

A Parking Dilemma

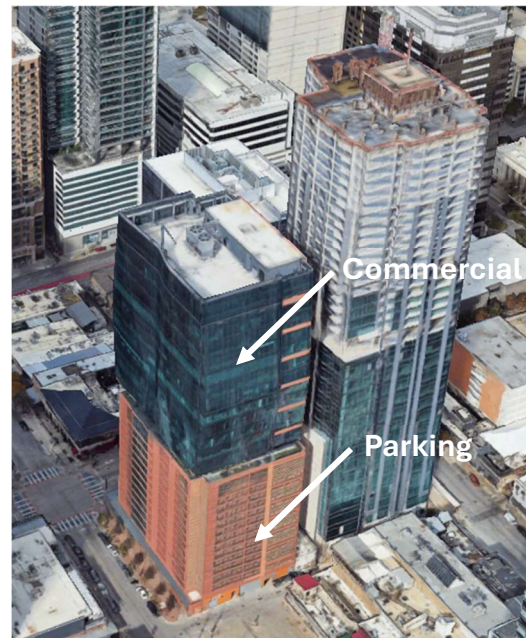
To Build or not to Build New Parking Capacity, That's the Dilemma:

Urban Texas continues to see new structured commercial parking garages constructed at great cost to the private development industry and communities in which they build. These costs are passed on to the end-users in the form of increased parking charges, increased rental rates for the associated land use, and higher taxes (to repay bonds if public funds are used or as a function of the increased per square foot commercial property assessment, albeit on under-performing parking spaces rather than commercial revenue-generating space).

Urban planners know that large parking structures and surface lots have community costs beyond the simple financial impacts, they consume space within a development stack that could otherwise be used for higher and better purposes (added leasable space for commercial, retail or residential uses). Garages and surface parking lots separate destination land uses, requiring added street networks for access or added vertical infrastructure. Arguably, this separation makes a city less walkable and less accessible by other modes of transportation by pushing activity spaces farther apart. Similarly, consuming space within the urban fabric with parking often conflicts with other public policies seeking to build affordable housing, pedestrian amenities, parks and plazas, etc. within our most dense urban developments – space desired for these amenities is simply tied up in the form of parking spaces.

Donald Schupe and others have argued that using scarce urban land resources for storing private vehicles (especially when offered as a free service to the user) is not sustainable nor is it logical. Studies have found that private automobiles remain unused for as much as 95% of the time (source: FOTW #1356, Aug 19, 2024, US Department of Energy). This means that they are parked, taking up that valuable urban space when not in use. Owning a private vehicle on average costs a US resident between \$11,500 and \$12,300 per year (Source: AAA Automotive), making vehicles an expensive proposition for the private individual to own – especially for such an underutilized asset (remember, vehicles on average are only used 5% of the time).

Structured parking is also expensive to construct. A search of Real-Time Price Insights on LatestCost.com suggests the cost for construction of a typical parking garage ranges between



Podium Parking in Austin
(Source Google Earth)

\$18,000 and \$70,000 per space, depending on factors such as structural choice (concrete or steel), foundation conditions related to soil conditions, and locational specifics (i.e., land prices, building codes, environmental constraints, etc.) (Source: [LatestCost – Real-Time Price Insights](#)). In many of our Texas downtowns, parking is required to be constructed underground and is often impacted by shallow water tables, requiring pumping and unique construction methods. Austin's South Waterfront development is committed to building underground parking and adjacent to Lady Bird Lake – most certainly requiring consideration of how to deal with the shallow water table on-site which will most certainly increase overall construction costs.

