Creative Solutions to Planned Conflict

Functional Classification, Freight and Urban Form

Workshop: Innovation in Urban Freight

February 7, 2012

Seattle, WA

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Part 1:
East Metro Connections Plan (EMCP)

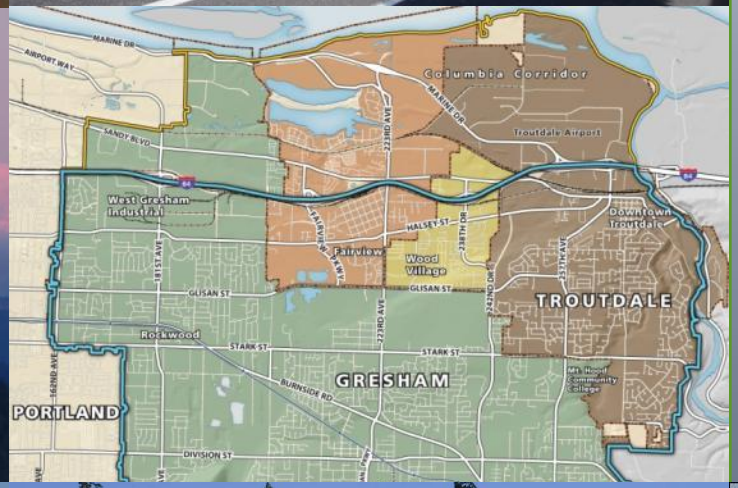
A case study in mismatched roadway functions & designations

Or…why did we go down this rabbit hole anyway?

East Metro

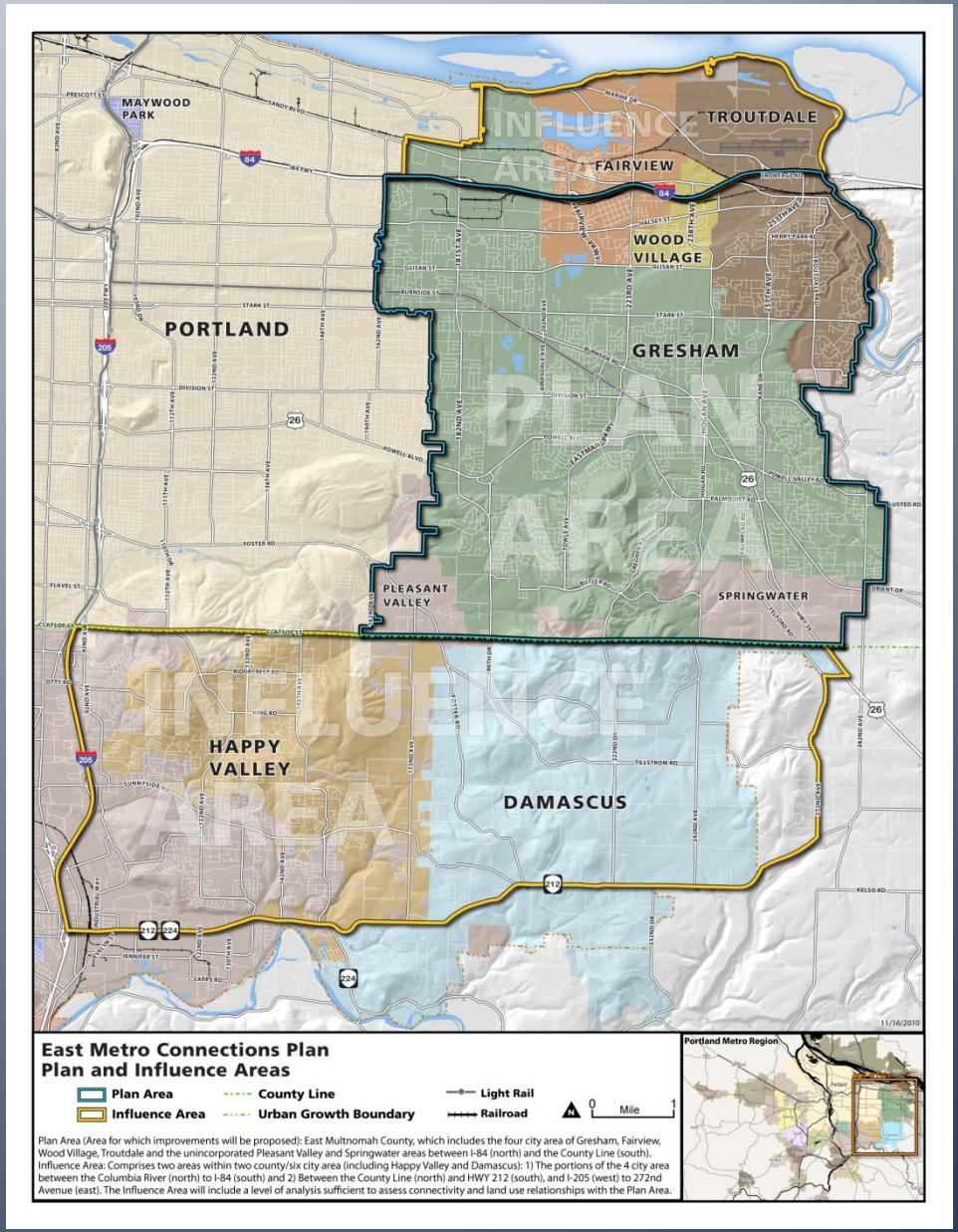
Connections Plan

www.oregonmetro.gov/eastmetro



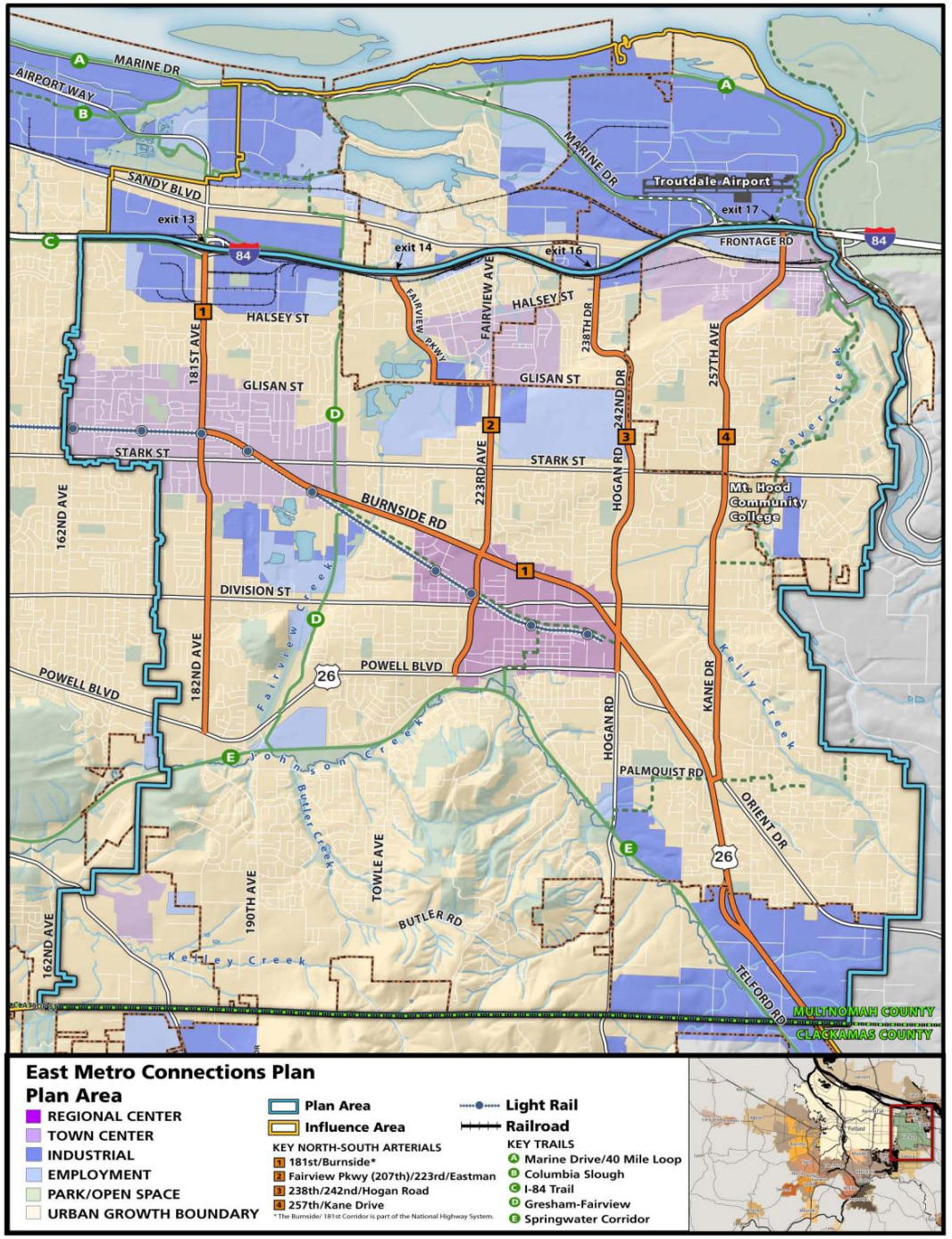
East Metro Connections Plan

- 20+ years of study
- Former “Mt Hood Freeway” proposals now DOA
- Silver buckshot vs. silver bullet
    - Shared benefits/burdens



EMCP Goals

- Support north/south connectivity between I-84 and US 26, as well as east/west connectivity
- Make the best use of the existing transportation system
- Develop multiple solutions that encompass all transportation modes
- Foster economic vitality
- Distribute both benefits and burdens of growth
- Enhance the livability and safety of communities
- Support local land use vision
- Enhance the natural environment



Related freight objectives
(from tech staff and stakeholders)

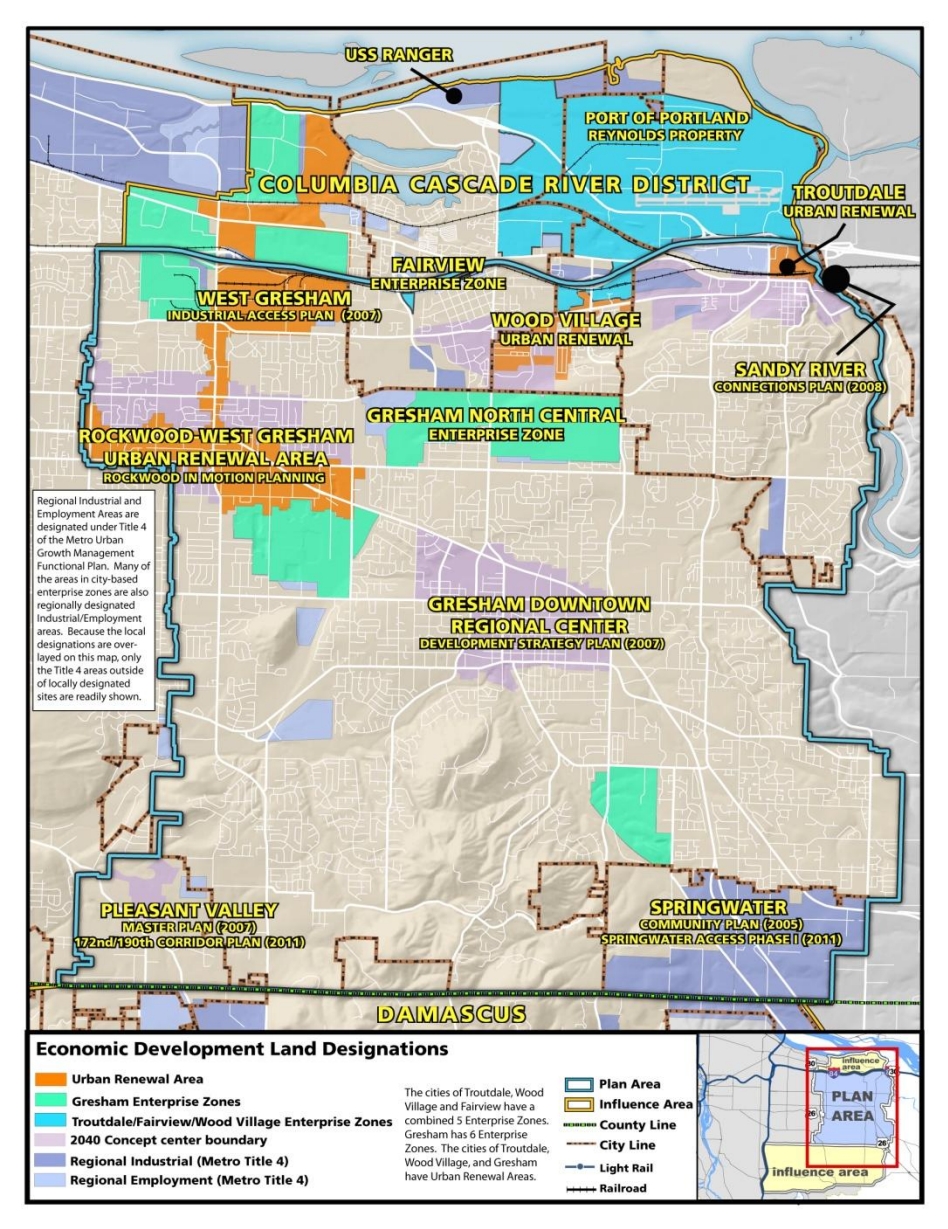
- Ensure truck access to industrial and commercial areas
- Use proper routing, access management, safety improvements and urban design innovations to reduce community impacts
- Define a high-performing NHS freight route connecting I-84 and US 26 *[note the conflation of NHS and freight route!]*
- Identify and design for necessary additions or revisions to freight connectors and arterials within the Plan Area
- Ensure that all routes are safe and reasonably efficient for all modes-including needed freight access, even if their chief function is not as a freight route
- Invest in projects that support local industrial and commercial activity and employment as well as mobility through the Plan Area

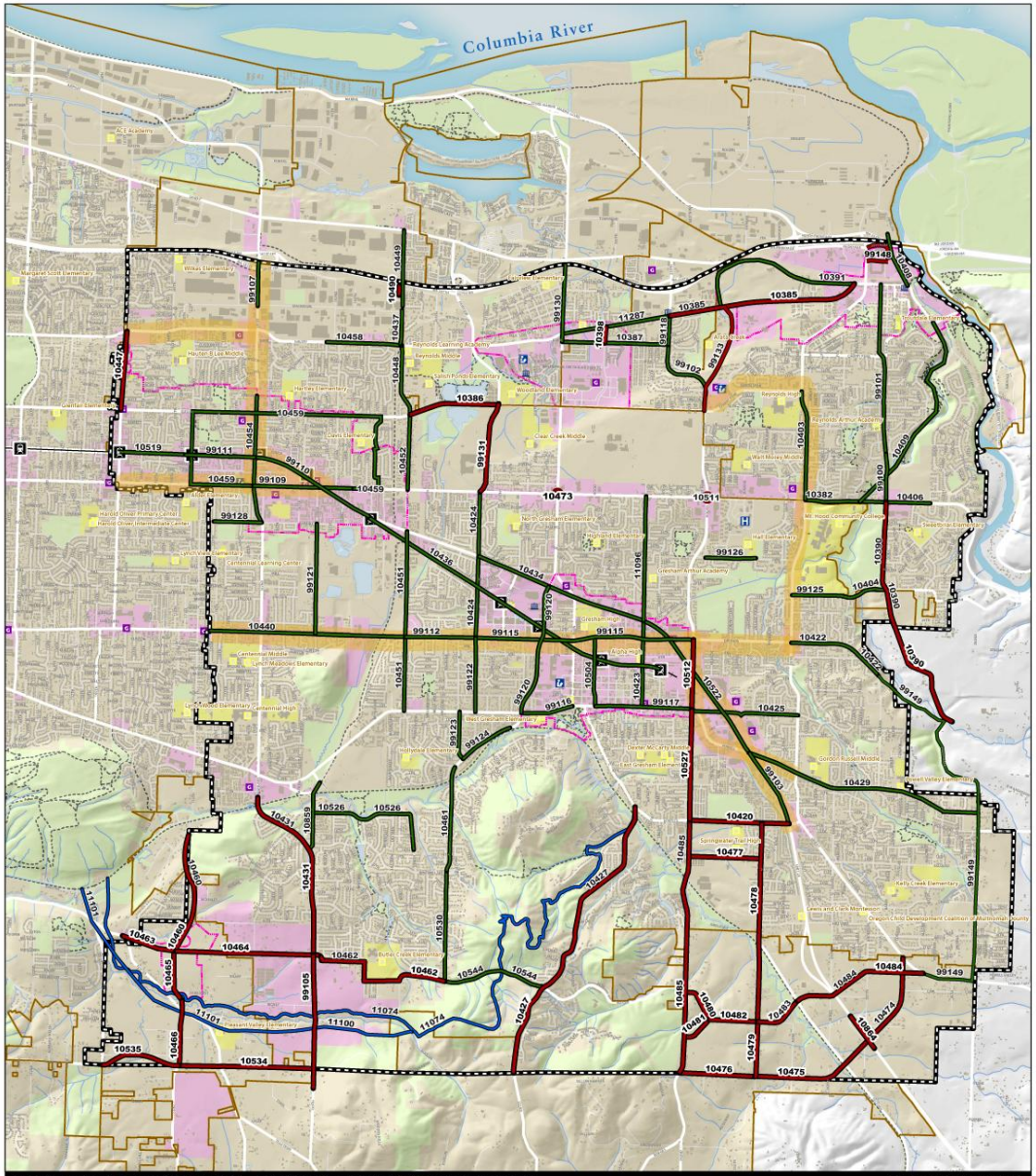
Final Problem Statement

Economic and community development are supported by the transportation system, but the road system (design and function) has conflicts with these goals. Additionally, freight drivers who need a through route(s) between I-84 and US 26 are not choosing the designated National Highway System freight route. Economic vitality and opportunity are hampered by infrastructure gaps (transportation and otherwise) and market conditions, which could be improved with regionally coordinated, targeted investments, local policies and incentives. Near- and long-term gains can be realized through strategies that balance development aims with safety, community health, livability and equity goals. A range of actions that benefit existing and future uses should all be evaluated as part of an overall solution, including: managing traffic better; creating some new capacity for future growth; improving transit, bicycle and pedestrian options and access to them; and reconsidering freight routes and the NHS freight designation

