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Light Rail in Phoenix, Arizona: Increasing Economic, Environmental, and Social Sustainability

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ABSTRACT: In an effort to increase sustainability, reduce vehicular congestion, revitalize neighborhoods, and lower pollution from automobiles, Phoenix, Arizona launched the Valley Metro Light Rail system in December of 2008. The purpose of this investigation was to assess the environmental, social, and economic impacts as related to sustainability of the Valley Metro Light Rail system. In this qualitative case study of Phoenix sustainability and light rail policy subsystem, the researchers conducted semi-structured expert interviews with government officials and other policy-makers, non-government organizations, neighborhood and citizen associations, and other advisory bodies to understand and analyze the communities served by the light rail system. Key findings from interviews and research indicate that the light rail system has made significant positive impacts on environmental quality, economic prosperity, and the livability in areas which it serves. Plans for expansion of the system currently include areas along Central Avenue through the community known collectively as, “South Phoenix.” Conflicting views of the proposed extension, and potential far-reaching, unintended consequences of its approved configuration, were examined and incorporated into the research.

I. INTRODUCTION

Many experts in community planning and sustainability fields view Phoenix as a prime example of the negative consequences of explosive growth, lack of investment in public transportation, and an exodus from downtown to suburban areas. Yet, true to its name, Phoenix may be once again rising, and the center of rebirth is taking place along the corridor served by the Valley Metro light rail system. Fuelled by a generation of young Millennials favoring urban over suburban, the preference of mass transit over the individual automobile, and a city-wide focus on Transit Oriented Development (TOD), Phoenix is currently attempting to transition-from a failed city center, to one seeking economic growth and increased urban livability and sustainability.

As Phoenix continues to grow and evolve, this investigation examined if traditionally underserved communities such as South Phoenix would be included in the new urban landscape. Also, the investigation highlighted how historically entrenched interests have helped to marginalize communities of color in Phoenix, and how they may be impacted by future expansions and extensions. As Phoenix politicians debate the very existence of the light rail system, as well as expansion, this research provides a comprehensive view of the impact of the current
light rail system and examines in detail the potential impacts along the proposed South Phoenix extension.

An article from 2004 offered an assortment of the collective thoughts of Philadelphia newspaper editorials as the population of Phoenix stood poised to surpass that of Philadelphia. Among the many opinions offered were, “…dedicated to the car, Phoenix has no downtown…and neighborhoods? None to speak of… [it] doesn’t rate as an actual city…it’s more like a place where a lot of people happen to live.” “For most commentators, Phoenix cannot be a city because it does not have a light rail system…”

Due to decades of poorly planned growth, suburban sprawl, and infrastructure growth, the automobile is still the preferred mode of transit in the Phoenix metropolitan area. This reliance on single occupant automobiles has led to concerns regarding how air quality, excessive commuting times, and congestion have impacted the daily lives of Phoenix residents. After nearly a decade of contentious political debate, planning, and construction, Phoenix launched the Valley Metro Light Rail System in December 2008. Ridership has increased on a yearly basis, areas served by light rail have increased, and economic growth has occurred along the light rail corridor. As positive as these indicators are, little is known about the impact of the light rail system on sustainability in metropolitan Phoenix.

This research focuses on analyzing the outcomes of the light rail system through the lens of the three facets of sustainability: the environmental, economic, and social or quality of life impacts. When considering sustainability and the light rail system, the goal was to answer the following research questions: 1) What positive or negative impacts has the light rail system made on environmental quality in areas which it serves? 2) What economic impact has the light rail system had on communities which it serves? 3) Do communities and individuals in light rail areas enjoy a different (positive or negative) quality of life than those not served by the light rail? and 4) overall, what are the future challenges, opportunities and implications of the light rail system on the community.

II. AN OVERVIEW OF PHOENIX GROWTH AND MASS TRANSIT HISTORY

In 1940 the city of Phoenix had a population of 65,414 and covered an area of just under ten miles². The city of Phoenix entered its perpetual growth spurt in the optimistic decades following World War II. In 1950 the population of Phoenix was 106,818 covering an area of 17 square miles³. By 1970 the population had increased to 548,303 in an area of 248 square miles⁴. Twenty years later, the 1990 population stood at 983,403 with a footprint covering 424 miles⁵. By 2010, the population of a once sleepy capital had grown to 1,445,632 with the city limits of Phoenix enclosing an area of 519.1 square miles⁶.

