



***Cars Need a Home Too:
Principles of
Parking in the
Livability
Community***

Overview of
Fundamentals



Cars Need a Home Too: Principles of Parking in the Livability Community

Jason Schrieber, Nelson\Nygaard















Davis Square Station, Somerville MA

- No parking provided
 - o 66% arrive by foot
 - o 21% take the bus
 - o 13% use cars



From 1977-1987, vacancies increased 20%.

Today there are 0 vacancies.



12,000 Daily Boardings



Outliving Mobile Communities with Transit

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RAINS AND CONCOURSE SHOPPING

RED LINE





PASSENGER DROP OFF / PICK UP





Alewife Station, Cambridge MA

- 2,000 car garage
- No on-street parking
- Top 20 congested intersection



Alewife Station, Cambridge MA



- Only active at rush hour
- One restaurant
- Crime & homelessness

11,000 Daily Boardings



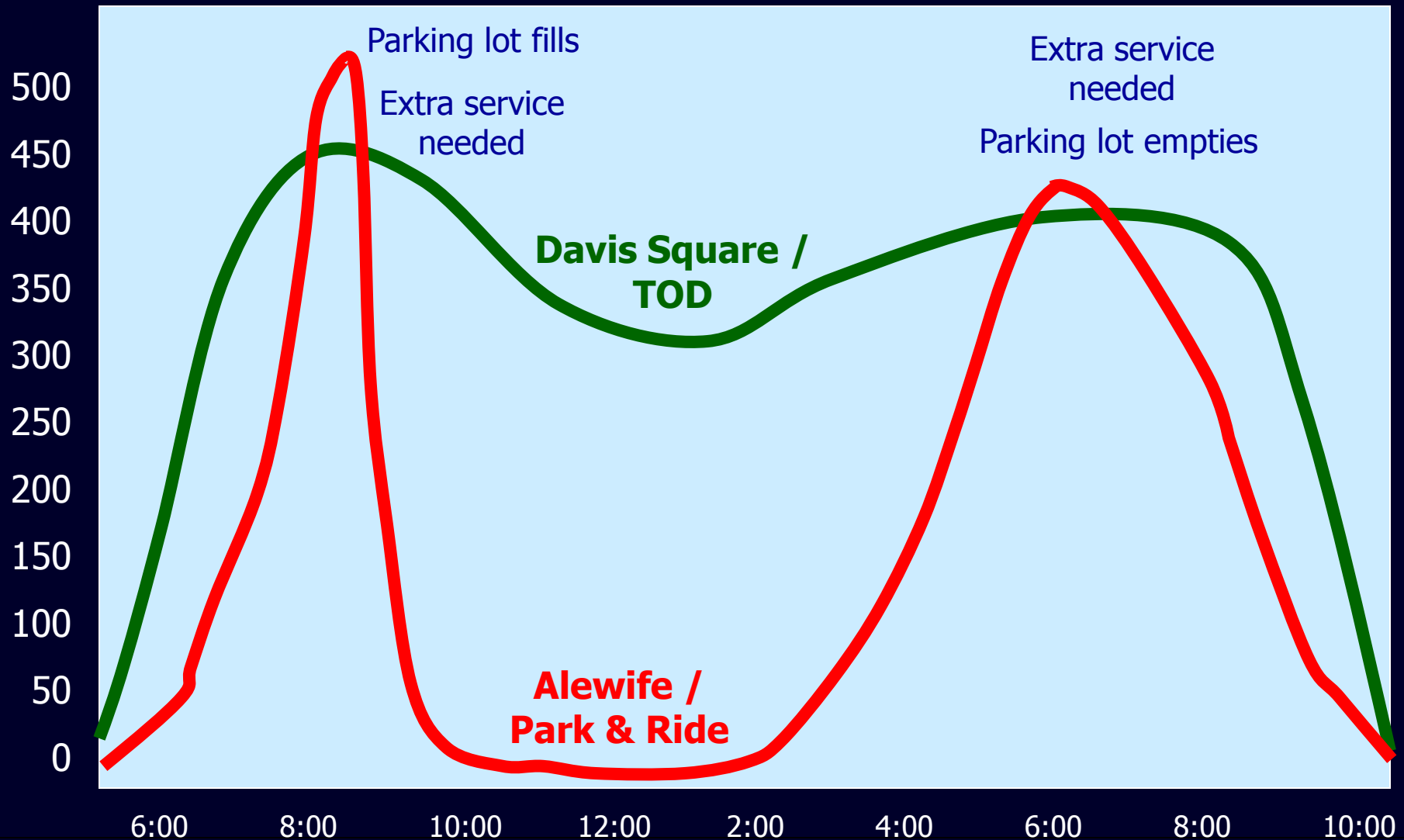
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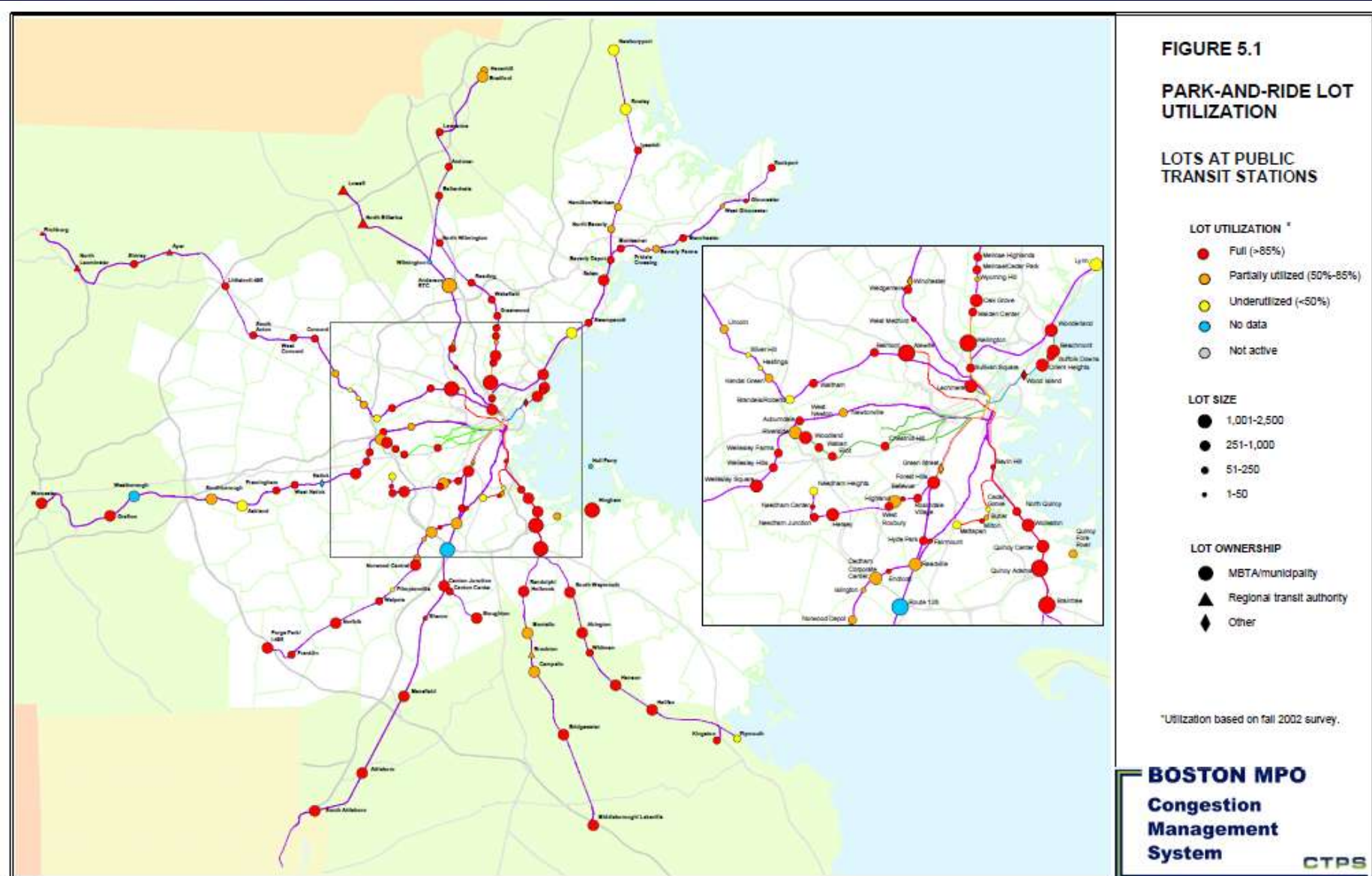
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Ridership Profiles

