The Smart Location Calculator:

A new tool for measuring the social and environmental benefits of workplace location efficiency

APA Planning Webcast Series
January 22, 2015

EPA Office of Sustainable Communities

Helps communities pursue smart growth strategies through:

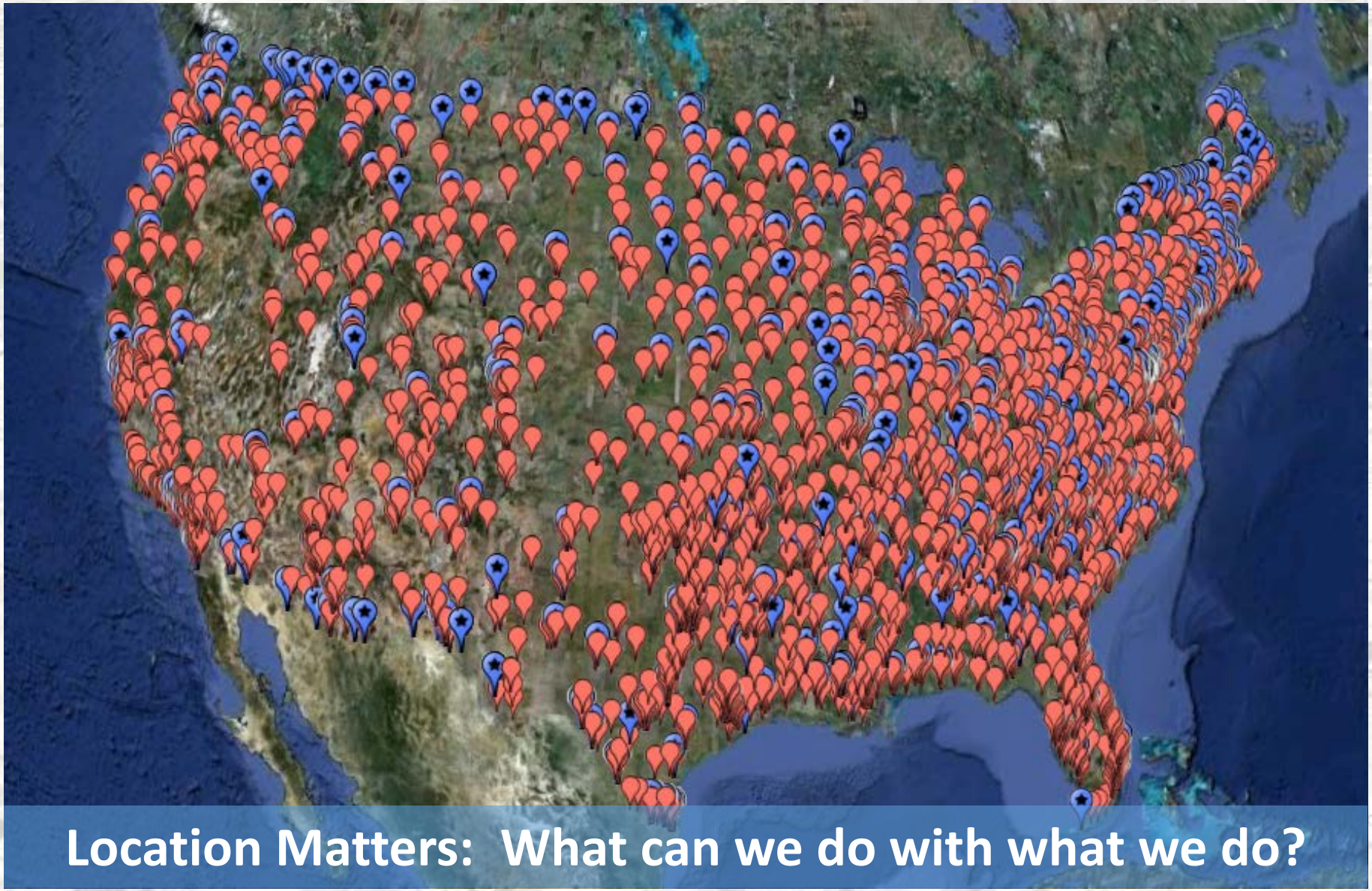
- Grants and technical assistance
- Partnerships
- **Research and tool development**

Smart Growth
PROGRAM

EPA Office of Sustainable Communities

GSA Urban Development | Good Neighbor Program

GSA Urban Development | Good Neighbor Program



Location Matters: What can we do with what we do?

Overview

- Background of the SLC
- SLC Demonstration
- Underlying block group model
- SLC details
- Application
- Q&A

SLC Background: Location Efficiency

- Much like energy efficiency, location efficiency **reduces resource** demands while fostering a healthier, **more sustainable built environment** and providing **equitable access** to government jobs and services.

