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Closing the Performance Gap with Value Management

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Corporate Project and Asset Management (CPAM)
Corporate Analytics & Innovation (CAI), The City of Calgary

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AGENDA

Calgary

Background and Context of VM

Calgary's Experience and Results

Challenges and Lessons Learned

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About Myself

Architect (1993 -2000)

Urban Planner (2002 – 2008)

Value Management (2008 – to date)

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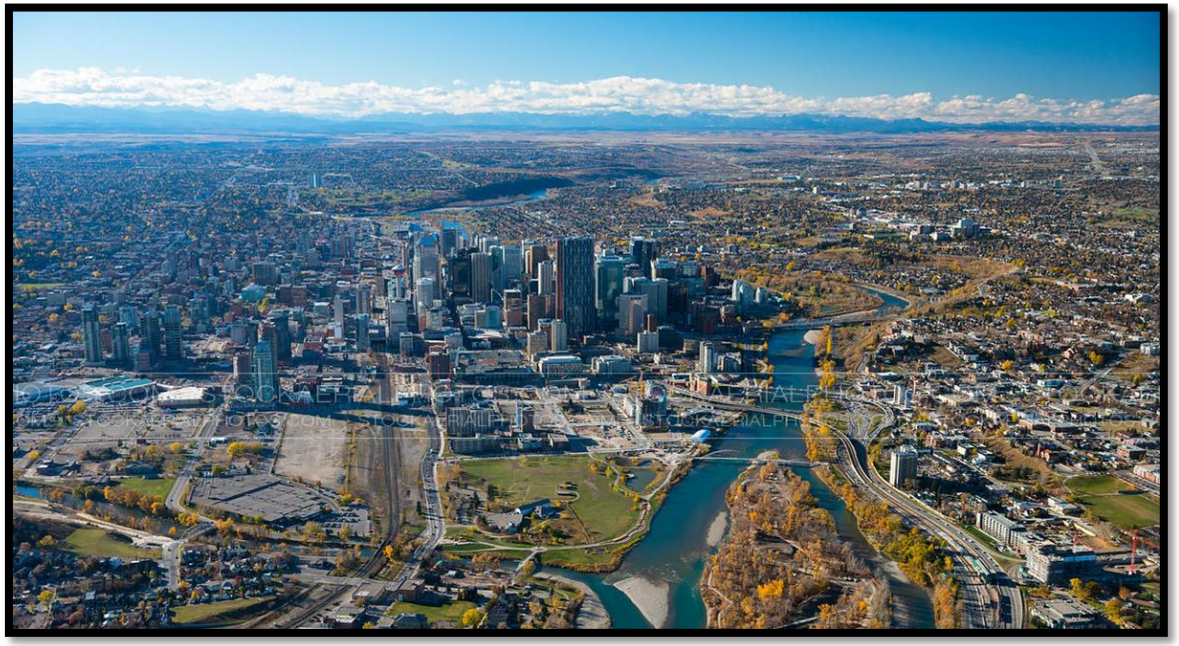
Calgary, AB



4th Largest
1.5 M Popn.
36.3 Median Age
820 sq kms
3430 ft Elevation
20K – 25K/ year (0.9%)
1.9% Economic Growth
$85 B City Assets
$1.5B Capital Investment/ Year

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Why VM is Critical Now?

Uncertain Economic Times

Shrinking Budgets

Demanding Customers/ Citizens

Competition/ Competing Priorities

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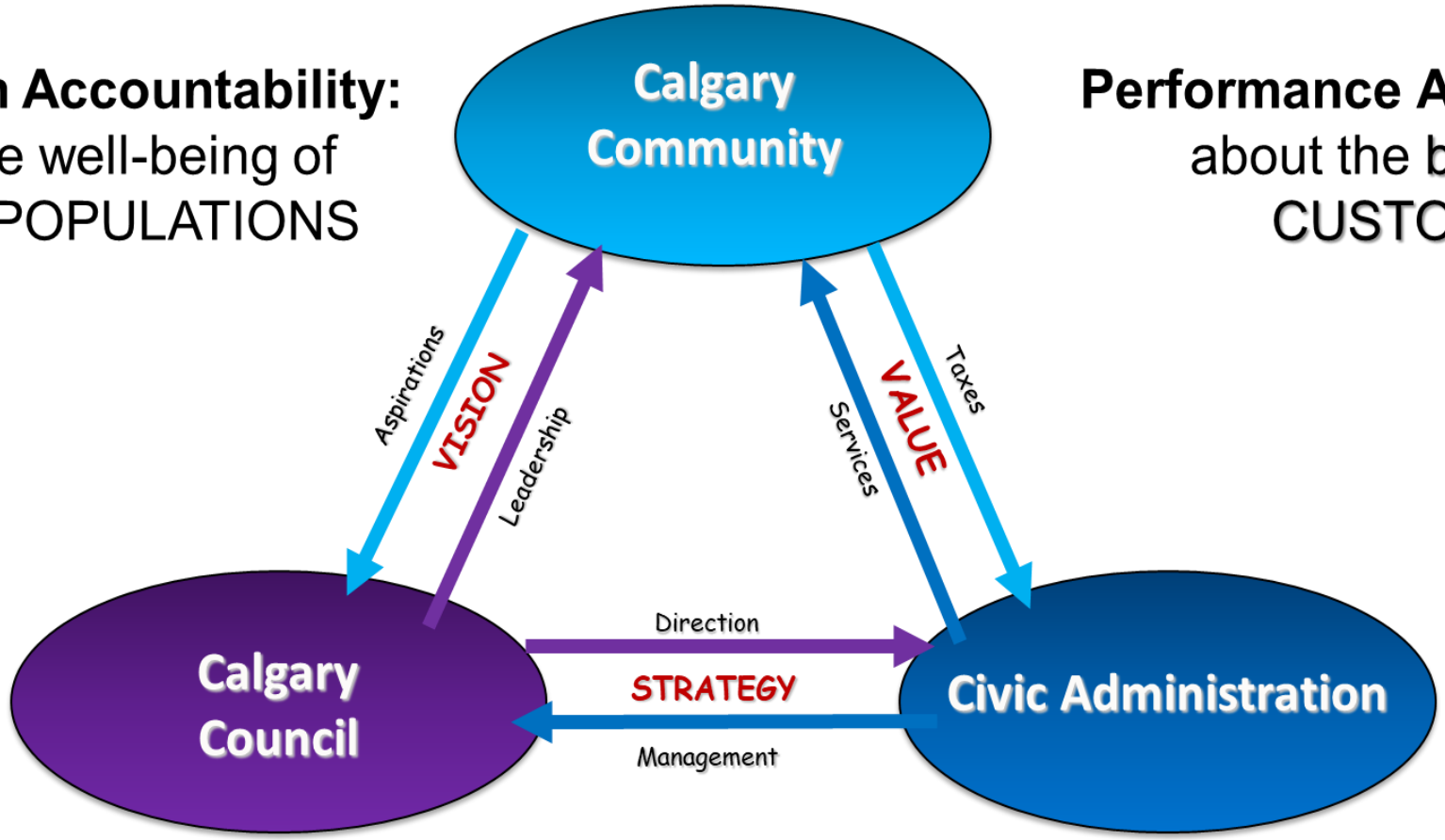
Public Accountability

Population Accountability:
about the well-being of
WHOLE POPULATIONS

Performance Accountability:
about the benefits for
CUSTOMERS



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VM - NOT New To Calgary

2000 - 2014

23 Successful VM Studies

Avg. VM study cost vs. estimate: 0.23%

Avg. ROI 130:1

Avg. % cost avoidance/ deferral: 12.6%

Avg. VM study cost: C$90K

Range of programs and projects reviewed: C$6.0M to C$523.0M (C$60.0M median)

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2011 City Auditor's Report

2013-0026 Corporate Project Management Framework - Progress Report - Att4.pdf
Unrestricted

