

APPENDIX D: SCENARIO EVALUATION RESULTS

As described in Chapter VI, Imagine Central Arkansas includes a scenario planning process used to explore alternatives for growth, development and transportation investment, and thus is intended to spur discussion of long range planning and the regional Vision by analyzing the impacts of two land use scenarios. The scenarios are intended to help explain the outcomes of different growth and development patterns, and to analyze if the regional Vision optimally meets the intent of the Imagine Central Arkansas Vision statement, goals and objectives.

The distinct placetypes defined for the Imagine Central Arkansas scenario planning process vary in density, diversity and design. Some placetypes are intended to replicate existing development patterns that would normally apply to the central Arkansas region, such as rural residential, suburban residential, suburban apartment and suburban commercial, whereas other placetypes represent more walkable and compact development patterns that are more in line with the regional Vision, such as rural cluster neighborhood, walkable neighborhood and mixed-use center/corridor.

The two hypothetical development scenarios were evaluated against a wide range of indicators that fall under different categories: Land Use, Transportation, Environment, Economy and Workforce, Housing and Neighborhoods and Infrastructure. The detailed indicator results are described in the following sections.

Land Use

Consumption of Land

A shift toward more compact growth types, such as those represented by the mixed-use center/corridor and walkable neighborhood placetypes, has a fundamental impact on the amount of residential and non-residential land consumed. The bulk of land consumption in the Emerging Trend scenario is attributed to less compact and more dispersed development patterns, but by design under the

Regional Vision scenario, growth and development is more compact.

This shift toward more compact growth patterns can have a significant impact on the region. The scenarios represent a progressively intensive shift from the status quo of rural and suburban growth (Emerging Trend Scenario) to more compact growth in the form of higher densities and smaller lot sizes. This shift results in a clear and measurable impact in the form of:

- The Regional Vision scenario consumes less than half the land of the Emerging Trend Scenario (approximately 33,800 acres vs. 83,300 acres), thereby preserving a greater amount of environmentally sensitive lands
- Up to 20% less impervious surface, resulting in less stormwater impacts and a reduction in urban footprint.
- Shorter automobile trips and greater potential for walking, bicycling and riding transit.
- Less in sanitary sewer and potable water supply infrastructure needs and costs, and less water consumed.

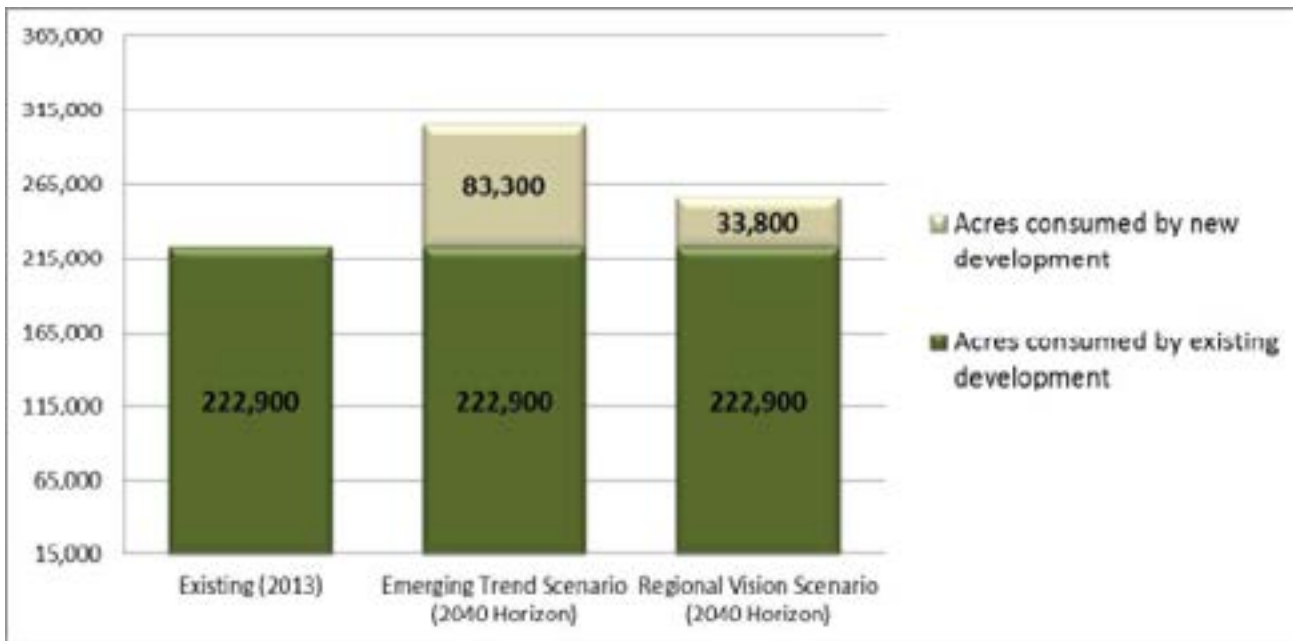
Environment

During the Imagine Central Arkansas outreach phases, people expressed that they value maintaining natural beauty and reducing development footprints.

Impervious Surface

New development in the form of buildings, pavement, sidewalks, parking lots, etc. all combine to form impervious surface, which collects solar heat, producing “heat islands,” impacts on native habitats and, perhaps more importantly, adds to stormwater runoff. Runoff creates flooding potential and discharges harmful pollutants into water bodies. The region includes features that are susceptible to runoff, including the Arkansas River, its tributaries and several wetlands.

