The Link Between Infrastructure & Housing Attainability

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Outline

- The Supply Linkage
- The Leverage Linkage
- The Density Linkage
- The Regional Accessibility Linkage
- The Walking-Distance Linkage

The Supply Linkage – Theory

- Theory
  - Housing demand in excess of supply increases prices.
  - Insufficient infrastructure supply in the face of demand reduces buildable land supply and thus reduces housing supply thereby increasing prices.
  - Infrastructure expansion commensurate with development demand sustains the housing pipeline thus moderating housing price increases.

The Supply Linkage – Evidence

- Overlooked research question.
- Metro Portland, OR requires infrastructure concurrent with demand. Studies housing prices lower than West Coast metros.
- Burge & Ihlanfeldt at FSU found that impact fees increase supply of affordable housing. Why?
  - Impact fees are used to provide infrastructure concurrent with growth
  - Impact fees reduce/eliminate afforable housing NIMBYism.

The Leverage Linkage – Theory

- Clear infrastructure planning can determine external funding sources that may be cultivated over time.
- Short-term revenue streams such as impact fees, cash proffers, local budget allocations can leverage external funding sources.
- As external funds are leveraged infrastructure is expanded and moderates the housing demand-supply relationship, moderating prices.

The Leverage Linkage – Evidence

- Another overlooked research question.
- Ihlanfeldt & Shaughnessy at FSU found that impact fees are capitalized backward in the land market but increase the value of homes despite sustaining affordable housing supply. Why?
  - Impact fees create stable infrastructure provision the market is willing to pay for.
  - Impact fees leverage state funds especially for roads, schools, and open spaces.
  - Other studies show impact fees sustain affordable housing supply by reducing NIMBYism.

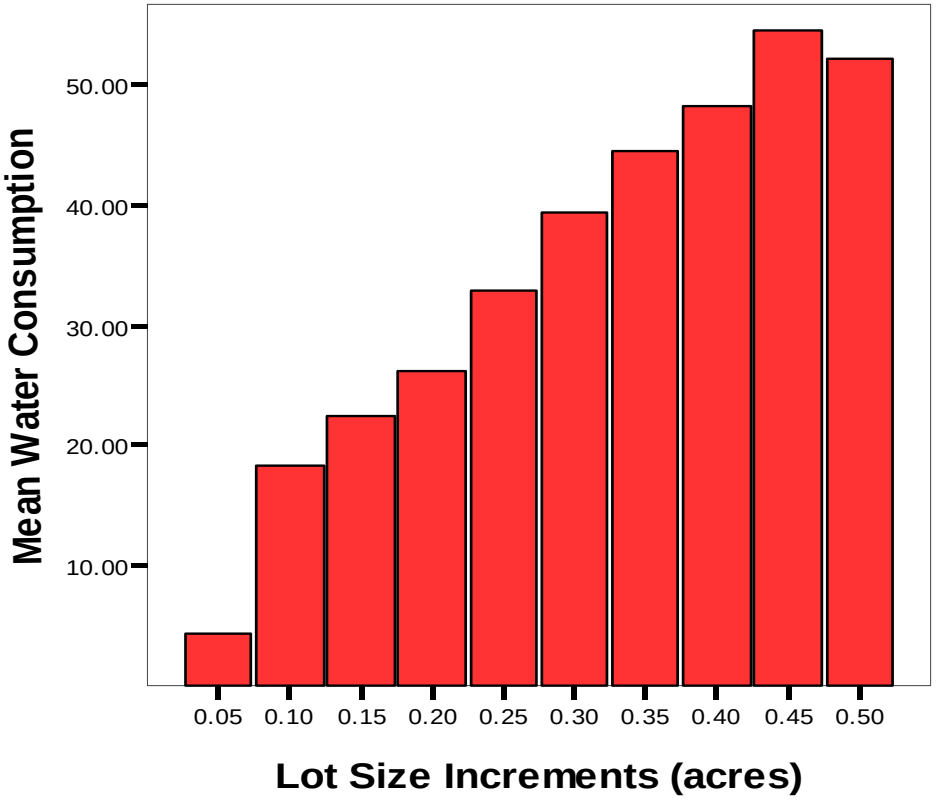
The Density Linkage – Theory

- Many (not all) infrastructure elements are sensitive to density.
- Utilities → Capital and maintenance costs decline per unit with increasing density.
- Public safety → Capital and operating costs decline per unit with increasing density in response area even accounting for congestion effects.
- Schools → Capital costs decline per unit with increasing density as older schools sustain critical mass of attendance.

