# Parking Demand 101

aka:
The Good
The Bad and
The Ugly

Parking

WALKER
PARKING CONSULTANTS

# Goals

- Discuss fundamentals of parking demand
- Discuss hot topics
- Frame issues for other panelists

# Why?

## Parking is a key driver of density

- Offices: 1 sq ft  pkg/sq ft GLA
- Retail: 1.5 sq ft pkg/sq ft GLA
- Restaurants: >5 sq ft pkg/sq ft GLA

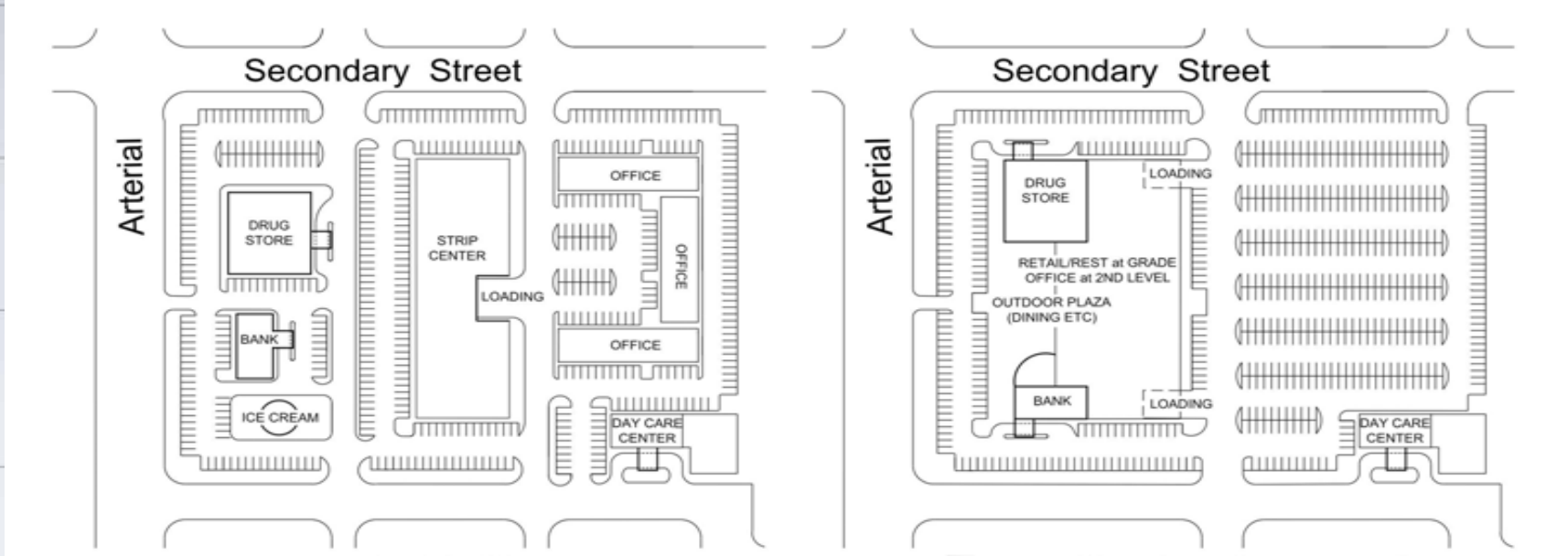
As Michael Eisner once said
"Form Follows Parking"

As quoted by Russ Rymer, "Back to the Future: Disney reinvents the company town", *Harpers*, October 96, pp65-76

# And…

- Shared parking is a key to:
  - New Urbanism
  - Smart Growth
  - Transit Oriented Development
- Because shared parking reduces spaces required and mass devoted to it up to 40%

# In fact, it could vastly improve ANY and ALL development




As Built

Local Zoning Controls:
FAR, number of spaces,
architectural, driveway locations

Better for everybody!

Form based codes,
Mandatory mixed uses/shared parking
50% more GLA!

