

REIMAGINING PARKING

An Action Guide on
Adaptions, Flexible
Uses and Resilient
Development



About the National League of Cities

The National League of Cities (NLC) is the voice of America’s cities, towns and villages, representing more than 200 million people. NLC works to strengthen local leadership, influence federal policy and drive innovative solutions.

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NLC’s Center for City Solutions provides research and analysis on key topics and trends important to cities, creative solutions to improve the quality of life in communities, inspiration and ideas for local officials to use in tackling tough issues and opportunities for city leaders to connect with peers, share experiences and learn about innovative approaches in cities.

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Executive Summary

PARKING ACCESS HAS evolved over the past 50 years into a fundamental need to travel to and from places in the United States. Parking has become a contentious topic in local infrastructure development as momentum grows in many places for more walkable, transit-oriented, and bicycle-friendly options while others prefer to maintain car-centric roads for travel within their cities, towns and villages. As more economic, environmental, social and health benefits of widening the spectrum of transportation options become known, local leaders have a responsibility to re-evaluate their parking footprint and consider how to best prioritize their residents' well-being.

This action guide highlights how local leaders can reimagine parking through adaptations, flexible uses and resilient development. The guide breaks down the state of parking in the U.S., delving into parking's high costs to cities and residents. It shares tools available for local leaders to measure how much parking is available and needed in their municipalities as well as how to identify alternative transportation investments to prioritize for more equitable outcomes. It gives background on federal funding available to local governments to take action on these changes and innovations that have already been taken by other cities, towns and villages. The guide elaborates on a variety of options available to cities on how to reimagine parking through local zoning policy, existing lots and spaces, curb management, green infrastructure, multimodal strategies and large structure development.



Introduction

ACCCESS TO PARKING has evolved over the past 50 years into a fundamental need for Americans to travel to and from places across the United States. Parking has increasingly become a contentious topic in local infrastructure development as concerns grow about its economic, environmental, social and health costs, despite the transportation technologies and innovative advances that have expanded and upgraded the options to travel via micromobility, e-scooters, rail, buses, shared mobility programs and more for low-carbon, healthier means of travel. The COVID-19 pandemic highlighted a booming desire to return streets to simple means of moving around, particularly walking and bicycling. Some local governments made adjustments in light of these transportation shifts, but car-centric infrastructure development, such as parking, still continues as the dominant federal, state and local transportation funding investments in cities throughout the U.S.

This action guide will cover challenges and recommendations for three main parking types:



On-street parking

Spaces adjacent to the street



Off-street parking

Spaces anywhere else on surface land that is not directly on the street



Structured parking

Parking spaces within a structure

This action guide highlights how local leaders can reimagine parking through adaption, flexible uses and future short- and long-term investments. The guide breaks down the state of parking in the U.S., delving into parking’s economic, environmental, social and health costs to cities and their residents. It shares tools available to local leaders to understand their municipalities’ parking footprint. It provides background on federal funding available to local governments to make the changes and innovations referenced throughout this guide. It will elaborate on a variety of options available to cities to reimagine parking through policy, existing lots and spaces, curb management, green infrastructure, multimodal strategies and large structure development.



The State of Parking in the U.S.

RESearch shows that the U.S. has anywhere between 800 million and two billion parking spaces, with more than five percent of urban land in the country covered by surface parking lots. This equates to about eight parking spots for every car.¹ In some cities, the problem is even more severe and detrimental to the community. The City of Los Angeles, CA, for instance, has more land occupied by parking than housing.² A study of the City of Jackson, WY, found a 27:1 ratio of parking spaces (i.e., on-street, off-street surface and off-street parking) to households.³ When there is excess parking, cities are less able to solve other systemic, citywide challenges, such as the housing, homelessness and climate crises.

Over-investing in parking not only costs a city available land; it also produces economic, environmental, social and health costs beyond the municipality's scope. The following section describes the cost burden of developing parking, how parking hinders the local and regional climate as well as the obstructions on residents' everyday lives.

Economic Costs

High Construction and Infrastructure Burden

Building parking lots and spaces is a large expense to cities. Building a single parking stall ranges from \$5,000 to \$10,000 while building a single parking spot in a garage can range from \$23,000 to \$36,000.⁴ The cost burden of parking infrastructure is often paid for by the city through passing the cost onto residents.

Sprawl, caused in part by excessive parking, leads to higher public infrastructure costs. Roadways and water and sewer infrastructure necessary for parking infrastructure, for instance, are expensive to construct and require constant maintenance. Large surface parking lots spread these resources farther apart where extensive infrastructure networks are necessary. The public services and infrastructure costs required for these changes are paid for by the local government and the public.



Sprawl

Common development pattern in towns, cities and villages across the U.S. that is characterized by spread-out, low-density housing. The result is urban areas that span a large distance, fragmented ecological systems, car-dependent mobility and residential areas isolated from amenities.⁵



Free Parking

Many local leaders have had extensive debates on whether to charge for parking or not. By not charging for public parking, cities put its construction and maintenance costs onto residents, not the people using the service. Free parking makes it more convenient and cheaper for people to drive, which in turn increases the demand and encourages fewer people to use alternative modes of transportation for their commute. This trend leads to added congestion.⁶

Housing Unaffordability and Low Inventory

Requiring excessive parking is expensive and can limit affordable housing development. Regulating a certain number of parking spots per housing unit drives up costs for developers. These extra costs for housing developments are subsequently passed onto the tenants, leading to an average of a \$225 per month increase in rent.⁷ Developers may also decide that the additional costs from parking requirements are too high, deterring them from pursuing a particular housing development altogether. This decreases the housing supply and further increases rent prices. Parking requirements for affordable housing projects, which aim to keep costs low in order to keep the units affordable, can make them economically infeasible for developers.

Small Businesses Liability

The cost of building and maintaining parking spaces is passed onto small business owners, whether they rent or own the spaces. Developers and property owners pass on the costs through rent increases, or the business owners are responsible for the maintenance and upkeep of their parking lots. Large corporations can afford these additional expenses, but small business owners with less overhead and capital are forced into an expenditure burden.

