

## **Sustainability Brief: The Built Environment: Issues in Land Use, Transportation, Housing, and Infrastructure**

There is significant evidence from the last several decades that dispersed development has detrimental impacts on our communities, transportation modes and travel times, housing patterns, environmental health and social connections and due to those impacts results in an overall loss in quality of life. The rise in associated congestion and greenhouse gases has also impacted the climate and environment.

In America we value freedom of choice in our lifestyles. While the automobile provides freedom of mobility, the resultant land use patterns don't provide freedom of choice in other aspects. They limited choice in housing and employment location, cost of housing and transportation, and quality of education. The ongoing poor economic conditions have increased these negative impacts on those least able to handle them.

Land use, transportation, housing and infrastructure are so deeply interrelated that they need to be considered comprehensively. Any changes in one area impacts the others, and yet together they make an almost unmanageable subject. For the purposes of this discussion the order will be land use and development patterns, transportation modes, housing and infrastructure. This *Sustainability Brief* presents a preliminary overview of these topics, but it is by no mean comprehensive or exhaustive, further research into the interconnections of these topics is necessary to fully understand the ramifications that changes to any one part of the equation would have on the whole.

### **1 Background**

#### **1.1 Land Use**

Recent and current zoning and land use patterns segregate uses, originally as an improvement on poor health conditions resulting from the proximity of industrial and residential uses. Even in towns and cities where some mixing of uses may occur the norm has been to clearly separate residential, commercial and industrial uses. Zoning codes determined specific separated uses, densities and buffering to create healthy residential, commercial and retail areas. The segregation of uses has led to sprawling growth of the built environment and led to environmental, social and economic concerns.

#### **1.2 Transportation**

The expansion of transportation into mechanized mass transit and then personal automobiles increased the opportunity to be "out of the city". This promoted even greater separation of uses and lower densities. This peaked in the 1990-2000's with urban sprawl consuming significant land in rural communities where land costs were lower but the resultant transportation costs in time and monies were higher. This has had unintended consequences on environmental ecosystems, economic viability of communities and physical health. Multi-modal transportation is an area of growing interest.

### 1.3 Housing

The development of housing follows the establishment of land use and transportation patterns, which since the post war period has focused on new lower-density single-family housing development in suburban and exurban locations over higher density housing in older cities and suburbs. Current housing stocks are insufficient in quantity, quality and location to meet the demands of the housing market. Housing affordability is a major issue, as costs of living have risen faster than incomes over the past decade. Complicating this is a significant shift in the market. There is a strong trend among both older and younger generations to move to more urban locations. They are interested in better access to amenities, multi modal transportation choices and smaller housing units and properties. With the downturn in the economy and the significant loss of home values there has also been a shift away from purchasing and towards rental. Senior citizens in particular are facing a tough housing market as insufficient affordable units are located in areas that provide the necessary amenities.

### 1.4 Infrastructure

Infrastructure is a very broad term that covers a wide variety of tangible and intangible systems that support life. It is alternately defined by the *Merriam-Webster* dictionary as a “system of public works of a country, state, or region”; also “the resources (as personnel, buildings, or equipment) required for an activity” and as “the underlying foundation or basic framework (as of a system or organization).”

Infrastructure is the pathway that links land use, transportation and housing together. Issues of sustainable infrastructure relate to habitat or ecosystems, man-made systems such (as water, wastewater, stormwater, power, communications, transportation etc.), and economic and social infrastructure.

### 1.6 Quality of Life

Quality of life, used in a wide range of contexts including international development, healthcare and politics, refers to ideas of the general well-being of individuals and societies. Standard indicators of quality of life generally include wealth and employment, the built environment, physical and mental health, education, recreation and leisure time and social belonging. Particularly difficult to measure, quality of life contains both quantitative and qualitative properties.

