URISA

ANAHEIM, CA
September 29–October 2, 2009

CORE INFORMATION CHALLENGES AND OPPORTUNITIES, 2010-2020: BUILDING ON STRENGTHS

Wellar Consulting Inc.   Dr. Barry Wellar

CORE INFORMATION CHALLENGES AND OPPORTUNITIES, 2010-2020: BUILDING ON STRENGTHS

Dr. Barry Wellar
wellarconsulting.com

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This is No Time for Business As Usual

URISA
ANAHEIM, CA
September 29–October 2, 2009

URISA

URISA 2009 Annual Conference & Exposition
Providing Solutions to Challenges

September 29 - October 2, 2009 • Anaheim Marriott • Anaheim, California

KEYNOTE ADDRESS

Prior Presentations on Core Information Challenges and Opportunities?
Yes, I've Done a Few,
Some of Them with Some of You

CONTEXT (3)

CRITERIA (1)

TIMEFRAME (2)

THEMES (1)

VITAL LINK (1)

STRENGTHEN IIs (7)

CLIMATE CHANGE & II (7)

SAFETY AND SECURITY (8)

GIS LEARNING TOOL (4)

SEIZE THE DECADE (1)

"Evolution of Information Systems as Essential Infrastructure in Urban and Regional Governments"
1977 URISA Conference
(URISA Proceedings, Vol. 1, 20-28)

"Achievements and Challenges in the Field of Automated Cartography: Their Societal Significance"
1983 International Symposium on Automated Cartography
(Auto-Carto Six Proceedings, Vol. 1, 2-13)

"Science, Applications, Coherence, and GIS: Seizing the Moment"
1990 GIS/LIS Conference
(GIS/LIS Proceedings, Vol. 2, 854-871)

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"IS/GIS Progress in Perspective:
The Rationale and Terms of Reference for a
Major Bench-Marking"
1992 URISA Conference
(URISA Proceedings, Vol. V, 1-14)

"Information and Knowledge Bases for Decision Making"
1992 URISA Conference
(URISA Proceedings, Vol. V, 85-105)

"A Progress Report on Public Policy Objectives
Achieved Through IS/GIS/LIS"
1992 URISA Conference
(URISA Proceedings, Vol. V, 117-144)

Slide 2

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Prior Presentations on Core Information Challenges and Opportunities?
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SEIZE THE DECADE (1)

"Significant Advances in Applied Geography from Combining Curiosity-Driven and Client-Driven Research Methodologies"
2005 Anderson Lecture
Association of American Geographers
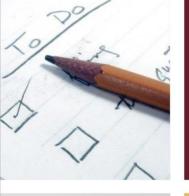http://agsg.binghamton.edu/wellar2005.pdf

"Sustainable Transport by Design or by Default? Either Way, the Wasteful Ride is Over"
2007 National TravelWise Association Conference
http://www.transport2000.ca/

Slide 3

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Criteria for Recognizing Strengths Upon Which to Build a Core Information Challenges and Opportunities Program

KEYNOTE ADDRESS

☑ **CONTEXT (3)**

CRITERIA (1)

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CLIMATE CHANGE & II (7)

SAFETY AND SECURITY (8)

GIS LEARNING TOOL (4)

SEIZE THE DECADE (1)

- **The measurable impacts of URISA in the family of IS fields (DSIS, EIS, FIS, GIS, HIS, LIS, MIS, PIS, PPIS, TIS, W/WWIS, etc.).**

- **The kinds and amounts of URISA product "adopted" by individuals and organizations.**

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Criteria for Recognizing Strengths Upon Which to Build a Core Information Challenges and Opportunities Program

KEYNOTE ADDRESS

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SAFETY AND SECURITY (8)

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SEIZE THE DECADE (1)

Why the Timeframe (1)?

A timeframe for action is **required** to become the "Go To" organization in the next decade for those needing to tie in **NOW** with a group that understands why and how core information connects time, space, and matters that matter.