Opportunity Costs

Parking lots and structures take up space that could be used for alternative development, leading to additional economic loss.

A study in Hartford, CT, in 2014 found that the city forgoes \$1,200 in tax revenue each year for each parking spot.⁸

This valuable real estate is underutilized by providing parking instead of using it in other more economically advantageous ways, such as retail space, outdoor space or housing.





Environmental Costs

Parking minimum policy

Local zoning policy that requires private and residential development include a minimum number of parking spots. The number of parking spots is typically determined by the square footage of commercial development and the number of bedrooms in residential development.¹¹

Mixed-use development

Pedestrian-friendly development that combines multiple uses such as housing, commercial space and cultural or industrial uses.



Soot, carbon dioxide and sulfur dioxide are forms of **air pollution** found to cause cancer, damage respiratory health, headaches, dizziness, sweating, mental depression and many additional harmful effects.¹³

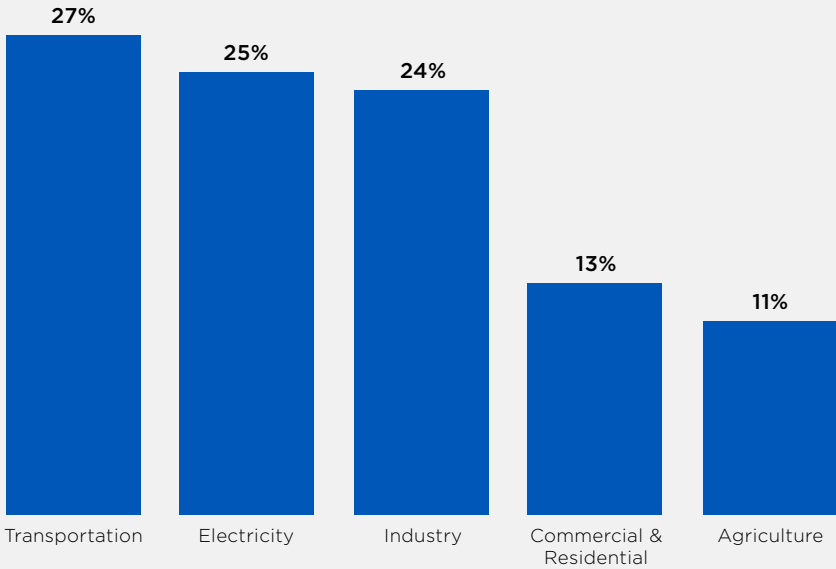
Greenhouse Gas Emissions

Excessive parking exacerbates local climate risks and generates greenhouse gas (GHG) emissions. The transportation sector contributes 27 percent of U.S. GHG emissions, more than any other economic sector. Within transportation, motor vehicles account for more than half of the emissions.⁹ It is estimated that cars generate 30 million tons of carbon dioxide from idling alone.¹⁰

Parking minimum policies reinforce an overdependence on cars. The emphasis on motor vehicles takes away opportunities to balance transportation investments across a spectrum of public transportation development. Local parking minimum policies mean that each new structure must use more land for parking, making it harder to foster **mixed-use**, walkable development with easier access to community amenities. As cities continue to prioritize sprawl development, residents are increasingly reliant on cars for their transportation needs, creating a cycle that reinforces reliance on cars, reducing use and investment in public transit and increasing GHG emissions from motor vehicles.

In addition to the environmental risks associated with too many parking spaces, the emissions associated with constructing and maintaining parking infrastructure are significant. They stack onto the emissions from the driving that are encouraged by excess parking. Just like roads or highways, maintaining parking is material intensive, expensive and generates emissions. The carbon dioxide emissions that come from driving a car show a 10 percent increase when accounting for estimated emissions from parking construction and maintenance in emissions emitted per mile for an average car.¹² When calculated over the lifetime of a vehicle, the number of other gases like sulfur dioxide can rise by as much as 25 percent and the amount of soot as much as 90 percent.

TOTAL U.S. GREENHOUSE GAS EMISSIONS BY ECONOMIC SECTOR IN 2020



Source: U.S. Environmental Protection Agency. (n.d.). *Source of Greenhouse Gas Emissions*. www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions



Surface Parking Lots Induce Excess Heat

Surface parking lots are a major contributor to urban heat islands. The massive amount of these lots across cities makes it challenging for cities to cool down at night, impeding residents' ability to recover from heat stress or have access to cool refuge from the outdoors.¹⁶

Heat Island Effect

Over-saturated parking development perpetuates heat island. The heat island effect describes hotter temperatures and more extreme heat events due to infrastructure like buildings and roads absorbing and re-emitting more heat. These heat islands have minimal natural landscapes, resulting in areas that are 1-7°F hotter than the surrounding environment.¹⁴ In sprawling places with more parking and where concrete landscapes extend out many miles, the heat island effect is pronounced.¹⁵ The heat island effect is also rooted in environmental injustice, as neighborhoods plagued by heat islands are predominantly communities where the majority of households are of low-income status or majority Black, Indigenous and other people of color (BIPOC). Because of historical divestment in trees and green space in these neighborhoods, the residents bear an even higher strain of excess summer heat. While the heat island effect is a local impact, it perpetuates higher energy consumption as people attempt to stay cool through air conditioning and other cooling systems, creating more GHG emissions and further contributing to climate change.

Stormwater Flooding

Higher parking footprints worsen flooding. Parking lots are mostly constructed from impervious, non-porous materials. As communities grow and build more parking lots and roads, there is a less natural landscape to absorb excess water and store it as groundwater. It is estimated that annual floods increase by 3.3 percent on average for each percentage point increase in impervious basin cover.¹⁷ Places dominated by road and parking lots withstand more stormwater runoff than their drainage systems can manage, causing stormwater to runoff directly into bodies of water and interrupting those ecosystems. When dense development favors large asphalt surface lots with few green infrastructure or stormwater management designs, it risks worsening flooding and increasing stormwater runoff.