- Location-efficient commercial facilities are generally:
  - Accessible via multiple **transportation options**, including public transit and active transportation;
  - **Centrally-located** within their "commute shed" or region so as to maximize accessibility and minimize travel distances for employees and other users; and
  - Integrated within a **mixed-use environment** that offers easy access to services and destinations.

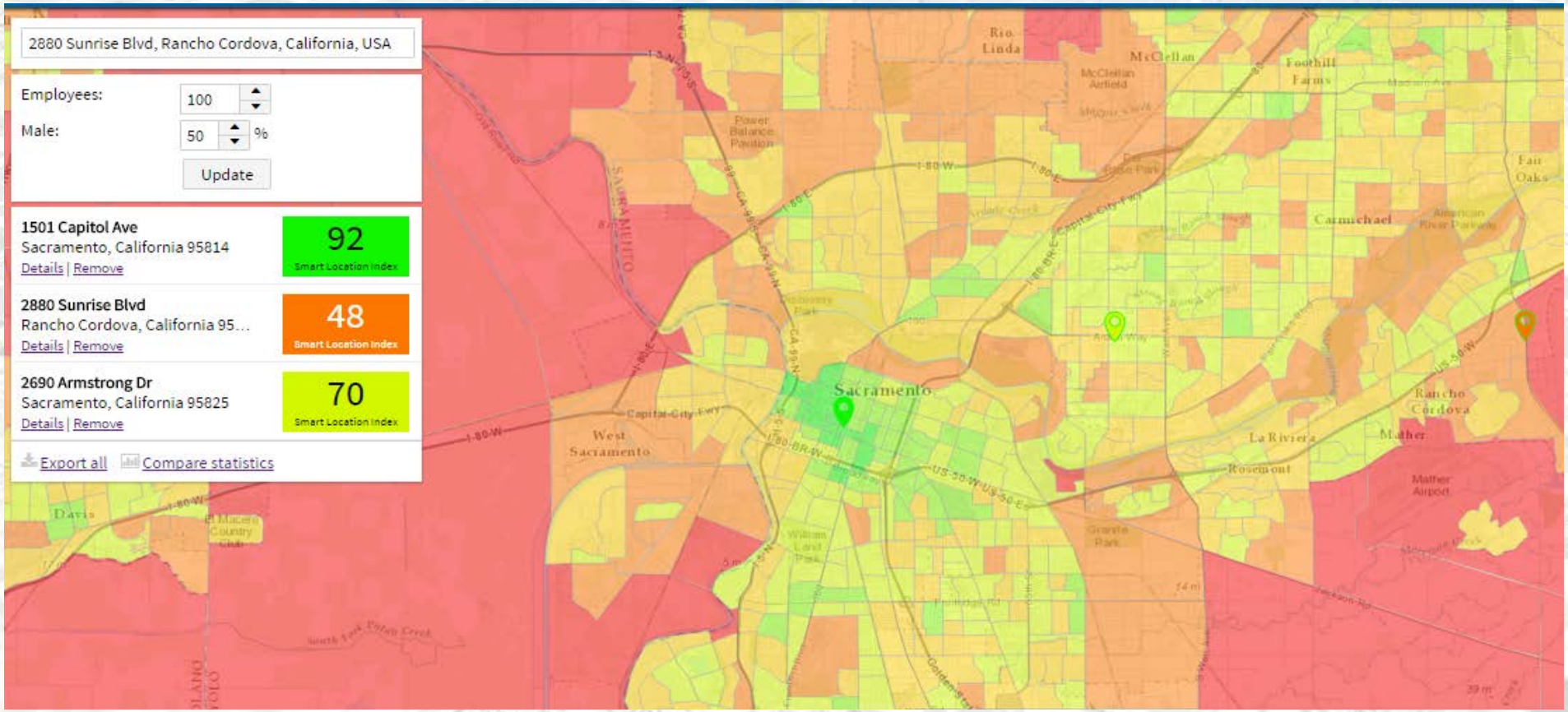
SLC Background: Development

- Federal Leadership in Sustainability
  - Measuring GHG of Federal operations, incl. employee commutes (EO 13514)
  - Continued attention to Local Planning Goals (EO 12072)
  - Implementing Instructions on Sustainable Federal Locations (EO 13693)
- GSA Environment
  - Emphasis on consultation, collaboration, coordination
  - Educating large organization on ‘location efficiency’
  - Challenging decision-making environment in the field
- Teaming up with EPA Expertise
  - Applying science to planning principles
  - Bringing measures to the table
  - Making data easily available to decision-makers

SLC Background: Research questions

- What measures of location efficiency would enable us to compare facility locations relative to each other – ie put numbers to the policy?
- How can we fill the gap where there has been little research into the effect of the built environment around workplace locations?
- How can we estimate worker vehicle miles traveled (VMT) and greenhouse gas emissions (GHG) associated with that travel?

