



PLANNING FOR LONGSTANDING
SUSTAINABILITY: ADDRESSING THE
DOWNFALLS OF GREEN INFRASTRUCTURE
PLANNING

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Land Acknowledgement

Acknowledge that Nanaimo is on the unceded territory of the Coast Salish Peoples, and the Snuneymuxw First Nation.



Presentation Overview

- Introduction to Green Infrastructure
- Methodology
 - Literature Review
 - Semi-Structured Interviews
 - Case Study Analysis: Buttertubs Marsh
- The Benefits of Green Infrastructure
 - Environmental, Social, & Economic
- Key Barriers to Green Infrastructure
- Potential Solutions





Introduction to Green Infrastructure



Components of Green Infrastructure



Bioswale



Green Roof



Green Infrastructure

Natural Assets

- Wetlands
- Forests
- Parks
- Lakes/Rivers/
Creeks
- Fields
- Soil

Enhanced Assets

- Rain Gardens
- Bioswales
- Urban Trees
- Urban Parks
- Biomimicry
- Stormwater
Pond

Engineered Assets

- Permeable
Pavement
- Green Roofs
- Rain Barrels
- Green Walls



Rain Garden



Buttertubs Marsh

Methodology

- Literature Review
- Semi-Structured Interviews
 - 22 participants
 - Across Canada: Coastal Canada, central Canada, & the prairies
 - Public, private, & non-profit sectors
- Case Study Analysis:
Buttertubs Marsh, Nanaimo, British Columbia

Benefits of Green Infrastructure

Environmental

- Flood protection and water management
- Urban heat island effect
- Improved air quality

Economic

- Cost savings

Social

- Physical health
- Mental health





Environmental Benefits

Flood Protection & Water Management

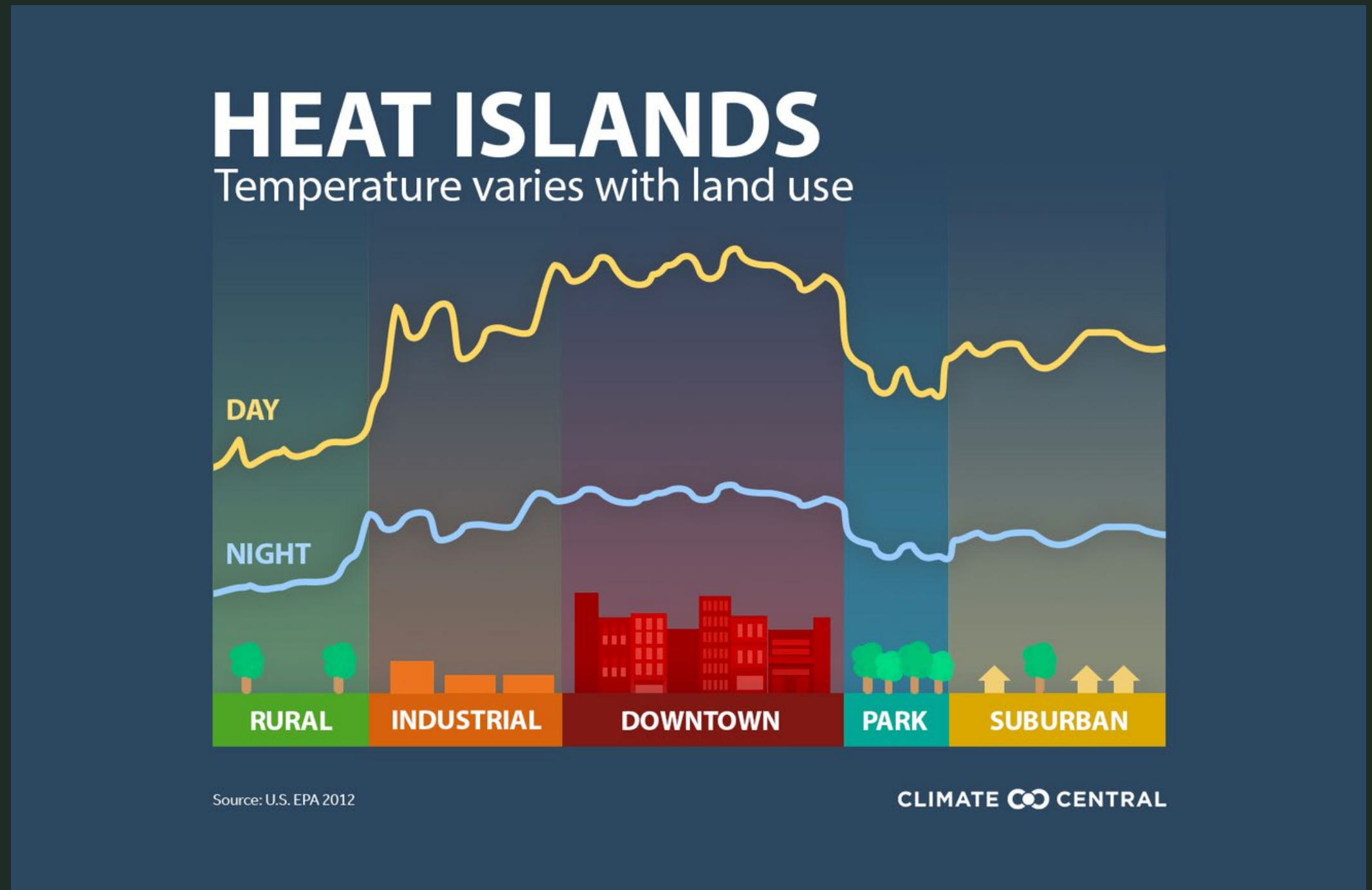
- Absorbs rainfall, preventing water from overwhelming pipe networks and pooling into the streets.
- Improve watershed's hydrological health and functions