16 Avenue North Urban Corridor Project Audit Report Recommendation (2011 June 27)	Corporate Project Management Framework Action
The City Manager develop and implement a mandatory project management methodology for capital construction projects. The methodology should include (but not be limited to:	• Corporate Project Management Framework initiated and underway. • Project Management Quality Assurance development underway with implementation in 2013.
• A requirement for a business case setting out why (in quantifiable terms) the project is required, and showing why the option pursued is the best option for The City to resolve the issue. The business case should include measurable project objectives that can be measured at project close to determine the success of the project.	• Project Business Case standard created
• A comprehensive planning process, including a requirement to detail timelines and budget at an appropriate scale for the project, identify dependencies, critical path items and contingencies, develop and communicate roles and responsibilities, and to set a series of formal project checkpoints with required deliverables. Any inspection processes required to complete projects must be included in the plan, as well as quality activities required to ensure that the completed project is fit for purpose.	• Project Charter and Project Plan stand implemented. • Inclusion of key policies and practices procurement). • Project Management Quality Assura implementation in 2013.
• A proactive risk management process covering the whole project lifecycle, including the creation of a formal risk register which is updated throughout the project lifespan, and documentation of mitigating actions, monitoring of actions and the results/decisions.	• Included in Project Charter, Project Reporting standards. • Project Risk Management standar
• A system of regular reporting to management on progress against the original approved timelines/budget/scope/quality and checkpoints, reasons for any variances, a review of risks and mitigating actions, and summary of issues (affecting time, budget and quality/scope) that arose. Meetings to discuss the reports, including actions arising, should be documented to ensure that issue resolution can be tracked.	• Project Progress Report standar • Project Dashboard initiated with
• Appropriate tools and techniques should be developed to support the methodology, including an evaluation of financial systems available to support the project manager to record project commitments, track expenditure and variances etc.	• Assessment underway. • Alignment with Peoplesoft Project Costing implementation underway.

ATT

City Auditor Report to
The Audit Committee
2011 July 21st

ISC: UNRESTRICTED
AC2011-54
Page 1 of 1

AUDIT REPORT – 16 Avenue North Urban Corridor Project

SUMMARY/ISSUE

The City Auditor's Office has issued the 16 Avenue North Urban Corridor Project Audit Report. The report includes Management's Response to five recommendations made by the City Auditor's Office.

PREVIOUS COUNCIL DIRECTION/POLICY

On 2004 May 17, Council approved Bylaw 30M2004, which established the position of City Auditor and the powers, duties and functions of the position.

The City Auditor's mandate, under Bylaw 30M2004, is to assist Council in: its oversight of the Administration; and ensuring accountability for the stewardship of public funds and the achievement of value for money.

RECOMMENDATION:

That the Audit Committee receive this report and the attached Audit Report – 16 Avenue North Urban Corridor Project for information.

To improve the project management practices across the City, we have directed two of the five recommendations to the City Manager and Chief Financial Officer respectively. The remaining three recommendations have been directed to the business unit, Transportation Infrastructure, as they relate to improving the project management practices we observed directly from the 16th Avenue project.

The City Auditor will monitor and report on the implementation status of the recommendations as part of the City Auditor's Office regular reporting on implementation of recommendations.

IMPLICATIONS

General

This report has been reviewed for alignment with The City of Calgary's Triple Bottom Line (TBL) Policy Framework. No implications are identified.

Social

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2012 Corporate PM Framework

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2015 Council's Notice of Motion

…further enhance project management capabilities

- ***The application of innovative quality and project management approaches, including value management and stage gating,***
- *The identification of ways to better capture capital construction project savings and increase project efficiency,*
- *Analysis on how The City could better demonstrate economic benefit and the multipliers of all construction projects,*
- *Options to reduce capital construction project delivery timelines.*

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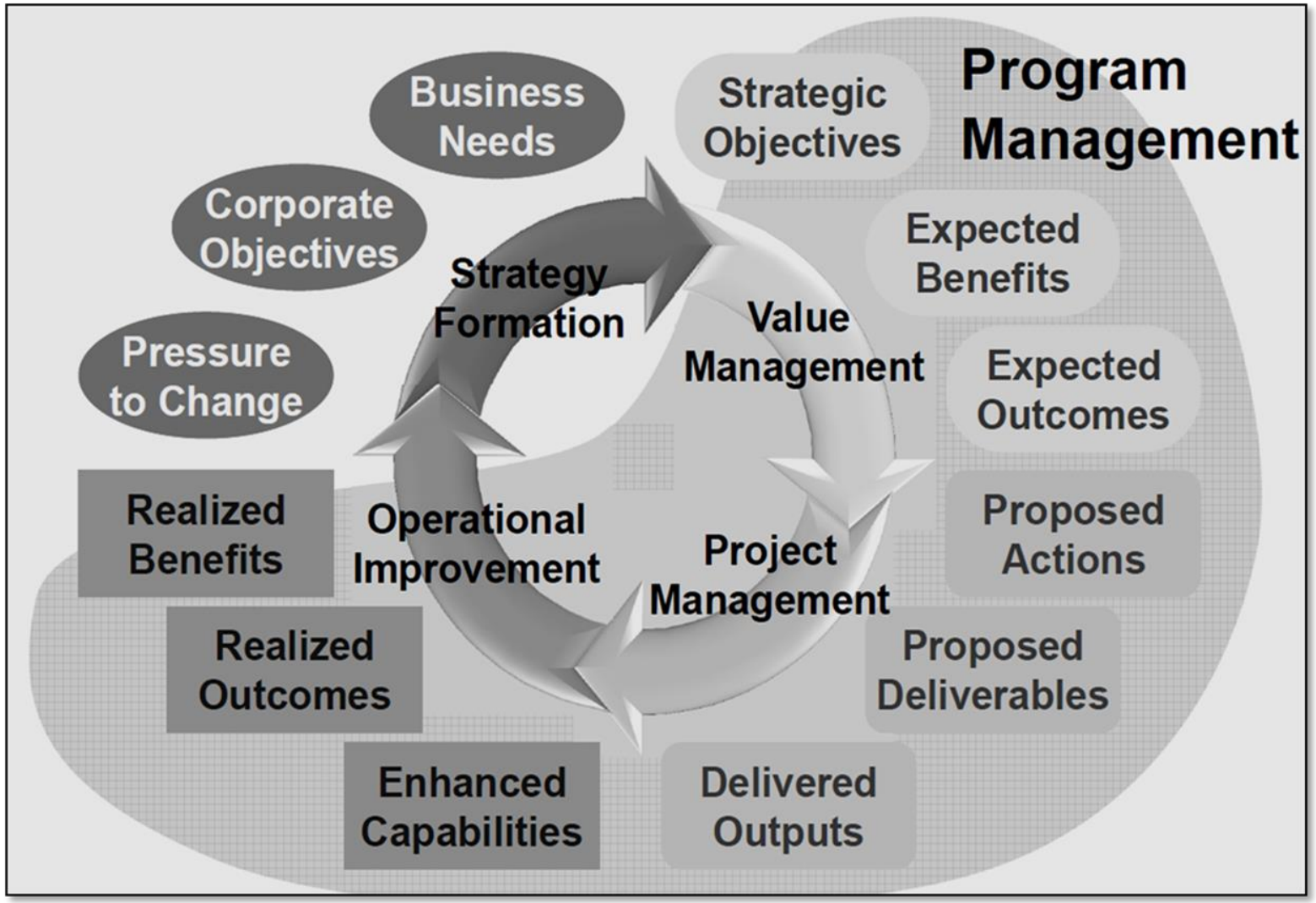
Deliver Business Value



