THE EVOLUTION OF
UNIVERSITY PARKING
MASTER PLANNING

A webinar presented by Kimley-Horn, Texas A&M University, and Arizona State University

AGENDA

1. Introductions ....**Presentation Team and Attendees**
2. Traditional Planning Challenges for Universities ....**Sam Veraldi**
3. Innovations in Technology...**Erin Gentle**
4. University Case Studies ....**Brett Wood**
5. Peer Discussion ....**Texas A&M (Peter Lange/Eric Irwin)**
   ....**ASU (Melinda Alonzo/Gabe Mendez)**
6. Questions and Discussion

PRESENTATION TEAM BIOS

BRETT WOOD, P.E., CAPP

Brett has extensive experience in parking demand and management analysis, including supply and demand evaluations, parking operations management, and strategic parking planning for downtown areas, larger communities, universities, and medical campuses. Brett led the development of a unique software application, Park+, which helps municipalities monitor changes to parking demand based on development intensity, transportation mode choices, and zoning changes. Over the past three years, Brett has implemented variations of this platform in more than 25 municipalities, universities, and medical campuses throughout the country.

ERIN GENTLE, GISP

Erin leads the planning and GIS integration component of the Park+ model, including adapting parking demand modeling techniques into ArcGIS. She has an extensive background in the management of local and regional multi-modal transportation and long range planning, allowing her to identify, test, and apply the most effective planning scenarios specific to each community. Erin's management of planning and GIS related projects relates to many disciplines and includes a wide range of capabilities including database management, creation, and analysis.

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SAM VERALDI, CAPP

Sam has recently joined Kimley-Horn after five years of being the Director of Parking and Transportation Services at Duke. He received his CAPP designation in 2014. He has been on the faculty at Duke for 18 years teaching finance, strategy, consulting and entrepreneurship. He is also currently on the IPI Education Committee and is developing a Finance course for the CAPP Program. Prior to joining Duke University, Sam spent over 20 years in Senior Finance Roles in GE Capital and IBM. In addition, his roles encompassed Strategic Planning, Business Development and Operations.

PETER LANGE

Peter Lange is executive director of Transportation Services at Texas A&M University in College Station, Texas. He is responsible for one of the largest parking, transportation and fleet operations on any college campus in the country. Transportation Services at Texas A&M was named "2009 Parking Organization of the Year" by the International Parking Institute and "Innovative Organization of the Year - 2012" by the National Parking Association.

ERIC IRWIN

Eric has been a GIS professional for nearly 20 years. He provides mapping solutions for the Transportation Services department at Texas A&M University, as well as other departments around campus. Eric is the primary liaison for Park+ operations on campus, working closely with parking and transportation staff to model demand scenarios. He is also an advanced user who has helped Kimley-Horn define new modules and practices for the modeling application.

MELINDA ALONZO, CAPP

Melinda is Director of Parking and Transit Services where she oversees ASU's comprehensive parking and transportation program serving more than 80,000 students across four unique campuses comprised of 24,000 parking spaces. She manages a system that includes 10 structured facilities, and alternative mode programs that include 10 intercampus shuttles, Zipcar/car sharing, bicycle and public transportation programs. With more than 18 years of industry experience, this Arizona native began in the private sector with Ace Parking Management, oveseeing the company's downtown Phoenix operation before joining ASU in 1999.

GABE MENDEZ, CPP

Gabe is the department's Strategic Support manager whose duties include project management and strategic support for department programs and initiatives. He is currently leading the department's implementation of a multi-year, multi-million dollar package of upgrades and technology advancements that include updating current gate access technology, visitor meters and pay machines and the recent introduction of the ParkMobile app at ASU. Gabe also works closely with Kimley-Horn on the development of the University's Park+ scenarios.

Today's Webinar

- Introductions
- Traditional University Planning Efforts
- Technological Innovations
- Case Studies
- Peer Discussion
- Question and Answer

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INTRODUCTIONS

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Presentation Team

- Peter Lange
- Eric Irwin

- Melinda Alonzo, CAPP
- Gabe Mendez, CPP

- Brett Wood, P.E. CAPP
- Erin Gentle, GISP
- Sam Veraldi, CAPP

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TRADITIONAL PLANNING CHALLENGES

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Traditional Planning Challenges

- **Inventory of Parking Facilities**
  - Necessary
    - Coordination of other departments
    - Cooperation with Master Planning
- **Accumulation Counts**
  - Labor Intensive
  - Resource Limitations
    - Quality of Data Suspect
    - Timing is Critical
  - Duration, Turnover, or Parking Violations Not Considered

- **Duration and Turnover Surveys**
  - Requires LPR
    - Expensive
  - Alternatives have to be made
    - Trade offs between data collection costs and study accuracy

Traditional Planning Challenges

- User Information Surveys
  - Parking Interviews
    - Challenge to get correct data as people just want to get to destination
  - Post Card Studies
    - About 30-35% Return Rates- Bias sensitive
      - Drivers over estimate needs
      - False reporting

- Parking Ratio Splits

- Land Use Characteristics
  - Types
  - Intensities
- Mode Splits
  - Daily Impacts
  - Coordination with Service Providers
- FTE growth accuracy suspect
  - Student
  - Faculty/Staff
  - New Construction

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Bringing it All Together

- Recognized the fragmentation with campus planning and data management

- Inherent redundancies in the traditional planning method

- Opportunity to leverage technology to collect, maintain, and use data to improve planning
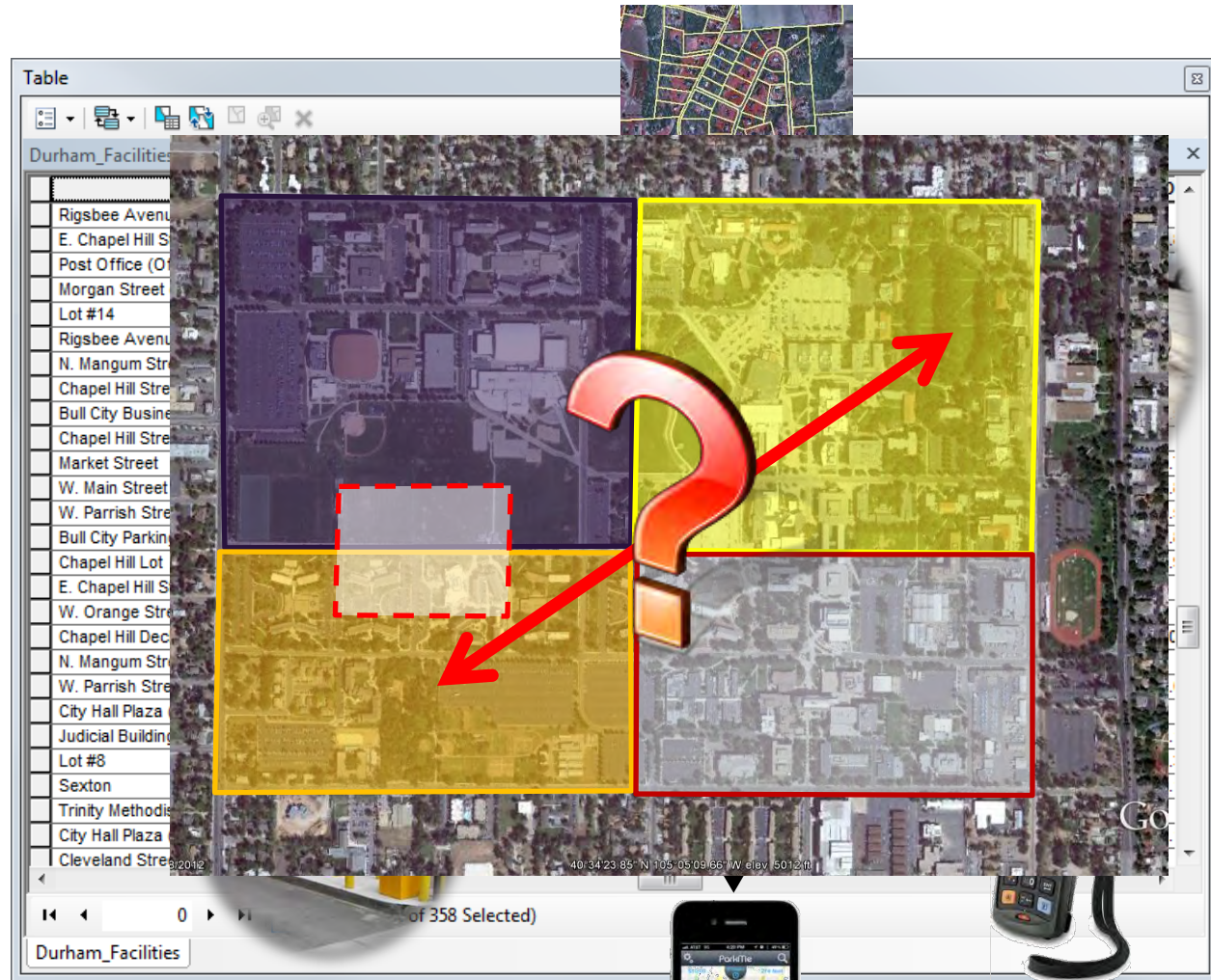
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Redundancy in Supply/Demand

