A ULI ADVISORY SERVICES PROGRAM REPORT

New Jersey Institute of Technology
Newark, New Jersey

Urban Land Institute

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Newark, New Jersey

Parking Management and Architectural Development Strategies

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An Advisory Services Program Report

ULI–the Urban Land Institute
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About ULI–the Urban Land Institute

ULI–the Urban Land Institute is a nonprofit research and education organization that promotes responsible leadership in the use of land in order to enhance the total environment.

The Institute maintains a membership representing a broad spectrum of interests and sponsors a wide variety of educational programs and forums to encourage an open exchange of ideas and sharing of experience. ULI initiates research that anticipates emerging land use trends and issues and proposes creative solutions based on that research; provides advisory services; and publishes a wide variety of materials to disseminate information on land use and development.

Established in 1936, the Institute today has more than 34,000 members and associates from 90 countries, representing the entire spectrum of the land use and development disciplines. Professionals represented include developers, builders, property owners, investors, architects, public officials, planners, real estate brokers, appraisers, attorneys, engineers, financiers, academics, students, and librarians. ULI relies heavily on the experience of its members. It is through member involvement and information resources that ULI has been able to set standards of excellence in development practice. The Institute has long been recognized as one of America's most respected and widely quoted sources of objective information on urban planning, growth, and development.

This Advisory Services panel report is intended to further the objectives of the Institute and to make authoritative information generally available to those seeking knowledge in the field of urban land use.

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About ULI Advisory Services

The goal of ULI's Advisory Services Program is to bring the finest expertise in the real estate field to bear on complex land use planning and development projects, programs, and policies. Since 1947, this program has assembled well over 400 ULI-member teams to help sponsors find creative, practical solutions for issues such as downtown redevelopment, land management strategies, evaluation of development potential, growth management, community revitalization, brownfields redevelopment, military base reuse, provision of low-cost and affordable housing, and asset management strategies, among other matters. A wide variety of public, private, and nonprofit organizations have contracted for ULI's Advisory Services.

Each panel team is composed of highly qualified professionals who volunteer their time to ULI. They are chosen for their knowledge of the panel topic and screened to ensure their objectivity. ULI's interdisciplinary panel teams provide a holistic look at development problems. A respected ULI member sho has previous panel experience chairs each panel.

The agenda for a panel assignment is intensive. It includes an in-depth briefing composed of a tour of the site and meetings with sponsor representatives; interviews of key people within the community; and a day of formulating recommendations. On the final day on site, the panel makes an oral presentation of its findings and conclusions to the sponsor. At the request of the sponsor, a written report is prepared and published.

Because the sponsoring entities are responsible for significant preparation before the panel's visit, including sending extensive briefing materials to each member and arranging for the panel to meet with key local community members and stakeholders in the project under consideration, participants in ULI's panel assignments are able to make accurate assessments of a sponsor's issues and to provide recommendations in a compressed amount of time.

A major strength of the program is ULI's unique ability to draw on the knowledge and expertise of its members, including land developers and owners, public officials, academicians, representatives of financial institutions, and others. In fulfillment of the mission of the Urban Land Institute, this Advisory Services program report is intended to provide objective advice that will promote the responsible use of land to enhance the environment.

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The panel would also like to thank the more than 30 civic leaders and stakeholders in the communities of Ridgewood, East Orange, Metuchen, and Red Bank for taking time to meet with the panel. Their insight, experiences, and candid discussion provided valuable information that was critical to the completion of the panel's recommendations.

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Foreword: The Panel's Assignment

In 2004, the New Jersey Department of Transportation (NJDOT), on behalf of New Jersey Transit (NJT), issued a task order to the New Jersey Institute of Technology (NJIT) to embark on a two-year, multifaceted program of research, analysis, and design to better understand the relationship between structured parking and transit in a variety of communities in New Jersey. To carry out its task, NJIT assembled a multidisciplinary team from a variety of its own departments, including Infrastructure Planning, Architecture, Transportation, and Civil Engineering. In addition, NJIT collaborated with the Voorhees Transportation Center of the Bloustein School of Planning and Public Policy at Rutgers, The New Jersey State University, as well as other institutions and private firms.

The project's goal is to develop design guidelines and management standards, culled from the best practices in New Jersey and around the country. These standards and guidelines are intended to serve agencies and communities in New Jersey as well as a broader audience of those interested in incorporating structured parking in a smart growth environment.