Economic Development Focus

- A driver for both freight access and mobility concerns.
- Something the locals *might* agree on
- Roadway access to industrial land use viewed (rightly or wrongly) as critical to economic development.
- Road access and congestion were not identified as top obstacles by our economic development consultant





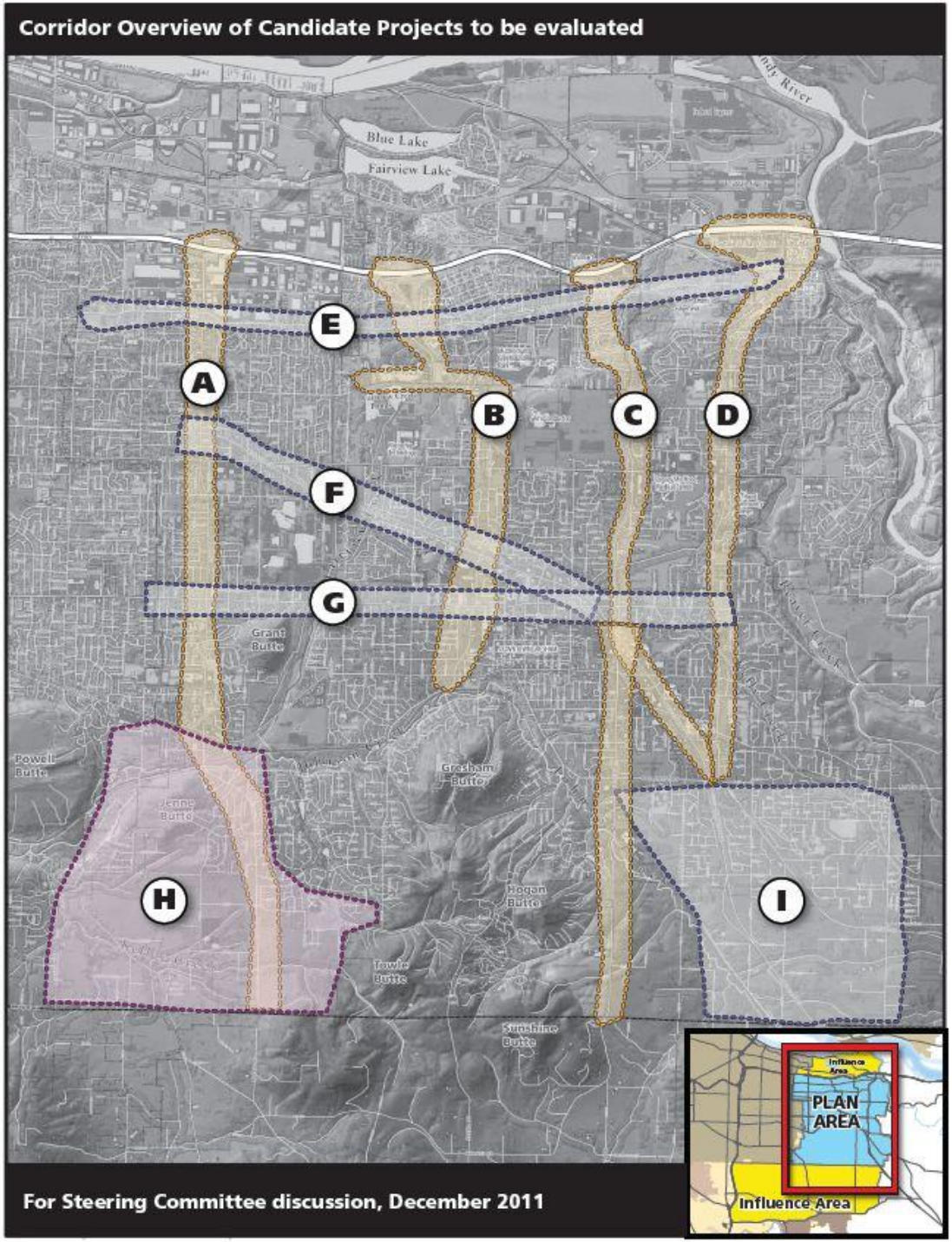
East Metro Connections Plan - candidate projects to be evaluated **January 17, 2012**

- Roadway projects to be evaluated
- Bicycle and Pedestrian projects
- Environmental related projects
- Safety Corridor to be evaluated

0 0.25 0.5 Miles

In addition to projects identified on this map, EMCP will also be evaluating a transit system network, as well as improvements in system utilization to specific arterials. Please refer to the transit map and system management map for those projects.

- Schools
- Libraries
- Hospitals
- City halls
- Grocery stores
- Light Rail
- Light rail stops
- Trail
- 2040 Center
- School
- Park/Natural Area/Golf Course
- Mixed Use Residential
- Urban growth boundary
- Plan Area
- City boundary lines



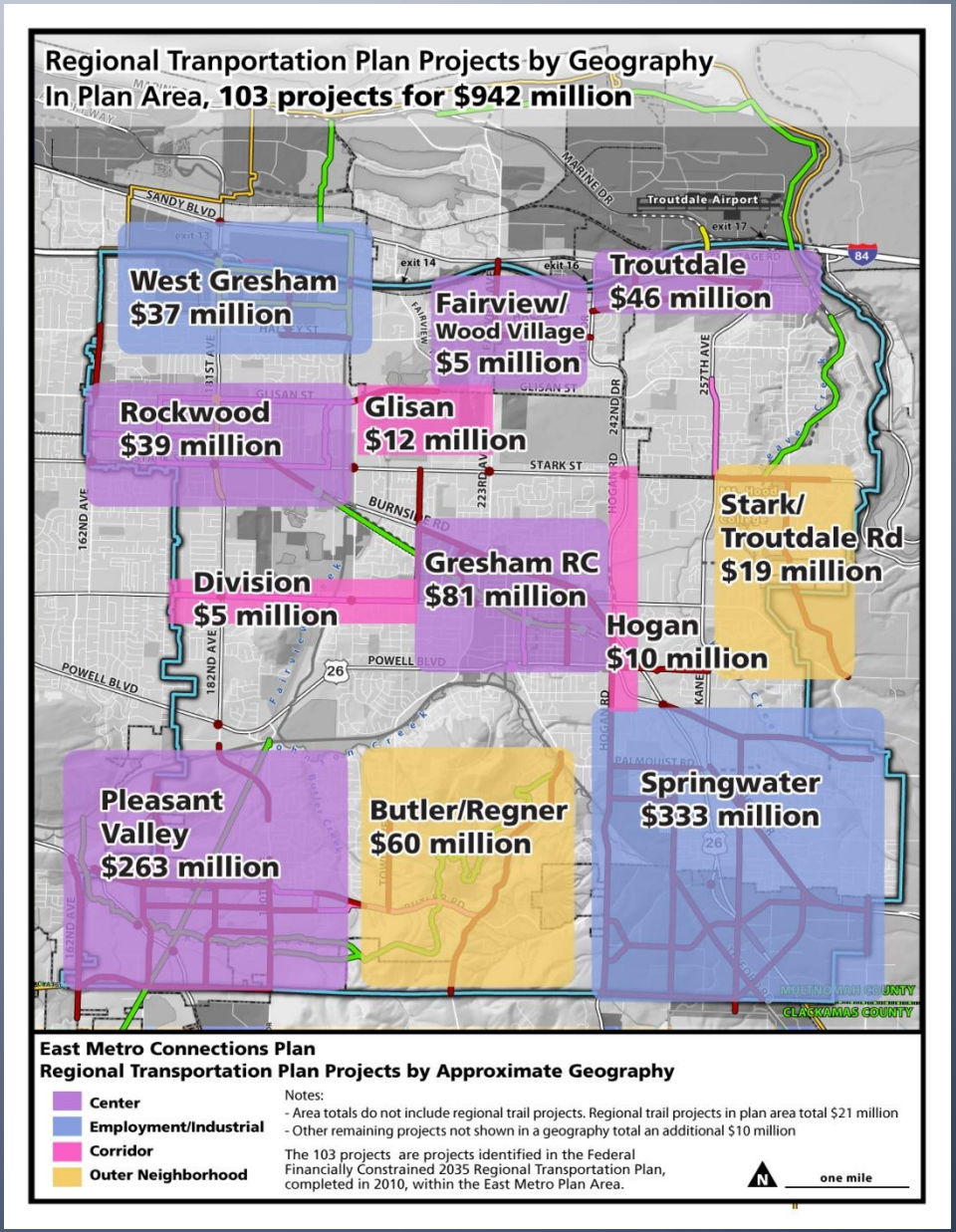
Summary of candidate projects to be evaluated

- Note locations along major arterials, and in targeted development areas

Another major driver of the study: $$

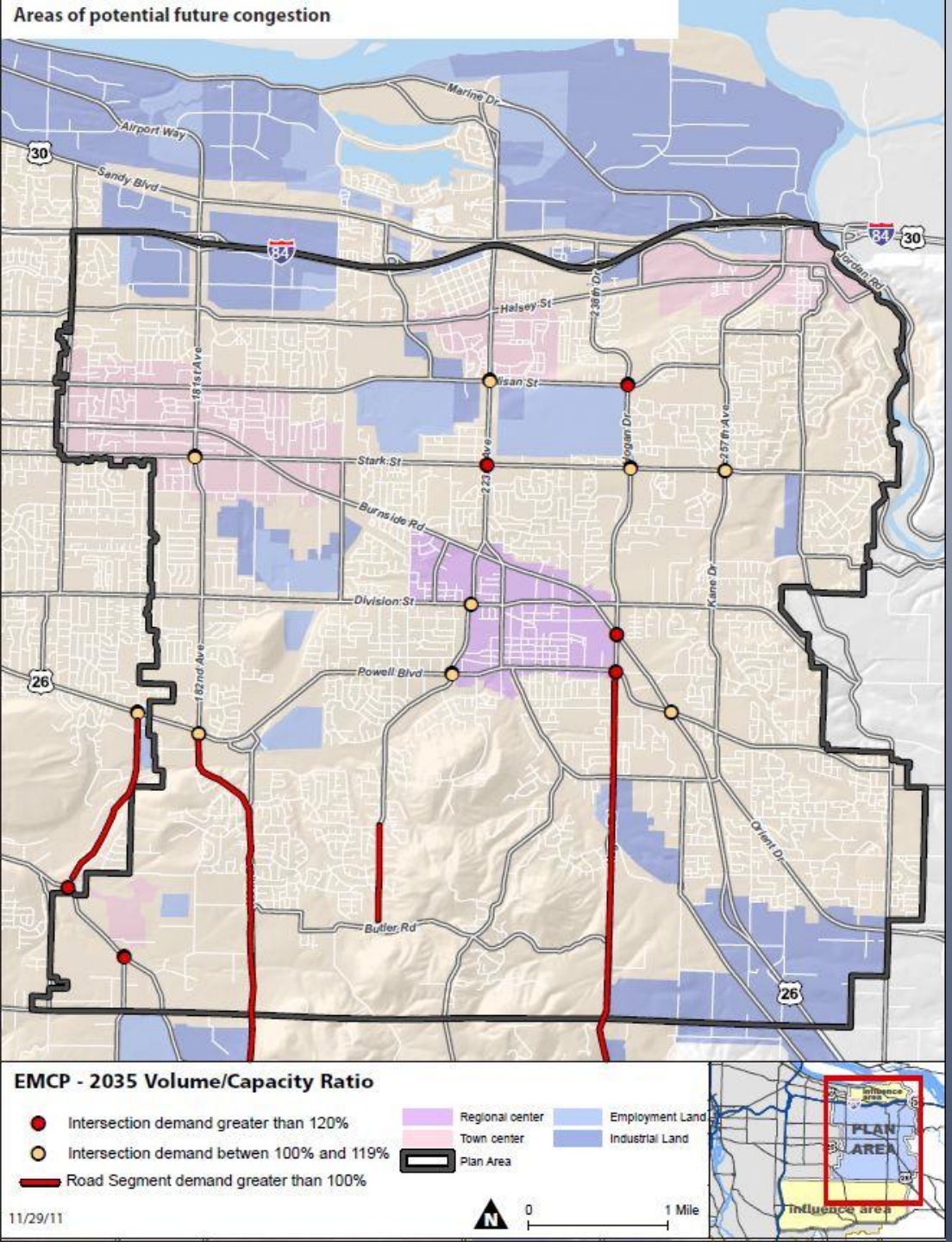
We do NOT have enough money for everything in the RTP

How do we prioritize?



Additional Factors Affecting Freight Analysis

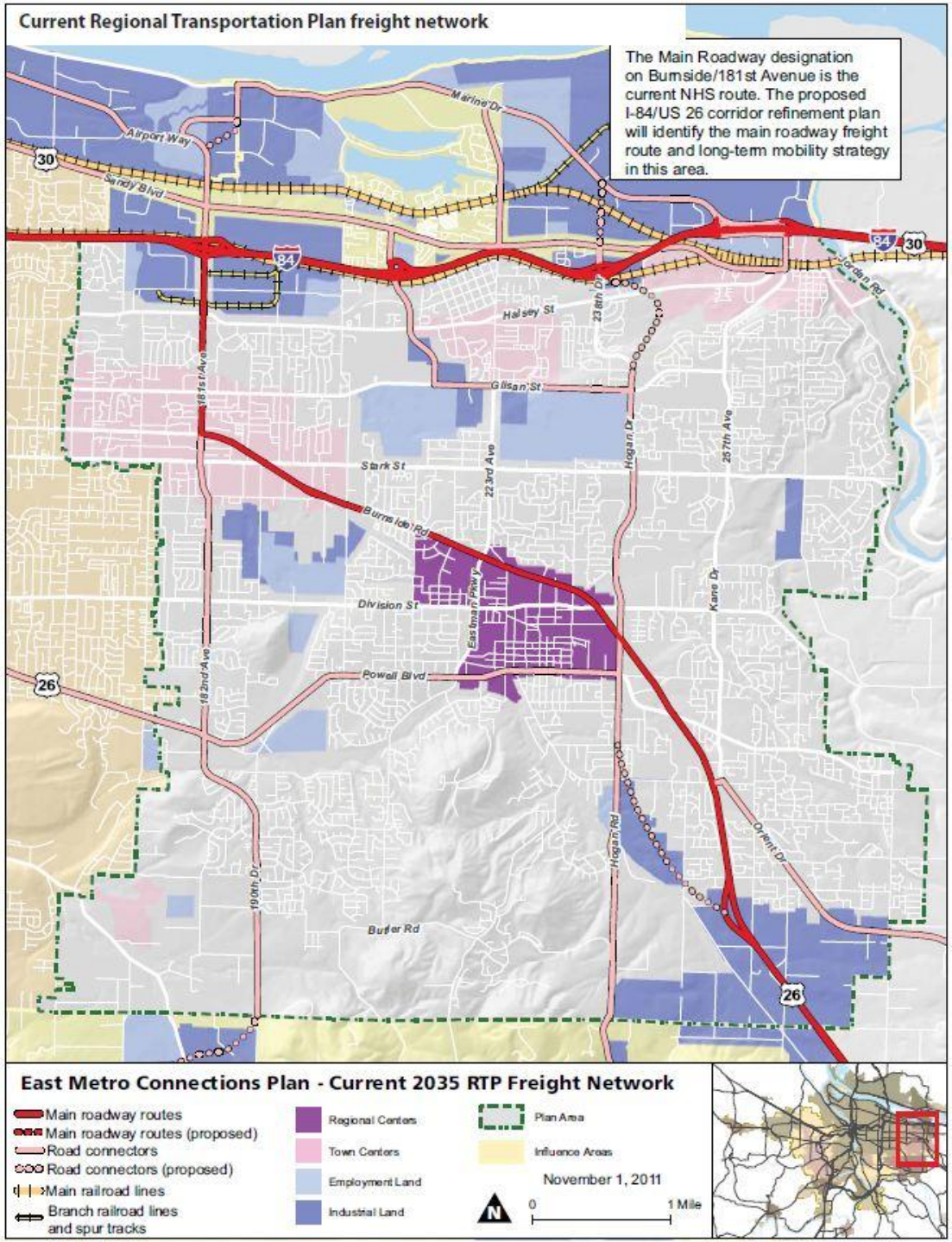
- Local jurisdictions reluctant to take on the burden of being the "one" NHS route
- On the other hand…weird "glamour" of freight (planners want to put everything on the freight grid!)
  - Might be money in the future???
  - But…we also don't like real or perceived design restrictions!
  - And…no one wants any truck impacts in their neighborhoods.
- Local victim mentality (bad through-trips cost locals money and interfere with local business access!)
  - Yet each of the four cities wants an "exit #" from I-84 to its downtown
- Economic development views (everything from cargo cultists to the deeply cynical)
- Unrealistic livability demands on arterials that serve local connector functions
- Political will, public opposition, safety concerns



Future vehicular needs and opportunities

- Modeled results are largely related to forecast growth in currently semi-rural areas.
- RED shows 2035 congestion without any new projects.

