ECOSYSTEM SERVICES CREDITING STRATEGIES FOR TRANSPORTATION AGENCIES

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Integrated Ecological Framework (IEF)

CUMULATIVE EFFECTS ASSESSMENT AND ALTERNATIVES
Planning

STEP 1: Build and strengthen collaborative partnerships and shared vision/values

STEP 2: Build the foundation for a regional ecosystem framework: Integrate conservation, natural resources, watershed, and wildlife management plans.

STEP 3: Populate the regional ecosystem framework: Integrate conservation and restoration priorities and plans for the target region into transportation plans.

STEP 4: Assess transportation effects on resource conservation objectives stated in the REF.

STEP 5: Establish and prioritize opportunities for conservation.

STEP 6: Develop an up-front crediting strategy to accompany the Regional Mitigation Strategy.

STEP 7: Develop programmatic permits/consultations or other programmatic document agreements.

STEP 8: Assure implementation on the transportation side. Design projects and integrate programmatic agreement measures to minimize impacts to resources.

STEP 9: Update REF annually/as important new information becomes available and balance predictability and adaptive management so funding and staff time can be allotted appropriately and schedules can be met.

REGULATORY ASSURANCES
Project Planning

ECOSYSTEM MEASUREMENT
Measuring Impacts, Mitigation, Restoration

Transportation Crediting

- FHWA funded a team effort with OSU, Willamette Partnership, U.C. Davis, NatureServe, ICF & Venner Consulting to promote crediting strategies.
- The team did a literature search, a state-of-the practices, and two crediting frameworks.
- Framework 1 is a transportation crediting strategy guide for agencies with limited crediting experienc
- Framework 2 is a valuation and crediting for agencies with complex conditions.

Crediting at DOTs and MPOs

CALTRANS
Colorado DOT
Florida DOT
Maryland DOT
Minnesota DOT
North Carolina DOT
Ohio DOT
Oregon DOT
Texas DOT
Virginia DOT
Washington DOT

Atlanta Regional Commission
Charlottesville – Albemarle MPO
East – West Gateway COG
Houston-Galveston Area Council
Lane COG
Ohio-Kentucky-Indiana Regional COG
Pikes Peak Area COG
Rogue Valley COG
San Diego Association of Governments
Thurston Regional Planning Council

Existing State Crediting & Trading Programs

- North Carolina Ecosystem Enhancement Program
  - Wetlands and Stream Mitigation & Crediting Program involving NC DENR and DOT
- Maryland Watershed Resources Registry
  - Interagency mapping approach to characterize and prioritize mitigation, restoration and conservation
- Willamette Partnership and Clean Water Services
  - Multiple trading, focused on ESA and CWA regulatory drivers
- California – CEQA, RAMP and SAMI
  - Existing ESA and Wetland Banks potentially linked through newly developing initiatives.

Critical Factors for Success in Crediting

- The Desire or Perceived Need for Crediting.
- State Agency Organization and Structure.
- State, Federal and MPO Agency Relationships.
- History of Partnerships between regulatory agencies and others, particularly with DOTs.
- The availability of NGO partners with crediting experience.

Framework 1

Ecosystem Crediting Strategy for Transportation

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Why build and ecosystem crediting strategy?

- Predictability for implementing projects
- Certainty that conservation goals are met
- Consistent way to track and account for conservation and development activities

Components of an Ecosystem Crediting Strategy

- Credit quantification tools
- Protocol for creating & tracking credits
- Regulatory approval process
- Credit procurement process

Feasibility: Do we need a strategy?