## 2 Sustainability Issues

### 2.1 Land Use

#### 2.1.2 Urban Sprawl

Defining urban sprawl has proven difficult, it is a highly complex issue and oversimplification of the characteristics of urban sprawl has led to wildly different estimates of which regions sprawl the most. Most often described as a higher rate of land consumption than population growth, this definition of sprawl ignores the form in which that growth occurs. A more nuanced definition describes urban sprawl as low-level density development with residential, shopping and office areas that are rigidly segregated; a lack of thriving activity centers; and limited choices in travel routes (Ewing, Pendall, & Chen, 2002). Urban sprawl gobbles up prime agricultural land, increases commute times, exacerbates urban air, water, and noise pollution, and increases accident rates. It is estimated that the costs of urban sprawl are over \$1.1 trillion each year. (Talberth, 2012)

While different definitions of sprawl exist, most researchers agree that high levels of urban land are a key indicator of urban sprawl. In New Jersey, during the 21 year period since land use datasets were first compiled, the state urbanized a massive 323,256 acres (507 sq mi) of land adding 26.8% to the state’s pre 1986 urban footprint. (Hasse & Lathrop, 2012) More recently, researchers project that more than 50 percent of four states

will be urban land by 2050: Rhode Island (71percent), New Jersey (64 percent), Massachusetts (61 percent), and Connecticut (61 percent). (Kramer, 2013)

The astonishing growth in urban land in New Jersey is due to many different converging factors. Current zoning and land use patterns segregate uses; residential housing is separated from places of business and commerce. Caught in a feedback loop with car dominated transportation systems, the distances between segregated uses increase dependence on the auto dominated transportation. Issues of transportation, housing and infrastructure are explored further below.

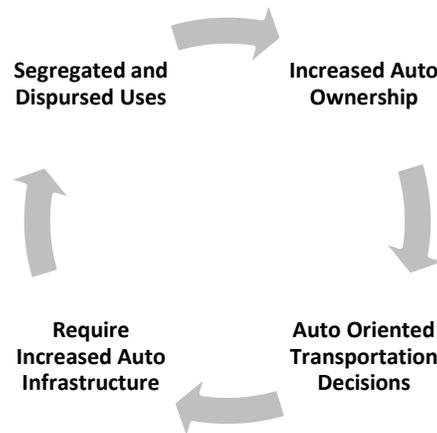


Figure 1: Auto dependent land use feedback loop

## 2.2 Transportation

### 2.2.1 Car Dominated Transportation Infrastructure

According to Federal Highway Administration statistics in 2011 there were 212 million licensed drivers in the United States and 245 million registered vehicles on the roads, which means that for every driver there were 1.15 cars. In the United States cars are a symbol of personal freedom, allowing us to come and go as we wish; however, there are environmental, economic and social prices to be paid for this freedom.

Each year the average car is responsible for seven tons of carbon dioxide that is released into the atmosphere, about a fifth of which comes from the extraction of petroleum and the production and delivery of the fuel (Union of Concerned Scientists, 2012).

In order to service all of the cars and trucks on the roads of the United States an immense infrastructure network has been constructed which translates into millions of acres of impervious paved surfaces. In addition to almost 4 million miles of public roads that crisscross the country there are several hundred million parking spaces in thousands of parking lots around the United States. It is estimated that in order to accommodate each car there are likely two to three off-street parking spaces per vehicle, one residential and two non-residential, plus two urban on-street spaces (Litman, 2012). This extensive impervious coverage, and concomitant loss of forest, farmland and wetlands, is a leading cause of stormwater runoff which increased the State's water quality and flooding issues.

