Transit Oriented Development: Beyond the Basics

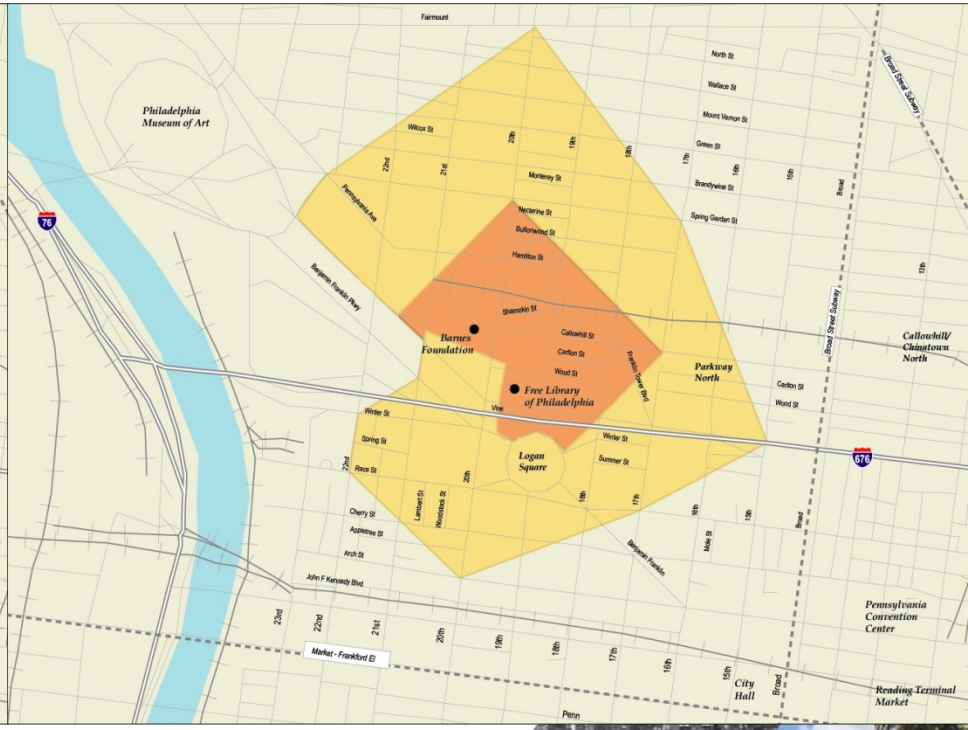
David Fields, AICP

Nelson\Nygaard Consulting Associates

Successful TOD is Born in the 5-Minute Walk

distance

time



What Is TOD?

Land Use Elements

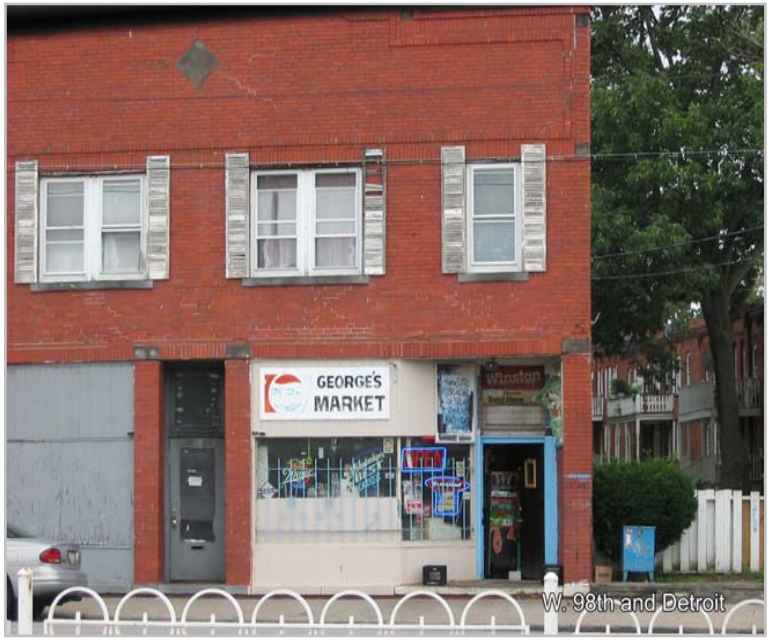
- Encourage mixed uses: retail first floor, office, residential above
- Moderate to high density -- >12 units per hectare+ preferred
- *Encourage* public facilities, theaters, recreational uses, parks
- *Discourage* land uses that are highly dependent on automobiles for accessibility

Design Places that Attract People

- Active uses for the first 3-6 meters of building height
- Smaller blocks with more frequent intersections are safer (and feed curiosity!)
- Bring buildings up to the sidewalk
- Public space/green space in any breaks of building line

Zoning & Design

- Conventional zoning's intent:
  - limit height & density
  - segregate uses
  - require setbacks
  - provide ample free parking
- Starting to be addressed well in form-based codes
- Solution: To provide assurance to developers and reduce risk:
  - Codes must allow transit-oriented development AS OF RIGHT



Who Said TOD = Train Oriented Development?

