

Transportation Impact of School Redistricting Options for Brunswick County Schools

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Brunswick County Schools Redistricting

BCS is working with a consultant who has proposed various school attendance area scenarios associated with the opening of the new Town Creek Middle School. This results in changes in school boundaries for each of the following:

- Town Creek Middle School (new)
- Leland Middle School
- Lincoln Elementary School
- Belville Elementary School
- Town Creek Elementary School
-and possibly a small change to Bolivia Elementary School.



Edulog's Transportation Impact Project

This project provides assistance to BCS in assessing the transportation impact of various attendance line scenarios for the affected schools.

Deliverables include data that will outline key transportation indicators to be used by the BCS Board of Education in determining which redistricting scenario to carry forward for implementation.

Changes in routes, time and mileage

Transportation impact points to the need for an additional 6-7 buses, given the assumptions listed above. This need emerged regardless of which re-assignment scenario was chosen.

Because an additional school provides the opportunity for many reassigned students to go to a school closer to home than their previous school, overall time and mileage is decreased.

There is not a significant difference among the 4 scenarios in overall route time of mileage.

Overall student ride times are improved

Changes in Buses and Mileage

Scenario	Total Buses	Δ Routes (Buses)	TOTAL RUNS	Δ RUNS	LOADED MILES	DEADHEAD MILES	CHECK POINT MILES	TOTAL MILES	Δ Loaded Miles	Δ Deadhead Miles	Δ Checkpoint Miles (@12.3/Route)	Δ Total Miles	Estimated change in ANNUAL operating cost (172 days) at \$1.64/mile
CURRENT	52	0	163	0	2,888	444		3,332	0	0	-	-	\$ -
OPTION 1	59	7	167	4	2,862	500		3,362	-26	56	-	-30	\$ 8,462
OPTION 2	59	7	167	4	2,855	510		3,365	-33	66	-	-33	\$ 9,309
OPTION 3	58	6	165	2	2,845	549		3,394	-43	105	-	-62	\$ 17,489
OPTION 4	59	7	167	4	2,821	564		3,385	-67	120	-	-53	\$ 14,950



