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Analysis of TRB's Research Needs Statements (RNS) Database for Records Related to Sustainability

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Purpose

➢ **Determine to what extent the topic of sustainable transportation is addressed in RNS records**

➢ **Identify committees supporting sustainability-related research**

➢ **Help ADD40 begin the process of developing its research portfolio**

Methodology

- **Developed a list of search terms:**
  - Economic Development
  - Economy
  - Environment
  - Equity
  - Society
  - Sustainability
  - Sustainable

- **Number of records returned for each:**
  - 20
  - 55
  - 186
  - 50
  - 44
  - 30
  - 56

Methodology, cont.

➢ **A score was assigned to each record based on its relevance to the three dimensions of sustainable development**

  ➢ Environment

  ➢ Society/Equity

  ➢ Economy

Defining Sustainability

Dimension	Area
Environment	Health and Environmental Damage
	Standards
	Noise
	Land Use
	Emissions and Waste
	Renewable Resources
	Non-renewable Resources
	Energy
	Recycling
Equity/Society	Access
	Safety
	Intragenerational Equity
	Intergenerational Equity
Economy	Affordability
	Efficiency
	Social Cost
	Employment

Scoring the Record

➢ **A score was assigned for each sustainability dimension (Env, Soc, Econ)**

0 = No relevance

0.5 = Some relevance

1.0 = Relevant

➢ **Maximum possible score = 3.0**

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Methodology: Example

✓ **Access**

✓ **Emissions and Waste**

✓ **Health and Environmental Damage**

✓ **Intra-generational Equity**

Research Needs Statements

SHARE

Browse Projects > Detailed View

Investigating the Disaggregate Travel Behavior Effects of the Built Environment

Problem Statement

Increasingly, changes in neighborhood and commercial area design are being proposed and implemented in urban areas as solutions to transportation and environmental problems. Travel behavior varies depending on the design of the built environment at both ends of the trip. It is likewise affected by the quality and availability of transportation facilities and services, which connect trip ends. The extent to which proposed changes in land use mix, density, and improvements in connectivity between complementary uses (live, work, play) increase transit and nonmotorized travel, reduce auto dependence, improve air quality, reduce fuel consumption, and benefit public heath is clearly worthy of both further exploration and translation into better planning and analysis tools. Research on the effects of the built environment on travel choice has become more sophisticated over the last decade and now includes many detailed forms of household-, person-and trip-level analysis. However, further work is needed to refine and fill gaps in these analyses to make existing models more responsive and to develop new tools that more accurately predict travel and other effects of urban form. Improvements in our ability to assess land use and transportation relationships can be achieved both through recent gains in the quality of land use, travel, and transportation service data and through integration of these types of data in ways that are more comprehensive and readily consistent with available and developmental travel demand forecasting processes. Advanced parcel-level data on the built environment need to be fully and jointly incorporated with disaggregate trip-level transportation data into analyses that predict how land use affects travel choice. Enhanced information ranging from microscale aspects of the built environment, on the one hand, to transportation syste[m] ... al in better explaining travel behavior. The development of [a] modeling process is crucial for the creation of land-use including both mobility and health improvements.

The analysis phase would advance the understanding and quantification of behavior. This analysis would be accomplished through the use of trip-level disaggregate socio-economic data and other trip-end variables. Trip-end va variables should be considered in regional travel demand modeling. The m travel and the purpose of that travel. Various data preparations would obvi data, full travel path transportation service data (distance, travel times bro Ex t i