The Phoenix Street Railway system provided streetcar transportation to residents of the city.

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3 Ibid.
4 Ibid.
5 Ibid.
6 Ibid.
of Phoenix from 1887 until 1948. Residents were able to travel along multiple routes in the city center as well as connect to close in suburbs. Post World War Two prosperity granted a generation of American families the ability to purchase automobiles. Personally owned transportation, coupled with the expense of the Phoenix streetcar system and steadily decreasing ridership, made the operation of the streetcar system difficult to justify. In October of 1947 the storage and maintenance facilities of the streetcar system were destroyed by fire. Only six streetcars were spared from the blaze. In February of 1948 the streetcar system was decommissioned, and streetcar lines were paved over to accommodate increasing automobile traffic.

In the early 1980’s regional and City of Phoenix planners began to see that an explosion in population was looming. In 1988, the Regional Public Transportation Authority (RPTA) began to draw up public transportation plans that included 103 miles of elevated train tracks through Phoenix and surrounding communities. Construction of rail facilities was to be financed through sales tax, city, state, and federal funding, with construction taking from 1989-2019. In 1989, nearly sixty five percent of voters voted, “No” to the proposed sales tax increase and the idea of rail transportation in Phoenix would lay dormant for several years. During an interview with the author, an expert from Julie Ann Wrigley Arizona State University School of Sustainability lamented the lost opportunity, “We would almost be done with construction by now…it’s frustrating to imagine the opportunity we lost.”

City of Phoenix and neighboring community leaders and planners revisited the topic of light rail in the late 1990’s. In 1996 voters in Tempe approved a half cent tax increase, as well as approving funding for studying the feasibility of light rail. In March of 2000, Phoenix voters approved a 0.04 cent sales tax increase to fund an initial light rail line. In November of 2000, both the city councils of Tempe and Phoenix approved plans for an initial 20-mile light rail corridor. In September of 2001 Phoenix began purchasing property and invoking eminent domain to secure land along the proposed light rail route. November of 2004 saw passage of Proposition 400 by Maricopa County voters (the county in which Phoenix is located) which provided further funding for the light rail system. Initial track was laid in March of 2006 and construction and testing of light rail cars continuing until December of 2008. Valley Metro began light rail operations for the public on December 27th of 2008.

Valley Metro currently operates 26.3 miles of light rail track, with 38 stations and eight park and ride facilities, and serves the cities of Tempe, Mesa, and Phoenix. Ridership on the light rail system has generally shown increases, though occasional decreases in total ridership have occurred since inauguration of the system. In 2014 light rail ridership was 14,331,448. In 2016 ridership saw an increase of over a million additional passengers to 15,574,737. The most recent statistics from fiscal year (July 1st-June 30th) 2018 indicate a total ridership of 15,786,911. During fiscal year 2018 average weekday boarding of the light rail system were 49,686.

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8 Ibid.
9 Ibid.
10 Ibid.
Figure 1. Current Valley Metro light rail alignment with proposed extensions. Years in grey represent original completion dates of extensions. Years in black represent revised extension completion dates.


III. METHODOLOGY

Semi-structured interviews were conducted with participants able to assess the impact of the light rail system on the environmental, economic and social facets of sustainability in the communities serviced by the light rail. Interviews were audio-recorded, transcribed and analyzed (non-statistical) to obtain trends, patterns, comparisons and contrasts that are relevant to the research goal. Potential interview subjects were recruited from all communities served by the Valley Metro Light Rail System.

Participants were either responsible for or engaged with the light rail system in the communities serviced by the light rail. As such, interviews were conducted with appropriate individuals in their leadership and professional capacities as state and municipal actors, interest groups, neighborhood and citizen associations, economic development agencies, environmental quality agencies, and other citizens who, in the exercise of their professional office or role, are impacted by, or are responsible for the Valley Metro Light Rail System.

Twelve in-person interviews were conducted with stakeholders ranging from light rail planners, community activists, and business leaders, during a site visit in July of 2018. These interviews, coupled with author observations, environmental and economic data, shed light on the economic and environmental impact of the light rail system, its contribution towards making Phoenix a more livable city, and assess current political challenges which may impact further light rail expansion.