The comprehensive research includes four phases:

- Phase I: Project definition;
- Phase II: Asessment;
- Phase III: Design-testing for applicability;
- Phase IV: Implementation and training.

Research to Date

The panel assisted the research at its midpoint, between Phases II and III. When the panel arrived, the NJIT-led research team had studied structured parking as part of a graduate transportation-planning studio taught at the Bloustein School. In the studio, three faculty members led eight students in studying four communities that had either unsuccessfully attempted to build structured parking or were planning structured parking and were experiencing difficulties.

Faculty members and staff of NJT and NJDOT chose the case study communities with which the studio worked. All four communities selected were older ones that had developed largely around rail before World War II. All four were geographically distributed and operating along different branches of NJT's network. The village of Ridgewood and the boroughs of Metuchen and Red Bank were smaller towns and boroughs with vibrant downtowns, whose residents were largely white-collar workers who commuted to Manhattan. The city of East Orange differed from the others, having a significantly lower mean income, but it was also adjacent to a robust commercial

Location map.

district with several redevelopment plans in various states of development.

The Assignment

ULI was asked to serve as an independent review board at this critical point in the project, the end of the assessment phase and beginning of design-testing. The panel will provide supplemental insight for the guidelines that will be developed and design-tested. The panel was also asked to give examples of how other communities have faced and addressed similar problems; recommend ways to balance traffic and density in relation to parking; and provide insight on parking garage design, mixed-use development, and strategies for shared parking.

The Panel Process

Before visiting New Jersey, the panel reviewed briefing materials prepared by NJIT staff members that provided information on the research done to date and the case study cities. This material included brief histories as well as demographic and market data and outlined each city's respective plans for parking garages close to its New Jersey Transit rail station. The panel spent three days in New Jersey touring and meeting with the research team, civic leaders, and stakeholders in the case study communities. It then shared its findings and recommendations with the design team and stakeholders. The following report is a summary of the panel's findings and observations.

Guiding Principles

After meetings and tours held in the case study communities, the panel derived nine principles to address structured parking in relation to transit. These guiding principles were the result of years of experience and lessons learned by the panel. They are presented to augment the research team's goal of developing guidelines for the often difficult process of incorporating structured parking within existing developed areas. The panel highlights best practices from around the country that deal with locating parking close to transit. The nine principles are as follows:

- Transit adds value to the community.
- Successful transit villages need the right amount of parking.
- Transition gracefully to higher-density parking.
- Put the parking where it is needed, not just where land is available.
- Pedestrian traffic is good for you.
- Shared parking—the right mix makes it work.
- Good design is a good investment.
- Parking management is key to success.
- Devote parking revenues to parking.

Transit Adds Value to the Community

The four case study communities the panel visited have two unique assets: the transit magnet that is New York City and the incredible transit infrastructure that has developed over the past century. The New York metropolitan area generates one-third of all transit trips in the United States. In the case study communities of Ridgewood, East Orange, Metuchen, and Red Bank, the transit share of commute trips ranges from approximately 12.7 percent in Red Bank to 27.8 percent in East Orange. Metropolitan areas all across the country are struggling mightily and spending billions to achieve transit shares of just 5 percent of commute trips. New Jersey's high ridership is a distinct asset.

New Jersey is indeed fortunate to have extensive transit infrastructure, and these communities need to embrace their valuable asset. Transit alone cannot eliminate traffic congestion, but transit in these communities has made a significant dent and provides another choice—a mainstay goal of smart growth. Transit is also a "locator" for development. Historically, rail enabled these communities to develop and it still can be a powerful locator for additional development and redevelopment.

Communities need to understand the value of transit and plan for its success. All too often, transit is accepted as is or ignored. Transit should be used to its full potential to provide commuters with an alternative to driving, alleviate congestion by reducing the number of automobiles on the roads, and encourage nearby development. Communities need to proactively promote transit's value and use. This strategy will help change the negative perception that transit is slow, unreliable, and unsafe and will build support for future transit-oriented development.

Successful Transit Villages Need the Right Amount of Parking

Many of the communities that are on New Jersey Transit lines have stations located in or close to their downtown. These stations have the potential of serving a purpose greater than just being a place to park and use the transit to leave the community. The stations have the ability to connect the community with others that are along the transit line and with their immediate surroundings as well. Transit stations are a focal point for the community because they generate activity in a concentrated location. To better connect the transit station with the community, planners need to incorporate a mix of uses in any station area and parking development program.

