

Marine Asset Management Plan for an Inland Ferry Fleet



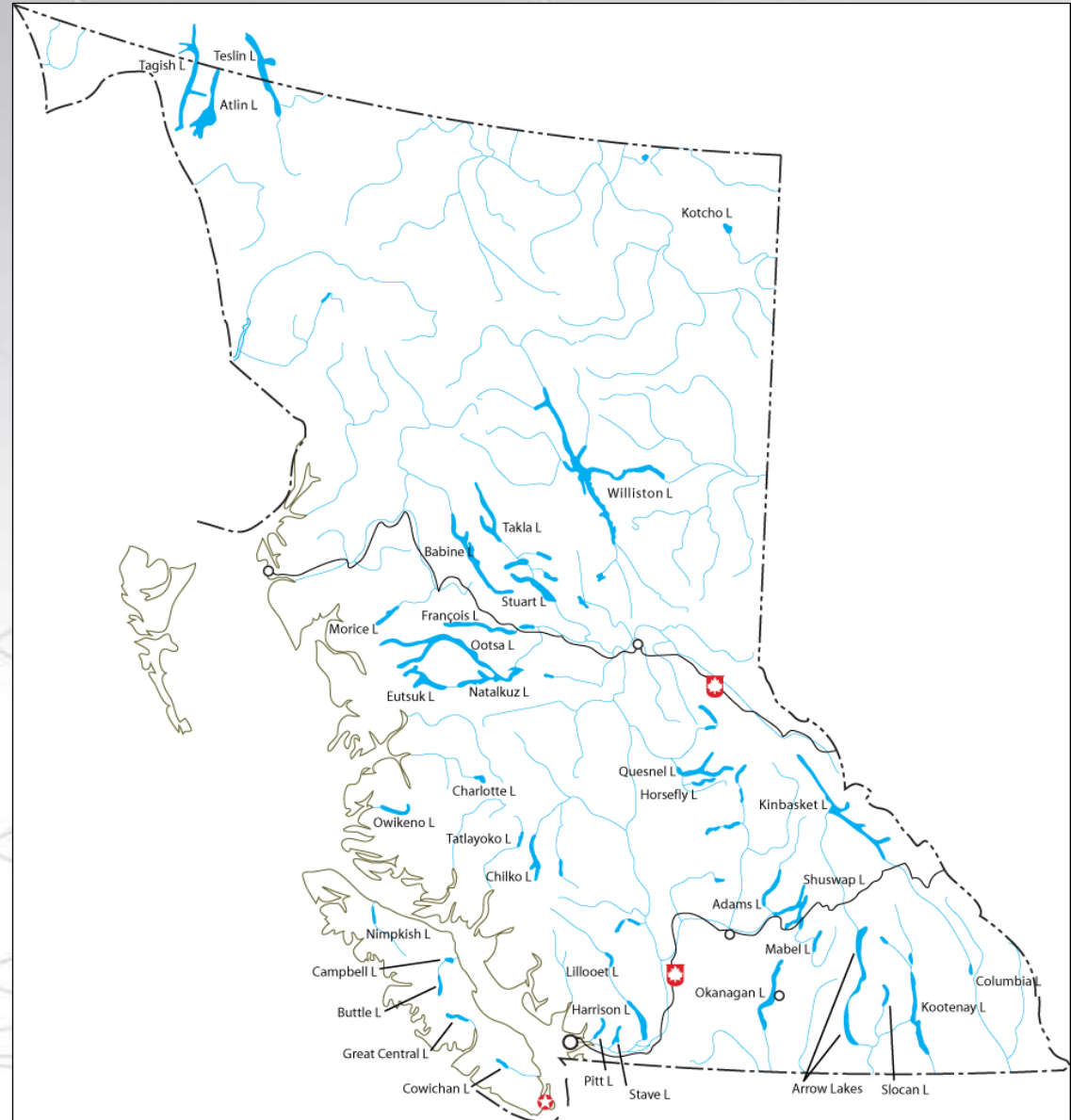
***Opus International Consultants (Canada) Limited
March 2012***



