

A National Performance Based Transit-Oriented Development Typology

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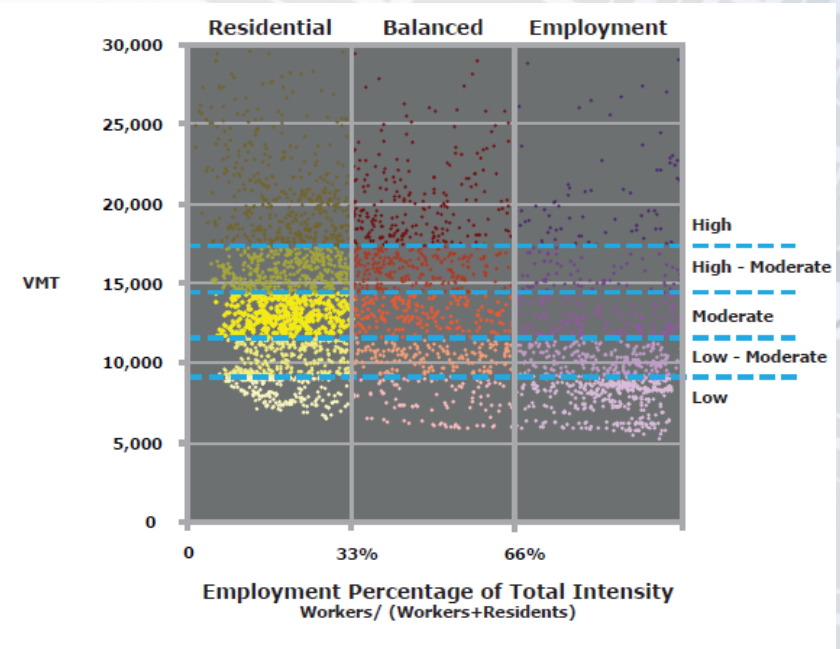
At Reconnecting America, we help transform promising ideas into thriving communities – where transportation choices make it easy to get from place to place, where businesses flourish, and where people from all walks of life can afford to live, work and visit.

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Overview:

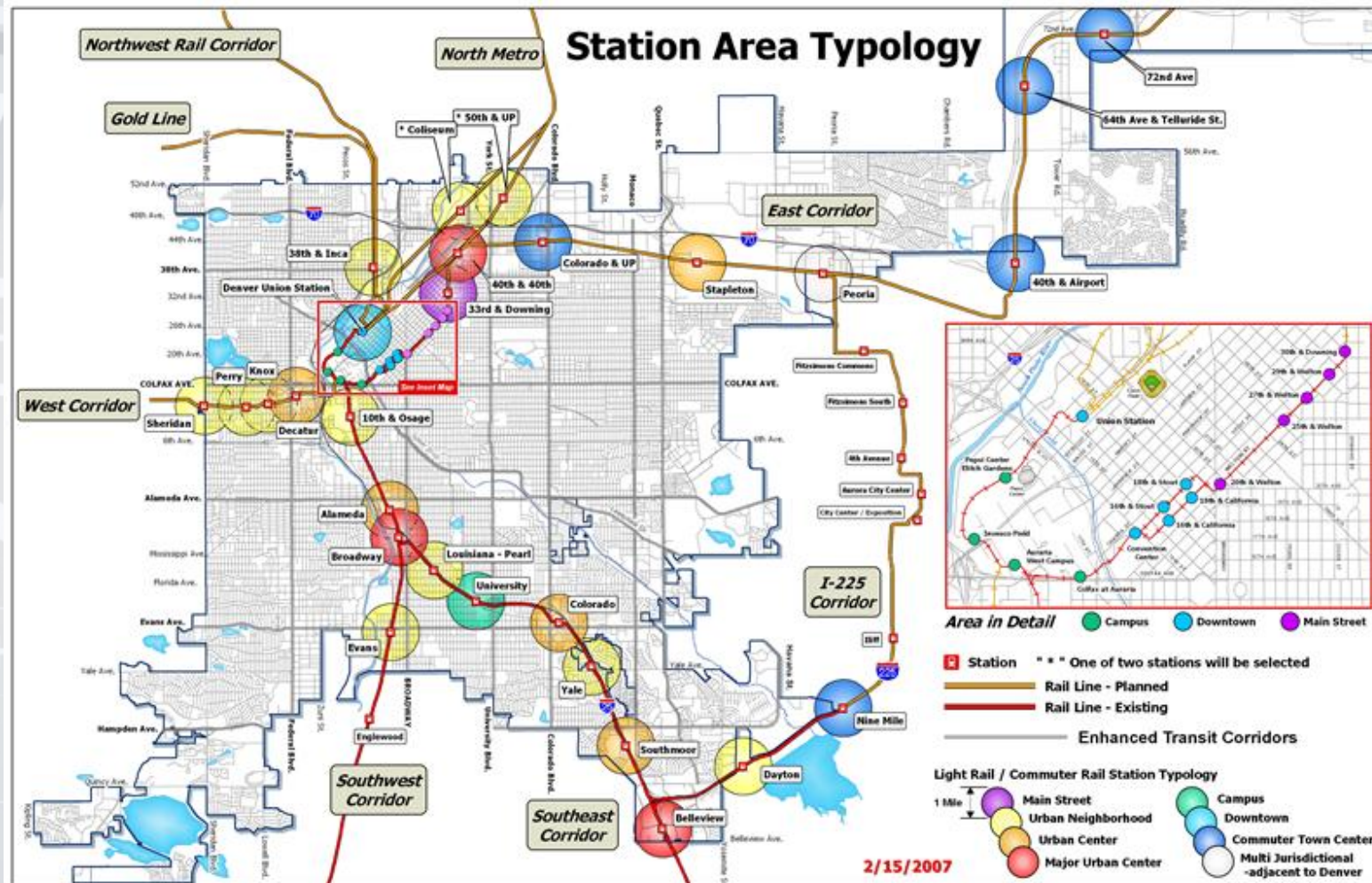
- TOD Typologies
- Normative Metrics
- Case Studies
- Development Scenario
- Policy Implications



