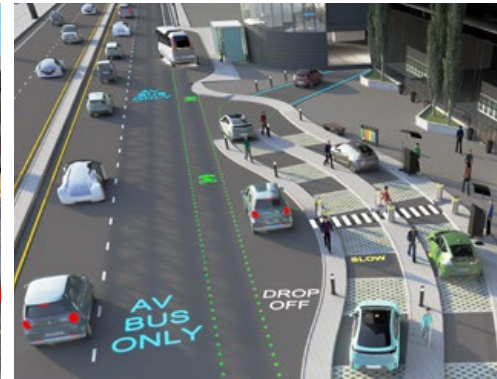




Smart Solutions for Shared Mobility



The National Parking Association explores the future of the evolving share-the-road ecosystem—and investigates how today's innovations will shape a new parking experience and transportation plan for decades to come.

Smart Solutions for Shared Mobility

According to the National Parking Association (NPA), the movement of people and goods will shift as logistics automation continues and parking structures adapt to new uses as logistics hubs.

In this flagship series, the National Parking Association explores future possibilities shaping a share-the-road ecosystem that brings shared mobility to the commuter, homeowner, and visitor — with a multimodal approach to the movement of people and goods in the first/last mile.

As the transportation ecosystem evolves, real estate development, parking structure construction, adaptive uses, and the expansion of smart cities will shape a new parker experience and transportation plan for decades.

Thought leaders across parking, transportation, urban planning, infrastructure, capital markets, government, and researchers are exploring the shape of the future of parking.

As fewer new parking structures are constructed in urban centers, the value of parking near destinations increases. Future development should be designed in anticipation of shared mobility applications to reduce congestion.

Christine Banning, IOM, CAE is president of the National Parking Association.
Email: ChristineBanning@WeAreParking.org.

Mobility Hubs / Adaptive Facility Design / Mixed-Use Hubs / Reinventing the Curb /
Automation & Electrification / The Internet of Things / Reduce Congestion / Policy Implications





THE FUTURE OF PARKING

Mobility Hubs

Smart cities will feature mobility hubs that connect the first mile/last mile. Real estate is finite. As a mobility platform, the next generation of parking will feature access zones for driver vehicles, valet services, TNCs, and autonomous vehicles. Enhanced curbs will ease congestion and promote safety.

New Methodologies for “Hug the Curb”

Parking infrastructure can enhance urban mobility and reduce congestion by reinventing parking as a last-mile component within the transportation ecosystem. Parking is evolving as a mobility hub within the cityscape to support ease of access and keep cities vibrant.

Amenities and Enhanced Consumer Experience

Moving consumers to frictionless transactions offers a value-add for asset owners as the parking industry applies a consultative approach to facility development, management, consumer experience, and reporting to better serve citizens, communities, and cities.

Curb Management

Active curb management through policy making, transportation planning, parking management, effective signage, and technology deployment will create a smart first-mile/last-mile system to connect drivers to cities, providing multiple in-city options for mobility.

Public Policy Implications

The implication of mobility hubs are that public policy making will support enhanced curbs, pull-off lanes, and designated lanes for buses and bikes to foster safe multimodal transportation.

Mobility hubs will connect people with destinations and reduce congestion by moving vehicular traffic out of active roadways and into designated curb loading/unloading zones and off the street into parking structures for storage. Moving vehicles into parking hub zones reduces congestion.

Mobility Hub Features

- 1

The Fast Lane

Designated lanes for cash/credit, LPR, shared vehicles, TNCs, car rental, and autonomous vehicles will funnel traffic to parking areas efficiently. Enhanced technology will enable short-term pricing in 10-minute increments, as well as best-price-guarantee spaces to optimize inventory utilization.

in-car systems will support enhanced wayfinding, reservations, and parking space locating services for short-term, long-term, premium, TNC parking zones, and EV charging spaces.
- 2

Shared Parking Logistics Lanes

Enhanced pick-up and drop-off lanes near designated parking for TNCs provide passenger safety and ease of use for TNCs to pull off the road when not carrying passengers.
- 3

Shared Vehicles

Shared vehicle pick-up/drop-off and in-town rental/ vehicle pick-up/drop-off throughout cities at a variety of structures create commuter, business traveler, and visitor hubs that increase the ease of moving through a city using different transportation modes.
- 4

Reservations and Wayfinding

Enhanced structure navigation will help fill and optimize parking spaces. Reservation apps, online portals, and
- 5