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Criteria for Recognizing Strengths Upon Which to Build a Core Information Challenges and Opportunities Program

KEYNOTE ADDRESS

☑ **CONTEXT (3)**

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GIS LEARNING TOOL (4)

SEIZE THE DECADE (1)

Why the 2010-2020 Timeframe (2)?

• Short enough to establish a sense of immediacy.

• Long enough to achieve significant outputs.

• The right length to capture and hold the attention of individuals, enterprises, and government agencies.

• It starts **NOW**.

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KEYNOTE ADDRESS

Themes for 2009 URISA Keynote:
Focus on Core Information

☑ *CONTEXT (3)*

☑ *CRITERIA (1)*

☑ *TIMEFRAME (2)*

THEMES (1)

VITAL LINK (1)

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CLIMATE CHANGE & II (7)

SAFETY AND SECURITY (8)

GIS LEARNING TOOL (4)

SEIZE THE DECADE (1)

- **Strengthening Interdependent Infrastructures**

- **Climate Change Mitigation and Adjustment**

- **Safety and Security**

- **GIS as a Societal Learning Tool**

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Linking URISA and the Four Themes Through Information

CONTEXT (3)

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VITAL LINK (1)

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GIS LEARNING TOOL (4)

SEIZE THE DECADE (1)

URISA	Information	Interdependent Infrastructures
URISA	Information	Climate Change Mitigation and Adjustment
URISA	Information	Safety and Security
URISA	Information	GIS as a Societal Learning Tool

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Strengthening Interdependent Infrastructures (1)

☑ *CONTEXT (3)*

☑ *CRITERIA (1)*

☑ *TIMEFRAME (2)*

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GIS LEARNING TOOL (4)

SEIZE THE DECADE (1)

Illustrative Infrastructures

1. **Communications and Information Technology** (including telecommunications [phone, fax, cable, satellites], broadcasting systems, software, hardware, and networks [including the Internet]);
2. **Energy and Utilities** (including electrical and nuclear power, natural gas and oil production and transmission systems, and dams);
3. **Finance** (including banking, securities and investment);
4. **Food** (including food safety, agriculture and food industry, and food distribution);
5. **Government** (major government facilities, services [e.g., meteorological services] and information networks or assets, key national symbols [cultural institutions and national sites and monuments]);
6. **Health Care** (including hospitals, health-care facilities, blood-supply facilities, laboratories, and pharmaceutical stockpiles);
7. **Manufacturing** (including chemical industry and defense industrial base);
8. **Safety** (including chemical, biological, radiological, and nuclear safety, search and rescue, emergency services [police, fire, ambulance and others] and dams);
9. **Transportation** (including air, rail, marine, and surface);
10. **Water** (including drinking water, wastewater and wastewater management).

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Strengthening Interdependent Infrastructures (2)

☑ *CONTEXT (3)*

☑ *CRITERIA (1)*

☑ *TIMEFRAME (2)*

☑ *THEMES (1)*

☑ *VITAL LINK (1)*

STRENGTHEN IIs (7)

CLIMATE CHANGE & II (7)

SAFETY AND SECURITY (8)

GIS LEARNING TOOL (4)

SEIZE THE DECADE (1)

The General How Question

How can URISA and its members build on its record of research and applications in <u>information systems</u> to strengthen the linkages between interdependent infrastructures?