# Basic terms

- **Parking supply:** total number of spaces available to serve a destination. It may include spaces on-site, off-site, on-street, or shared with other uses.
- **Parking accumulation:** number of parked vehicles observed at a site.
- **Parking generation rate:** number of parked vehicles observed per unit of land use.
- **Parking demand:** used two ways:
  - number of parking spaces that should be provided
  - expected accumulation of vehicles at design hour
- **Parking ratio:** number of spaces per unit of land use that should be provided.

# IMPORTANT!

- Parking Demand: number of spaces that should be provided for a specific site considering:
  - mode split, persons per car, etc
  - price of parking
  - constraints on supply, walking distance, security,

- Unadjusted Parking Ratio: number of spaces

that should be provided per unit of land use,

before consideration of price of parking,

mode adjustments, etc

# What's generally accepted basis for "unadjusted" parking ratios?

Expected accumulation of vehicles

at the peak hour

on a design day

assuming nearly 100 percent modal split to auto use and minimal ridesharing,

INCLUDING

effective supply considerations

That is, how many spaces should be provided

if the land use is all by itself….in a cornfield!

# Resources for unadjusted ratios:

- ITE *Transportation Planning Handbook* (2nd Edition, 1999) Ch 14 Ratios out of date, info on planning and pkg management strategies
- ULI/ICSC *Parking Requirements for Shopping Centers* (2nd Ed, 1999)
  - Recommended ratios for shopping centers
- ITE *Parking Generation* (3rd Edition, 2004)
  - Generation/accumulation not recommended ratios…

  USE WITH CARE
- ULI/ICSC *Shared Parking** (2nd Edition Dec, 2005)
  - Recommended ratios for most common land uses
- NPA/PCC *Recommended Zoning Ordinance Provisions for Parking** (2nd Edition, early 2007)
  - Ratios for other uses
  - Opinion, backed by Parking Gen data and experience
- APA *Planning and Urban Design Standards* (1st Edition, 2006)
  - Includes ratios that were based on early versions of Parking Gen and Shared Parking, but last minute changes in latter results in conflicting ratios

# First though, regarding ratios…. Let's all use the same convention!

- Old: 1 space/x sq ft (e.g. 1 sp/250 sq ft)
- Today: y spaces/1000 sq ft (e.g. 4/1000 sq ft)
  - *It's simply much easier to work with!*

