

# **Parking Stall Demand Reduction**

## **MODEL ORDINANCE**

**Suffolk County Planning Commission**

**US Green Building Council – Long Island Chapter**

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# Parking Stall Demand Reduction (PSDR)

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<u>CONTENTS</u>	<u>PAGE</u>
<b>1. Introduction</b>	3
<b>2. Benefits of PSDR</b>	4
i. Benefits to Municipalities and the Public	4
ii. Benefits to Builders	4
iii. Benefits to Employees and Residents	5
<b>3. PSDR Techniques</b>	6
<b>4. PSDR Model Ordinance</b>	8
I. Purpose and Legislative Intent	8
II. Performance Standards	9
III. Design Criteria	9
IV. Incentives	11
V. Methodology	11
VI. Applicability	12
VII. Severability	12
<b>APPENDIX</b>	

## 1. INTRODUCTION

**T**ransportation demand management is the application of strategies and policies to reduce travel demand, or to redistribute this demand. Managing transportation demand can be a cost-effective alternative to increasing transportation capacity. One aspect of transportation demand management is Parking Stall Demand Reduction (PSDR), which uses a variety of strategies that seek to reduce the number of parking stalls needed, or to use parking stalls more efficiently.

Parking management arose out of a concern that parking lots and off-street parking are inefficient land uses that cover a significant area, particularly in high-demand regions such as downtown business districts. Large parking areas can be an eyesore, can reduce walkability, and can be depriving a municipality of additional property tax revenues where land has a high value and the land could be put to better use. PSDR aims to reduce the number of single occupancy vehicles (SOVs) generated by a proposed development and thereby reduce the number of parking stalls required.

PSDR techniques can be incorporated into the design of any development, but can be particularly useful with Transit Oriented Development. Transit Oriented Development (TOD) is defined as compact, pedestrian-oriented mixed-use buildings located near rail stations, generally within a 5 minute walk or one quarter mile. TODs are becoming increasingly prevalent and contributes to healthy, vibrant, livable, sustainable communities, making it possible to live

without complete dependence on an automobile for mobility.

Residents and employees in a TOD are more likely to use more mass transit, thereby reducing car use. TOD allows land that would otherwise be utilized for surface parking to be used for other purposes, such public spaces or additional development. A 2001 Suffolk County Planning [study](#) indicated that among working people in the housing complexes near railroad stations, 23% used the nearby railroad station to get to work. A University at Denver [study](#) of the 2009-2010 commuting patterns of 3,400 employed residents who live near light rail lines revealed that 18% of those residing less than a 10 minute walk (1/2 mile) from transit utilized the transit, and for those residing less than a 5 minute walk (1/4 mile), that figure was 26% utilizing the transit.

Trip generation of TODs can be overestimated which may lead municipalities to require greater numbers of parking stalls per project than what is actually needed. A municipality could adopt parking management and information strategies that distribute demand before considering adding to the parking stall supply. Parking supply in downtown areas often exceeds maximum demand and better parking management could effectively help manage available parking.

A PSDR model ordinance can offer municipalities and builders examples of PSDR features that can be incorporated into developments, and can identify incentives for incorporating those features, to help reduce parking stall demand.



## 2. BENEFITS OF PSDR

Convenient and accessible off-street parking is an important building amenity for building residents, customers, visitors, and employees. PSDR can benefit a variety of stakeholders, including the local municipality. A PSDR model ordinance can identify specific incentives for the builder, the employee, and the resident for voluntary reduction of site-generated parking stall demand. If a development offers alternative transportation options besides a parking lot, building and maintenance costs could be reduced and fewer parking stalls will need to be constructed.

PSDR strategies help address a cause of congestion: the need to have a car and a parking stall to store it wherever it goes. The need to own a car is a personal consideration, and one may not need or want to give up their car even if they live, visit, work, or shop in a TOD or a walkable community. PSDR ordinances encourage developers, employers, and building managers to provide amenities and/or incentives to persuade residential occupants or employees to use a mode of transportation other than an SOV.

### **Benefits to Municipalities and the Public**

PSDR techniques can assist a municipality in the local implementation of regional policy. PSDR can help with traffic congestion management and contribute to economic development goals. In response to parking variance petitions, a PSDR ordinance would allow the Town Board, Planning Board, and Board of Zoning Appeals to reduce parking requirements at their discretion. Even if a PSDR ordinance isn't adopted, PSDR techniques offer municipalities examples of program and design elements that can be incorporated into proposed development. PSDR techniques can also be cited in the municipality's comments or conditions of an approval.

Many of the most successful and vibrant downtown centers in Suffolk County still have significant traffic congestion. Some of the congestion may be due to a parking stall shortage and cars searching for a convenient parking stall. Moreover, some off-street parking stalls are reserved for residents or specific businesses, whether they are occupied at the moment or not. Shared parking agreements can alleviate this problem somewhat, but can have limited success in addressing the demand for off-street parking during holidays and weekends when residents are home, businesses are open, tourists are visiting, and commerce is at its peak. At these times, shared parking schemes break down. The incorporation of PSDR features into building design and approval can help alleviate these problems, especially as part of an overall Parking Management Plan.

PSDR techniques can help alleviate worsening traffic congestion. An example of the effect of a reduction in the use of SOVs on local roadways can be inferred from reduced morning traffic congestion on school holidays. According to the U. S. Bureau of Labor Statistics, in 2018 approximately 8% of all workers in Suffolk County were employed in private or public education. During school vacation periods, these workers are generally not on the road during the morning rush, and there is a perceptible decrease in local traffic congestion at these times. If PSDR strategies can lead to a similar reduction of SOV drivers switching to mass transit or other modes of transportation, a perceptible reduction in congestion could be achieved.

