

# Land-use Decision Support Workshop

Reducing Risks From Hazards



## Visual Report

Simon Fraser University Downtown Campus –  
Vancouver, BC

September 17, 2010



you think it, i ink it

# Congratulations on a successful workshop!

This visual summary captures discussions and activities that took place as participants from a range of disciplines came together to create a guide for considering land-use options to build disaster resilience. You have received a PDF version of this report, jpg's of the individual images and the original wall-size charts. Here are a few suggestions on using these images:

Distribute them to participants as soon as possible

Capitalize on the momentum from your session! Get the images into the hands of the participants right away so they can progress to developing actions steps while the energy is high. Circulate prints, post them to your website, or email the report.

Hang them in individual/common work areas

Maintain your focus by posting them somewhere where you/others will see them daily. Select one or two key visuals or consider having them summarized into one custom visual. In sight = in mind.

Continue to work on them

Continue to dialogue with colleagues and add to the visuals. Get out your markers from time to time - build on ideas, add new thoughts, developments and supporting information.

Review them periodically as a group

Bring the images to other related meetings. Review and discuss them from time to time. Use them to get fresh perspective --- celebrate accomplishments and zero in on areas for further action.

Share them with absentees or new employees

Present the images to other professionals who couldn't attend or use them to orient newly interested parties to the issues. The images are packed with meaning, especially for those who took part in the creation of them. Solicit an attendee to provide a little context and explanation for others.

# Meeting Agenda

Welcome	Bert Struik – Natural Resources Canada
Official Welcome	Heather Lyle – Emergency Management British Columbia
Purpose	Bert Struik – Natural Resources Canada
Introduction	Murray Day – Justice Institute of BC
Keynote Presentation	Ken Topping – Topping Associates International
Working Session #1 – Within Discipline	Participants
Working Session #2 – Mixed Groups by Domain	Participants
Presentation – Risk-based Planning: Land Use Simulation	Bert Struik, Natural Resources Canada
Graphic Review Walk About	Participants
Working Session #3 – Mixed Domain Groups by Planning Phase	Participants
Discussion of Working Session #3 Findings	Participants
Closing	Participants



Bert Struik opened the morning and explained the purpose of the workshop:

- 1) to create a guide for considering land-use options to build disaster resilience
- 2) build a mitigation network, encouraging sharing of knowledge and experience

# Keynote Presentation

Ken Topping of Topping Associates International spoke about best practices in building disaster resilience along the Westcoast (USA).



# Morning Activities



Keynote speaker, Ken Topping.



Working Session #1



Participants gathered in their disciplines to consider a scenario across 4 domains (knowledge, risk definition, decision-making and governance).

# Working Session #1 - Within Discipline



In plenary, participants reported important considerations across the four domains.

Flipcharts recorded by each group included in Appendix A.

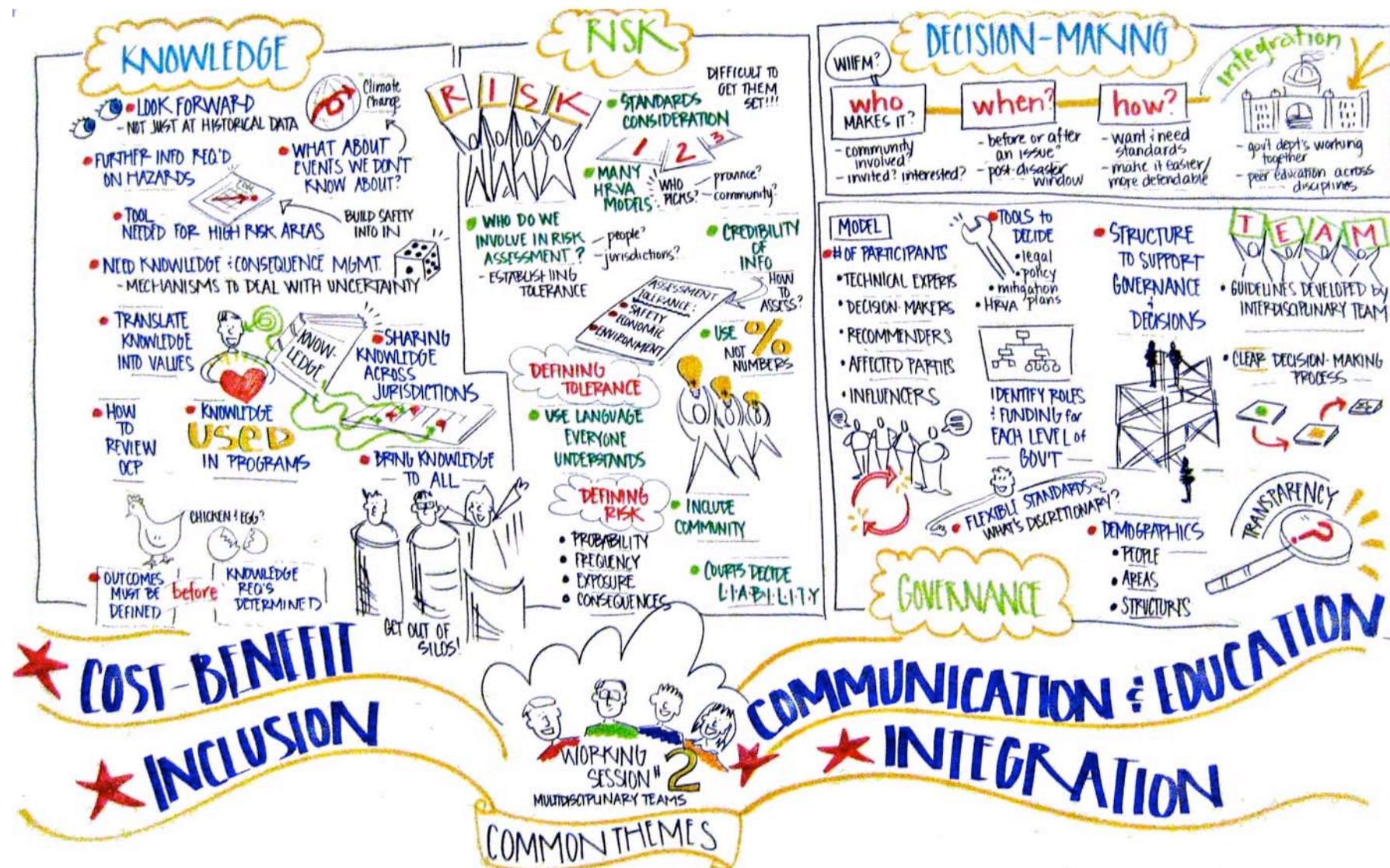
# Working Session #2 – Mixed Groups by Domain