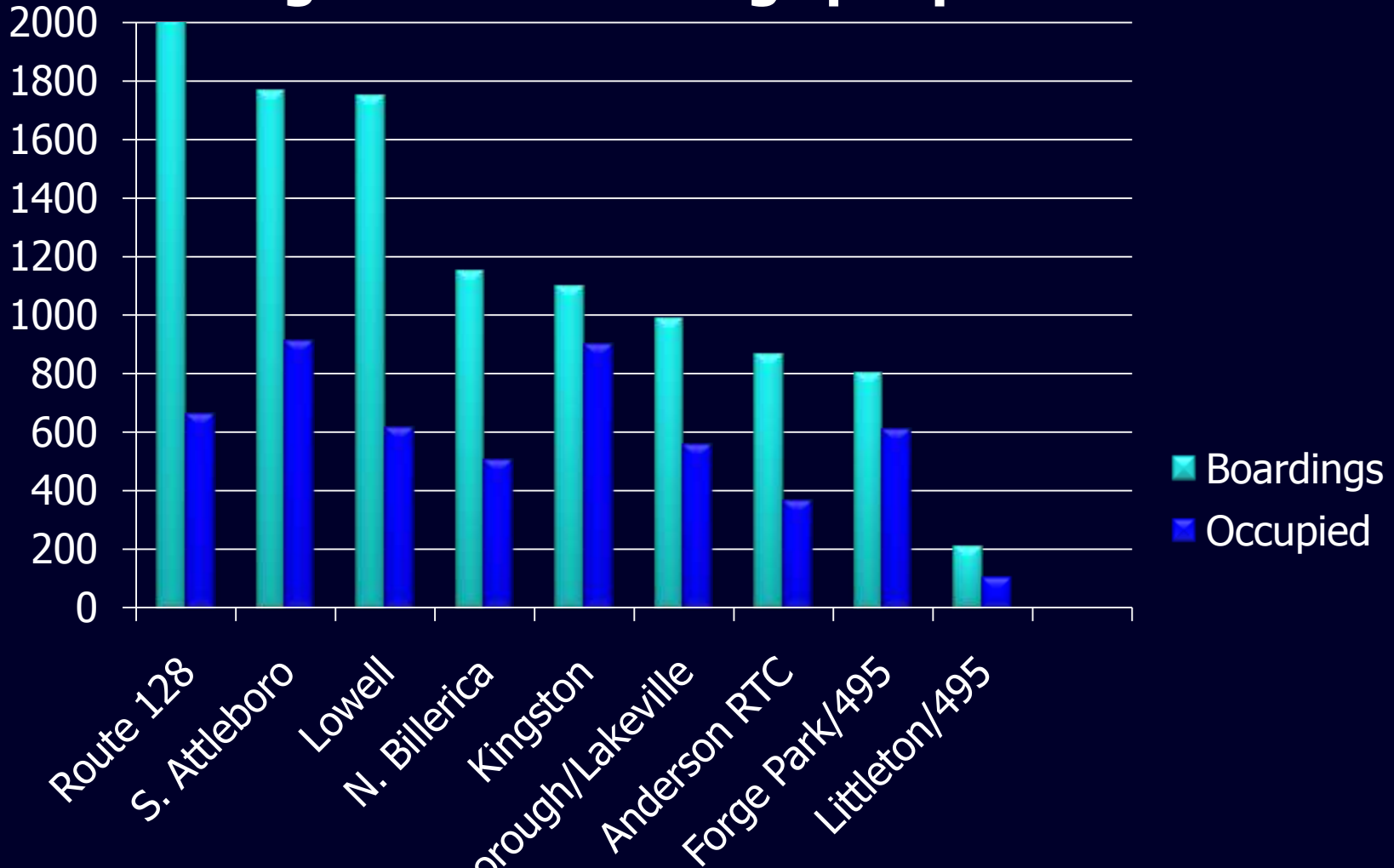


2005 Park & Ride Utilization Counts



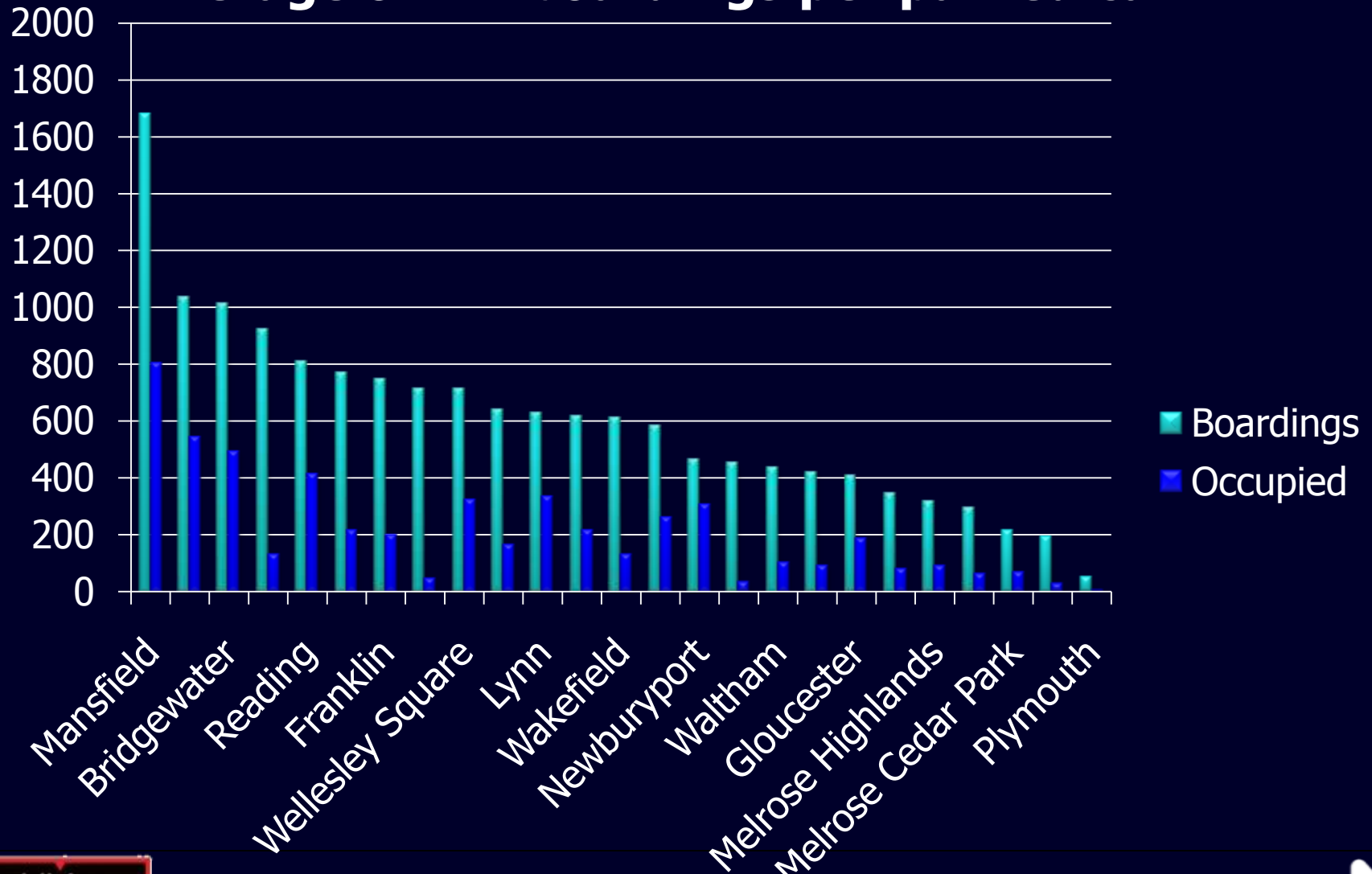
MBTA Commuter Rail: Park & Ride Stations

Average of 1.9 boardings per parked car



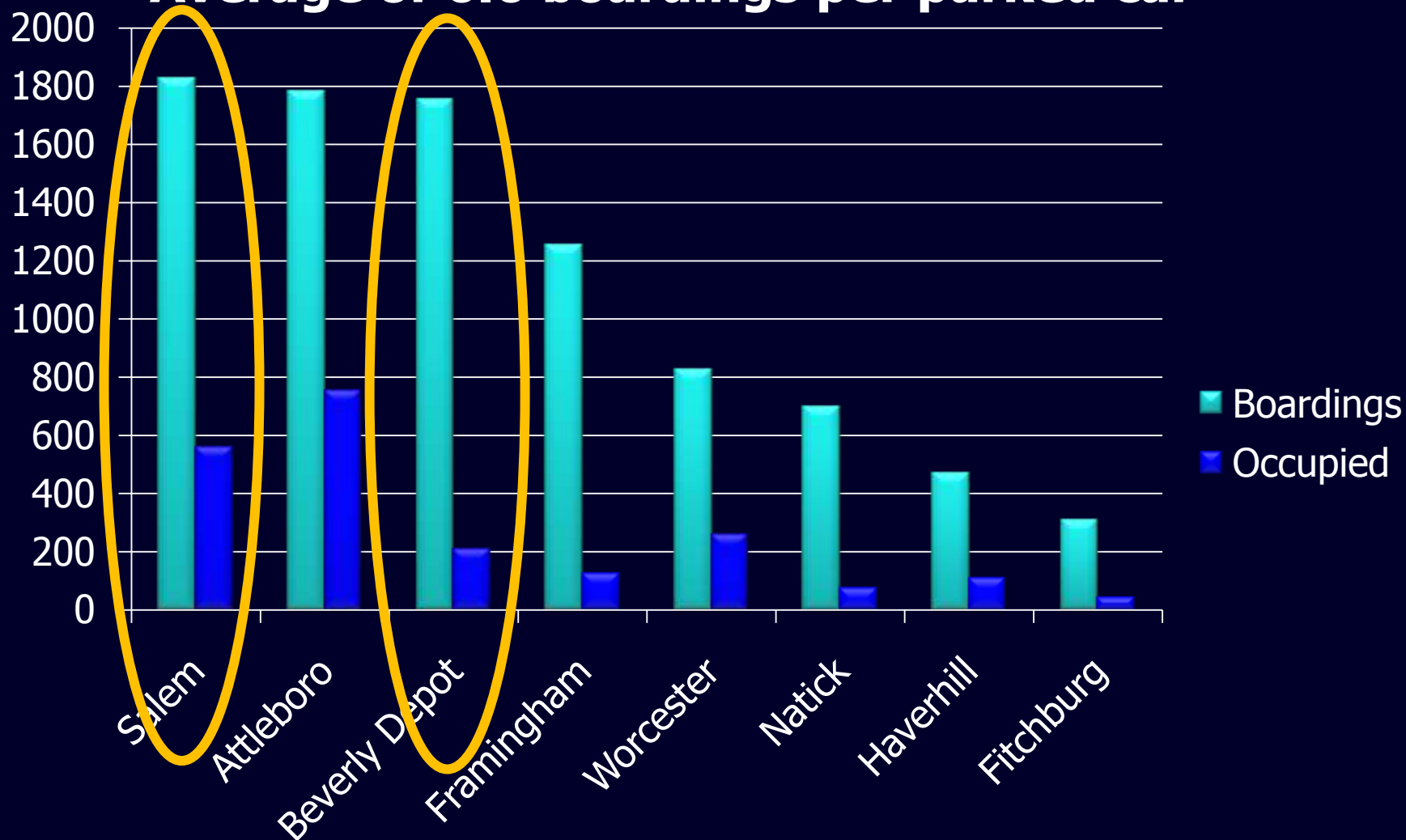
MBTA Commuter Rail: Village Settings

Average of 4.7 boardings per parked car



MBTA Commuter Rail: Downtowns

Average of 6.6 boardings per parked car



Parking Wastes Money



What Does a Parking Space Cost?



Bayview Medical Center Garage



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Monthly Cost Per Parking Space

Assume:

- \$20,000 per space added
- 7% interest
- 40 year lifespan

Equals:

- \$125 per space per month

Operating Costs:

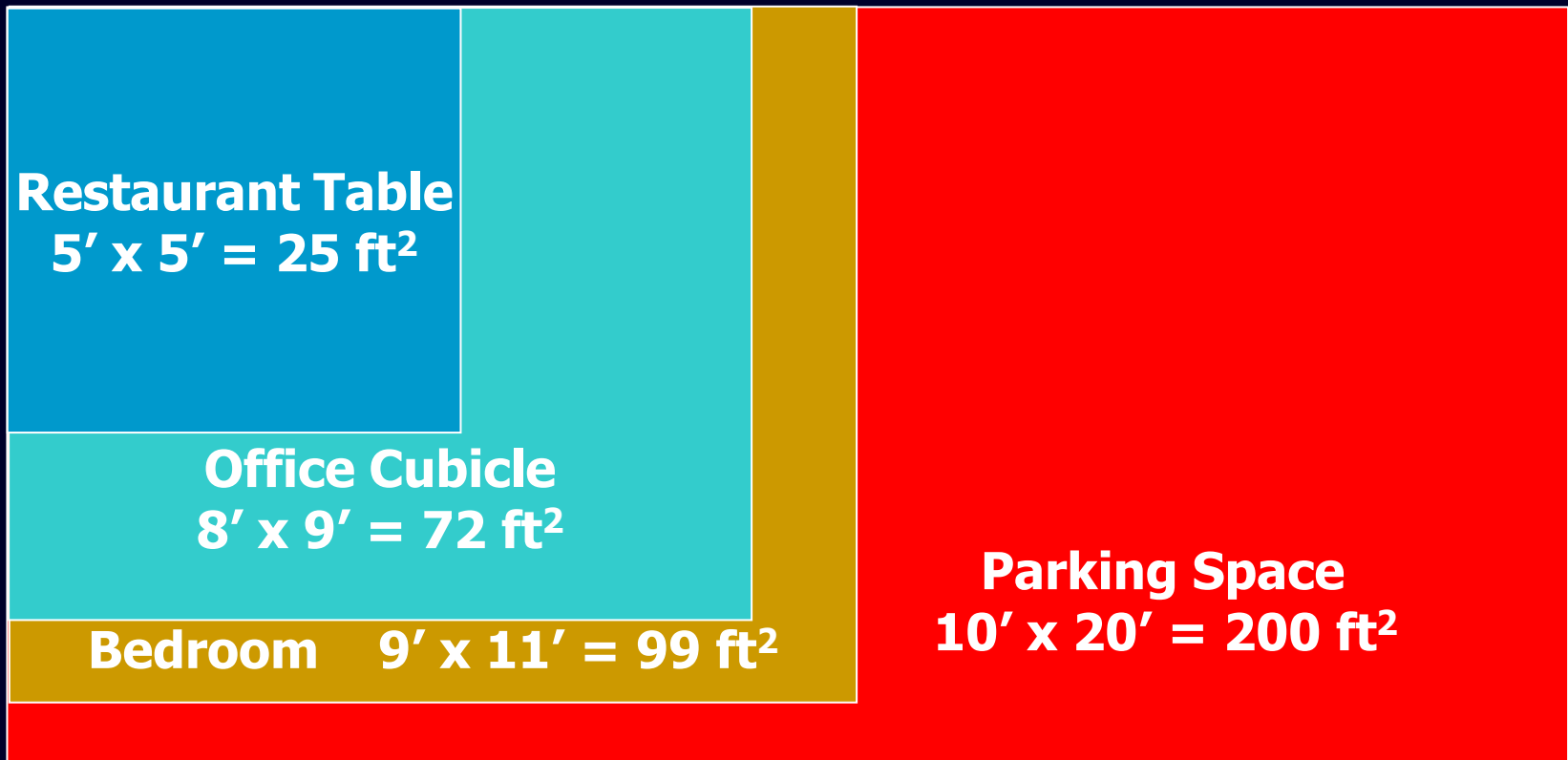
- Includes cleaning, lighting, maintenance, etc.
- National average: \$300 per space/month (minimum)

Total Cost:

- \$150 per space per month
- Parking price \$0/mo.
- = Cost to Employer \$150**
- (or \$7/day per commuter)**

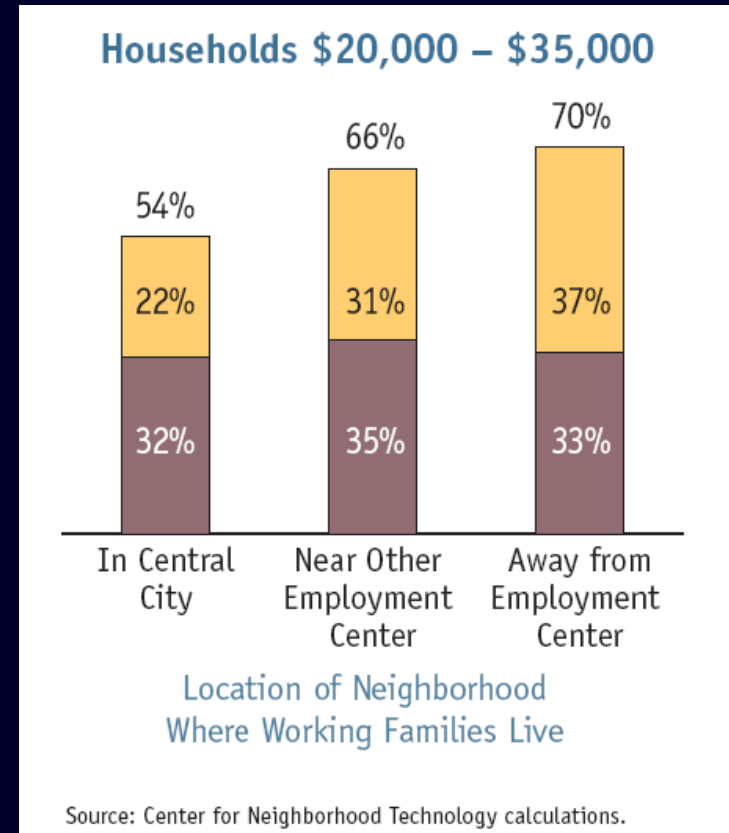


Parking Wastes Land



Parking Worsens Housing Affordability

- For each parking space required in a residential unit:
 - Price of unit increases 15-30%
 - Number of units that can be built on typical parcel decreases 15-25%
- Working families spend more on transportation than housing in auto-oriented suburbs.
- No accommodation for car-free households: Getting rid of a car = extra \$100,000 in mortgage
- At >300 sq ft, each parking space consumes more space than an efficiency apartment



Sources: "A Heavy Load: The Combined Housing and Transportation Burdens of Working Families," Center for Neighborhood Technology, 2006. "The Affordability Index: A New Tool for Measuring the True Affordability of a Housing Choice," Center for Neighborhood Technology, 2008. Sedway Cook studies of parking and housing costs in San Francisco and Oakland.