Valet Services

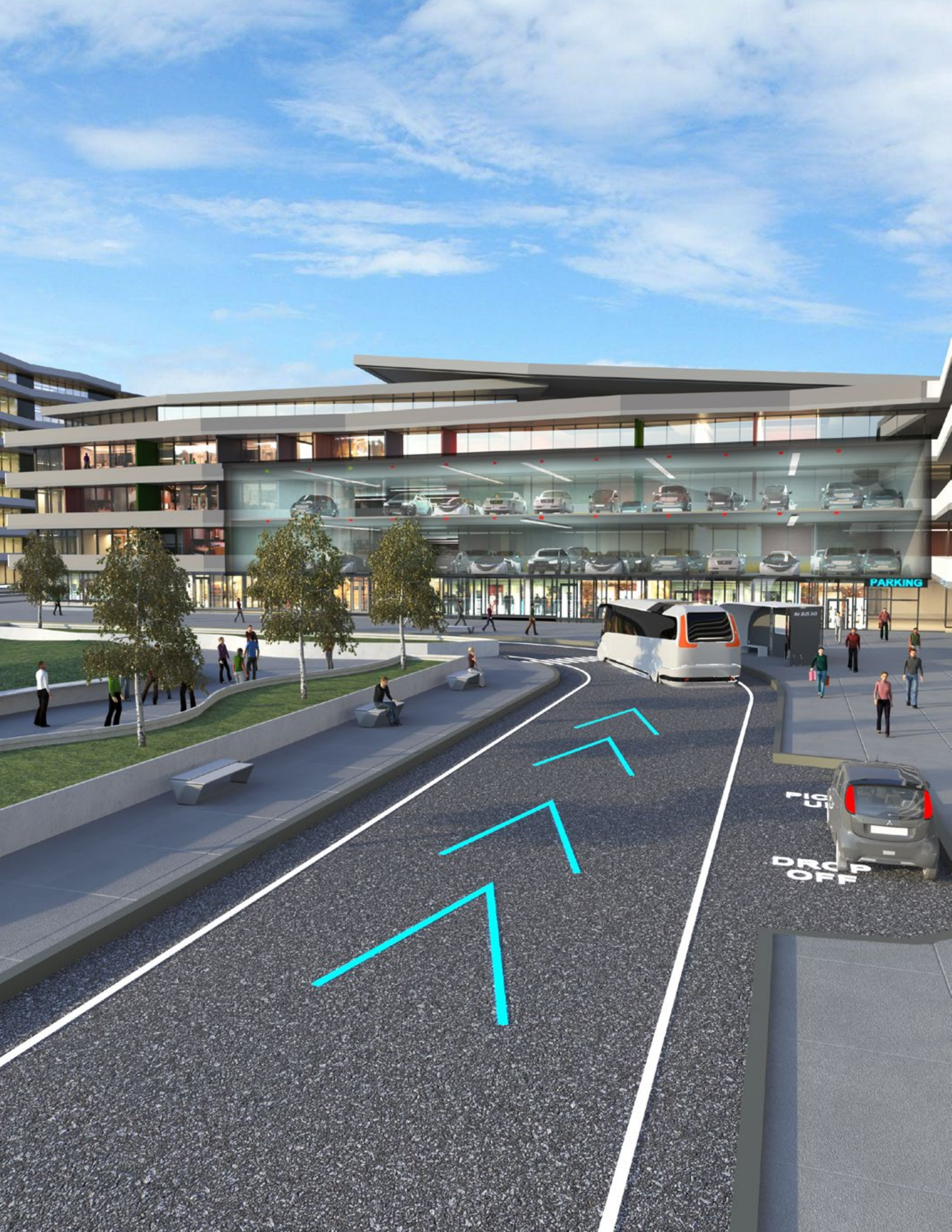
Enhanced valet drop-off and service will provide a premium experience with personal assistance to enhance the parking experience. Concierge, grocery unloading, luggage unloading, dry cleaning pick-up, and car wash services support a live-play-work approach.
- 6

First- and Second-Floor Retail

From coffee shops and dry cleaners to flexible work-space, retail can enhance mobility hubs and increase convenience and usability of cities for commuters, residents, and tourists.
- 7

Autonomous Vehicle Parking

Automated and mechanical parking can maximize urban space for autonomous vehicle use in the city center. Staging-zone parking hubs in industrial or commercial city zones can serve as secondary near-city vehicle storage areas.



THE FUTURE OF PARKING

Adaptive Facility Design

Adaptive facilities that can transform based on tenant and community needs provide an economic development and real estate platform that adapts to market demand.

An adaptive facility design boasts the added benefit of revitalizing cities by enhancing city streets with a more flexible streetscape to foster vital urban centers.

Advance Planning

For the development of parking structures and buildings featuring adaptive design, mechanical and automated parking and convertible garages increase the usefulness of prime real estate. Convertible garages with first-floor retail bring a more robust streetscape and value to the community.

