

Exhibit 4-4. Selection of Time Horizons

Cost Flow Characteristics	Benefit Flow Characteristics		
	Immediate, basically steady stream	Deferred: (1) Lagged, then steady; or (2) Initially low, then rising	Sporadic, predictable only for longer stretches of time
No significant peaks, fairly steady annual flow, e.g., replacement of equipment or introduction of labor standards introduced gradually with natural attrition of existing equipment/labor; new procedures that involve higher costs but no start-up investments	Fairly short time horizon since costs and benefits well balanced each year; probably 10 years is sufficient	Longer than for immediate, steady benefits; depends on spread between regularly recurring costs and benefits in later years; try 20 years, to 30 if benefits rise rapidly between 20th and 30th year.	Time horizon at least as long as benefits prediction period, depending on how benefits are stated (e.g., if expect to avoid 3 accidents over 20 year period, then benefit prediction period is 20 years); maximum of 30 years.
High one-time initial costs, negligible or lower level recurring thereafter (no more significant peaks); e.g., large initial expenditure on labor training, thereafter incurred only as new employees added	Time horizon depends on situation; if benefits are substantial, a 10 to 15 year horizon may be sufficient to demonstrate net benefit; if costs are heavily front loaded and benefits are steady but not spectacular, could required 30 years (which is comparable to infinite horizon)	Time horizon longer than that for immediate and steady benefits; 30 years is maximum.	Time horizons at least one benefit-prediction period; more if this too short for benefits to counter high initial costs; up to a maximum of 30 years.
High initial costs with equipment replaced at regular intervals thereafter; peaks define capital cycle	Time horizon equivalent to one cost cycle, i.e., peak-to-peak interval, since pattern is repeated hereafter.	Time horizon of one cost cycle at least; may need to extend to two or more depending on benefits profile	Time horizon equivalent to at least one benefit-prediction period, depending on how this matches cost cycle; or use 30 years
High initial cost, followed by lower level regular costs punctuated with lower peak(s); e.g., start-up investment in labor training and various new pieces of equipment with varying life-cycles (lower peaks define life cycle of different equipment components)	Depends on height of lower peaks relative to initial peak; if start-up costs are very high relative to subsequent peaks (e.g., one-time labor costs plus investment in equipment of varying useful lives replaced a few at a time at different times). Try to choose a time horizon that ends just before a new capital cycle begins, so that most of capital investment has had a full cycle to generate benefits; may need long time horizon to capture full effects—perhaps 30 years.	Longer than for immediate steady benefits, may need to include several cost cycles of shorter-lived equipment (up to maximum time horizon of 30 years)	Choice of time horizon guided by period within which benefits are sure to occur, may need to extend to several cost cycles; need to find "common denominator"; or use 30 years