Best Practices for Risk-Based Forecasts of Land Volatility for Corridor Management and Sustainable Communities

NCHRP 20-68A Domestic Scan 10-01

U.S. Domestic Scan Program

American Association of State
Highway and Transportation Officials

NCHRP

National Cooperative
Highway Research Program

Scan Team NCHRP 20-68A

State DOTs:

- *Marsha Fiol, VA
- Jerri Bohard, OR
- Matthew DeLong, MI
- Charla Glendening, AZ
- Charlene Kay, WA
- Polina Knaster, NJ

* Team Chair

Arora & Associates P.C.:

- Harry Capers, Jr.
- Michael Wright
- Melissa Jiang

University of Virginia:

- James Lambert
- Shital Thekdi

Background

- Federal initiatives for transportation require coordination in the development of land uses and transportation facilities
- Regional planning organizations and local governments :
  - Encourage economic growth and land development
  - Protect existing and future corridors
  - Promote sustainable economic development

Background (cont.)

Deferral of advance and/or concurrent acquisition:

- Higher right of way acquisition costs
- Decreased corridor travel times
- Congestions
- Safety concerns

Advance right of way acquisition:

- Land is no longer available for development
- Funding is obligated
- May appear to have been imprudent if growth does not occur as anticipated.

Background (cont.)

- Transportation agencies need best practices in the forecasting of land use and the ensuing actions for corridor management
- Evaluating land use as a **source of risk** to the performance of multimodal transportation corridors in the course of planning, programming, and funding project delivery could be an innovative and effective re-framing of this topic

Target Issues

- Identifying corridors that may experience capacity issues due to development
- Addressing capacity issues in the development of long-range corridor plans
- Assessing factors that contribute most to risk of adjacent land use
- Forecasting land use changes and the associated demand on the transportation facilities by means of methods, models, and data analysis
- Methods, models, and data used to forecast land uses adjacent to transportation facilities
- Integrating land use forecasts into transportation plans with a multi-year horizon

Host Agencies

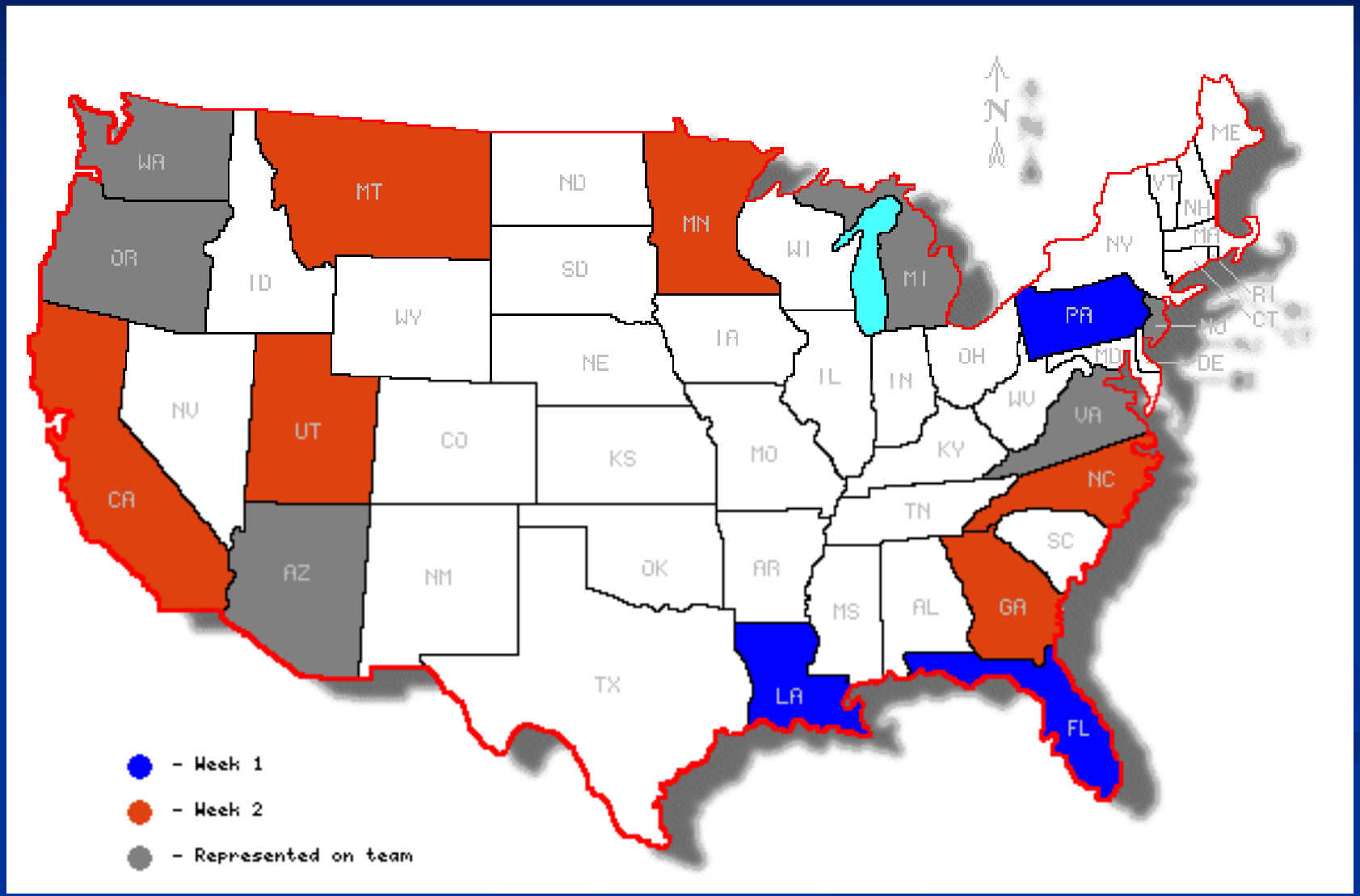
East Coast:

- Florida DOT
- New Orleans Regional Planning Commission
- Pennsylvania DOT
- Georgia DOT
- North Carolina DOT

Midwest and Western:

- Utah DOT
- Montana DOT
- California DOT
- Minnesota DOT
- Washington DOT

Host Agencies (cont.)



Scan Team Members

Scan Itinerary

- October 2-7, 2011
  - Tallahassee, FL
  - New Orleans, LA
  - Harrisburg, PA
- October 30 – November 5, 2011
  - Atlanta, GA
    - Virginia DOT presentation
  - Salt Lake City, UT
    - Minnesota and Montana DOT webinars
  - Sacramento, CA
    - North Carolina and Washington DOT webinars

Summary of Findings

- Monitoring/tracking of key decision points across agencies and stakeholders, by need and by project, as implemented in Florida by FDOT
- Systematic documentation of environmental regulations and compliance, by need and by project, as implemented in Pennsylvania by PennDOT
- Coordination with localities and sharing of databases for land use and transportation facilities, as implemented in New Orleans by the NORPC.

Findings (cont.)

