Shared Mobility and Technologies Impact on Parking Design and Curbside Management

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Today’s Discussion

The Known Future
Shared Mobility Explosion
Parking Technology
Curbside Management

The Unknown Future
What Do We Plan For?
How Do We Plan?
Designing Parking For The Unknown
The **KNOWN** Future
Land Use Trends

- Compact Development
- Mix of Uses
- Density of People
- Property and Parking Costs
- Shared Parking

- Parking Requirements
- Affordability of Housing
- Distance from Work to Home
Travel Behavior Trends

- Telecommuting
- Transportation Options
- EV Usage
- Use of Technology

Car Ownership
- Acquiring Drivers License
- Cost of Alt. Modes

Change in Millenial Travel Patterns Between 2001 & 2009

16% More Walking Trips
24% More Biking Trips
40% More Transit Trips
23% Fewer Driving Trips

What We Think and IS Happening

- Continued Demand for Real Time Information
- Alignment with Pricing with Demand (Dynamic Pricing)
- Smart Parking Systems (Availability, Reservations, Mobile Payment, etc.)
- Frictionless Parking Access (Virtual Gates such as LPR)

- Less Parking Demand (For Most Land Uses)
- Shared Mobility
- Technology Integration
- Increased Curbside Pressures/Amenities
  - On-street parking
  - TNC zones
  - Bike and carshare
  - On-demand delivery services
Shared Mobility Explosion
What Changed?

Don't get into cars with strangers

Don't meet people from the internet

Don't trust the internet with your credit card information

Call a complete stranger from the internet for a ride, give them your credit card information and pick up other strangers along the way.
Shared Mobility Categories

- Enterprise Commute Trip Reduction
- Mobility Aggregators
- Rideshare w/in 10 min
- Rideshare w/in 24 hours
- Taxi-like services
- Carshare
- P2P Carshare
- Bikeshare
- Microtransit

- Personal Electric Transport
- Vanpooling
- Commute Mode Detection Technologies
- Miscellaneous Apps
- Personal Rapid Transit
- Niche ride match
- SOV Apps
Rideshare Services

- A transportation network company (TNC) (sometimes known as mobility service providers or MSPs), connects via websites and mobile apps, pairing passengers with drivers who provide such passengers with transportation on the driver's non-commercial vehicle.

- TNCs include Gett, Lyft, Juno, Cabify, Uber, goCatch, Via, Ola Cabs, GoCar, GO-JEK, Careem, Wingz, Taxify, GrabTaxi, Didi Kuaidi, Easy Taxi, and Fasten.

- TNCs are examples of the sharing economy.
Carshare Services
Car2Go, Zipcar, Enterprise Car Share

What is Car Sharing?

• Drive cars by the hour or day. Gas & insurance included.
• Now in neighborhoods, cities and airports
• Could save $ over car ownership
• Memberships start as low as $7/month.
Microtransit Services

Bridj, FLEX, Chariot

What is Microtransit?

• On-demand small-scale transit service
• Can service first-mile/last-mile
• Commuter shuttle service
• Includes a mobile application
• Implemented by private sector and municipalities
• Alternative to standard transit
  • Typically more costly
• Similar to Uber Pool and Lyft Line
Bike and Scooter Share Services

Spin, CitiBike, LimeBike, Bird

• A bicycle-sharing system, is a service in which bicycles are made available for shared use to individuals on a very short term basis.

• Bike share schemes allow people to borrow a bike from point "A" and return it at point "B". Many bike-share systems offer subscriptions that make the first 30–45 minutes of use either free or very inexpensive, encouraging use as transportation.

• First and Last Mile Solution
Parking Technology
Trends in Parking Technology

- Real Time Information
- Multiple Payment Options
- Convenience / Safety
- Removing Hardware
- License Plate Verification
- Software Specializing in Data Analysis
Progression of On-Street Parking Technology
Progression of On-Street Parking Enforcement
Progression of Off-Street Parking Technology
Real Time Information
• Integration of Real Time Occupancy (Required for CV integration)
• More Efficient and Utilized Facilities, Higher Turnover
Dynamic Pricing

• Reflecting Supply and Demand
• To change behavior and maximize system efficiency
Connected System and Analytics

1. Every arrival & departure is detected in real-time
2. Motorist is guided to available parking
3. Motorist parks
4. Motorist pays by phone & activates timer
5. Officer is guided to unpaid violations, overstay, no parking & restricted zones
6. Staff receives web-based analytics for decision making

Or pay by meter (brand not relevant)
Curbside Management
Curbside Uses
• Ped access to/from sidewalk
• Parking
• Emergency vehicle access
• Public transport
• Loading zones
• Bicycle infrastructure
• Pick-up/drop-off
• Waste management access
• Repair/maintenance access
• Commercial space
• Green space
Increased Curbside Management

Different curbside uses have varying abilities to draw people to an area and to support nearby businesses.