Congestion is a result of land costs and segregated uses increasing the average commuting times in the New York metro area the average commuter spends 52 hours stuck in traffic which is estimated to cost \$1,281 per

commuter in value of delay time and wasted fuel (Schrank, Eisele, & Lomax, 2012). Congestion contributes to global warming and air pollution as each commuter emits approximately 557 pounds of CO<sub>2</sub> per year. Additionally, every ten minutes of commuting reduces all forms of social capital by 10%. (Putnam, 2000)

### **2.2.2 Multi-modal transportation**

A multi-modal transportation system provides access to a wide range of transportation options including, but not limited to; commuter or heavy rail, bus rapid transit (BRT) or regular bus service, bicycles, walking, commercial or industrial rail, light rail, air transport and shipping. Multiple modes of transportation that interlink provide flexibility for commuters and goods to travel and allow for greater opportunities for land development patterns and housing. According to a recent survey by the Urban Land Institute (ULI), 52 percent of Americans consider convenient public transit to be a meaningful community attribute, and while 75 percent are satisfied with the quality of public transit when it is available 51 percent are dissatisfied with the lack of public transit availability in their area. (ULI, 2013)

The economic impact of a multi-modal transportation system is greatly dependent on the pattern of land uses, density of population and quality of services. In a new paper set for publication in *Urban Studies*, Chatman and Noland make the case that transit produces agglomeration; they report that this hidden economic value of transit could be worth anywhere from \$1.5 million to \$1.8 billion a year, depending on the size of a city. (Jaffe, 2013)

### **2.2.4 Health, Safety and Life Style Impacts**

There are significant health and safety impacts due to the overwhelmingly car centric transportation system in the United States, according to the latest National Highway Traffic Safety Administration statistics, while traffic fatalities in the U.S. have been on a steady decline for nearly a decade pedestrian fatalities have actually been rising since 2009. According to these statistics, it suggests that a pedestrian is killed in America in a traffic crash every two hours, and injured every eight minutes. Twenty-one percent of children aged 10-15 who die in traffic crashes actually weren't in the car – they were pedestrians. (Badger, 2013)

## **2.3 Housing**

### **2.3.1 Housing Demand**

It is estimated that between 2005 and 2050, the United States will need 42 percent more, or 52 million, new housing units. In addition, 37 million units will likely be built to replace existing homes. Together the number of new and replacement units projected to be built in this time is equivalent to about two-thirds of the 132 million housing units that existed in 2011. Researchers also estimate that between 2005 and 2050, the amount of nonresidential space will grow by about 60 percent to 160 million square feet, and about 130 billion square feet of nonresidential space will be rebuilt, some structures more than once. (Kramer, 2013)

The demand for these new and replacement units provides the opportunity to build in greater variety, with mixed income and mixed use locations, increased density and transportation proximity and to build with greater energy and water efficiency.

### **2.3.2 Housing Affordability**

The old rule of thumb of affordability was that housing and transportation costs should not be more than 30 percent of income, however by 2010 housing and transportation costs consumed an average of 48 percent of the median American household's income (this includes homeowners who had paid off their mortgages). For households earning 50 to 100 percent of the median income (moderate-income households) of their metropolitan area nearly three fifths (59 percent) of income goes to housing and transportation and can reach upwards of 65 to 72 percent for certain areas (Hickey, Lubell, Haas, & Morse, 2012).

Despite the recent housing market downturn, housing and transportation costs have risen about 1.75 times faster than income over the past decade. Transportation expenses alone increased by 33 percent over that time period, due to rising gas prices and continued suburban development (Hickey, Lubell, Haas, & Morse, 2012). As affordable housing options in urban, transit oriented communities become more expensive due to shifting Boomer and Millennial preferences, moderate-income families that pursue the “drive till you qualify” approach to home ownership as a way to save on housing expenses often pay more in transportation costs than they save on housing, placing an additional burden on their budgets.

### **2.3.3 Changing Housing Preferences**

The American Dream of home ownership seems to be changing. The Baby Boomer and the Millennial generations have shown a strong housing preference for more urban, mixed-use, walkable communities. According to a recent survey by the ULI “more than half of Americans prefer neighborhoods that are close to shops, have a mix of incomes, and have public transportation.” (ULI, 2013) Additionally, 61 percent prefer shorter commutes and smaller homes; a fact that has been noted by the National Association of Realtors and the National Association of Home Builders.