- Project proposal submission, filtering, and review/evaluation in several tiers of analysis, as implemented in Pennsylvania by PennDOT.
- Education of local authorities and citizens of the factors involved in land use and transportation, as implemented in Montana by MTDOT.
- Balancing transportation innovation with the memory/recovery of legacy communities and facilities, through data collection and analysis, as implemented in New Orleans by the NORPC.

Findings (cont.)

- Analyzing the risk of adjacent land developing considering the current densities of access points, forecasts of land development, and current and forecasted travel demands, as implemented in Virginia by VDOT.
- Prioritizing and filtering needs for near-term, mid-term, and long-term action of planners, developers, and citizens, as implemented in Virginia by VDOT.

Types of Best Practices

- Forecasting corridor development
- Understanding how transportation systems are influenced by land development
- Prioritizing funding allocations to maximize the beneficial economic effects of land development
- Protection of rural corridors and communities.
- Protection of existing corridors to insure the function of the facility

Best Practices (cont.)

Scan Site Visit	Process/Method/Tool
FDOT	Efficient Transportation Decision Making (ETDM) Memorandum of Understanding (MOU) Integrated Florida Standard for Urban Transportation Modeling Structure (FSUTMS) Alternative Analysis Research Tool (AART)
LDOTD, NORPC	INDEX model
VDOT	Access Control Prioritization System (ACPS) Virginia Land Development Forecasting and Prioritization System (VLDFS)
PennDOT	State Smart Transportation Initiative (SSTI) Municipalities Planning Code (MPC) Pennsylvania Community Transportation Initiative (PCTI) Smart Growth Transportation Program (SGT)
GRTA, GDOT	Access Management Permit System (AMPS) Unified Growth Policy Map (UGPM) Livable Centers Initiative (LCI) Access Management Permit System (AMPS)
MNDOT	Right of Way Acquisition Loan Fund (RALF) Transportation Policy Plan (TPP) Real Estate Acquisition Land Management System (REALMS)
MTDOT	Memorandum of Understanding (MOU) Highway Economic Analysis Tool (HEAT)
UDOT	Corridor Preservation Revolving Fund (CPRF)
NCDOT	Memorandum of Understanding (MOU)
SACOG, CalTrans	Sustainable Communities (SCS)
ADOT	Red Letter program
ODOT	Features, Attributes, and Conditions Survey - Statewide Transportation Improvement Plan (FACSTIP) Least Cost Planning Tool (LCPT) Transportation Planning Online Database (TPOD)

Best Practices vs. Requirements

	FL				LA	VA		PA				GA			MN			MT		UT	NC	CA	AZ	OR		
	ETDM	MOU	FSUTMS	AART	INDEX	ACPS	VLDFS	SSTI	MPC	PCTI	SGT	AMPS	UGPM	LCI	RALF	TPP	REALMS	MOU	HEAT	CPRF	MOU	SCS	RLP	FACSTIP	TPOD	LCPT
Project perspective																										
Integrated/comprehensive	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	●
Risk-informed	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Multimodal	○	○	○	○	○	○	○	●	○	○	○	○	○	●	○	○	○	○	○	●	○	●	○	○	○	○
Sustainability	○	○	○	○	○	○	○	●	○	○	●	○	○	●	○	○	○	○	○	○	○	●	○	○	○	○
Environmental	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Recovery from catastrophe	○	○	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Maturity of system																										
Active expansion	●	●	●	●	●	◎	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	●	●	●	●
Preservation	●	●	◎	○	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Proactivity																										
Forecasting	○	○	●	○	○	○	●	○	○	○	○	○	◎	○	○	○	○	○	○	○	○	○	○	○	○	○
Promote desired land use	○	○	◎	○	○	○	◎	○	○	○	○	○	●	○	○	○	○	○	●	○	◎	●	◎	○	○	◎
Advanced ROW acquisition	○	○	○	○	○	○	○	○	○	○	○	○	○	○	●	○	●	○	○	○	○	○	○	○	○	○
Transparency and political awareness																										
Promote coordination	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Transparency of approach	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	●	○	○	●	○	○	○	○	◎

Best Practices vs. Requirements (cont.)

	FL				LA	VA		PA				GA			MN			MT		UT	NC	CA	AZ	OR		
	ETDM	MOU	FSUTMS	AART	INDEX	ACPS	VLDFS	SSTI	MPC	PCTI	SGT	AMPS	UGPM	LCI	RALF	TPP	REALMS	MOU	HEAT	CPRF	MOU	SCS	RLP	FACSTIP	TPOD	LCPT
Decision making																										
Protective action strategies	○	○	○	○	○	○	●		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎
Coordination and communication																										
Data sharing	●	○	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	○
Data and quantitative tools																										
Availability of data	●	○	○	○	●	○	○	○	○	○	○	●	○	○	○	○	●	○	○	○	○	○	○	●	●	○
Interactive databases	●	○	○	○	○	○	○	○	○	○	○	○	●	○	○	○	●	○	○	○	○	○	○	◎	●	○
Automated decision making	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	●	○	○	○	○
Building awareness for risk and implications for corridor management																										
Workshops and training	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	○	○
Manuals and web materials	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	●	○
Funding																										
Alternative funding sources	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	○	○	○	○	◎	○	○	○	○	○	○
Objective prioritization	○	○	○	●	○	◎	◎	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	●
Low-cost/high return investments	○	○	○	○	○	●	○	●	○	○	●	○	○	●	○	○	○	○	○	○	○	○	○	○	○	●

Agencies vs. Requirements

		FDOT	LDOTD, NORPC	VDOT	PennDOT	GRTA, GDOT	MNDOT	MTDOT	UDOT	WashDOT	NCDOT	SACOG, CalTrans	MDOT	NJDOT	ADOT	ODOT
Project perspective																
	Integrated/comprehensive	✓	✓	✓	✓	✓										
	Risk-informed		✓	✓								✓				
	Multimodal		✓						✓			✓				
	Sustainability	✓	✓		✓	✓						✓				
	Environmental	✓										✓				
	Recovery from catastrophe		✓													
Maturity of system																
	Active expansion	✓	✓					✓	✓		✓					
	Preservation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Proactivity																
	Forecasting			✓								✓				
	Promote desired land use		✓	✓		✓			✓			✓				
	Advanced ROW acquisition	✓	✓				✓	✓	✓		✓				✓	✓
Transparency and political awareness																
	Promote coordination	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Transparency of approach	✓			✓											
Decision making																
	Protective action strategies			✓								✓				

Agencies vs. Requirements (cont.)