Most roads and parking lots are made of impermeable, non-porous materials, meaning that liquid cannot be absorbed. Permeable pavement is an environmentally friendly alternative that is made of porous materials that allow flowing through.

Noise Pollution

High car traffic correlates with noise pollution, having a profound impact on residents. Parking in residential places draws traffic to the area and generates noise near a parking lot from cars driving by, engines starting, slammed doors, vehicle alarms and more.¹⁸ High noise levels from traffic and other ambient street noise have been associated with a higher incidence of heart conditions and metabolic disorders in addition to causing sleep disturbances and exacerbating mental health conditions.¹⁹ It is critical to consider the many ways that parking infrastructure impacts residents, as noise pollution worsens by the presence of too much parking.



Supply Chains

Parking's physical infrastructure requires processed materials, energy, labor and other inputs, which in turn depend upon their own supply chains. For example, asphalt requires aggregate, which is mined and then must be transported. Each of these activities consumes energy and produces emissions. In the lifespan of a parking lot, including construction and all required maintenance, emissions from parking infrastructure may cost the U.S. between \$4 and \$20 billion annually.²⁰ Compared to the cost of pedestrian and bike infrastructure, car infrastructure is much more expensive, material intensive and demands more maintenance. The cost of highway and street construction materials increased about 20 percent in 2022, meaning cities will have to increasing spending on building highways when those funds could have more utility and longevity with other transportation mobilities.²¹

A long-term cost-benefit analysis of environmentally friendly alternatives compared to traditional parking materials in Baltimore, MD, by Smart Surfaces Coalition found that light-reflective parking or permeable surfaces pay off for cities and their residents. This would be especially impactful for residents in the city who are of low-socioeconomic status and/or neighborhoods where the majority of residents are BIPOC suffer from more extreme heat. It was estimated that adopting permeable parking would deliver a benefit-to-cost ratio of 14:1 in 20 years.²²

Social and Health Costs

Physical and Mental Health Disparities

Air pollution from motor vehicles has triggered physical and mental health consequences, including aggravated asthma, reduced lung capacity and increased vulnerability to respiratory illnesses for children and adults.²³ This frequency is likely to rise without intervention or transportation investment changes. Children are especially at risk from motor vehicle emissions. A study by the University of Southern California found that children exposed to daily auto emissions are strongly linked to adverse cardiovascular effects as adults.²⁴ People who live in areas with higher traffic conditions are also more susceptible to anxiety, depression and cognitive deficits.²⁵

Historic development choices further health disparities today. Residents who live in redlined neighborhoods are more likely to suffer poor health outcomes because emissions-harmful entities (e.g., industrial facilities and highways) were purposely located closer to neighborhoods where the majority of residents were of low-socioeconomic status and/or BIPOC. These health conditions and outcomes have led to worse health outcomes for these residents and higher healthcare costs associated with them.²⁶ Air pollution audits at parking lots, or other concentrated locations where emissions are released from motor vehicles, could be implemented to see how these emissions influence human and environmental health.



Redlining is the illegal discriminatory practice in which neighborhoods with a prominent population of Black residents or other people of color were marked to note as a warning to mortgage lenders. The practice commonly denied loans, often because of the racial characteristics of the applicant's neighborhood.²⁷



Healthier Lifestyles

As parking is reimagined for adaptive and alternative transportation modes, public transportation, low-carbon mobility options and walkability investments offer opportunities to mitigate health disparities and promote better health outcomes for residents. Fewer motor vehicles on the road and less time spent looking for parking will reduce the associated health consequences. Walking and bicycling have been shown to improve mental and physical health through reduced stress levels, decreased anxiety and improved mood.²⁸ Public transportation and walking allow people to have human connection and foster social cohesion, improving individual and community mental health. Even if conversations are not happening among people in these modes, increased face-to-face contact reduces the risk of depression and social isolation, in comparison to motor vehicles where people are typically alone in a car.²⁹

Space for Community Amenities

Not only does high parking shift the balance away from other low- and zero-carbon mobility options; it takes away prospects for amenities in the neighborhood that foster place attachment and bring joy. The high – often overconcentration – of parking means less dedicated space for other community amenities that benefit residents, such as parks, public transportation, play spaces, community gardens, nature preserves, restaurants, housing, small businesses and more. These amenities allow residents to engage with nature, have access to a home, travel around a neighborhood freely, promote business and exercise, all of which improve our mental and physical health. Reimagining parking space is an opportunity to narrow the equity gap in terms of access to neighborhood amenities for neighborhoods of various incomes, races and abilities.





Tools for Evaluating Local Parking Footprint

CITY LEADERS HAVE access to several data tools to assess the state of parking within their communities. These data tools allow cities to measure present and future demand for parking, assess available and accessible parking supply, and evaluate alternative zero- and low-carbon mobilities. This information can empower local leaders to make more strategic, data-informed decisions related to parking.

Estimate Local Car Ownership

The American Community Survey, a U.S. Census data source, contains information on vehicle ownership down to the Census block level. This data can be used to determine an estimate for the number of cars present in a municipality.³⁰ This data can be exported for mapping and visualizations with other social, environmental and transportation variables to develop a more comprehensive assessment of a neighborhood or community. Additionally, leveraging local data on zoning and land use could be used to estimate the demand for parking in different areas of the community. For example, a high-density commercial area may expect to have higher parking demand as compared to a low-density residential area.

For its Precinct 2 Parks & Trails Master Plan, Harris County, TX hired a private planning firm to conduct a suitability analysis that evaluated the socioeconomic vulnerability, community health, environmental vulnerability, and park need throughout Precinct 2. The analysis identified pinpointed areas of vulnerability from mapping all of these characteristics on one map together. Estimated vehicle ownership was one of several variables integrated in the socioeconomic vulnerability index.³¹



Evaluate the Existing Parking Supply

Mapping and spatial analysis tools, such as ESRI's ArcGIS, can be leveraged to catalog a city's public parking locations and assess the existing parking supply.³² The demand and supply side data could then be combined to analyze where supply exceeds demand or vice versa where additional supply may be warranted.