The Density Linkage – Evidence

Mean Water Consumption by Lot Size (Grouped in .05 acre increments)

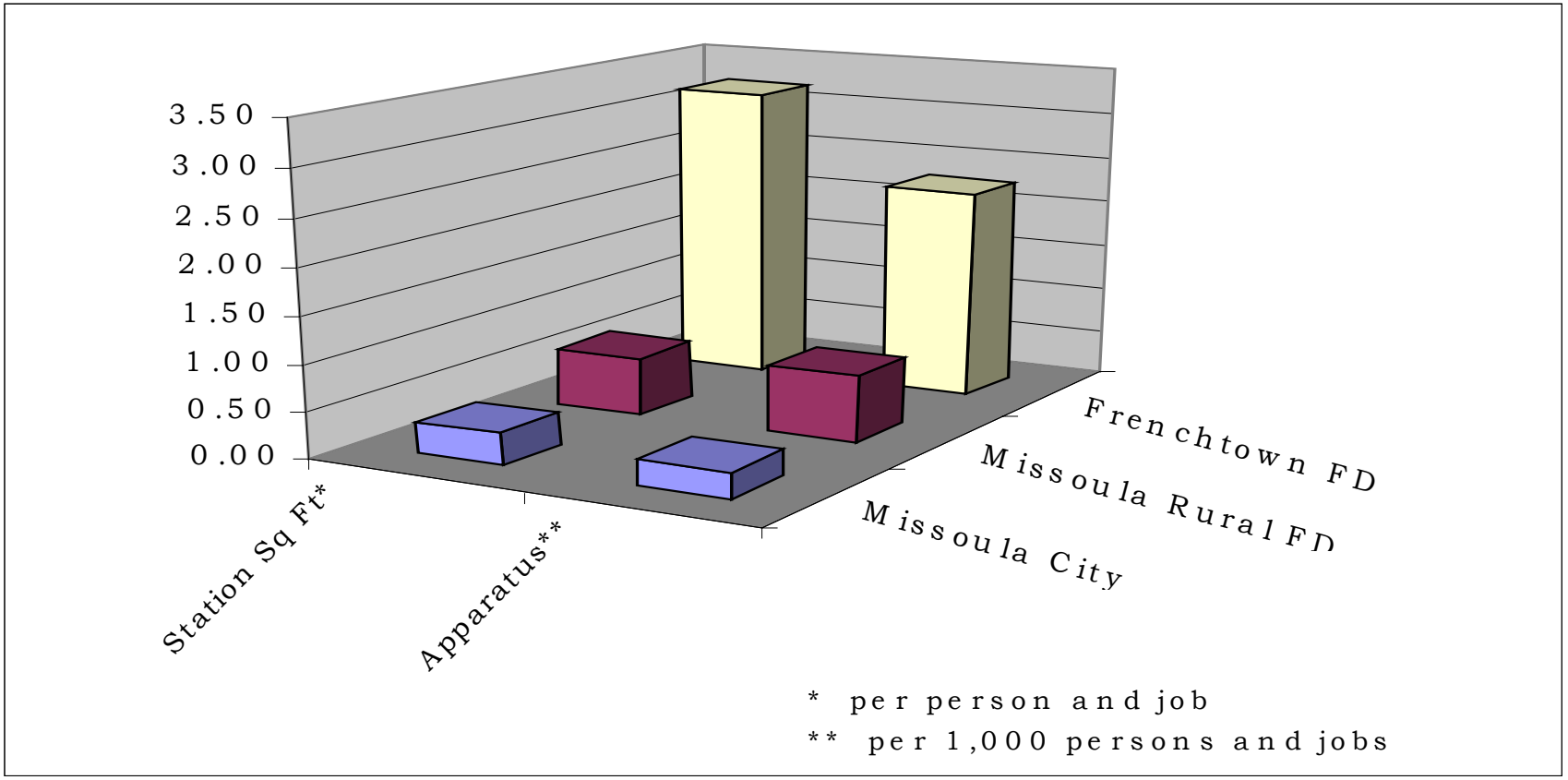
5 Year Average for June Water Consumption