	FDOT	LDOTD, NORPC	VDOT	PennDOT	GRTA, GDOT	MNDOT	MTDOT	UDOT	WashDOT	NCDOT	SACOG, CalTrans	MDOT	NJDOT	ADOT	ODOT
Coordination and communication															
Data sharing	✓	✓		✓		✓	✓								✓
Data and quantitative tools															
Availability of data		✓													
Interactive databases	✓	✓			✓	✓									
Automated decision making	✓		✓								✓				
Building awareness for risk and implications for corridor management															
Workshops and training	✓	✓		✓	✓		✓								
Manuals and web materials	✓			✓											
Funding															
Alternative funding sources		✓			✓	✓		✓							✓
Objective prioritization				✓	✓		✓								
Low-cost/high return investments				✓		✓			✓		✓				

Sample of Best Practices

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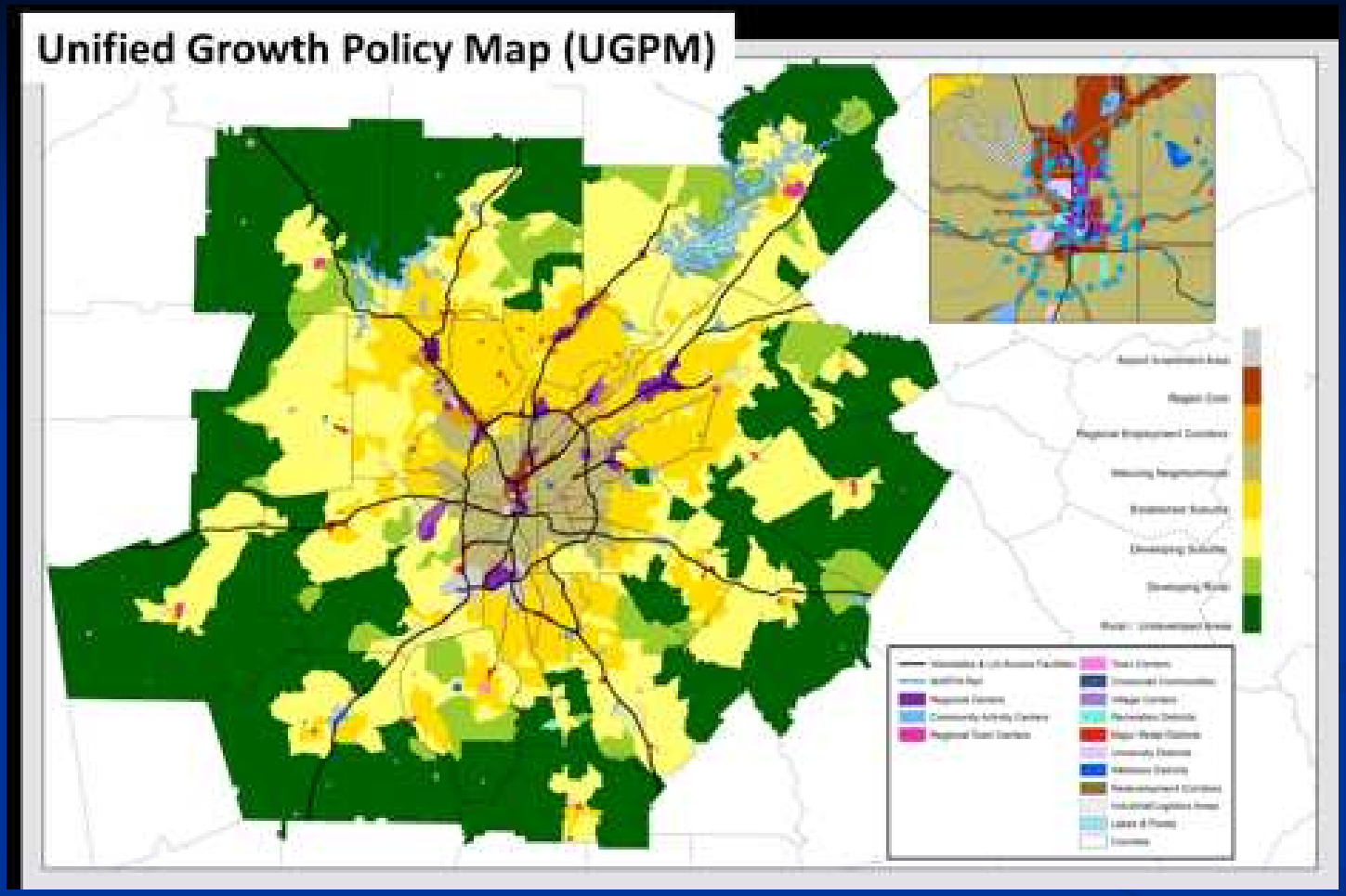
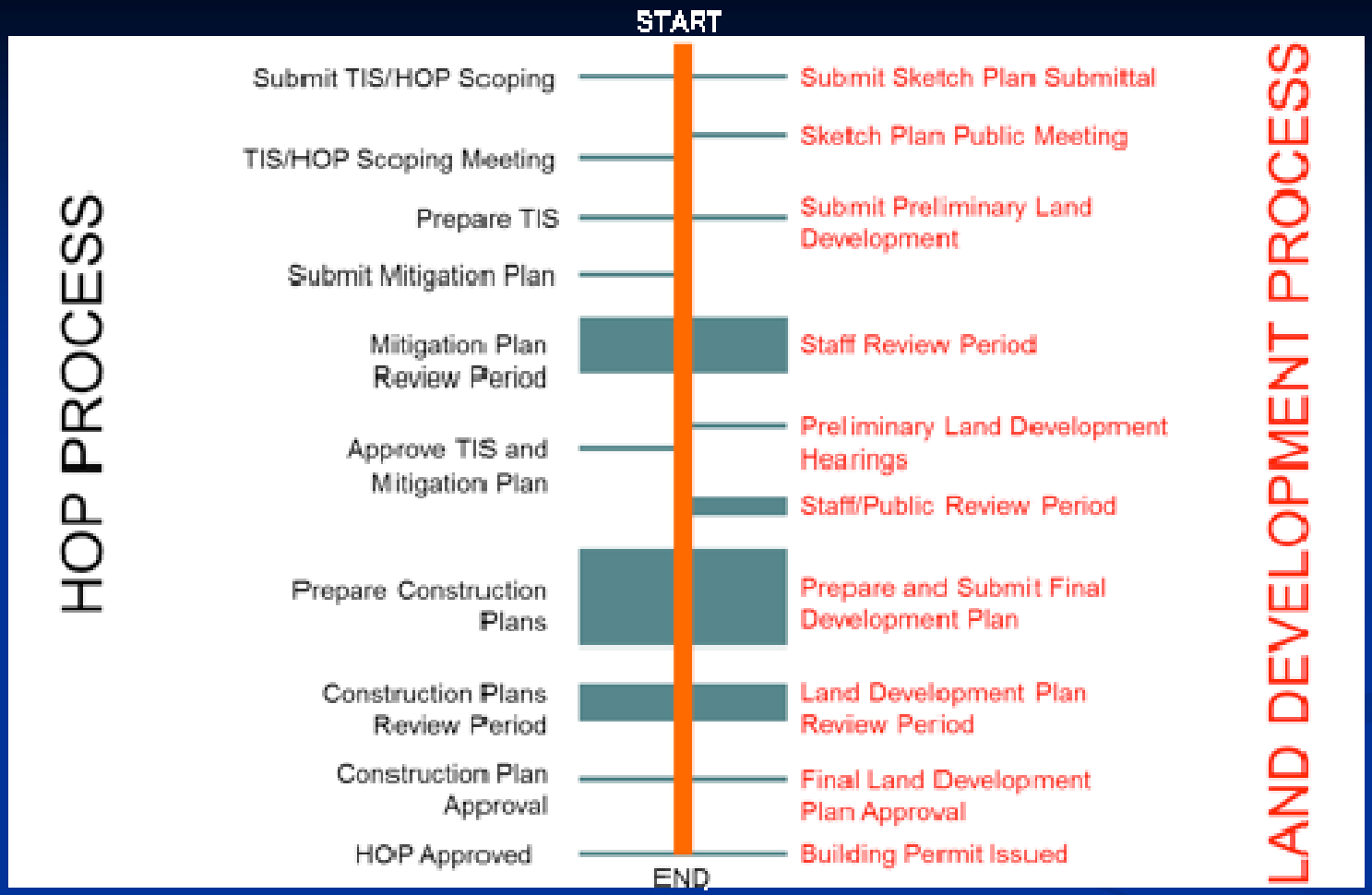
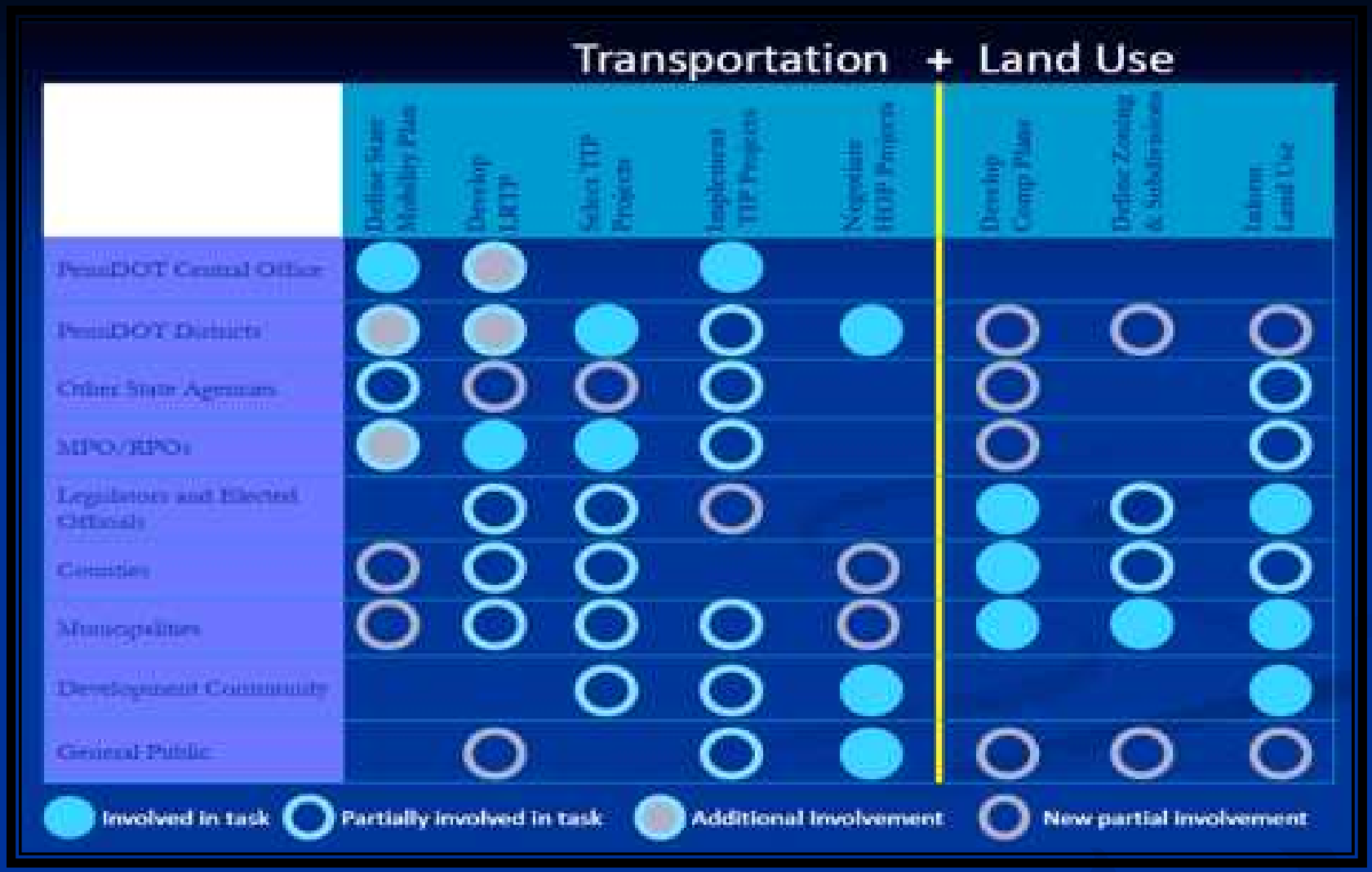