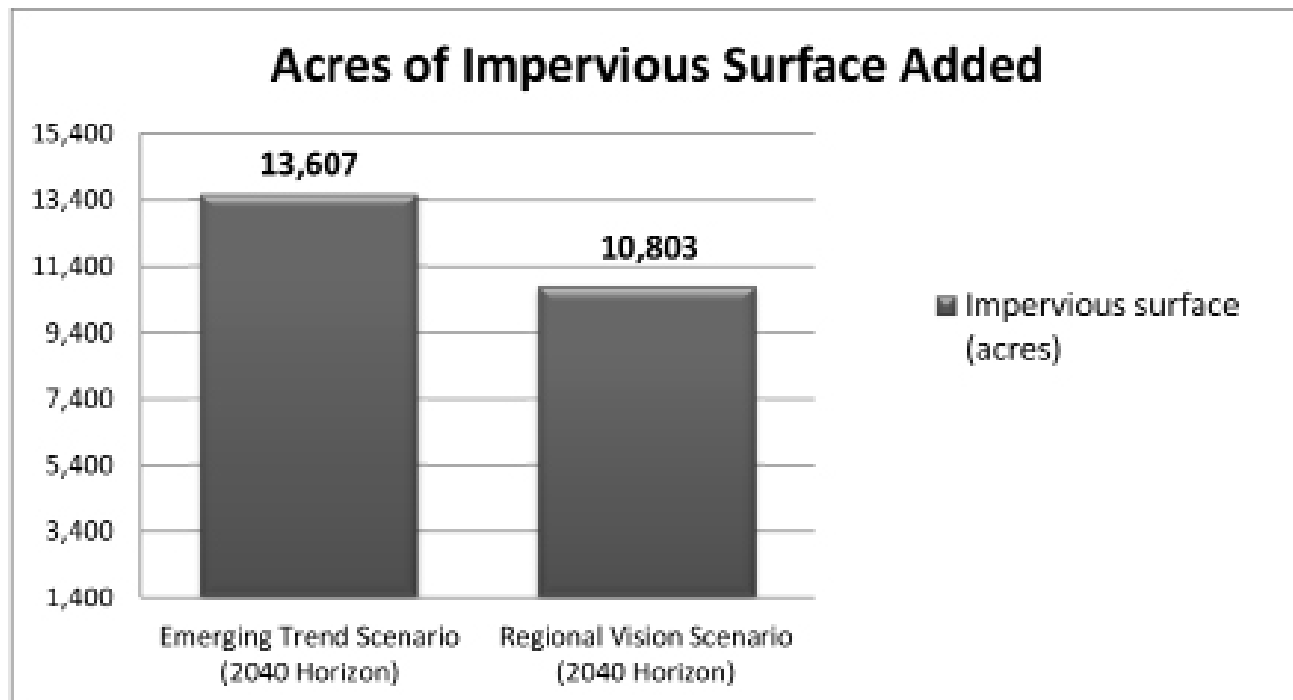
Figure D-1. Consumption of Land



Generally speaking, the greater the amount of impervious surface, the greater the potential for stormwater flooding and harmful runoff. The difference in impervious surface is attributed to factors, including:

- Smaller home sizes, consistent with smaller lot sizes;
- Smaller parking lots due to shared parking for mixed-use;

Figure D-2. Impervious Surface



- Less pavement, hardscape, etc. due to more compact development and redevelopment, and
- A more vertically-oriented building style as evidenced by higher floor area ratios.

The extent to which development decisions are made which include these factors, the region can reduce the potential for runoff issues.

Personal versus Shared Open Space

Even as places grow and develop, people value open space for the continuity it provides with natural systems, venues for public gatherings and recreational opportunities. The Regional Vision scenario by design includes placetypes that cluster homes and buildings around shared open space, including plazas, greens, common areas, etc. By contrast, the Emerging Trend scenario is made up of suburban-oriented placetypes and puts more emphasis on private “green space” in the form of yards.

Since the Regional Vision scenario favors more compact growth and consumes far less land, the result is essentially a trade-off between personal and shared open space. Under the Regional Vision scenario, new single-family residential neighborhoods would have significantly smaller yards and lot sizes, with more emphasis on shared, designated open space. This is a key trade-off that must be taken into consideration when considering policy decisions about growth.

Transportation

For many central Arkansas, the personal automobile is the only option for travel. Currently, only one in four homes have access to local transit, only 15 percent of the streets have sidewalks and bicycling is growing but the region still lacks critical connections. During the Imagine Central Arkansas outreach phases, people expressed that they value choice in transportation and expanding walking, cycling and transit opportunities. In addition, they want convenient neighborhoods, where school, shopping, transit, entertainment venues and jobs are only a short walk, bike or drive away from homes.

Walk Potential

For a number of reasons, including livability, cost, health and the environment, a growing number of central Arkansans are interested in having a variety of transportation options available to them whether it be walking, bicycling, riding transit or driving. In large part, the ability or potential to use one of these mobility options relies on proximity: the distance between origins (homes) and destinations (work, school, shopping, etc.).

One-quarter mile, which translates into a five-minute walk, is the average maximum distance that a healthy person will walk. Walk potential is also dependent on the availability of sidewalks as well as street connections and networks, which can vary from dense urban grids of highly interconnected, straight streets to sparse suburban networks of curving streets forming loops and cul-de-sacs. As a result, this is typically the standard used to determine walk potential.

Today, approximately 49,530 homes are within walking distance to retail and service areas (areas with at least 50 commercial employees, such as strip centers, department stores, etc.). In terms of

Figure D-3. Quarter-mile Walking Radius



walk potential to retail/service areas, the difference between the scenarios is less dramatic. Under the Emerging Trend scenario, just over 68,250 homes are within walking distance to retail and service areas, compared to almost 78,000 homes under the Regional Vision scenario. Of the two scenarios, the Regional Vision scenario is most likely to provide a walk-friendly environment because the clustering of compact residential growth around mixed-use areas.

Good access to parks is an important part of quality life. The park proximity indicator took into account both existing parks as well as the locations of planned parks in the region, at both the city/county and regional scale of parks. Planned parks include those that are identified in regional Comprehensive Land Use Plans. This percentage also assumes that the future planned parks will be built. Again, there are incremental differences in the potential for walking between the scenarios. The amount of homes within a quarter-mile walking distance to existing and planned city/county scale parks is only 20 percent (77,190) under the Emerging Trend scenario, and increases slightly to 22 percent of the total homes (83,615) under the Regional Vision scenario. Under both scenarios, the amount of homes within a quarter-mile walking distance to existing and planned regional scale parks is only 1 percent of the total homes, that same it is today.

The indicators for walk potential to parks confirm the need for the region to think about planning for new parks to serve growth within central Arkansas. Co-locating parks and schools can make the siting process more efficient and will create walking benefits for both places.

The number of homes within walking distance of destinations represents a fraction of the overall number of homes in the region. These findings are the result of several factors: it is more difficult to change land use patterns around parks that have already been built and a fundamental change in density would be required to have a significant impact on walk potential.

Bike Potential

Cycling can be a healthy, environmentally friendly and cost-effective alternative to driving under the right circumstances. The data represented by the following indicators is based on a one-mile radius. Although a two-mile radius is an appropriate distance for experienced cyclists, less experienced and younger cyclists may not be willing or able to ride that far, in which case a smaller radius, such as a mile, is more appropriate.

Under both scenarios, a majority of the homes are within cycling distance of retail and service areas and of existing and planned city/county parks, but the