Check out these maps to see how cities are assessing their parking footprint.



Parking Lot from NYC Open Data (Tool Link)
[Click Here](#)



Parking Meter Locations from City of Tampa, FL
[Click Here](#)



For example, the City of Pittsburgh, PA launched an initiative to integrate various multimodal forms of transportation into a singular app to make it easier to identify their availability to improve city planning and resident accessibility.³⁴

Identify Alternative Transportation Investments

Tools are also available to evaluate alternative forms of transportation, which could impact the supply and demand analysis. [Walk Score](#), for instance, allows communities to determine the quality of active transportation infrastructure that might lessen the demand for parking.³³ Additionally, the presence of public transportation should be considered in a supply and demand analysis. If there is a perceived overdemand with a limited supply of parking, it may be beneficial to consider whether current alternatives exist or if investing in alternative forms of transportation would alleviate the issue.





Pursuing Federal Funding Investments to Reimagine Parking

AS MUNICIPAL LEADERS determine the best way to reimagine parking in their communities, American Rescue Plan Act (ARPA) and Bipartisan Infrastructure Law (BIL) funding are available to make changes a reality. Local ARPA and BIL allocations can financially support changing not only how parking is done in a city, town or village, but also how residents travel to and around downtown corridors. Many of the non-car-centric options are low-carbon, support climate resiliency and provide economic and community benefits to residents.

Cities across the country are exploring bicycling, electric mobility (e.g., bike share programs and scooters) and ride share accessibility that can support the goals of their communities. Investments in reimagining parking can also lead to accessibility and walkability improvements through sidewalk infrastructure upgrades to create better ease in how someone moves from parking spaces to other nearby amenities. By using a mix of federal, state and local funding, local leaders have a chance to rethink parking and mobility in their communities.

Local governments' swift changes to streets, roadways and parking lots to expand services outside during the COVID-19 pandemic showcased the benefits of thinking about transportation differently. The Coronavirus Aid, Relief and Economic Security (CARES) Act funding kicked off this initial investment by expanding business services outdoors. Municipalities followed by creating new policies to meet this demand as the number of drivers on the road decreased. ARPA continued this trend as many localities are still looking to use street and park areas to expand business through pilot programs funded by their State and Local Fiscal Recovery Funds (SLRF). The City of Pleasanton, CA, for example, approved \$250,000 of its SLRF funds to create a parklet grant program that will cover 50 percent of the cost, capped at \$10,000 per restaurant.³⁵ SLRF funds to local governments can also be used to build infrastructure to meet the needs expedited by the COVID-19 pandemic, including expanding low-carbon mobility options and repurposing parking structures.

The BIL contains a variety of programs that can be used to reimagine public spaces, including parking and how residents interact and arrive at places near amenities. Some of the largest programs include Rebuilding American Infrastructure with Sustainability and Equity (RAISE), Surface Transportation Block Grants (STBG) and National Significant Multimodal Freight & Highway Projects and the U.S. Department of Transportation's INFRA Grants Program. Additionally, there is federal funding for electric vehicle charging infrastructure through Community Charging Grants. For a complete list of BIL programs, see the Resources section at the end of this guide.

Local leaders interested in learning more about BIL programs should visit [NLC's Read to Rebuild page](#).



REIMAGINING PARKING USE

Highlighted Actions & Cases

THE FOLLOWING SECTION highlights several ways that cities, towns and villages can reimagine parking through six types of action:

**Policy Reform**

**Adaptions & Flexible Uses of Parking Lots & Spaces**

**Curb Management**

**Multimodal Strategies**

**Long-term, Large Structure Development**

**Green Infrastructure**

Each section will describe the action type's:

- ◆ **General Description:** Gives background on how this type of action is influencing parking.
- ◆ **Urban Context:** Explains how this type of action is shaping parking in urban areas.
- ◆ **Suburban and Rural Context:** Explains how this type of action is shaping parking in suburban and rural areas.
- ◆ **Government Role:** Suggests the role local leaders can play – or have played – in influencing this type of action.
- ◆ **Project Funding & Partners:** Describes how this type of action is typically funded or can be funding. It also suggests partners who can support or supplement this development through partnerships and collaboration.
- ◆ **Implementation Options:** Provides more specifics on the types of examples within this type of action.
- ◆ **Case Studies:** Elaborates on examples of how one or several policy options were executed at the municipal level.

These ideas shared in this section intend to inspire local leaders on how to approach reimagining parking. They are not intended to serve as an exhaustive list of options for local leaders but starting points to consider as they envision changes.



Reimagining Parking Policy

Zoning code requirements, such as parking minimums, have led to oversaturated parking development, lending toward sprawl and preventing cities from creating walkable communities. Local policy and zoning ordinances can be altered to discourage excessive parking spaces for new developments and allow for more flexible uses of existing parking lots and spaces.



Urban Context

Urban communities have adapted their code to discourage building parking in areas where public transportation and mixed-use developments exist, often referred to as transportation-oriented development. This can help encourage people to walk or take public transportation to necessities and amenities, such as grocery stores, health centers, shopping, dining and more.



Suburban and Rural Context

Suburban and rural communities are more likely to rely on cars for transportation and should carefully consider their existing parking availability when implementing new policies.³⁶ Removing parking minimum policies and adding parking maximum policies in business improvement districts (BIDs) can encourage the downtown area to transform into more walkable, easily accessible destinations. Building a parking garage in tandem with these policies can discourage developers from building excessive surface lot parking while still meeting parking demand.



Government Role

In most cases, local governments have full jurisdiction over zoning ordinance changes necessary to implement parking policy. However, some states, like California, are looking to step into this space and address the topic themselves.³⁷



Project Funding and Potential Partners

Unless paired with a capital project like a parking garage, there are no major costs associated with implementing these policies. If specifically focusing zoning changes on BIDs, working with local business leaders and associations can increase participation and buy-in.