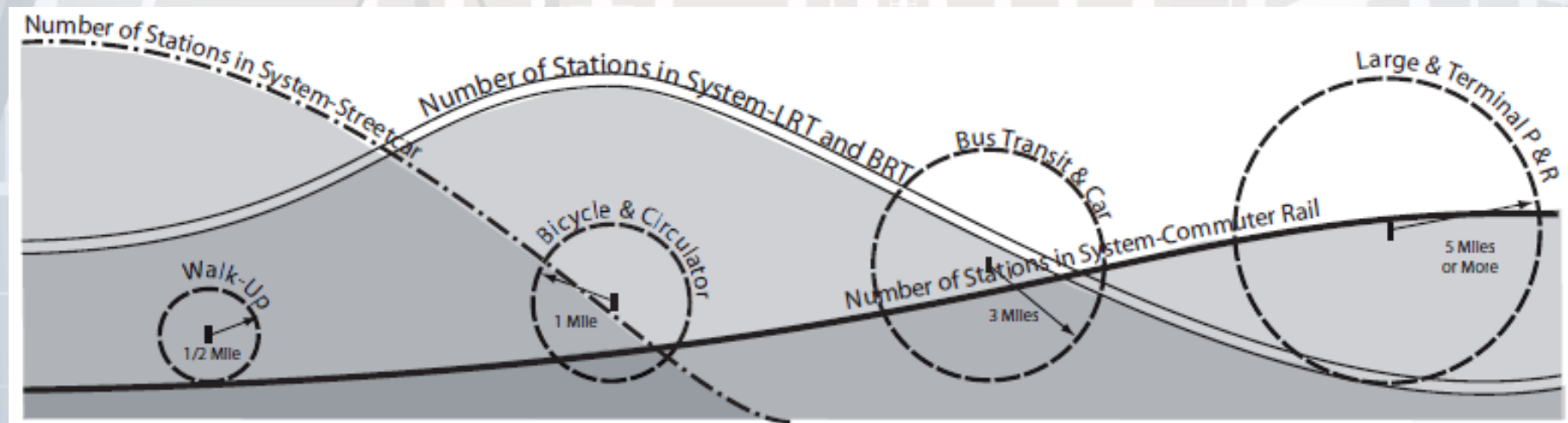
TOD Typologies: Not One Size Fits All

TOD Typology	Desired Land Use Mix	Desired Housing Types	Commercial Employment Types	Proposed Scale	Transit Connectivity	Color Code	Examples
Regional Center	Office Residential Retail Entertainment Civic Uses	Multi-Family and Loft	Prime Office and Shopping	5 Stories and above	Intermodal Facility/ transit hub. Major Regional Destination with quality feeder connections		
Urban Center	Office Retail Residential Entertainment	Multi-Family/Loft/ Townhome	Employment Emphasis, with more than 250,000 sf office and 50,000 sf retail	5 Stories and above	Sub-Regional Destination. Some Park n Ride. Linked district circulator and feeder transit service		
Suburban Center	Residential Retail Office	Multi-Family/ Townhome	Limited Office. Less than 250,000 sf office. More than 50,000 sf retail	3 Stories and above	Sub-Regional Destination. Some Park n Ride. Linked district circulator and feeder transit service		
Neighborhood	Residential Neighborhood Retail	Multi-Family/ Townhome/Small Lot Single Family	Local-Serving Retail. No more than 50,000 sf	2-5 Stories	Walk up station. Very Small Park and Ride, if any. Local and express bus service.		
Main Street	Residential Neighborhood Retail	Small Lot Single Family	Main Street Retail Infill	2-4 Stories	Bus or streetcar corridors. Feeder transit service. Walk up stops. No parking.		
Campus/ Special Events Center	University/Campus Sports Facilities	Limited Multi-Family	Limited Office/Retail	varies	Large Commuter Destination.		

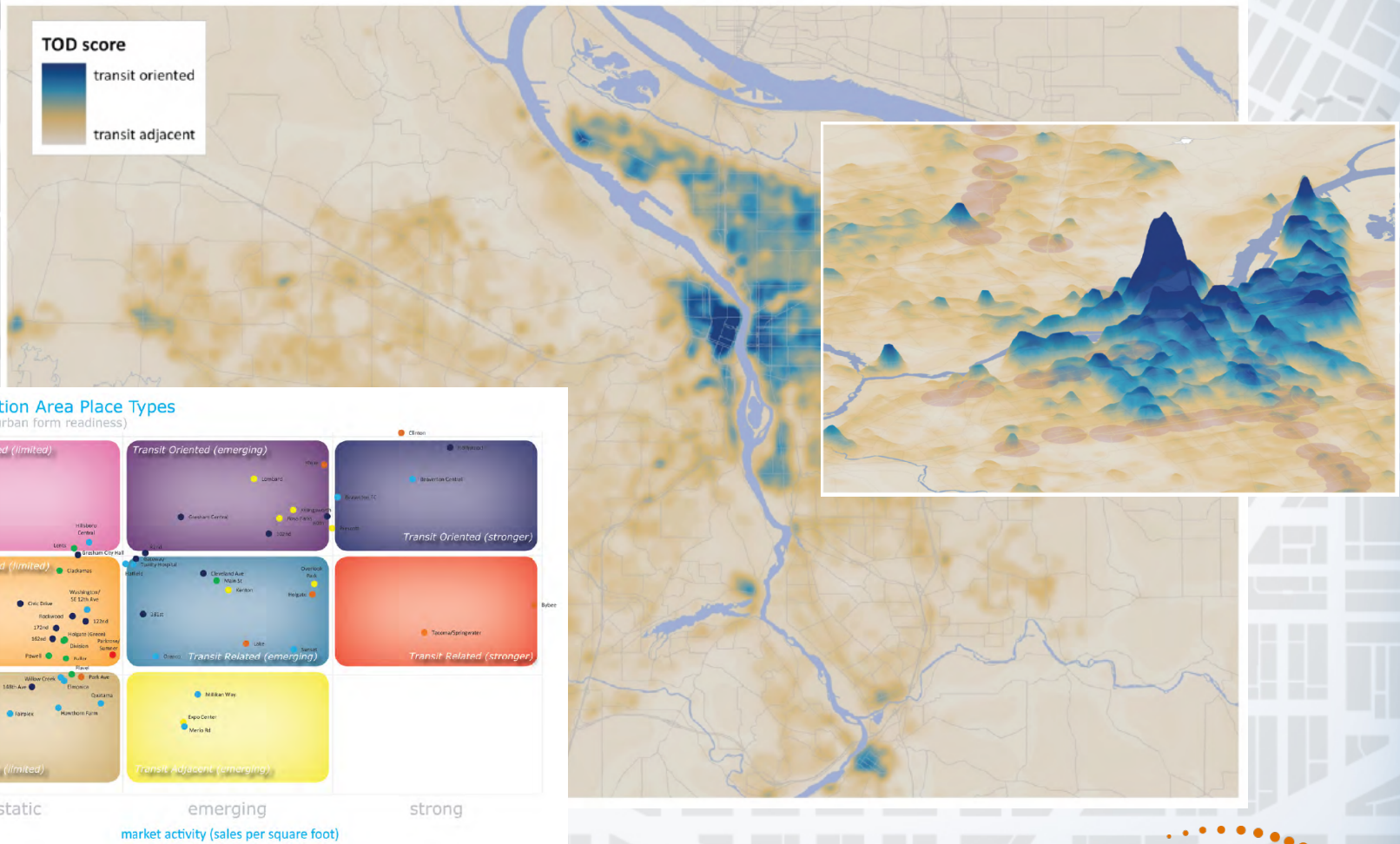
Denver: Investment Strategy When Multiple Transit Stations Are Coming Online at Once



Charlotte: An Access Typology that prescribes the investments in access that need to be made



Portland: Builds off of a number of different typologies to show where regional investments will push the market



Why a Performance Based TOD Typology?

- Allows Us to Create a User Friendly Tool for Understanding Key Conditions in Places that influence GHG emissions
- Use existing data to measure stations and compare them with one another
- Establishes a base condition from which stakeholders can identify strategies to improve performance

Using VMT as the Main Metric

- Low VMT Places Tend to have Better Mode Splits
- Simplifies the Focus & Discussion
 - Easier to understand build 1000 units vs. reduce emissions 30%
 - Transportation relates to many other strategies and goals
- User Friendly Tool
 - Easier to understand build 1000 units vs. reduce emissions 30%
 - Transportation related to many other strategies and goals

VMT Estimation

- Modeled on Boston Odometer Readings
- Primary Influencers of VMT Performance:
 - Household Income | Household Size
 - Commuters per HH | Journey to Work
 - HH Density | Block Size
 - Transit Access | Employment Access
- Urban Form is a greater influence than socio-economic indicators

