Agenda
Village of Glen Ellyn
Special Village Board Workshop
Monday, September 11, 2023
6:00 PM
Glen Ellyn Civic Center, Room 301

Meeting Procedures Statement

Visitors are most welcome to attend all meetings of the Village Board and can find copies of the Agenda at the meeting or online at www.glenellyn.org prior to the meeting. Any individual with a disability requiring a reasonable accommodation in order to participate in a meeting should contact The Village of Glen Ellyn ADA Coordinator, 630-469-5000, at least five (5) business days in advance of the next scheduled meeting. All matters on the Agenda may be discussed, amended, and acted upon.

A. Call to Order

B. Pledge of Allegiance

C. Roll Call

D. Audience Participation

1) Open:

Members of the public are welcome to speak to any item not specifically listed on tonight's agenda for up to (3) three minutes. For those items which are on tonight's agenda, the public will have the opportunity to comment at the time the item is discussed. In either case, please complete the Audience Participation form and turn it in to the Village Clerk. It is requested that, if possible, one spokesman for a group be appointed to present the views of the entire group. Speakers who are recognized are requested to step to a microphone and state their name, their topic and the group, if any, they are representing prior to addressing the Village Board. Individuals wishing to address the Board shall exercise proper decorum and respect for the proceedings and the business of the Village Board, and shall refrain from abusive demeanor and language. The practice of ceding time to other speakers shall be prohibited, except in the discretion of the presiding officer of the meeting. Public officials are not obligated to respond to questions.

E. Presentation

1) Glen Ellyn Metra Station and Multimodal Access Improvements Project (Engineer Daubert)

F. Adjourn

Glen Ellyn Village Board
535 Duane Street
Glen Ellyn, IL 60137

Meeting 9/11/2023 6:00 PM
Department: Public Works
Department Head: Dave Buckley
Category: Presentation
Prepared By: Rich Daubert

AGENDA ITEM (ID # 2023-873)

DOC ID: 2023-873

Glen Ellyn Metra Station and Multimodal Access Improvements Project (Engineer Daubert)

Statement of the Issue:
As the Village Board is aware, a major focus of the ongoing engineering for the Metra Station project is Value Engineering to optimize the project value. CDM Smith led Value Engineering Exercises with members of the Village Board, CIC, Plan Commission, and Staff in June.

Engineering staff has worked with CDM Smith to refine the Value Engineering Report including further investigations into platform costs with officials from Union Pacific and Metra. The report has been presented to the Capital Improvements Commission with CIC recommendations secured on the recommended Value Engineering Items.

The purpose of this agenda item is to present the report findings, give an update on project funding, and secure Village Board direction on critical design parameters in order to keep the Phase II Engineering assignment moving forward. On this note, concurrence is also sought on continuing to advance the project design.

Analysis:
The Value Engineering Exercises as well as CDM Smith's concurrent review of estimated cost escalation and project contingencies yielded approximately $8.4M in project cost reductions. The cost reductions are summarized in the following Table 1:

Table 1 - Value Engineering Cost Reductions

Item	Cost Reduction	How?
Station Depot	$2,491,000	Reduced New Depot Size from 3,600 Sq. Ft to 3,000 Sq. Feet + Escalation & Contingency Reduction
Platform and Warming Shelters	$4,257,000	Met with UP and Metra to discuss force account estimate – was inaccurate/for different platform type + Escalation & Contingency Reduction
Plaza	$45,000	Escalation & Contingency Reduction
Underpass	$515,000	Escalation & Contingency Reduction
Roadway, Parking, Site Work	$570,000	Minimizing Plaza Excavation + Escalation & Contingency Reduction
Construction Engineering	$563,000	Align with Reduced Construction Cost/Capitalize on Coordination with Engineer for Streetscape and Utility Improvements
Total VE Cost Reduction	**$8,441,000**	

It is particularly important to note that Staff and CDM Smith are continuing to scrutinize the project platform design and associated construction costs, especially in the context that the platform work should be fully funded by Metra. Other items that require further scrutiny are the land use permission costs from UP (currently estimated at $1M) as well as the cost of Construction Engineering Services for the project.

Having said that, the past project cost estimates did not include underground utility work costs to the tune of $2.9M; although this is associated with the streetscape and utility improvements and not the station and underpass improvements in of itself. Regardless, staff has directed CDM Smith to update the project cost estimates to reflect the inclusion of the utility work.

The following Table 2 and Table 3 respectively commemorate the prior and post Value Engineering (VE) opinions of probable construction cost. Note, the tables are for the construction contract only. As such, the difference between the two subtotals is $7,878,000. To get to the total VE cost reduction of $8,441,000, add the Construction Engineering cost reduction of $563,000.

Table 2 - Previous opinion of probable construction cost:

Item	2022 Cost	Contingency	Escalation	Totals
Station Depot	$6,446,000	$1,289,000	$1,392,000	$9,127,000
Platform and Warming Shelters	$9,105,000	$1,821,000	$1,967,000	$12,893,000
Plaza	$757,000	$151,000	$163,000	$1,071,000
Underpass Including Ramps and Stairs	$8,659,000	$1,732,000	$1,870,000	$12,261,000
Roadway, Parking, Site Work	$3,874,000	$775,000	$837,000	(*) $5,486,000
Construction Subtotals	$28,840,000	$5,768,000	$6,229,000	**(*) $40,838,000**
(*) Utility Replacement	included in total	included in total	included in total	(*) 2,900,000
Revised Construction Subtotal				**$43,738,000**

(*) For consistency the costs of the utility replacements in Crescent Boulevard and the streetscapes and utility replacement scope on Park Avenue was not included in the "Construction Subtotal" because it was not part of the scope when the previous estimate was completed. The Rough Order of Magnitude (ROM)of that work is $2.9 million.

Table 3 - Revised post VE opinion of probable cost:

Item	2022 Cost	Contingency	Escalation	Totals
Station Depot	$4,892,000	$978,000	$766,000	$6,636,000
Platform and Warming Shelters	$6,367,000	$1,273,000	$996,000	$8,636,000
Plaza	$757,000	$151,000	$118,000	$1,026,000
Underpass Including Ramps and Stairs	$8,659,000	$1,732,000	$1,355,000	$11,746,000
Roadway, Parking, Site Work	$3,624,000	$725,000	$567,000	(*) $4,916,000
Construction Subtotals	$24,299,000	$4,859,000	$3,802,000	**(*) $32,960,000**
(*) Utility Replacement	included in total	included in total	included in total	(*) 2,900,000
Revised Construction Subtotal				**$35,860,000**

Project Funding

Including all project design, land acquisition, and construction costs, the following Table 4 summarizes where the project funding currently stands and what the target funding is, albeit conservative in the project team's eyes. Staff and CDM Smith will continue to monitor additional outside funding opportunities to reduce the Village's share for the project. As the design is advanced, the eligibility of the overlapping streetscape and utility items will be refined but conservatively low assumptions have been made in the table below. Outside funding by Metra is also proposed to be revisited as it relates to the platform and warming shelter costs. The Village did commit to fully funding Phase I and II Engineering. Hence, a minimum of $4.8M (including preliminary engineering review by UP) of the costs below will be fully borne by the Village.

Table 4 – Current Project Funding Status

Program Costs (All Project Expenses Including Phase I, II, and III Engineering)		**Current**		**Target**	
Item	**Total**	**Outside Funding**	**Local Funding**	**Outside Funding**	**Local Funding**
Station, Underpass, Plaza	$24,864,498	$19,408,806	$5,455,692	$21,923,404	$2,941,094
Platforms & Shelters	$10,619,013	$4,000,000	$6,619,013	$7,583,111	$3,035,902
Streetscape & Utilities	$9,610,723	$0	$9,610,723	$2,000,000	$7,610,723
Totals	**$45,094,235**	**$23,408,806**	**$21,685,429**	**$31,506,516**	**$13,587,719**

What is important to note in Table 4 is that the Station, Underpass, and Plaza components are anticipated to be funded primarily by outside funding sources with the majority of the local share for the project being due to the Streetscape and Utility Improvements and engineering design for the project.

With respect to securing the additional funding shown under the target columns in Table 4, the Village's application for the 2023 CMAQ/CRP/STP Shared Funding was not successful in securing additional funding. However, this was largely due to the Village's project not being as far along with engineering as competing projects. Elmhurst's Metra Station project actually scored lower than the Glen Ellyn's and Elmhurst received an additional $8M in funding given their project is further along with Engineering with their construction timeline better aligning with the available funds. Despite this, Glen Ellyn's project is currently at the top of the STP Shared Fund Contingency List. Hence, the project can theoretically receive additional funding from the current program, should additional funding become available. Similarly, the Village recently secured $921K for the Crescent Boulevard Resurfacing project which was on a funding contingency list.

Assuming the advancement of engineering will continue to be supported, the project team feels that the Village will again have a strong application in the 2025 CMAQ/CRP/STP Shared Fund call for

projects. While the Village was successful in securing an additional $3M in Grade Crossing Protection Funding for the underpass this year, a subsequent request will be made once the project is further along with engineering.

On the notion of advancing engineering, now is an important time to check in with the Village Board on whether it supports completing engineering for the project. This is in the context of where the project stands in terms of cost, funding, and ongoing expenditures with the already approved ~$1.6M 30% design contract. Moreover, it's also in the context of needing to further advance engineering to ready the project for securing additional funding and getting the already in place funding obligated in time. While not trying to force the decision, the Village should be fully committed to completing Phase II Engineering or consider an otherwise direction such as stopping engineering for the project. Hence, the first question asked in the action requested section of this memorandum.

Capital Improvements Commission Review and Recommendation

The Capital Improvements Commission reviewed the Value Engineering Report, Funding Status, and Architectural Design items in detail at its August 8, 2023 Meeting. Six members were present and unanimously approved a motion to recommend to the Village Board that the proposed station depot be reduced by approximately 600 square feet; i.e. from 3,600 square feet to approximately 3,000 square feet (to realize the $2.5M in project cost reduction) as well as to maintain the architectural style of the proposed station depot as presented in the current conceptual rendering but with architectural details of the station depot to be further reviewed as the design moves forward.

Another item encircling the potential reduction of the footprint and excavation for the Plaza area was discussed. However, it was decided that more information was needed to further review this matter.

Budget Impact:

Contribution to Strategic Plan

Strategic Priority: Infrastructure; Initiative: Begin Phase II Engineering of the Train Station and Pedestrian Tunnel Project to maximize ability to acquire additional grant funds for this project by January 2025.

Action Requested:

Staff and CDM Smith will be present at the September 11th Village Board Special Workshop Meeting to present on the attached memorandum, Value Engineering Report, and PowerPoint presentation. Specific direction is then sought from the Village Board on the following:

1. Does the Village press forward with the balance of the project design (full Phase II Engineering Contract of ~$4M) given where we stand in terms of cost, funding, and the criticality to ready the project for additional funding and construction?

2. Does the project team reduce the station depot size by approximately 600 square feet and simplify the depot design to result in a ~$2.5M cost savings?
3. Does the project team maintain the architectural style of the proposed station depot as presented in the current conceptual renderings? This is asking the question from a big picture perspective and not intended to get into details of the renderings such as materials, how much brick, etcetera.

Attachments:

1. CDM Smith Memo
2. Value Engineering Report
3. PowerPoint Presentation

Memorandum

To: *Richard Daubert, Village Engineer, PE*

From: *Robert Cheval, AIA, PMP*

Date: *09.01.2023*

Subject: *Glen Ellyn Metra Station and Multimodal Access Improvements Project – Value Engineering and Next Steps*

Please see below status summaries and recommended next steps:

- Value Engineering
- Funding Status
- Station Design

Value Engineering (VE)

The VE workshop held during the week of June 12, 2023 resulted in the identification and assessment of a host of value engineering proposals that were discussed by the VE team which included members from CDM Smith (Design Consultant and VE facilitation lead), Village staff, and several Village Officials. The VE proposals were then vetted for feasibility and potential to improve project outcomes without impacting the function of the station nor the project components deemed necessary for meeting the grant funding stipulations. Cost implications were discussed throughout the VE workshop and several proposals identified considerable cost savings.

With respect to the cost savings, the recommended strategies for value engineering yield a cursory estimated construction cost reduction of approximately $7.9 million. The term 'cursory' is used as CDM Smith and Village Staff are continuing to review ways to reduce platform costs as well as develop a better understanding of what UPRR will entertain in terms of construction & maintenance/lease agreements. Recommended VE strategies include:

- Aligning the station size with new Metra requirements.
- Reducing the grading requirements on the north side of the tracks while maintaining a balance with the desired function of the plaza and underpass access.
- Examining specific line-item costs for reduction, including the platforms and construction management.

Additionally, ideas were generated that added value to the project without substantially affecting project cost. Strategies include:

- Making the interface with Crescent Boulevard more inviting for pedestrians.
- Examining sustainable components especially with regard to stormwater management and natural lighting.
- Using durable materials including within the landscaping to decrease future maintenance costs.

Please refer to the VE report for additional detail on the VE proposals discussed and their overall impact on project value and cost.

Funding Status

Glen Ellyn has pursued a multi-pronged grant strategy to fund the Metra station and multimodal access improvements project. The efforts of Village staff and the Design Team have reduced the program (all project design and construction costs) funding gap by $11.4 million or approximately 14% through a combination of outside funding increases and value engineering efforts. Both efforts will continue as the design of this project progresses.

Given the Village has been committed to funding design expenses for the project, another way to look at the funding level is based solely on construction and construction engineering costs. In this regard, outside project funding has increased from approximately 43% to 59%. This does not account for additional outside funding which the team is very optimistic in securing.

The project team has focused on applying for a diversified set of grant opportunities, maximizing federal grant awards and supplementing the required federal match with other state grant sources to further minimize Glen Ellyn's local project cost. As such, Glen Ellyn has secured over $23.4M in grants for this project from a diversified set of funding sources. This currently includes:

- $14.4M in CMAQ funding
- $5M in ICC Grade Crossing Protection Program funding
- $4M in Metra contributions

During Phase I, Glen Ellyn applied to the Congestion Mitigation and Air Quality (CMAQ) grant program in 2018 and was awarded $14.4M for construction and construction engineering. CMAQ funding is federal funding and requires a 20% local match (either state or local dollars).

To fund the pedestrian tunnel construction, Glen Ellyn applied to the ICC Grade Crossing Protection Fund grant program, a state funded program. The Village was successful in securing an additional $2M in to fund construction of the tunnel, the maximum allowable funding for a pedestrian tunnel at the time. Recently, the Illinois General Assembly lifted this cap on funding for pedestrian tunnels

and Glen Ellyn applied for additional ICC Grade Crossing Protection Funds at the end of 2022. Glen Ellyn was recently awarded an additional $3M in GCPF, for a total of $5M in funding.

Additionally, Glen Ellyn has been leveraging its partners, particularly Metra, to secure additional funding for construction. Metra has initially committed to $4M in funding of the project. Finally, local Surface Transportation Program (STP) funds that are programmed through DMMC were explored. DMMC recently changed their programming guidance to no longer allow funding of transit facilities, however the project team is reviewing if funds may be available for roadway work.

Glen Ellyn also recently applied for a new round of CMAQ and Shared STP grant funding through another grant application. While the Village was not successful during this latest grant application, it was the top scored transit facility in the Shared STP grant program and was also very competitively scored in the CMAQ grant program. One of the components that is considered in awards under these programs is project readiness, and as this project is still in Phase I, it was a factor in awarding additional funds, with lower scoring projects receiving funding over Glen Ellyn's project.

Having said that, the project is at the top of the STP Shared Fund Contingency List for an additional $10.8M in funding. Additionally, CMAQ grants are open every other year, on the odd years. CMAP has traditionally prioritized project readiness and project advancement during their programming exercises. As such, Glen Ellyn has a strong opportunity to re-apply for funds in 2025 but the Village's success is dependent on continuing to advance and complete as much engineering as possible by the application. There is also an opportunity to continue to collaborate with CMAP on opportunities to increase the existing CMAQ award through the project cost increase process.

To mitigate the impact of escalating costs throughout the construction market, holding to the project schedule is one of the most effective measures of controlling costs increases due to inflation, and it also decreases the risk of the loss of grant funding due to sunset dates. More explicitly, the Village's CMAQ funds need to be obligated (project awarded) by September 30, 2026.

Station Design

Project History

The current design being developed in Phase II engineering is a result of a multi-discipline investigations conducted during preliminary engineering (Phase I). The Phase I process was comprised of concurrent and coordinated engineering studies, environmental reviews, and public involvement and stakeholder outreach that resulted in identifying a preferred alternative (project). Value Engineering is its own process typically performed towards the end of Phase I or after Phase I is complete. Phase I studies are currently substantially complete, and we are now in process of integrating the VE recommendations into the preferred alternative so that Phase II construction documents can be developed. This process is required for any project that uses federal funding and typically results in designs that are supported by the general public, local stakeholders, local governments and resource review agencies.

The proposed station design (see rendering next page) is based on the 1926 Chicago, Aurora, and Elgin Railroad station (see photograph next page). The similarity can be seen in the entrance arches, roof slopes, and stone facade. Other notable buildings within the Glen Ellyn Historic Districts were also referenced for design details to create a harmonious look and feel within the downtown. These attributes were used as a starting point for engaging stakeholders throughout the Phase I process.

The 1926 Glen Ellyn station, seen looking southwest across Main Street on March 28, 1957.
Photo by P. Stringham, from the collection of William Raia

The proposed Glen Ellyn station style, seen looking southwest across Crescent Blvd.
Conceptual rendering by CDM Smith.

This design of the project (including station, tunnel, parking lots, streets, plaza and sidewalks) and the associated architectural style has been developed, presented, and reviewed in a variety of engagement settings over the life of Phase I. Updates to the overall project design were incorporated based on rigorous input from a variety of stakeholders including Glen Ellyn residents and Businesses, Village staff, local and regional resource agencies (IHPA, State Historic Preservation Officer, etc.). Public input on the design and functionality were solicited through a variety of public workshops, on-line surveys, and Village Committee and Board presentations.

The following is a snapshot of the public and stakeholder engagement efforts during Phase I:

- Public Outreach
    - An extensive public outreach survey was conducted in 2017 that received over 800 responses. The results of this survey indicated that improved outdoor waiting space and a pedestrian tunnel crossing were desired.
    - At a workshop held on 08/02/2017, a public workshop was held in Glen Ellyn. Discussion of the building style was facilitated through images of other stations and a sketch of the proposed station layout. The results of that workshop indicated that the aesthetics of La Grange Metra station (see photograph next page) were desirable, which closely resembles the style of the 1926 Glen Ellyn station.

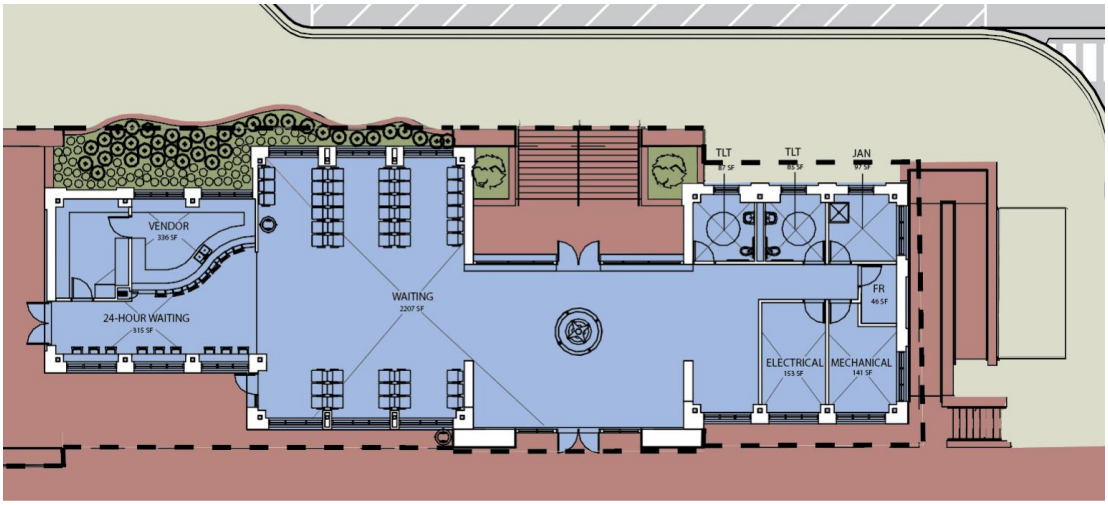
- Capital Improvements Commission (CIC)
    - At a workshop held on 10/10/2017, the project was presented including results of the public outreach, conceptual drawings, and project scope alternatives.
- Board of Trustees
    - At a workshop held on 01/16/2018, the project was presented including results of the public outreach, conceptual renderings, and project scope alternatives. Alternatives included new vs. renovated station, and a limited scope option that included the underpass. The board voted for Alternative A, which became the basis for the design developed during Phase I.
- Historic Preservation Commission (HPC)
    - At a meeting held on 06/21/2018 the project was presented to HPC including project renderings. It was determined by the required cultural review of the existing 1965 Colonial Revival station by Illinois State Historic Preservation Office (SHPO) that it is eligible for listing on the National Register of Historic Places (NRHP). The commission reached unanimous support of the proposed project with no concerns with the demolition of the existing station. The commission noted that the project will be more fitting with Glen Ellyn's Historic District.

La Grange Metra Station
Built 1901.