**Score = Environment (1) + Society/Equity (1) + Economy (0) = 2.0**

Records per Year by Score (and percent related to sustainability)
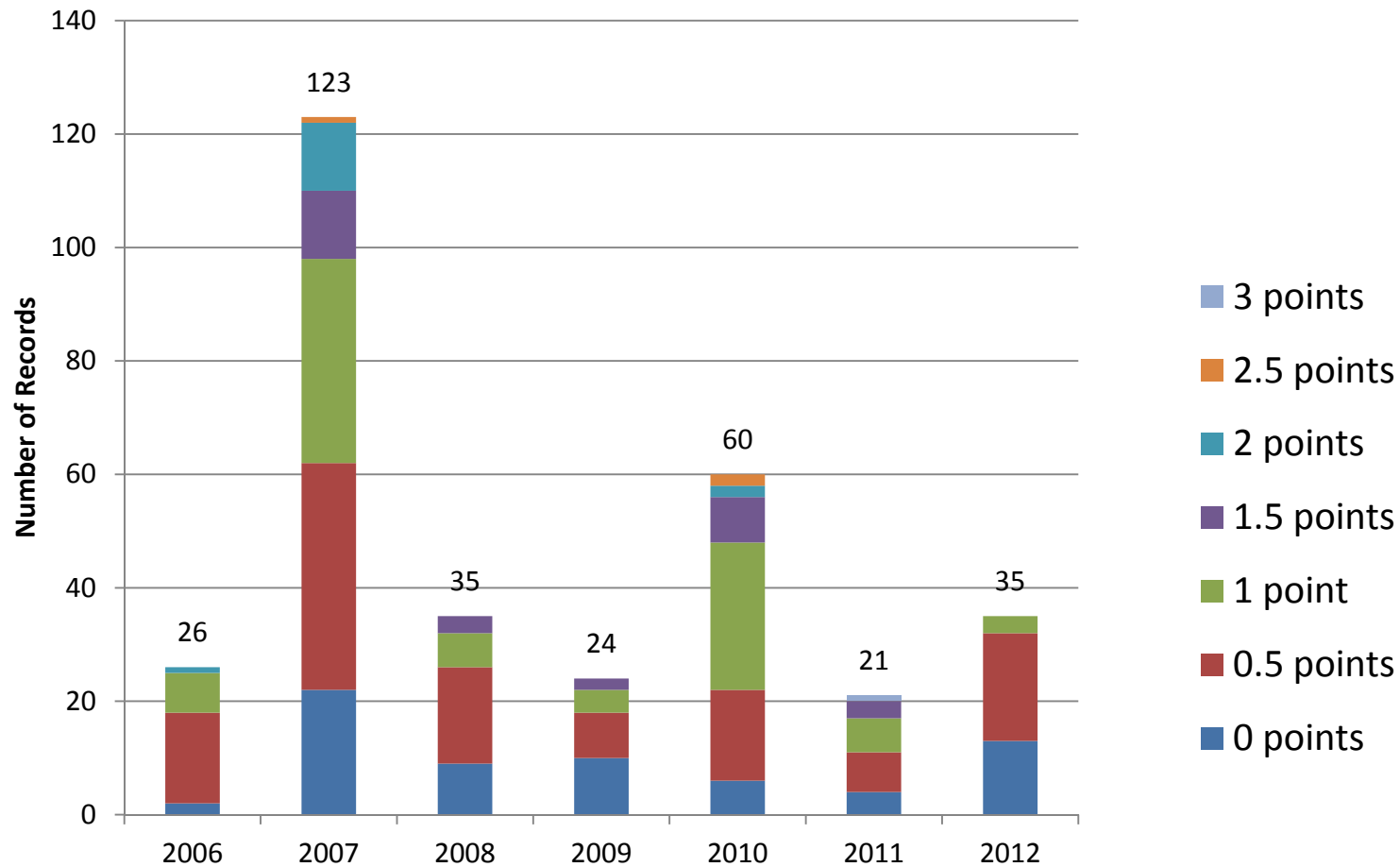
Records per Year by Score (and percent related to sustainability)

Records by Sustainability Score

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325 records

Pie chart showing records by sustainability score:

- **20.6%** — 0 points
- **37.8%** — 0.5 points
- **27.1%** — 1 point
- **8.6%** — 1.5 points
- **4.6%** — 2 points
- **0.9%** — 2.5 points
- **0.3%** — 3 points
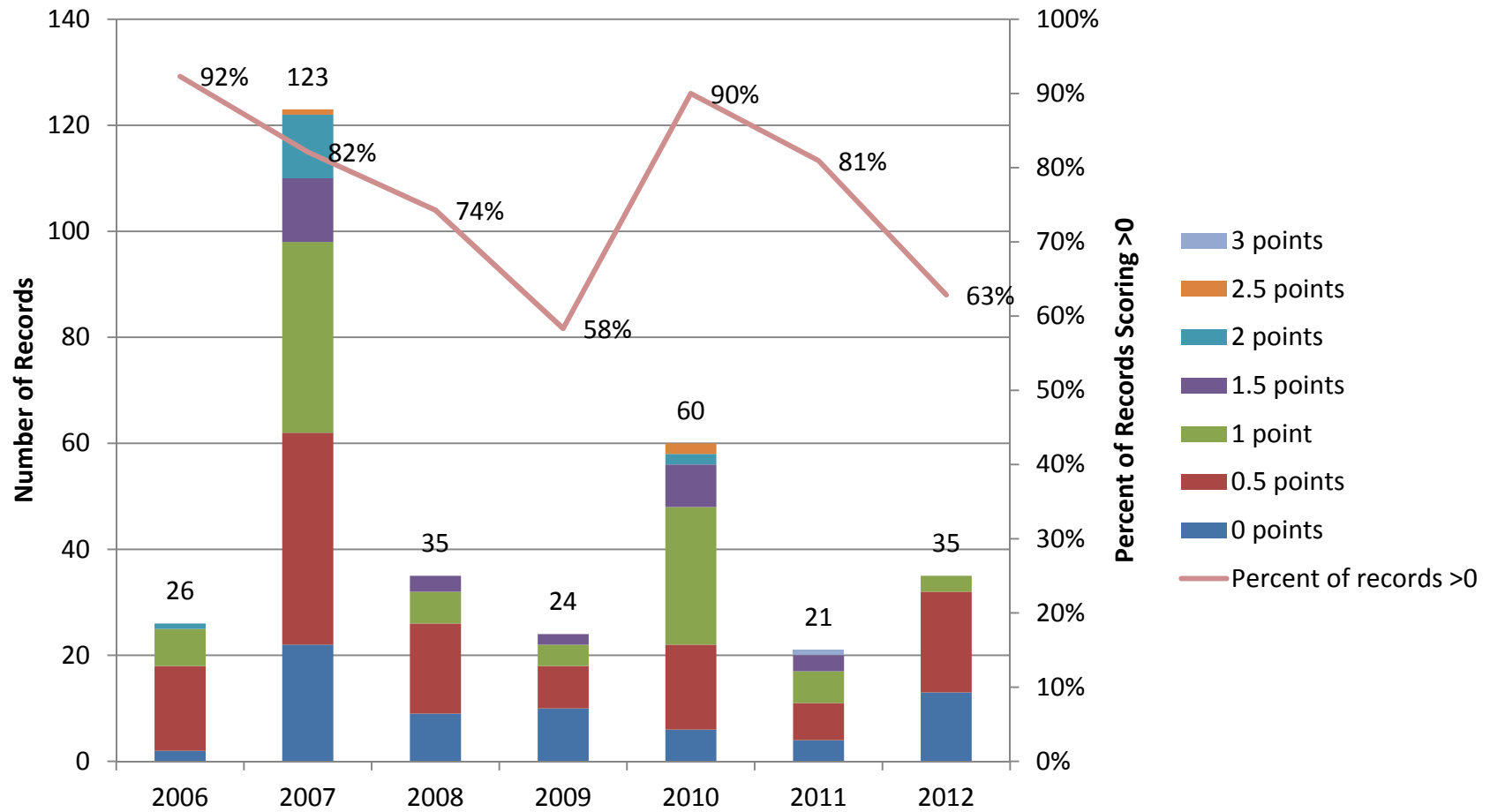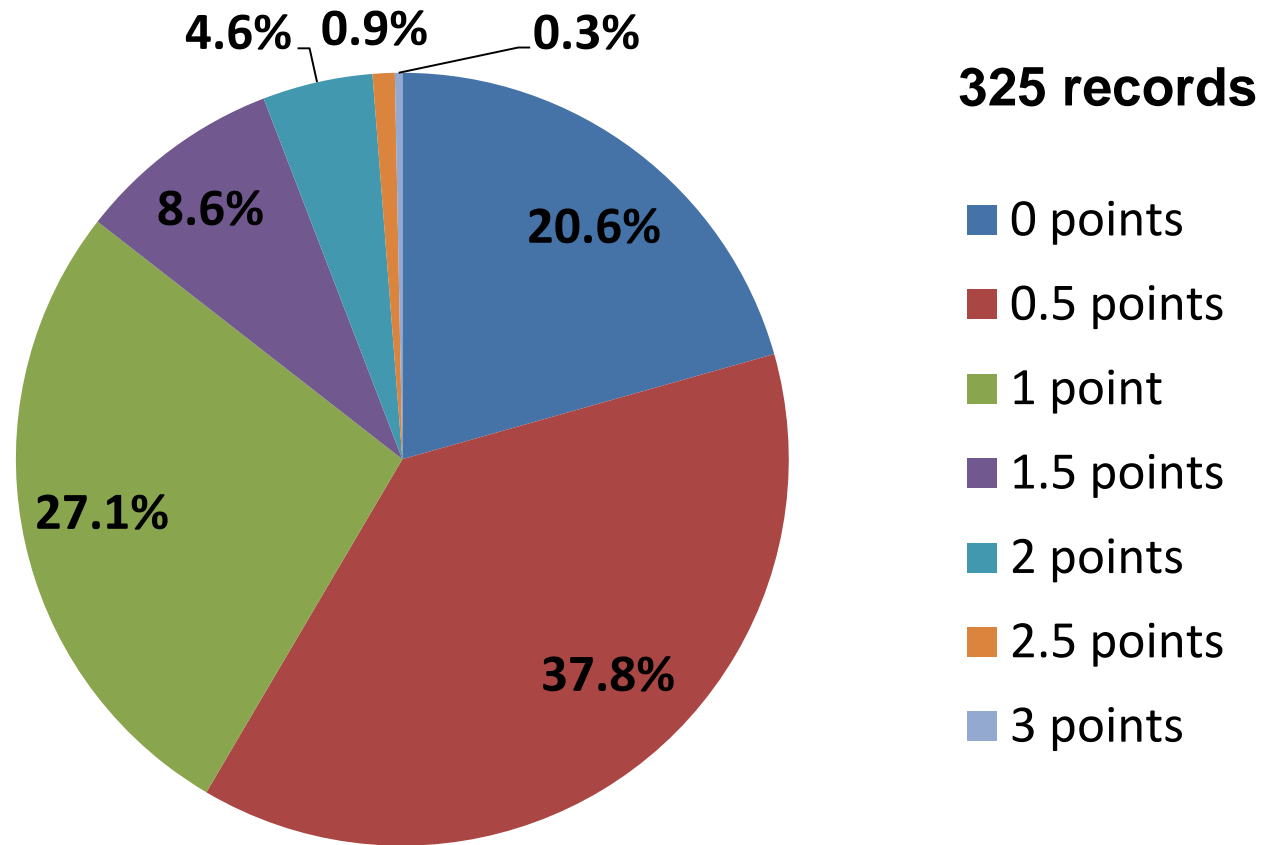
Legend:
- 0 points
- 0.5 points
- 1 point
- 1.5 points