Creating the Typology

Table 1. VMT Types

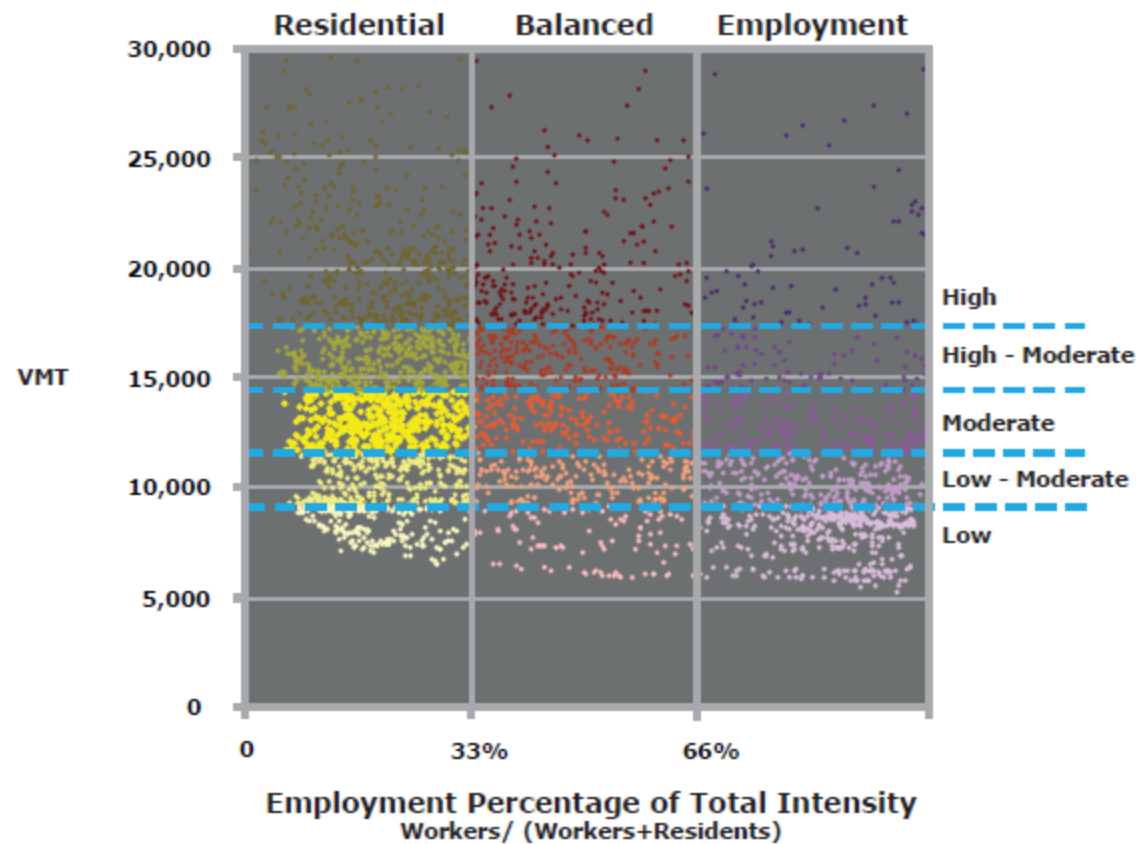
Household VMT Type	VMT Range
1 - Low	< 9,100
2 - Low-Moderate	9,100 to 11,600
3 - Moderate	11,600 to 14,300
4 - High-Moderate	14,300 to 17,200
5 - High	> 17,200

Table 2. Use Mix Types

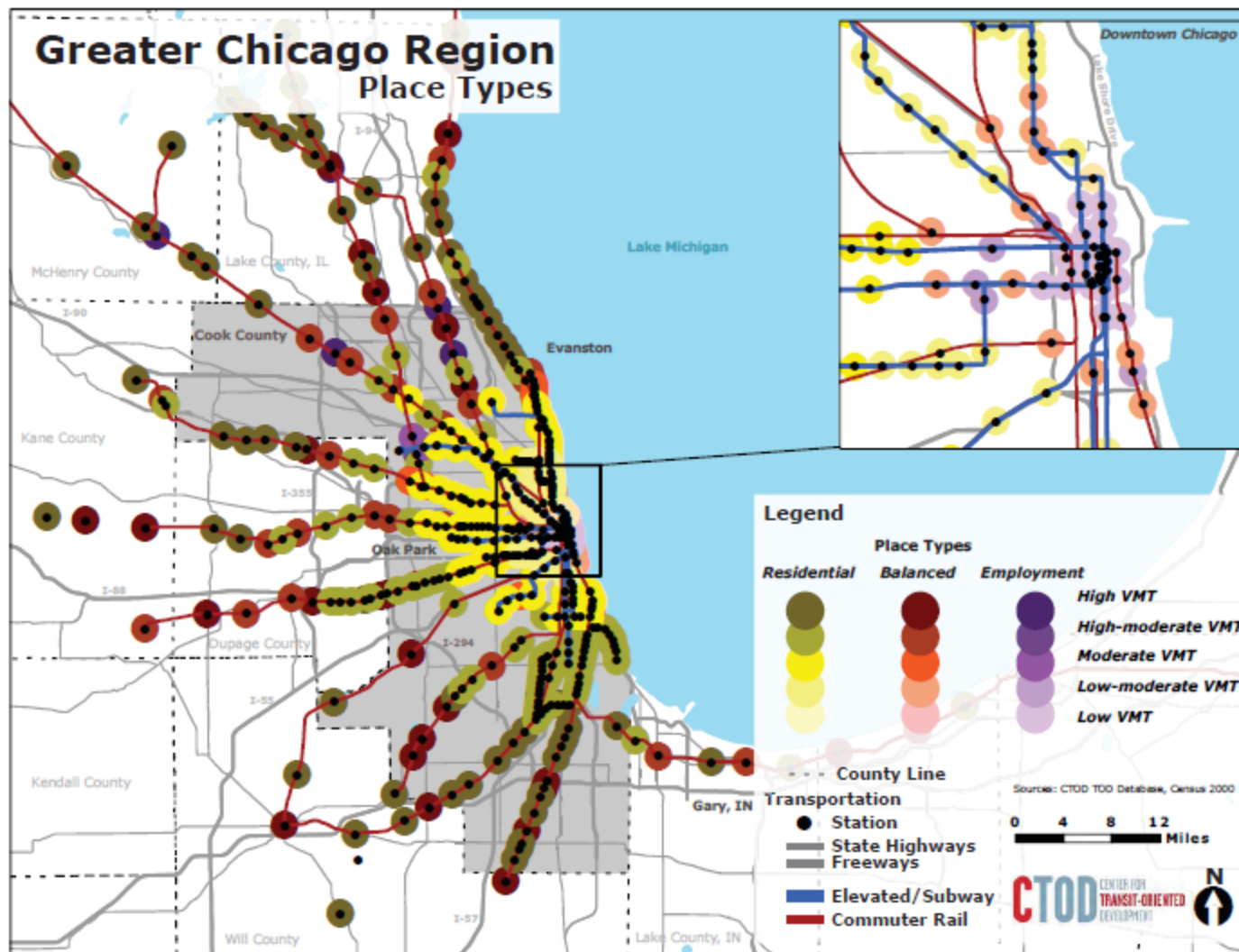
Use Mix Type	Percentage of workers relative to workers and residents
1 primarily residential	33.3% or less
2 balanced	33.3% to 66.7%
3 primarily employment	66.7% or more