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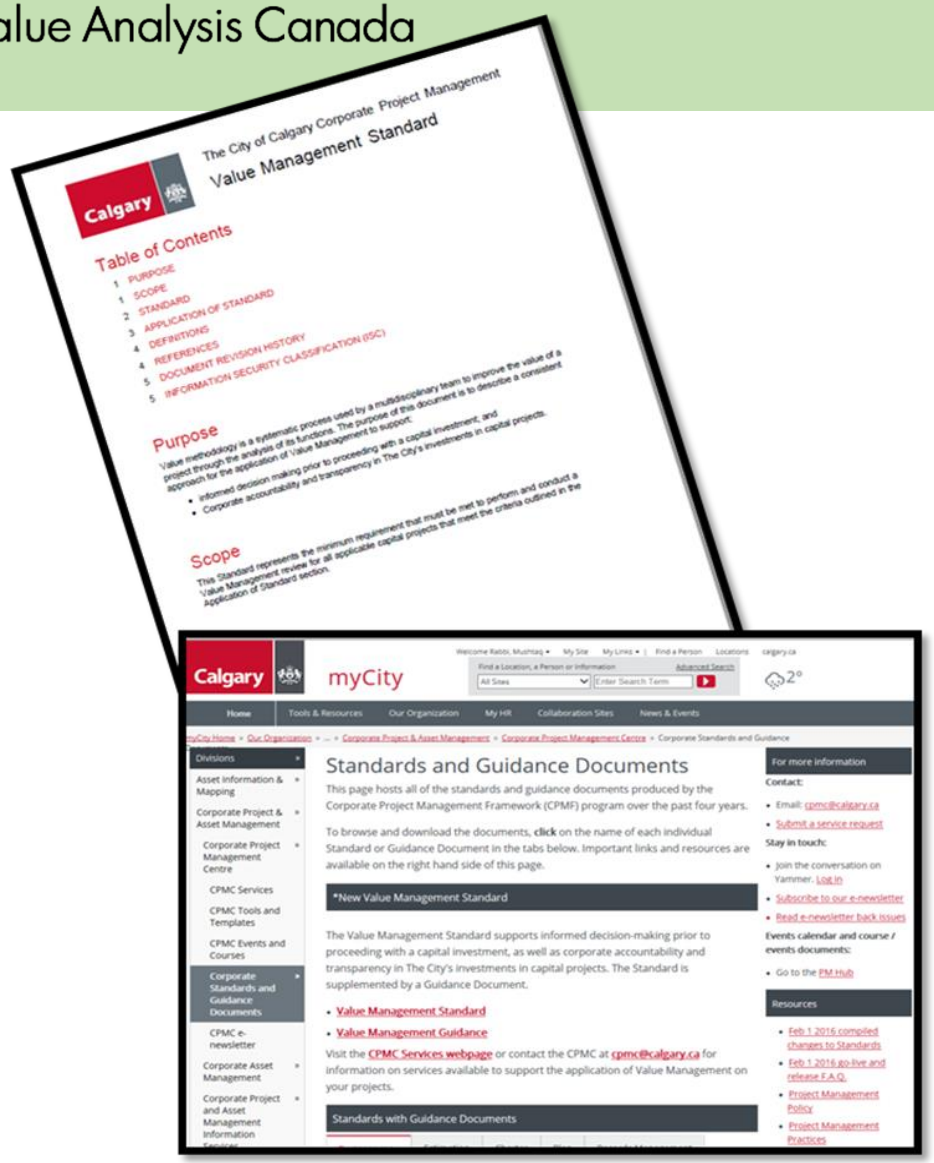
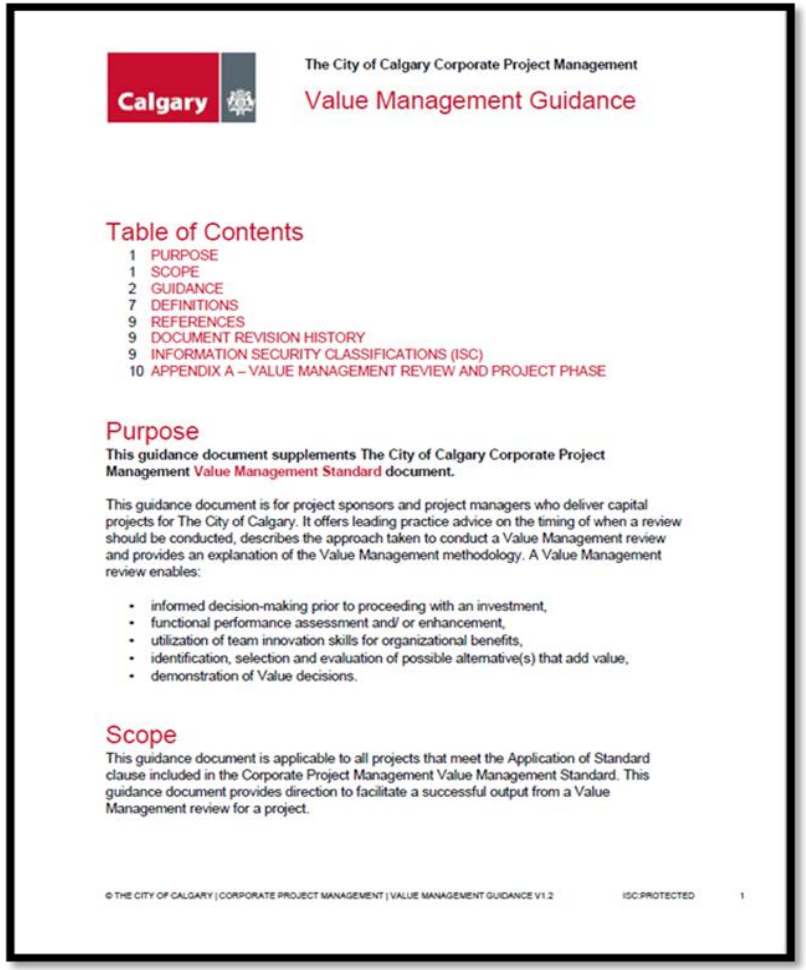
2016 City's VM Standard & Guidance





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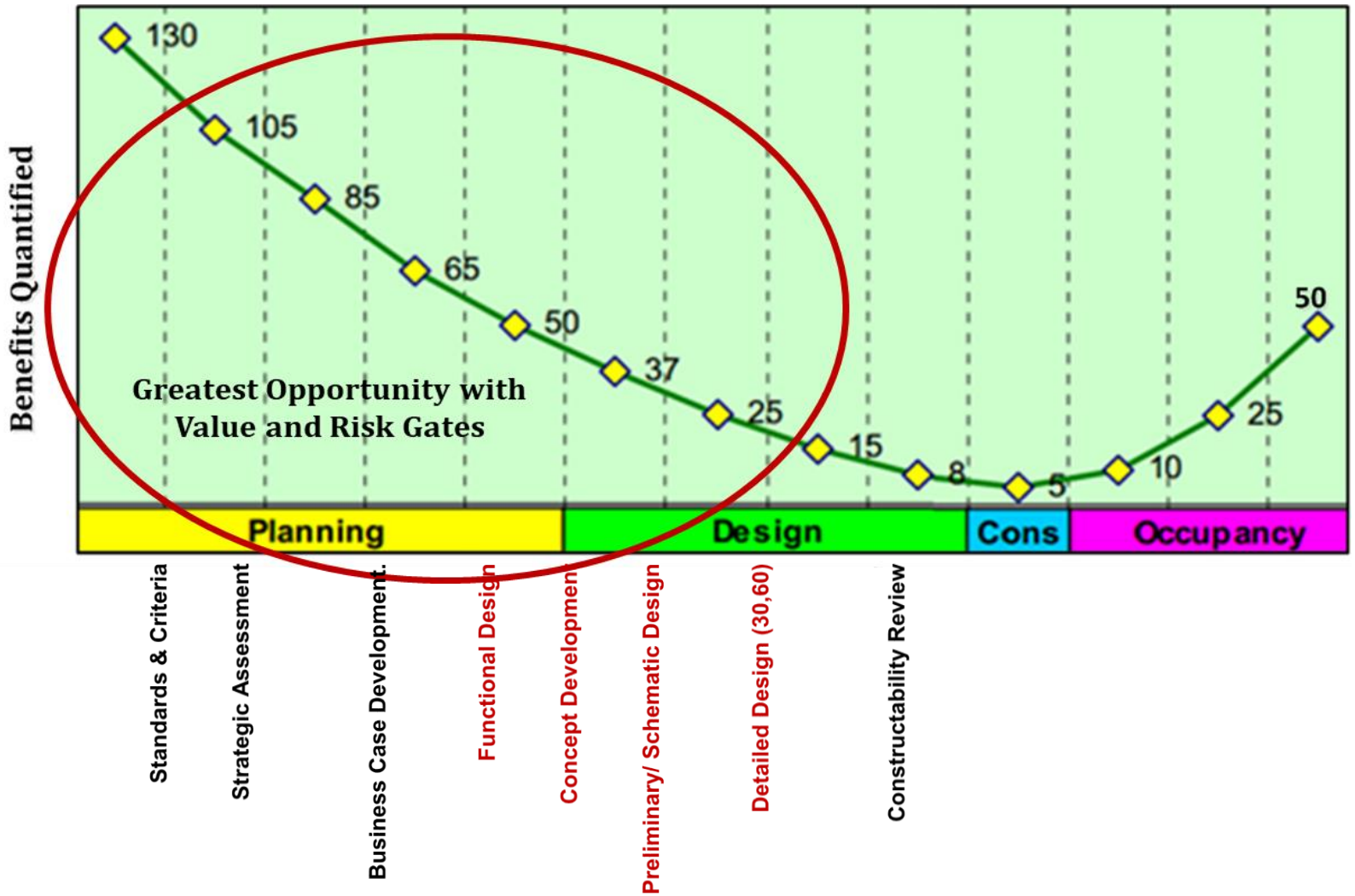
Timing of VM is Important