IV. THE PROPOSED SOUTH PHOENIX LIGHT RAIL EXPANSION

Valley Metro is currently studying the potential impacts of the proposed expansion of light rail service through South Phoenix. In 2014, the Phoenix City Council approved fast tracking the project after Phoenix voters approved a transportation budget of over 30 billion dollars. Initially slated for completion in 2034, the project aims to begin construction in 2019, and begin operations in 2023. The total amount of track to be installed is 5.5 miles, and arrives with a cost of over one billion dollars, split between the City of Phoenix, the state of Arizona, and the federal government. However, this proposed project, which may help to alleviate generations of economic stagnation, has pitted segments of the South Phoenix community against each other, and has brought the very existence and continued funding of the light rail system to the political forefront in the city of Phoenix.
V. MASS TRANSIT AND ENVIRONMENTAL SUSTAINABILITY

In the United States, transit related activities account for 29% of the greenhouse gasses emitted yearly\(^\text{11}\), with personally owned vehicles accounting for most greenhouse gasses emitted. Annually, the use of mass transit prevents consumption of 4.2 billion gallons of gasoline\(^\text{12}\). Transit promoted reduction in fossil fuels use that decreased carbon emissions by 37 million metric tons\(^\text{13}\).

Compared to an automobile, heavy rail (above or below ground) produces 76% less greenhouse gas emissions per passenger mile\(^\text{14}\). Busses, the most commonly used form of mass transit in the United States, produces 33% less harmful greenhouse gas emissions per passenger mile than an individually driven automobile\(^\text{15}\). Light rail systems, which are becoming increasingly more popular in the American west and southwest, produces a staggering 62% less greenhouse gasses than automobiles\(^\text{16}\).

VI. MASS TRANSIT AND ECONOMIC SUSTAINABILITY

The environmental benefits of mass transit are readily apparent. However, the manner in which mass transit contributes towards economic sustainability is frequently not so obvious. One advantage presented by mass transit is connectivity. By increasing mobility options for individuals without personally owned automobiles their economic options are increased as well. With increased access to transportation, comes increased access to educational opportunities and higher paying employment opportunities. Individuals without automobiles are no longer trapped in employment and educational deserts and forced to choose from a meagre palate of options. Simply put, as transportation options increase, so too do the economic opportunities of those with access to mass transit, all while contributing to the overall economic sustainability of an area.

With improved transit options, individuals and families will become increasingly less reliant on personally owned automobiles. By taking mass transit and living with one less car the American Public Transportation Association estimates that it is possible for a family to save $10,000 per year on automobile related expenses\(^\text{17}\). In the United States, families spend sixteen cents of every dollar earned on transportation related expenses, of those sixteen cents, 92% is dedicated to maintenance and operation of personally owned automobiles\(^\text{18}\). Clearly, automo-

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\(^{13}\) Ibid.


\(^{15}\) Ibid.

\(^{16}\) Ibid.


\(^{18}\) Ibid.
biles are a factor inhibiting the financial sustainability of individuals and families. By decreasing reliance on automobiles, and increasing investments in public transportation, it is possible to improve the overall financial sustainability of families and of an area.

In an increasingly automated, tech-driven, soundbite society it can be difficult to think in a long-term manner regarding investing money in public transportation. Mass transit investment takes years, or even generations to achieve its goal. This has led to a reticence to invest money needed today, on projects that will result in gains in the somewhat distant future. It is well established that the construction of transit projects brings economic stimulus during the installation phase.

According to the American Public Transportation Association (APTA), the twenty-year return on investment in transit projects is roughly 4:1\(^9\). Per the APTA, for every billion dollars invested in transit, a 3.7 billion-dollar increase to the Gross Domestic Product (GDP) occurs\(^20\). For each one billion dollars invested in transit projects, an increase of 50,731 jobs will occur after twenty years\(^21\). It is very clear that investment in public transportation has long term effects that contribute to the economic sustainability and viability of an area.

VII. AIR QUALITY BENEFITS OF LIGHT RAIL USE IN PHOENIX

According to Valley Metro statistics as reported to the Pima County Association of Governments in May of 2017, light rail use accounts for 10,300 vehicles removed from roads daily\(^22\). The elimination of 10,300 vehicles from roads equates to

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\(^20\) Ibid.