Environmental Benefits

Urban Heat Island Effect

- The Urban Heat Island effect occurs when cities replace the natural land cover with dense concentrations of pavements, buildings, and other surfaces that absorb and retain heat
- It helps through shading, evaporative measures, and infiltration capacities





Environmental Benefits

Improved Air Quality

- Absorbs smog, pollutants, and carbon dioxide in the atmosphere
- There are two primary mechanisms by which urban vegetation improves air quality locally:
 - Dispersion
 - Deposition





Economic Benefits

Cost Savings

The Town of Gibson saved over \$4 million in capital investment in a stormwater pipe project by investing in natural asset-based alternatives costing \$900,000 in comparison





Social Benefits

Mental & Physical Health

- Improves people's health and well-being through recreation and reduced air pollution
- Provide opportunities for outdoor recreation, exercise, and social gatherings
- Exposure to greenery improves attention and mood and reduces psychological distress.





Barriers to Green Infrastructure

Insufficient Maintenance Plans

- No requirements for operation and maintenance
- Uncertainties around maintenance requirements and regulations
- Lack of maintenance design standards, best management practices, codes and ordinances





Barriers to Green Infrastructure

Lack of Education & Knowledge

- Makes it increasingly difficult to receive government and public support and acceptability
- Stemmed from the lack of guidance from the provincial and federal levels of government