Figure D-4. Walk Potential to Retail and Service Areas

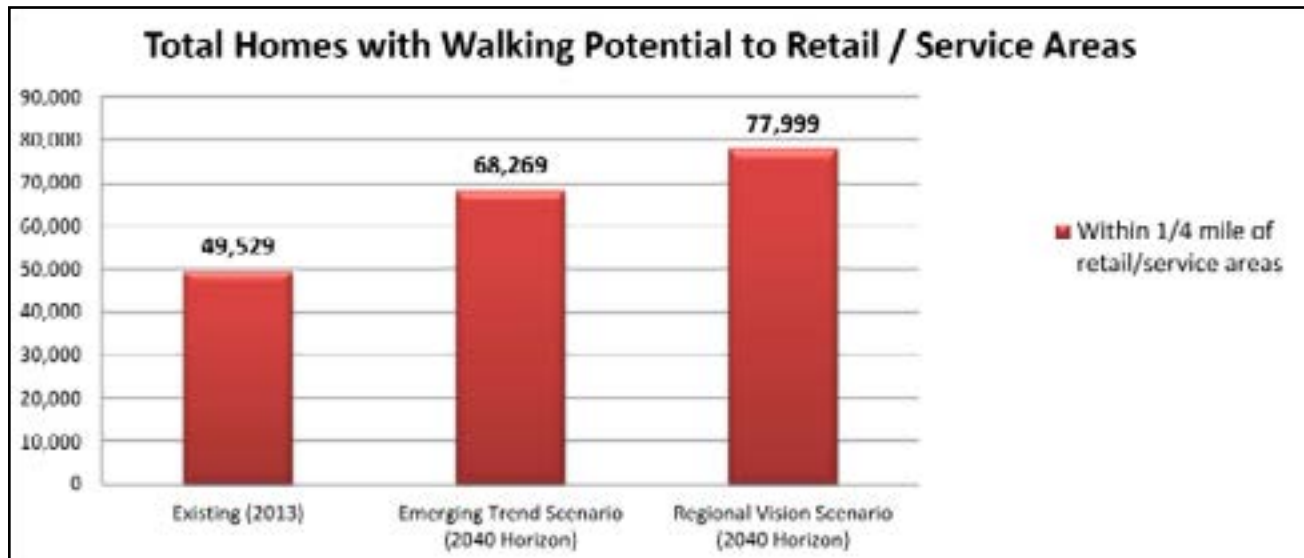


Figure D-5. Bike Potential to Retail and Service Areas

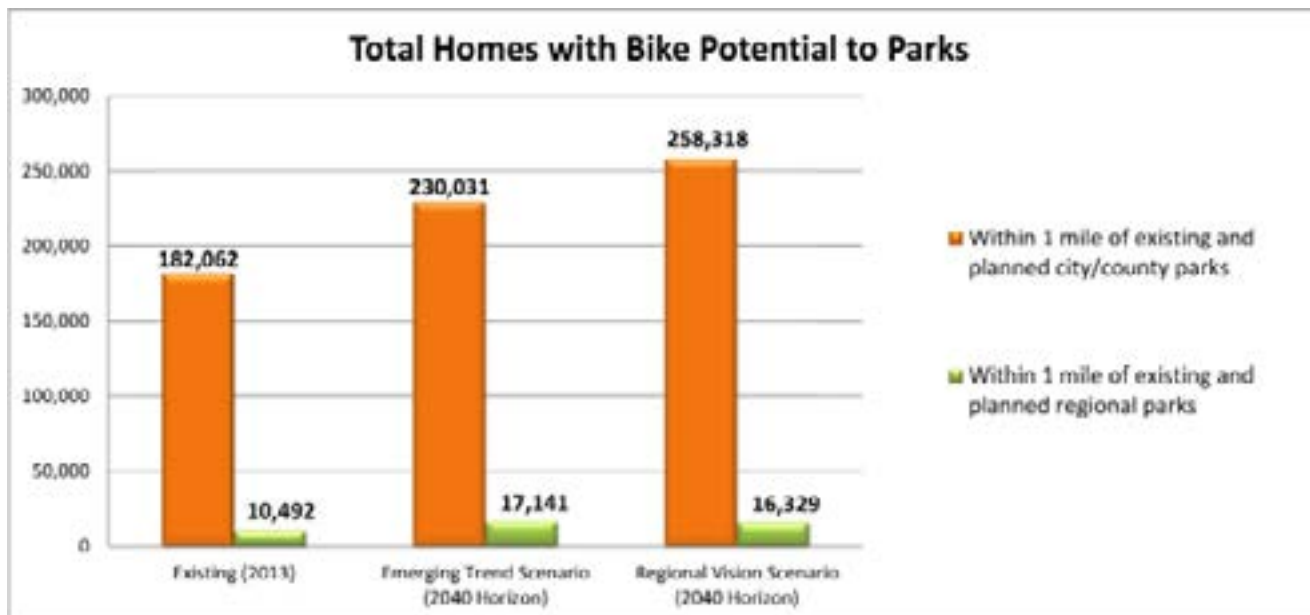


Regional Vision scenario has the greatest number of homes where cycling to retail/service areas and city/county parks is possible. Again, this data represents the potential for cycling. Adequate facilities must be in place for the potential to be realized. This includes a robust, interconnected network of low-volume, low-speed streets, shoulders and bike lanes on higher-speed, higher volume facilities and off-road paths when possible (utility easements, etc.).

Local Transit Potential

Existing fixed-route transit service is provided by Central Arkansas Transit Authority (CATA) and is limited to linking neighborhoods and activity centers in Pulaski County only. Today, 26 percent of homes (70,320) and 59 percent of jobs (195,223) are located within walking distance to CATA routes. Less compact, dispersed development patterns that are difficult to serve efficiently with fixed-route service

Figure D-6. Bike Potential to Parks



are one reason why so few central Arkansas residents have access.

There are currently no funds programmed for expansion of CATA beyond its existing service areas. Although the percentage of homes and jobs located within walking distance to existing local transit service routes goes down under the Emerging Trend Scenario, the total number of homes (76,530) and jobs (227,153) in the region would increase. The percentage of households with transit access is less under the Emerging Trend Scenario compared to existing conditions because most of the new residential growth occurs in areas where there is not existing CATA service.

In contrast, under the Regional Vision scenario 23 percent of homes (88,042) and 59 percent of jobs (273,079) in areas within one-quarter mile of existing local transit service areas than the Emerging Trend scenario. If agencies pursue a more balanced transportation investment strategy and people begin to

seek out more options for local and regional travel as the region becomes more urbanized, then local transit service areas will be able to expand. Assuming the under the Regional Vision scenario that local transit service were to be expanded into Faulkner County, northern Lonoke County and southeast Saline County, then approximately 57 percent of the homes (218,096) and 83 percent of the jobs (380,200) in the region would be within one-quarter mile of the existing and expanded local transit service routes.