The amount of parking will ultimately drive the development program of any transit village because it will determine how many people can park near the station, the amount of retail space and the number of housing units nearby, and the overall mix of potential uses. Parking is a key element in the success of a transit village. For example, Fruitvale Village along the Bay Area Rapid Transit line in Oakland, California, provides the right balance of parking for commuters, residents, and patrons of the retail and commercial establishments in the transit village.

The mix of programmed uses and number of parking spaces is an important factor for the viability of a transit village. Concern about parking may seem to be a contrarian view when people are being encouraged to come to the transit village by means other than driving, but most people in the United States still commute to work by automobile. According to the 2000 U.S. Census, the case study communities follow this trend but are below the state's average. Figure 1 shows the percentages of means of travel to work by commuters.

Transit villages with a mix of uses cannot survive on the economic contributions of weekday commuters alone. They will need to draw visitors from the surrounding area seven days a week. A mix of uses that includes housing, retail, office, and entertainment space, such as restaurants and movie theaters, will attract uses at all times. For example, at Mockingbird Station in Dallas, Texas, the developers learned that the retail portion of the project did not depend on transit to succeed; rather, access was an additional factor.

In developing a parking garage in a transit village, ensuring that there is not too much parking is as important as making sure there is enough. Requiring too much parking will cause garage size and costs to quickly escalate. Moreover, the garage will have problems fitting into its surroundings because it will dominate the streetscape. If too little parking is available, people will go beyond the parking garage and park in the surrounding neighborhoods, causing problems with the community. People may also opt to drive to work and avoid public transportation altogether. To avoid these problems, communities that plan on building parking garages need to carefully research and analyze their parking needs to ensure they build the right size parking garage.

Figure 1
Means of Travel to Work

Community	Transit	Drive Alone	Carpool	Walk	Other
East Orange	27.8%	51.0%	14.3%	3.6%	3.3%
Ridgewood	15.8%	69.8%	5.7%	2.5%	6.2%
Metuchen	16.7%	71.8%	4.3%	2.7%	4.5%
Red Bank	12.7%	64.6%	11.3%	7.1%	4.3%
New Jersey	9.6%	73.0%	10.6%	3.1%	3.7%

Source: 2000 U.S. Census.

Transition Gracefully to Higher-Density Parking

Many New Jersey transit villages experience parking problems. These problems have increased in the past few years as transit ridership has increased, because of better service, unbearable traffic, the increasing cost of gas, and the revitalization of the downtowns in which many transit stations are located. In such communities, parking has become a critical issue, dividing commuters, residents, and the downtown business community. Unfortunately, no simple solution exists.

Communities not accustomed to growth must address their parking issues with solutions usually reserved for larger cities to meet their parking demands and to more efficiently use the land that they have available. Understandably, small communities facing this problem fear they are becoming too urban. If designed and developed correctly, parking structures can be gracefully integrated into the community to solve the transit-related parking problems.

Currently, parking demand is not being met in the parking lots adjacent to or within a short walk of transit stations. Those lots have become overcrowded—pushing commuters to park in surrounding business districts or residential neighborhoods or to avoid transit use altogether. To combat this problem, communities need to transition to higher-density structured parking. In many cases, this concept is new for communities and will be met with resistance. Citizens often have negative perceptions of structured parking facilities because they believe that such facilities are expensive, unsightly, and dangerous and increase traffic. In planning to introduce this new building typology to their transit station and downtown area, communities must use caution to avoid many of the mistakes that create the negative perception that parking garages are dark, unsafe, and difficult to use.

Parking garages take up a lot of space and can easily overwhelm streetscapes. During the design phase, careful attention must be paid so that the structures add to the street environment and fit in with their surroundings. Design elements such as street-level retail space, attractive facades, and landscaping can help integrate the structure into its environment. Because garages are often seen as a catalyst for future development, although the garage may seem out of scale, designers must envision what the area will look like in the future.

Several design techniques can accommodate a parking garage while masking its size and mitigating its effect on its surroundings. For example, designing parking structures with retail space on the ground floor is becoming common. The retail presence helps activate the streetscape and makes the walk to and from the parking lot more interesting. It creates built-in clientele for the retail uses: in transit-village environments, these spaces are filled with eateries and dry cleaners, the kinds of services that commuters patronize. Creative designers are also wrapping garages with liner buildings that contain office space and residential units to lessen the negative effect of a large structure. The mixed-use approach hides the parking and eases the integration of the garage into its surroundings. Examples of such garages are located in many cities across the United States, including Princeton, New Jersey; Portland, Oregon; West Palm Beach, Florida; and Albuquerque, New Mexico.