The Density Linkage – Evidence

Fire District Level Of Service Comparison

	Missoula City	Missoula Rural FD	Frenchtown FD
Station Sq Ft*	0.34	0.63	3.20
Apparatus**	0.27	0.72	2.27



The Density Linkage – Evidence

Trip Distribution by Density, 2001

Housing Units Per Square Mile	Private Motor Vehicle	Bus	Rail	Bicycle	Walk	All Other Modes
26 – 750	97.0%	0.5%	0.3%	0.1%	1.7%	0.5%
751 - 2,000	95.4%	1.1%	1.2%	0.3%	1.4%	0.6%
2,001 - 4,000	92.4%	2.8%	1.6%	0.4%	2.4%	0.4%
4,001 - 6,000	82.4%	7.4%	3.2%	1.4%	5.0%	0.7%
6,000+	56.6%	13.7%	18.7%	1.4%	8.6%	0.9%
All	90.9%	2.90	2.5%	0.5%	2.8%	0.5%

Source: Nationwide Household Transportation Study 2001.

The Density Linkage – Evidence

Units/Acre	Total Costs/Unit
3	$37,368
10	$28,544
15	$25,421
30	$20,509

James E. Frank, *The Costs of Alternative Development Patterns: A Review of the Literature*, Washington: Urban Land Institute, 1989. Figures in 2000 dollars.