Figure D-7. Local Transit Potential to Homes

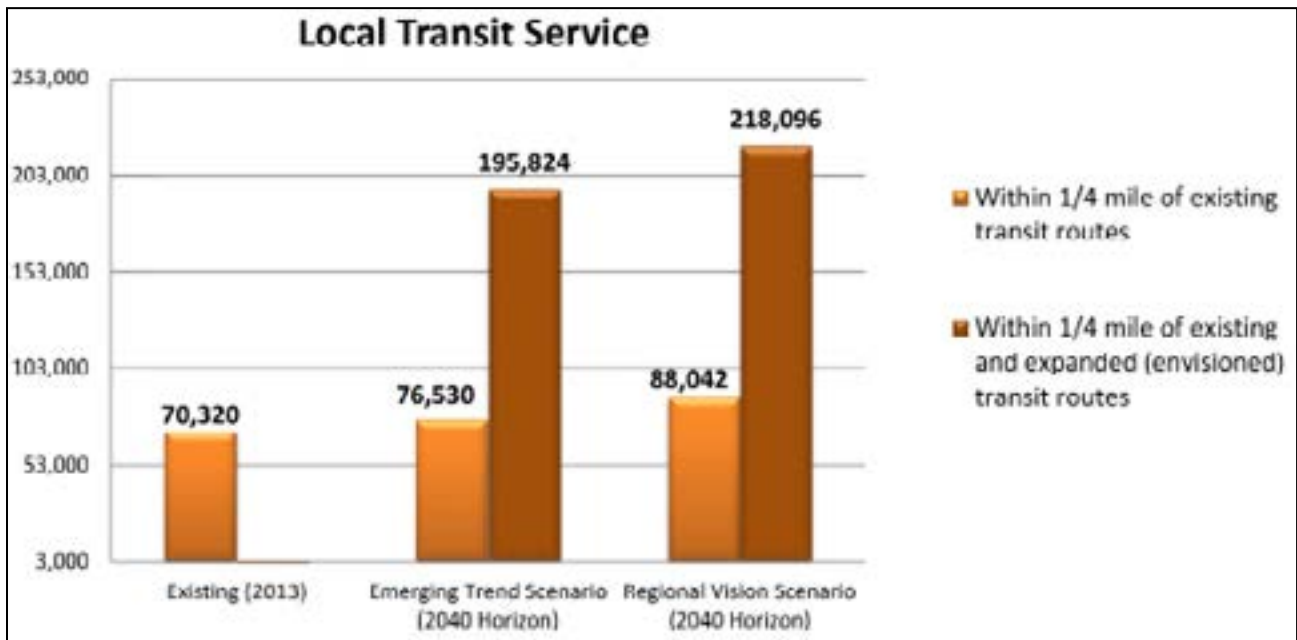
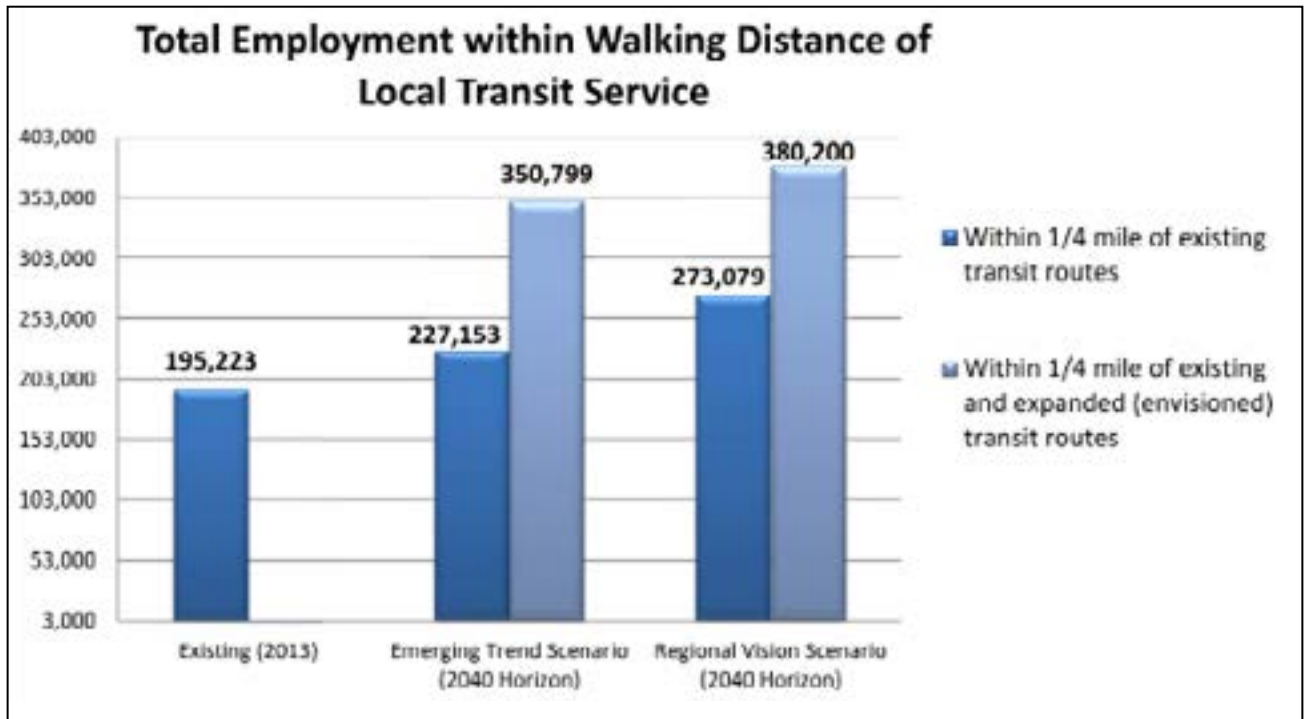


Figure D-8. Local Transit Potential to Employment



Regional Transit Potential

The creation of regional transit system is envisioned (such as bus rapid transit, light rail transit and commuter rail lines) that would link places within each county to regional destinations, such as downtown Little Rock, the Little Rock Airport, Conway, Cabot, and Bryant. A limited number of stops/ stations would be accessed via car (park and ride), walking, cycling or local transit. Regional transit potential is measured by the number of homes and jobs within a half-mile radius of proposed stations.

The potential for regional transit service under the Regional Vision scenario is a direct result of its emphasis on mixed-use centers (areas where regional transit stops would be located). Under the Regional Vision scenario, 14 percent of the homes (53,899) and 51 percent of the jobs (235,596) would be within a half-mile to regional transit stations.

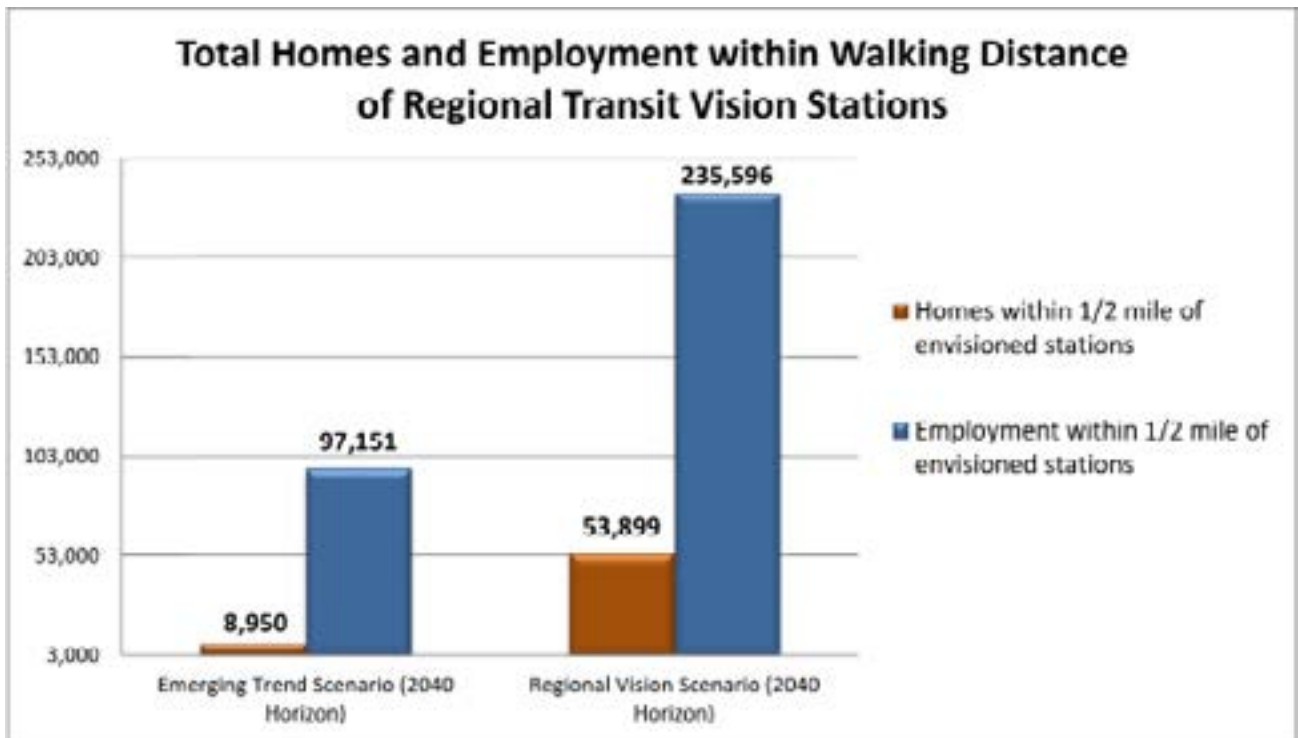
Economy and Workforce

During the Imagine Central Arkansas outreach phases, people expressed that they want to ensure that the region remains a globally competitive hub for economic activity. One way to make central Arkansas stronger and more economically competitive is to tie the region’s employers more closely to the workforce.

