



Zoned-High-School-First Transfer Bus Model

Internal Process Memo

Executive Summary

This report evaluates a full-day zoned-high-school-first transportation model for Passion4Learning[1] in Richmond[2], designed for Richmond Public Schools[3]. Under the model, students would board the bus serving their zoned high school, scan a QR-based student ID at boarding, scan again when arriving at the zoned campus, receive breakfast access there, and—if they attend another school or program—transfer to a second bus for a direct interschool trip. The approach aligns with RPS's current high-school bell structure, which runs from 9:00 a.m. to 4:00 p.m., and with RPS's Community Eligibility Provision meal program, which already provides breakfast and lunch at no charge to all enrolled students. [4]

The strongest operational case is in the morning. RPS policy currently relies on specialty-school hub stops and explicitly makes it the family's responsibility to get students to and from those hub locations. The proposed model would replace many of those first-mile hub trips with ordinary neighborhood pickup at the student's zoned high school, which is both safer and more equitable. The district's late high-school start also means buses can complete zoned pickup first and then run a second transfer round without colliding with elementary and middle school tiers. [5]

Based on my review of the uploaded route books dated February 27, 2026, the current specialty/hub structure appears to include 22 morning routes and 21 afternoon routes that could be removed as dedicated specialty-service runs: 9 AM / 9 PM for Franklin Military + Early College, 7 AM / 6 PM for Richmond Community, and 6 AM / 6 PM for the shared Open / Maggie Walker / CodeRVA route book. The proposed transfer structure, as described, uses 8 transfer buses at each of the 5 comprehensive high schools, or 40 AM transfer trips and 40 PM transfer trips as the upper-bound operating design. That is a net increase in daily trip segments, but not necessarily a fleet increase, because morning transfer trips are sequential rather than peak-concurrent. Afternoon feasibility is more conditional: it can also avoid fleet growth, but only if RPS stages the PM transfer loop before neighborhood departure waves or accepts staggered PM departures from the zoned campuses.

The labor cost implication is therefore not "buy more buses," but "pay for more driver time." The 2024–2027 transportation collective bargaining agreement states that, effective July 1, 2025, bus operators work under six-hour-per-day standard contracts; school-time and after-school extra work is paid at straight time unless the employee has already exceeded 40 hours in the week; paid stand-by time is tied specifically to gaps before after-school activity runs; and the School Board retains the right to revise routes and schedules. On that language, the base-case cost assumption for transfer service is straight time, with overtime risk only where weekly hours actually exceed 40. [6]

Using 184 school days, public pay postings for RPS bus operators and substitute bus operators, and a planning fringe load for payroll taxes and benefits, I estimate the full-day program at approximately \$128,800 to \$455,300 in annual wage-only cost, or roughly \$152,000 to \$592,000 loaded with payroll taxes and benefits, depending on transfer-trip length and what hourly benchmark RPS ultimately validates. A medium planning case is about \$292,200 wage-only and \$362,300 loaded for steady-state annual operation. A prudent first-year authorization, including startup friction and contingency, is about \$0.40 million to \$0.50 million, with a high-side protection ceiling around \$0.65 million if PM staging proves more time-intensive than expected. [7]

The equity case is exceptionally strong. A 2025 study hosted by Virginia Commonwealth University^[8] found that Richmond's selective-admissions schools are concentrated in the northern part of the city, require the longest travel times to access, and that Passion4Learning offers the most promising solution studied, with the potential to increase geographic access to specialty education by 60%. That makes this proposal not only an operational redesign, but a research-backed equity strategy. ^[9]