SLC Demonstration: Overview



https://www.slc.gsa.gov/slc

SLC Model: Intro to Block Group Model

- Demo showed difference between denser urban areas vs suburban sprawl or rural areas
- Urban form impacts commute patterns and VMT
- Urban form and transit data comes from the EPA's Smart Location Database (SLD)

SLC Model: Urban Form and Travel "D" Variables

- Density
- Diversity
- Design of Street Network
- Destination Accessibility
- Distance to Transit

Image sources: Lincoln Land Institute's "Visualizing Density" and Victor Dover

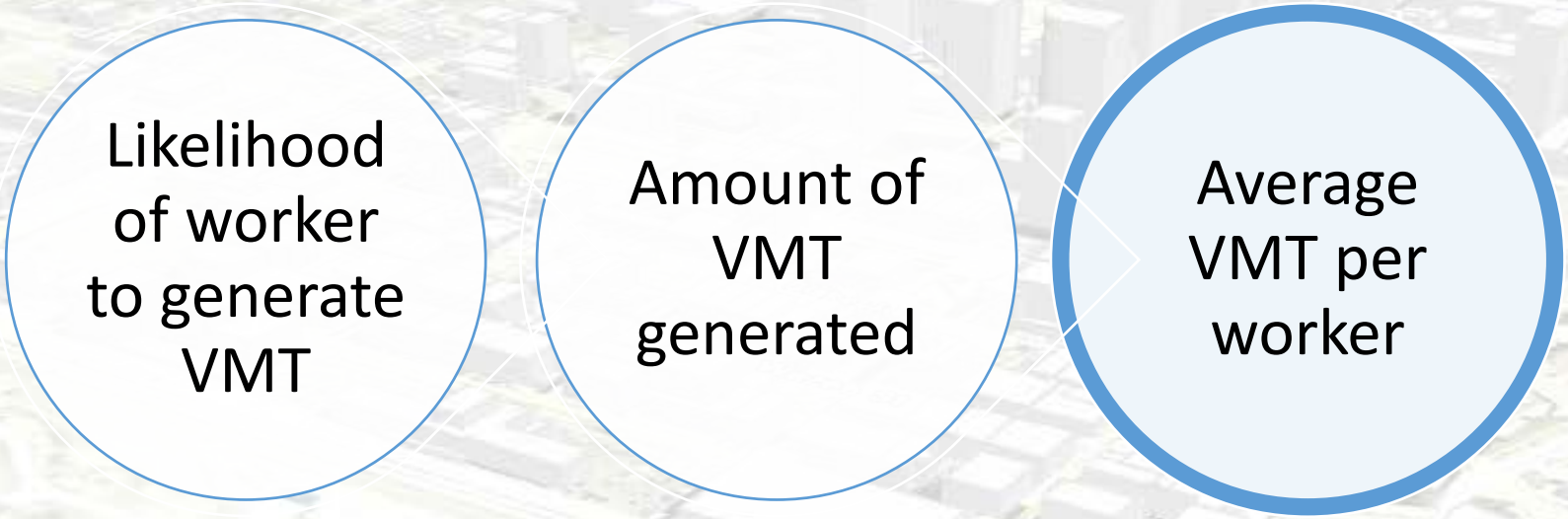
SLC Model: Data Source (1)

- EPA's Smart Location Database (SLD)
  - Nationwide geographic data resource including more than 90 attributes summarizing characteristics such as diversity of land use, neighborhood design, destination accessibility, employment, and demographics.
  - SLD dependent upon many data sources, including American Community Survey, NAVTEQ streets, Longitudinal Employment Household Dataset, plus more
  - Find more information about the SLD, including interactive mapping, data downloads and user guide at http://www2.epa.gov/smartgrowth/smart-location-mapping#SLD

SLC Model: Data Source (2)

- Model estimates how urban form characteristics of workplace block groups impact worker VMT generation when traveling to/from workplace block groups
- Worker commute data comes from 2009 National Household Travel Survey
  - Worker characteristics (income, gender, etc.)
  - Whether a trip generated VMT, and if so, how much

SLC Model: Modeling Process



SLC Model: Independent variables

A few example variables and their impact on VMT

- Density of development in workplace block group
  - Gross residential density ↑ VMT ↓
  - Gross employment density ↑ VMT ↓
- Street design characteristics in workplace block group
  - Auto-oriented links per square mile ↑ VMT ↑
  - Pedestrian-oriented links per square mile ↑ VMT ↓