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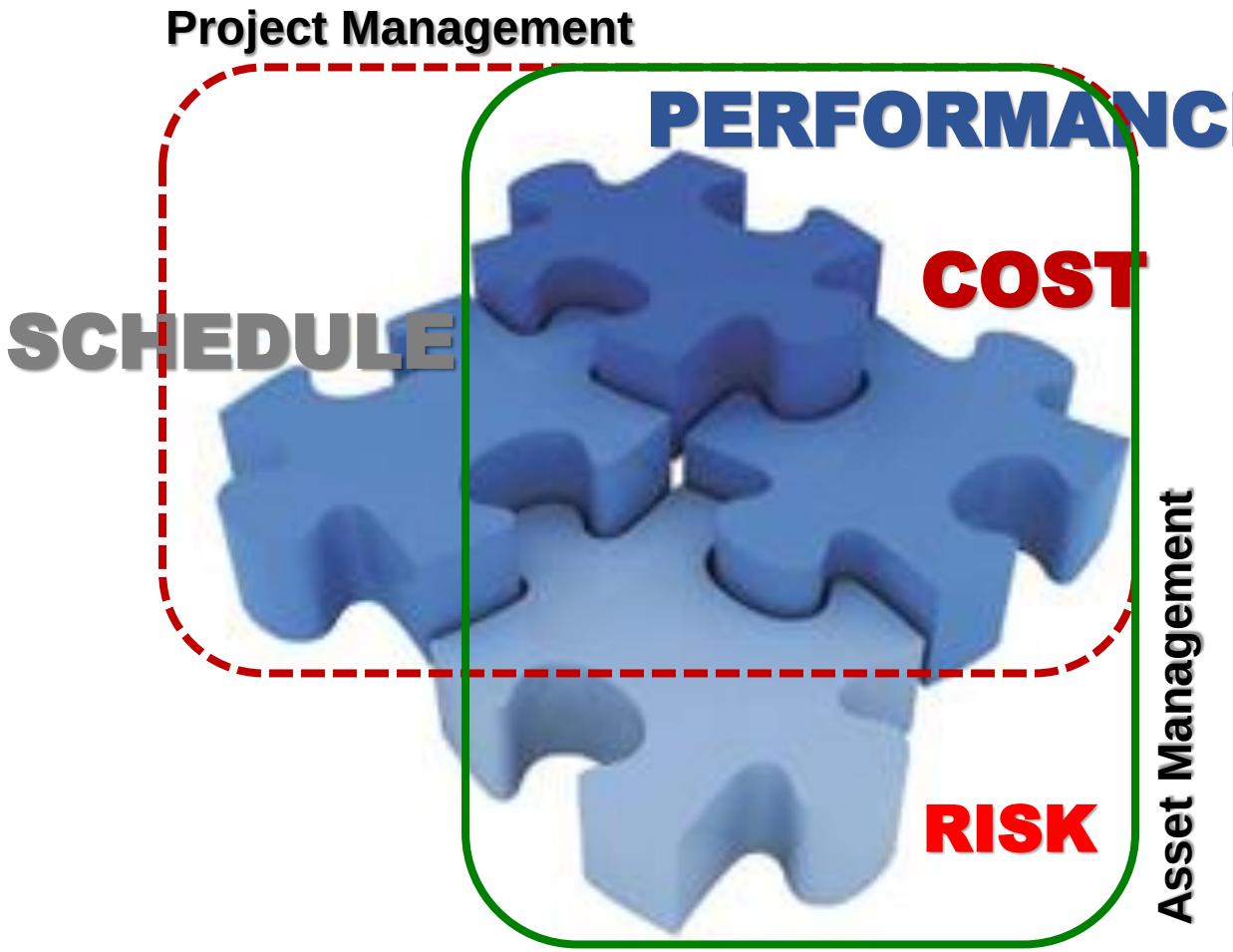
VM Ties Programs, Projects and Asset Investments



Right Level of Service
Reduced Risks
Life Cycle Cost impact

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2016 City's VM Results

Avg. 19% Capital + LCC Avoidance
ROI 113:1

Study Title	BU	Before VM	After VM	Avoidance/Deferral %
Inglewood Sanitary Trunk	WR	Est. $97.0 M	Schedule reduction Avoidance/ Deferral: $17.0M	~17.5%
Bonnybrook Electrical Systems Upgrade	WR	Est. $97.5 M	Reinforced systems Avoidance/ Deferral: $1.1 M	~ 1.12%
Downtown Fire Infrastructure Strategy	CFD	Est. $64.0 M	Est. $39.0 M Avoidance/ Deferral: $25.0 M	~ 39%

Analyse de la valeur Canada
Value Analysis Canada

2017 City's VM Results

Avg. 18% Capital + LCC Avoidance
ROI 3,827:1 (with Green Line)
ROI 217:1 (without Green Line)

Study Title	BU	Before VM	After VM	Avoidance/Deferral %
Woodlands Woodbine Community Drainage Improvement (CDI)	WR	Est. $67.0 M	Est. $52.0 M - $57.0 M Avoidance/ Deferral: $10.0 M - $15.0 M	~ 15% - 23%
Green Line LRT Program	TI	Est. $6.7 B	CONFIDENTIAL	CONFIDENTIAL
Rangeview Sanitary Trunk	WR	Est. $97.5 M	Est. $74.0 M - $91.2 M Avoidance: $6.3 M - $23.5 M	~ 6.5% - 24%
North Calgary Water Supply System	WR	Est. $70.0 M	Est. $46.0 M - $55.0 M Avoidance/ Deferral: $15.0 M - $24.0 M	~ 21% - 34%
9 Av SE Bridge Replacement	TI	Est. $24.0 M	Est. $ 21.4 M - $22.4 M Avoidance/ Deferral : $1.6 M - $2.65 M	~ 6.7% - 11%

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2018 City's VM Results

Avg. 45% Capital + LCC Avoidance
ROI 747:1

Study Title	BU	Before VM	After VM	Avoidance/Deferral %
16 Ave NW Widening, Banff Tr. Access	TI	Est. $25.7 M	Enhancement of access; No cost comparison completed	N/A
Calgary 911 PSAP Optimization	911 Centre	Configurations Evaluation	4 New configurations developed for call routing	26% reduction in wait time
OWAM – GIS Integration	WR	Est. $19.0 M	Est. $8.8 M - $10.26 M Avoidance: $8.74 M	~ 46%
Water Long Range Plan (Risk and Value)	WR	Est. $500.0 M - $800.0 M (cost of risk mitigation)	Est. $95.7 M; risks mitigated; Avoidance/ Deferral: $404 M - $700 M	~ 81%
TransCanada Sanitary Trunk	WR	Est. $70.1 M	Developed 3 Scenarios Avoidance/ Deferral : $14.4 M - $21.5 M	~20.5% - 31%
Upper Plateau Separation Storm Trunk	WR	Est. $55.33 M	Developed 3 Scenarios Avoidance/ Deferral $6.8 M - $51.9 M	~12% - 94%
Manchester Stormwater Management	WR	Est. $8.8 M	Developed 3 Scenarios Avoidance/ Deferral: $5.8 M - $6.5 M; Long term: ($5.0 M)	~66% - 74%

