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FUNDAMENTALS OF LOCAL BUS PLANNING

Steve Mahowald
December 13, 2016



FUNDAMENTALS OF LOCAL BUS PLANNING

- **Cycle Time**
- **The Trade Offs**
 - **Directness vs. Nearness**
 - **Frequency vs. Coverage**
- **The Necessity of Density**
 - **Transit Market Areas**
- **The Pedestrian Base**
 - **The Bus Stop and Connecting to It**



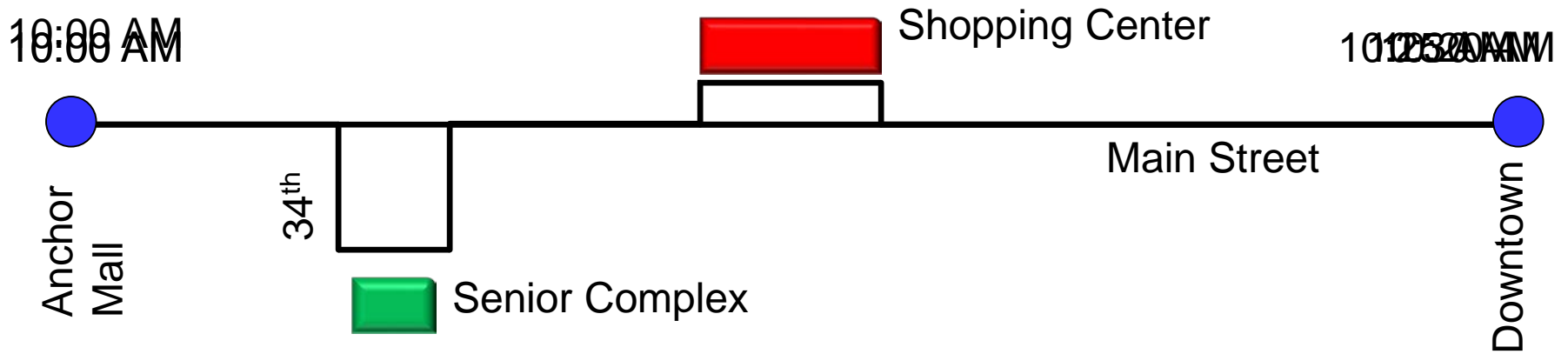
Cycle Time

- Cycle time = round trip running time + recovery time
- Along with frequency, determines buses needed
 - **60'' cycle time/60'' frequency = 1 buses**
 - **60'' cycle time/30'' frequency = 2 buses**
 - **60'' cycle time/15'' frequency = 4 buses**



