

4.60m  
↓

**NO  
CLIMBING  
OR  
JUMPING  
FROM BRIDGE**  
City of Courtenay

# 5<sup>th</sup> Street Bridge Rehabilitation

## Council Briefing

May 21, 2019

Courtenay City Hall

# Presentation Objectives

1. Overview and background of the 5<sup>th</sup> Street Bridge Rehabilitation Project
2. Project Development
3. Project Options
4. Discussion

# Strategic Plan Reference

- Implement key transportation initiatives
- Focus on asset management for sustainable service delivery

*“To extend the service life of a bridge asset requires routine maintenance and periodic rehabilitation.”*



# 5<sup>th</sup> Street Bridge Rehabilitation Project Agreement



## • New Build Canada – Small Communities Fund Funding Agreement

- Agreement w/ Province signed 2017
- **Completion Date: March 2022**  
(extension from original Mar. 2020)
- **Project Scope from 2015 Application**
  - **Bridge Recoating:** *paint removal, steel repairs and recoating steel*
  - **Bridge Deck Repairs:** *removal + new overlay, removal + new deck*

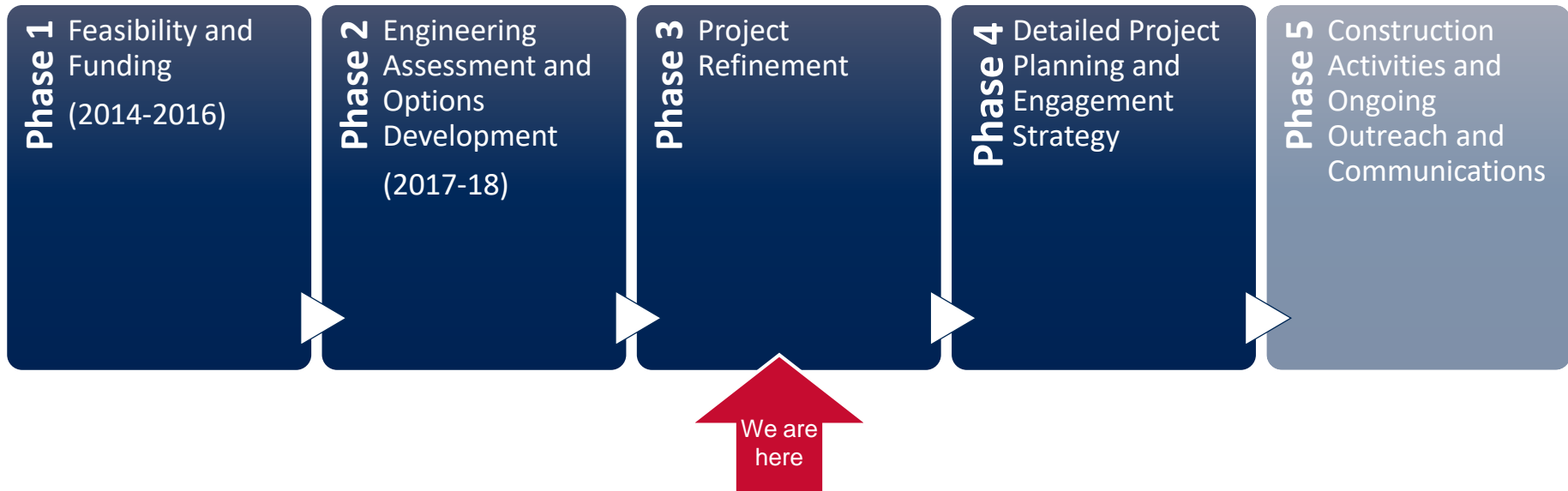
### 2015 Project Cost Estimate: \$2.9M

- *Prov./Fed. \$1.96M*
- *City: \$0.94M*

### 2019 Project Cost Estimate: \$6.3M

- *Prov./Fed. \$1.96M*
- *City: \$4.34M*

# Project Development Stages



# Project Development

## Cost Fundamentals



### Cost escalation

- *Inflation, construction trends, trade impacts to material costs*
- *Funding availability leads to contractor demand and therefore price increases*
- *Significant cost escalations between 2014 to 2018 on Vancouver Island*
- *Impacts to many municipal projects*