Implementation Options

Remove Parking Minimums

Parking minimums are local requirements for businesses and residents to provide a set number of parking spaces. Mandatory parking minimums can increase prices for developers, decreasing available affordable housing and creating barriers for small businesses to afford property rental space.

Reform Parking Minimums

Local governments can add flexibility within their zoning code to encourage smart parking development. If a city does not want to remove its parking minimums, it can reform its zoning ordinances to encourage sustainable, multimodal parking structures. Requiring electric vehicle charging, micromobility parking, or building with sustainable materials can mitigate the negative impacts of large parking lots.

Adopt Parking Maximums

Parking maximums are local requirements that limit the number of parking spaces that can be built by developers. These can be done in tandem with removing parking minimums to discourage excessive parking development by developers.

Reform Parking Maximums

Cities can require that developers provide additional amenities if they want to build parking past a parking maximum, such as commercial business space, affordable housing, or other incentives that meet a municipality's goals.

CASE STUDY

Data Analysis to Use Parking Spaces More Efficiently in Bastrop, TX

The City of Bastrop, TX, completed a parking study that found a 76 percent parking vacancy rate at any given time.³⁸ The city subsequently updated its Bastrop Building Block Code in 2019 with several parking policies aimed at decreasing excessive parking and car reliance.³⁹ It removed parking minimums and implemented market-based minimums and maximums for different areas of the city.

For example, the new code decreased the parking minimums for retail buildings due to the shift towards online retail shopping. This update decreased the parking minimums for all developments and ensured that developers do not waste funds on building unneeded parking spaces.





Reimagining Parking Surface Lots and Spots

Parking lots are often empty or underutilized during non-business hours. Since the COVID-19 pandemic in particular, businesses have opted to utilize parking spots and outdoor space for more revenue-producing or social means, such as outdoor dining, play streets and car-free zones for bicycling and walking areas. Reimagining parking lots as farmers’ markets, outdoor seating, community gathering spaces and more can bring additional value to businesses and the community.



Urban Context

Reimagined parking lots can provide valuable outdoor space to people living in an urban environment, where readily available public parks and gathering spaces may not be equitably accessible for everyone. Parking lots that are no longer deemed necessary can be redeveloped and help cities with limited underdeveloped land. When empty during off-peak, non-business hours, this space could also host recreational, arts and cultural activities and pop-up events.



Suburban and Rural Context

Parking lots can lead to sprawl and limited walking opportunities. Using parking lots for alternative uses decreases the physical space for residents to travel to and between social programming and amenities. It also makes a community denser and more walkable.



Government Role

Local governments may need to update their municipal code to allow for expanded outdoor eating and business operations, especially when it will take away from street parking.



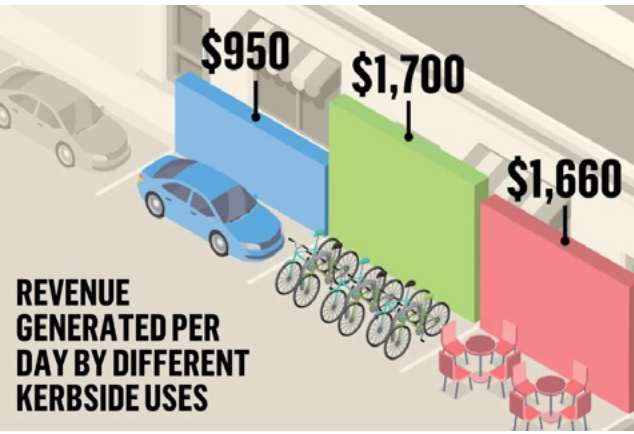
Project Funding and Potential Partners

BIDs, community and economic development corporations, foundations, local business associations and other nonprofits may provide grant funding opportunities for expanded outdoor dining spaces. Some local governments are using their ARPA SLRF allocations to provide grants to small businesses for outdoor dining and public spaces.

Implementation Options

Temporary Adaptations

Parking lots or spaces can be for outdoor seating, farmers’ markets, art exhibitions, pop-up small business events, food truck vendor spaces, summer musical events, outdoor movies and more. This can occur during low parking demand hours, after business hours or on weekends. These low-cost changes can quickly adapt a single-purpose parking space into a multi-use gathering venue, while also changing parking demand.



Source: Lee, A. (2021, July 19). Economic benefits of dining parklets, bike parking. Urbis www.linkedin.com/pulse/economic-benefits-dining-parklets-bike-parking-car-alison-lee/

Permanent Adaptations

Underutilized parking can be permanently adapted to better serve the community. This usually involves more significant capital investment, such as permanent bollards or structures being built. Parking lots and spaces can be adapted to create permanent outdoor seating, outdoor green space or developed as new buildings for businesses or homes.

See NLC’s [Future of Cities: Reimagining Public Space to Support Main Street Retail Action Guide](#) for more foundational steps local leaders can take to reimagine public space in ways that meet the needs and wants of residents while supporting equitable economic development.

CASE STUDY

Creating Space with Pedlets in Great Falls, MT

The City of Great Falls, MT, allows businesses to create Pedlets - commonly known as parklets - an expansion of their outdoor seating into parking spaces during the summer months.⁴⁰ To encourage residents to use these outdoor spaces, the city provides a Pedlet Passport. When residents go to five different Pedlets, they are entered into a raffle to win gift cards for local businesses. Pedlets were funded in a variety of ways; the BID paid for construction, maintenance and storage while restaurants paid for the furniture and staffing. One business that participated reported a 35-percent increase in sales.



Reimagining Parking through Curb Management

Curb management is the effective allocation and operation of the curb for parking, pick up and drop off, transit stops and no parking zones. Advances in technology and changes in transportation choices have led many cities to reconsider how they effectively manage this space. This can involve removing street parking to create transit stops or pick-up/drop-off zones for ride share, changing or instituting time limits on parking or using the curb space for alternative purposes like outdoor dining.