Future freight and goods needs and opportunities



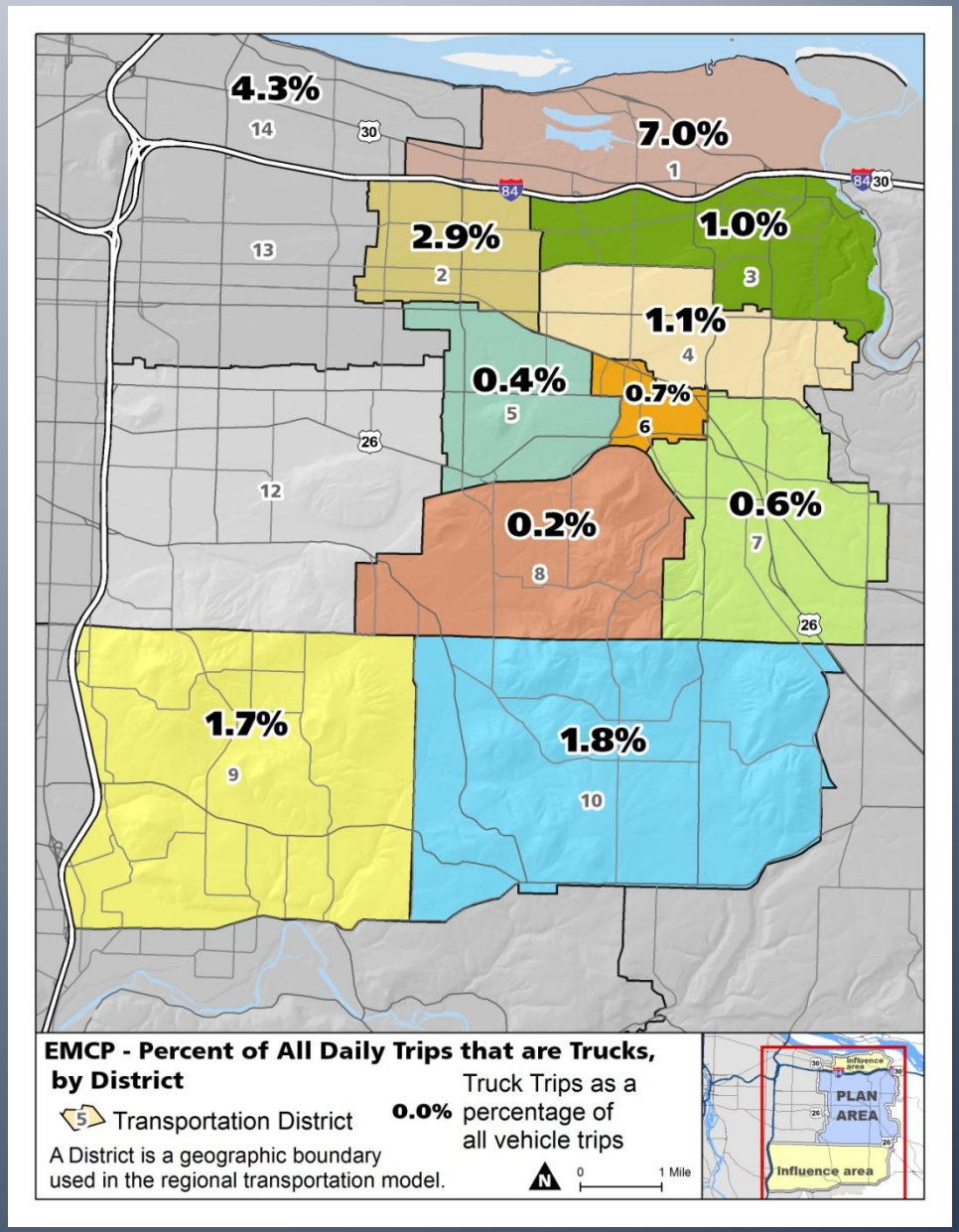
Transportation findings to date

- The area has a rich network of east west and north south arterials.
- Current traffic congestion is not severe, although some areas and intersections are near capacity.
- Through truck drivers do not choose the current designated freight route.
- There are numerous safety issues and conflicts with surrounding land uses.
- Future population growth is expected to add to traffic congestion.
- System is lacking good north/south transit and key bike and pedestrian connections.

Land use findings to date

- Centers have policies and plans in place but face numerous challenges to achieving these aspirations.
- There is available industrial land but problems such as lack of infrastructure hinder redevelopment.
- Corridors (or the land use along the arterials) have residential and employment capacity and would benefit from focused land use planning efforts.
- The jurisdictions could benefit from coordinated strategy to overcome obstacles and obtain funding for needed improvements.

Low TRUCK % of Daily Trips in Plan Area



Selected Regional 1-hr and 2-hr Midday Peak Hour Truck Percentages

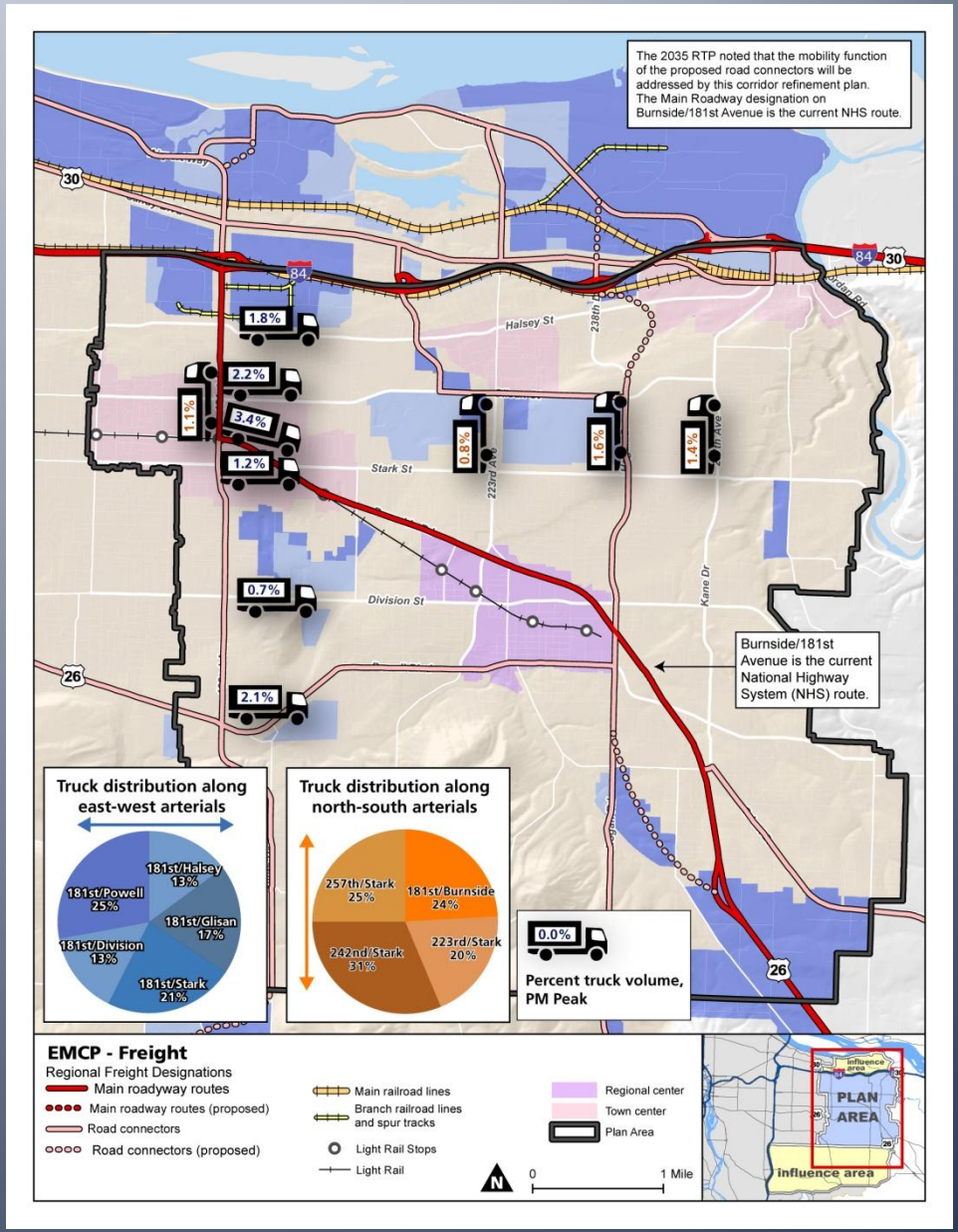
Intersection EMCP Sites in RED	**2-hour MD Truck %**	**Total Volume**	**Truck Volume**
E Burnside and Hogan	2.3%	3,588	84
I-5 NB off-ramp to Vancouver City Center	3.0%	333	10
I-5 SB on-ramp from Hayden Island	3.0%	1,000	30
All 12 EMCP locations	3.1%	30,188	936
E Burnside and SE 181st	3.2%	2,632	84
SE Stark and SE 242nd	3.8%	3,584	136
I-5 NB on-ramp from 39th Ave/SR-500	4.0%	250	10
Gresham ATR (26-003): 0.18 mile south of Powell on US-26	4.6%	32,273	1,484
Gresham ATR (26-003): 0.18 mile south of Powell on US-26	4.7%	33,225	1,562
I-5 NB off-ramp to SR-14 EB	5.0%	900	45
I-5 SB on-ramp from Fourth Plain Blvd	6.0%	333	20
I-5 NB off-ramp to Victory Blvd	7.0%	357	25
I-5 SB on-ramp from Mill Plain Blvd	7.0%	786	55
I-5 SB on-ramp from Columbia Blvd	19.0%	500	95
Troutdale ATR (26-001): MP 17.71 on I-84	20.4%	29,637	6,046
I-5 SB on-ramp from Marine Dr	23.0%	283	65
I-5 NB off-ramp to Marine Drive	32.0%	359	115

Do you see a theme?

Our data confirmed several previous studies, including a truck-following study-

- Truck volumes and percentages are low
- Trucks are fairly even distributed along the arterials

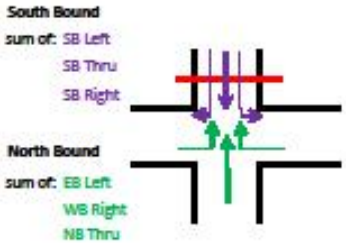
THINK "GRID"



Truck Volumes as Percentage of All Vehicles

North/South Movement at Screenline

Cross-streets:	181st & Burnside					223rd & Stark					242nd & Stark					257th & Stark				
Vehicles	All	Lt/Med Trucks	Heavy Trucks	TOTAL trucks	% of total trucks at this screenline location	All	Lt/Med Trucks	Heavy Trucks	TOTAL trucks	% of total trucks at this screenline location	All	Lt/Med Trucks	Heavy Trucks	TOTAL trucks	% of total trucks at this screenline location	All	Lt/Med Trucks	Heavy Trucks	TOTAL trucks	% of total trucks at this screenline location
Both Directions	2442	17	10	27	24.1%	2663	14	8	22	19.6%	2130	24	11	35	31.3%	2116	14	14	28	25.0%
		0.7%	0.4%				0.5%	0.3%				1.1%	0.5%				0.7%	0.7%		



TOTAL	All	Lt/Med Trucks	Heavy Trucks	TOTAL trucks	% of total trucks at this screenline location
Both Directions	9351	69	43	112	100.0%
		0.7%	0.5%		

Light/medium trucks include: Buses and single unit trucks (up to 53 foot–regular trucks)
Heavy duty – Trucks larger than a single unit truck

1 Hour PM Peak
Source: March 2011 Traffic Counts, Metro

EMCP_screenline_08.xlsm NS

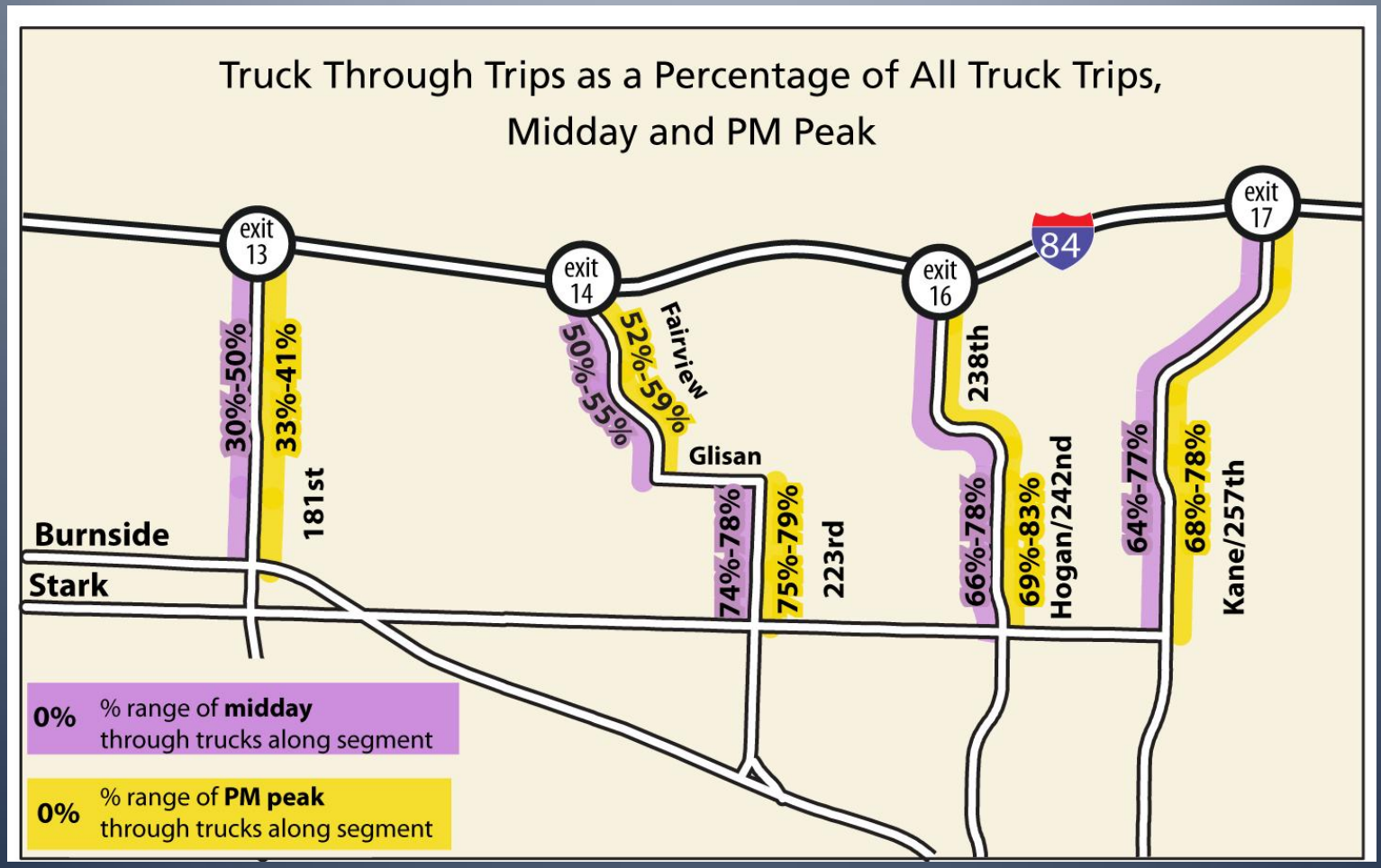
K. Gladhill 6/7/2011

January 2012 Truck Counts on (257th) Kane Drive

- Daily truck percentages:
  - Northbound: 3.1 %
  - Southbound: 3.7 %
- Morning (5:00 a.m. to 9:00 a.m.) truck percentages:
  - Northbound: 3.8 %
  - Southbound: 3.9 %
- Mid-Day (12:00 noon to 1:00 p.m.) truck percentages:
  - Northbound: 3.7 %
  - Southbound: 4.2 %
- Afternoon (3:00 p.m. to 7:00 p.m.) truck percentages:
  - Northbound: 2.7 %
  - Southbound: 4.0 %

Classification Count collected by All Traffic Data, Inc. from 1/23/12 - 1/24/12 on SE Kane Dr. South of SE El Camino Dr.

