Fourth Oregon Symposium on Integrating
Land Use and Transportation Models

A Retrospective on TLUMIP

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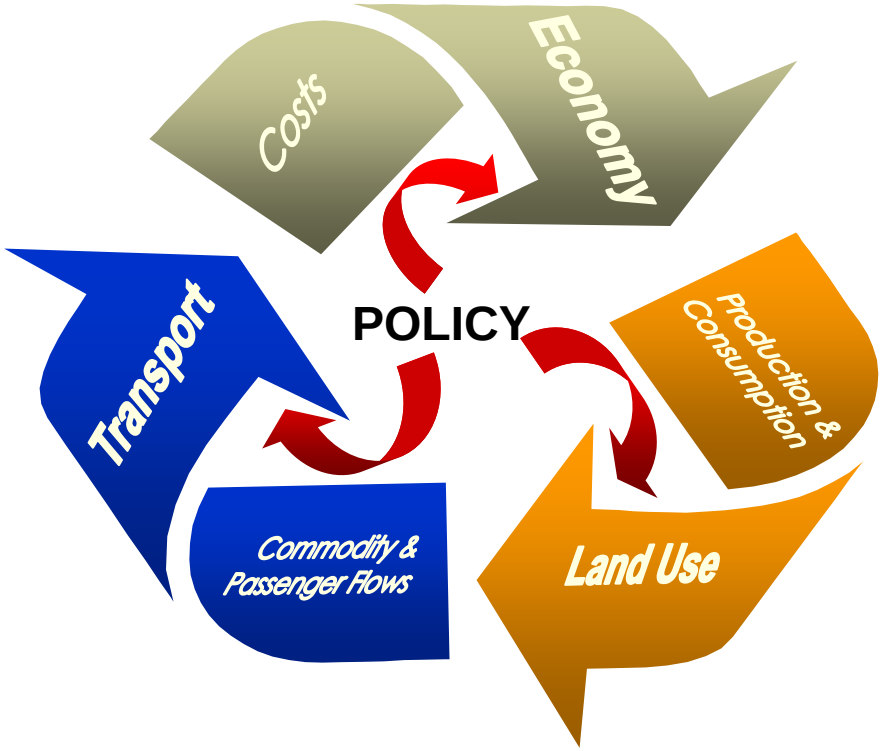
First opinion

"Well, it's certainly intriguing.
But it seems incredibly risky,
even by your standards."