SLC Model: Commute vs. Non-Commute Travel

Commute Travel	Non-Commute Travel
Home-Work Any trip made between home and work, including all legs of trip (stopping to drop off child, go shopping, go to gym, etc.)	**Work-work** Any trip starting and ending at a workplace. Includes mid-day lunch trips, business outings, or trips from one workplace to another

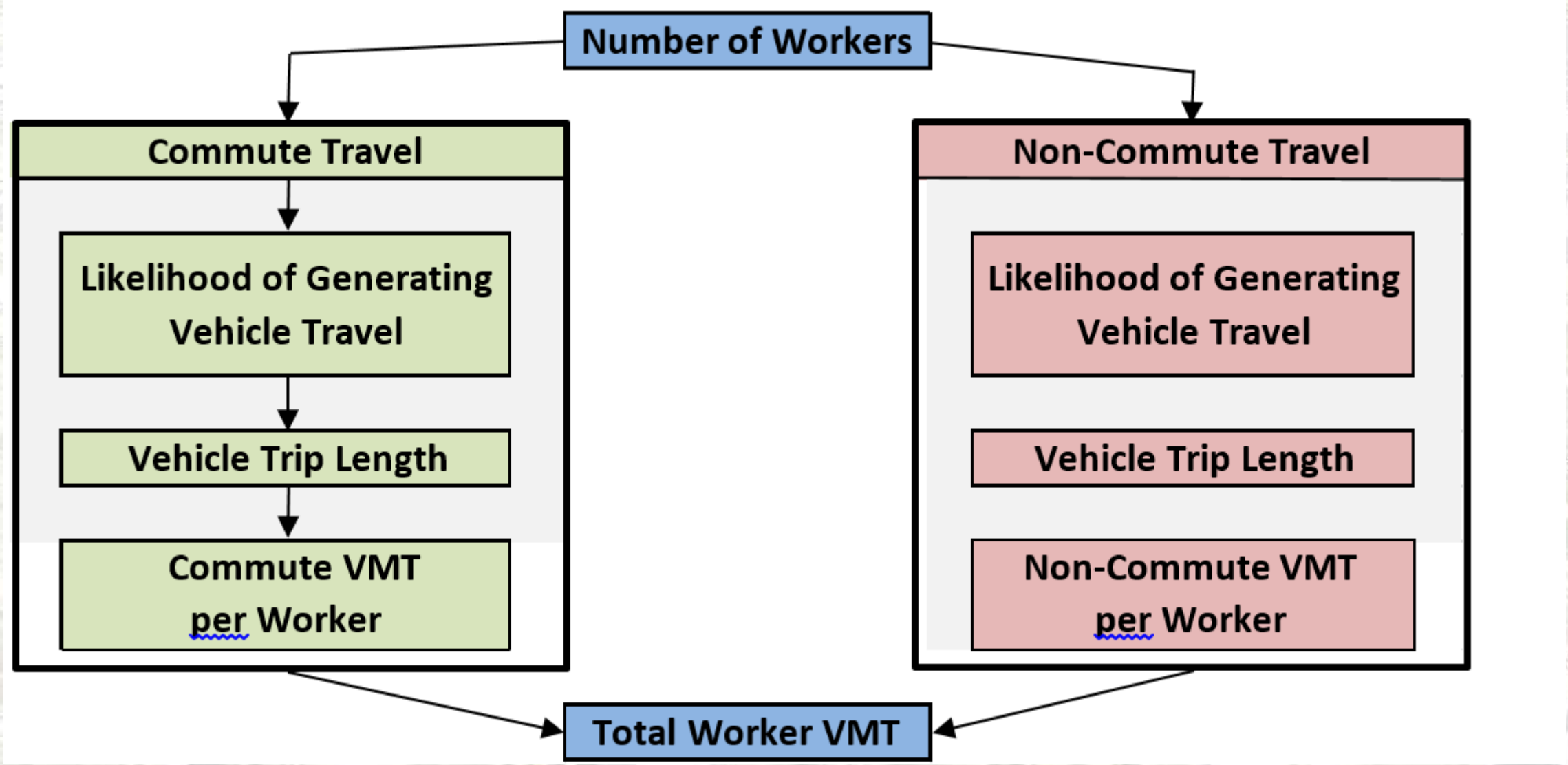
Home-based-other trips were removed from dataset (trips from home to social events, shopping, recreation, etc)