### New Project Scope

- *Traffic Management - **\$0.35M***
- *Alternating lane construction vs bridge closure **\$0.7M***
- *Cathodic Protection: structural rust protection to the bridge deck - **\$1M***

# Project Development

## *Cathodic Protection*



### Cathodic Protection vs. Concrete Slab Replacement

- shorter construction duration
- extended service life – no deck rehab for 50 years
- reduces corrosion to insignificant levels
- comparable pricing to alternative

|                   | Cathodic Protection | Concrete Slab Replacement |
|-------------------|---------------------|---------------------------|
| Construction time | 1.5 months          | 2.5 months                |
| COST (2019)       | \$1M                | \$1M                      |
| Life Expectancy   | 50-100 years        | 20-30 years               |

# Project Development

## Traffic Management



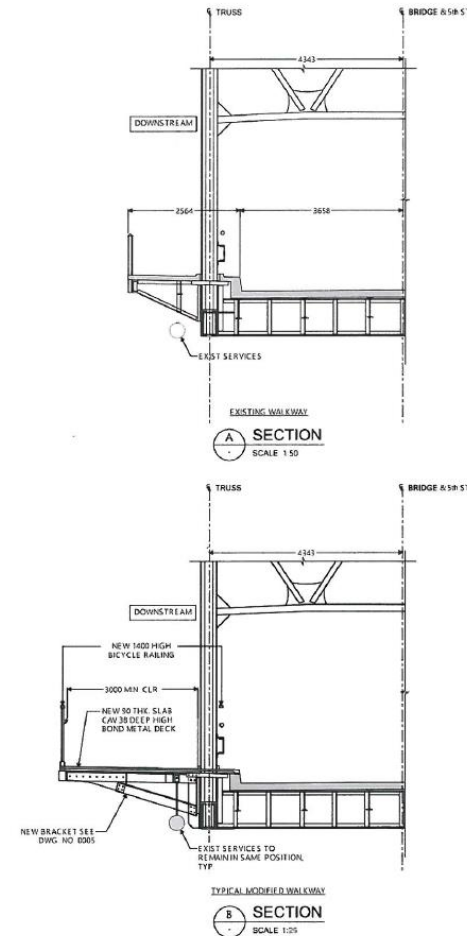
- Original estimate assumed a full bridge closure
- Vital transportation route for regional and local needs
- Project costs and implementation plan now include additional traffic management
  - Example – working with MoTI to raise awareness of the North Courtenay Connector on Piercy Rd

|                     | Full Closure | Alternating Single-Lane |
|---------------------|--------------|-------------------------|
| DURATION            | 5 months     | 6 months                |
| Bridge Recoating    | \$4.2M       | \$4.8M                  |
| Bridge Deck Repairs | \$1.4M       | \$1.5M                  |
| Total               | \$5.6M       | \$6.3M                  |

# Project Development Cantilever Concept



- Design for multi-use pathway (3m, both sides)
- Preliminary concept only





# Project Development

## 2019 Cost Estimate



Original  
Scope of  
Work +  
Cathodic  
Protection

Optional  
Cantilevers

| Project Element   | COST (2019 \$) |
|---|----------------|
| Removal and replacement of <b>Protective Coating</b>            | \$4.10M        |
| <b>Cathodic Protection System</b> to Extend Life of Bridge Deck | \$1.05M        |
| Structural Improvements   | \$0.80M        |
| Traffic Management  | \$0.35M        |
| <b>Total</b>  | <b>\$6.3M</b>  |
| Cantilevers   | \$2.0M         |
| <b>Optional Total</b>   | <b>\$8.3M</b>  |

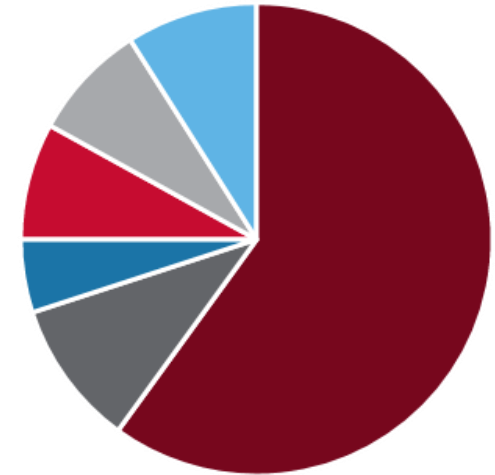
# Project Development

## *Cost Comparisons and Types of Costs*



- **Project costs are comprehensive and cover the full investment**
  - *Engineering*
  - *Contract Administration*
  - *Engagement and Planning*
  - *Construction*
  - *Contingencies*
  - *Inspection and Safety*
- **Tender or construction costs reflect the dollars required for building only and are much less than project costs**