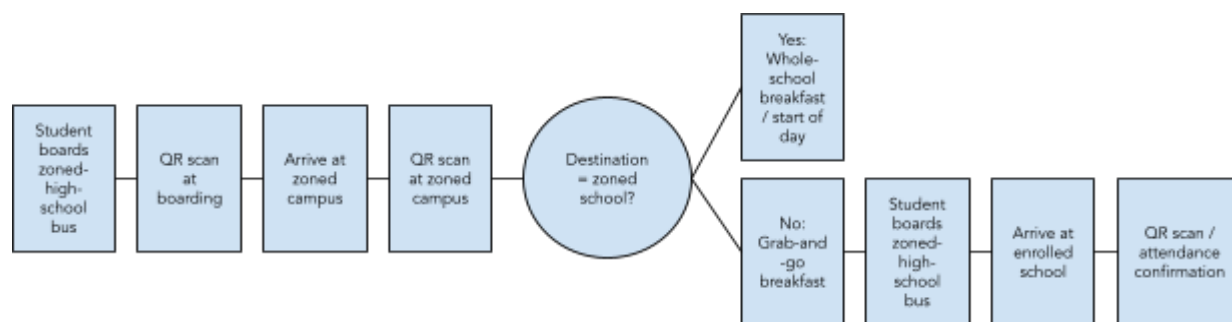
Operating Design

The operating design is straightforward. Every student begins the day on the bus route for the high school they are zoned to attend. At boarding, the student scans a QR-based ID into a tablet workflow; at arrival on the zoned campus, the student scans again. Students who are actually enrolled at that zoned campus proceed into breakfast and the ordinary start-of-day routine. Students whose enrolled school is elsewhere receive a grab-and-go breakfast and board a second transfer bus to their destination school. The same logic reverses in the afternoon: transfer students leave their enrolled school on a return shuttle to their zoned campus, check back through the transfer workflow, and then board the neighborhood bus home. This preserves one neighborhood collection layer and one interschool transfer layer rather than mixing both functions into long, cross-city specialty pickup routes. The design fits RPS's high-school day because all high schools operate on the 9:00 a.m. to 4:00 p.m. schedule, while breakfast is already built into the arrival period at several campuses, including Huguenot, John Marshall, and Armstrong. ^[10]

The check-in/check-out technology concept is feasible, though RPS should validate the exact product configuration during procurement. Public materials from Raptor Technologies^[11] show that VisitorSafe can run on iPads and Android tablets, supports QR-based check-in, and is designed to reduce wait times during peak entry. Raptor's mobile ecosystem also describes real-time visibility and digital QR workflows, while Raptor's hardware catalog specifically includes a 2D barcode reader for student and staff ID badges. Separately, Raptor's SchoolPass materials describe "baseline" campus scans that can be used to create real-time attendance and custody records. In other words, the district is not starting from a theoretical technology stack; it is adapting an existing tablet-and-scan workflow to student transportation custody control. ^[12]

The proposal's use of two iPads per campus is an important throughput decision rather than a minor implementation detail. One device should handle students ending their trip at the zoned campus, while the second handles students transferring onward. That split reduces line buildup, keeps breakfast service moving, and creates cleaner data about who arrived, who transferred, and who may need exception handling. Because RPS already guarantees breakfast access to all enrolled students through CEP, a "whole-school breakfast" buffer of about 20 minutes is operationally credible: it converts arrival variability into structured breakfast, socialization, tutoring, and teacher-access time rather than treating transfer students as simply late. ^[13]

For planning, the receiving transfer network is centered on students first arriving at their zoned comprehensive high school: Armstrong High School, Huguenot High School, John Marshall High School, Richmond High School for the Arts, and Thomas Jefferson High School. Then, transferring students bound for a different comprehensive high school for a Passion4Learning program, a selective admission high school Franklin Military Academy, Richmond Community High School, Open High School, Richmond Technical Center, Maggie L. Walker Governor's School, CodeRVA Regional High School, and J. Sargeant Reynolds Community College for Early College Academy. RPS already operates within a system in which high schools start later than elementary and middle schools, and RTC already describes a part-time transportation model in which students are served from and back to their home schools during the day. ^[26]



Fleet and Route Effects

The route-count findings below are derived estimates from the uploaded RPS route books supplied for this analysis. I counted unique RA route codes as morning routes and unique RP route codes as afternoon routes. Because these are user-supplied PDFs rather than web-indexed sources, the counts should be revalidated in the district routing system before board action. Even so, they are sufficiently consistent to support planning.

Current specialty routes that can be removed

Current specialty / hub route group	AM routes removed	PM routes removed	Daily total removed
Franklin Military + Early College	9	9	18
Richmond Community	7	6	13
Open / Maggie Walker / CodeRVA	6	6	12
Total removed	22	21	43

Source note: these counts are derived from the uploaded route PDFs dated 2/27/2026 supplied for this analysis. RPS policy confirms that specialty-school transportation is currently organized around hub-stop access rather than ordinary home-to-school pickup. [28]

Current comprehensive-campus route books and transfer capacity

Zoned comprehensive campus	Current AM routes	Current PM routes	Planned transfer buses	Share of current AM route count used by 8-bus transfer plan
Armstrong	10	10	8	80%
Huguenot	22	22	8	36%
John Marshall	8	8	8	100%
RHSA	14	14	8	57%
Thomas Jefferson	14	14	8	57%
Total	68	68	40	—

This table shows why John Marshall and Armstrong are the key operational stress points. At John Marshall, an 8-bus transfer plan effectively consumes the full current AM/PM route-book count. At Armstrong, it consumes four-fifths. By contrast, Huguenot, RHSA, and Thomas Jefferson have visibly more slack in the current route books. That does not mean John Marshall and Armstrong cannot participate; it means they require the strongest contingency planning, the most precise student assignment forecasting, and the highest confidence that cluster “double-ups” really reduce bus demand in practice.