Gordon Shunk's reaction to original
TLUMIP ideas, July 1996

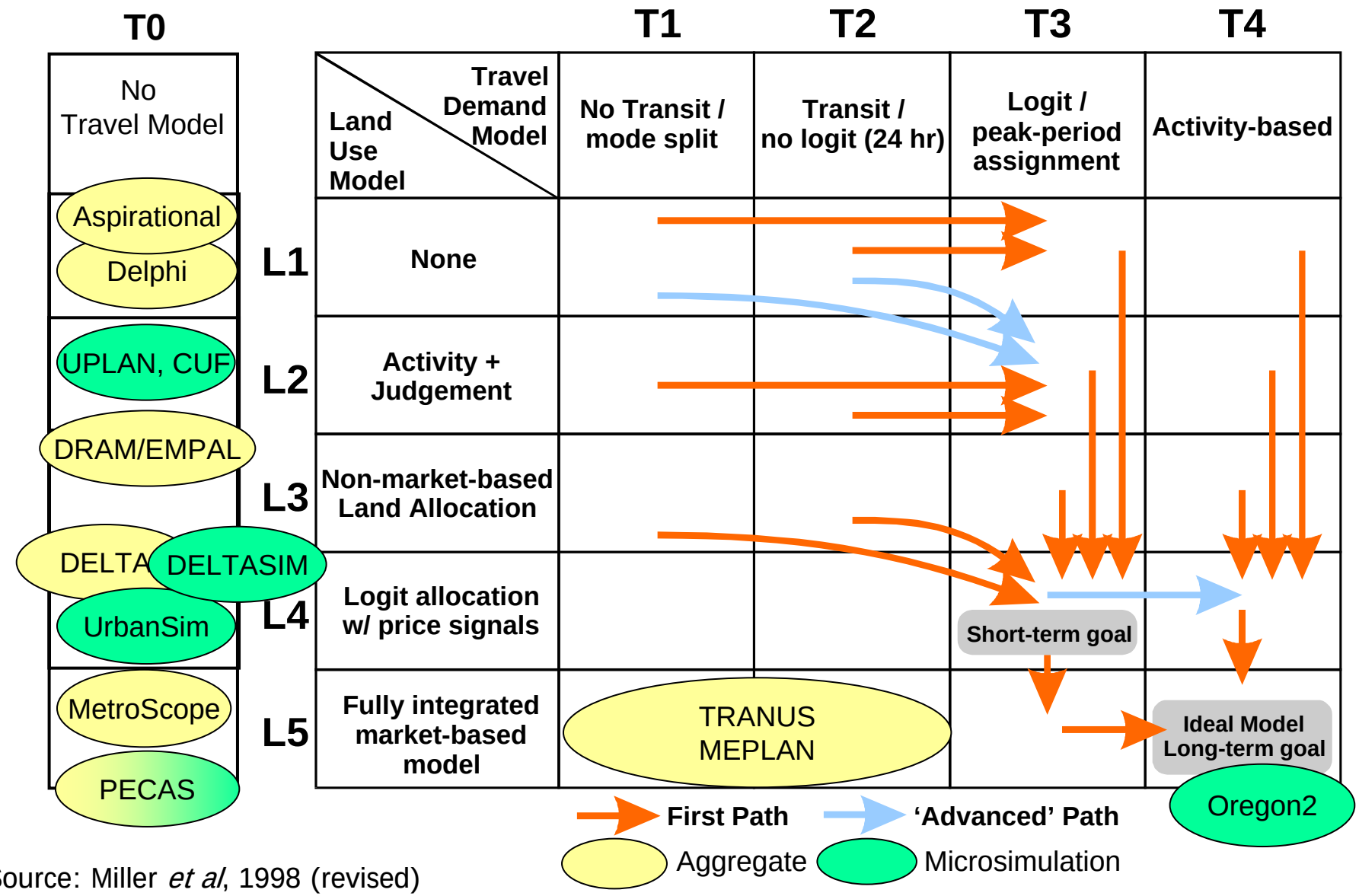
Client perspective



Why?

- Model methods (outside Portland Metro area) were very outdated
- Could not meet new state and federal mandates
- Could not provide needed information
- Losing ability to effectively participate in decision-making process