- **BIKE SHARE STATION**: 40 riders/day
- **FOOD TRUCK**: 150 meals/day, $800–1800 income/day
- **PARKLET**: 100 visitors/day, 10–20% revenue boost to nearby businesses
- **LOADING ZONE**: 20 deliveries/day, $10,000 in daily sales per block
- **PARATRANSIT & ACCESSIBLE LOADING**: Serving 19% of the US population
- **METERED PARKING SPOT**: 15 vehicles/day
- **BUS STOP**: 1,000 riders/day
- **PASSENGER DROP-OFF ZONE**: 100 passengers/day
Increased Curbside Management

FLEX ZONES

Curbside space changes use depending on month, week, or day

- Loading Zones (12am – 6am)
- Bus Stop and HOV Lane (6am – 9am and 4pm – 6pm)
- On-Street Parking (9am – 4pm)
- Public Space and Parking (6pm – 12am)
- Other Uses: Bike Parking/Lanes, TNC drop-off/pick-up, Food Trucks, EV Charging Stations, Pedestrian Infrastructure
Rideshare Drop-Off/Pick-Up

- Intended to reduce congestion and vehicles stopping in the road
- Locate in high activity areas (i.e. main street, stadium, convention center, hotel, airport, etc.)
- Short term parking area (i.e. 3 minutes)
- Requires enforcement to be effective
Las Olas Improvement Project
How Much Do We Know About the Future?
Maybe More Than We Think........
The Verdict Is Out

- Autonomous Vehicles
- Ownership Model Will Impact Parking Demand
- Mobility as a Service (Maas)
- Connected Vehicles
- Subscription vs. Advertising
- Integration of parking occupancy and pricing (parking facilities not connected, don’t exist)
- Dashboard Displays or Smart Phone
- Parking Costs
  - Rolled into Maas Fee or Remain Separated
The Verdict Is Out

- Future of Advertising (e.g. Billboards and Wayfinding Signage)
- Drone Rooftop Loading Areas
- Transit’s Role
  - Competition with autonomous/connected vehicles
  - Or
  - Enhanced through last mile connectivity
  - Threats to lower speed/local service
  - Opportunity for transit providers to enhance service
So What Do We Plan For?
Lower Parking Demands

- Upwards of 50%-90% Less Parking in Next Few Decades
- Designing for Adaptive Reuse or Phasing Construction
- Garage Conversions (e.g. storage units)
- Short-Term Parking (EV charging and Ride Hail Vehicles)
Migration of Parking to Less Proximate Locations
Surface Parking Exit Strategy
Design of Parking Facilities

- Adaptive reuse of existing facilities
- Plan for partial demolition
- Redevelopment of surface parking
- Reconfiguration of existing parking garages to meet the needs of a changing automobile
- Creating a parking system that meets the changing uses of our transportation system
Adaptive Reuse of Parking Facilities

- Increased floor to floor heights
- Flat floors
- Additional expansion joints
- Increased loads
- External ramping
- Stair/Elevator design and placement
- Alternative uses: loading, TNC drop-off/pick-up, storage
Design Parking for Autonomous Vehicles

- Stack vehicles
- Color drive aisles and walls
- Technology integration
- EV stations
- Smaller space widths
- Automated access control
- 60% space-efficiency increase

CONVENTIONAL GARAGE DESIGNED TO ADAPT TO AUTONOMOUS VEHICLES

PHASE 1: 2018 - 2025

Today, the typical car is used only 5% of the time. 95% of the time it is parked: in a garage, at a house or on the street.

However, by the time today’s garages are built, self parking cars and shared fleets will be a reality.

By 2025, fully autonomous cars are expected to be available to the general public for an additional $10,000. Source: Boston Consulting Group
Design Streets for Autonomous Vehicles

- Narrower lane widths
- Less need for on-street parking
- No signage needed
- Less traffic
- More drop-off/pick-up locations
- Curbside support alternative uses
- Various colored pavement
- More technology integration into infrastructure
How Do We Plan?
Embrace the Trends

- Develop policy to integrate rideshare and promote a more coordinated usage
- Partner parking and mobility to define a suite of options for patrons
- Develop policy and framework to communicate your technology with the connected car
- Modify parking design guidelines and parking requirements
Key Considerations

- Treat Parking as a Piece of the Mobility Ecosystem
- Plan for the Right Amount of Parking
  - Off-Site Parking (e.g. park-and-ride)
  - On-Site Parking (e.g. shared parking)
- Parking Management
  - Ownership
  - Pricing
  - Policies / Enforcement
- Share As Much As Possible
- Right Mix of Land Uses
- Design Parking Appropriately
- Attention to Driveway and Street Design
Planning Tools

- Shared Parking Studies

Park+

A Kimley-Horn Software Solution
Planning Tools
• Geospatial Mapping Software
Planning Tools

• Transportation Demand Management Strategies
“Our world is going to change radically and we are going to be alive to see it. It’s not a generation away, it’s 10 years away.”

~ Andy Cohen, Los Angeles architect