Through vs. Local Trucks



We talked to truckers

- Ron Cazeres – FedEx
- Kent Sparby – Roma Foods
- Phil Healy – Port of Portland
- David Ulmer – Gresham Transfer
- Jeff Nelson – Forte Transportation Logistics
- Mark Childs – Capacity Commercial
- Paul Burkhart – Seko Logistics
- Numerous participants at Oregon Truck Driving Championship

What our freight stakeholders want

- Fewer stops and starts (keep trucks rolling)
- Safety (so important you don't even need to prioritize it)
- Poor signage on restricted hill

•Posted freight routes! Identify through-route(s) plus local freight access routes (most folks agreed that more than one route was needed)

A truck-eyed view of arterials: weighted measures

Route	Length	Arterial signals	Minor signals	Marked cross-walks	# of un-marked access points	Forced turns to stay on route	Truck stops along route	Freight Route Connections
181st/ Burnside	6.0	10	13	2	210	1	0	3
223rd	5.0	9	7	0	130	3	0	2
242nd	5.4	9	7	0	89	3	0	0
257th	4.7	4	13	0	130	2	1	5
Weight	25	25	10	10	1	50	-50	-5
Points	527.5	800	400	20	559	450	-50	-50
% of total	9%	14%	7%	0%	10%	8%	1%	1%

Freight Stakeholder Comments on 181st/Burnside (exit 13 and National Highway System route)

- Local area managers know about the NHS route but drivers are typically unaware
  - Managers direct drivers' routes
- Inappropriate for a NHS route – Burnside is a light rail route!
- Only out of state haulers unfamiliar with the route would use 181st/Burnside.
- It's a tight turn-not even truck friendly
- Too many stop lights; Too many driveways
- Safety problem with impatient passenger car drivers when trucks are slowing for the bank as on NB 181st they approach the ramp to WB I-84

A resident's view of arterials: weighted measures

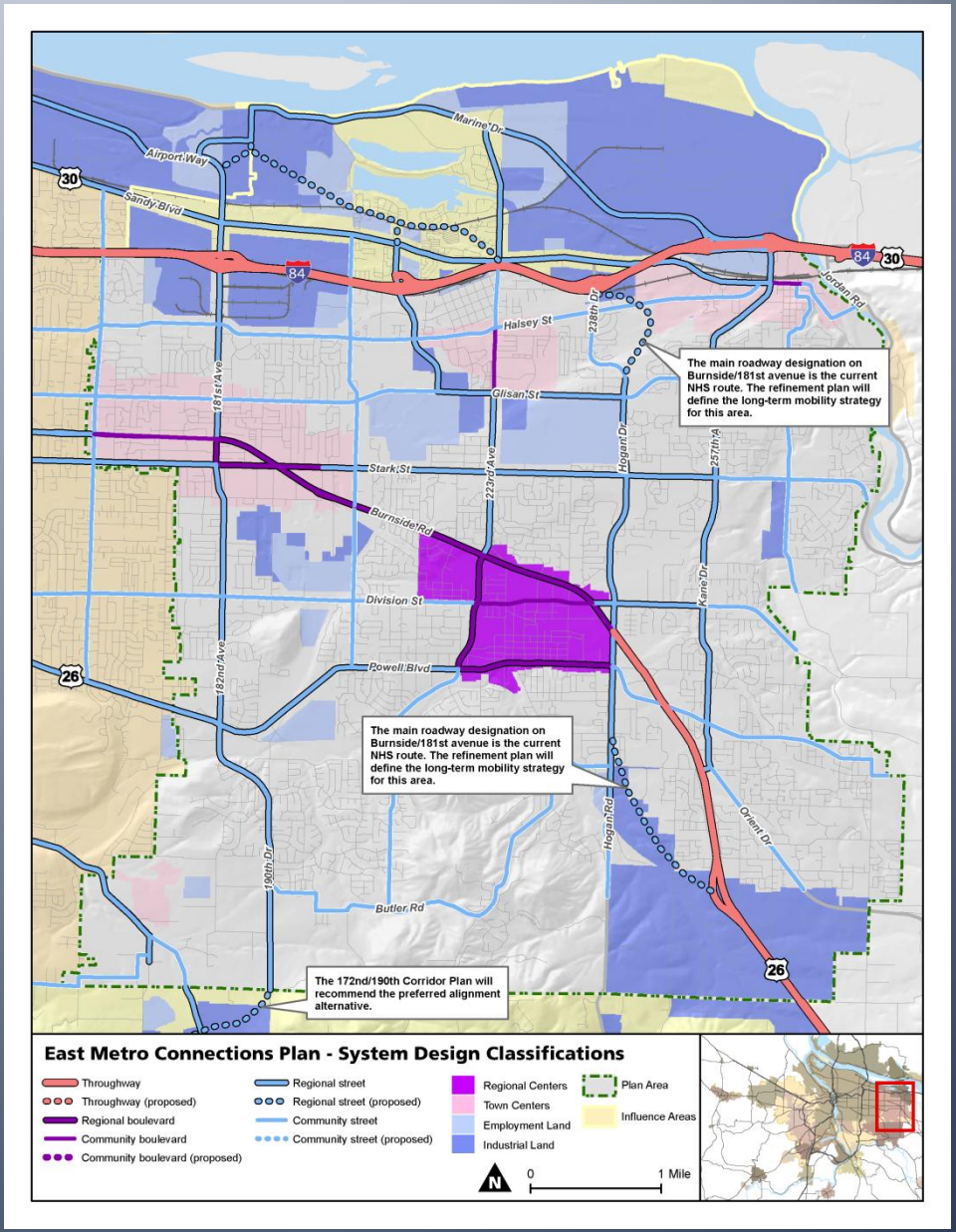
Route	MAX stops	Total transit Ons/Offs	Schools w/i 500 ft	HH w/i 500 ft	Pop w/i 500 ft	# of Centers traversed
181st/ Burnside	3	6,164	1	4,781	11,375	2
223rd	0	590	3	2,826	6,379	1
242nd	0	403	3	3,093	6,894	0
257th	0	2,328	4	3,961	8,601	1
Weight	50	0.05	75	0.04	0.02	50
Points	150	474.25	825	586.44	664.98	200
% of total	14%	8%	14%	10%	12%	3%

A Planner’s view of arterials

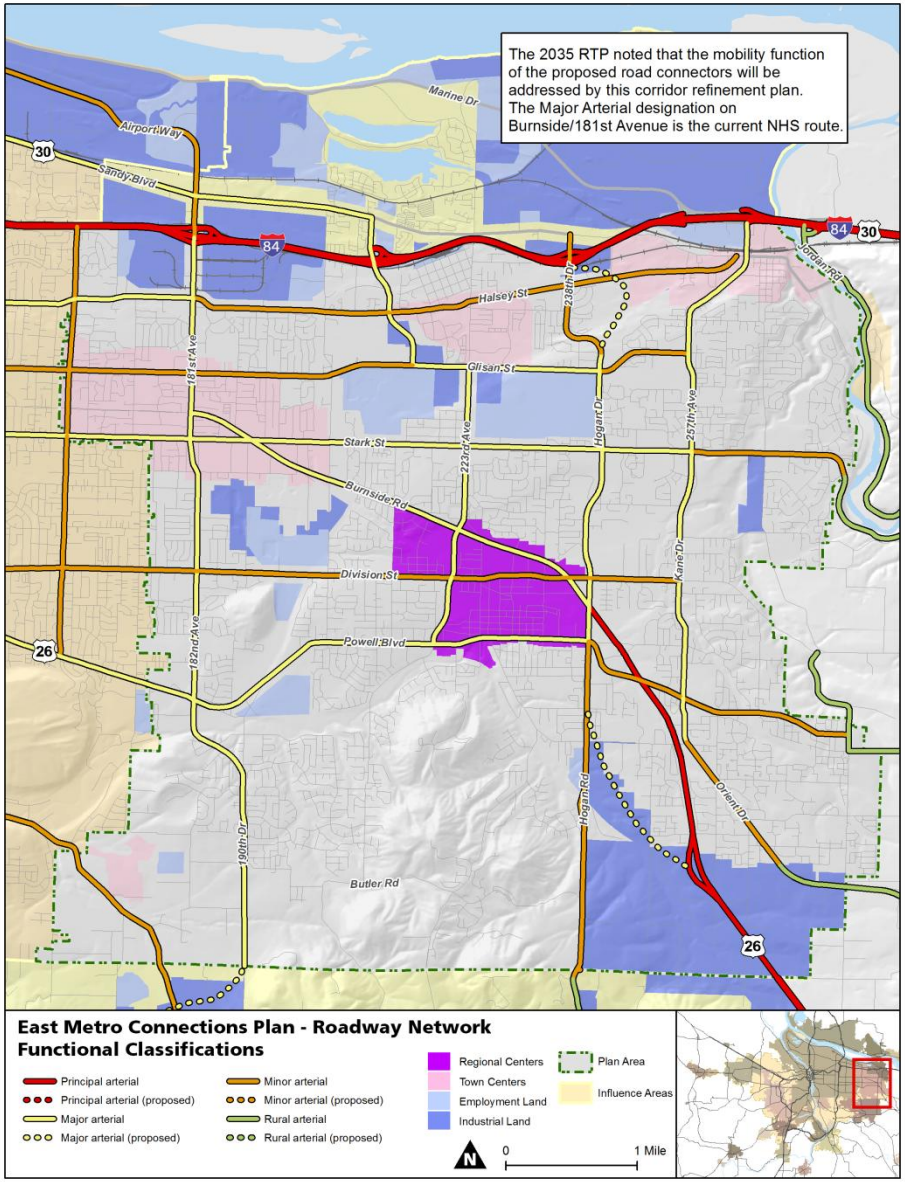
Context sensitivity, balancing trip purposes

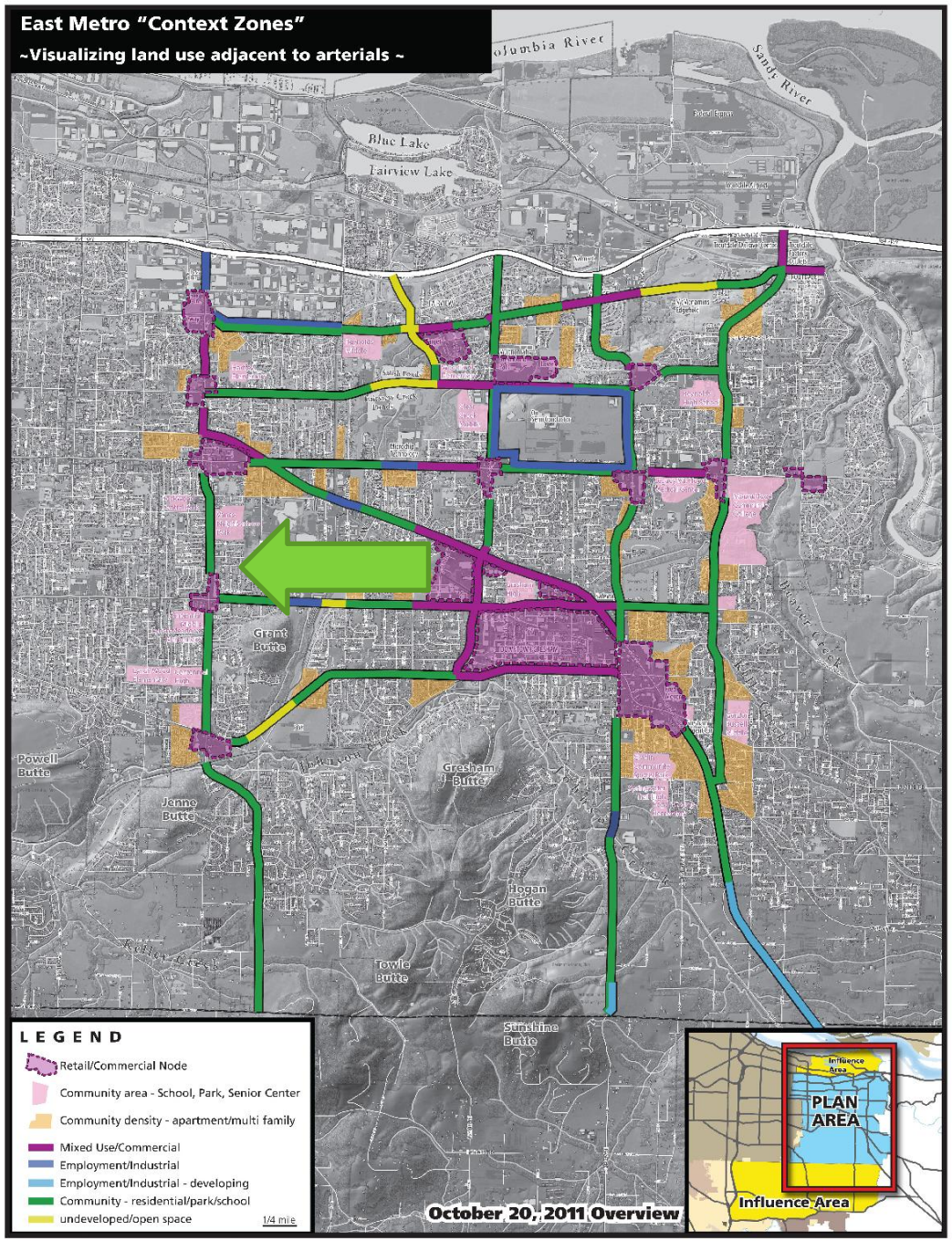
Regional designations conflict with NHS

City of Gresham reviewing its own functional classification system, inherited from Multnomah County



Generic Roadway Classification





East Metro Context Zones

The NHS Meeting, October 2011

The "Experts"

- FHWA
- ODOT
  - Freight Mobility and Region 1, planning and engineering staff
- Metro planning and engineering staff

Even the experts were confused!

- Freight route (fed, state, regional) vs. NHS
  - Formal designation vs. informal usage
- NHS vs. NN?
- Funding?
  - Seriously, is there any?
- Restrictions?
- Who owns the NHS revision process?

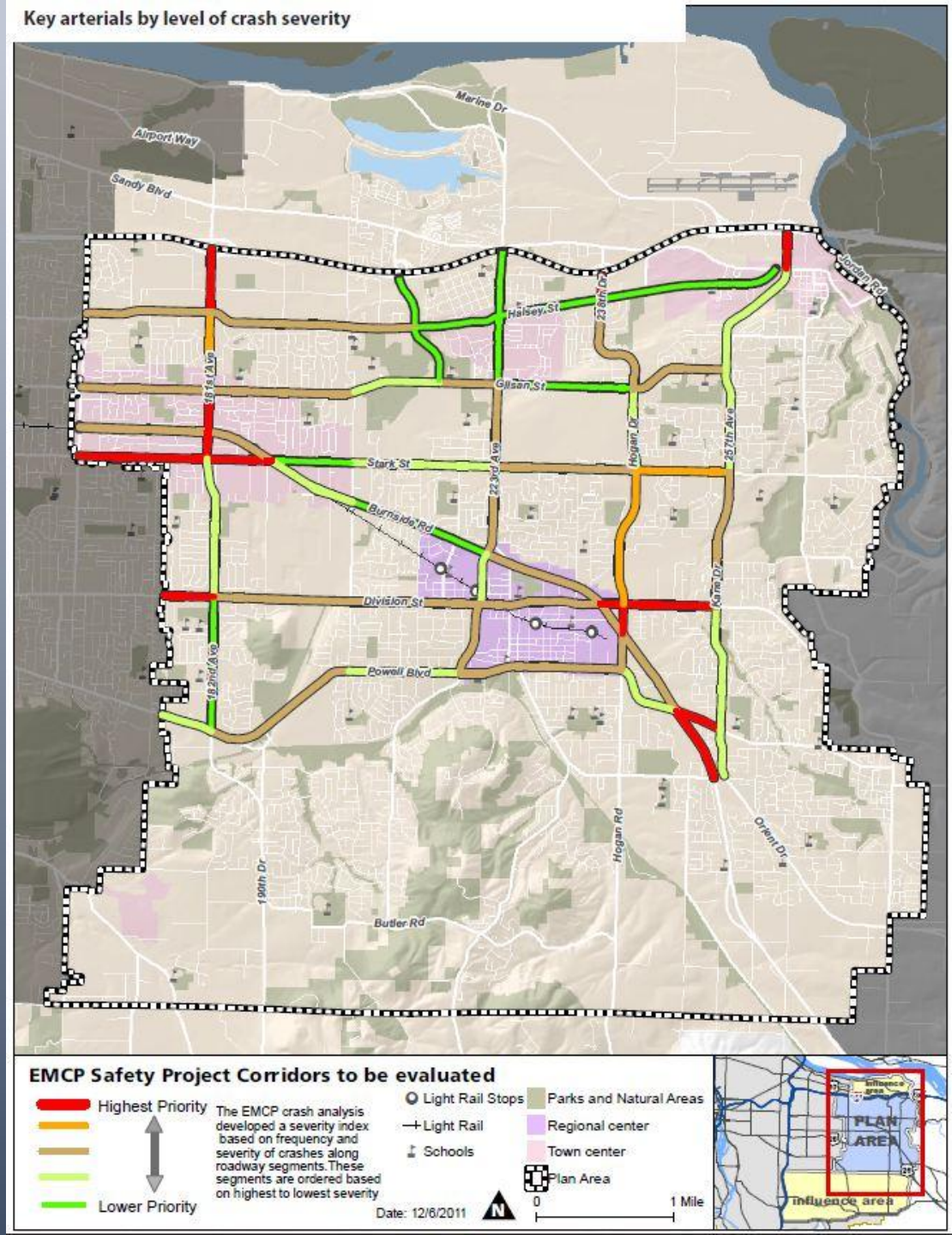
PART 2: Functional Classification and Freight

A dis-functional relationship?