Communities across Texas are responding to these increased cost to urban development and the loss of valuable urban space from parking construction by eliminating parking requirements. In 2023, Austin became the largest U.S. city at the time to abolish parking minimums citywide for nearly all types of development (Source: [kut.org](#), [mysanantonio.com](#), [archive.st...gtowns.org](#)). In 2025, Dallas followed suite, eliminating parking requirements (Source: [better-cities.org](#)). Smaller communities such as Bastrop, Bandera and Taylor have also removed parking requirements, allowing developers flexibility to choose how much parking they provide (Source: [better-cities.org](#), [24-7pressrelease.com](#)). Even car-centric Houston has removed parking minimums in their Central Business District (CBD) and in primary transit-oriented developments (TODs) (Source: [parkingreform.org](#)). These actions will begin to change building design, with new developments reducing their commitments to construct parking garages and those with already constructed ones, opening them to the market on a for-pay basis.

Despite the efforts of Texas cities to remove parking requirements for new developments, investors and property owners continue to need new parking capacity within their developments, resulting in new parking construction. This may be due to a concern that if parking is not easily available (i.e., not convenient), that the development will be less competitive. This concern however, ignores the changing nature of Texas communities and the way their residents are traveling. Not only do urban centers enjoy expanded public transit options (bus and rail) and expanded active transportation networks (expanded bike and pedestrian infrastructure), the private sector is deploying on-demand (OD) services such as ride-share (Transportation Network Companies like Uber and Lyft state-wide), on-demand scooters and bikes (including systems by Bird, B-Cycle, Lime, and Metro Bike) and automated taxis (Waymo, Tesla, and Zoox in Austin). And, Texans have shown a strong affinity to telecommuting, working-from-home, and alternative work schedules. All these new options are banking on the idea that Texans are ready to leave their private automobiles for another way of travel, limiting the need for additional new parking in many urban developments.

What about convenience and the need to be competitive? A study in 2020 by Daniel Kondor et al. analyzed the minimum parking needs of a community where on-demand (OD) mobility was widely deployed (test city being Singapore that also has mass transit and other forms of public travel systems). That study found that a 57% reduction in parking

could be achieved with only a 1.3% increase in vehicle kilometers traveled (VKT) (source: [Scientific Reports](https://www.nature.com/scientificreports/10.15885) (www.nature.com/scientificreports/10.15885)). This study was performed prior to widespread automated vehicle services (AV) being deployed in the test city. The study suggests that the introduction of AV or robotaxis would be expected to further reduce the need for parking by making OD services even more accessible and available in a city that already offers many travel options.

In Central Texas, OD mobility services (both with and without drivers) are well established and popular, provided by companies such as Lyft, Tesla, Uber, Waymo, and Zoox. The implication from the Kondor study is that a significant reduction in parking supply (57%) can be accommodated with minimal increases in VKT (its English unit equivalent of Vehicle Miles Traveled [VMT] used frequently as a measure of travel congestion). This suggests that with the prevalence of OD options like those seen in Austin, end-use destinations remain convenient for customers and from a public perspective only generate a minimal increase in actual congestion or inconvenience.

How does this address the parking dilemma? It means that reducing the parking capacity in buildings that lie within a rich multi-modal OD travel environment (think transit, OD options, active transportation options, and OD scooter options), likely won't increase traffic congestion, meaning individual developments remain convenient (i.e., competitive). It means that municipal governments should be bold in their efforts to use public policy to nudge developers towards reducing the number of parking spaces they build and that developers should have some confidence that they can achieve their overall development goals with less parking when rich travel options exist.

Note: the Kondor Study also did not include the beneficial impacts of proactive efforts from local governments to promote the use of alternative travel modes. Many of the major urban centers in Texas not only have governments that promote multimodal travel diversification, they also have transportation management associations (TMAs) like Movability in Central Texas that actively promote and facilitate the use of alternate modes for everyday commuting (for more information on the robustness of such programs, see: www.MovabilityTX.org). These type of organizations and concerted community effort to diversify the travel spectrum will only accelerate the anticipated decline in parking demand as the general public finds alternate modes of travel more convenient and more cost effective than their private automobile.

So, What's the Problem That Needs Solving?