While home ownership remains popular – greater than seven in ten renters aspire to own one day – more than half of American adults (57%) believe that buying a home has become less appealing, while nearly the same portion (54%) believe that renting has become more appealing (Hart Research Associates, 2013). This shift in preferences has placed a premium on existing housing and land in cities and communities that are close to transit or other amenities that Boomers and Millennials desire creating additional issues.

### **2.3.4 Senior Housing**

By 2030 the senior population of the United States is expected to be twice as large as it was in 2000. This major demographic shift is due to the aging of the Boomer generation. In addition, more than 35 percent of older Americans are considered to be low income. In order to allow this growing sector of our population to age in place, existing affordable housing near services, amenities and transit will need to be preserved while additional new housing designed to fit the preferences and needs of an aging population will need to be developed. While a substantial number of existing affordable apartments are located within one-half mile of transit, more than two thirds of the federal subsidies that keep these apartments affordable will expire by 2014 (Harrell, Brooks, & Nedwick, 2009). After the federal subsidy contracts expire housing owners may convert the units to market-rate housing to meet new market rate demands, exacerbating the already short supply of subsidized housing.

## **2.4 Infrastructure**

### **2.4.1 Environmental Systems**

Certain environmental systems such as watersheds and ecosystems function as infrastructure, providing the underlying foundation or basic framework for a vast variety of life forms and economic and cultural activities. While most environmental infrastructure (such as a watershed) is not man-made, certain systems (such as greenways) are pieces of a larger bio-system that has been singled out and preserved by man for its environmental, economic and/or social importance.

Further discussion on the sustainability issues and responses regarding watersheds, biodiversity, habitats, and other natural systems is explored in other *Sustainability Briefs*.

### **2.4.2 Economic Infrastructure**

Every four years the American Society of Civil Engineers produces a report card for the Nation’s infrastructure. The most recent, released in 2013, rates the Nation’s infrastructure as a D+ overall (an improvement over 2009)

and says that there is a need for \$3.6 trillion in infrastructure investments by 2020. Highlights from the report card are below:

- *Drinking water (D) and Waste water (D)* – Our drinking water and waste water systems are aging, with some parts over 100 years old, and much of the system reaching the end of its useful life. It is estimated that the cost to replace all drinking water infrastructure would be about \$1 trillion, with another \$298 billion needed in the next 20 years for waste water upgrades.
- *Dams (D) and Levees (D-)* – The average age of dam infrastructure is 52 years, and the majority of dams and levees were initially constructed to protect agricultural lands which have become increasingly developed over the past several decades. The estimated investment to repair and rehabilitate these structures is placed at \$121 billion. (Many of the levees are on rivers that now annually flood at the 100 year storm level producing increasing failures of the structures and flooding of residential and commercial properties.)
- *Parks and recreation facilities (C-)* – Parks and recreational facilities contribute over \$646 billion annually to the U.S. economy and employ 6.1 million. Declining state and municipal budgets have led to \$18.5 billion in unmet needs, while the National Park Service has an \$11 billion backlog.
- *Energy (D+)* – The electrical grid and pipeline distribution network are aging, with some components dating to the 1880s. While there has been increased investment since 2005, permit and siting issues are barriers to new large-scale projects.
- *Transit (D) and Heavy Rail (C+)* – Despite an increase in ridership and investment over the past decade, most local transit systems face shrinking budgets forcing service cuts and fare increases. Heavy rail on the other hand is having a competitive resurgence, as gasoline prices are increasing, Amtrak doubled its ridership to 31.2 million passengers between 2000 and 2011 and freight rail lines saw an increase in investment during the recession (\$75 billion since 2009).
- *Communications (not covered in ASCE Report)* – Communications infrastructure such as cell towers and wireless coverage unlike other forms of infrastructure is mostly constructed and maintained by private providers. While the state of these systems is in much better repair than other forms of infrastructure, they still have problems during major events, such as 9/11 or the Boston Marathon Bombings, where large numbers of users overwhelm the capacity of the system. Increased investment, particularly in densely populated areas, could improve the reliability of the system during disaster events.