Communities that wish to build structured parking must educate their citizens on the benefits of this new type of development. They must clearly demonstrate the current parking problems and articulate the advantage structured parking has over surface lots. They must communicate how this expensive investment will benefit the community in the long term, beyond meeting the basic parking needs.

Put Parking Where It Is Needed, Not Just Where Land Is Available

As communities begin to address their transit parking issues, they need to set clear objectives for their station and parking facilities. They must decide if the parking structure is going to be used only for commuter parking or if it is going to be part of a larger, mixed-use development. If the structure is going to be mixed use, careful attention must be paid to the design of the garage because parking is a major factor in determining the layout of the surrounding transit station area. How the station is connected with, or separated from, the surrounding community will determine the parking requirements and development program of a transit village.

If a parking structure is intended to serve more than commuters, planners must understand the relationship the parking structure will have with the transit station and the retail, residential, and commercial uses. A detailed parking study must be undertaken to determine an accurate number of spaces needed for a mixed-use development and a commuter parking lot.

Parking studies should be comprehensive to account for commuter traffic as well as retail and residential users. The study should recognize that locating a mixed-use structure close to transit will affect the amount of parking needed. For example, the developer of Mockingbird Station was required to build more parking than necessary because the city of Dallas did not take into account the number of users who would access the development by mass transit. A comprehensive parking study could have determined the correct number of parking spaces needed.

Contrary to common practice, in which parking is located immediately adjacent to the transit station, broader community goals are best met when parking is moved away from the platform. The land closest to the station is the most valuable and should be used for higher-density, mixed-use development. Using it only for parking is a lost opportunity.

The parking garage will need to be located a little bit farther from the transit station than the commuters are used to. This issue needs special attention because a commuter is only willing to walk so far from his or her vehicle to the transit platform. This distance can be extended if commuters have an inviting environment to walk through. The path from the parking to the station provides an excellent area for commuter-friendly retail uses, such as a coffee shop, dry cleaner, or newsstand. Commuters can take care of daily needs and purchase goods on their way to and from the transit station.

A careful balance of distance from the parking to the station must be met so that commuters will park and use public transportation. In general, placing parking about 1,300 feet, an easy five- to seven-minute walk, from the station opens prime real estate for development and does not deter commuters from using transit.

When moving the parking away from the station, the pedestrian's path from the garage to the station should be kept as safe and inviting as possible. To achieve this goal, the developer or the community may need to improve pedestrian amenities, such as sidewalks, street crossings, landscaping, street furniture, and lighting. A wayfinding system should be in place to direct the commuters to the station.

These improvements should also recognize the needs of the automobile because street-traffic patterns affect the pedestrian experience. Traffic-calming measures may be needed if the streets are too busy for safe and easy pedestrian movement. These improvements are necessary to ensure pedestrian safety and make commuters comfortable with a longer walk from the garage to the transit station.

In the case study community of Ridgewood, the proposed parking structure at the corner of Walnut Street and Franklin Avenue meets a number of the community's needs. A parking structure is clearly needed to meet the demands of the popular dining and retail establishments on East Ridgewood Avenue and throughout the downtown. The structure will meet this need and also provide parking for the NJT station. Although this garage is not directly adjacent to the station, it is only a five-minute walk away. The walk up East Ridgewood Avenue to the transit station is inviting because it affords significant pedestrian amenities and an interesting mix of retail and commercial uses. The walk to the station on Franklin Avenue is not as inviting. If the sidewalks, lighting, and street crossings are upgraded, the structure will be better integrated into its surroundings.

Pedestrian Traffic Is Good for You

One of the many perceptions that a parking garage conjures is of an increase in traffic and congestion. This perception is false because a parking garage removes cars from the street that would otherwise be circling for an open parking space. A commuter is willing to search for parking for only a limited time before giving up and driving to his or her final destination.

Communities should want to capture these commuters in their parking garages because these drivers are potential customers for transit and the communities' retail and commercial establishments. Automobiles that enter a parking structure turn into pedestrian traffic as drivers exit the structure and walk to the transit platform. This pedestrian traffic is necessary to support retail establishments in a transit village. The challenge is to create an environment that is inviting enough to get people to stop and patronize the businesses.