British Columbia's Inland Ferry System



- ❑ 14 Routes
- ❑ Variety of types including
 - **Reaction ferries**
 - **Cable ferries** and
 - **Free running ferries**



Reaction Ferries



Cable Ferries



Free Running Ferries



Terminal Facilities



Terminal Facilities



Terminal Facilities



Terminal Facilities



Inland Ferry Fleet

- ❑ 14 Routes
- ❑ Provides connectivity for road network
- ❑ Free for users
- ❑ Outsourced service

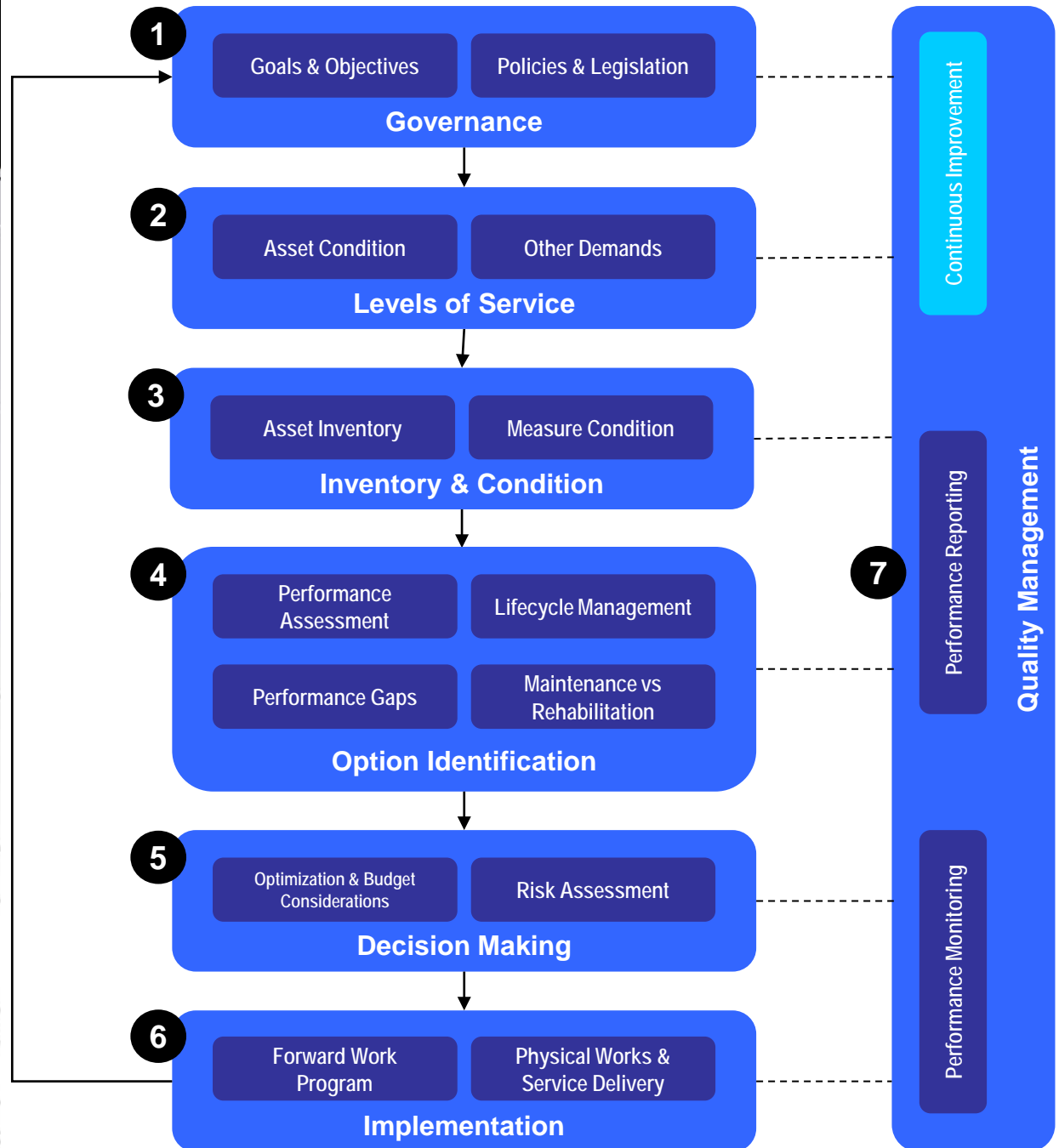


Asset Management Plan Project Drivers

- ❑ Is a cornerstone strategic planning document
- ❑ States how assets are to be managed over a period of time to achieve Ministry objectives
- ❑ Defines Marine Branch's practices, processes and systems that are being applied to the management of its infrastructure assets
- ❑ Documentation to retain institutional knowledge / practice