***Construction cost is typically only 2/3 of the overall project cost.***



# Project Development

## Industry Examples: Campbell River & Duncan



**Courtenay**

**\$6.3M**



**Duncan**

**>\$4.5M**



**Campbell River**

**>\$2.9M**

- ✓ *Bridge Wrap*
- ✓ *Traffic Management*
- ✓ *Full Coating Rehabilitation*
- ✓ *Cathodic Protection*
- ✓ *Deck rehabilitation*

- ✓ *Bridge Wrap*
- ✓ *Traffic Management*
- ✓ *Full Coating Rehabilitation*

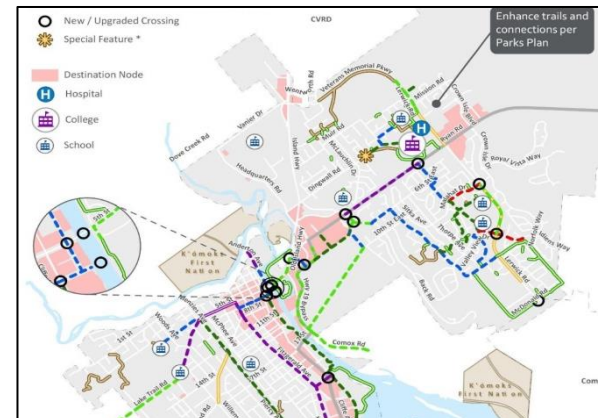
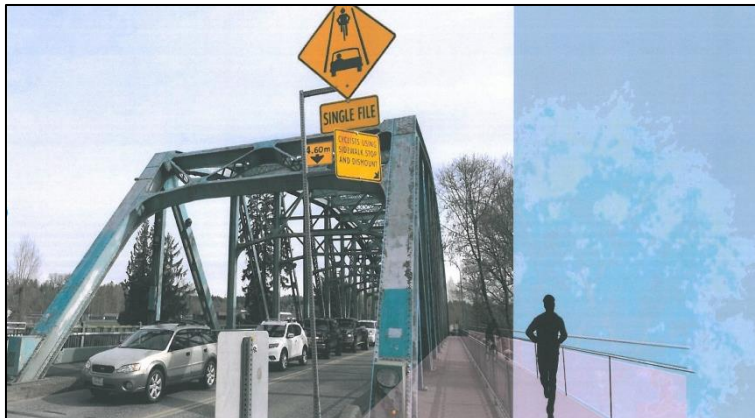
- ✓ *Bridge Wrap*
- ✓ *Traffic Management*
- ✓ *Partial Coating Repair*

Multiple and significant differences among the projects: scope of rehabilitation, project cost types, location, year, and size of bridge.

# Project Development Options

- **Consider the range of options**

1. *Original Rehabilitation (Scope of Grant)*
2. *Rehabilitation + Cantilevers (Scope of Grant + Option)*
3. *Defer Project*
4. *Consider Bridge Replacement*





# Option 1



# Original Scope Rehabilitation

## Features:

- Full recoating, deck repairs and related upgrades.
- Approx. 5 to 6 months construction.
- Project costs exceed original grant by \$3.4M.

| COST (2019 \$)          |               |
|-------------------------|---------------|
| Bridge Recoating        | \$4.10M       |
| Cathodic Protection     | \$1.05M       |
| Structural Improvements | \$0.80M       |
| Traffic Management      | \$0.35M       |
| <b>Total</b>            | <b>\$6.3M</b> |