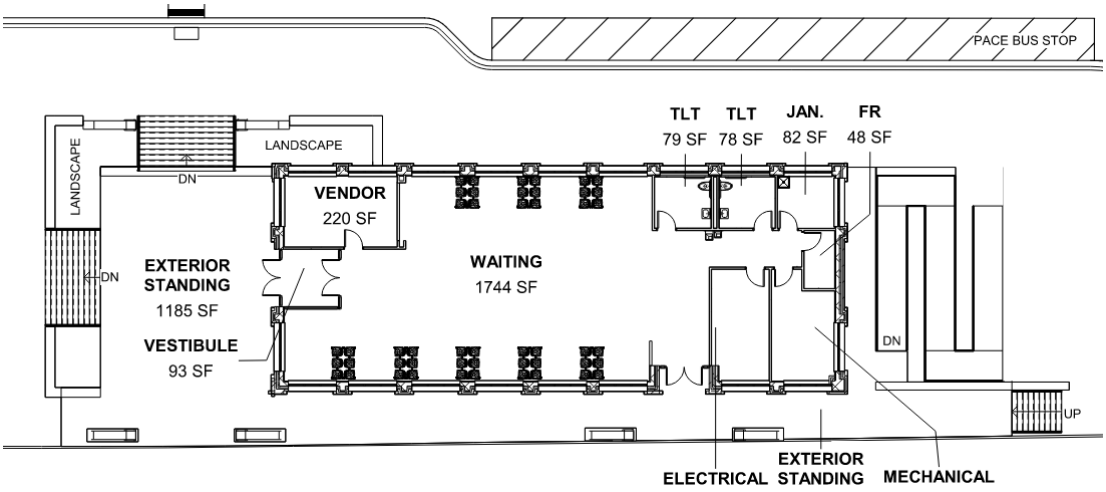
Existing Glen Ellyn Train Station, looking Northwest.
Historical Photo c. 1967.

Proposed Revisions

Based on the VE workshop, proposed revisions to the station design concept include reducing station size to better align with new Metra standards, as published post-pandemic in 2022. This cost reduction is based on a simplified footprint and maintaining the same general architectural style. The revised conceptual floor plan meets the new Metra standards for standing, seating, heated, and covered waiting areas, which are based on current 20-year ridership projections from Metra to accommodate future growth. It also accommodates a small vendor area inside the station. This design reduces the footprint by approximately 600 SF, an increase from the existing station of approximately 1,000 SF. It reduces the cost from previous estimates by approximately $1.5M (before application of mark-ups, contingency, and escalation) and $2.5M after application of markups. Refer to the floor plan diagrams below.



Previous conceptual floor plan – approx. 3,600 SF



Revised conceptual floor plan – approx. 3,000 SF

The proposed revision also considers making the interface with Crescent Boulevard more inviting for pedestrians. Better integrating the station into the Crescent Boulevard fabric will amplify the value of the station as a focal point for the community. The main entrance is relocated to align with Forest Avenue, creating a visible pedestrian access point, and the Eastern accessible ramp is reconfigured to provide a more clear and convenient circulation path from the Pace Bus Stop to the platform for pedestrians, including those with disabilities.

Next Steps

The station design will be developed throughout the Phase II process. Important considerations include the use of durable materials throughout to decrease future maintenance costs, and implementation of sustainable strategies to reduce operational costs and impact on the environment. Design decisions driven by these functional requirements can greatly influence the

design character and expression of the station. Elements that may be developed include the application of different façade materials in different ratios, specific window styles and ornament. Site design elements such as pedestrian connections and landscaping will also be developed further, including consideration of alternate pavement textures or materials at the Crescent Boulevard/Forest Avenue intersection to define the area as a special pedestrian zone.

The level of detail as presented in the conceptual floor plans and renderings will be reviewed by the Village as part of the 10 percent design package submitted later this year. This design phase will also include initiating the zoning process with input from the Architectural Appearance Commission, Historic Preservation Commission, Plan Commission, and presentation to the Village Board. To continue the design process along the planned project schedule, it is recommended that the Value Engineering recommendations be approved, and the general design concept be maintained from Phase I, with specific design decisions to be reviewed at project milestones. This will prevent further cost escalation due to schedule delays and any additional design costs due to rework and alternatives development.

VALUE ENGINEERING REPORT

Glen Ellyn Metra Station

Village of Glen Ellyn, Illinois

September 1, 2023

Rev00

CDM Smith

Table of Contents

1 Executive Summary

During the week of June 12, 2023, a Value Engineering (VE) team conducted a workshop examining the proposed Glen Ellyn Metra Station project. This was a structured workshop following the VE process outlines by SAVE International. (This process is also the process used by multiple federal departments including the Federal Transit Administration and the Federal Highway Administration). While VE workshops almost always result in improved value for the projects under study, this workshop was undertaken specifically because the estimated cost of the project has grown, potentially increasing the local funding share of the project to be borne by the Village of Glen Ellyn.

1.1 Project Description

The subject project for this Value Engineering study is the Glen Ellyn Metra Station and Multimodal Access Improvements Project. The project includes the station building, vehicular parking, bicycle parking, sidewalks, boarding platforms, a pedestrian tunnel under the Metra tracks, stairs, ramps, landscaping, roadway improvements and utility replacement.

1.2 Summary of Value Engineering Proposals

VE Proposals fell in the subject areas of:

- Better aligning the station size with Metra requirements.
- Decreasing the grading requirements on the north side of the tracks while maintaining a balance with the desired function of the plaza.
- Using durable materials (including within the landscaping) to decrease future maintenance costs.
- Making the interface with Crescent Boulevard inviting for pedestrians.
- Examining sustainable components especially with regard to stormwater management and natural lighting.
- Holding to the project schedule (to the extent possible) to prevent further escalation of project costs due to inflation and also to decrease the risk of the loss of grant funding if some grants were to sunset.
- Examining specific line-item costs for reduction, including the platforms and construction management.

1.3 Cost Data

Cost data was primarily based on the ten percent opinion of probable cost. This ten percent opinion of probable cost means a cost estimate based on the conceptual plans using general unit cost information such as cost per square foot of sidewalk or cost per square foot of building. At the ten percent design level, detailed quantities are not yet available. The cost estimate at this stage is

intended to provide a range or an informed order of magnitude. At this stage, the estimate should not be viewed as an "engineer's estimate" that is prepared during final design just before bidding. For the platforms, the cost data had been supplied by Metra. During the workshop, the VE team developed several recommendations that would lower the project cost. In addition, the platform replacement cost was examined using an independent estimate (based on recent cost data from a similar Chicago-area project). See Section 9 of this report for further discussion.

A summary of the cost reduction possible if incorporating the value engineering proposals is below.

Previous opinion of probable cost:

Item	2022 Cost	Contingency	Escalation	Totals
Station Depot	$6,446,000	$1,289,000	$1,392,000	$9,127,000
Platform and Warming Shelters	$9,105,000	$1,821,000	$1,967,000	$12,893,000
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Revised Construction Subtotal				**$43,738,000**

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Revised post VE opinion of probable cost:

Item	2022 Cost	Contingency	Escalation	Totals
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(*) Utility Replacement	included in total	included in total	included in total	(*) 2,900,000
Revised Construction Subtotal				**$35,860,000**

(*) For consistency the costs of the utility replacements in Crescent Boulevard and the streetscapes and utility replacement scope on Park Avenue was not included in the "Construction Subtotal" because it was not part of the scope when the previous estimate was completed. The Rough Order of Magnitude (ROM)of that work is $2.9 million.

The sum of value engineering proposals yields an estimated reduction of $7.9 million - construction cost, or approximately 18%. These scope reductions do not impact the function of the station, nor the required scope components related to the grant funding.

The total grant funding (rounded) was $20.4 million (including the Metra component for the platforms). Following the original cost estimate, an additional $3 million dollars was recently

awarded, to increase the total outside funding to $23.4 million. Note that there are additional and/or increased grant funding being pursued for this project.

1.4 Value Engineering and Transit Projects

Value Engineering for a transit project has complexities beyond the scope of the project itself. Decisions made based on the VE workshop typically have potential to impact station-area businesses (or station-area development), customer satisfaction, and ultimately attraction of customers to the station to use the Metra service. Unlike a VE study for an industrial project (where the owner is only interested in costs and benefits to the company), transit projects have benefits (and potentially impacts) that do not belong to the owner of the project. In the case of the Glen Ellyn Metra Station project, one very interesting aspect is the benefit of the pedestrian tunnel beyond simply Metra ridership. The tunnel has the potential to benefit traffic patterns, parking patterns, and pedestrian flow to and from businesses on either side of the Metra and Union Pacific Railroad tracks.

1.5 Recommended Value Engineering Proposal

The VE workshop generated 47 ideas during the creativity phase of which about half were advanced into VE proposals. In the final phase 14 proposals were recommended for incorporation into the project or for further evaluation during the design phase.

There were three main VE recommendations that generated more than nominal cost reductions.

- Aligning the station size, covered areas, and warming shelters based on Metra's revised requirements. A potential cost reduction of approximately $2.5 million is estimated including application of mark-ups, contingency, and escalation.
- Scaling back the grading for the north plaza while preserving the function of the plaza including providing improved connectivity to Crescent Boulevard. A potential cost reduction of approximately $570K is estimated including application of mark-ups, contingency, and escalation.
- Limiting the scope of the construction engineering based on personnel needs (rather than a straight percentage calculation). A potential cost reduction of $563K is estimated.

VE Related Cost Reductions Summary

Item	10 PCT OPC	VE Adjustments	Cost Reduction
Station Depot - 2022 Cost	$9,127,000	$6,636,000	$2,491,000
Platform and Warming Shelters – 2022 Cost	$12,893,000	$8,636,000	$4,257,000
Plaza	$1,071,000	$1,026,000	$45,000
Underpass Inc. Ramps & Stairs	$12,261,000	$11,746,000	$515,000
Roadway, Parking, Site Work - 2022 Cost	$5,486,000	$4,916,000	$570,000
Construction Subtotals			**(*) $7,878,000**
Construction Engineering	$4,062,500	$3,500,000	$563,000
Project Totals			**$8,441,000**

** Approximately $3.3 million of the VE reductions are due to escalation and contingency reductions.*

Since these cost reduction items also affect other markups that are based on percentages, the estimated total reduction in construction cost based on the VE recommendations is estimated to be $7.9 million. When the potential cost reductions of limiting the scope of the construction engineering is included there is an anticipated reduction of approximately $8.4 million dollars to the project.

2 Value Engineering Overview

Value Engineering is not simply a cost-cutting exercise. Value Engineering is a function-based, multi-disciplinary approach to find the best value for a project without sacrificing the project's basic function and requirements. For transit projects, capital costs are intertwined with multiple project goals, and, because of this, care must be taken when removing or reducing capital cost elements.

Value Engineering (VE) is often viewed as "cost cutting," a means to reduce capital cost when a project has run over budget. Projects run over expected cost for a variety of reasons ranging from the addition of project elements by a multitude of stakeholders to fluctuation of market prices, including for key materials and labor. For the last two years, inflation in the construction industry has been common across the country for all types of projects.

For transit projects and, in this case, specifically a transit station, capital costs are intertwined with, at minimum:

- Customer service and convenience,
- Rail operations,
- Ease of maintenance and cost of future operations (e.g., energy use),
- Ability to support surrounding development,
- Ability to support future growth, and
- Safety and security.

Beyond functions, transit stations have requirements including those related to the railroad and those related to accessibility.

Simple cost cutting on this project without an understanding of how the ***system*** functions – how all the parts function together to address project goals and requirements – can result in undesirable consequences. As an example, capital cost could be reduced by using an open-air shelter instead of an enclosed building. While this would reduce up-front construction cost, this would certainly be viewed as impacting customer comfort. A true VE study (using functional analysis) examines how such a capital cost reduction would potentially have negative effects on the attraction of customers, perceived customer service, and likely the impact on supporting station-area development.

2.1 Value Definition

The definition of "value" should be kept in mind when conducting VE workshops to help maintain a balanced outcome.

$$Value = \frac{Function}{Cost}$$

In other words, while a lower cost for the same function improves value, if a lower cost results in a decreased function, then the value may not be improved. (*Note that the formula represents the value concept. Converting some functionality, such as aesthetics, sustainability, or resilience, into dollars for a mathematical comparison is not the intent.*)

Function can include maintainability, operability, attraction of customers (transit riders), customer convenience, customer comfort, safety, security, aesthetics (including station architecture, landscaping, and art), reliability, transfer time (affecting total travel time), ability to respond to incidents, sustainability, resiliency, and so forth. Cost includes capital cost and operating & maintenance costs. Cost should, basically, keep life-cycle costs in view (as part of asset management); however, precise calculation of life-cycle costs is typically not possible during a time-constrained VE workshop. Cost cutting solely to reduce up-front construction cost typically has consequences down the line.

2.2 Value Engineering Process

VE studies follow phases as outlined by the Society of American Value Engineers (SAVE, now SAVE International). This process is the identical process recommended by federal agencies including FTA, FHWA, and USACE.

2.2.1 Pre-Workshop Phases

In addition to the creation of a Job Plan specific to the VE topic, two phases of the VE process occur prior to the workshop.

- Project identification
- Team formation

The pre-workshop phase also included the logistics for the workshop itself. (During and following the Covid-19 pandemic, VE workshops carried out virtually have been found to be just as effective as in-person workshops, with the added benefit of reduction in VE study cost, the ability to tap into national resources if needed, and greater flexibility in scheduling.)

Pre-study project identification includes a definition of the study scope and objectives. Typically, the client may provide points of emphasis or may provide aspects of the project which are constrained. As an example, if the pedestrian tunnel under the Metra tracks is tied to a portion of the grant funding, then installation of a tunnel is a project constraint.

The VE study scope may include, but is not limited to:

- Tunnel
- ADA access to station, platforms, parking, and multi-modal transfer area
- Station
- Bicycle parking
- Constructability
- Impact to rail operations during construction
- Risk (related to perceived Contractor risk impacting bid prices)
- Stormwater management
- Sustainability goals
- Potential Resiliency improvements

Elements that may constrain VE recommendations include, but are not limited to:

- ADA laws
- ICC grade protection
- Historic designations (from SHPO)
- Grant requirements

Several principles of **team formation** feed directly into successful VE studies. First, studies tend to be more successful if the team has a mix of some persons with agency and area familiarity plus persons with "fresh eyes" on the project. Persons with a mix of geographic experience help "cross pollinate" ideas based on experience from other similar agencies or projects. VE workshops flow better when the participants are "big picture" thinkers, able to examine the entire system from the vantage point of different disciplines. For VE Studies, recent research indicates participants identify themselves as "lead adaptors," comfortable with examining ideas which are outside of the status quo.

Finally, the range of team members should cover the disciplines needed for the subject of the study. For this workshop, the disciplines include, but may not be limited to:

- Station architecture
- Multi-modal (bus, bicycle, walking, vehicular)
- Construction and constructability
- Rail operations (related to Metra operations during construction)
- Stormwater and sustainability
- ADA requirements
- VE facilitator
- Cost estimator (non-workshop support, background support during evaluation and development)
- Administrative (support, non-technical participant)

Other participants may be added based on review of the job plan. While VE team members are typically experienced, VE teams sometimes include one "junior" member who may benefit from the VE workshop experience. See Section 3 of this report for listing of team members.

This VE workshop was held using a virtual platform (Microsoft Teams).

Project information basically consisted of the existing materials at the time of the VE study. These materials also included planning documents. Understanding constraints related to the funding grants was important. Some materials were sent to participants one week ahead of the workshop. Participants were expected to review the information prior to the start of the workshop, if possible. Supplemental material related to the VE process was distributed during the week prior to the workshop.

2.2.2 Workshop Phases

Up to six VE phases can occur within the workshop, although the phase in the last bullet point often follows the workshop, especially when the workshop is held virtually.

- Information phase
- Functional analysis phase
- Creativity phase
- Evaluation phase
- Development phase
- Reporting/Presentation

Information phase: This is the review of plans and any other available materials pertinent to the VE study. Beyond simply review by VE team members, usually a designer who is thoroughly familiar with the plans makes a presentation. The information phase can also include direction from the client, especially in regard to perceptions of constraints that may not be found in the planning documents.

Functional Analysis phase: Review of high-cost components, high worth items, cost-worth mismatches, and the basic functions for the study subject. Function analysis helps separate "must have" from "nice to have." Functional analysis primes the participants for the creativity phase. Functional analysis also sometimes allows visioning of "simple and elegant solutions" rather than attaching Band-Aids to address individual concerns. Certain project elements could address multiple functions, improving function and decreasing cost. Conversely, other project elements may be identified with relatively high cost and questionable value. The latter may be good candidates to evaluate during the workshop.

Creativity phase: Also called brainstorming, this is the generation of many potential ideas for improving project value (which often involves reducing up-front construction cost).

Evaluation phase: Review of ideas to narrow to a list of the best recommendations for value improvement. Evaluation can take many forms including pairs analysis (which looks at ideas with similar function two at a time), matrix analysis, benefit-cost calculations, or other forms. The evaluation types should be left to the team since a variety of methods may be appropriate. A variety of evaluation types helps address bias (of various forms) which can creep into the VE study. Evaluation is typically iterative with the Development phase.

Development phase: Development of enough detail to further evaluate and provide reasonable assurance the recommendations can be implemented. It is not uncommon to find out, upon development of further details, that a seemingly good idea turns out to be impractical for implementation. (Note that some VE studies end up confirming the original design. The outcome of VE studies is not known at the onset of the study.)

Reporting and Presentation: As mentioned above, it is possible to prepare a draft report and provide a presentation during the workshop. However, this is usually done when the workshop is conducted in person, full time, across five days. The culmination of the workshop is a presentation of VE recommendations. For virtual workshops, the draft report and presentation usually occur during the weeks following the workshop.

2.2.3 Post-Workshop Phases

Following the workshop, the draft report would be revised, VE recommendations would be reviewed for approval, and a final VE report developed. Note that the report remains draft until

the client confirms the recommendations. The recommendations then would be passed to the design team for incorporation.

3 Team Members

The VE Team needs to include persons who have appropriate experience to cover the disciplines used on this project. Team members should be experienced, be "big picture" thinkers, be able to view the project from multiple vantage points and have availability to fully participate without distraction.

As stated above, the disciplines tied to this project include, but are not necessarily limited to:

- Station architecture
- Multi-modal access (bus, bicycle, walking, vehicular)
- Roadways, parking lots, and utilities
- Tunnels and geotechnical engineering
- Construction and constructability
- Rail operations (related to Metra operations during construction)
- Stormwater and sustainability
- ADA requirements

Because of the existing station area development, experience in urban planning may be useful.

In addition to covering the disciplines, the team will have a facilitator:

- Tom Williams, PE, VMA (Value Methodology Associate certification number 201202038) – Tom has facilitated over a dozen VE studies in four states. Six studies have included rail transit with several of these including stations and station areas.

The team will also have a cost estimator and administrative support in the background to the workshop. Additionally, to help junior staff develop, one intern has been included on the team.

For this size study, a team (in the workshop) of six to eight (including the facilitator) would be appropriate and manageable. (*Note that the team expanded beyond this originally estimated number of workshop team members*.)

Value Engineering Team

Name & Agency/Firm	Subject Matter	Summary Biography
Tom Williams, PE, VMA CDM Smith	Facilitator	Discipline Leader for Rail Transit at CDM Smith with 42 years of experience. Tom has facilitated over a dozen VE studies in four states. Six studies have included rail transit with several of these including stations and station areas.
Sarah Sutherlin, AIA, LEED AP CDM Smith	Architecture	Discipline Leader for Transit Architecture at CDM Smith; licensed architect with 15 years' experience, recent experience with major transit projects including rail and bus facilities.
Robert Cheval, AIA, PMP CDM Smith	Architecture, Building Systems, CDM Smith Project Manager	Senior Project Manager at CDM Smith with 17 years' experience as a Licensed Architect. Experience includes municipal buildings and CTA facilities. Experience also includes utility tunnel reconstruction.