\(^21\) Ibid.

reducing carbon emissions by 23.2 million pounds annually\textsuperscript{23}. Air quality and smog are of particular concern in Phoenix with 46 High Pollution Advisories (HPA) being issued in 2017 and 55 being issued from January 1, 2018-September 14, 2018\textsuperscript{24}. A casual glance at these brief statistics show a worrying increase in HPA’s issued in Phoenix. The high number of HPA’s issued stands in stark contrast to a stated City of Phoenix Sustainability Goal of, “By 2050, Phoenix will achieve a level of air quality that is healthy for humans and the natural environment.” \textsuperscript{25} Increased use of light rail will assist in decreasing HPA’s as well as achieving Air Quality Sustainability Goals as outlined by the City of Phoenix. Though the Arizona Department of Environmental Quality (ADEQ) maintains 24 air quality tracking stations in locations throughout the Phoenix metro area, to date no comprehensive study has been carried out by either the ADEQ, Valley Metro, or other governmental agencies to identify areas which receive the most environmental benefits from light rail transportation. In an era of shrinking budgets and questions regarding light rail efficacy it would seem that such a study must surely be on the horizon. An ADEQ employee was somewhat embarrassed when he stated, “Those are numbers that we just don’t have right now.”

\textbf{VIII. THE ECONOMIC BENEFITS OF LIGHT RAIL IN PHOENIX}

With a modest 26.3 miles of track connecting Phoenix with Tempe and Mesa, and one line in operation, casual observers may be skeptical of the economic impact in dollars that the first decade of light rail has brought about. Indeed, scholarly research and governmental statistics is shockingly scant in regard to this topic. A spokesperson for Valley Metro, remarked, “No, no we don’t, there is no single report with all that [economic] information,” yet it is still possible to discern general trends as the ten-year anniversary of light rail service approaches. In March 2016, Valley Metro stated that, along existing light rail lines. “Since construction began in 2005, over 200 projects worth approximately $8.2 billion dollars in economic development have occurred.” \textsuperscript{26} Significant opportunity for further economic development currently exists along the existing light rail corridor, “…277 acres of vacant land are within $\frac{1}{2}$ mile of proposed light rail alignment… A significant amount of land within $\frac{1}{2}$ mile of is underutilized.” \textsuperscript{27} Proper utilization and development of vacant and underdeveloped lands along the light rail corridor will assist in making Phoenix more economically sustainable.

A 2017 study by Kevin Credit of The University of Michigan examined new business starts along existing light rail lines from its inception in 2008 to 2016. The study focused on new business starts in the retail, service, and knowledge sectors of the Phoenix economy and their adjacency (ranging from .25 miles, .50 miles, or 1.0 miles) to light rail stations. A key finding from this recent study concludes that, “adjacency to light rail stations is worth

\textsuperscript{23} Ibid

\textsuperscript{24} Valley Metro, “High Pollution Advisory.” \url{https://www.valleymetro.org/high-pollution-advisory} (Accessed August 26, 2019).


\textsuperscript{27} Ibid.
about 88% additional new starts in the knowledge sector, 40% new starts in the service sector, and 28% new starts in the retail sector over the time that the line has been open.”

While local governmental data is lacking, and Census Bureau data currently lacking due to the timing of census surveys and the lifespan of the light rail system, it is evident that the light rail system in Phoenix has brought about significant economic impact. Further investigation is needed to properly demonstrate the economic impact of such a huge investment in the infrastructure of the fifth largest city in the United States.

IX. SOUTH PHOENIX: A NEIGHBORHOOD IN NEED

Unfortunately, every major city has a geographic area that is lacking in opportunities, scarred by urban blight, and is home to the less fortunate. In Phoenix, that area is commonly referred to as, ‘South Phoenix.’ South Phoenix is an area that has suffered historic both de-facto and codified discrimination. Historically, all non-Anglo residents of Phoenix were forced by housing restrictions, threats, or economic obstacles to live in the South Phoenix neighborhood. Generations of Hispanics have called South Phoenix their home, the largest concentration of African-American residents of Phoenix reside here, grandchildren of former Chinese railroad laborers made residences in the area, as well as former internees and the descendants of

scrap metal recycling installations, polluting factories, and other businesses, that while necessary to the Phoenix, were not permitted nor desired in more northern parts of the city.