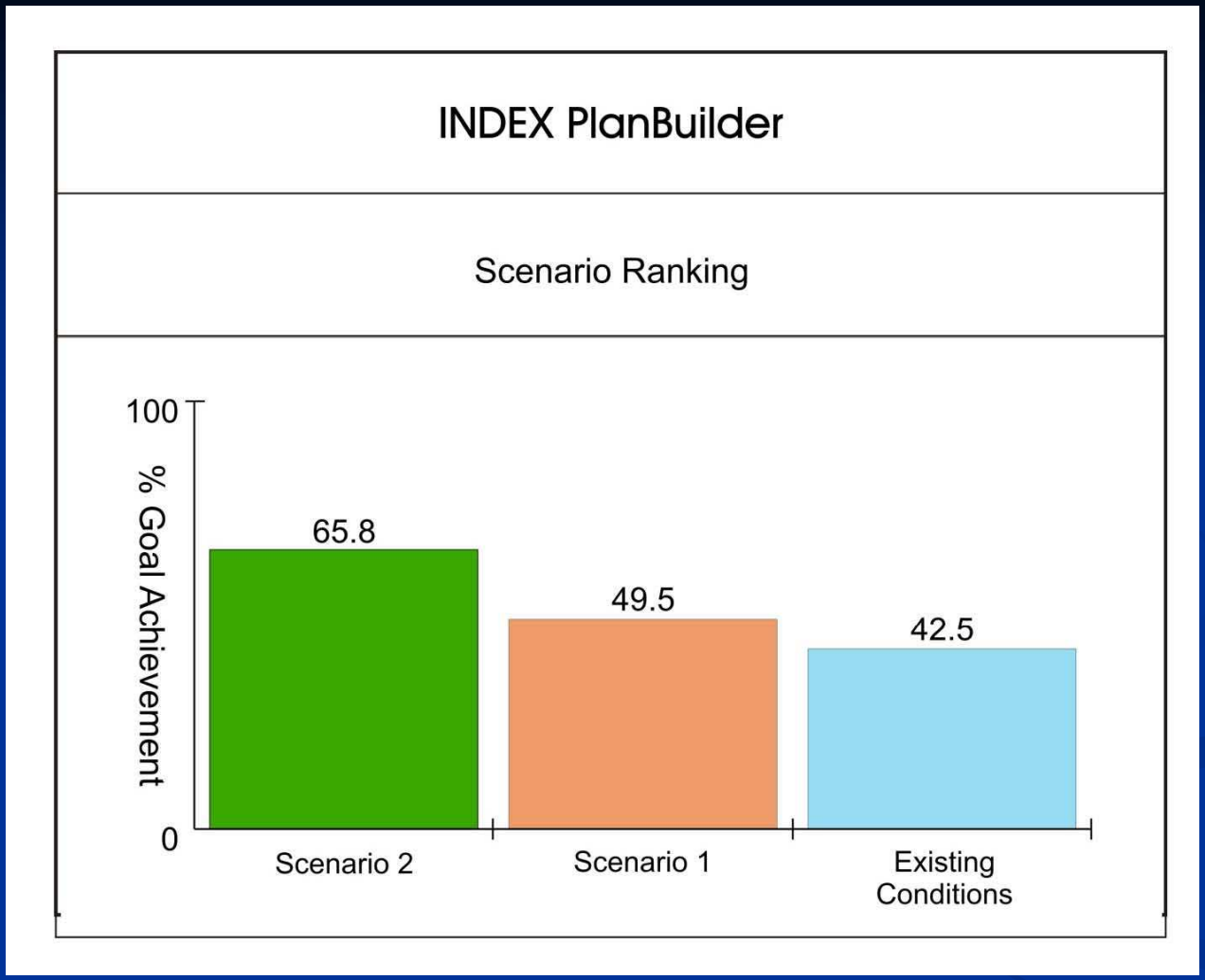
GDOT Unified Growth Management Policy map used with local agencies to forecast and plan future land use (Source: GDOT)