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Strengthening Interdependent Infrastructures (3)

The Specific How Question

How can better information and better information systems help to <u>both</u>:

- **Achieve the positive benefits of interdependent infrastructures?**

- **Reduce the risk that a weakness in one or more infrastructures causes other infrastructures to fail?**

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Strengthening Interdependent Infrastructures (4)

Initial Inventory of Interdependent Infrastructures (II)

	C&I Tech	Ener&Util	Finance	Food	Gov't	Health	Mfg	Safety	Trans	Water
C&I Tech	1,1	1,2	1,3	1,4	1,5	1,6	1,7	1,8	1,9	1,10
Ener&Util	2,1	2,2	2,3	2,4	2,5	2,6	2,7	2,8	2,9	2,10
Finance	3,1	3,2	3,3	3,4	3,5	3,6	3,7	3,8	3,9	3,10
Food	4,1	4,2	4,3	4,4	4,5	4,6	4,7	4,8	4,9	4,10
Gov't	5,1	5,2	5,3	5,4	5,5	5,6	5,7	5,8	5,9	5,10
Health	6,1	6,2	6,3	6,4	6,5	6,6	6,7	6,8	6,9	6,10
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Safety	8,1	8,2	8,3	8,4	8,5	8,6	8,7	8,8	8,9	8,10
Trans	9,1	9,2	9,3	9,4	9,5	9,6	9,7	9,8	9,9	9,10
Water	10,1	10,2	10,3	10,4	10,5	10,6	10,7	10,8	10,9	10,10

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Strengthening Interdependent Infrastructures (5)

☑ *CONTEXT (3)*

☑ *CRITERIA (1)*

☑ *TIMEFRAME (2)*

☑ *THEMES (1)*

☑ *VITAL LINK (1)*

STRENGTHEN IIs (7)

CLIMATE CHANGE & II (7)

SAFETY AND SECURITY (8)

GIS LEARNING TOOL (4)

SEIZE THE DECADE (1)

Steps in the "Go To" Process

- Base claim as the "Go To Organization" for interdependent infrastructures information (III) on a proven record of science, applications, coherence, GIS, and sharing.

- Champion interdependent infrastructures information (III) as a core enterprise decision support component.

- Build partnerships with organizations that complement URISA's **Triple-I** agenda.

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KEYNOTE ADDRESS

Strengthening Interdependent Infrastructures (6)

☑ **CONTEXT (3)**

☑ **CRITERIA (1)**

☑ **TIMEFRAME (2)**

☑ **THEMES (1)**

☑ **VITAL LINK (1)**

STRENGTHEN IIs (7)

CLIMATE CHANGE & II (7)

SAFETY AND SECURITY (8)

GIS LEARNING TOOL (4)

SEIZE THE DECADE (1)

Raise the Bar on Examining How "Cascading" Affects Interdependent Infrastructures

• Elaborate both the positive and the negative aspects of cascading between/among interdependent infrastructures.

• Elaborate the information and information systems needed to perform analyses and evaluations of cascading causes and effects between/among interdependent infrastructures.

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Strengthening Interdependent Infrastructures (7)

☑ *CONTEXT (3)*

☑ *CRITERIA (1)*

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☑ *VITAL LINK (1)*

STRENGTHEN IIs (7)

CLIMATE CHANGE & II (7)

SAFETY AND SECURITY (8)

GIS LEARNING TOOL (4)

SEIZE THE DECADE (1)

Raise the Bar on the Criteria Used to Test for Critical Information on "Cascading" Causes and Effects

- **Pertinent**

- **Robust**

- **Timely**

- **Spatial**

- **Dynamic**

- **Text, Numerics, Graphics**

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Climate Change Mitigation and Adjustment (1)

CONTEXT (3)

CRITERIA (1)

TIMEFRAME (2)

THEMES (1)

VITAL LINK (1)

STRENGTHEN IIs (7)

CLIMATE CHANGE & II (7)

SAFETY AND SECURITY (8)

GIS LEARNING TOOL (4)

SEIZE THE DECADE (1)

General II Aspect of Climate Change

Successful climate change mitigation and adjustment depends in part upon how well we understand the actual, real-world contributions that the interdependence of infrastructures such as Communications and Information Technology, Energy, Finance, Food, Manufacturing, Transportation, and Water makes to climate change processes and outcomes.