Major Employment Centers

Currently, home locations tend to be dispersed relative to employment. The average home in central Arkansas is roughly 4.5 miles from the nearest employment center (downtown Little Rock, UAMS/Medical District, Conway or Little Rock Air Force Base), and that increases slightly to 4.7 miles under the Emerging Trend scenario since homes become more spread out. Under the Regional Vision scenario, the average home in central Arkansas is roughly 2.0 miles from the nearest employment center. This distance shortens due to the inclusion

Figure D-9. Regional Transit Potential



of more mixed-use centers around the potential transit stations under Regional Vision scenario creates more employment centers, and they emerge in such areas as Maumelle, Bryant and Cabot. Under the Regional Vision scenario, 69 percent of homes (264,342) and 93 percent of the total employment (426,015) would be located within two miles of major employment centers, compared to 42 percent of the homes (160,388) and 71 percent of the employment (328,063) under the Emerging Trend scenario.

a range of variables studied, including population density, distance to a store, distance to transit or distance to jobs (Cervero and Ewing, *Travel and the Built Environment: A Meta-Analysis*).

Across central Arkansas today, the quality of street networks (as measured by four-way intersection density) varies. Downtown Little Rock, built on a “grid” street system, has the greatest density at about 200 four-way intersections per square mile. Other areas that have relatively dense networks (100-150 four-way intersection per mile) include North Little Rock, west of downtown Little Rock, downtown Conway, downtown Jacksonville, downtown Benton and City of Lonoke. Most other areas in central Arkansas have very few closely spaced intersections that result in any degree of network quality.

The walkable places indicator addresses the potential for walking based on a street intersection density of more than 160 four-way intersections per square mile. The percentage of homes and employment added within walkable places is highest under the Regional Vision scenario (63,408 new homes and 116,840 new jobs) than the Emerging Trend scenario (680 homes and 7,290 new jobs). More compact

Housing and Neighborhoods

Walkable Places

Connected street networks can have a powerful influence on the ability to walk (and cycle). A rich street network disperses traffic, creates a highly walkable block system and results in smaller streets that are more suitable for walking and bicycling. A recent analysis of more than 50 studies of travel and the built environment found that intersection density – the number of four-way intersections per square mile – had the greatest impact on walking among

Figure D-10. Average Distance to Nearest Major Employment Center

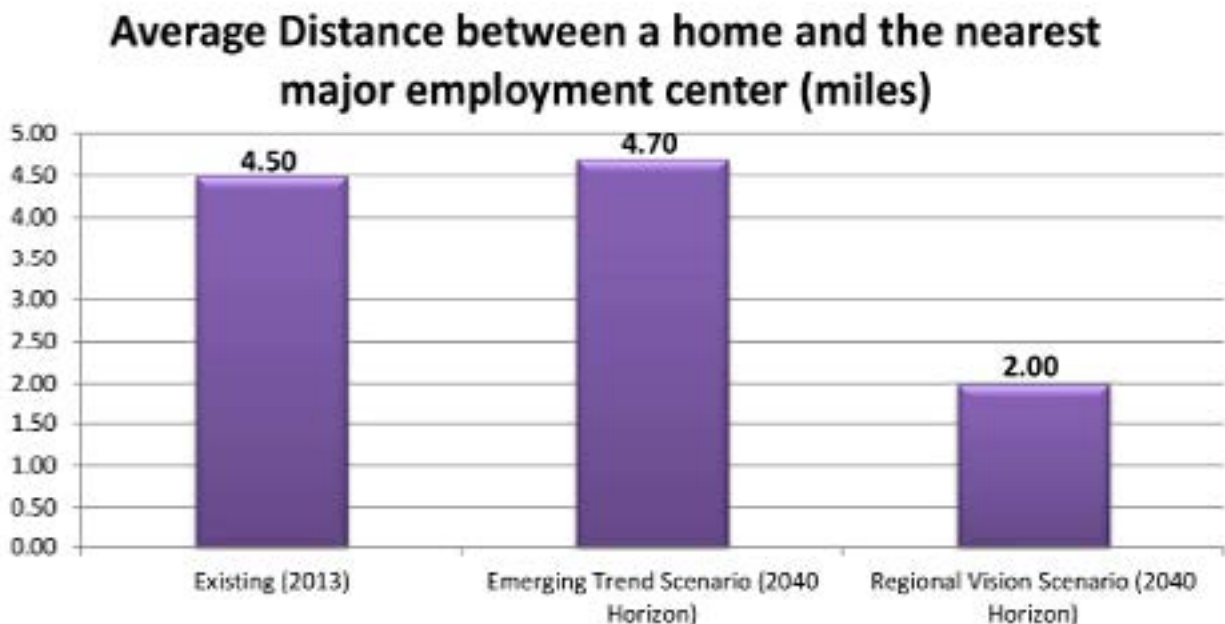
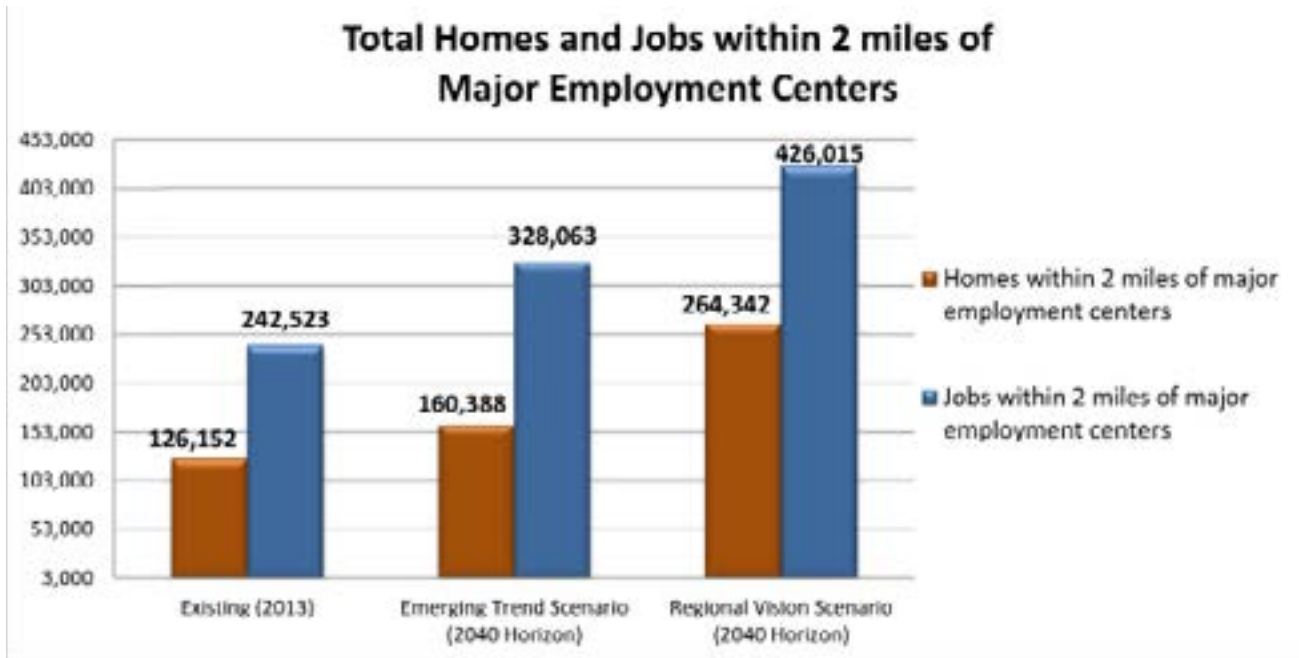