An aerial photograph of a large parking lot filled with numerous cars, primarily in red, white, and black. The cars are parked in rows, with some spaces left empty. The perspective is from directly above, looking down at the vehicles.

Parking Standards

Edited by
Michael Davidson and Fay Dolnick



American Planning Association



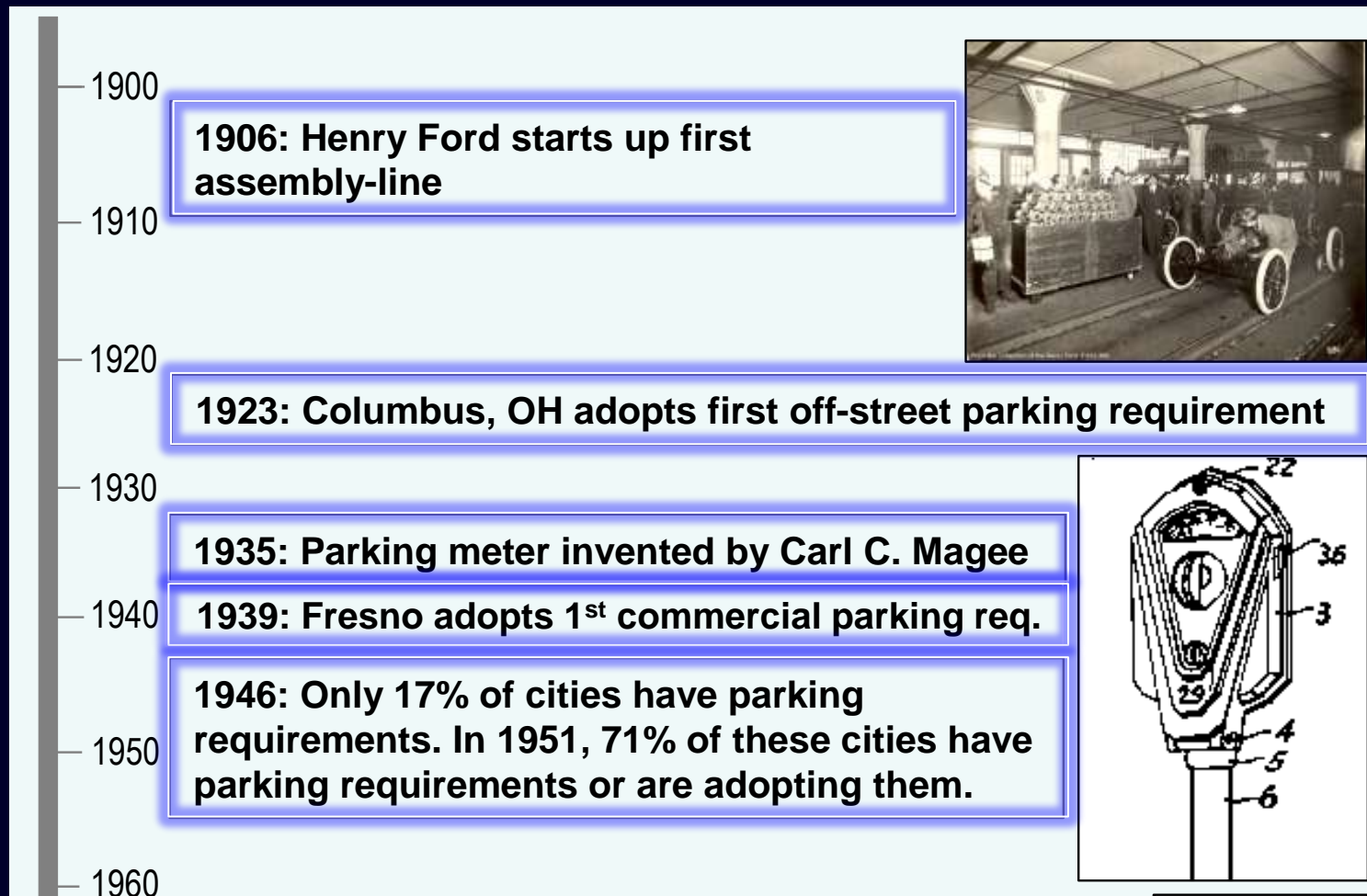
Planning Advisory Service
Report Number 1100-11

Rail-Volution

Outfitting Mobile Communities with Transit

N
NELSON
NYGAARD

A brief history of parking requirements



An aerial photograph of a large parking lot filled with cars. The cars are mostly white, red, and black, arranged in various patterns, some in rows and others more haphazardly. The background is a solid dark blue.

Parking Standards

Edited by
Michael Davidson and Fay Dolnick



American Planning Association



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ALL USES

a

abattoir (*see* slaughterhouse)
 accessory dwelling unit
 administrative office (*see* office uses)
 adult use
 adult use, adult arcade
 adult use, adult cabaret
 adult use, adult motion picture theater
 adult use, adult theater
 adult use, book store
 adult use, entertainment facility
 adult use, massage parlor (*see also* massage establishment)
 adult use, sex novelty shop
 advertising agency (*see also* office use)
 agricultural use, unless otherwise specified (*see also* farm uses)
 agricultural processing plant (*see also* industrial uses)
 agricultural-related industry (*see also* agricultural use, unless otherwise specified)
 agricultural sales and service use (*see also* farm supply store; feed store)
 aircraft charter service
 airport (*see also* airport terminal)
 airport hangar
 airport, local/private use
 airport terminal (*see also* airport; transportation terminal)
 ambulance service
 amphitheater (*see also* stadium)
 amusement enterprise (*see also* recreation facility uses)
 amusement enterprise, indoor
 amusement enterprise, outdoor
 amusement park
 amusement park, children's
 amusement park, water
 ancillary use (*see* accessory use)
 animal boarding facility
 animal breeder establishment
 animal grooming salon
 animal hospital
 animal sales establishment (*see* pet shop)
 animal shelter
 animal training facility
 antique shop (*see also* second-hand store)
 apartment (*see* dwelling, apartment uses)
 apartment hotel (*see* extended-stay hotel)
 apparel store (*see* clothing store)
 appliance and equipment repair establishment (*see also* equipment uses)

appliance sales establishment
 aquaculture use
 aquarium
 arboretum (*see also* botanical gardens; community garden)
 arcade, amusement (*see also* amusement enterprise uses)
 archery range (*see also* rifle range; shooting range)
 arena (*see* stadium)
 armory
 art gallery (*see also* cultural uses)
 art school (*see* educational facilities; school for the arts)
 art supplies store
 artisan workshop (*see also* live-work studio)
 artist studio (*see also* artisan workshop; live-work studio)
 asphalt manufacturing facility (*see also* industrial use, heavy)
 assembly hall (*see also* auditorium; civic center)
 assisted living (*see* elderly housing; assisted living)
 asylum (*see* mental health facility)
 athletic field (*see also* ball field; grandstands; recreation facility uses)
 auction, automobile
 auction house
 auditorium (*see also* assembly hall; civic center)
 automated teller machine (ATM)
 automated teller machine (ATM), exterior, on bank property
 automobile convenience store (*see* gas station; mini-mart)
 automobile dealership (*see also* motor vehicle sales establishment)
 automobile graveyard (*see* automobile salvage yard; junk yard)
 automobile impound facility (*see also* towing service)
 automobile laundry (*see* car wash uses)
 automobile maintenance, quick service establishment (*see also* automobile repair service establishment)
 automobile mail (*see* automobile dealership uses)
 automobile parts store
 automobile rental establishment (*see also* motor vehicle rental establishment)
 automobile repair service establishment (*see also* gas station; motor vehicle repair service establishment; fire store and

service establishment)
 automobile salvage yard (*see also* junk yard)
 automobile service station (*see also* gas station)
b
 bait shop (*see also* retail use, unless otherwise specified)
 bakery
 bakery, wholesale
 ball field (*see also* athletic field; grandstands; recreation facility uses)
 ballroom (*see also* banquet hall; dance hall)
 bank (*see also* accessory banking; automated teller machine (ATM); credit union)
 bank, drive-thru only (*see also* drive-thru use, unless otherwise specified)
 bank, with drive-thru (*see also* drive-thru use, unless otherwise specified)
 bank, without drive-thru
 banquet hall (*see also* ballroom; dining room; meeting hall)
 bar (*see also* beer garden; bottle club; brew pub; night club)
 barber shop (*see also* beauty shop; personal services establishment)
 baseball field (*see* ballfield)
 basketball court
 batch plant (*see* concrete production plant)
 bathhouse (*see also* health spa; sauna bath)
 batting cage facility
 beach, commercial
 beach, community
 beauty shop (*see also* barber shop; personal services establishment)
 beauty school (*see also* educational facility; trade school)
 bed and breakfast home
 bed and breakfast inn (*see also* tourist home)
 beer garden (*see also* outdoor seating area)
 bicycle rental and repair shop
 bicycle repair shop
 bicycle sales shop
 billiard hall (*see* pool hall)
 big box retail establishment (*see also* department store; shopping center uses)
 bingo hall
 blood donor center
 blueprinting shop (*see also* copy shop; printing and publishing facility)
 boarding house (*see also* lodging house; rooming house)