SLC Model: Factors Affecting VMT

	Commute VMT	Non-Commute VMT
Jobs Density	■	■
Housing Density	■	
Employment Mix		■
Job/ Housing Balance	■	
Pedestrian Oriented Network	■	
Transit Proximity		■
Transit Density	■	■
Auto Accessibility for Workers	■	
Transit Accessibility for Workers	■	
Regional Compactness	■	■
Regional Transit Trips per Capita	■	■

** Other factors: income, car ownership, gender, gas price*

SLC Model: Modeling Process



SLC Model: Smart Location Score Calculation

After VMT modeling is complete, each block group is evaluated relative to the other block groups in its region (CBSA or county)

$$\text{Smart Location Score} = 100 * \left(1 - \frac{VMT\_tot - VMT\_tot\_min}{VMT\_tot\_max - VMT\_tot\_min}\right)$$

where VMT_tot_min and VMT_tot_max are the minimum and maximum VMT_tot scores for the region

SLC Model: The Smart Location Index (SLI)

- The block group scores are categorized using the following scale:

90-100 = Excellent

80-89 = Very good

70-79 = Good

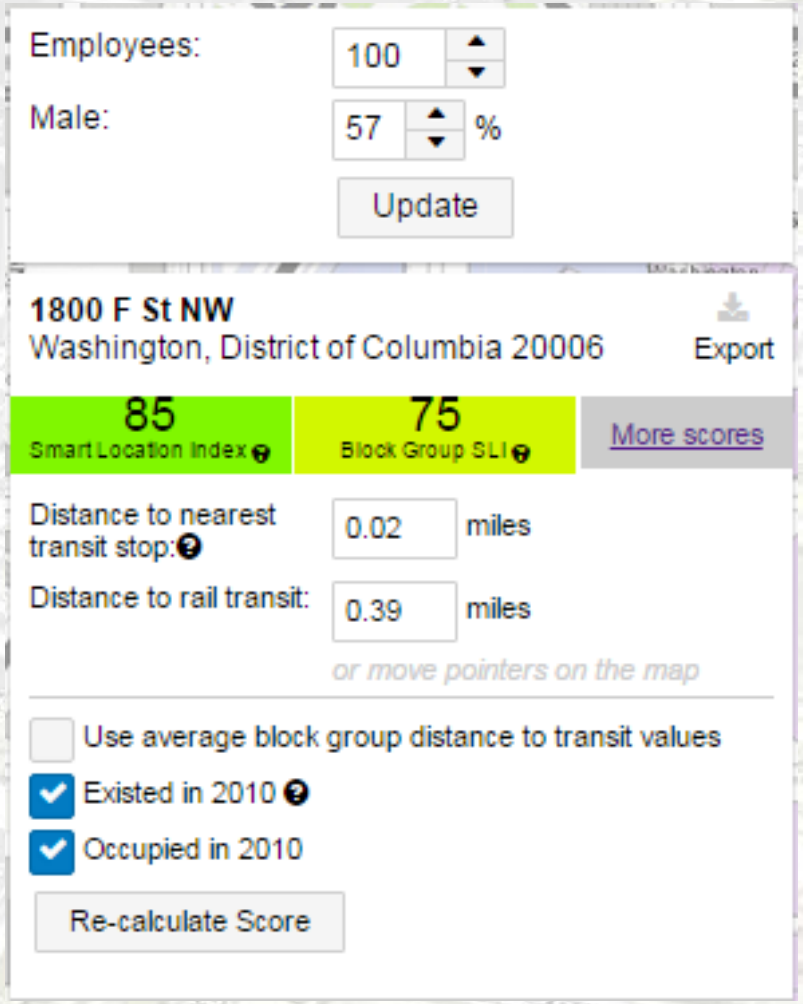
60-69 = Fair

40-59 = Low

<40 = Very low

SLC: Block Group vs. Facility Level scores

- User-entered data
- Distance to transit
- ¼ mile buffer
  - Tool adjusts for edge effects
  - Variables impacted: residential and employment densities, network variables (links), transit density, access, land use mix



Application: GSA's Economic Catalyst Initiative

- The goal of GSA's Economic Catalyst effort is to promote placing buildings/leases in locations that are sustainable and drive community economic development to be consistent with existing Federal policy

- GSA's new Location Policy (ADM 1097.1) directs us to:
  - Incorporate economic impact in evaluating and selecting space locations and making long term facility plans
  - Improve coordination with local and regional planning groups to support local planning and sustainable development
  - Collaborate, Consider, Coordinate …