Current vs proposed peak-bus impact

Scenario	Neighborhood / home-route buses at peak	Specialty / transfer buses at peak	Peak buses required	Interpretation
Current AM	68	22	90	Current comprehensive + specialty morning service
Proposed AM, sequential	68	0 additional peak buses	68	40 transfer trips happen after zoned drop-off
Current PM	68	21	89	Current comprehensive + specialty afternoon service
Proposed PM, simultaneous	68	40	108	If transfer loops and home routes leave at the same time
Proposed PM, staged	68	0 additional peak buses	68	If transfer loops run before neighborhood departures

This distinction between trip count and peak fleet count is the heart of the proposal. Morning service works because the second round is sequential. Afternoon service can also work without adding fleet, but only if the district adopts a staged PM departure design—for example, early release for transfer students, short holding periods at zoned campuses, or a second departure wave for specific neighborhoods. Without that staging, the PM model would create a temporary peak-fleet conflict. [27]

Net trip-segment effect

Design assumption	AM transfer trips	PM transfer trips	AM net change vs removed routes	PM net change vs removed routes
Clustered base case	35	35	+13	+14
8-bus planning cap	40	40	+18	+19

The “clustered base case” assumes that some destinations are regularly combined on one bus, consistent with the planning logic you provided for Armstrong/Franklin, John Marshall/Technical Center, and Maggie/Open/CodeRVA. The “8-bus planning cap” is the conservative upper-bound structure: every comprehensive campus has eight active transfer assignments available whether or not all eight are used every day.

Representative transfer-bus allocation by origin campus

Origin campus	Representative 8-bus plan
Armstrong	Huguenot; John Marshall + Technical Center; RHSA; Thomas Jefferson; Franklin; Community; Maggie/Open/CodeRVA; ECA/Flex
Huguenot	Armstrong + Franklin; John Marshall + Technical Center; RHSA; Thomas Jefferson; Community; Maggie/Open/CodeRVA; ECA; Flex
John Marshall	Armstrong + Franklin; Huguenot; RHSA; Thomas Jefferson; Community; Maggie/Open/CodeRVA; ECA; Technical Center/Flex
RHSA	Armstrong + Franklin; Huguenot; John Marshall + Technical Center; Thomas Jefferson; Community; Maggie/Open/CodeRVA; ECA; Flex
Thomas Jefferson	Armstrong + Franklin; Huguenot; John Marshall + Technical Center; RHSA; Community; Maggie/Open/CodeRVA; ECA; Flex

This is a planning template, not a final route plan. Actual dispatch assignments should be driven by student counts by origin-destination pair. Its value is that it shows how the “8 buses per campus” concept can be made operationally concrete while still preserving a flex slot for overflow or same-day disruption.

Labor Cost and Budget Impact

The contract rules matter. The transportation collective bargaining agreement says that bus operators move to six-hour-per-day standard contracts effective July 1, 2025. It also says that school-time field trip work and after-school activity runs are paid at straight time unless the employee has already worked 40 hours in the week, at which point time-and-a-half applies. Paid stand-by time is available for employees bridging the gap between their regular shift and an after-school activity run, not for every operational pause in the day. Separately, Article 4 defines overtime as work over 40 hours in a Monday–Sunday work week, and explicitly states that the School Board has the right to revise routes and schedules to

meet its needs. Article 5 indicates that changes to working conditions should still be discussed with the union. [6]

That means the correct base-case budgeting assumption is straight time for added transfer work, not automatic overtime. The important caveat is actual weekly accumulation. If a driver's weekly total remains under 40 hours, the transfer run should not generate a premium under the contract language available publicly. If some operators are already near the 40-hour threshold because of route structure, activity runs, or other duties, then a fraction of transfer time could become overtime. In short, the bottom line is sensitive to scheduling practice, but the contract itself does not require time-and-a-half simply because the trip is an extra round. [29]

For pay-rate modeling, public job postings reflecting RPS bus-operator openings show roughly \$39,477 to \$60,712 annually for bus operators and about \$21 per hour for substitute bus operators. Because public mirrors still show an 8-hour shift convention while the current CBA moved operators to six-hour standard contracts, there is a real ambiguity in the effective hourly rate implied by annual postings. For conservative planning, this report uses the public-facing annual range converted on the public 8-hour-posting basis, and treats the six-hour conversion as an upside-risk case that Finance should validate before a final budget is adopted. [30]