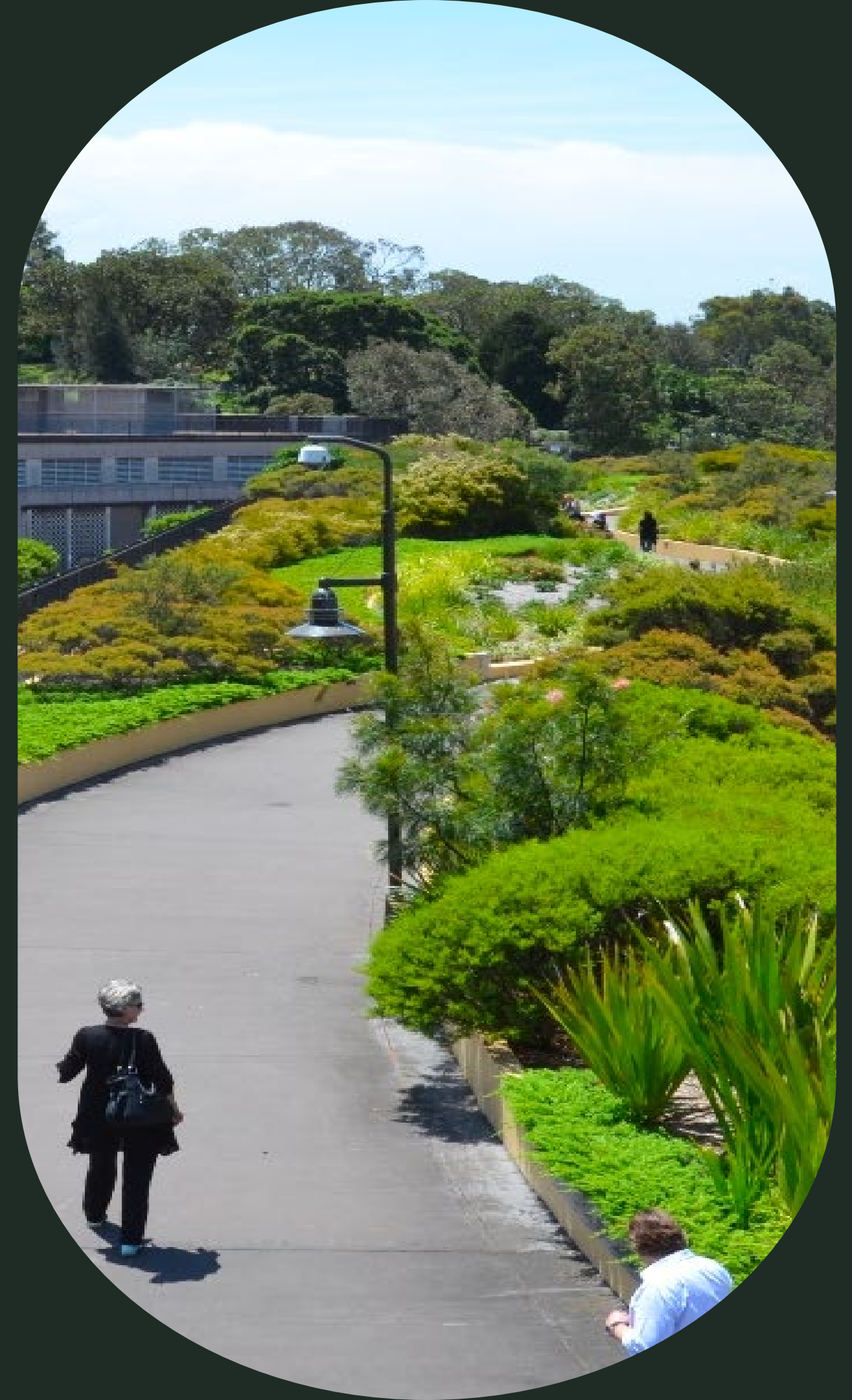




Barriers to Green Infrastructure

Limited Funding

- Only funding is available for boots on the groundwork
- There is a lack of knowledge of the project implementation process, creating uncertainty and risk from the funder's perspective
- Causes a lack of inter -agency and community cooperation





Solutions

Improved & Required Maintenance

- Hold the same requirement as grey infrastructure networks
- Maintenance needs to be specific to the type of green infrastructure installed
- Greater support from local and senior levels of government and trained professionals





Solutions

Required Education & Training

- Implementation of outdoor classes in school
- Greater education for post-secondary institutions
- Required training for engineers, planners, construction workers, the public works department, government regulators, etc.