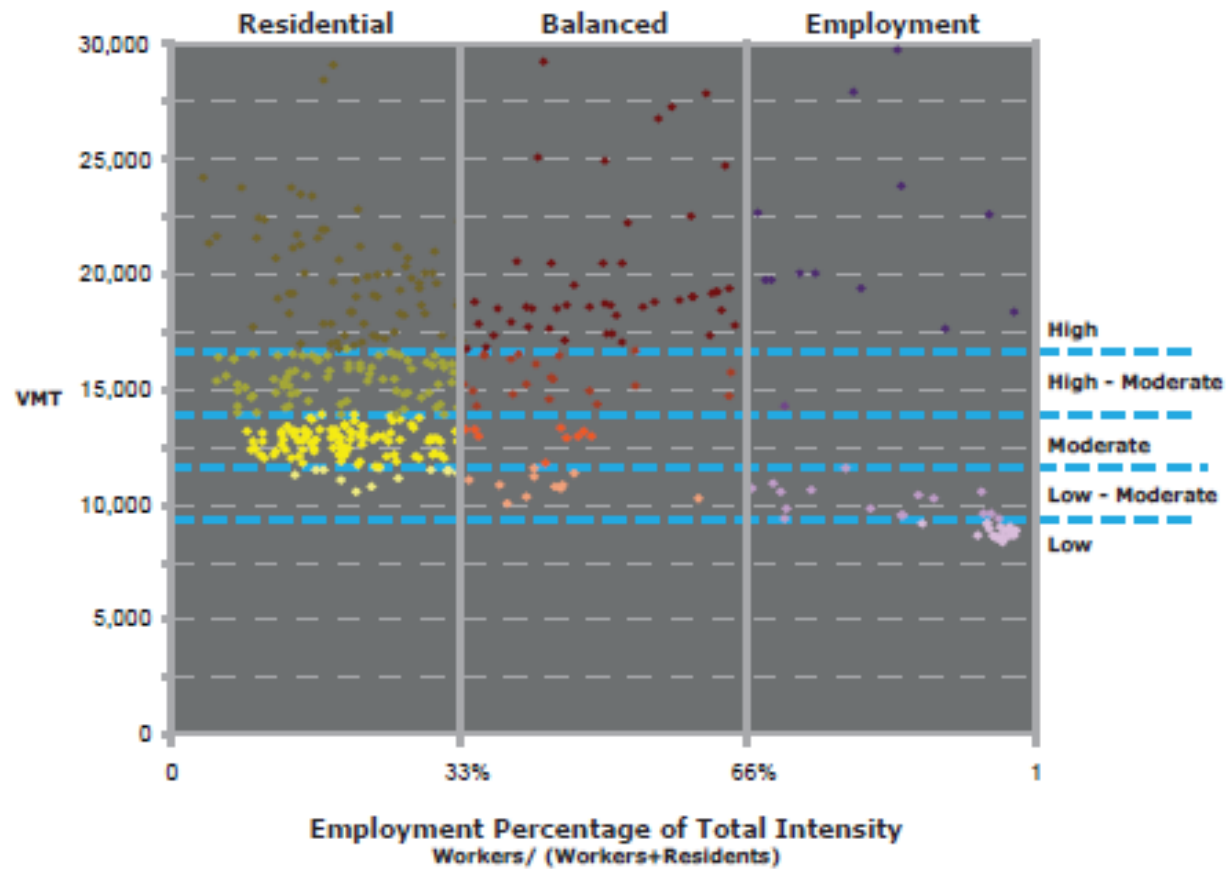
Plotting Every Station



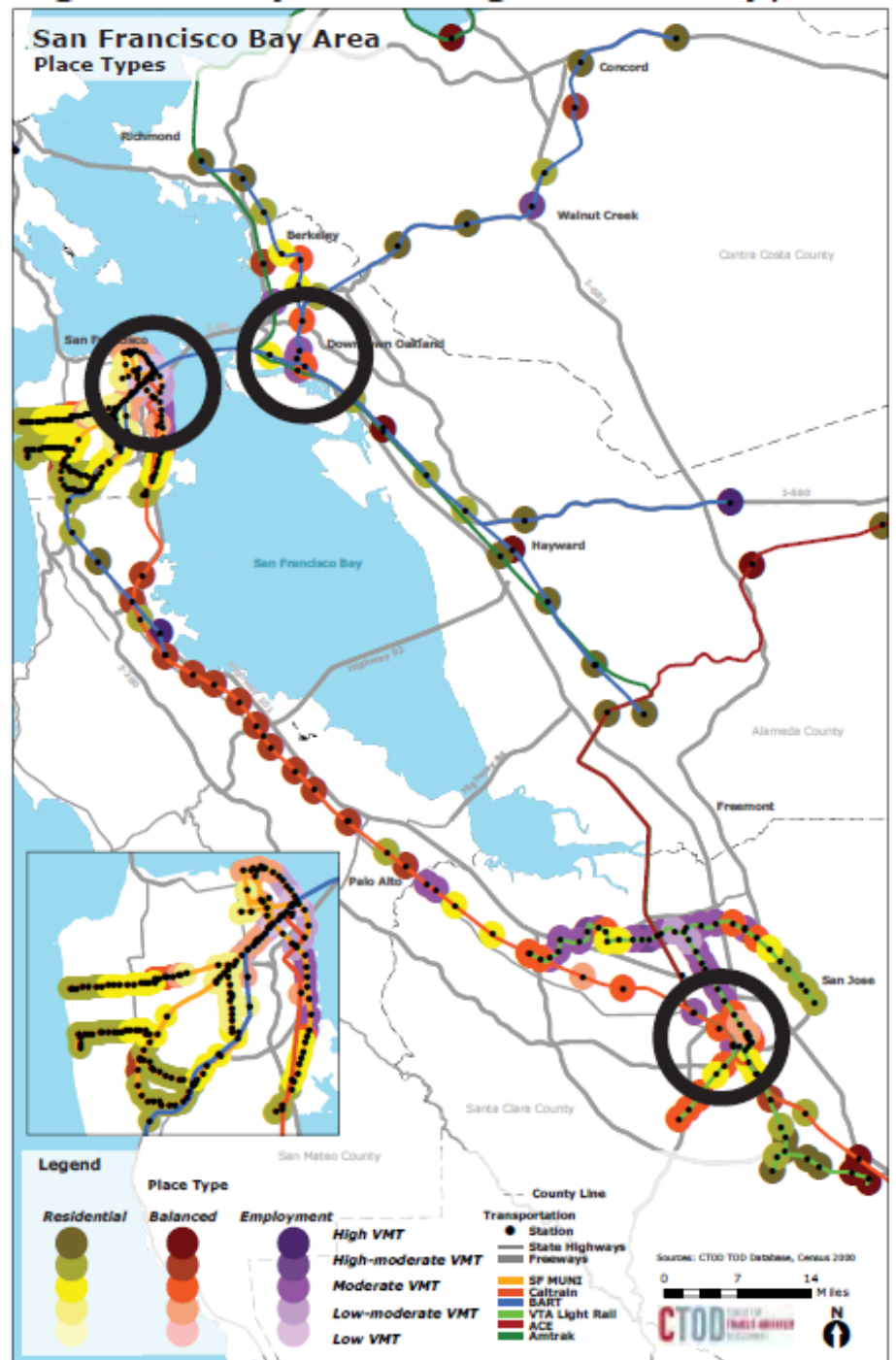
What Do Regions Look Like?