CONVENÇÃO SECOVI SP 2011

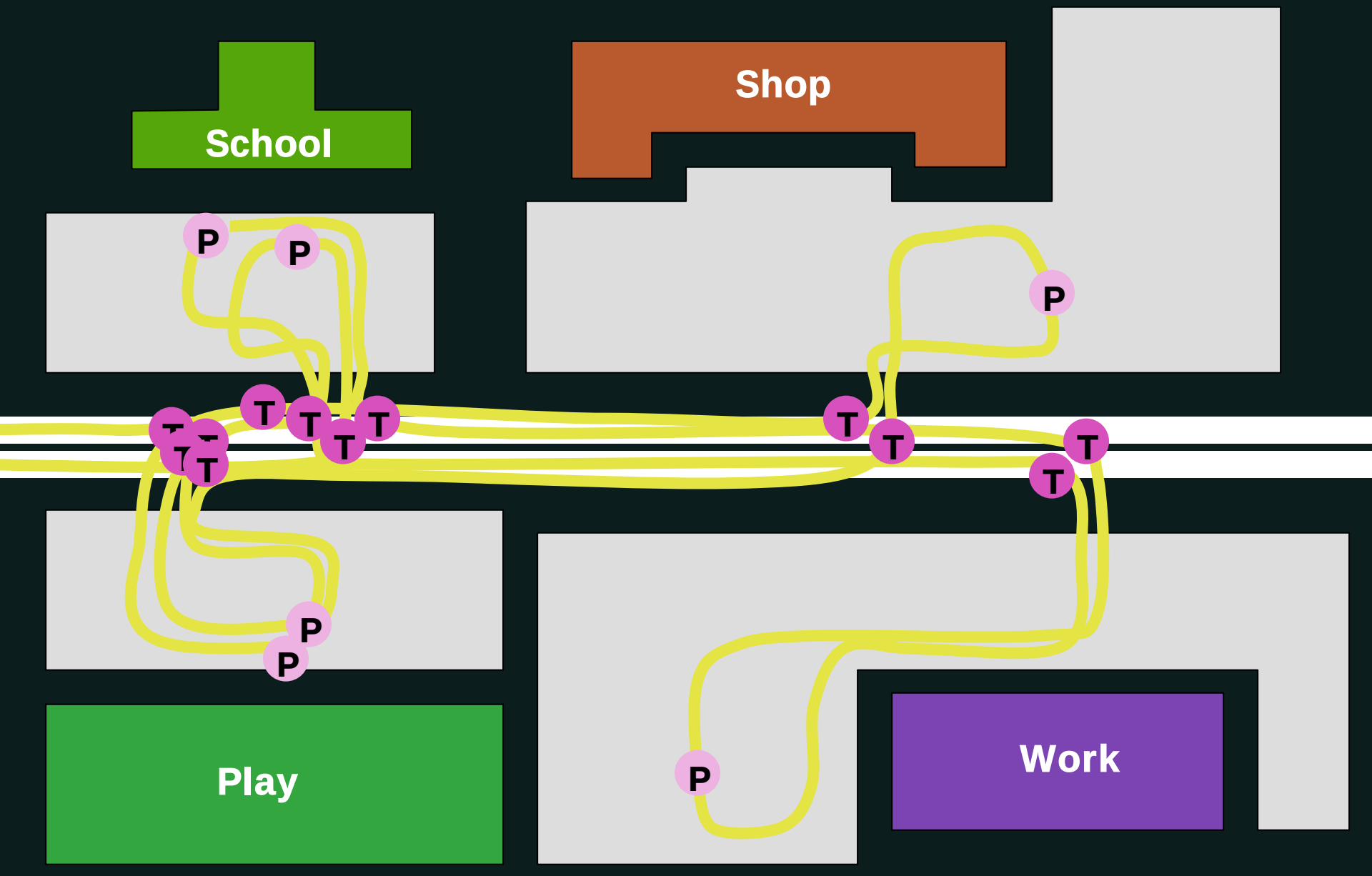
1) Trains are great, but it's not always the key to the neighborhood:
    - Walking, shopping, living, quality of life.
    - Mixed uses ORIENTED towards pedestrians, not autos.
2) Lots of options for transportation:
    - Pedestrian
    - Bike
    - Bus
    - BRT
    - LRT
    - and yes, Trains

Provide Transit People Can Use

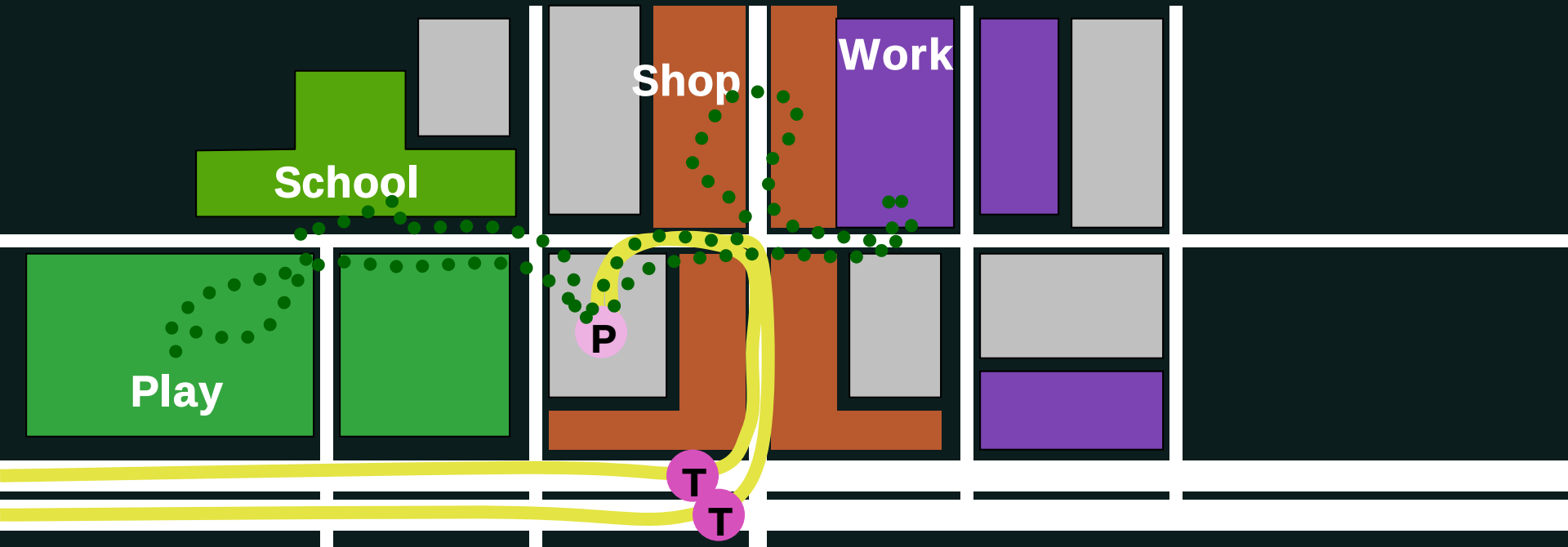
- Frequent
- All Day
- Fast and Reliable
- Easy to Figure Out, Access, and Use
- User Amenities

These are the characteristics that make a train appealing, but there's no copyright on good transit.

Conventional Development



Mixed Use, Park Once District



Results:

- <½ the parking
- <½ the land area
- ¼ the arterial trips
- 1/6th the arterial turning movements
- <¼ the vehicle miles traveled

Transit Oriented Development

Pedestrians and Bicycles: Most Sustainable, Least Impact, and Most Often Forgotten

How do people get to the train without being hit by a car?