The Trade Offs

Directness vs. Nearness

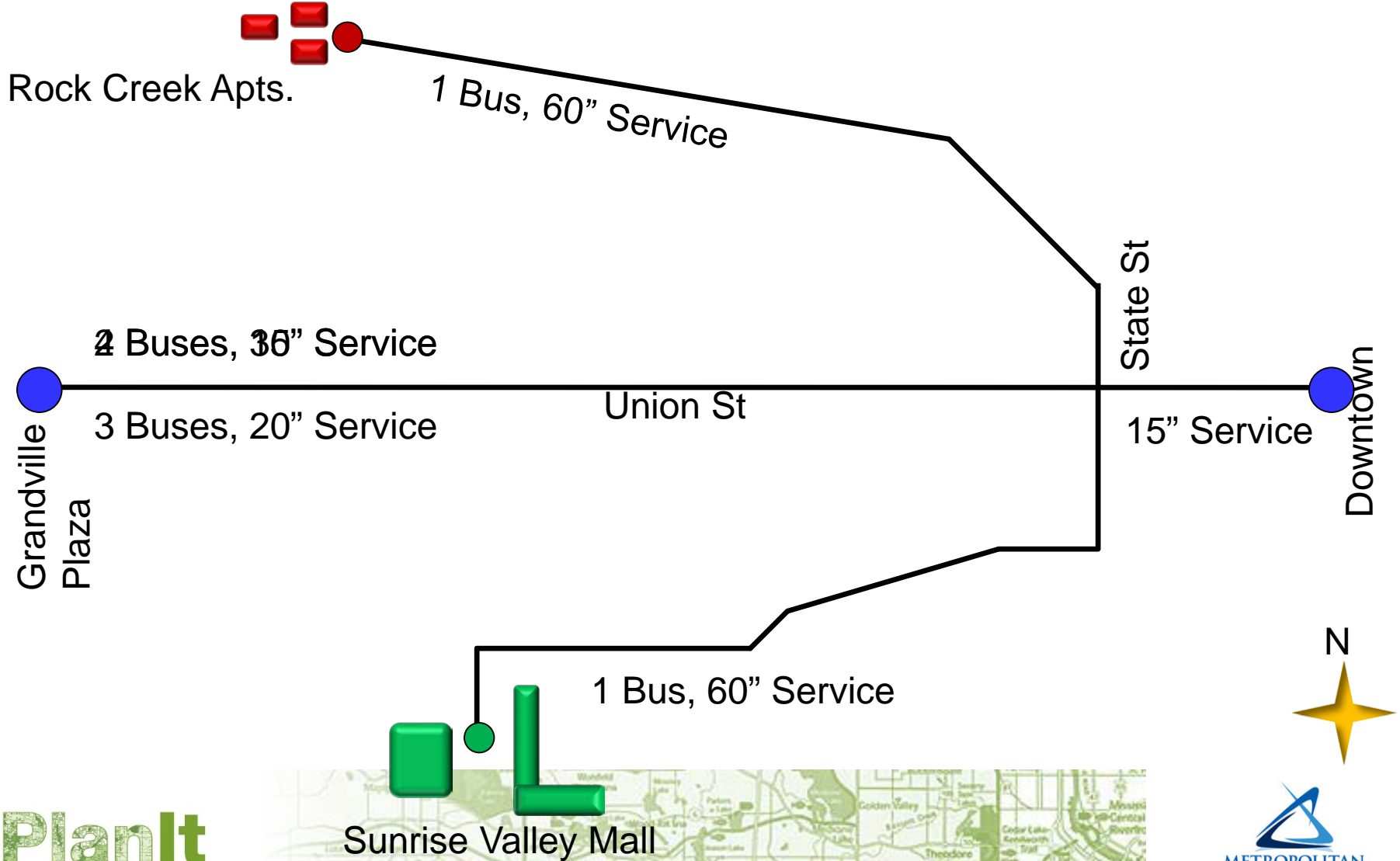


- Diversion Adds Another 5' One Way Total of 30"
- 20" One Way Travel Time
- 20% Increase in Travel Time
- With 1 Bus We Can Provide 60" Service
- With 2 Buses We Can Provide 60" Service
- With 4 Buses We Can Provide 15" Service
- With 5 Buses We Can Provide 15" Service



The Trade Offs

Frequency vs. Coverage



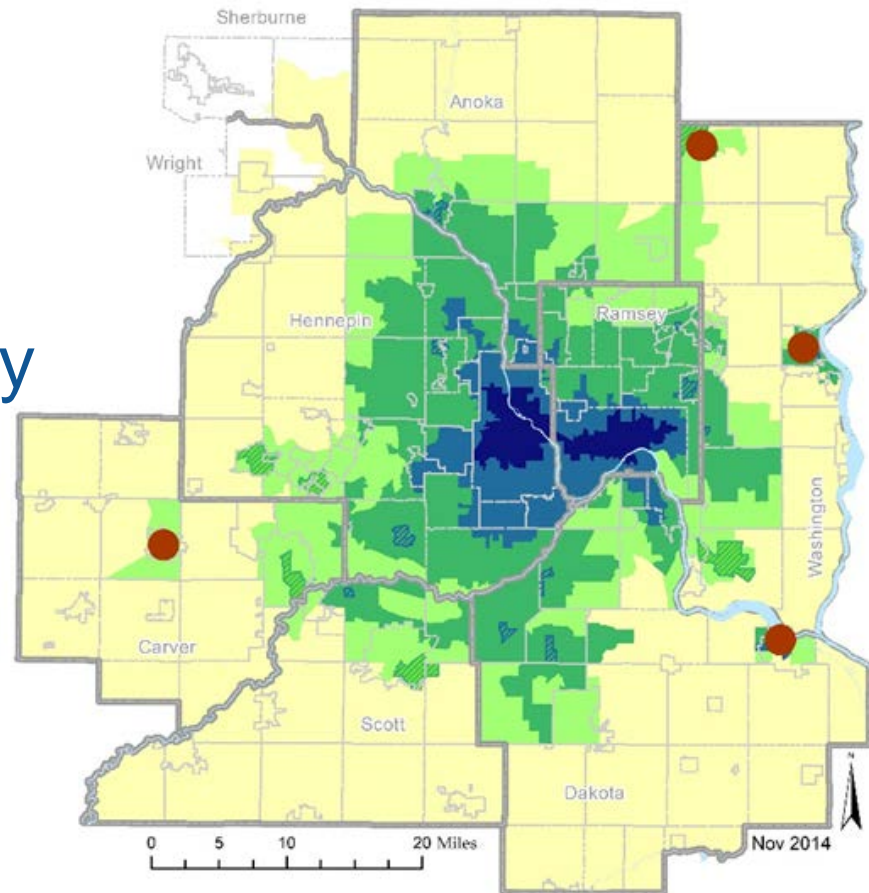
The Necessity of Density

- Without it along transit corridors, transit can not operate efficiently
- Density, mixed use and transit dependent development guided to the transit corridors improves effectiveness and efficiency of transit
- The level of density and pedestrian network guide the level of transit service that can be provided
- Transit Market Areas are the region's guide to level of service based on development patterns