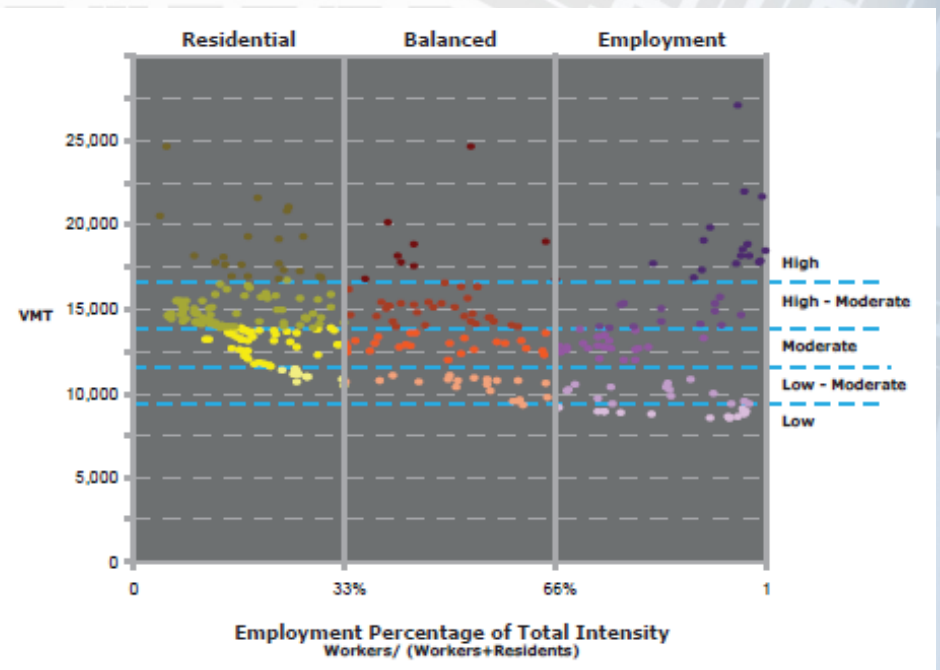
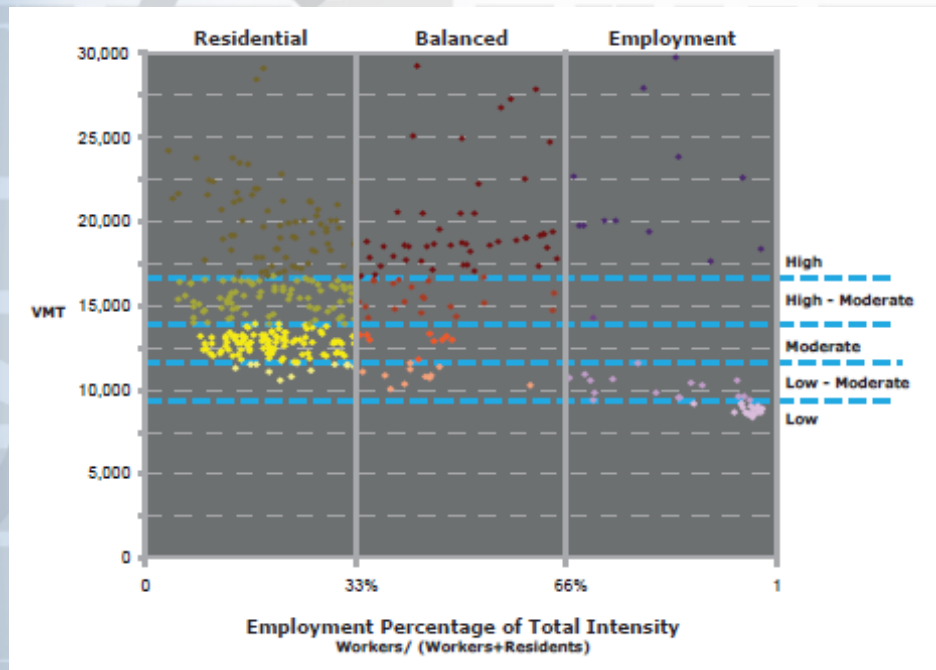
Chicago's Station Breakdown



Bay Area



Chicago vs. SF Bay Area

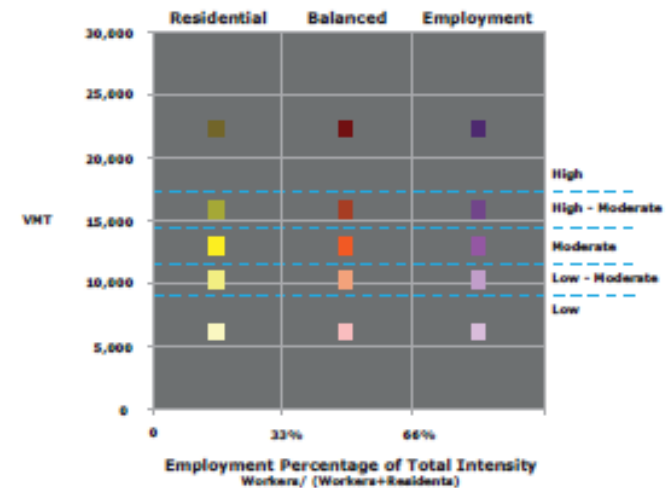
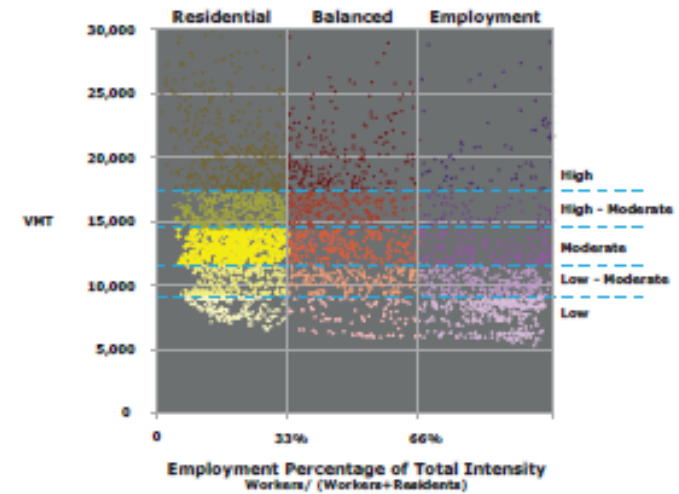


Normative Metrics

Place Types	Residential Places					Balanced Places					Employment Places				
	Low VMT	Low-Mod VMT	Mod VMT	High-Mod VMT	High VMT	Low VMT	Low-Mod VMT	Mod VMT	High-Mod VMT	High VMT	Low VMT	Low-Mod VMT	Mod VMT	High-Mod VMT	High VMT
Total Intensity (residents + workers)	54,216	24,718	12,580	7,708	3,429	64,155	21,783	11,600	6,867	3,242	109,306	34,914	13,009	5,969	2,325
Residents	44,293	20,106	10,229	6,292	2,718	29,875	10,792	5,884	3,695	1,784	12,581	5,103	2,065	1,154	321
Workers	9,923	4,612	2,351	1,416	715	34,280	11,031	5,716	3,172	1,478	96,725	29,811	10,944	4,815	2,004
Workers/Residents	18.3%	19.5%	19.6%	20.3%	19.6%	51.6%	49.7%	48.2%	48.0%	46.2%	88.5%	83.9%	84.2%	83.0%	87.1%
Households	16,214	7,664	3,908	2,253	974	15,466	4,646	2,429	1,467	670	6,828	2,524	861	467	120
Household Size	2.71	2.61	2.62	2.71	2.68	1.95	2.21	2.41	2.43	2.60	1.58	1.67	2.22	2.28	2.64
Gross Density (units/acre)	50.0	21.6	10.3	5.7	2.2	48.7	16.4	7.6	4.0	1.9	28.5	10.3	4.6	2.2	0.9
Residential Density (units/acre)	53.2	23.6	12.1	6.7	3.4	55.6	20.9	10.5	5.8	3.5	51.4	20.6	10.8	6.0	2.9
Block Size (acres)	4.2	4.1	5.7	7.7	18.8	3.7	5.8	8.5	9.9	23.7	3.7	6.4	14.2	69.9	86.7
Monthly T Cost	\$422	\$563	\$688	\$781	\$906	\$394	\$597	\$721	\$794	\$900	\$463	\$613	\$713	\$793	\$920
Yearly T Cost	\$5,064	\$6,756	\$8,256	\$9,372	\$10,872	\$4,728	\$7,164	\$8,652	\$9,528	\$10,800	\$5,556	\$7,356	\$8,556	\$9,516	\$11,040
Average Median Income (\$999)	\$31,713	\$35,643	\$41,344	\$53,492	\$62,069	\$43,097	\$37,364	\$43,395	\$51,138	\$65,544	\$41,875	\$34,183	\$43,935	\$40,985	\$57,582
Travel Time to Work (minutes)	35.6	31.4	27.4	25.5	24.7	23.5	22.1	21.4	21.6	22.9	18.0	17.1	18.7	19.0	21.5
Employment Proximity	233,690	127,448	65,640	42,260	20,788	451,725	152,310	73,393	41,335	27,131	396,277	159,118	99,648	58,747	32,187
Transit Access Index	31	19	13	10	3	56	28	11	9	4	85	45	19	10	4
Autos/Household	0.45	0.82	1.18	1.47	1.71	0.52	0.87	1.22	1.41	1.68	0.48	0.74	1.11	1.18	1.61
Home Journey to Work Transit	58%	39%	23%	15%	8%	43%	25%	14%	10%	8%	25%	16%	13%	9%	5%
Home Journey to Work Walk/Bike/Transit	66%	47%	27%	18%	10%	64%	40%	23%	15%	11%	58%	37%	24%	18%	9%
Workplace Journey to Work Transit	33%	20%	11%	7%	2%	38%	17%	8%	5%	3%	38%	16%	9%	5%	3%
Workplace Journey to Work Walk/Bike/Transit	47%	30%	18%	12%	6%	48%	23%	12%	8%	5%	43%	19%	11%	7%	5%