Framework

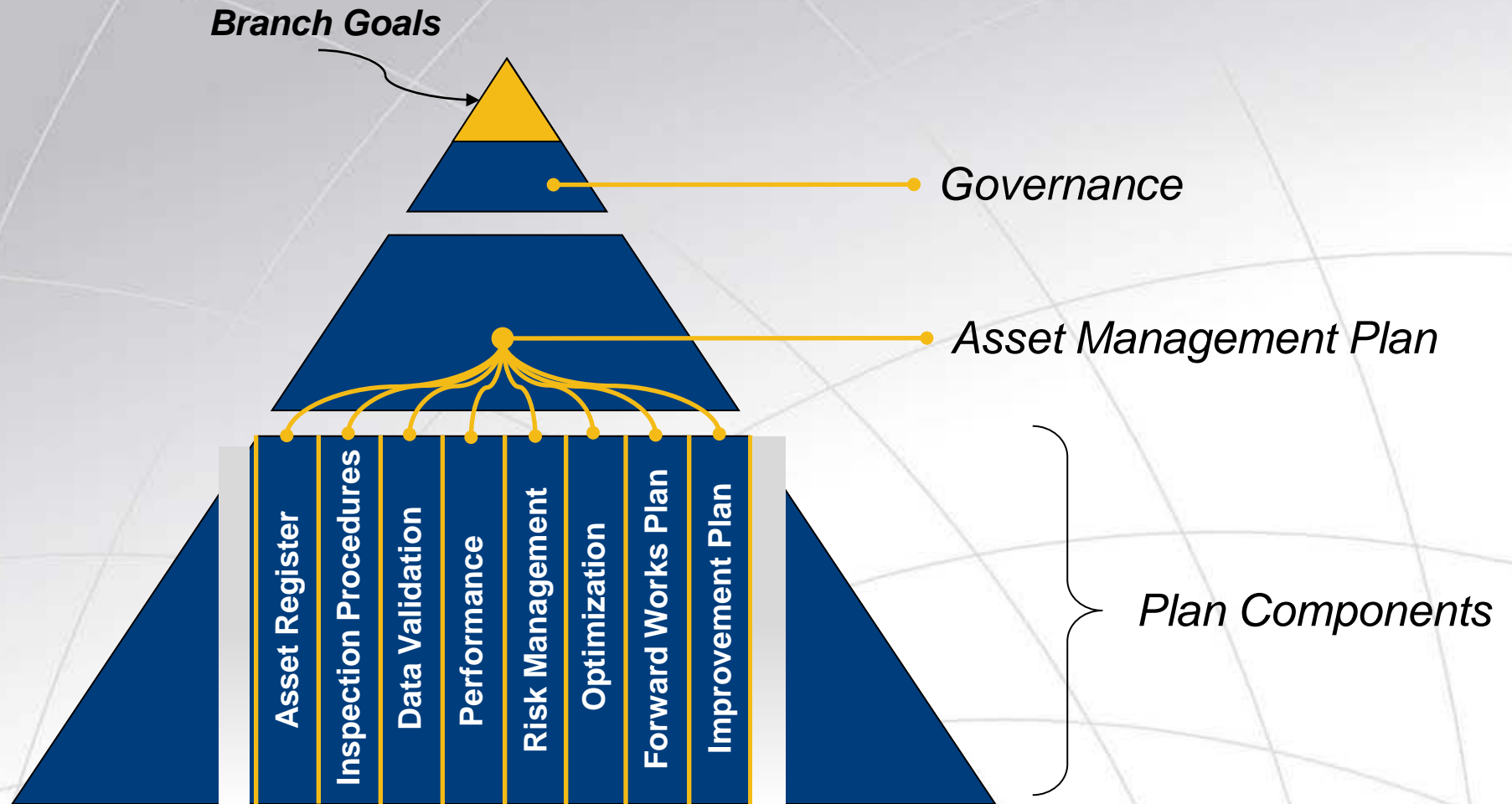
❑ Asset Management as a Process



What we developed:

- ❑ Governance Plan for critical assets
- ❑ Establishment of terminal and vessel asset registers
- ❑ Standardized inspections and condition assessments
- ❑ Inland ferry levels of service defined
- ❑ Initial benchmarks and performance targets
- ❑ Demand forecasting/lifecycle management strategies
- ❑ Risk assessment framework
- ❑ Branch decision-making processes mapped
- ❑ Ten year financial plan
- ❑ Quality Management and Improvement Plan

Governance Plan



Governance Plan

Linkages
between
Levels of
Government

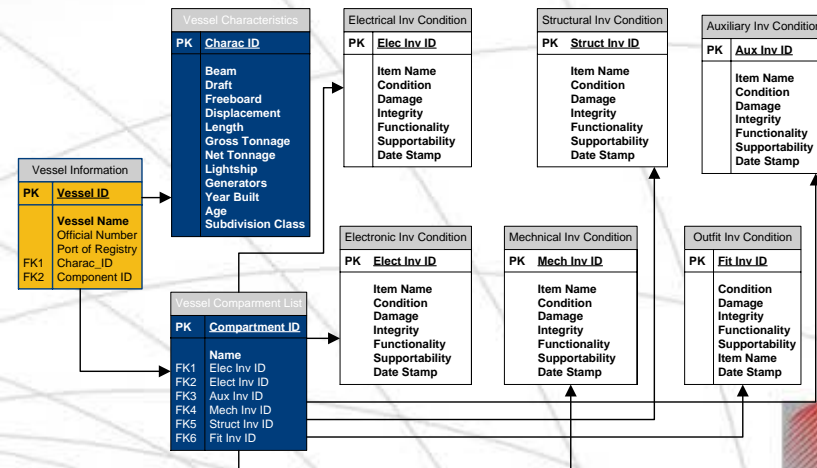


Understanding
and Managing
Expectations



Standardized inspections and condition assessments

- ❑ Focused on preserving the asset;
- ❑ Objective, repeatable, consistent survey methods;
- ❑ Definitions for Excellent, Good, Fair, Poor, Very Poor
- ❑ % of each key component at a given condition level
- ❑ Overall structure index used for planning
- ❑ Data collection programs should be rational, practical and methodical



Levels of service and performance measurement

□ Customer Expectations

- Timely service
- Vessel capacity
- Reliability of service
- Communications
- Improved services over time
- Condition of assets
- Professionalism of operator
- Emergency services
- Disabled Access
- Environmentally friendly operation

Levels of service and performance measurement

□ Ministry's Priorities

- Regulatory compliance
- Condition of assets
- Safety of the asset
- Capacity of assets
- Reliability of infrastructure
- Preservation of assets
- Maximize asset service life
- Improved services over time
- Optimized delivery

Levels of service and performance measurement

Regulatory

Assessed through knowledge of the asset, investigations, inspections, regulatory checks or through completed risk assessments.