A Parking Deck Hidden

Within the façade of the building, a hidden parking deck allows for future repurposing of the space as needs change. Features include removal of ramps, adjusting ceiling heights, and facility design that anticipate change in a mixed-use environment.

Increased Market Value

A facility's value can be enhanced for asset owners by extending facility life, increasing attractiveness to tenants, and by right-sizing the number of parking spaces in the up-front investment into an adaptable parking structure. The initial investment in parking structure development for adaptive use provides asset owners with more ways to optimize occupancy long term.

Public Policy Implications

The implications of adaptive facility design are that planning, zoning, and parking geometrics will keep pace with policies that foster traditional and nontraditional transit and parking methodologies through mobility hubs. Policy makers may reduce or eliminate parking minimums to encourage developers to build only the amount of parking needed to meet projected demand.



THE FUTURE OF PARKING

Mixed-Use Service Hubs

Economic development and city vitality are enhanced by an integrated ecosystem with transit hubs to streamline access to transportation options and increase mobility effectiveness with integrated pedestrian pathways, drop-off lanes, curbside amenity services, parking, and retail.

Dedicated Drop-Off Zones

Enhanced pedestrian access, designated bike lanes, and concentrating rideshare, bus, and parking (as well as subway systems in some cities) will provide commuters with transportation options, safety, and convenience. The ease of city entry and moving around a city enhance the best use of infrastructure for the specific needs of business, commuters, and tourists.

AV Ingress/Egress

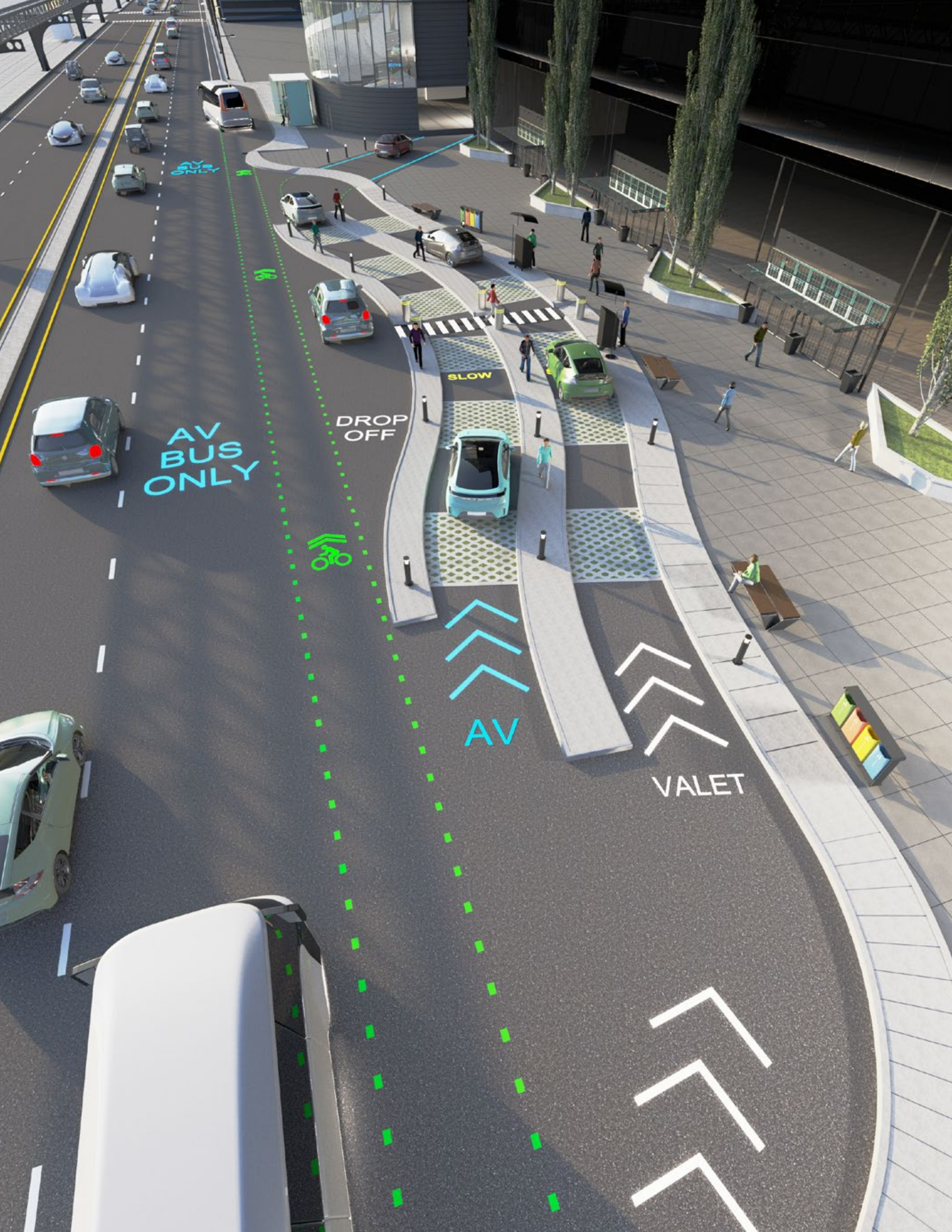
Dedicated autonomous vehicle ingress/egress with a tighter turning radius will allow more parking spaces within the same footprint. This will also support convenient storage of AVs until needed mid-day for potential shared use and/or for peak usage during rush hour, optimizing vehicle use and reducing congestion.