Pedestrian improvements are often:

- Simple
- Isolated
- Site-specific
- Human scale

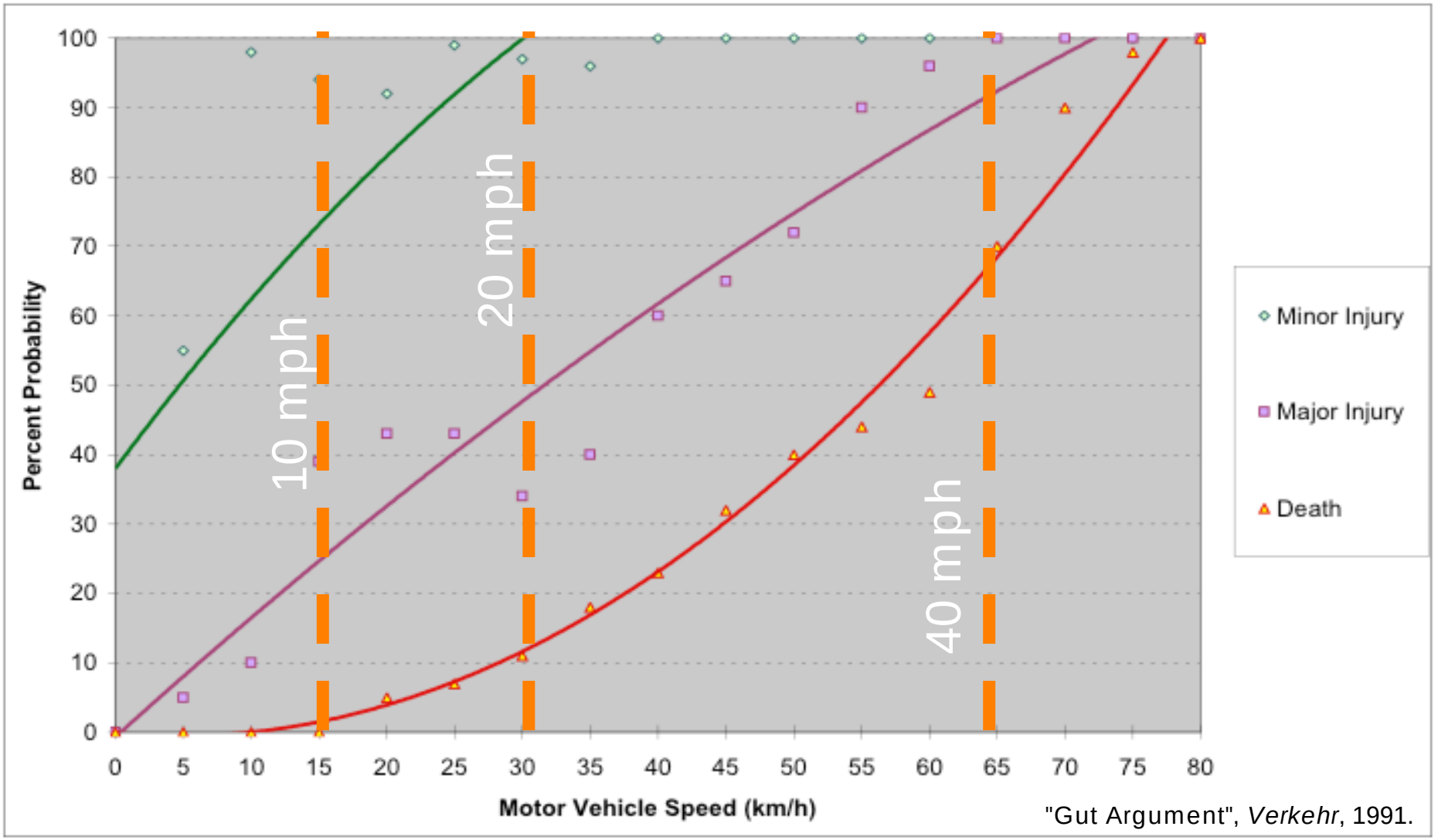
Someone just has to pay attention

6 Keys to Pedestrian Access

1. Safety:

Pedestrians should be well protected from road hazards such as vehicles

Vehicle Speed v. Pedestrian Injury



"Gut Argument", *Verkehr*, 1991.

6 Keys to Pedestrian Access

2. Security:

An environment where pedestrians are not susceptible to robberies or other crimes

6 Keys to Pedestrian Access

3. Directness:

A pedestrian path that minimizes the distance travelled

Also…Don’t add more than 30 seconds of delay

6 Keys to Pedestrian Access

4. Ease of Entry:

The walk does not involve onerous actions, such as walking up steep inclines

6 Keys to Pedestrian Access

5. Comfort

Quality and quantity of pathway, plus protection from inclement weather, such as sun, wind, and rain

6 Keys to Pedestrian Access

6.Aesthetics

The walking environment is pleasing to the eye and inspires a person to use public transport

Bikes on Transit

- Improve multi-modal transportation system and increase ridership
- Reduce vehicle capacity
- Remove vehicles from service to retrofit

Lightrail in Switzerland

Caltrain

San Diego, CA

Bikes and Transit

Bikes Extends Transit Capture Area by as much as 10x.

How can we facilitate biking to transit?

- Secure/protected bike parking at transit and destination
- Taking bikes on board transit
- Shower facilities at/near final destination.
  - Included in development codes for new office buildings

Parking for TODs

What's the Nexus between Land Use & Transportation?

CONVENÇÃO SECOVI SP 2011

Restaurant Table
1.5m x 1.5m
= 2.25 m^2

Office Cubicle
2.4m x 2.7m = 6.5m^2

Parking Space
3m x 6m = 18m^2

How Much Parking is Enough Parking?

- No right answer; every place is different
- No such thing as set “demand” for parking:
  - Pricing
  - Availability
  - Transportation choices
- Supply = station goals
- Don’t confuse supply and availability

Why is Parking So Important?

Parking is an important part of the transportation network, but:

- Parking consumes land
- Parking is expensive
- Parking can work for or against the pedestrian

How Much does Parking Cost?

CONVENÇÃO SECOVI SP 2011

Surface: +/- 16,400 BRL or 100 BRL/month ($10,000 or $60/month)

Garage:
+/- 32,800 BRL or
200 BRL/month
($20,000 or $120/month)

Underground:
+/- 65,600 BRL or
400 BRL/month ($40,000
or $240/month)

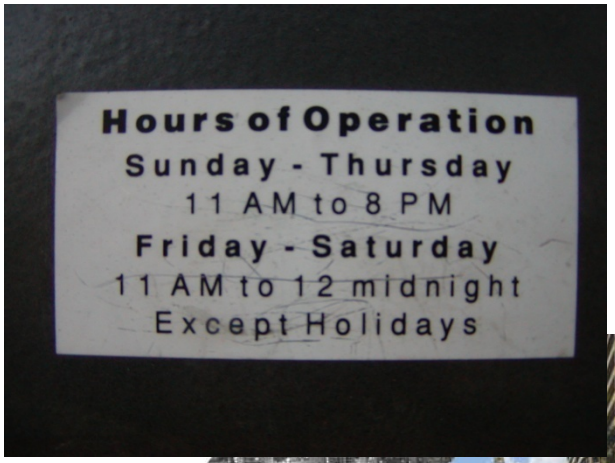
Don’t Allow Parking to Scare People Away