Name & Agency/Firm	Subject Matter	Summary Biography
Antonio (Tony) Cerda, PE, PMP CDM Smith	Roadway	Over 30 years of experience in transportation design and managing complex highway transportation projects.
Jared Wendorf, PE, PMP CDM Smith	Civil	Senior Civil Engineer and Project Manager at CDM Smith; 15 years' experience including structures and rail transit; lead civil design on over 50 design and construction projects.
Mahmood Khwaja, PE CDM Smith	Tunnel, Geotechnical (Limited Availability)	Senior Geotechnical-Structural Engineer with 29 years of experience including transit projects. Experience includes ground improvements and foundation design.
Hong Yang, PE, GE CDM Smith	Tunnel, Geotechnical	Sr. Geotechnical Engineer with over 30 years of experience in geotechnical and tunnel engineering on subway, light trail, and water projects.
Sam Smith CDM Smith	Intern	Transportation intern. Sam will also be available to perform research into VE ideas generated.
Martin (Marty) Scott, AICP Village of Glen Ellyn	Zoning	Director of Community Development with a few decades of experience. The department handles zoning, planning, building, development engineering, and fire/life safety. Experience includes downtown redevelopment and associated streetscape concept planning.
Robert J. Schmidt Village of Glen Ellyn	Building Official	20+ years in the private sector architectural design, including the build end of the business prior to transitioning to municipal public service in 2013.
Dave Buckley Village of Glen Ellyn	Public Works	Glen Ellyn Public Works Director. 33 years with the Village of Glen Ellyn (17 years Recreation and 16 years Public Works). Involvement with this train station project since inception.
Mark Franz Village of Glen Ellyn	Village Manager	Mark Franz has been the Glen Ellyn Village Manager since 2011. He holds more than 27 years of municipal experience.
Derek Peebles, PE Village of Glen Ellyn	Landscape Architecture	(Observer) Civil Engineer with over two decades of experience with transportation management in the municipal realm.
Richard Daubert, PE Village of Glen Ellyn	Project Manager	Village Engineer with 20 years of experience in the planning, design, and construction of roadway, sewer, water, and transit infrastructure projects as well as extensive experience in the entitlement, permitting, and construction of private development projects.
Steve Szymanski Village of Glen Ellyn	Capital Improvements Commission Chair	Stephen Szymanski is the Chair of the Capital Improvements Commission (CIC), an advisory body to the Village of Glen Ellyn Board of Trustees. He has 42 years of experience within a major industry.
Tim Loftus Village of Glen Ellyn	Plan Commission Chair, VE Reviewer	Forty years of experience in the field of Construction Project Management and Plant & Facilities Construction & Maintenance. Facilities included a Fortune 10 corporation, Big 10 and Division 1 Universities and a U.S. Department of Energy laboratory. Current Chair of the Glen Ellyn Plan Commission, former Chair of the Glen Ellyn Historic Preservation Commission and member of the Glen Ellyn Architectural Review Commission.
Trustee Donna Jean Simon	Village Trustee	Donna Jean Simon was elected trustee in 2023. She has lived in Glen Ellyn since 1982. Her previous work experience included practice as an attorney in real estate and corporate law.
Trustee Steve Thompson	Village Trustee	Steve Thompson was elected as Village Trustee in 2019. He has been a resident of Glen Ellyn since May 2000. He is an active volunteer in the Glen Ellyn Chamber of Commerce. Trustee Thompson holds a Bachelor of Arts degree in Political Science from Creighton University.
Ramesh Nair Vistara	Cost Estimating	Cost estimating experience includes both CTA and Metra projects with a wide variety of scope.

Note: The assembled team brought over *380 years* of experience to bear on this project. Almost all team members were able to attend all meetings with a few exceptions.

4 Schedule

The following schedule was based on team availability. A full 40-hour workshop was not deemed necessary for the size of this project. Microsoft Teams invitations were sent to participants for the following dates and times.

- June 12 – 1:30-4:00PM – Kick-off, Information Phase, start Function Phase
- June 13 – 11:00AM-4:00PM (with break 12:30-1:30PM) – Complete Function Phase / Creativity Phase / Begin Evaluation Phase
- June 14 – 9:00-11:30AM – Continue Evaluation Phase / Begin Development Phase
- June 15 – 9:00-11:30AM – Continue Development Phase / Iterate (as necessary) with Continued Evaluation
- June 16 – 9:00-11:30AM – Complete Development Phase / Consolidate Recommendations

Breaks were provided as needed by the team and as we reached natural breaking points. Team members needing to step away for calls or short meetings were accommodated.

Almost all team members were able to review materials provided in the week prior to the workshop.

5 Information Phase

5.1 Workshop Introduction

The workshop started with an opportunity for Village leaders to provide observations and concerns. Some of the comments included:

- One major concern is overall cost. While some elements (streetscaping, platforms) may be addressed using other funds, the gap between the estimate and the available grant funding is substantial.
- The look and feel of the station and station area is important.
- The size and scope (related to cost) are of concern. Should not build bigger than we need to. Aim toward the actual requirements, not exceeding the requirements. (And make sure we have the current data related to requirements.)
- While the station should not be overbuilt, building the station and site "correctly" (meaning how it functions, not just as a train station but as a connector within the Village) is important. The station will be a focal point of downtown for decades to come.
- Residents generally want the project!

- Additional sources of funding may be possible.
- Note that there are historic elements to this project.
- Don't forget the future operating and maintenance costs, even costs such as snow removal from the parking lots.
- Also don't forget about sustainability (and measures of sustainability such as LEED rating).
- Safety and security (for the station and pedestrian tunnel) needs to be a key consideration. This will be a user concern and a Village Police concern.
- The existing station is currently undersized (per Metra standards for the 2018 ridership).
- The existing station has condition issues leading to maintenance and repair costs.
- The existing station does not provide the level of accessibility desired. Remember that accessibility extends to those with strollers and also the aging population.
- Drop off and pick up areas do not currently exist.
- The station is in the "heart of downtown" and affects the character. The image – both the station building and the landscaping – is important.
- The project is connected to other projects such as the U.S. Bank site development.
- The new station needs to protect the commuters from the elements. This includes snow and rain, but also means providing shade in the summer.
- Beyond natural light in the station building, also considered operable windows (such as the previous casement windows) to allow natural ventilation in the station.
- Minimizing, to the extent possible, the impacts to adjacent businesses during construction is important. Ensuring access to the businesses remain open is vital.

5.2 Review of 10% Design Information

Informational materials were provided in the week prior to the workshop for participants to become familiar with the study topic and general project background. Materials were reviewed during the information phase. This project does have constraints, some related to the grant funding and some related to agency requirements. As an example, Metra has a formula for square foot requirements for train stations and platforms based on passenger volumes.

Laws and codes also constrain via requirements. An example is ADA requirements. Building codes are another example.

For reference, inbound Metra weekday ridership in 2018 averaged 1,888. In 2023 (post-Covid), ridership on the UP-West Line has come back to near 54% of the 2018 levels.

6 Functional Analysis Phase

Functional analysis starts with some basic questions. What are the high-cost components of the project? What elements are perceived as high worth? What elements carry high risk? Are there value mismatches?

6.1 High-Cost Components

Based on the opinion of probable cost prepared at the 10 percent design level, the following were identified as high-cost contributors:

- The station building (22% of construction cost) and specifically, the station size.
- Passenger boarding platform replacement with warming shelters (32% of construction cost)
- Pedestrian tunnel with ramps and stairs (30% of construction cost)
- Road, Parking, and Site (13% of construction cost)
- Ornateness of any elements (e.g., lighting, planters) can result in higher cost.

6.2 High Worth Component

The #1 component identified as high worth by workshop participants was the pedestrian underpass. This feature not only increases pedestrian safety but also improves connectivity and traffic patterns downtown:

- This allows pedestrian flow unrelated to Metra boardings, including between parking and businesses.
- Changes the traffic patterns and parking demand.
- Improves train access (especially when tracks are blocked).
- Provides connectivity for economic development, including connecting directly with the U.S. Bank property project.

6.3 Higher Risk Factors

What project elements carry higher risk to the Contractor or to cost variation?

- Pedestrian tunnel, including monitoring track elevations. Note that UPRR will play a significant role in controlling the pace of the work.
- Sub-elements of the tunnel can also be high risk, including grouting.
- Utilities, including fiberoptic lines.
- Stormwater management (since if larger volumes are required, more area or more volume underground will be needed).
- Lead service lines (for water).

- Platforms (including contractor coordination and flagging).

6.4 Value Mismatches

A value mismatch can be something that has high cost but a low perceived value, or a high perceived value but a relatively low cost. Value mismatches with high cost are typically targets to examine in a VE study. Items identified included:

- Vendor space – since competing vendors (such as Dunkin' and Starbucks) are across the street.
- Need for a temporary station (and associated costs).
- The platform (replace existing asphalt platforms with concrete platforms)

6.5 Functional Analysis and Basic Function

A transit station has multiple functions. The station in the Village of Glen Ellyn is no different. In fact, the station and station area have roles in the community that many transit stations do not. The team identified:

- Connect Commuters
- Transport Commuters
- Staging Point for Commuters
- Support Equitable Modes of Transportation (part of CMAQ grant scoring)
- Shelter Commuters (in the main building, in warming shelters, under stairway/ramp canopies) – applicable to snow, rain, shade (in summer sun).
- Provide a Focal Point for Downtown
- Provide Open Space / Gathering Space / Community Space
- Project Image of Glen Ellyn (both historic and future)
- Act as a Landmark
- Serve High School Students (related to gathering space, lunch destination)
- Provide Entry Point into Glen Ellyn
- Contribute (positively) to the Image of the Village
- Encourage Use of the Illinois Prairie Path
- Provide Safety and Security
- Facilitate Events (e.g., Polar Express)

- Provide Amenities (e.g., Coffee Vendor, restrooms)
- Support Multi-Modal Access (including vehicular, vespa, bicycle)
- Provide Bicycle Parking Amenities (e.g., covered bike parking, overflow bike parking)
- Allow for Charging of EV
- Manage Curbside Demand
- Replace Utilities / Repair Aging Infrastructure
- Provide Streetscape Anchor
- Contribute to the Identity of Downtown
- Support the Village's Strategic Plan
- Support Mixed-Use Development
- Provide a Continuity Function
- Provide Opportunity to Unite the North and South Historic Districts
- Support Heritage Tourism
- Contribute to Sustainability
- Encourage People to Live in Glen Ellyn (i.e., Competitiveness in the Suburban Market)

A basic function is a function, without which, the project cannot be successful. The basic function of a Metra station is:

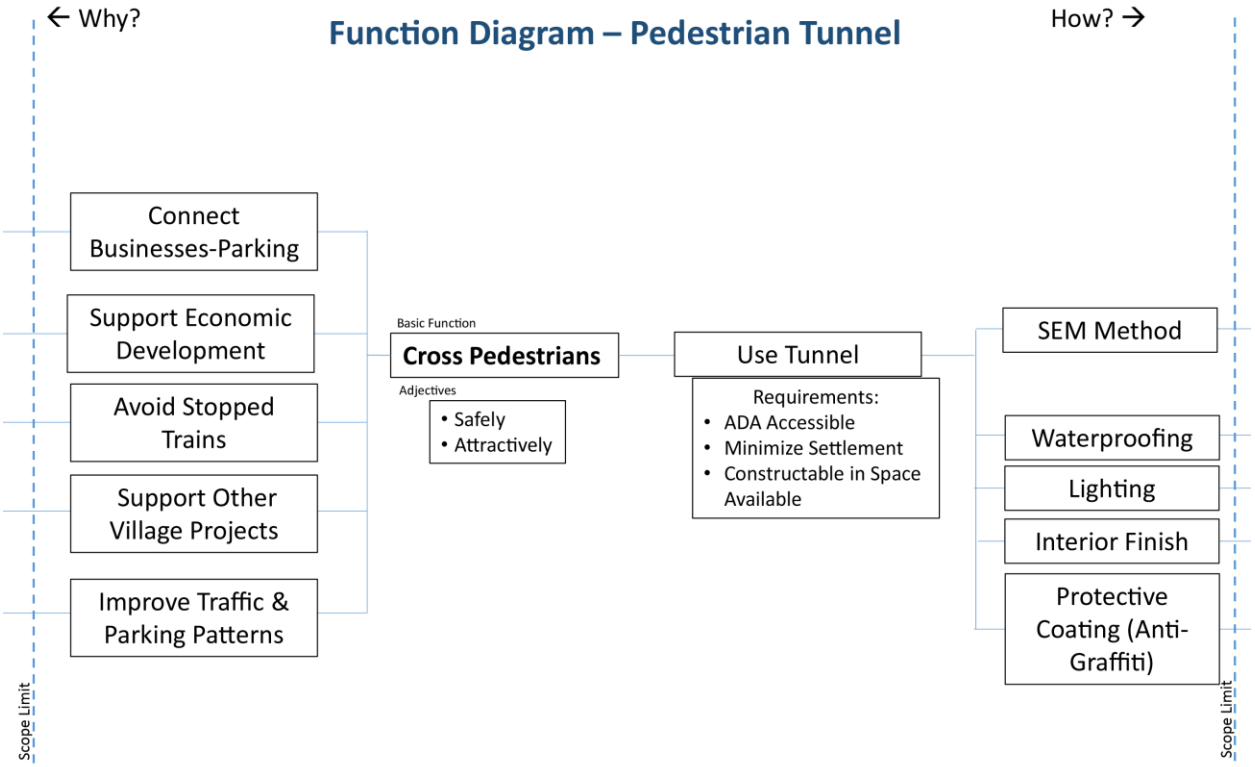
Provide for Boarding/Alighting Trains

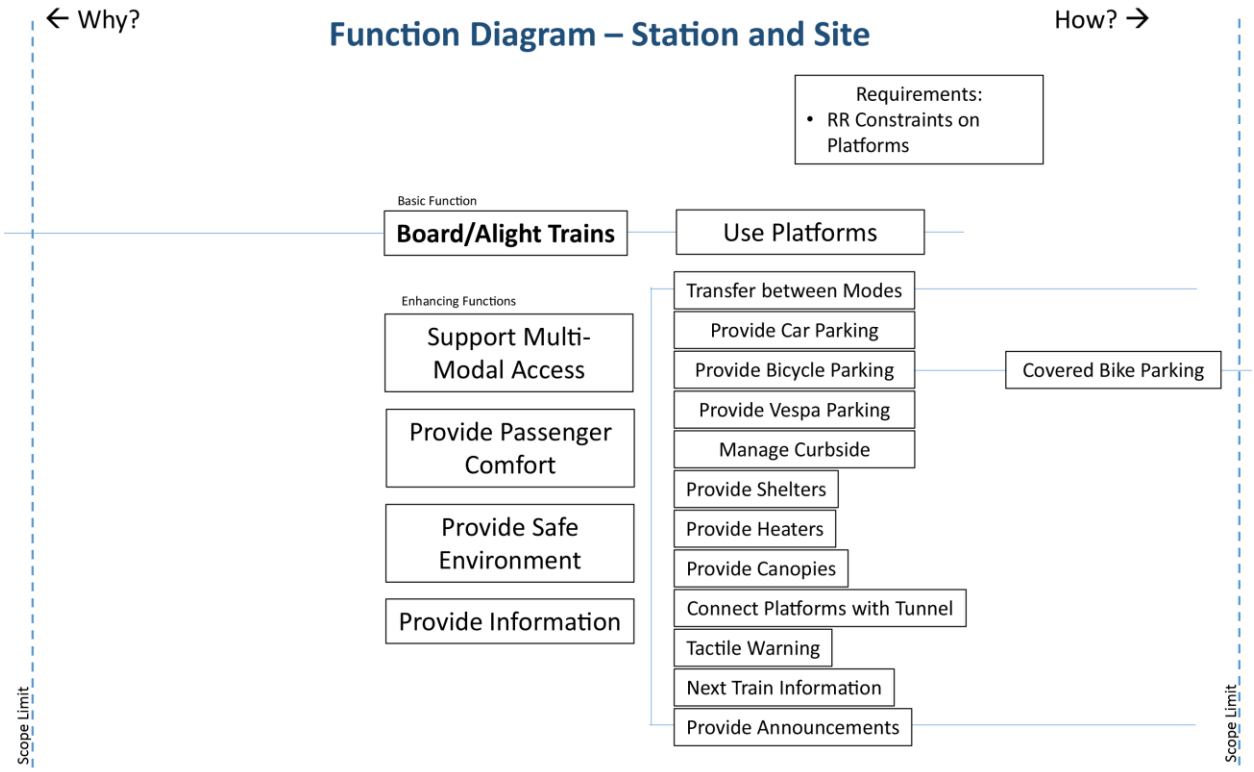
While this is the basic function, it cannot be overstated that the secondary (or enhancing) functions are vital to the success of the station and station area project. The Village (as with many communities along the Metra lines) can be considered a "train town." Historically, many aspects of the Village grew up around the train station. As such, the station and station area are a focal point, contributing in many ways beyond simply the downtown Chicago commuters' boarding point.

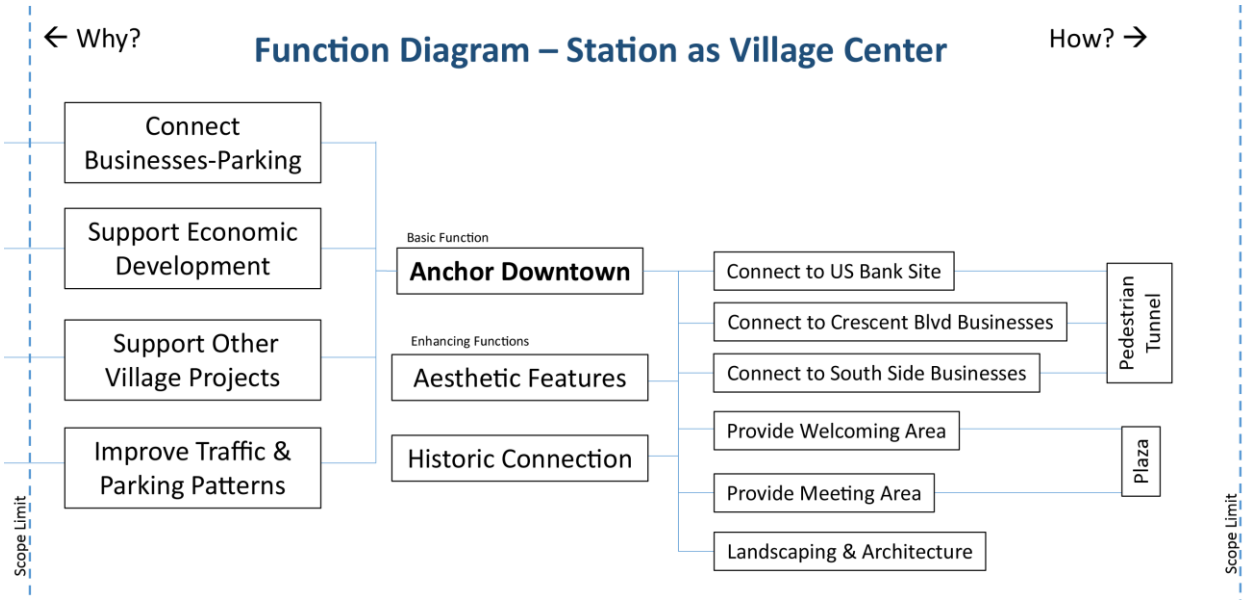
In many VE studies, the secondary or enhancing functions become targets for cost reduction. With this study, a number of the secondary functions are as important, if not more important than the basic function.

See the following three figures related to function. The first is just the function of the pedestrian tunnel. The second is the basic function of a train station. The third became the most important function in this study: recognizing the station and station area as a centroid for the Village of Glen

Ellyn. *(This aspect made this particular VE study more interesting and more complex than almost all past VE studies in which this facilitator has been involved.)*







7 Creativity Phase

The Creativity Phase is also called Brainstorming. The objective is to create ideas that will add to the value of the project. Value is often increased by decreasing cost, but value may also be

increased by improving functions without an increase in cost (or at minor or negligible increase in cost).

During the creativity phase, the participants were asked not to evaluate any of the ideas. (Evaluation during the phase tends to slow the creation of ideas.)

The creativity phase started using "stream of thought," meaning that team members just listed ideas in no particular order. After the creation of ideas slowed, then some probing questions were asked to direct thinking toward certain topical areas. After a list was created, the ideas were then sorted (to place related ideas next to each other for evaluation).

Stream of Thought Ideas

1. Consider alternatives to the tunnel – e.g., overpass, ramp (like Maggie Daley connection)
2. Align interior and exterior size with requirements from Metra. The exterior size includes those waiting areas under the roof (but not circulatory areas with a roof).
3. Look at minimal station to meet requirements – then debate what to include in addition to the minimum.
4. For temporary station, use an enclosed warming shelter. (This applies to the warming shelter on the inbound side of the tracks.)
5. Are both warming shelters needed? Do they need heaters?
6. Assess platform sizes / Do we even need new platforms?
7. Better interface with land uses along Crescent Boulevard.
8. Remove canopy over pedestrian tunnel (ramps, stairs)
9. Consider ramping/garden landscape entryway rather than stairs (that may be perceived as "sterile")
10. Create interconnection of US Bank site and site/tunnel
11. Landscaping needs to be durable, native – need to withstand the salt, wind, etc. (easy maintenance)
12. Wood frame building versus masonry (Note: Metra standards may address building materials.)
13. Consider a prefabricated, modular building for the station.
14. Evaluate need for reconstructing parking. (Identified as 14N for north side and 14S for south side.)
15. Use permeable pavers for parking spaces (sustainability for stormwater)

16. Explore historic nature – Note that the current design (as shown in renderings) is based on reflecting the original Chicago, Aurora, and Elgin Railroad station which was a "mission style." The similarity can be seen in the entry arches.
17. Create efficient passenger drop-off/pick-up (so people don't line up or wait in cars)
18. Minimizing excavation – get rid of some street level plaza, minimize access points (single focal point)
19. Leave existing platforms (unless Metra/UPRR are fully contributing)
20. For tunnel, make finished tunnel more interesting.
21. Skylights in tunnel
22. Different crossing pavement for Crescent – set apart as pedestrian.
23. Stick to simple, basic materials to keep cost down.
24. Eliminate Vendor Space (and let people use Vendors on Crescent).
25. Facilitate use of vendors on Crescent by adding "Next Train" signs.
26. Renovate and restore existing station building (Note: a report had been prepared separately on this topic. Information from the report can be used to evaluate.)
27. Eliminate the 24-hours (No Trains run 1:27AM-4:50AM)
28. Use sustainable materials.
29. Skylights in the station
30. Other lighting technique in the station – light shelves, daylight harvesting.
31. Eliminate planters (simplify landscaping and retaining walls)
32. Use geothermal (building), solar panels, or others to offset operational cost (Geothermal study later in contract)
33. Are there further grant opportunities (e.g., related to sustainability)?
34. Use more durable materials to decrease life-cycle cost.
35. Precast platform sections with electrical heaters
36. Potential for heated ramps/stairs to decrease snow removal maintenance cost.
37. Precast box culvert for tunnel (cut and cover)
38. Precast box culvert (box jacking method)
39. Jack and bore pipe tunnel – 14-ft diameter.