Urban Context

City curbs can be hectic and require additional consideration for goods movement loading and unloading to avoid the need for double parking. Effective curb management in cities should consider the multitude of uses of the curb, such as public transportation, pick-up and drop-off parking or adaptive uses such as outdoor dining. Using technology allows for dynamic curb management that is flexible based on the time of day and existing demand.



Suburban and Rural Context

Curb management for rural or suburban communities can be beneficial in their downtowns, specifically providing short-term parking areas so people can pick up from restaurants and businesses without searching for a spot.



Government Role

Local government, particularly planning and engineering departments, play a key role in developing curb management policies.



Project Funding and Potential Partners

Cities can access grants from their Metropolitan Planning Organization (MPO), state or federal DOT, including the DOT Transportation Alternatives Program⁴¹ or FHWA's Advanced Transportation and Congestion Management Technologies Deployment.⁴² Another option is exploring pilot projects with technology companies to test out curb management platforms like kiosks and electronic signs.

Implementation Options

Utilize Pick-Up/Drop-Off Zones

Pick-up and drop-off zones can easily be implemented using temporary or permanent signs and can be beneficial in downtown areas so people can quickly pick up food or goods do not drive around looking for a parking spot, increasing congestion.

Install Dynamic Management

Dynamic management involves electronic signs that can change to adapt to changing demand or provide information to drivers. Examples of this include changing pick-up/drop-off zones to parking spaces during major events or displaying “no parking” signs during rush hour so the curb can be utilized as a bus lane.



CASE STUDY

Managing Congestion with Curbside Kiosks in Las Vegas, NV

The City of Las Vegas, NV, has implemented a dynamic curb management pilot focused on managing congestion.⁴³ Through a public-private partnership, the city built curbside kiosks that let drivers know how much time they have been parked in a pick-up zone. A countdown clock clearly displays how much time they have left, and if they overstay the countdown, an alert is sent to the city for parking enforcement.





Reimagining Parking through Green Infrastructure

Removing parking lots completely may not be feasible in the short term or because of parking demand. Green infrastructure investments can ensure that necessary parking lots or spaces have reduced environmental and human health consequences. Green infrastructure improvements, such as porous pavement, green landscaping, renewable energy and other sustainable materials, can make more resilient, pleasant parking lots. Many of these investments decrease maintenance and drainage costs over time (e.g., loads to water treatment plants), making green infrastructure economically beneficial in the long term.



Urban Context

The urban heat island effect threatens residents’ safety, health and well-being and heightens pressure on the built environment. It leads to higher temperatures in cities compared to surrounding suburban and rural areas.⁴⁴ Green infrastructure improvements can decrease the heat island effect by integrating parking lots with trees, solar panels, stormwater management design and shade sails.



Suburban and Rural Context

In addition to reducing the heat island effect, green parking lots produce substantial stormwater management benefits. Porous pavement reduces runoff and allows water to drain into the ground naturally instead of overflowing or flooding streets and parking surfaces. This reduces the demand for drainage systems, risk of runoff and erosion, and safety risk to residents.



Government Role

Local governments can update stormwater design guidelines and regulations to require or encourage green parking lot development.



Project Funding and Potential Partners

Local governments can partner with local businesses and developers to improve private parking structures and lots. The EPA has a range of grant programs that could be used for green infrastructure projects.⁴⁵

Green infrastructure development is also one of the main ARPA eligibility opportunities available to local government, as highlighted in NLC’s ARPA Clean Water Fact Sheet.

Implementation Options

Low-Cost Solutions

Many green infrastructure investments are low-cost and can foster sustainable parking. Porous pavements are often made from inexpensive materials and decrease drainage costs. Depending on the location and the existing layout of the parking lot, green landscaping, such as adding bioswales or native plants, can be low cost. Traditional parking lots have a low albedo, meaning it absorbs a significant amount of heat. Painting the asphalt a lighter grey can increase the albedo and the heat being absorbed, therefore decreasing the heat island effect from the lot, as highlighted by the Smart Surfaces Coalition as a reflective cooling pavement.^{46, 47}

High-Cost Solutions

More strategic green infrastructure improvements, such as green landscaping or solar panel shading, green roofs, or shade sails can have a higher initial cost but lead to economic improvements in the future.

Replace Parking Lots with Green Space

In situations where parking is no longer needed, replacing parking lots with a park or greenways can provide valuable gathering, healthy, cooling spaces for residents.

CASE STUDY

Green Parking Lots in Milwaukee, WI

The City of Milwaukee, WI, is investing in green parking lots, creating a grant program that provides up to \$25,000 for green infrastructure design and/or implementation.⁴⁸ Recipients can use the grant for rain gardens, bioswales, pavement or asphalt removal, porous pavement, green roofs and native plants and trees. The city is also working to replace underused parking lots with green space and play areas to address stormwater runoff and provide new amenities to the community.⁴⁹



Before lot conversion. Natural Learning Initiative. (2020).
Shape NC: Harmony Place. NC State Design.



After lot renovation. Natural Learning Initiative. (2020).
Shape NC: Harmony Place. NC State Design.

CASE STUDY

Lot Conversion to Outdoor Learning in Asheboro, NC

Harmony Place, a school in Asheboro, NC, collaborated with the North Carolina State University's Natural Learning Initiative to transform the school's unused parking lot into an outdoor learning environment. The changes included an edible garden, blackboard, multipurpose lawn, flowers, a boardwalk, picnic tables, and more.⁵⁰

Reimagining Multimodal Parking Strategies

Revamping car-only parking lots as multimodal transportation centers or hubs can encourage individuals to use alternative modes of transportation. While cars are still the dominant commuting form in the United States, alternative commute methods like public transportation and biking have increased in popularity since 2019.⁵¹ These multimodal transportation centers, often called mobility hubs, can include bike racks, storage lockers, bike and scooter share, dining, package shipping and public transportation stops. Mobility hubs encourage access and increase the likelihood of residents using alternative modes of transportation while still providing necessary parking.



