

Accelerating decision-making with dynamic group processes and state-of-the-art systems.

Case Study

Facilities planning

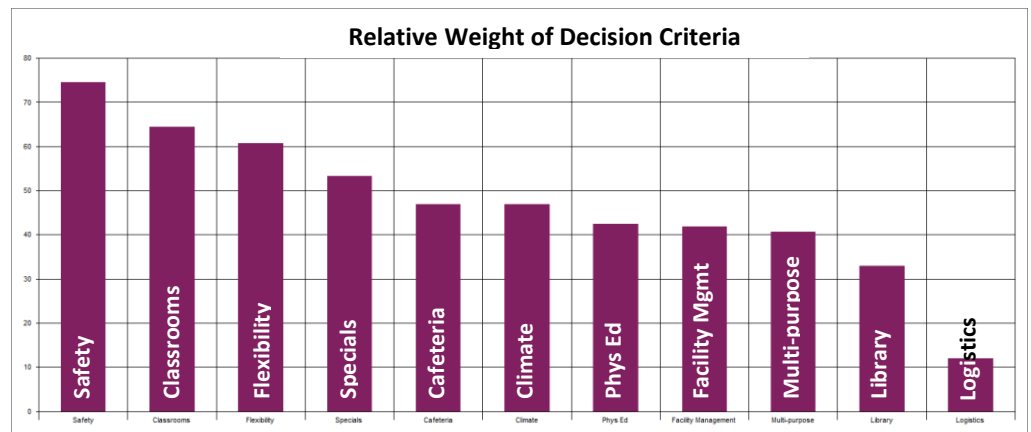
Prism’s Sean Brady recently helped the Elmsford Union Free School District facilities planning task force grapple with a complex decision. Elmsford’s Dixon Primary, a PK-1 building built in 1894, enjoys the love of many community stakeholders but is considered woefully inadequate to serve the needs of its students. The issue is emotional and many task force members arrived with preconceived notions: some, that the building needs to be closed; others, that building should be renovated. This would be a another great test to see whether or not [Prism’s group decision support system](#) could make an intractable decision tractable!

From impasse to agreement—in five collegial meetings

The task force spent the first night walking through Dixon Primary and generating a research plan. At the second meeting, they walked through Grady Elementary, a grade 2 to 6 building, and shared the results of their research. The task force then achieved its first [consensus decision](#):

Having our students continue to attend Dixon Primary in its current state is unacceptable.

Subsequently, the Task Force agreed to and weighted eleven decision criteria (see chart right). At the third and fourth meetings, the task



force converged on three facilities options:

- Demo the old Dixon primary and build a new one (Dixon New)
- Renovate Dixon primary (Dixon Reno)
- Renovate Grady to accommodate all students PK-6 (Grady)

With the help of the architects, the task force created evidence-based side-by-side comparisons of the three options against the 11 criteria.

Voting the decision matrix

At the fourth meeting, the group used radio response keypads to complete a [weighted criteria and cost-benefit analysis matrix](#) of the three options where:

- Value = (Benefit – Cost)
 - Benefit = total contribution to weighted criteria
 - Cost = total construction costs



First, individuals reviewed the evidence and used a 1 to 9 scale to score the three facilities options against the 11 on a worksheet. Then, in subgroups, they shared their worksheets and began to converge on reasonable, evidence-based scoring. Finally, the whole group used their keypads to vote all 33 cells. After voting each cell, the task force looked at and discussed the bar graph of results, revoting if necessary to narrow the range. Because participants voted with integrity, we only needed to revote a few cells.

Total weighted score

Once the vote was complete, the decision matrix displayed the average of the 1 – 9 scores for each cell (Table 1). The matrix also multiplied these average scores by each criterion weight to calculate the Total Benefit score (i.e., the sum of the weighted scores) for each facilities option (Table 2). The Total Benefit score for Option #1 (Dixon New) was 4,262; for Option #2 (Dixon Reno), 3,276; and for Option #3 (Grady), 4,129. So Option #1 was superior and we had a decision, right?

Analyzing costs and benefits

Wrong. Thus far, we had only considered benefits. We now needed to look at costs. We added the construction costs of the three options in millions of dollars (Table 3): Option #1 costs \$17.8M; Option #2, \$14.3M and Option #3, \$11.1 M.

The matrix then completes the cost-benefit calculation. It normalizes the numbers in both the “Total Benefit” and “Cost” columns so that it can subtract Cost from Benefit to calculate relative Value:

$$\text{Value} = (\text{Benefit} - \text{Cost})$$

The value analysis in Table 4 shows that based on the Task Force’s analysis:

- Option #2 (Dixon Reno) is out of the running. Option #2 had a significantly lower Total Benefit score (3,276) and had the lowest Value score (-15).
- Option #1 (Dixon New) had the highest Total Benefit score (4,262), which was 133 points—or 3%—higher than Option #3’s Total Benefit score (4,129). However, Option #1 costs \$17.8 million, 60% more than Option #3 (\$11.1 million).