Safety needs and opportunities

Safety and Livability Fixes

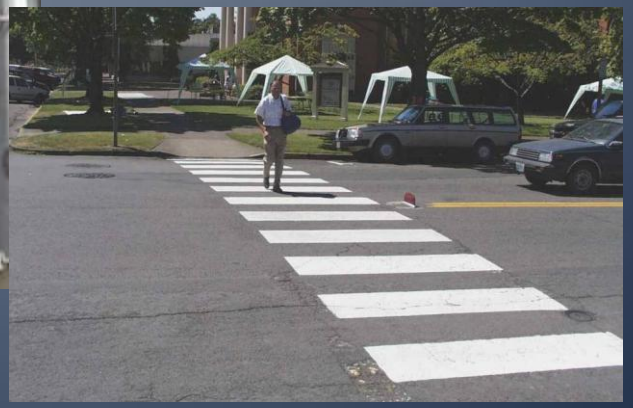
We weren't considering anything too radical…



Ped Crossings *at* Major Intersections

◊ Potential solutions

- Shorten crossings where practical
- Break up long crossings with medians or refuges
- High-visibility markings
- Countdown ped signals
- Longer WALK signal, “Rest” signal in WALK



Low to moderate cost

Candidates: everywhere

Ped Crossings *between* Major Intersections

◊ Turn a dangerous crossing into a safe and comfortable crossing.

- Medians or refuge island (40% crash reduction)
- RRFBs (rapid flash beacon)

Low to moderate cost

Candidates: all 3-lane/5-lane arterials

Access Management

◊ Add medians

◊ Consolidate driveways where feasible

- Increases corridor capacity
- Safer – can reduce crashes by 40-50%
- Better for bikes, peds

Moderate cost

Candidates: major arterials (181st, 223rd, 242nd, Glisan, Burnside, Stark, Division, Powell, others)

Modal Priority Signal System

- ◊ Prioritize, not pre-empt

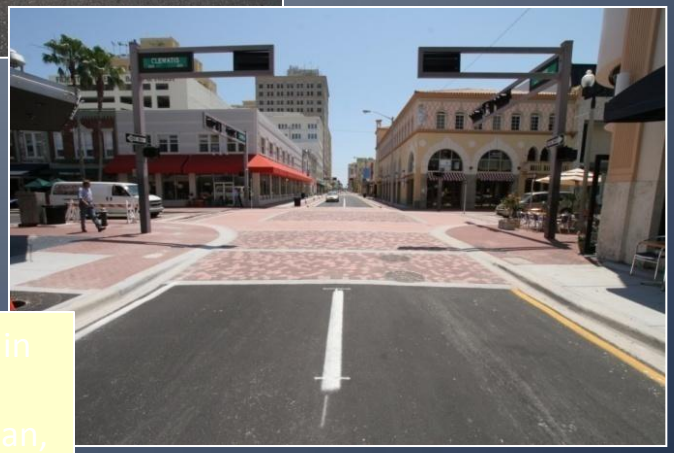
- ◊ Freight
  - Extends green for approaching trucks
  - Reduces stops, red-light running
- ◊ Transit
  - Adjusts timing to favor buses
  - 15% bus travel time savings

Low to moderate cost

Candidates:
Freight - 223rd, 242nd, Powell
Transit – 223rd, Stark, Division

Speed Management

◊ Techniques to manage traffic speeds on arterial roadways



- Urban form: enclosure
- Raised or textured intersections
- Gateway treatments
- Medians and crosswalks
- Video enforcement

Low to moderate cost

Candidates: Rockwood arterials, 257th in downtown Troutdale, Powell in downtown Gresham, Division & Eastman, 238th in Wood Village, others

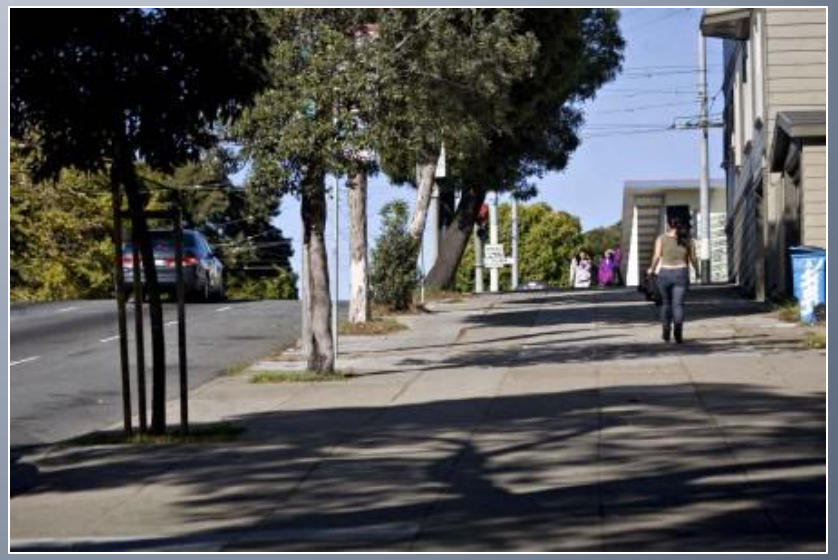
Wide and buffered sidewalks

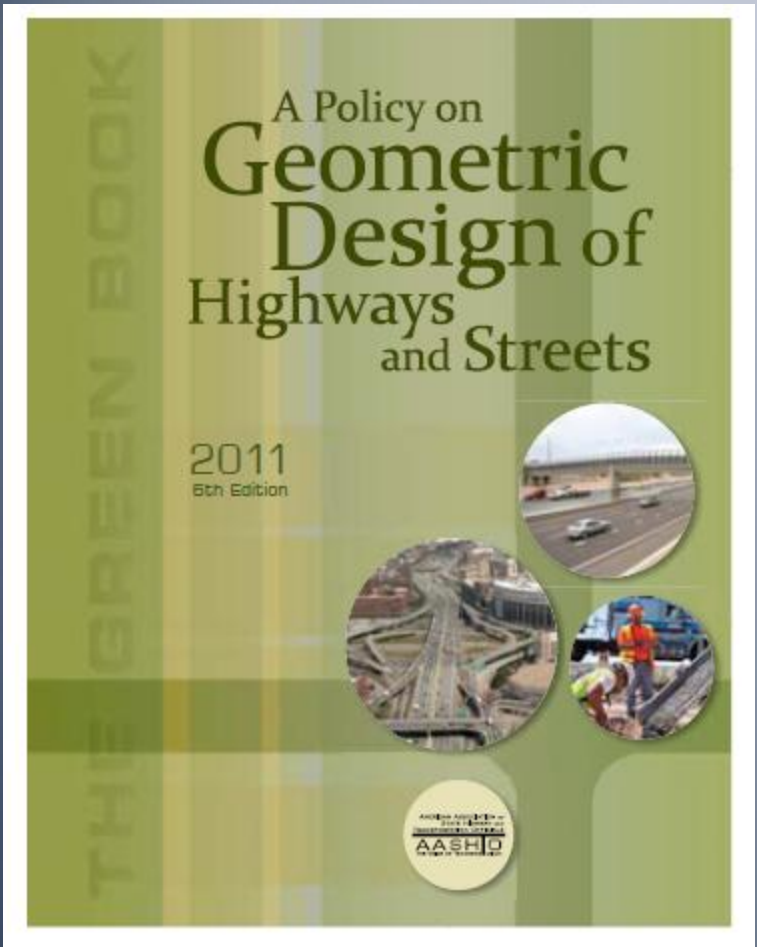
- ◊ Makes walking safer and more comfortable
- ◊ Improved Ped LOS

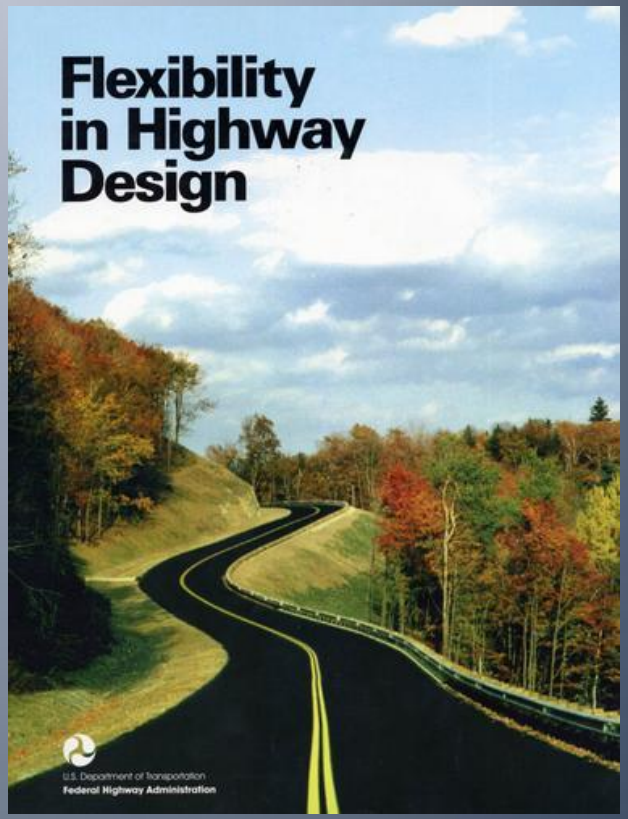
Along arterials:

- Preferred: 15’ (10’ + 5’ buffer)
- Constrained: 12’ (7’ + 5’)
- Absolute min: 10’ (5’ + 5’)
- Less width is ok next to on-street parking

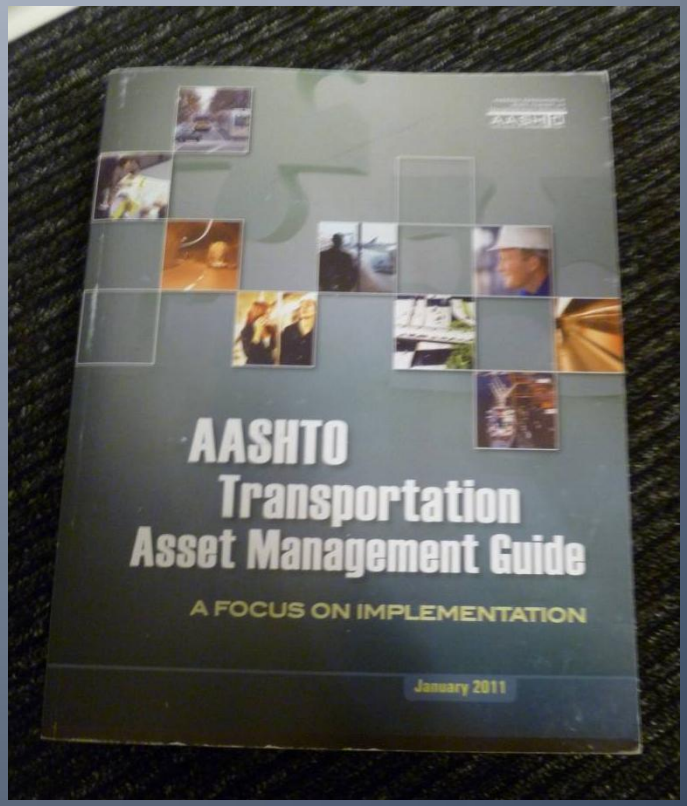
Always include street trees, recommended spacing: 15’ – 30’




THE GREEN BOOK
A Policy on
Geometric Design of Highways and Streets
2011
6th Edition
AASHTO


Flexibility in Highway Design
U.S. Department of Transportation
Federal Highway Administration


Oregon Department of Transportation
Highway
Design
Manual


AASHTO
Transportation
Asset Management Guide
A FOCUS ON IMPLEMENTATION
January 2011

AASHTO Fundamentals

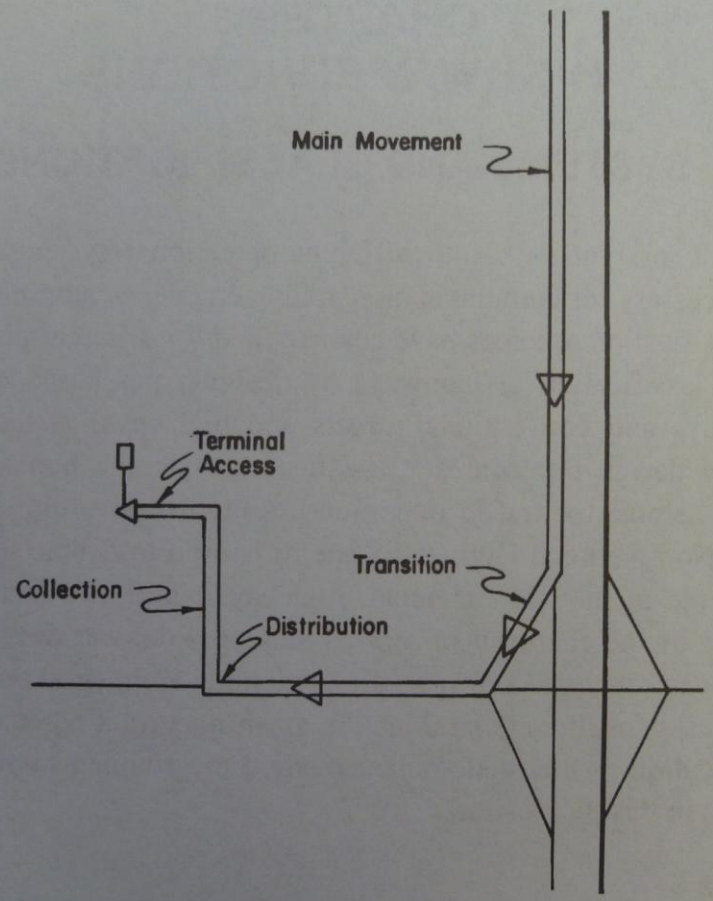


Exhibit 1-1. Hierarchy of Movement

THE Figure

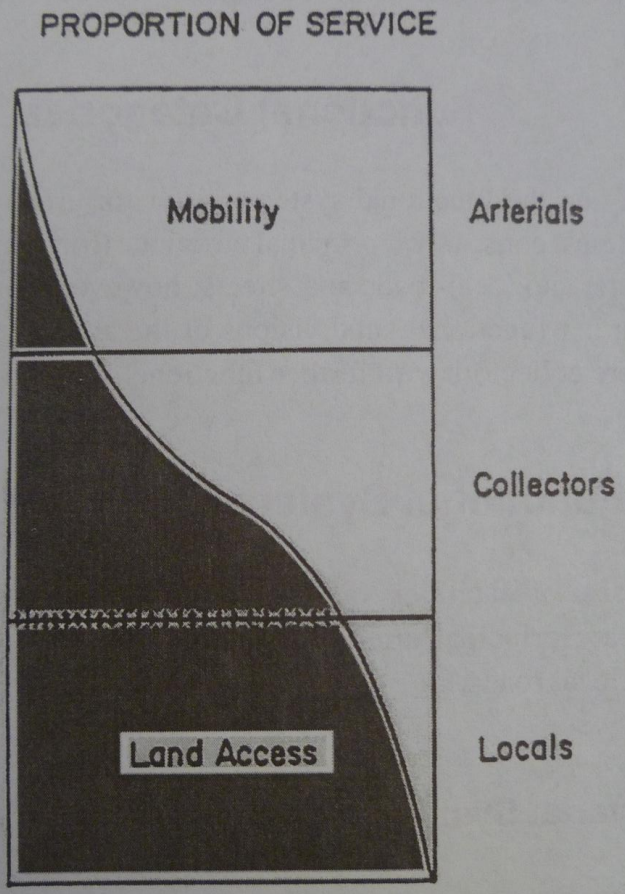


Exhibit 1-5. Relationship of Functionally Classified Systems in Serving Traffic Mobility and Land Access