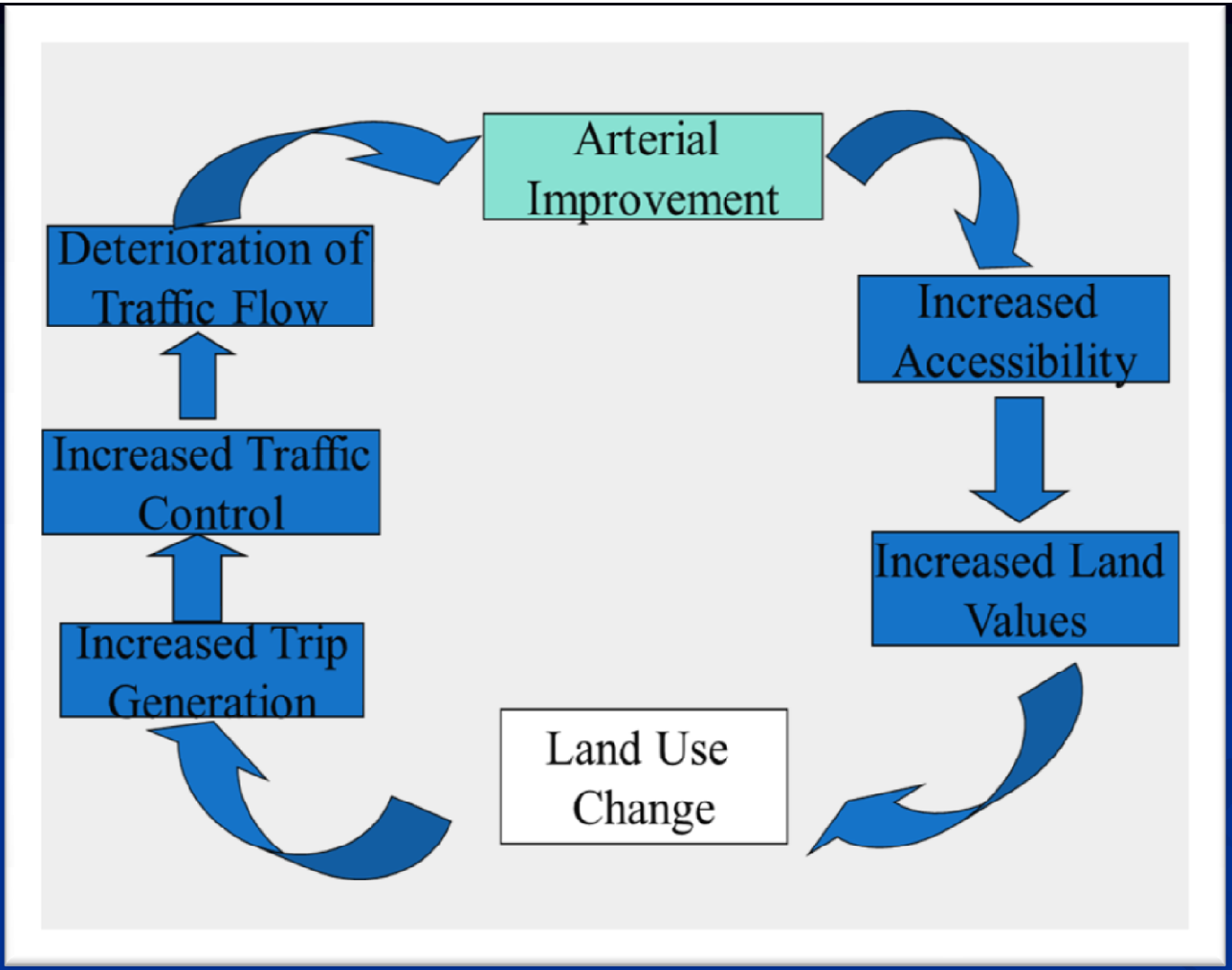
Pennsylvania land development process aligned with high occupancy permitting process. The procedures enable PennDOT to coordinate with over 2500 municipal governments (Source: PennDOT).



