Overview…a problem statement

- Outsourcing can be enterprise-wide, by location, by fleet segment, by maintenance category, by specific work item or vehicle
- Multiple factors bear on outsourcing decisions, including:
  - *Capability and capacity*
  - *Cost effectiveness*
  - *Quality and timeliness of service*
  - *Readiness and immediate availability of vehicles/equipment (emergencies, other priorities)*
  - *Strategic issues, such as "reversibility" of outsourcing choices -- once taken*
- Private sector models for revenue-generating fleets do not translate well for use in most DOT fleets

A decision framework is useful -- for systematic outsourcing analysis and decision-making for public sector non-revenue fleets

Decision challenges for DOT fleets…

- Market availability of services needed
- Reversibility of outsourcing decisions
- Scale and variety of fleet/equipment types and maintenance activities
- Workforce utilization and displacement
- Quality measurement and expectations
- Ownership, control, and reserve fleet implications
- Cost development and “apples-to-apples” comparison
- Procurement policy constraints

Purpose and goal of the outsourcing decision framework…

…to enable a systematic process for evaluation of state DOT fleet and equipment outsourcing and privatization decisions.

On a practical level, the decision framework and tools can help agencies achieve ***acceptable levels of service quality*** and ***cost savings***

Outsourcing decision framework requirements…it should:

- Be able to address the range of outsourcing options possible—from completely outsourcing the fleet maintenance function, to outsourcing a single repair location, to outsourcing specific activities—fleet-wide or a single location
- Capture the general characteristics of DOT fleet profiles and maintenance, breadth of repair, and replacement options, so that it will be widely applicable and adaptable to most agencies
- Allow practitioners to incorporate strategic, analytical, and operational decision criteria
- Allow consideration of local, regional, or statewide operating imperatives
- Recognize, define, and describe process differences between internally and externally driven outsourcing initiatives

Key factors considered in the decision framework…

- Size and composition of fleet
- Variety of maintenance activities performed
- Effects of key influence factors
- Cost of both fleet and non-fleet activities of maintenance personnel
- Evaluation of capabilities available in local and regional service markets
- Agency-specific procurement policy and rules constraints
- Long-term implications and risks associated with outsourcing.

minor repair,
preventive maintenance,
overhaul,
heavy repair

Shop workload
Shop priorities
Full direct and indirect costs
Performance/quality
Policy/mandates
Internal capability

Forms of outsourcing…

Forms	Fleet "Ownership"	Role and Responsibility			Consideration in the decision framework
		Maintenance Service Performed by	DOT Management and Policy Responsibility	Financial Responsibility	
Asset Transfer	Private Sector	Private Sector	Limited, case by case	Private	**Strategic Alternative**
Outsourcing	State DOT	Private Sector	Full control—state DOTs	State DOT	**Primary Alternative**
Insourcing	State DOT	State DOT	State DOT	State DOT	**Primary Alternative**
Managed Competition	State DOT	Public or private depends on competition	Full control—state DOT	State DOT	**Strategic Alternative**
Public–Private Partnership	Joint	Private Sector	Joint	Joint	**Strategic Alternative**

Approach taken for the decision framework…

- A commonly accepted typology of vehicle/equipment classes and maintenance types was defined for the logic model and the case examples. These may be redefined by any user of this logic framework
  - Six vehicle/equipment classes, grouping similar configurations and maintenance characteristics
  - Five general maintenance types, grouping activities with similar characteristics and frequency
- A core three-dimensional decision variable was defined to allow for systematic expression of the may possible alternatives for outsourcing and for consistency in evaluating insourcing and outsourcing options
- Four major process groups were laid out in the model (with sub-processes defined), and a fifth stage in the logic for synthesis of results
- The process was refined through case-testing for plausible scenarios

Vehicle/Equipment classes used for framework development…

Equipment Class	Examples
Small engine	Chainsaws, grass trimmers, lawnmowers
Seasonal attachments	Plows, salt and sand spreaders, mowers
Light duty	Sedans, light pickup trucks, light trucks
Medium duty	Heavy pickups, Medium dump trucks
Heavy duty	Heavy trucks
Specialized	Tractors, loaders, graders, backhoes, oil spreaders