Detailed Level of Service	Performance Measure				
	Resp	Code	Scale	Targets	Potential Actions
Marine Safety (See Appendix I for more details)		RM1	ROUTE: 1. Compliant 2. NC with Board decision 3. NC urgent action required	ROUTE: 1. Compliant; or 2. Noncompliant / Low Risk	OPTIONS: - Obtain exemptions to regulatory requirements for vessels that are low risk - Refurbish vessels - Replace vessels
		RM2	FLEET: Percentage of fleet that is at Level 2 or better	FLEET: At least 85 percent of the fleet is at Level 2 or better	
Operational Health and Safety (See Appendix I for more details)		RM3	ROUTE: Number of occupational health and Safety events per year	ROUTE: X event per year or less (X: Figure to be determined)	OPTIONS: - Increased auditing and monitoring - Improved work practices - Contractual incentives
		RM4	FLEET: Number of occupational health and Safety events per year	FLEET: X events per year or less (X: Figure to be determined)	
Environmental (See Appendix I for more details)		RM5	ROUTE: Number of environmental impact events per year	ROUTE: X event per year or less (X: Figure to be determined)	OPTIONS: - Improved work practices - Increased inspection - Increased auditing and monitoring - Contractual incentives
		RM6	FLEET: Number of events affecting users / the local environment annually	FLEET: X operational impact per year or less (X: Figure to be determined)	

Regs

Compliance with Federal Marine

Health and Safety Targets

Environmental Targets

Levels of service and performance measurement

Service Provision - External

Detailed Level of Service	Performance Measure				
	Level 5	Level 4	Level 3	Level 2	Level 1
Reliability (Weight 35%)	Ferry may be out of service for unknown lengths of time based on site conditions which may be beyond the control of the contractor	Unscheduled downtime does not exceed 3 hours per month	Unscheduled downtime does not exceed 7 hours per month	Unscheduled downtime does not exceed 2 hours per month	No unscheduled downtime
Peak Volume Traffic % of total sailings where vehicles were left behind where data is available (Weight 25%)	Less than 40% of total sailings where vehicles are left behind	Less than 35% of total sailings where vehicles are left behind	Less than 30% of total sailings where vehicles are left behind	Less than 20% of total sailings where vehicles are left behind	Less than 10% of total sailings where vehicles are left behind
Communication Ferry service disruptions and/or delays (Weight 25%)	Ferry Operator: - Updates Drive BC - Notifies MoT	Ferry Operator: - Updates Drive BC - Notifies MoT - Notify key stakeholders directly by phone (i.e. emergency service providers and/or frequent users)	Ferry Operator: - Updates Drive BC - Notifies MoT - Notify key stakeholders directly by phone (i.e. emergency service providers and/or frequent users) - Important stakeholders are notified directly by automatic email from the Drive BC system	Ferry Operator: - Updates Drive BC - Notifies MoT - Notify key stakeholders directly by phone (i.e. emergency service providers and/or frequent users) - Important stakeholders are notified directly by automatic email from the Drive BC system - Proactively makes use of other information systems such as the TIS and portable CMSs	Ferry Operator: - Updates Drive BC - Notifies MoT - Notify key stakeholders directly by phone (i.e. emergency service providers and/or frequent users) - Proactively updates DriveBC with information about expected delays (when usual busy times are approaching or expected delays) - Proactively makes use of other information systems such as the TIS and portable CMSs - Important stakeholders are notified directly by automatic email from the DriveBC system
Amenities (Weight 15%)	Amenities not required and not provided	Amenities Available on an unscheduled basis	One or two amenities available	Two to three amenities available in total on the vessel and/or onshore	Four or more amenities available in total on the vessel and/or onshore

* Key amenities include wash facilities on the vessel or at the terminal, rest areas for travelers, food services and foul weather shelter for passengers.



Levels of service and performance measurement

Service Provision - External

Detailed Level of Service	Performance Measure				
	Level 5	Level 4	Level 3	Level 2	Level 1
Reliability (Weight 35%)	Ferry may be out of service for unknown lengths of time based on site conditions which may be beyond the control of the contractor	Unscheduled downtime does not exceed 5 hours per month	Unscheduled downtime does not exceed 3 hours per month	Unscheduled downtime does not exceed 2 hours per month	No unscheduled downtime
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Reaction Ferry
Route Target:

Level : 3.75

* Key amenities include wash facilities on the vessel or at the terminal, rest areas for travelers, food services and foul weather shelter for passengers.