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Climate Change Mitigation and Adjustment (2)

Specific II Aspect of Climate Change

	C&I Tech	Ener&Util	Finance	Food	Gov't	Health	Mfg	Safety	Trans	Water
C&I Tech	1,1	1,2	1,3	1,4	1,5	1,6	1,7	1,8	1,9	1,10
Ener&Util	2,1	2,2	2,3	2,4	2,5	2,6	2,7	2,8	2,9	2,10
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Climate Change Mitigation and Adjustment (3)

☑ *CONTEXT (3)*

☑ *CRITERIA (1)*

☑ *TIMEFRAME (2)*

☑ *THEMES (1)*

☑ *VITAL LINK (1)*

☑ *STRENGTHEN IIs (7)*

CLIMATE CHANGE & II (7)

SAFETY AND SECURITY (8)

GIS LEARNING TOOL (4)

SEIZE THE DECADE (1)

The II Information Aspect of Climate Change

• Identify the **II information** that is needed for climate change mitigation and adjustment programs involving urban and regional governments.

• NOTA BENE: Infrastructure interdependence cuts both ways, and core information potentially resides in all the II cells. URISA NEEDS TO FOCUS ON CELLS FOR WHICH IT HAS CREDIBILITY THROUGH EXPERTISE AND EXPERIENCE.

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Climate Change Mitigation and Adjustment (4)

☑ *CONTEXT (3)*

☑ *CRITERIA (1)*

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☑ *THEMES (1)*

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☑ *STRENGTHEN IIs (7)*

CLIMATE CHANGE & II (7)

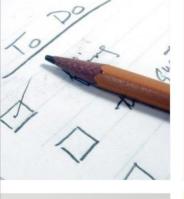*SAFETY AND SECURITY (8)*

GIS LEARNING TOOL (4)

SEIZE THE DECADE (1)

II Information System Design

Specify how **II information** can best be created for and applied by urban and regional governments to achieve climate change mitigation and adjustment measures.

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Climate Change Mitigation and Adjustment (5)

CONTEXT (3)

CRITERIA (1)

TIMEFRAME (2)

THEMES (1)

VITAL LINK (1)

STRENGTHEN IIs (7)

CLIMATE CHANGE & II (7)

SAFETY AND SECURITY (8)

GIS LEARNING TOOL (4)

SEIZE THE DECADE (1)

II Information System Demos

Demonstrate through workshops and conference programs how **II information** can best be created for and applied by urban and regional governments to achieve climate change mitigation and adjustment measures.

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Climate Change
Mitigation and Adjustment (6)

☑ *CONTEXT (3)*

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☑ *THEMES (1)*

☑ *VITAL LINK (1)*

☑ *STRENGTHEN IIs (7)*

CLIMATE CHANGE & II (7)

SAFETY AND SECURITY (8)

GIS LEARNING TOOL (4)

SEIZE THE DECADE (1)

Walk the Talk on II Information

Champion and demonstrate **due regard** for interdependent infrastructures information (III) in the design and implementation of climate change mitigation and adjustment measures.

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Climate Change Mitigation and Adjustment (7)

☑ *CONTEXT (3)*

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☑ *VITAL LINK (1)*

☑ *STRENGTHEN IIs (7)*

CLIMATE CHANGE & II (7)

SAFETY AND SECURITY (8)

GIS LEARNING TOOL (4)

SEIZE THE DECADE (1)

Focus on Quantitative Approach

Champion and demonstrate **due regard** for the role of quantitative methods, techniques, and information in making decisions on climate change issues at the urban and regional scale.

