Incorporating Risk Analysis into the Prioritization and Ranking of Asset Projects

FTA Transit Asset Management Roundtable
Cambridge, MA
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TAMS

Background: VIA Metropolitan Transit

Service Description

Area: *1,210 mi2 of Bexar Co, TX*
Modes: *Fixed Route, Paratransit & Van Pool*

Revenue Miles: *37,468,594*
Passengers: *41,759,524*

FY17 Budget

Expense: *$220M*

Capital: *$452M*

Fleet

Revenue: *602*

Support: *130*

Facilities *(Provision of Transit)*

32 Acre Operating Facility
Executive Office Building
Dispatch Facility

13 Transit Facilities
7,200 Bus Stops

Risk Evaluation Focus Areas

1. Level of Service

- **Availability & Stewardship of Resources:**
  Financial, Staffing, Assets, Materials and Supplies
- **Standard Operating Procedures**
- **Operating Contingencies (Resources & Procedural)**

2. Safety & Security

- **Protection of customers, employees and the community**

3. Natural Environment

- **Protection of the natural environment as stewards of public resources**

Legacy System of SGR Risk ID & Mitigation through Capital Programs

Risk ID

1. Level of Service
2. Safety & Security
3. Environment

Stakeholder Departments

- Facility Maint.
- Fleet Maint.
- Fiscal Mgmt.
- Safety
- Police/Security
- Environmental
- Transportation
- Employment
- IT
- Facility Engineering
- Passenger Amenities
- Audit
- Planning
- Customer Service
- Administration

SGR Project Development

Fleet & Facilities Division with Stakeholder Departments

- Problem defined
- Alternatives evaluated
- Project identified
- Preliminary scope
- ICE
- Project plan

SGR Capital Planning *(unconstrained $)*

Fleet & Facilities Division with Stakeholder Departments

SGR Projects:

- Justification
- Prioritized
- Ranked
- Draft Schedule

SGR Capital Planning *(unconstrained $)*

Fleet & Facilities & Fiscal Management Divisions

- SGR Projects set to agency draft budget & schedule

Agency Capital Planning *(constrained $)*

Executive Staff

- SGR, IT & SPPD projects evaluated
- Executive hearings
- Capital plan balanced
- Executive approval

Agency Capital Planning *(constrained $)*

Board of Trustees

- Board hearings
- Board approval of capital plan

Implementation

Examples of Risk Mitigating SGR Capital Projects Under Legacy System (2017-18)

Project	Cost	Risk Mitigation		
		Level of Service	Safety & Security	Environment
Revenue Vehicles	$175.0M	✓✓✓✓	✓✓	✓✓✓
Replace Fuel/Oil Underground Tanks	$1.5M	✓✓✓	✓	✓✓✓
Natural Gas Compression Infrastructure	$11.0M	✓✓✓✓	✓	✓✓✓
Security Fence – Operational Facility	$1.8M	✓	✓✓✓	✓
ERP System	$4.7M	✓✓✓	✓	✓
New Paratransit Facility	$26.5M	✓✓✓✓	✓✓✓	✓✓
Replace Fuel Control System	$0.8M	✓✓	✓	✓
Bus Yard Concrete Repairs	$0.1M	✓	✓✓	✓✓

Notable Aspects of SGR Project Development (Legacy System)

Effectiveness to Date

- No significant LOS, safety & security or environmental issues
- Agency's low cost of operation
- No significant issues identified by E&A firms performing comprehensive facility assessments.
- Agency meeting SGR goal of 3 on scale of 1 to 5.

Concerns for Future

- Lack of procedural documentation and succession planning
- Agency expansion
- Legacy system not sustainable

Moving Forward: SGR Capital Project Development

Formalize and Document

- TAM system implementation based on ISO 55001
    a. Context of the organization
    b. Roles, responsibilities and dedicated resources
    c. Documented Plans and procedures
    d. Communication
    e. Operation, evaluation and improvement

Objectives

- Leverage existing business functions and procedures
- Develop a practical, effective and sustainable system
- Effective and robust communication of TAM activities throughout agency

Moving Forward: Mitigating Risk through SGR Capital Projects – Natural Environment Example