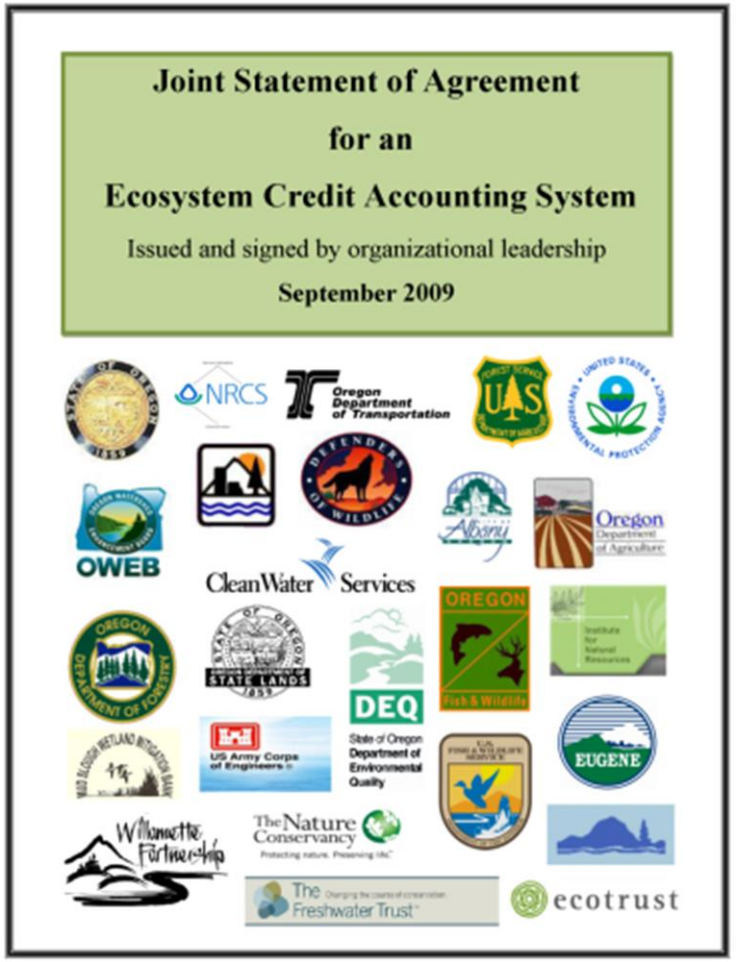
- Demand: Potential vs. Real; Type; Volume; Timing; Locale
- Supply: Usually a short-term barrier in first 1-2 years
- Science: It exists at the right scale, and people like it
- Policy: Authorities exist to make room for crediting
- People: Partners in place ready to implement

Design: Build a strategy

- Be clear on what counts as a credit
- Have a standard process for confirming credit projects are performing over time
- Ensure there is an account ledger of credits that's available for the agencies and the public to see what's going on
- Risk and uncertainty is inherent: Be upfront about it, and clear how you manage it
- Make sure there's a plan for when something goes wrong

Agreement: Formally saying yes

- Set expectation early on what form of agreement is expected
- Make sure there is good communication between agency staff and directors throughout
- The first version of the written agreement can be built upon



Operations: Maintaining a strategy

- Identify who will do what
  - Buyers & Sellers
  - Strategy Administrators & Verifiers
- Choose a procurement strategy
  - Banks, permittee-sponsored, and In-lieu mitigation can all work
  - Depends on capacities and goals
- Plan and budget for adaptive management
  - Monitoring & reporting
  - Ongoing improvement

Framework 2

addresses states with exceptionally complex issues and a large number of ongoing programs, especially those with local, regional or statewide statutes that include crediting programs.

