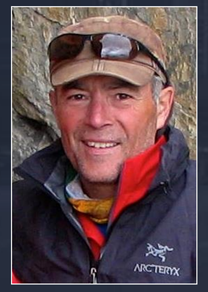
Understanding Risk
British Columbia
Collaboration and Innovation for a Resilient Future
2020 | Online Symposium + Event Series

Black Swans over Vancouver

Using Risk Models to Inform Disaster Resilience Planning



Murray Journeay

Jackie Yip

DRR-Pathways Project

Toward a Functional recovery model for Metro Vancouver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Emergency Management BC


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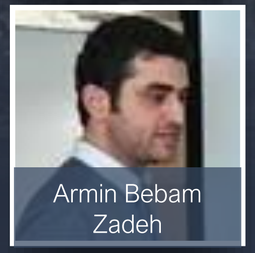
Armin Bebam Zadeh


Ryan Reynolds


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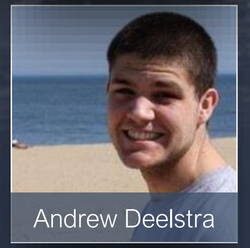
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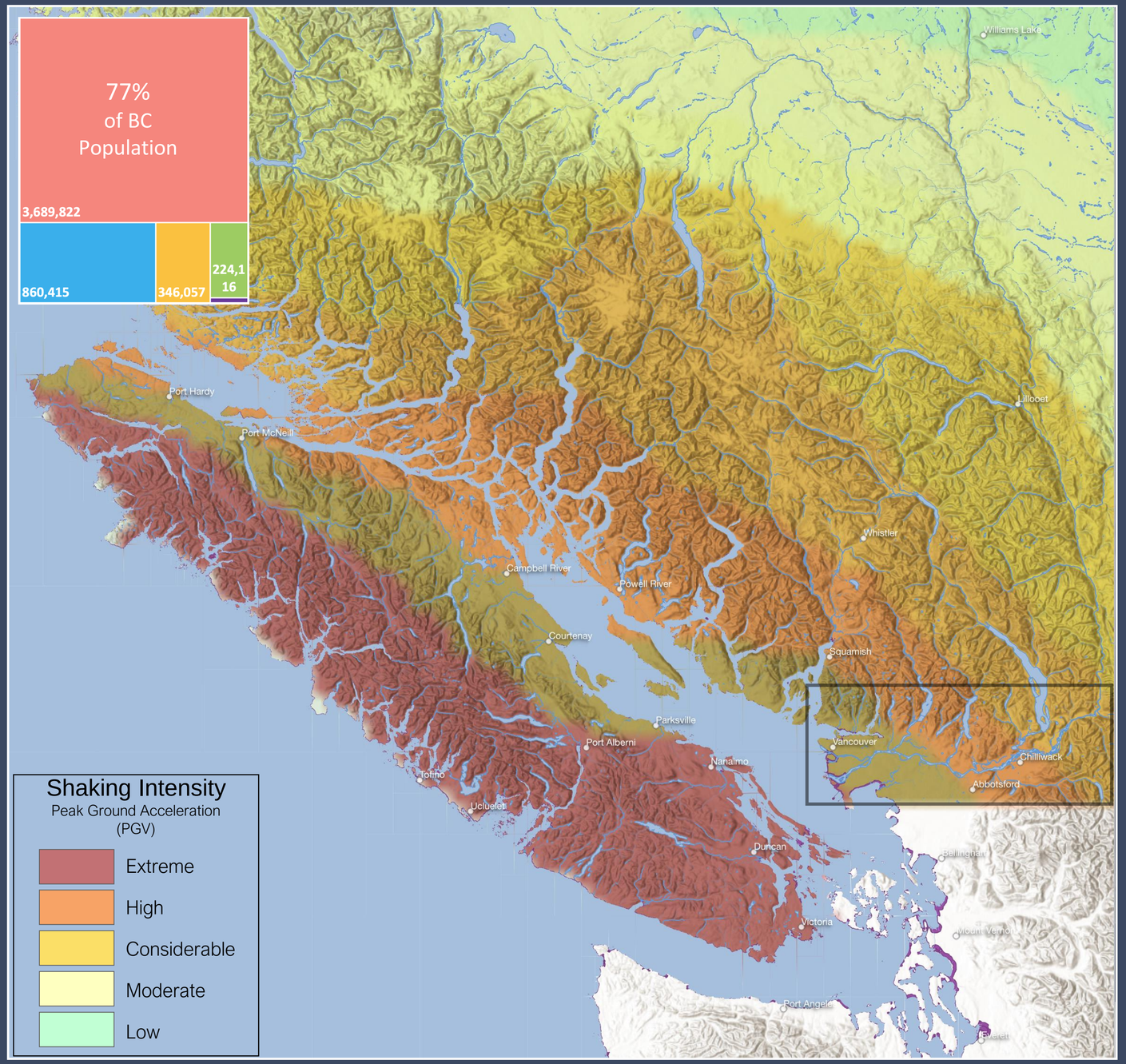
What are Black Swans ?

- extremely rare events with severe socioeconomic consequences.
- not easily predicted, but widely considered obvious in hindsight.
- immediate physical impacts are amplified by cascading system failures and downstream consequences
- Disaster hotspots reveal underlying socio-economic inequities —the most vulnerable bear the greatest burden of risk