Weighted criteria & cost-benefit analysis

Table 1:

Average row scores (N = 13):

	Multi-purpose	Cafeteria	Classrooms	Logistics	Flexibility	Library	Facility Mngmt	Phys Ed	Safety	Specials	Climate
Dixon New	8.6	8.9	8.9	7.2	8.2	8.2	7	7.6	7.8	8.6	8.6
Dixon Reno	6.2	6.3	5.7	6.2	6.5	6.1	5.2	6.2	7	7.1	6.8
Grady	7.8	7.2	7.4	8.3	8.5	8.3	8.8	8.3	7.6	8.1	8.2
Criterion weight	41	47	64	12	61	33	42	42	75	53	47

Table 2:

Benefit = Sum of weighted scores

	Multi-purpose	Cafeteria	Classrooms	Logistics	Flexibility	Library	Facility Mngmt	Phys Ed	Safety	Specials	Climate	Total Benefit
Dixon New	351	419	575	87	495	270	293	324	585	459	404	4,262
Dixon Reno	250	296	367	74	392	200	219	261	522	377	318	3,276
Grady	319	339	476	100	514	273	370	353	568	430	386	4,129

Table 3:

Benefit and Costs:

	Multi-purpose	Cafeteria	Classrooms	Logistics	Flexibility	Library	Facility Mngmt	Phys Ed	Safety	Specials	Climate	Total Benefit	Cost*
Dixon New	351	419	575	87	495	270	293	324	585	459	404	4,262	\$17.8
Dixon Reno	250	296	367	74	392	200	219	261	522	377	318	3,276	\$14.3
Grady	319	339	476	100	514	273	370	353	568	430	386	4,129	\$11.1

*Construction cost (\$ Millions)

Table 4:

Value = Benefit (normalized) - Cost (normalized)

	Multi-purpose	Cafeteria	Classrooms	Logistics	Flexibility	Library	Facility Mngmt	Phys Ed	Safety	Specials	Climate	Benefit^	Cost^	Value
Dixon New	351	419	575	87	495	270	293	324	585	459	404	110	124	-14
Dixon Reno	250	296	367	74	392	200	219	261	522	377	318	84	99	-15
Grady	319	339	476	100	514	273	370	353	568	430	386	106	77	+29

^Normalized

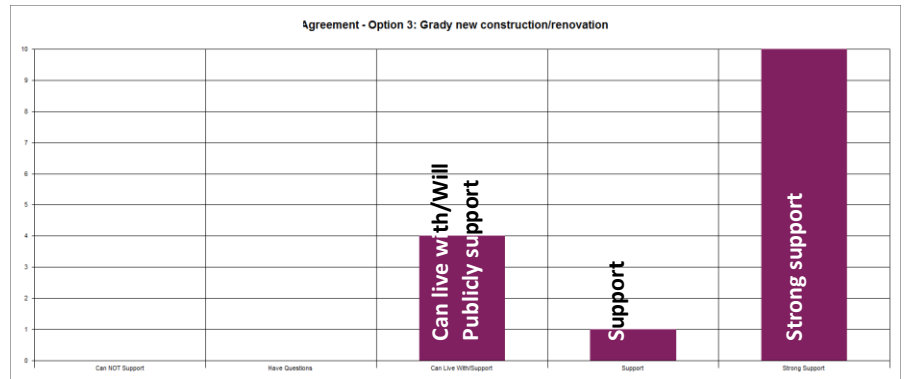
- Option #3 (Grady), therefore, has the highest Value score (+29) and Option #1 has a much lower Value score (-14). Based on the Task Force’s analysis, the highest value option for the district is Option #3.

In simplest terms, the Task Force’s analysis shows that Option #3 (Grady) provides the greatest bang for the buck: it provides 97% of the total Benefit at just 62% of the Cost of Option #1. In the language of a relative cost-benefit analysis: Option #3 is worth much more than it costs, whereas Option #1 costs much more than it is worth. So we had a decision, right?

Reaching consensus

Not yet. When asked at the end of meeting #4 to indicate their consensus support for Option #3, only eight of 13 task force members did so. The final meeting began with additional information sharing to address some outstanding concerns, including the superintendent’s

impassioned explanation for why it was critical for the committee to support the highest value facilities option with a strong consensus. The group re-voted its consensus support for Option #3 with the caveat that the task force and staff members will have the opportunity to participate in the detailed design phase of a Board approved facilities project. There was consensus: 10 members voted "Strong Support," one member voted "Support," four members voted "Can Live With/Will Publicly Support" and no members voted "Have Questions" or "Can NOT Support." See consensus vote results above.



With that decision, the Elmsford Facilities Review Task Force completed its work with hearty and warm congratulations filling the room, and [Prism’s Group Decision Support System](#) proved once again capable of making a seeming intractable group decision tractable.