Figure D-11. Access to Major Employment Centers



developments have street networks that are denser, urban grids of highly interconnected, straight streets. In comparison, more rural and suburban places have more sparse suburban street networks, of curving streets forming loops and cul-de-sacs.

For example, mixed use centers are intended to concentrate retail, office, service and high residential uses at busy intersections, and are intended to provide a walk-friendly environment because of their emphasis on a robust, interconnect local street network. One would have to keep in mind that other characteristics, such as connectivity, safety and adequate facilities would factor into the ability to walk.

Figure D-12. Walkable Places

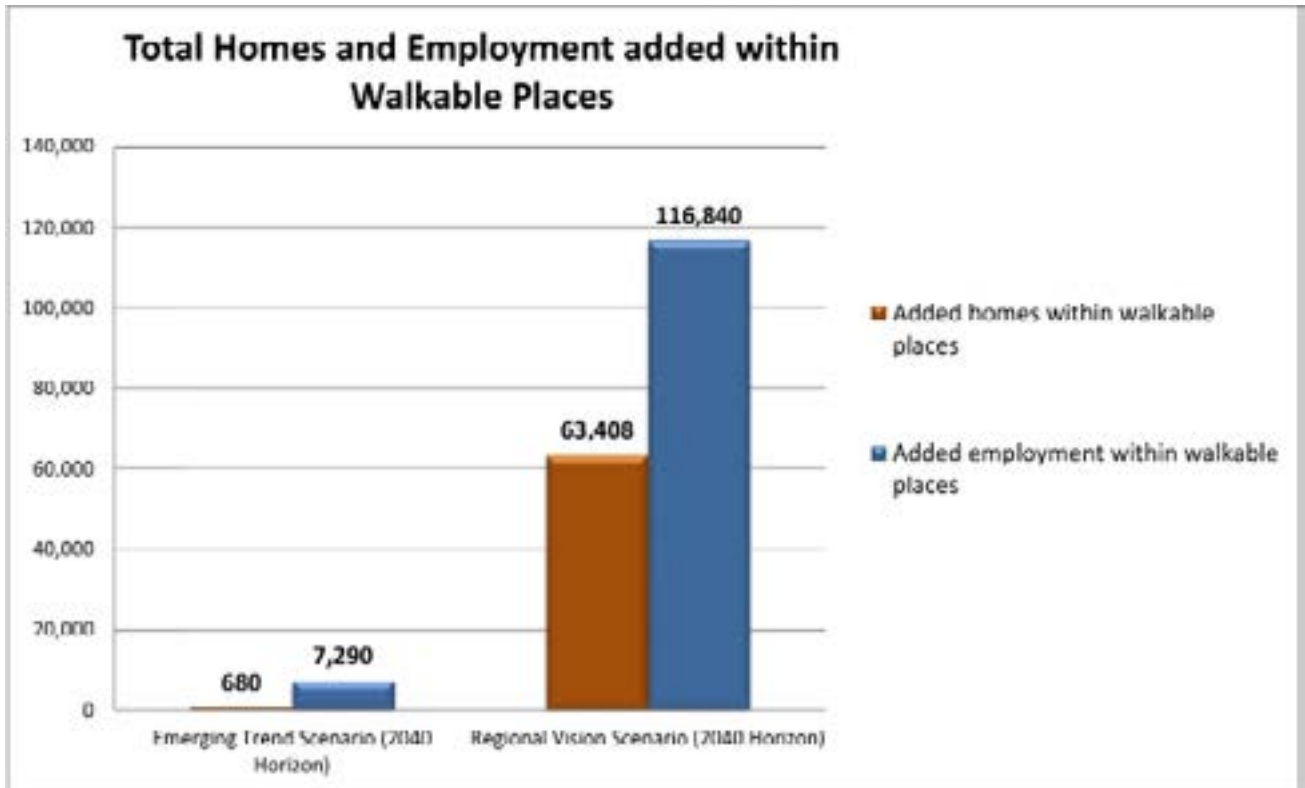
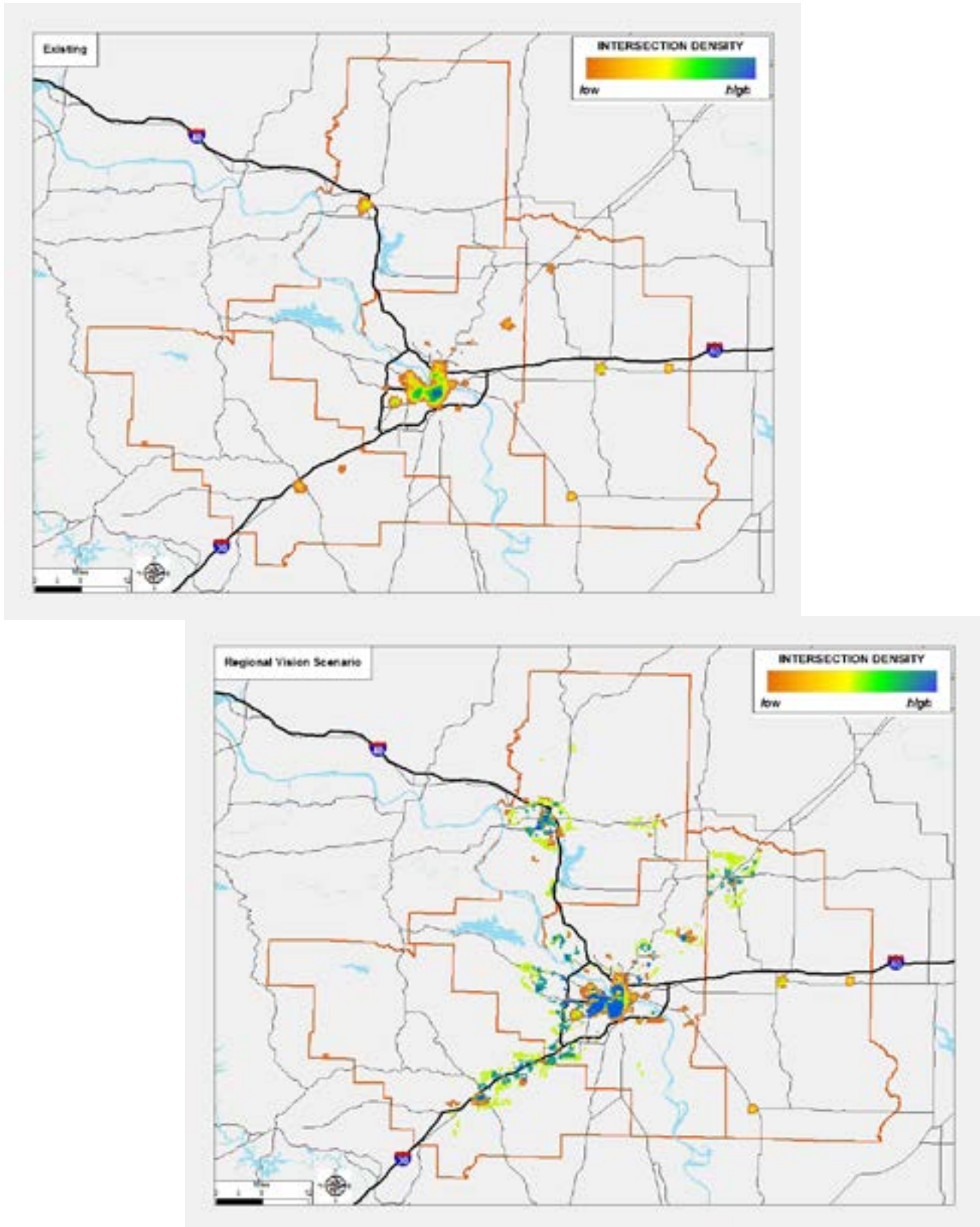