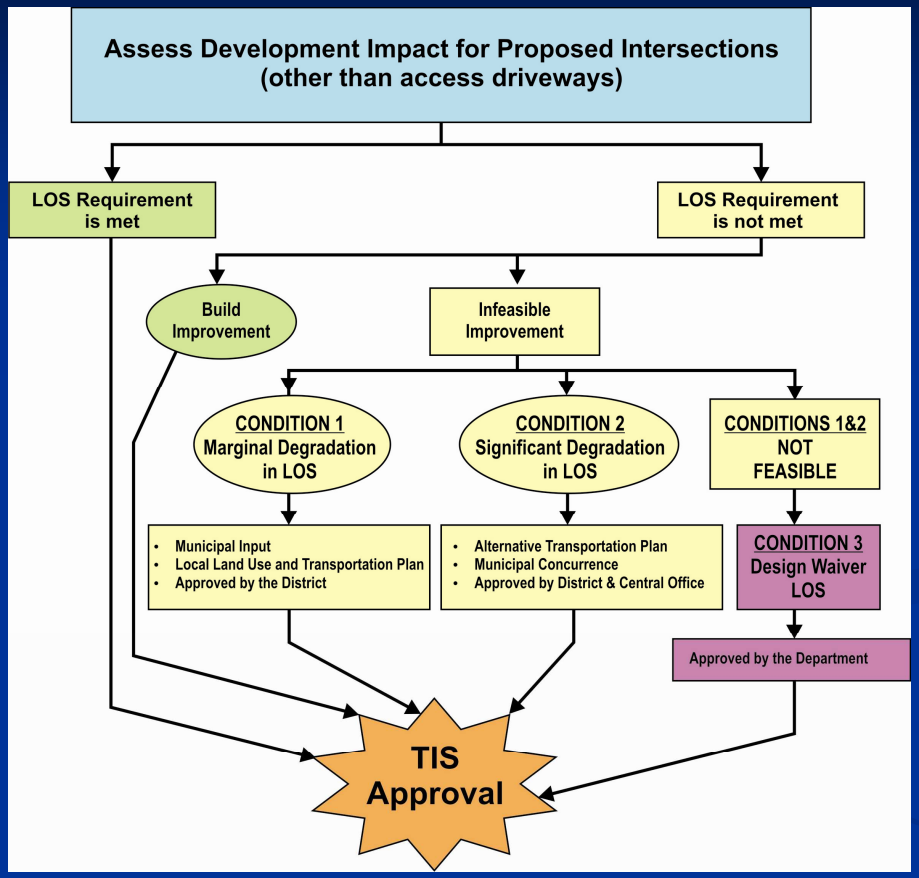
Roles of stakeholders in the Pennsylvania coordination of transportation corridors and risk management. The procedures enable PennDOT to coordinate with over 2500 municipal governments (Source: PennDOT)



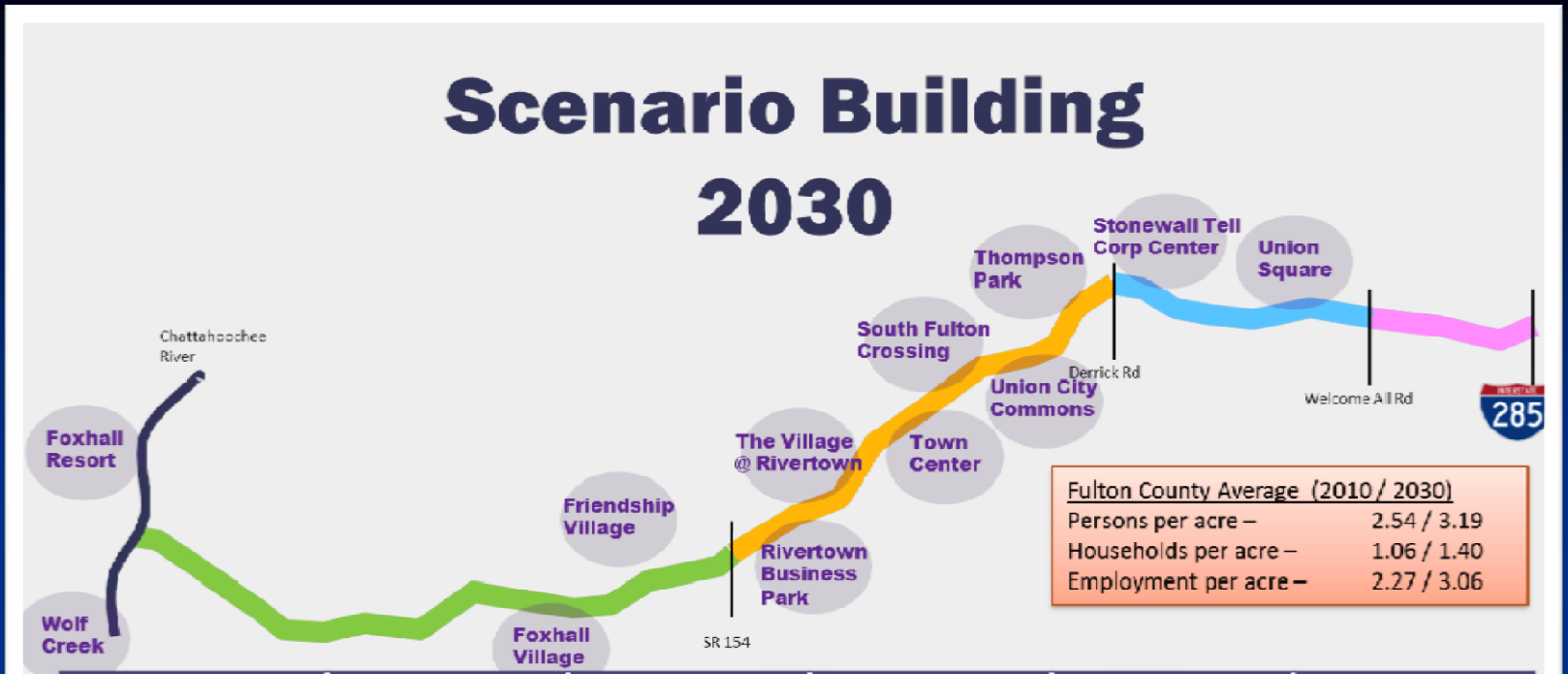
New Orleans Regional Planning Council INDEX model output showing the impact of land use scenarios on organizational goals (Source: NORPC)



Life cycle showing the impact of land use change on transportation corridor performance (Source: GDOT)