New structured parking garages have effective lives of 40 to 75 years based on typical engineering standards (Source: American Concrete Institute ACI 365.1R) with a typical lifespan used for planning purposes of 50 years (Source: Precast/Prestressed Concrete Institute). Similar lifespans can be shown for steel construction with the lives of either concrete or steel heavily dependent on the upkeep and maintenance applied. At the same time, vehicle automation is accelerating and gaining acceptance in Texas cities quickly.

Tesla, Waymo, Zoox and others are deploying automated ride-share services in Austin and other national centers of innovation now and the early signs suggest that the traveling public is adopting these new technologies with enthusiasm. Waymo self-driving robotaxis were introduced as an opt-in opportunity in Austin under the Uber app in March 2025 and by the last week of that same month accounted for around 20% of all Uber trips in Austin. (Source: [\[govtech.com\]](http://govtech.com), [\[readthejoe.com\]](http://readthejoe.com), [\[pythonandfinancehub.com\]](http://pythonandfinancehub.com)). This is even more impressive when we acknowledge that the Waymo launch was prior to the launches of other automated taxi services (Tesla and Zoox) now operating in Austin. The continued entrance of new companies into the robotaxi market suggests a strong affinity by Central Texas residents towards expanded use of automated shared vehicles. What is important here is that the adoption of shared automated vehicles is underway now – not ten years from now. This, along with other changes in the travel markets of Texas Cities (adoption of active transportation modes, expansion of transit, and the prevalence of telecommuting) will accelerate the decline in parking demand. The decline is underway. That change will most certainly reach critical momentum over the next 20 years (far sooner than the expected lifespan of any new parking garage being constructed now and this means more empty garages in the near future, financial risk, and potentially more underutilized space in buildings across our future communities. One only needs to walk around most Texas downtowns today and you will discover underutilized parking garages in all but the most successful private or government run facilities, often where in-office participation is mandated by policy.

Admittedly, it is difficult to predict a tipping point when construction of new parking will no longer be profitable or when financiers and investors in Texas will no longer routinely require excessive parking capacity be constructed as part of an overall development stack. Some level of parking to facilitate handicap access and delivery as well as drop-off and pickup operations will always be warranted, but the author would argue that one can be assured that within the next 20 years, the need for both public and private parking in urban centers is likely to be greatly reduced and large new parking capacity projects are already at risk of being over-built.

In some places, we can already see developers responding to the transition. For example, the Aloft/Element hotel in downtown Austin opened in August 2017, developed by White Lodging without significant on-site parking. All vehicles arriving at the hotel must be valet parked in a pre-existing off-site garage, leased from an adjacent landowner who had underutilized structured parking. This pattern of development, choosing to lease off-site parking instead of constructing on-site dedicated parking, should be encouraged. From a development economics perspective, it shifts the necessary financial outlay of a development from a capital expenditure to a future operating one which can be passed along to the end-user in the form of daily paid parking charges. But there is a practical limit to how many buildings can secure long-term leases from existing parking owners. High-density parking techniques, enabled by technology, can also provide a solution to ease the transition process towards building fewer new parking spaces.

High-Density Parking Technology Provides a Solution:

High-density parking technologies consist of mechanical parking devices with varying degrees of automation that enable developers, contractors, and operators to significantly shrink their parking footprints. For example, using stackers and suspended platform type high density parking, building owners can shrink the average space required per parking space from the more typical 350 sf to as little as 187 sf. The reduction in required space is accomplished by double or even triple stacking vehicles and by eliminating or minimizing the need for two-way access isles and speed ramps within parking structures.

Mechanical stacking devices can be used during the construction phase to facilitate construction activities by doubling or tripling the capacity of individual surface parking facilities, allowing parking to be consolidated on one portion of the surface lot and construction activities on the vacated portion. They can be used to assist valet operations with little change to the parking experience from the customer's perspective, with the valet attendant interfacing with the technology, resulting in each individual parking attendant being able to manage a larger number of parked vehicles than traditional runner-enabled valet services. They can be deployed as semi- or fully automatic systems as part of the permanent development concept, provided as a higher level of amenity with expanded user experience, including the integration of urban storage pods where fully automated systems are deployed. And, assuming a thoughtfully integrated approach, these technologies can be removed if desired in the future to make way for higher revenue-generating uses (i.e., additional commercial space, additional residential units, etc.).