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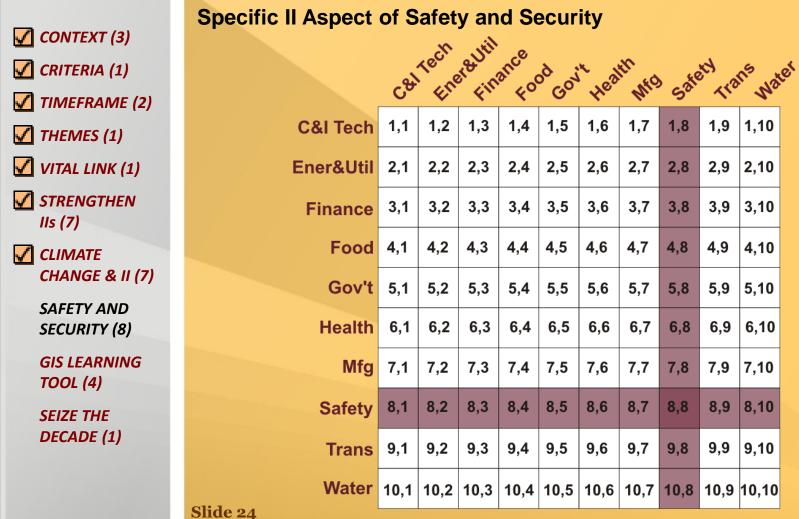
Safety and Security (1)

General II Aspect of Safety and Security

Dealing with interdependent infrastructures significantly increases the scope of the safety and security infrastructure, and involves a new order of information system complexity.

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Safety and Security (2)

Specific II Aspect of Safety and Security

	C&I Tech	Ener&Util	Finance	Food	Gov't	Health	Mfg	Safety	Trans	Water
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Safety and Security (3)

☑ *CONTEXT (3)*

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☑ *STRENGTHEN IIs (7)*

☑ *CLIMATE CHANGE & II (7)*

SAFETY AND SECURITY (8)

GIS LEARNING TOOL (4)

SEIZE THE DECADE (1)

The II Information Aspect of Safety and Security

- Identify the **II information** that is needed for safety and security programs involving urban and regional governments.

- NOTA BENE: Interdependence cuts both ways, and core information resides in all the II cells. URISA NEEDS TO FOCUS ON CELLS FOR WHICH IT HAS CREDIBILITY THROUGH EXPERTISE AND EXPERIENCE.

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Safety and Security (4)

☑ *CONTEXT (3)*

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☑ *STRENGTHEN IIs (7)*

☑ *CLIMATE CHANGE & II (7)*

SAFETY AND SECURITY (8)

GIS LEARNING TOOL (4)

SEIZE THE DECADE (1)

II-Based Information System Design

Specify how **II information** can best be created for and applied by urban and regional governments to achieve safety and security objectives.

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Safety and Security (5)

☑ *CONTEXT (3)*

☑ *CRITERIA (1)*

☑ *TIMEFRAME (2)*

☑ *THEMES (1)*

☑ *VITAL LINK (1)*

☑ *STRENGTHEN IIs (7)*

☑ *CLIMATE CHANGE & II (7)*

SAFETY AND SECURITY (8)

GIS LEARNING TOOL (4)

SEIZE THE DECADE (1)

II-Based Information System Demos

Demonstrate through workshops and conference programs how **II information** can best be created for and applied at the urban and regional scale to achieve safety and security objectives.

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KEYNOTE ADDRESS

Safety and Security (6)

☑ *CONTEXT (3)*

☑ *CRITERIA (1)*

☑ *TIMEFRAME (2)*

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☑ *CLIMATE CHANGE & II (7)*

SAFETY AND SECURITY (8)

GIS LEARNING TOOL (4)

SEIZE THE DECADE (1)

Walk the Talk on II Information

Champion and demonstrate **due regard** for interdependent infrastructures information (III) in the design and implementation of safety and security initiatives at the urban and regional scale.

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Safety and Security (7)

Focus on the Quantitative Approach

Champion and demonstrate **<u>due regard</u>** for the role of quantitative methods, techniques, and information in making decisions on safety and security issues at the urban and regional scale.