For payroll loading, there are at least three official cost layers beyond straight wages. First, the employer FICA rate is 7.65%. Second, RPS employees participate in the Virginia Retirement System, and VRS confirms that employers make separate retirement contributions for covered employees; for political subdivision employers without enhanced hazardous duty, the average defined-benefit employer rate most recently published by VRS was 4.98%, with additional hybrid defined-contribution matching of 1.0% to 3.5% depending on employee elections. Third, RPS publicly describes a broader benefits structure that includes health, dental, vision, life, disability, leave, and retirement support, so a marginal load above base wage is unavoidable even if the exact fringe rate varies by employee group. On that basis, I use 18% / 24% / 30% as low / medium / high planning loads. [31]

Full-day annual cost scenarios

Scenario	Daily transfer trips	Average paid minutes per trip	Annual added hours	Hourly benchmark used	Wage-only annual cost	Loaded annual cost	Year 1 loaded cost with 10% startup	15% contingency reserve
Low	80	25	6,133	\$21.00	\$128,800	\$151,984	\$167,182	\$22,798
Medium	80	35	8,587	\$34.03	\$292,204	\$362,333	\$398,567	\$54,350
High	80	45	11,040	\$41.24	\$455,290	\$591,876	\$651,064	\$88,781

These estimates assume a full-day design with 40 AM and 40 PM transfer trips as the planning cap. If actual clustering reduces active transfer trips to 35 in the morning and 35 in the afternoon, annual costs would fall by about 12.5%. The model is sensitive to route duration because driver labor is the main new cost center.

The budget takeaway is practical. A district that wants a realistic board-planning number should carry about \$0.36 million loaded for steady-state full-day service in the medium case and authorize roughly \$0.40 million for year one. A district that wants a board-safe authorization ceiling should carry roughly \$0.50 million including contingency, or up to \$0.65 million if it wants to fully protect against longer-than-expected PM transfer times and partial overtime exposure.

Student Time, Safety, Equity, and Breakfast Access

The student example you supplied is powerful because it shows how the proposal changes the total trip, not just the bus route. In that planning scenario, a student living at 9101 Stony Point Parkway and attending Early College currently faces an estimated 57-minute walk to the nearest hub stop, followed by an estimated 63-minute bus trip, for a one-way total of 120 minutes and no guaranteed breakfast opportunity. Under the zoned-transfer model, that same student would use the nearby Huguenot route, walk about 2 minutes to the stop, ride about 33 minutes to Huguenot, then transfer on a 15-minute direct shuttle to Early College, for a one-way total of about 48 minutes. That is a 72-minute reduction, or 60%, and returns roughly 221 hours over a 184-day school year on the morning trip alone. Because these figures come from your planning example rather than a live routing engine, they should be presented in the proposal as an illustrative case study. The arithmetic, however, is exact.

That sample also fits the broader route-book patterns. In the uploaded route books, current specialty/hub routes average about 39.6 minutes in the morning and 42.7 minutes in the afternoon, while the comprehensive-campus route books average about 28.4 minutes in the morning and 31.8 minutes in the afternoon. If the average interschool transfer leg is about 15 minutes, then the proposed model roughly breaks even whenever the current hub-stop access burden is more than about 4 minutes each way. That means students already close to a hub might see only modest travel-time gains, but students with meaningful hub walks—or particularly unsafe hub walks—are likely to gain substantially. The students with the largest burden today are exactly the students the model helps most.

The safety case is strong enough to stand on official city evidence. The current RPS transportation policy says that students attending specialty schools catch buses from hub stops and that it is the parent or guardian's responsibility to get them to and from those hub-stop locations. In the Huguenot/Westchester area relevant to your example, the City of Richmond's official neighborhood traffic-calming study described the area as bounded by Huguenot Road, Cherokee Road, and the Stony Point / Evansway / Cedar Grove / Croatan corridor, noted that school AM peaks overlap with the adjacent streets, and reported shoulder-and-ditch roadway conditions with deep ditches close to the travel way in multiple places. The city later installed a new full traffic signal and pedestrian upgrades at North Huguenot Road and Cherokee Road specifically to improve safety. That does not prove every block is unsafe in every condition, but it does corroborate the core concern that this is not an ideal first-mile walking environment for students trying to reach a hub stop. [33]