### **Benefits to Builders**

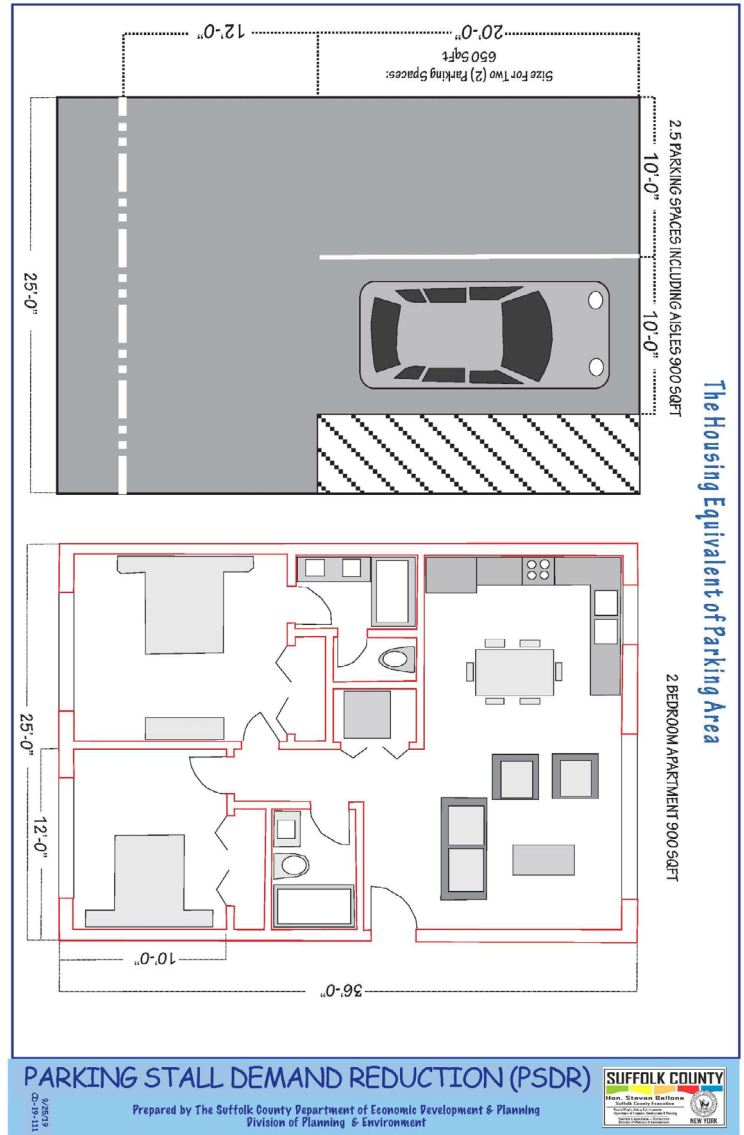
A PSDR ordinance can offer builders some codified guidance, certainty, and information on PSDR policy and implementation. In addition, builders may be willing to apply PSDR techniques if they are provided a benefit such as an expedited review of their application or a density incentive, such as additional units or a floor area bonus. Floor Area Ratio (FAR)

is the amount of permitted square feet of floor area of a building per square foot of lot area, the ratio of total building floor area to the area of its zoning lot. A FAR bonus is a unit and/or height bonus. A builder may be able to build on land otherwise dedicated to parking. A PSDR ordinance can identify incentives for the builder for voluntary implementation of PSDR techniques.

If fewer parking stalls are constructed, another benefit could be the reduction of construction and maintenance costs. For example, one to two parking stalls per residential unit may add an additional 6-16% to the construction cost per unit in a project. Parking garage construction cost per parking stall can range between \$20,000 for above ground parking and \$34,000 for underground parking. Local engineers in Suffolk County estimate that surface parking lots can cost \$4,500 per space to construct. Building operations can benefit as well. Overhead costs are reduced because there is less parking area to maintain. In a typical city building with structured, it costs approximately \$225 per month to maintain a parking stall, including asphalt repair, re-striping and snow removal.

**Benefits to Employees and Residents**

Employees and residents of a development that undertakes PSDR techniques may benefit in various ways. Housing costs could be reduced if the building unbundles the cost of a dedicated parking stall from monthly rent or association fees, which would allow a resident to benefit financially from not owning a car. A building could offer to residents a discount transit pass or a bike-share membership instead of a parking stall. When office buildings offer showers and secure bike parking they may see an increase in walking and biking. If priority parking spaces are set aside for HOVs, this is an incentive to carpool and vanpool.



### 3. PSDR TECHNIQUES

**P**arking Stall Demand Reduction (PSDR) aims to offer incentives that change the behavior of residents, employees, and employers in a TOD in order to reduce Single Occupancy Vehicle (SOV) use. Some transportation demand management techniques can be applied to existing buildings or developments, but these types of programs address parking stall demand after development is approved, constructed, and occupied. Currently, few proposed developments incorporate PSDR techniques by design, and even fewer continue them by covenant.

Before starting implementation of PSDR strategies, a municipality should analyze the distribution of the

existing parking stall inventory in the municipality, or commission a larger parking management plan. After completing an inventory of parking stall supply, the municipality should create a best management plan, and then implement PSDR on a project by project basis.

There are a number of PSDR techniques that can be incorporated into the design of a project that can reduce the number of single-occupancy vehicles generated by the project and thus reduce the number of parking stalls required for a development. Some of these techniques involve modifications to the parking lot, site, or building design. **PSDR features may include:**

1. Locker rooms including shower facilities.	2. Bus Stop Turn-Off and Shelter: A designated area for people to wait for buses to arrive.
3. Bicycle Lockers (Enclosed Bike Stations): <i>A structure intended to secure an individual's bicycle</i>	4. Transit Reduction Percentage (TRP): A percentage decrease in transit usage.
5. Ride Share Program: Program that encourages commuters to carpool, which can reduce traffic generation.	6. Parking Validation: If a customer patronizes a participating business, the customer's parking is free.
7. HOV Preferred Parking: Parking reserved for high occupancy vehicles (each carrying multiple occupants; not a single occupancy vehicle).	8. Shuttle Transportation Program: The implementation of shuttle vehicles to transport commuters, reducing parking stall demand.
9. Pedestrian Access: The ability for a pedestrian or cyclist to get to a destination without the use of a motor vehicle.	10. Transit Info Screens: Large, highly visible screens that display real-time transit information to inform of the most convenient means of transport.
11. Parking time restrictions: Restrictions put in place to regulate when, and for how long, vehicles are permitted to park in a designated area.	12. Workforce Housing Factor: Reduction percentage based on the percentage of workforce housing units above 15% of all units.
13. Metered Parking: Designated parking stalls where parking is permitted by payment of a fee at a parking meter, or other methods of parking management.	14. Workplace Travel Plan (Employee Commute Option): A strategy employed by an organization to promote more sustainable transport among staff, visitors, and deliveries.

