

White Paper #7: Impacts of Changing Transportation Trends and New Mobility Technologies on Future Parking Demand

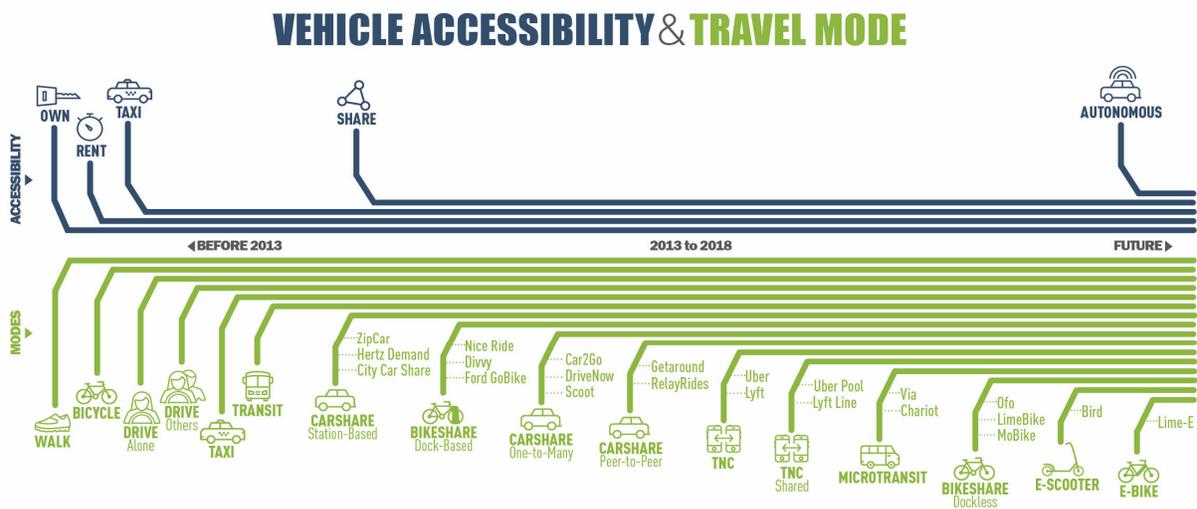
1.0 Introduction

Parking is inseparably tied to how people and goods move in a city and is significantly impacted by how people choose to travel. With a changing landscape of mobility technologies that enable access to a variety of travel modes, the role of parking in downtown areas is likely to change dramatically in the future. This paper explores how changes in transportation trends and new mobility technologies are likely to impact parking demand in the future. It also identifies tools and information that the City of Hood River can use to better balance the promise and perils related to new mobility future.

2.0 New Mobility Options

Figure 1 shows how the landscape of mobility has changed since 2013. Before 2013, access to private automobile travel was limited to people who owned, rented, or used traditional taxi services. Since 2013, car sharing services and ridehailing apps allow vehicles to be shared or rented for single trips and short periods of time. In the future, people may be able to access an autonomous vehicle without the need to drive it or hire another person to drive the vehicle.

Figure 1: Growth of Shared Mobility, 2013-2018



Similarly, since 2013, mode choice has expanded from the traditional modes (drive alone, walk, bike, taxi, and transit) to include carshare, bikeshare, ridehailing, microtransit, e-scooters, e-bikes, etc. Central to these options is the concept of shared mobility, the technology that enables users to have short-term access to a fleet of shared vehicles on an as-needed basis. These new mobility options are described below.