Funding is the major stumbling block for most infrastructure maintenance and rehabilitation. Federal funding for infrastructure continues to decline as many States face large budget shortfalls. The Federal Highway Trust Fund, which has historically paid for most road and transportation construction and repair, is projected to run out in about 2 years according to the Congressional Budget Office. The federal gasoline tax which supports the fund has not been raised in 20 years, and does not rise with inflation. In New Jersey the state gasoline tax, the third lowest in the country, has also not been raised on over 20 years, despite the state's Transportation Trust Fund being completely emptied (this year none of the tax paid at the pump will go to road improvements, it will all go to debt service) (Reitmeyer & Rouse, 2013).

Segregated and disperse land use patterns also lead to an increase in the need for infrastructure; more roads to link together uses, more water and sewer pipes to reach each individual structure, more power lines, more cell towers, more public services like libraries and schools, more everything. While impact fees and exactions attempt to force new development to pay its fair share, new land owners often do not pay for the full cost of the new infrastructure needed, pushing the burden on the municipality and existing residents. The costs of installing and maintaining the entire infrastructure needed for development can often place a large financial burden on a municipality; in extreme cases, as what is happening in Detroit, some municipalities may try to

encourage sparsely populated neighborhoods to move as the cost to provide services is higher than taxes can support.

## 2.5 Quality of Life

The convergence of several factors, including land use patterns, transportation and infrastructure systems and housing conditions all contribute to the quality of life for an area. Existing patterns of human development in the United States, with increased commuting times has led to reduced personal and family social times which has a measurable effect on social capital. Putnam has shown that every ten minutes of commuting reduces all forms of social capital by 10% (Putnam, 2000).

Further discussion on the sustainability issues regarding other standard indicators of quality of life such as employment, physical health and social belonging please see the *Sustainability Brief(s)* relating to those topics.

## 3 Sustainability Responses

“...in the future, as labor costs begin to level out, logistics will be the most expensive thing and the local will become not only the most cost-beneficial but the necessary.” – *William McDonough, in an interview with Thomas L. Friedman from Hot Flat and Crowded*

This section includes on a small selection of sustainability responses to issues relating to land use, transportation, housing and infrastructure. A comprehensive listing and discussion of each response is beyond the scope of this *Sustainability Brief*.

### Smart Growth

Smart Growth proposes urban, suburban and rural communities that support a wide range of housing and transportation choices near jobs, shops and schools. The approach supports local economies, protects the environment and fosters the creation of social capital. The US Environmental Protection Agency, in conjunction with the Smart Growth Network, developed a set of ten basic smart growth principles: mix land uses; take advantage of compact building design; create a range of housing opportunities and choices; create walkable neighborhoods; foster distinctive, attractive communities with a strong sense of place; preserve open space, farmland, natural beauty, and critical environmental areas; strengthen and direct development towards existing communities (infill); provide a variety of transportation choices; make development decisions predictable, fair, and cost effective; and encourage community and stakeholder collaboration in development decisions.

The goal of Smart Growth is to comprehensively deal with transportation, land use, housing and infrastructure issues. Some of the Smart Growth strategies to tackle the issues above are presented here.

- Higher density and/or clustered development – Locating structures closer together reduces infrastructure, such as roads, power lines or water and sewer pipes, and can be done in urban, suburban and rural communities. [Clustered development](#) concentrates development on a portion of a site while preserving the rest as open space or farmland; it may be particularly effective in suburban and rural communities as it does not increase the overall density of a site, while still preserving the more rural character of these communities.
- Mixed use development – A mixture of uses in the same neighborhood, or same building, decreases the distance people have to travel to reach jobs, housing and amenities. In urban areas the introduction of residential uses into commercial areas has also been [shown](#) to decrease crime.