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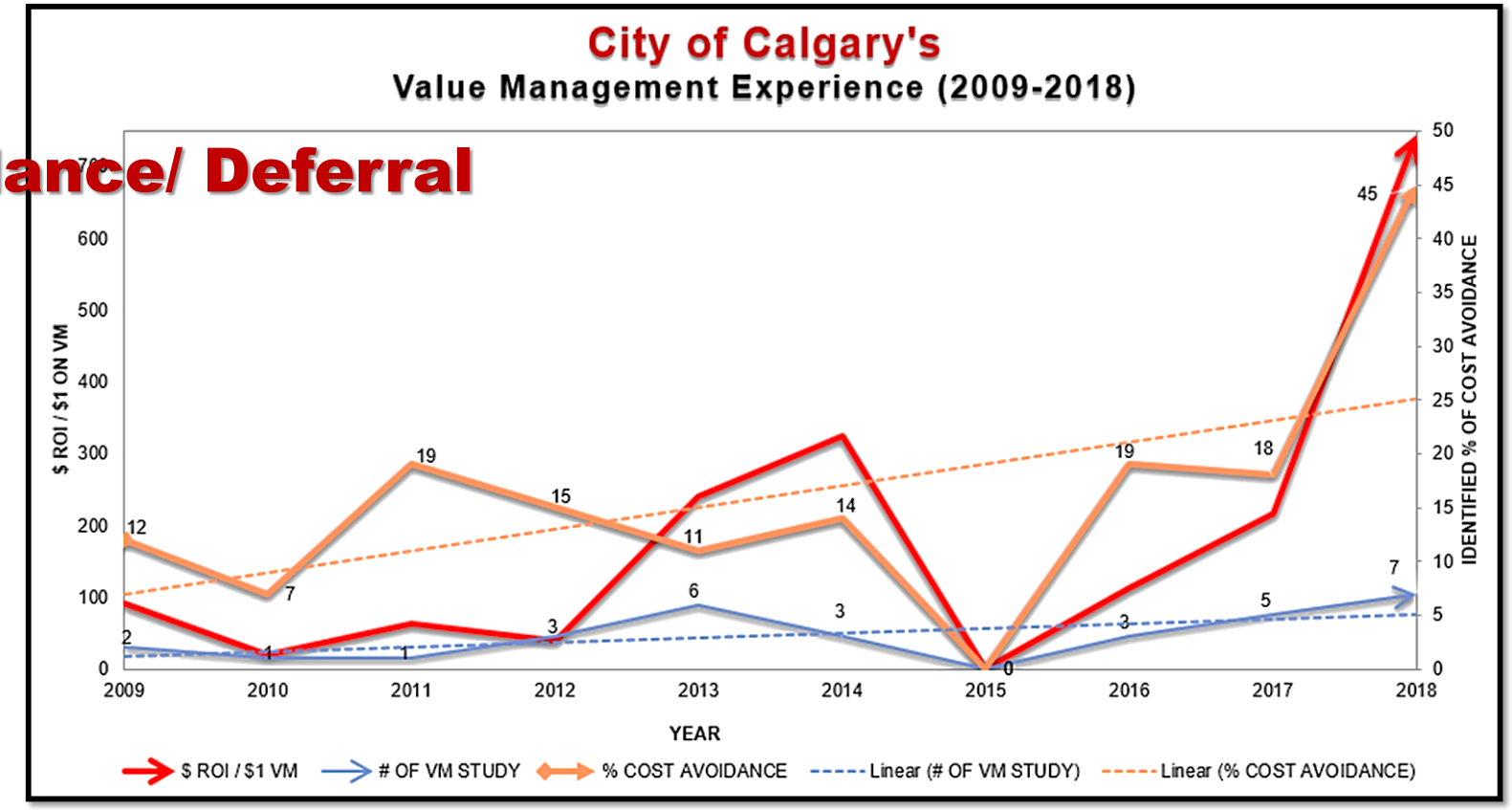
2009 – 2018 VM Results

Total 32 Studies
Avg. 16% Cost Avoidance/ Deferral
Avg. ROI 186:1



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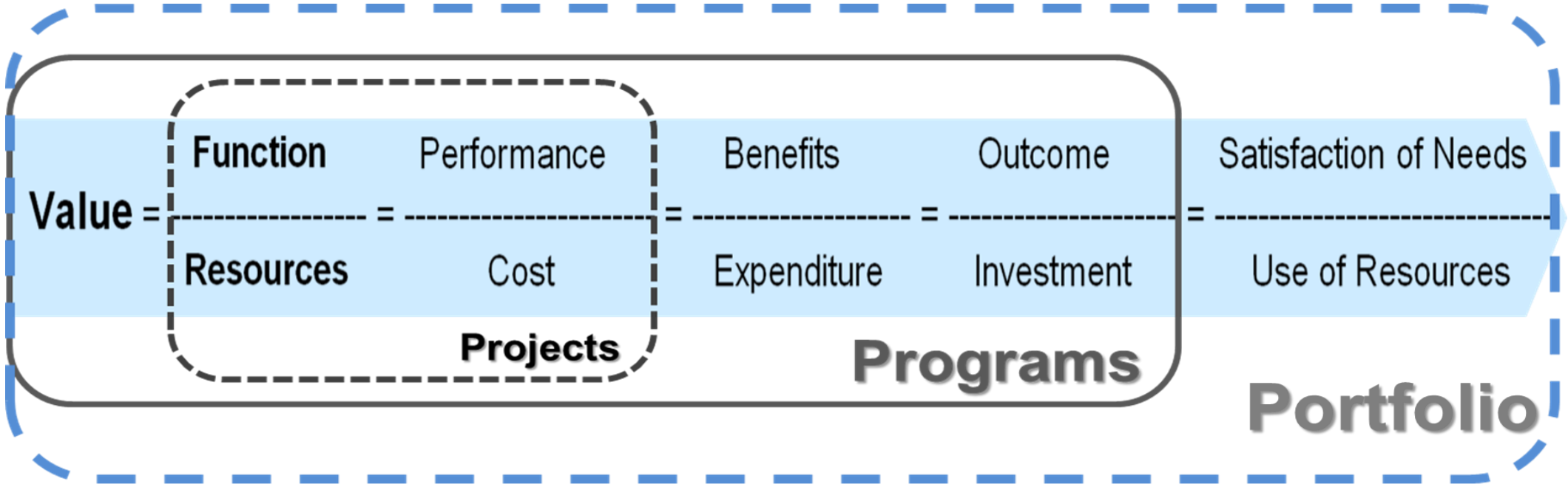
Beyond Projects Only



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Challenges

Tracking the Results (after the study)

Desire to Shorten Study Hours

Perceived as an Interruption- Skip It

Lack of Knowledge of VM Capability

(PMs, Sponsors, Management)

Upfront Effort and Cost of VM

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Summary

VM Champion

Ease of Procurement

Timing of VM

Share VM results

Create and Build Awareness

Positioning VM Service

Working/ Consulting with External Organizations

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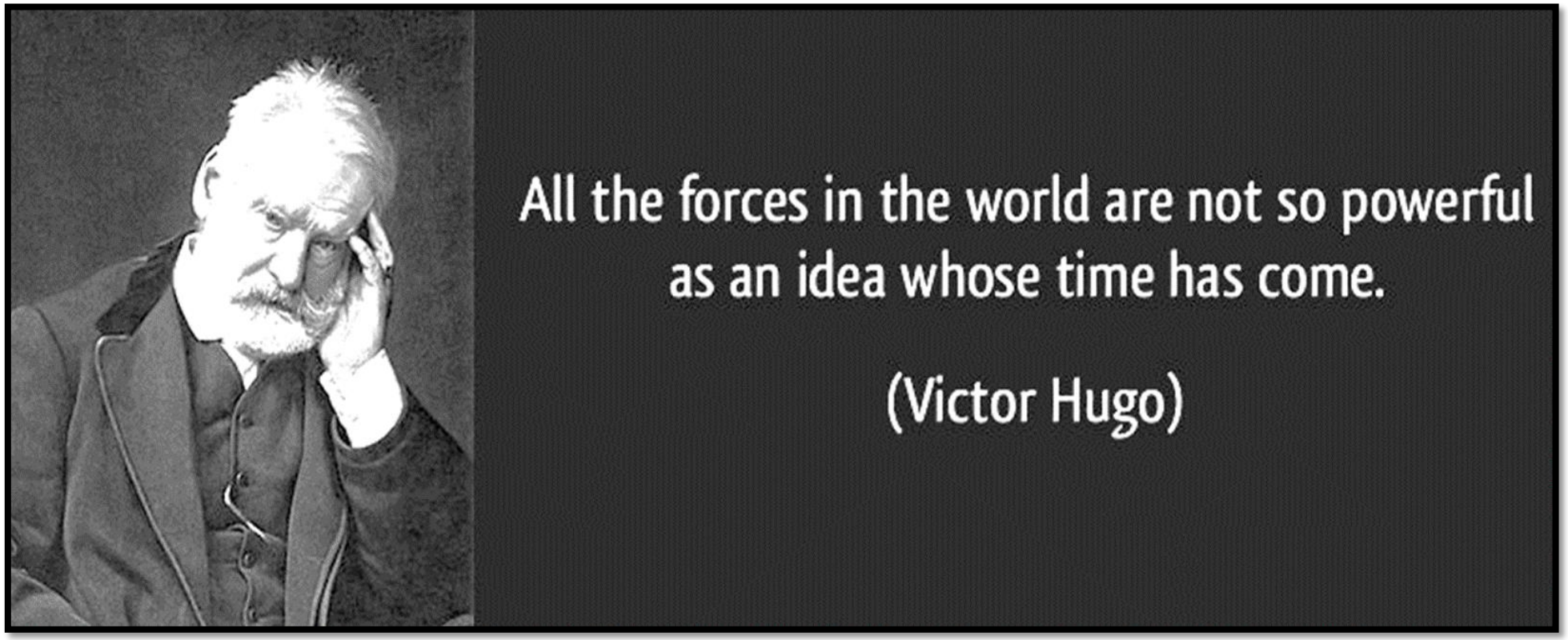
Closing Thought



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Questions/ Comments?