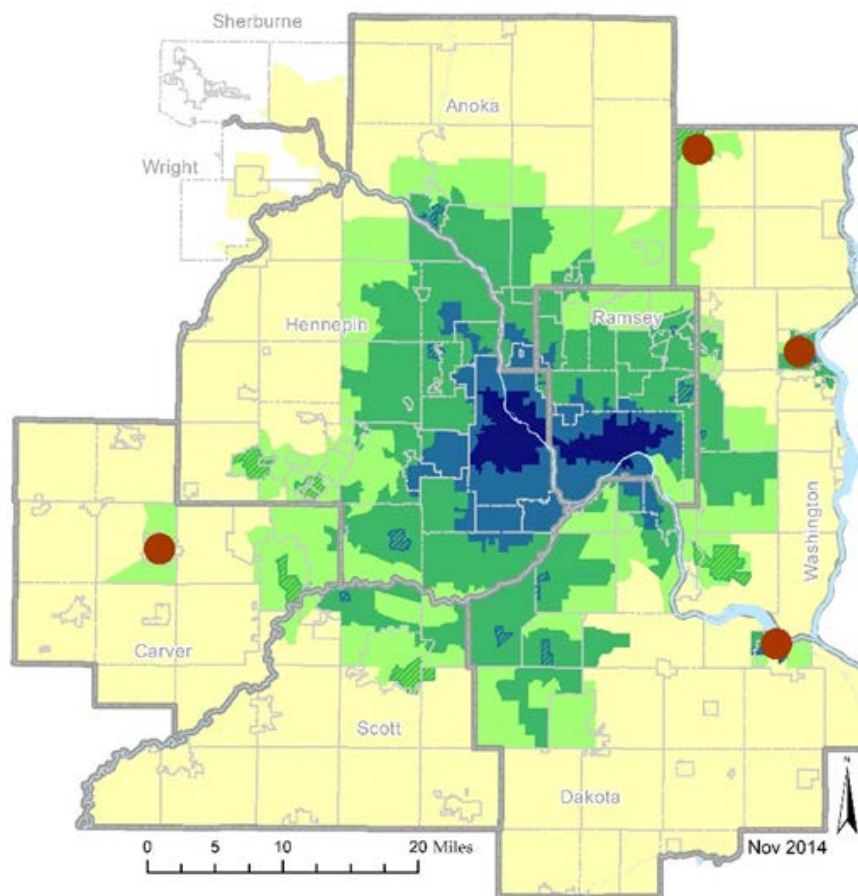
Transit Market Areas Are Based On

- Population density
- Employment density
- Intersection density
- Automobile availability



Transit Market Areas Guide

- Type of service
- Spacing of routes
- Frequency of service
- Span of service



The Pedestrian Base

Reid Ewing & Keith Bartholomew in Pedestrian & Transit Oriented Design (APA 2013) provided a hierarchy of pedestrian features:

- Nice to have
- Highly desirable
- Essential
 - **Safe Crossings**
 - **Continuous & Wide Sidewalks**
 - **Comfortable & Safe Place to Wait**



Major transit corridor, 10" peak service

Six lanes of traffic—posted 35 MPH, moving at 40



Curb sidewalk

Stop lights spaced 2,640' (½ mile)

TOD literature recommends safe crossings spaced at 200'-600'

HAWK Signal in Phoenix



In this case, when pedestrian presses button it activates a solid, steady red light

Cedar Riverside Pedestrian Crossing



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METROPOLITAN
COUNCIL

Safety Islands-Kennewick WA



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Safety Island-Excelsior Ave-St. Louis Park



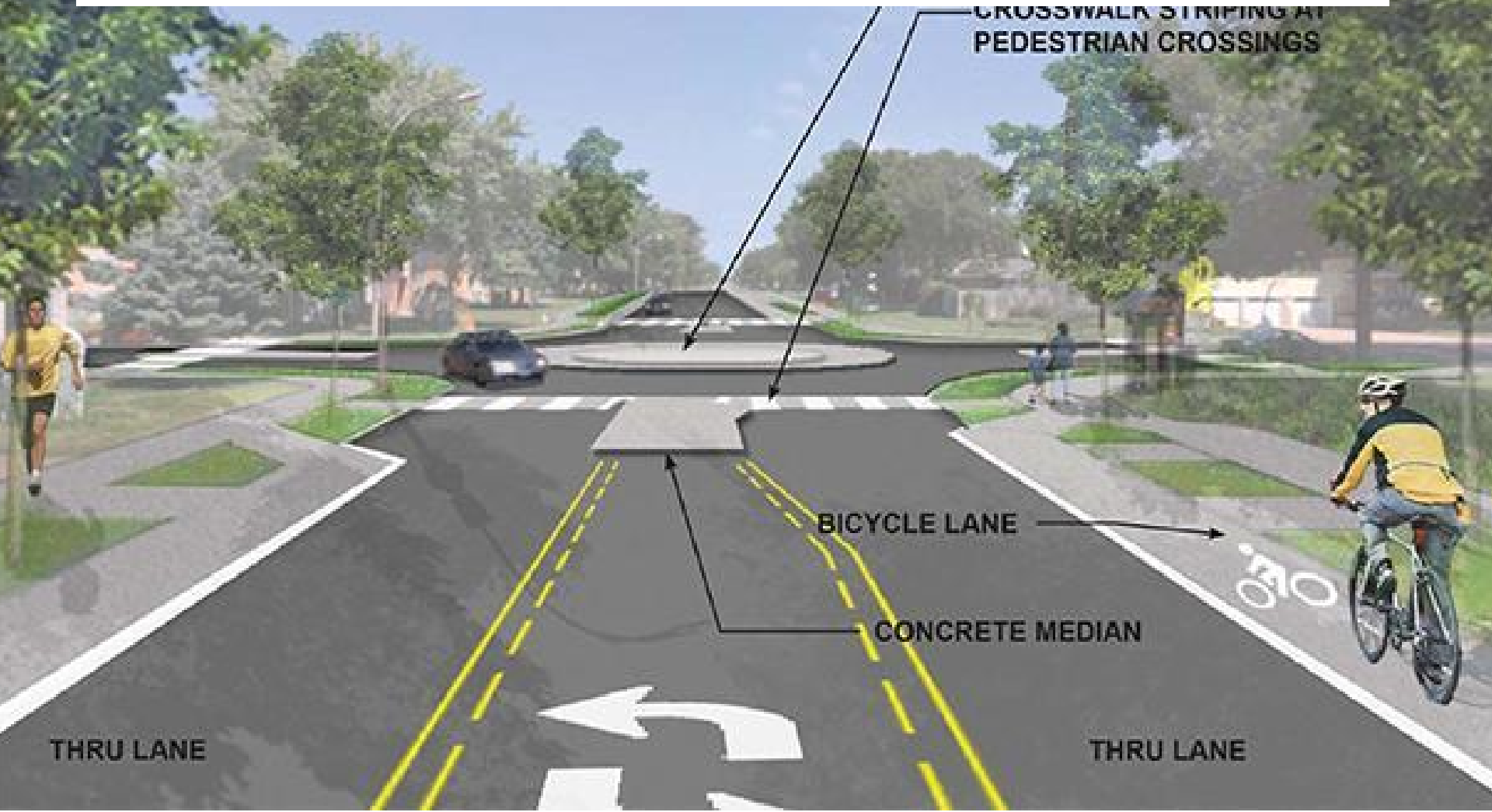
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Bump Outs-Mainstreet Hopkins