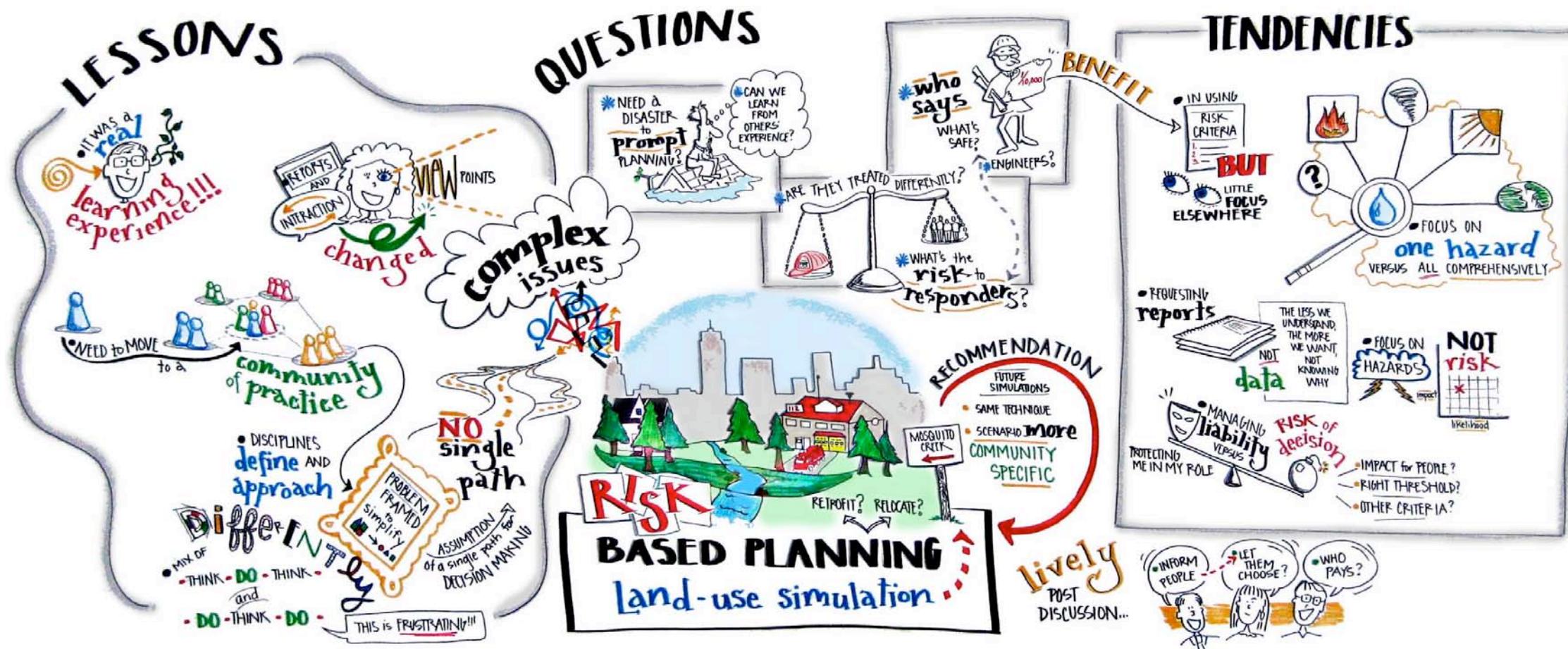
Next, in multi-disciplinary groups, each group considered one domain.