- **Carsharing** – Carsharing offers membership-based access to a fleet of cars and/or light trucks. These vehicles may be located within neighborhoods, at public transit stations, employment centers, universities, etc. Carsharing companies typically provide insurance, gasoline, parking, and maintenance. Members who join the organization typically pay an hourly rate to use a vehicle (e.g. Zipcar, Car2go, Getaround, etc.) in addition to a one-time or annual membership fee.
- **Ridesharing** – Ridesharing (also known as carpooling and vanpooling) is defined as the formal or informal sharing of rides between drivers and passengers with similar nearby origins and destinations. Ridesharing includes vanpooling, in which 7 to 15 passengers share the cost of a van and operating expense and may share driving responsibility. Ridesharing can be implemented through a service or peer-to-peer network (e.g. Enterprise Rideshare, Zimride, Lyft Carpool, etc.)
- **Ridehailing** – Ridehailing services (Uber, Lyft, etc. - also sometimes called “ridesourcing”) are prearranged and on-demand transportation services in which drivers and passengers connect via digital applications. Digital applications are typically used for booking, electronic payment, and ratings.
- **Micromobility** – Micromobility refers to small, lightweight, electric-powered or electric-assist personal mobility devices such as e-bikes and e-scooters. These can be privately owned (e.g. electric skateboard) or operated in a shared fleet (e.g. Lime and Bird e-scooters). Micromobility devices include e-bikes and e-cargo bikes (e.g. JUMP), electric kick scooters (Lime, Bird, Spin e-scooters), and seated scooters (Razor, Wheels seated e-scooters). Fleets of micromobility devices are typically deployed throughout downtown areas or other neighborhoods with high levels of foot traffic. Unlike docked bikeshare (next category), micromobility devices can typically be parked anywhere within a service area.
- **Docked Bikeshare** – Docked bikeshare provides users with on-demand access to bicycles at a variety of pick-up and drop-off locations for one-way or roundtrip travel. Bikesharing fleets are commonly deployed in a network within a metropolitan region, city, neighborhood, employment center, and/or university campus.
- **Microtransit** – Microtransit (sometimes also referred to as on-demand transit) is defined as a privately- or publicly-operated, technology-enabled, transit service. Microtransit typically uses multi-passenger/pooled shuttles or vans to provide on-demand or fixed-schedule services with either dynamic or fixed routing. Transportation Network Companies (TNCs) such as Uber and Lyft remove the task of driving while bikes, electric-bikes (e-bikes), and electric scooters (e-scooters) in shared platforms provide faster travel times on crowded downtown streets (and sidewalks) where vehicle speeds have dropped close to walking speeds.

The City of Hood River has a compact downtown, but currently does not have the mobility options available in dense urban environments such as downtown Portland. As some of the new mobility options become more mature and ubiquitous, the City will start to see interest from both public and private service providers interested in offering new mobility services. Trips made on these new mobility

services by residents, employees, and visitors will replace trips made in personal vehicles, thereby reducing demand for parking in Downtown Hood River. The City can encourage the implementation of these services in Downtown and other key trip originators as a strategy to influence mode choice and in turn manage parking demand.

3.0 Disruptive Transportation Trends

Technological innovation in transportation, such as ridehailing services (Uber/Lyft), bikeshare/e-scooter share, and microtransit services today and autonomous vehicles (AVs) in the future, could fundamentally change the use of parking in a downtown setting. While some of these technologies are already reducing parking demand at specific land uses in urban areas, such as airports, hotels, and event centers, these technologies are not yet having an impact in Hood River.

As it is currently understood, AV technology is expected to do the following:

- Reduce the cost of vehicle travel (in both money and time)
- Reduce parking costs and terminal times
- Eliminate the task of driving
- Reduce the potential for collisions
- Make vehicle travel more convenient