- 2 points
- 2.5 points
- 3 points
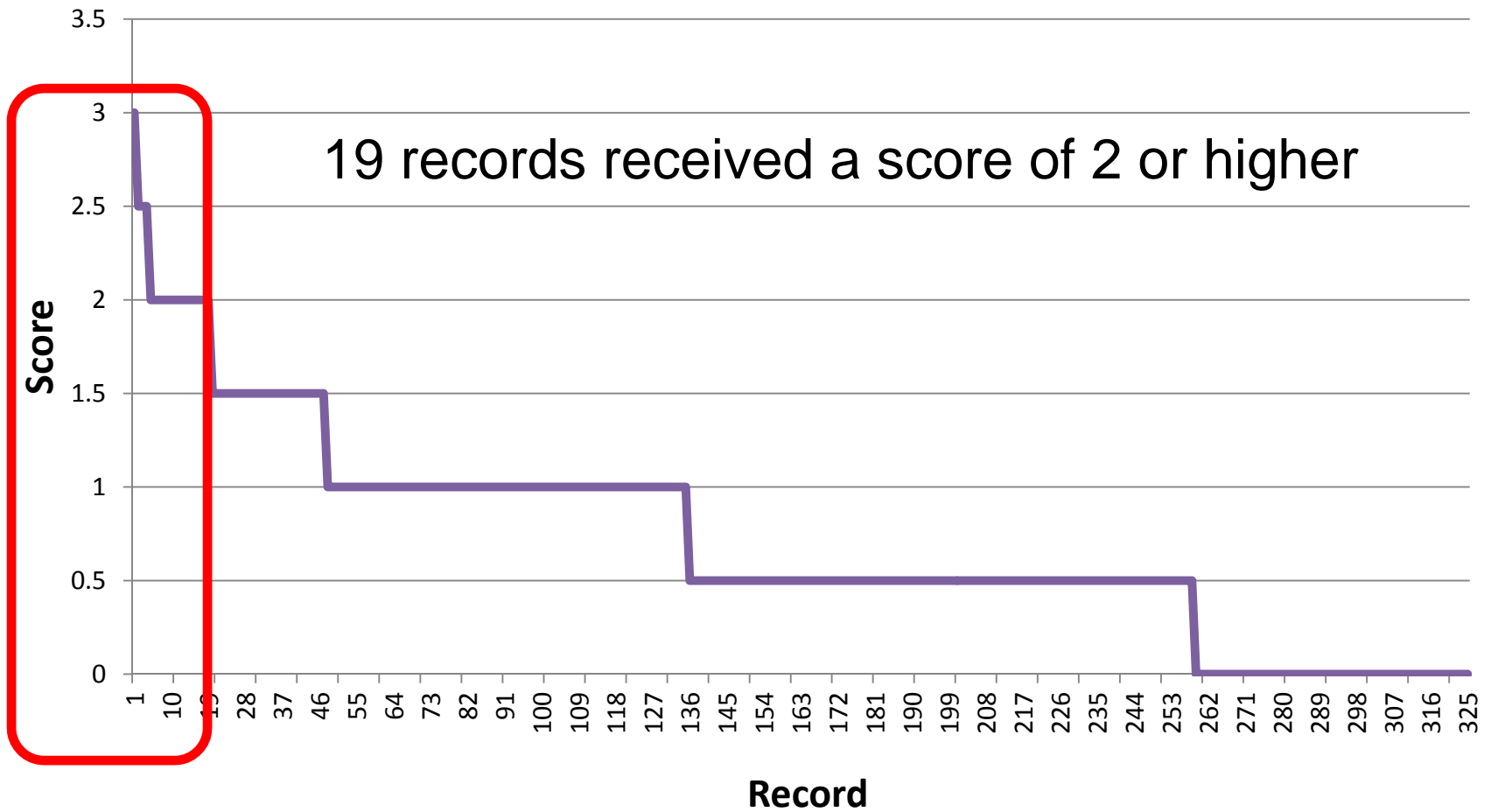
Percent of Records (scoring 0.5 and above) that Address Sustainability Areas