<p>15. Green Trip Certified: A certification program to support multi-family developments that employ strategies to reduce traffic, excessive parking, and greenhouse gas emissions.</p>	<p>16. Unbundling Parking Costs (parking fee): Creating a separate fee for parking rather than including parking in the overall cost of occupancy, to encourage commuters to use transportation other than SOVs.</p>
<p>17. Alternative Work Schedules: Staggered work hours or a compressed workweek (where the shift times and hours worked are altered, allowing employees to work the required number of hours in a workweek at varying times or in fewer days.)</p>	<p>18. 511NY Ride Share: Membership based commuter organization providing carpooling coordination, transit itinerary options to commute by bike, and establish telework programs for employers and employees (<a href="https://511nyrideshare.org/">https://511nyrideshare.org/</a>).</p>
<p>19. Valet Parking: A service in which the driver arrives at their destination, exits the vehicle, and allows a worker to park their vehicle. (However, this service reduces the number of parking spaces needed on site, but doesn't reduce the net number of cars in the area or on the road.)</p>	<p>20. Shared Parking Agreement: Adjacent property owners share parking lots and reduce the number of parking spaces that each would provide on their individual properties. This strategy is particularly useful if adjacent land uses have different peak hours of parking demand.</p>
<p>21. Commuter Pre-Tax benefit: An IRS provision that allows employees to designate a portion of their taxable salary as a tax free qualified transportation benefit. The current limits are \$265/month for transit or vanpooling expenses, and \$265/month for work related parking expenses.</p>	<p>22. Transit Solutions: Employer enrolment offers employees access to transit benefit program aids in reducing parking demand and reducing payroll tax and employee pre-tax dollars to finance their commute for savings cited up to 40% (<a href="https://www.transitsolutions.org/">https://www.transitsolutions.org/</a>).</p>
<p>23. Car Share program: a membership-based, self-service, short-term car access system with a network of vehicles for which members pay by time and/or distance. For convenience, locations for pickup for car shares, carpooling, vanpooling, and ride-sharing apps such as Uber should all be located together at a central location.</p>	



## 4. PSDR MODEL ORDINANCE

**P**SDR features can be mandated in the ordinance, or a PSDR ordinance can include specific incentives for a builder to voluntarily implement PSDR. If PSDR features are voluntary with no formal structure in place, PSDR may be inconsistently incorporated into development applications and may not be particularly effective in boosting economic activity and reducing auto trips.

The best time to ensure that PSDR features are included in a project is before construction, when a permit is being negotiated. In this way, PSDR techniques become as important as features such as site design elements or roadway improvements. As part of the development approval conditions, covenants, and restrictions, a contractual agreement between the project developer and the municipality should address the following:

1. The specific PSDR techniques that will be implemented, when they will begin, and how long they will operate. All PSDR features should be required to be installed before the building opens.
2. The expected outcomes of the PSDR program.
3. How to measure outcomes.
4. The types of monitoring data provided by the developer or assignees, how often and when are they due, and who will receive them.
5. If independent monitoring is to be conducted to assure that developer-provided data are accurate, the monitoring should be done by (or for) the municipality, with the costs to be recoupable by the municipality.
6. If the development changes ownership, who will be responsible for funding and operating the PSDR features. Ideally, PSDR features should continue in perpetuity with the development.

7. Length of grace period if the monitoring shows the performance is substandard
8. Specific penalties if the performance goals are not met. Penalty for non-achievement of performance goals or failure to continue PSDR programs. A bond or letter of credit from the project sponsor can be held by the monitoring agency in an amount sufficient to operate the programs if the developer should default or fail to achieve the goals. This is the most effective way to keep the developer or the assignees focused on achieving the PSDR goals. The bond or credit can be decreased over time.
9. Detailed benefits to developer (such as a tax rebate) if the developer can prove that the implemented PSDR techniques are working.

This model ordinance is in a format that can easily be incorporated into local municipal codes throughout Suffolk County. A PSDR ordinance can include the techniques outlined in this report.

**Chapter [ 000 ] of the Code of [name of municipality]**

**Article [ 000 ] Parking Stall Demand Reduction (PSDR)**

### I. PURPOSE AND LEGISLATIVE INTENT

(May include the following language)

[Name of municipality] encourages existing and proposed developments to have convenient and accessible off-street parking for residents, visitors, customers, and employees, and also infrastructure and amenities that support alternative transportation modes besides single-occupancy vehicles. Reducing the number of parking stalls that are required for a development may help reduce trip generation and traffic congestion, and may encourage a healthier walkable lifestyle. Moreover,



land that previously would have been dedicated to parking stalls could be available for economic development.

This [Chapter/Code/Section/Article] provides Parking Stall Demand Reduction (PSDR) techniques and programs that can be incorporated into the design of a development project to reduce the number of single occupancy vehicles (SOVs) generated by the project and reduce the required parking stall area to accommodate them.

A schedule of percentage reduction in parking stalls is found in section III and incentives to provide PSDR in projects is found in section IV.

## II. PERFORMANCE STANDARDS

Siting new mixed-use development near major transportation routes allows a greater choice of transportation options besides a single occupancy vehicle (SOV) for residents and commercial district patrons, visitors, and employees. A reduction in SOV use results in lower trip generation, fewer automobile miles traveled, less congestion, reduced fuel use and lower emissions, and fewer parking stalls necessary to accommodate SOVs and thereby a more efficient use of land and infrastructure through compact design.