Improving the Process

- Better flexibility in planning and analysis

- Better control of your supply/demand

- Better use of existing data

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Leveraging Technology

- **Park+**
  - Kimley-Horn's answer to the redundancy with supply/demand

- Park+ can:
  - Evaluate new development
  - Project event conditions
  - Provide policy support
  - Inform management decisions
  - Strengthen planning and operations approaches

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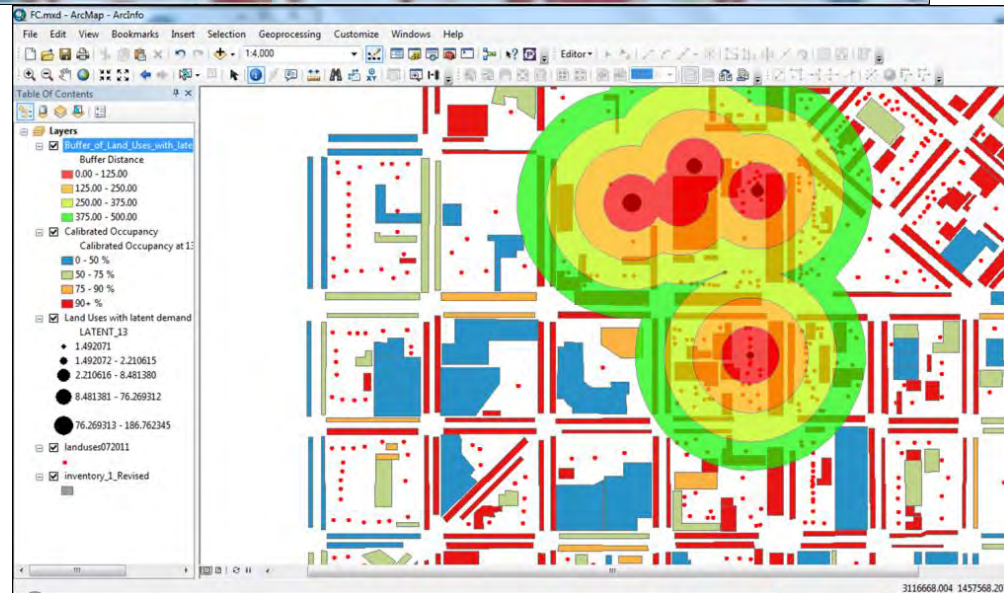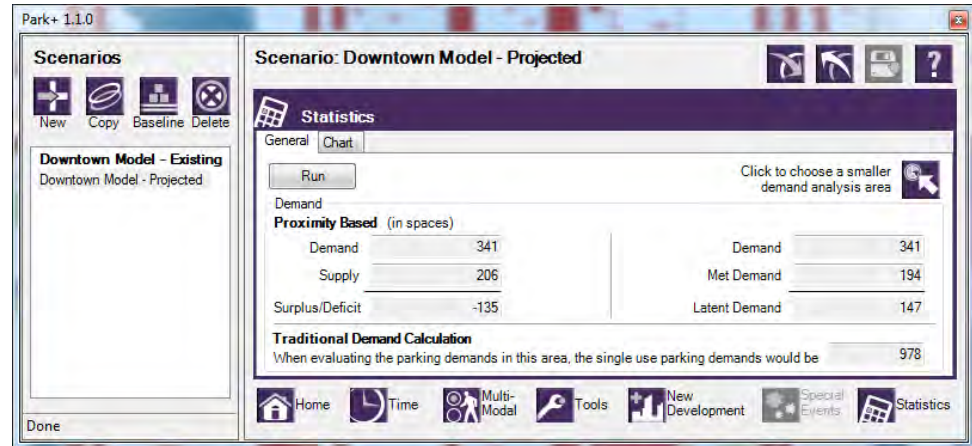
Campus Master Planning with Park+

- Calibrated data in the model is based on local conditions

- Scenario planning provides flexibility in campus planning

- Outputs provide numeric and visual confirmation of problem areas

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CASE STUDIES
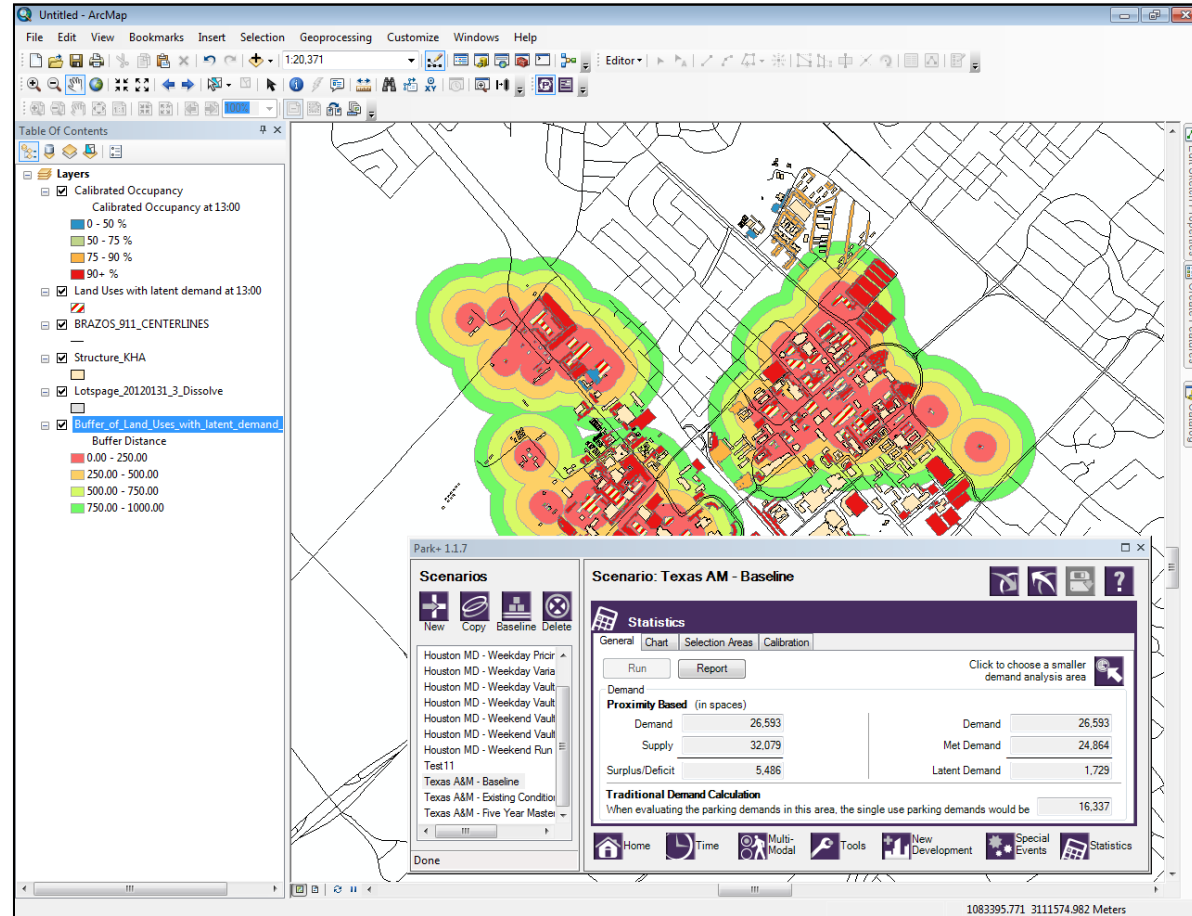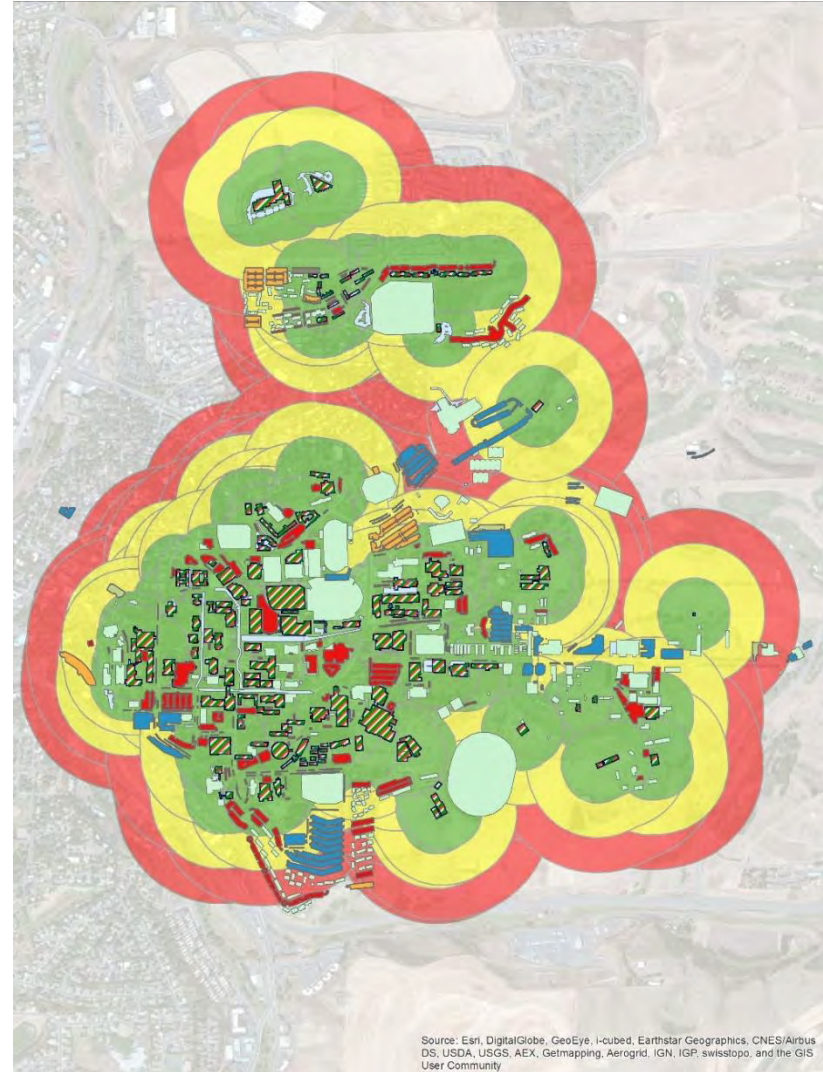
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Colorado State University