Approach

5-step valuation process

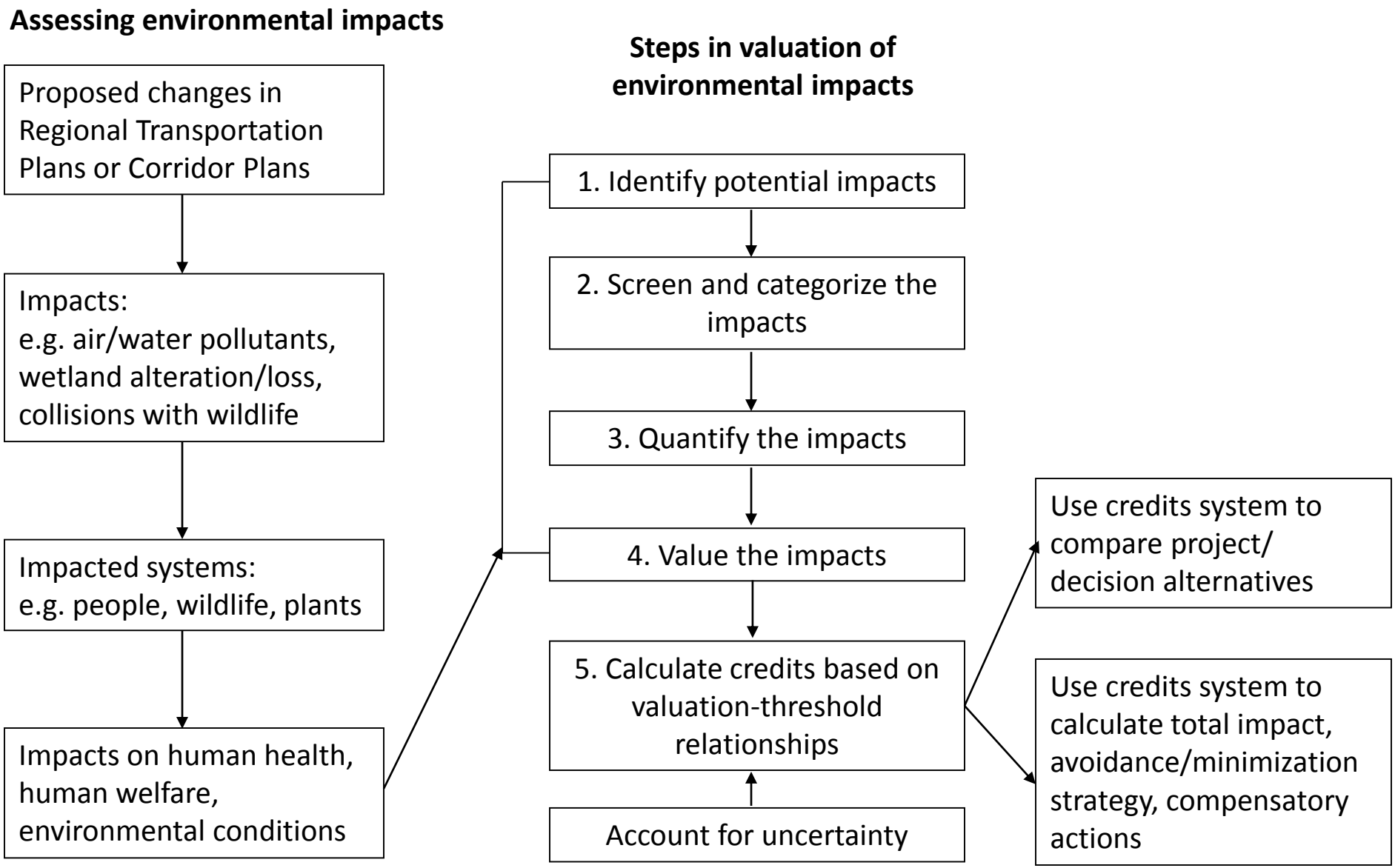
Two geographic/planning scales – region and corridor

Incorporate findings into regional system planning, regional project prioritization, and project alternative analysis