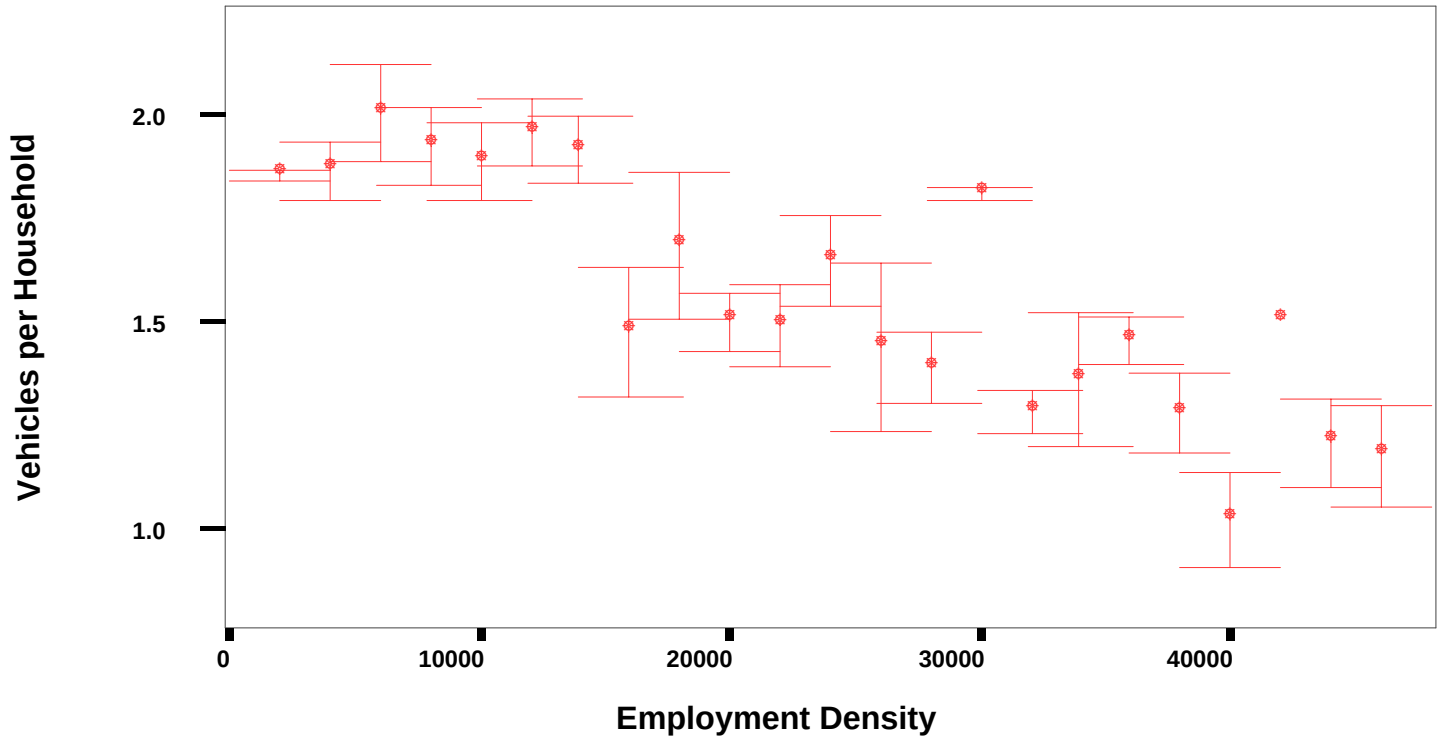
The Density Linkage – Evidence

Urban Form	Cost/Unit
Compact	$9,252
Contiguous	$11,230
Linear	$16,387
Scattered	$19,638

James B. Duncan & Associates, *The Search for Efficient Urban Growth Patterns: A Study of the Fiscal Impacts of Development in Florida*, Tallahassee: Florida Department of Community Affairs, 1989, adapted from p. 13.

Regional Accessibility Linkage – Theory

At greater employment densities, households own fewer autos



Center for Neighborhood Technology, Carrie Makarewicz Virginia Tech. October 2006.