Important ideas and shared themes were identified from flipcharts recorded by each group.

Flipcharts included in Appendix B.



# Land Use Simulation – Key Findings



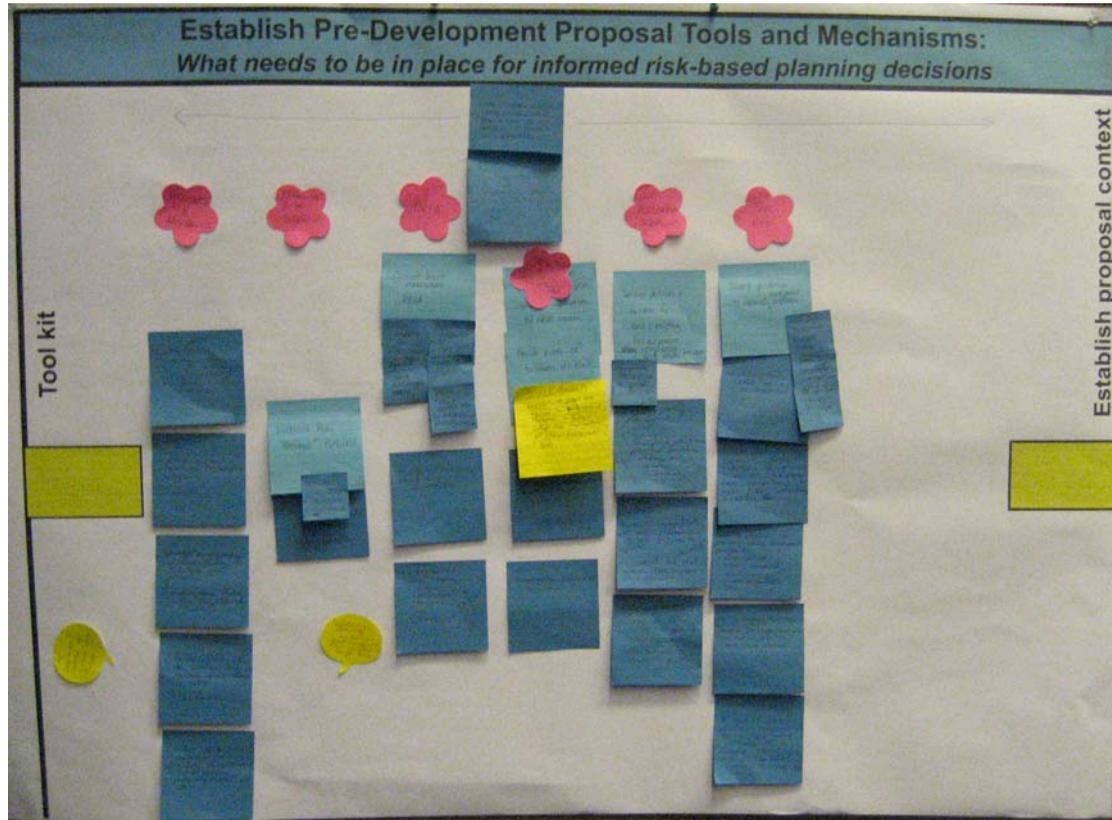
Between working sessions, Bert Struik presented key findings from a land use simulation exercise conducted earlier in the week. Participants heard how other groups experienced a similar risk-based planning exercise.