Projects shall achieve, by a combination of means in Sections I and IV herein, the following performance standards:

- a) Reduce SOV parking demand by 10%<sup>1</sup>.
- b) Increase non-motorized personal mobility from ¼ mile (5 minute walk) by up to three (3) miles by incorporating incentives for walking, bicycle, skateboard, scooter, etc.
- c) Increase mass mobility by greater than three miles by incorporating incentives for Car Share, HOVs, Bus, Train, etc.
- d) Incorporate best available technology and best management techniques to provide real time transportation information to residents of and commuters to and from TODs.

## III. DESIGN CRITERIA

In the [development], no building, structure or premises shall be used or occupied and no building or part thereof or other structures shall be so erected or altered without the adoption of Parking Stall Demand Reduction (PSDR) techniques. The use of any of the following may be combined for mixed use, retail, office, and residential development proposals to achieve the desired total parking stall demand reduction.



<sup>1</sup> Oregon's Transportation Systems Plan requires local governments to amend their land use and subdivision regulations to achieve a 10% reduction in the number of parking spaces per capita (Canepa, 2015).

**TABLE 1**

<b>PSDR Method</b>	<b>Percent % Reduction</b>
<b>a)</b> Apartment Income Factor based on percentage of workforce housing units above 15%	2:1
<b>b)</b> Bicycle Parking based on location for lockers; bicycle rail/ramp for staircases; enclosed bike stations; bike share station; onsite bike maintenance area Multi-family housing alone	2.5-20 10
<b>c)</b> Bus Stop Turn-Off and Shelter	10-40
<b>d)</b> Commuter Pre-Tax benefit	10-20
<b>e)</b> Cross Access (Shared Parking) Agreement	10-30, 15
<b>f)</b> HOV Preferred Parking (Primary Parking)	2
<b>g)</b> Metered Parking	1.75
<b>h)</b> Parking Pricing (Peak Pricing)	10-30
<b>i)</b> Parking Time Restrictions	10-30
<b>j)</b> Parking Transportation Allowances	10-30
<b>k)</b> Pedestrian Access	5-15
<b>l)</b> Ride Share Program	4-10
<b>m)</b> Shower Facilities (Locker Rooms)	2
<b>n)</b> Transit Info Screens/Ride Share Marquee	5
<b>o)</b> Transit Reduction Percentage (TRP) based on number of stops/hour 05%/stops/hr.	5%/stop/hr.
<b>p)</b> Unbundling Parking Costs	10-30
<b>OTHER</b>	5-15
<b>q)</b> Alternative Work Schedules	5-15
<b>r)</b> Car Share Program	5-15
<b>s)</b> Green Trip Certified	5-15
<b>t)</b> Parking Validation	5-15
<b>u)</b> Shuttle Transportation Program	5-15
<b>v)</b> Valet Parking	5-15

**NOTE:** As more and more of these features are added to a development, there may be a point of diminishing returns as each additional feature is added. There may be some minimum number of parking space demand attributed to a use whereby compounding PSDR methods will not achieve additional reduction in parking stall demand. It is believed that this number is project and locational specific. A project within a TOD will be able to achieve a greater PSDR than a project in a more suburban context. A mixed use attached unit building would be expected to achieve a greater PSDR than a detached single use building.

Additional research is needed to determine a formula with respect to a point of diminishing returns for PSDR application.

**NOTE:** Percentages in Table 1 are recommendations on PSDR. Multipliers have been drawn from the literature and sources can be found in the Appendix. The multipliers applicable to PSDR continue to evolve in available sources. The Suffolk County Planning Commission and the Suffolk County Department of Economic Development and Planning welcome collaborating comments on this endeavor.

**NOTE:** There may be several ways to provide developers with further derivation on the use of PSDR credits. Another possible way could be in the form of adding a “peak hour auto trips reduced” credit for defined actions. For example, a bus shelter could be worth a three auto trip-end reduction, or participation in a car-share program is worth two

#### IV. INCENTIVES

The following incentives<sup>2</sup> may be offered by the [adopting local government’s Legislative, Planning or Appeals] Board in order to encourage Parking Stall Demand Reduction (PSDR). The Board may reduce the parking requirements in accordance with Sections I through III herein for applications that demonstrate elevated transit usage, significant pedestrian and walkability amenities and are located within [one-quarter mile (1,320 feet) of a LIRR Station<sup>3</sup>]:

- a) The Board may grant an increased residential density up to [48] units per acre. The highest density shall be reserved for applications that include substantial community benefits or amenities and are located within [one-quarter mile of a LIRR Station].
- b) The Board may grant an increased FAR of up to [2.2]. The highest FAR shall be reserved for applications that include substantial community benefits or amenities and are located within [one-quarter mile of a LIRR Station].
- c) The Board may grant an increased building height of up to [4 stories].

auto trips-end reduction. Allowing for PSDR actions to also reduce the site trip generation, so the trips are not reflected (or credited as a reduction) in the traffic impact analysis (TIA) for the proposed development could be another incentive bestowed upon the developer by the municipality.

#### V. METHODOLOGY

The following methodology for the application of PSDR shall be employed in accordance with Sections I through IV herein:

- a) [The municipality’s] parking requirements for the proposed mixed use, retail, office, or residential development is calculated utilizing the standard methodology as provided for in the zoning law of the [municipality].
- b) PSDR is established by compiling PSDR techniques in accordance with Table 1, Section III, herein.
- c) Conditions, covenants, and restrictions trading municipal incentives for PSDR in accordance with a Written Developers Agreement to the satisfaction of the [municipality’s] Attorney’s office are recorded.
- d) Final approval is given to the proposed development.
- e) Monitoring in accordance with the Written Developers Agreement.

<sup>2</sup> These examples are from [Town of Babylon Zoning Law](#) (Downtown Copiague).