Evolving towards integration

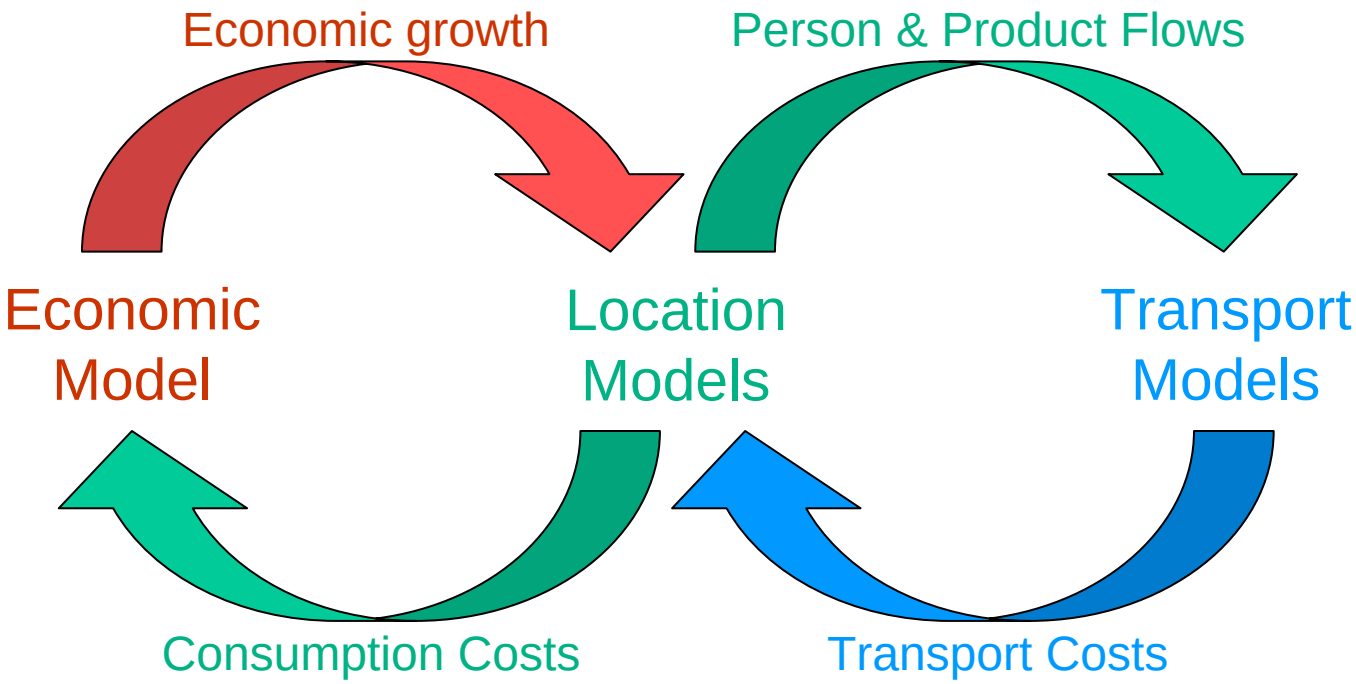


Source: Miller *et al*, 1998 (revised)

Initial impetus

Issue	State-wide	Sub-state	Urban
Effect of land supply on land use and location decisions	■	■	■
Effect of congestion on land use and location decisions		■	■
Cumulative effects of retail location choice			■
Effects of large commercial developments at UGB periphery		■	■
Effect of land supply on travel behavior	■	■	■
Effect of highway capacity increases on travel behavior	■	■	■
Effect of network connectivity on travel behavior			■
Effect of parking supply on travel behavior			■
Effect of urban form on mode choice			■
Effect of rail investment on highway use	■	■	
Effect of changes in the demographic composition of Oregon	■	■	

The first generation models



- Economic Model determines growth of state economy
- Location Models allocate production and transactions
- Transport Models estimate demand and allocate trips to routes
- Model components are linked in space and time