Seismic Hazard Threat in BC

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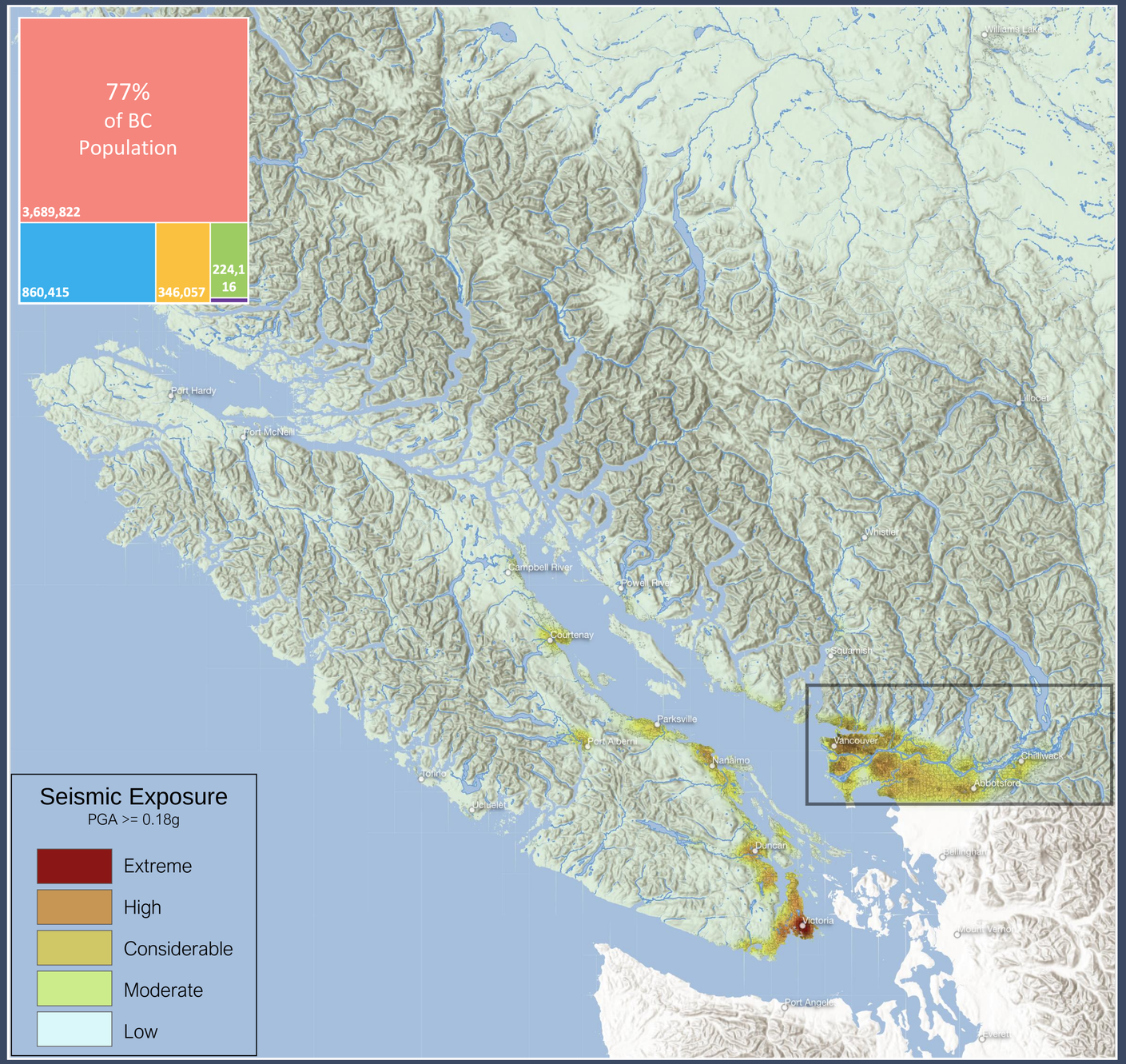

Seismic Hazard Threat in BC

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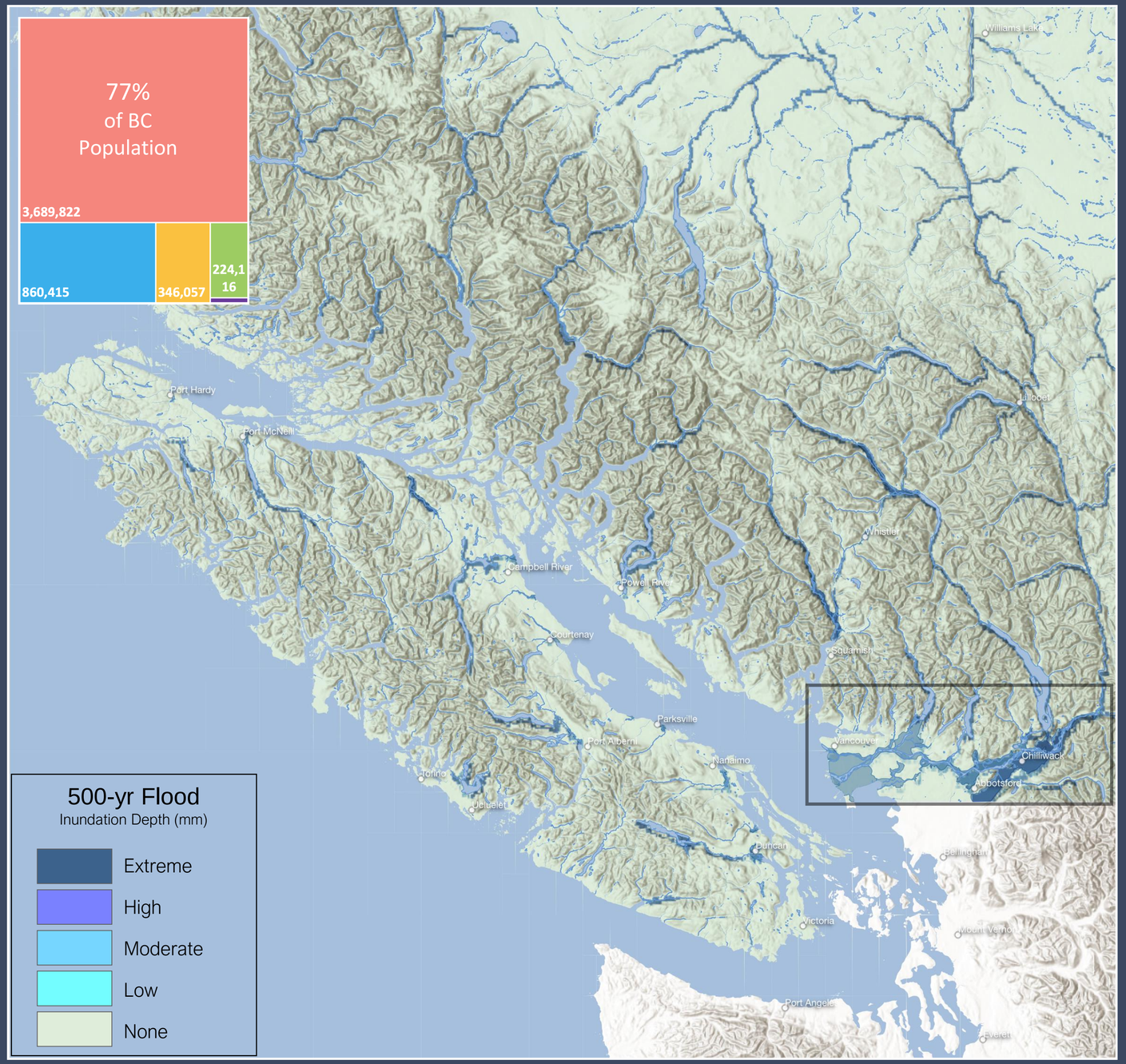