- Transit oriented development (TOD) and “location-efficient areas” – Focusing development of jobs and housing near transit stations or along transit corridors decreases the need for roads by providing more transportation options. Location-efficient housing reduces transportation costs by providing greater transportation choices and shorter travel distances.
- Affordable housing – Protecting existing affordable, location-efficient housing near job centers, public transit stations, and other places where transportation costs are low; promoting regulatory reform that reduces the cost of creating new housing in location-efficient areas; and incentivizing the construction of affordable housing in location-efficient areas helps to reduce the housing and transportation burden on moderate-income and low income households. Mechanisms to ensure long-term affordability of housing should also be put in place.

### **Land Use**

- Increased redevelopment of brownfields and vacant retail/commercial properties near transit
- Increased conservation of resource lands and working lands.
- Increased mix of land uses including local agriculture, parklands and resource conservation
- Eco-villages, Eco –districts and net zero energy, water and waste developments and individual buildings (use ref to number of buildings that will be built and rebuilt) LEED to ILBC

### **Transportation**

- Transit Funding – An adjustment to federal transportation allocation formulas, to provide more funding for transit, or other non-auto oriented transportation initiatives should be encouraged in areas where the population is dense enough to support such alternatives. Tweaking the funding allocations to favor maintenance of existing road networks over new construction would also help to contain new low density or sprawling growth.
- Raise the Gas Tax – or find other transportation funding options such as tolls or public-private partnerships (PPPs or P3s) to increase funding for road maintenance or transit projects. Raising the gas tax is the most politically fraught, as no political party wishes to raise this tax. In a PPP, private investors pay the government up front for infrastructure upgrades (that might otherwise take decades to arrange funding for) in exchange for a share of revenue raised by the service provided.
- Align disparate federal planning requirements to take into consideration transportation cost
- Increased support for mass transit infrastructure over vehicular infrastructure-extension of existing systems , creation of new light rail and BRT systems as interim to heavy rail (greater flexibility both benefits and detriment), high speed rail as alternative to air travel along heavily developed corridors and metropolitan regions
- Increase in fuel efficient SOVs, alternate flexible shared transportation using bicycles and cars,

### **Housing**

- Increased development of mixed income housing at transit locations, mixed rental, condominium and for sale responding to Gen Y (desire to be in urban context with access to amenities , delay marriage, children) and Baby boomers-Empty nesters (desire to be in urban context with access to amenities.).

### **Infrastructure**

- District infrastructure –renewable energy-solar, geothermal; water systems using gray and black water reuse and treatment, redundancy and ability to survive natural disasters
- Increase in “clean energy” systems on mega scale-wind farms, solar arrays and water flow systems with trans state transmission lines.
- Cleaner energy-cleaner coal, smaller scale nuclear using fuel rods from larger systems, natural gas .

### Quality of Life

- Use of the Genuine Progress Indicator (GPI) vs. Gross Domestic Product (GDP)

## 4 Implications

Smart Growth if implemented correctly can help create social capital, decrease infrastructure needs (including roads, water, electricity, etc) while increasing municipal revenue. However, implementing all of the necessary components of a good smart growth policy can be very difficult. Local zoning ordinances don't always allow higher mixed-use densities and the construction of affordable housing is often fought by local citizens. The necessary zoning changes are unlikely to happen in all of New Jersey's 565 municipalities, many of which wish to remain exactly as they are; however, some of the more urban and inner ring suburban communities are beginning to implement smart growth strategies.

Gentrification is another issue as changes in housing preferences (to cities) have begun to push out the lower income communities to suburbs where there is fewer transportation options, repeating a similar cycle from the mid 70's in many cities.