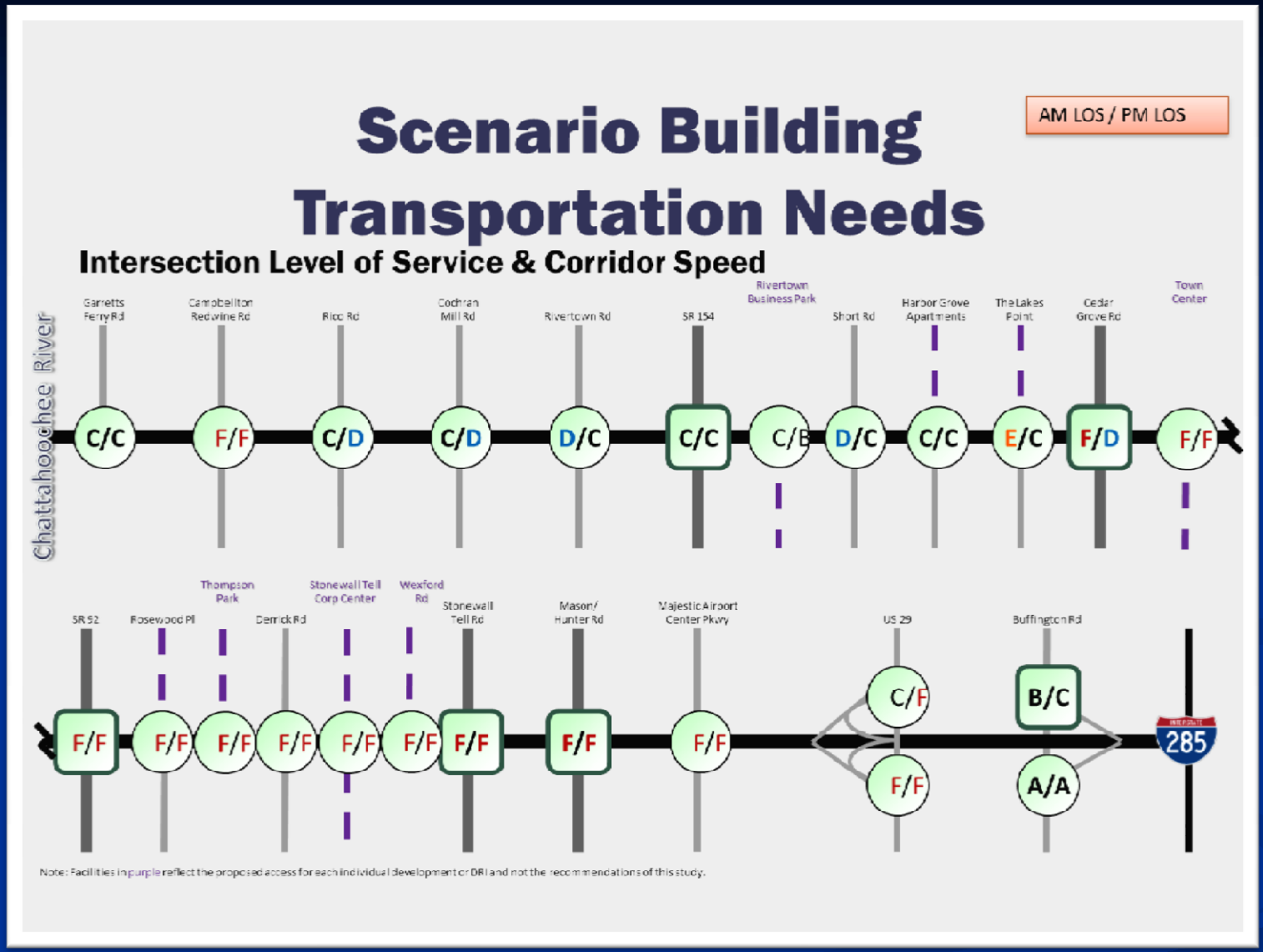


Example assessment of the development impact for proposed intersections (Source: PennDOT)

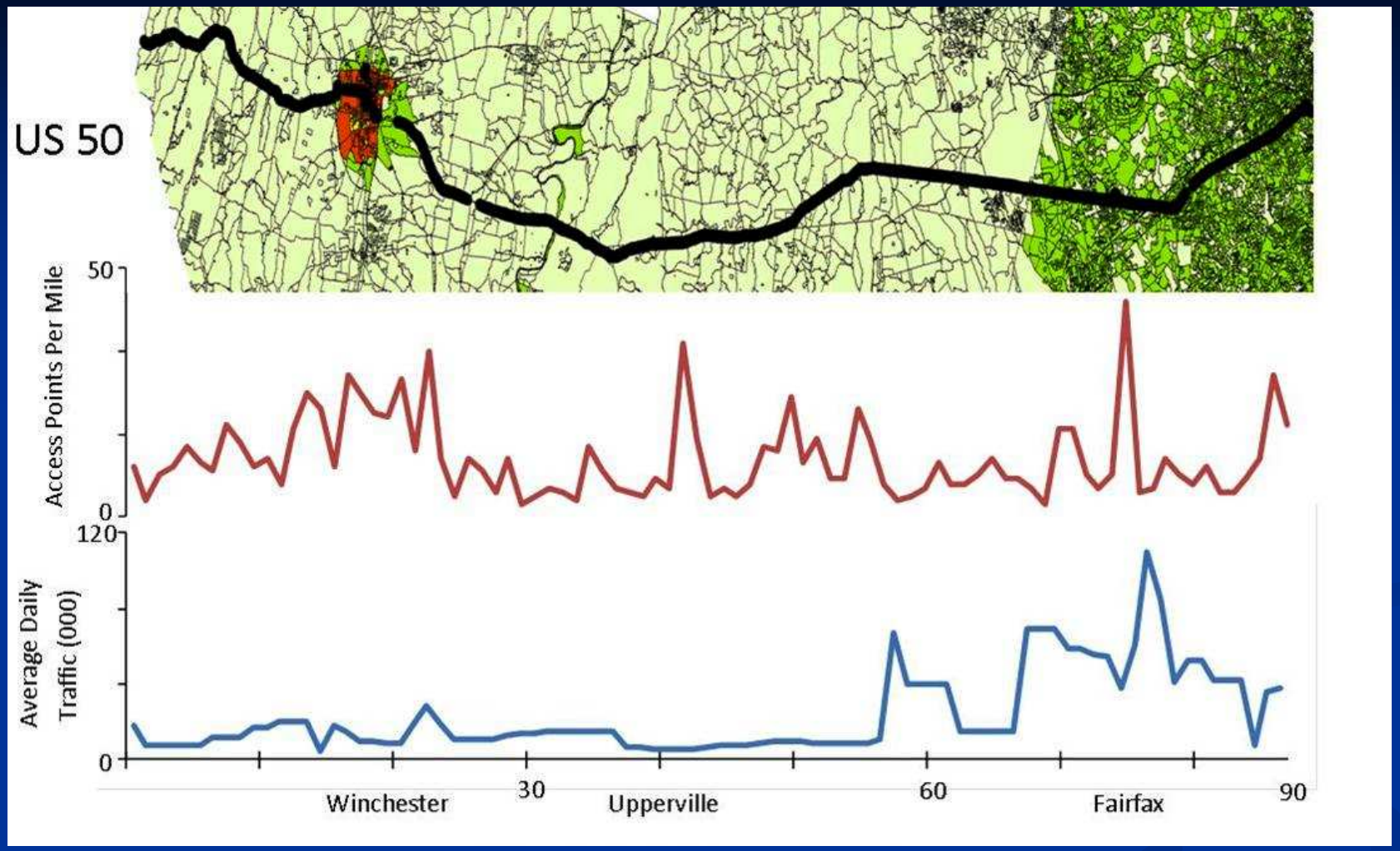


	Section 4		Section 3		Section 2		Section 1		Total	
	Baseline	Scenario 1	*Baseline*	Scenario 1	*Baseline*	Scenario 1	*Baseline*	Scenario 1	*Baseline*	Scenario 1
Persons per Acre	*0.16*	1.42	*0.51*	1.34	*1.34*	1.41	*3.50*	3.50	*0.93*	1.74
Households per Acre	*0.06*	0.58	*0.21*	0.54	*0.54*	0.56	*1.35*	1.35	*0.37*	.070
Employment per Acre	*0.10*	0.14	*0.06*	1.75	*0.90*	0.98	*1.50*	1.50	*0.43*	0.79

Scenario analysis for Georgia South Fulton Parkway Access Management Plan (Source: GDOT)



