



 **Infrastructure Redefined**
A PATH TO PROSPERITY STRATEGY

Infrastructure Redefined

For Knox County to prosper economically it needs to grow because with this growth will come the talent to expand workforces, the new customers for shops and restaurants, and the need for more products and services. It will also result in increased sales and property tax revenue to be invested in better schools, roads, parks, sidewalks, and other amenities. In short, the greater the growth the community experiences, the greater the opportunities for its residents.

Population growth can, however, be a double-edged sword if the region's infrastructure is unprepared for its arrival.

"We don't want to be another Nashville," is an oft-heard refrain of East Tennesseans who bemoan the interstate gridlock in the Music City, where the average commute time is 25 percent higher than in Knoxville. Yet, Nashville is the economic envy of many regions for its sustained job growth that serves as a magnet for young professionals, entrepreneurs, and global companies, who are creating high-paying and in-demand jobs.

Knoxville and Knox County can take a different path by preparing now for the growth needed to prosper economically, thus mitigating the negative by-product of the Tennessee's capital city population expansion. Now is a time of disruption where innovation and consumer preferences demand a fresh look at the necessary infrastructure to drive regional prosperity. This includes reimagining solutions to address the increasing number of regional commuters and freight transport on the region's interstate and connector roads. Integrating charging stations and other technological advances that pave the way for electric and autonomous vehicles will be a critical component of the 21st century transportation ecosystem. New means to pay for these improvements will need to be explored as revenues from gasoline taxes decline.

It's vital to remember that cars and trucks are not the only elements of a community's infrastructure system.

While work-from-home has certainly taken hold during the pandemic, many still face transportation barriers to getting to work -- or to their clients -- pointing to the need for public transportation routes that connect residents to employment centers and additional low-cost air flights from McGhee Tyson Airport. An inventory of buildings and land available for new and growing businesses must be available, as well as housing for the individuals who work there. To ensure that inventory is maintained, water and sewer infrastructure maintenance and expansion should be coordinated. Clear and predictable planning, regulatory and zoning policies can help to avoid the all-too-frequent, time-consuming and, often, unnecessary battles between developers and neighborhoods.

Finally, the backbone of prosperous communities will be the universal ability for citizens to access the Internet, the gateway to improved education, health, and economic opportunities.

As it has done with workforce development, talent retention and attraction, and access to capital, the Knoxville Chamber, along with a plethora of partners and stakeholders, has crafted what it believes to be a comprehensive strategy to address the Knoxville/Knox County community's infrastructure to support future growth. Entitled *Infrastructure Redefined*, this strategy aims to highlight a spectrum of short- and long-term infrastructure recommendations that the community can consider as it strives to ensure economic prosperity for all.