A recent study by the Pew Charitable Trust highlights some unsettling traits in this historically neglected area. Residences along the proposed South Central light rail extension have an average household incomes of $34,789 compared to a Maricopa County average of $68,636. Nearly 30% of area households were below the poverty level in the past twelve months as indicated in 2017. The area is also highly transit dependent, with 28% of residents neither owning nor leasing an automobile. This stands in stark contrast to a Maricopa County transit dependency rate of 7%. In South Phoenix a staggering 83% of births are publically funded by city, state, or federal aid programs. As a South

31 Pew Charitable Trusts p.31.
32 Ibid 
33 Pew Charitable Trusts p.33.
Phoenix community justice advocate stated, “This neighborhood has had, and still has, so much going against it.” “Can the light rail help, I hope so, I really do.” Areas adjacent to the proposed light rail extension have higher heart disease, cancer, diabetes, and respiratory failure rates than all other areas of Maricopa County, as well as homicides, vehicle accidents, and unintentional poisonings being twice the Maricopa County average.34 As if to encapsulate the difficulty of all aspects of daily life in South Phoenix, a City of Phoenix light rail planner observed, “South Phoenix has one of the highest pedestrian fatality rates in the United States, people aren’t going to walk a half mile in 110 degree heat to cross a street.”

X. MASS TRANSIT AND NEW URBANISM

Along with quantifiable environmental and economic benefits associated with public transportation, come the harder to quantify benefits of an increased sense of place and livability. For many young Americans returning to the city center, their first step towards creating a sense of permanence and place is to refrain from the purchase and use of the personal automobile. For the Millennial Generation, the love affair with the automobile has ended. In record numbers, young adults are declining to purchase automobiles and instead rely on public transportation to meet their mobility needs. In fact, the number of 19-year-old adults with a driver’s license fell to 69% in 2014 from almost 90% in 1980.35 This is in concurrence with a decrease in adults in their 20’s with a driver’s license, which has fallen by 13% since the 1980’s.36

As younger Americans are eschewing the standard practices of car ownership they are also returning to central city areas in increasing numbers. Not satisfied with the car dependent commuter lifestyle of their parents, less willing to purchase homes than previous generations, and seeking the cultural, entertainment, and employment opportunities that central city areas offer, across the United States young professionals are returning to the city in a movement coined New Urbanism. As an educator and light rail advocate from the Melrose neighborhood explained, “We [she and her husband] moved here from Glendale in 2001. We walk to work, rarely use our car…it’s just a better for us.”

As new residents arrive in urban centers from the suburbs and other destinations, their built environment is being shaped by the mantra of Transit Oriented Development (TOD). TOD is a style of development/redevelopment that seeks to make public transportation the core element in the new urban experience, with high density housing, infill development, and employment sources, educational, cultural, and recreational activities all planned to be within walking distance from public transportation elements. TOD is predicated on a car-free existence, a willingness to walk, and a desire to be in a densely inhabited urban area, and is aimed at a well-educated, tech-savvy generation of Millennial looking to live, work, and play in a core area. An observation from a resident of the Garfield neighborhood is a prime example of the New Urbanist mentality, “I take the train [light rail] to work, an Uber if I need to get groceries, or other things. I’m done wasting money on a car.”

34 Pew Charitable Trusts p. 38.  
36 Ibid.
XI. REINVENT PHOENIX

As New Urbanism and TOD were gaining traction across the United States and beyond, Reinvent Phoenix was launched in a partnership between the City of Phoenix, the U.S. Department of Housing and Urban Development, Arizona State University, and numerous civic organizations. One principal goal is that of Quality Development which seeks to, “Create an attractive investment environment for high quality and equitable Transit-Oriented-Development.”

Another primary goal of Reinvent Phoenix is to, “Establish a model process for guiding smart, cost-effective investments along light rail corridors.” A tertiary aim of the Reinvent Phoenix model is to, “Capitalize in the community’s investment in light rail by guiding development to benefit residents, lower the cost of living and enhance unique and historic characteristics.” A City of Phoenix light rail planner deeply involved with Reinvent Phoenix saw the project, “As a way out of years of overall neglect.”

From 2012-2015 Reinvent Phoenix staff met with community members, business leaders, and village steering committees, (Phoenix, though an incorporated city is divided politically into villages based on geography and historic factors), to form plans that would lead to sustainable development based on TOD goals. In 2015 the Phoenix City Council adopted the recommendations of Reinvent Phoenix and improvements began in the five villages of Midtown, Eastlake-Garfield, Gateway, Solano, and Uptown.