- Modeled annual build-out projections over a 15-year horizon

- Modeled new parking facilities

- Evaluation of mode-split requirements and TDM policies to reduce spaces per student

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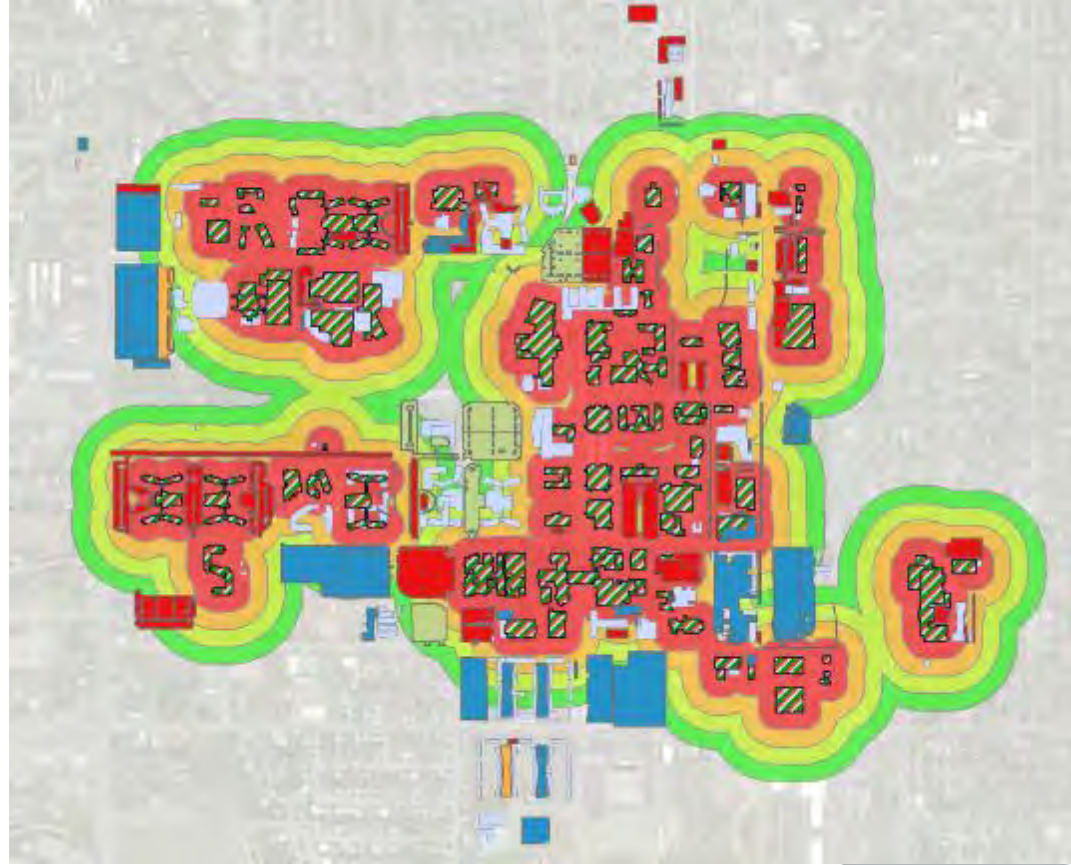
Washington State University

- 10 year campus plan
  - New infrastructure
  - Loss of parking
- Modeled new parking facilities
  - Optimal location
  - Sizing and permitting

Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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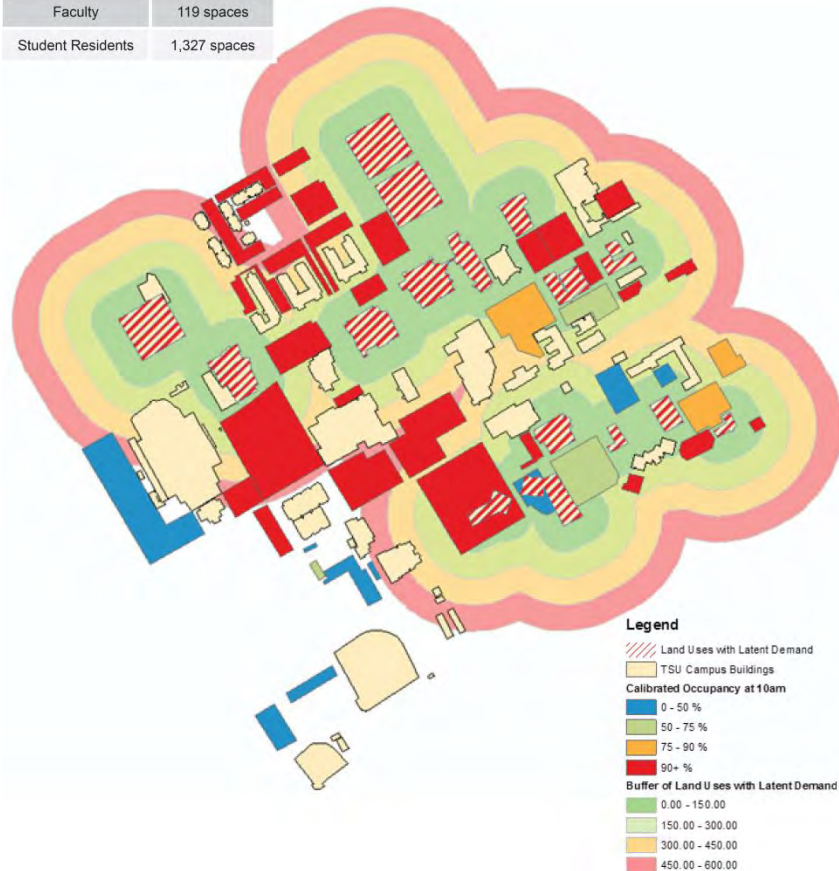
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University of Washington

- Modeled existing, event, and proposed build-out conditions

- UW has since modeled additional scenarios:

  - New on campus infrastructure

  - New on campus parking

  - Demand-based parking permitting
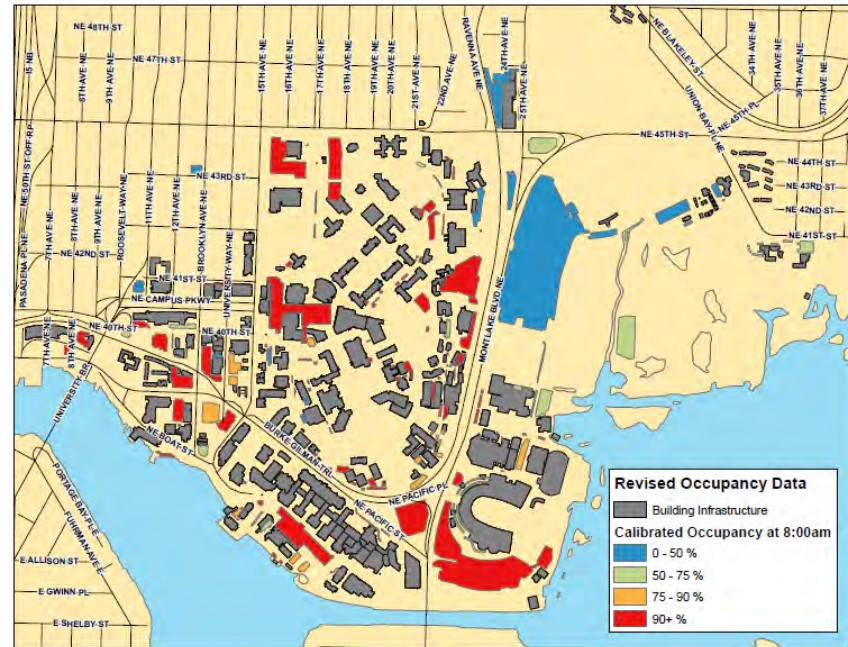
Tarleton State University, Stephenville, Texas

USER GROUP	LATENT DEMAND
Commuters	221 spaces
Faculty	119 spaces
Student Residents	1,327 spaces

Legend
///// Land Uses with Latent Demand
TSU Campus Buildings
Calibrated Occupancy at 10am
0 - 50 %
50 - 75 %
75 - 90 %
90+ %
Buffer of Land Uses with Latent Demand
0.00 - 150.00
150.00 - 300.00
300.00 - 450.00
450.00 - 600.00

- Evaluated existing, 5, 10, and 20 year build-out projections

- Analyzed new parking facilities

- Modeled permit allocation and pricing as a catalyst for balancing parking demands

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PEER DISCUSSION

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Arizona State University

ASU Quick Facts	
Total Enrollment	86,000
Tempe Campus	45,000
Campus Size	642 acres
Parking Stats:	
Total spaces	20,045
Student spaces	7,889
Visitor spaces	3,959
Faculty/staff spaces	4,353
Resident spaces	3,844

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Arizona State University

Legend

Land Uses — Land Uses
Latent Demand — Latent Demand

Calibrated Occupancy
- 0 - 50 %
- 50 - 75 %
- 75 - 90 %
- 90+ %

Latency Impact Area
- Less than 300'
- 300 to 600'
- 600 to 900'
- 900 t0 1200'
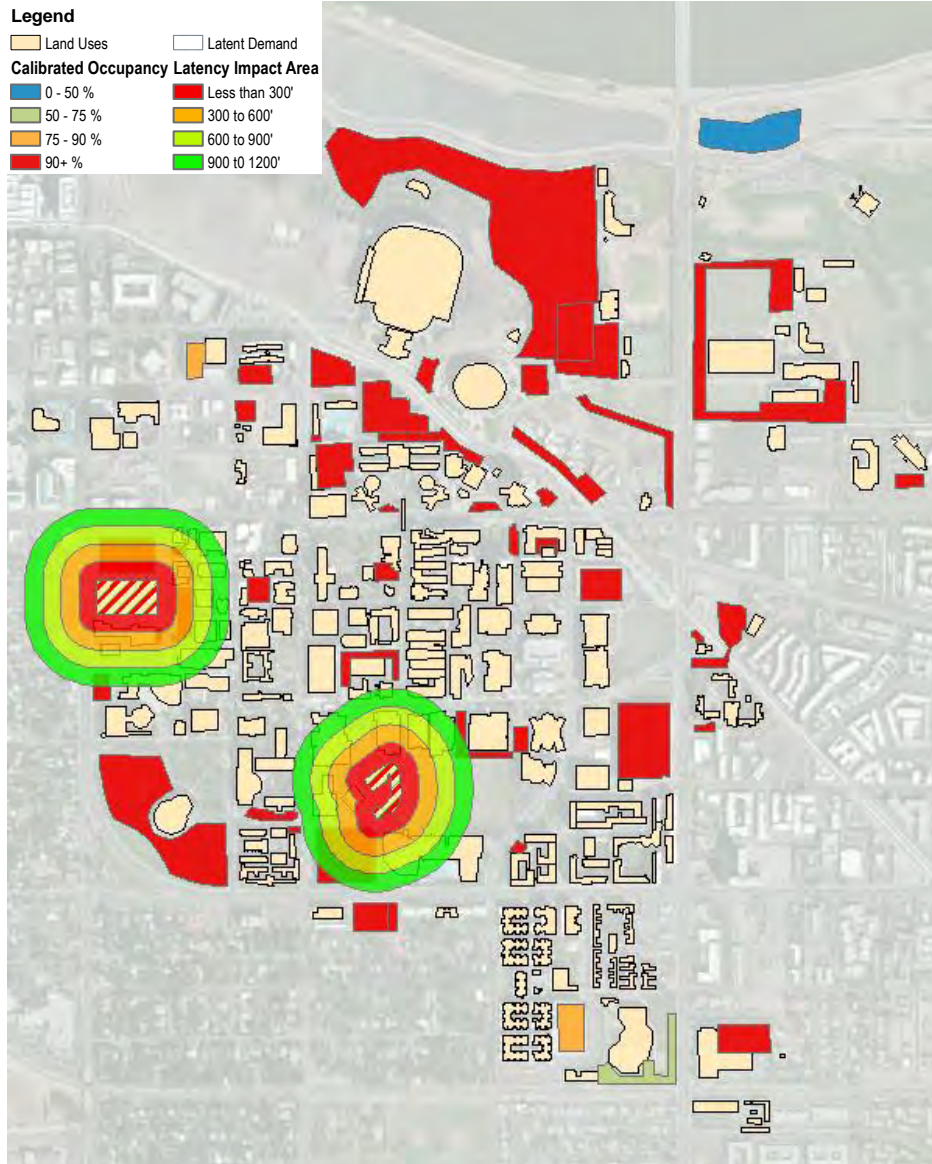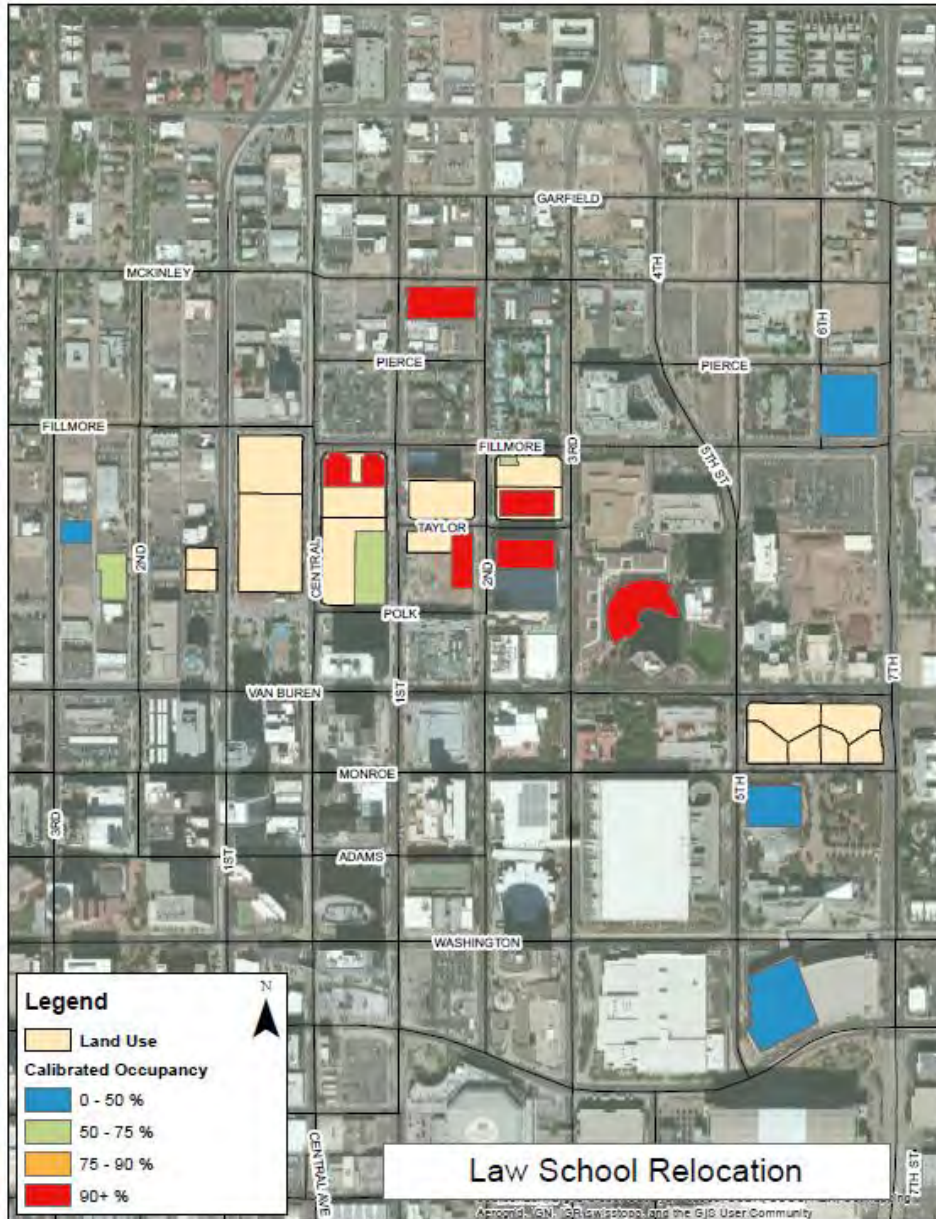
- New On-Campus Infrastructure
  - Retail, office, classroom, residential, conference
- Loss of parking
- New Development reduces campus surplus by 50%
- Proposed alternatives:
  - Build new parking capacity
  - Incentivize adjacent light rail transit