Vary Parking by the Goals of your TOD

	Auto-Prioritized "Regional" Station	Combination Stations	"Downtown" Stations
Conditions	☐ Free parking ☐ Costs born by all riders, not just drivers ☐ Limited development or place-making	☐ Paid parking ☐ Walkable, though not always connected ☐ Transit ☐ Mixed Use ☐ Medium density	☐ Limited/No commuter parking, always paid ☐ Walkable to the district ☐ Mixed Use ☐ Higher density
Traffic	**High** ←	→	**Low**
$ Subsidy	**High** ←	→	**Low**
Pollution	**High** ←	→	**Low**

Price Encourages Modal Choice

- Parking charges reduce parking demand by 7% - 40%
- Parking price elasticity of demand
  - -0.1 to -0.6
  - Typical: -0.3
  - Each 10% rise in parking fees is accompanied by a 3% decrease in demand
- If the land uses are attractive, price reduces vehicle demand, not trip demand



Avoid Parking Oriented Development

CONVENÇÃO SECOVI SP 2011

Avoid Parking Oriented Development

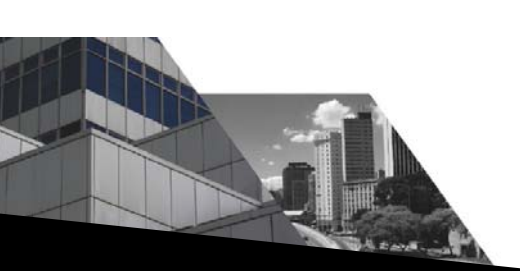
Ground floor devoted to restaurant space, not a blank façade.

Upper floors of the garage look like a normal building.

Arlington, Virginia

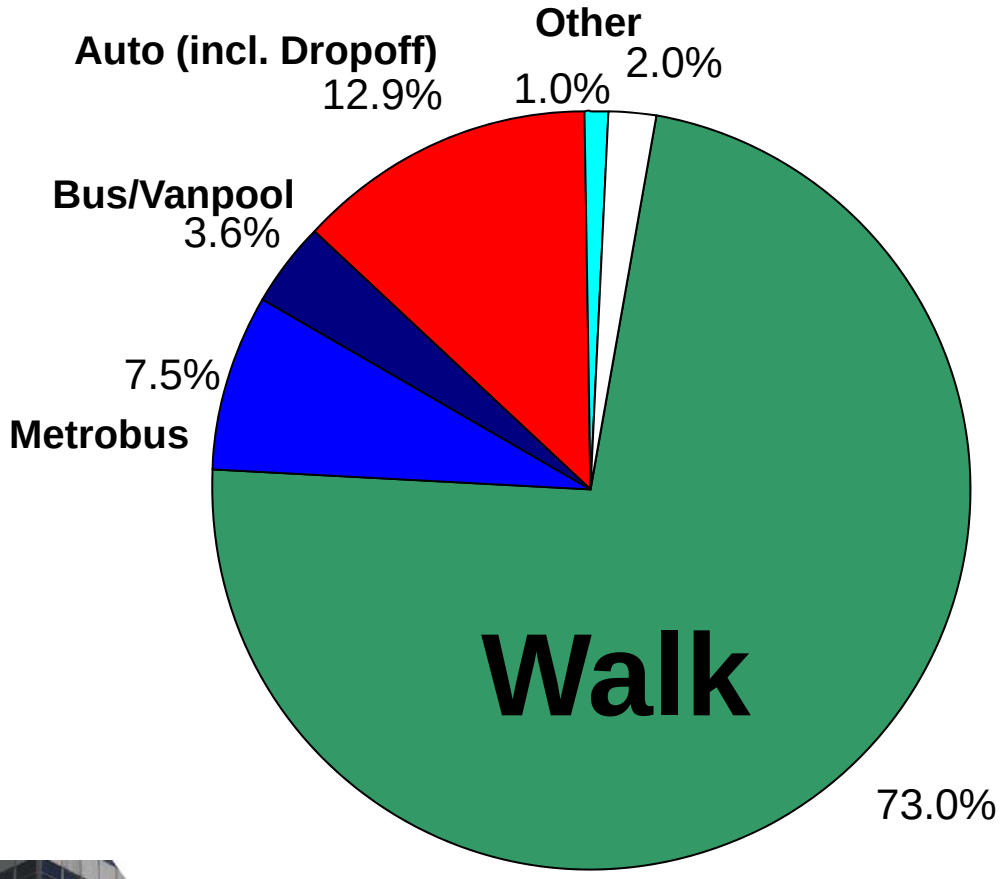
RB Corridor Development Patterns

	1970	2000
Office (sf)	6.7 million	30 million
Retail (sf)	.6 million	4.1 million
Housing Units	5,300	26,500
Jobs	27,000	120,000
Housing/Jobs Balance	1:5	1:4.6

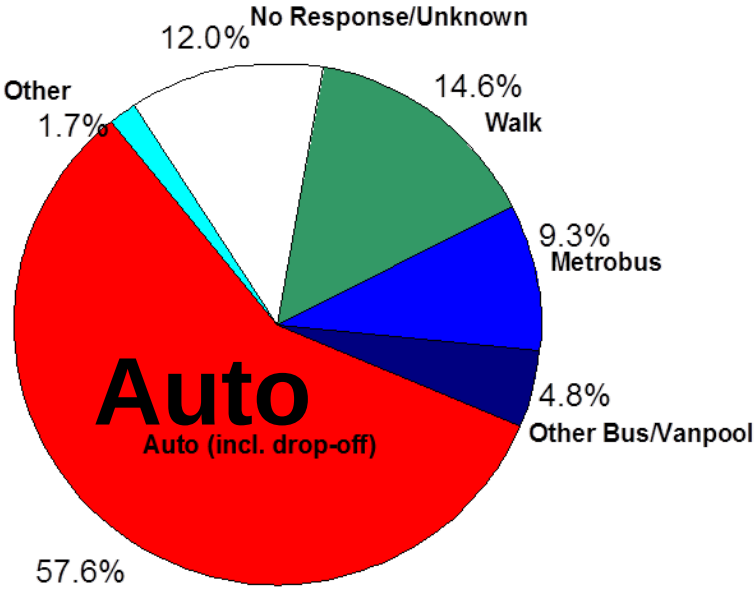


Rosslyn-Ballston Corridor vs Fairfax County

39,500 daily boardings



29,250 daily boardings



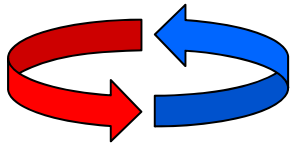
Source: WMATA May 2002 weekday Metrorail ridership and access data

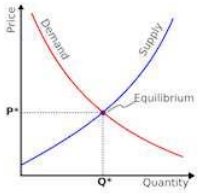
Why Bother with TOD? Sustainability

CONVENÇÃO SECOVI SP 2011

The ability for a system to be used over and over again without the use degrading the system.