## Working Session #3 – Mixed Domain by Planning Phase

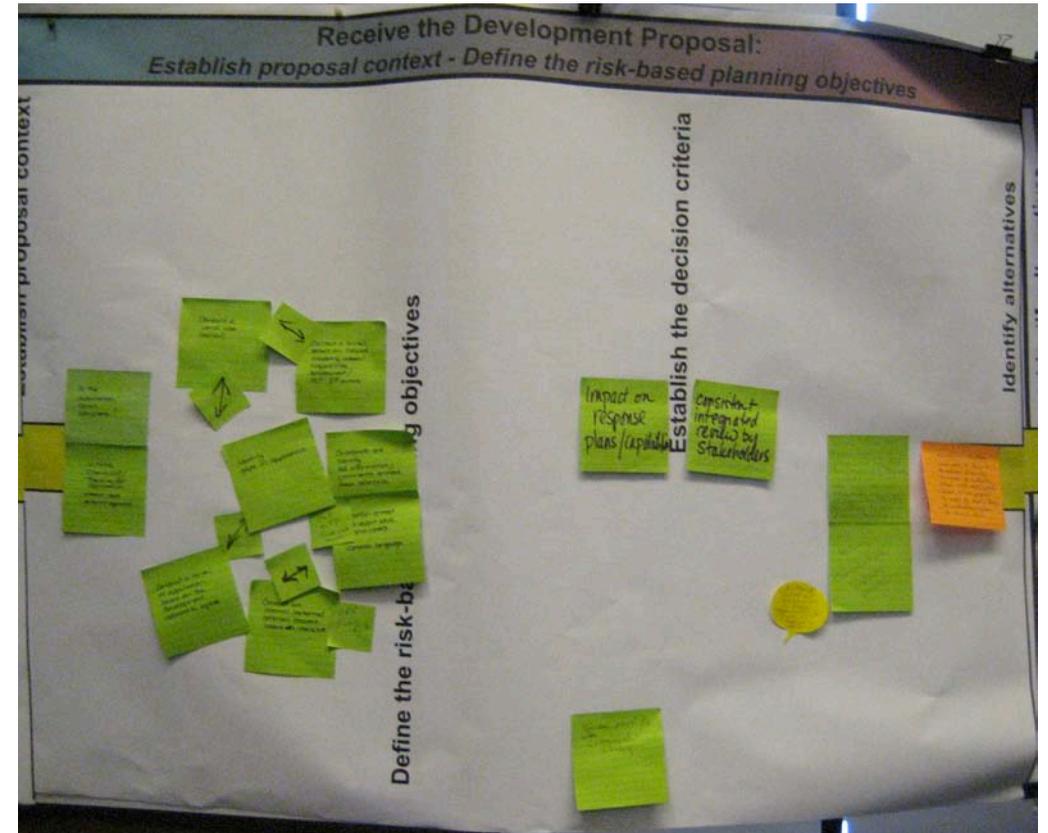


After reviewing the graphic recordings and reflecting on the previous working sessions, new groups were formed to develop pathways outlining key elements, resources and data required in planning phases. Ideas recorded on sticky notes were then used to create a large graphic banner displaying the requirements for four planning phases (prior to considering development, receiving the proposal, evaluating and deciding, evaluating the decision and monitoring)

# Pathways Banner – Planning Phases 1&2



Prior to considering development.



Receiving the development proposal.