Maintenance types…

Maintenance Types	Examples
Preventive Maintenance	planned inspection, maintenance and service include inspection and replacement of minor parts and consumables
Minor Repair	Repair/replace specific parts/components that fail or wear such as TBA, electrical system components, brakes, alternators
Major Repair	Component/system repair with special tools or equipment, typically requiring more time and training
Overhaul and Rehabilitation	includes extensive renewals of power train, chassis, and body systems
On-Road Repair	includes mobile road-call response, with on-site repairs or vehicle recovery

A core three-dimensional decision variable was used…

$$D_{ijk} = \begin{cases} 1\text{—Insourcing} \\ 2\text{—Outsourcing} \\ 3\text{—Tradeoff} \end{cases}$$

where,
i *= Equipment Class*
j *= Maintenance Type*
k *= Organizational Unit*

The value of the decision variable represents three possible outcomes of the decision-making process: (1) the process favors an insourcing decision; (2) the process favors an outsourcing decision; and (3) the process gives a neutral or equivocal result – (within the confidence margin for the ratings and estimates used).

The handling of the equivocal result is discussed further in subsequent slides.

A full range of outsourcing alternatives can be addressed by the core decision variable…

- ***Day to day***: Outsourcing decisions made independently at individual fleet locations. These outsourcing decisions can range from outsourcing a single type of maintenance for individual equipment classes to outsourcing the entire fleet maintenance services at a particular location. State DOT repair shops often need to make outsourcing decisions for a single type of repair for a single particular vehicle, on a case-by-case situation

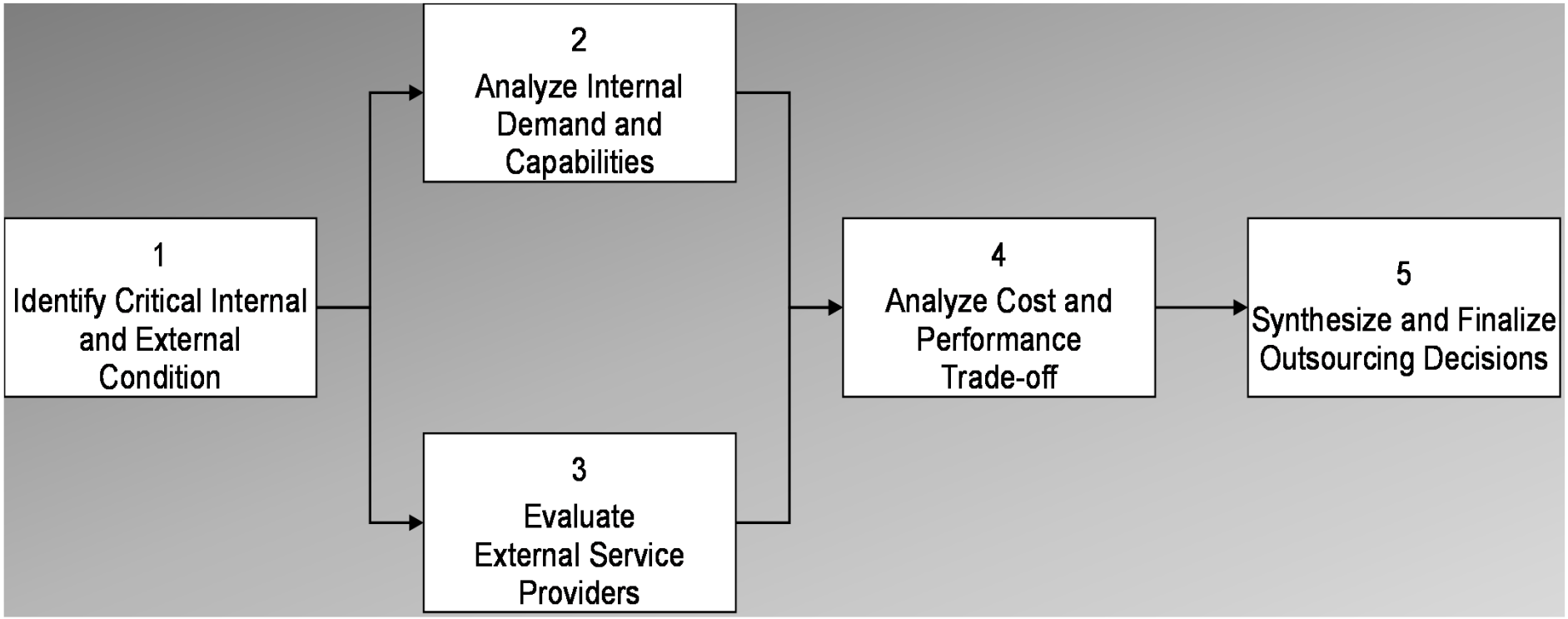
- ***Operational***: Outsourcing decisions made at district and regional levels. For example, a decision can be examined to outsource the entire district's heavy repair services.