- Environmental
- Transportation
- Spatial
- Economic



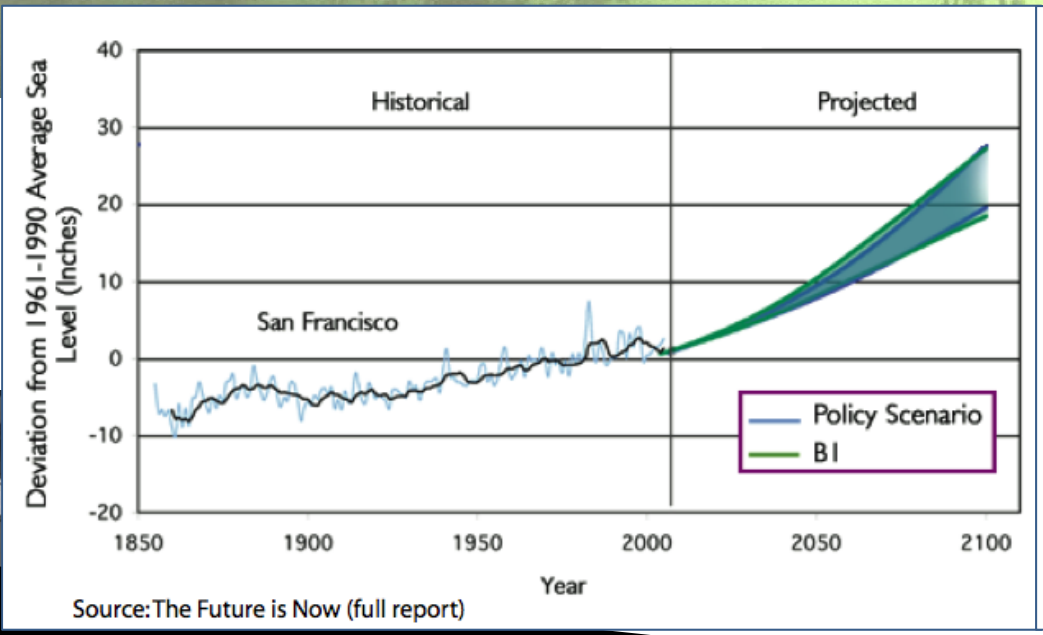


Planning provides the framework for the sustainability of development

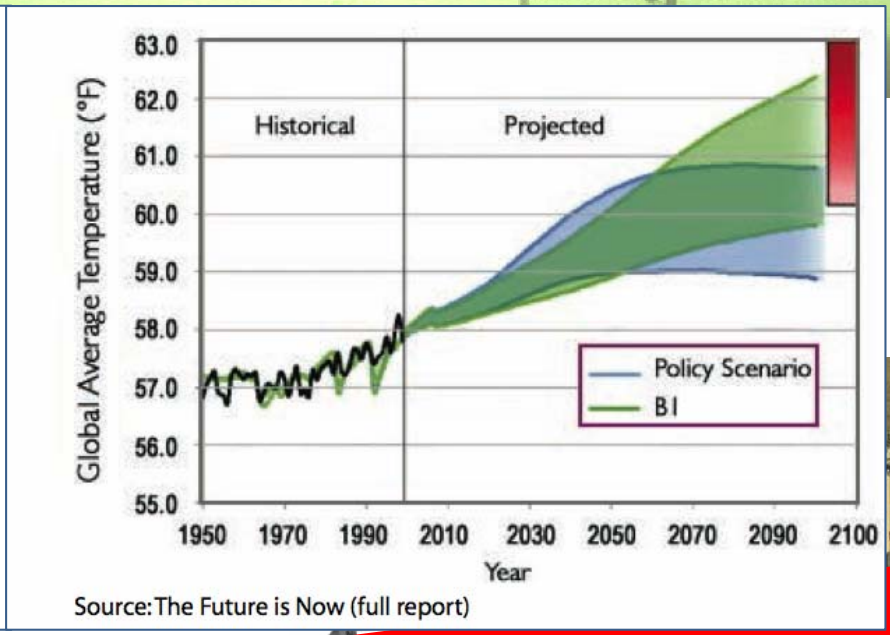
We Should All Be Worried

CONVENÇÃO SECOVI SP 2011

- 17cm-58cm higher sea levels by 2100
- 3 degrees C temperature increase by 2100
- Droughts, wildfires, human health impacts
- Need to cut global emissions 50-80% below 1990 levels to reduce risk