Drive With the High Beams On

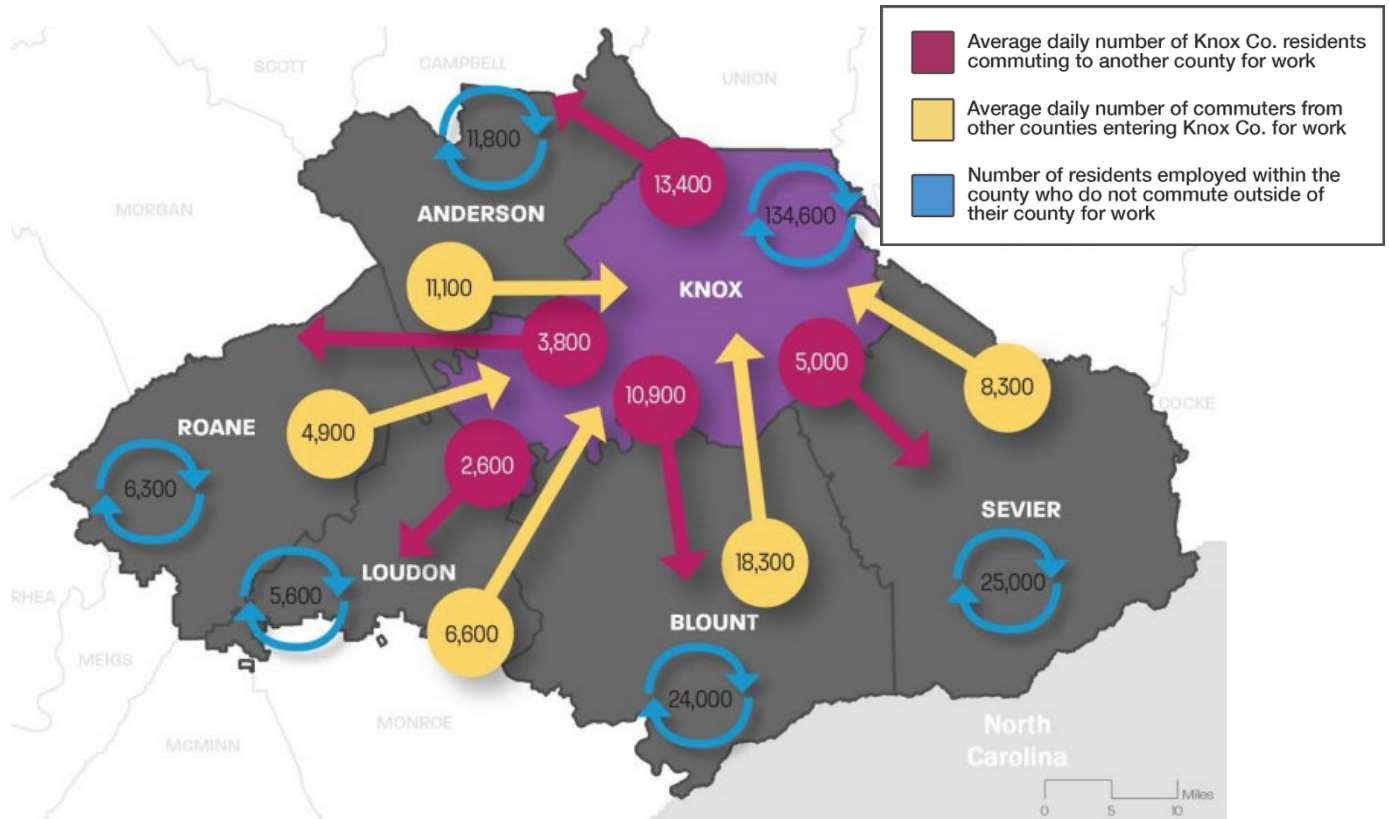
Continuing the Nashville analogy, and perhaps adding Atlanta, the perception of a metro area's infrastructure typically rests on how easy it is for residents to get where they need to go. As Knoxville is spliced by two major interstates, I-75 and I-40, the ability of these thoroughfares to keep up with not only local growth, but also increased traffic related to the pandemic-caused realignment of a supply chain capitalizing on the region's proximity to markets east of the Mississippi, is under pressure.

According to the Tennessee Department of Transportation, four out of five of Tennessee's highest traffic count stations are in Knoxville. These include the intersection of I-640/I-275 on the north end, and locations from the I-40/I-75 and I-640 interchange west to Bridgewater Road. The pandemic resulted in just one of those locations being dropped from the top five.

Commuting patterns illustrate the regional nature of the Knoxville-area economy. Almost half of the people who work in Knox County commute from outside the county, and about a third of Knox County's population commutes to a surrounding county for work¹.

¹ Knoxville Regional Transportation Planning Organization

Knoxville Area Regional Commuting Patterns



Mobility Plan 2045, Knoxville Regional TPO LEHD Data 2017

In addition to the interstate dissection, the Knoxville area’s proximity to Interstate 81 makes the region a magnet for truck trips. Between 2014 and 2019, truck trips increased by about 14 percent on Interstates 40 and 75, and by 2045 commercial trucking by tonnage is expected to double in our region.²

One method that the Knoxville Regional Transportation Planning Organization (TPO) uses to measure congestion is the level of travel time reliability or LOTTR, which assigns a percentage value based on the consistency of a commuter’s ability to travel a specific section of road. Portions of I-40/I-75 are unreliable more than 50 percent of the time from downtown west to I-140, known locally as Pellissippi Parkway. TPO has prioritized solutions that do not increase capacity by adding lanes including operational and technology strategies. The time has come, however, to study growing the capacity because projections for road transport continue to rise.