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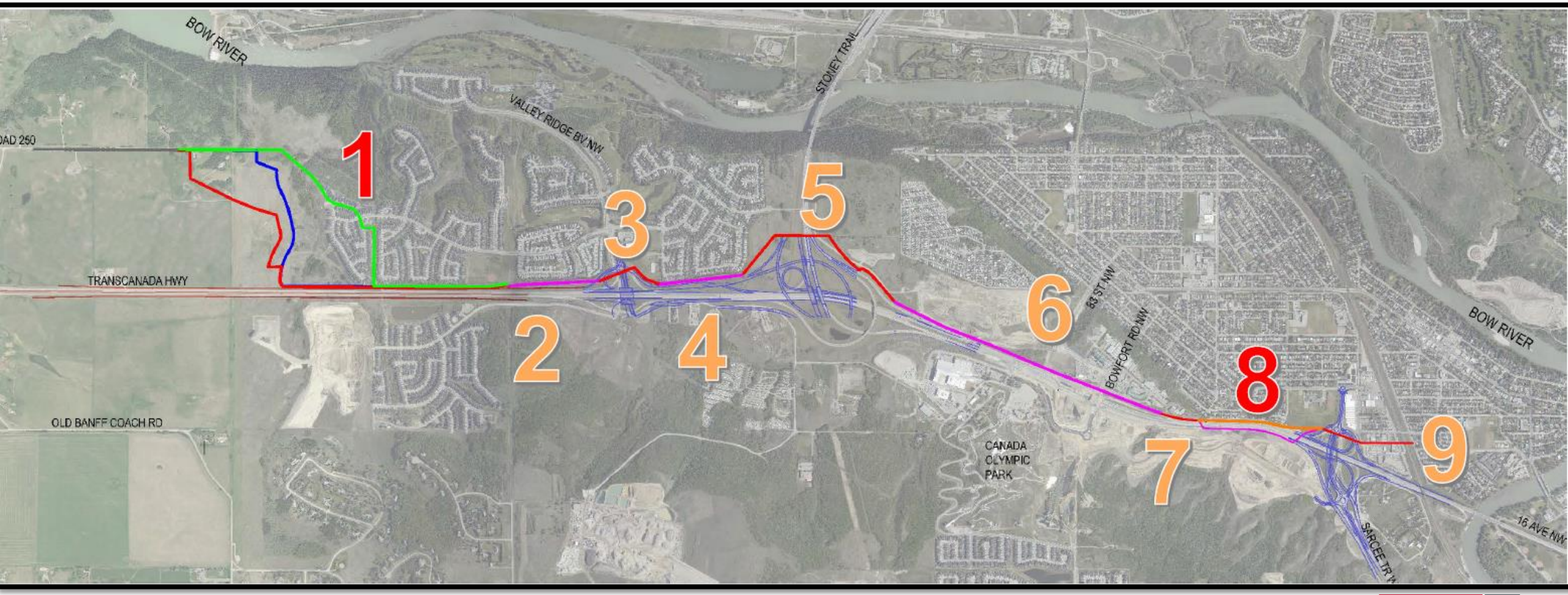
Trans Canada Sanitary Trunk