Figure D-13a&b. Intersection Density showing Walkable Places (Existing vs. Regional Vision Scenario)



Growth within and outside of Existing Service Areas/City Limits

As the region grows and expands, keeping up with the demand on infrastructure and community services will be paramount. Expanding development footprints can place a strain on service coverage, such as the amount of land that must be covered by police patrols and fire/EMS facilities. It can become difficult to maintain adequate response times and levels of service. Using the existing incorporated areas or city limits as a measure for existing service coverage areas, 27 percent of the homes (102,694) and eight percent of the total employment (38,512) will be located outside of existing incorporated areas under the Emerging Trend scenario. These percentages fall somewhat under the Regional Vision scenario to 22 percent of the homes (85,444) and six percent of the total employment (28,751) that will be

located outside of existing incorporated areas. While there is not a large difference between the scenarios, the homes under the Emerging Trend scenario will place more of a strain on existing infrastructure because they are more spread out.

Figure D-14. Homes within and outside of Existing Service Areas/City Limits

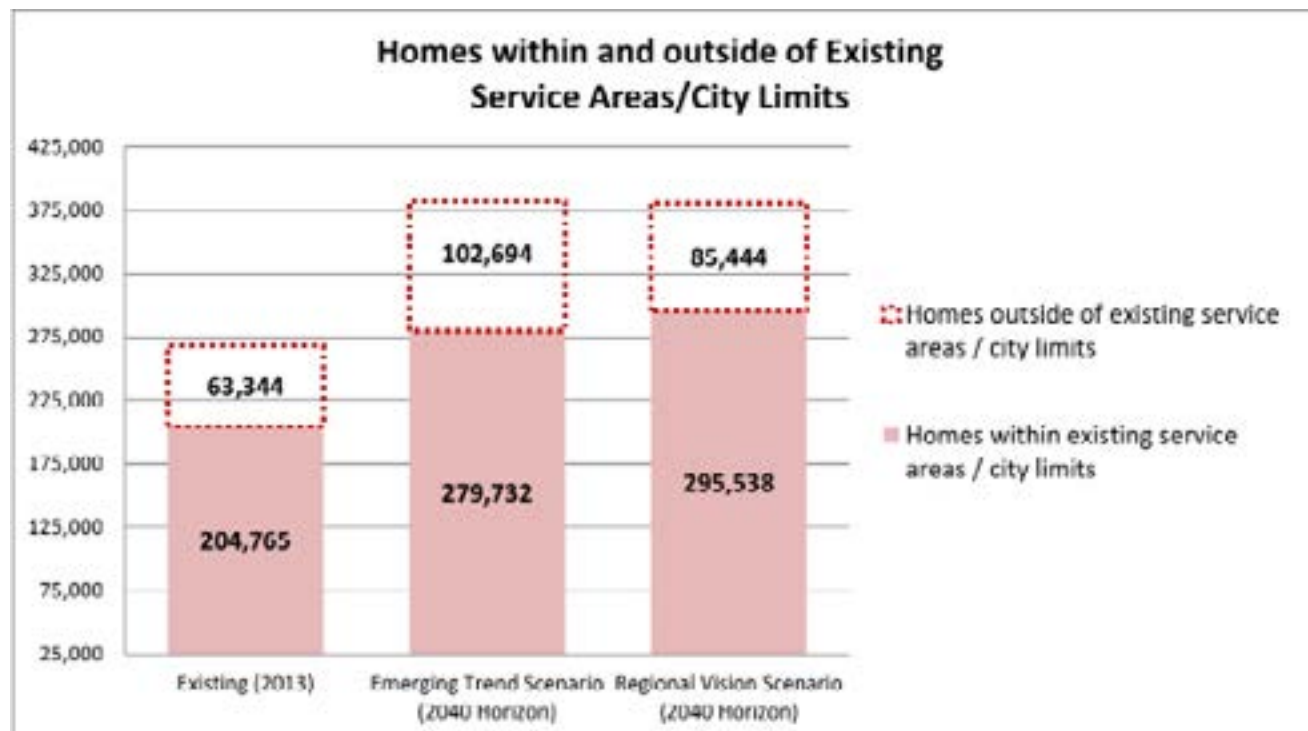
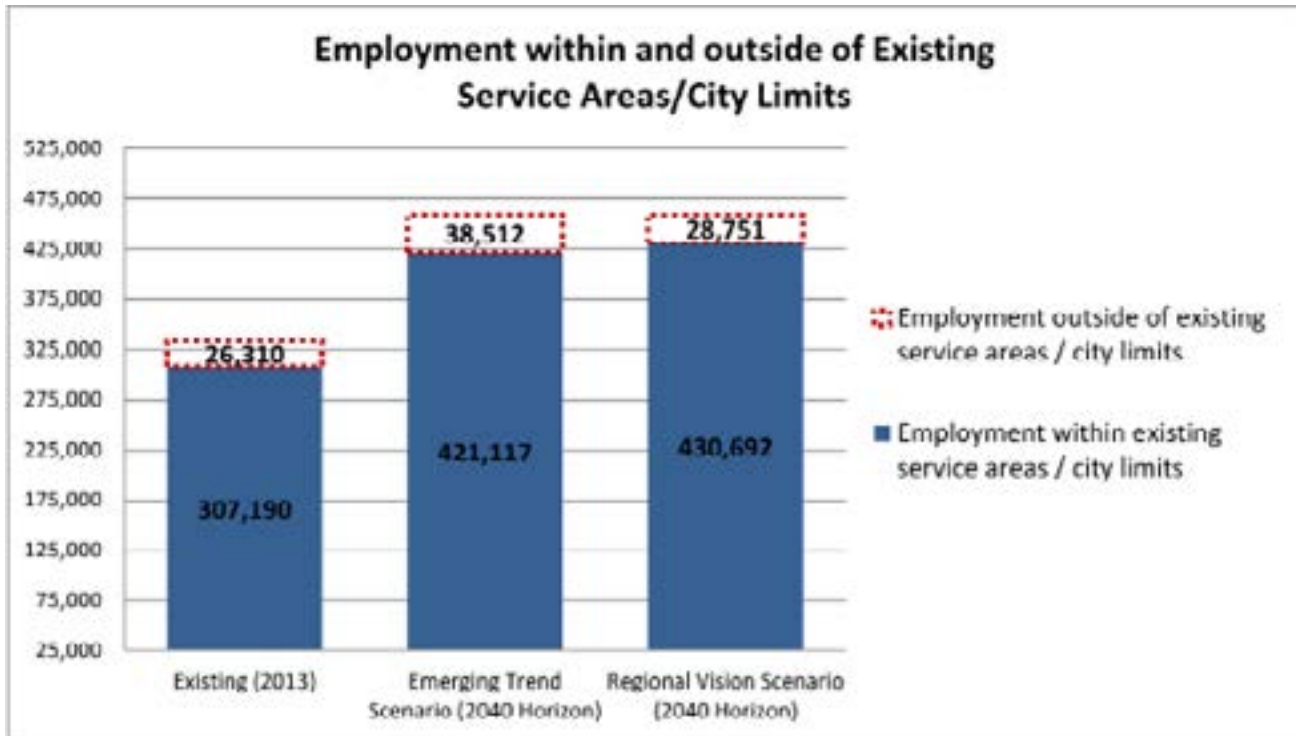