40. Modular block walls for retaining walls.
41. Use planters as "rain gardens" for stormwater from station roof.
42. Do we need two bathrooms? Do we need any bathrooms? (May be building code requirement)
43. Consolidate ramps.
44. Continue Aggressive Schedule to prevent further escalation.
45. Evaluate the $4M placeholder for Construction Management
46. Early release bid packages (e.g., to relocate storm sewer, relocate fiber)
47. Packaging – do we want one GC or do we want separate packages. Tunnel and building are likely to be different subs if there was one prime. Can platforms be removed (to eliminate the GC profit/overhead) to a future Metra/UPRR project?

8 Evaluation and Development Phases

Three sub-phases were used in evaluation.

First, the list of VE ideas was reviewed to see if any should be eliminated right off the bat. Reasons may include, for instance, the fact that past research was done or that the Village does not have responsibility for the mentioned item. The ideas eliminated by inspection were:

- (Idea #1) Consider alternatives to the tunnel – e.g., overpass, ramp (like Maggie Daley connection). This was eliminated because a past study was done related to using an overhead structure with elevators on both sides of the tracks. Over UPRR, the railroad clearance required is 23'-4". This leads to considerable stairs up one side and down the other. The overpass was not preferred by Metra nor the historic reviewers.
- (Idea #14N) Evaluate need for reconstructing parking on north side. This was eliminated primarily because, for accessibility, parking needs to be reconfigured.
- (Idea #35) Precast platform sections with electrical heaters. This was eliminated because the maintenance of the platforms, including snow removal, is UPRR's responsibility. The electric heaters would add capital and operating cost to the project.
- (Idea #42) Do we need two bathrooms? Do we need any bathrooms? Evaluating the need for the restrooms was eliminated because building codes had already been reviewed. With the number of patrons using the station, two bathrooms are required.

The **second phase** was iterative with development. The VE ideas listed below required only brief development. Those requiring more detailed development are included in Appendix A.

- (Idea #43) Consolidate ramps. After development, this was eliminated. Based on topology (elevation of Crescent Boulevard), top of rail elevation, and ADA requirements, the sum total of the originally proposed ramps cannot be reduced by consolidation. However,

investigation did show the importance of minimizing the depth of the tunnel floor. (Every 30 inches more of depth means the ramp would be 70 feet longer including landings, adding to travel distance and cost.) In other words, the tunnel type is interconnected with ramp and stair costs.

- (Idea #16) Architectural Style. No development was required because the Architectural Style had been previously recommended by Historic Preservation Commission and the Glen Ellyn Historical Society but discussion at the VE workshop did yield some highlights. The proposed station was based on a reflection of the Chicago, Aurora, and Elgin Railroad station, the version rebuilt in 1926. This was Mission Style. The style is intended to (1) be complimentary to building styles up to the 1960s (including the style along the Prairie Path), and (2) provide a transition from the north historic district (which has multiple Tudor Revival buildings) to the south historic district. Caution should be taken to not duplicate the style of other stations (such as Wheaton). *Note that there is still discussion and debate regarding whether this Mission Style architecture is in keeping with the Crescent Boulevard location.*

The second Glen Ellyn station, seen looking southwest across Main Street on March 28, 1957. This station was rebuilt in 1926.
Photo by P. Stringham, from the collection of William Raia

- (Item #5) Per Metra standards, a minimum of one warming shelter on each side with heaters is required. See the write-up for Items 2, 3, and 4 combined for the area.

- (Item #6) Regarding platform lengths, the weekday boardings and alightings indicate the existing platforms are shorter than desired per Metra standards. However, in discussion with Metra, lengthening the platforms will not be required. First, lengthening the platforms would extend the platforms over Park Boulevard or Main Street (or both). Second, lengthening to the west would place additional length of platform in a curved track section, which is not desirable. As the existing platform lengths are already shorter than desired in Metra standards, decreasing the length would not likely be acceptable.

- (Item #8) Regarding canopies over the stair and ramps, preventing rain and snow from falling on the ramps and stairs and then (rain) flowing downward toward the tunnel floor is desired. (Of course, providing a more pleasant experience for Metra riders is also desired.) This stated, if design, the area of the canopies should be examined (so as not to over design) and the materials should be examined (to keep within the architectural context of the station and station area, but use lower cost and lower life-cycle cost as possible.)

- (Item 14S) Regarding parking lot reconstruction on the south side of the tracks, a review of this option indicates this is feasible in part. A portion of the south parking will be reconstructed for the ramp construction and implementation of two-way flow adjacent to the ramp and where Forest Avenue intersects the parking. Somewhat in the centerline of the parking, a utility trench will be used to install new storm sewer. While reconstruction is not critical to the function of the parking, the required work will leave the parking lots as a "patchwork." Not only will the appearance be potentially undesirable, but the future maintenance of the parking surface will be staggered with some pavement surface needing maintenance in the next several years while the new portions will not require maintenance for 10 to 12 years (on average). As little capital cost would be saved with the patchwork approach, the VE team's recommendation was to bring the south lots up to a new condition with this construction. While this slightly increases the up-front capital cost, the overall maintenance cost (including disruption to customers using the parking) will be decreased for the life cycle.

- (Item #19) Metra's contribution to the project is intended to cover the cost of replacing platforms. The estimated cost has escalated with the recent sharp rise in construction costs. One option to decrease overall project cost and decrease the net cost to the Village is to leave the platforms as is. (Metra could replace in the future.) A second option is to coordinate with Metra regarding funding the full replacement cost of the platforms.

- (Item #20) Related to the pedestrian tunnel interior finish, the approach is highly dependent on the tunnel construction method. With a jack-and-bore steel pipe, the interior finish would typically be a painted liner yielding a smooth surface. (Typically, a white surface is used for good light reflectivity.) With a box-jack, the interior surface of the precast concrete box is a smooth, concrete finish. A painted liner is also typically applied to protect the surface. With the SEM method, the interior is typically a shotcrete (sprayed concrete) surface which has a random, textured surface (unless intentionally smoothed in a second operation). A painted liner could be applied to the textured surface yielding an interesting, rough-hewn surface. Otherwise, concrete can be smoothed, or additional material (such as tile) added. In summary, the interior finish and the cost of the finish or liner is dependent on the tunnel type.

- (Item #23) One way to reduce cost is to use basic, durable materials for which repair, maintenance, and replacement use standard techniques. The following list provides a comparison related to parking or plaza surfaces. These are examples and are representative of Chicago-area costs. An observation is that the lower the cost, the lower the durability or lower the aesthetic value. Unit costs include material, labor, and equipment. The values should not be viewed as "quotes" since values are dependent on quantities, site conditions, bidding competitiveness, and other factors.
    - Asphalt parking lot surface - $40-45 per square yard
    - Concrete sidewalk (5") on 6" of aggregate - $9-12 per square foot
    - Concrete drive (6") on 6" of aggregate - $12-15 per square foot
    - Parking or plaza surface of concrete paving bricks – approx. $30-32 per square foot
    - Observe that concrete (more durable) carries a higher cost than asphalt, thicker concrete (more durable) has a higher cost than thinner, and the most aesthetic carries additional cost.
    - Concrete can be stamped or tinted to improve aesthetics at a lower cost than installation of pavers.
    - Plazas can use even a higher design level such as granite paving stones, of course at an even higher cost.
- (Item #26) This VE idea related to rehabilitating and expanding the existing station (as opposed to constructing a new station building). This idea was not developed further because it was the subject of a past cost comparison. The result was that, while the rehabilitation option carried a small initial capital cost savings, the savings was not enough to offset life-cycle cost increases. The higher future costs included both energy (related to the lower energy efficiency of the existing station building) and maintenance (since, after completion, the Village still would have an older building to maintain). The past study led to the determination that a new station building, fully integrated into the landscaping, plazas, and ADA improvements, was the preferred option.
- (Item #28) This VE idea was to use more sustainable materials. The word "sustainable" carries a wide range of potential meanings. At first thought, this might mean use renewable resources, such as wood. It may also mean using local materials for which transportation cost (and energy use) is lower than transporting from a great distance. It may also mean examination of the entire life cycle of a product. (As an example, for this latter item, the use of solar panels may seem sustainable, but the manufacture involves mining rare earth minerals, typically overseas – in other words, the manufacturing process is not very sustainable. Another example, electric vehicles seem very sustainable, but at the end of life for batteries, the disposal process is not very sustainable.)

All that said, for the station building, development of VE idea #12 looked at the use of wood and wood laminates for the building material. The wood laminated option can have the same cost as traditional masonry, but use of wood laminated framing greatly restricts future modification to the building.

Much of the remainder of the project includes concrete, steel, and asphalt. Although energy intensive in original manufacturing, steel and asphalt are easily and commonly recycled. Concrete is often crushed to make aggregate.

In summary, when the choice of material does not make a capital cost or life-cycle cost difference, selecting sustainable materials (or local materials with low energy use for transportation) is preferred. However, when the use of sustainable materials increases the capital cost – especially when one goal of this VE study was to reduce capital cost – then use of these materials is not preferred.

- (Item #31) Because of the cost, one idea was to eliminate or reduce the landscaping planters. The brick veneer seat walls add capital cost to the project. As with other elements, the only objective is not cost reduction. The plaza and station must be welcoming. Nice landscaping and high-quality design tend to be welcoming (and, indeed, transit-oriented development studies have shown the importance of high-quality design). Also, seat walls serve a dual purpose, providing a place for people to sit to enjoy coffee, lunch, or conversation, or just a place to sit while waiting for their mode of transportation. The recommendation is to, in the design phase, review where the seat-wall planters contribute to the welcoming nature of the station area and where a different, less expensive wall might be used to contain the landscaping. See VE Item #40 in the Appendix for examples of modular block walls used in landscaping.

- (Item #32A) Note that a study of the feasibility of geothermal heating for the station is already part of the proposed design scope. A recommendation will be provided separate from this VE study.

- (Item #34) The VE suggestion was to use more durable materials to decrease life-cycle cost. In the research for the station structural system (Items #12 and #13), materials were discussed. For the public spaces in the station, the materials required are based on durability. No additional durability is required.

- (Item #36) This VE idea, similar to heated platforms (for train boarding), is to provide heated ramps and stairs. Heated surfaces increase the cost of construction, the cost of operations (through higher energy cost), and the cost of maintenance (since snowmelt systems increase maintenance requirements). The main ramps and stairs are under shelter. While the canopies above do not prevent blowing snow or refreeze of snow melt, the canopies do decrease the snow removal requirements. With emphasis on reducing overall project cost, increasing the cost with a snowmelt system is not desirable. However, recognize there is interaction and trade-off between the canopies (over stairs and ramps) and use of a snowmelt system. Further study may be required. The Village of Glen Ellyn, on average, receives 20 to 23 snow events per year. While up-front cost and life-cycle cost may increase for the snow melt system, there may be a corresponding decrease in snow

removal cost and a decrease in concrete maintenance caused by the use of salt. See a description of a glycol snowmelt system in the Appendix (under Item #36).

For the remainder of the VE Ideas, see the Appendix for more detailed descriptions and assessments.

The **final phase** of evaluation was undertaken when considering the final recommendation list after VE ideas were more fully developed. On the last day of the VE workshop, the team walked through each idea to confirm the ideas to carry forward. These are listed here:

VE Ideas Recommended for Incorporation or Further Evaluation in Design

- Align the interior and exterior size with Metra requirements (and check the size regarding accommodation of future growth). [Estimated cost reduction of $1M.]
- Better interface with the land uses along Crescent Boulevard including highlighting the pedestrian nature of crossings. [Neutral or minor cost change.]
- In the design phase, examine the canopy areas and types over stairs and ramps for potential additional savings. [No cost assessment at this time.]
- Move the station entrance stairs to the west arch across from Forest Avenue. [No change in cost.]
- Ensure the landscaping includes a mix with native, durable, and salt-resistant plants (in order to decrease maintenance cost). [No change in capital cost.]
- Improve curb-side management for passenger drop-off and pick-up. [Minor cost change (less than $1500) to a bit more moderate change (near $35,000).]
- Stick to basic, durable materials that don't require specialized future maintenance. [Keeps the cost low and also keeps the life-cycle cost low.]
- Coordinate with Metra to eliminate 24-hour station requirement. [Decreases maintenance cost.]
- In the design phase, use architectural techniques to bring natural light into the station. [Neutral or minor capital cost change. Some reduction in lighting cost.]
- Seek additional grant funding. This may be related to specific components including those related to sustainability. Regarding timing, some grant applications require further design before the application can be submitted.
- Utilize landscaping adjacent to the station for stormwater management. [Neutral or minor cost change. Improves stormwater sustainability.]
- Assess jack-and-bore versus sequential excavation method for pedestrian tunnel. Select based on lowest overall cost, lower contractor risk, and potential impact to schedule.

Determination could not be made at this time without additional geotechnical information.

- Continue to advance project to keep on schedule. This is to prevent additional inflation from increasing the cost further. [Each year of delay adds a million dollars or more to the project cost.]
- For the Construction Engineering (CE) phase, limit the construction oversight role to the basic staffing and hours needed (as opposed to costing based on a typical percentage).

Further development of all these recommendations can be found in the Appendix.

9 Opinion of Probable Cost (OPC)

For the VE workshop, the opinion of probable cost used was the 10-percent estimate prepared in 2022, escalated to 2025 (which is the estimated mid-point of construction), and previously reviewed by the Village. This initial cost information is show here (with rounded values).

10PCT OPC Cost Summary

Item	2022 Cost	Design Contingency (20%)	Escalation (to 2025)	Totals
Station Depot	$6,446,000	$1,289,000	$1,392,000	$6,446,000
Platform and Warming Shelters	$9,105,000	$1,821,000	$1,967,000	$9,105,000
Plaza	$757,000	$151,000	$163,000	$757,000
Underpass Including Ramps and Stairs	$8,659,000	$1,732,000	$1,870,000	$8,659,000
Roadway, Parking, Site Work	$3,874,000	$775,000	$837,000	$3,874,000
Construction Subtotals	**$28,840,000**	**$5,768,000**	**$6,229,000**	**(*)$40,837,000**
(*) Utility Replacement				(*) $2,900,000
Revised Construction Subtotals	**$28,840,000**	**$5,768,000**	**$6,229,000**	**$43,737,307**
Phase I Engineering				$762,754
Phase II Engineering				$3,971,481
C&M/Lease Agreement				$1,000,000
Construction Engineering (CE)				$4,063,000
Program Total				**$53,535,235**

(*) For consistency the costs of the utility replacements in Crescent Boulevard and the streetscapes and utility replacement scope on Park Avenue was not included in the "Construction Subtotal" because it was not part of the scope when the previous estimate was completed. The Rough Order of Magnitude (ROM)of that work is $2.9 million.

Several pertinent observations regarding the costs include:

- It is vital to understand that at ten-percent conceptual design, the opinion of probable cost is not an "engineer's estimate" that is prepared at the 90- or 100-percent phase of design. Detailed design has not been prepared for many aspects of the project. Unit costs are generally more "planning level," that is, based on general areas and quantities, not based on detailed line-item quantities. This type of estimate is a Rough Order of Magnitude Estimate which evaluates a project's level of effort and cost. Generally, this is used for estimating a project budget. More detailed estimates using unit costs and planned quantities will be performed as the design process advances.

- Escalation from 2022 to 2025 values used 18 percent. This was based on the high rate of cost escalation for transportation construction projects in the last 18 months. This rate should be examined in more detail since multiple cost estimating sources state inflation is cooling off. From 2021 to 2022, average construction inflation was 8 percent with some materials being much higher. From January 2022 to January 2023, the rate was observed

to be reduced to 4.9 percent. The forecast annual average for 2023 is 3.8 percent. The actual rate for any specific project depends on materials. Steel cost is seeing a slight downward trend while cement is still increasing. *Using a 13 percent projection for inflation, the construction cost would be reduced by $2.5 million.* Note in the discussion for VE Item #44 that further schedule slip will continue to cause cost escalation due to inflation.

- Contingency is a cost component related to risks and future unknowns. During conceptual design, the contingency accounts for elements not fully designed. As an example, the cost for parking lots may be based on typical cost per square yard or even typical cost per parking space. Later design may determine that the stormwater management system carries more cost than expected. The design contingency accounts for this more advanced design. Contingency is also to account for the unpredictable bid environment. Material prices, contractor bid amounts, and perceived risk by the contractor will create fluctuations in the cost that cannot be accurately predicted. Note that contingency is typically adjusted based on risk for each line item. (For instance, utility relocations almost always carry higher risk of unknowns and, therefore, should carry a higher contingency value.)

- The platforms (without the warming shelters, demolition, and other associated items) make up an estimated $6,732,000 of the cost. Upon detailed review of the cost, the estimate includes wood headers, anchor bolts and rods, trench drain, lighting, conduits, and other components. In other words, the platform cost is not simply the 6-inch concrete slab with tactile warning tiles.

The following two sections provide details on the VE recommendations. The first shows the cost reduction related to VE recommendation incorporation. The second provides a summary of an independent assessment of platform costs.

9.1 Incorporation of VE Recommendations

There were three main VE recommendations that generated more than nominal costs reductions.

- Aligning the station size, covered areas, and warming shelters based on Metra's revised requirements. A potential cost reduction of approximately $2.5 million is estimated including application of mark-ups, contingency, and escalation.

- Scaling back the grading for the north plaza while preserving the function of the plaza including providing improved connectivity to Crescent Boulevard. A potential cost reduction of approximately $570K is estimated including application of mark-ups, contingency, and escalation.

- Limiting the scope of the construction engineering based on personnel needs (rather than a straight percentage calculation). A potential cost reduction of $563K is estimated.

Since these cost reduction items also affect other markups that are based on percentages, the estimated total reduction in construction cost based on the VE recommendations was $7.9 million. When the potential cost reductions of limiting the scope of the construction

engineering is included there is an anticipated reduction of approximately 8.4 million dollars to the project, please refer to the VE Related Cost Reductions Summary.

VE Related Cost Reductions Summary

Item	10 PCT OPC	VE Adjustments	Cost Reduction
Station Depot - 2022 Cost	$9,127,000	$6,636,000	$2,491,000
Platform and Warming Shelters – 2022 Cost	$12,893,000	$8,636,000	$4,257,000
Plaza	$1,071,000	$1,026,000	$45,000
Underpass Inc. Ramps & Stairs	$12,261,000	$11,746,000	$515,000
Roadway, Parking, Site Work - 2022 Cost	$5,486,000	$4,916,000	$570,000
Construction Subtotals			**(*) $7,878,000**
Construction Engineering	$4,062,500	$3,500,000	$563,000
Project Totals			**$8,441,000**

* Approximately $3.3 million of the VE reductions is due to escalation and contingency reductions

9.2 Independent Assessment of Platform Costs

The 10PCT OPC Cost Summary (shown above) includes a cost for the new platforms excluding the warming shelters of $6,732,000 including escalation and contingency. Because this value (in comparison to the number of square feet of platform) appears high, an independent assessment of platform costs was performed.

In digging into details, the platform cost includes many components that are not itemized in the summary line item. The cost needs to account for the following (which may not be a complete list):

- Demolition of existing platforms (in stages to allow continued passenger boardings and alightings during construction phases)
- Disposal of the demolished materials
- New bedding and compaction
- Wood headers (which face the tracks) including bolts and anchor rods
- Forming, reinforcement steel, and placement of concrete
- Tactile warning tiles
- Joint seals
- Trench drains
- Lights, conduits, control panel and service
- Equipment
- Labor
- Flagging

In addition to the detail above, the cost must take into account a low productivity rate (including the need to keep portions of the platform open for boarding and alighting during construction) and an inefficiency related to pausing work as trains passed by the station in either direction.

Based on an independent assessment and revised Union Pacific Force Account Estimate Data, the platform costs are expected to be reduced by approximately $4.2 M including escalation and contingency.

The design team along with Village staff continue to review alternatives to reduce the platform costs to this project including engagement with Metra to align Metra's contribution with their operational needs.

9.3 Summary of Cost Adjustments

Including an adjustment in the escalation rate, the VE recommendations, and an adjustment related to the platforms, the opinion of probable cost post-VE is:

Adjusted 10PCT OPC Summary

Item	2022 Cost	Design Contingency (20%)	Escalation (to 2025)	Totals
Station Depot	$4,892,000	$978,000	$766,000	$6,636,000
Platform and Warming Shelters	$6,367,000	$1,273,000	$996,000	$8,636,000
Plaza	$757,000	$151,000	$118,000	$1,026,000
Underpass Including Ramps and Stairs	$8,659,000	$1,732,000	$1,355,000	$11,746,000
Roadway, Parking, Site Work	$3,624,000	$725,000	$567,000	(*) $4,916,000
Construction Subtotal	$24,299,000	$4,859,000	$3,802,000	**(*) $32,960,000**
(*) Utility Replacement				(*) $2,900,000
Revised Construction Subtotals	$24,299,000	$4,859,000	$3,802,000	**$35,860,000**
Phase I Engineering				$762,754
Phase II Engineering				$3,971,481
C&M/Lease Agreement				$1,000,000
Construction Engineering (CE)				$3,500,000
Program Total				**(*) $45,094,235**

(*) For consistency the costs of the utility replacements in Crescent Boulevard and the streetscapes and utility replacement scope on Park Avenue was not included in the "Construction Subtotal" and "Project Total" because it was not part of the scope when the previous estimate was completed. The Rough Order of Magnitude (ROM)of that work is $2.9 million.