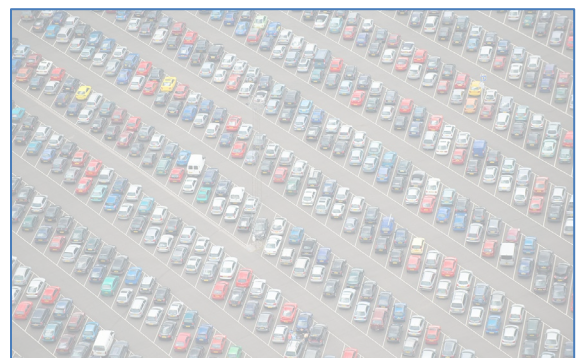
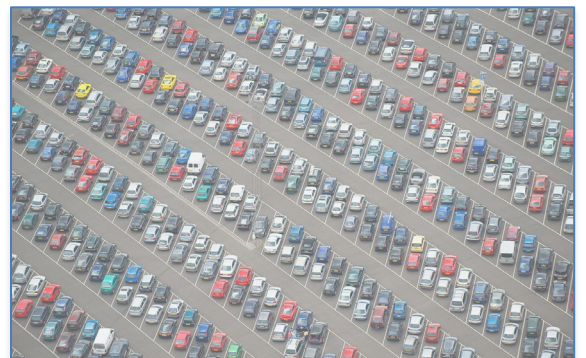
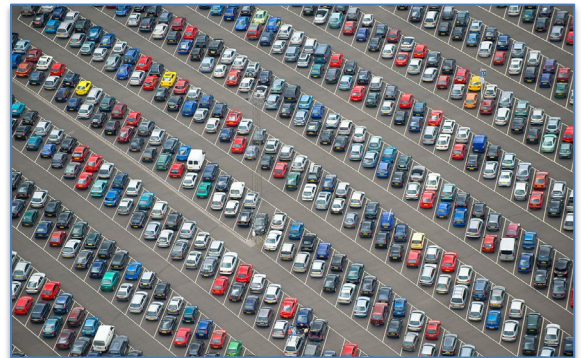
<sup>3</sup> One quarter mile is approximately a five minute walk.

## VI. APPLICABILITY:

The provisions of this Article can be applied TODs or to any development that has desirable locational criteria for multi-family housing and mixed-use buildings, such as:

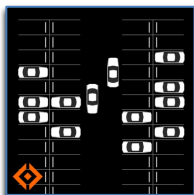
Convenient location, within one-quarter mile of:

- 1) Public transportation
- 2) Hamlet area that provides:
  - a) Central Business District
  - b) Mixed use retail centers
  - c) Community facilities
  - d) Multi-modal public transportation
  - e) Recreational open space
- 3) Access to public utilities:
  - a) Public Water
  - b) Public Waste Water Treatment
- 4) Existing zoning for multi-family or mixed-uses
- 5) Compatibility with surrounding zoning and land uses



## VII. SEVERABILITY – Conflicts with other provisions.

- a) If any clause, sentence, paragraph, subdivision, section or other part of this article shall for any reason be adjudged by any court of competent jurisdiction to be unconstitutional or otherwise invalid, such amendment shall not affect, impair or invalidate the remainder of this article, and it shall be construed to have been the legislative intent to enact this article without such unconstitutional or invalid parts therein.
- b) If any portion of this article is found to be in conflict with any other provision of any other local law or ordinance of the Code of the [Name of the adopting local government], the provision which establishes the higher standard shall prevail.



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### APPENDIX

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## APPENDIX

### References and Notations for Parking Stall Reduction Percentages

#### **Bicycle Lockers:**

Under section 3-26: *Off-Street Parking Requirement*, Point E.1, it provided a chart for “Percent of Required Automobile Parking” for Residential Uses (Multifamily apartment complexes and Timeshares) and Non-Residential Uses. The purpose is to use bicycles instead of cars. Multifamily apartment complexes and Timeshares are 10% reduction each. Non-Residential Uses range from 2.5%-20% reduction.

**Bicycle Lockers (Enclosed Bike Stations)      multifamily=10%,                      10%**

“Reduce requirements 5-15% in very walkable and bikeable areas, and substitute bike parking for up to 10% of car parking.”

<https://www.planetizen.com/node/92360/reduced-and-more-accurate-parking-requirements>  
<https://www.codepublishing.com/WA/PortOrchard/#!/PortOrchard20/PortOrchard20124.html#20.124.130>

#### **Bus Stop Turn-Off and Shelter:**

Under section 18.38.180 *Administrative Modifications*; point B, talks about the increase or decrease of required parking spaces that are between ten percent and forty percent. The request would be done by the project applicant so the Director would consider. In the request, it should include “application fee, and any evidence and reports, prior to any final, discretionary approvals, such as land use approval, environmental review, or construction permits. Under points 2a and 2b, it mentioned percentage of parking. Any site and use characteristics under 20% would be site and proximity for transit infrastructure and transit times; bicycle and pedestrian infrastructure, parking opportunities that are shared and combined, and “Employee or customer density and transportation usage and patterns.” Requests between 20% and 40% would “provide the contents of a twenty percent or less request,” a transportation engineer that is licensed in the state of Washington needs to prepare and show a parking demand study that supports for more parking, if increases. Also, if it decreases, the site needs to be shown where it is or within 6 months of occupancy will be within a one-quarter-mile walk to transit service. Intercity Transit needs to verify. The site needs to be more than 300 feet from a single residential zone.

**Bus Stop Turn-Off and Shelter**

**10-20% or 21-40%**

#### **Cash-out Programs:**

“Parking cash out is an arrangement in which an employer offers employees cash in lieu of a parking space. One study of parking cash out (Shoup, 1997) showed that carpooling at eight companies increased from 14 to 23 percent when parking cash out was implemented.” (From source 4 above.)

[http://www.bestworkplaces.org/pdf/carpool\\_June07.pdf](http://www.bestworkplaces.org/pdf/carpool_June07.pdf)

**Covenanted; Pre-Tax benefit:**

Under 30.32.070-Reduction of Parking Requirements section, it provided charts. One chart talked about requirements for parking space reduction. There are projects that need to meet some criteria. Another chart measures and point value for *Transportation Demand Management (TDM)*. A third chart shows % of reduction and the Point Thresholds. The percentage of reduction depends on point thresholds and incentive categories. To get 10% reductions, the point threshold is between 6-9 points. For 20% reduction the point threshold is between 10-14 points and “from at least 3 incentive categories.” For 30% reduction, the point threshold is 15 or more and “from at least 4 incentive categories including 1 parking or financial incentive.” (Pages 143-146). \*Note: 30% wasn’t mentioned on the excel chart.