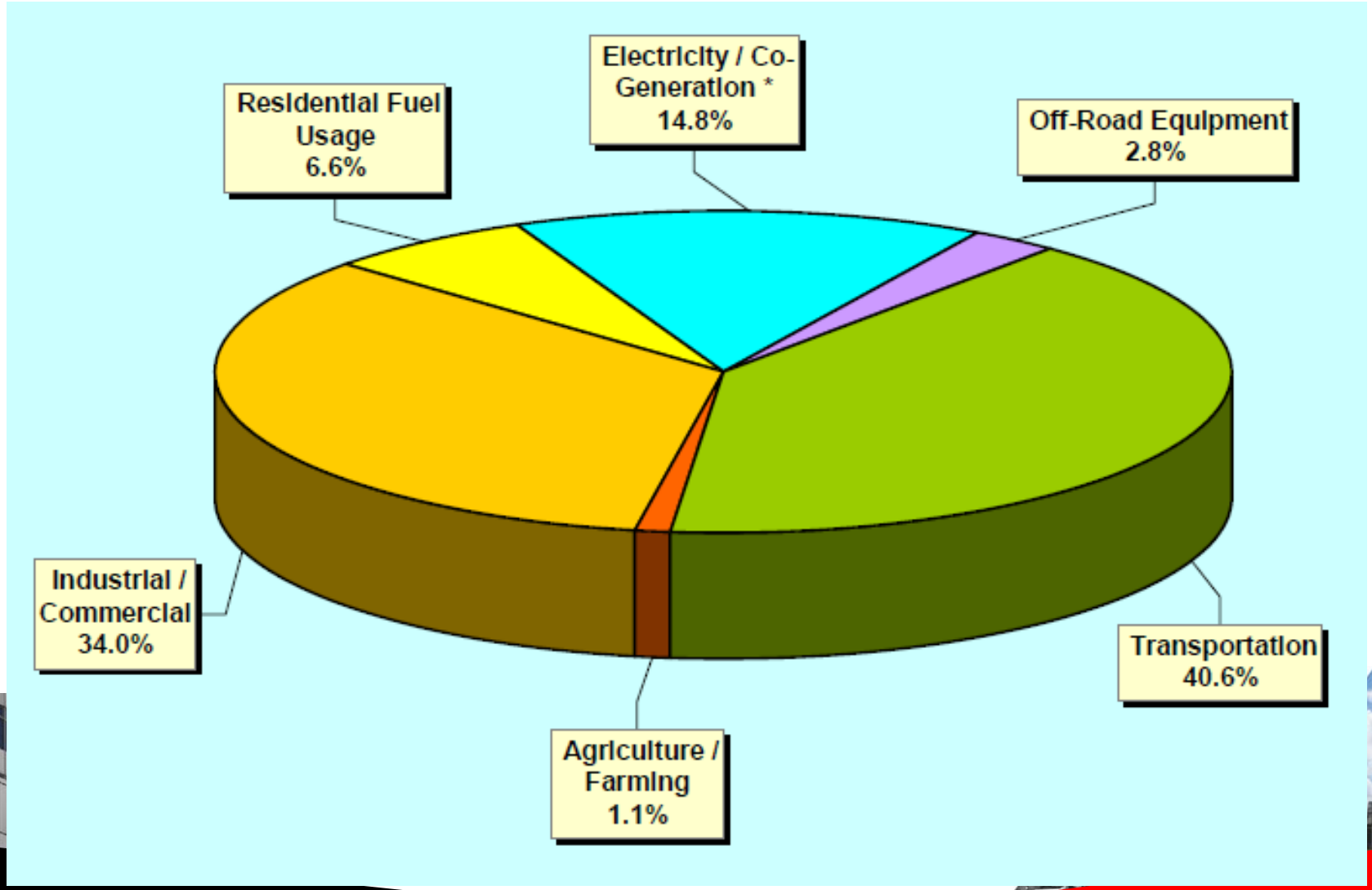


Source: The Future is Now (full report)



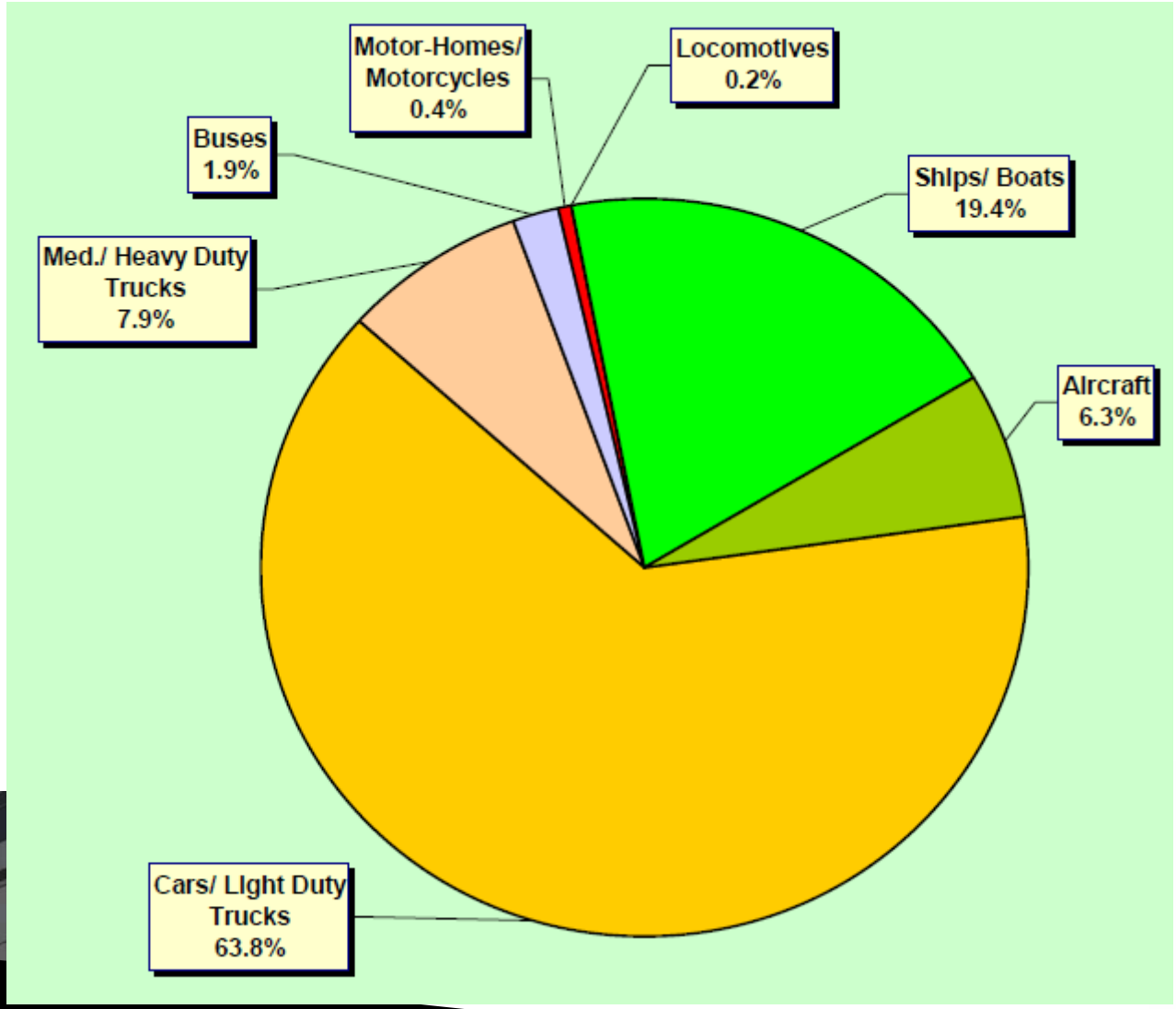
Source: The Future is Now (full report)