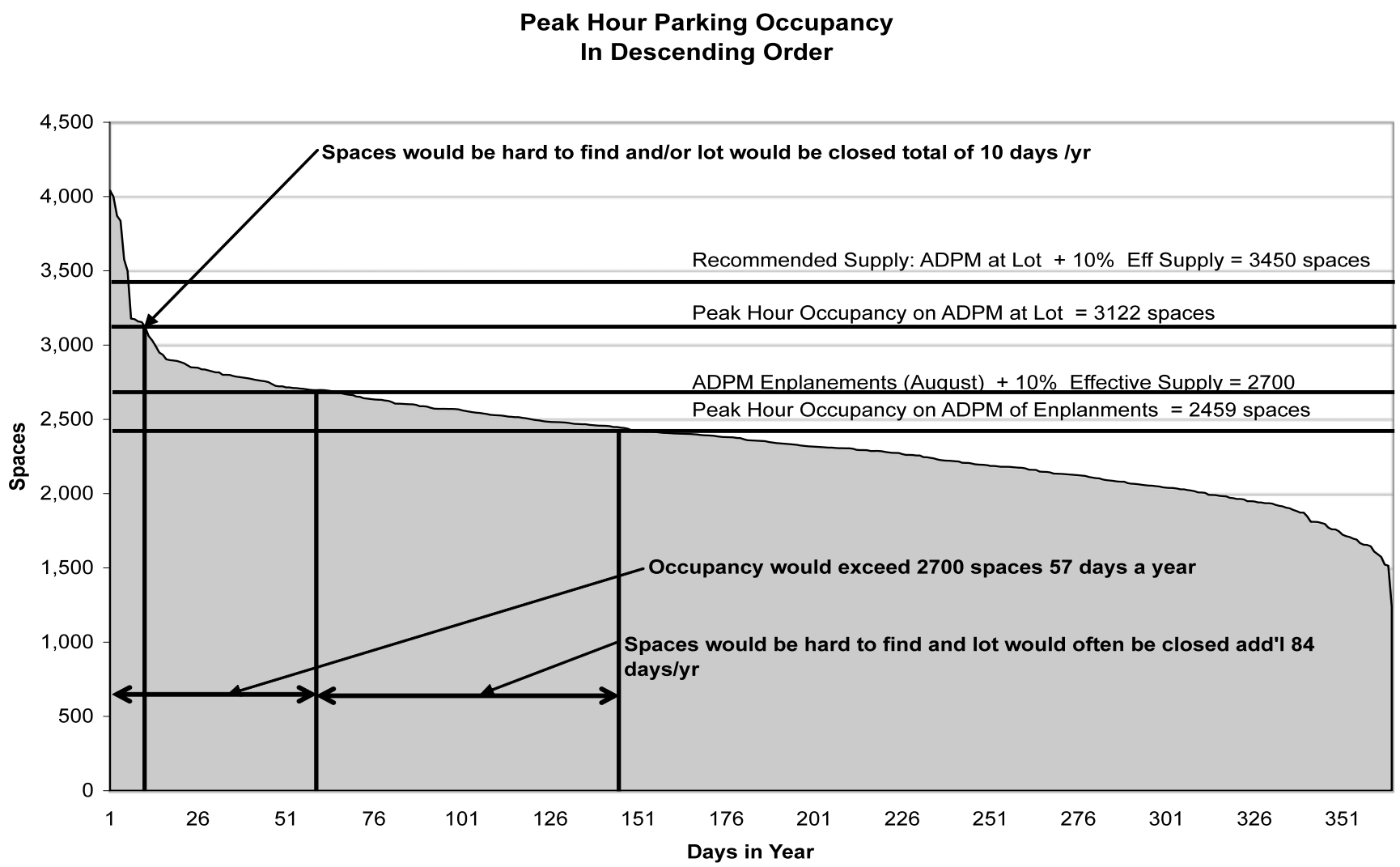
# What's Effective Parking Supply?

- **Effective parking supply:** number of occupied spaces at minimally acceptable operating efficiency.
- Reflects perception of facility as full at less than capacity ("demand" for more spaces even when some aren't used)
- Depends on user type:
  - Short term, unfamiliar 85-90%
  - Long term, familiar 90-95%
- Reduces need to search entire system for last few parking spaces, thus reducing patron frustration.
- Provides for operating fluctuations, miss-parked vehicles, snow cover, vehicle maneuvers and vacancies created by reserving spaces for specific users, e.g. disabled parking
- Also provides some capacity for activities above design hour/day.