- ***Strategic***: Outsourcing decisions made at the fleet-wide level. This can be driven by legislation, policy direction, agency's strategic plan, or recommended by fleet managers after thorough performance analysis. Such outsourcing decisions may suit most—but not all—situations in the field, so they are usually implemented via policy, guidelines, phase-in plans, and exception rules *(examples follow)*

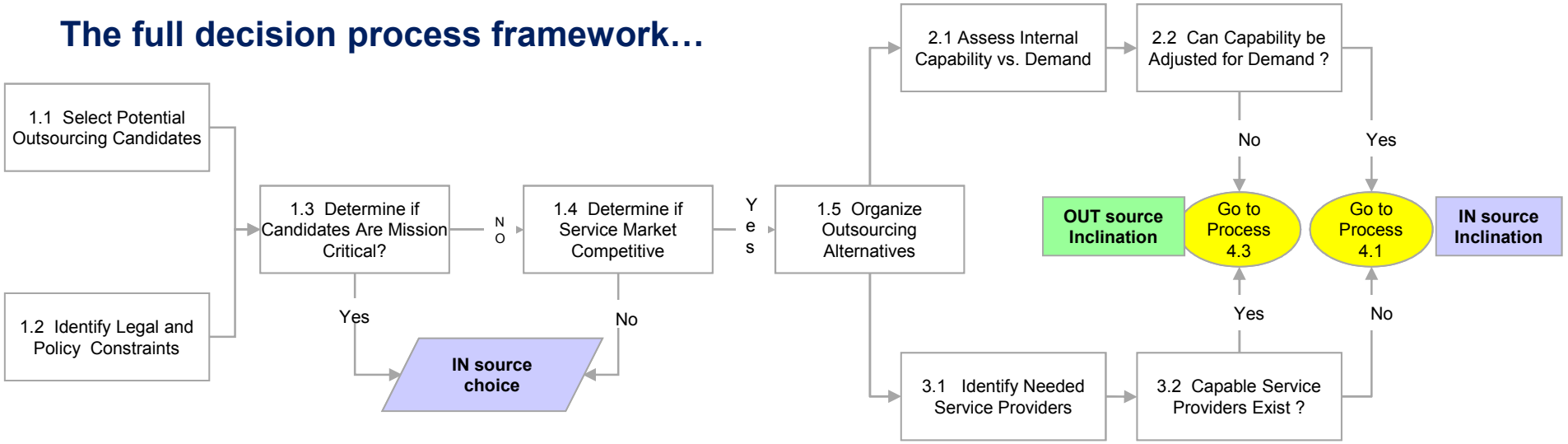
Example of decision scenarios addressed by the decision model…