Network

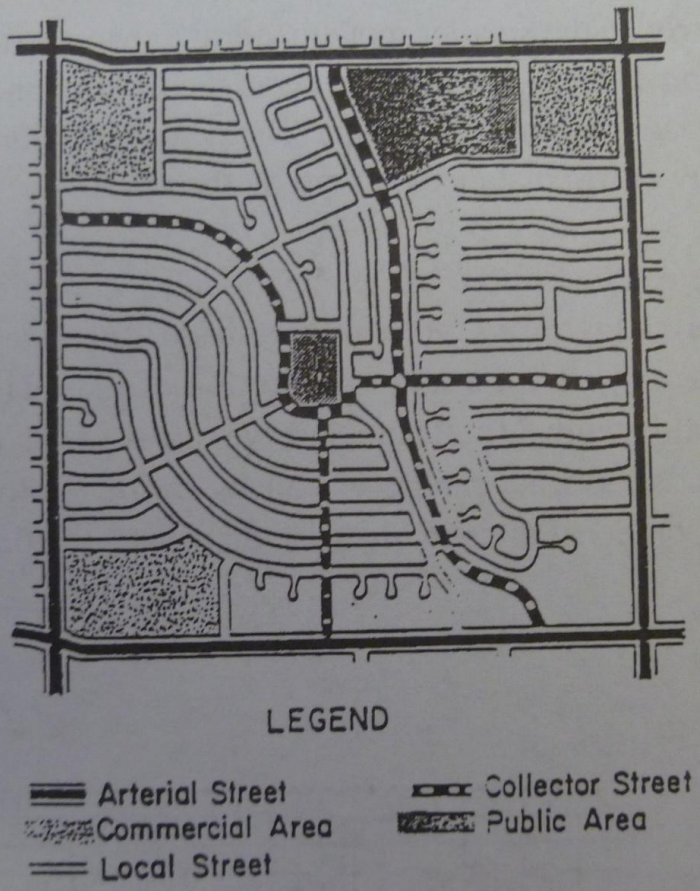
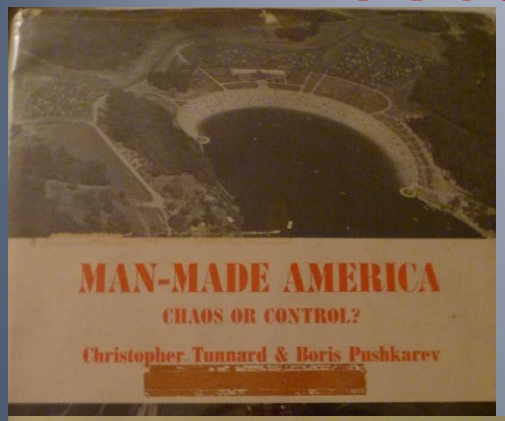
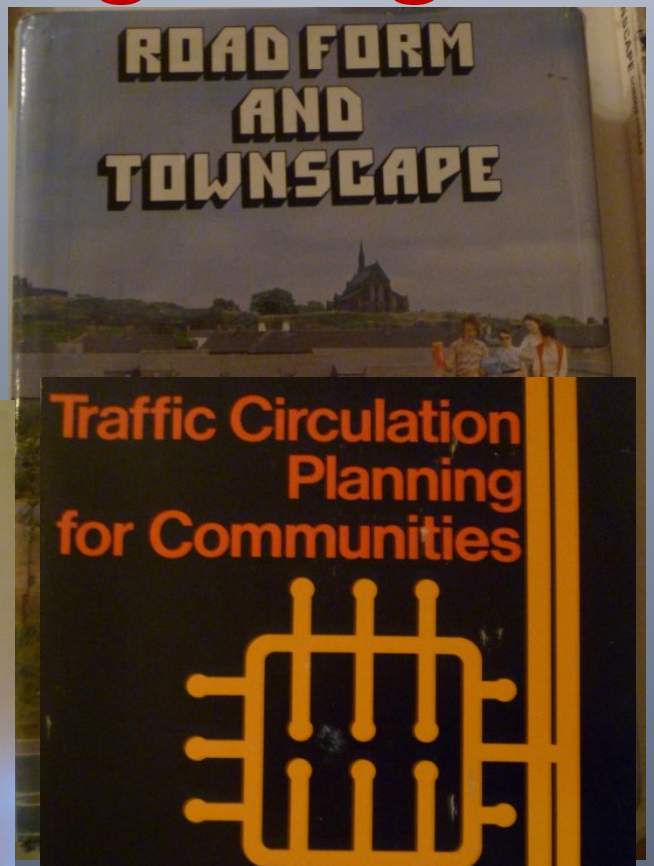
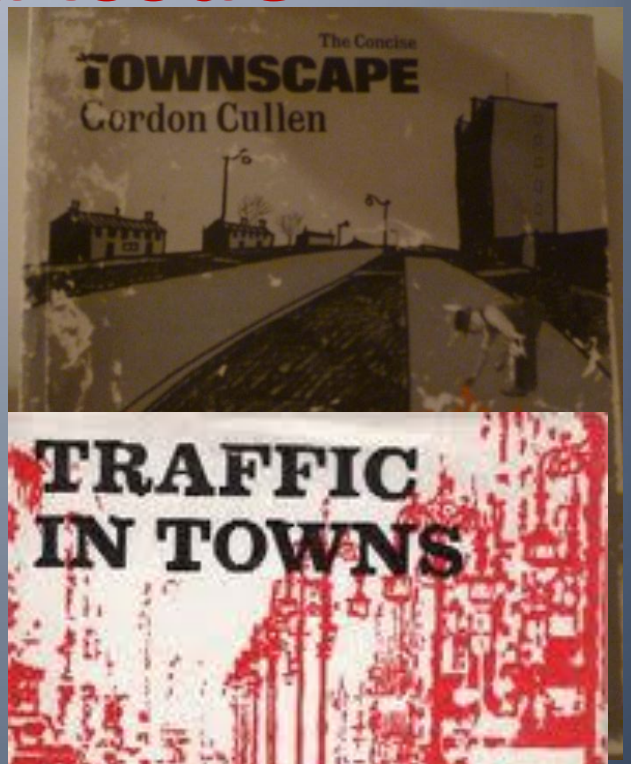


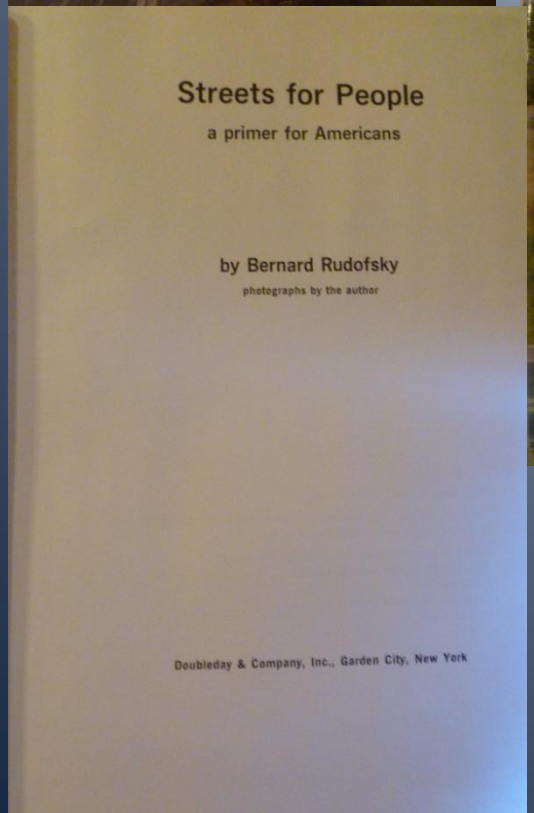
Exhibit 1-4. Schematic Illustration of a Portion of a Suburban Street Network