258 Records

Efficiency and safety are areas most commonly addressed

- Efficiency: 45%
- Safety: 38%
- Access: 22%
- Emissions and Waste: 17%
- Intragenerational Equity: 15%
- Health/Environmental Damage: 15%
- Social Cost: 8%
- Energy: 7%
- Affordability: 4%
- Land Use: 4%
- Non-renewable Resources: 2%
- Employment: 2%
- Noise: 2%
- Standards: 1%
- Recycling: 1%
- Renewable Resources: 1%
- Intergenerational Equity: 0%
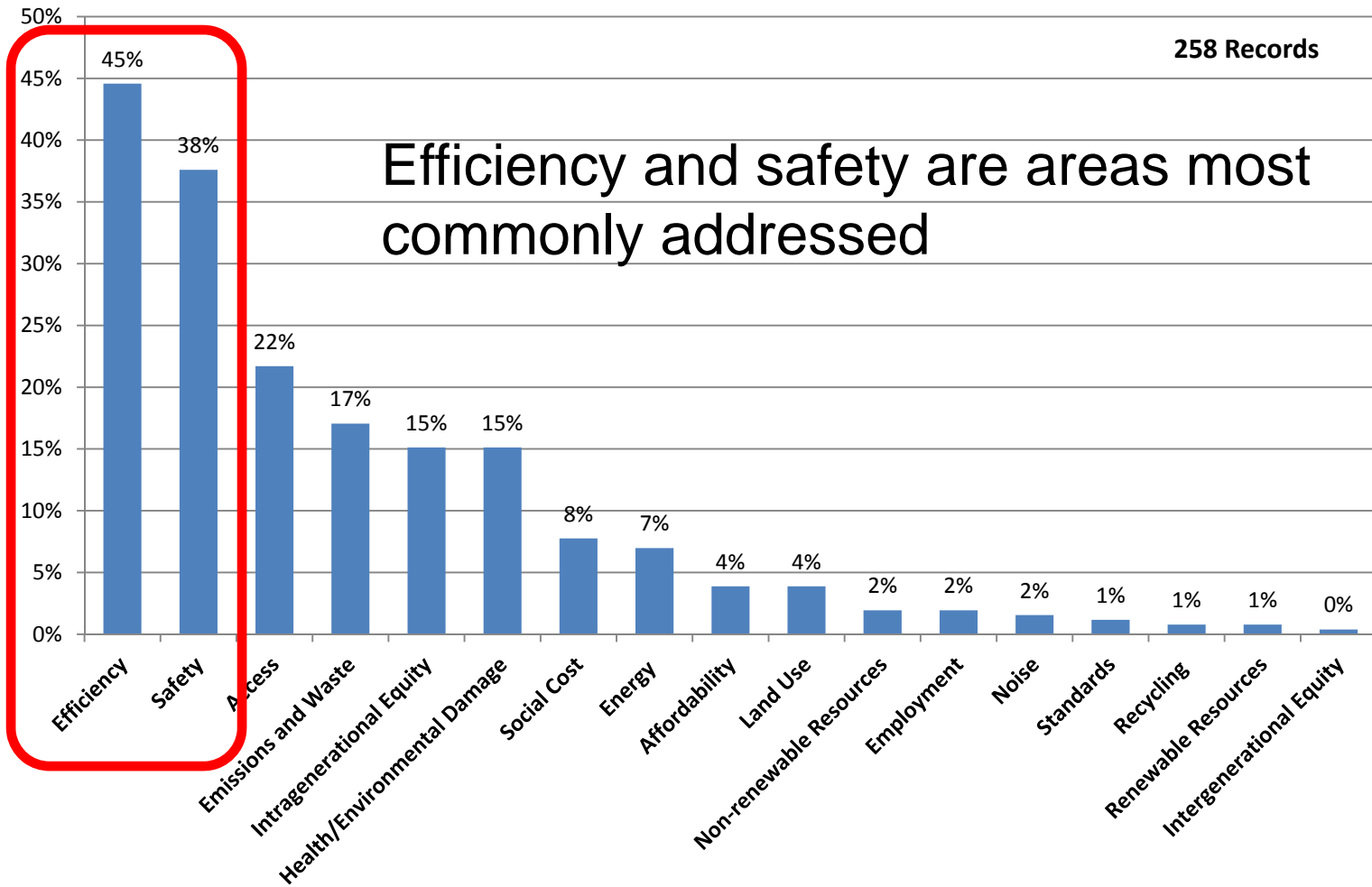
Top Scoring Records and TRB Committees