**Commuter Pre-Tax benefit: 10-20%**

Parking Transportation Allowances: *Transportation allowances are provided directly to employees, who can then choose to purchase parking, buy transit passes, carpool, or keep the money.* (<https://ops.fhwa.dot.gov/publications/fhwahop12026/fhwahop12026.pdf>)

**Easement for Sharing Parking and Cross Access Agreement:**

It does mention that there are 20% and 30% reductions. Up to 20% reduction would be towards any areas that have different peak-day or peak-hour within the same parking facilities and up to 30% reduction would be towards “Child care facilities, houses of worship, recreational uses, restaurants, civic centers, libraries, schools, and theaters.” (Pages 14-15)

The second source also opens. Under section 10.100.020 *Access and Street Connectivity*: Points 1.b.v. up to 20% reduction can be permitted, depending when the peaks occurs.

**Cross Access (Shared Parking) Agreement 20-30%,20%**

“Cooperative parking is common in State of Washington communities where a 20% reduction of the total combined required parking is allowed. The City of Des Plaines allows for cooperative parking, allowing for a 25% reduction when 4 or more uses are included or a 15% reduction when 3 uses are included.”

<https://www.westmont.illinois.gov/AgendaCenter/ViewFile/Item/1142?fileID=1455>

Depends on the differences in peak demands with other land use. 20-40% reductions are often possible.

<https://www.planetizen.com/node/92360/reduced-and-more-accurate-parking-requirements>  
[https://library.municode.com/fl/ormond\\_beach/codes/land\\_development\\_code?nodeId=LAND\\_DEVELOPMENT\\_CODE\\_CH3PEST\\_ARTIIIIOREPACILO\\_S3-27REPASP](https://library.municode.com/fl/ormond_beach/codes/land_development_code?nodeId=LAND_DEVELOPMENT_CODE_CH3PEST_ARTIIIIOREPACILO_S3-27REPASP)

**HOV Preferred Parking:**

Under 17.57.050 *Special Provisions* Point C.3, offices or industrial that offer preferred parking spaces to employees that carpool or vanpool. By carpooling or vanpooling, this could decrease the amount of spaces. There will be a max of 2% reduction. (Ord. 508 (part), 1983)

**HOV Preferred Parking (Primary Parking) 2%**

### **Metered Parking:**

San Francisco Municipal Transportation Agency (SFMTA) has four ways to manage on-street parking. It will make “it easier to park, reducing congestion and illegal parking, improving Muni’s speed and reliability, and increasing public safety and economic vitality.” The four ways are *Parking Meters*, *Residential Parking Permits (RPP)*, *Posted Time Limits*, and *Color Curb Regulations*. (Page 2)

- 1) **Parking Meters** will be used in “commercial areas (downtown, neighborhood commercial districts, mixed use areas, and standalone businesses); public spaces and facilities that are major trip generators (parks, hospitals, universities, sports venues, concert halls, or transit stations); major transportation corridors; and high-density residential areas or buildings.”
- 2) **Residential Parking Permits (RPP)** goal is not to have commuters or visitors park long-term in low-density areas or buildings.
- 3) **Posted Time Limits** are parking demand that does not require parking meters or not ideal to put parking meters.
- 4) **Color Curb Regulations** is when colors represent a specific kind of parking. Blue is disabled parking, white is passenger loading, yellow is commercial loading, green is time limited parking, or red is no parking.

According to the website, the definition of Parking Availability is “the percentage of legal parking spaces in an area that are not in use at a given.” An example provided was “a block 20 spaces where 18 are occupied and two empty has a parking availability of 10 percent.” (Page 5 subtext.)

Also according to the website, *Parking Turnover* “is a consequence of maintaining parking availability.” Turnover is also when “the number of cars that park on a block or blockface over some period of time.” An example provided was “if there were ten spaces on a blockface and a total of twenty cars parked in these spaces over a period of 8 hours then the average turnover per space would be  $2.0/8.0 = 0.25$  cars per hour per space. (Page 5 and subtext)

<https://www.sfmta.com/sites/default/files/reports-and-documents/2017/12/20120828sfmtapoliciesforon-streetparkingmanagement.pdf>

Parking demand management strategies will have different policies and programs that are made to “reduce parking demand, preserve parking for certain trip types and users, and promote a shift from single occupant vehicle (SOV) trips to transit , pedestrian, and bicycling trips. Parking pricing and supply-side are part of the Parking demand management. Parking pricing is “charging a fee for parking” and an example provided was “introducing or raising parking fees in areas of high parking demand such as a central business district (CBD), employment areas, and retail centers.” Parking supply strategies is “the supply of available parking to achieve a desired outcome” and an example provided was “Parking time limits (2-hour maximum parking).” (Page 1.)

There were effectiveness to the parking demand management strategies:

- 1) “For every 1% increase in parking price, parking demand will typically decrease by 0.1% to 0.6% (with 0.3% being the most frequently cited value).” (6 *Transit Cooperative Research Program (TCRP) Report 95*. “Chapter 13: Traveler Response to Transportation System



Changes: Parking Pricing and Fees.” 2004. p. 13-4

[http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp\\_rpt\\_95c13.pdf](http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_95c13.pdf).)

- 2) “In general, the user cost of parking has a larger impact on SOV mode share, than the available supply or allowed time limit of parking. A highly-correlated inverse relationship ( $r=-0.88$ ) exists between increasing on-street meter charges and decreasing SOV use, with similar effects observed for off-street monthly rates and daily charges.” (7 *TCRP Report 95*. “Chapter 18: Parking Management and Supply.” 2003. p. 18-30. ) & (8 Correlation coefficients — indicated by the symbol “ $r$ ” — are measures of the strength of relationship between two variables, and should not be construed as elasticities. They range from 0 to 1 or -1. The closer to 1 or -1, the stronger the relationship, which is inverse if the “ $r$ ” is negative.)

(<http://www.oregon.gov/ODOT/Planning/Documents/Mosaic-Parking-Demand-Management-Pricing.pdf>)

### **Metered Parking**

**1.75%**

“Various researchers have shown that a 10% increase in the price of parking can reduce demand between 3-10%.”