Develop capacity within DOTs and clear decision-points to use valuation findings

Implement model valuation project with planners in select districts/regions

Proposed valuation and crediting framework



Step 1:
Identify the potential impacts

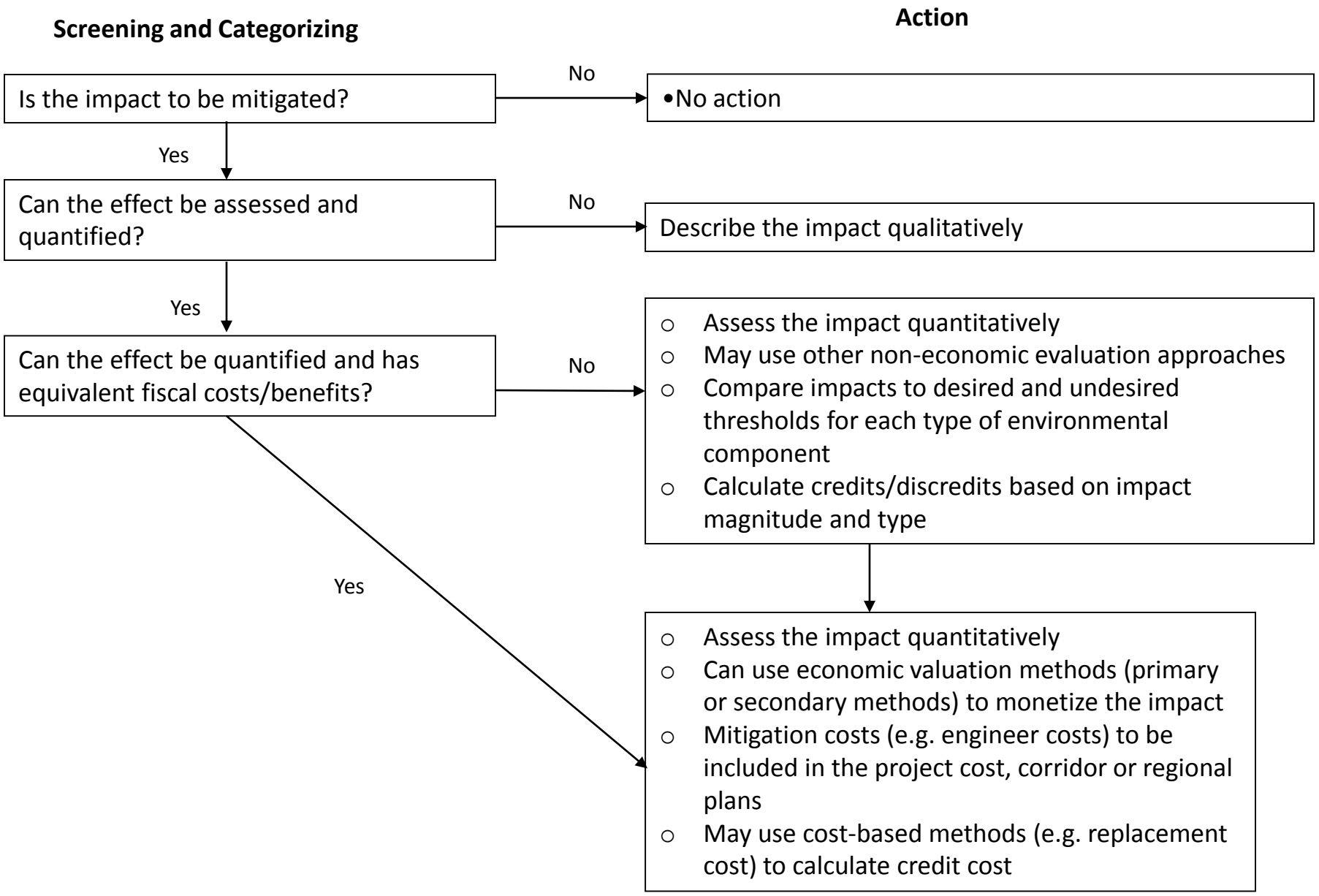
DOT guidance handbooks and manuals

State Environmental Requirements categories

NEPA

Other resources (e.g., Victoria Transport Policy Institute; Asian Development Bank)

Step 2: Screen and Categorize the Impacts



Step 3: Quantify the Conditions & Impacts

- Requires data on potential risks, geographical and temporal extents of the impacts, and severity
- Express the impacts in the physical units to quantify the magnitude of each impact
- Also involve assessing the magnitude of the impacts and impacted elements
- Scientists would need to use models to quantify the impacts

  Examples:
  - Dose-response functions – link expected exposure to stressors and impacts on receptors
  - Human health risk assessment models
  - Ecological risk assessment models
  - Ecological models
- Physical data would also need to be in a form that is suitable for monetization when analysts carry out an economic valuation study.

Step 4: Calculate Values & Credits for Impacts on Environmental Conditions

Determine desired and undesired reference conditions/targets

Policy guidance (e.g., no wetland loss, air quality standards)

Scientific literature (e.g., habitat fragmentation effects on wildlife)

Output is a pair of targets – desired and undesired

Describe relationship between credits and change in condition

Scientific literature (e.g., linear increase in risk to health from changes in air quality parameters)

Differentiate between **relative impact** within a study area and total impact

Output is a mathematical relationship defining incremental credits and description of possible uses (e.g., comparison of alternatives, calculating equivalent fiscal cost).