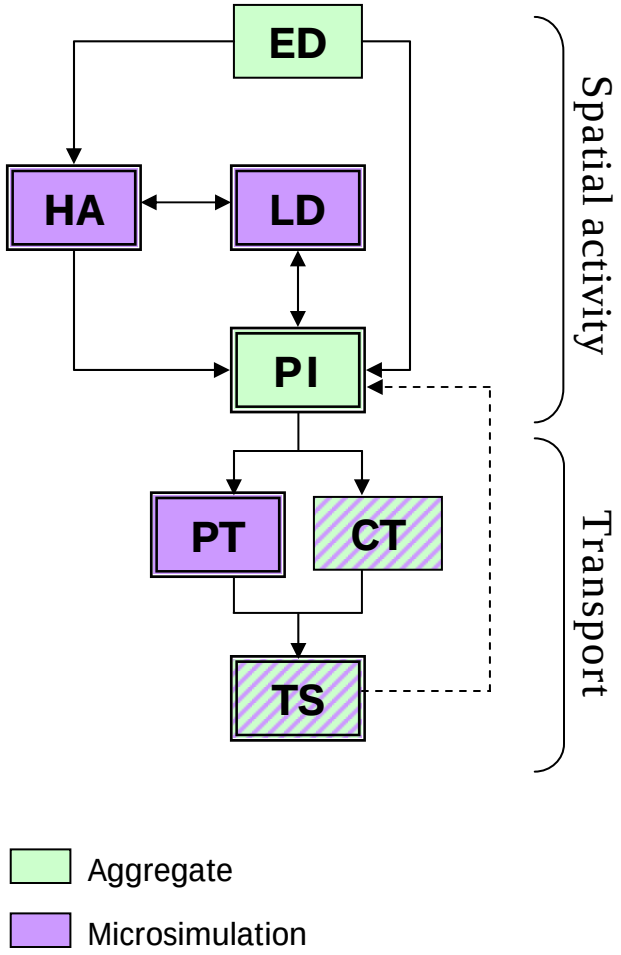
Impetus for second generation models

- Build on lessons learned in Gen1 development
- Establish fully integrated statewide model
  - Explicit representation of economy, land use, and transport
  - Linkages to environmental analyses and performance indicators
- Fit into OMIP framework
- Systems thinking approach
- Appropriate scale
- Evolving technologies
  - GIS
  - Distributed computing
  - Remote sensing data
- Experience elsewhere
  - European models
  - TRANSIMS
  - Activity-based travel models
- Anticipated emphasis on sustainability

Gen2 requirements

- Operate at a single geographic scale (TAZ within urban areas, Census tracts outside?)
- Transport, land use, and economic models to be fully integrated
- Model should be fully dynamic
- Hybrid structure
  - Equilibrium for economic and transport markets
  - Disequilibrium for land markets and activity interactions
- Activity-based travel model
- Affordable data requirements, both for development and application

Model structure



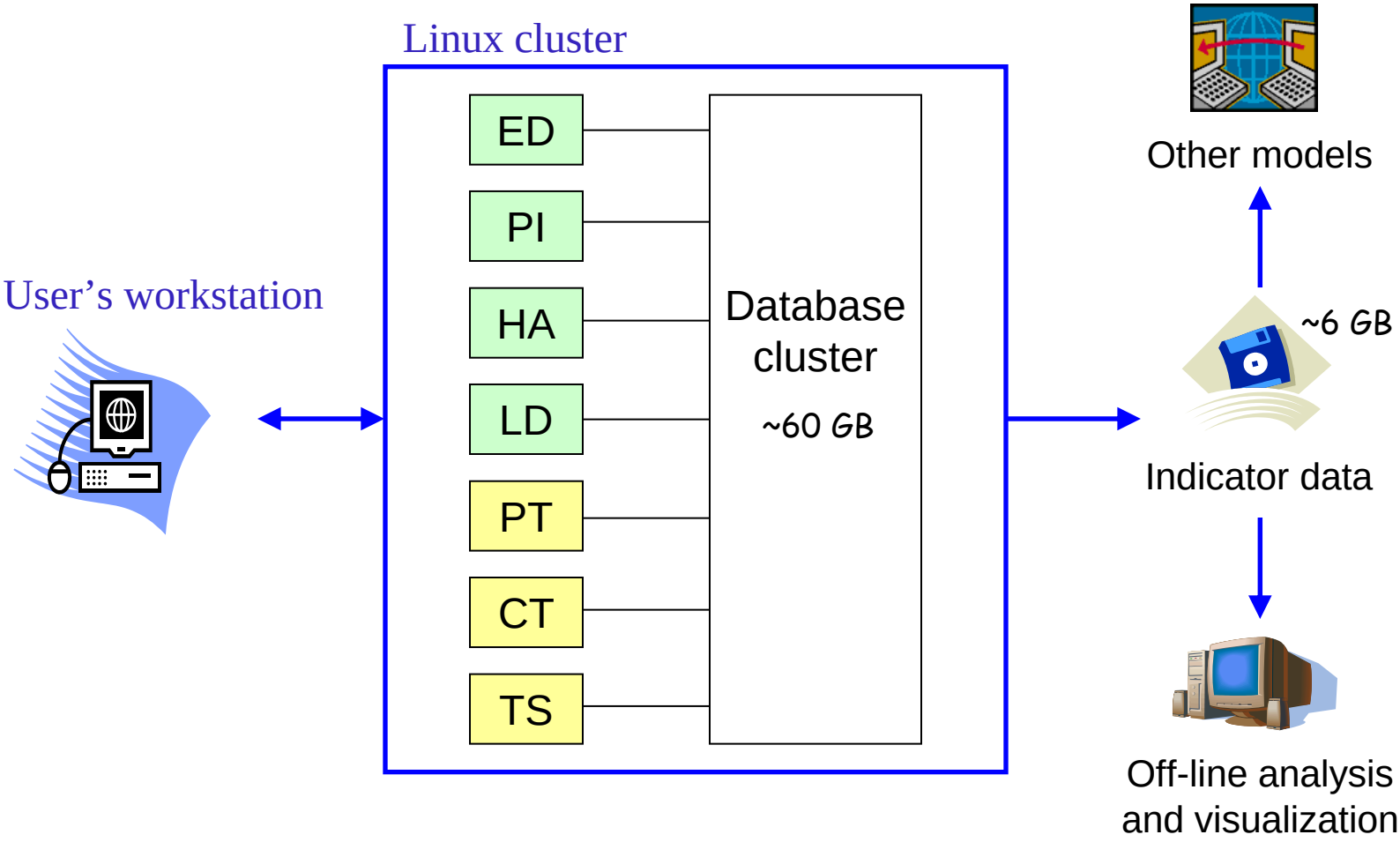
- Economic and demographic (ED)
- Production allocation and activity interaction (PI)
- Household allocation (HA)
- Land development (LD)
- Person travel (PT)
- Commercial travel (CT)
- Transportation supply (TS)
- Utilities