The combination of the VE components yields an estimated reduction in construction cost and construction engineering cost of $8.4 million see the VE Related Cost Reductions Summary. The scope reductions did not impact the function of the station, nor the required components related to the grant funding.

The total grant funding (rounded) was $20.4 million (including the Metra component for the platforms). Since the original cost estimate, an additional $3 million dollars was awarded, for a

total of $23.4 million. Note that additional and/or increased grant funding is being pursued for this project up through advertisement for construction.

10 Presentation and Accepted Recommendations

The VE report documents the flow of the study, ideas generated, and ideas recommended after evaluation and development. The status of each VE proposal can be found in the review section of each proposal. The status of each proposal is indicated **with bold print that is highlighted yellow.**

Appendix – Value Engineering Proposals

This appendix includes development of most of the VE ideas that are not included in the body of the report. Development sheets are included whether the idea was recommended or not (including for the purpose of documentation). The intent of included ideas which were not recommended is two-fold. First, the development sheet serves to document the findings. Second, there may be ideas which later may be reconsidered, perhaps because additional grant funding becomes available (or grant funding specific to certain goals such as sustainability).

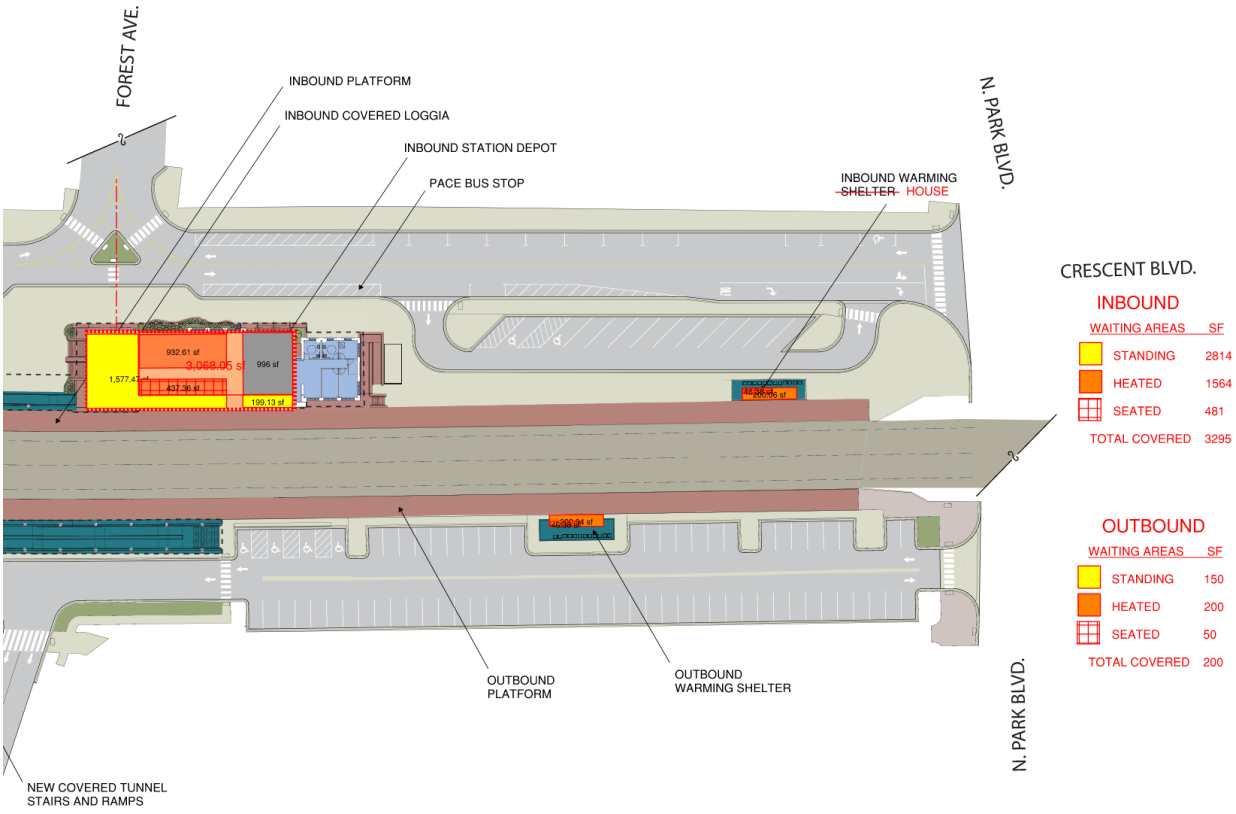
Each proposal includes a summary. Some ideas have additional reference materials or photographs.

Note that the proposals are intended only to be a summary. Time was constrained to the single week of study in the workshop. Research for each item could not be exhaustive.

Value Engineering Proposal No. 2, 3, 4, and 24 - Station Square Footage

Project:	Glen Ellyn Metra Station
Date:	June 14, 2023
Summary Description:	Align interior and exterior waiting area size with Metra requirements.

Description: The proposed alternate design contains the minimum waiting areas per Metra standards, lessening the interior and exterior covered areas at the inbound depot, and reducing the size of the warming shelters on either side of the tracks. The proposed alternate design also does not include the vendor space (approximately 200 SF per guidelines), which would need to be negotiated with Metra. The inbound warming house is intended to be used as a temporary station and eliminate that requirement as well, if approved by Metra.



Original Design: Conceptual design from Phase I was approximately 3,600 interior SF, with approximately 7,600 SF under the cover of the station roof. Warming shelters were approximately 500 SF each.

Alternate Design: Alternate proposed design contains approximately 3,000 interior SF, with approximately 5,000 SF under the cover of the station roof. Warming shelters are approximately 200 SF each.

	For comparison, the interior SF of the existing station is just under 2,000 SF, with approximately 3,000 SF under the cover of the station roof, and approximately 200 SF unheated canopies on the platforms.
Advantages:	The primary advantage to this proposal is a reduction of cost due to reduction of built square footage.
Disadvantages:	Disadvantages of reduction in seating area and square footage would be risking an undersized station in the future, dependent on ridership trends.
Discussion:	Refer to Metra guidelines for the required areas. Requirements are based on boardings. Suggest a sensitivity analysis be conducted to see the impact on requirements if the boardings increased more rapidly than projected. (I.e., How much additional area would be required if the number of boardings increased 10% higher than projected?) Regarding the vendor space, eliminating the vendor space may have ramifications outside of capital cost. First, with the vendor (and with the customers utilizing the vendor), additional "eyes" are inside the station, providing a higher level of security. Second, the presence of the vendor likely discourages some inappropriate activity which, in turn, decreases maintenance costs. Finally, there may be a contractual and public image component related to the vendor. The VE recommendation is to align the station size per new Metra standards while allowing some cushion for future growth. The vendor space should ***not*** be eliminated.
Summary:	Estimated cost increase in Design Phase: Dependent on village stakeholder/public involvement in revising design Estimated capital cost change: Up to $1M reduction depending on final design. Estimated schedule change: Dependent on village stakeholder/public involvement in revising design.
Review:	☐ **Accept and include in project** ☐ Further study needed ☐ Reject for this project

Value Engineering Proposal No. 7 and 22 - Crecent Boulevard Integration

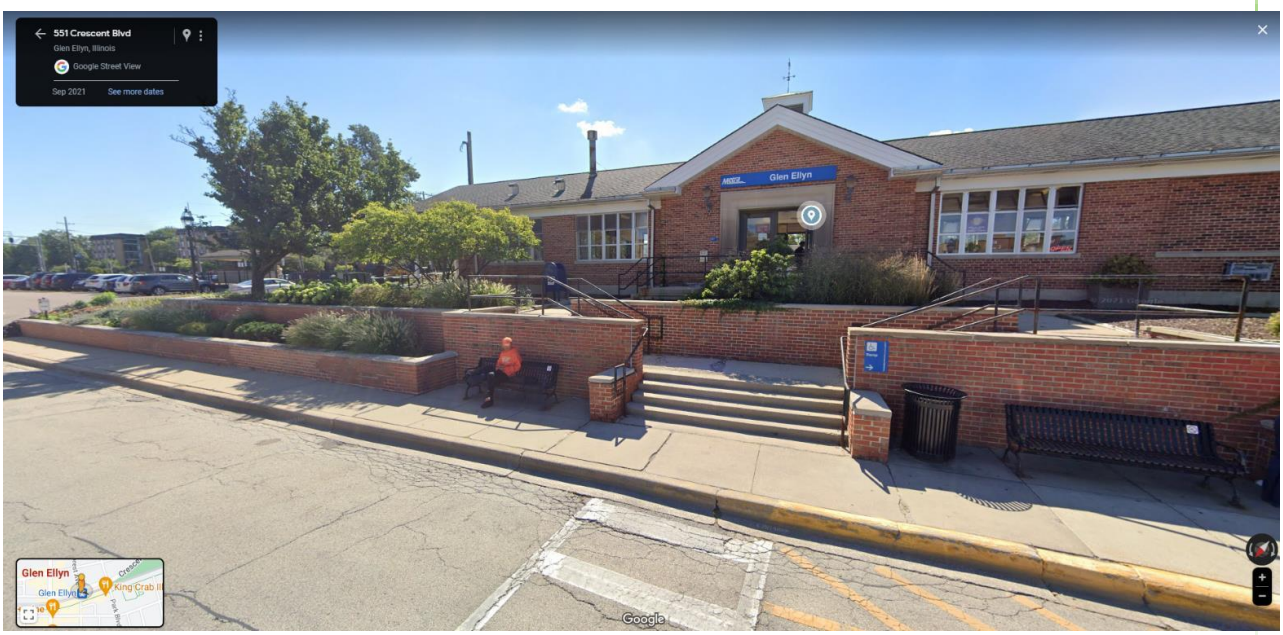
Project:	Glen Ellyn Metra Station
Date:	June 16, 2023
Summary Description:	Better interface with land uses along Crescent Boulevard and Different crossing pavement for Crescent – set apart for pedestrians
Description:	Under current conditions the station feels set apart from adjacent land uses to the north along Crescent Boulevard. Part of this separation is due to the elevation difference between Crescent and the station, and the design of the staircase access at front which provides friction in access. The alternative to the staircase being a long walk around to access ramps. Better integrating the station into the Crescent Boulevard fabric will amplify the value of the station as a focal point for the community. Furthermore, in keeping with transit-oriented design principles around commuter train stations, walking and biking access to the station should be a priority. Use of alternate pavement materials and/or color pavement for the area in front of the station will provide a cue to drivers that they are entering a special zone, and equalize the environment for peds/bikes.
Original Design:	The current design addresses the elevation difference (based upon renderings), but still does not convey a sense of integration with the adjacent land uses. Sidewalk at station frontage is narrow. And standard asphalt street represents a ped/bike division at the station frontage.
Alternate Design:	Review the station design with an eye toward integrating with the north side Crescent Blvd uses. Review potential pavement materials that can provide the psychological/visual cue that it is a multimodal zone, but are still cost effective and will have longevity.
Advantages:	Advantages are greater synergy between the station and the surrounding uses. Creating a desirable public space vs. a series of disconnected spaces.
Disadvantages:	Disadvantages are any impacts upon vehicle flow, of elevating ped and bike access at the Crescent Boulevard frontage along the station – although Crescent is not a major thoroughfare and traffic volumes are lower than at many downtown stations along Metra lines – representing an opportunity. A disadvantage of alternate pavement material is increased installation cost and potential maintenance cost or longevity. Need research on best available practices. Noting that Dutch model liberally uses colored pavement throughout to the purpose of safety and clarity in communication about the context of areas.
Discussion:	No additional discussion. Not at all flushed out in this treatment. Just presenting the general idea versus exact solutions.

Summary:	Estimated cost increase in Design Phase: None/Negligible Estimated capital cost change: Minor related to crosswalk details Estimated schedule change: None
Review:	☐ **Accept and include in project** ☐ Further study needed ☐ Reject for this project

Crescent Boulevard looking East. (Source: Google Streetview)

Notice that the retaining walls, while nice materials and landscaping, make access to the station building more difficult, less porous. The walls, narrow sidewalk, and roadway act as a divider from the businesses and activity on the north side of the road.

Crescent Boulevard at Forest Avenue looking East. (Source: Google Streetview)



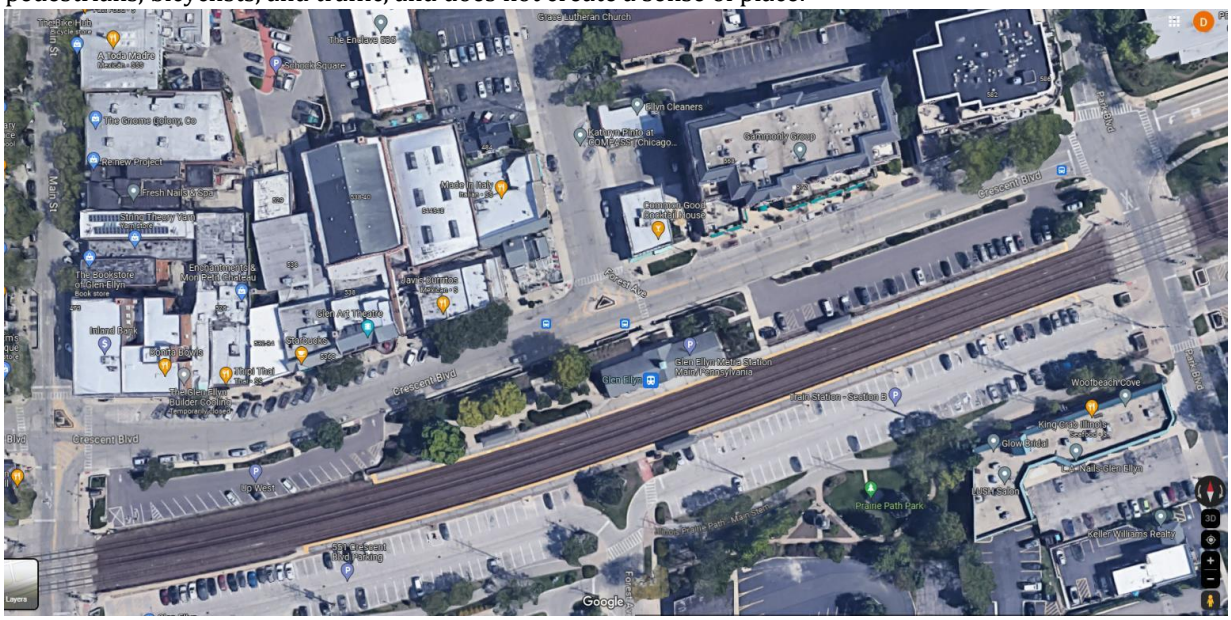
A view of the existing station entrance from Crescent Boulevard. (Source: Google Streetview)

Note that while the existing stairway is a nice aesthetic design (with landscaping), it adds friction between station and Crescent. The sidewalk along Crescent it too narrow to be inviting.

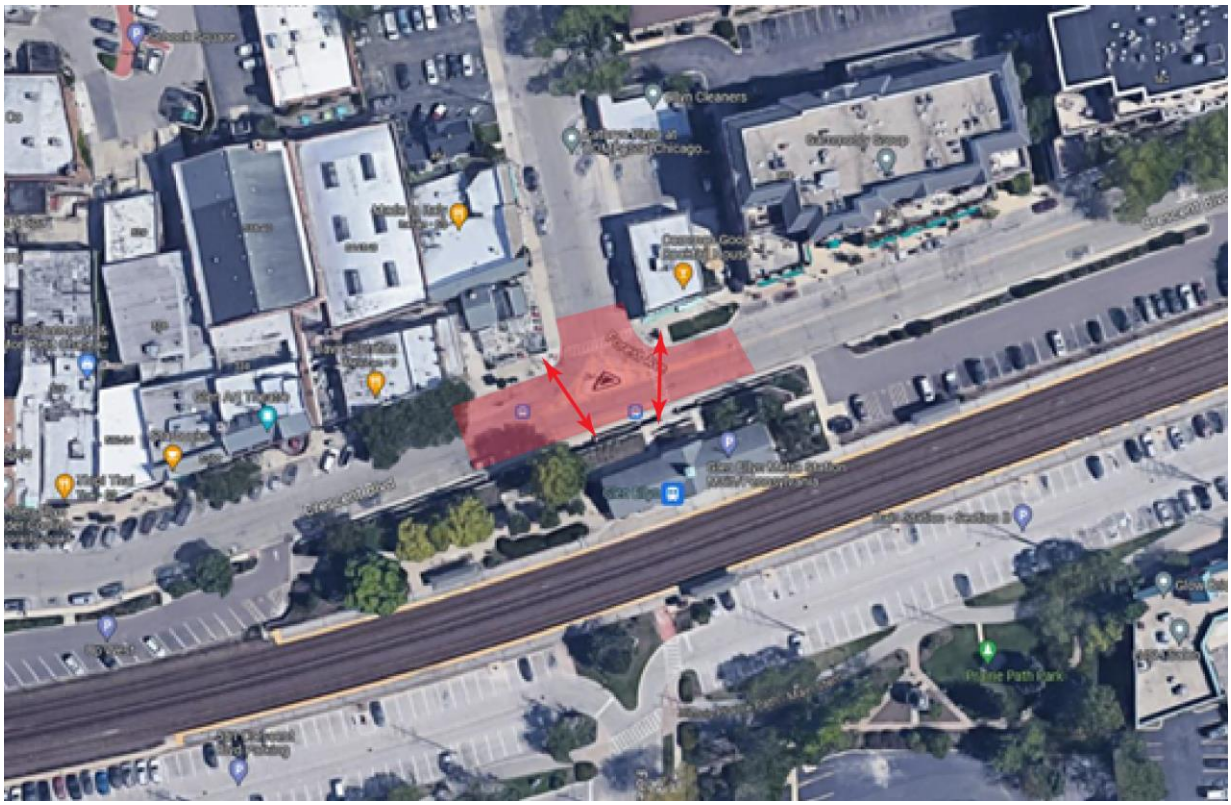
The station entrance based on a concept rendering.

While some aspects of the rendering may not reflect the 10% conceptual design, the rendering does appear to still include a narrow sidewalk between a wall and traffic. (Actual sidewalk width in the design is 13 feet.) This design, while aesthetically pleasing does little to better integrate uses and function. The placement of the stairs from the station exit somewhat directs people out into the street. (There is not a connection to

"place" when exiting the station building.) Additionally, the roadway layout and material does not equalize pedestrians, bicyclists, and traffic, and does not create a sense of place.



Existing Conditions. (Source: Google Maps)



In and approaching the Crescent Boulevard/Forest Avenue intersection, use alternate pavement texture, material and/or color to define the area and provide drivers a cue that they are entering a special (pedestrian) zone. This zone is to better connect the station to the adjacent land uses. It is important to create a sense of place for people (as opposed to defining the road for use by cars).

Before image: Note the crosswalks are barely visible and worn. Little conveyance to drivers that this intersection is also used by pedestrians.

After image: Installed in 2015, note the more visible crosswalks with a pattern. Note this was reinstalled in 2021 because of pavement resurfacing. Photos are available to show the new appearance and the wear after one year. This pattern used inlayed thermoplastic so that snowplows did less damage to the pavement markings.

A “street print” installation that highlights the intersection.

Lessons can be learned from other countries. Netherlands, for example, uses colored pavement to establish context, identify appropriate users, and enhance aesthetics. As this project is a Federal Aid project, need to be cognizant of Federal guidelines, including MUTCD. The current MUTCD version limits the use of color (red for bus lanes and green for bike lanes). A new version of MUTCD is expected soon and the hope is that it will provide greater flexibility from the start with various crosswalk and pavement treatments.

See examples of shared streets including:

Argyle Street (in Chicago)

Shared street in Batavia

Also see examples of other surface coatings and pavement markings.

Sample surface coating product:
https://www.pavementsurfacecoatings.com/decorative-surfaces/

Sample inlaid pavement marking treatment products:
https://www.gallagherasphalt.com/streetprint/
https://www.outdoordesign.com.au/news-info/duratherm-asphalt-surfacing/5482.htm

Value Engineering Proposal No. 9 - Station Entryway Ramping / Garden Landscape

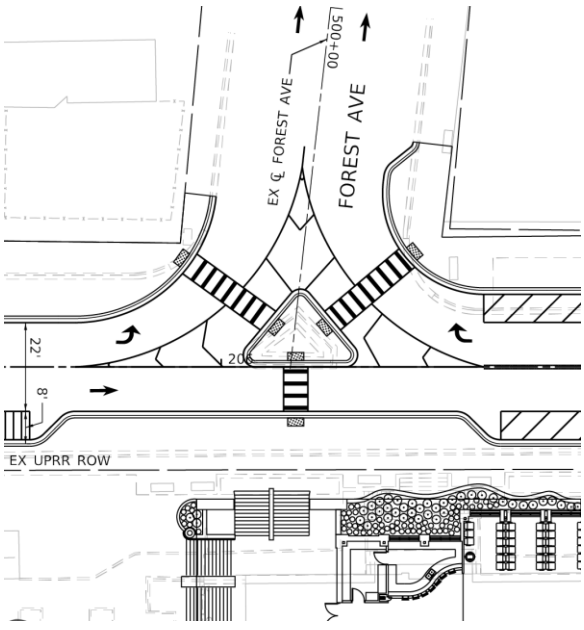
Project:	Glen Ellyn Metra Station
Date:	June 14, 2023
Summary Description:	Consider ramping/garden landscape entryway rather than stairs (that may be perceived as "sterile")
Description:	This item relates to reviewing an alternative to the stairway entrance along Crescent Boulevard which leads from street level up to the main entrance to the Depot.
Original Design:	See screen shot below.