Road Diets Can be Done on Transit Corridors with Appropriate Planning



Continuous & Wide Sidewalks



Connecting sidewalk



Driveway

Code requirement for new development or additions increasing floor area by 25% or more

Shaded wide boulevard sidewalk along Lyndale Ave in Bloomington

Comfortable & Safe Places to Wait

- The Bus stop is transit's front door
- For many potential users, the quality of the wait experience is a factor in their choice to use transit
- If it's not a comfortable and safe place to wait, they're less likely to continue to use the system



Bus stop in Uptown

Hi-frequency service, 200 boardings/alightings



**City garbage can in
ADA landing area**

**Bike chained to
bus stop sign**

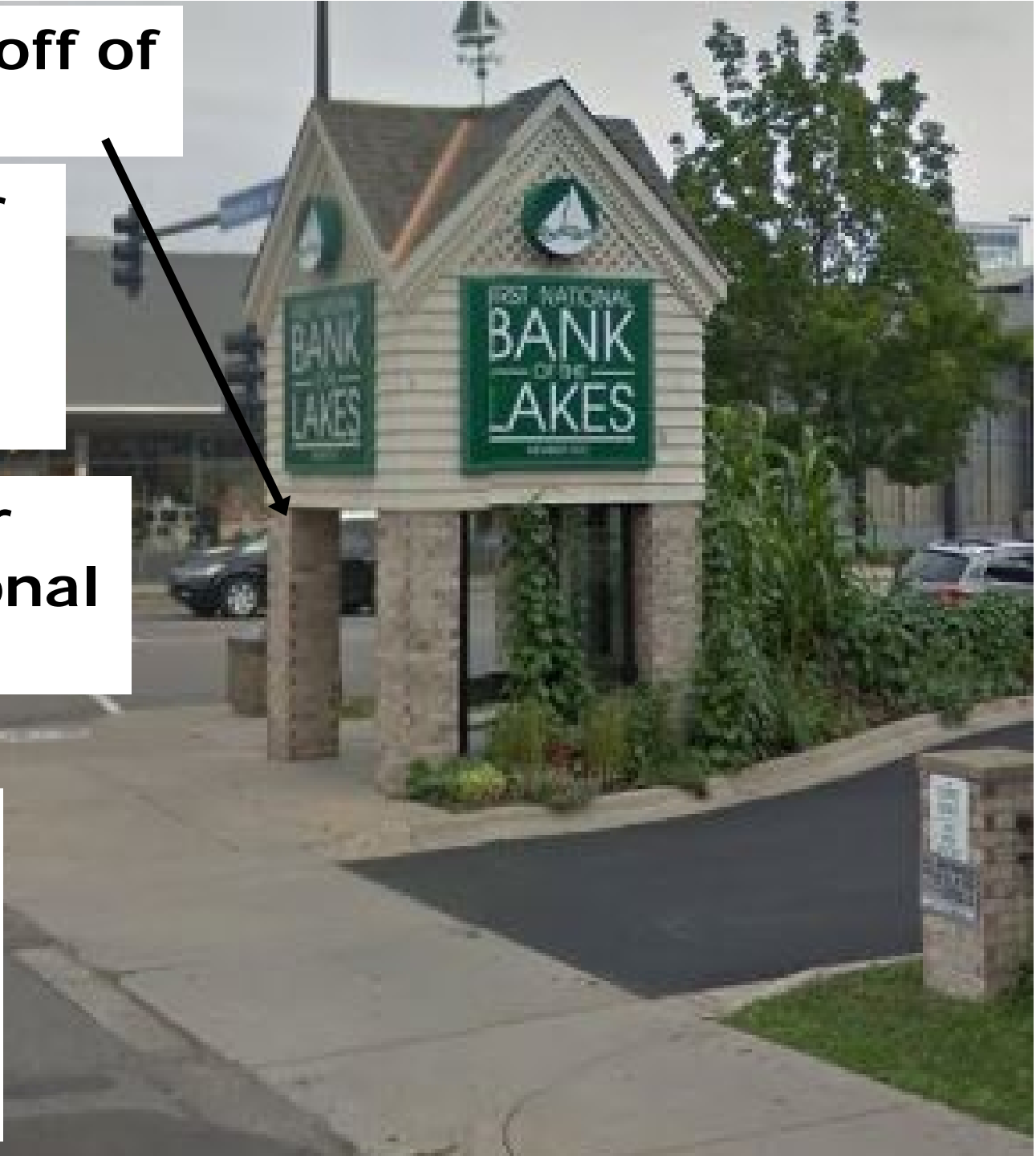
**Advertising bench—
duplicates bench in
shelter**