“Lots to Lose.” The Guardian. <https://www.theguardian.com/cities/2016/sep/27/cities-eliminating-car-parks-parking>.

### **Parking Cash Out:**

On page 10, section *Services that Support Implementation*, it has a brief description of Parking Cash Out. Instead of parking space, an employer can offer employees cash. One study was done, (Shoup, 1997), that carpooling was being done at eight companies and showed an increase from 14% to 23% when there was parking cash out.

**Parking Pricing (Peak Pricing):** [demand based?]: *Lot pricing is variable throughout the day, rising during ‘peak’ times with floor and ceiling pricing.* (<https://nextcity.org/daily/entry/san-francisco-demand-based-pricing>)

<https://www.cob.org/Documents/mayor/boards-commissions/fairhaven-parking/todd-litman-parking-pricing-implementation-guidelines-2013.pdf> (pg. 3: % reductions in management tactics)

### **Parking Synergy:**

*Victoria Transport Policy Institute: The Victoria Transport Policy Institute is an independent research organization based in Victoria, British Columbia dedicated to developing innovative and practical solutions to transportation problems.*

q. Pedestrian Access – 5-15%

s. Parking Transportation Allowances [Financial incentives] – 10-30%

u. Parking Time Restrictions [Regulations?] – 10-30%

v. Parking Pricing – 10-30%

**Construction cost per space in selected cities:**

<https://webcache.googleusercontent.com/search?q=cache:5Nm981I2dIJJ:https://www.vtppi.org/tca/tca0504.pdf+&cd=19&hl=en&ct=clnk&gl=us>

**Ride Share Marquee:**

According to the website, **TransitScreen** “displays all your mobility options, at a glance, in real time.” (<https://transitscreen.com/about> - TransitScreen Website)

Having TransitScreen at university/colleges, so it can be more useful for students to get around and use fewer cars throughout campuses. (TransitScreen PowerPoint - Melanie Morris-Suffolk County Community College)

**Transit Info Screens/Ride Share marquee**

**5%**

“We have seen some evidence of behavior changes from TransitScreen, for example, drive-alone commuters decreased by 5% in the San Francisco residential towers we studied.”

“Changing Urban Transportation with Real-Time Screens.” TransitScreen. Transit Blog.

**Ride Share Program:**

**4-10%**

“Parking requirements can be reduced with the inclusion of car-share parking at the rate of 4 spaces per car-share space. Applicant must show documentation of an agreement with a car-sharing organization.”

“The City of Evanston allows a 10% reduction of parking spaces with a long-term lease with a carsharing service. For projects requiring 5 – 10 off-street parking spaces a reduction of one space is allowed. Projects requiring more than 10 off-street spaces are allowed a reduction of 10% of the required parking spaces.”

<https://www.westmont.illinois.gov/AgendaCenter/ViewFile/Item/1142?fileID=1455>

[http://www.bestworkplaces.org/pdf/carpool\\_June07.pdf](http://www.bestworkplaces.org/pdf/carpool_June07.pdf)

**Shower Facilities:**

Under section *17.57.050 Special Provisions* Point C.1, talked about developments that have one hundred or more employees will provide showers and clothing locker facilities for any employees that rides their bicycles to work. This may reduce parking requirement. “Two percent of required parking or five spaces, whichever is greater.”

**Shower Facilities (Locker Rooms)**

**2%**

**Transit Reduction Percentage: (TRP) based on number of stops/hour      **05%/stop/hr.****

Reduce requirements 10% within ¼ mile of frequent bus service, and 20-50% within ¼ mile of a rail transit station.

<https://www.planetizen.com/node/92360/reduced-and-more-accurate-parking-requirements>

**Transit Service:** Allows for a 15% reduction in required parking spaces for developments within 440 feet of and 10% reduction in required parking spaces within 800 feet of a commuter rail station for fixed route transit with 15-minute minimum headway”

“Village of Highland Park ...allows for a 15% reduction for uses located within 1,000 feet of fixed routes transit service or a commuter rail station.”

<https://www.westmont.illinois.gov/AgendaCenter/ViewFile/Item/1142?fileID=1455>

Los Angeles, California, USA, grants a reduction in the parking requirement of 0.5 stalls per affordable housing unit, with further reductions if the units are within 1,500 feet of high-order transit.

<http://citeseerx.ist.psu.edu/viewdoc/download;jsessionid=B0BB0B022844FC07BA2B4152682E1B7F?doi=10.1.1.377.5225&rep=rep1&type=pdf>

### **Unbundle Parking Costs: (parking fee)**

According to the website, the definition of Unbundled Parking is “the practice of selling or leasing parking spaces separate from the purchase or lease of the commercial or residential use.”

[http://www.qcode.us/codes/santamonica/view.php?topic=9-3-9\\_28-9\\_28\\_110](http://www.qcode.us/codes/santamonica/view.php?topic=9-3-9_28-9_28_110)

### **12.5% reduction (commute trips)**

Reduce requirements 10-20% for unbundling (parking rented separate from building space).

<https://www.planetizen.com/node/92360/reduced-and-more-accurate-parking-requirements>

“Where parking is bundled, meaning packaged in with the cost of renting, auto-ownership is higher and driving alone is 12.5 percent higher for commute trips and 40 percent higher for non-commute trips.”

<https://mobilitylab.org/2018/05/31/unbundling-parking-costs-is-a-top-way-to-promote-transportation-options/>.

However, it does turn out that actual demand goes down 20% or more when you actually price the space at its true cost.

<https://parkingpolicy.com/reduced-requirements/>

### **Additional Sources:**

<http://www.cmap.illinois.gov/documents/10180/96911/StepByStep3.pdf/39fa6452-2e19-4691-87bd-abac8b06c248>

Parking supply is a good way to use the appropriate strategies to better manage the supply. “A desirable occupancy rate is 85 percent, where one or two spaces are open on each block at all times. When parking occupancy rates approach 90 percent, drivers spend extra time searching for parking and add to congestion on the roadways.” Pricing Mechanisms, policies, and practices would be effective. Depending on the community, the strategies will differ. Density

levels, transit access, median income, bicycling and pedestrian infrastructure, access to businesses and services in the local downtown area are going to have an impact on parking management. (Page 18)

<http://50.17.237.182/tdm/pdf/measure/pkg1.pdf>

There is a point system for Unbundle Parking.