Alternate Design:	Move main entrance to the west near Forest Avenue as to capitalize on the stairs at that location as well as the ramps to the underpass and platform levels. The existing main entrance pictured above could in turn be eliminated. See attached mark up of site plan for some rough thoughts. Planters could be utilized to frame the stairway entrance to the depot on the street side. A ramp leading to the main entrance door would be challenging to keep along Crescent Boulevard given the grade differential between Crescent and the Depot Floor which is 7 feet. The ramp would be on the order of 100' long and take up significant real estate along the north side of the building.
Advantages:	Keeps main entrance more proximate to the underpass as well as the ramps leading from the plaza level to the platform level.

	Eliminates staircase on Crescent thereby resulting in cost savings. Could free up usable space in the depot and thereby allow for reducing the footprint, simplifying the floor plan, and roof line which would support reducing the project cost. Clarifies entrance point which would be more central to the kiss and ride and bus stop lanes.
Disadvantages:	Less flexibility in terms of points of ingress/egress. Could reinforce drop offs at Forest/Crescent in such a manner as to bock the thru lane. Some may prefer current design from an aesthetic standpoint. If as part of this modification we shifted the depot to the west, this would compromise some of the plaza area.
Discussion:	This matter really needs to be reviewed along with reviewing the size of the depot and its architectural design character.
Summary:	Estimated cost increase in Design Phase: Reviewing additional conceptual alternatives will result in added costs and could get significant depending on the number of floor plans and renderings that are requested, and the amount of time invested by the design team and staff. Need to affirm our desire and then consult with CDM Smith on Scope and Fee. Estimated capital cost change: Needs more vetting but the ROM estimate provided as part of the reduction in the footprint of the depot was a good starting point at say $1M savings and could be bolstered say by another $400K with the revisions. Having said that, adding a ramp to the main entrance would result in added costs. Ramp could easily approach $250K given its size. Estimated schedule change: Could add 3-6 months to design timeline to look at various alternatives including vetting any Metra concerns with significant design exception requests.
Review:	☐ Accept and include in project ☐ Further study needed ☐ **Reject for this project**

The recommendation from the VE team is to move the entry stairs to the west arch, aligned with Forest Avenue. This is depicted in the plan view to the right. Unless this move requires examination of alternatives by multiple parties, the schedule change should be minor.

Note that this change works in conjunction with other VE ideas #7 and #22. This change also would allow simplification of the station building layout (not shown), further reducing cost.



Value Engineering Proposal No. 10 - US Bank Interconnection

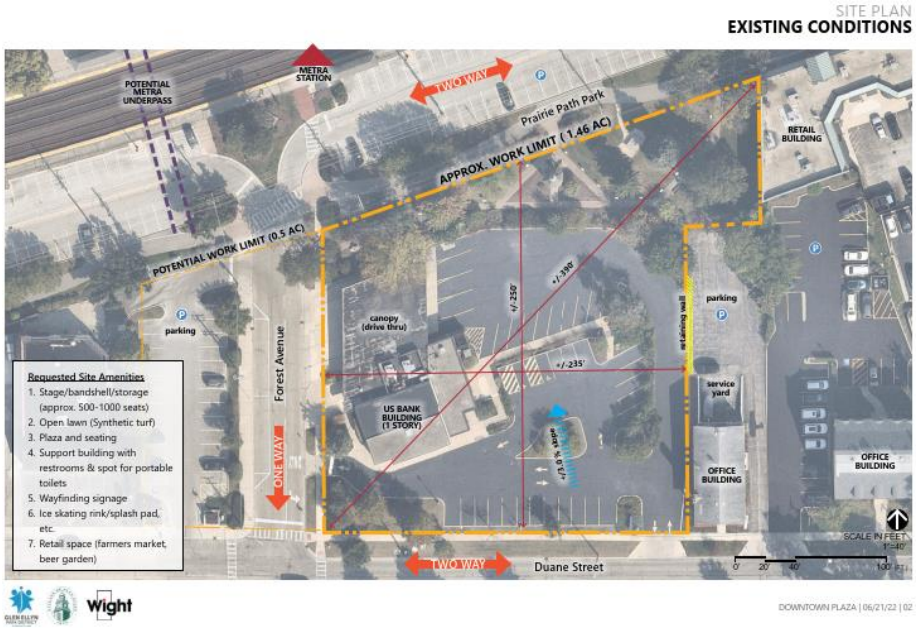
Project:	Glen Ellyn Metra Station
Date:	June 14, 2023
Summary Description:	Create interconnection of US Bank site and site/tunnel

Description:

The US Bank site was purchased by the Village of Glen Ellyn (VoGE) with the goal of selling it to the Glen Ellyn Park District (GEPD) to develop an event/park space in the Central Business District. Interviews of site development firms was conducted jointly by GEPD and VoGE. Included in the negotiations on the sale of the property (including 2 other passive park's maintenance and development leased to GEPD by VoGE) was the improvements to Forest Ave to enhance the US Bank event space uses while meeting the needs/design of the Metra Train Station and parking lots. Site Design awarded contract for development of the US Bank property. (https://www.site-design.com/)

VoGE views this space as a premier location for events/green space to attract more people (residents and visitors) to the downtown Glen Ellyn, providing economic impact.

Note:



Original Design: What did the design as presented depict?

Design was for typical roadway treatments and to convert Forest Avenue to 2-way traffic (currently one way south bound) as well as redesign of Forest/Duane parking lot to provide a Kiss and Ride option on the south side of the UPRR.

Alternate Design: What is proposed differently? Added? Removed? Changed?

Consideration of incorporating elements to the roadway and/or parking lot design that are both aesthetically and functionally synergistic with the park/event space.

- Permeable pavers
- Flex street
- Transition into parking lot for overflow
- Connect IPP, Event Space and pedestrian tunnel traffic

Advantages: Describe the advantages.

Interconnection of the projects to provide a better experience for US Bank event space programs and users (Forest and Forest/Duane lot)

Better aesthetics for those using the pedestrian tunnel travelling through the event space (on forest or through the park)

Move Sunday Farmer's Market to Forest (no need to close a parking lot)

Disadvantages:	Describe disadvantages in any category. Increased cost (pavers, elements needed to protect event and parking area from Forest vehicle traffic) Timing of construction of the two projects may create inefficiencies for both projects Possible impact to the optimum functionality of the roadway/parking lot for train station purposes
Discussion:	Provide any additional discussion for a future reader to understand and evaluate the recommendation. There is a balance between 2 projects that have different goals in adjacent space. Both of these projects have been intensely discussed by elected officials of VoGE and GEPD. There may need to be significant coordination with design and construction for any of the proposed improvements to be implemented.
Summary:	Estimated cost increase in Design Phase: (Unknown) Estimated capital cost change: (Unknown) Estimated schedule change: (None)
Review:	☐ **Accept and include in project** ☐ Further study needed ☐ Reject for this project

Value Engineering Proposal No. 11 – Landscaping Durability

Project:	Glen Ellyn Metra Station
Date:	June 14, 2023

Summary Description:	**Landscaping Durability**
Description:	The landscaping around the station must be native and durable while also being low maintenance. Choosing plants native to the area creates a connection with the people who live in that area and is sustainable, because the plants would not need to travel a far distance from where they originate to the station. Plants that are durable to the Midwest weather allow for low maintenance.
Original Design:	Plant list not specified at 10%.
Alternate Design:	Add in durable, native, and low maintenance plants.
Advantages:	Having plants that are durable to the weather reduces maintenance cost. Using plants that are native to the area greatly decreases pollution related to transport to the site by not needing to be transported long distances. Individual plant species advantages listed below for three examples.
Disadvantages:	N/A
Discussion:	Examples of native, hardy plantings:

Bald Cypress Tree: Is tolerant to salt and its roots to do not tend to cause damage, it is also native to Illinois.

Achillea Millefolium (Common Yarrow): Is a wildflower native to Illinois that is salt tolerant and has deep roots. Deep roots allow it to withstand high winds and does not require a lot of water resulting in lower maintenance.

Agastache Foeniculum (Hyssop – various varieties): Native to Illinois, drought resistant, salt tolerant, deep roots. Attractive to pollinators.

Summary:	Estimated cost increase in Design Phase: None

Estimated capital cost change: None or negligible
Estimated schedule change: None

Review:	☐ **Accept and include in project**
	☐ Further study needed
	☐ Reject for this project

Note: Salt tolerance behind planter walls at the plaza level may not be required. Planter walls tend to prevent runoff with deicing chemicals into the landscaping. The exception may be near the platforms where broadcasting of salt may throw salt directly into landscaping beds.

Note: The examples show on the previous page are only intended as representative. For final design, plantings are typically outlined in specifications with any requirements. Most specifications include a list of acceptable species (or prohibited species).

Illinois Native Plants (gardenia.net)

Value Engineering Proposal No. 12, 13 - – Station Construction Types

Project:	Glen Ellyn Metra Station
Date:	June 14, 2023
Summary Description:	Analysis of different construction types for the station

Description:

Proposed alternate construction types evaluated include Wood Framed (Type V-B), Mass Timber (Type IV), Insulated Concrete Forms (ICF), and Structural Insulated Panels (SIP).

Original Design:

Conceptual design was masonry and steel construction (Type II-B): concrete masonry unit (CMU) backup with drainage cavity, insulation, and masonry/stone veneer exterior. The roof structure would be steel framed.

Alternate Design:

Wood Framed: Wood stick framed construction with interior and outboard insulation, drainage cavity, and masonry/stone veneer. The roof would also be wood framed.

Mass Timber: Mass timber structure with fire treated wood framed or insulated panel exterior walls with insulation and masonry/stone veneer. The roof would also be timber framed. Typically, today this construction type would be done with laminated timber, an engineered wood consisting of layers of wood glued together, not whole heavy timber sections, due to material availability.

ICF: Modular system of concrete-filled hollow foam blocks, with masonry/stone veneer. The roof structure would be steel framed.

SIP: Panels with insulating foam core sandwiched between OSB facings, with masonry/stone veneer. SIPs can also be used for the roof structure.

Example wall sections of each type are shown below for reference.

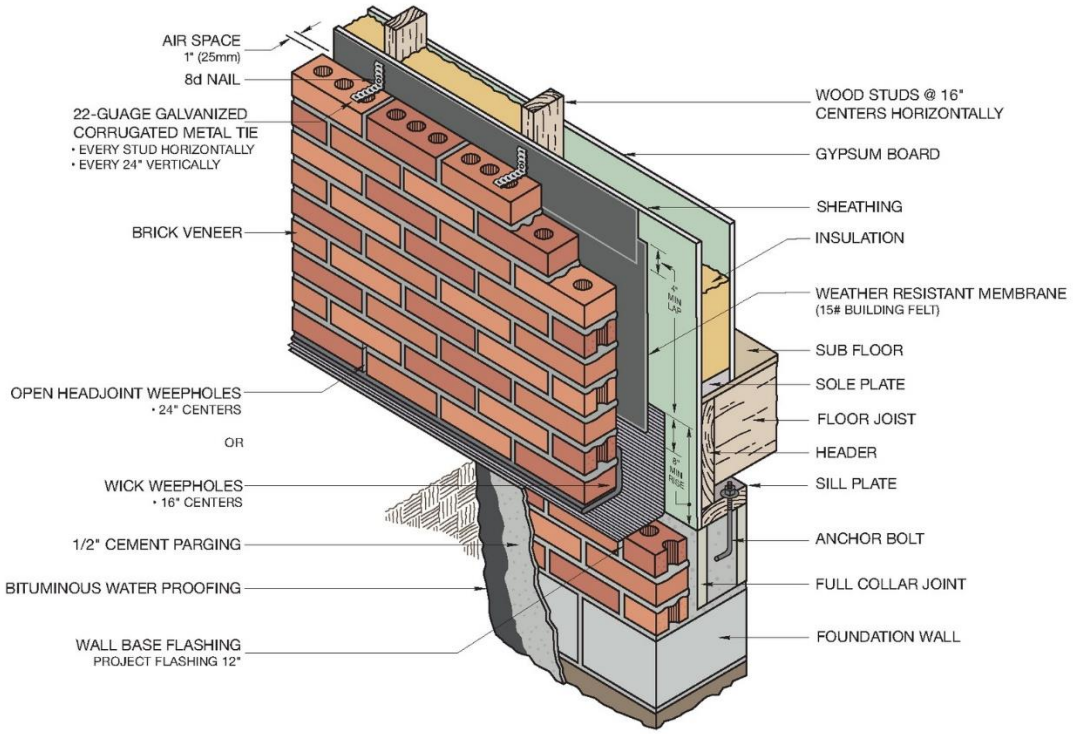
Advantages/ Disadvantages:

SIPs and ICFs are high-performance modular building systems, advantages being an airtight, well-performing thermal envelope that could result in operational cost savings. Also being modular construction systems, they can result in construction schedule savings. The cost savings realized by these systems are more significant on larger projects, and specialized trades may drive up costs and negate that cost savings. SIPs are typically only used in residential and light commercial construction and are susceptible to pest and moisture damage as well as offering lower fire resistance. ICF offers very high durability and fire resistance. Between the two modular systems analyzed here, ICF would be recommended.

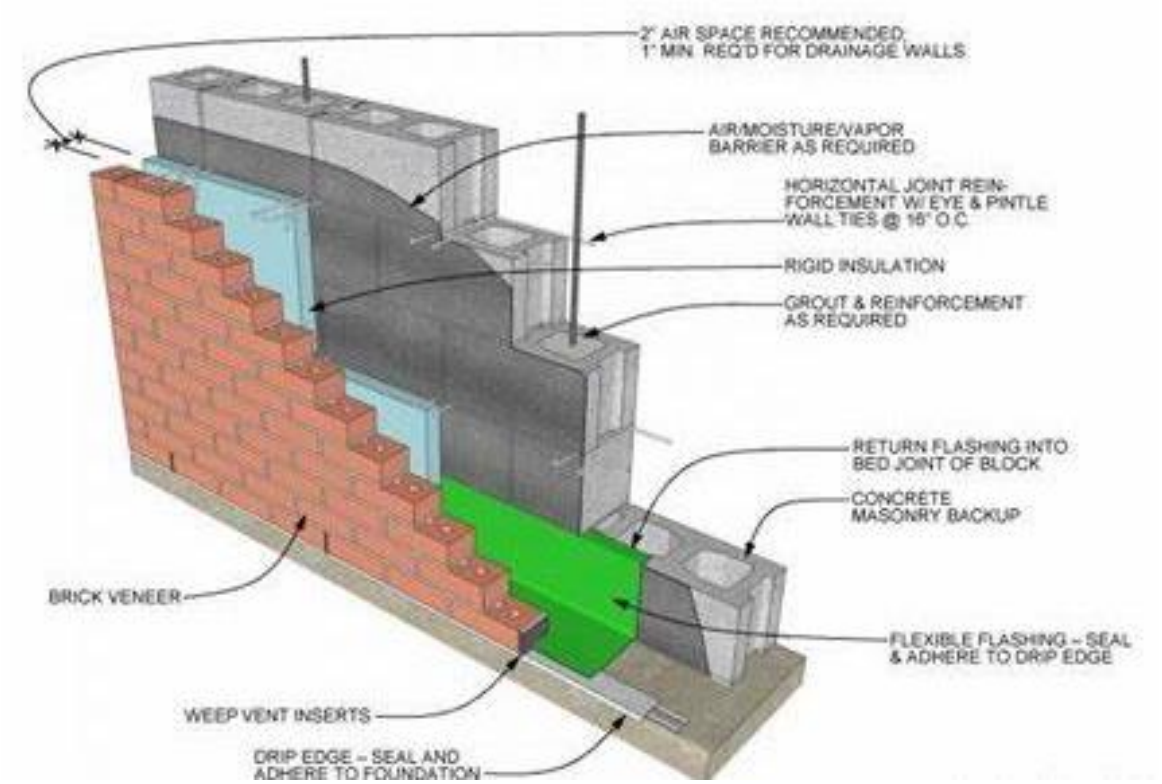
Wood framed buildings are typically the least expensive alternative and could result in project cost savings as well as schedule savings. However, wood stick-framing is typically only used in residential and light commercial construction and is susceptible to pest and moisture damage and is more suited to lower ceiling spaces. Mass timber construction is a wood framed construction method using larger timbers or laminations. A more durable, aesthetically pleasing, and fire-resistant solution than stick framing, it is also more expensive, similar to the baseline masonry construction cost. Laminated timber structures also have very

	specific design coordination needs which reduces the flexibility of making any changes to the building in the future. Wood framing is less energy intensive to manufacture than steel, making it a more sustainable solution. Between the two wood systems analyzed here, mass laminated timber would be recommended. The baseline masonry construction system is durable, made with readily available trades and materials, and reduces the number of trades on the job. If design was simplified and/or larger, some of the alternative construction types would be more beneficial.
Discussion:	Metra guidelines encourage the use of stone, brick and precast masonry for the exterior material, and allows use of masonry (CMU), wood, or metal framed construction as backup. Interior finishes in passenger areas should be brick or tile for durability, regardless of structure type. Typical code implications of construction type include sprinkler requirements, fire-rating requirements, and limitations for allowable area. For Assembly use (A-3) in a sprinklered 1-story building, all allowable areas are over the proposed station area. A Village of Glen Ellyn amendment requires sprinkler systems for the station regardless of construction type. The fire-rating requirements of Mass Timber construction include rated exterior bearing walls. Masonry and Wood framed construction do not require fire ratings. Based on this initial analysis it appears that all proposed construction types would be technically feasible.
Summary:	Estimated cost increase in Design Phase: Some increase in design fee would be expected for revising construction types that may necessitate team changes to engineers specialized in that building type, and/or reassessing design fee. Estimated capital cost change: Varies, see discussion. ***Note that for the relatively small building size of the station, the traditional masonry construction would likely be the least cost.*** Estimated schedule change: Varies, see discussion.
Review:	☐ Accept and include in project ☐ **Further study needed** ☐ Reject for this project

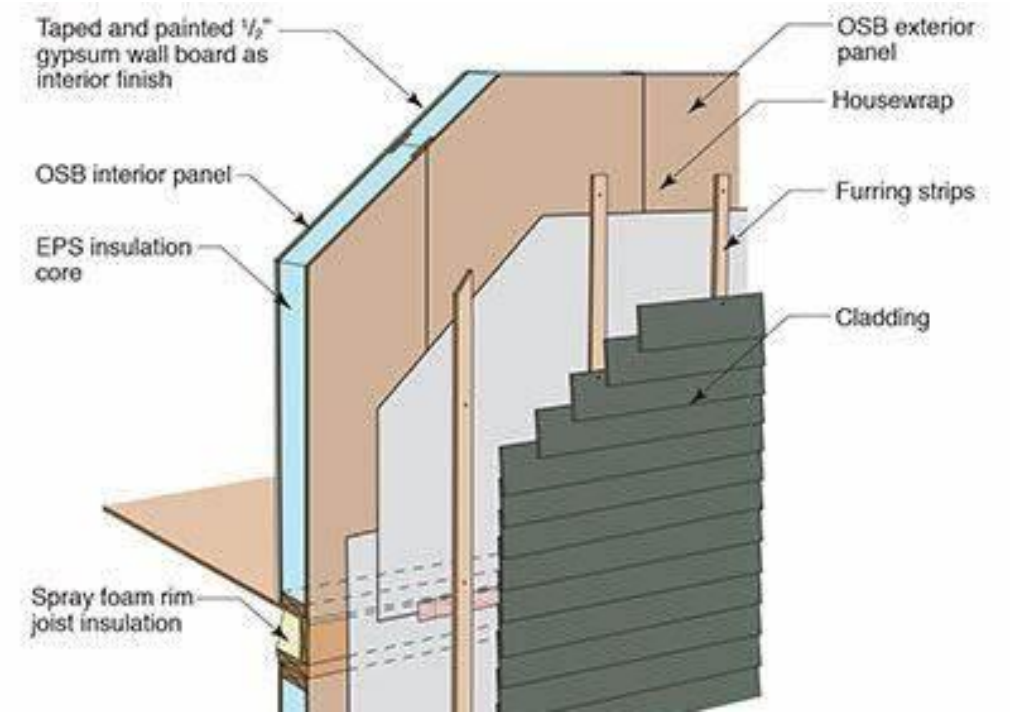
Wood Framed:



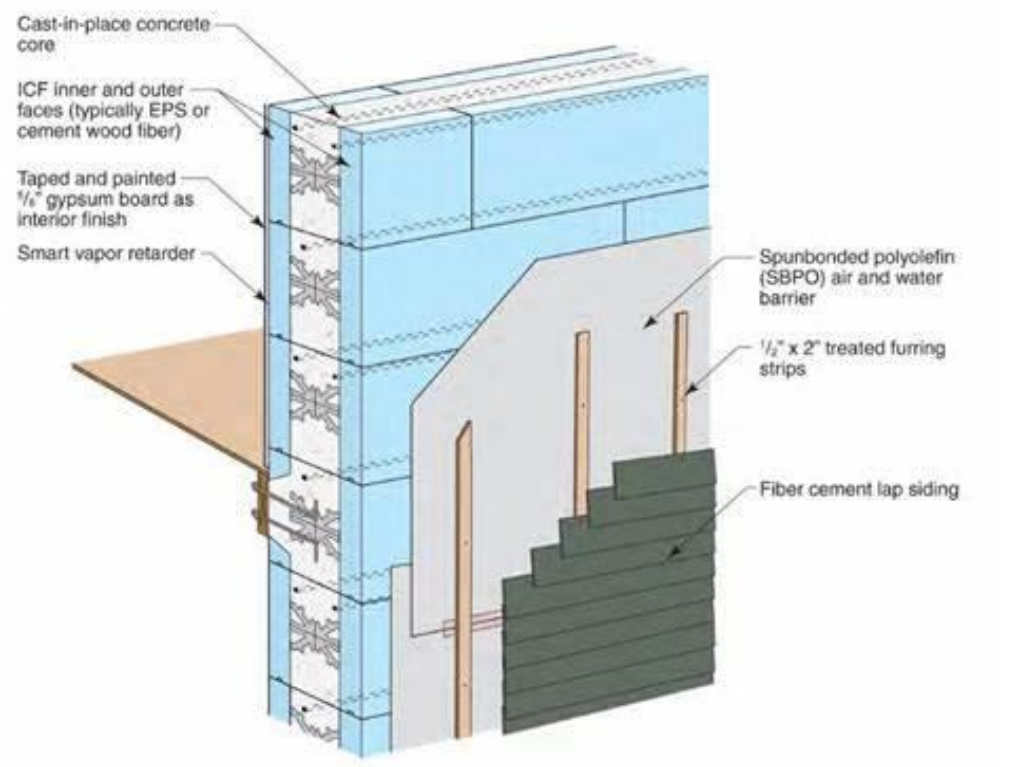
Masonry:



Structural Insulated Panel (SIP):

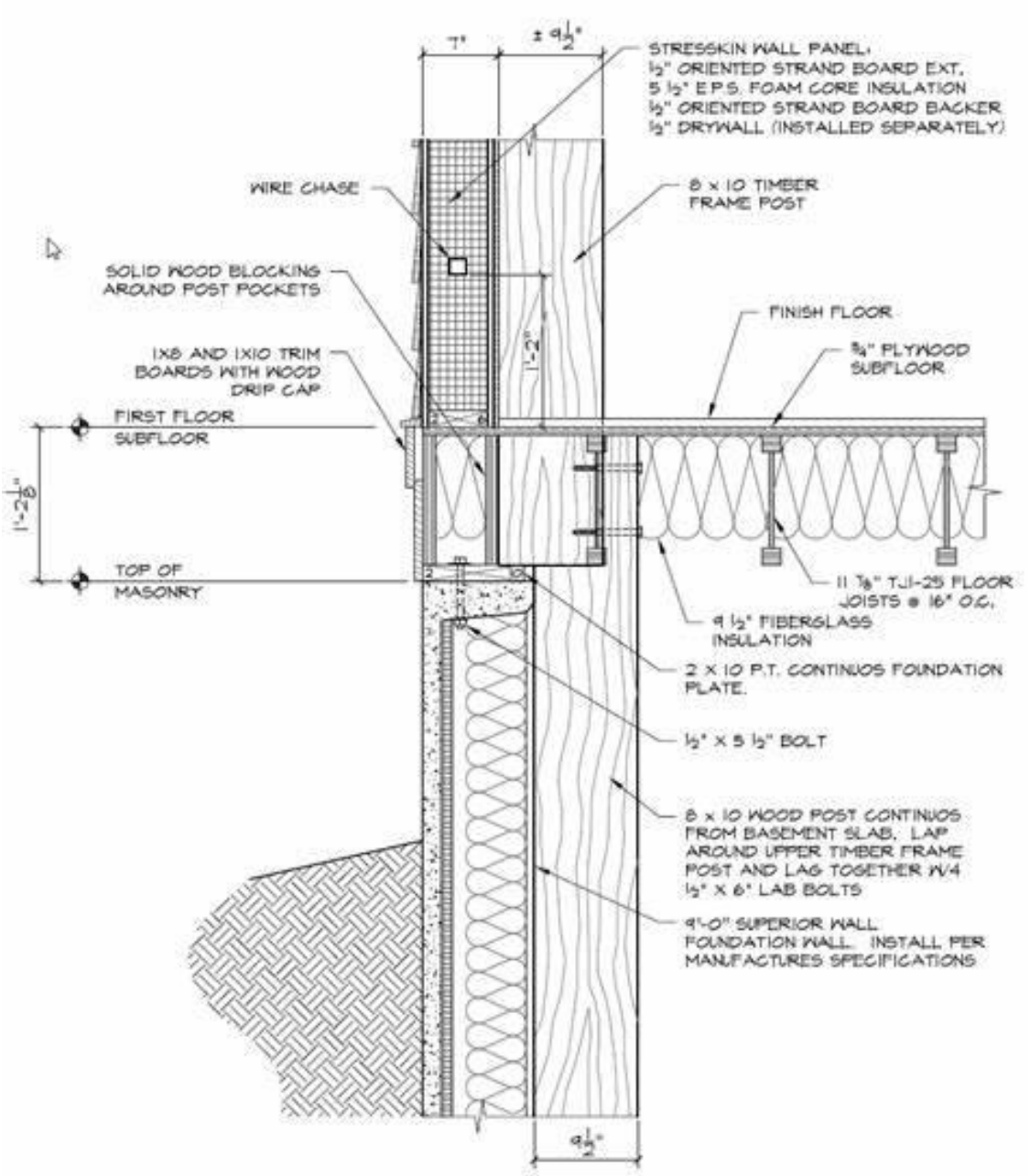


Insulated Concrete Form (ICF):



Heavy Timber:

Mass Timber (including Glue Laminate Timber):



**Vinyl or wood cladding is shown in representative wall sections, however brick veneer may be used in all*

Value Engineering Proposal No. 15 - Permeable Pavers

Project:	Glen Ellyn Metra Station
Date:	June 15, 2023
Summary Description:	Use Permeable Pavers for Parking Space and Plazas
Description:	Permeable pavers can be used on sidewalks, parking spaces, and other hard landscape features. (Note that pavers are not recommended for the driving aisles of parking lots.)
Original Design:	This level of detail was not included in the 10% concept drawings.
Alternate Design:	Incorporate permeable pavers in the appropriate areas of the project.
Advantages:	Stormwater capture by permeable pavement can mitigate a portion of volume and peak runoff mitigation requirement. Past studies indicate a portion of the cost of pavers is offset by the decrease in inlets and piping. Also aesthetic benefit. Customer benefit in that puddles do not form. Can also use an under-paver stormwater management system (in ground).
Disadvantages:	Can be costly, requires different maintenance than traditional pavement. See photo for typical snow removal equipment.
Discussion:	While pavers can add cost when only looking at the pavement cost, since the pavers reduce stormwater runoff, use of pavers can reduce the cost of other stormwater infrastructure, such as inlets and storm sewers. The pavers especially can be valuable if the decrease in impervious surface prevents the need for expensive stormwater detentions (especially underground detention). Note that some grants may be used for this stormwater benefit. If a grant was secured to pay for the installation of pavers, this can be reconsidered.
Summary:	Estimated cost increase in Design Phase: None or minor Estimated capital cost change: Add~$65-70K for parking in north to lots Estimated schedule change: None or minor
Review:	☐ Accept and include in project ☐ Further study needed ☐ **Reject for this project**

Typical equipment used for snow removal with pavers:

Some Chicago-area unit costs (with material, labor, and equipment) – *only for comparison*:

- 5" sidewalk with 6" stone base: $9-12/sq ft
- 6" concrete driveway with stone base: $11-13/sq ft
- Pavers (in parking lot application): ~$30/sq ft
- HMA parking lot on stone base: ~$40/sq ft

Value Engineering Proposal No. 17 – Passenger Loading Zone

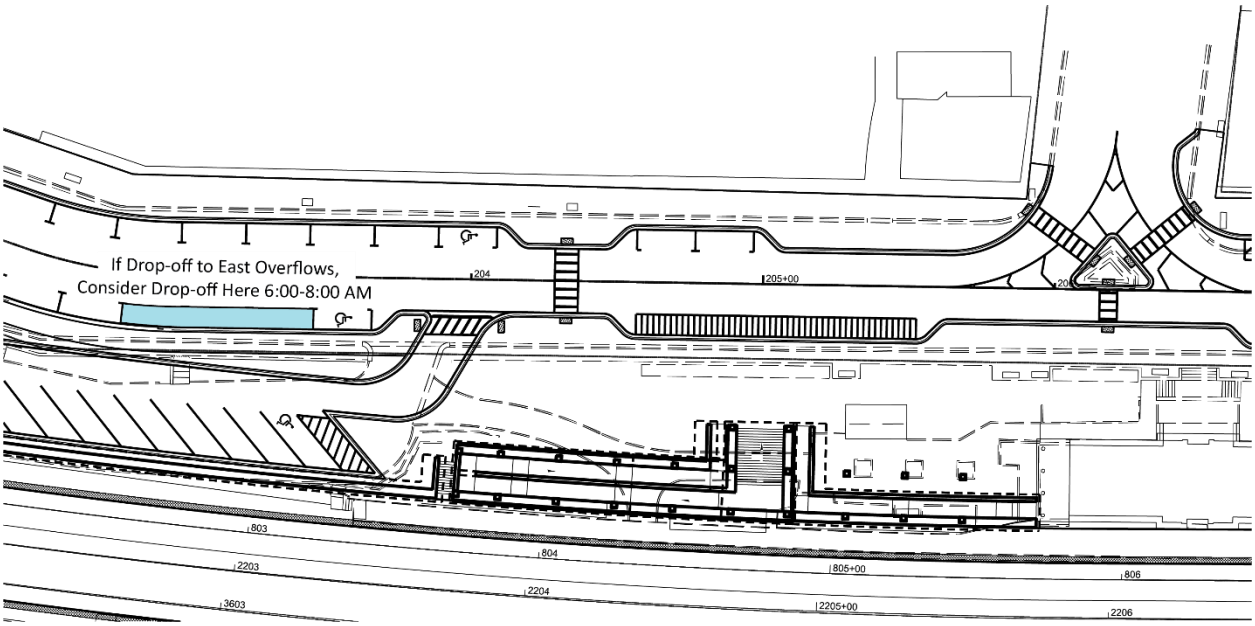
Project:	Glen Ellyn Metra Station
Date:	June 14, 2023
Summary Description:	**Passenger Loading Zone Installation**
Description:	Create/Designate Additional Passenger Drop-Off and Pick-Up Areas.
Original Design:	The original design had the passenger drop off area as an indented curb design on Crescent Blvd (on the in-bound side of the tracks). A passenger loading zone (for pick-up, on the out-bound side of the tracks) is curbside along Forest south of the tracks.
Alternate Design:	See exhibits for potential added area. See advantages/discussion for the basis. Two of three potential added areas would be by using signage only (creating a time-based separation of loading and parking). One potential area could utilize an indented curb.
Advantages:	If drop-off and particularly pick-up areas are overflowing, drivers then may wait in areas creating traffic or pedestrian safety concerns. (For instance, double-parking or waiting curbside in an intersection.) Recognizing that constrained parking means people will be dropped off and picked up at the station, provide additional space (or monitor use of the space and be prepared to expand if necessary).
Disadvantages:	Approximately seven parking spaces would be designated for a two-hour window as "active loading/unloading." On Crescent, this could be negatively viewed by businesses along Crescent.
Discussion:	Curb space is a valuable asset. Curbside management has been a growing topic of interest (and topic of webinars) in the last five years and even more so during and since the pandemic. Curbside management, depending on the location, may need to address goods delivery, food trucks, parking, passenger loading (including Uber and Lyft), bicycle access, food delivery, and more. As parking is constrained for the Glen Ellyn Metra Station (as demonstrated by the number of persons on the waiting list for station parking permits), passenger drop-off and pick-up will continue. While improved bicycle facilities (including bicycle parking at the station) may offset some of the rise in drop-off demand for days with pleasant weather, the demand will not likely decrease. Curb space should be managed for the public good. Fortunately, curb space demand at a Metra station tends to have distinct peaks associated with train departure and arrival times. By using the same space for different purposes at different times, the cost of managing the curb space can be minimal. (Note this temporal separation is already done by closing portions of parking for the weekend farmers' market.) This time separation likely already occurs in the PM peak period. Since some cars would have already left parking spaces, some drivers awaiting an arriving train to pick up a rider likely already use a vacated parking space to

wait. Much like a cell phone lot at an airport, this practice should be encouraged (along with a prohibition on idling vehicles more than a few minutes). (Signage already indicates a parking permit is not required after 11:00 AM.)

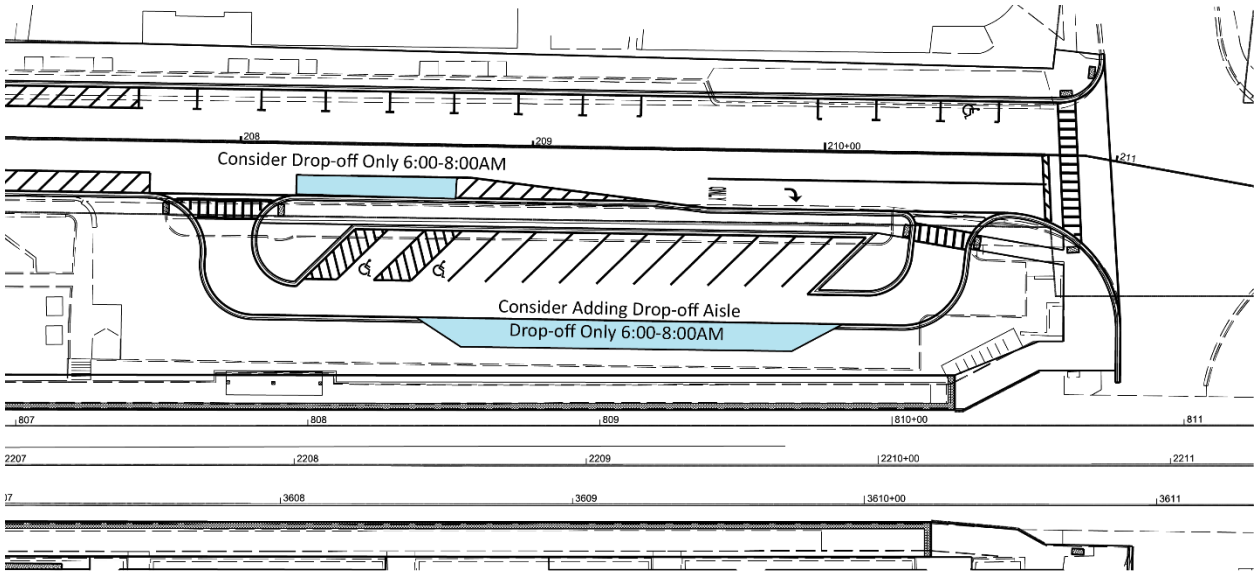
See the exhibits below for potential additions to drop-off and pick-up zones. The times vary based on whether the need is on the in-bound side (for drop-off, tending to be shorter wait times) or out-bound. Management of curbside space involves data collection. The adequacy of drop-off and pick-up space should be monitored seasonally to determine if adjustments are required.

Summary:	Estimated cost increase in Design Phase: None or Negligible. Estimated capital cost change: From minimal (cost of signs and installation ~$1500) to cost of an indented curb area (~$32,000). Estimated schedule change: None.

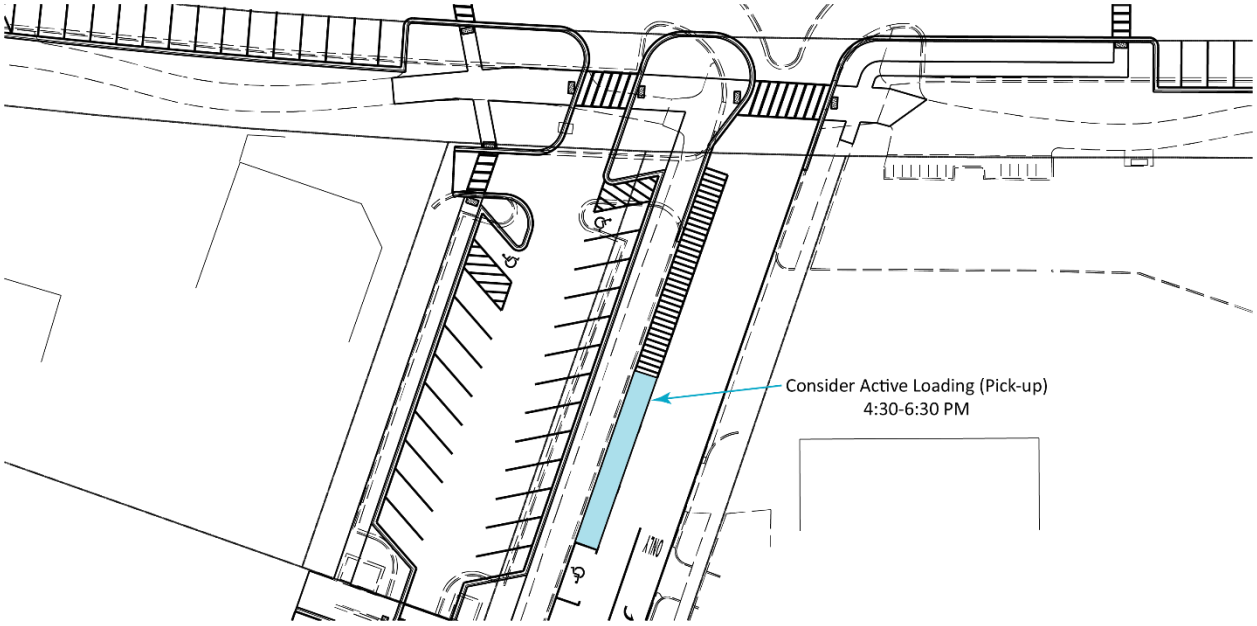
Review:	☐ Accept and include in project ☐ **Further study needed** ☐ Reject for this project



If the curb-side drop-off space directly at the proposed plaza begins to overflow (which may present a pedestrian crossing or traffic flow issue), consider (a) time restrictions (e.g., active unloading only), and/or (b) expansion of drop-off curb space to the area shown in blue.



Again, if the drop-off space to the west overflows, consider (a) adding more space curbside (that reverts to parking after 8:00 AM), and/or (b) creating a curb inset within the parking lot. This latter space may be more popular for those who need more time to unload. Also, the platform could be accessed from the east end rather than from the stairs at the station.



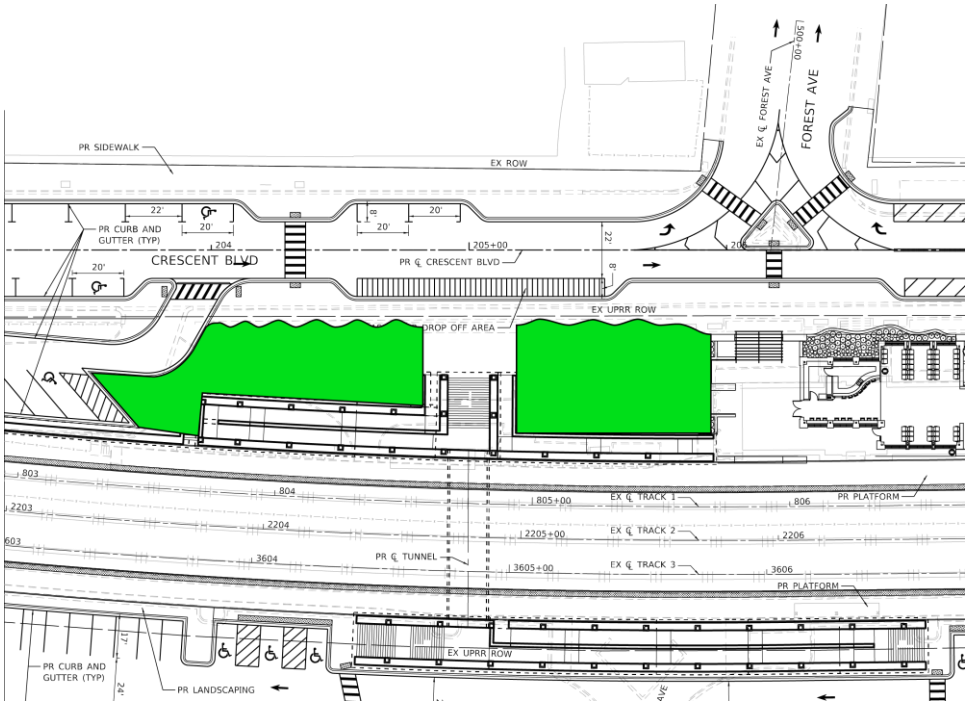
For pick-up, the more popular spaces will be on the outbound side of the tracks. If the designated space proves inadequate (as "line ups" tend to occur in the PM peak), the three parking spaces to the south can be designated for active loading from 4:30-6:30 PM. Note that the suggested times for both drop-off and pick-up are based on the density of train departure and arrival times specific to the Glen Ellyn Metra Station.