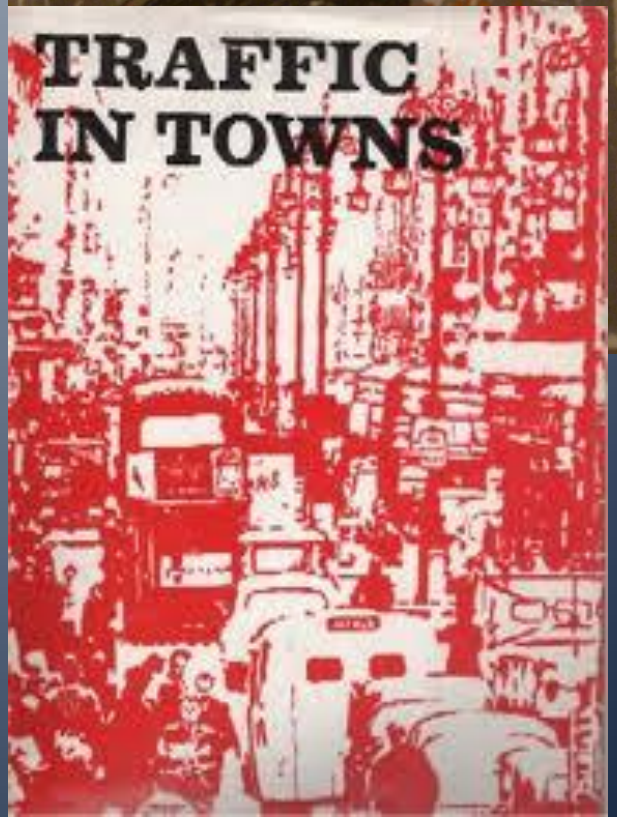
A long recognized issue



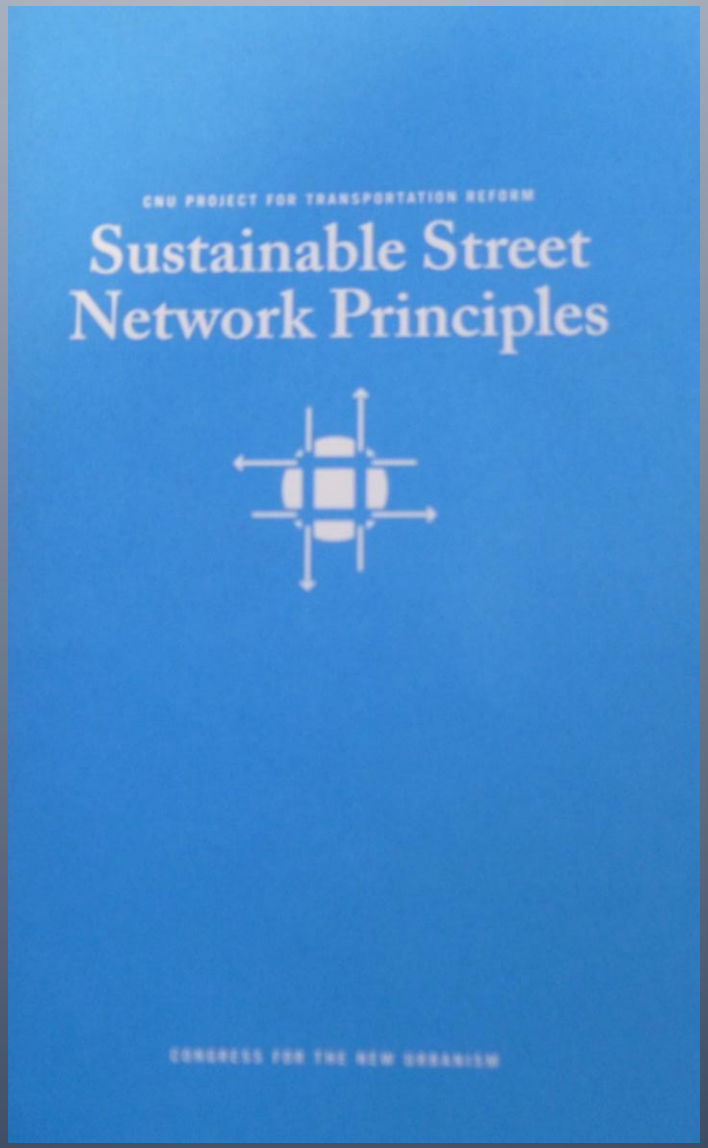


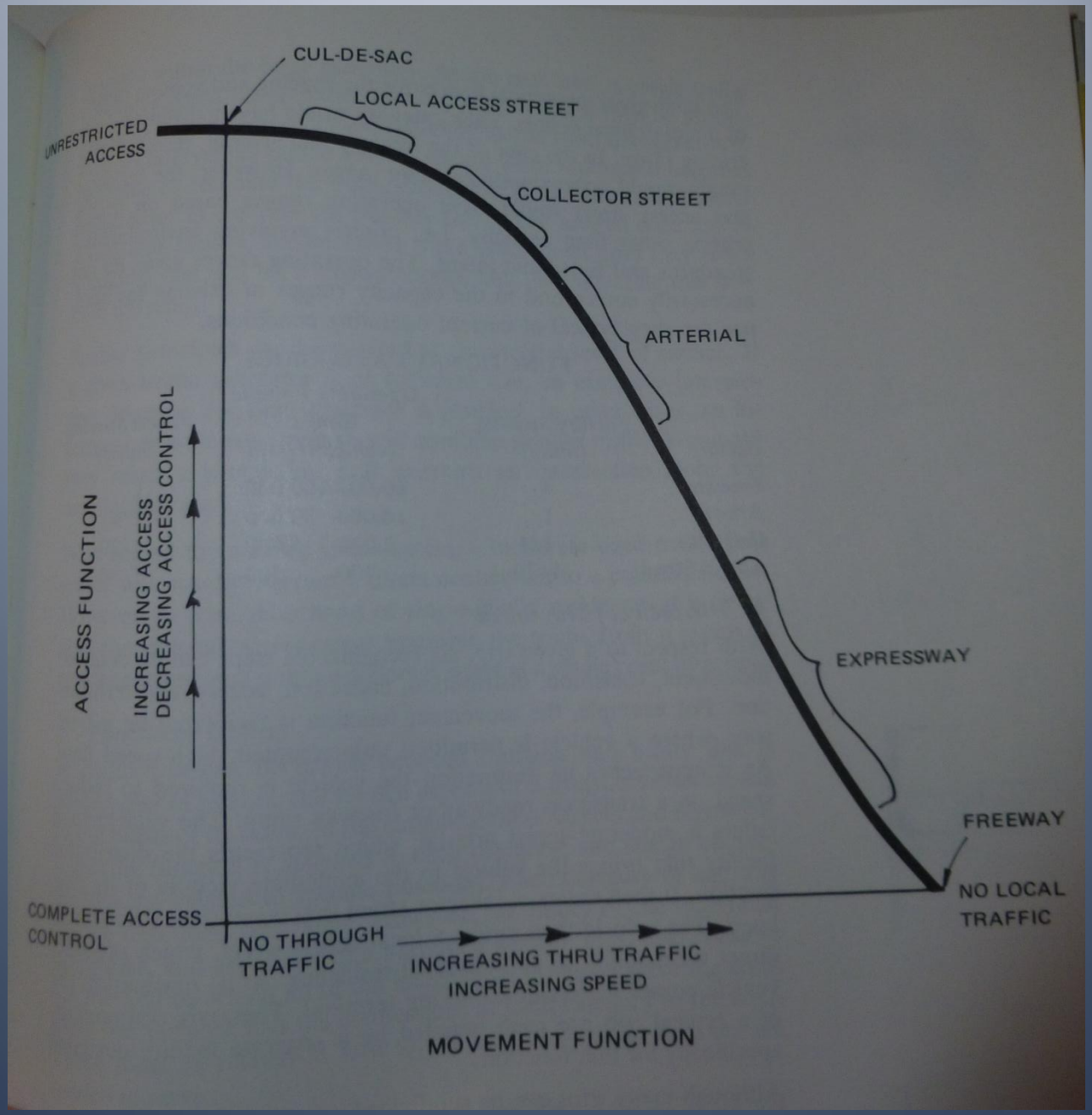




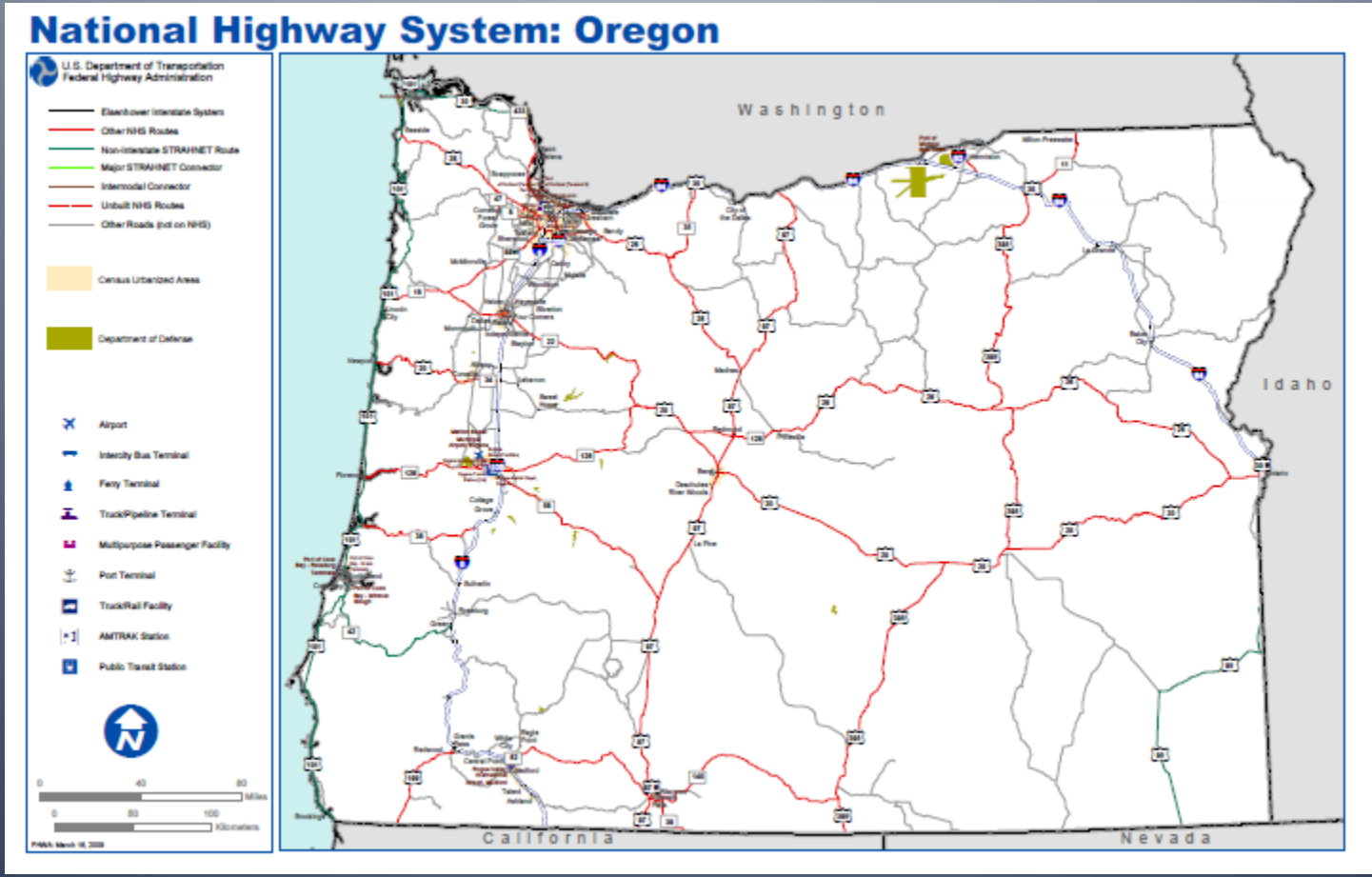


And still recognized

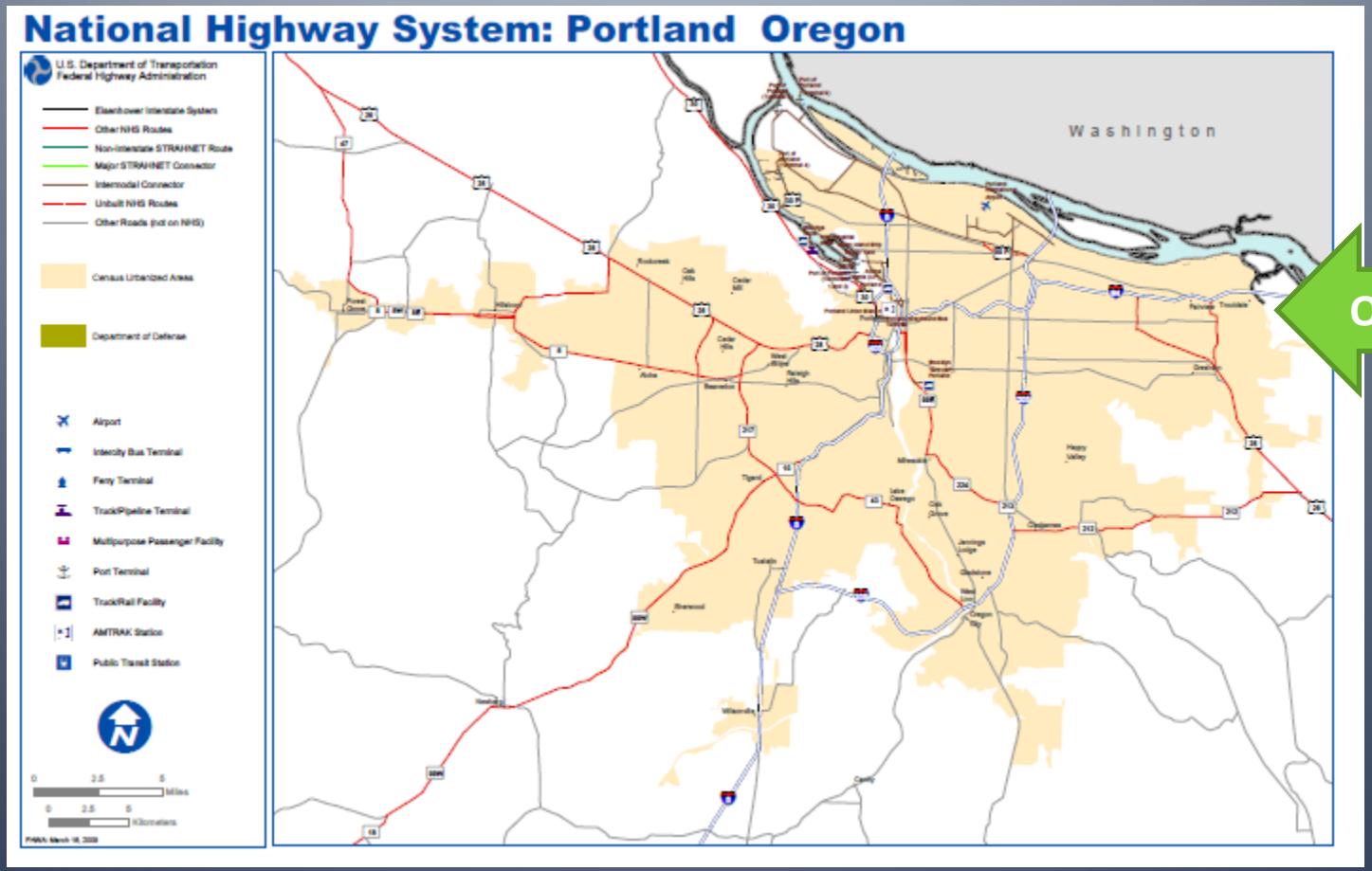



CUL-DE-SAC
LOCAL ACCESS STREET
UNRESTRICTED ACCESS
COLLECTOR STREET
ARTERIAL
EXPRESSWAY
FREEWAY
NO LOCAL TRAFFIC
ACCESS FUNCTION
INCREASING ACCESS
DECREASING ACCESS CONTROL
COMPLETE ACCESS CONTROL
NO THROUGH TRAFFIC
INCREASING THRU TRAFFIC
INCREASING SPEED
MOVEMENT FUNCTION

NHS Oregon


National Highway System: Oregon
U.S. Department of Transportation
Federal Highway Administration
Eisenhower Interstate System
Other NHS Routes
Non-Interstate STRAHNET Route
Major STRAHNET Connector
Intermodal Connector
Unbuilt NHS Routes
Other Roads (not on NHS)
Census Urbanized Areas
Department of Defense
Airport
Intercity Bus Terminal
Ferry Terminal
Truck/Pipeline Terminal
Multipurpose Passenger Facility
Port Terminal
Truck/Rail Facility
AMTRAK Station
Public Transit Station
Miles
Kilometers
Washington
Idaho
California
Nevada

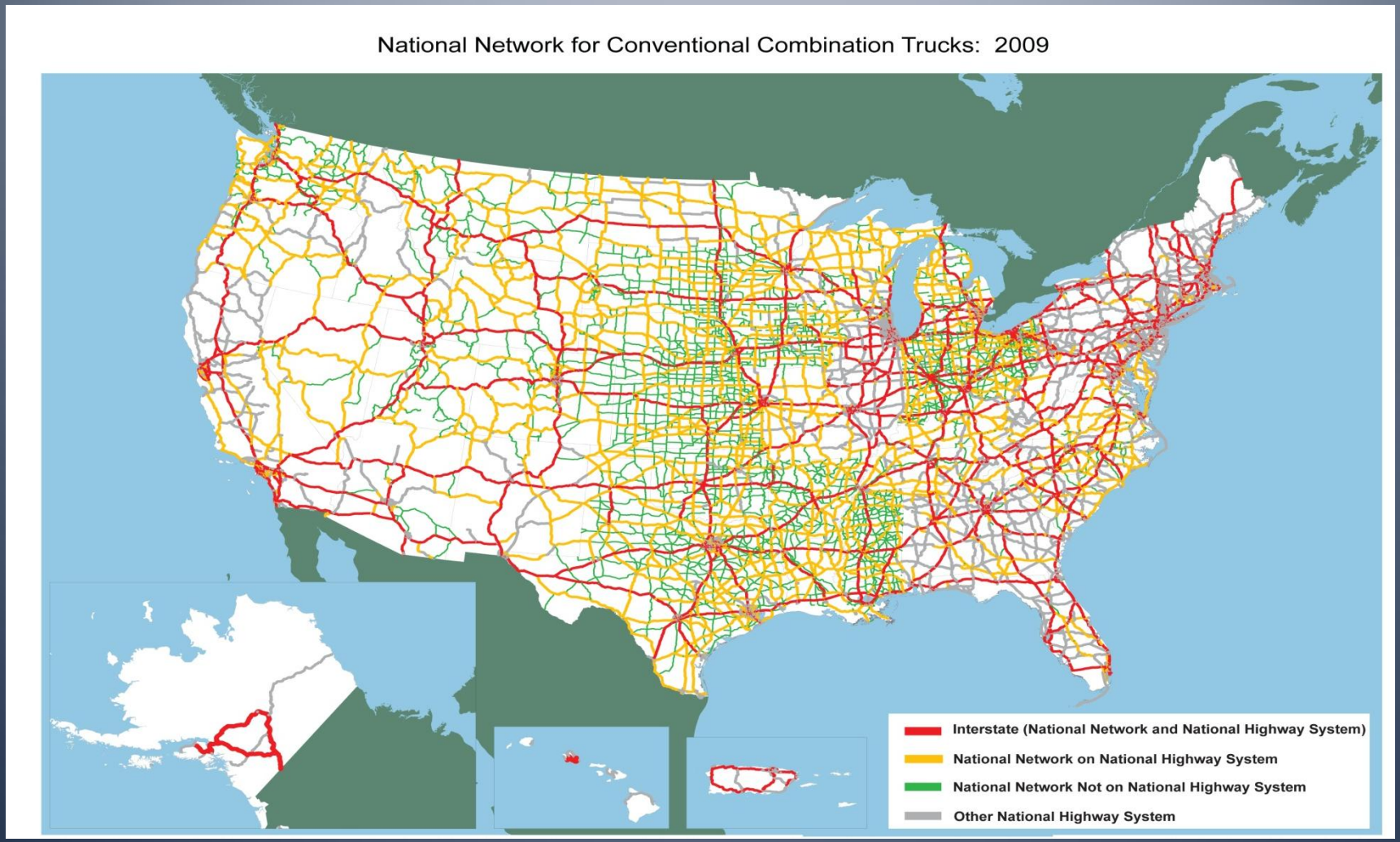
NHS Portland



Enter ORS 366.215

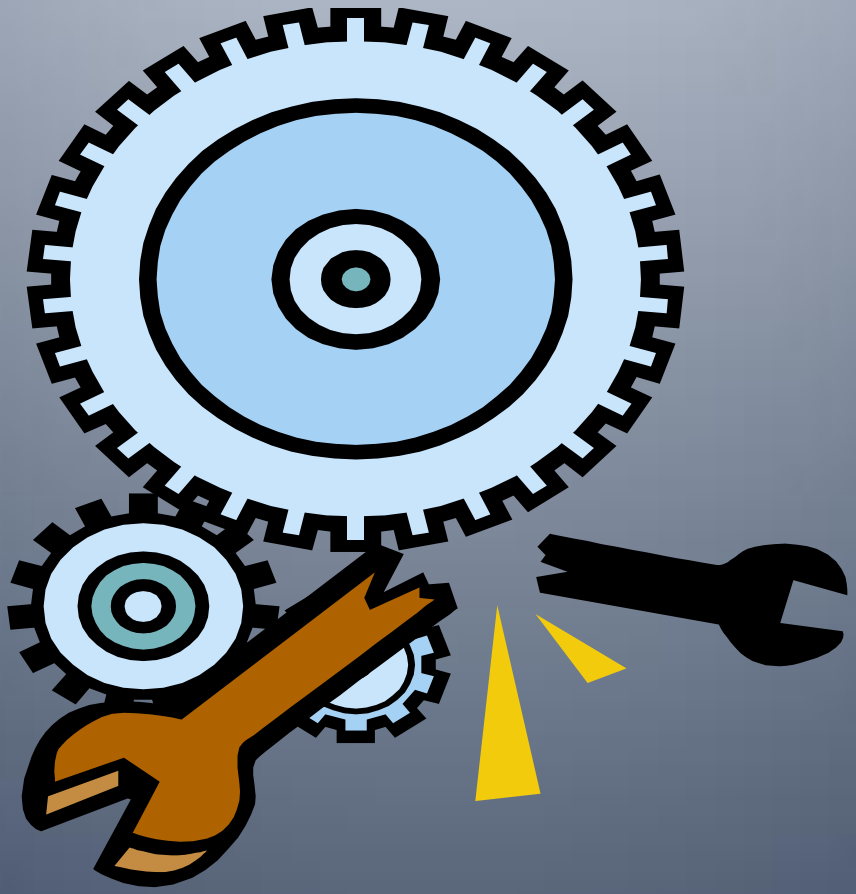
- ORS 366. 215 is a state statute pertaining to freight mobility on state highways. Many of the state highways have been designated as ORS 366.215 routes. The statute states the Oregon Transportation Commission may not permanently reduce the vehicle-carrying capacity of an identified freight route. Specific exceptions to this prohibition are allowed by statute. ODOT staff have developed a guidance document to help implement the statute.
- ***Doesn't apply to EMCP, but more designation fun!***