Rideshare Moving Off Street

Vehicles searching for parking spaces or circulating on streets with no passengers increases congestion. By providing enhanced off-street parking, traffic lanes can remain open to vehicles with passengers. Parking will offer rapid-park, 10-minute increment, short-term parking for rideshare to reduce congestion.

Public Policy Implications

Transportation planning and policy making that embrace all transportation options in a node format encourages use of transit and provides consumers choice and flexibility. The combination enhances the mixed-use urban experience and encourages the population to use the city — maintaining a healthy retail, business, and tourist environment.



THE FUTURE OF PARKING

Reinventing the Curb

Reinventing the curb will increase pedestrian and vehicle building access and safety and reduce congestion. Effective multimodal deployment of designated traffic lanes and HOV hot lanes to ease congestion can all work in concert.

Pedestrian and automotive friendly curbs, walkways, designated drop-off lanes, and loading zones keep roadways clear. A hug-the-curb approach can prevent vehicles from blocking traffic lanes.

Rideshare and Ground Transportation

Establish staging areas for rideshare and ground transportation with expanded curbs and pull-off lanes to support loading zones, rideshare drop-off, and buses for pick-up/drop-off in dense population and commuter areas.

Bikeshare and Carshare

Public bikeshare and off-street bicycle storage support multimodal transportation. Commercial parking structures will feature designated spaces for bikeshare, carshare, and EV charging.

Valet Services

Valet lane services at hotels, condominiums, hospital campus complexes, and CBD offices provide enhanced customer service and rapid/attentive loading and unloading. High-occupancy parking structures will require valet stack parking.

Delivery and Loading Zones

Reimagine loading zones with enhanced curbs, off-street, short-term delivery parking paid via app, and pedestrian friendly drop-off zones with easy access to building entry. Increase enforcement to reduce obstructed driving and curb lanes.

Public Policy Implications

Updated zoning policy will be required to specify curb usage, dimensions, ingress and egress, as well as fees for any short-term curb usage. An increased enforcement policy will be needed for double parking and stopping in the roadway to encourage compliance with the law.



THE FUTURE OF PARKING

Automation & Electrification

Increased usage of automated and mechanical parking, future geo-fenced autonomous vehicle usage, and designated parking ingress/egress will provide effective real estate management for parking logistics.

AV integration into high-density, geo-fenced urban areas will provide a targeted transit solution for a specific application.

Autonomous in Geo-Fenced, High-Density Cities

Autonomous parking for in-city staging and vehicle storage in high-density urban areas will increase transportation access and minimize wear and tear on vehicle storage at greater distances.

Mechanical and Automated Parking

Automated parking structures will increase based on their ability to maximize usage per square foot for parking in high-cost-per-square-foot real estate markets.