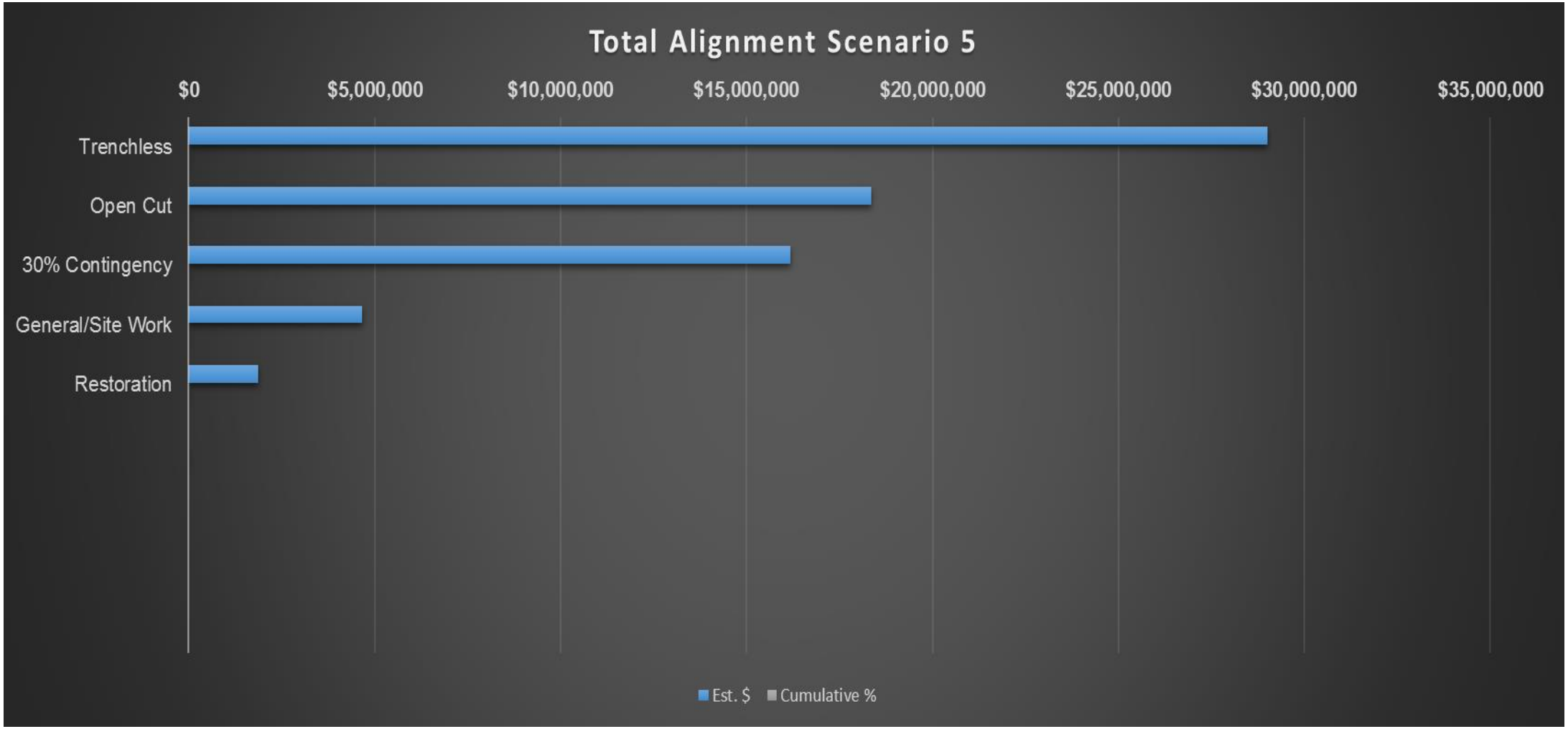
8.23 km long, est. $70.1M



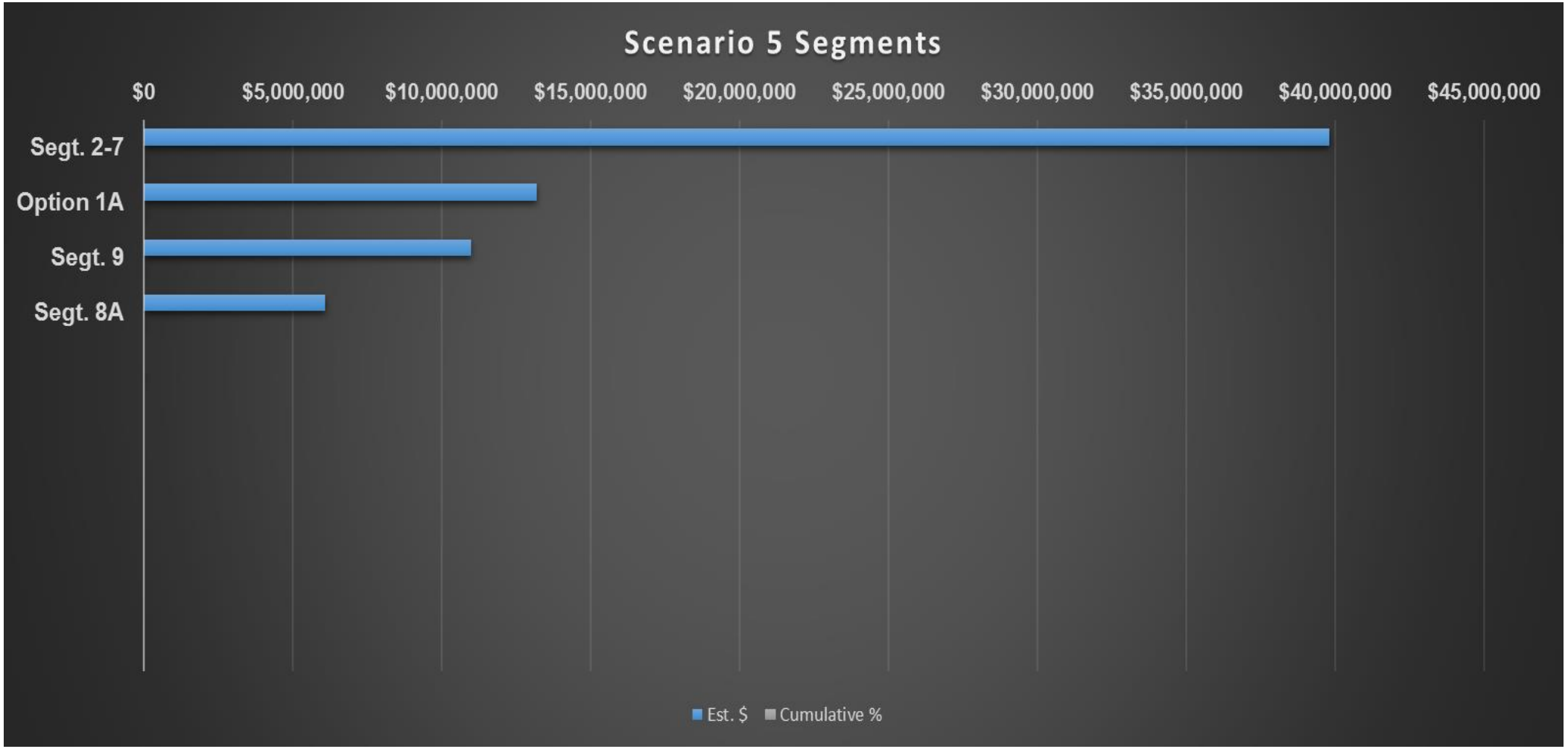
VM Objectives (from PM, Sponsor)

1. How the TransCanada Sanitary Trunk would reduce the risks of overflow to the system and allocate future flows for regional customers and inside City growth?
2. Cost-effective and beneficial trunk alignment
3. Will it be cost effective to build before or after the West Ring Road?
4. What are the cost implications for the scenarios and reducing risks to acceptable level? What are the risk related and other benefits of doing or not doing the project?
5. What construction method is recommended for the alignment?
6. What installation methods to deliver the project? How many phases are needed in the next few years?
7. When will be the best time to build the TCST? Any need for upgrades in the interim prior to the TCST is in place?
8. What type of material is recommended for the pipe?
9. Is there any impact of H2S in the downstream system? Is there a need to include a H2S treatment at the tie in with the force main from Cochrane?
10. Evaluate optimal route alignment and construction approach for this trunk