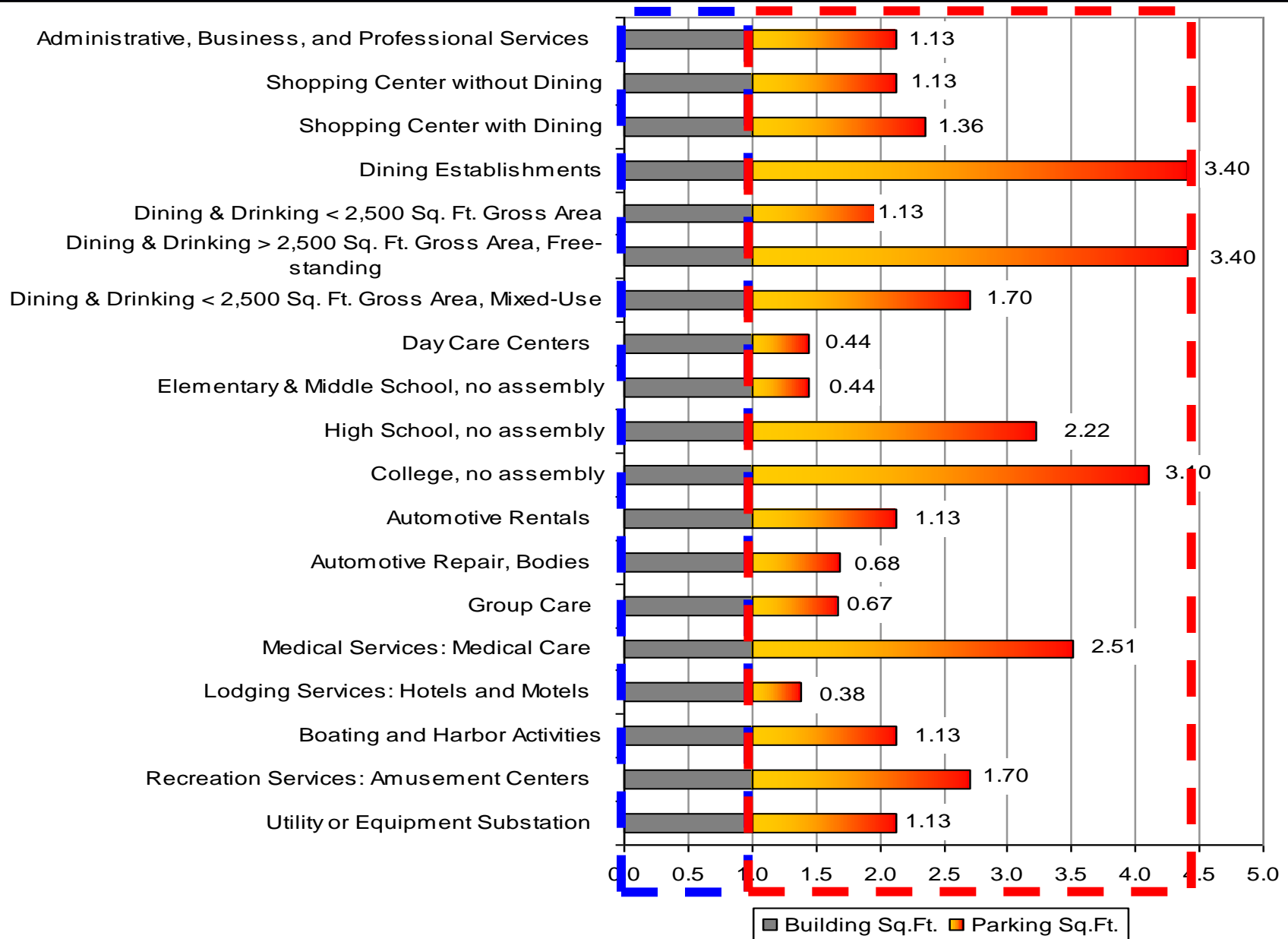
TABLE 3-4

PATAPHYSICAL PARKING REQUIREMENTS

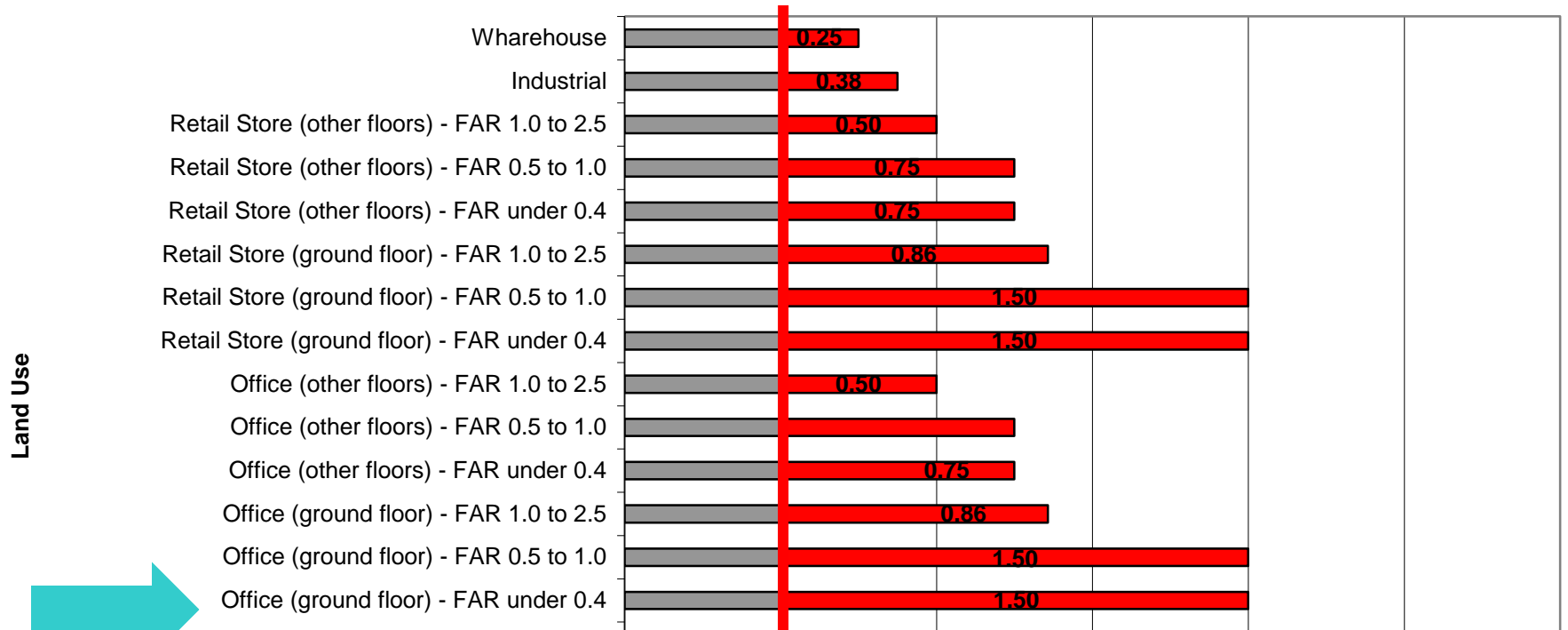
Land use	Parking requirement
Adult entertainment	1 space per patron, plus 1 space per employee on the largest working shift
Barber shop	2 spaces per barber
Beauty shop	3 spaces per beautician
Bicycle repair	3 spaces per 1,000 square feet
Bowling alley	1 space for each employee and employer, plus 5 spaces for each lane
Gas station	1.5 spaces per fuel nozzle
Health home	1 space per 3 beds and bassinets, plus 1 space per 3 employees, plus 1 space per staff doctor
Heating supply	3.33 spaces for every 1,000 square feet of sales and office area, plus 2 spaces per 3 employees on the maximum shift, plus 1 space for every vehicle customarily used in operation of the use or stored on the premises
Heliport	1 space per 5 employees, plus 5 spaces per touchdown pad
Machinery sales	1 space per 500 square feet of enclosed sales/rental floor area, plus 1 space per 2,500 square feet of open sales/rental display lot area, plus 2 spaces per service bay, plus 1 space per employee, but never less than 5 spaces
Mausoleum	10 spaces per maximum number of interments in a one-hour period
Nunnery	1 space per 10 nuns
Rectory	3 spaces per 4 clergymen
Swimming pool	1 space per 2,500 gallons of water
Taxi stand	1 space for each employee on the largest shift, plus 1 space per taxi, plus sufficient spaces to accommodate the largest number of visitors that may be expected at any one time
Tennis court	1 space per player

Sources: Planning Advisory Service (1964, 1971, and 1991); Witheford and Kaman (1972)

Ventura CA



Brookline Off-Street Parking Requirements



2- Story Office Building

■ Building Sq Ft

■ Parking Sq Ft

Rail-Volution

Eliminate Minimum Parking Requirements

These cities have abolished parking requirements, allowing market-based parking supply:

- Coral Gables, FL
- Eugene, OR
- Fort Myers, FL
- Fort Pierce, FL
- United Kingdom
(entire nation)
- Los Angeles, CA
- Milwaukee, WI
- Olympia, WA
- Portland, OR
- San Francisco, CA
- Stuart, FL
- Seattle, WA
- Spokane, WA



Eliminate Minimum Parking Requirements

	SOV	Transit
• Pittsburgh, PA	32%	45%
• San Francisco, CA	39%	39%
• Madison, WI	71%	5%
• Phoenix, AZ	72%	20%
• Indianapolis, IN	74%	6%
• San Antonio, TX	80%	3%
• Winston-Salem, NC	90%	8%
• Greenville, SC	99%	0.5%

Source: TCRP Report 95, Traveler Response to Transportation System Changes, Chapter 18: Parking Management & Supply



Arlington County



Development Patterns, 1960s – 1970s

- Loss of status as Northern Virginia's main retail district
 - Depressed retail sales
 - Declining population as families moved to the suburbs
 - Disinvestment in residential neighborhoods, absentee landlords, land speculation
- New shopping centers emerging instead in Fairfax County
- Large scale office development and increasing employment in Rosslyn





M Rosslyn

M Courthouse

M Clarendon

M Virginia Square

M Ballston

NORTH

FAIRFAX DRIVE

WILSON BLVD

Arlington VA



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Arlington VA: Clarendon Metrorail Station



Avoid Parking Oriented Development



Ground floor devoted to restaurant space, not a blank façade.



Upper floors of the garage look like a normal building.



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No Park-and-Ride

- All parking charged at market-rate
- Prepaid ParkSmart debit cards can be used to pay for metered parking
- Parking brochure
 - Locations of all public on- and off-street parking in the 5 villages
 - Information on alternative transportation options



PARKING
IN THE ROSSLYN-BALLSTON
CORRIDOR

*A Guide to Parking Places and
Other Information for
Visiting and Shopping In*

ROSSLYN
COURT HOUSE
CLARENDON
VIRGINIA SQUARE
BALLSTON

Short-term meter rate: 75¢ / hour
12-hour meter rate: 50¢ / hour
FREE everyday after 6 pm
FREE all day Sunday
FREE at designated meters Saturday

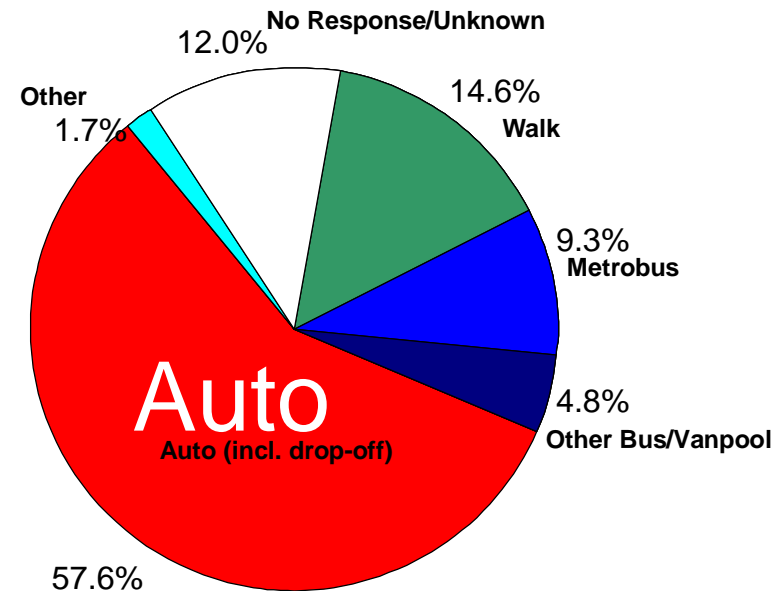
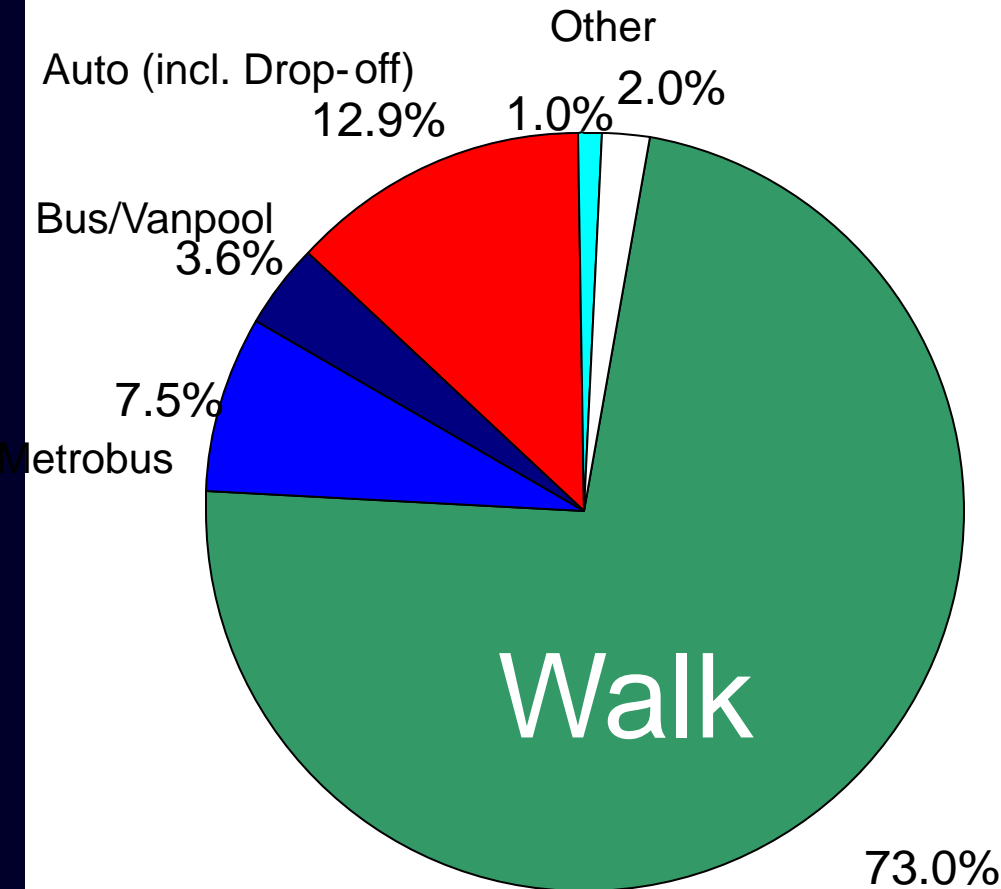
YELLOW	SILVER	BLUE	RED	GREEN
1/2 hour	1 hour	2 hours	4 hours	12 hours