Application: Tracking GSA Performance

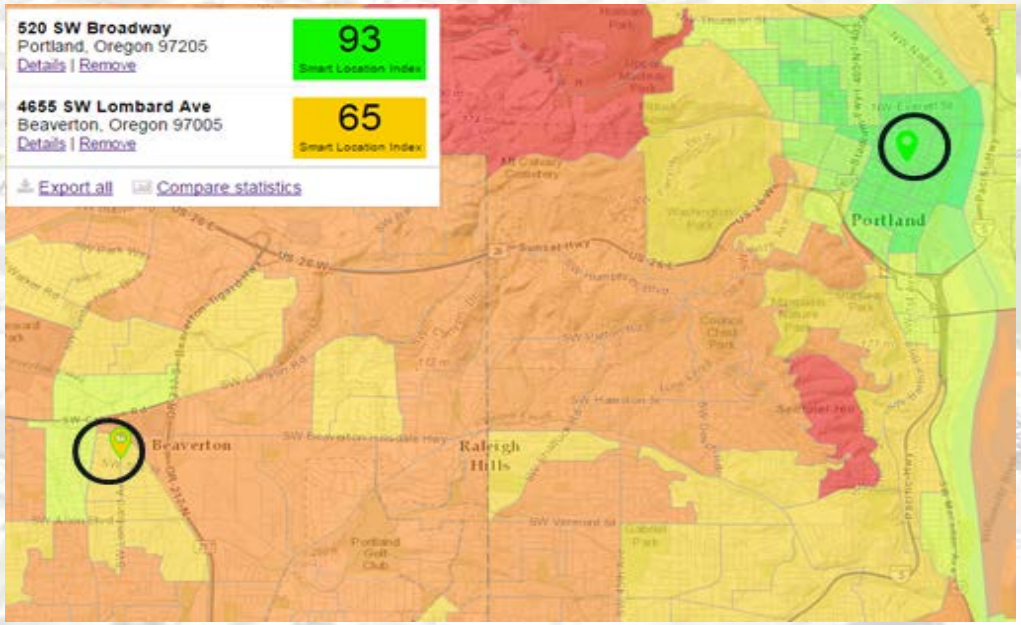
Goals:
Advance sustainability and support local development through smart location selections for GSA controlled space

Encourage space actions in areas close to mass transit, near employment densities and where people are more likely to conduct business

National Measure:
Based on transactions (agreements with customer agencies)

Evaluate SLI on office space locations developed during FY 2016

Goal is >70



Reporting: Overall Inventory / New Transactions

Smart Location Index (SLI) - Overall Inventory
OAs Effective in FY2015

Region	Owner	No. OAs	RSF	Weighting	Weighted SLI
1	F	18	52,428	4,337,324	83
1	L	28	183,722	14,928,368	81
1	**Total**	**46**	**236,150**	**19,265,692**	**82**
2	F	15	154,978	10,888,332	70
2	L	16	143,700	7,937,968	55
2	**Total**	**31**	**298,678**	**18,826,300**	**63**
3	F	15	62,644	5,488,821	88
3	L	36	942,305	48,437,822	51
3	**Total**	**51**	**1,004,950**	**53,926,643**	**54**
4	F	18	440,370	30,343,576	69
4	L	87	910,452	62,992,446	69
4	**Total**	**105**	**1,350,822**	**93,336,022**	**69**
5	F	15	334,997	28,038,296	84
5	L	40	502,173	38,872,283	77
5	**Total**	**55**	**837,169**	**66,910,579**	**80**
6	F	15	444,340	25,819,335	58
6	L	28	186,068	11,836,695	64
6	**Total**	**43**	**630,408**	**37,656,031**	**60**
7	F	24	117,785	10,030,606	85
7	L	45	798,528	53,605,770	67
7	**Total**	**69**	**916,313**	**63,636,376**	**69**
8	F	39	648,337	50,913,979	79
8	L	27	387,300	26,505,746	68
8	**Total**	**66**	**1,035,637**	**77,419,726**	**75**
9	F	29	137,389	11,568,704	84
9	L	56	771,768	60,445,376	78
9	**Total**	**85**	**909,157**	**72,014,080**	**79**
10	F	20	109,550	8,136,875	74
10	L	29	429,499	35,941,909	84
10	**Total**	**49**	**539,049**	**44,078,784**	**82**
11	F	10	400,657	28,634,655	71
11	L	36	2,228,210	153,510,791	69
11	**Total**	**46**	**2,628,867**	**182,145,446**	**69**
ALL	Own	218	2,903,475	214,200,502	74
	Lease	428	7,483,724	515,015,176	69
	Total	**646**	**10,387,199**	**729,215,678**	**70**