Transit shelter off of public ROW

Property owner built & maintains shelter

Property owner allowed additional advertising

Shelter off of sidewalk frees up sidewalk for it's primary use



Bus stop at Target Corporate office served by 28 express routes, 500+ boardings



Leaning rail

Heat and lighting provided by property

Sheltered waiting space off public ROW, maintain by property, part of FAR bonus

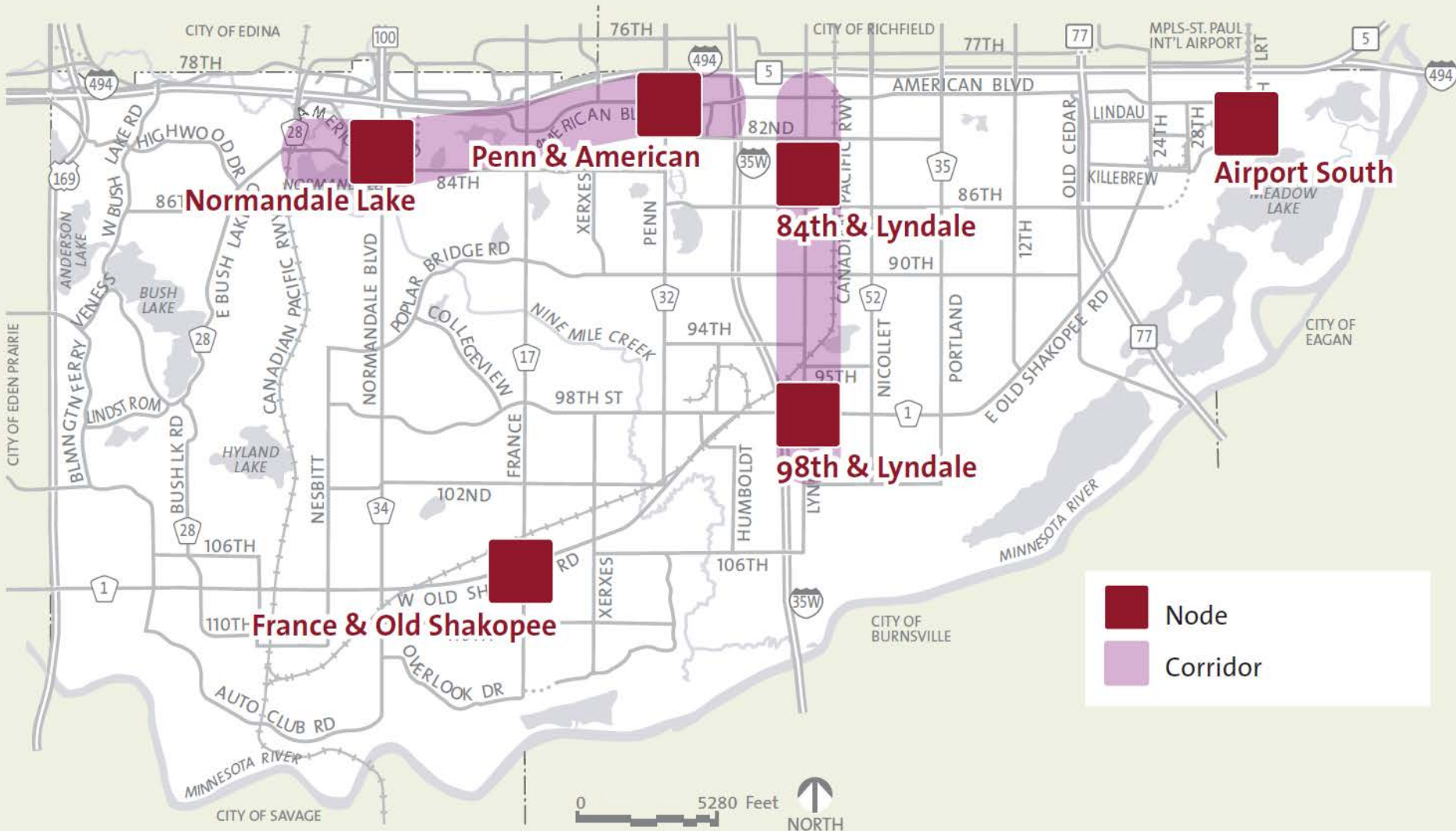
Comp Plan & Supporting Plan Elements to Strengthen Transit