Appeal of microsimulation

- Flexibility in aggregation
- Shift burden from wetware to hardware
  - Increased computational burden
  - Reduced model complexity
- Permit more complete accounting
- Facilitate explicit treatment of influences
  - Non-linearities
  - Finer resolution
  - Higher fidelity

  } behavioral, spatial, temporal…
- Enable sensitivity variation as source of dispersion

Implementation view



Outreach

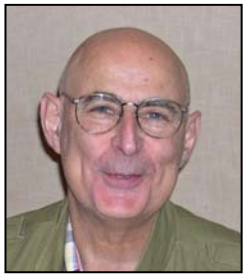
- Peer review
- OMSC ← staff & technology sharing
- Partnering
- Biannual symposia
- Publications
  - Traditional outlets (TRB, IATBR, etc.)
  - Web portal & electronic publishing
  - TMIP
- Open source software
- University collaboration

Peer Review Panel

Julie Dunbar
North Central Texas Council of Governments → Dunbar Consulting

Kim Fisher
Transportation Research Board

Robert Gorman
Federal Highway Administration



Frank Koppelman
Northwestern University

Keith Lawton
Portland Metro → Keith Lawton Consulting

Gordon Shunk
Texas Transportation Institute

David Simmonds
David Simmonds Consultancy (UK)

Michael Wegener
University of Dortmund → Spiekermann &Wegener (DE)