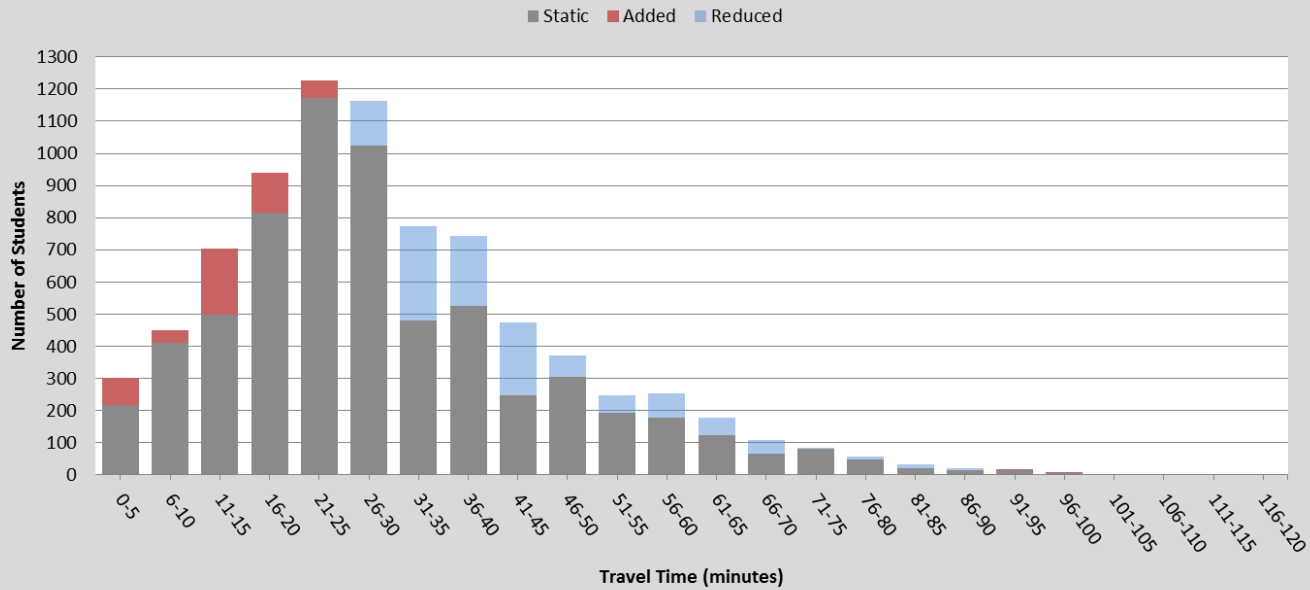
Changes in Route Time

Scenario	Total Buses	Δ Routes (Buses)	TOTAL RUNS	Δ RUNS	LOADED TIME (Daily Minutes)	DEADHEAD TIME (Daily Minutes)	CHECK POINT TIME (Daily Minutes)	TOTAL TIME (Daily Minutes)	Δ Loaded Time	Δ Deadhead Time	Δ Checkpoint Time (Minutes)	Δ Total Time (Minutes)	Δ Total Time (Hours Daily)
CURRENT	52	0	163	0	8078	1065	-	9,143	0	0	-	-	-
OPTION 1	59	7	167	4	7729	1099		8,828	-349	34	-	(315)	(5.25)
OPTION 2	59	7	167	4	7579	1191		8,770	-499	126	-	(373)	(6.22)
OPTION 3	58	6	165	2	7535	1166		8,701	-543	101	-	(442)	(7.37)
OPTION 4	59	7	167	4	7563	1292		8,855	-515	227	-	(288)	(4.80)