Existing Risk Assessments – Natural Environment

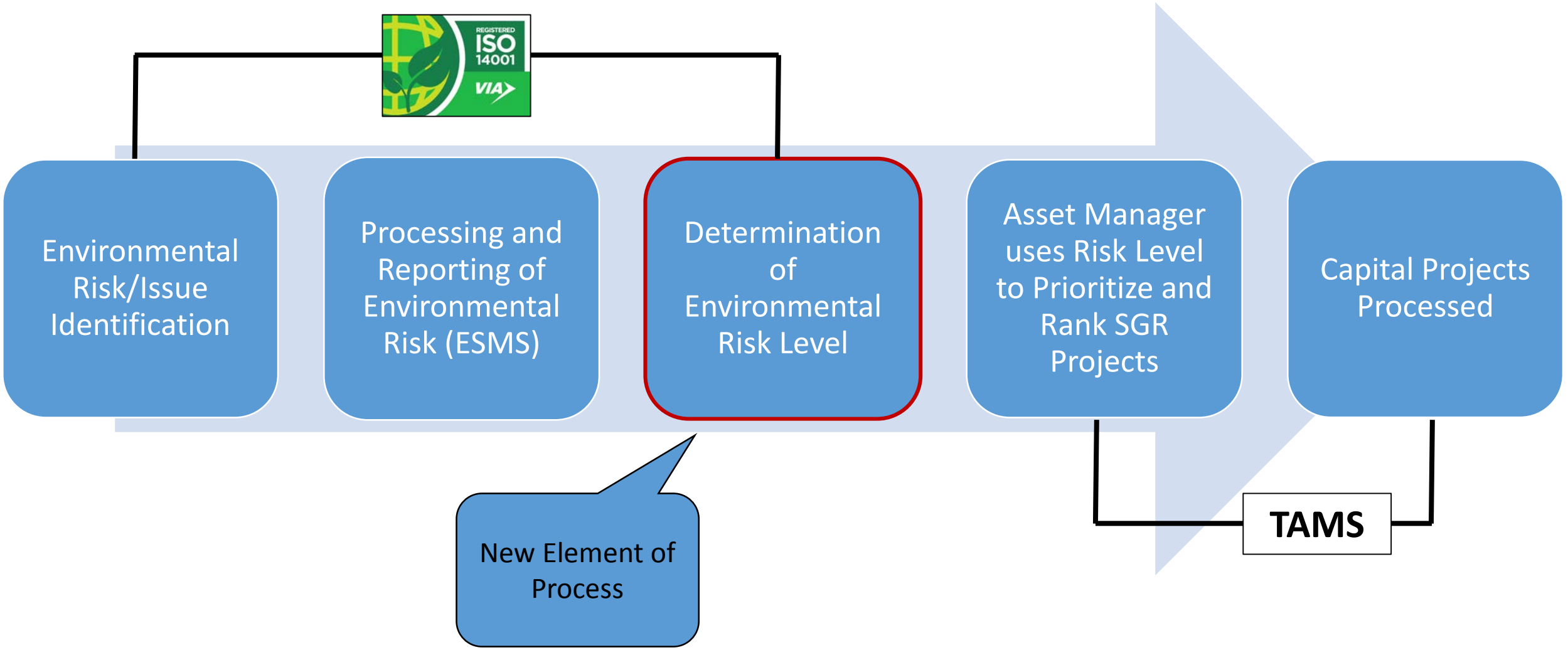
Existing Environmental Plans	Regulatory Requirement	Documented Assessments, Inspections, Reviews
Slug Discharge Control Plan	EPA	• Quarterly facility inspections • Bi-annual plan review & report
Storm Water Pollution Prevention Plan	EPA	• Quarterly facility inspections • Annual plan review & report
Hazardous Communications Plan	DOL-OSHA	• Annual plan review • Annual hazmat inventory
Pollution Prevention Plan	TCEQ - WRPA	• Annual assessment of waste minimization activities
Spill Prevention Control and Counter Measures Plan	EPA	• Daily facility inspections • Annual plan review
Environmental & Sustainability Management System	TCEQ – Permits Emissions PSTs Waste	• Quarterly/annual facility inspections • Annual testing • Random issue reporting • Quarterly plan reviews • Management reviews

Moving Forward: Processing Environmental Risk through ESMS

Environmental and Sustainability Management System (ESMS) Processes

- Dedicated Environmental Programs Manager
- Issue reporting procedures and forms
- Issue documented, evaluated and communicated
- Issue tracked and reported
- Bi-weekly team review
- Semiannual executive management review
- Annual evaluation of compliance
- Annual internal audit
- Annual external audit

Moving Forward: Processing Environmental Risk



Determining Environmental Risk Level

Event Risk Level = (Probability)(Consequence)

Determination of Probability		Probability
Rare	> 20 years	0.02
Unlikely	Within 10 -20 years	0.05
Possible	Within 6 -10 years	0.1
Moderate	Within 3 – 5 years	0.3
Likely	Within 2 years	0.7
Almost Certain	Within 1 year	0.9

Source: International Infrastructure Management Manual (IIMM)

Consequence Factor	5 (Catastrophic)	4 (Major)	3 (Severe)	2 (Minor)	1 (Insignificant)
Total Cost	>$1M	$250K-$1M	$50K-$250k	$2k-$50k	<$2K
and/or					
Impact on Environment	Damage not fully reversible.	Damage reversible within 5 years.	Damage reversible within 1 year.	Damage reversible within 3 months.	Damage reversible within a week.

Determining Environmental Risk Level

Probability	Consequence				
	5 (Catastrophic) >$1M and/or Damage not fully reversible.	4 (Major) $250K-$1M and/or Damage reversible within 5 years.	3 (Severe) $50K-$250k and/or Damage reversible within 1 year.	2 (Minor) $2k-$50k and/or Damage reversible within 3 months.	1 (Insignificant) <$2K and/or Damage reversible within a week.
> 20 years	**0.1**	**0.08**	**0.06**	**0.04**	**0.02**
Within 10 -20 years	**0.25**	**0.2**	**0.15**	**0.1**	**0.05**
Within 6 -10 years	**0.5**	**0.4**	**0.3**	**0.2**	**0.1**
Within 3 – 5 years	**1.5**	**1.2**	**0.9**	**0.6**	**0.3**
Within 2 years	**3.5**	**2.8**	**2.1**	**1.4**	**0.7**
Within 1 year	**4.5**	**3.6**	**2.7**	**1.8**	**0.9**

Conclusion

Thank You

TAMS