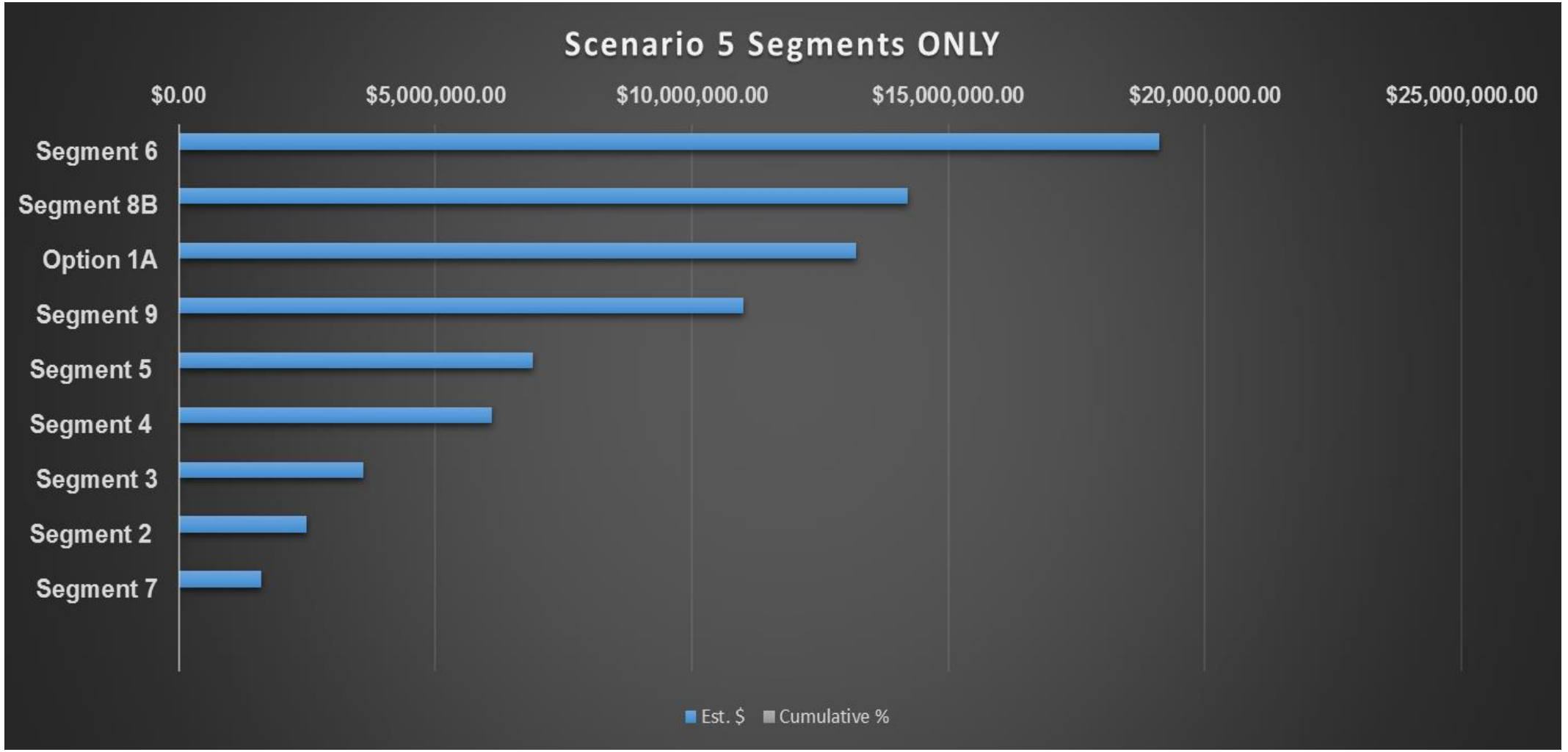
PARETO COST MODEL



PARETO COST MODEL

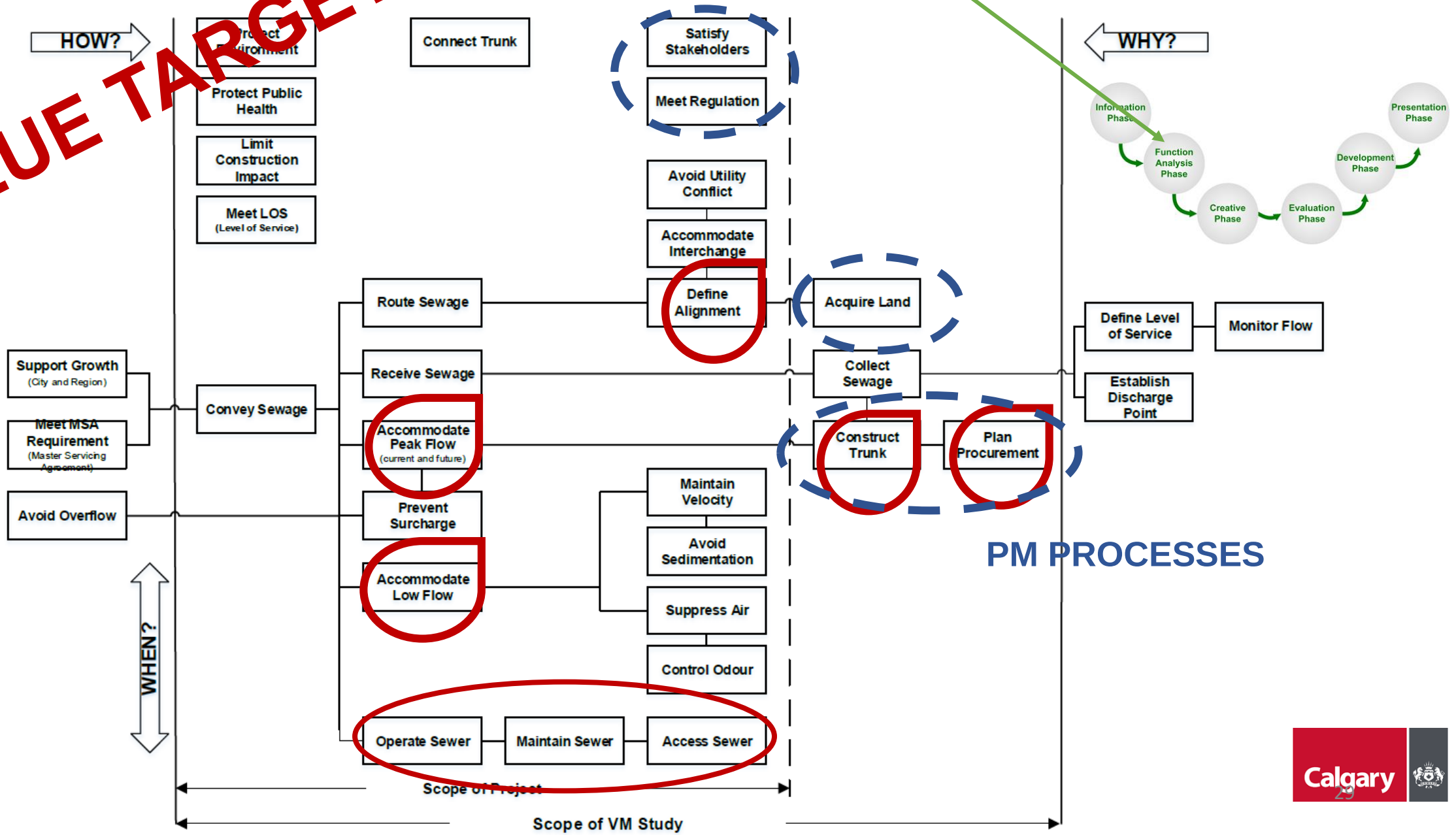


PARETO COST MODEL



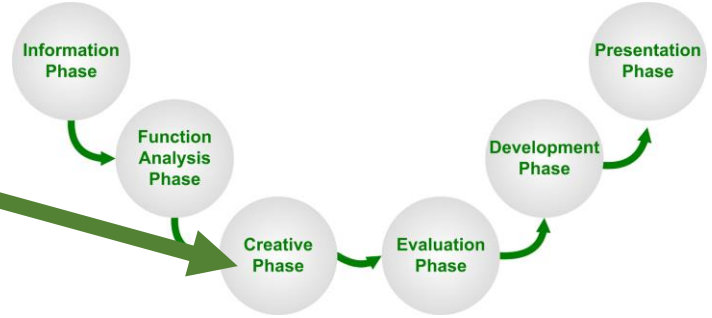
Function Analysis System Technique (FAST) Diagram
TRANS-CANADA SANITARY TRUNK

VALUE TARGETS



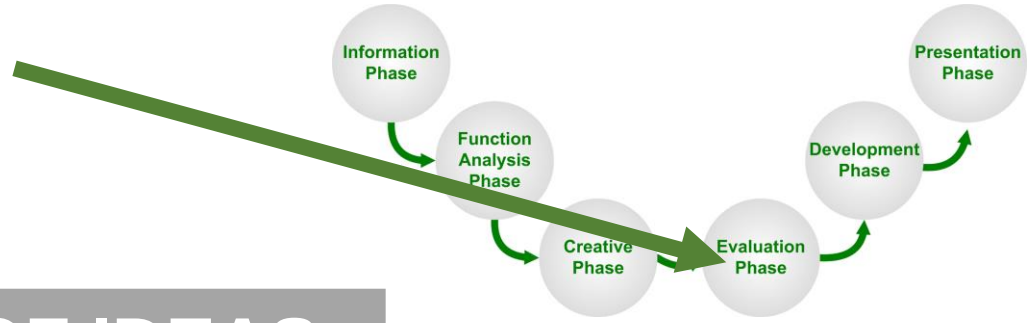
PM PROCESSES

CREATIVE PHASE



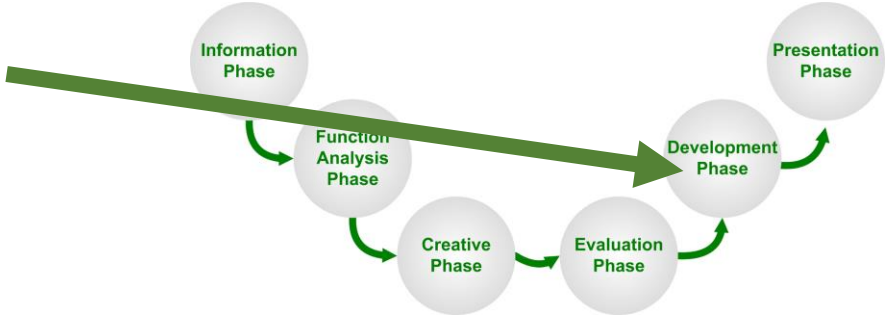
VALUE TARGETS	# OF IDEAS
ACCOMMODATE FLOW	28
INSTALLATION METHODS	19
SEWER O&M	13
PROCUREMENT STRATEGY	17
TRUNK ALIGNMENT	19
VALUE ADDED	9
TOTAL	**105**

EVALUATION PHASE



VALUE TARGETS	# OF IDEAS
ACCOMMODATE FLOW	4
INSTALLATION METHODS	4
SEWER O&M	2
PROCUREMENT STRATEGY	2
TRUNK ALIGNMENT	7
VALUE ADDED	1
TOTAL	**20**

DEVELOPMENT PHASE



VALUE TARGETS	# OF IDEAS	QUANTITATIVE	QUALITATIVE
ACCOMMODATE FLOW	4	2	2
INSTALLATION METHODS	4		4
SEWER O&M	2	2	
PROCUREMENT STRATEGY	2	1	1
TRUNK ALIGNMENT	7	6	1
VALUE ADDED	1		1
TOTAL	**20**	**11**	**9**

PRESENTATION PHASE

VALUE TARGETS	QUANTITATIVE	COST AVOIDANCE/ DEFERRAL/ ADD	QUALITATIVE
ACCOMMODATE FLOW	2	• **PRESSURIZED PIPE SYSTEM: CC $27.9M; LCC $21.6M** • **BUILD PHASE 1 + DIVERT**: CC $33.5M; LCC $14.5M (Deferral till 2037)	2
INSTALLATION METHODS		• Perform constructability, cost and schedule review @ 60% design • Explore more open cut construction • Seg 6B – more open cut and less trenchless • Uniform design for Manhole drop structures	4
SEWER O&M	2	• INTRODUCE REAL TIME CONTROL: CC $700K; LCC $870K • MAINTENANCE VEHICLE ACCESS: CC $150K; LCC $300K	
PROCUREMENT STRATEGY	1	• **Build Upper Trunk in the P3 Contract : $11.8 M** • Define global schedule w/ interim milestones and variations	1
TRUNK ALIGNMENT	6	• **PLACE PIPE ON GROUND, ELIMINATE MICRO TUNNEL; RELOCATE PATHWAY; EXTEND COCHRANE FORCEMAIN: CC $21.2M** • **STRAIGHTEN ALIGNMENT OF 1A: CC $1.2M**	1
VALUE ADDED		• Conduct air management study on the TCST	1
TOTAL	**11**		**8**

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9. Is there any impact of H2S in the downstream system? Is there a need to include a H2S treatment at the tie in with the force main from Cochrane?
10. Evaluate optimal route alignment and construction approach for this trunk

VM RESPONDED TO MOST QS

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Questions/ Comments?

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