In the case study communities, the panel heard about automobile traffic generated by commuters. The traffic is generally heaviest during the morning rush hour, as commuters race through the downtowns to find a parking space in the park-and-ride lots or on the streets in the immediately surrounding area. This practice is problematic because the parking lots and surrounding streets then sit idle for the rest of the day until the commuters return from work. The pattern creates inactive areas that do not generate enough pedestrian traffic for businesses to be sustainable. Potential customers cannot find parking and decide to shop elsewhere.

For example, in Metuchen, commuters at the Pearl Street surface parking lot walk directly from their vehicle to the station platform. This direct route avoids all of the businesses near the station on Main Street. If this surface parking lot were to be developed into a mixed-use structure, the commuters could be directed to walk down Pearl Street to Main Street. This pedestrian traffic would activate the street and encourage commuters to patronize the businesses along Main Street.

This commuter traffic is good for the development of a mixed-use parking garage. It is a built-in and established customer base for the transit village's businesses. These businesses need this base, but they cannot survive on it alone. Their success also depends on traffic that is generated by people coming to the transit village to patronize the retail and commercial uses available during the day and in the evening and weekend hours.

People also arrive at the transit station by foot and on bicycles. This type of traffic will increase as a mix of uses is incorporated into the station area. Communities need to provide amenities, such as better lighting, crosswalks, landscaping, and wayfinding systems, to further attract pedestrians and ensure their safety.

Shared Parking—The Right Mix Makes It Work

Construction of parking in a downtown is expensive. The typical downtown has very little land available to add additional parking, or the available land is currently used for surface parking lots. In either case, the cost of adding parking in a downtown is usually more than $10,000 per space if new surface lots are constructed through property acquisition and demolition. To add structured parking over an existing surface parking lot, the typical construction costs are $15,000 to $20,000 per parking space for the structure.

An added difficulty is the need to relocate existing parking during construction. Special attention should be paid to the duration of the construction process to minimize the inconvenience to commuters and the effect on surrounding businesses. In many small downtowns, a three- to four-level parking structure is the tallest structure appropriate. With such a small garage, the existing on-grade parking spaces must be reconstructed. This situation results in a typical cost per added parking space of $20,000 to $30,000, because the reconstructed spaces do not add to the parking supply.

Because of the high cost of building structured parking, a mix of uses can, and should, use the parking over as many hours per day as possible. As expected, many complementary uses peak at different times of the day or week. If development opportunities are found that complement each other, the added spaces can be used by many different drivers over the course of the day. The panel believes that the proposed structures in all of the case study communities are ideal for shared parking arrangements between NJT and the surrounding retail and commercial establishments.

Figure 2 summarizes major uses that peak during the day compared with those that peak at night and on the weekends. Commuters and office uses are compatible with entertainment, restaurants, and special events because their intended use times are at different periods of the day. The type of office use will determine the frequency of parking space turnover. For example, a doctor's office will have a higher frequency of visitors as people come for scheduled appointments than a law firm that has only a few visitors.

Residential parking is a more-difficult issue when it is located adjacent to transit stations. Residential users in transit villages are likely to own only one vehicle per household and to use transit to commute to work. The occupancy of these spaces remains high most of the day because these users do not use their vehicles. The lowest occupancy of these parking spaces is during the evening hours and weekends, when the residents return and use their vehicles to run errands and make other trips by vehicle. To complicate matters further, many residential developers insist on reserving residential parking 24 hours per day, so shared uses are not possible. A solution to this problem is providing valet parking for both the residents and commercial users. This technique allows users easy access to their intended destination while it permits the efficient use of the parking garage.

The occupancy of each use group in Figure 2 varies throughout the day with a reasonable mix of heavy daytime and heavy nighttime use. By

Figure 2
Complementary Shared Parking Uses

Day	Night/Weekends
Commuters	Entertainment/Events
Office	Retail
School	Restaurants
Deli/Fast Food	Hotel
Residential	Residential
	Churches

working with a developer, a design team should identify a mix of uses that optimizes the use of a structured parking garage. In this specific study, the commuter parking tends to dominate uses in communities with rail stations; however, planning and zoning requirements should be modified to take advantage of complementary uses. In so doing, the expense, size, and architectural impact of added parking is minimized because the parking is sized on the basis of peak occupancy rather than according to traditional zoning requirements that assume all parking peaks occur at the same time of day.