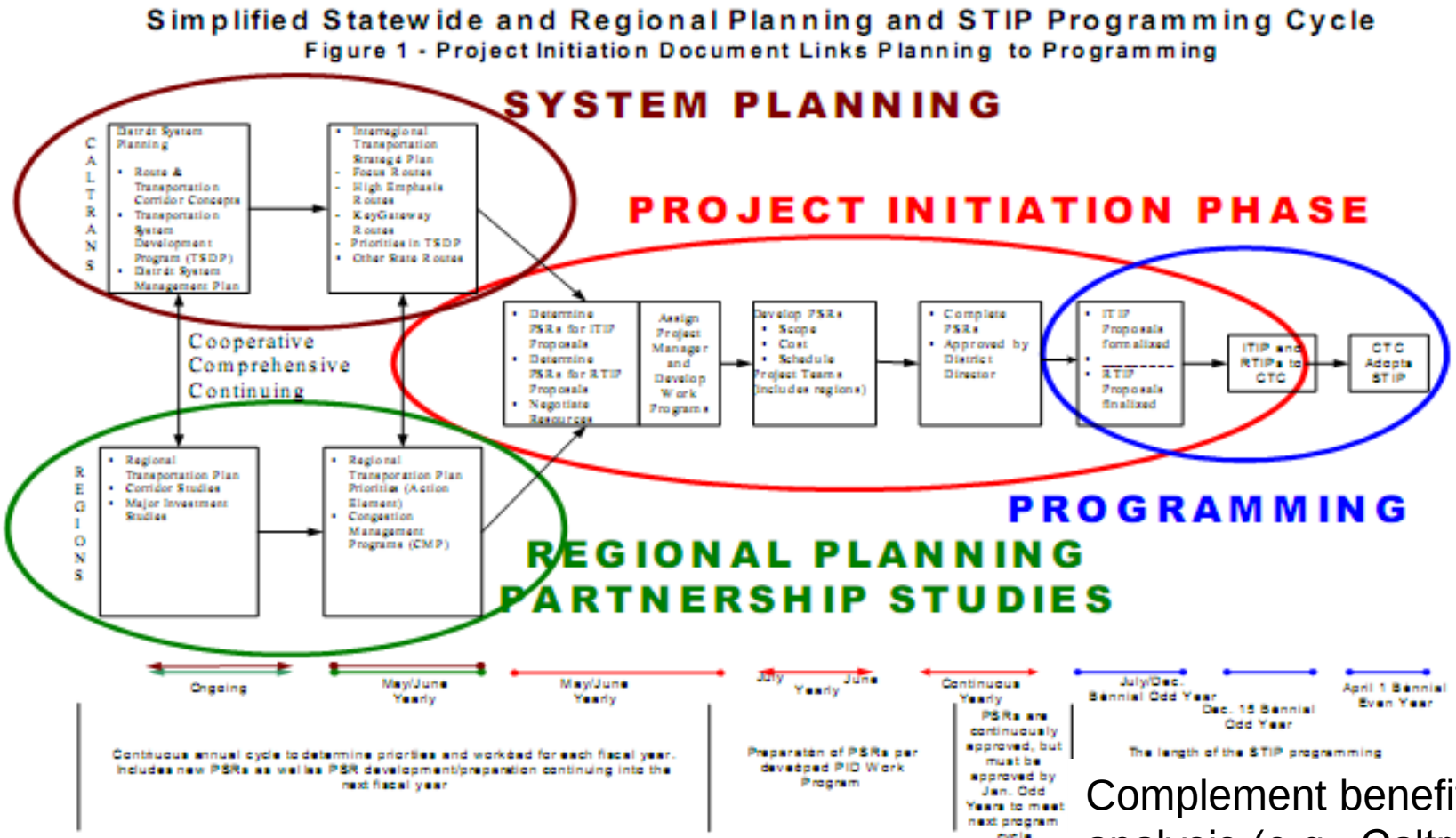
Step 5: Develop and use credits to:
a) address relative impacts,
b) inform project comparison, and
c) develop fiscal equivalents

Example of using credits to compare among alternatives including structural and modal changes.

Credits are calculated based on comparison to desired and undesired conditions.

Alternative	Domain	Desired Target	Undesired Target	Credits	Total
A. Lane addition; 20,000 AADT increase; short term 5% reduction in travel time, then 5% increase; 10% increase in air pollutants; 40 acres (2%) habitat consumption; 1,200 acres impacted area (60%, traffic noise)	AADT	20,000 reduction	40,000 increase	-50	-230
	Congestion	20% reduction travel time	20% increase travel time	0	
	Air quality	10% reduction	10% increase	-100	
	Habitat	10% increase	10% decrease	-20	
	Impact area	0% increase	100% increase	-60	
B. Light rail system augmentation; 10,000 AADT decrease; long-term 10% reduction in travel time; 5% reduction in air pollutants; 0 acres habitat consumption; 400 acres impacted area (20%, LRT noise)	AADT	20,000 reduction	40,000 increase	+50	+130
	Congestion	20% reduction travel time	20% increase travel time	+50	
	Air quality	10% reduction	10% increase	+50	
	Habitat	10% increase	10% decrease	0	
	Impact area	0% increase	100% increase	-20	
C. No action; 15,000 AADT increase; 15% increase in travel time; 7.5% increase in air pollutants; 0 acres habitat consumption; 900 acres impacted area (45%, traffic noise)	AADT	20,000 reduction	40,000 increase	-38	-233
	Congestion	20% reduction travel time	20% increase travel time	-75	
	Air quality	10% reduction	10% increase	-75	
	Habitat	10% increase	10% decrease	0	
	Impact area	0% increase	100% increase	-45	

Possible decision-points for the use of valuation/crediting in planning, programming, and project evaluation



Complement benefit-cost analysis (e.g., Caltrans' Cal-B/C model) at the programming stage

Summary

- Trading & Banking have long been known and used by DOTs and MPOs, but multi-crediting systems remain rare.
- The framework 1, developed by the Willamette Partnership, provides easy to use methods & tools for agencies wanting to get started.
- Framework 2 is a more complex methodology that includes valuation in mitigation crediting and all aspects of transportation decision making.

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