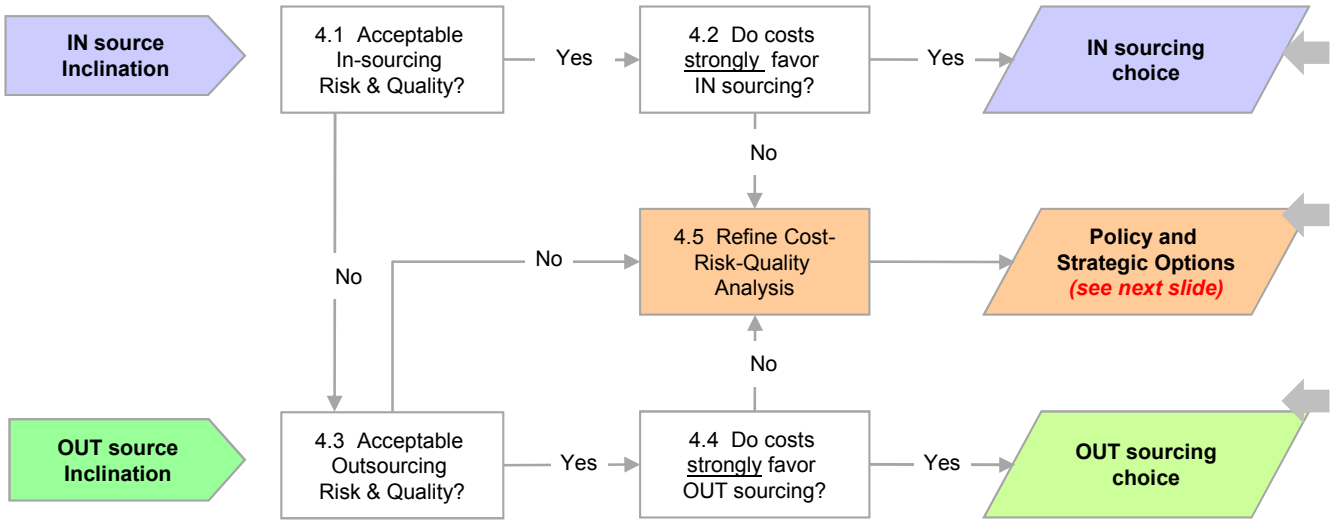
Organizational Dimension	Scenario	Equipment Class	Maintenance Type	Outsourcing Nature
Individual Locations (i.e., a local garage/shop)	1	Specific unit	Single type	**Day-to-day decisions**
	2	Single class	Single type	**Operational decisions**
	3	Single class	All types	**Operational decisions**
	4	Multiple classes	Single type	**Operational decisions**
	5	Multiple classes	All types	**Operational decisions**
Regional (i.e., District-wide all garage shops)	6	Single class	Single type	**Operational decisions**
	7	Single class	All types	**Operational decisions**
	8	Multiple classes	Single type	**Operational decisions**
	9	Multiple classes	All types	**Operational decisions**
Statewide (including all fleet locations)	10	Single class	Single type	**Strategic outsourcing**
	11	Single class	All types	**Strategic outsourcing**
	12	Entire fleet	Single type	**Strategic outsourcing**
	13	**Entire fleet**	**All types**	**Strategic outsourcing**