### **Frequent Transit Service**

Seattle has a service called *Frequent Transit Service (FTS)*. Under Seattle's code, FTS is "transit service headways [time between scheduled bus arrivals] in at least one direction of 15 minutes or less for at least 12 hours per day , 6 days per week, and transit service headways of 30 minutes or less for at least 18 hours every day."

"Parking strategies for transit-oriented development"

<https://www.masstransitmag.com/40-under-40/article/10286900/parking-strategies-for-transitoriented-development>

From "reduced and more accurate parking requirements"

<https://www.planetizen.com/node/92360/reduced-and-more-accurate-parking-requirements>

### **Chapter 18.100 ACCESS AND CLEAR VISION:**

Under Section 18.100.020 Point 1.b.v it talked about "**shared parking areas**" shall be permitted a 20 percent parking spaces if peak demands do not occur at the same time.

### **Email:**

There was a study done with UC Berkeley and Zipcar. The study showed there were 30% fewer cars on campuses with car sharing.

Parking strategies for transit-oriented development"

<https://www.masstransitmag.com/40-under-40/article/10286900/parking-strategies-for-transitoriented-development>

From "reduced and more accurate parking requirements"

<https://www.planetizen.com/node/92360/reduced-and-more-accurate-parking-requirements>

A website called Parking Requirement Adjustments Factors. This website provided typical adjustments for different factors. One factor was Car sharing and it was to see if there was any services close by a building. If there any services onsite, there would be a decrease of residential requirements between 10-20%, but if it was close by, there would be a decrease of between 5-10%.

A bill that was introduced by Bridget Fleming, a Suffolk County Legislator, saying that in Suffolk County, the rideshare services would not be in use, unless local municipalities would get back 4% surcharge, which it is going towards NYS general fund.

**Article-“Legal Lessons”:**

In the article, it talked about two cities, Buffalo, New York and Hartford, Connecticut. In Buffalo, there was a new zoning done by the City Council that buildings that are smaller than 5,000 square feet, it can have minimum parking. Buildings bigger than 5,000 square feet must still provide parking, but applicants must fill out a form to see many spaces are required. This adoption was done in December 2016.

In Hartford, the zoning code was redone by the Planning & Zoning Commission. In every downtown building and retail service would decrease parking minimums. Hartford would enforce a maximum to parking property owners that they could provide. This adoption was done in January 2016.

**511NY Ride Share:** Membership based commuter organization providing carpooling organization, transit itinerary, options to commute by bike, and establish telework programs for employers and employees (<https://511nyrideshare.org/>).

**Transit Solutions:** Employer enrollment offers employees access transit benefit program aids in reducing parking demand and reducing payroll tax and employee pre-tax dollars to finance their commute for savings cited up to 40% (<https://www.transitsolutions.org/>).

## Miscellaneous Factors

Factor	Typical Adjustments
<b>Geographic Location.</b> Vehicle ownership and use rates in an area.	Adjust parking requirements to reflect variations identified in census and travel survey data. 40-60% reductions are often justified in Smart Growth neighborhoods.
<b>Residential Density.</b> Number of residents or housing units per acre/hectare.	Reduce requirements 1% for each resident per acre (e.g. 15% where at 15 residents per acre and 30% at 30 res. per acre).
<b>Employment Density.</b> Number of employees per acre.	Reduce requirements 10-15% in areas with 50 or more employees per gross acre.
<b>Land Use Mix.</b> Land use mix located within convenient walking distance.	Reduce requirements 5-15% in mixed-use developments. Additional reductions with shared parking.
<b>Transit Accessibility.</b> Nearby transit service frequency and quality.	Reduce requirements 10% within ¼ mile of frequent bus service, and 20-50% within ¼ mile of a rail transit station.
<b>Car sharing.</b> Whether car sharing services are located within or near a residential building.	Reduce residential requirements 10-20% if car share services are located onsite, or 5-10% if located nearby.
<b>Walkability and bikeability.</b> Walking environment quality.	Reduce requirements 5-15% in very walkable and bikeable areas, and substitute bike parking for up to 10% of car parking.
<b>Demographics.</b> Age and physical ability of residents or commuters.	Reduce requirements 20-40% for housing occupied by young (under 30), elderly (over 65) or disabled people.
<b>Income.</b> Average income of residents or commuters.	Reduce requirements 10-20% for the 20% lowest income households, and 20-40% for the lowest 10%.

<p><b>Housing Tenure.</b> Whether housing is owned or rented.</p>	<p>Reduce requirements 20-40% for rental versus owner occupied housing.</p>
<p><b>Pricing.</b> Parking that is priced, unbundled or cashed out.</p>	<p>Reduce requirements 10-30% for cost-recovery pricing (i.e. fees that pay the full cost of parking facilities), and 10-20% for unbundling (parking rented separate from building space).</p>
<p><b>Sharing/overflow.</b> Ability to share parking facilities with other nearby land uses.</p>	<p>Depends on the differences in peak demands with other land use. 20-40% reductions are often possible.</p>
<p><b>Parking &amp; Mobility Management.</b> Parking and mobility management programs implemented at a site.</p>	<p>Reduce requirements 10-40% at worksites with effective parking and mobility management programs.</p>
<p><b>Design Hour.</b> Number of allowable annual hours a parking facility may fill.</p>	<p>Reduce requirements 10-20% if a 10<sup>th</sup> annual design hour is replaced by a 30<sup>th</sup> annual peak hour. Requires overflow parking plan.</p>
<p><b>Contingency-Based Planning.</b> Use lower-bound requirements, and implement additional strategies if needed.</p>	<p>Reduce requirements 10-30%, and more if a plan exists indicating the responses that will be deployed if the number of parking spaces initially built is insufficient in the future.</p>

# Parking Stall Demand Reduction



END