Good Design Is a Good Investment

The construction of a parking structure is an expensive investment for any community. Incorporating a garage into a transit village requires special attention in planning and design. The garage must be in context and fit in with its surroundings. It must integrate with the neighboring buildings and not overpower the streetscape. The structure should incorporate local architectural styles and reflect the character of the community. Meeting this requirement is difficult because parking structures are large and often unsightly; nevertheless, many design techniques can be applied to lessen the structure's effect. Designers can include materials such as brick on facades to match surrounding buildings, add faux windows, grow ivy to break up large dead spaces in the facade, or wrap the structure with a liner building that incorporates a mixture of uses.

The design of a parking structure that is incorporated into a downtown or transit village must show greater sensitivity than that of a regular parking garage. Because of the added design features, a mixed-use parking structure typically costs more to build than a conventional parking garage. As noted in discussion of the previous principle, the cost per space of construction can range from $15,000 to $30,000. Adding parking to an existing downtown area, however, can substantially increase the value of adjacent properties that are served by the parking. A portion of the increase in property values needs to be captured and used to help fund the parking.

A tax increment financing (TIF) district can be used for this purpose. TIF districts can be very useful in developing parking where strictly private financing might be difficult to obtain. The money that is generated from the TIF district can be used to pay for the parking or enhance pedestrian amenities, such as lighting, wayfinding, and street crossings. TIF money can also be used to offset the land acquisition and infrastructure costs in new parking structure development. A well-designed parking structure that integrates with its surroundings will help foster a sense of place and provide lasting value for the community.

Parking Management Is Key to Success

A good parking management program is a key element of a successful downtown. A management program for the sake of just providing parking spaces is not enough. It must be flexible, continually balancing the demand for parking with the existing supply. Managers must be able to teach communities about their parking patterns. They must be able to identify trends and react quickly.

For example, a downtown commercial block in the village of Ridgewood had a retail mix last year of 50 percent restaurant and 50 percent retail. This year, that same block now has 70 percent restaurant and 30 percent retail. The parking program needs to respond to this change by adjusting rates, time zones, and enforcement to better manage the change in uses.

Many communities develop deficiencies within their systems, such as the previous example. If enforcement does not change the laws governing parking from 5 p.m. to 10 p.m., then every restaurant employee who works in the area will fill the on-street spaces by 5:15 p.m. This issue will negatively affect the restaurant patrons' experience because they will not be able to park in the spaces that are intended for them and they will have to search for an open space.

A tool that communities often used to manage parking is permit parking. These permits can be issued for residential neighborhoods, the central business district, and the train station. Such a program can be effective if run properly. Unfortunately, many programs are oversupplied, and the community has difficulty understanding what it really needs for each program.

For example, Ridgewood issues 900 resident permits for 300 residential parking spaces. How does the village know the number of spaces being used and when? From a verification standpoint, the only control used in this program is whether the tag is current for the year it is issued. This system does not provide the vital details necessary to make this program successful; it gives little indication how many spaces are really needed to support it.

The panel noted that most of the communities it visited were using parking equipment that only accomplished the minimum of tasks, basically maintaining parking. Far better, technologically advanced equipment is available that will allow communities to understand their parking patterns and space needs. Such upgraded equipment and permit programs will give communities better data with which to make decisions.

Multibay meters are an example of technologically advanced parking equipment. These meters serve more than one parking space. They are often located in a central location within a parking lot, garage, or street. Patrons park in a numbered space and then pay for parking at the multibay meter. The meter then issues a receipt that is to be placed in the vehicle. The meters accept coins, cash, and credit cards. Multibay meters can help communities manage their parking better because they can collect valuable data, such as the average length of stay for a vehicle, the frequency of turnover per space, and the average revenue per car. They can also be adjusted to charge different rates during different times of the day or week.

Another technology that can be used to better manage the resident parking program is bar-coded parking permits. A bar-coded parking permit is linked to a specific vehicle and can be scanned when it enters and exits a lot or garage. By scanning the bar code, information such as the average length of stay; the number of cars parked each day, week, or month; and the distance the car travels can be collected. With the information gathered from bar codes, a community can determine how often resident permits are being used and it can set programs and policies to effectively use the available spaces.

Devote Parking Revenues to Parking

Nobody likes to pay for parking. Many people feel that a free and convenient parking space is a birthright. Citizens find it a hassle to find change to deposit in a meter. Local merchants do not like paid parking because they believe it will drive business away; neither do they like the appearance that parking is not available in front of their business. In these circumstances, parking management becomes a necessity, but many communities have neglected the time and resources to meet the parking needs of their citizens and the business community.