| Record Title	Sustainability Score			
	Envi.	Econ.	Eq.	Total
Research Program to Develop a Sustainable Decision Making Tool for Transportation Applications Based on Life Cycle Assessment	1	1	1	**3**
Analysis of Social Costs and Benefits of Advanced Biofuels and Other Low Carbon Fuels	1	1	0.5	**2.5**
Analysis of Synergies between Transit, Land Use, and Pricing Strategies to Reduce Greenhouse Gas Emissions	1	1	0.5	**2.5**
Performance Measures for Societal Goals	0.5	1	1	**2.5**
Quantify and Incorporate Environmental Benefits into Life Cycle Costing Models for Common Roadway Construction Practices	1	0.5	0.5	**2**
Innovative Applications of Sustainability Performance Measures for Transit Planning	0.5	0.5	1	**2**
The Economic Impact of Public Lands Transportation Systems on Gateway Communities	1	0.5	0.5	**2**
The Economic Impact of Transportation Systems on Gateway Communities	0.5	1	0.5	**2**
Policy Sensitivity: Trip-Based vs. Tour- and Activity-Based Models	0.5	0.5	1	**2**
Analysis of Property Value Impacts of Transportation Projects	0.5	1	0.5	**2**
Potential Travel Responses to Alternative Highway Pricing and Financing Systems and the Impact of Fuel Consumption and Greenhouse Gas Emissions	0.5	1	0.5	**2**
Parking Strategies to Reduce Environmental Impacts and Improve Place	1	0.5	0.5	**2**
Establishing Equity Measures for Environmental Justice Cost-Benefit Analyses	0.5	0.5	1	**2**
Early and Continuous Scoping and Stakeholder Involvement	0.5	0.5	1	**2**
Determining The Economic Value of Roadway Access Management	0.5	1	0.5	**2**
Controlling Air Emissions At Marine Port Terminal Operations	1	0.5	0.5	**2**

Top Scoring Record and TRB Committee

TRB Committee	Record Title	Sustainability Score			
		Envi.	Econ.	Eq.	Total
AFH30, Emerging Technology for Design and Construction	Research Program to Develop a Sustainable Decision Making Tool for Transportation Applications Based on Life Cycle Assessment	1	1	1	3

Problem Areas and Applicable Tools Found in Top-Scoring Records

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Tools

- Life Cycle Assessment
- Cost Benefit Analysis
- Economic Analysis
- Pricing Strategies
- Indicators/Performance Measurement
- Air Quality Standards
- Impacts Assessment
- Activity-Based Modeling
- No Tools Identified

Problem/Application

- Design and Construction
- Low Carbon Fuels
- Gateway Communities
- Parking Reform
- Access Management
- Reduced GHG Emissions
- Behavior Change
- Transit
- Environmental Justice
- Port Emissions
- Property Value Impacts
- General Transport Issues
- Stakeholder Involvement

Findings

➢ **325 total records returned by searches (*out of a possible 1,096 records*)**

➢ **258 (79%) were related to sustainability (scored at least 0.5)**

➢ **Very few records (16) addressed sustainability in a way that addressed all three dimensions**

➢ However, many RNS records are addressing sustainability, at least in a limited way

Implications of Analysis

➢ **ADD40 does not have a research portfolio**

    ➢ Recommend a Research Subcommittee be formed to develop research portfolio (with federal/state members)

➢ **Committee ADD40 should**

    ➢ Work with willing TRB committees with high/medium scoring statements to reorient them towards sustainability

    ➢ Take the initiative in developing comprehensive research proposals (that address all three sustainability dimensions)

    ➢ Develop guidance for other committees for addressing sustainability issues

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QUESTIONS?

The full report and raw data can be downloaded from:
http://ralphphall.wordpress.com

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