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Arizona State University

Law School Relocation

Legend
Land Use
Calibrated Occupancy
- 0 - 50 %
- 50 - 75 %
- 75 - 90 %
- 90+ %

- Expansion of Downtown Campus
  - Law school, classroom, residential
- New parking infrastructure
- Evaluated parking permit prices and allocation
- Defined parking and space needs for 2020 master plan vision
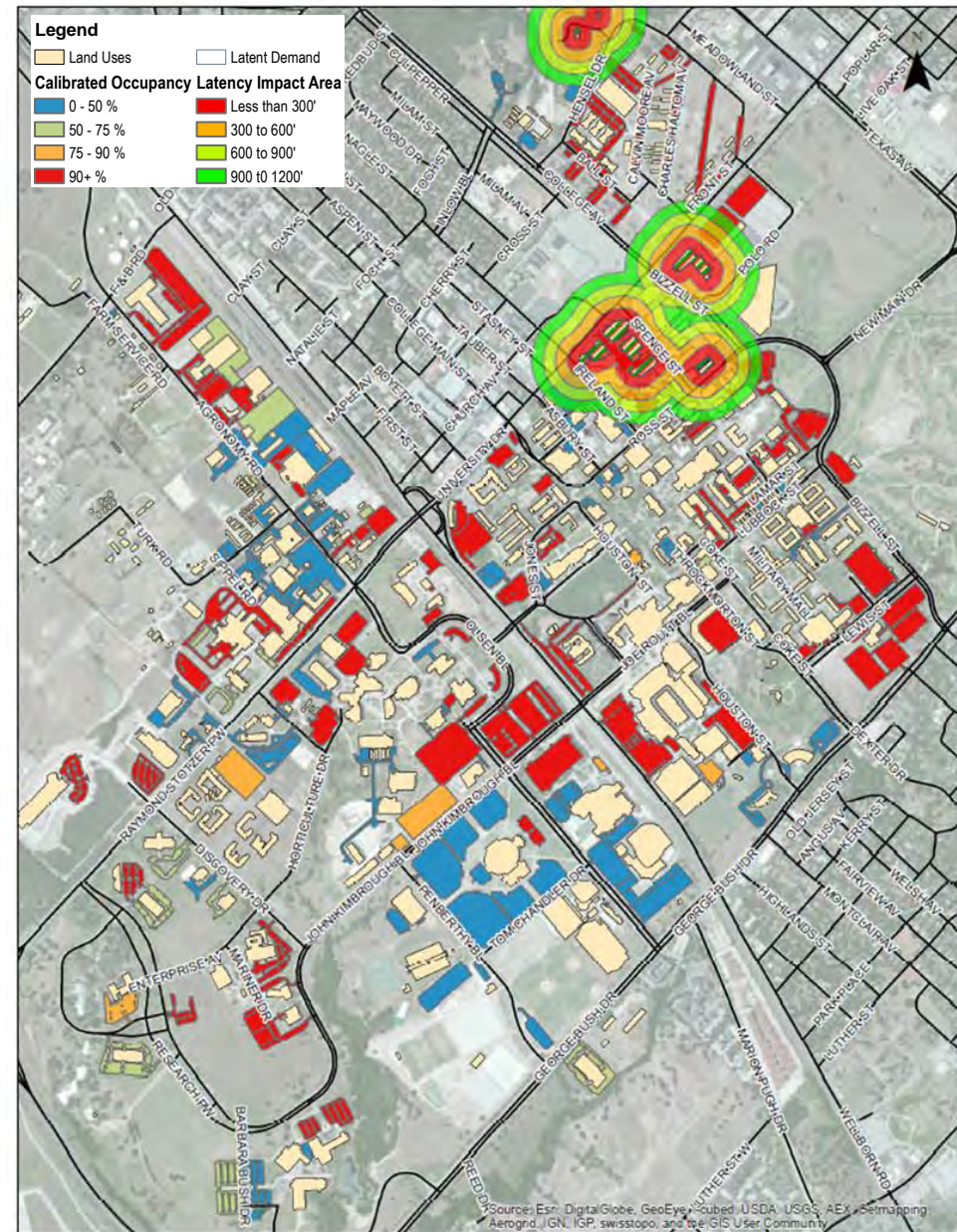
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Texas A&M University

- Teaching and research-intensive university

- 42,000+ undergraduates

- 10,500+ graduate students

- Utilized the Park+ model to identify parking infrastructure needs on campus

Texas A&M University

- Evaluated previous master planning parking estimates

    – New engineering, fine arts, and residential space

    – Athletics expansion

- Modeled results indicated a need for less overall parking spaces

Legend
Land Uses — Latent Demand

Calibrated Occupancy — Latency Impact Area
- 0 - 50 %   Less than 300'
- 50 - 75 %   300 to 600'
- 75 - 90 %   600 to 900'
- 90+ %   900 t0 1200'

Texas A&M University

- Evaluated vet school expansion

- Indicated a need for additional parking

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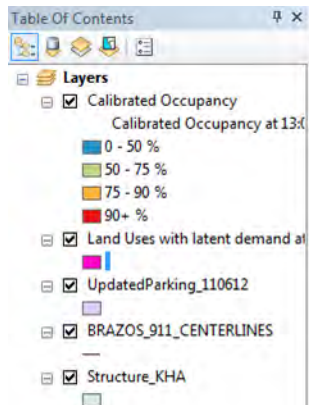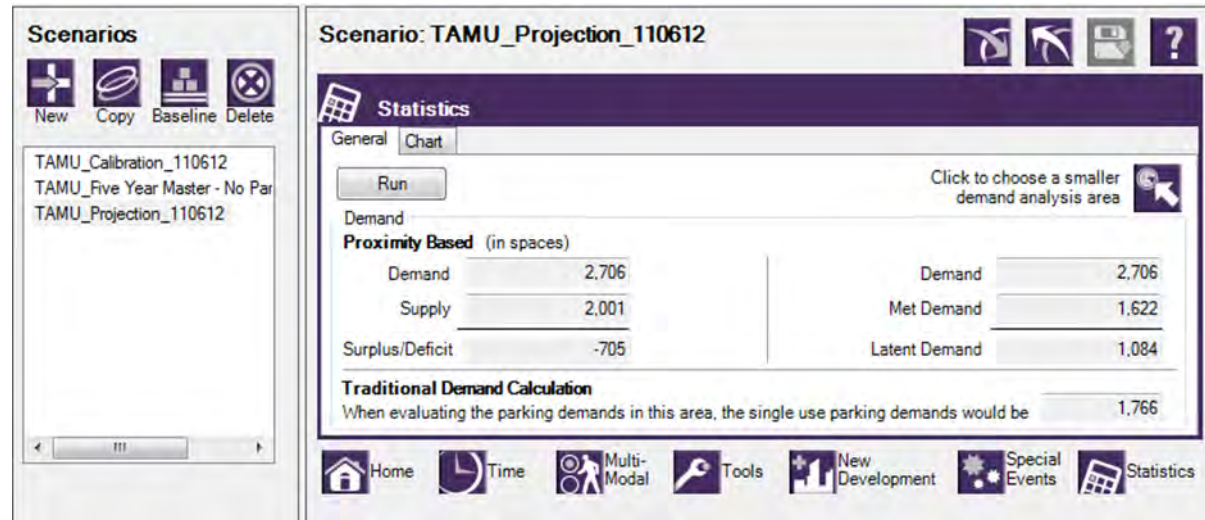
Texas A&M University