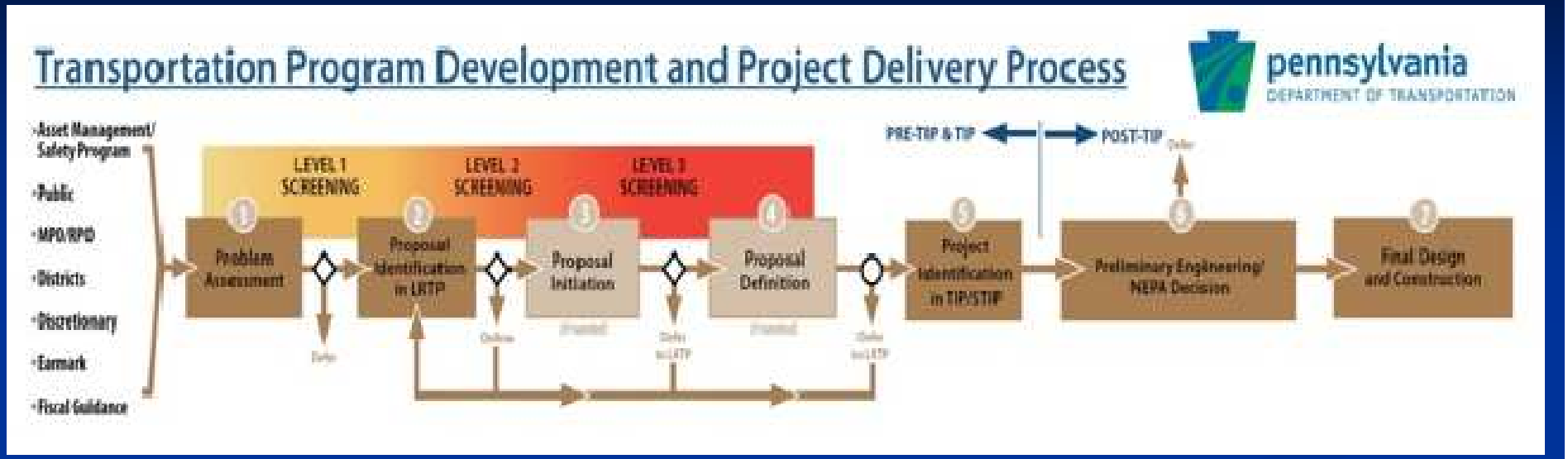
Level of service planning for the Georgia South Fulton Parkway Access Management Plan (Source: GDOT)



Prioritization of corridor segments based on access points per mile, risk of land development prediction, and average daily traffic (Source: VDOT, University of Virginia)

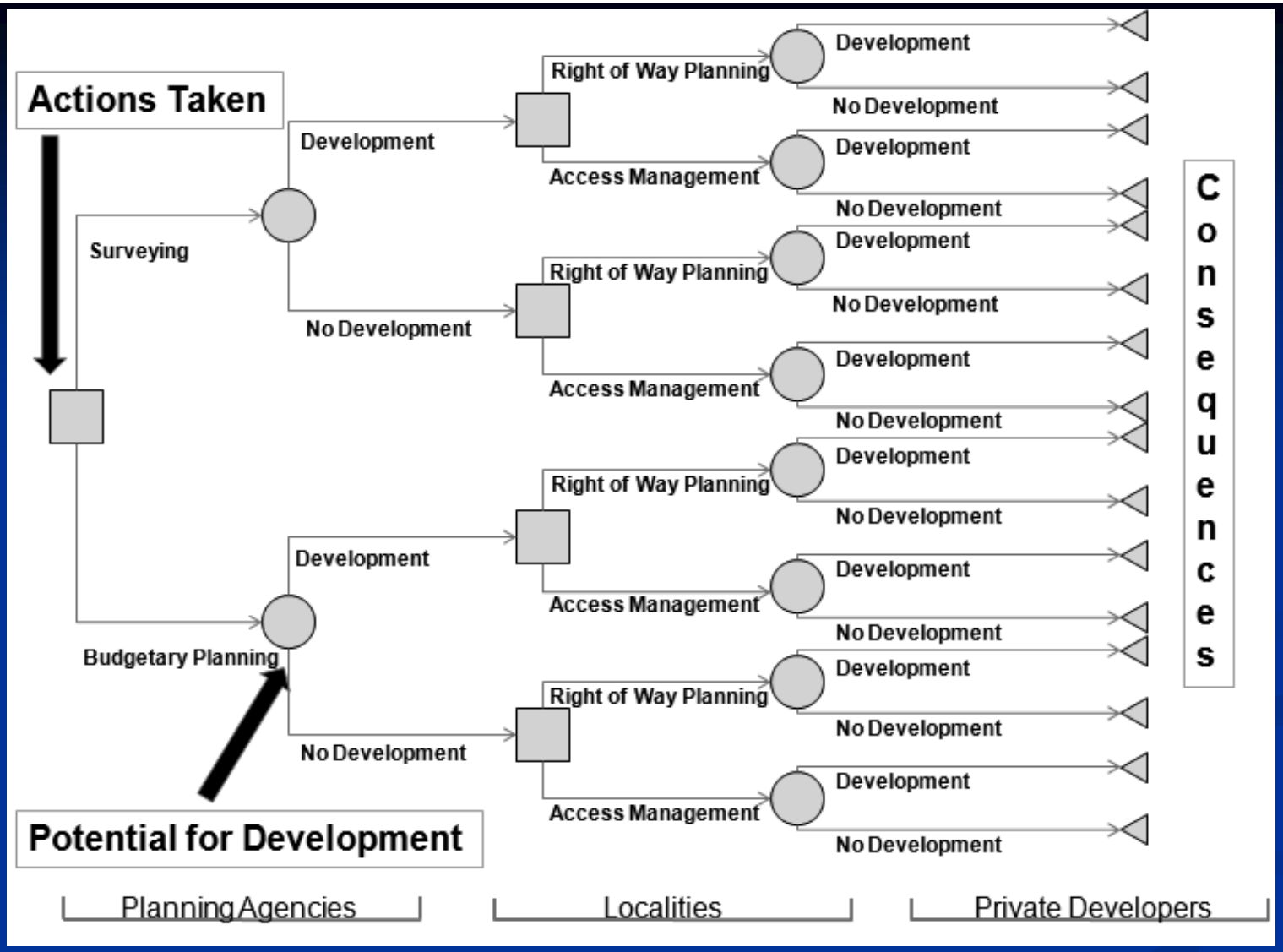
Type of Funding Request	# of Selections	% of Total Selections	Total Funding for Selected Projects	% of Total Funding
Planning	22	44%	$ 3,320,500	6%
Construction	25	50%	$ 51,557,292	87%
Planning and Construction	3	6%	$ 4,407,200	7%
TOTAL	***50***	***100%***	***$ 59,284,992***	***100%***

PennDOT PCTI funding allocation (Source: PennDOT)



Linking corridor planning and the NEPA process (Source: PennDOT)

Forecasts of land development along transportation infrastructure vulnerable to adjacent land development (Source: VDOT, University of Virginia)



Managing land development for multimodal transportation corridors, suggesting the local triggers for land acquisition or other management actions (Source: VDOT, University of Virginia)

Best Practices for Risk-Based Forecasts of Land Volatility for Corridor Management and Sustainable Communities

End Presentation

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