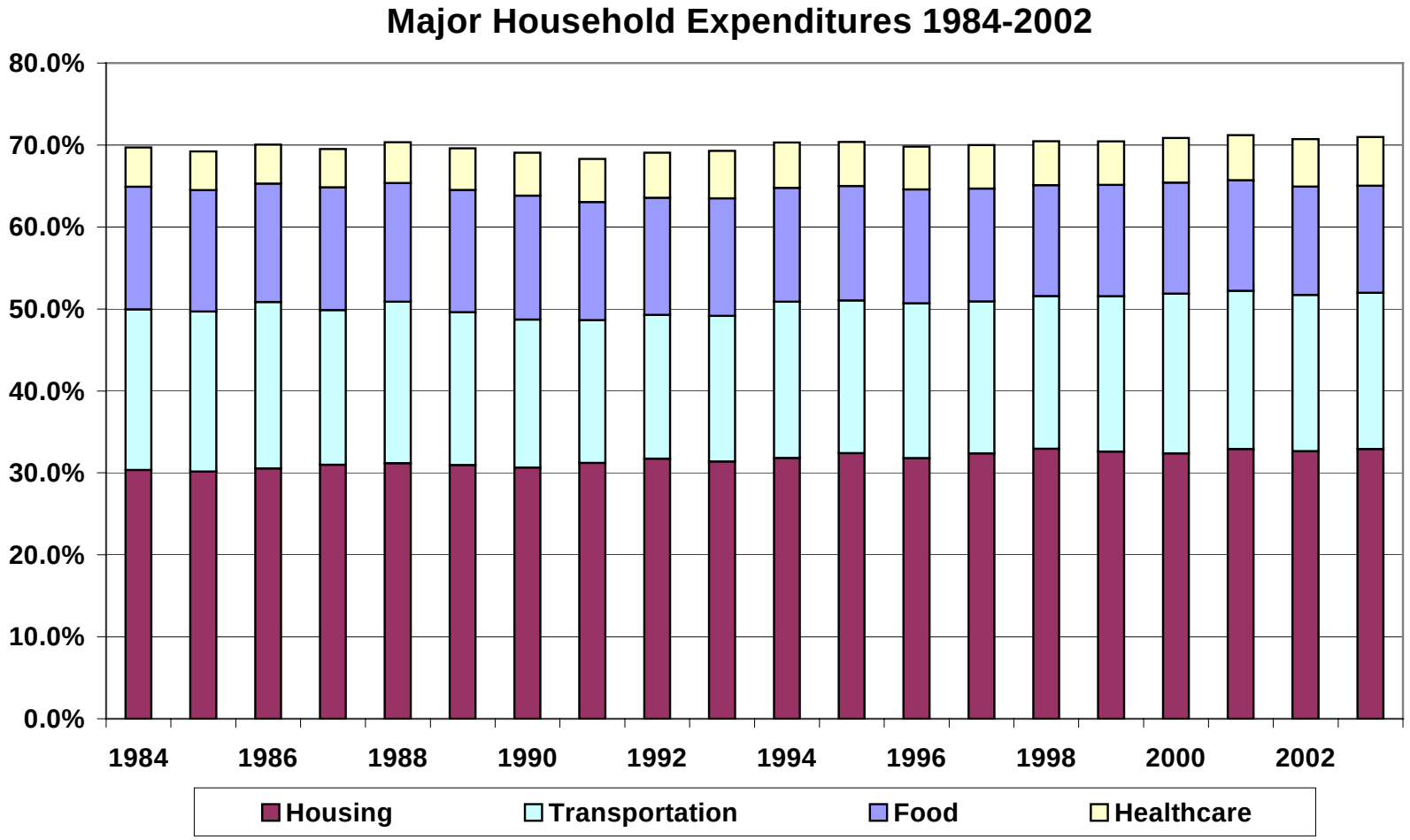
More Cars = Higher Total Costs

H+T Affordability Index Equation

$$\text{H+T Index} = \frac{(\text{Housing Costs} + \text{Transportation Costs})}{\text{Income}}$$

Center for Neighborhood Technology, Carrie Makarewicz Virginia Tech. October 2006.

Total Household Costs



Source: Consumer Expenditure Survey for all consumer units, Bureau of Labor Statistics 1984-2002

Transit Zones & Affordability Index

Income & Expenditures	High Transit Use	Medium Transit Use	Low Transit Use
$20-$35K			
% T	16%	22%	30%
% H+T	47%	52%	62%
$35-$50K			
% T	12%	16%	22%
% H+T	36%	39%	47%

Proximity to transit without density, services, jobs, and walkability will not alone lower transportation costs

Walking-Distance Linkage – Current View

Jurisdiction	Distance of District Boundary
Seattle, WA	¼-mile radius from LRT station
Hillsboro, OR	1,300-ft radius from LRT station
Portland, OR	¼-mile radius from LRT station
Washington County, OR	½-mile radius from LRT station; ¼ mile radius from primary bus routes
San Diego, CA	2,000-ft radius from transit stop