Flood Hazard Threat in BC

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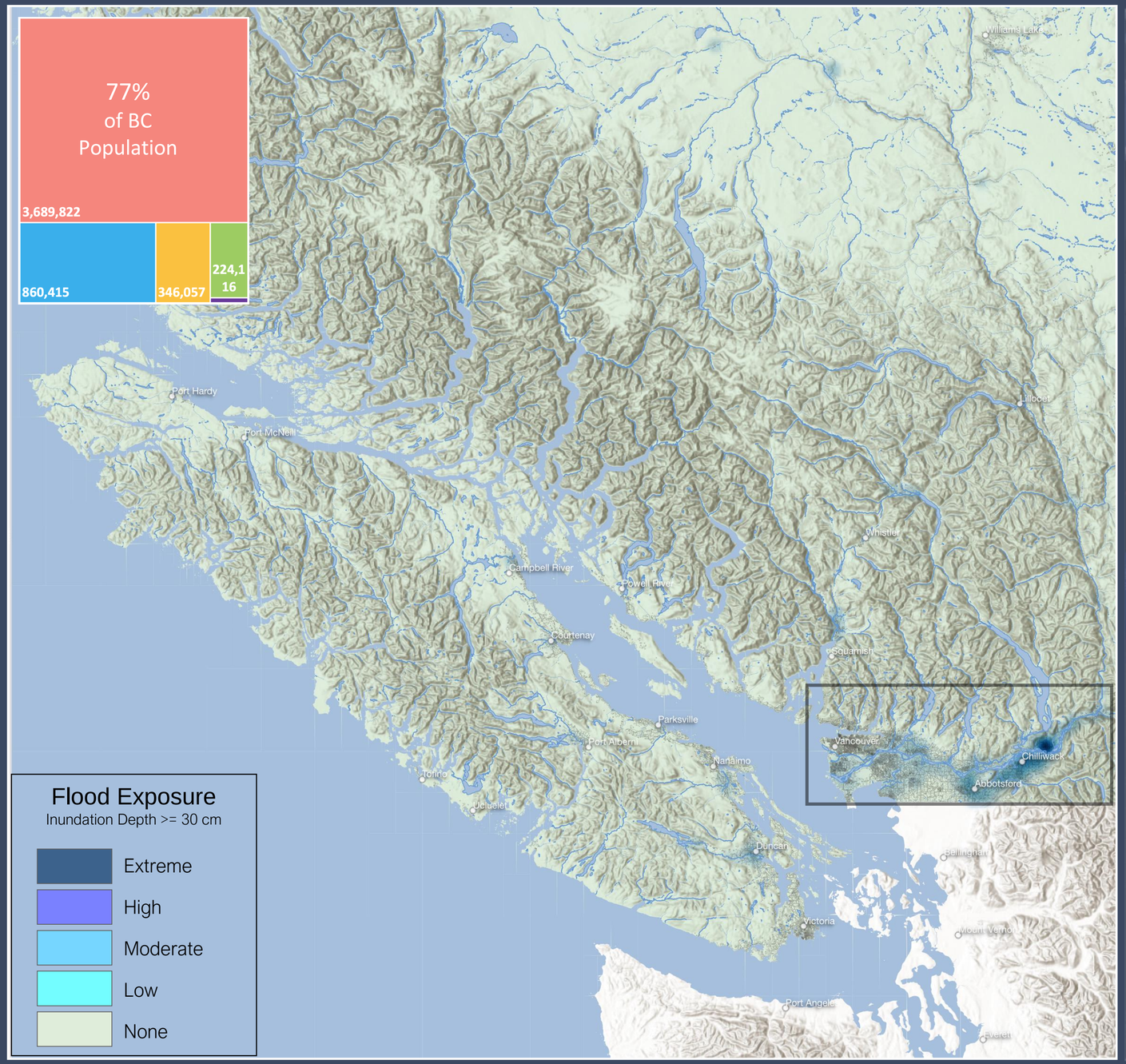

Flood Hazard Threat in BC

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What kind of a disaster recovery pathway do we envision ?

DRR-Pathways Project

Toward a functional recovery model for Metro Vancouver

The Challenge

Residents, businesses and communities are increasingly receptive to the principles of disaster resilience planning - but unlikely to invest in proactive risk reduction measures without a clear value proposition.

Meanwhile, risk trends are outpacing capabilities to manage the consequences of a future disaster event.

The Opportunity

Develop high resolution urban disaster recovery models that are capable of informing a wide range of choices and consequences

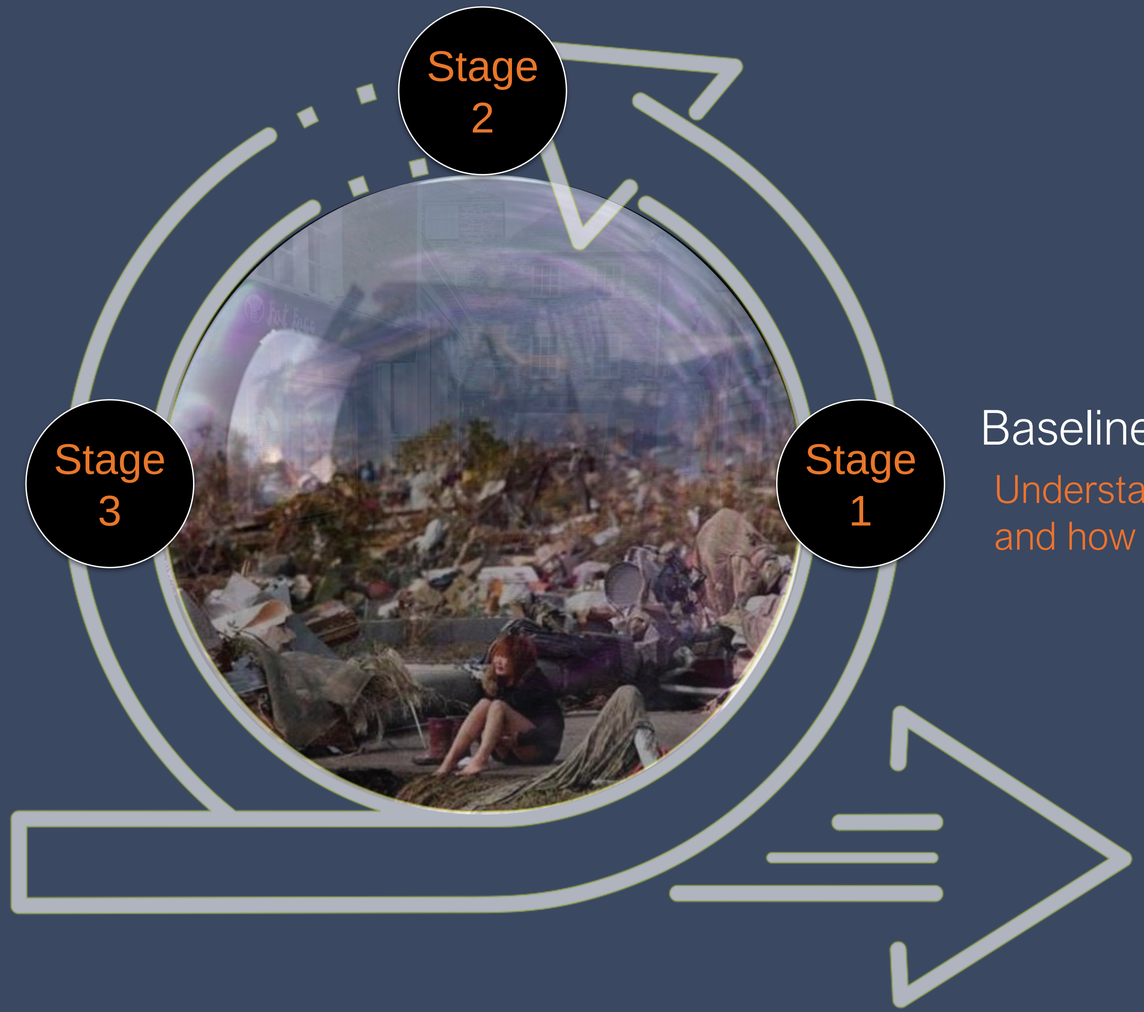
— and that provide the necessary base of evidence to empower proactive investments in mitigation and adaptation measures that lead to a more desirable outcome