# Pathways Banner – Planning Phases 3&4

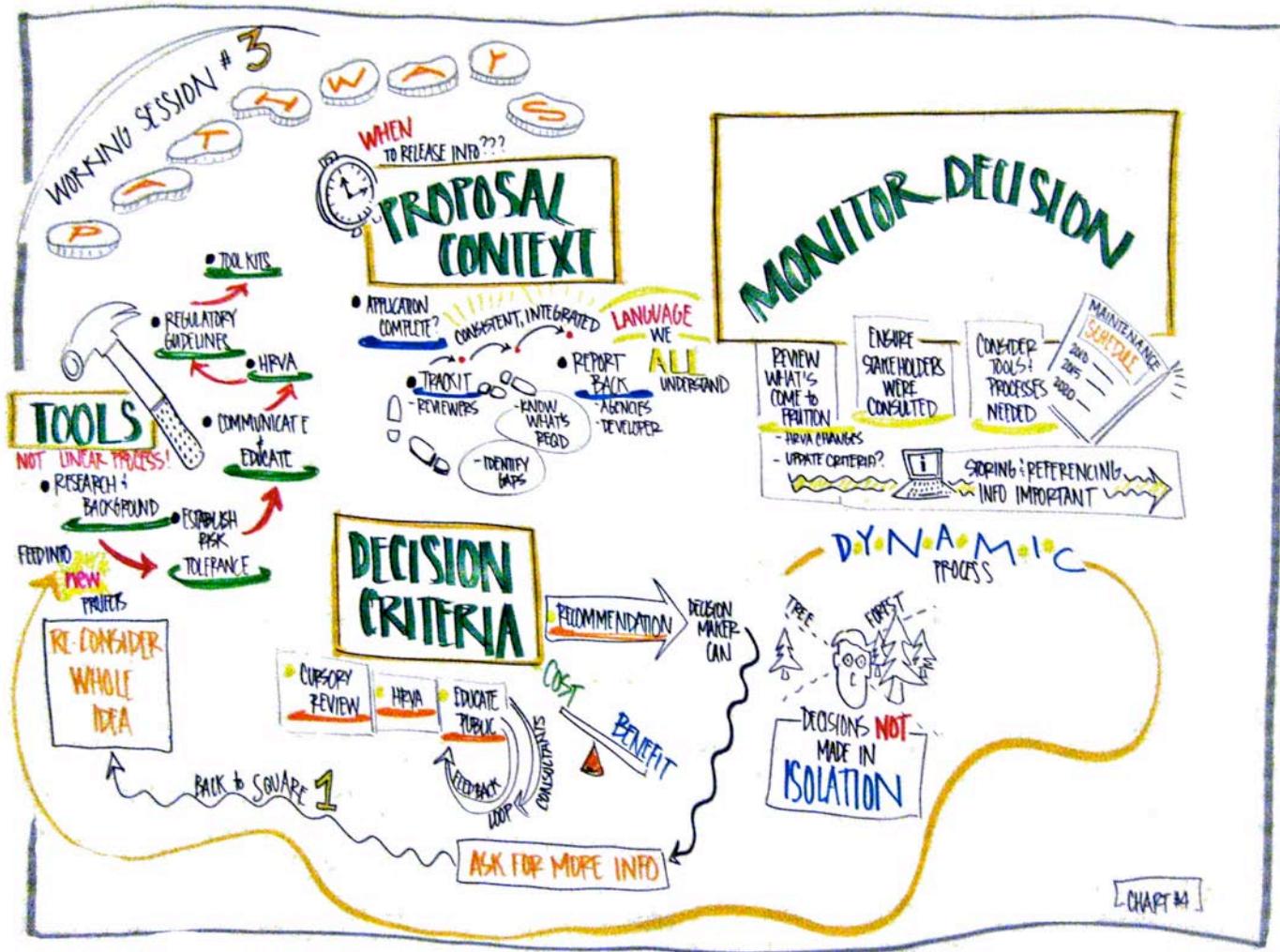


Evaluating and deciding on the proposal.



Once built, evaluating the decision and monitoring for change.

# Pathways Banner



A representative from each group reported back in plenary, explaining process requirements for each planning stage. The group then considered gaps, clarifying questions and points of emphasis before the workshop came to a close. The work done allows the development of the first draft of a land-use guide.



Bert Struik and Laurie Pearce.

## About Get The Picture



Lisa Arora works as a graphic facilitator and a graphic recorder. A professional through and through, she prides herself on creating meaningful visual imprints of each meeting. Her ability to achieve a high level of group interaction, with humour and style, make her a driving force throughout the meeting process.

With more than 10 years of facilitation experience Lisa's solid background in public and private sector workshop delivery give her the high level of expertise required to engage group participants to increase both interactivity and productivity.

Being a professional graphic facilitator takes more than just the ability to draw pictures. It requires a unique set of skills. The ability to manage group dynamics, high level multi-tasking and intense focus is essential.

A master of these skills, Lisa listens intently, extracts relevant information from participant input, guides the group and at the same time organizes the data into a visually meaningful graphic. Her drawings display key content, important stages in the group's collective thought processes and multiple points of view, all building consensus and group memory.

Lisa is trained in the field of graphic facilitation by well-known experts in the field, Christina Merkley and David Sibbet and is a member of the International Association for Visual Practitioners.

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# Appendix A – Working Session #1

## Engineers & Systems

BOI Engineers & Systems  
 Knowledge 1083  
 - Data - soil properties  
 - Steepness  
 - hydrology / Groundwater

Already have - hazard mapping  
 - seismic  
 - fire  
 - flood

Impacts of development on infrastructure Social  
 traffic Study

Part of Application  
 - slope stability  
 - geotech - contamination  
 - environment veg/habitat

Existing infrastructure  
 - wildlife  
 - can it cope.

Vulnerability of Hwy  
 Sensitive Structure - hosp  
 - senior  
 - schools  
 - emergency

Community plan

BOI Engineering & System 283  
 Need to know the process which involved - government - applicant

OCP → Community → Developer

Resilience Index of existing structures & infrastructure

Recovery Plan

Threshold pay  
 Insurance - limits liability  
 Build at your own risk / mitigation plan  
 Public safety  
 Due diligence - minimize potential  
 Incentives to do it right

Risk Tolerance

BOI Engineers & Systems 383  
 - Data natural & man made Systems

Resilience & Vulnerability

Monitor → baseline comparisons  
 risk exposure

Identify - mitigation measures.

# Emergency Managers

## ① EM - SESSION #1

### KNOWLEDGE

- ZONING / COMMUNITY PLANS
- VULNERABILITIES OF AREA
- DESIGN - IMPACT
- ENVIRO IMPACTS
- HOW PUBLIC CAN SHARE INFO + ISSUES?  
↳ WHO ARE AGENCIES
- DISCUSSION ON WHERE TO ACQUIRE
- LOCAL KNOWLEDGE ACCESSING

### RISK - RISK TO DECISION-MAKERS

- MULTI-HAZARD
- IMPACT ON INFRA
- MODELS IN PLACE
- ~~NO~~ IS HRVA ROBUST ENOUGH
- IS DEV MEETING RISK TOLERANCE
- WHAT IS HRVA BASED ON  
↳ \$  
↳ IS IT INCLUDED IN PLAN
- ARE APPROPRIATE PERSONNEL INVOLVED  
AGENCIES
- LOOK AT IMPACT ON OTHER COMMUNITIES

## EM - SESSION #1 ②

### GOVERNANCE

- STAKEHOLDER AGENCIES
- PARTNERSHIPS (MOA, DAA)
- COMMUNITY REVIEW
- ~~ARE APP~~ WHO HAS GOVERNANCE RESPONSIBILITY?
- IS THERE SOMEWAY OF PROTECTING DECISION-MAKERS?
- WHAT LEGISLATION IS NEEDED IN PLACE TO SUPPORT LONG TERM?

