.

Emily: What has been the effect of ADHS on public transit planning in Appalachia?
Interlocutor 2: Just by the growth of the area, Virginia Tech particularly, it’s been the engine that’s driven everything in the area development-wise. Had it not been for the ARC funding to get Route 460 in condition, it would have probably had to have been done through other means anyhow with the growth of Virginia Tech. You just couldn't serve much of anything with a two-lane road.

Interlocutor 2: Transit and Transit are very successful, but County Transit is the most rural. They do very good, they cover a lot of area, and the ridership is pretty small, but they do handle a lot of rural people. That one is more attuned to what a rural sort of system would do.

Interlocutor 1: Rail is a piece too that’s coming. Passenger rail has been expanding to Roanoke, it came a couple years ago with a new station. We used to have passenger rail to Virginia Tech back until 1954. It literally came down the road and went backwards to Blacksburg to pick up cadets. It’s coming back, I’d guess, in 10 years. There’s some good traction, and is getting a new station. There were originally 12 candidates for the new station, but did quite well with the scoring. That’ll definitely connect rural areas because people can get south and west and get to the busy areas up north without having to drive. It’s a big piece of the puzzle but it’s very slow-moving.

Interlocutor 2: One time there was a conference on that, dealing with the ARC and why it was founded, why it started, and the purpose that it was to serve. It came about after the national interstate system was mapped out and this one area, a lot of it has to do with topography, and there was a big hole here that had no interstate service. The intent was to provide access in this region, both for people and for freight.
Emily: What do you think is the role of public transportation in Appalachia?

Interlocutor 1: I would say it’s really challenging. My mother lives in the rural country of California. She’s 80-something and she’s driving a little during the day. For her to get a public transit bus, you just have to jump through so many hoops to get a ride. She just hasn't made the effort because she can still drive a little. It’s so challenging in rural areas because you have to plan a 3-hour trip just to get to the doctor or to Walmart or wherever. And then the resources are so limited. We’re lucky because we’re a big system in the grand scheme of things and our paratransit is buffered by the fact that we have such a big fixed route. Our paratransit system really helps the people who need it. It’s mostly people without licenses, people who don’t want to drive, and those who can’t drive. Right now, it’s free with COVID-19 and it’s normally only 50 cents, but it is quite a process just to get a ride. Prior to COVID-19 we didn’t do same-day service at all. The maximum we run is 4 vans at a time. But then you have rural areas that are even more hilly and challenging. Finding drug-fee qualified drivers would be really hard, and they have to follow all the federal guidelines with Marijuana being legal. We’re having trouble getting drivers, too. We’re always recruiting. I think that’s a big problem in any system. You probably want retired truck or bus drivers to be your drivers. But the training is substantial — about 100 hours. You need a relatively big system to run the small system. You need to have the crew out there mobilized and ready to do the extra work. If you have a big fixed route system you can absorb the work of the on-demand route. All the stuff — apps, marketing — it requires a lot of resources.

Emily: Is it worth it?
Interlocutor 1: Well, I would say yes just because I’m a transit guy and I have to say yes. But if you do the numbers and break it down that way, people would say “no way, you’re only doing 4 people a day and you’re paying someone 100 dollars an hour to run some of these routes? It doesn’t add up if that’s all you do.” But it’s sort of a public option that people should have. Even if it was twice a week, at least it’d be something that people could get to. And I think in rural areas that’s how you have to talk. It’s kind of like the train: it comes once a week or once a day or whatever. At least it’s an option for someone who can’t get anywhere. It’s a public thing so it should be open to more people.

Interlocutor 2: I tend to agree. I remember from a survey that it’s people who are using it to get to work that don’t have a vehicle or can’t drive. If I’m remembering currently, it’s like 60 or 70 percent of the ridership. There’s going to be a cost involved with it but you need to facilitate it. That boils down to the local government and whether they think it’s worth their funding. My personal opinion is that you need to do as much of that as you possibly can.

Emily: Can it be a tool for economic development? Is that the wrong approach?

Interlocutor 1: Our director would say for sure, especially in a university town. I think we bring in a hundred thousand dollars per year just in advertising. All the major apartment complexes, doctors and lawyers, and local events will rent space on the bus to wrap it. The university does several a year. And just getting people to the mall. For that chunk that doesn’t want to drive or can’t now, they can go eat or spend money at the mall. We have a lot of development happening in this town still, a lot of it student centric. They’re doing more parking lot infill projects and reviving malls.
The developers integrate the transit stops into their plans. There’s talk of some other food places that people really want. So yes, it’s definitely a driver of economic development. Some people are embracing transit-oriented development but it’s still a hard sell. It’s easy to talk about but it’s really hard just to get a bus stop improved by a developer, even though they're mandated to do it.

Interlocutor 2: Two of the things some companies like to check off when they’re opening a new location is transit and recreational trails. Those are things that I’ve heard the economic development people say that companies like. I think it plays a role in attracting new companies.

Interlocutor 1: With COVID-19 now you have people walking more than ever. If they have to go back to work in-person and they have a nice new trail nearby they might go for a little walk at lunch. More people have realized during the pandemic that they need to get out more, and they realize what that does for you. Adding a trail is a low-cost thing.

Emily: What do you think about the viability of a regionally-managed deviated fixed route system in Appalachia?

Interlocutor 1: You’re talking to the two regional people right now, so we are the people who help facilitate that. A lot of what we do is coordinate regional efforts, whether it be broadband or transit. I think some coordination between the agencies would be really hard to sell. It would be very tricky. There were some good efforts to get Transit under Transit. At the time, it should have happened. Our director at the time did a pretty good fight for it but I think there were some personality issues that played a role. It didn’t go that way, so now you have two
semi-competing groups. We do split money and we do a lot of regional stuff. It could go either way. If a bus breaks down there it could be challenging to get it back here, for example. I don’t think in my lifetime there will be a regional agency here. I think it'll continue to be the MPO and the regional commission continuing to do the work we do. It’s in my best interest to keep it that way. There are advantages to it being separate, but you could argue that it should be together, too.

Interlocutor 2: I agree. On the surface the different governments appear to get along but sometimes that’s not feasible. The MPO started out as [redacted], [redacted], and [redacted] County. Then we added [redacted] County and [redacted] County. It was like pulling teeth getting them to join. Everybody thought we got along until that. They really didn't want to be part of the MPO. When the funding came through the MPO for transit and the MPO had to designate how to split the money between all the places and how much to give to each agency, that just frayed everyone’s nerves even more. Sometimes we don’t get good participation from [redacted] County and [redacted] County. It’s a tough sell. I think it would be more efficient to have one system at least for [redacted] and [redacted] County, but I don’t see that as ever happening. We tried, but it didn’t happen, and I don't see it happening.

Interlocutor 1: [redacted] Transit runs right down the main street here, and right behind it is the [redacted] Transit bus, then a bus from [redacted] comes down the same street. So, you have buses from 3 or 4 different systems running down the same street. Occasionally you’ll get 3 at once. So, there is some duplication and that’s a downside of having everything separate.

Emily: Are there a lot of people who switch between agencies?
Interlocutor 1: Not much. In theory someone could go from [redacted] to [redacted]. It probably happens occasionally. Trips from the rural areas are possible, but it’d be a 5-hour round trip. You can do it but it’s tough to coordinate. A few people probably do it a couple times a year. Interviewee 2 and I actually proposed an idea to the state to make it easier for commuters to transfer between agencies and also to make it fare-free. It got some approval but not enough to pass.