What-if Planning Scenarios

Explore the potential for risk reduction and the efficacy of mitigation/adaptation pathways that lead toward a more desirable future

Disaster Resilience Strategy

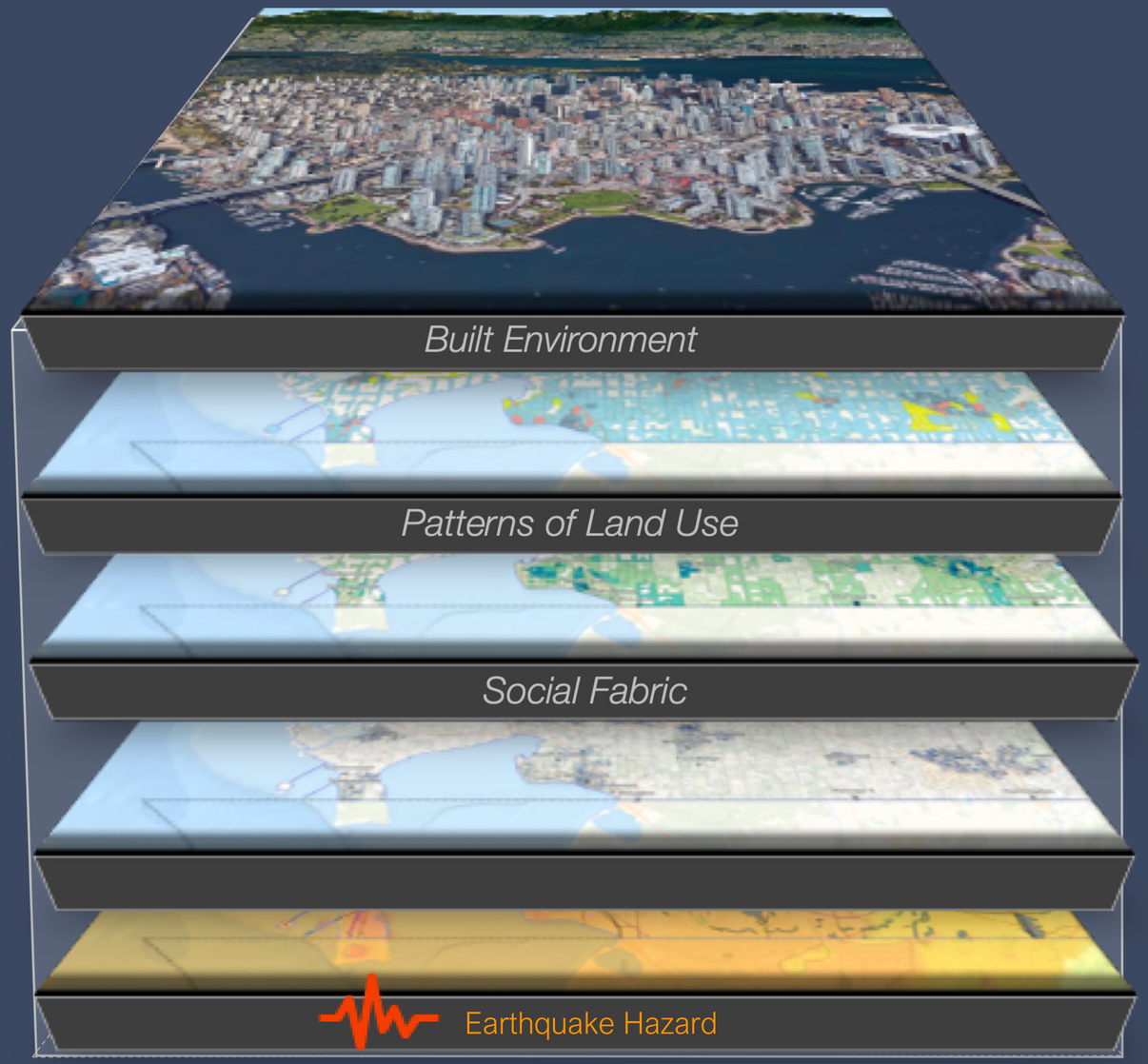
Identify goals and targets to help navigate a sustainable path forward



