

Polling Location Consolidation Election Processes Simulations

Executive Summary

Purpose:

As part of the Simulation Modeling for an Immersive Learning Experience (SMILE) project, the Polling Location Consolidation module investigates several methods for consolidating two precincts and three precincts into a single polling location for a three-step voting system. By estimating voter wait times at different voting equipment needs through computer simulation, different consolidation strategies are compared to identify which requires the fewest resources while keeping voter wait times short (i.e., less than 30 minutes).

3 Consolidation Strategies:

- 1. <u>Complete Combination Strategy</u>: two or three combined precincts are served by the same resources in the consolidated polling location.
- 2. <u>Partial Combination Strategy</u>: the check-ins and voting booths are shared by all combined precincts, but ballot scanners are separated per precinct
- 3. <u>Shared Facility Strategy</u>: no resources are shared between precincts.

Results:

Using simulated voter wait times, the resources required to ensure that voters wait less than 30 minutes are determined per consolidation strategy for the combination of two and three precincts. Below are three tables showing the required voting equipment per consolidation strategy, the required equipment cost, and the square footage of the required equipment.

Table 1: Findings show that the best strategies for combining two precincts are the *complete* and *partial combination strategies*. The *complete combination* requires allocating one more check-in device than the *partial combination strategy*, but the *partial combination strategy* requires one more ballot scanner than the *complete combination strategy*. When combining two precincts, the *shared facility strategy* requires more voting equipment than the *complete* and *partial combination strategies* and is not recommended; although the *shared facility strategy* is the least sensitive to check-in and voting booth shortages.

According to the data, the *shared facility* and *complete combination strategies* are the best options for combining three precincts. Both strategies offer benefits, but each requires a different quantity of voting equipment. The *shared facility strategy* requires two fewer check-in devices than the *complete combination*, while the *complete combination* requires one fewer voting booths and one fewer ballot scanners. When combining three precincts, the *partial combination* is not recommended.

Table 2: Complete combination is the least expensive consolidation option when combining two precincts. The shared facility strategy requires the most equipment and the highest cost to ensure short voter wait times.

When combining three precincts, the *complete combination* is the least expensive consolidation option, and the *partial combination* is the most expensive.

Table 3: When combining two precincts, the *partial combination* requires the least square footage of equipment, good for polling locations of limited size.

When combining three precincts, the shared facility requires the least square footage of equipment.

Each consolidation strategy has pros and cons. *Shared facility* requires large polling locations and deliberate equipment layout but does not include voters of different precincts sharing voting equipment. The *complete* and *partial combination strategies* require additional considerations to ensure voters check-in to the proper precinct, receive the correct ballot, and use the correct voting equipment.

Table 1

Required	Voting E	Equipment	by Col	nsolidation	Strategy
----------	----------	-----------	--------	-------------	----------

Voting Equipment	Unconsolidated Precinct	Two Precincts Total (per Precinct)		Three Precincts Total (per Precinct)	
Complete Combination					
Check-ins	3	5	(2.5)	8	(2.7)
Voting Booths	8	17	(8.5)	23	(7.7)
Ballot Scanners	1	1	(0.5)	2	(0.7)
Partial Combination					
Check-ins	3	4	(2)	7	(2.3)
Voting Booths	8	16	(8)	22	(7.3)
Ballot Scanners	1	2	(1)	3	(1)
Shared Facility					
Check-ins	3	6	(3)	6	(2)
Voting Booths	8	16	(8)	24	(8)
Ballot Scanners	1	2	(1)	3	(1)

Table 2

Cost of Required Voting Equipment by Consolidation Strategy

Consolidation Strategy	Total Cost of Required Voting Equipment				
	Unconsolidated Precinct	Two Precincts	Three Precincts		
Complete Combination	\$10,024	\$13,704	\$23,375		
Partial Combination	\$10,024	\$17,958	\$27,628		
Shared Facility	\$10,024	\$20,049	\$26,936		
		Cost per Precinct			
	Unconsolidated Precinct	Two Precincts	Three Precincts		
Complete Combination	\$10,024	\$6,852	\$7,792		
Partial Combination	\$10,024	\$8,979	\$9,209		
Shared Facility	\$10,024	\$10,025	\$8,979		

Table 3

1 5 1					
Consolidation Strategy	Total Squ	are Footage of Voting Eq	uipment		
	Unconsolidated Precinct	Two Precincts	Three Precincts		
Complete Combination	86 sq.ft.	155 sq.ft.	232 sq.ft.		
Partial Combination	86 sq.ft.	142 sq.ft.	220 sq.ft.		
Shared Facility	86 sq.ft.	172 sq.ft.	213 sq.ft.		
	Square Footage of Voting Equipment per Precinct				
	Unconsolidated Precinct	Two Precincts	Three Precincts		
Complete Combination	86 sq.ft.	77.5 sq.ft.	77.3 sq.ft.		
Partial Combination	86 sq.ft.	71 sq.ft.	73.3 sq.ft.		
Shared Facility	86 sq.ft.	86 sq.ft.	71 sq.ft.		

Square Footage of Required Voting Equipment by Consolidation Strategy

*These results are determined from a simulated three-step voting system. While real election data were used, these results may not directly apply to voting processes that include more or fewer steps to vote or contain processes that are particularly quick or slow to complete (e.g., ballots with many questions or ballots with few questions). Additionally, precincts that expect a large number of in-person voters may experience different outcomes than those presented.