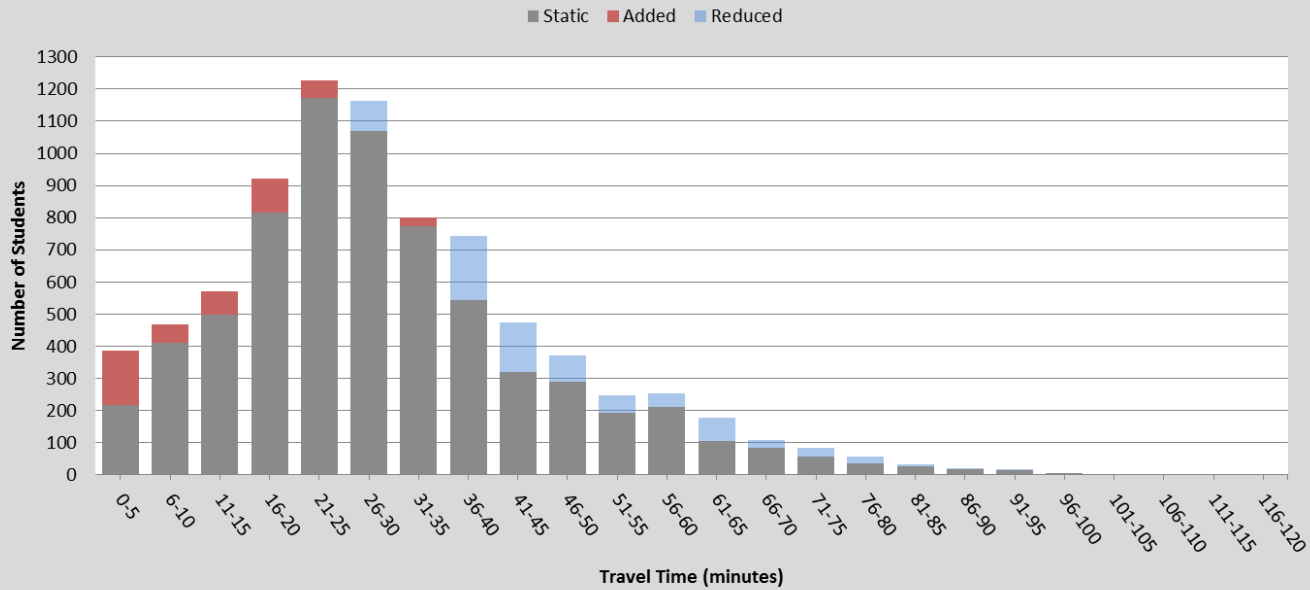
Student Travel Time

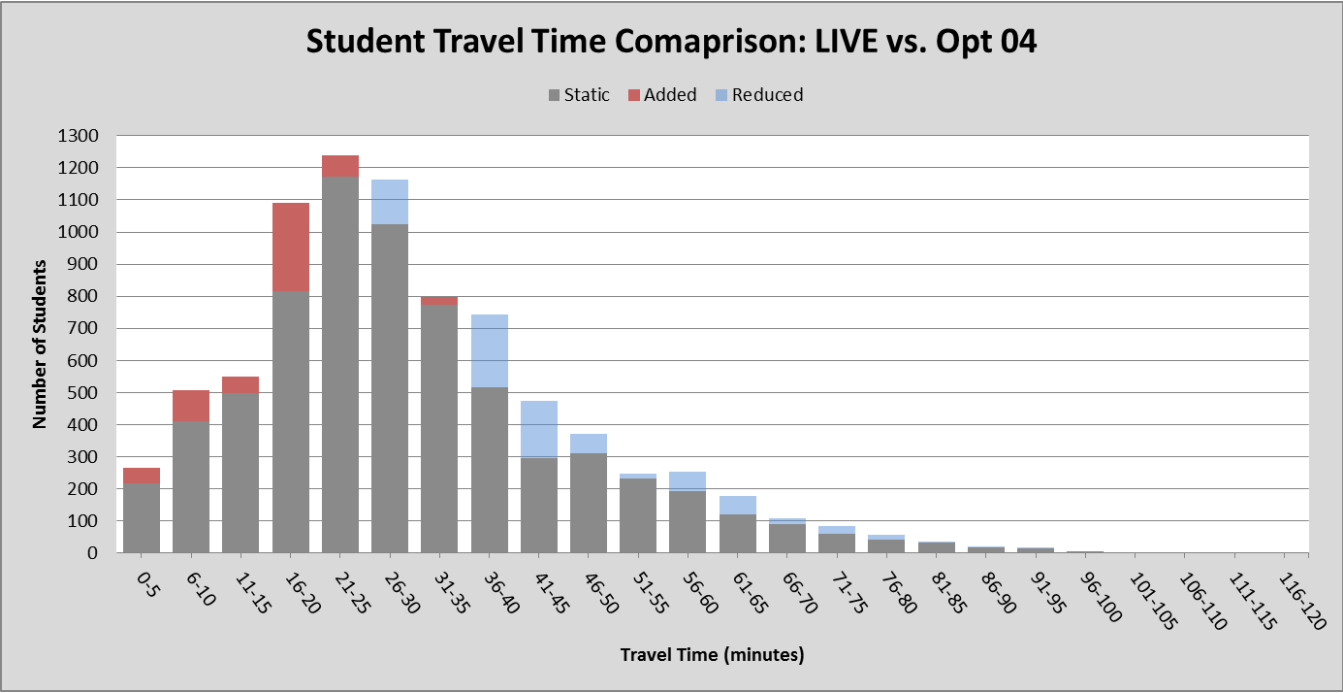
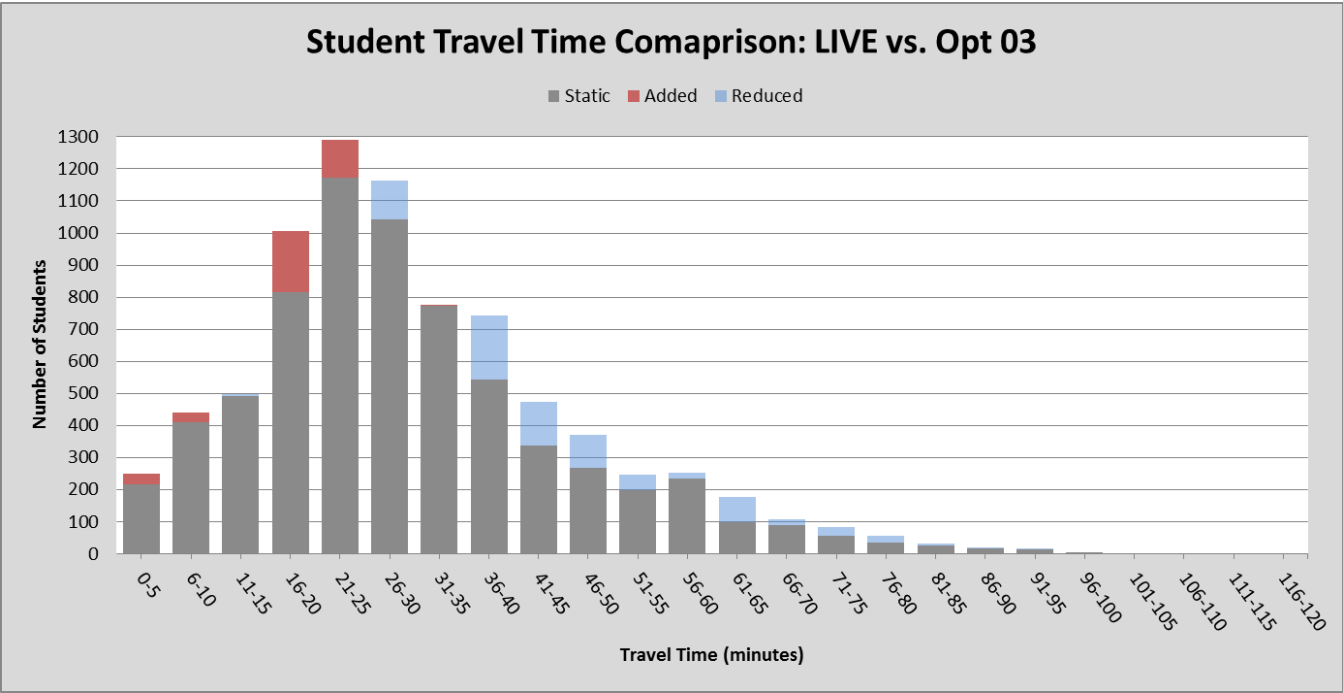
- The trend is definitely toward lower student ride times as most of the time periods seeing increases are less than 25 minutes. There are fewer stops in each of the longer (>25 minute) ride time intervals.