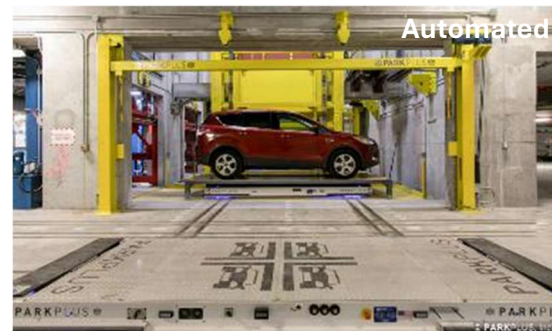
These systems have proven to be successful in garages and on surface parking facilities nation-wide. When evaluating a potential high density parking investment, it is important to evaluate not just the capital cost (which on the surface may seem an added cost), but the entire return on investment (ROI) generated by a reduced parking footprint, better building flow, more revenue generating space, reduced construction and operational overhead costs, more efficient delivery schedule, and the opportunity for discrete infrastructure replacement. Not only do high-density parking (HDP) systems provide these benefits, HDP technologies improve customer safety, vehicle security and overall project sustainability. They can be used to support LEED building applications and used to meet transportation demand management goals/requirements.

High density parking systems can be classified into four types of technologies:

- Mechanical parking lifts (manually operated systems for basic stacking): these can be multi-layered and serve hundreds of vehicles as part of a valet supported operation.



- Semi-automated parking systems (hybrid design for effective self-parking stacking): these can facilitate either valet or customer self-parking operations.
- Automated parking systems (advanced technologies offering fully robotic parking solutions): these provide a premium self-parking experience for the customer and also allow for integration of urban storage pods as an added perk.
- Vehicle display units (creative solutions for custom design and exposure): these are effective in urban car dealerships, where real estate is scarce or a high-end experience is desired.



Example projects and videos of these technologies in use can be explored at:

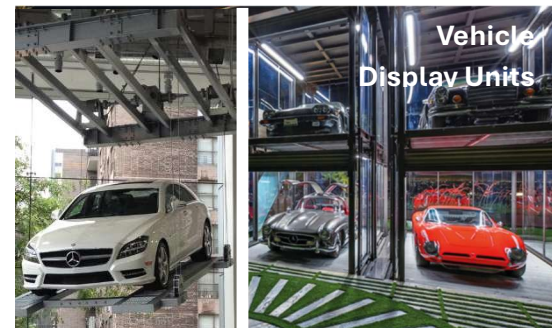
[PARKPLUS Products](https://parkplusinc.com/products)

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[PARKPLUS-Products.pdf](https://parkplusinc.com/PARKPLUS-Products.pdf)

(<https://parkplusinc.com/PARKPLUS-Products.pdf>) .



High-density parking technologies can be permanent or temporary. Equipment can be leased or purchased, depending on the use case scenario. These technologies can be installed to address specific needs and removed when no longer required. This flexibility facilitates a range of practical applications that can respond to transitional needs (i.e., how to maintain parking on-site during construction, how to mitigate parking impacts due to construction of large public works type projects, how to shrink an existing parking footprint, to meet a transitional demand at an intermodal site, etc.).

It's Time for High Density Parking in Texas:

High-density parking technologies have been popular on the East- and West Coast for years. Developments in cities ranging from New York City to Miami and from Los Angeles to Seattle have successfully installed and operated high-density parking technologies. It's easy to dismiss these example installations as only viable because they occurred in

America's largest, most dense urban centers where real estate is costly and urban development expensive. This couldn't happen successfully in Texas, or could it?