Walking-Distance Linkage – Research

Perth Study of Distances Walked to Access transit

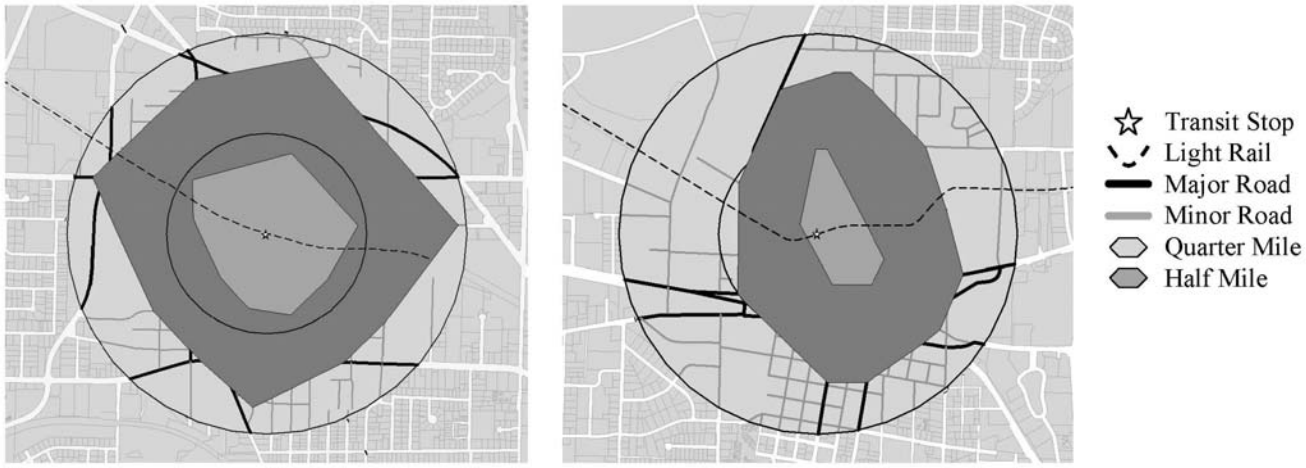
- 10.5% came from within 1,312 feet
- 22.5% came from 1,312 – 2,625 feet
- 12% came from 2,625 – 3,280 feet
- 34% came from 3,280 – 6,562 (1.24 miles) feet
- 14.5% came from 1.24 – 1.86 miles

Walking-Distance Linkage – Research

10-Minute Walking Distances

- Walk-in-the-Park (saunter)
  - 10 minutes = 1,500 feet (1/4 mile)
- Business walk
  - 10 minutes = 3,000 feet (1 kilometer)
- New York walk
  - 10 minutes = 3,900 feet (3/4 mile)

Walking-Distance Linkage – Revised



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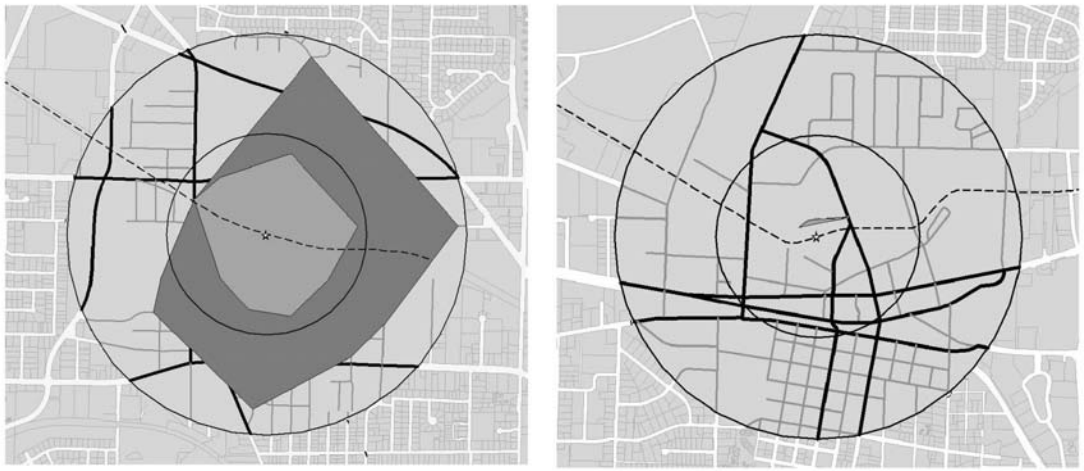

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Review

- Infrastructure supply commensurate with demand moderates housing prices; increases supply.
- Affordable housing supply promoted when infrastructure provided concurrent with demand.
- Infrastructure supply enhanced with long-range planning and leveraging external funds.
- Infrastructure costs decline with density.
- New view of TODs suggests the appropriate radius is 1 kilometer (or more).

THANK YOU!