By neglecting this critical issue, many communities treat parking as a "stepchild," passing responsibility from one city department to another. Most cities do not have trained parking managers. The panel saw parking operations managed by a wide variety of departments, such as the city controller's office, police department, parks and recreation department, and the maintenance department.

The revenue generated from parking fees and fines is often put into the general fund instead of into a parking program. This practice is flawed because it does not address the parking problems of the merchants or the users of the parking spaces. A successful parking program requires that parking revenue is dedicated to the parking program. This constant source of income should be used to fund future capital projects and address parking problems within the community. Revenues can come from parking meters, monthly parking permits, and parking ticket collections. The money that is generated can be used for upgraded meters and pay stations; streetscape improvements, such as landscaping, street furniture, lighting, and wayfinding systems; and "clean-and-safe" programs. Merchants will clearly see the benefits to paid parking and their doubts will be alleviated when the community commits to dedicate all of its parking revenues to the parking program.

If the parking revenue is still not sufficient to cover capital needs, then communities can consider several other options. Public/private partnerships are often used to finance and build parking garages. Financing structures for public/private partnerships are as varied as the developments themselves. Typically, the public sector provides the land while the private sector builds the garage. The two entities then share the parking revenues. In the case of mixed-use garages, the public sector can sell the development rights for the liner buildings and ground-floor commercial space to help finance the construction of the structure.

The private sector can also solve parking problems. If available land and significant demand for parking exist, private companies can build and manage garages, particularly if the site has the potential to include a mix of uses in addition to the parking garage. The developer will then be able to use the parking spaces for more hours of the day with greater efficiencies, thus generating more revenue.

Conclusion

The panel has provided its best professional opinions to address incorporating structured parking in developed areas along transit; however, the panel realizes the hard work of implementation and solving this challenging problem remains with the local communities of New Jersey. The solutions are multifaceted, they are not short term, and they require constant monitoring and vigilance to determine what is working and what is not. Changes in transit ridership and the real estate market will likely require changes to policy. The guiding principles provide communities facing this challenge with a framework from which to begin the planning process. The panel believes that if these principles are followed, local municipalities will be able to successfully integrate structured parking and create transit-oriented development in their communities.

About the Panel

William (Bill) R. Eager

Panel Chair
Seattle, Washington

Eager is cofounder and president of TDA, Inc. He has more than 40 years of experience in the transportation field as an educator in transportation engineering, in the research of commuter travel characteristics, and as a consultant on projects throughout the United States and abroad.

Before founding TDA, Eager was vice president of transportation for a large economics consulting firm. Earlier, he was responsible for analysis of ground transportation systems for the Boeing Company.

Eager is a member of the Pacific Asia Travel Association and principal of INTRA—International Tourism and Resort Advisors. He is a longtime member of the Urban Land Institute, where he was a trustee for seven years and currently serves on the Public/Private Partnership Council as an honorary member.

Robert Dunphy

Washington, D.C.

Dunphy is Senior Resident Fellow, Transportation, at the Urban Land Institute. He created ULI's program of transportation research and has been responsible for the Institute's research, books, conferences, public policy, and public outreach on transportation and land use, transit, and parking.

Previously, he directed studies of seven large regions recognized for their efforts in implementing consistent regional transportation and development policies, reported in his book *Moving Beyond Gridlock: Traffic and Development*. He is the author or project director of numerous books, including *Residential Streets, Dimensions of Parking, Parking Requirements of Shopping Centers*, and *Transportation Management through Partnerships*, as well as a forthcoming book on transit-oriented development and the transportation chapters in *Implementing Smart Growth at the Local Level* and *Transforming Suburban Business Districts*. In addition, he created "Myths and Facts about Transportation and Growth," a popular brochure that presents hard facts on often soft issues and became the first in a series.

Dunphy has collaborated on a number of studies of national interest. For the Federal Transit Administration (FTA), he directed, in partnership with the Texas Transportation Institute, the development of land use criteria for new transit systems that are now being used as part of the federal approval process. Also for FTA, he teamed with the University of California for a series of workshops on the development of real estate adjacent to transit facilities.