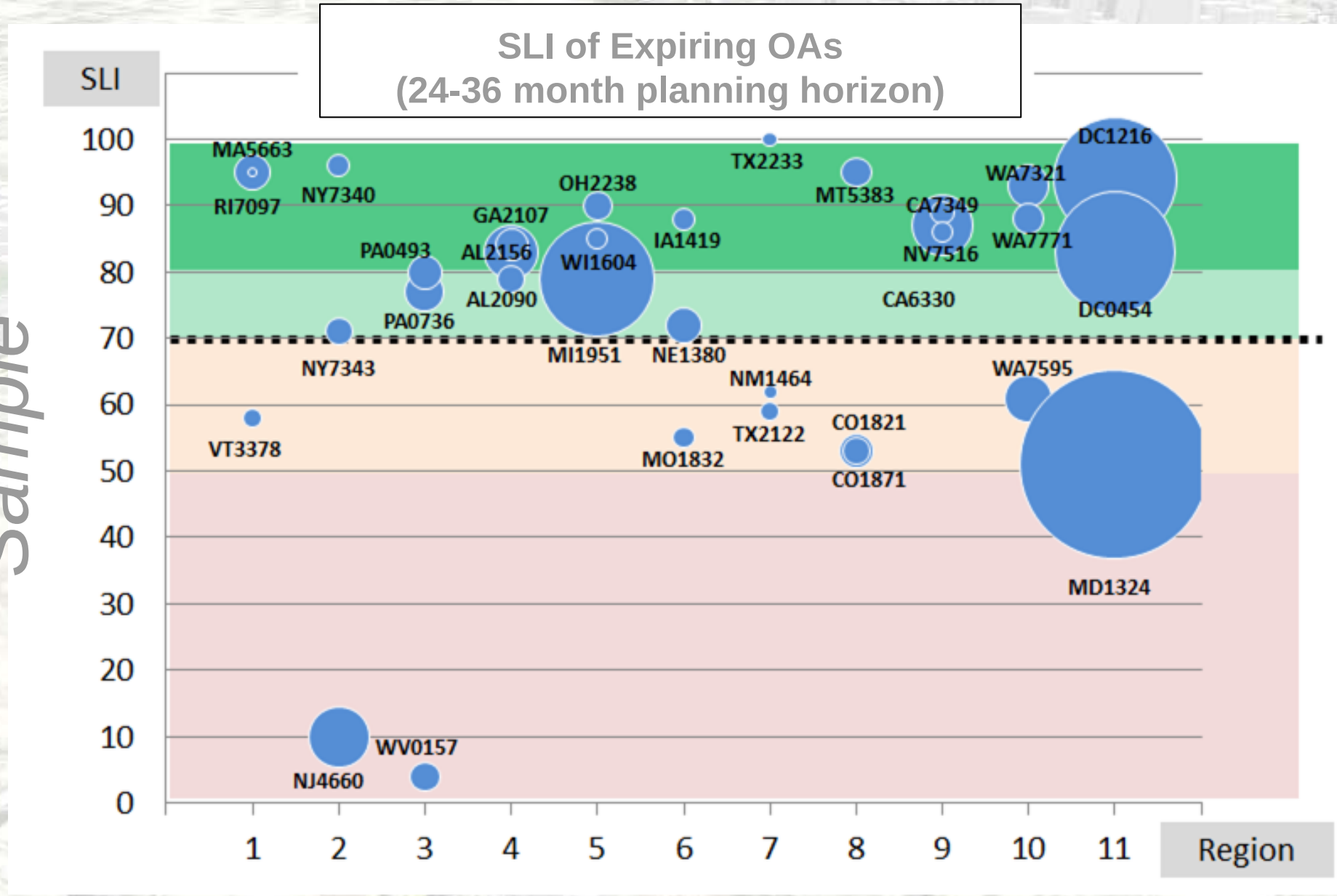
Sample

- New transactions
- All Transactions & Overall Inventory
- Downloadable data

Smart Location Index (SLI) - Recent Activity
Effective date: May-Jun-Jul 2015

Region	Owner	No. Leases	RSF	*Weighting*	Weighted SLI
1	L	3	12,728	887,412	70
2	L	4	22,622	1,007,645	45
3	L	7	328,466	23,232,888	71
4	L	12	107,332	6,747,094	63
5	L	3	26,831	2,027,470	76
6	L	6	89,726	6,802,577	76
7	L	8	112,414	6,193,136	55
8	L	5	24,511	1,840,677	75
9	L	8	202,255	16,410,329	81
10	L	1	172,320	16,156,124	94
11	L	2	68,012	5,318,222	78
	Total	**59**	**1,167,217**	**86,623,573**	**74**