RB Corridor Arlington vs. Fairfax County

39,500 daily boardings

29,250 daily boardings



Source: WMATA May 2002 weekday Metrorail ridership and access data



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SHARED PARKING



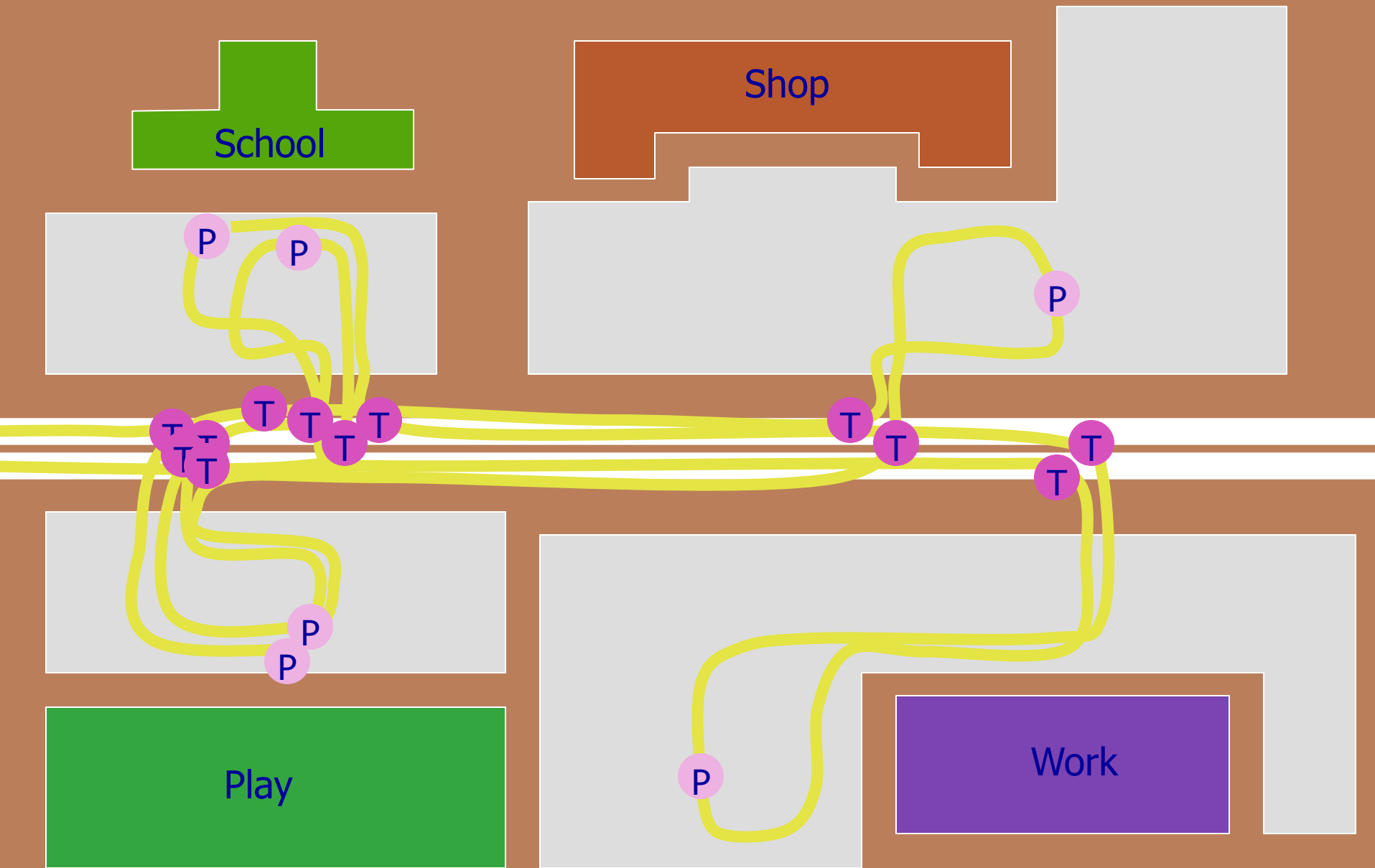
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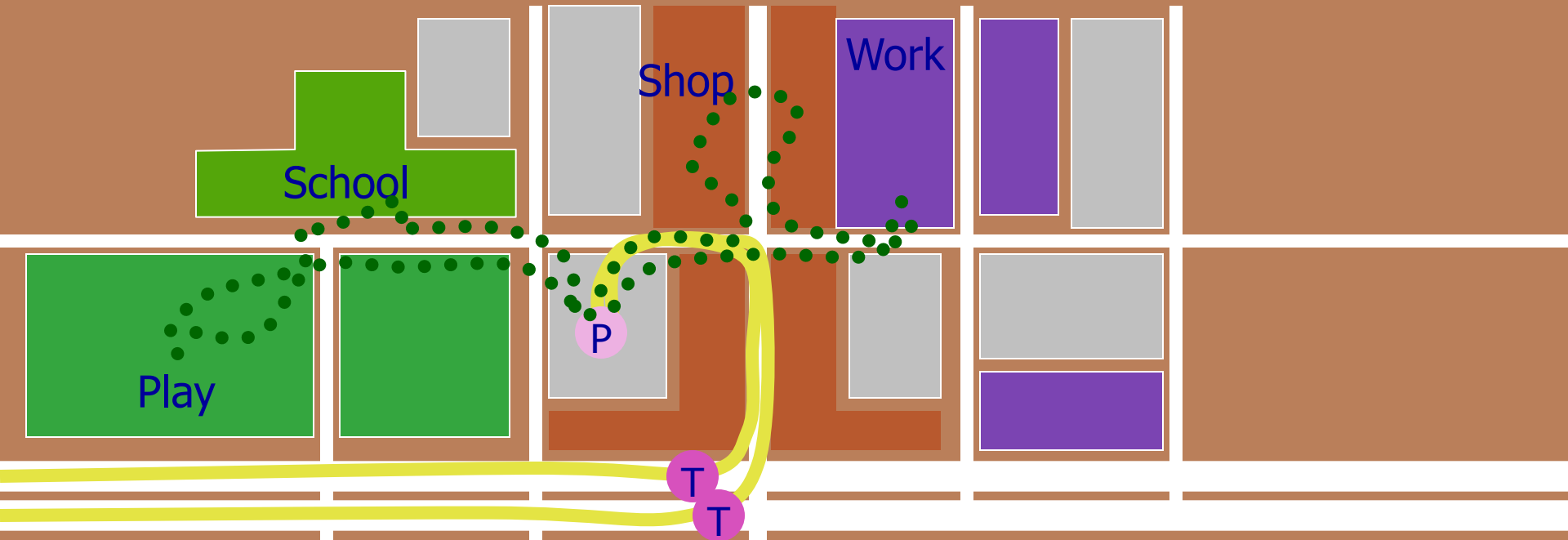
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Conventional Development



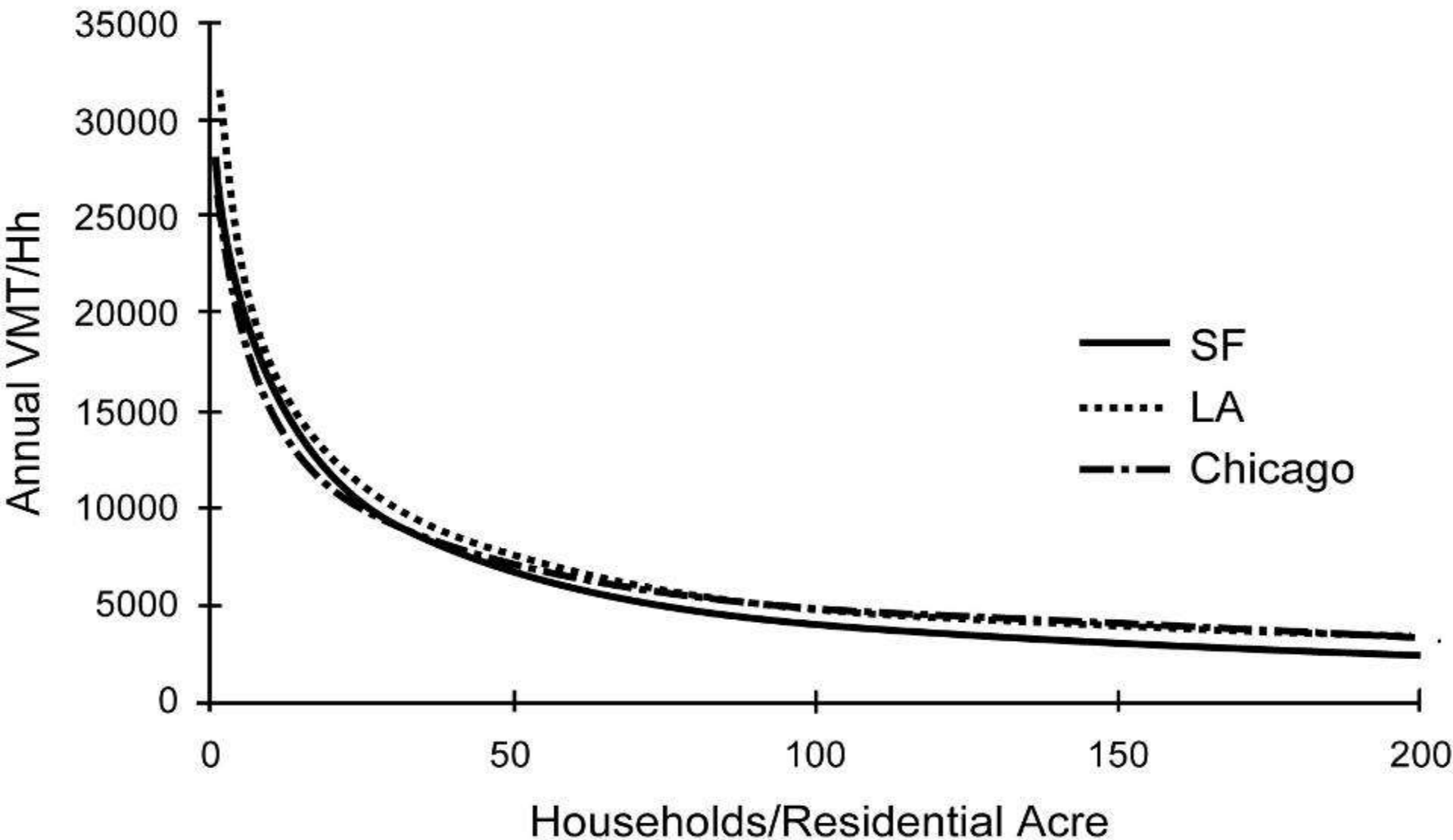
Mixed Use, Park Once District



Results:

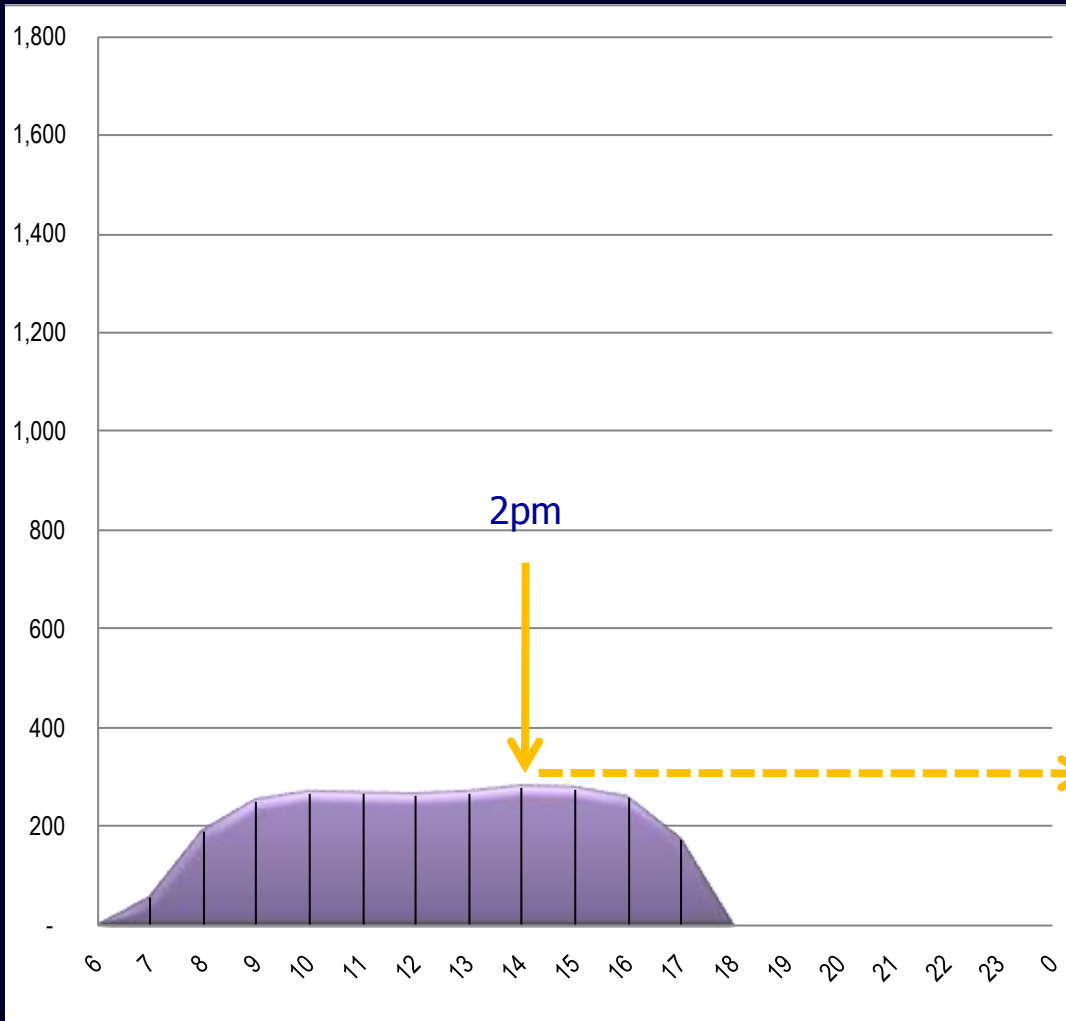
- $< \frac{1}{2}$ the parking
- $< \frac{1}{2}$ the land area
- $\frac{1}{4}$ the arterial trips
- $\frac{1}{6^{\text{th}}}$ the arterial turning movements
- $< \frac{1}{4}$ the vehicle miles traveled