Solutions

Policy Implementation

- More robust policy to build capacity:
 - Target a percentage of imperviousness
 - Divert stormwater from going into the grey infrastructure systems
 - Targets removing 80 % of the total suspended solids on an annual runoff

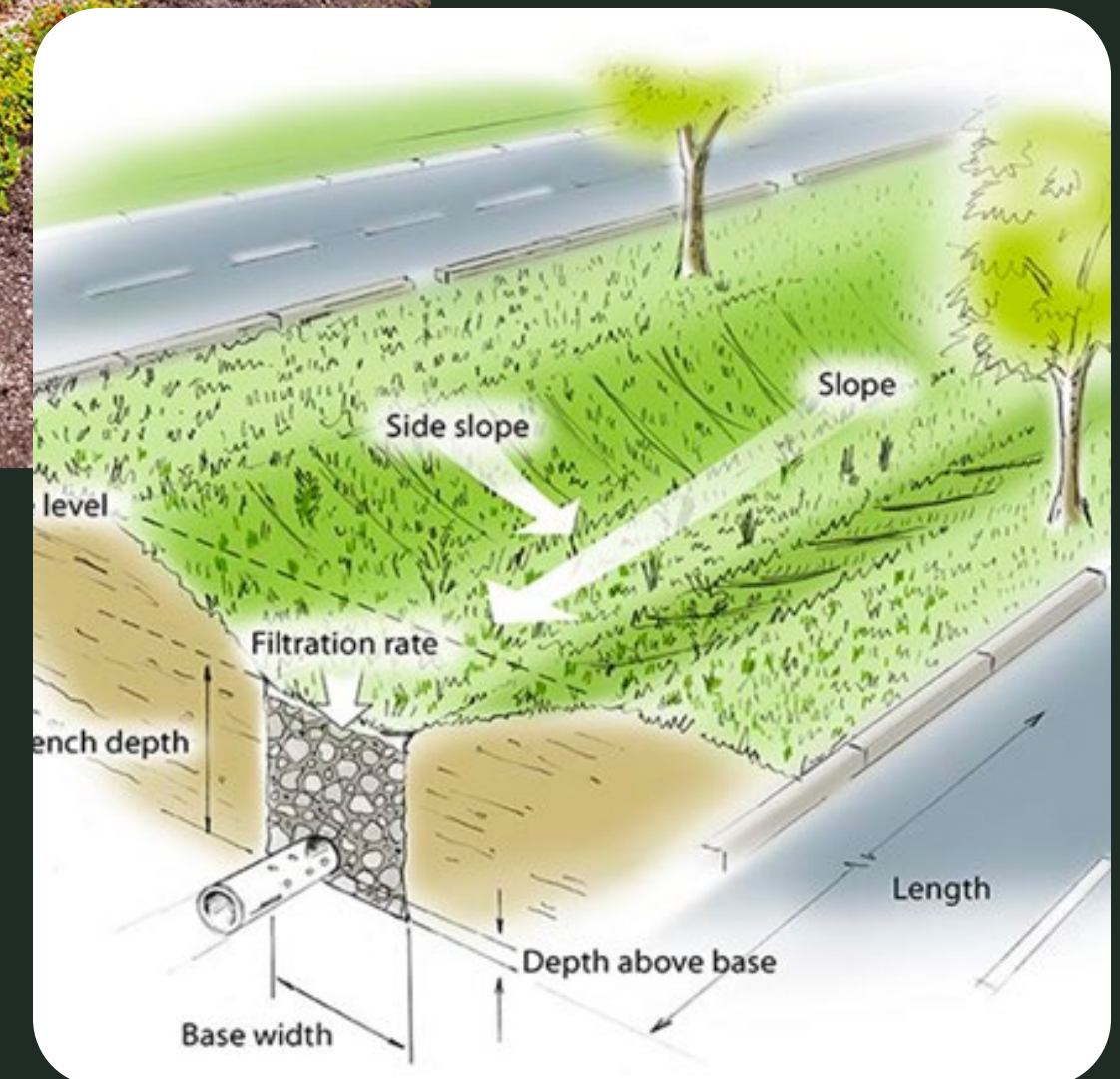




Solutions

Incentives

- Streamlined approvals process
- Density bonus
- Increased Floor Space Ratio (FSR)
- Height bonus
- Decreased parking
- Greater funding





THANK YOU FOR LISTENING!

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