Urban Context

Multimodal mobility hubs that prioritize transit and micromobility options can encourage alternative transportation methods instead of driving.



Suburban and Rural Context

In suburban and rural areas where car dependence is more prevalent, park and rides allow people to park their cars in a parking lot and take public transportation. This is an energy-efficient, healthier alternative to depending on driving for their entire commute. In more dense suburban areas, bike and scooter storage at mobility hubs can further encourage more sustainable, healthier local commutes.



Government Role

Multimodal strategies require coordination at multiple levels of government, such as with local department of transportation offices, transit authorities, metropolitan planning organizations, engineering departments and planning departments. It is also highly recommended that transportation entities collaborate with housing offices and authorities as well to ensure connectivity between housing and other local amenities, which would mitigate sprawl patterns.



Project Funding and Potential Partners

Local transit authorities, bicycling coalitions, local planning departments, local businesses and state and federal government departments are potential partners in the planning and funding of multimodal parking. The U.S. Department of Transportation has several grant programs that encourage multimodal access and could be used to fund multimodal parking structures.⁵² Public-private partnerships with businesses can help fund the project by splitting the cost burden, such as allowing micromobility companies to build scooters or bike parking for their services on the property.

Implementation Options

Expand Park and Rides

Park and rides can be expanded to include more of the previously mentioned transportation options and amenities to encourage residents' likelihood of trying them.

Invest in Mobility Hubs

Mobility hubs can promote an assortment of transportation modes and uses, which can improve transportation access and decrease congestion. These can include car, bike and scooter share, public transportation stops, electric vehicle charging stations, and pick-up and drop-off zones for ride share companies.



CASE STUDY

Building a Multimodal Parking Hub in Glens Falls, NY

The City of Glens Falls, NY, is building a multimodal transportation hub on an old surface parking lot.⁵³ The lot will include a parking structure, bus station, car and bike share and potentially retail space. This project will not only increase the amount of parking available at this location but also provide a variety of options for individuals who choose not to drive. A New York State Downtown Revitalization Initiative grant and BIL allocations will fund this project.



Reimagining Large Structure Parking

Large parking structures can help prevent sprawl and reduce a city’s parking footprint. The saved space can be allocated to serve other community amenities, such as more parks, gathering spaces, housing, businesses and more. Parking structures may be empty during off-peak hours or changing future demand may decrease the parking need. Parking structures can be repurposed, either temporarily during off-peak hours or transformed permanently into livable and workable spaces.



Urban Context

The increase in ride shares and the forecasted rise in autonomous vehicles may mean that large parking structures become unnecessary in urban areas. This will lead to an increased need for pick-up and drop-off zones and less parking demand. This opportunity will allow parking structures to be repurposed for community amenities, housing or office space in the future.



Suburban and Rural Context

While large parking structures are often unnecessary in smaller communities, they can serve downtown or main street areas by providing one or several central parking locations and reducing the need for large sprawling parking in surrounding areas. They can also be used for alternative purposes during off-hours.



Government Role

If the government manages and maintains the parking structure, permission for additional uses may not be needed. For private garages, local governments may want to collaborate with parking authorities or individual owners to make these changes.



Project Funding and Potential Partners

Many temporary projects require little capital investment. However, permanent changes do require more funding. Public-private partnerships with local businesses can help encourage private redevelopment. Projects that aim to increase economic development may qualify for federal grants, such as the Better Utilizing Investments to Leverage Development (BUILD) program.⁵⁴

Implementation Options

Temporary Reimagining of Large Structures

Parking structures can be used for arts performances and installations, farmers’ markets, pop-up health sites, flea markets or many other temporary uses by blocking off areas for pedestrian uses. Implementation requires limited capital and infrastructure.

Permanent Reimagining of Large Structures

Parking structures can be redeveloped to meet different needs. Cities have begun converting small and large garages into housing, bars, offices, commercial spaces and mixed-use parking for these other purposes. They could also be converted to wraparound service sites for youth or people who experience homelessness or substance use challenges.