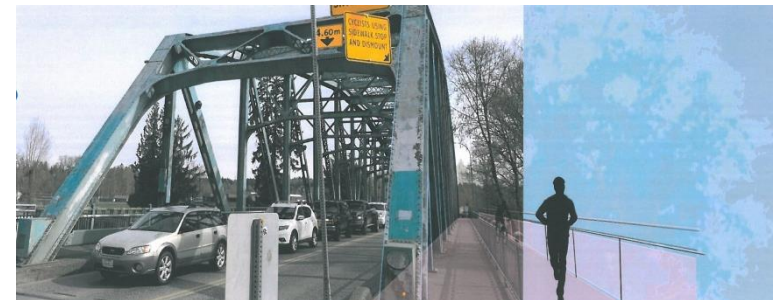
# Option 2



# Rehabilitation + Cantilevers

## Features:

- Full recoating, deck repairs and related upgrades.
- Two sided bike/ped facilities.
- Approx. 8 month duration.
- Project costs exceed original grant by \$5.4M.
- ~\$300,000 Cost efficiency for cantilevers during rehabilitation.



| COST (2019 \$)        |               |
|-----------------------|---------------|
| Bridge Rehabilitation | \$6.3M        |
| Cantilever Paths      | \$2.0M        |
| <b>Total</b>          | <b>\$8.3M</b> |

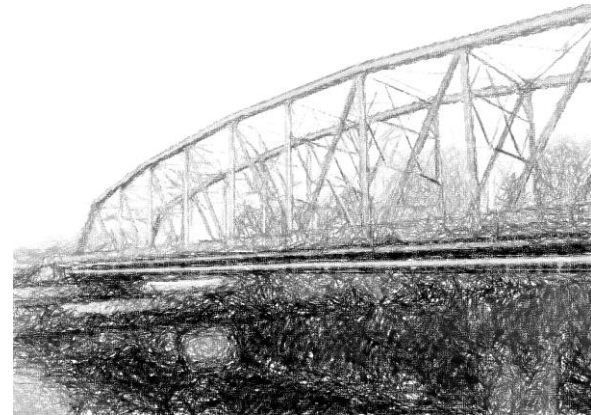
# Option 3



## Defer 5<sup>th</sup> Street Bridge Rehabilitation

### Features:

- Return \$1.96M in grant funding.
- Asset deterioration continues.
- Cost escalation continues.



# Option 4

Not studied to date



# New 5<sup>th</sup> Street Bridge

## Features:

- Return \$1.96M in grant funding.
- Not studied to date.
- Additional design, planning and environmental work.
- Preliminary cost estimate \$25M - \$30M.





# Project Development Options Summary



|                                     | Original Scope<br>Rehabilitation | Rehabilitation<br>+ Cantilevers | Defer<br>Project | New<br>Bridge             |
|-------------------------------------|----------------------------------|---------------------------------|------------------|---------------------------|
| <b>DURATION</b>                     | 6 months                         | 8 months                        | N/A              | N/A                       |
| <b>Bridge Recoating</b>             | \$4.1M                           | \$4.1M                          | TBD              | N/A                       |
| <b>Structural &amp;<br/>Traffic</b> | \$2.2M                           | \$2.2M                          | TBD              | TBD                       |
| <b>Cantilever Paths</b>             | -                                | \$2.0M                          | TBD              | Options                   |
| <b>Total</b>                        | <b>\$6.3M</b>                    | <b>\$8.3M</b>                   | <b>TBD</b>       | <b>\$25M to<br/>\$30M</b> |
| <b>COST BEYOND<br/>GRANT</b>        | <b>+ \$3.4M</b>                  | <b>+ \$5.4M</b>                 | <b>N/A</b>       | <b>All</b>                |

# Project Finance

## *Costs Beyond Original Scope*



### Option 1

Original Scope of  
Rehabilitation

**+\$3.4M**

### Option 2

Rehabilitation +  
Cantilevers

**+\$5.4M**

### *Finance Options for Future Discussion*

1. Defer other general capital projects 4+ years
2. Borrow the amount with annual debt servicing costs; \$1M borrowing costs are ~\$70k/year
3. Reserves
4. Combination

For future  
discussion

# Preparing for Staff Report and Project Direction – June 10

- *Further define risks and opportunities*
- *Options analysis and priorities*
- *Key considerations for successful project implementation*
  
- **Questions?**



## POTENTIAL CRITERIA TO WEIGH OPTIONS

Connectivity

Funding

Schedule