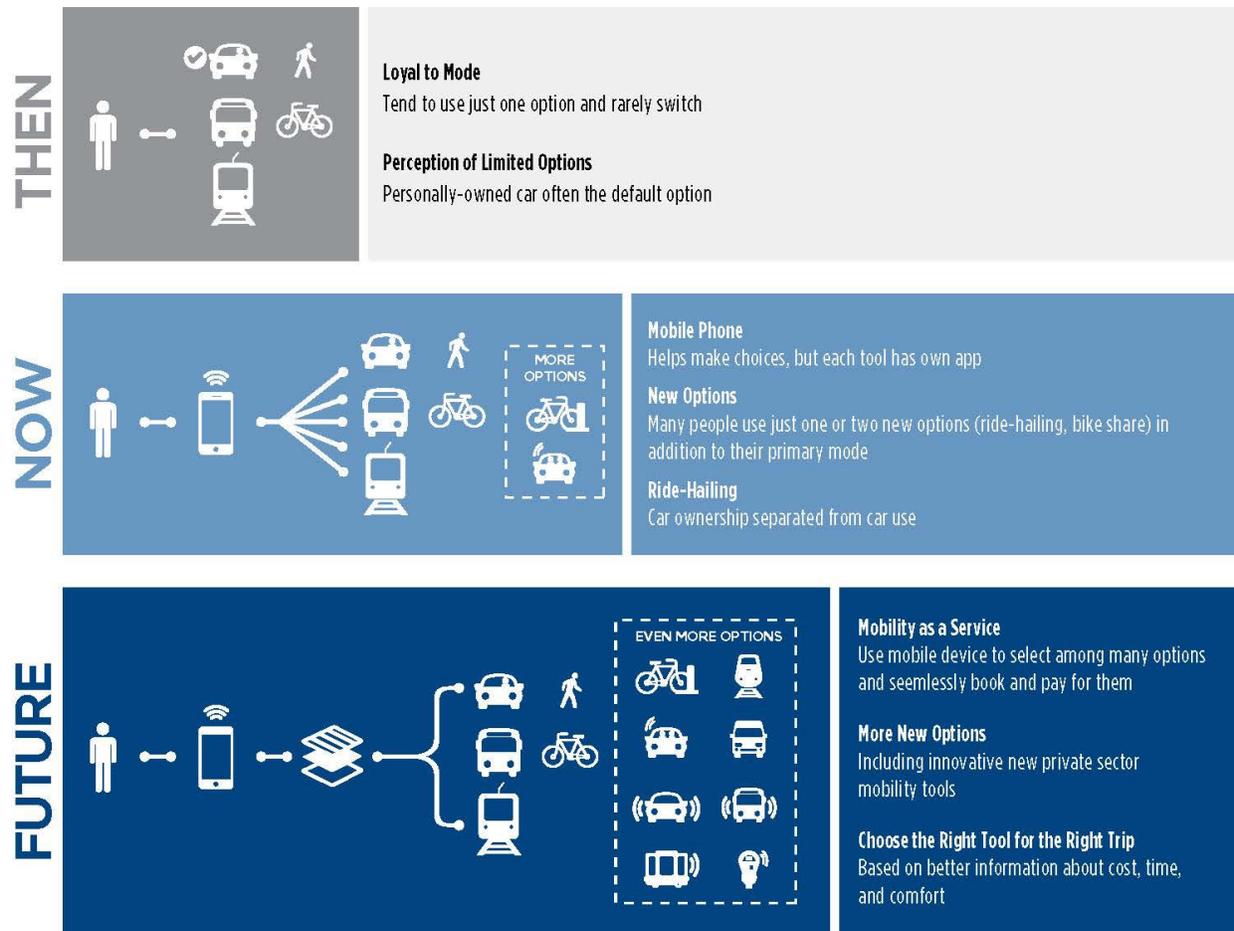
AVs are expected to make vehicle travel more attractive and increase vehicle use overall. Increases in vehicle use could exacerbate current problems associated with congestion and emissions, especially if vehicles remain large and vehicle occupancy levels remain low. While the timing and impact of these trends is uncertain, many areas could see less general demand for parking. This may be especially true in dense urban areas that can be well served by shared self-driving fleets, public transit, and other mobility options, enabling people to substitute these modes for personal vehicles. At the same time, the need for space to maintain those fleets could increase, along with demand for new types of spaces, such as pick-up/drop-off zones and electric vehicle charging stations.

When it comes to parking in downtowns, AVs will have the ability to pick up/drop off passengers without needing to park the vehicle for more than a few minutes in a curb space or in a parking lot. The effect on parking demand would resemble that of ridehailing services like Uber or Lyft, where the passenger is dropped off and the TNC departs to pick up its next passenger. As a result, the demand for brief (under 5-minute) stops at the curb will increase, but the demand to park vehicles near destinations for longer periods will decline.

As more shared mobility solutions and a combination of modes are used, these trends may lend themselves to a subscription model of vehicle use, where households do not own AVs but instead subscribe to services offering pick-ups/drop-offs in AVs. This could not only mean a reduction in parking demand at destinations, but a reduction in vehicle ownership and demand for parking spaces to store vehicles at residences.