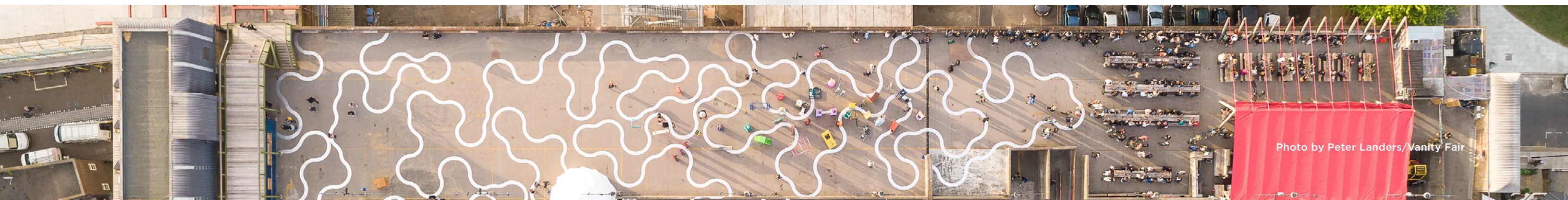
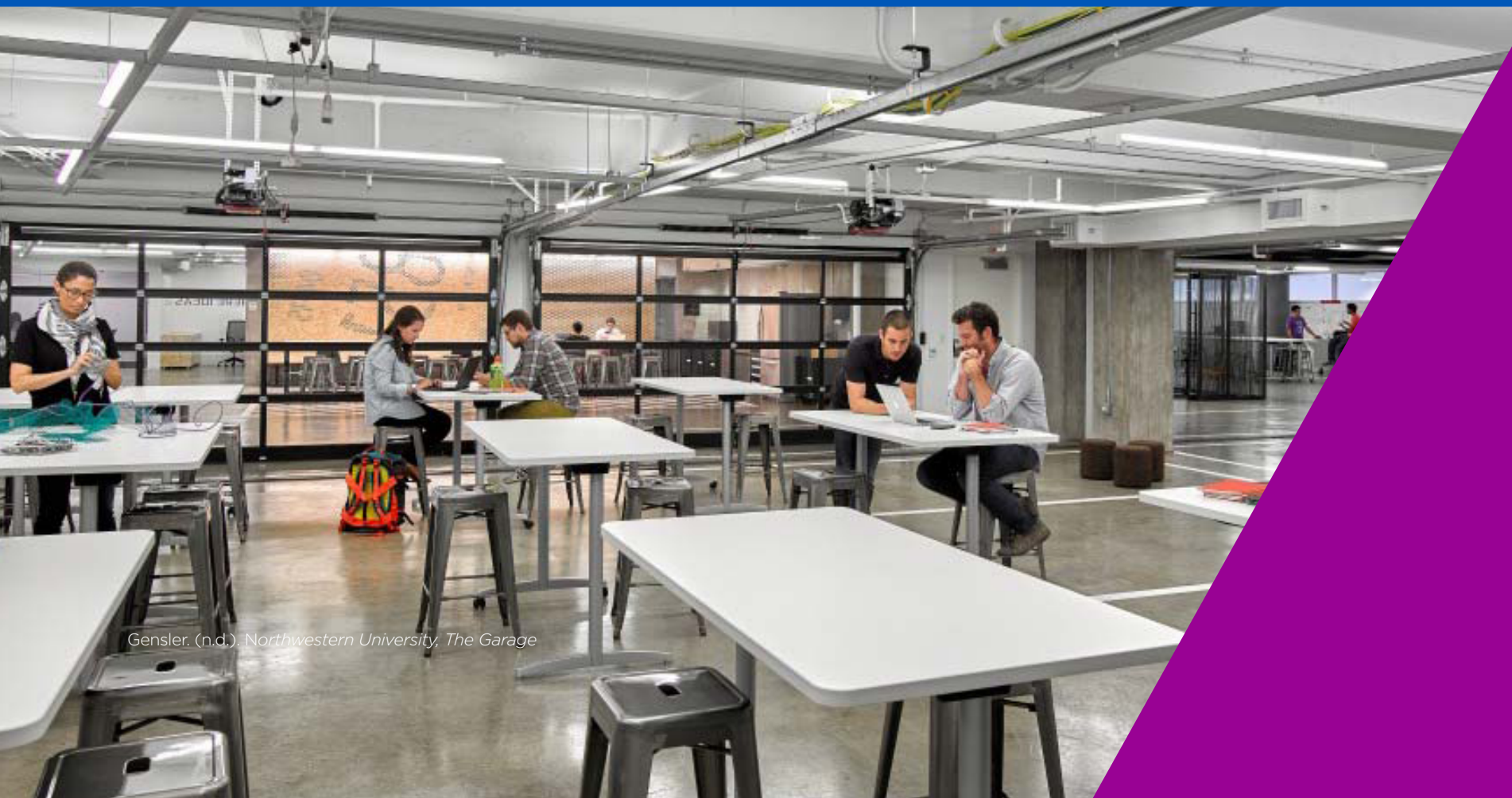


Photo by Peter Landers/Vanity Fair

CASE STUDY

Repurposing an Abandoned Parking Garage in Wichita, KS

In the City of Wichita, KS, a developer redeveloped an abandoned parking garage, converting part of the structure into apartments and office space while maintaining some of the parking for residents and visitors.⁵⁵ This unique space demonstrates how underutilized or unused parking structures can be adapted to serve community needs.



Gensler. (n.d.). Northwestern University, The Garage

CASE STUDY

Northwestern University Hosts Entrepreneurial Space in a Parking Garage

The Garage in Chicago, IL, is an entrepreneurial community where students at Northwestern University can gather to work on more than 1,000 student-founded startups and projects.⁵⁶ The Garage was built in the North Campus Parking Structure and provides an example of a permanent reimagining of a parking structure. The use of only part of the structure allows for parking while providing additional value to the community.

Conclusion

THE ABILITY TO reimagine parking requires the brave creativity of local leaders to examine their zoning laws and suggest ideas beyond continuing car-only parking development because “it has always been done this way.” Parking and cars throughout history have not been the norm but the abnormal: The first bicycle was invented in 1817. The first cable tram was established in 1873. The first wheeled “vehicle powered by a gas engine” was crafted in 1886. The first airport was built in 1909, and the first commercial flight took place in 1914, almost 10 years before the first parking minimum was established in Columbus, OH, in 1923, long after the car itself was created. Transportation technology continues to evolve in ways that expand mobility for everyone. Using those modes of transit will still require parking but the kind of parking needed will depend on the actions of the local municipal leaders. Reimagining parking in the ways exemplified in this action guide will equip local leaders with the opportunity to serve their communities in innovative, equitable ways that return “choice” of mobility into residents’ hands.



Resources

The following resources provide more guidance on how to approach the recommendations highlighted in this brief.

- ◆ [NLC Micromobility Report](#)
- ◆ [NLC Congestion Pricing Report](#)

BIL Programs to Fund Parking Investments

- ◆ [Carbon Reduction Program](#)
- ◆ [Congestion Mitigation and Air Quality Improvement Program](#)
- ◆ [Community Charging Grants](#)
- ◆ [National Significant Multimodal Freight and Highway Projects \(INFRA\)](#)
- ◆ [Congestion Relief Program \(Program information coming later this year.\)](#)
- ◆ [Pilot Program for Transit Oriented Development](#)
- ◆ [Urbanized Area Formula Grant Program](#)
- ◆ [Safe Streets and Roads for All](#)
- ◆ [Rural Surface Transportation Program](#)
- ◆ [Rebuilding American Infrastructure with Sustainability and Equity \(RAISE\)](#)
- ◆ [Transportation Alternatives Set-Aside in Surface Transportation Block Grant](#)

Endnotes

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