² Mobility Plan 2045: <https://knoxmobility.org>

Similar projections prompted state traffic engineers to recommend a Knoxville bypass more than decade ago, but objections by residents to the planned route – near Hardin Valley – resulted in the entire project being scuttled. In the meantime, residential and commercial growth in the Hardin Valley area has exploded.

A stalled interstate system affects not just Knoxville, but the entire region, so solutions need to be regional and embraced by local elected officials. To thwart a standstill of traffic in the future, the time to begin those conversations anew is now in order for construction to be completed in the next 30 years.

Unfortunately, within that same timeframe, if not sooner, the means to fund transportation projects (i.e., a tax on gasoline and diesel fuel) will be diminished. Sixty percent of the state’s transportation budget – or \$560 million for fiscal year 2021 – was derived from the tax. Another \$346 million was allotted to cities and counties.³ The state’s governor and lawmakers have historically taken pride in the fact that no debt is issued for road projects and little political will exists to change from this “pay as you go” status. This strategy is mindful that new revenue sources will need to be considered to keep pace, but that advanced transportation technology will also need infrastructure, in addition to roads, to succeed.

It is equally important to prepare for the effects of an ever-growing electric vehicle (EV) environment where charging at home and public charging stations will increase electrical demand. Connectivity is at the heart of autonomous vehicles (AVs), whether they be powered by green energy or gasoline, so the Knoxville community must be reinforcing its fiber and sensor networks, internet of things (IoT) device capabilities⁴, facilities for safe public Wi-Fi, and superspeed 5G as all are needed for AVs to receive and transmit enormous amounts of data that the vehicles require.⁵

With the possible influx of infrastructure funds from the federal government, the region needs to be poised to advocate for its share. According to the Tennessee Department of Transportation (TDOT), projects that are “Ready to Move Forward”⁶ and those that are strongly supported by unified communities are more likely to be awarded. As such, Knoxville/Knox County needs to be prepared now even though those long-term solutions can take decades to materialize.

³ Tennessee’s Gas Tax: <https://www.tn.gov/tdot/finance/gas-tax1.html>

⁴ The Internet of Things is the network of physical objects that are embedded with sensors, software, and other technologies to connect and exchange data with other devices and systems over the internet. For AVs, that includes smart phones of pedestrians and cyclists, traffic sensors, and parking detectors.

⁵ <https://www.intellias.com/how-will-urban-infrastructure-change-with-autonomous-driving/>

⁶ Phase readiness as determined by TDOT Project Development staff.

Recommendation: Lead and advocate for short- and long-term solutions to relieve roadway congestion, safety improvements for all modes of transportation, and advancements in movement to drive regional economic prosperity.

Components:

- Identify regional solutions to alleviate growing congestion on I-40/I-75 through Knoxville
- Work with regional stakeholders to identify long-term transportation needs and solutions and present them to the state legislature as a united front
- Explore alternative transportation funding sources as dedicated gas tax revenues decline
- Identify and encourage infrastructure improvements needed for safety and to support technological advancements, including electric and autonomous vehicles

It's All About Talent

Between January 2020 to July 2021, eight companies announced their intent to locate to the Knoxville area, thus creating 2,265 new jobs, while 10 others have announced expansions, thereby adding another 866 jobs⁷. While this is great news for the region, it also puts added pressure on an already strained labor force. Companies' need for the talent required to take advantage of a strong economy continues to grow and indications are that the talent is going to be younger. Previous estimates have forecast that members of the Millennial and Gen Z generations would make up nearly 60 percent of the workforce by 2030, a percentage that may be even higher as many Baby Boomers – the longest-working generation – left the workforce during the COVID-19 pandemic.