Figure D-15. Employment within and outside of Existing Service Areas/City Limits



Infrastructure

Potable Water and Sanitary Sewer

The availability of central water and sanitary sewer service is an essential infrastructure component for any type of large-scale residential, commercial or industrial development. There is a direct relationship between the amount and location of growth and the cost to provide infrastructure. New growth in the region under the Emerging Trend scenario is anticipated to generate 38.9 million gallons per day of demand for water, but that amount decreases under the Regional Vision scenario to 28.1 million gallons per day. The discrepancy between scenarios is largely attributed to larger yard sizes for irrigation under the Emerging Trend Scenario.

The more compact development under the Regional Vision scenario requires less miles of new infrastructure to serve growth, and thus, the cost to provide new water and sewer service to accommodate additional growth is will be higher under the Emerging Trend scenario. Under the Regional Vision scenario, it is anticipated that the the miles of new

water line required to serve new development areas is 165 miles less than the amount anticipated under the Emerging Trend scenario (266 versus 101 miles). This is attributed to the additional miles of water service infrastructure required to serve new areas, as well as the cost to augment existing water treatment plants.

In addition, under the Regional Vision scenario it is anticipated that the miles of new sewer line required to serve new development areas is less (by 182 miles) than the amount anticipated under the Emerging Trend scenario (346 versus 164 miles). This is also attributed to the additional sewer lines, lift stations and other infrastructure necessary to transport waste over longer distances, and to the construction of localized treatment plans where line extensions are unfeasible. The need to provide additional water and sewer service will need to be coordinated with the utility districts, in the areas of both expansion of service lines and the capacity to meet demand.

Figure D-16. New Gallons of Water Consumed

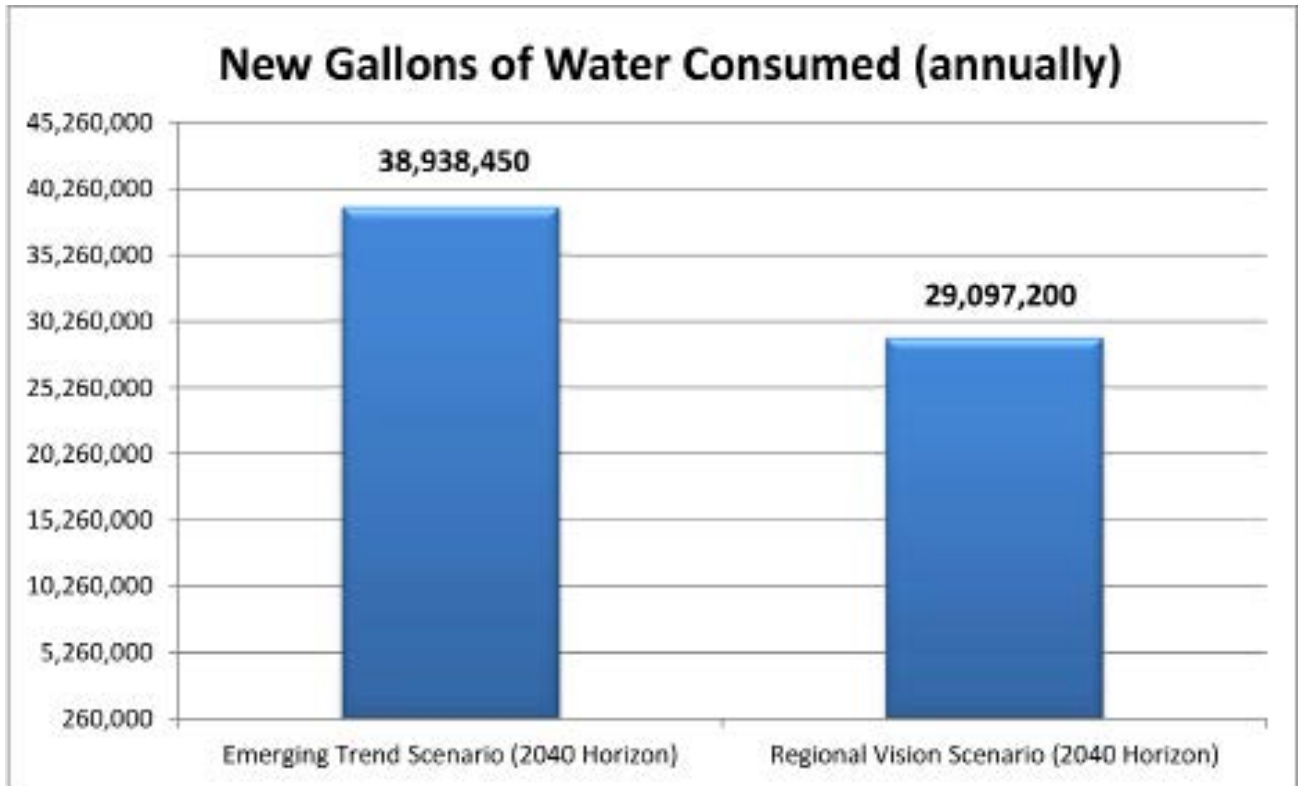


Figure D-17. Solid Waste Generated



Solid Waste

The amount of solid waste generated under each of the scenarios is higher under the Emerging Trend Scenario, with 2.7 annual tons generated under the Trend Scenario compared to 2.0 annual tons generated under the Regional Vision scenario. It is anticipated that the less compact Emerging Trend scenario will cost more to collect and transport solid waste because of the longer distances required.