The high-level view of the decision framework…



The full decision process framework…

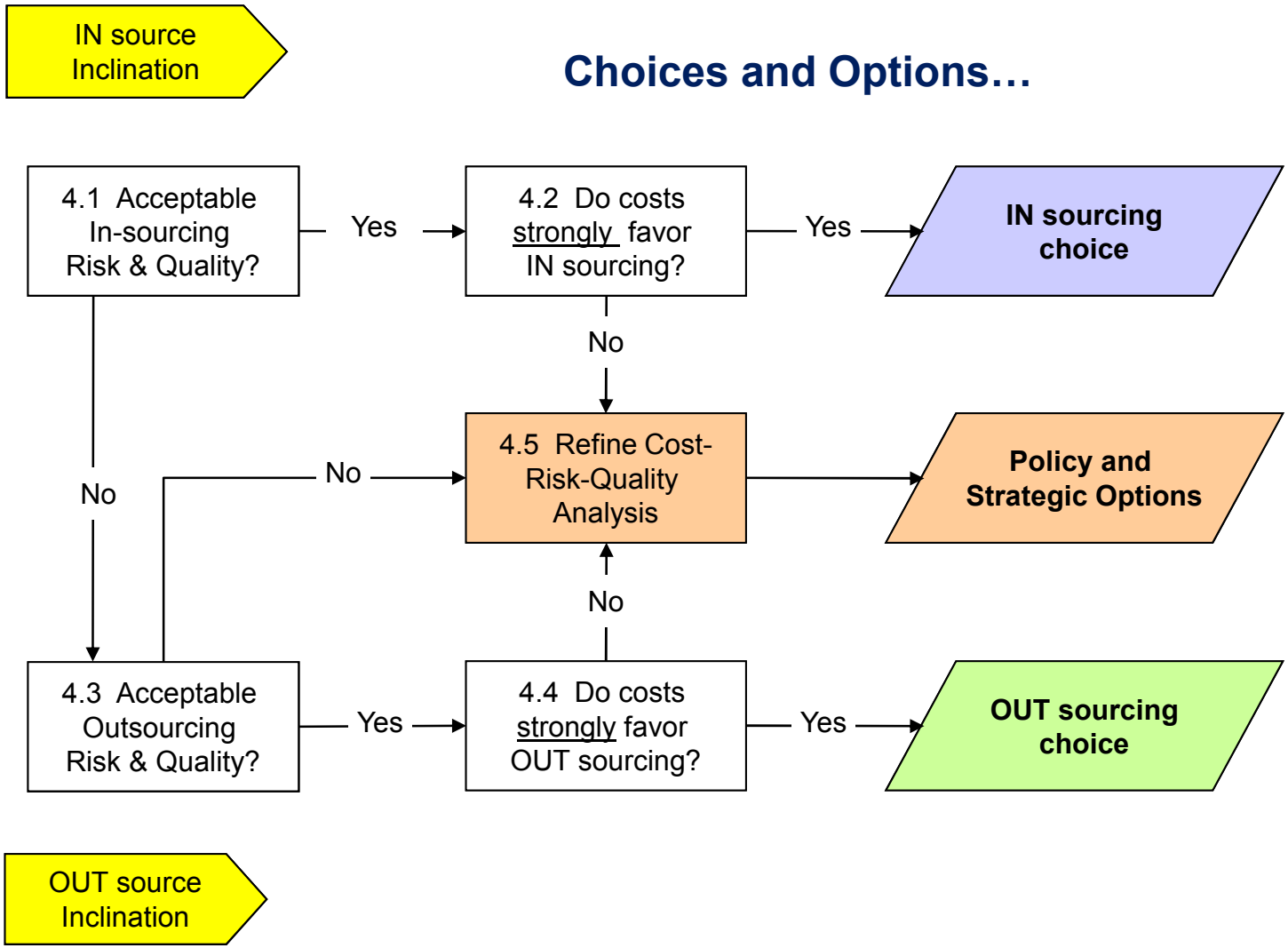




Three source decision outcomes need to be expected, since:

- *Cost/Pricing estimates can be flawed or approximate, and usually apply only to the near-term*
- *Quality and performance are measurable but may include subjective evaluation*
- *Risk is more subjective, longer-term, and depends on the priorities and weighting assigned by decision-makers*