A younger talent pool translates to a different set of priorities and desires. “When considering how to appeal to these generations, evaluating the health of your city’s transportation system is critical,” wrote Leane Storey for Metro, a transit industry trade journal, recently. “In fact, recent research suggests that when looking for a place to settle, the most important criteria for those aged 24-44 is easy access to transit.”

The city of Knoxville’s efforts over the past 15 years to revitalize its urban core and surrounding corridors – Cumberland Avenue to the west, the South Waterfront, Central Avenue to the north and now Magnolia Avenue to the east – bodes well for creating the environment that allows for transportation options that do not involve automobiles. The city and planners have long adopted Smart Growth America’s Complete Streets philosophy that street design should consider the safety and pleasure of people walking, biking, driving, riding transit and moving actively with assistive devices. These public investments in downtown and, more recently, the corridors have leveraged private investment, particularly residential spaces, that gives the younger workforce the multi-modal urban setting they prefer.

Still, many of the region’s largest employers sit outside the city limits, where public transit is not available, and distance makes other options unfeasible. This also becomes an equity issue as the cost of maintaining reliable vehicles can be a barrier for youth and adults seeking employment. Consider that Amazon’s requirements for its East Coast headquarters had transit at the top of the list. Closer to home, the company is working with Knoxville Area Transit (KAT) on an enhanced bus stop at its new facility at the former Knoxville Center Mall.

Just minutes beyond the city limits, however, literally hundreds of jobs remain unfilled at Forks of the River (FOTR) Industrial Park. A Knoxville Chamber survey found that FOTR employers have between 250 and 500 jobs currently unfilled, and they hope to add another 800 to 1,400 jobs over the next five years. About half of the 52 companies responding reported employees with no or unreliable transportation. With more industrial property available further east at the Eastbridge and Midway Business Parks, the demand is certain to grow.

⁷ Knoxville Chamber Economic Development Announcements, January 1, 2020, through July 31, 2021.

More work is needed to quantify how much of a barrier transportation is to meaningful employment and possible solutions, and nothing should be considered “off the table.” For instance, the Knoxville-Knox County Community Action Committee (CAC) has been providing daily service for up to 17 riders per van from homes to businesses in FOTR since 2001. The Chamber has been working with the park’s employers to increase awareness of CAC’s on-demand service, while exploring other solutions including identifying pockets of high unemployment and creating pick up points. The engagement of workforce service providers is important to identify populations who can be served by these options and the flexibility of employers will be critical.

The “work from anywhere” mentality that has been intensified by the pandemic has resulted in the region’s workforce now including a growing number of individuals who are able to live anywhere but have chosen to stay or move to the Knoxville area. They must still, however, have diverse and affordable air access to markets around the country. The Metropolitan Knoxville Airport Authority has historically taken the lead on recruiting carriers and additional flights to the region, with support from the Smoky Mountains tourism communities and the Competitive Airfare Partnership, a business coalition managed by the Chamber. These efforts should continue while garnering support from a broadened section of area stakeholders.

Recommendation: Support infrastructure projects that aid in workforce development, talent retention and attraction, and business recruitment efforts.

Components:

- Advocate for better utilization of public transportation to connect residents to employment centers
- Support efforts to expand existing routes and recruit low-cost air carriers to McGhee Tyson Airport

The Built Environment

The previous two sections of this strategy discussed the traditional aspects of infrastructure, particularly related to getting people from here-to-there in the short- to medium-term, while also preparing for the future. As communities compete for a shrinking labor market and the all-important Millennial generation, infrastructure takes on a wider meaning.

Knoxville Mayor Indya Kincannon, during her 2021 budget address, reiterated her commitment to make redevelopment within the city more user-friendly because residents and newcomers are increasingly seeking a city where they can walk or bike to restaurants, entertainment and recreational opportunities from their homes and workplaces.