The breakfast case is more straightforward. RPS already guarantees breakfast and lunch to all enrolled students at no charge through CEP. Huguenot's published bell schedule shows breakfast from 8:35 to 9:00, John Marshall's schedule shows all students reporting to breakfast from 8:30 to 9:00, and Armstrong's schedule builds breakfast into the pre-9:00 arrival block as well. A zoned-campus-first model therefore turns breakfast from an uncertain opportunity after a long commute into a guaranteed operational feature of the transportation design. Transfer students can receive grab-and-go breakfast; zoned-campus students can use the ordinary meal window; and a whole-school breakfast buffer reduces the stigma of "late-arriving transfer students" by normalizing that time for everyone. [34]

The equity rationale is the strongest part of the proposal. The VCU geographic-access study concluded that Richmond's selective-admissions schools are concentrated in the northern part of the city and require the longest travel times to access, and it found that Passion4Learning offers the most promising solution studied, with the potential to increase access by 60%. That is precisely the language a formal proposal should use when explaining why the district partnered with VCU to study geographic access: not as a generic research partnership, but as a targeted equity analysis focused on the students historically least well served by existing travel patterns. [9]

Implementation, Pilot Design, and Performance Metrics

The implementation strategy should be phased, even though the final model is full-day. Morning service is the lower-risk starting point because it benefits from the late high-school start and avoids a same-minute dismissal crunch. Afternoon service should be added only after the district proves that clustered transfer assignments, scan throughput, breakfast distribution, and custody controls work reliably in real time. That sequencing is not a retreat from the full-day model; it is the correct way to protect students and operations during launch. [27]

Recommended pilot rollout timeline

Phase	Timing	Main actions	Decision gate
Design and validation	Late spring to early summer	Confirm destination counts by zoned campus; validate pay coding with Finance and Labor Relations; confirm Raptor workflow, FERPA/privacy controls, breakfast staging, and RTC coordination	Go / no-go on pilot campuses
Route simulation and training	Mid to late summer	Build student lists, cluster destinations, simulate AM and PM departure waves, train drivers and campus staff, issue QR IDs, communicate with families	Pilot readiness review
Morning pilot	Opening 6–9 weeks	Launch at lower-stress campuses first, ideally Huguenot and RHSA, with John Marshall and Armstrong held for phase-two expansion unless counts are modest	AM on-time and scan-rate threshold met
Afternoon pilot	Immediately after AM stabilization	Add PM reverse-transfer design at the same pilot campuses with staggered departures and campus holding procedures	PM late-bus and overtime threshold met
Scale-up	Remainder of semester / next semester	Add remaining campuses, refine cluster pairings, standardize breakfast and attendance procedures	Full-day standard operating model

I recommend starting with Huguenot and RHSA rather than John Marshall or Armstrong because the uploaded route books show more available operational slack at those campuses. John Marshall should not be excluded, but it should not be the first place the district tests a design that requires precise cluster loading and little margin for assignment error.

The metrics framework should use the scan system itself. Raptor's tablet-and-QR architecture is most valuable if it becomes both a custody-control tool and a performance-measurement tool. The district

should track: boarding scan compliance, zoned-campus arrival scan compliance, onward-transfer scan compliance, destination-arrival scan compliance, afternoon return-transfer scan compliance, breakfast uptake by transfer status, average AM dwell time on the zoned campus, average PM wait time before home departure, missed-transfer incidents, on-time arrival to first block, percentage of riders with one-way travel over 60 minutes, driver overtime hours, and route-level complaint volumes. Public Raptor materials support QR-based entry, tablet workflows, real-time visibility, and scan-based tracking; the district's task is to define those events as transportation operational data rather than only front-office records. [35]

Three mitigation steps deserve explicit inclusion in the formal proposal. First, John Marshall and Armstrong need a built-in contingency, such as a flex bus or districtwide spare-assignment protocol, because their route-book counts leave less slack than the other comprehensive campuses. Second, the district should write a formal PM staging rule—for example, early release for transfer students from specialty destinations, a defined hold window at zoned campuses, and two departure waves for home routes where needed—because the return trip is the tightest operational moment in the model. Third, RPS should define an exception workflow for scan failures, lost IDs, device outages, and students whose declared destination does not match the day's manifest. Doing so protects custody, avoids delay, and keeps drivers from having to resolve data problems while loading students. [36]

My overall recommendation is to take this proposal forward as a formal district pilot with a path to full-day scale, not as a concept memo. The district should present the proposal as one that improves student safety, reduces inequitable walking to hub stops, preserves breakfast access, advances the VCU geographic-access findings, and avoids capital spending on additional buses—while being transparent that the principal new cost is driver labor and that the PM design depends on deliberate staging. If that framing is used, the proposal will be both operationally credible and financially honest.

[1] [12] [14] [19] [35] <https://raptortech.com/protect-your-school/raptor-self-service-visitor-management/>
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