# What design day/hour is used?

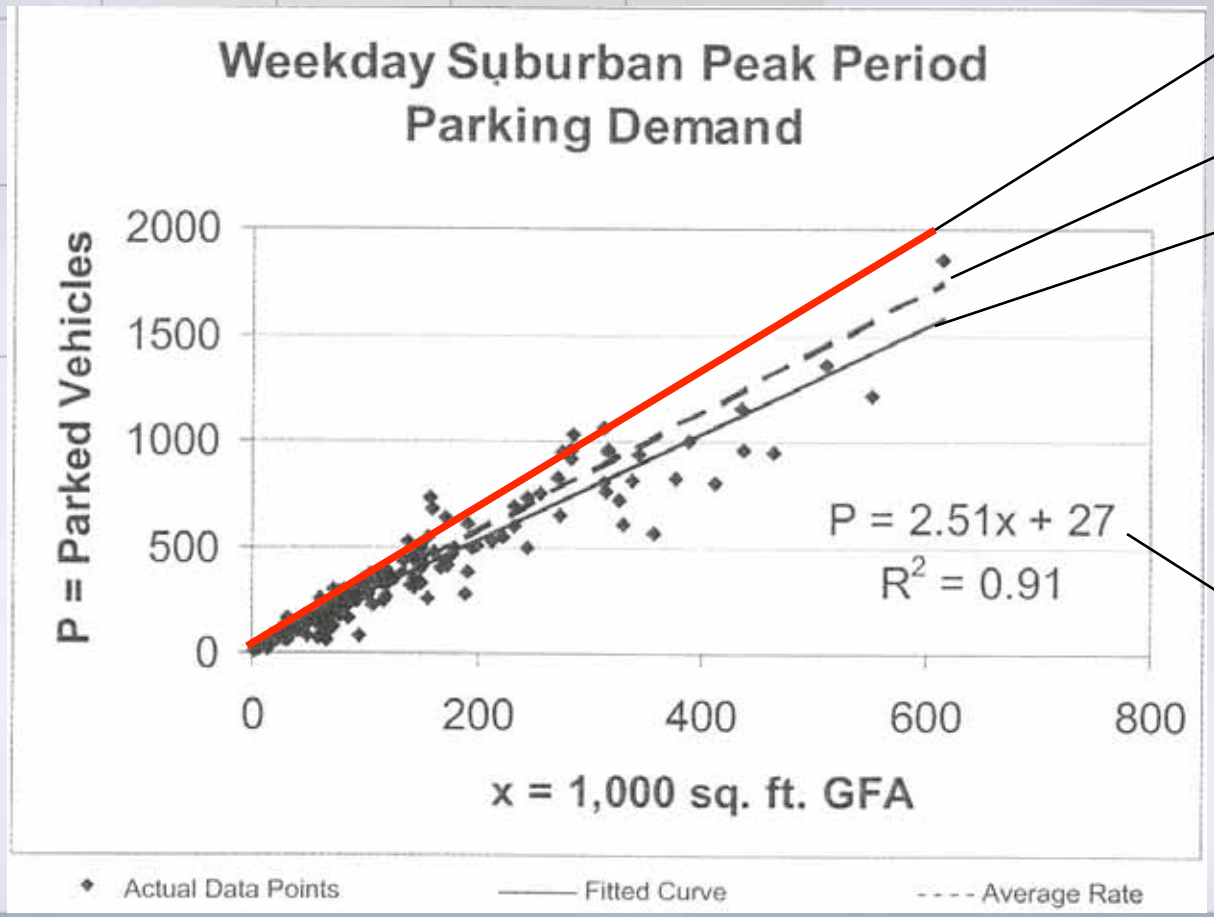
- **Design day or design hour**: occurs frequently enough to justify providing spaces for that level of activity.
- NOT an average or median day: insufficient supply for the peak (if not multiple) hours on roughly half days in a year
- NOT peak accumulation of vehicles ever observed at any site with that land use.
- Streets and roadways are designed for 85th or 90th percentile of observed traffic volumes in **peak hours on average days**
- Most in parking/traffic planning profession agree that parking ratios should reflect 85th percentile of peak-hour observations across large sample of many days
  - Although some argue for peak hour on average day….

# Effective Supply and Design Day Considerations for an Airport



# The only land use in ITE *Parking Generation* with reliable data: office

Parking Gen is data, not recommended ratio




85th percentile

Average

Fitted curve indicates demand declines as size increases, but most users don't use equation

# Shopping centers are undoubtedly the best documented land use!

- *Parking Requirements for Shopping Centers* (ULI/ICSC)
- 1965: *Technical Bulletin 53*
- 1982: First Edition
- 1999: Second Edition
  - ‘97 data from more than 490 centers to determine design day/peak hour
  - Accumulation counts at 169 centers in peak hours on design day in ‘98