- Recent evaluation:
  - Engineering school expansion
  - Westside dorms
  - Northside housing
- Results indicated a need for new garages to support proposed development

QUESTION & ANSWER

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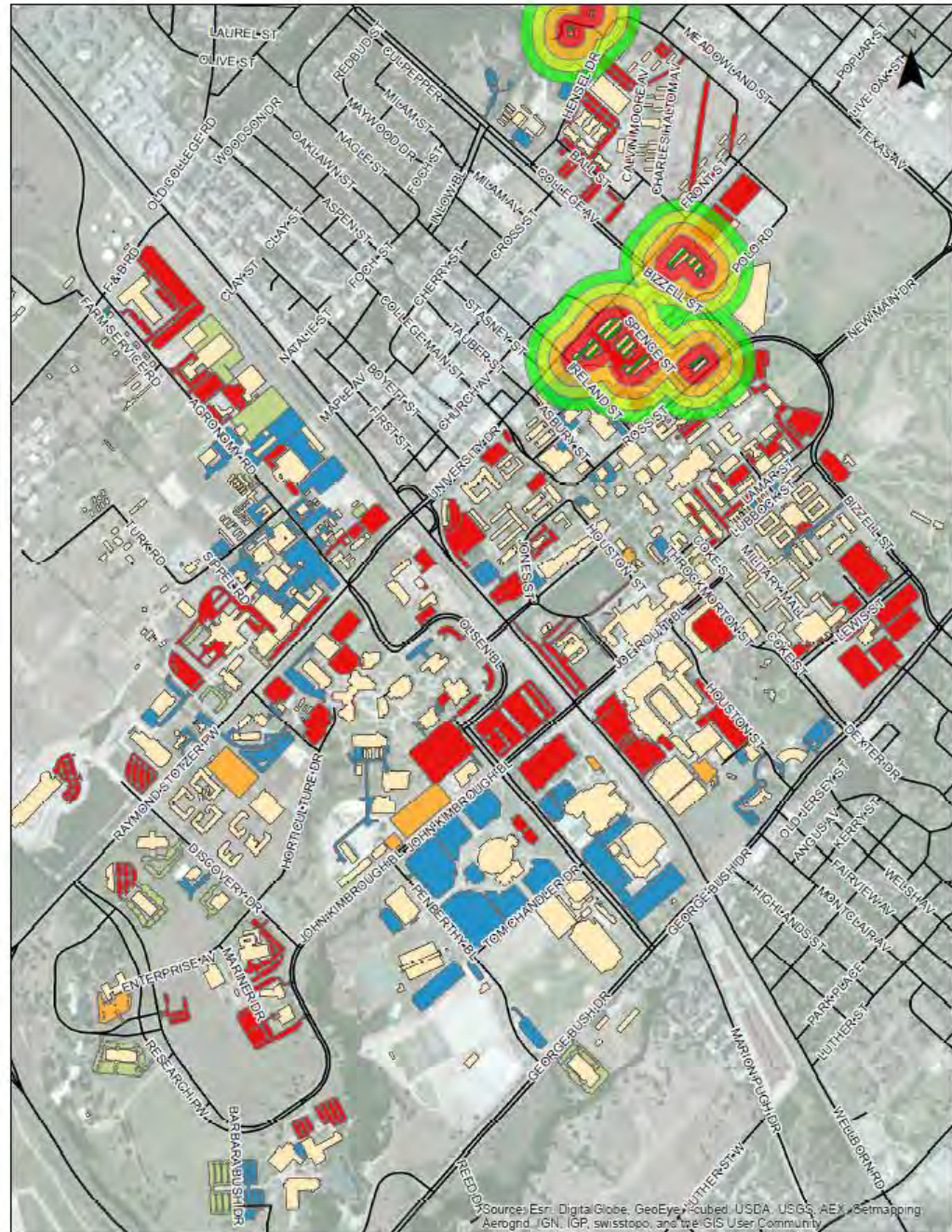
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WHAT IS PARK+?

Park+ is an interactive parking scenario planning model, integrated with ArcGIS, that has the ability to:

- Evaluate existing parking supply and demands
- Identify and test new development and parking facilities
- Set multimodal parameters
- Apply parking management strategies

The Park+ model enables users to analyze the impacts of parking demand for an endless array of municipal, campus, and future development scenarios.

Join the Revolution

WHY WAS IT CREATED?

Kimley-Horn created the Park+ model in response to recognized redundancies inherent in traditional parking supply/demand studies. Traditional supply/demand study results vary dramatically based on the latest change to master planning efforts or committed developments. It became apparent that conducting supply/demand studies was like selling a new car – the minute a study is completed, it depreciates in value.

In an effort to counter this trend, Kimley-Horn developed Park+ to manage and evaluate parking management decisions and the ever-evolving parking environment. A more advanced and expansive tool unlike any other in the industry, the Park+ model evolved further away from supply/demand and into the realm of scenario planning — asking and answering those tough **"What If?"** questions that drive parking and transportation management decisions in our clients' communities and campuses.

THE PARKING SUPPLY/DEMAND LIFE CYCLE
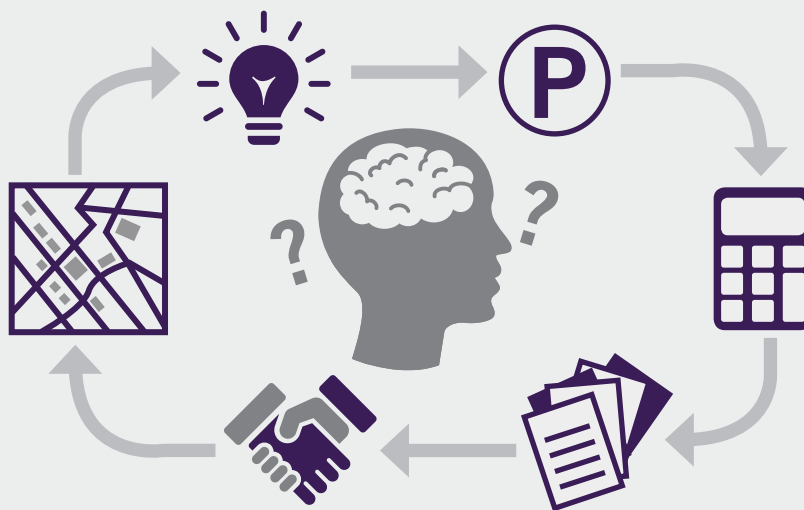
Basing the model in a geospatial environment significantly enhances its efficiency, making the model dynamic, interactive, and revolutionizing the way the industry calculates parking demand for land uses. The model's proximity parking algorithm allows for viewing and predicting parking demands in a more "Right-Sized" environment, working to balance parking supply with the demands of various users in your community.

Scenario: Baseline

Statistics

Walking Tolerance	600 ft	Run

Overall Statistics (in spaces)

Demand	6,001	Met Demand	6,001
Supply	10,994	Latent Demand	0
Surplus/Deficit	4,993		

Single Use Parking
When evaluating the parking demands in this area, the single use parking demands would be:

15,342 spaces

Home | Time | Multi-Modal | To...

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WHAT DATA IS THE MODEL BASED ON?