Levels of service and performance measurement

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Free Running
Ferry Target:

Level : 2.2

* Key amenities include wash facilities on the vessel or at the terminal, rest areas for travelers, food services and foul weather shelter for passengers.



Levels of service and performance measurement

Service Provision - External

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Free Running
Ferry Target:

Level : 2.2

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Component, Structure/Vessel and Portfolio Condition Thresholds

Asset Management - Structures

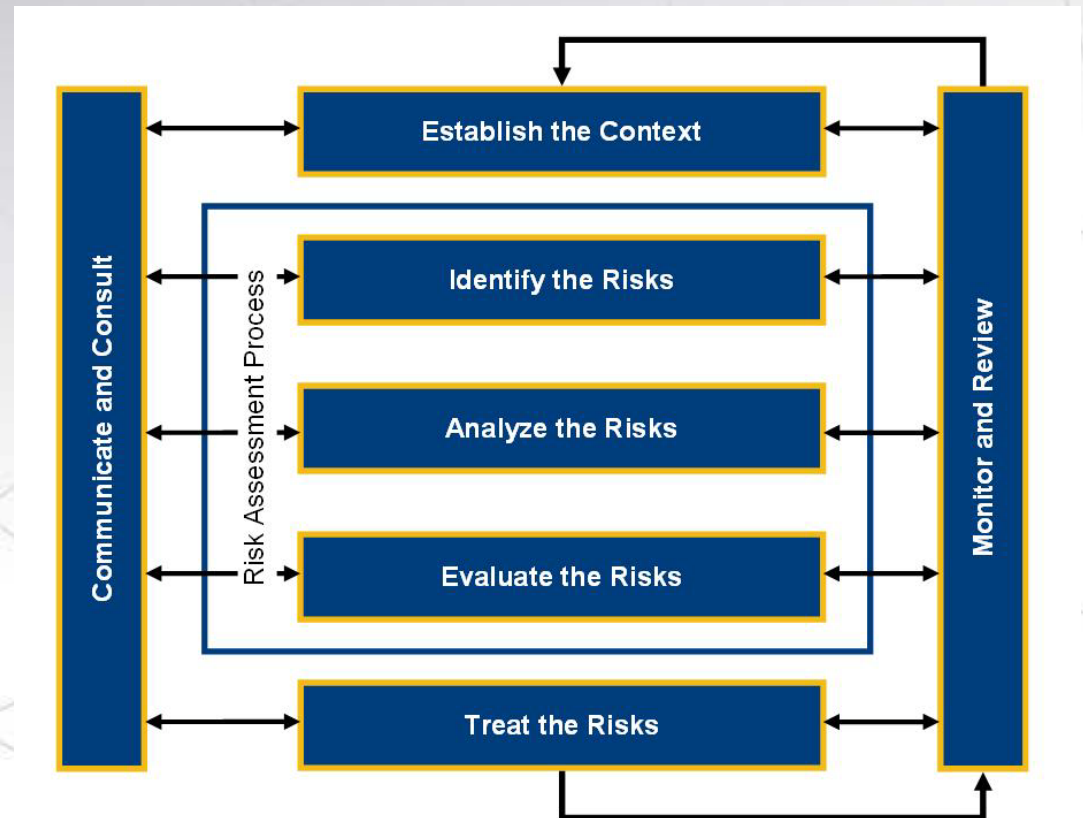
Detailed Level of Service		Performance Measure			
		Code	Intervention Criteria	Action	Timeframe
Component	Condition (Limit Asset Consumption)	MS1	For any structure component having a Condition rating of 3.0 or greater but less than 3.5	<ul style="list-style-type: none"> Develop a remediation strategy for the defect, deterioration or damage; or Undertake works so component condition rating is less than or equal to 3.0 by the time the next scheduled condition inspection is undertaken 	Year 3 to 5
	Condition (Serviceability)	MS2	For any structure component having a Condition rating of 3.5 or greater but less than 4.0	<ul style="list-style-type: none"> Fully investigate and have in place a remediation strategy for the defect, deterioration or damage; or Undertake works so component condition rating is less than or equal to 3.0 by the time the next scheduled condition inspection is undertaken 	Year 2 to 3
	Condition (Reactive)	MS3	For any structure component having a Condition rating of 4.0 or greater	<ul style="list-style-type: none"> Undertake works so component condition rating is less than or equal to 3.0 by the time the next scheduled condition inspection is undertaken 	Year 1