- Direct, encourage density and mixed used development to transit corridors



Focus High Density Development on Transit Routes

Figure 3.7 Priority Areas for Additional High Density Housing



Comp Plan & Supporting Plan Elements to Strengthen Transit

- Direct, encourage density, mixed used development to transit corridors
- Strengthen pedestrian base and it's connections to transit corridors
 - Safe crossings
 - In particular on major arterial and transit corridors
 - Spaced no more than 600 feet apart
- **Information you need?**
- **Barriers & Opportunities?**











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A Planner's Perspective on Transit

Alicia Vap
December 13, 2016



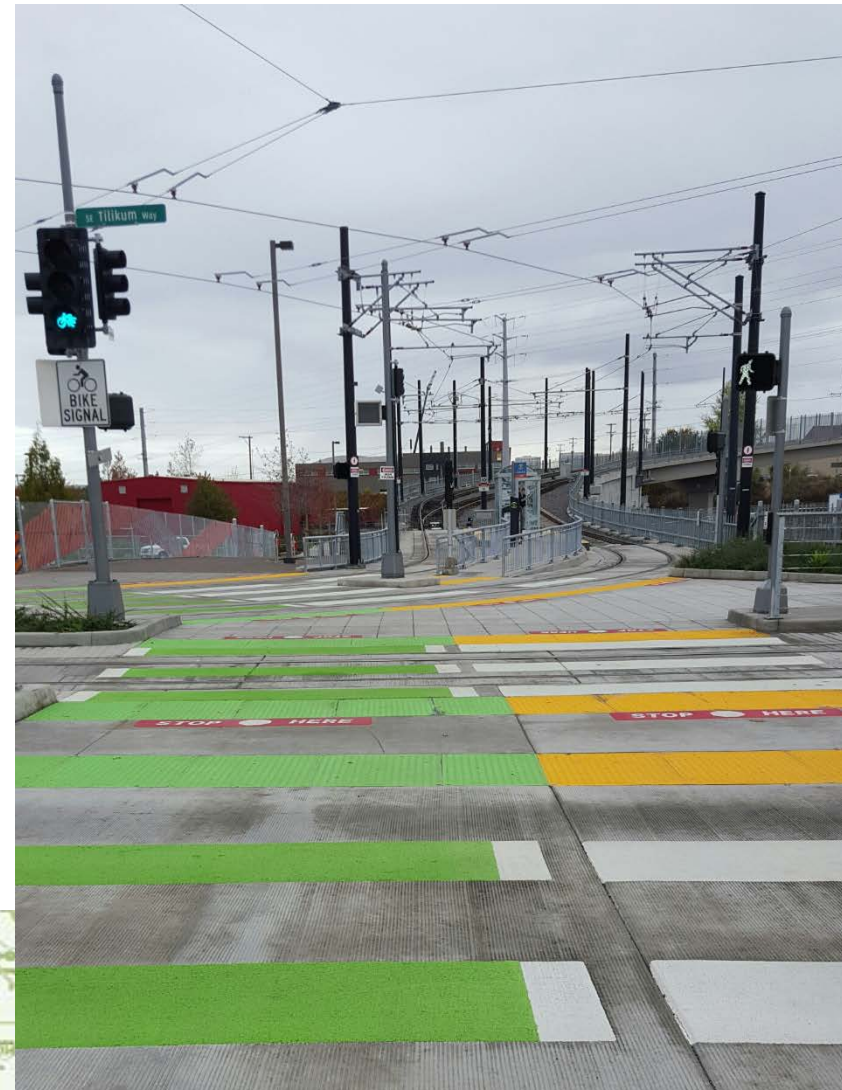
Everyday Considerations In Transitway Planning - Topics

- Items to consider in planning
 - Access
 - Great Connections
 - Focus Investments
- If seeking federal funding, what matters?