Each Park+ model is uniquely customized for the community or campus it represents. The model uses local land use, parking and transportation data, and area-specific characteristics that act as the foundation for predicting parking demands specific to the community, downtown, or development. Once the Park+ model is calibrated, it allows the user to create and test an endless array of alternative management and development scenarios that reflect community plans, goals, and projections through manipulating site-specific variables. The results provide you the tools to better define parking demand specific to your community as it evolves and develop appropriate management strategies to support future parking goals and objectives.

WHO SHOULD USE PARK+?

Parking problems extend across institutional, jurisdictional, and spatial boundaries — so does the applicability of Park+. Planners, engineers, managers, campus planners and administrators, private parking operators, and developers can all benefit from introducing the Park+ model into their parking systems, as it offers the tools to identify and manage parking demand within any community and agency.

Isn't it time you took control of your parking demand?

PARK+ SCENARIO PLANNING

The Park+ model allows the user to consolidate gathered data and define assumptions and characteristics through a user-friendly interface. The user can then create and run unlimited scenarios using the model's predictive proximity parking algorithm and evaluate the results on multiple levels. Park+ provides selection settings that drill down from the study area level to a specific block, node, or intersection. Scenarios can be evaluated at a large-scale, multiphase development approach or at a small-scale, parcel-by-parcel level.

Park+ contains similar components of a traditional parking supply/demand study; however, it goes far beyond what is currently provided by overall modeling efforts of the parking industry, resulting in greater flexibility and dynamic applications. Additional tools that Park+ can apply include:

- Multi-modal components
- Special event analyses
- Pricing components
- Parking management overlays
- Public/private parking allocation
- Interpretive statistical analyses

Test unlimited future redevelopment and build-out scenarios

Identify and plan projected parking demands for major community events

Application is customized for your city, using existing land use data and local parking regulations

Calculate parking supply/demands throughout the day

Apply localized multimodal splits and set custom walking distance thresholds

Create maps and reports of results

BENEFITS OF PARK+

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The Park+ model can help you in the following areas:

MASTER PLANNING – The Park+ model provides the user the ability to evaluate and modify master planned scenarios on the fly, creating quick analysis scenarios that measure the parking demand impacts associated with land use, parking, multimodal, and management decisions. What used to be a static process now becomes a dynamic evaluation tool that allows community and campus planners the ability to modify and analyze scenarios as they are envisioned, keeping the creative planning process flowing and allowing for more realistic, accessible, and robust results.

DOWNTOWNS – The Park+ model provides a unique tool for high-density downtowns to evaluate the push-pull relationship between public and private parking demands, resulting in "Right-Sized" parking evaluations that aim to reduce the overall footprint of parking while complementing the dynamic nature of development in the area. By combining the evaluation modules in Park+ including multimodal, pricing, private parking allocation, and special events, downtown managers and planners can uniquely evaluate how an urban parking system truly impacts the vitality of a community.

LOCALIZED GENERATION RATES – The Park+ model allows users to develop and record unique and localized parking generation rates for each specific land use within the study area. This differs greatly from previous methodologies that would derive the parking generation rate for a land use category based on blanket national standards, rather than a particular land use. Park+ provides a more accurate and appropriate land use parking generation rate calculation specific to the community, development, or campus at hand.

UNIVERSITIES – Park+ has proven to be increasingly valuable in the campus environment, easily replicating parking characteristics that are unique to university settings. Using User Type allocations, Park+ uniquely defines demands for students, faculty, visitors, and countless other users in an academic setting. Park+ is especially helpful in the master planning setting, helping universities better plan, manage, and prepare their parking system for future campus growth.

SPECIAL EVENTS – Park+ includes a special event module capable of evaluating large-scale arena and stadium-style event demands, as well as user-created localized events. This tool allows you to understand event conditions from the big football game to the one-off music festival. Users can define locations and demand characteristics, including street closures, temporary parking, and events occurring across multiple locations.

REDEVELOPMENT – Park+ provides an excellent tool for evaluating redevelopment scenarios. The model has the flexibility to adapt new development patterns while applying area-specific characteristics. The flexibility of Park+ allows the user to add land uses; modify the shape, use, and size of land uses; and define analysis for specific study areas — all while evaluating the impacts of the development within the entire context of the community.

SMALL COMMUNITIES – The Park+ model can be implemented in lower density "Main Street" communities to evaluate how mixtures of uses affect a shared parking supply or even how the introduction of a centralized system can impact overall parking demands. The versatility of the Park+ model allows any community, large or small, to analyze its parking system, manage growth wisely, and prepare for the future.

EVALUATING PRICING – The Pricing Module in the Park+ application allows users to evaluate the impacts of parking pricing changes on parking behaviors within their community. The model utilizes price as a component of the driver decision tree, meaning that a user can evaluate how changing prices in one section of a community will impact demands on adjacent streets, facilities, or neighborhoods.