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Safety and Security (8)

☑ *CONTEXT (3)*

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☑ *CLIMATE CHANGE & II (7)*

SAFETY AND SECURITY (8)

GIS LEARNING TOOL (4)

SEIZE THE DECADE (1)
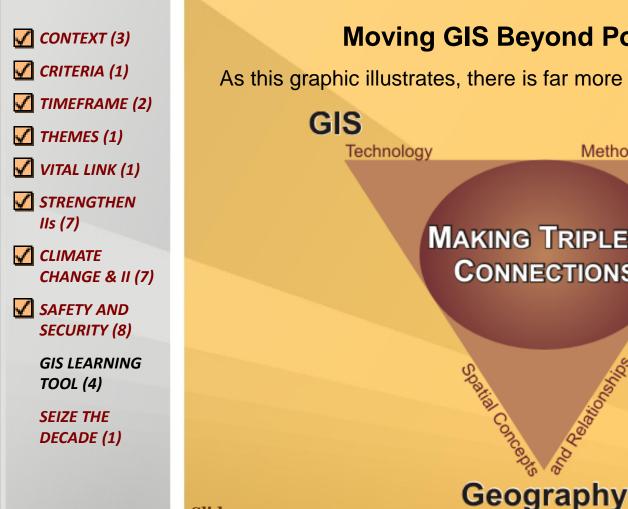
Use Information as Key to Partnerships
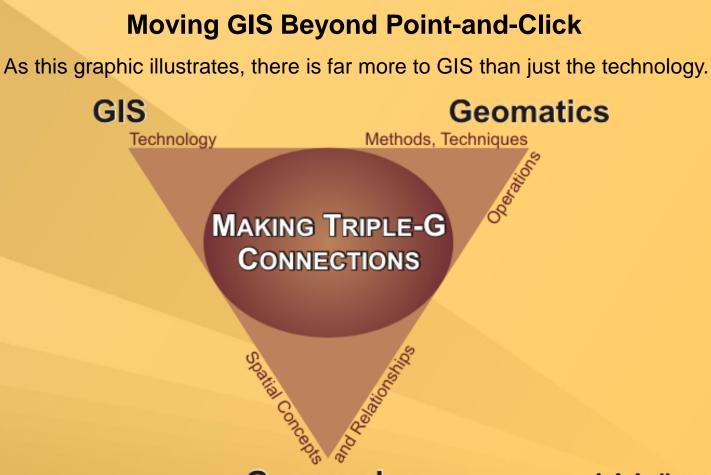
Focus on the <u>process of producing information</u> as a key means of integrating multi-disciplinary research and applications on the safety and security of interdependent infrastructures at the urban and regional scale.
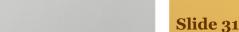
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GIS as a Societal Learning Tool (1)

Moving GIS Beyond Point-and-Click

As this graphic illustrates, there is far more to GIS than just the technology.

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GIS as a Societal Learning Tool (2)

- ☑ *CONTEXT (3)*
- ☑ *CRITERIA (1)*
- ☑ *TIMEFRAME (2)*
- ☑ *THEMES (1)*
- ☑ *VITAL LINK (1)*
- ☑ *STRENGTHEN IIs (7)*
- ☑ *CLIMATE CHANGE & II (7)*
- ☑ *SAFETY AND SECURITY (8)*
- *GIS LEARNING TOOL (4)*
- *SEIZE THE DECADE (1)*

Promoting Civic Engagement Via GIS

The challenge and opportunity for URISA is to frame how GIS is a "citizen-friendly" means of learning about the spatial dimensions and urban and regional implications of interdependent infrastructures, climate change mitigation and adjustment measures, and safety and security issues.

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GIS as a Societal Learning Tool (3)

☑ *CONTEXT (3)*

☑ *CRITERIA (1)*

☑ *TIMEFRAME (2)*

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☑ *SAFETY AND SECURITY (8)*

GIS LEARNING TOOL (4)

SEIZE THE DECADE (1)

Inducing Civic Engagement Via GIS

Courtesy of the Internet, there are many ways for citizens to virtually and vicariously participate in civic affairs. However, very serious thought is required to design a GIS-based program of learning and communicating that induces citizens to **engage** in civic affairs.

