City of Vancouver – Seismic Risk Reduction for Buildings

What we are doing to reduce seismic risk in Vancouver's existing buildings

<u>Work Programme</u>:
Develop policy to reduce the risks we all face from earthquake-prone, privately-owned existing buildings

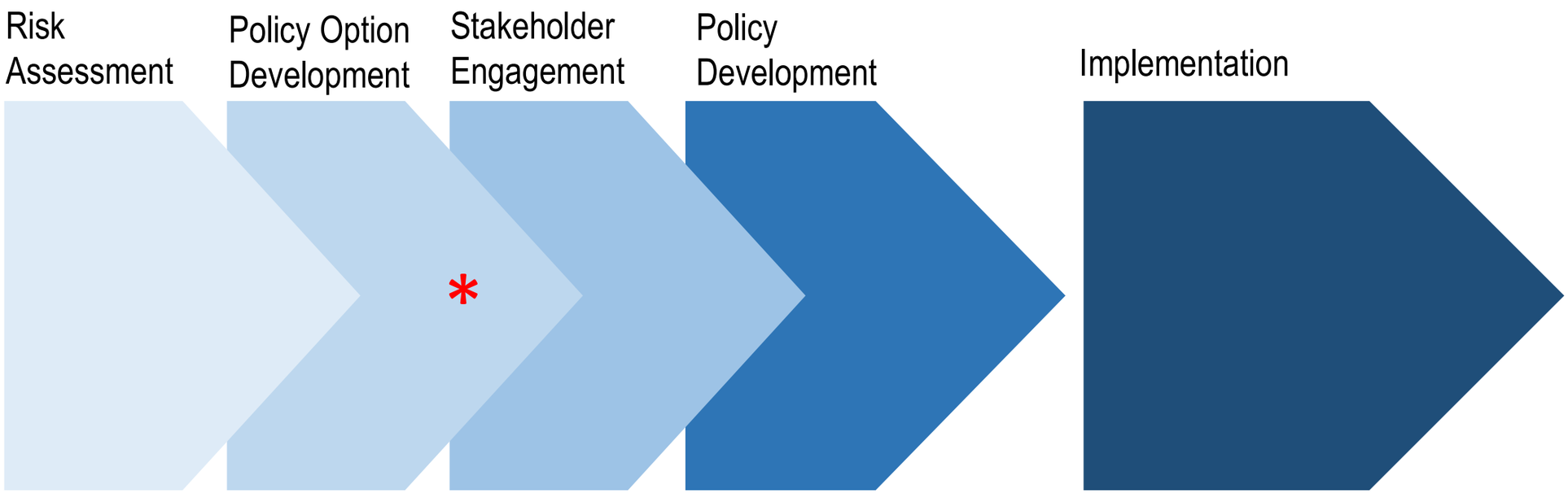
<u>Ultimate Goal</u>:
Protect life and safety; Equitably reduce risk and the advance recovery of the city and our communities from a major earthquake

<u>Deliverables</u>:
Risk assessment, policy options, engagement process, a strategy

Seismic Policy Advisory Committee
Technical Working Group

Seismic Risk Reduction for Buildings

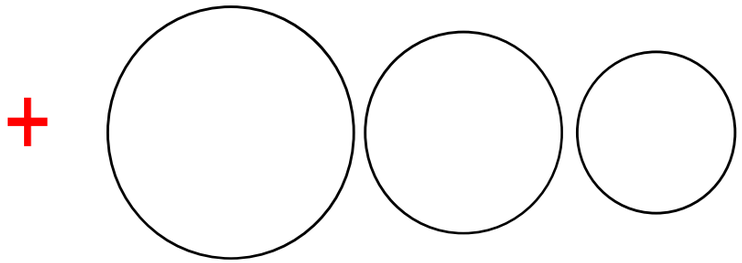
Where we are in our process



- Build a building inventory
- Develop a specific and comprehensive assessment of our risks
- Develop a set of policy options that link to our data-driven analysis outcomes
- Engage with stakeholders on those options
- Analyze policy options further and develop a finalized set of recommended actions – a strategy for action