Driving vs Residential Density

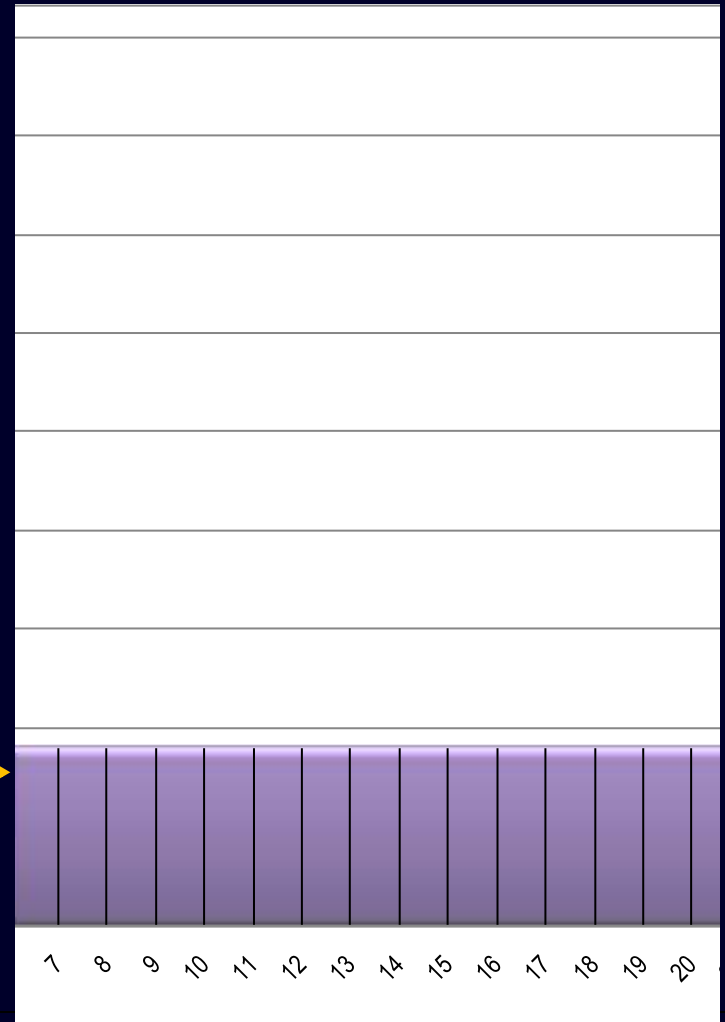


Office (150k SF):

Real Demand



Unshared Supply



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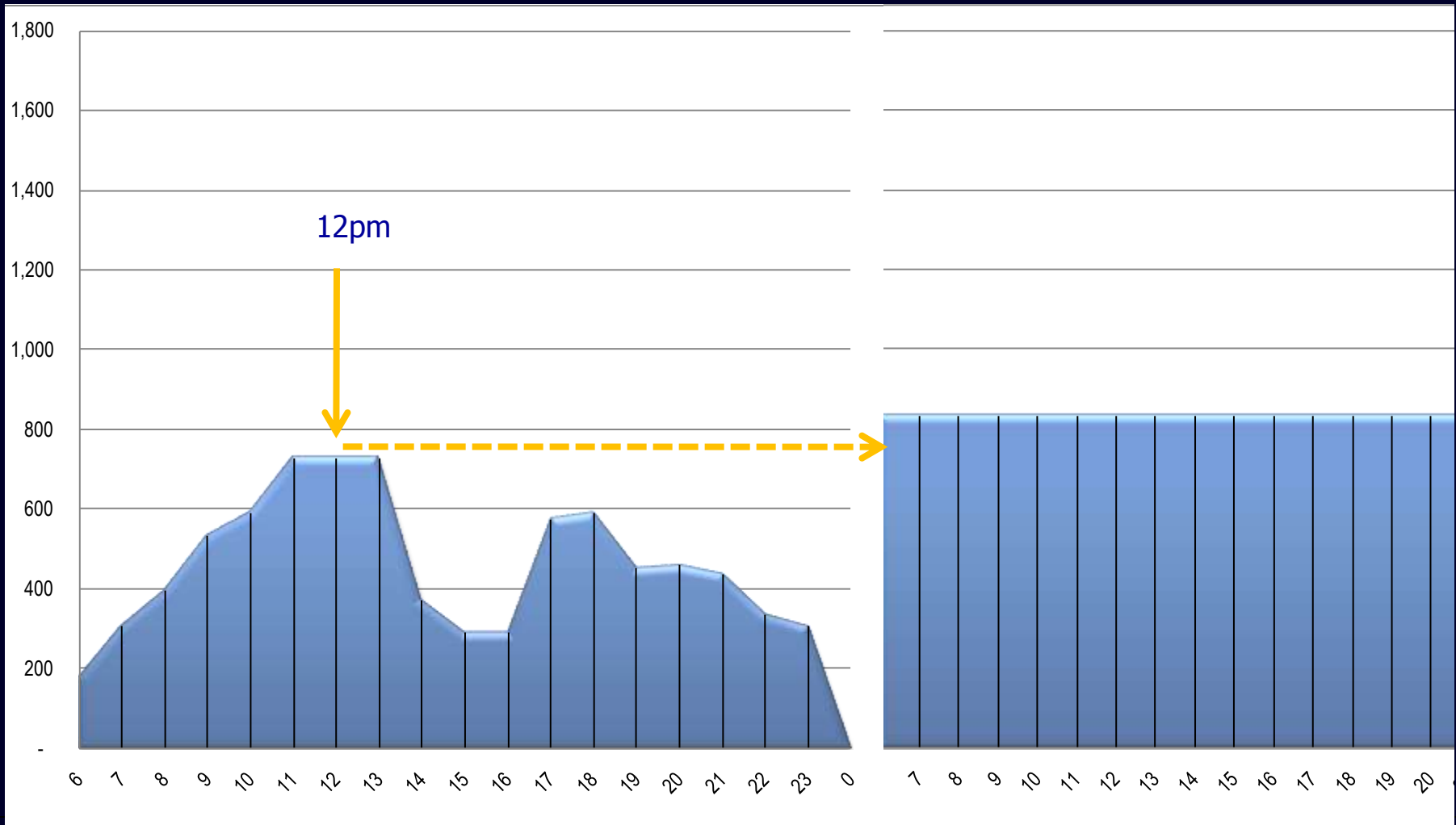
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Restaurant (150k SF):

Real Demand

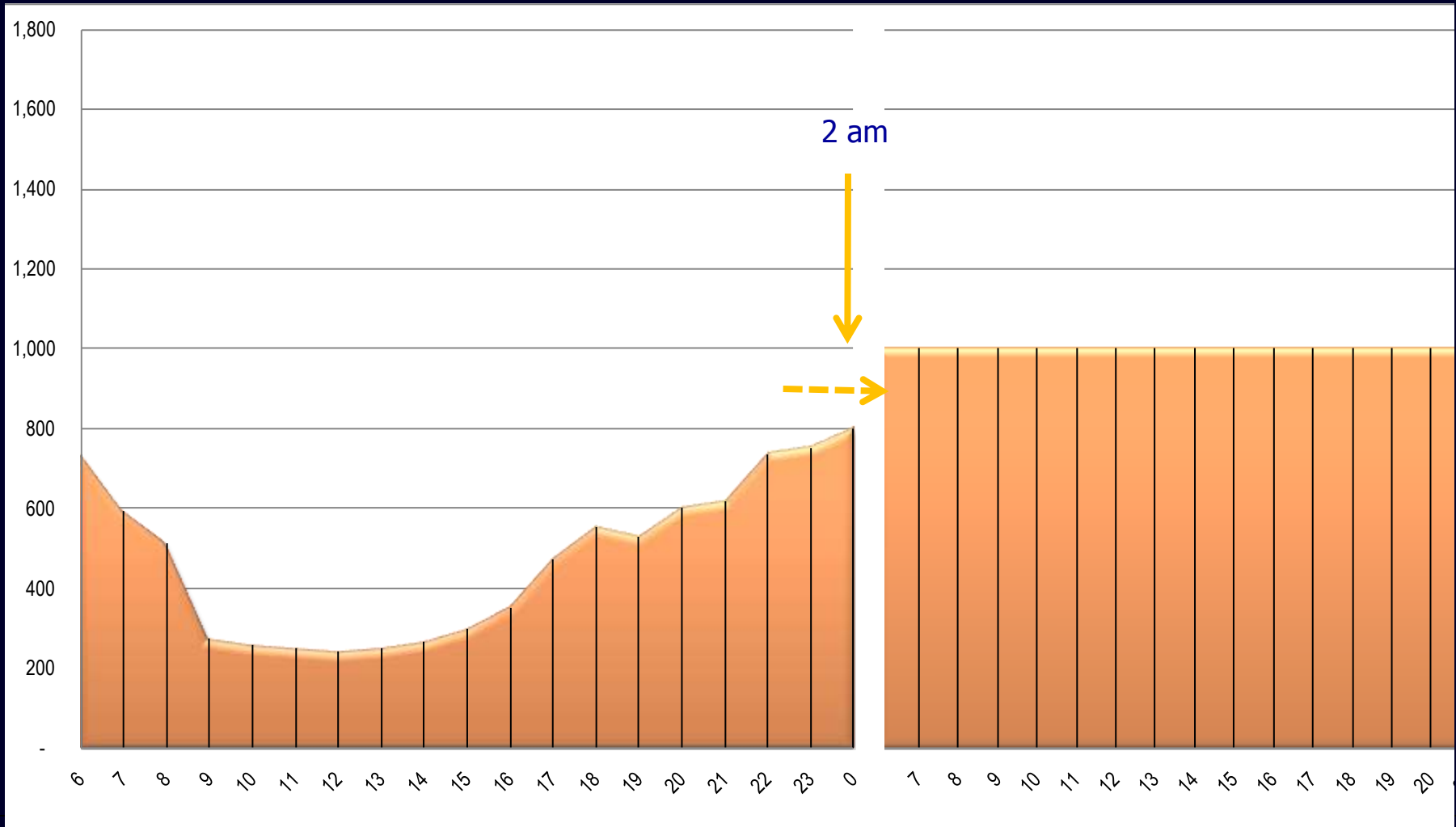
Unshared Supply



Residential (150k SF/1000 units)