The financing of large urban housing projects or infrastructure projects is likely to become increasingly complex. In the past the federal government paid for significant portions of these types of projects but the economy has reduced both federal budgets and state and municipal ones. Options to raise funds for transportation projects, such as raising the gas tax or increasing tolls are politically fraught and currently unlikely. Public private partnerships on the other hand are becoming more common and are likely to continue for the foreseeable future despite [past issues](#) with certain terms and conditions.

## 5 Defining and Tracking Sustainability

Work has been done to identify metrics on issues such as sprawl (Center for Neighborhood Technology Sprawl Index) and transportation issues with ongoing research to identify appropriate indicators for all of the complex issues discussed above. The U.S. Department of Housing and Urban Development (HUD) has developed some targets and metrics for its six livability principles (provide more transportation choices; promote equitable, affordable housing; enhance economic competitiveness; support existing communities; coordinate policies and leverage investment; value communities and neighborhoods) which guide its funding initiatives.

## 6 Conclusions

Current efforts are increasingly attempting to deal with land use, transportation, housing and infrastructure issues comprehensively through the application of smart growth principles. Changes in housing and transportation preferences by Boomers and Millennials have already begun to change the built environment. Since 2005, total vehicle miles driven have fallen 8.75 percent, while the average yearly number of miles driven by 16 to 34 year olds dropped 23 percent between 2001 and 2009. (Plumer, 2013) Financing is also a major issue, especially now. New creative financing strategies are needed, especially for needed infrastructure improvements. While it is important to grow intelligently, this does not truly address all of our current issues; the transportation infrastructure, land use patterns, housing stock and other infrastructure systems that we currently have are not going to disappear new creative ideas to retrofit our current infrastructure will be needed to truly create a sustainable future.

**Table 1. Land Use, Transportation, Housing, and Infrastructure Sustainability Measures and Metrics**

<b>Sustainability Goal</b>	<b>Proposed Sustainability Measures &amp; Metrics</b>	<b>Scale of Analysis</b>	<b>Availability and Period of Data</b>
Provides for mixed use walkable communities with access to amenities at urban, suburban and rural locations	Communities provide parks with a ½ mile radius of all housing	•Municipal, county and state	•Annual for state, unknown for municipal and county
Provides mobility in the form of pedestrian, bicycle, vehicular and mass transit to all residents	Vehicle Miles Traveled per capita reduces	•State  •State and county •Energy source and utility •Energy source	•Annual, unknown period  •Annual, long-term •Research studies •Research studies
Land use developments are resource efficient, healthy and safe environments	<ul style="list-style-type: none"> <li>• Percentage of land developed per capita reduces from current levels</li> <li>• Land consumption is lower than population growth</li> </ul>	•State  •	•Annual, unknown period  •
Communities provide balanced supplies of low, moderate and market rate housing with access to public transit	•	•State  •	•Annual, unknown period  •
<b>Infrastructure improvements are</b>		•Municipal, county and state	•Annual for state, unknown for municipal and county
<b>Mass transit ridership increases per capita</b>		•State	•Annual, unknown period

Sustainability Goal	Proposed Sustainability Measures & Metrics	Scale of Analysis	Availability and Period of Data
		<ul style="list-style-type: none"> <li>•State and county</li> <li>•Energy source and utility</li> <li>•Energy source</li> </ul>	<ul style="list-style-type: none"> <li>•Annual, long-term</li> <li>•Research studies</li> <li>•Research studies</li> </ul>
<p><b>Mass transit ridership increases per capita</b></p>		<ul style="list-style-type: none"> <li>•State</li>   <li>•</li> </ul>	<ul style="list-style-type: none"> <li>•Annual, unknown period</li>   <li>•</li> </ul>
<p><b>VMT per capita decreases</b></p>		<ul style="list-style-type: none"> <li>•State</li>   <li>•</li> </ul>	<ul style="list-style-type: none"> <li>•Annual, unknown period</li>   <li>•</li> </ul>

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