Planning and Designing for an Unknown Future
Agenda

- Florida Parking & Transportation Association (FPTA)
- Hot Parking Topics
- Parking Design Trends
- Parking Technology Trends
- What’s Next?
Mark N. Santos, P.E.

- 18 years of experience dedicated to parking
- Diverse background in parking studies, parking design, structural engineering, and restoration
- Florida Parking Association (FPA) Board Member
- International Parking Institute (IPI) Planning, Design, and Construction Committee Co-Chair
- Parksmart Advisor
Florida Parking and Transportation Association

• Founded in 1979
• Approximately 250 members
  • One of the largest State Regional Associations
  • Municipalities, Higher Education, Consultants, Vendors
• Events
  • Front line training
  • Annual conference and exhibition
Mobility and Alternative Transportation Trends

Figure 1.

**How People Travel to Work: 2013**
(Percentage of workers. Universe: workers 16 years and older. Data based on sample. For information on confidentiality protection, sampling error, nonsampling error, and definitions, see [www.census.gov/acs/www/](http://www.census.gov/acs/www/))

- Drove alone: 76.4%
- Carpool: 9.4%
- Public transportation: 5.2%
- Worked at home: 4.4%
- Walked: 2.8%
- Other means of travel: 1.3%
- Bicycle: 0.6%

Source: U.S. Census Bureau, 2013 American Community Survey, Table S0801.
Cars Still Dominate

Figure 3. **Commuting by Automobile: 1960 to 2013**
(Percentage of workers. Universe: workers 16 years and older. Data based on sample. For information on confidentiality protection, sampling error, nonsampling error, and definitions, see [www.census.gov/acs/www/](http://www.census.gov/acs/www/) )

Millenials don’t love cars.
Self-Driving Cars

- All of the major car manufacturers are working on autonomous vehicle technology.
Shared Use Mobility

- Ride Sharing
- Car Sharing
- Bike Sharing
- Uber/Lyft
- Taxis /Limos
- Other
UberPool Ride Sharing

- Launched in San Francisco in August 2014
- Each UberPool car removes 3 – 4 cars from the roads.
- In Los Angeles, 14% of UberPool trips start or end at Metro stations.
Parking Design Trends
Evolution of the Parking Garage

- Utilitarian - Auto Oriented
- S.F. /Space

1970

- Aesthetics - Exterior Facade

1980

- Interiors - Pedestrian Oriented
- Human Space

1990

2000

2010
Market Trends

High quality experience:

- Safety
- Aesthetics
- Comfortable
- Lighting/Daylight
- Wayfinding
- Sustainability
Design with the User in Mind

- Pedestrian connectivity
- Lobby areas
- Lighting/painting of structure
- Conceal MEP (conduits)
- Graphic signage themes
Demand-Based Pricing

- Creative data sources
- Setting goals
- Focusing policy on the right aspects
- Crafting the right message
- Using within a Smart City concept
Parking Fundamentals

- Functional design
- Safety/security
- Sustainability/Parksmart
- Structure/Durability
- Technology
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Management (Facility Operations)
- Pricing, Shared Park
- Recycling
- Cleaning
- Commissioning
- Construction
- Life Cycle Assessment

Programs (Services Offered to Patrons)
- Placemaking
- Wayfinding
- Green Spaces
- Bicycles
- Education
- Alt Fuel Fleet

Technology & Design (Features & Initiatives)
- EV Charging
- HVAC
- Lighting
- Water Resources
- Idle Reduction
- Renewable Energy
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Parking Technology Trends
Technology Trends

- Parking Access and Revenue Control Systems (PARCS)
- Cashierless and Gateless Systems
- License Plate Recognition (LPR) Systems
- Parking Guidance Systems (PGS)
Parking Guidance Systems

Count System
- Provides information on the number of stalls available in a given location
- Reduces time spent searching multiple levels for stalls

Illuminated Stall Identification System
- Increases efficiency of parking facility
- Reduces time spent searching floor plate or aisle for open stall
Parking Guidance Systems

- Disney Springs
Parking Guidance Systems

- FLL
The World Is Increasingly Connected

- Wayfinding guidance
- Self-parking garage robots
- Predictive algorithms
- “The Connected Traveler”
- Variable messaging signage
- Smart meters
- Mobile app integration
What is the Connected Car?

A vehicle with the ability to
- Access the internet.
- “See” with sensors.
- Communicate with the roadway.
- Communicate with other vehicles.
- Interact with drivers and passengers.
Evolution of the Automated Car

- **Level 0**: Driver only
  - Hands on
  - Eyes on
  - Lateral or longitudinal control is accomplished by the system

- **Level 1**: Assisted
  - Hands on
  - Eyes on
  - System has longitudinal and lateral control in a specific use case

- **Level 2**: Partial automation
  - Hands on
  - Eyes on
  - Driver has to monitor the system at all times, must always be in a position to resume control

- **Level 3**: Conditional automation
  - Hands off
  - Eyes on
  - Driver does not have to monitor the system at all times; must always be in a position to resume control

- **Level 4**: High automation
  - Hands off
  - Eyes off
  - Driver is not required during defined use case

- **Level 5**: Full automation
  - Hands off
  - Eyes off
  - System can cope with all situations automatically in a defined use case

**Vehicle Role**

- Eyes on
  - Hands on
  - Eyes off
  - Hands off
Current Status of Automated Vehicles

- Tesla (Level 2)
- Uber is actively testing (Level 2)
- GM – Cadillac 2017 Super Cruise (Level 3)
- Volvo – testing in Sweden (Level 3)
- Urban Autonomous – 2022 (Level 4)
- Fully Autonomous – 2025 Mercedes planned rollout (Level 4…5?)

Far away…but not far away…
Smartphone Based Communication

- Old approach: provide static information that informs the consumer
- New approach: provide multi-modal information that educates the consumer
Who’s Going to Put it All Together

- The ultimate smartphone application will allow us to:
  - Search for destination
  - Find parking nearby
  - Pay for parking
  - Access information about our transaction
  - Add time
  - Manage before, during, and after experience
Designing for the Future

- What does the future hold?
  - Advanced use of Rideshare
  - Changing behaviors and demographics
  - Beginning rollout of autonomous vehicles
Designing for the Future

• How do we plan for a changing future?
  • 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
Designing for the Future

• What to do with all that parking?
  • Adaptive reuse of existing facilities
  • 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
Thank you

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