Among the multitude of recommendations from the Reinvent Phoenix Workgroup are calls for: infill development that is faithful to historical characteristics, an increase of bike lanes,

38 Ibid.
39 Ibid.
more access to bike share programs, attracting grocery stores to downtown areas, providing shade at bus stops, and increasing economic opportunities for community members. Not all Phoenix residents are in favor of infill, as a Phoenix real estate expert declares, “They’re just bringing the suburbs to the city, most of these projects are just awful.” Additionally, a South Phoenix community organizer felt that bike sharing programs, “Though good, need to be placed in areas of high transit dependency, to have any real impact.”

**XII. THREE DIFFERING OPINIONS REGARDING ONE TRACK**

The very name South Phoenix is a misnomer based on decades of stereotypes and generalizations that fail to capture the uniqueness of three areas which have been conveniently labeled for the ease of outsiders. From City Hall south, to the Union Pacific railroad tracks, resides the Warehouse District. This area, formerly home to industry and storage facilities for railroad goods, is now the locus of creative enterprises, and high tech startups. This Warehouse District is sparsely populated and is home to a small amount of music venues and nightlife destinations.

Descending south from the railroad tracks, until reaching the Salt River, one discovers the neighborhood of Central City South. This area contains the largest amount of public housing in Maricopa County and is predominantly Hispanic and home to small, independent businesses which line Central Avenue. The Director of a prominent South Phoenix community organization, stated that, “Over 70% of voters in our neighborhood voted yes. We want this. Our community needs this.” Many of these businesses in this area are auto related, and in the opinion of an Instructor at the Julie Ann Wrigley School of Sustainability, “Would likely not survive after light rail installation, most were on their way out anyway.”

Some small business owners in the area are opposed to the extension of light rail service as they feel that reduction of Central Avenue from four lanes to two lanes will seriously harm their businesses, or force them to close completely. From this small cadre of business owners has sprung the movement of, “Four Lanes or no Train.” This small, but well organized, and extremely vocal group has held numerous protests, forced debate in the Phoenix City Council regarding the issue. In fact, in June of 2018 this group was able to force the city council to revisit the very issue of light rail expansion in their neighborhood, with a vote that was held in September of 2018.

![Figure 7. Map of proposed South Central light rail extension.](https://cronkitenews.azpbs.org/2017/09/13/south-phoenix-light-rail-extension/) (Accessed August 26, 2019).
Continuing South from the Salt River until Baseline Road is the true South Phoenix. This area is dominated by one and two story businesses which line Central Avenue on both sides. This area is home to families of Hispanic, and varied Asian origin that have lived in the area for generations. Once again residents in this area voted predominantly “Yes” for extension of light rail services, but business owners along Central Avenue fear for the wellbeing of their operations if lanes are reduced from four down to two in order to install light rail.

Though voters in the potential expansion area voted “Yes” for the project many fear gentrification and being pushed out of the neighborhood that they call home. Many residents point to the glistening high rises along Central Avenue in the Midtown and Roosevelt neighborhoods, the knowledge based jobs for which they likely are not qualified, and the influx of young, Anglo Millennials as what happens when light rail becomes a reality. Though a small, vocal, and well financed group is attempting to stop light rail expansion, a large percentage, though fearful of change, sees light rail as the path to better opportunities for themselves and their children.

XIII. SOUTH PHOENIX EXTENSION UPDATE

On September 26th 2018 the City Council of Phoenix voted 6-2 to approve a two-lane design for the Central Avenue extension in South Phoenix. However, this may have been a Pyrrhic victory for light rail advocates in Phoenix. Months after this announcement, a group calling itself, “Building a Better Phoenix,” submitted the required twenty thousand signatures on a petition calling for voters to decide any and all further light rail expansion; not just in South Phoenix, but valley wide, as well as calling for light rail funding to be redirected to surface street upgrades, and prohibiting any further investment in light rail projects. A City of Phoenix special election was set for August 27, 2019 for voters to decide on Proposition 105. If this proposition were to pass all future light rail extensions, upkeep and most maintenance activities, would be prohibited by changes to the City of Phoenix Charter.

On August 27, 2019, the citizens of Phoenix spoke decidedly in favor of maintaining and extending the light rail system. In the largest ever turnout for a special election, Proposition 105 was defeated, with 62% of voters in favor of light rail and 37% against. This marked the fourth time that voters have cast their ballots in favor of light rail in Phoenix. Indeed, this was also the largest margin by which light rail initiatives were supported by voters.