National Network

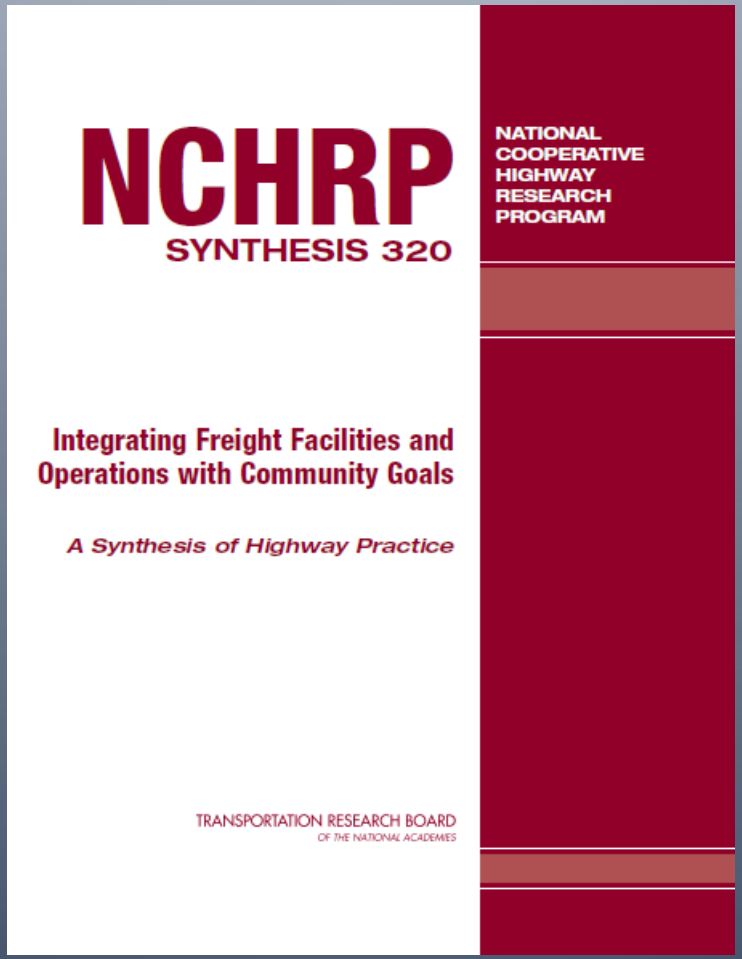


The idealized approach

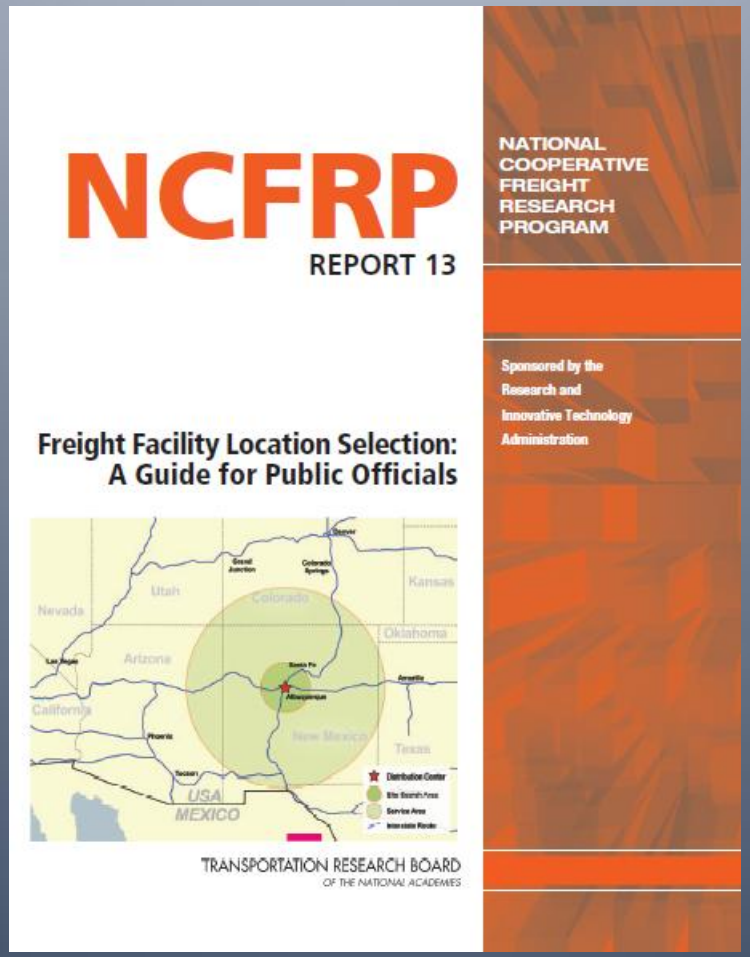
Reality



Role of Freight



Role of Freight



That was then … this is now

Then

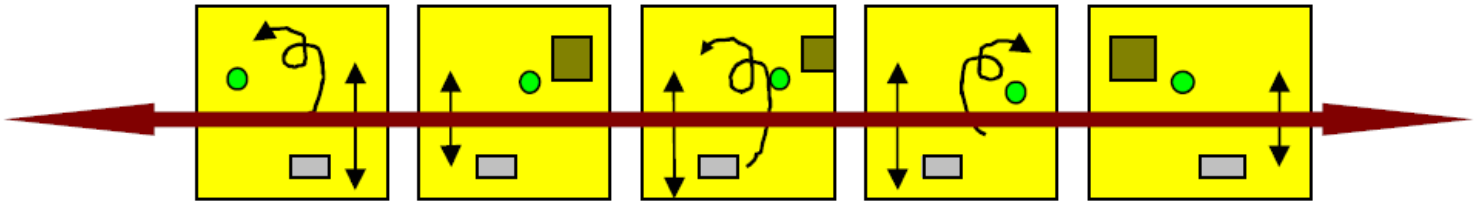
- Four step models
- Unlinked asset modules
- TDM as add-on
- Limited MPO role
- Limited CSD role
- Limited freight planning
- “Block” truck design
- No GHG role
- Safety as reaction

Now

- Activity based models
- Linked asset models
- Operations as implicit
- Strong MPO role
- Centrality of CSD
- Included at some level
- Finer level truck analysis
- Plans for GHG reduction
- Safety to be planned

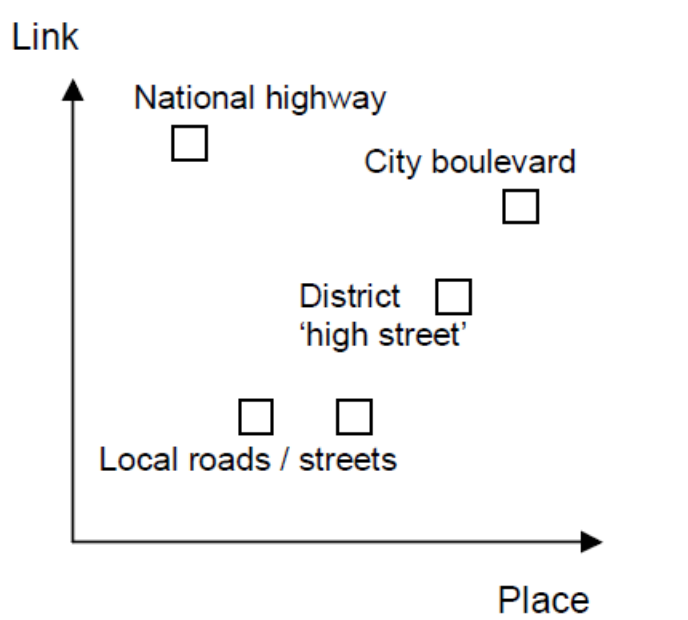
Context Based Design Does Not Go Far Enough

ARTISTS



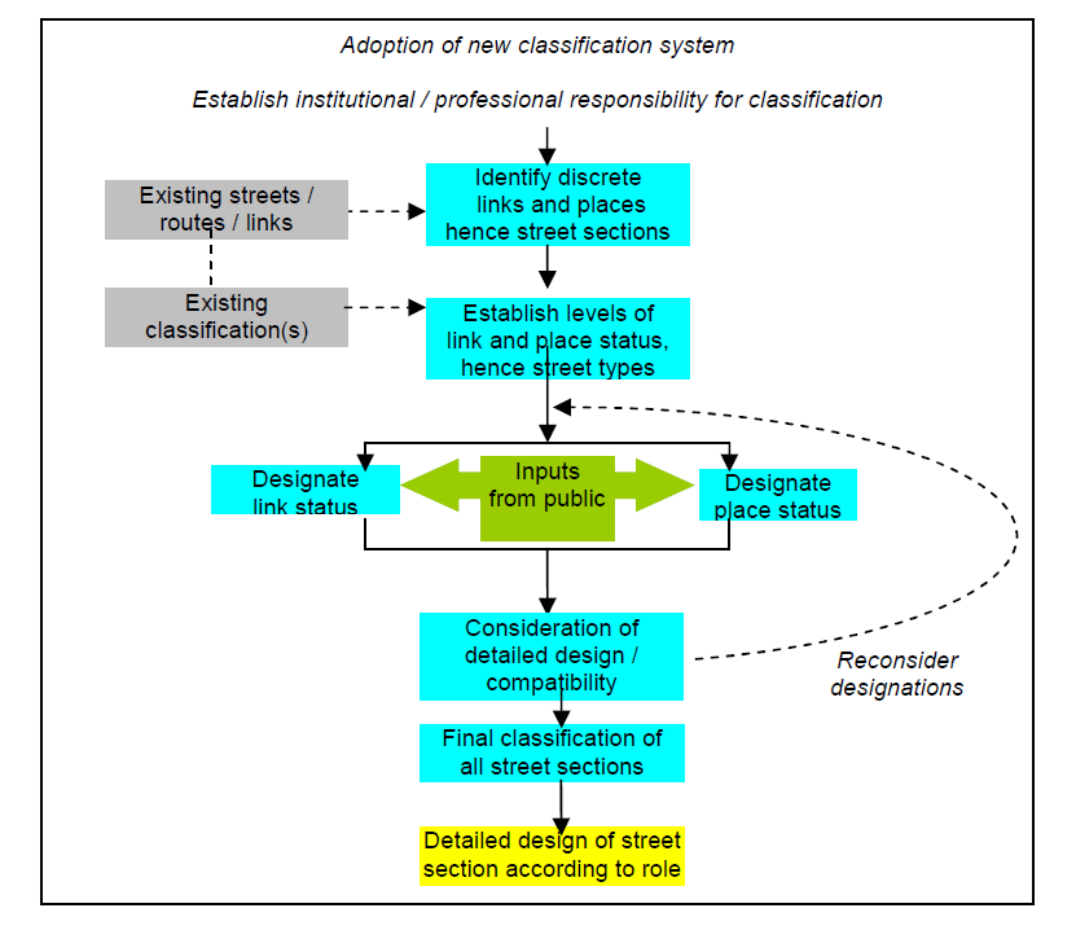
A whole street is made up of a succession of sections. The demand for through movement, common to and continuous through all of the sections, sometimes tends to assume a significance greater than that of any other demand within an individual section.

Another schematic



Different types of street can be recognised according to their combination of roles as link and locale (place).

How do we make this work?



A Manual for Streets

Analysis of existing movement patterns

3.6.8 It is recommended that the design of a scheme should follow the user hierarchy shown in Table 3.2.

Table 3.2: User hierarchy

Consider first	Pedestrians
↓	Cyclists
	Public transport users
	Specialist service vehicles (e.g. emergency services, waste, etc.)
Consider last	Other motor traffic

A Manual for Streets

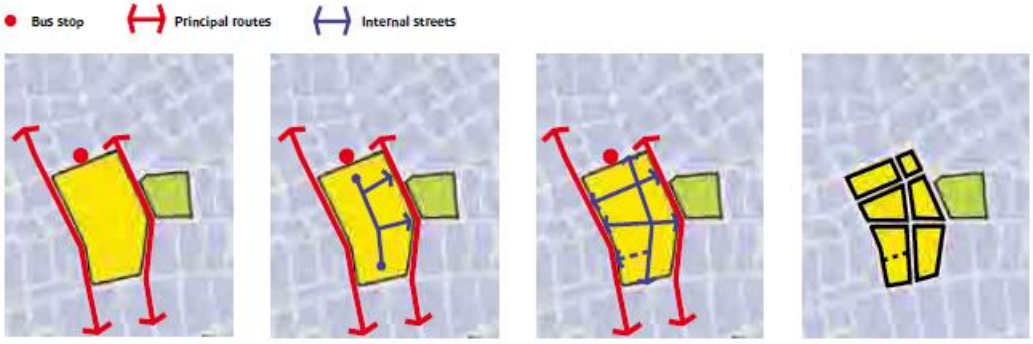


Figure 4.1 Integrating new developments into the existing urban fabric is essential (source: *The Urban Design Compendium*[1]).

The critique

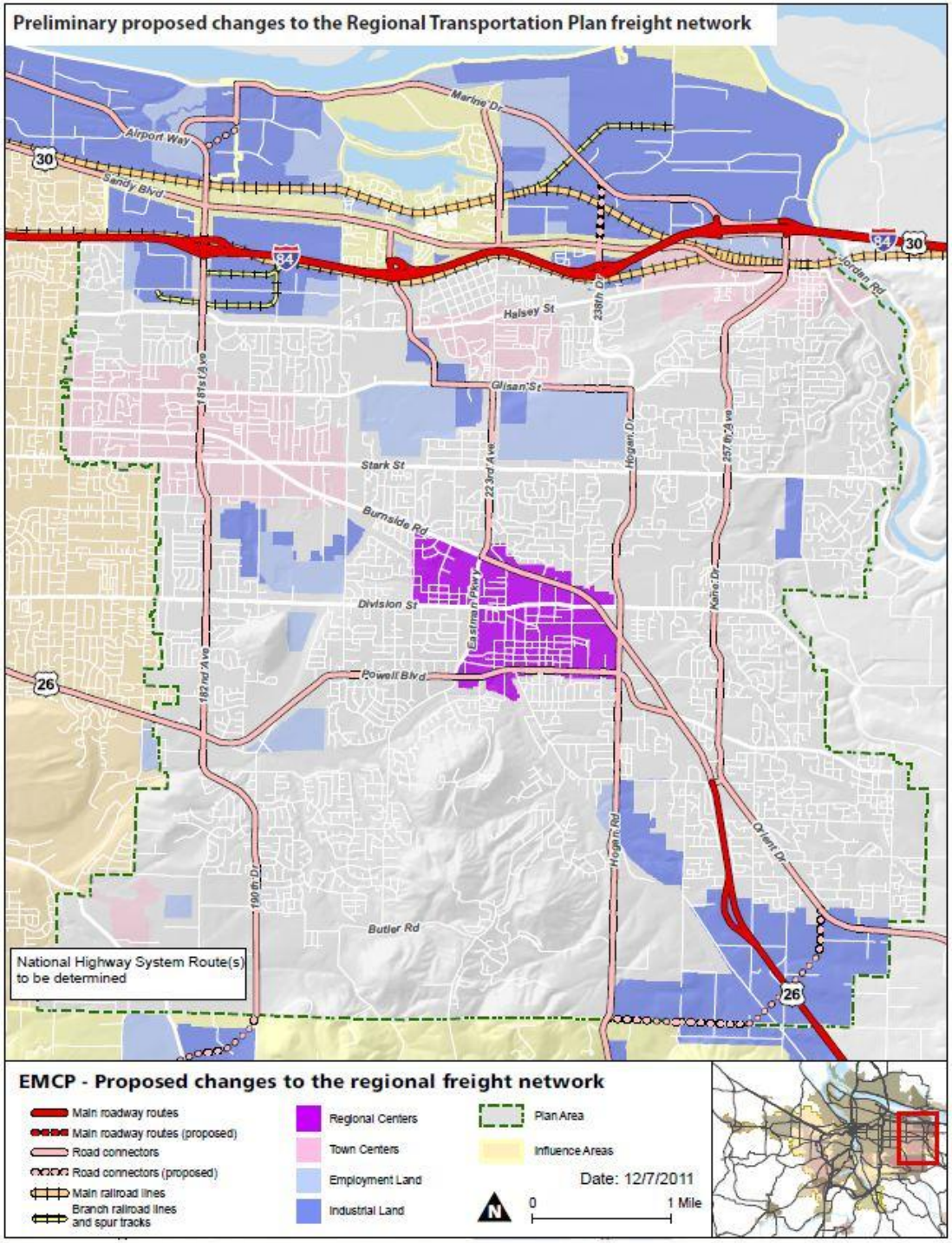
- A yes but approach
- The arterial dilemma

Better

- Place-centric
- Corridor anchored
- Network cover

Strengthened Approach

- Spatial
- Place
- Economic
- Linear
- Temporal



Preliminary proposed changes to the regional freight network

Practical relationship of freight operations to the NHS designation

Much ado about…not so much

- The proposed freight grid recognizes that all arterials should be "freight friendly" and be able to accommodate trucks safely.
- There is no evidence that NHS designation attracts through-trucks to a route. In fact, both truck count data and the regional transportation modeling points to the fact that the current NHS route on 181st/Burnside does *not* do so.
- There has been concern expressed by some (notably not truck drivers) that truck drivers won't find the best route between I-84 and US 26.
  - However, in the era of internet access and GPS systems, drivers are likely to know the best route, regardless of what the national, state or regional route designations are. It is likely that signage and information technology could address this issue.

Conclusions – EMCP

- Regional freight grid connecting I-84 and US 26 probably works for everyone. *(silver buckshot)*
- NHS is still a question…but not so urgent
  - Leave as is?
    - But what about the mistaken NHS designation on the controversial (and still imaginary) "new" 242nd link to I-84? *(awkward…)*
  - Designate everything NHS? Or a subset of the regional system? (2 routes?)
  - Put it on east-west Powell Blvd?
    - Connects US 26 with ODOT-owned Powell, and "un-strands" US 26 *(happy ODOT!)*
    - But…our freight stakeholders say Powell is not popular
    - And…City of Portland might have other plans
  - Something else?

Final Comments from a Selfish Regional Planner

- Clarify and simplify existing designations, pending larger re-thinking
- Make it easier for MPOs to change designations
- It would be nice if all DOTs (and their internal departments) followed more or less the same process. (revisions and flexibility)
- Show me the money! *If we have to go through all this, at least make it worth while!*
  - Attach some real money to designations, or provide something locals really care about.
- Balance complete streets approach with practical specialization – freight friendliness vs. freight route

Lost Opportunities ☹

- Bolder design/designation response to community needs along non-freight heavy arterials
- Risk of default to Business-as-Usual
  - Still that urge to build 5-lane arterials everywhere
- Silo-busting (equity, economic development, housing and multimodal connections are so connected!)
  - A larger view might have allowed trade-up from old cul-de-sacs and substandard housing stock to a local street grid and real community-building *as part of economic development!*

Conclusions – Earnest FHWA Author

- Clarify the NN and NHS for funding and intent
- Consider funding to locals for livability mitigation
- Need more specific guidance
- Is “balance” the right approach?
- Tackle functional classification head-on
  - Long term solution