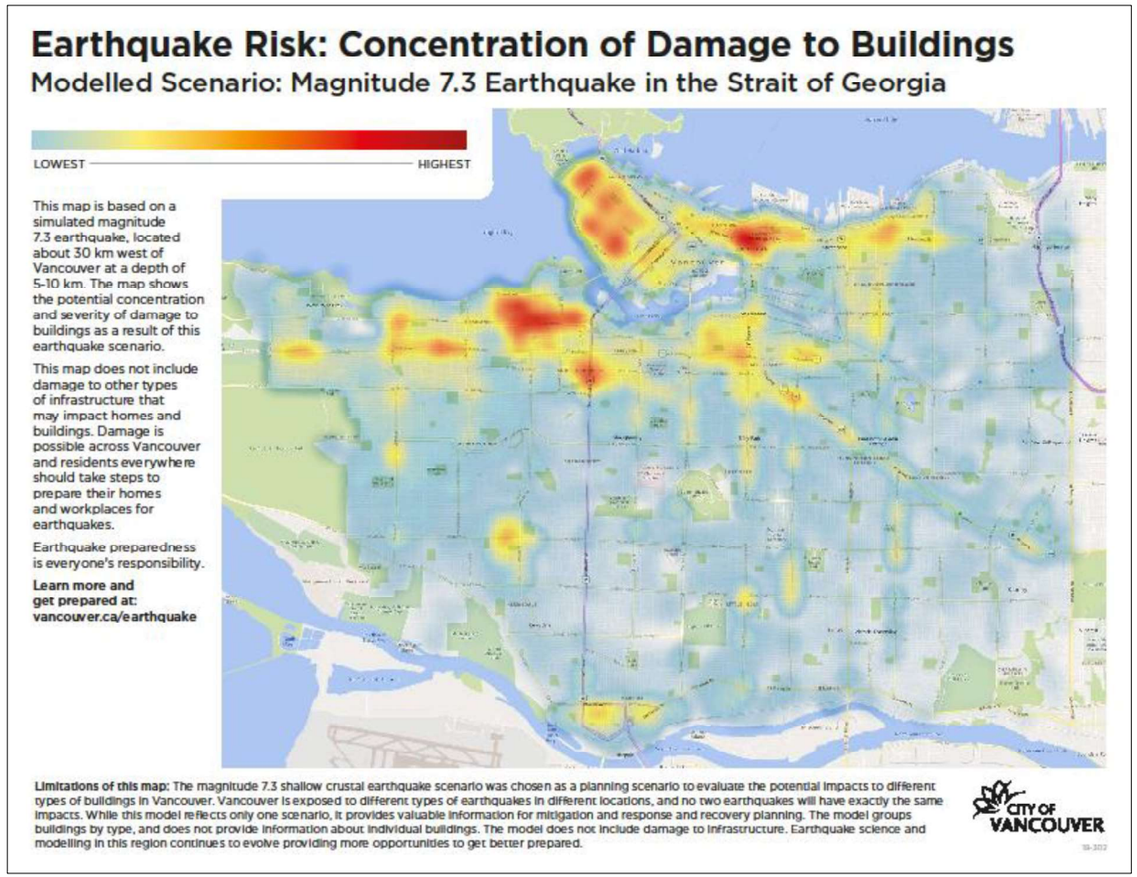
Seismic Risk in Existing Buildings – What We Know