Figure 2 shows a comparison of our past mode choices, our current mobility options, and the potential future expansion of mobility options to allow seamless use among multiple options to travel from point A to point B.

Figure 2: Mode Choice – Then, Now and Future



4.0 Demand for Curbspace

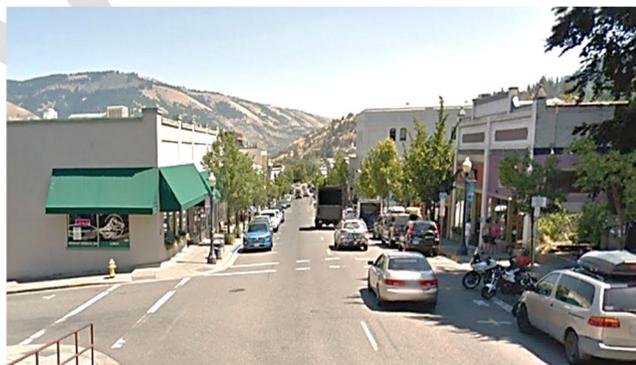
Curbspace is a valuable and flexible public space which is not always optimized for its highest and best use. Curbspace can be used not only for car parking and loading, but also as sidewalk cafés, bus stops, and delivery zones, among other purposes. It can serve many functions throughout the day and is usually a source of revenue for municipalities through parking fees or other surcharges.

Figure 3 summarizes the various potential functions of a curb, including mobility, access for people, access for commerce, activation, greening and storage.

Figure 3: Functions of the Curb

FUNCTION	DEFINITION	USES
 MOBILITY	Moves people and goods	<ul style="list-style-type: none"> • Sidewalks • Bus or streetcar lanes • Bike lanes • General purpose travel lanes - includes freight • Right- or left-turn only lanes
 ACCESS FOR PEOPLE	People arrive at their destination, or transfer between different ways of getting around	<ul style="list-style-type: none"> • Bus or rail stops • Bike parking • Curb bulbs • Passenger load zones • Short-term parking • Taxi zones
 ACCESS FOR COMMERCE	Goods and services reach their customers and markets	<ul style="list-style-type: none"> • Commercial vehicle load zone • Truck load zone
 ACTIVATION	Offers vibrant social spaces	<ul style="list-style-type: none"> • Food trucks • Parklets and streateries • Public art • Seating • Street festivals
 GREENING	Enhances aesthetics and environmental health	<ul style="list-style-type: none"> • Plantings <ul style="list-style-type: none"> - Boulevards - Street trees - Planter boxes • Rain gardens and bio-swales
 STORAGE	Provides storage for vehicles or equipment	<ul style="list-style-type: none"> • Bus layover • Long-term parking • Reserved spaces (e.g. for Police or other government use) • Construction

The expansion of shared mobility options like bikeshare, ridehailing, micromobility, and e-commerce package deliveries has intensified the demand for curb access and amplified the need for thoughtful planning and management of curb space. This is most evident in urban areas, where demand for curbside access competes with the largest variety of other uses, such as vehicle parking and commercial loading.



Roadway right-of-way and curbspace activity at Oak Street and 5th Street.

Source: Google Maps

In response to this growing competition for space, some cities are starting to be more intentional about defining curbside uses

with the goal of increasing the productivity of the curb. Many municipalities are developing policies and frameworks in response to the changing needs and uses of curb space. **Figure 4** shows a sample of curbspace allocation among various users of the curb.

Although the City of Hood River currently does not experience the same demands for curb access compared to denser cities like Portland, the city should consider defining functions along specific street segments that experience heightened activity from parking/loading to make the curbspace more productive. This will become especially relevant when additional mobility options begin to target Hood River and evaluate the feasibility of such operations within the downtown area in the future.

Figure 4: Curbspace Management



Sample image showing allocation of curbspace to various functions.