In addition, Dunphy has directed ULI outreach efforts in Atlanta and Charlotte intended to engage the development community in a dialogue on strategies for implementing transit-oriented development. He directed a ULI forum on balancing land use and transportation, which brought together a wide range of leaders active in local real estate, traffic, transit, and parking concerns from across the United States. He organized ULI's first conference on technology and real estate and has directed national and regional seminars on transportation and growth, joint development, and landfill siting.

Dunphy is active in national committees of the Institute of Transportation Engineers and the Transportation Research Board, for which he chairs the Transportation and Land Development committee. He is a member of Lambda Alpha International, an honorary land economics society. Dunphy is a frequent speaker on issues of transportation and smart growth, transit-related development, and parking to national and local groups, including ULI District Councils, business and leadership

organizations, transit associations, and government agencies. He served on Maryland's Transportation Solutions Group, organized by Governor Parris N. Glendening to advise on a controversial suburban highway proposal.

Reed Everett-Lee

Fort Lauderdale, Florida

Everett-Lee has been with Carter & Burgess for more than five years. For the last two years, he has led the development and expansion of Carter & Burgess's transit practice in South Florida.

Before joining Carter & Burgess, Everett-Lee was manager of systems planning for VIA Metropolitan Transit in San Antonio, Texas. Before going to San Antonio, he held the position of manager of corridor and environmental planning for Dallas Area Rapid Transit (DART) and was project manager for DART's Southeast Corridor Major Investment Study. Before returning to DART, he was principal analyst in the Market Development Division of the Regional Transportation Authority (RTA) in Chicago. While at the RTA, he was responsible for policy development and analysis, and project management of the RTA's Transit-Oriented Development program, including the formation of the RTA's Regional Technical Assistance Program. That program, now in its seventh year, has provided technical assistance for station area planning, county transit plans, corridor studies, and technology initiatives for 29 communities in the Chicago metropolitan region.

Everett-Lee holds a PhD and master's degree in anthropology from Southern Methodist University, and a bachelor's degree in sociology and a master's degree in city and regional planning from the University of Texas at Arlington. He is a member of the American Institute of Certified Planners and the American Planning Association.

Greg Stormberg

Nashville, Tennessee

Stormberg is the executive vice president for Central Parking Corporations where he has held several leadership positions since joining the company in 1995. Stormberg's offices are in Nashville, where the company's headquarters have been located for more than 35 years.

During his 21-year career in the parking and transportation industry, Stormberg has been involved with numerous projects, including transportation corridor agency toll roads of Orange County, California; privatization of Bush Intercontinental and Hobby Airports, Houston, Texas; multilevel garage development at Louis Armstrong International Airport, New Orleans, Louisiana; Astrodome, Houston, Texas; Toyota Center, Houston, Texas; University of California Irvine Medical Center, Irvine, California; and Eisenhower Medical Center, Rancho Mirage, California. Along with the previously mentioned facilities, he has worked on many projects that are helping pave the way for the advancement of technology applications within the parking and transportation industry.

In his current role, Stormberg has direct responsibility for several areas of the United States that include New York, Los Angeles, San Francisco, Atlanta, Miami, Arenas and Stadium Division, Airport Division, and Toll Road Division. His entire area encompasses several hundred properties and in excess of 10,000 employees.

Stormberg serves on the ULI Entertainment Council and previously served as vice president for the Texas Parking Association. He is active in several other organizations, such as BOMA; International Downtown Association; International Bridge, Turnpike and Toll Association; National Parking Association; and International Parking Association.

David Vander Wal

Boston, Massachusetts

With Walker Parking Consultants since 1986, Vander Wal serves as senior project manager for major projects throughout the United States and internationally. During his time at Walker, he has been responsible for the design of more than 50 parking structures. He is experienced in parking planning, design and construction engineering administration of new parking facilities, and restoration design for existing parking facilities.

Currently, Vander Wal is the lead functional designer for the 7,500-space parking structure for Block 35/36 and the 2,500-space Central Park parking structure, both in New Songdo City, Korea. Other representative parking structure projects he has designed include the Morgan Stanley underground garage, Purchase, New York; Walter Street parking structure, Springfield, Massachusetts; Sempra Energy, Stamford, Connecticut; and Fortunoff parking structure, White Plains, New York. Other functional consulting assignments include parking structures for Albany Airport, Albany, New York; Park Central, Las Vegas, Nevada; Oyster Bay, Syosset, New York; City Center, Salt Lake City, Utah; and Waterside Place at Pelican Bay, Naples, Florida.