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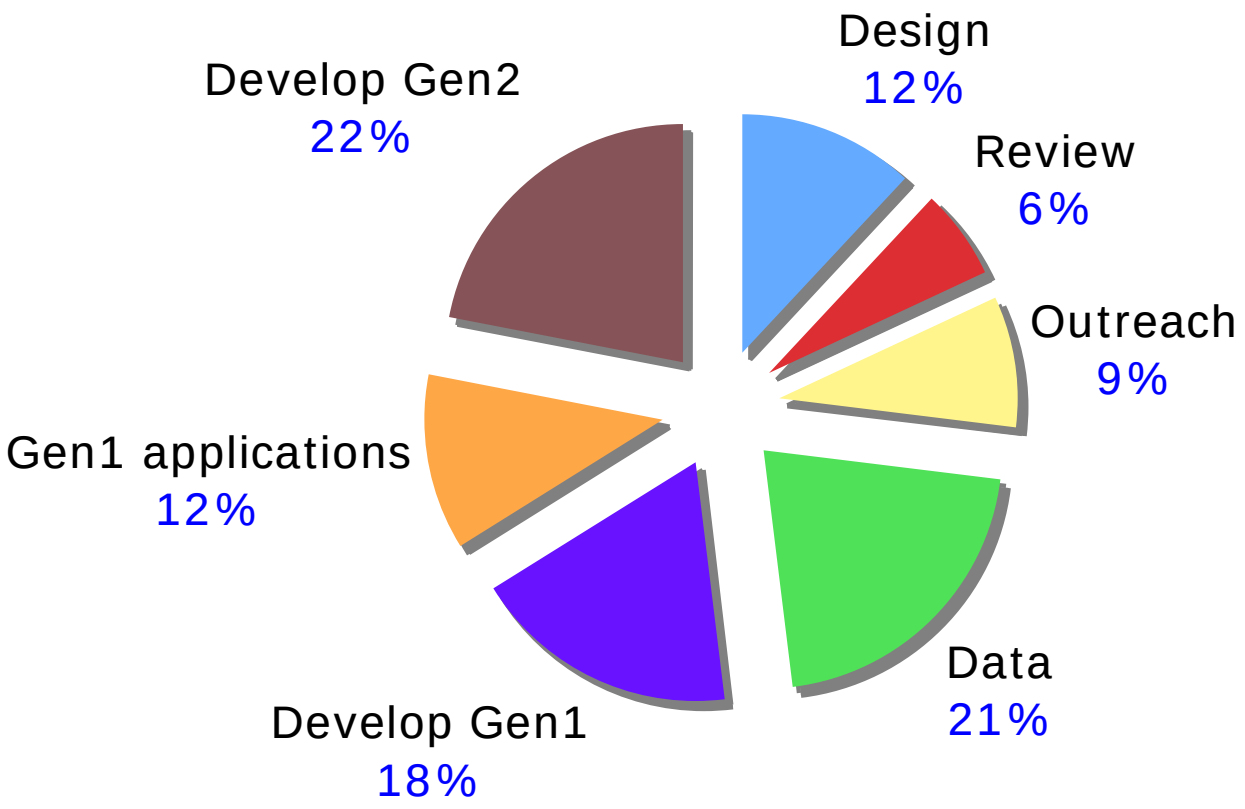
What's been done?

- Long-range design
- Proof of concept
- Foundational work
  - Data
  - Software
  - Hardware
  - Wetware
- Successful applications
- Peer review

Resource allocation



What remains to be done?

- Revisit analytical context

Analytical context

Original issues

- Land supply on land use and location decisions
- Congestion on land use and location decisions
- Cumulative effects of retail location choice
- Large commercial developments at UGB periphery
- Land supply
- Highway capacity increases
- Network connectivity
- Parking supply
- Urban form and mode choice
- Rail investment and highway use
- Changes in the demographic composition of Oregon

Emerging issues

- Market connectivity
- Job creation and maintenance
- Changes in Oregon's economic structure
- Commodity flow
- Fuel prices
- Induced travel demand

What remains to be done?

- Revisit analytical context
- Second generation models
  - Development
  - Applications
- Urban-statewide integration
- Stronger university ties
- Implementation
  - Business practice
  - Staff development
  - Bear hug

Symposium program

Today

- Where we've been and where we're going
- How integrated models have influenced decision-making

Tomorrow

- Progress in TLUMIP model development
- Noteworthy advances elsewhere

Thursday

- Microsimulating employment and firms