Real Demand

Unshared Supply



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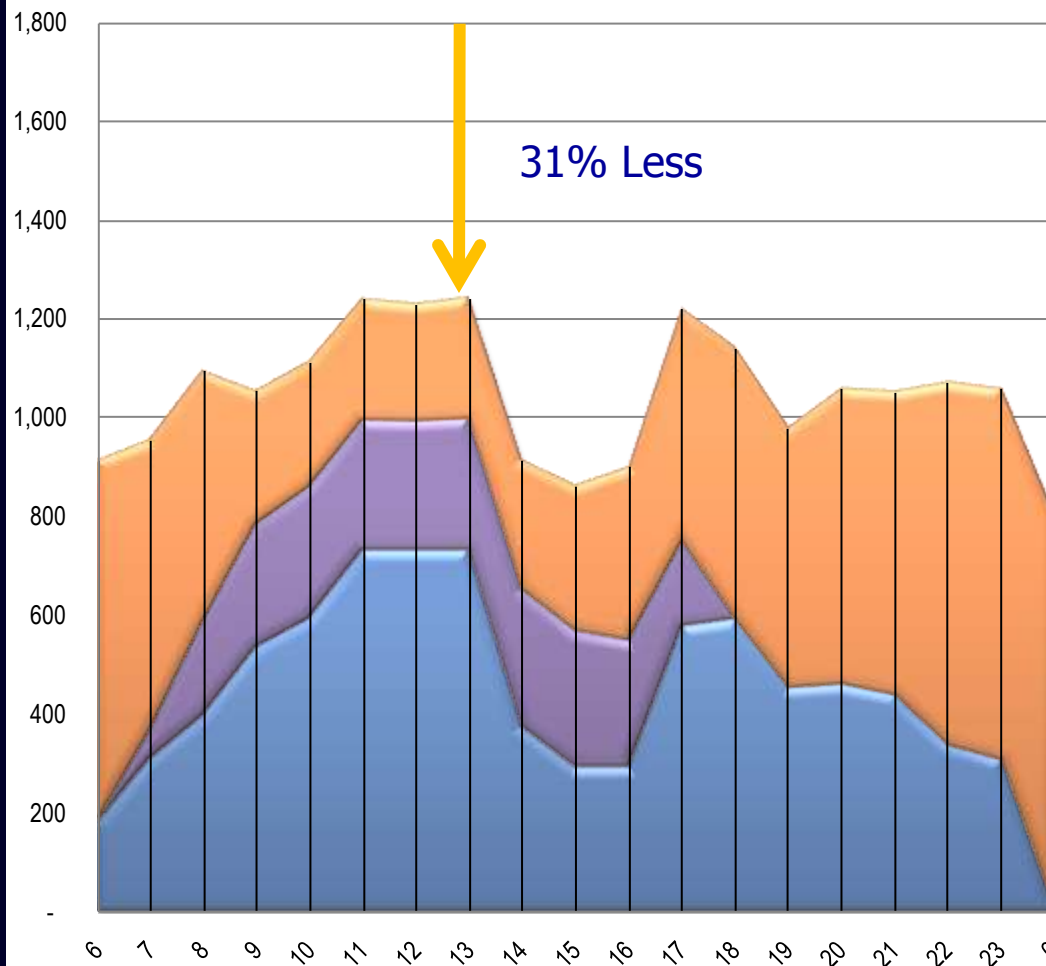
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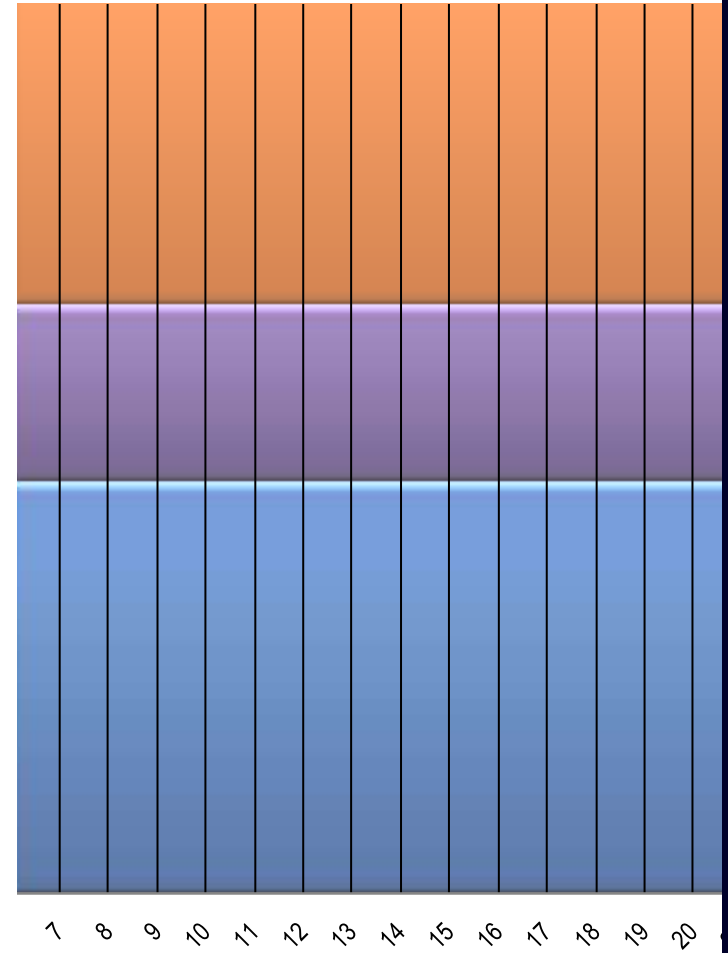
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Shared Uses:

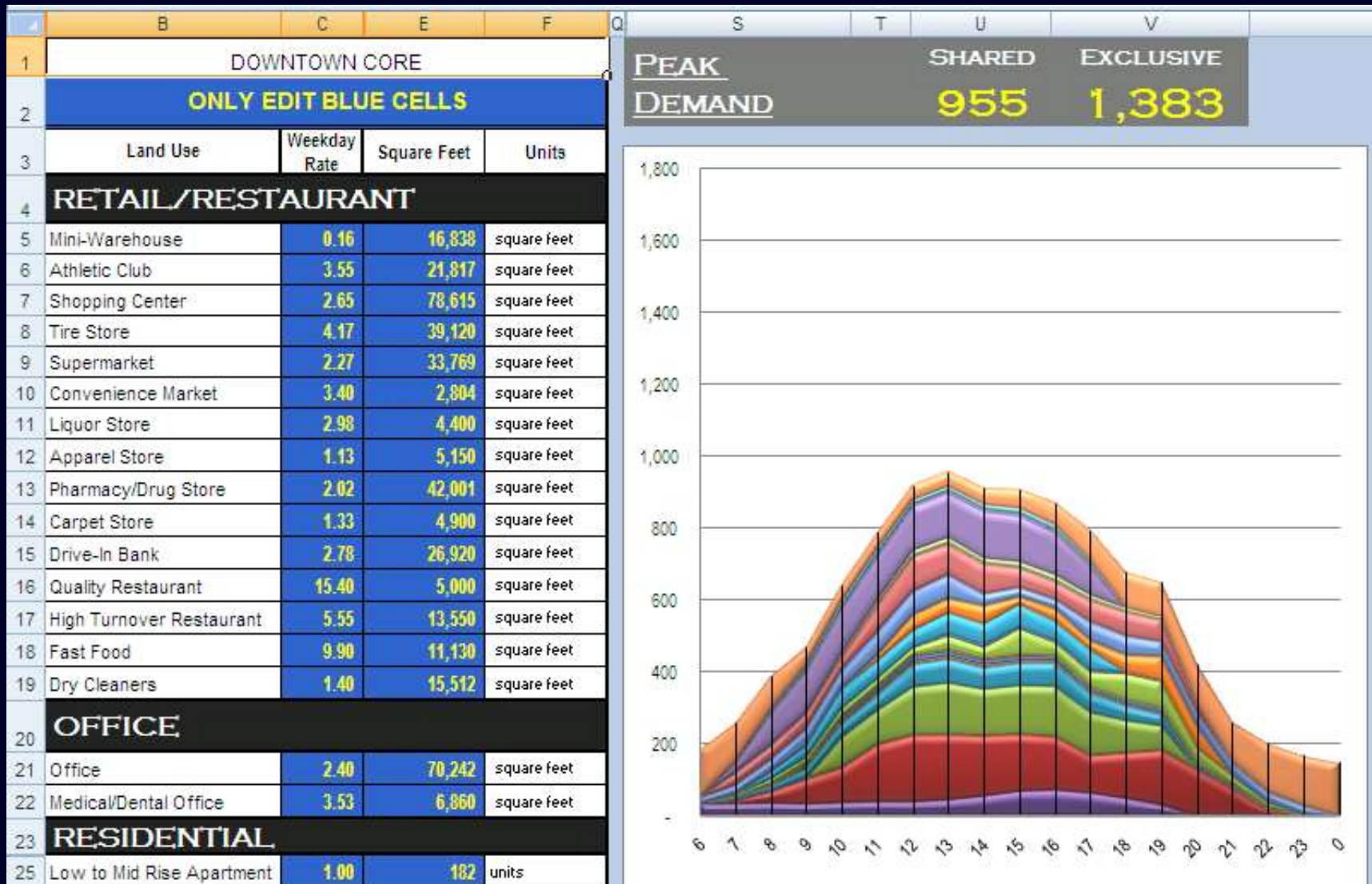
Real Demand



Unshared Supply



ULI Shared Parking Model



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DEMAND RESPONSIVE PRICING



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Where is the Parking Problem?

Main Street



Off-Street Parking



- Building more spaces cannot solve the on-street shortage

Example: Redwood City, CA

- Plagued by traditional parking “problems”:

- 100% utilization on Broadway all day long
- Perception of parking unavailability

- BUT:

- Ample unused parking around the corner from commercial strip
- Peak occupancy 69% in city-owned lots (ideal is 85%)



Photo by BWChicago

Example: Redwood City, CA

#1: Institute Market-Rate Pricing

- Fee structure set to price most desirable spots the highest
- Maintain 85% occupancy (by ordinance)
- Priced differently at highest-use times (Weekdays 10AM-6PM) than at off-peak times



Example: Redwood City, CA

#2: Eliminate Time Limits

- Time limits impose an artificial restriction on usage and are inconvenient
- Enforcement is costly to manage
- Time limits not efficient at producing even 85% occupancy
- Allow pricing to create turnover instead



Example: Redwood City, CA

#3: Convert to Pay-by-Space Meters

- Able to track occupancy rates and adjust price rates accordingly
- A host of other benefits:
 - o Better urban design
 - o Quicker repairs
 - o Solar power
 - o Better information
 - o Revenue control
 - o Better data collection
 - o Convenience



Source: Digital Payment Technologies, 2005

Example: Redwood City, CA

#4: Modify the Parking Permit Program

- To accommodate employees, crafted a parking permit program for spaces in garages with varying levels of access for purchase



Permit Type	Valid Locations and Times	Monthly Cost
Marshall / Middlefield BRONZE	Marshall Garage: Monday - Friday, 6am until 7pm Middlefield Lot: Monday - Friday, 6am until 7pm	\$30.00
Marshall / Middlefield SILVER	Marshall Garage: Monday - Friday, 6am until Midnight Middlefield Lot: Monday - Friday, 6am until 7pm	\$35.00
Marshall / Middlefield GOLD	Marshall Garage: Monday - Sunday, 6am until Midnight Middlefield Lot: Monday - Friday, 6am until 7pm	\$40.00
Perry / Winslow / Main BRONZE	Perry Lot: Monday - Friday, 6am until 7pm Winslow Lot: Monday - Friday, 6am until 7pm Main St. Lot: Monday - Friday, 6am until 7pm	\$40.00
Perry / Winslow / Main SILVER	Perry Lot: Monday - Friday, 6am until Midnight Winslow Lot: Monday - Friday, 6am until Midnight Main St. Lot: Monday - Friday, 6am until Midnight	\$50.00
Perry / Winslow / Main GOLD	Perry Lot: Monday - Sunday, 6am until Midnight Winslow Lot: Monday - Sunday, 6am until Midnight Main St. Lot: Monday - Sunday, 6am until Midnight	\$60.00

/ Community

Washington DC: Ward 6 Parking Zones

❖ Commercial Lots:

- Red Zone \$35
- Green: \$25-15
- Orange: \$20-15



SFpark



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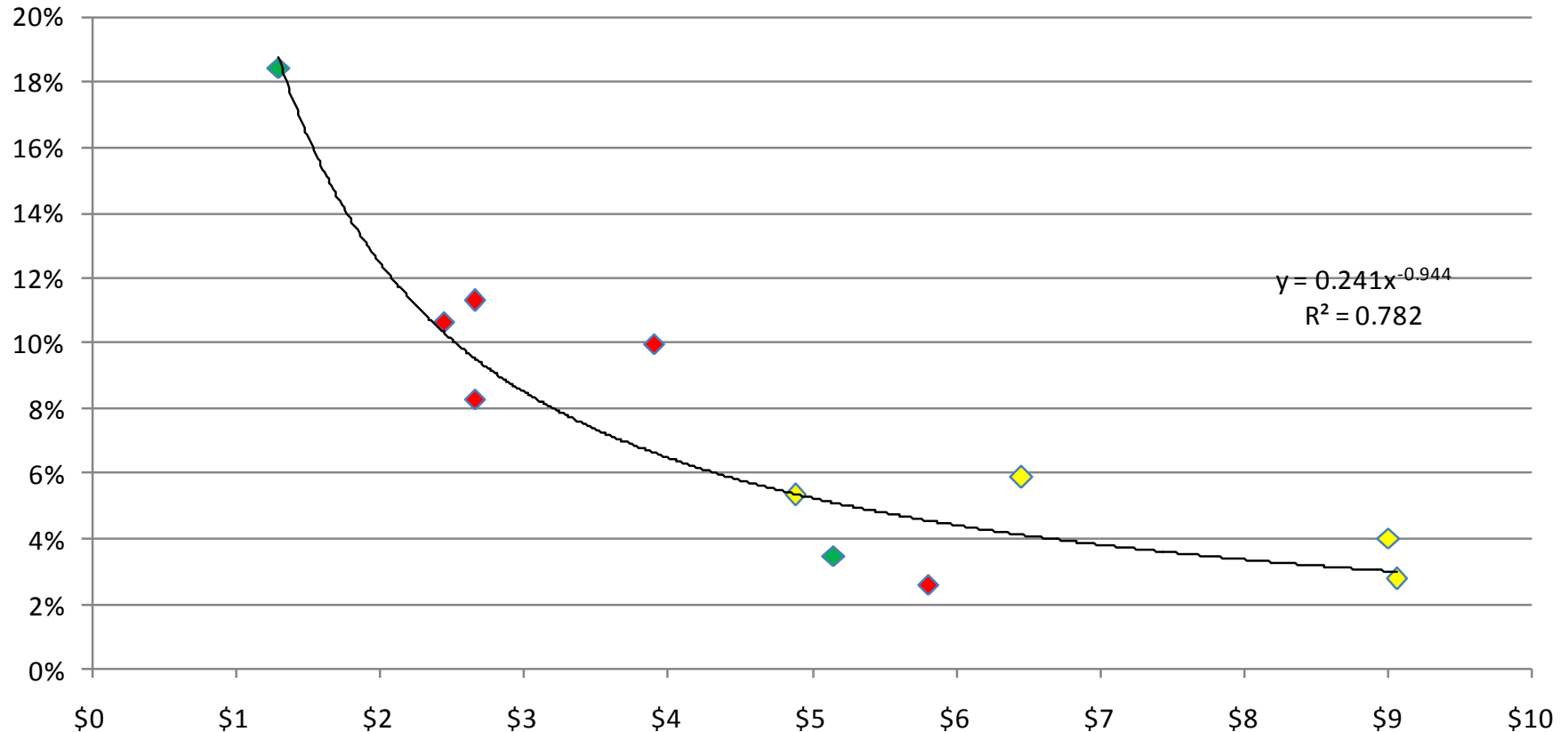