This is not a 90,000-building problem



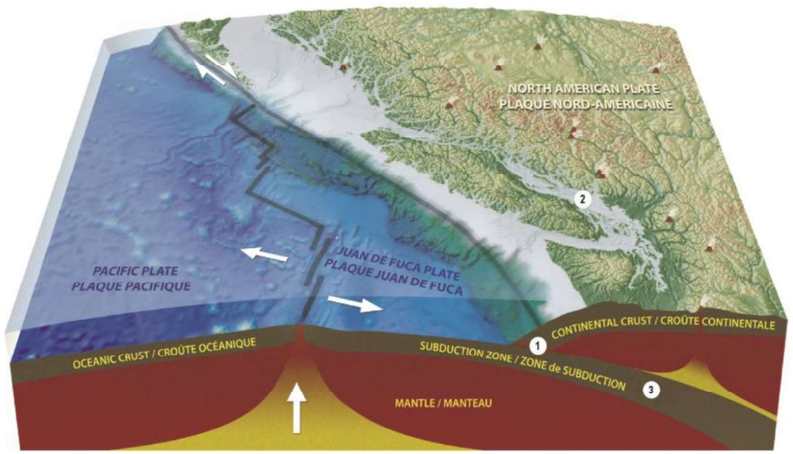
General Problem | 90,000 Buildings | 6 Types, Buildings | At-Risk Buildings

- We know where risk will be concentrated
- We know the types of buildings that are of most concern
- We know a lot about those types of buildings
- We know what other municipalities have done to reduce risk and our own unique context and tools



Seismic Risk in Existing Buildings – What We Know

We know there are key types of buildings that contribute most of our risk



- Our current modelling looks at a M7.3 event in the Georgia Strait. We are looking at a number of other earthquake planning scenarios.
- Risk is measured in terms of casualties, disruption-displacement of occupants, damaged buildings, and direct loss in building value

We know that between 1/3 and a 1/2 of Vancouver residents will be heavily **disrupted or displaced**

A massive earthquake will cause hundreds of **causalities and injuries**

We know that **building damage** is concentrated largely in just 10% of the city's buildings

We expect upwards of $8B CAD in **direct losses**

Types:

- (URM) Older brick buildings
- Older multi-family wood-framed buildings
- Older concrete buildings

Risk Reduction Options – Key Considerations

There are a spectrum of options. No one option solves everything.

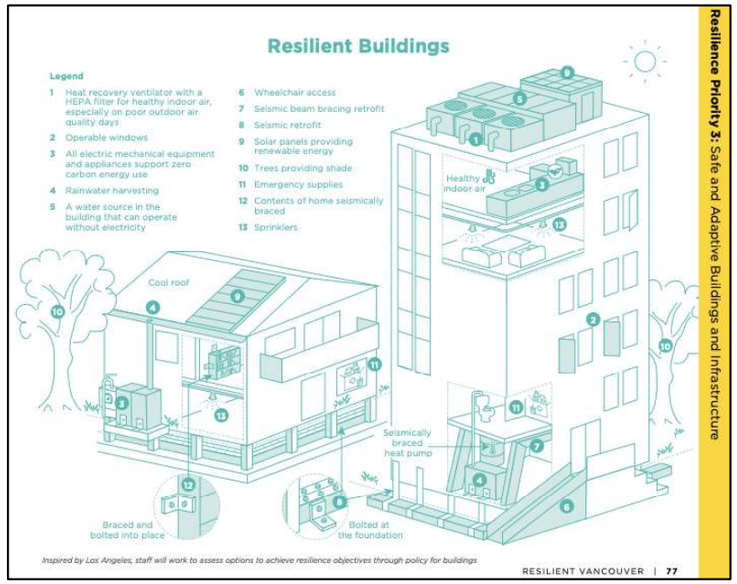
At-Risk Building Inventory	Mandated Evaluation	Notification	Voluntary Retrofit	Code-Triggered Retrofit	New Building Policy	Land Use Planning	Mandatory Retrofit	Building Replacement

Effectiveness

Difficulty

KEY CONSIDERATIONS

- Tenant Displacement
- Tenant/Occupant Disruption
- Cost – Financing
- Cost – Passthroughs
- Upgrade Phasing
- Programme Timing
- Competing Objectives for Existing Buildings
- Market Readiness