Source: Fehr & Peers

5.0 Impact on Future Parking Demand in City of Hood River

Demand for parking is already changing in dense urban environments where, in addition to the traditional modes of travel, numerous mobility options are now available for people to travel from point A to point B. On-street parking is already competing with other functions, including demand from new mobility services (ridesharing, ridehailing, micromobility, etc.) and increased deliveries associated with e-commerce. Municipalities are considering policies to organize and enhance safety around these

activities. In addition, as AVs become ubiquitous 20-30 years from now, the role of parking in downtown and overall demand for parking will be greatly impacted. Provided below is a summary of anticipated changes to parking demand in City of Hood River:

Today (0 – 5 years)

The City does not currently have new mobility services operating within its downtown area. One reason for the lack of interest from operators could be not enough year-round demand of these services given the demographics, population, and geographic location of the City of Hood River. As these services get more mature and gain efficiencies in deployment in smaller and less urban towns, these services could provide an alternative to travelling in an automobile. Successful deployment will be dependent on the city's policies to encourage and incentivize these services. During peak tourist seasons, some of these new mobility options such as e-bikeshare and e-scooter-share can fill a much-needed gap of short trips between tourist attractions (e.g. Waterfront Park) and the Downtown. These services can also be used to connect remote parking facilities to Downtown. The city could consider conducting a pilot program during peak tourist season to explore feasibility of one or more of these services (e.g. e-bikeshare) in the next 2-3 years.

Near- to Mid- Term Future (5 – 12 years)

Learning from the speed of evolution and adoption of some recent mobility technologies, it is likely that new mobility services (including ridehailing, bikeshare, micromobility, microtransit, etc.) could become financially feasible to deploy in smaller cities and town within 5-7 years. As the city starts to experience a greater demand for curbspace from new mobility services and increased deliveries associated with e-commerce, the City could take proactive steps to design, measure, price, and manage its curbspace in collaboration with transit agencies, private mobility operators, technology sector innovators, and key stakeholders.

Long Term Future (12+ years)

Looking a decade into the future and beyond, AVs have a high possibility of reducing parking demand, especially in a dense downtown setting. The extent of impact of an AV future on parking demand will depend on how AVs are used and whether people prefer to own AVs as personal vehicles or subscribe to an AV rideshare service for their transportation. Impacts on parking demand in a community could vary based on several factors including age, income levels, geographic location, access needs, etc. For example, AVs will improve mobility for those who are currently unable to drive a vehicle (elderly, without driving license, etc.). If this group owns AVs in the future, the demand for parking could initially grow. On the other hand, younger generations are more inclined to adopt AVs in a rideshare (Uber/Lyft) model, which will reduce parking demand. Government policies related to climate, congestion, equity, etc., will significantly influence personal ownership vs a shared-fleet model.

Given the uncertainty surrounding AVs' influence on parking demand, it is safe to assume that under a private ownership model, overall demand for parking spaces will be marginally impacted. However, parking resources could still be relocated outside of a downtown area to ensure highest and best use of

land within downtown. Need for curbspace management and allocation of pick-up/drop-off zones would only grow and directly compete with on-street parking as AVs grow in adoption.

Whether AVs are part of a shared fleet or privately owned, they have the potential to change the role of parking in a downtown setting by reducing demand and spurring the conversion of long-term parking spaces to short-term pick up/drop off zones.

6.0 Summary

At present, new mobility options are being developed, deployed, continually evaluated and refined in dense urban settings. The market for such technologies is still at an early stage with and there is not enough data available to quantify potential impacts on parking demand without being speculative. Smaller and less dense cities such as Hood River may not have the demand for successful deployment of a majority of the new mobility services. As demand for these services becomes more defined and technology evolves, Hood River should consider pilot-testing some of these services in the future.

For any decisions related to adding new permanent parking facilities, the city should consider the effects of an AV future on parking demand. If adding new parking supply is needed to meet demand in the interim, parking facilities should be designed to allow for future partial or full conversion to other use. This will ensure that the reduction in parking demand will not result in the facility becoming obsolete before the end of its useful life.

Considering the rapid pace of technology adopted and other disruptive trends in transportation, the city should regularly (every 2-3 years) calibrate its plans and policies on infrastructure investments to leverage the opportunities presented by technology-enabled mobility and counter the negative effects of disruptions in the future.