Annual Scorecard

Route	Route Specific										Fleet / Overall							
	Clas	Regulatory			Condition						Clas	Regulatory			Comm.		Condition	
	SP1	RM1	RM3	RM5	MS2	MS3	MS4	MS5	VM1	VM3	SP2	RM2	RM4	RM6	CM1	CM2	MS6	VM4
Free Running Ferry Routes																		
Kootenay Lake	2.55	C	Future Implementation	Future Implementation	1	4	Future Implementation	Future Implementation	0.0%	9.1%	Future Implementation	84.6%	Future Implementation	Future Implementation	100.0%	Future Implementation	Future Implementation	0.5%
Upper Arrow	2.40	C			3	4			0.0%	0.0%								
Francois Lake	1.80	C			2	0			50.0%	0.0%								
Barnston Island	1.80	C			0	3			0.0%	0.0%								
Cable Ferry Routes																		
Arrow Park	2.55	C			1	2			9.1%	0.0%								
Needles	2.90	C			0	0			0.0%	0.0%								
Glade	2.55	C			1	0			0.0%	0.0%								
Harrop	2.55	C			1	0			0.0%	0.0%								
Adams Lake	2.55	C			0	0			4.5%	0.0%								
Reaction Ferry Routes																		
Lytton	3.25	C			0	0			0.0%	0.0%								
Big Bar	3.25	C			0	0			30.0%	0.0%								
McLure	3.25	C			0	0			0.0%	0.0%								
Little Fort	3.25	C			0	0			0.0%	0.0%								
Usk	3.75	N			0	0			0.0%	0.0%								

Risk assessment framework

- ❑ Business Management
 - Previous focus
- ❑ Project Management
 - Consultants and Capital Works
- ❑ Contract Management
 - Ferry Operators
- ❑ Asset Management
 - Asset Data / System
 - Asset Performance
 - Ops and Emerg. Response