### DECISION MAKING

RESPONSE CAPABILITY  
DEVELOPER OBLIGATION  
↳ MAINTENANCE OF INFRASTRUCTURE OVER LONG TERM

### COST SHARING

BENEFITS OF DEVELOPMENT  
↳

### AFTER ACTION PROCESS

- ↳ INTEGRATED - SOUND DECISIONS
- \* HOW MUCH DO YOU INVOLVE PUBLIC
- PLANNING SHOULD INVOLVE EM - WHAT ~~DEVELOPMENT~~ IMPACT BE ON PUBLIC SAFETY?

Blue Group ①

## Knowledge

- Need for complete hazard mapping + identification
- Environmental Impacts
- All-hazards assessment approach + pot-risk
- "Should" → Key word  
↳ who pays?
- Baseline info available vs. additional info
- Quality, standards-based, updated
- Mitigation strategies for safer developments

## Defining Risk

Blue ②

- Prov. set standards for risk + define "safe for use intended"
- <sup>quantitative</sup> - risk tolerance thresholds defined  
by gov./community/qualified professionals (engineers)
- common language
- tolerable risk different for different areas/people/infrastructure/land use
- public consultation
- leg

## Science & Academics

### Governance

Blue (3)

- leadership by senior / higher government levels
- Zoning by-laws, OCP, APEGBC guidelines
- legal requirements / liabilities

standards + by-laws

→ incl. mit. strat.s

### Decision making

Blue (4)

- multi-disciplinary committee including public → all members have some access to info → w. qualified professionals
- access to knowledge

→ haz + risk  
env. impact  
mit. pot.

# Policy/Government

## Knowledge

Historical  
Future predictions  
Current

geophysical  
environmental  
ORTHO PHOTO'S  
Hydrology

\* HAZARD influence of development  
+ upstream / downstream

\* Compatibility of Infrastructure  
- Proposed  
- Existing  
|  
TRANSPORT

\* Communication - id what exists,  
who needs to be part / how notified

## Defining Risk

+ List - Multi Risk analysis  
- <sup>Economic</sup> ALL HAZARD  
- Don't forget Social  
+ psychological  
| Direct  
+ Indirect

+ Ensure all participants in process  
are educated

Hazard / Vulnerability = Risk  
(as per definition)

# Policy/Government

## Governance

- \* Identify Range of influence in making decision
  - OCP / registration selected officials
- Id Policy framework that is base
- \* How do best practices fit within the identified gov process

Reasonable steps to get  
MAX AMOUNT OF INFORMATION  
evidence informed balance  
short term / long term

Identify drivers of decision  
making process

Open Process within framework  
existing or proposed alternate  
risk / mitigative measures

## 4. Decision

- O.C.P., Zoning,  
D.P. Areas
- Good background info
- \* Community involvement
- Overall Political involvement
- Committees
- Senior govt participation
  - advisory
  - guidelines
  - legislative
- \* Economic Consequences - over all  
as Insurance coverage / Liability  
Distribution of / Responsibility for

# Appendix B – Working Session #2

## Knowledge

### Knowledge

- more conservative standard to reflect changing environment
- \* - mechanisms to deal with uncertainty
- mitigation → consequence management
- \* - learning from other events / jurisdiction
- multi-disciplinary + holistic reviews of events ⇒ update legislation / process
- comprehensive approach
- inputs need to be clear + identified before issues come up, or process too cumbersome
- need hazard assessments / risk / vulnerable populations / infrastructure into for land use
- cost / benefit
- enforcement

①

- knowledge transfer / discussion<sup>②</sup> to change culture
- cost / benefit of building code communicated to public
  - communicating investment safeguarding
- consistent messaging / communication
- hydrometric network for complete data
- all-hazards standard assessments
  - overview studies for broad area
  - regional / local / secondary for mitigation
  - site specific for DPA
- legislated hazard mapping for "OCP"
  - density for hazard avoidance
  - need to quantify more than loss of life → economic losses