Other Reporting: Upcoming Opportunities



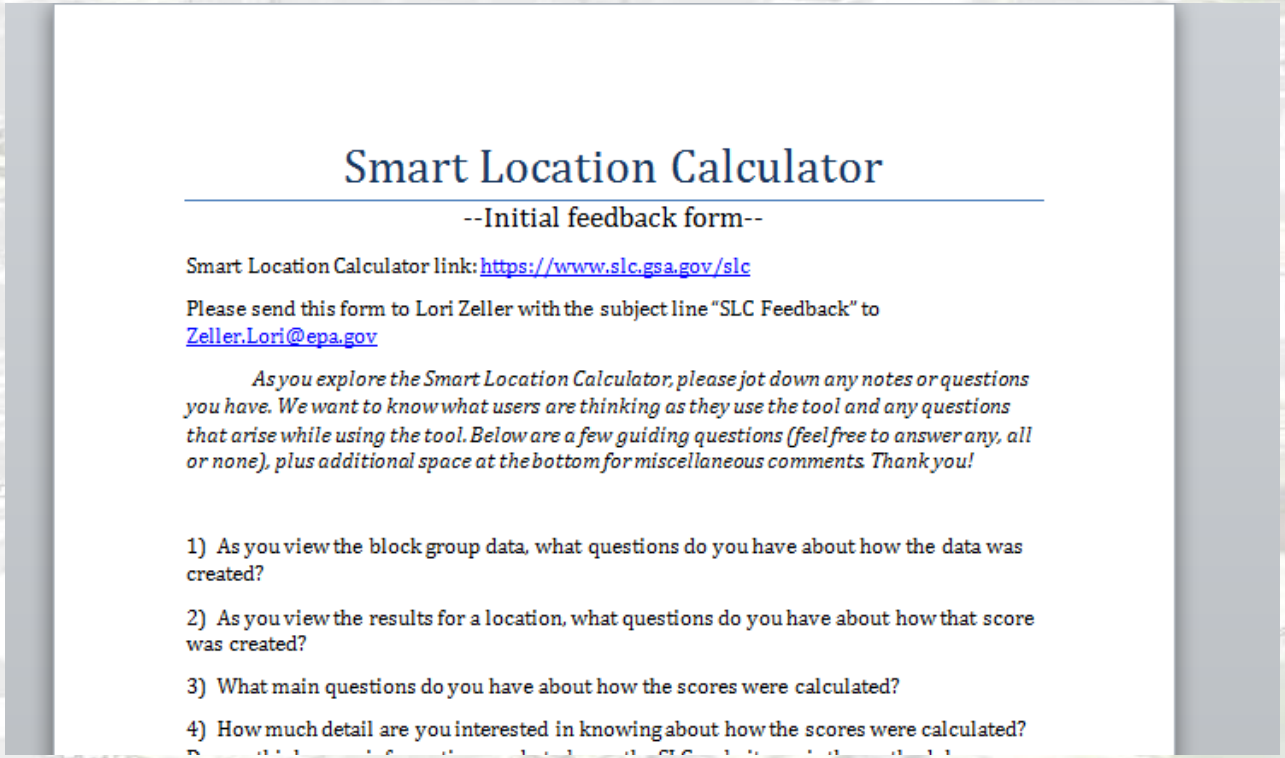
Application: Existing and Future Partnerships

- State facilities and strategic planning
  - California Strategic Growth Council
  - CA facilities in Sacramento and state-wide
  - Future state partnerships
- Rating systems
  - Use of the SLC to measure community compactness/site sustainability
- Post-webcast

Testing and Feedback

- Questions
- Use case scenarios
- Enhancements
- Methodology Critique

https://www.slc.gsa.gov/slc



Smart Location Calculator

--Initial feedback form--

Smart Location Calculator link: https://www.slc.gsa.gov/slc

Please send this form to Lori Zeller with the subject line "SLC Feedback" to Zeller.Lori@epa.gov

As you explore the Smart Location Calculator, please jot down any notes or questions you have. We want to know what users are thinking as they use the tool and any questions that arise while using the tool. Below are a few guiding questions (feel free to answer any, all or none), plus additional space at the bottom for miscellaneous comments. Thank you!

1) As you view the block group data, what questions do you have about how the data was created?

2) As you view the results for a location, what questions do you have about how that score was created?

3) What main questions do you have about how the scores were calculated?

4) How much detail are you interested in knowing about how the scores were calculated?

Email Lori Zeller at zeller.lori@epa.gov

Questions?

Ruth E. Kroeger

GSA Urban Development Program

ruth.kroeger@gsa.gov

(202) 208-3288

Frank Giblin

GSA Urban Development Program

frank.giblin@gsa.gov

(202) 501-1856

Lori Zeller

EPA Office of Sustainable Communities

zeller.lori@epa.gov

(202) 566-0549

John Thomas

EPA Office of Sustainable Communities

Thomas.john@epa.gov

(202) 566-1285