Student Travel Time Comparison: LIVE vs. Opt 01



Student Travel Time Comparison: LIVE vs. Opt 02





Observations for Elementary

- Scenario 1 - travel times are shortened on average, with *more* students having a ride time < 20 minutes, and *fewer* students experiencing ride times longer than 21 minutes.
- Scenario 2 - We see a very similar distribution for Elementary students, with ride times decreasing on average. However there has been an increase in the 31-35 minute ride time column. This is the result of the boundary for Town Creek Elementary now extending further East, towards the boundary of the district. By trading the Southern section of Belville's attendance boundary to Town Creek, the runs servicing it now have to travel significantly farther to service the student living out on/near River Rd SE. The distributions below are again compared to show the slight bump on the 31-35 minute range.
- Scenario 3 - The average ride time for Elementary students has now increased towards the 20-minute mark, with reductions actually occurring over the 6-15 minute range. The longer ride times are reduced overall, with notable exceptions for both the 31-35 and 56-60 range. The reason for both of these changes are primarily because Town Creek ES's new boundary covers a significant amount of Belville's Eastern area, requiring additional bus runs to service and increasing run lengths. Belville itself also gains a new area further West of its current boundary, which cover densely-populated suburbs.
- Scenario 4 - the average has moved towards the 20-minute mark, with smaller amounts of students now experiencing ride times less than 10 minutes. The reduction of ride times around the 11-15 range resulted from the zones traded between Lincoln, Belville, and Town Creek schools. The areas traded are suburbs that required a couple changes to the shorter runs to accommodate. Another change that resulted from the boundary trading between Belville and Lincoln Elementary schools is the small bump at the 56-60 minute range. Specifically, as Belville gained a dense suburban section to the North, run loads and paths had to be rebalanced, lengthening runs in the southern part of its attendance zone.

- There are trade-offs with the transportation impact of the various scenarios.
- Scenario 1 performs best for student ride times.
- The results are quite similar and transportation impact between the 4 scenarios may not be significant enough to outweigh other factors the board is considering.

State transportation funding formula

- Transportation allotment is based on a budget rating which is, in part, a measure of efficiency.
- Budget rating determines the percentage of total eligible expenditures covered by state funds
- In round numbers:
 - \$6 million budget
 - Each 1% budget rating = \$60,000
 - Add 7 buses, rating impact: loss of \$120,000

Implementation Plan

EduLog recommends that, once a scenario is chosen, an implementation plan be developed.

Once the plan is known, runs, routes and bell times can be optimized to improve efficiency.