	Residential	Balanced	Employment
Highest VMT	\$10,872	\$10,800	\$11,040
	\$9,372	\$9,528	\$9,516
	\$8,256	\$8,652	\$8,556
	\$6,756	\$7,164	\$7,356
Lowest VMT	\$5,064	\$4,728	\$5,556

Household Annual Transportation Costs
(For Residents)



Household Auto Ownership

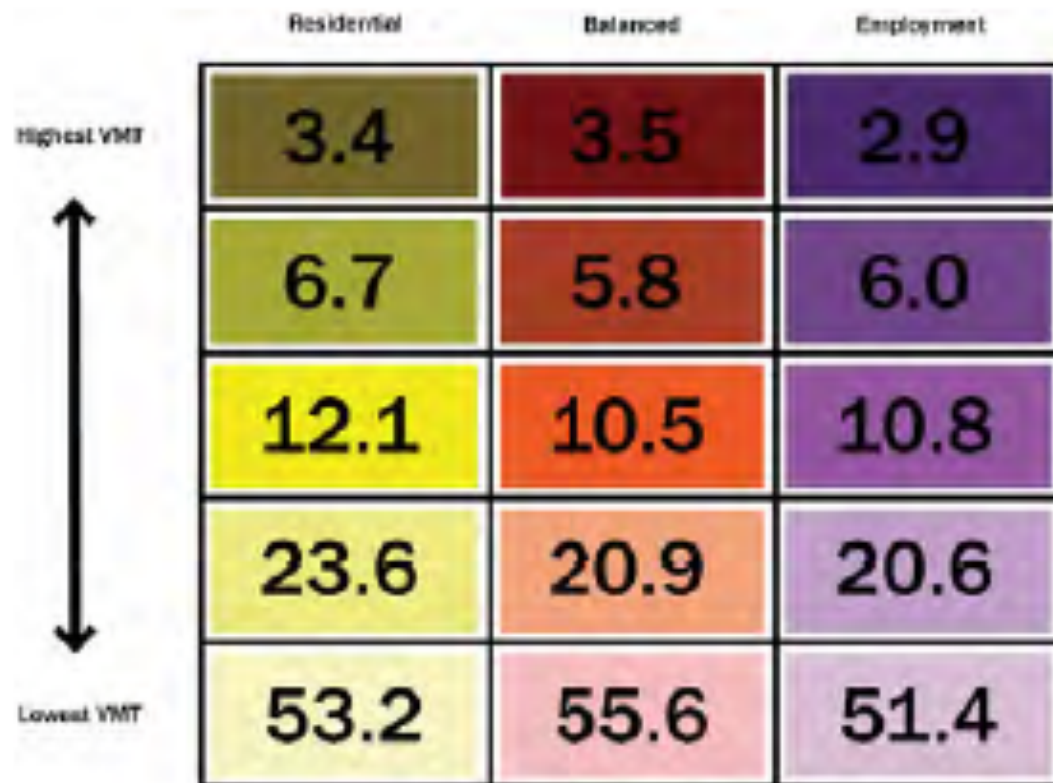


National
Average:
1.9

Household Automobile Ownership
(By Residents)

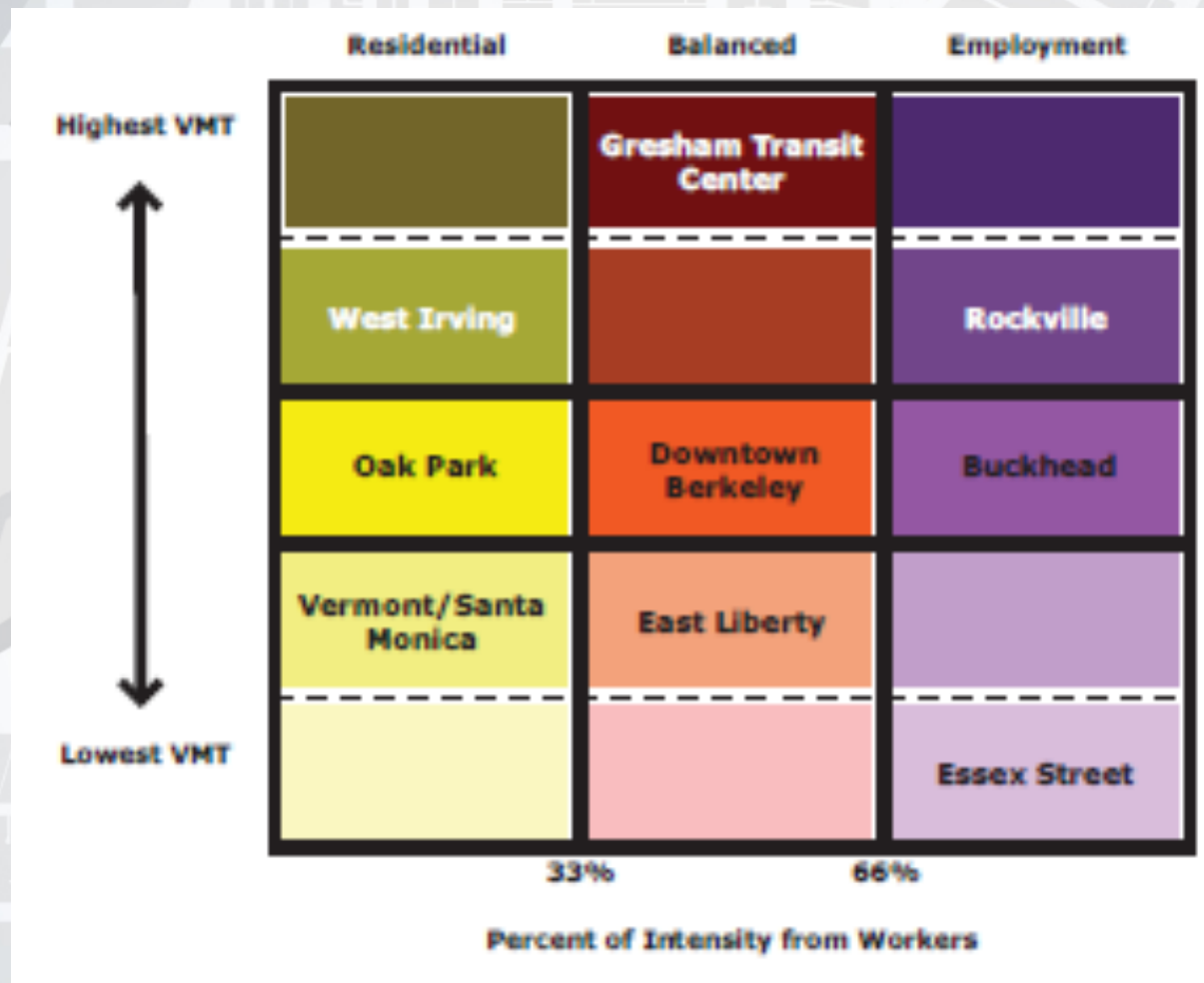


Residential Density



Residential Density
(Units per Residential Acre)