Transportation is 40-50% of our CO2 Problem



Source: BAAQMD

Transportation is 40-50% of our CO2 Problem



Personal driving is about two thirds of the transport sector CO2

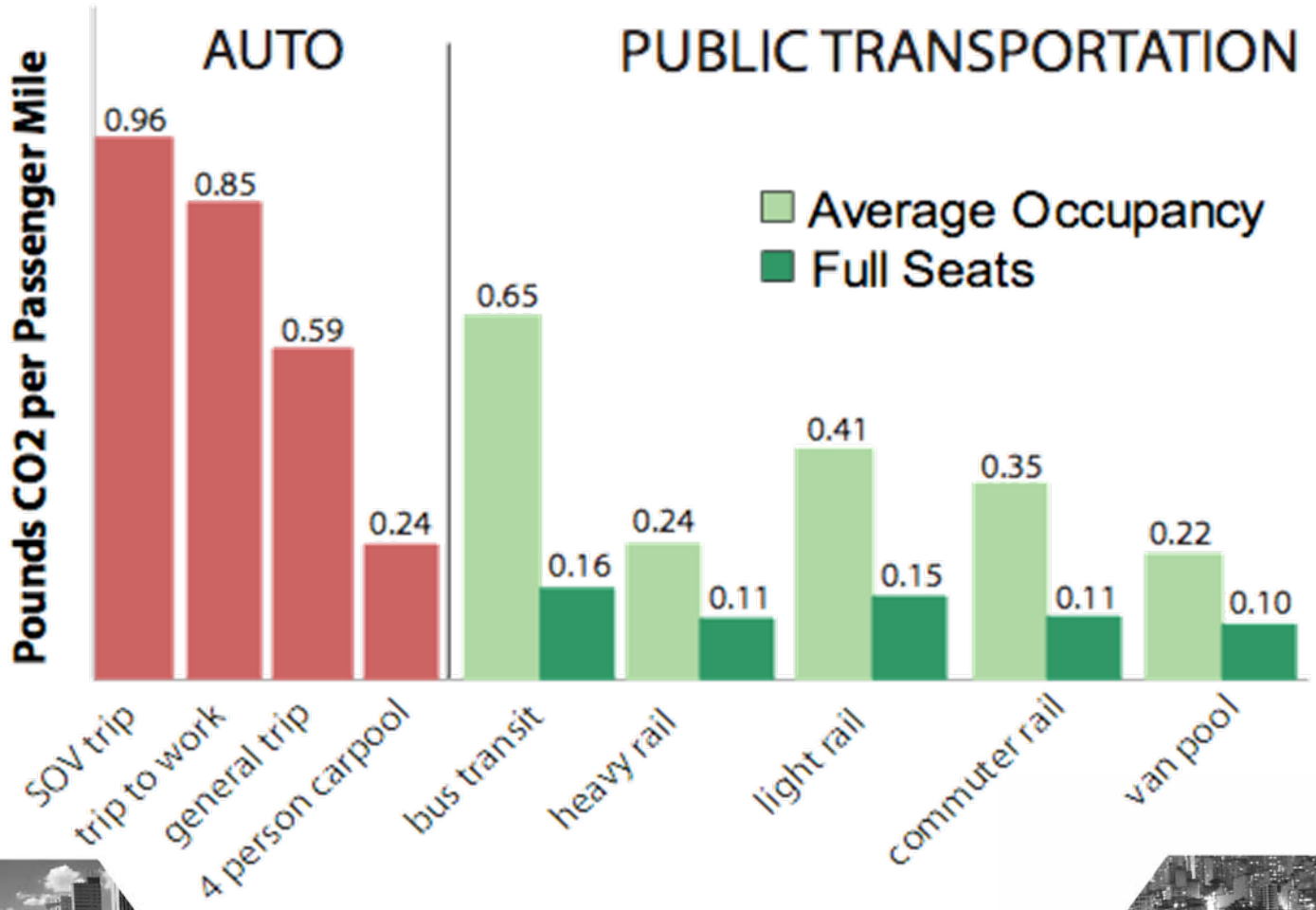
Source: BAAQMD

CONVENÇÃO SECOVI SP 2011

Why is TOD Sustainable?

Photo montage by Steve Price

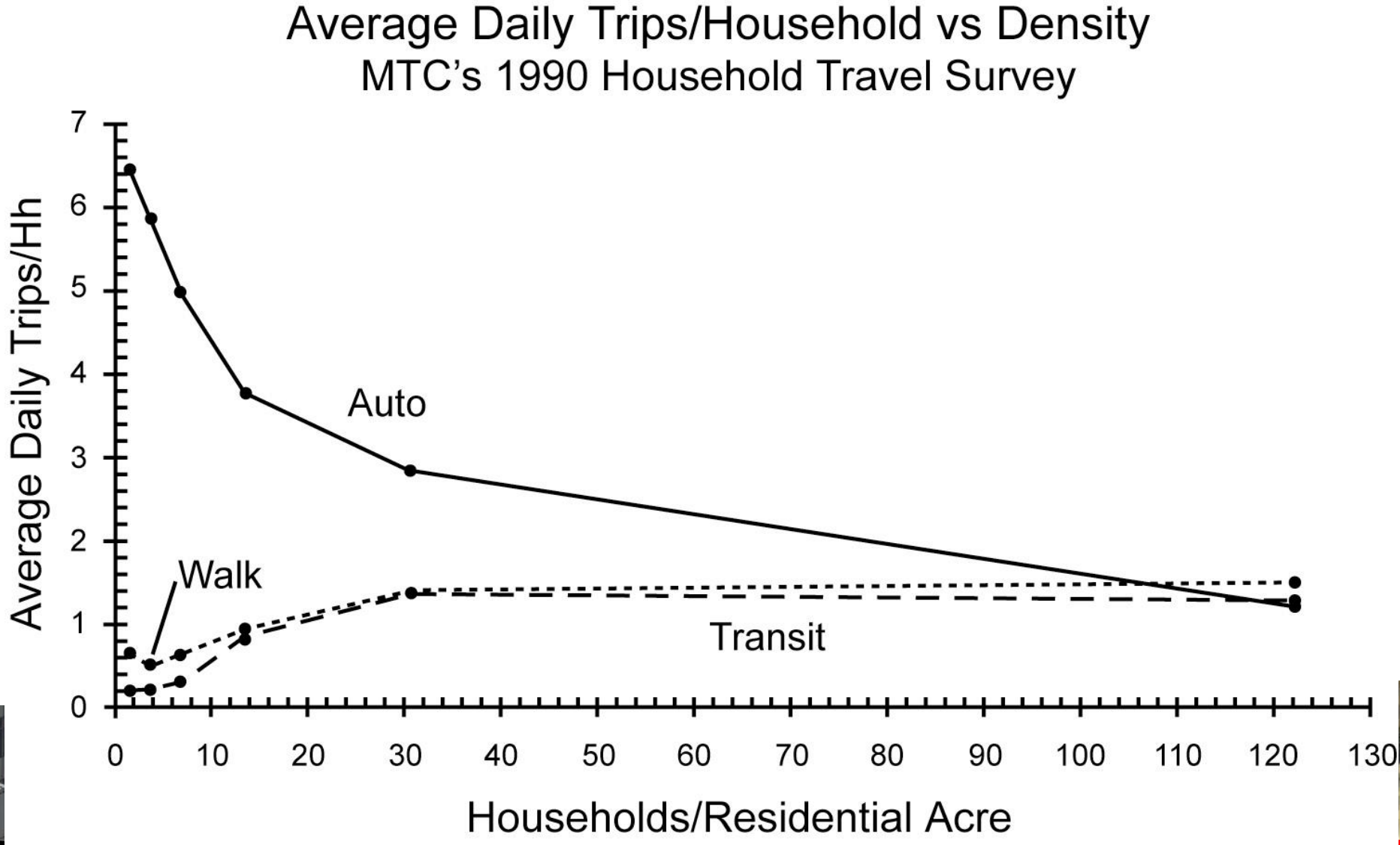
Modal Comparison



Source: Hodges, "Public Transportation's Role in Responding to Climate Change," FTA 2009.