Everyday Considerations In Transitway Planning - Access

- Sidewalk network & walkability
- Bike planning



Everyday Considerations In Transitway Planning – Great Connections

- Bus connections
- Pedestrian / Bike connections
- Car connections



Bike Storage & Bus Stop



Everyday Considerations In Transitway Planning – Focus Investments

- Investments should be focused where they would matter the most

2007-Westgate Station



2016-Westgate Station



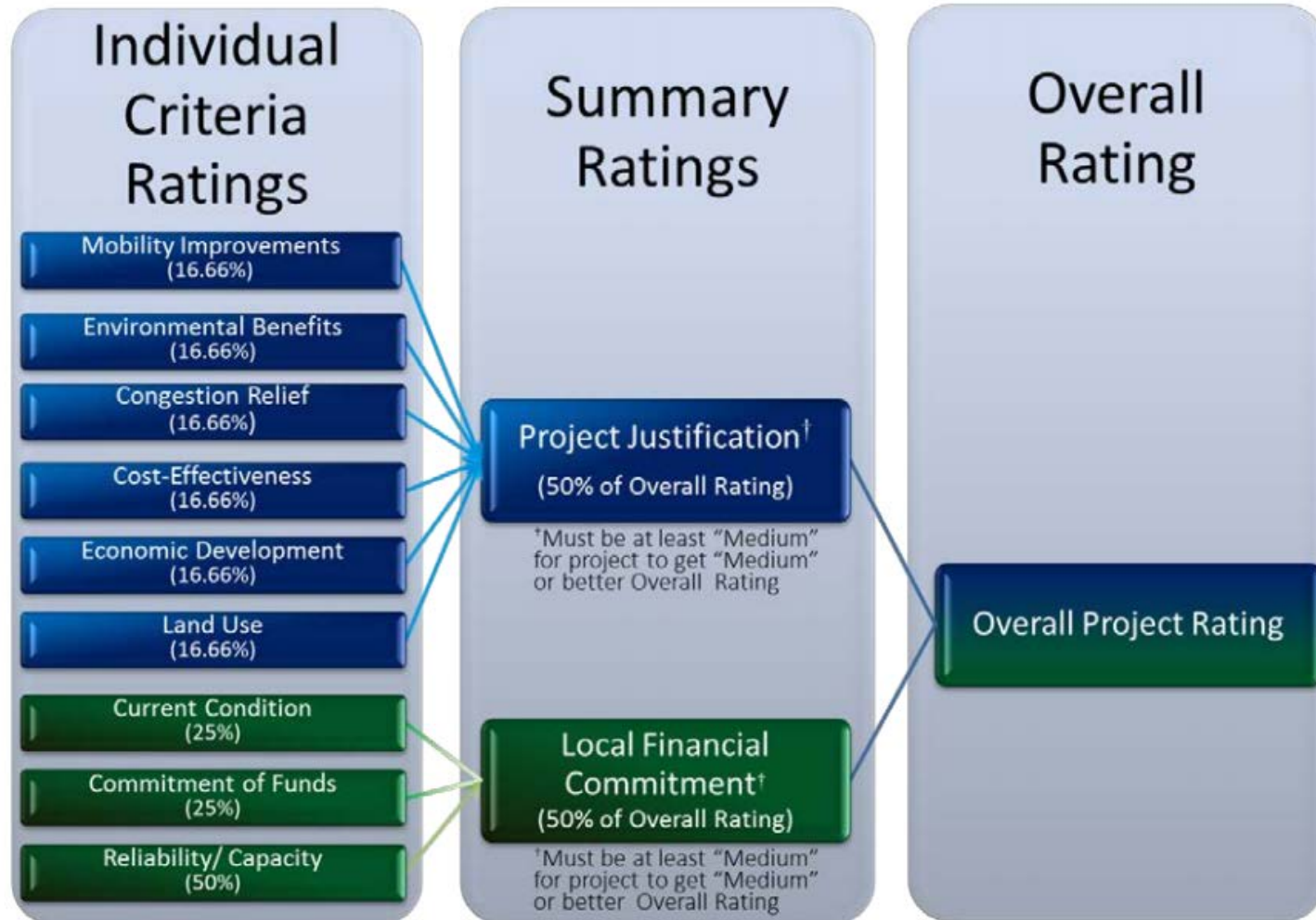
Everyday Considerations In Transitway Planning – New Starts

- Federal Transit Administration's (FTA) New Starts program funds up to 50% of proposed new fixed guideway projects or extensions to existing fixed guideway system
- All projects requesting for New Starts funds compete nationally and are ranked by FTA
- Half of a project's ranking is tied to project justification—33.32% of that half is in the hands of the communities and region