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GIS as a Societal Learning Tool (4)

Engaging Citizens as
GIS Advocates and Promoters

Figuring out how to actively involve citizens as demonstrators and users of GIS sciences and technology is key to engaging them in civic affairs.

URISA has the experience and expertise to lead this mission.

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Core Information Challenges and Opportunities, 2010-2020: Building on Strengths

☑ *CONTEXT (3)*

☑ *CRITERIA (1)*

☑ *TIMEFRAME (2)*

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☑ *CLIMATE CHANGE & II (7)*

☑ *SAFETY AND SECURITY (8)*

☑ *GIS LEARNING TOOL (4)*

SEIZE THE DECADE (1)

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About the Keynote Speaker

☑ *CONTEXT (3)*

☑ *CRITERIA (1)*

☑ *TIMEFRAME (2)*

☑ *THEMES (1)*

☑ *VITAL LINK (1)*

☑ *STRENGTHEN IIs (7)*

☑ *CLIMATE CHANGE & II (7)*

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☑ *GIS LEARNING TOOL (4)*

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Barry Wellar Bio-Note, URISA 2009 Plenary Address

Barry Wellar is from Latchford, Ontario, and is a graduate of Queen's University and Northwestern University. Formerly Assistant Professor of Geography and Research Associate, University of Kansas, and Senior Policy Advisor, Ministry of State for Urban Affairs, Government of Canada, Dr. Wellar is now Emeritus Professor, Geography and Environmental Studies, University of Ottawa, Principal, Wellar Consulting Inc., Distinguished Research Fellow, Transport 2000 Canada, Policy and Research Advisor, Federation of Urban Neighbourhoods (Ontario), and Distinguished Geomatics and GIS Scientist, Lab for Applied Geomatics and GIS Science, University of Ottawa. He is a Registered Professional Planner, is qualified as an expert witness in transportation, and is a URISA Past President (1978).

Dr. Wellar recently served on the Interdependent Infrastructures Panel, Public Safety and Emergency Preparedness Canada, and the Strategic Safety and Security Panel, Natural Sciences and Engineering Research Council (Canada). He is currently Program Director, Geographic Awareness Week, Canadian Association of Geographers, and Chair, Anderson Medal Committee, Association of American Geographers.

Recognitions for his contributions in information systems, transportation, research methodology, community development and planning, and applied geography include the Horwood Award and the Distinguished Service Award, Urban and Regional Information Systems Association, the Anderson Medal of Honor in Applied Geography and the Ullman Award in Transportation, Association of American Geographers, the Award of Merit, National Association of Towns and Townships (U.S), and the Service to Government and Business Award, Canadian Association of Geographers.

The title of Dr. Wellar's 2009 URISA keynote address is "Core Information Challenges and Opportunities, 2010-2020: Building on Strengths."

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Affiliation Acknowledgements

- ☑ *CONTEXT (3)*
- ☑ *CRITERIA (1)*
- ☑ *TIMEFRAME (2)*
- ☑ *THEMES (1)*
- ☑ *VITAL LINK (1)*
- ☑ *STRENGTHEN IIs (7)*
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- ☑ *SEIZE THE DECADE (1)*

The contributions of the following affiliations to the 2009 URISA plenary, **Core Information Challenges and Opportunities, 2010-2020: Building on Strengths**, are gratefully acknowledged.

Chair, Anderson Medal Committee, Association of American Geographers

Member, Public Safety and Emergency Preparedness Panel, Government of Canada

Past President (1978), Urban and Regional Information Systems Association

Senior Research Officer, Director, and Policy Advisor, Urban Affairs, Canada

Member, Interdependent Infrastructures Panel and Strategic Safety and Security Panel, Natural Sciences and Engineering Research Council of Canada

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Program Director, Geography Awareness Week, Canadian Association of Geographers

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