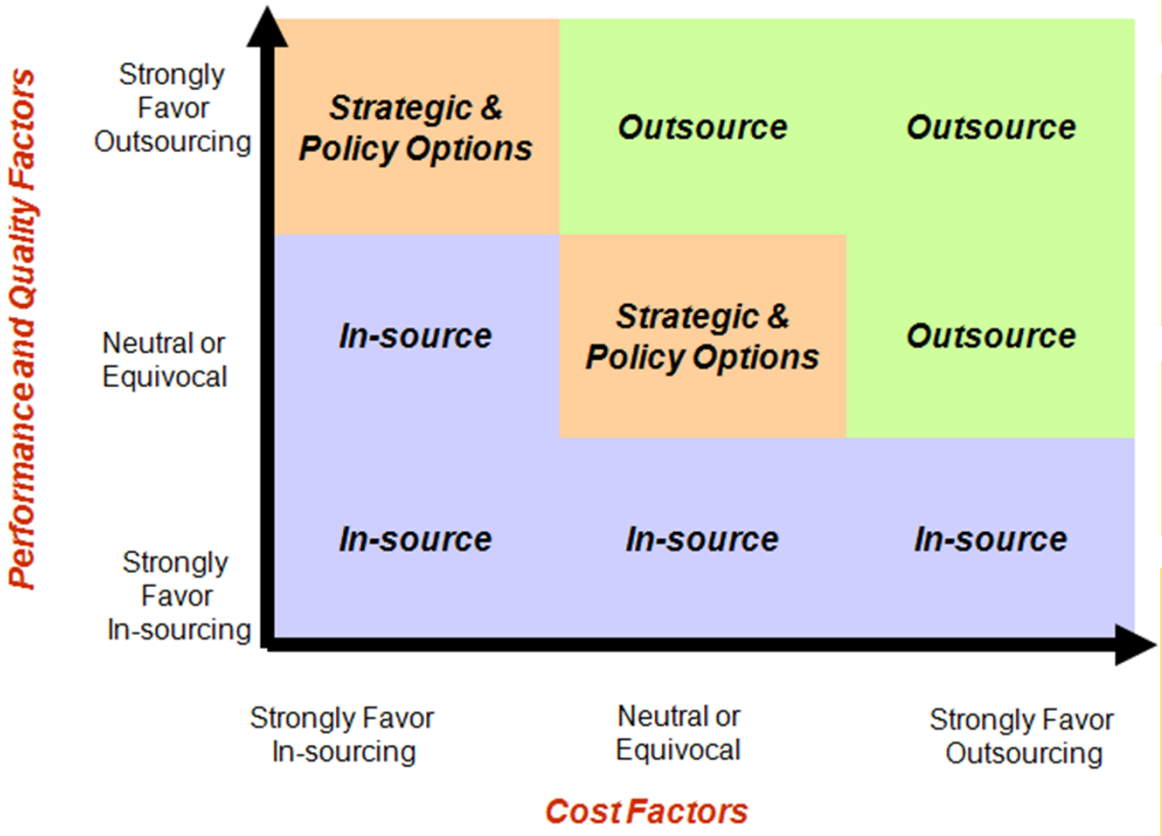
Choices and Options…



Three source decision outcomes need to be expected since:

- *Cost/Pricing estimates can be flawed or approximate, and are usually apply to the near-term*
- *Quality and performance are measurable but may include subjective evaluation*
- *Risk is more subjective, longer-term, and depends on the priorities and weighting assigned by decision-makers*

The tradeoff scenarios…



In the illustration, three out of nine outcomes in the cost-versus-performance and quality tradeoff analysis result in an outsourcing decision. In-sourcing would be considered if the external service providers do not have either the capability or capacity to provide adequate service quality irrespective of cost competitiveness.

If private sector costs are prohibitive and performance and service quality bias is neutral, in-sourcing would be the obvious choice. Four out of nine outcomes in the cost versus performance and quality tradeoff analysis likely result in an in-sourcing recommendation.

As shown, the decision-makers would need to explore strategic and policy options if both cost and performance and service quality bias are neutral or equivocal.

Or if the external service providers have sufficient capacity and capability and can deliver much improved service quality but their costs are only somewhat higher, a careful review of cost factors, and possible benefits of better service standards would be worth considering before arriving at a final decision.

Executing the decision processes…tools and suggestions

- The decision process can be executed using straightforward spreadsheet approach to “rack and stack” quantitative and qualitative ratings information each step of the way. Templates and case examples are provided
- The logic process is designed for the user to skip over unnecessary steps when the conclusions are known already – and to address the “show-stoppers” first, avoiding unnecessary effort in the cost-performance assessment, if not needed
- The typologies and be adjusted and tailored to fit current definitions and practice, at any level of breakdown
- This is a decision logic process – not design – so estimates can supplement hard data, to the extent needed. Refinement is needed only if the conclusions are very close
- Whether actual or estimated, costs must be ***full-cost*** on both sides of the decision tradeoff. Most accounting is not activity-based, so a consistent method is needed to include indirect cost factors for insource option, and to include acquisition and management for outsource options (real-cost comparisons)

Wrap-up…

- The NCHRP Report 692 is out and available
- Read through the report (only about 40 pages and appendix -- many readers will quickly digest it through experience)
- Walk through the cases and template examples
- Try out the logic process with estimates available information on recent real experience with outsourcing decision issues…
- The logic framework will provide a solid basis for thorough and transparent consideration of outsourcing decisions