- In 2025, the Floodgate downtown residential apartment tower in San Antonio opened, offering a fully automated parking garage for residents. The system, installed by Park Plus Inc., is San Antonio's first fully automated parking technology enabled residence. The site, situated on the San Antonio River Walk, is physically constrained. The high-density parking technology allows the developer to offer the needed parking and residential/commercial development required on this urban site (see: [Luxury High-Rise Apartments in San Antonio, TX | The Floodgate](#))
- Auto dealerships throughout Texas now use high-density parking technologies to display their vehicles, reducing the surface space needed in dense urban locations and improving their visibility. Both Mercedes Benz of North Houston and Mercedes Benz of Dallas are using ParkPlus Custom Jewel Box display units, custom engineered and installed above their showroom to maximize vehicle visibility to high-volume commuter traffic on adjacent freeways while maintaining safe operation within their active showrooms below.

Other examples across Texas can be found hiding in airports, private garages, and auto dealerships located along crowded urban freeways. These early pioneering investments are indicative of an emerging opportunity here in Texas for smarter, more compact, and higher density parking solutions.

Since my time as Director of Transportation at the City of Austin, I have been leaning on the importance of active parking management throughout Texas. Parking can be one of the most influential levers we have as urban practitioners to shape land use policy, create urban place and drive travel behavior towards more sustainable modes. It's time as an industry that we promote the use of high-density parking technologies and thoughtful parking policy to bear in solving the parking dilemma (dwindling parking demand and the long-life of parking infrastructure constructed today). As communities across the State, we need to reclaim our urban spaces for people instead of the parked car. High density parking technologies can address our absolute need to provide on-going parking capacity while shrinking its footprint and impact on our urban fabric. That's why as an urban mobility professional, I have partnered with ParkPlus Inc. to expand the exposure of these technologies to the larger development, municipal, and mobility industry in Texas.

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Robert is a recognized transportation executive, with proven success in expanding and managing multimodal transportation portfolios, deploying transit investments, and building SMART Transportation programs. He works with start-up companies and municipalities to jump-start mobility innovations, develop and invest in large infrastructure planning and programming efforts, and improve regional leadership. He served as the founding Director of Transportation for the City of Austin from 2008 to 2022 and as Director of Traffic Management for Seattle Department of Transportation from 2002-2004. In both Austin and Seattle, Robert was responsible for the successful modernization and expansion of the on-street parking management systems – generating millions in revenue dedicated to mobility improvements in both Cities. In 2025, Robert founded SMART Infrastructure Advisors, LLC, a company dedicated to helping deploy innovative technologies and infrastructure within the municipal mobility space.



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Paula brings more than 50 years of legal, real estate, government and community experience to the emerging, environmentally sound solution to one of America's most vexing problems: urban parking. Her belief that automated and mechanical parking systems are the answer to this parking dilemma was responsible for Park Plus Inc., a 50-year old East Coast firm, to open a California office.

Ms. Zinnemann began her career in real estate and later obtained a law degree to advance her interest and work in civic and public policy matters. While a real Estate broker in Beverly Hills, she was the 1984 President of the Beverly Hills Board of Realtors. She has served as OF Counsel to the law firm of Saltzburg, Ray & Bergman and later to the law firm of Schwartz, Wisot & Wilson.

In 1999, California Governor Gray Davis appointed Ms. Zinnemann as the California Real Estate Commissioner where she presided over the five offices and a staff of 300 at the Department of Real Estate until 2004. Today, her focus is on working with Park Plus Inc. to change the way people look at parking.



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Ryan is an architect, specializing in automated parking structures, high-density vehicle storage and retrieval systems. He leads project management and installation of projects for Park Plus, Inc. where he currently serves as a Sr. Vice President. He served as project manager for the installation of the fully automated Park Plus Inc. parking system installed within the Floodgate San Antonio and the Park Plus Inc. automated parking display systems in the Mercedes dealerships in Houston and in Dallas.