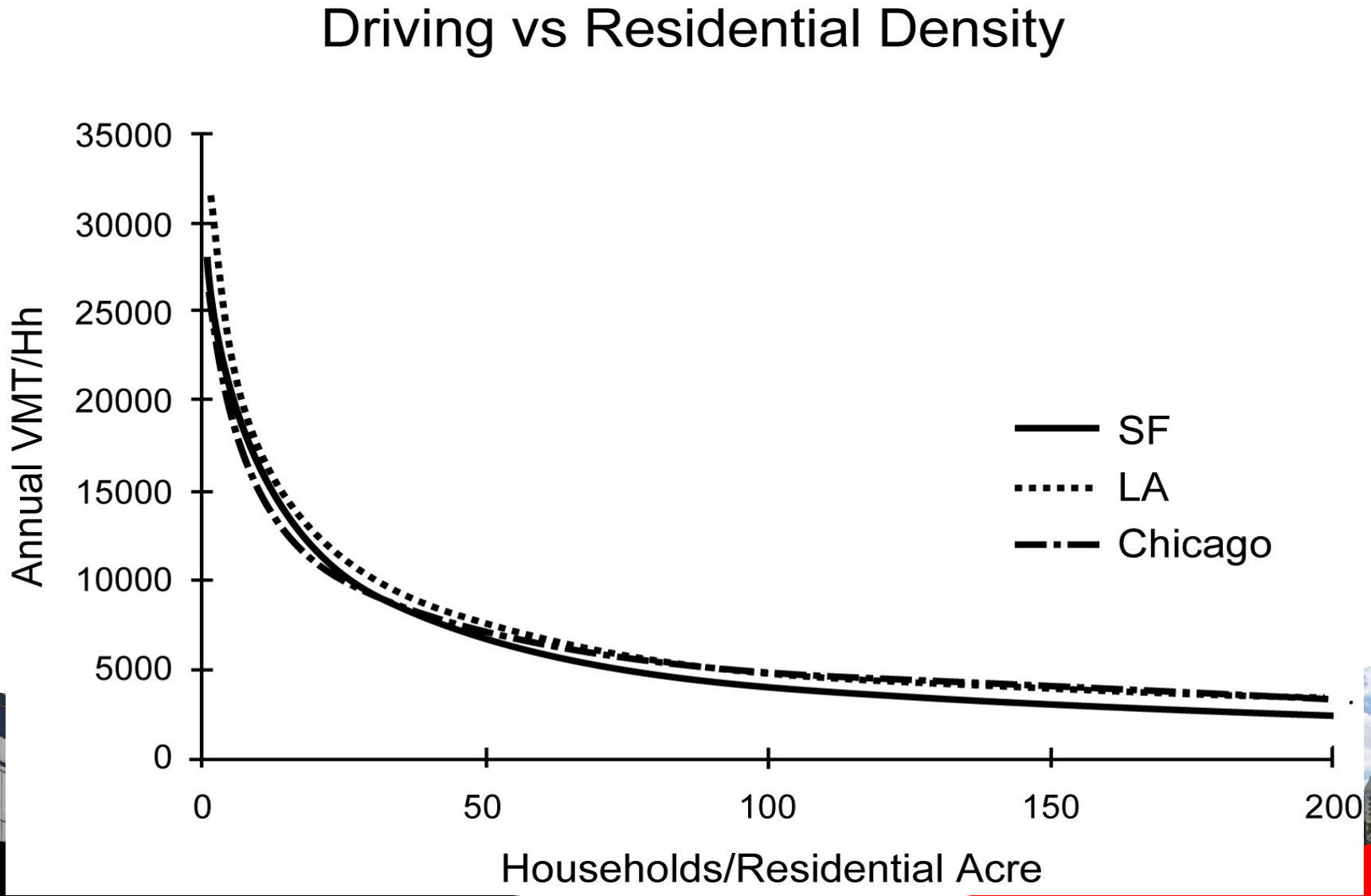
Transportation Sustainability

CONVENÇÃO SECOVI SP 2011



Environmental Sustainability

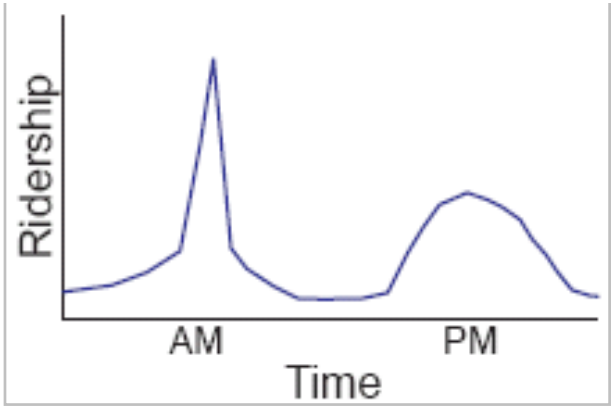
- 30-40% reduction in trips typical



Transit Sustainability

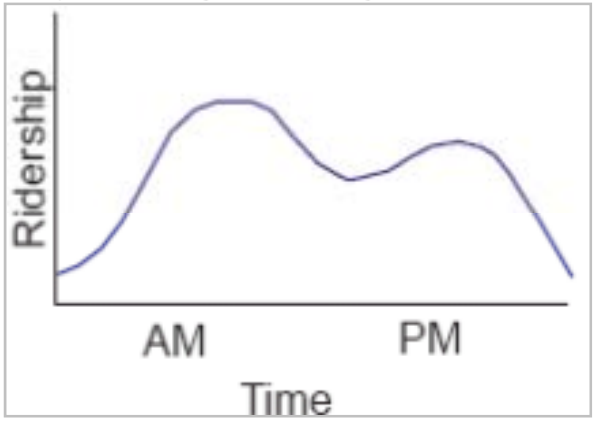
TOD = more transit ridership throughout the day

Ridership trends "Before" TOD and parking management



- Overloads station infrastructure (stairs, platforms) morning peak
- Under capacity midday
- Rush to find free parking spots morning peak

Ridership trends "After" TOD and parking management



- Marginal cost per rider decreases
- Spreads out peak ridership
- Efficient midday utilization
- Parking pricing evens out morning rush

The Bottom Line for TOD

CONVENÇÃO SECOVI SP 2011

+	Mixed Uses	⇨	People
+	Density	⇨	People
+	Design	⇨	People
+	Pedestrian Access	⇨	People
+	Parking Policy	⇨	People with Fewer Cars
+	Transportation Choices	⇨	People with Options

TODs are active, convenient, people-focused places.

Transit Oriented Development: Beyond the Basics

David Fields, AICP

Nelson\Nygaard Consulting Associates