# Design day/hour for shopping centers is higher than others

- 20th highest hour in year (second or third busiest hour on second Saturday before Christmas)
- >99th percentile hour, >97th percentile day in the year
- In 19 hours spread over 10 days, patrons will be unable to find parking within reasonable search time
- No extra effective supply cushion for this day
  (people expect/accept congestion at this time)
- But…..recommended ratios are the average of the observed parking generation rates in those hours!
- Yes, 50% centers perform better in this hour, but 99% hour!
- So it is still “high” ratio for recommended spaces/unit land use

# *Shared Parking* was consensus of experienced parking planners

- At last minute and with much discussion, *Shared Parking* team used 85th percentile without adding effective supply on top (except shopping center)
  - "selection of 85th percentile reflects need for effective supply, balanced with Smart Growth and other planning considerations"
    - That's why Urban Planning Stds book doesn't match final Shared Parking book!
  - Effectively, the day that has a 10% effective supply cushion is not 85 percentile day but day with 10% LESS accumulation of vehicles.
- Best available reference for base ratios
- Use it instead of predetermined formulas

  Use full Shared Parking model

  Start at 100% auto mode split

  Adjust for specific circumstances!

# Some (eg, Shoup) want lower design hour

- Ratios based on 85$^{th}$ percentile of observed peak hour needs perpetuate 100% auto modal split
  - E.g, shopping center ratio: over half rec'd spaces vacant 40% of operating hrs/year
- Most sites where studies are performed are 100% drive alone with free parking; excessive for other conditions
- Published sources of data are not statistically reliable
- Zoning ordinances are often based on other ordinances, not reliable studies
- Low cost land and surface parking facilitated "more is better" philosophy

# The other side of the coin:

- There'll be screaming for more parking at 50th percentile!
  - Effective supply" developed because basing parking supply on observed peak accumulation resulted in perception of inadequate supply
  - Retailers typically make virtually all their profit in holiday shopping season, can't survive without enough parking then
- Published sources of data are not uniformly based and/ or reliable
  - Parking Gen: took highest hour from each study, whether one observation or 100 in that study
    - Eg, Some of the hotel data points used in "peak hour generation rate" are midnight, others middle of the day

  This one cuts both ways!

# Because of lack of effective supply in SP ratios, some want to add it

Considerations:

- What happens on days when parking is difficult or impossible to find?
  - Demand shifts to other hours?
  - Lose customers to competitors?
  - Spills into neighborhood? 1/yr, 10/yr, 100/yr?
  - Move employees off site or car pool for peak month?
- How easy will it be to add more spaces if needed?
  - Most zoning are minimums, but what about maximums?
  - Surface lots yes, structures more difficult
- What is risk/reward?
  - To Developer
  - To Community

# Just remember:

Shared Parking and PCC's Rec Zoning are:

- Recommended Number of Spaces given
  - Unknowns:
    - strength of tenants….over time
    - change in tenants….over time, incl type
    - passage of honeymoon period
    - percent leased at any one time
  - Etc etc etc
  - Some projects will definitely need more but most less

# Practically speaking, how do we get acceptance of lower ratios?

We need to be MORE reliable, not less

- Zoning ordinances are out of date and/or all over the board
- Many don’t permit shared parking
- Most Model and local Ordinances that do permit shared parking have set formulas that are accurate in some locations, but not in others.

# Benefits of shared parking to owners:

- Less spaces and/or more GLA each site
- Reduced project cost
- Reduced operating expenses
  - less spaces
  - some costs spread over more users
- If paid parking, more revenue per space
- More activity….perception of project
  - Higher rents due to captive patrons
  - Improved passive security
- Less risk to lender

# And if you build fewer spaces/ sq ft GLA

You can afford to build better parking spaces!

# Most agree:

- Parking is oversupplied
- Oversupplied parking perpetuates free parking
- Paid parking encourages better modal choices, more efficient operations, etc
- Oversupplied free parking distorts the urban form

Some of us just disagree about how to get there!