②

③

- cost / benefit for mitigation<sup>③</sup>
- tools for density transferring
  - Prov. transfer bank?
- seize development / redevelopment opportunities
- seize teachable moments to change culture + value investment in mitigation / resilience
  - OCP reviews
- community communication
  - 2-way discussion
  - multi-stakeholder discussion
- bring knowledge to all disciplines
  - X-silo
- use language of user
- need knowledge of <sup>needed</sup> outcomes before knowledge can be defined

## Knowledge

### Knowledge

- \* Challenge is looking forward rather than just looking at historical data
  - ↳ modeling needs to change
- Invest in new technologies
- \* - What about events that we don't know anything about?
  - Eq. Climate Change
- What about economic realities?
- Communication re. cost/benefit analysis.
- \* - Tool for high hazard identification required
- Look for "teachable moments" opportunities
- \* - OCP reviews & self interests
- Feed safety interests into hazard information
- \* - Importance is sharing of knowledge
- \* - Knowledge re. consequence mgmt.
- How do we learn from events?
- Need to consider what caused event?
- Responding vs. looking forward
- What's the risk factor?
- Who "inputs"?
- Follow through from events Eq. legislative changes

## Knowledge

- Translate knowledge to values
- Challenge of disseminating the knowledge
- Further knowledge required re. hazards  
Identification of areas
- Is the knowledge we have being used & linked to programs & policy?

- Knowledge communication  
Problem / challenge  
Eq. Seat-belt compliance  
↳ We understand risk & safety benefit (+ legislation)  
& penalties required
- Hydrometric knowledge required to a greater extent
- Comprehensive hazard mapping required
- Density avoidance requirement
- Create mitigation code

# Defining Risk

## RISK SESSION 2 ①

### ⑤ DEFINITION

- MEASURES OF
  - PROBABILITY
  - FREQUENCY
  - EXPOSURE
  - CONSEQUENCES

CONSIDER STANDARDS AROUND IMPACT  
↳ DIFFICULT TO HAVE FEEL & PROY ON RISK TOLERANCE

WHO SHOULD BE CONSULTED & WHEN DOING HRVA?

\*1  
\*4 USE LANGUAGE THAT PEOPLE UNDERSTAND  
AROUND RISK & RISK TOLERANCE  
MANY HRVA MODELS - SHOULD COMMUNITIES PICK THEIR OWN OR SHOULD PROV SET STANDARDS

IN JURISDICTIONS OF GREATER INTEGRATION IN THIS PROCESS THE MORE INFORMED ALL PARTIES ARE  
2. + MULTI JURISDICTION, PRIVATE SECTOR, ET AL  
KEY IS IDENTIFYING WHOM?

MANY DECISIONS BY PRIVATE INDUSTRY ARE DONE WITHOUT CONSULTATION WITH OTHER PARTIES  
(RECOMMENDATION: CHANGE THIS PRACTICE)

LEGAL RISK - LIABILITY ②  
⑤ ↳ APPROVAL RESPONSIBILITY (COURTS DECIDE?)

HRVA - INVOLVE COMMUNITY MEMBERS  
- HOW CAN PEOPLE DECIDE WHEN THEY DON'T UNDERSTAND IT  
- WHO DECIDES?

⑤ TO DEFINE - INVOLVE PUBLIC

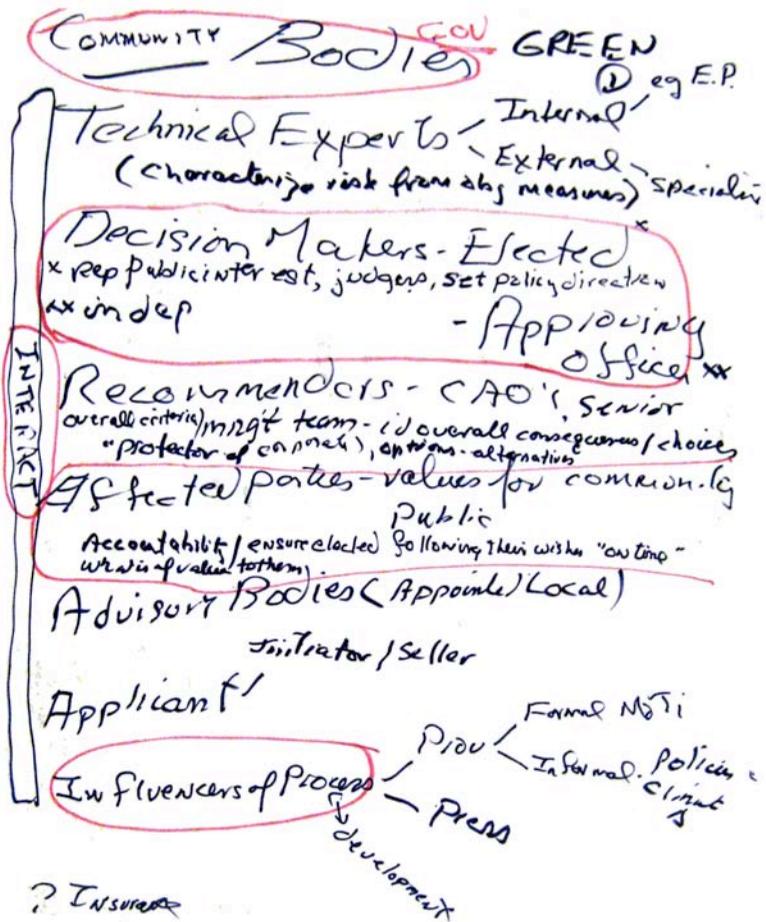
\*3\* HOW DO WE DECIDE WHAT IS CREDIBLE? (RE. RISK & RISK TOLERANCE)