Similarly, Knox County Mayor Glenn Jacobs in May 2021 announced that Knoxville-Knox County Planning would begin a comprehensive planning process that will guide land use and transportation decisions for the next 20 years.

Both initiatives provide the business community a meaningful way to advocate for planning and zoning policies, as well as sensible and consistent regulatory processes, that promote economic growth. This positive could quickly turn into a negative if the only voices heard are from those who argue for no growth or, in the alternative, processes that are so cumbersome that they result in stagnation.

Communication between all parties involved in the development process is crucial to its improvement. Mayor Kincannon, for instance, has invited dozens of professionals from architecture, construction, development and engineering to participate in roundtable discussions to highlight obstacles to redevelopment, particularly along the city's corridors. A handful of items likely can be rectified administratively or with better communication. Other items will require far more discussion and, possibly, City Council approval.

Mayor Jacobs, likewise, has budgeted for a consultant to assist with the creation of a Knox County Comprehensive Land Use and Transportation Plan. The mayor has previously expressed a desire for more cluster-type developments of homes and commercial properties particularly near employment centers or what he has characterized as smart growth that is coordinated with infrastructure needs. Both efforts will consider needed investments in water and sewer system maintenance and expansion to accommodate a growing population and economic development opportunities. Significant funds have been awarded to these utilities under the federal American Rescue Plan Act and more could be coming with a new federal infrastructure bill. Coordinating these investments with the general and transportation plan is paramount for efficiency.

Knoxville/Knox County has long boasted of its relatively affordable housing, but that competitive advantage is quickly evaporating. The Knoxville Area Association of Realtors reported record-high home sales and record low inventory in 2020 with the median sales price of a single-family home

reaching \$225,000, an increase of 12.5 percent over 2019. Prices will continue to creep up as the imbalance between supply and demand remains.

“Research consistently shows that job growth and economic development are closely linked to the availability and affordability of housing,” notes Hancen Sale, government affairs and policy director for the Knoxville Area Association of Realtors. “Without a steady and diverse supply of housing — affordable, market-rate, single-family, multifamily — local and regional businesses face competitive disadvantages when working to attract new talent and retain workers.”

Knox County's population grew by 10.8 percent from 2010-2020, yet its housing stock grew by only 8.2 percent during the same period, Sale reported. “This supply-side constraint underscores the importance of boosting Knoxville’s housing stock, as meeting the rising demand will be a defining challenge for our city in 2021,” Sale said.

The solutions rest on two pillars: stimulating the creation of new housing stock and helping individuals and families achieve homeownership. Crafters of the city’s two-year-old zoning ordinance had hoped to create more opportunities for so-called missing middle housing by permitting house-scale duplexes, fourplexes and cottage courts in additional residential zones. Their efforts were met with limited success.

What the new ordinance did encourage, however, was development of the city’s corridors. With the appropriate infrastructure, creative incentives and targeted marketing, an opportunity exists for mixed-used development that provides the work-live-play lifestyle today’s workforce is seeking.

Similarly, a well-executed middle housing development – leveraged with public investment – could allay the fears of traditional neighborhood opposition and become a showcase for future efforts. Areas suffering from property blight are particularly ripe for this approach to strengthen surrounding neighborhoods.

Knox County can also stimulate housing development with a new General Plan that encourages developments that offer a mix of housing types and price points. The county can also encourage these smart-growth neighborhoods with public investments in improved road designs.

City and county leaders received a crash-course in providing housing assistance when they stood up a partnership with nonprofit organizations during the pandemic to provide rental assistance to tenants and landlords using federal funds. The data and results of that effort can inform future efforts and be used as a springboard to further improve coordination among service providers.

Wherever they live, Knoxville’s paths to prosperity will be, to a large extent, dependent on their ability to access broadband Internet. The pandemic significantly increased the region’s dependence on broadband and exposed gaps in service. The digital divide exists primarily because of lack of internet infrastructure in rural communities and the cost of installation and subscriptions in urban areas.