Baseline Risk Scenarios

Understand the risk and how we got here

Patterns of Human Settlement

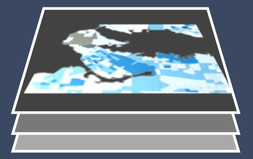


Mapping Schemes

Building Density

Built Environment

Demographics



Capacity Thresholds

Housing Conditions

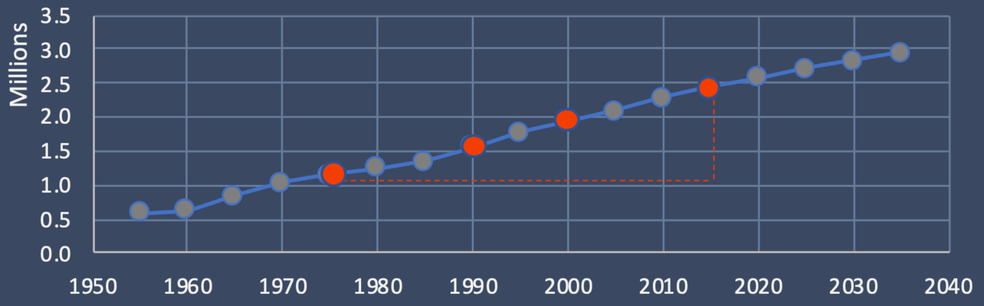
Family Structure

Individual Autonomy

Financial Agency

Population Density

Growth



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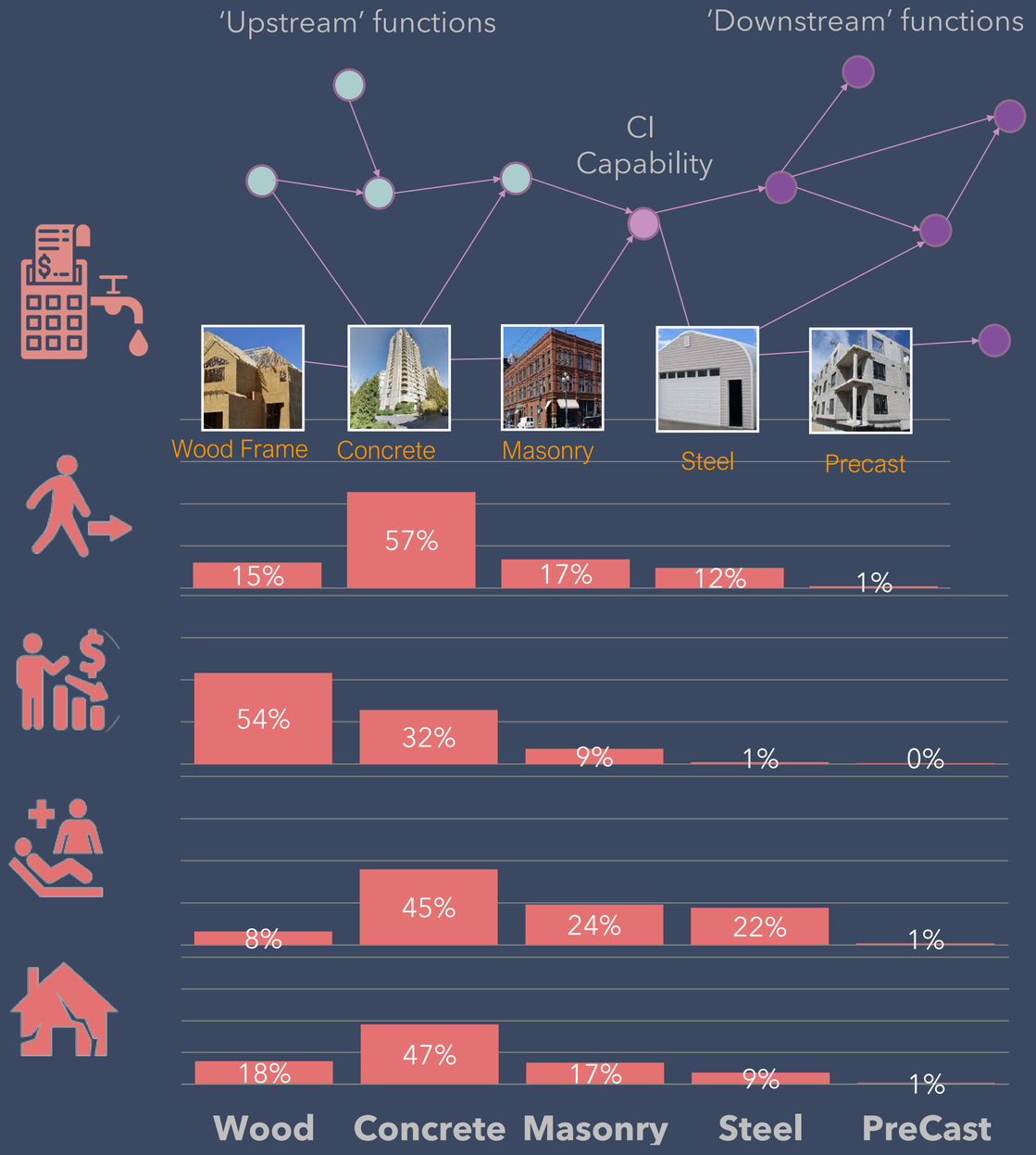
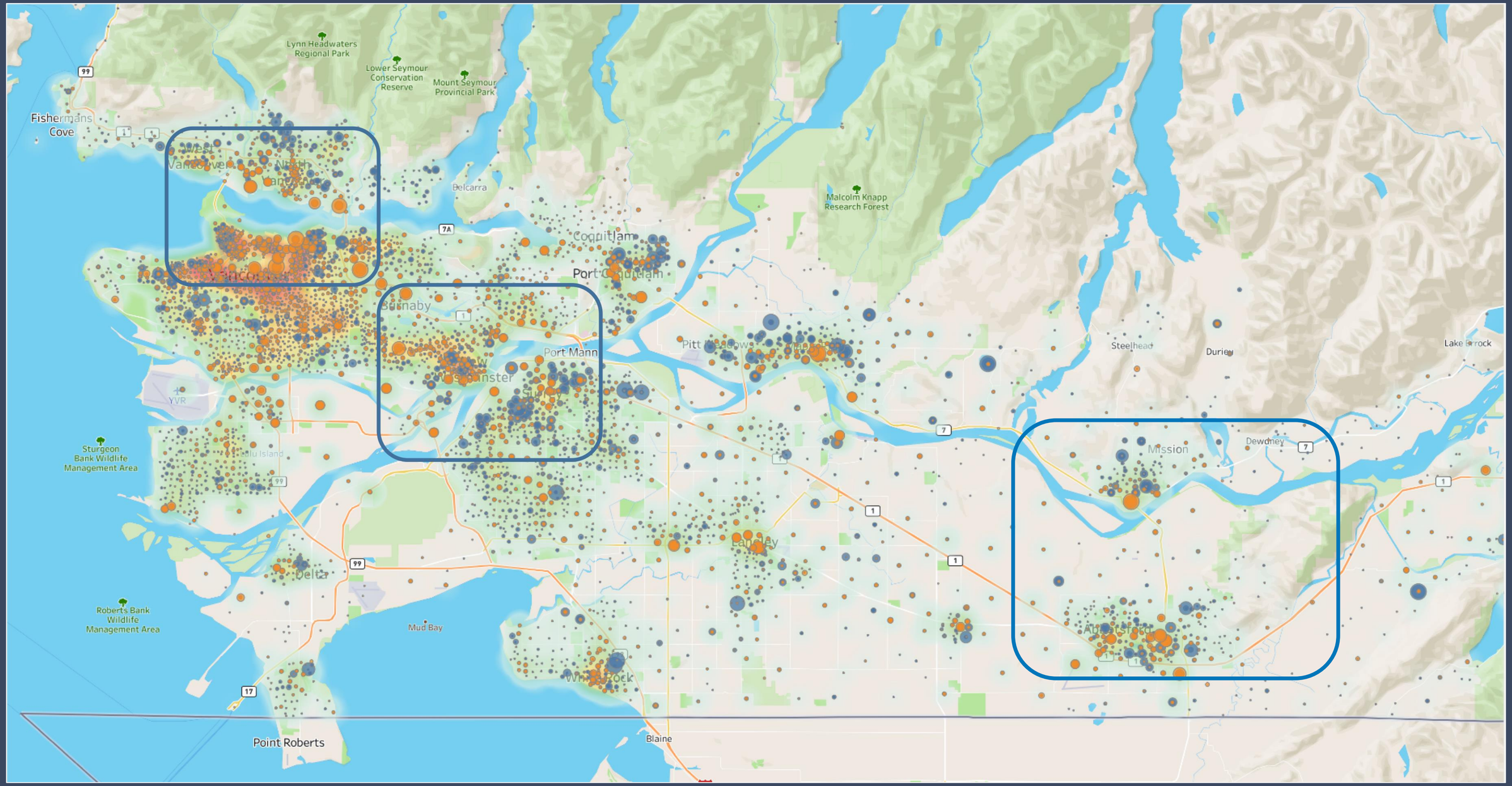
Earthquake Risk and Recovery Modeling

Cascading Failures & Consequences




Lynn Headwaters Regional Park
Lower Seymour Conservation Reserve
Mount Seymour Provincial Park
Fisherman's Cove
Belcarra
Malcolm Knapp Research Forest
Coquitlam
Port Coquitlam
Burnaby
Port Mann
Pitt Meadows
Maple Ridge
Steelhead
Durieu
Lake Errock
YVR
Sturgeon Bank Wildlife Management Area
Mission
Dewdney
Langley
Delta
Roberts Bank Wildlife Management Area
Mud Bay
White Rock
Point Roberts
Blaine

October Workshop

1. Explore Risk Hotspots & Driving Forces

Review profiles of risk for severe earthquake and flood events likely to impact the Lower Mainland region, and the capacities of neighbourhoods to withstand and recover from these disaster events.