RISK ECONOMIC RISK  
↳ LOSS VS BENEFIT

④ RECOMMENDATION TO DEFINE RISK TOLERANCE BY % VICE A#

- SAFETY  
- ECONOMIC  
- ENVIRONMENT

# Governance



## Internal Structure 6-2

Need to ensure how it should be actually works weight key components to min disaster/probs  
 → develop guidelines / review board on applicat / apps  
 - interdisciplinary team

clear decision making process / id weighting / sets of criteria that applicat proposals based on

\*Standardization - across municipalities has +/-  
 e.g. competitive for development trade off requirements for risk mitigation

## Tools

- policy
- regulation
- bylaws
- hazard mapping + analysis
- HRA
- standards
- mitigation plans
- d.p. process - modified
- CCP, zoning, Sub'URB, Development Approval
- BIC
- professional reports
- demographics - high risk - people, areas, structures
- indicates that require criteria (proposals)
- communication strategy
- CBA analysis

6-3

# Governance

Governance BOII ¼

- 3 levels of gov't + community

② Required Governance tools

- national disaster mitigation strategy  
- funding for ~~capital~~ mapping

trickle down funding from Fed.

Funding for tool

\* - baseline mapping for hazards

① Internal Structure <sup>2/4</sup>  
Change to existing governance  
- education

Better @ @

Community Charter → OCP

Communication strategies

\* - Regulations for interaction  
of all tiers of gov't  
↓ across tiers  
- context for collaboration

Regulations not voluntary  
need to be more  
as directives

# Governance

Policies for  
- OCP's

3/4

Disaster Financial Assistance,

Gaps

- accountability
- more overall Hazard policies
- all hazard approach

Tools

- \* risk/vulnerability analysis
- \* hazard assessments

Roles of Citizens

4/4

Tweaking what we have

Fed - umbrella program

Roles → Prov - legislation

- flood protection
- harder requirements

- multi-hazard
- standards/costs

Local - availability of tools

Citizen - become educated

# Decision Making

## D-MAKING

- THE IMP. OF THE PPL AT THE TABLE → NEED TO INVOLVE COMMUNITY
- ① WHO!
  - INTER / TRANS DISCIPLINARY
  - ?'S AROUND FRUITFUL ENGAGEMENT / REP. ENGAGEMENT
  - ② WHEN? (NOT JUST WHO) → ENGAGE
  - USING THE POST-DISAS WINDOW
  - TO BE PROACTIVE IN OTHER LOCATIONS

- ② MULTICULTURAL DIMENSIONS - WHO WANTS TO BE INVOLVED?
  - HRVA'S - RELUCTANT TO DO THEM, OR HIDE THEM
  - NON-STANDARDIZED DEF. OF RISK ; RISK MANAGEMENT, PROCEDURES
  - APEG BC - NEW STANDARDS PROV WIDE
  - DOWNLOADED RESP. FROM PROV WOUT CORRESPONDING FUNDING

## Decision Making

<sup>Session 2</sup>  
<sup>Decision Making</sup>  
③ SOME PROV. STANDARDS  
E.G. DATA GATHERING,  
MAPPING  
(HAVING PROV WIDE  
HAZ. OVERVIEW MAPS)

- THE IMP. OF PLANS  
SPEAKING TO ONE ANOTHER
  - EM PLANS - HRWA'S - INCORPORATE  
INTO OCP'S

<sup>How?</sup>  
- THE HOW?

- ③ SOME KIND OF  
STANDARDS
- FINAN. RISKS, vs OTHER TYPES
  - SOME KIND OF STANDARDIZED  
APPROACH FOR RISK  
MANAGEMENT

- <sup>Session 2</sup>  
<sup>Decision Making</sup>  
④ HRWA'S DON'T LOOK  
AT CAPACITIES/  
RESOURCES  
INTEGRATION  
- EDUCATION (CROSS-DISCIPLINARY)
- VOLUNTEERS HAVING  
NO VOICE (TAKING INTO  
ACCOUNT KNOWLEDGE OF  
PPL WHO ARE NOT 'PROFESSIONALS')
  - INTEGRATION ACROSS  
LOCAL GOVT. DEPT.'S