MULTIMODAL PLANNING – The Park+ multimodal tool allows the user to input the various transportation mode choices for users in a community, ultimately evaluating the associated impacts on parking demand related to transportation choice. This tool is highly beneficial when planning for parking in an area that is anticipated to be impacted by transportation system changes, such as the development of a light rail system, expansion of bus services, or improvements in bicycle infrastructure.
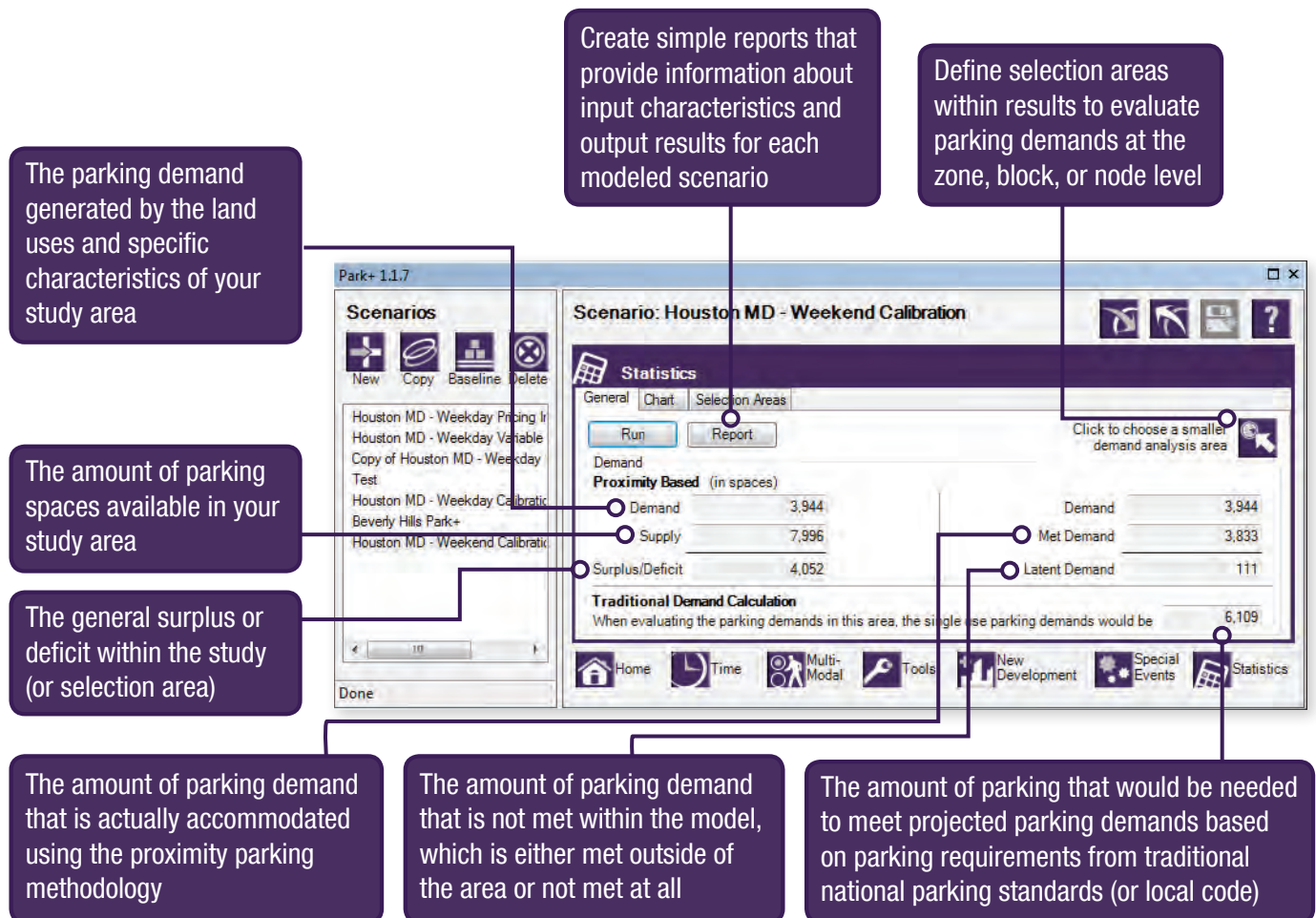
INFRASTRUCTURE PLANNING – The Park+ model provides an ideal tool for infrastructure planning, especially when combined with development and master planning efforts. The prediction and reporting tools within Park+ allow the user to measure and evaluate when and where off-street infrastructure investments are most appropriate. Park+ allows the user to place and size potential parking facilities, as well as modify capacity, price, and location, to better fit the needs of the area surrounding the parking facility and the community at large.
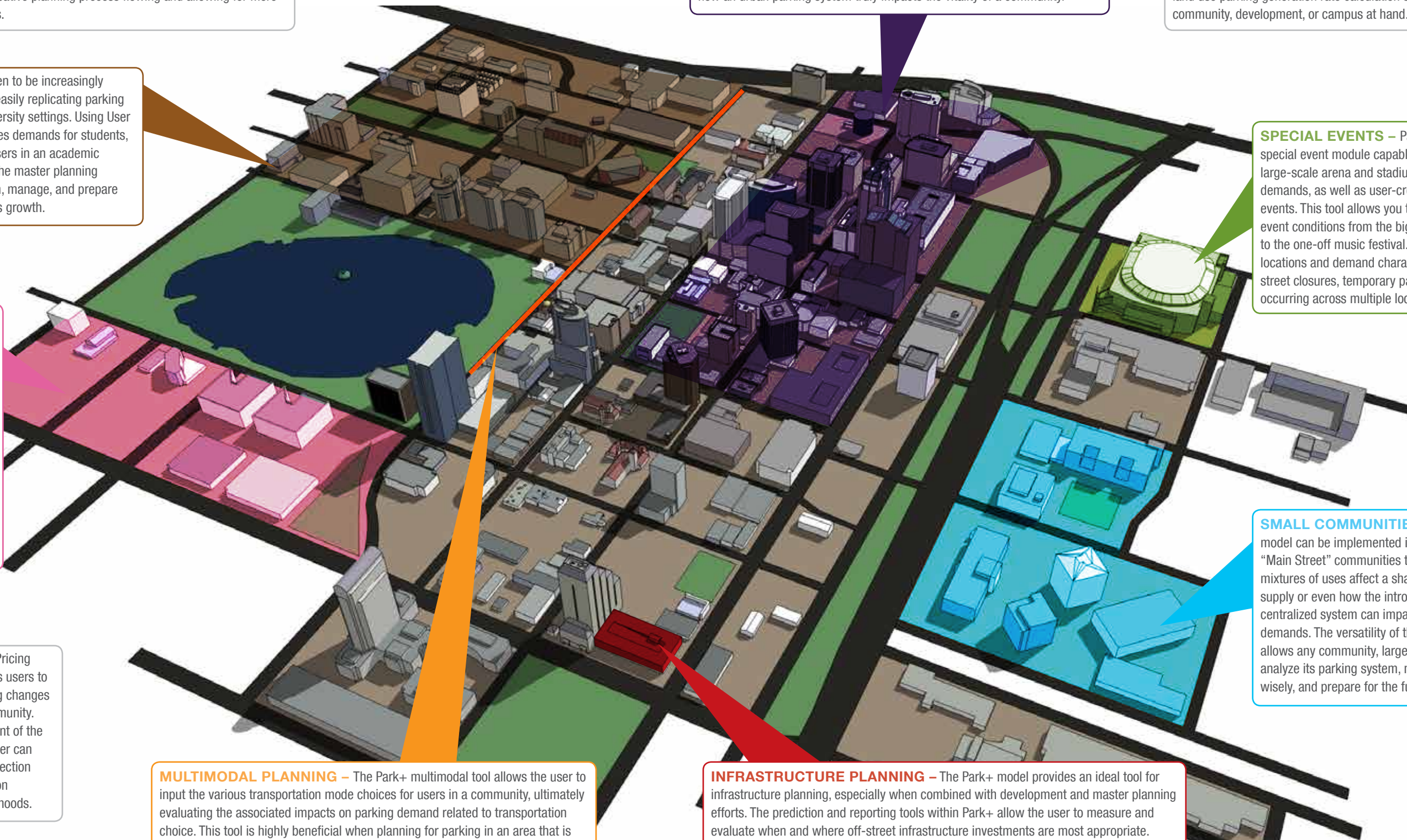
PARK+ EVALUATING OUTPUTS

Outputs from Park+ can be evaluated for the entire study area or for a smaller subset, defining localized demands at the zone, block, node, or intersection level. The benefit of this analysis tool is that it frees the Park+ model from zonal boundaries, allowing the user to define analysis areas as various development plans or master planned scenarios are evaluated. Park+ outputs can be evaluated for whichever scenario and study area you choose, which include the components shown in the interface below.

Create simple reports that provide information about input characteristics and output results for each modeled scenario

Define selection areas within results to evaluate parking demands at the zone, block, or node level

The parking demand generated by the land uses and specific characteristics of your study area

The amount of parking spaces available in your study area

The general surplus or deficit within the study (or selection area)

The amount of parking demand that is actually accommodated using the proximity parking methodology

The amount of parking demand that is not met within the model, which is either met outside of the area or not met at all

The amount of parking that would be needed to meet projected parking demands based on parking requirements from traditional national parking standards (or local code)

PROXIMITY PARKING ALGORITHM

The Park+ model is built on the principle of proximity parking, which assumes that parking demands are generally handled within a specific walking radius of a demand generator. This methodology is founded on the relationship between walking distance, price, attractiveness of facility, and general user decision making. The result of this methodology is localized parking generation rates that are predictive of actual demand conditions, which are representative of realistic parking generation characteristics for individual land uses throughout the specified study area.

USER GROUP ⓟ FEATURES

The Park+ User Group

The Park+ user group provides users the opportunity to collaborate, learn, and share best management practices and results of your Park+ experience with other users around the country. The user group is open to anyone who has purchased the Park+ model license as part of their development process. The communication avenues offered through the user group allow you to better utilize your Park+ investment by growing your understanding and application of the model through networking and learning from your peers and the dedicated Kimley-Horn support group. As the Park+ user group continues to provide input and guidance, the application will continue to evolve, allowing the model's uses and outcomes to increase in sophistication and benefit. Multiple opportunities to connect with Park+ users and core development team members are offered, which include:

User-Group Webinars

Throughout the year, Park+ users and the Kimley-Horn support group get together via webinar to share insights and experiences, ask questions, introduce improvements to the program, and provide feedback, creating a dialogue between users and the project team, accessible all within the comfort of your office.

Park+ Quarterly Newsletter

The Park+ Quarterly Newsletter provides an update on what's going on in the Park+ community, highlighting recent achievements and development, reporting updates to Park+ projects, welcoming new additions to the Park+ user group, providing user tips and tricks, disclosing upcoming improvements to the program, and acknowledging user spotlights and testimonials.

Annual User-Group Meetings

The annual user-group meeting provides an opportunity for Park+ users to meet face-to-face and participate in a variety of activities aimed at generating a more in-depth and interactive discussion of Park+, its applications, and its results. The user group meetings provide valuable insight into how Park+ can be utilized and how the program can be enhanced to support the evolving needs of its users.

User-Group Website

The Park+ User Group website is an easily accessible opportunity for sharing and accessing documentation on Park+ including quick tips, training documents, testimonials, documentation of results, and discussion boards.

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WHO'S USING PARK+?

Isn't it time you took control of your parking demand?

PARK+ DEPLOYMENTS

- (M) **Municipality**
- (U) **University**
- (B) **Municipality/ University**
- (D) **Development**

Arizona
Arizona State University, Tempe

Tempe

California
Beverly Hills

Salinas

Colorado
Colorado State University, Fort Collins

Fort Collins

Boulder

Florida
Venice

Georgia
Sandy Springs

Illinois
Orland Park

Nebraska
Lincoln

North Carolina
Asheville

Durham

Oklahoma
Oklahoma City

Texas
Houston

Tarleton State University, Stephensville

Texas A&M University, College Station

Virginia
Reston Executive Center, Reston

Washington
University of Washington, Seattle

Washington State University, Pullman

Wisconsin
Western Technical College, La Crosse

Put your community on the map

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