Case Studies

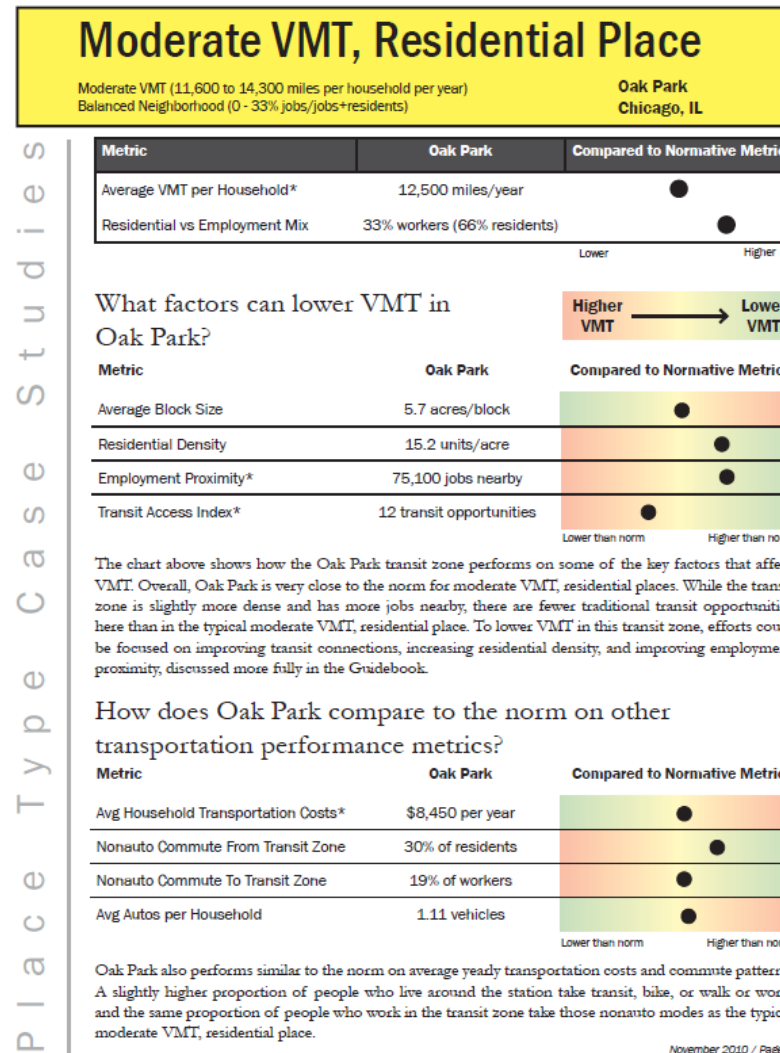


Evaluating Individual Locations

- **Choosing Case Studies**
 - Existed before 2000 Census
 - Region Size
 - Median Income
 - Type of Transit
- **Using the Case Studies**
 - Place Type Overview
 - Regional Context
 - Comparing to Normative Metrics
 - Other National Examples



Comparing to Normative Metrics



Build Your Own

Self-Assessment Tool

Metric	[Insert Transit Zone here.]	Compared to Normative Metric
Average VMT per Household*		●
Residential vs Employment Mix		●

Lower Higher

What factors can lower VMT in [insert transit zone here]?

Higher VMT → Lower VMT

Metric	[Insert Transit Zone here.]	Compared to Normative Metric
Average Block Size		
Residential Density		
Employment Proximity*		
Transit Access Index*		

Lower Higher

How does [insert transit zone here] compare to the norm on other transportation performance metrics?

Metric	[Insert Transit Zone here.]	Compared to Normative Metric
Avg Household Transportation Costs*		
Nonauto Commute From Transit Zone		
Nonauto Commute To Transit Zone		
Avg Autos per Household		

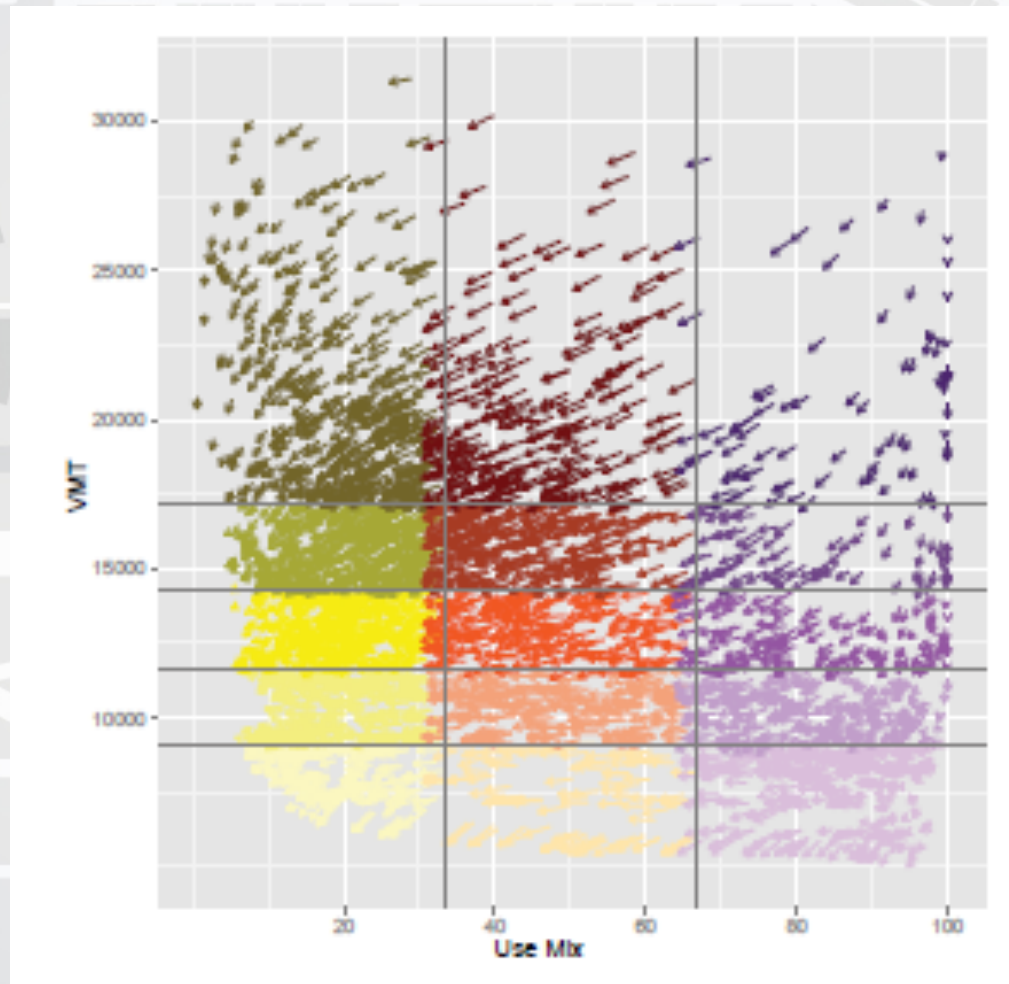
Lower Higher

Who lives and works in [insert transit zone here]?