2. Assess Physical Impacts and Strain on Social Fabric

Rank each of the numbered risk metrics for your region of interest based on physical impacts to the built environment (buildings, people and critical infrastructure) — and the strain on neighbourhoods with more limited capacities to withstand and recover from a disaster event

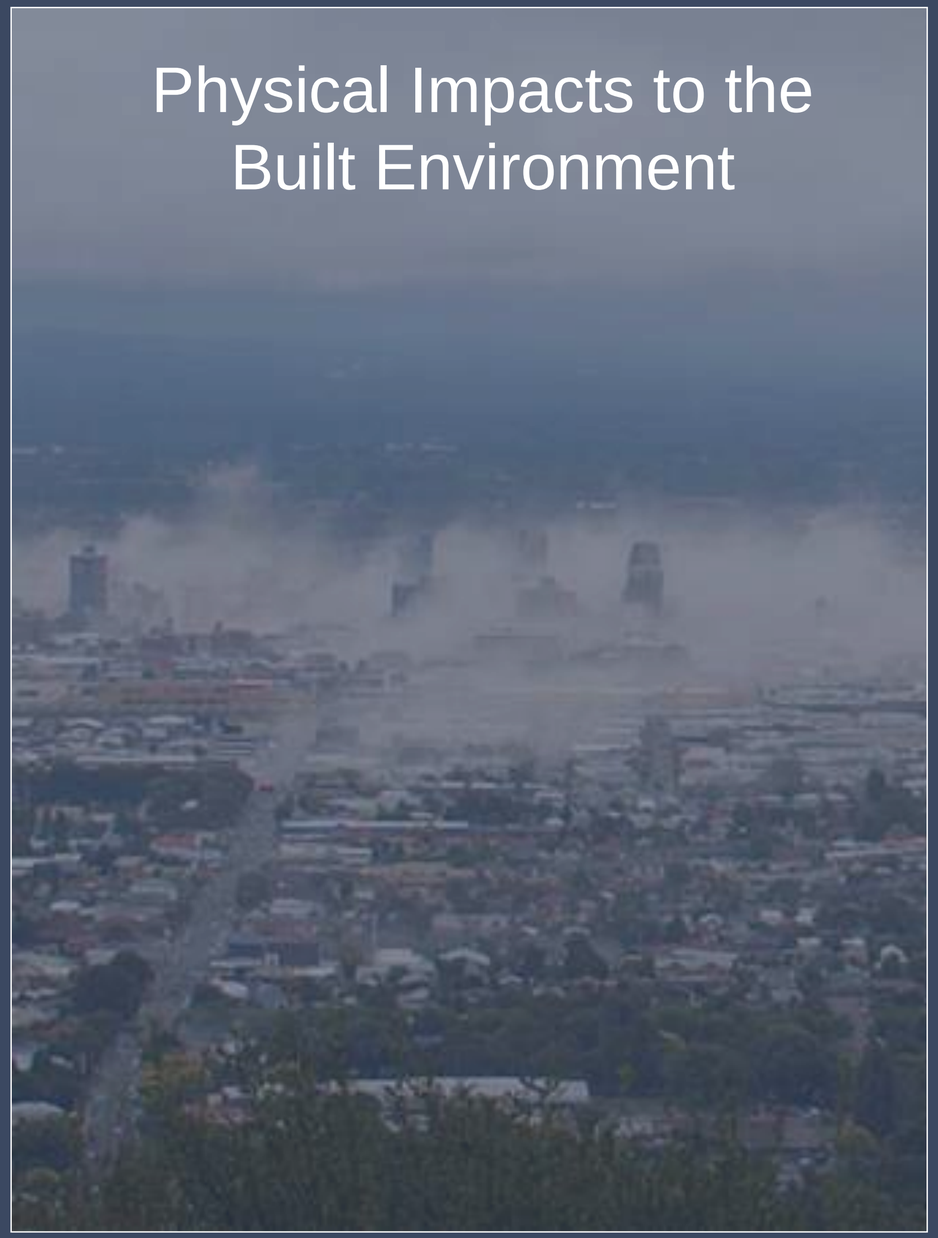
3. Identify Specific Risk Reduction Measures

Identify specific interventions that you think will be most effective in reducing disaster risk and recovery potential with appropriate resources and political will for each of the Indicators that rank highest in terms of both physical impact and strain on vulnerable neighbourhoods for your region of interest,

4. Explore Risk Reduction & Recovery Targets for 2030

Rank each of the risk reduction/recovery interventions based on your sense of which are likely to be the most effective in reducing both physical impacts on the built environment — and the downstream consequences of these impacts on vulnerable neighbourhoods in your region of interest.

Physical Impacts to the Built Environment



Strain on Neighbourhood Social Fabric

Impacts to Built Environment

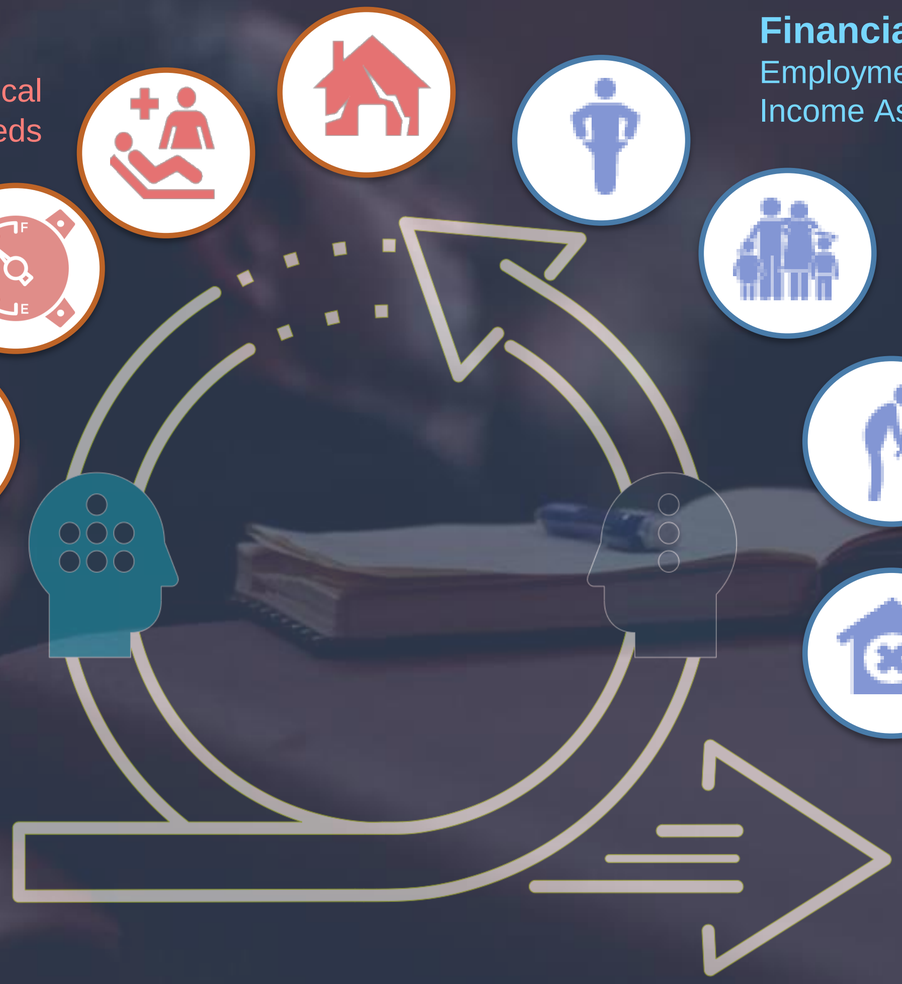
Building Performance: Damage, Recovery Time, Disaster Debris