As examined earlier in this investigation, the proposed extension was favored by many in the community, with the exception of a small, but vocal minority, who felt that their businesses and community were threatened by the extension. In other areas of Phoenix, the light rail has brought about increased economic growth, improved environmental quality, and a more livable lifestyle. There is reason to be cautiously optimistic for South Phoenix and for those who call this neighborhood home, as well as light rail in Phoenix in general, especially with three extension projects on the horizon, a street car system nearing completion in Tempe, and two further expansion studies current underway.

XIV. CONCLUSION

Phoenix is a leading example of post-World War Two, car-built, suburban cities that witnessed large and continuing increases in population beginning in the late 1940’s. This investigation examined how the light rail system in Phoenix, Arizona has impacted the quality of life of users and residents during its initial operations. Utilizing existing public data, semi-structured interviews, and author observations, we sought to shed light on varying aspects of sustainability as they relate to the light rail system. A lack of economic and environmental quality information made certain aspects of the in-
vestigation difficult to conduct. More economic and environmental quality data must become available in coming years, to provide a more complete picture of how the light rail system can better promote economic development, improvements in environmental quality, and equity among all residents along the light rail corridor. Though information is lacking it is still possible to provide some answers to the guiding research questions of this investigation.

Research has demonstrated that the light rail system has had a positive environmental and economic impact on the areas it serves. The elimination of 10,300 vehicles from roads equates to reducing carbon emissions by 23.2 million pounds annually. Increased use of light rail will assist in decreasing HPA’s as well as achieving Air Quality Sustainability Goals as outlined by the City of Phoenix. Billions of dollars of economic activity have taken place along the light rail route, including construction of new high density dwellings, increased employment, as well as higher paying employment opportunities. Unfortunately, as once neglected neighborhoods become prosperous again, a segment of the original inhabitants can no longer afford to live in areas that have been their homes for decades and generations.

Quality of life for many has improved along the light rail service area. Residents have greater access to employment, educational, and recreational activities. A greater sense of community and place have taken root among the New Urbanists who call areas served by Valley Metro home. A decade of constant change has also brought problems and concerns as well. Some claim that crime, access to drugs, and other illegal activities has increased along with positive aspects of living along the light rail corridor. A complex study of crime and police activity must be carried out to measure the impact that the light rail has had in order to state with certainty the impact upon overall quality of life.

One frequent critique of the Phoenix system is that it does not have a large enough service area. In order for other potential systems to be successful and quickly adopted by the public, the initial service area must be made as large as financially possible, to develop a core ridership that will help support the system. An early complaint of the light rail system was the manner in which expansion outreach operations were conducted by Valley Metro employees. Many business owners complained of the quality and quantity of Valley Metro outreach efforts to businesses during the difficult days of initial construction. Other cities considering light rail should make concerted efforts to keep business owners and residents along construction routes as involved as possible during the planning and outreach phases. With better outreach and communication plans it might have been entirely possible to avoid the whole opposition issue of, “Four Lanes or no Train” which led to challenges of the very existence of the system.

In order for the Valley Metro system to become more sustainable it must attract more riders. Many who oppose light rail extension cite the statistic that only 1% of the population of Phoenix uses the light rail. While there may be reason to question the veracity of that statistic, it still highlights the fact that a small segment of the overall population, uses a system that is paid for by the entire population—including those who have never rode the light rail.

As ridership increases, so too will Transit Oriented Development (TOD). By increasing populations along the current line, as well as any future extensions, a more sustainable economic climate will be created which will serve to encourage further extensions of the system. TOD is a self-feeding cycle of expansion and growth, in which a careful equilibrium must be maintained, in order to ensure

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40 Ibid.

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that the full economic and environmental benefits of the high density urban living and public transportation are realized.

Since its inception in the late 1990’s, and inauguration of service in 2008, the Valley Metro Light Rail has been an agent of change in neighborhoods it serves. Decades of downtown neglect have given way to infill, adaptive reuse, and new high density buildings designed to fit into the larger scheme of TOD. The citizens of Phoenix have decidedly cast their ballots in favor of maintaining, and extending the light rail system in Phoenix in four separate elections. There is reason to be cautiously optimistic for further economic development, increased environmental quality, and an increased quality of life and sense of community along the current and future light rail route. A more sustainable, livable city center catering to new urbanist Millennials who seek the downtown lifestyle is rising from the ashes of decades of exodus to the suburbs.