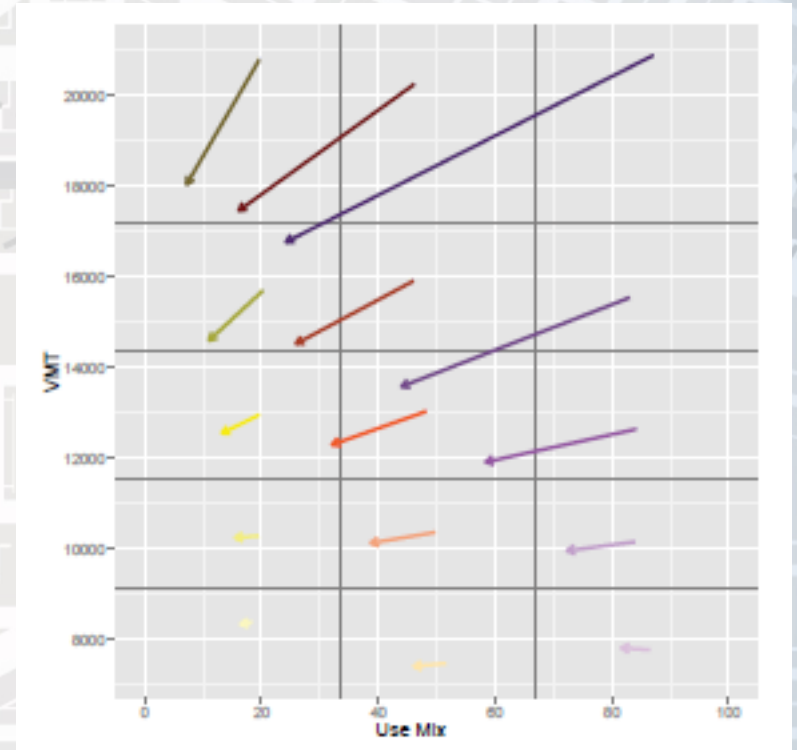
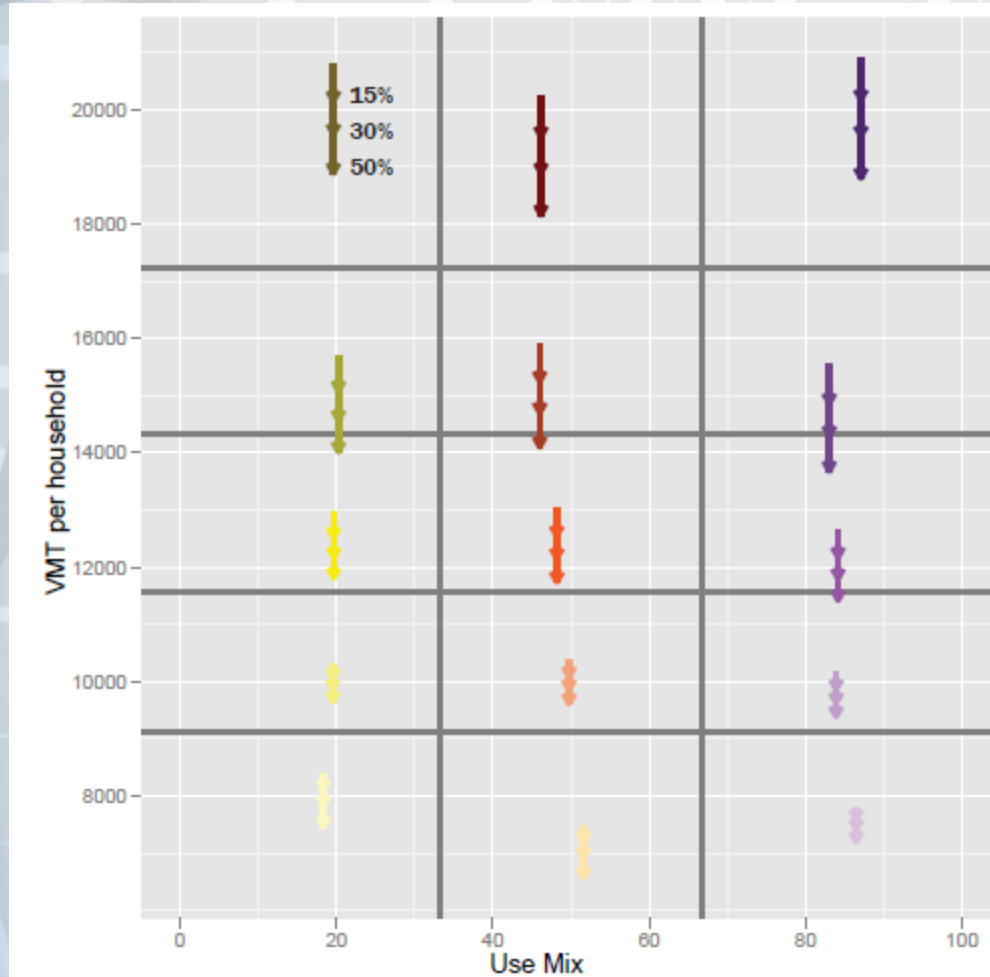
Metric	[Insert Transit Zone here.]	Compared to Normative Metric
Total Transit zone Population		
Total Residents		
Total Workers		
Median Household Income	\$23,500 per year	
Average Household Size	1.75 people/household	

Lower Higher

Scenario Planning



Increased Employment Access & HHs by 15%, 30%, 50% or 2,000 Households



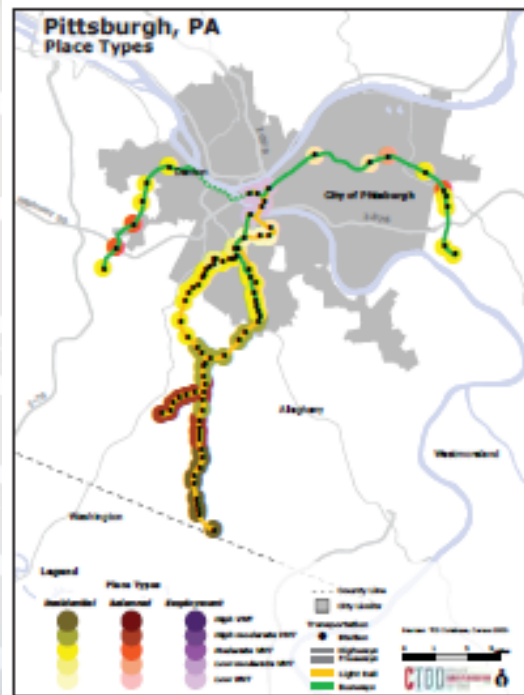
VMT Changes Similar Across the Board

Table 7: Scenario A: Increase households & employment access by 15%

VMT Type	Use Mix Type	Increase in Households	Increase in employment access	Increase in Jobs in Station Area	Change in Household VMT	% Change in Household VMT	Change in Household CO2 emissions (tons annually)
Low	Residential	2,430	35,100	1,490	-288	-3%	-0.13
Low-moderate	Residential	1,150	19,100	692	-240	-2%	-0.11
Moderate	Residential	586	9,850	353	-449	-3%	-0.20
High-moderate	Residential	338	6,340	212	-624	-4%	-0.28
High	Residential	146	3,120	107	-643	-3%	-0.29
Low	Balanced	2,320	67,800	5,140	-289	-4%	-0.13
Low-moderate	Balanced	697	22,800	1,650	-289	-3%	-0.13
Moderate	Balanced	364	11,000	857	-494	-4%	-0.22
High-moderate	Balanced	220	6,200	476	-663	-4%	-0.30
High	Balanced	100	4,070	222	-727	-4%	-0.33
Low	Employment	1,020	59,400	14,500	-194	-2%	-0.09
Low-moderate	Employment	379	23,900	4,470	-301	-3%	-0.14
Moderate	Employment	129	14,900	1,640	-476	-4%	-0.22
High-moderate	Employment	70	8,810	722	-685	-4%	-0.31
High	Employment	18	4,830	301	-720	-3%	-0.33

Scenario Findings

- Encouraging development in transit zones can reduce VMT
- High VMT zones can see significant reductions from moderate development
- Prioritizing low VMT transit zones for new development can produce the largest reductions in total regional VMT.



Possible Policy Implications

- **Typology**
 - Understanding Transit Ridership Better
 - Comparing Regions and Transit Networks
 - Creating Incentives to Plan for Reduced VMT
- **Normative Metrics**
 - Improving Public Health
 - Upgrading Station Area Design
 - Linking VMT Strategies to Equitable TOD
- **Scenario Planning**
 - Directing Regional Growth
 - Guide Visioning Processes
 - Understanding Impact of Developing Near Transit

Next Steps

- Web-based tool where individuals can “slide” metrics.
- Incorporating other metrics (e.g. affordable or equitable TOD metrics)
- Identifying how to link funding, regulation, and incentives to performance
- “Performance-based” planning and implementation



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