Fleet Logistics Staging Off-Street

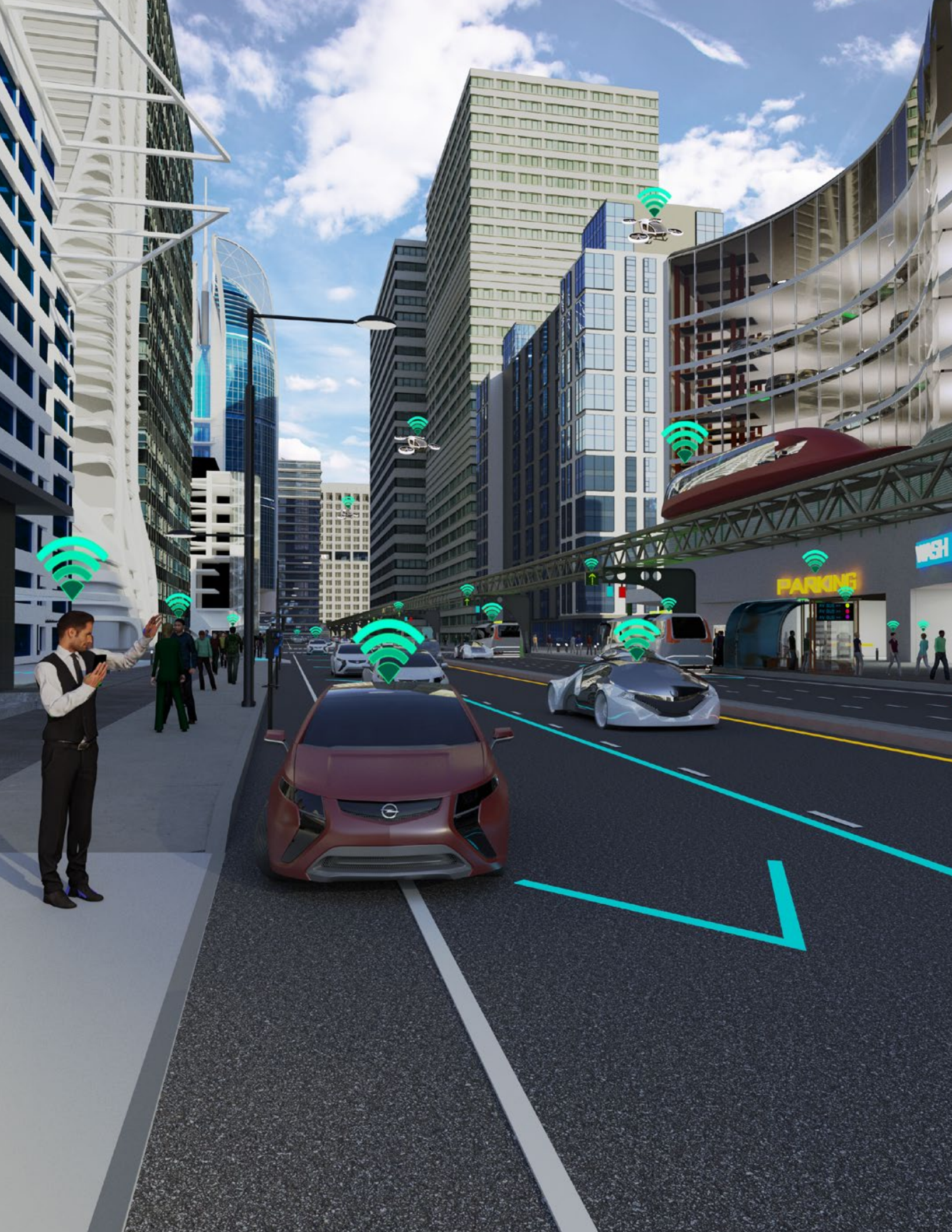
Automated, shared, leased, and fleet vehicles will be part of a diverse ecosystem. Effective staging of fleet vehicles in city and near city will contribute to effective storage, accessibility, and servicing of fleets near operating areas.

Expanded EV Charging

EV charging access at parking structures will increase in areas experiencing greater adoption of electric vehicles.

Public Policy Implications

A wide range of public policies and infrastructure deployments are necessary for Level 5 autonomous vehicles. During the interim, public policy should address regulation on use of the curb, through lanes, and cost of wear and tear on infrastructure from increased vehicle usage.



THE FUTURE OF PARKING

The Internet of Things

Increased technological adoption for navigation, wayfinding, locating parking spaces, parking reservations, ride hailing, and package delivery to designated locations will bring transportation, services, and products directly to consumers at any location.

Through smartphones, the connected consumer will power the movement of people and things. It will require demand management.

Internet of Things

Access to real-time transportation data, parking occupancy, and parking availability will enhance the consumer experience and provide public and private sectors with relevant transportation demand data — including peak times and congestion hot spots.

Artificial Intelligence Opportunities

Artificial intelligence will predict consumer demand, usage patterns, and peak/non-peak times, making dynamic pricing more effective and relevant to congestion management.

Big Data

Enhanced data reporting will enable a more consumer-connected experience with the opportunity for customization of services, ancillary services, and loyalty programs to reward consumers using public and private transportation hubs and modes during off-peak times.

Public Policy Implications

Privacy issues, data security, and the protection of citizens and business will increase the need for clarity in rulemaking as data becomes an ever-increasing part of public and private service delivery and transportation management.



NATIONAL
PARKING
ASSOCIATION

1112 16th Street NW, Suite 840
Washington, DC 20036
202-296-4336 | **WeAreParking.org**