Public Safety: Entrapment, Critical Injuries, Shelter Needs

Critical Infrastructure: Lifeline Services, Business and Neighbourhood Recovery Functions

Social Disruption: Household Displacement, Business Interruption

Economic Security: Direct Impact Losses, Cascading Indirect Losses



Strain on Social Fabric

Financial Agency: Income, Employment Status, Shelter Costs, Income Assistance

Family Structure: Support Networks, Dependency, Living Alone, Mobility

Individual Autonomy: Age, Social Marginalization, Race and Linguistic Barriers

Housing Conditions: Tenancy, Quality and Suitability of Housing, Capacity to Maintain

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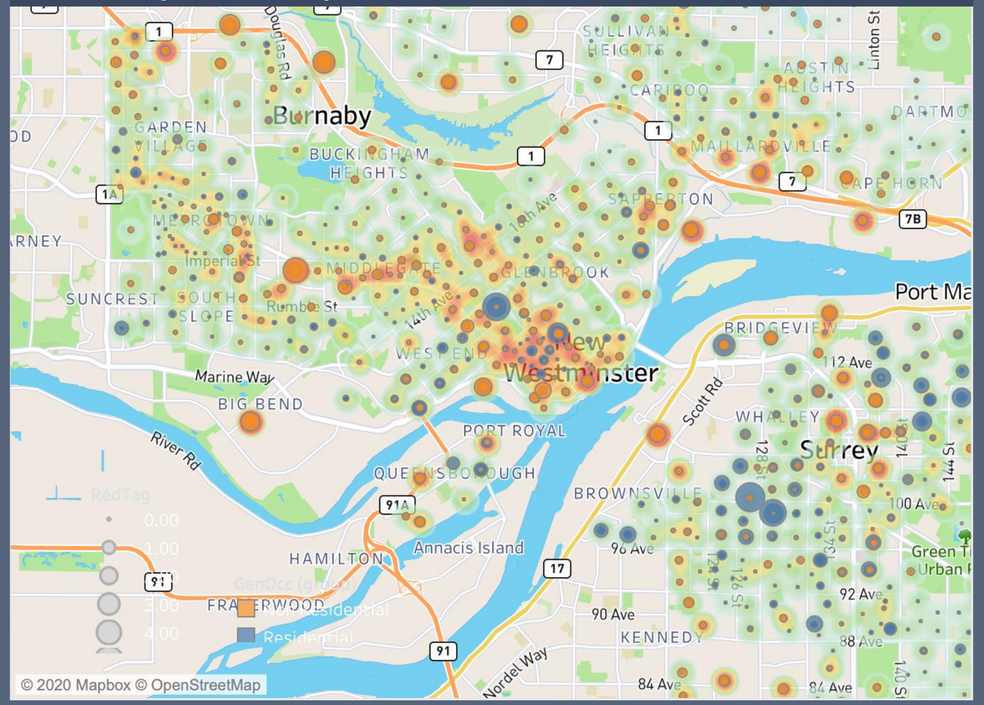
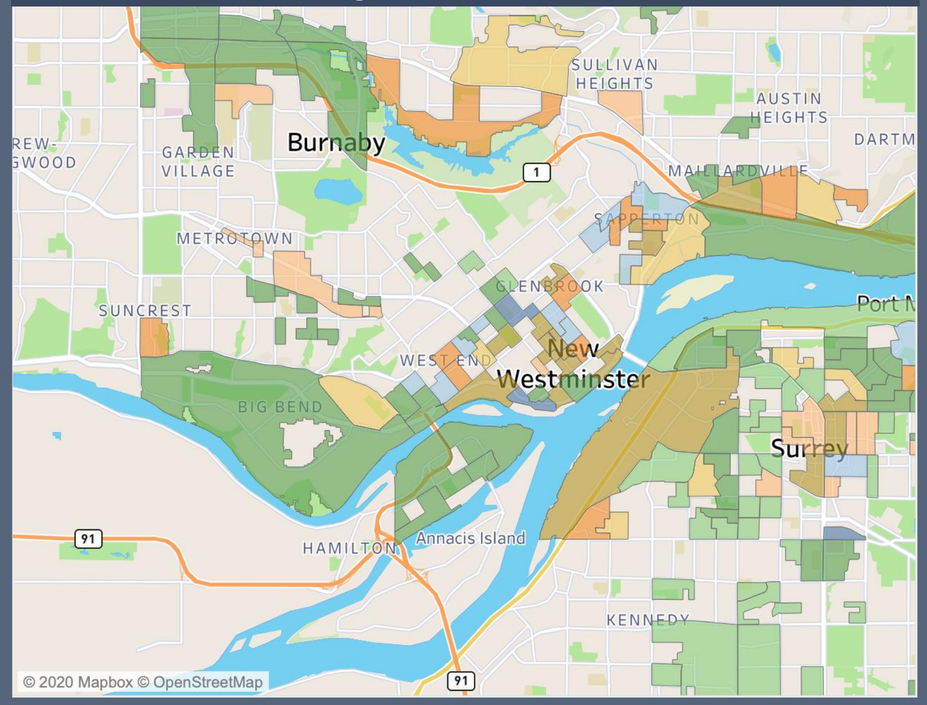
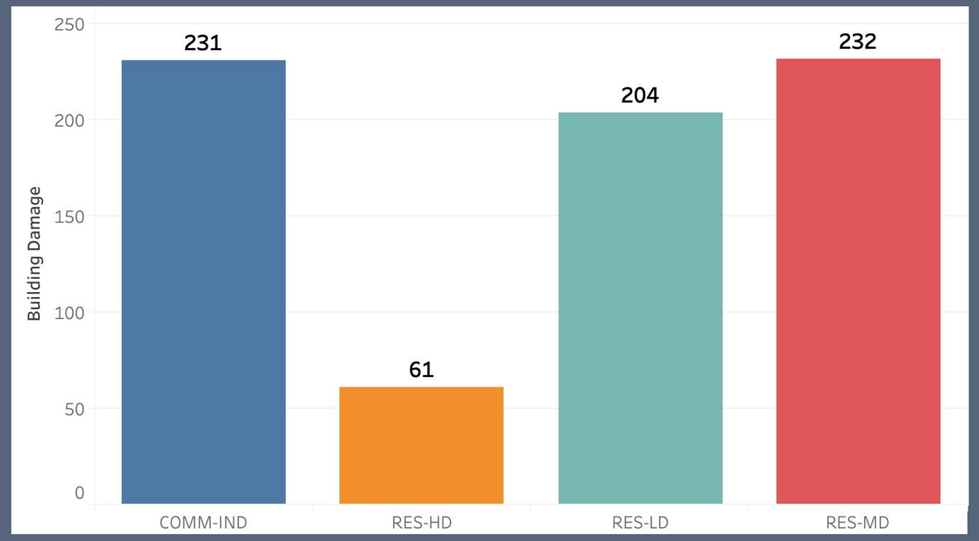
Physical Impacts to the Built Environment