Location	Fee/Month (\$2010)	Fee/Day (\$2010)	Demand Decrease
UW Seattle	\$26	\$1	24%
Warner Center	\$53	\$3	30%
Cornell University	\$49	\$2	26%
Bellevue	\$78	\$4	39%
Costa Mesa	\$53	\$3	22%
Mid-Wilshire, Los Angeles	\$129	\$6	38%
Washington, DC suburbs	\$98	\$5	26%
Los Angeles Civic Center	\$180	\$9	36%
Downtown Ottawa	\$103	\$5	18%
Downtown Los Angeles	\$181	\$9	25%
Century City	\$116	\$6	15%

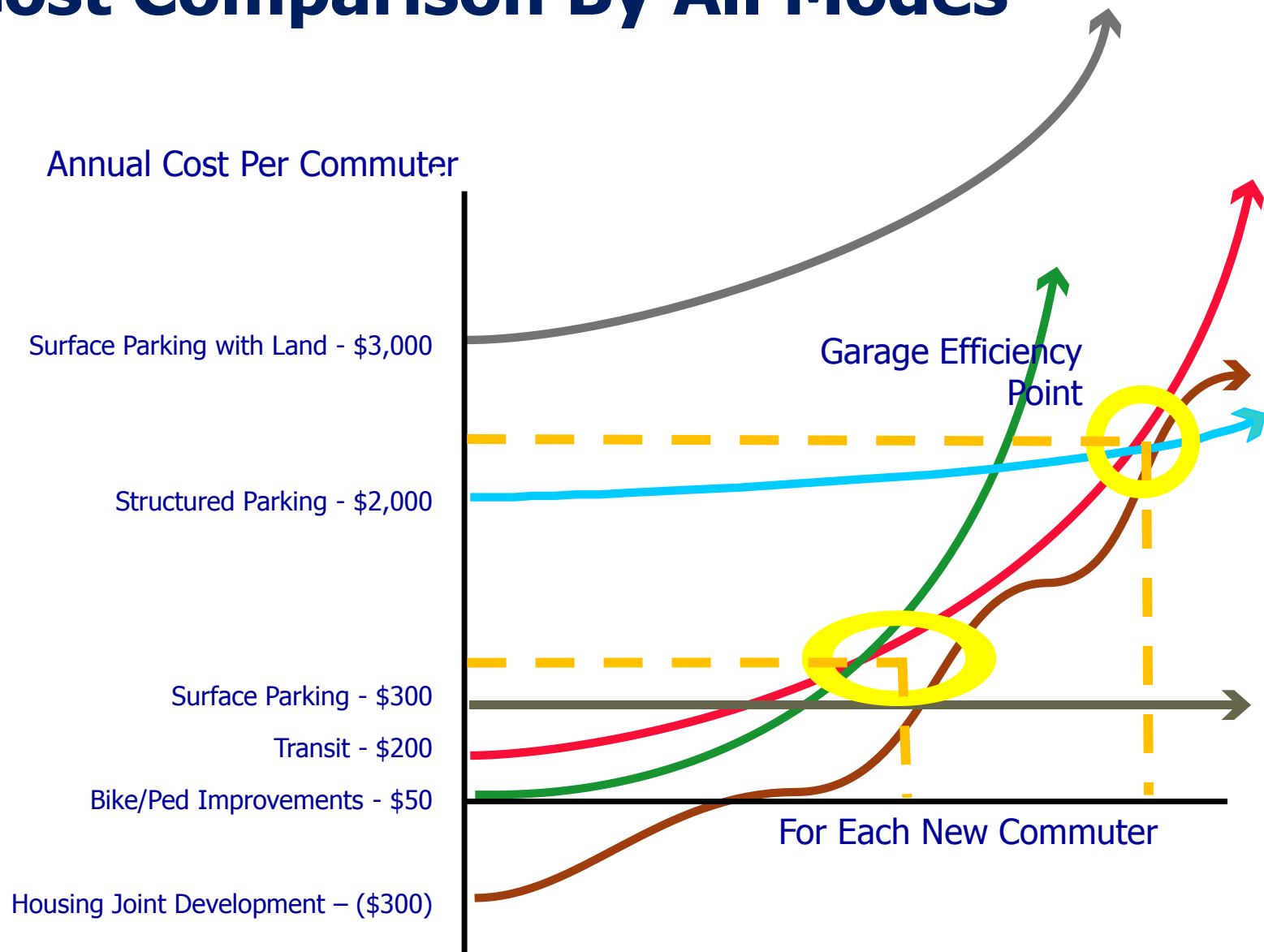


Charging for Parking: Results

Parking Demand Reduction (%) per Dollar



Cost Comparison By All Modes



Is Transit Really More Expensive to Operate?



- New Parking Garage
\$7 per commuter per day
- Operating a Free Shuttle
\$2 per commuter per day

**It is cheaper to pay
commuters not to
drive than to provide
more parking**

Employee Transportation Benefit

Drive Alone: \$150



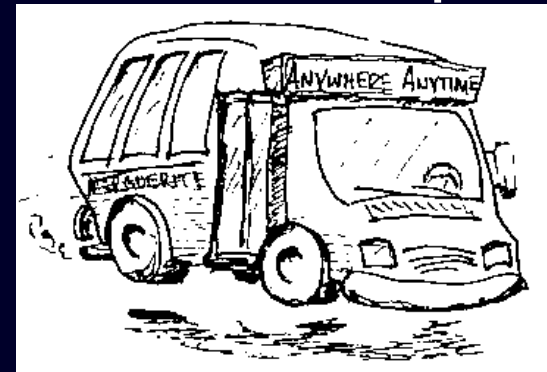
Carpool: \$0



Bike/Walk: \$0



Transit: \$0



Employee Benefits After Cash-Out

Drive Alone: \$150



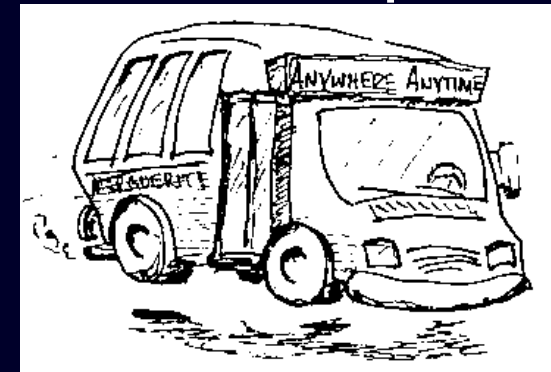
Carpool: \$150



Bike/Walk: \$150



Transit: \$150



TOD Without the Rails: Boulder CO



Source: Will Toor & Spenser Havlick

Parking Cash-Out = Savings to Business

- Cornell
- Stanford University
- Dartmouth
- Wyeth Pharmaceuticals
- Genentech
- Boulder CO
- Rhode Island public employees
- CA State law



Unbundle parking costs

House A:

- 2,000 sq. ft.
- 3 bedrooms
- 2-car garage
- **\$500,000**



House B:

- 2,300 sq. ft.
- 4 bedrooms
- 1-car garage
- **\$500,000**



Who's unbundling for sale?

San Francisco

- Four Seasons: \$150/month for self-park; \$250/month for valet parking (2004)
- 300 3rd Street: All parking owned by 3rd party, residents lease parking at market rate

Seattle (moda)

- All parking spaces leased month-to-month
- 251 units sold out in one week

St. Louis, MO (Ballpark Lofts)

- 25% of buyers opted for no parking space



Who's unbundling for sale?

Washington, D.C. (multiple examples)

- Developer typically leases parking facility to a 3rd party garage operator
- Parking spaces then typically leased to homebuyers for \$200/month (2004)
- Unused spaces can sometimes be leased to other residents or employees in the neighborhood

Chicago (multiple examples)

- Most common is for HOA to own all parking spaces
- Where parking demand is low, spaces are assigned to units at a nominal charge and often used for guest parking
- Where parking demand is high, monthly costs range from \$150-\$200 / month (2004)
- Tandem parking are generally less expensive and valet parking is generally more expensive



Residential Carshare Program

- Carshare programs are like automated, web-based rental cars in your neighborhood
- Each carshare vehicle eliminates demand for 15-20 private vehicles and each carshare member reduces their driving by an average of 50%



[Greenlagirl flickr.com](https://www.flickr.com/photos/greenlagirl/)



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San Francisco Carshare Regulation 2008

Planning Code, Section 166:

Units	Space
0-49 units	0 car share spaces
50-200 units	1 car share space
201 or more units	1, plus 1 for every 200 dwelling units over 200

Planning Code, Section 167:

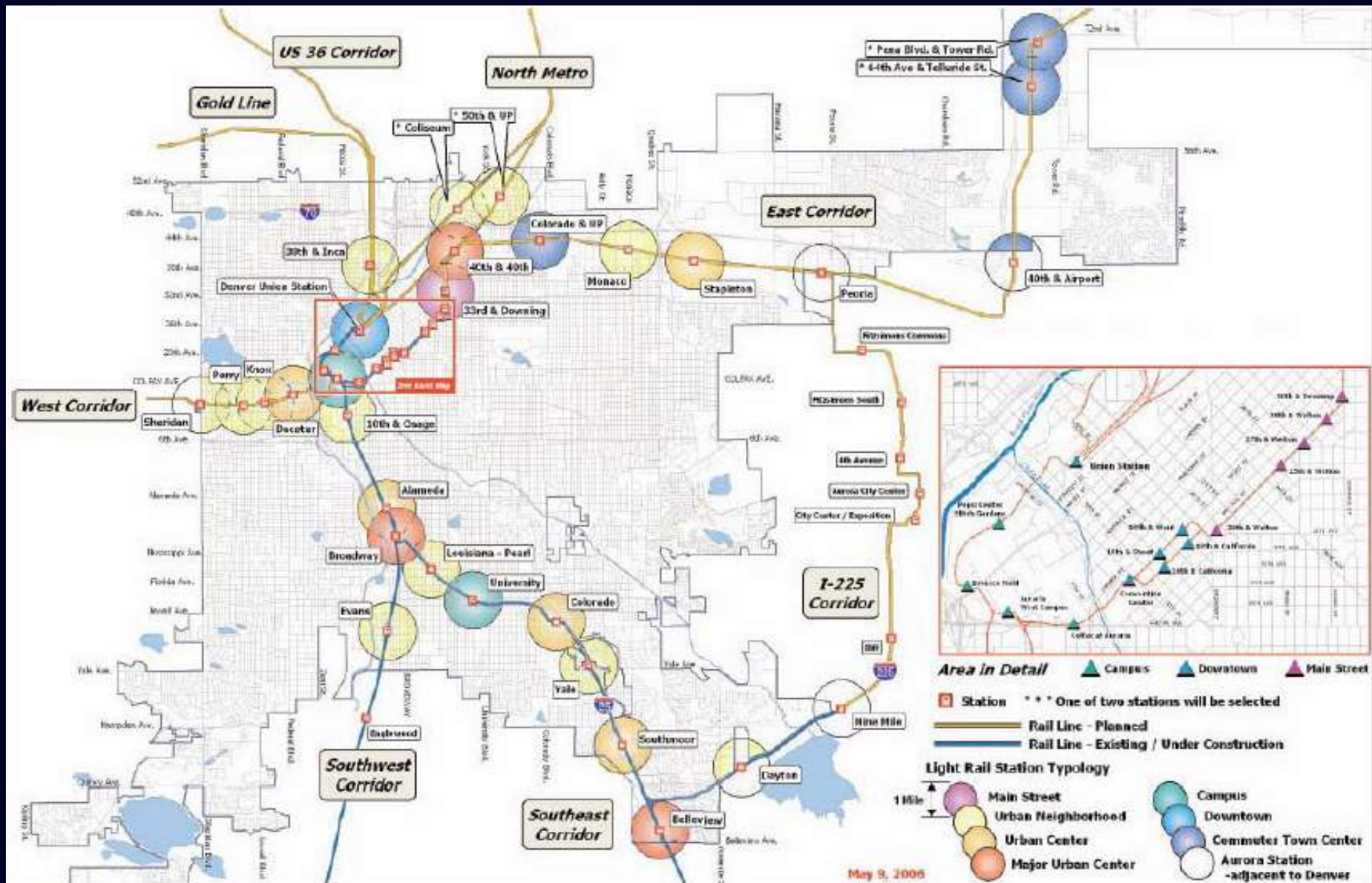
- If more than 10 units, parking must be leased or sold separately from the rental or purchase fees for the life of the unit
- Parking requirements were lowered or eliminated at the same time



Building Livable Communities with Transit



Learning From Success: Denver RTD



Jason Schrieber, Principal Nelson\Nygaard

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