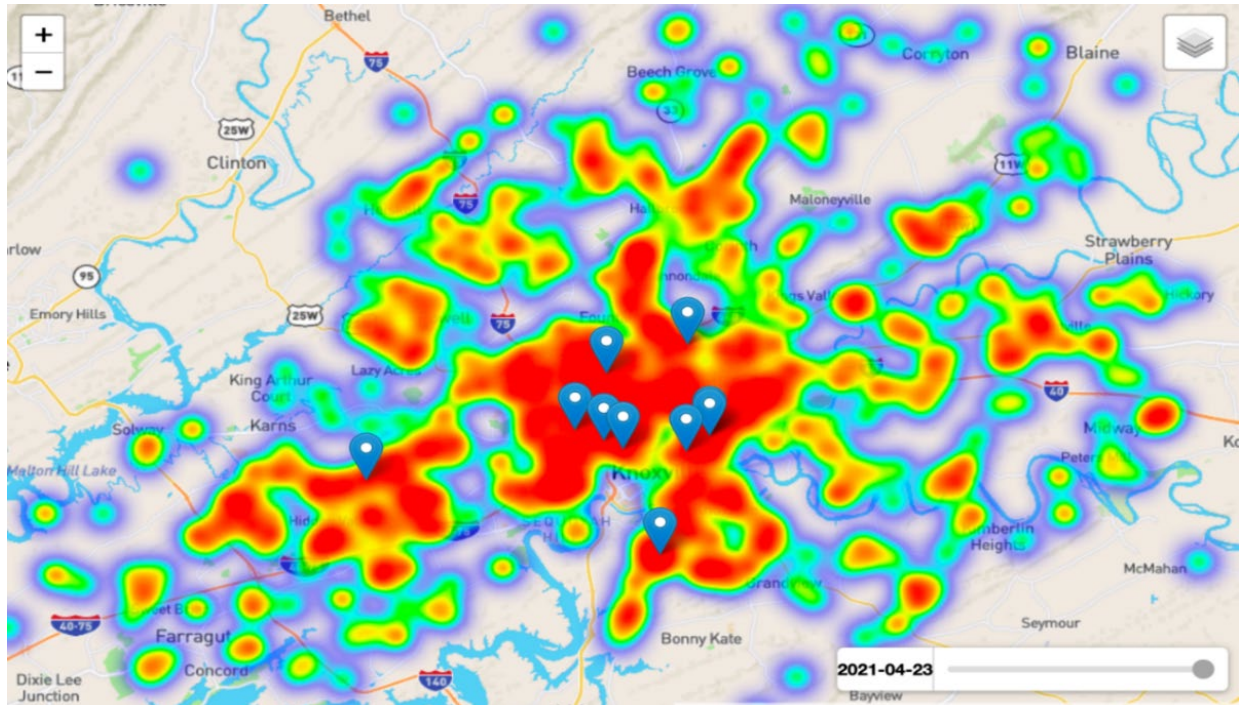
Based on Federal Communications Commission (FCC) and Microsoft measurements, 98 percent of households in Knox County have access to broadband service, but just 51 percent subscribe to service.⁸ FCC data, however, can overstate the availability of coverage, since broadband providers are only required to report on census blocks they serve. If one home in a census block is served, the FCC shows the entire census block as served.

Evidence of the digital divide in Knox County was witnessed in spring 2020 when schools closed because of the pandemic. At the time, Knox County Schools (KCS) offered no virtual education lessons because not all students were equipped with computers. The school system used federal relief funds to purchase 60,000 Chromebooks in July 2020, and a community-led task force called eKnox secured \$350,000 to help qualifying KCS families with Internet access. By the end of the 2020-2021 school year, 1,078 hot spot devices were loaned and 259 Comcast Internet Essentials coupon codes⁹ were activated.