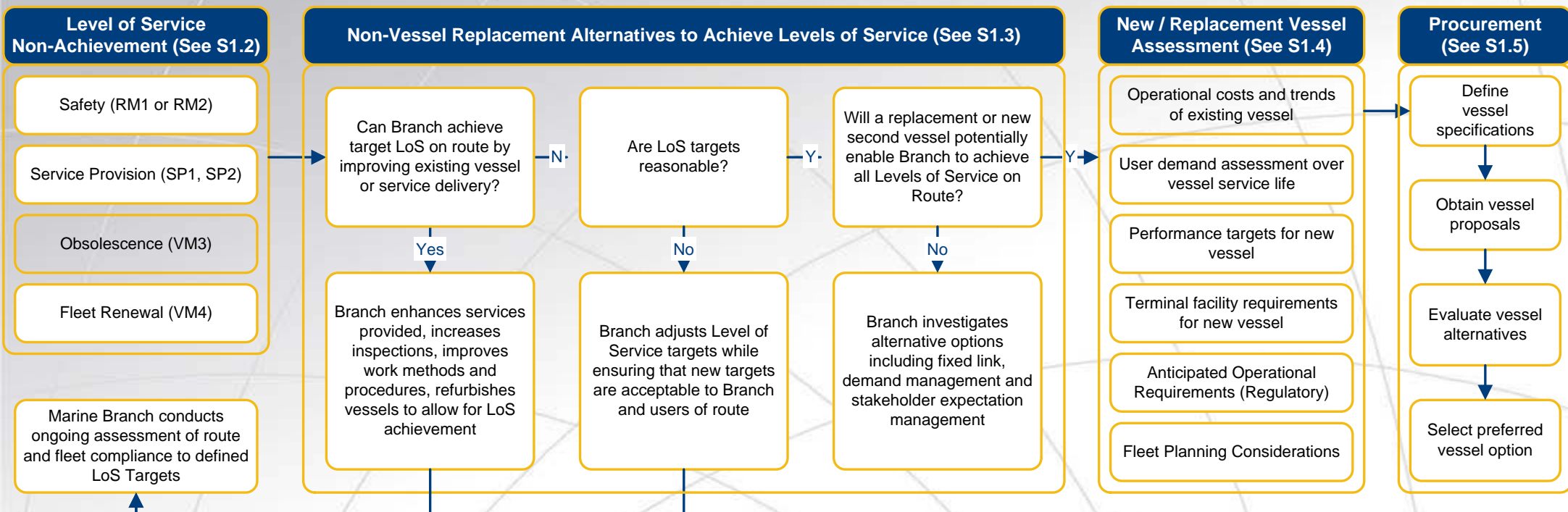
Risk assessment framework

- ☐ Availability
- ☐ Community relations
- ☐ Economic
- ☐ Environmental
- ☐ Probity
- ☐ Quality
- ☐ Safety
- ☐ Staff development
- ☐ Time/Schedule

		CONSEQUENCES (loss)				
		Negligible (1)	Minor (10)	Medium (40)	Major (70)	Substantial (100)
L I K E L I H O O D	Likely (5)	5 Low Threat ACCEPT ACTIVELY -Enhance systems to minimise potential -Accept or Repair	50 Moderate threat ACCEPT ACTIVELY -Enhance systems to minimise potential	200 Very high Threat AVOID -Immediate action -Enhance systems to minimise potential	350 Extreme threat AVOID Immediate Action -Cease Activity	500 Extreme threat AVOID -Immediate action -Cease Activity
	Quite Common (4)	4 Low Threat ACCEPT ACTIVELY -Enhance systems to minimise potential -Accept or Repair	40 Moderate threat ACCEPT ACTIVELY -Enhance systems to minimise potential -Insure	160 Very high Threat AVOID -Immediate action -Enhance systems to minimise potential	280 Extreme threat AVOID - Immediate Action - Cease Activity	400 Extreme threat AVOID -Immediate action -Cease Activity
	Unlikely (3)	3 Negligible Threat ACCEPT PASSIVELY -Repair	40 Moderate threat ACCEPT ACTIVELY -Enhance systems to minimise potential -Insure -Contingency Plan	120 High threat ACCEPT ACTIVELY OR TRANSFER -Immediate Action -Insure -Contingency Plan	210 Very high threat AVOID -Immediate Action -Contingency Plan	300 Very high threat AVOID -Immediate Action -Contingency Plan
	Unusual (2)	2 Negligible Threat ACCEPT PASSIVELY -Repair	20 Low Threat ACCEPT ACTIVELY OR TRANSFER -Repair	80 Low Threat ACCEPT ACTIVELY OR TRANSFER -Monitor - Insure -Contingency Plan	140 High threat AVOID OR TRANSFER -Monitor - Insure -Contingency Plan & Disaster Plans	200 Very high threat AVOID / TRANSFER -Monitor - Insure -Contingency Plan & Disaster Plans
	Rare (1)	1 Negligible Threat ACCEPT PASSIVELY -Repair	10 Low Threat ACCEPT ACTIVELY OR TRANSFER -Repair	40 Low Threat ACCEPT ACTIVELY OR TRANSFER -Monitor - Insure -Contingency Plan	70 High threat AVOID OR TRANSFER -Monitor - Insure -Contingency Plan & Disaster Plans	100 Very high threat AVOID / TRANSFER -Monitor - Insure -Contingency Plan & Disaster Plans

Branch decision-making processes mapping

❑ Vessel Replacement



Thank You

Any Questions?

Levels of service and performance measurement

- ❑ Class performance measure makes assumptions about the scale of importance for inputs.
- ❑ Peak volume traffic used as a proxy for wait times .
- ❑ Directly measure what users are most concerned about, e.g. wait times