Everyday Considerations In Transitway Planning – New Starts

New and Small Starts Project Evaluation and Rating



Everyday Considerations In Transitway Planning – New Starts

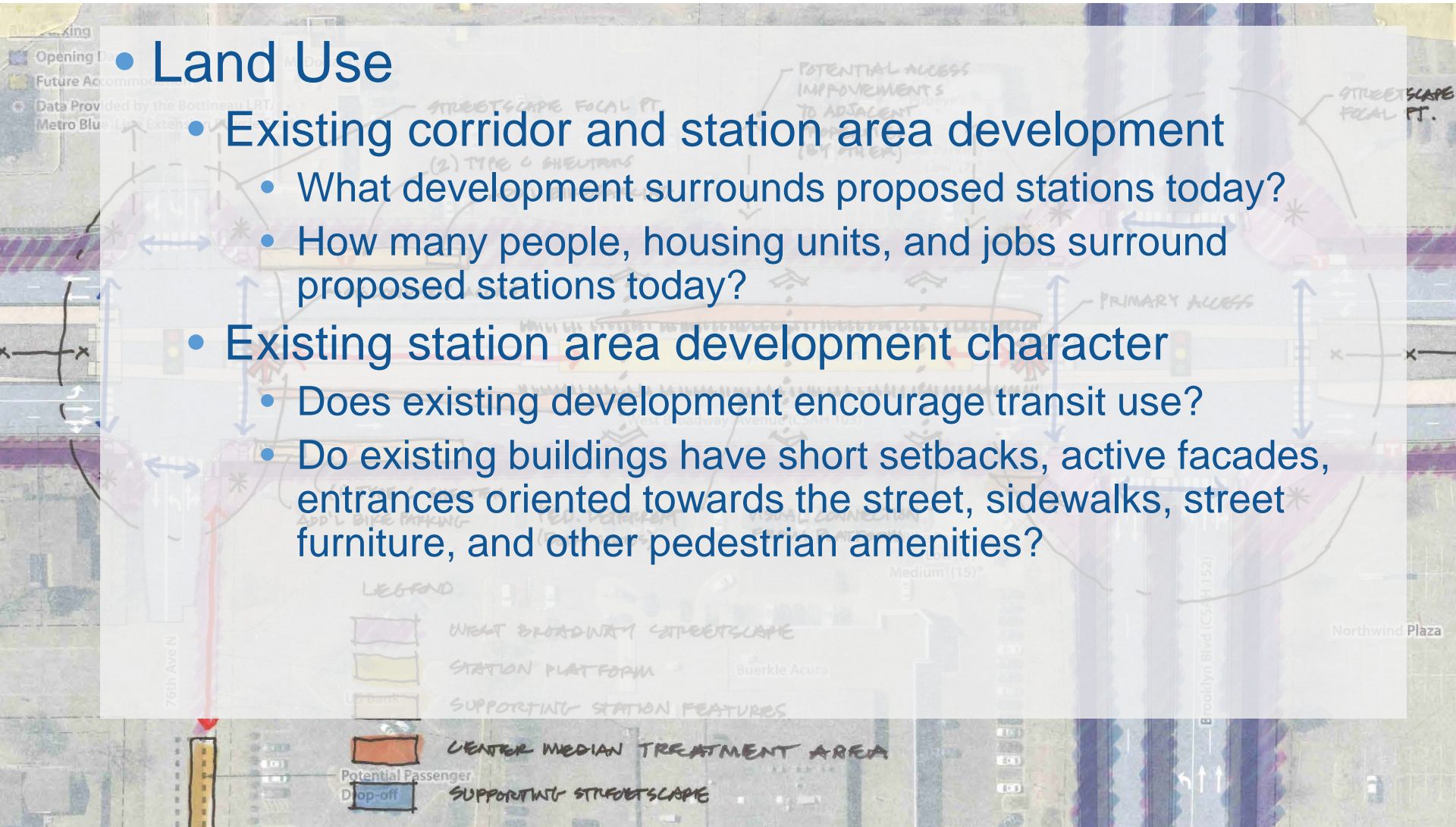
- Land Use

- Existing corridor and station area development

- What development surrounds proposed stations today?
- How many people, housing units, and jobs surround proposed stations today?

- Existing station area development character

- Does existing development encourage transit use?
- Do existing buildings have short setbacks, active facades, entrances oriented towards the street, sidewalks, street furniture, and other pedestrian amenities?



Everyday Considerations In Transitway Planning – New Starts

- Land Use
 - Existing station area pedestrian facilities, including access for persons with disabilities
 - Do existing pedestrian routes provide direct access to station areas?
 - Are sidewalks continuous and are crosswalks appropriately marked and/or signalized?
 - Existing corridor and station area parking supply
 - How many parking spaces are currently located in the central business district, and what are the current average and maximum daily and monthly rates?
 - What is the existing parking supply in station areas?
 - Existing legally binding affordability restricted housing



Everyday Considerations In Transitway Planning – New Starts

- Economic Development
 - Transit-supportive plans and policies
 - Growth management
 - Transit-supportive corridor policies
 - Supportive zoning regulations near transit stations
 - Tools to implement transit-supportive policies
 - Demonstrated performance and impacts of policies
 - Performance of transit-supportive plans and policies
 - Potential impact of transit investment on regional land use
 - Tools to maintain or increase share of affordable housing



Everyday Considerations In Transitway Planning – New Starts

- Economic Development—Supportive Zoning Regulations Near Transit Stations
 - Zoning ordinances that support increased development density in transit station areas
 - Zoning ordinances that enhance transit-oriented character of station areas development and pedestrian access
 - Zoning allowances for reduced parking and traffic mitigation



Everyday Considerations In Transitway Planning – New Starts

- Economic Development—Performance of transit-supportive plans and policies
 - Demonstrated cases of development affected by transit-supportive policies
 - Station area development proposals and status



Everyday Considerations In Transitway Planning – New Starts

- Economic Development—
Potential impact of transit investment on regional development
 - Adaptability of station area land for development
 - Corridor economic environment



2016-Prospect Park Station

Everyday Considerations In Transitway Planning – New Starts

- Economic Development—Tools to maintain or increase the share of affordable housing in the project corridor
 - Evaluation of corridor specific affordable housing
 - Plans and policies to preserve or increase affordable housing
 - Adopted financing tools and strategies targeted to preserving and increasing affordable housing
 - Evidence of developer activity to preserve and increase affordable housing in the corridor
 - Extent to which the plans and policies account for long-term affordability and needs of very and extremely low income households



Everyday Considerations In Transitway Planning – Planning!

- Station Area Planning
 - It's never too early to start thinking about this
 - Consider $\frac{1}{2}$ to $\frac{1}{4}$ mile radius around a station area
 - Outreach to your community is important – how do residents and policy makers want their community to develop? Redevelop?





Resources

**LOCAL PLANNING
HANDBOOK**

<http://metro council.org/Handbook.aspx>

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<http://www.metro council.org/Handbook/PlanIt.aspx>



Questions?

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