A Knox Education Foundation-created heat map using KCS student data from April 2021 shows areas in red with a high concentration of households assisted by the eKnox program. All of the subsidized low-income properties managed by Knoxville's Community Development Corporation (KCDC) are located in red zones. Within the urban core, undocumented families and those with language barriers comprised a large portion of student families with loaned hot spot devices. In the more rural outskirts of KCS boundaries, parts of Carter and South Knoxville have no wired access.

⁸ USA TODAY NETWORK, "In East Tennessee, many still lack broadband access", July 8, 2021.

⁹ Codes distributed by KCS Helpline assistants to a student household on the National School Lunch program or other qualifying federal assistance programs to be used to subscribe to Comcast's 50/5 Mbps internet service that is billed to KEF instead of the homeowner at the rate of \$9.95 per month.



KCS student households with activated Comcast Internet Essentials coupon codes or loaned hot spot devices, with KCDC properties flagged. Source: Knoxville Education Foundation, April 2021

Disparities in access and affordability have also impacted working adults. During the 2021 East Tennessee Broadband Summit led by Oak Ridge National Laboratory, Covenant Health administrators reported that about 45,000 patients in 2020 were seen by physicians using telehealth services. Many of its rural patients, however, were unable to utilize the option due to lack of internet access or computers. Stories of no, unreliable or unaffordable home internet were also shared at Knoxville Utilities Board’s community input meetings by residents including remote workers and college students. Realtors stressed the need for reliable high-speed internet to KUB board members, saying lack of it is often a deal-breaker.

Knoxville City Council’s approval in June 2021 of the Knoxville Utilities Board’s proposal to provide 1G/1G direct-to-home fiber internet to its electric service customers will provide additional access at a less expensive price for many residents. Of all technologies that provide broadband - fiber optics, fixed wireless, cable, DSL and satellite - fiber provides the fastest speed available with low latency.¹⁰

Along with affordability, an important factor in capitalizing on this access will be digital literacy. Residents who have never had Internet service do not understand the value. The Chamber is sponsoring a fellow through Lead for America’s American Connection Project to work with KCDC on the Western Heights Reimagined project to raise awareness of the value of Internet connectivity and work with partners on providing digital literacy training.

¹⁰ Latency is the time it takes for data to be transferred between its original source and its destination. [Optimum.com](https://www.optimum.com).

Affordable, high-speed Internet can be key to elevating more residents out of poverty by providing access to educational and economic opportunities.

Reliable, high-speed broadband is also essential to recruiting companies with high-wage workforces, entrepreneurs seeking to build new businesses and talent to make them successful.

Recommendation: Support projects and policies involving buildings, energy and land that support economic growth.

Components:

- Advocate for clear and predictable planning and zoning policies, as well as timely regulatory processes that promote economic growth
- Work with stakeholders to ensure a diverse inventory of buildings and land is available for new and growing businesses
- Advocate for water and sewer infrastructure maintenance and expansion to accommodate a growing population and economic development opportunities
- Support incentive-based programs and policies that promote affordable housing and effectively address property blight to strengthen neighborhoods
- Pursue 100 percent regional broadband access, as well as improvements in speed, reliability, service and affordability to improve education, medical care and economic opportunities

Final Words

Infrastructure Redefined is one of six Path to Prosperity strategies approved by the Knoxville Chamber's board of directors to prepare the region for growth. Paramount to this strategy is an acknowledgement that growth is good and necessary to retain and attract talent and jobs.

“To be in the running for educated, skilled and in-demand talent, the Knoxville region will need to continue to rank high in livability, with housing in different settings at many price points, unique amenities to fill leisure time, an infrastructure that supports growth ...” these words are borrowed from *Talent Redefined*, the Chamber's regional talent retention and attraction strategy, and they ring true for this effort, as well. The region's infrastructure needs will change but getting people from here to there and ensuring they have a place to live will remain top priorities.

Neither the Chamber nor any other individual or organization can move the needle by themselves on these items. Collaboration is necessary among many stakeholders so that the region can speak with one voice to garner the needed investments to ensure our infrastructure is well prepared for economic growth.