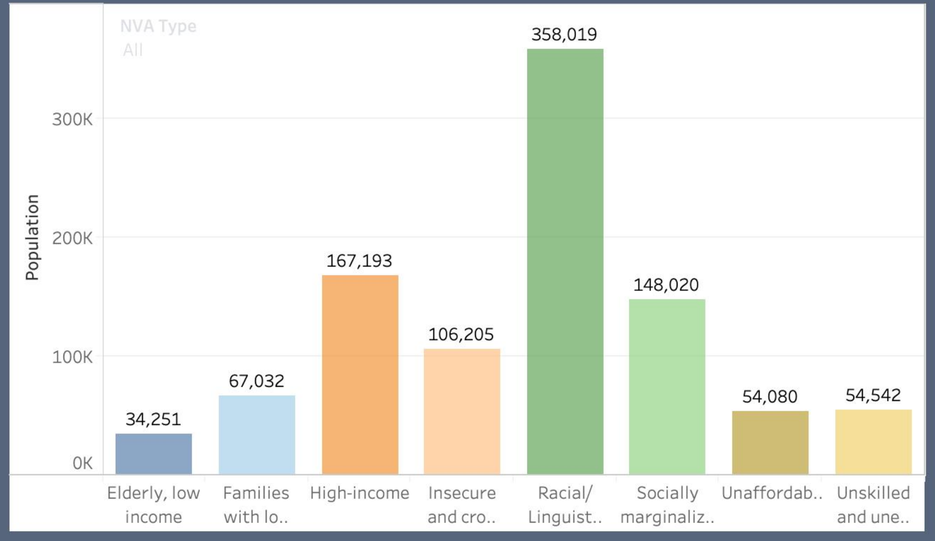


Strain on Neighbourhood Social Fabric





LandUse (group)
- COMM-IND
- RES-HD
- RES-LD
- RES-MD

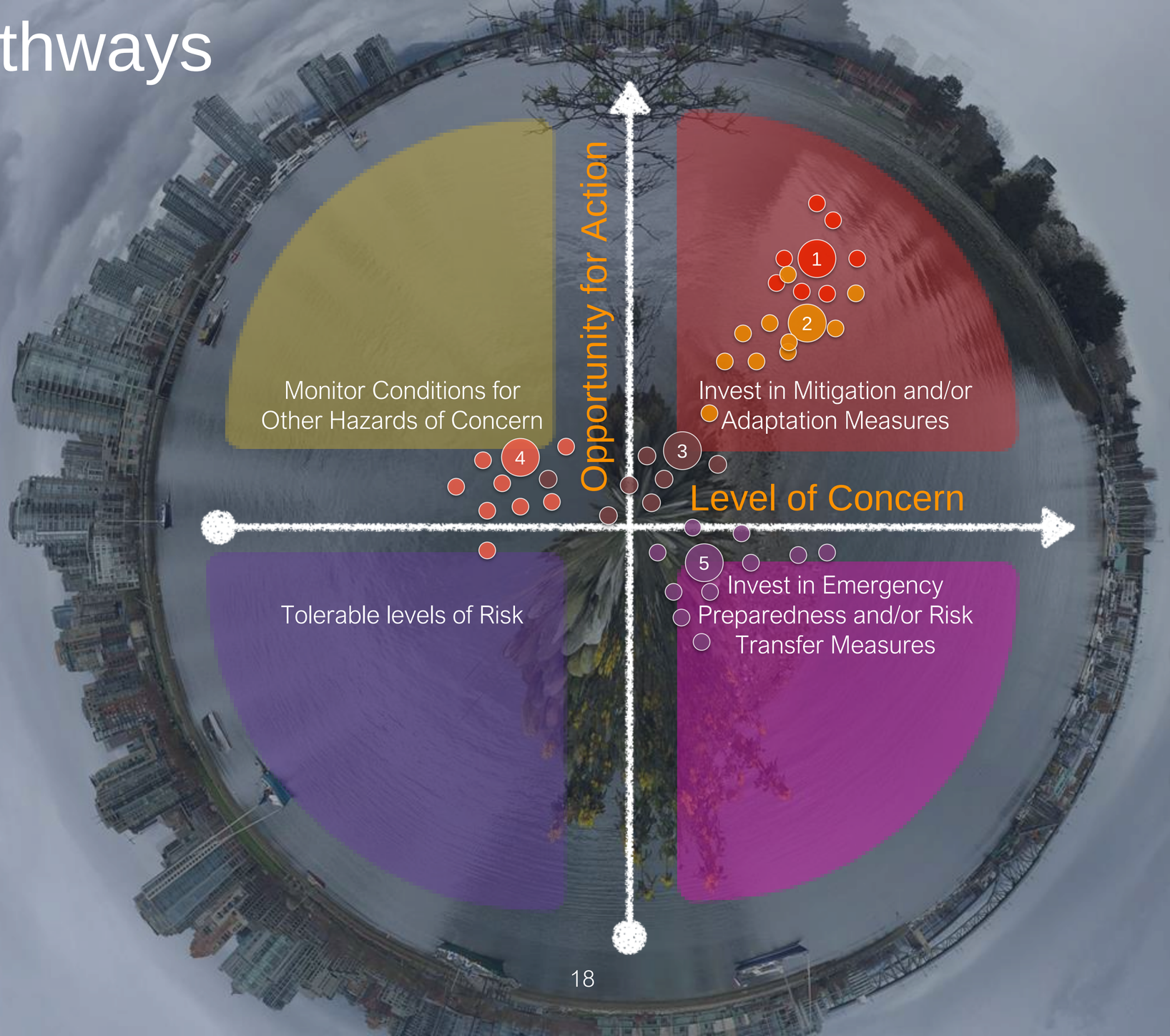


RedTag Buildings
2 to 50

NVA Type
- Elderly, low income
- Families with lone-parent and/or youn..
- High-income
- Insecure and crowded housing, newly ..
- Racial/Linguistic minority, average inc..
- Socially marginalized, unskilled, overc..
- Unaffordable, rental housing, low inco..
- Unskilled and unemployed, low income

DRR-Pathways

Toward a functional recovery model for Metro Vancouver



1. **Injuries** —> Elderly, children, linguistic minorities
2. **Social Displacement** —> Affordable housing, immigrants, care givers
3. **Downtime** —> Business interruption, access to services
4. **Economic Loss** —> Low income households, employment
5. **Building Damage** —> Evacuation challenges, physical mobility

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What kind of a disaster recovery pathway do we envision ?

Join us on October 13th at 9am

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