Risk Reduction Options – Case Studies

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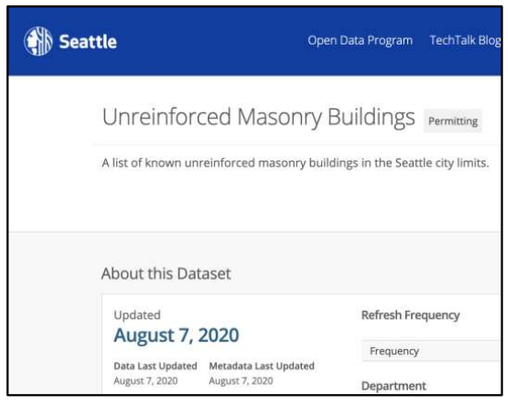
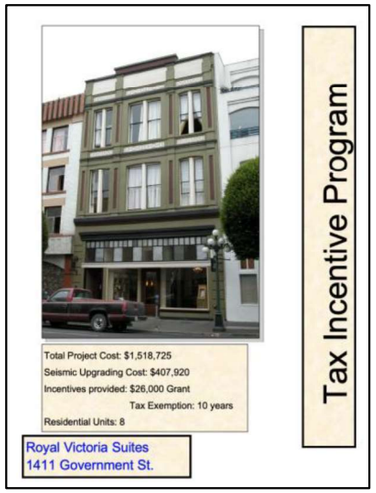


City of Seattle, Washington
Inventory of URM Buildings



City of Victoria, BC
Voluntary Retrofit with
a tax incentive

City of San Francisco, California
Mandated Evaluation of all
private school buildings

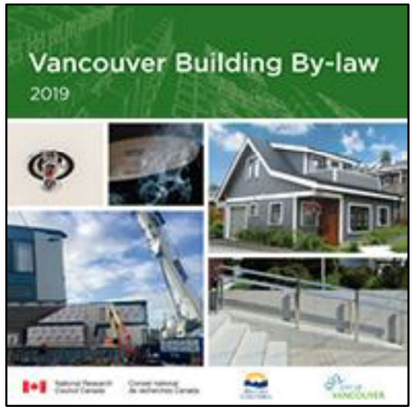
Risk Reduction Options – Case Studies

There are a spectrum of options. No one option solves everything.

City of San Francisco, California
<u>Mandated Retrofit</u> of all soft storey buildings

MILESTONE	REQUIREMENT
BEGIN PROCESS	Order received by building owner
3 YEARS AFTER ORDER	Submit one of the following: 1. Proof that structure meets ordinance 2. Plans for retrofit OR 3. Plans for demolition
10 YEARS AFTER ORDER	Obtain one of the following: 1. Permit for rehabilitation OR 2. Permit for demolition
25 YEARS AFTER ORDER	Complete one of the following: 1. Construction/retrofit OR 2. Demolition

City of Los Angeles, California
<u>Mandated Retrofit or replacement</u> of all non-ductile concrete buildings



City of Vancouver
What is the potential of **<u>Landuse-based tools</u>**?

Building Cohorts for Discussion

COHORT 1	(MURB) Multi-Unit Residential Buildings Wood-framed walk-ups, concrete midrise or towers, older brick buildings Tower and mid to low-rise residential will have different ownership models generally
COHORT 2	(HDC) High-Density Commercial Office towers or mixed-use buildings, generally downtown and professionally managed, larger businesses or multiple businesses
COHORT 3	(LDC) Low-Density Commercial Wood-framed mixed use or retail-office buildings, low-rise brick or concrete buildings downtown or in neighbourhood centres, small business

Question 1

POLICY OPTION SKETCH

What are actions government could or should take to effectively and feasibly reduce seismic risk for your cohort of buildings? And, what are the unique challenges to these options?

PROPOSED FORMAT

- Consider the (slide) list of policy options from other cities
- Prepare a list of policy options
- For each option not its effectiveness, feasibility, and key impediments

Question 2

NEEDED SUPPORTING ACTIONS

What supporting actions are needed to support the policy options you proposed from question 1? Specifically , what other policies would be needed to address the challenges-impediments, to increase effectiveness, and/or to increase the feasibility of policy?

PROPOSED FORMAT

- Consider the (slide) list of policy considerations
- Amend your list of policy options
- For each supporting action, consider how it would address the challenges-impediments, to increase effectiveness, and/or to increase the feasibility of policy