See ITE.org (under Complete Streets and Curbside Management Resources) for more information on curbside management.

Value Engineering Proposal No. 18 – Minimizing Excavation

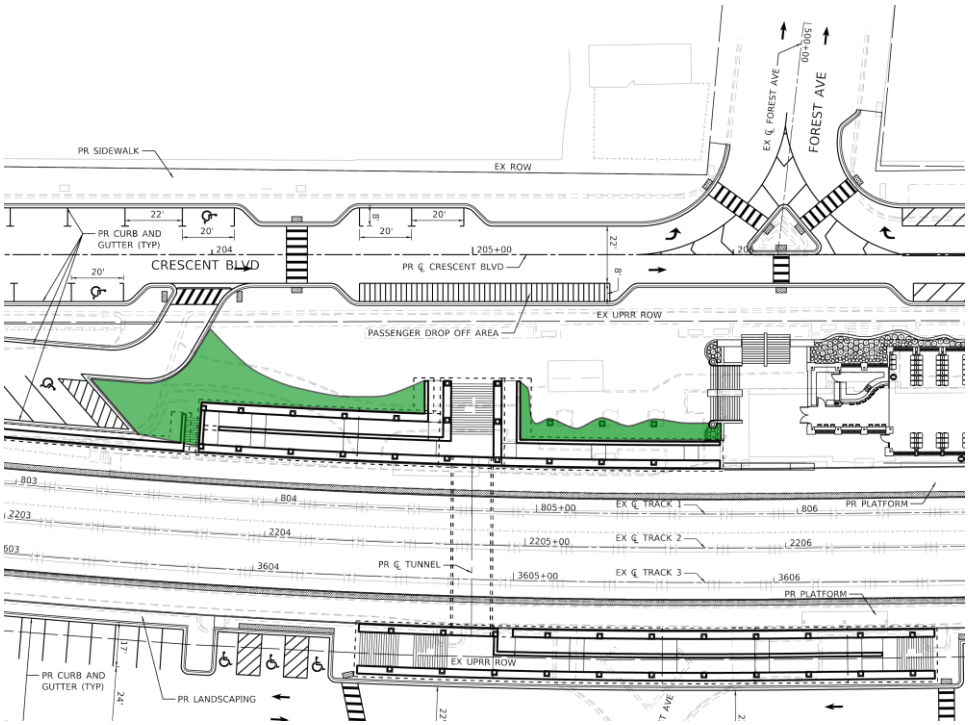
Project:	Glen Ellyn Metra Station
Date:	June 14, 2023
Summary Description:	Minimizing excavation – get rid of some street level plaza, minimize access points (single focal point)
Description:	Eliminate the street level plaza area to minimize excavation and cost of pavement elements.
Original Design:	Mass excavation to create plaza area with pavement, planters, bike racks, as a general amenity space.
Alternate Design:	Minimize excavation to create gradual slope up from Crescent towards the platforms. Make this a green space with landscaping and trees in lieu of a paved area with the aforementioned amenities.
Advantages:	ROM cost reduction - $800K - $1M Reduction in impervious/more green space with park like setting Reduced capital cost.
Disadvantages:	Loss of Plaza and amenities Will need additional retaining walls and they will create a cavernous feeling between Crescent Boulevard and the underpass. Ties back to prior concerns about ensuring the site feels open and safe.
Discussion:	At least one Board Member expressed desire of eliminating the plaza given the US Bank site conversion to a park. Not sure they're one in the same. We could also look at still mass grading to keep the open feeling but creating a green/landscaped area in lieu of pavement. That could still yield a significant savings of say $300K.
Summary:	Estimated cost increase in Design Phase: Additional retaining wall design and grading plan costs say $30K. Estimated capital cost change: Significant savings could approach $800K - $1M. However, balancing a reduction in grading with the need for plaza elements (related to various project goals), a value of $250K was used for the cost reduction. Estimated schedule change: Minor.
Review:	☐ Accept and include in project ☐ **Further study needed** ☐ Reject for this project

See exhibits on the following page. Note that exhibits are schematic in nature only, intended to convey the two concepts discussed above.



(Above) Depiction of minimization of excavation. The wavy planter wall is intended to duplicate the pattern of the planter to the east of Forest Avenue. The issue with this minimal case is that a "cavern" appearance is created from Crescent Boulevard. Additionally, no plaza is created.

(Below) Depiction of a balanced approach. By constructing a portion of the plaza (with associated excavation), some cost savings is realized, but the openness of the plaza creates the desired interface with Crescent Boulevard. This is the recommended option.



Value Engineering Proposal No. 21 – Light Harvesting Tunnel

Project:	Glen Ellyn Metra Station
Date:	June 14, 2023
Summary Description:	Light Harvesting for Tunnel
Description:	Rather than light the pedestrian tunnel during sunny days using lighting, harvest daylight and direct that light into the tunnel using fiberoptic strands.
Original Design:	At 10% design, no details had been developed for tunnel lighting.
Alternate Design:	Use collectors to harvest sunlight. The light is then transmitted using fiber optic strands to point lighting in the tunnel. While there are a number of residential and commercial brands, see the images of one collector on the following page. Note that the fiberoptic cables can transmit light more than 200 feet, so transmitting the length of the tunnel is within the limit of this sort of product.
Advantages:	Natural light during the daytime would be pleasing and save energy.
Disadvantages:	• Light harvesting using fiberoptic is still considered an emerging technology. • One report indicated the "pay back" period based on energy savings was over 100 years. • There is no easy location to mount the collector or collectors. (Directly adjacent to the platforms are the tunnel headwalls.)
Discussion:	Based on difficulty in finding a protected location to mount collectors, the added cost, the technical unfamiliarity (for contractors), and the lengthy payback period, this option is not recommended. LED lighting in the pedestrian tunnel with modern light controls is a lower cost, lower risk option. This lighting is required anyway for non-daylight times. Note there are other potential types such as light tubes. However, these cannot be placed in the railroad tracks/ballast area and doubtful if they can be placed in the platforms. Additionally, methods that require penetrations through the tunnel (including tunnel waterproofing) may cause structural or maintenance issues.
Summary:	**Not recommended.**
Review:	☐ Accept and include in project ☐ Further study needed ☐ **Reject for this project**

Rooftop collector on a commercial office building.

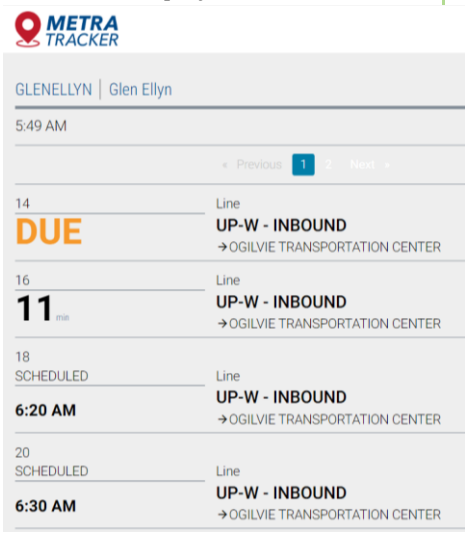
The collector focuses sunlight to fiberoptic strands which can be directed to multiple locations in the building. Smaller versions in residential applications have been used to bring daylight into closets or other interior rooms. Fiberoptic strands can carry light for hundreds of feet with little loss.

Value Engineering Proposal No. 25 – Next Train Displays

Project:	Glen Ellyn Metra Station
Date:	June 14, 2023
Summary Description:	"Next Train" Displays

Description: To encourage use of existing businesses on Crescent Boulevard for coffee and food while waiting for trains, either have a next train display on Crescent Boulevard or have businesses (e.g., Starbucks, Dunkin') mount a next train display inside.

Beyond just Metra, existing data consolidation sites can show Pace bus and Uber/Lyft. (In downtown Chicago, bikeshare locations and number of bikes available are shown in addition to Metra and CTA times.)



Original Design: Not addressed in the 10% conceptual plan.

Alternate Design: By providing next train information at vendors (especially on Crescent Boulevard, the inbound side of the tracks), customers can be better informed about when to leave the business.

Advantages: This is suggested if the vendor space within the station is removed. Customers may be encouraged to utilize the station-area businesses with good arrival time information.

Disadvantages: Businesses may not be interested. With mobile devices, this next train formation may be redundant (meaning many customers have this information readily available on their smart phones).

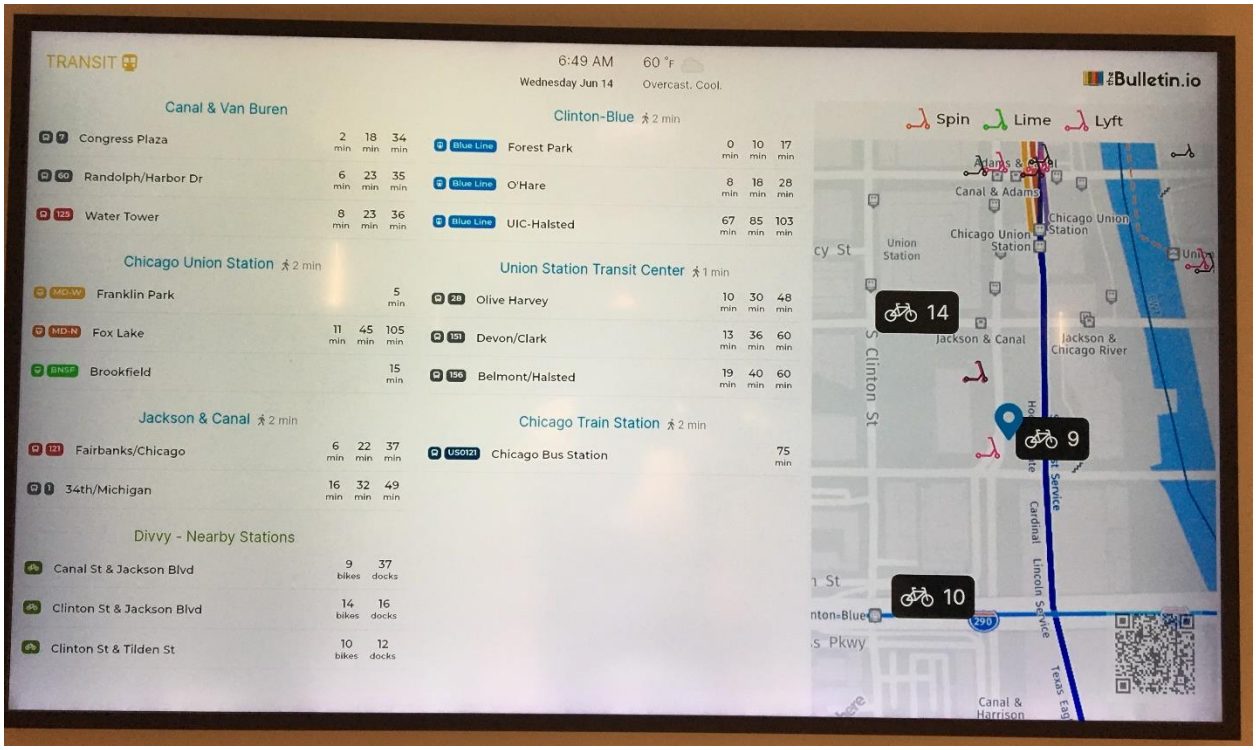
Discussion: Best way to implement may simply be to make owners aware of the available technology. If they are interested and they believe it may help generated a larger customer base, they can implement.

Not recommended as a project cost or task.

Summary:
Estimated cost increase in Design Phase: None
Estimated capital cost change: None to project
Estimated schedule change: None

Review:
☐ **Accept and include in project**
☐ Further study needed
☐ Reject for this project

Combined Transit Display at a Downtown Chicago Apartment Building



From a website "Bulletin.io." Displays Metra, CTA, bikeshare locations, and even locations of individual scooters. This screen cycles with advertising and announcements.

Value Engineering Proposal No. 27 – Eliminate 24-hour Station Operation

Project:	Glen Ellyn Metra Station
Date:	June 14, 2023
Summary Description:	Eliminate 24-Hour Station Operation
Description:	Although space requirements would not likely change, propose coordinating with Metra and the Glen Ellyn Police Department regarding closing the station building, at minimum, during late night hours.
Original Design:	Metra standards call for the station or a portion of the station to be open 24-hours.
Alternate Design:	Since the station is not staffed 24-hours, having the station open around the clock is a perceived security issue. Propose closing, at minimum, when trains are not operating. Closed hours can be adjusted, as presently, during the winter season.
Advantages:	Improved security. Decreased risk of late-night vandalism. Likely decrease cleaning cost.
Disadvantages:	This may be a customer inconvenience in cooler or colder weather when waiting for a train or waiting to be picked up at the station.
Discussion:	On weekdays, the last outbound Metra train is scheduled for 1:27AM. The first inbound train is scheduled for 4:50AM. At minimum, between these times, no station-related activity should be taking place. The closed hours should likely start earlier in the evening, except perhaps during winter weather, since outbound trains are generally spaced at one-hour intervals and alighting passengers are heading directly to cars or meeting their rides. The existing station is not open 24-hours.
Summary:	Estimated cost increase in Design Phase: None – only Metra Coordination Estimated capital cost change: None – does not affect required area. Maintenance/Operating Cost: Slight decrease (not estimated) Estimated schedule change: None
Review:	☐ **Accept and include in project** ☐ Further study needed ☐ Reject for this project

Value Engineering Proposal No. 29 – Station Skylights

Project:	Glen Ellyn Metra Station
Date:	June 14, 2023
Summary Description:	Design Skylights in the Roof
Description:	Further expansion of the description as necessary here.

Examples of Skylight Installations

Example of Hail Damaged Skylight at the CTA Kedzie Bus Garage

Original Design:	The original design included a pitched roof, no skylights.
Alternate Design:	Design skylights in the roof of the station.

Advantages:	More Natural Light is let into the building. The interior space seems larger. Creates opportunity to utilize daylight harvesting controls to save electricity used for lighting during sunny days.
Disadvantages:	Creates an opportunity for leaks to occur. During hail events the skylight could be severely damaged Allows for heat to escape during the winter increasing heating costs.
Discussion:	I worked in the CTA Facilities Maintenance Engineering department. Part of my responsibilities was to inspect the roofs and exterior walls of all the facilities in the CTA system. I averaged 60+ structures a year including the large bus and rail maintenance facilities. I can tell you that skylights are great in the beginning of their life cycles. They provide natural light as advertised. I also can say about 15-20 years into their life cycle that they turn into a constant maintenance headache. Most of the skylights I came across in the 15+ year old range were leaking or had sustained some kind of damage most likely from hail or other falling debris. Daylight harvesting sensors are finicky and must be carefully designed, calibrated, and maintained to get the full benefit. http://lightingcontrolsassociation.org/2006/03/13/why-do-daylight-harvesting-projects-succeed-or-fail/ Based on potential maintenance issues as the skylight age, this item is **not recommended.** The team believed there are better alternatives to bringing in natural light with much less risk related to future maintenance. ***Note:*** For windows, especially if clerestory windows are used, make windows openable for air circulation.
Summary:	Estimated cost increase in Design Phase: (Minimal Design Cost Implications if any) Estimated capital cost change: (Increase in Cost) Estimated schedule change: (Minimal Schedule Impact Assuming a Modular "off the shelf" system is selected)
Review:	*(Not recommended for consideration)* ☐ Accept and include in project ☐ Further study needed ☐ **Reject for this project**

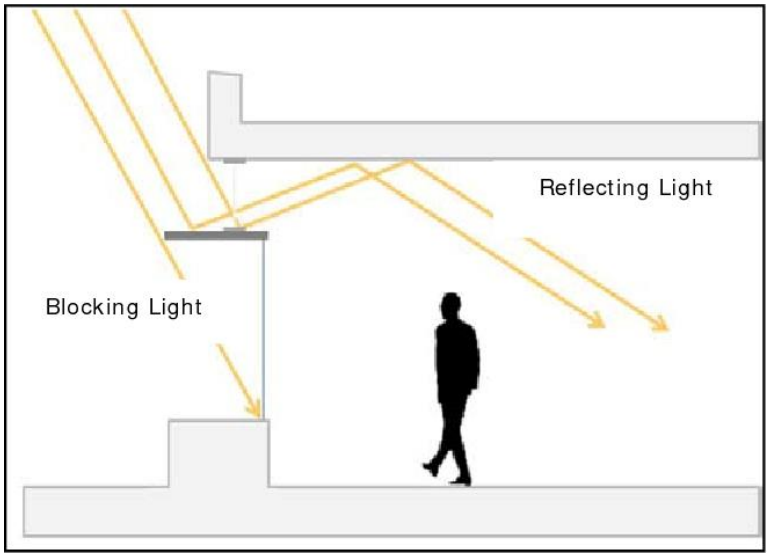
Value Engineering Proposal No. 30 – Passive Solar Optimization

Project:	Glen Ellyn Metra Station
Date:	June 16, 2023
Summary Description:	Use building features to (1) decrease heat load in summer and (2) bring in natural light in the winter.
Description:	The roof overhang will naturally decrease heat load when the sun angle is high. When the sun angle is low, light shelves will help bring natural light into the station. Other features may also be used.
Original Design:	At 10% design, this level of detail has not been developed.
Alternate Design:	Use light shelves in the design.

Light shelves bounce light off the shelf further into the interior of the building.

Advantages:	The roof overhang (for reducing summer heat load) and light shelves are passive measures to decrease energy use. Studies show user satisfaction is higher with greater incorporation of natural lighting. Passive daylighting features combined with lighting technology has been measured to reduce lighting cost by up to 70%. (All buildings, site orientation, and climate setting are different.)
Disadvantages:	Light shelves may need to be strategically placed related to architectural appearance.
Discussion:	Other passive measures are possible. Suggest allowing the architecture team to incorporate those appropriate for this building and the building orientation.

Summary:	Estimated cost increase in Design Phase: Negligible. Estimated capital cost change: Negligible. Estimated change in operating cost: Minor (related to cost of cooling and cost of lighting) – not able to quantify. Estimated schedule change: None.
Review:	☐ Accept and include in project ☐ **Further study needed** ☐ Reject for this project



An exterior light shelf can both block light causing a heat load and reflect light to provide natural lighting.

Value Engineering Proposal No. 32B – Solar Panels

Project:	Glen Ellyn Metra Station
Date:	June 14, 2023
Summary Description:	Use of Solar Panels
Description:	Further expansion of the description as necessary here.
Original Design:	Design did not utilize solar panels.
Alternate Design:	Utilize Solar Panels

Advantages:

Solar energy is a renewable energy source.

Solar energy can reduce the electrical utility bill via ComEd net-metering.

There are potentially grant programs available to help fund these types of installations.

Disadvantages:

There is a high initial cost.

Solar Energy is dependent upon the sun.

Solar Energy Storage is expensive. (In many applications, the owner elects not to store energy during the day to utilize at night.)

Solar panels are susceptible to supply chain issues.

The world needs more diverse solar panel supply chains to ensure a secure transition to net zero emissions - News - IEA

Solar Panels or (PV) panels require rare earth minerals a part of their manufacturing process which is a detrimental effect on the environment and because of their scarcity presents supply chain issues.

	Are rare earths used in solar panels? – pv magazine International (pv-magazine.com) A Scarcity of Rare Metals Is Hindering Green Technologies - Yale E360
Discussion:	The allure of utilizing PV panels is an exciting opportunity. The most successful projects that I am aware of collect solar energy and sell it back to ComEd via a net-metering. (Electrical room size would likely increase for the equipment needed to distribute and sell back.) There is an increase in initial cost on the design and construction side. Despite (PV) panels being designated a "green" technology their manufacturing creates a negative environmental effect due to the mining operations required to obtain the rare earth mineral needed to build them. Not So "Green" Technology: The Complicated Legacy of Rare Earth Mining (harvard.edu) **Recommendation: While renewable energy is important, the added capital cost is an obstacle to the use of solar panels. If grant funding can fund the majority of additional cost, this idea may be considered. Without grant funding, implementation of solar panels may not be affordable with this project.**
Summary:	Estimated cost increase in Design Phase: (There would be an increase in design costs) Estimated capital cost change: (Increase in Cost) Estimated schedule change: (A risk of a severe schedule impact is high due to lead times and supply chain issues)
Review:	☐ Accept and include in project ☐ **Further study needed** ☐ Reject for this project

Value Engineering Proposal No. 33 – Potential Funding Sources

Project:	Glen Ellyn Metra Station
Date:	June 13, 2023
Summary Description:	Potential Funding Sources
Description:	List of Potential Funding Sources to Explore
Original Design:	N/A
Alternate Design:	N/A
Advantages:	N/A
Disadvantages:	N/A
Discussion:	CMAQ – Submit a cost increase request to CMAQ for additional funding to cover funding short fall due to inflation. The timing of this will need to be coordinated. Preferably this will occur after the 60% estimate at the earliest. Metra Funding – The funding previously committed by Metra was meant to cover the platforms and other UPRR force account work. A recommended strategy is for the Village to get a commitment from Metra to fund the platforms and all UPRR force account work to simplify the funding and coordination process. ICC – Submit a cost increase request from ICC later on in the design process. DuPage County Water Quality Improvement Program Grant – Work with Jackie and the civil team to see if permeable pavers, bioswales, drywells, etc. can be utilized in this project and are eligible for this grant. Deadline was 1/6/2023. Check to see if there will be another NOFO.

Illinois Clean Energy Grant - The Illinois Clean Energy Community Foundation supports projects in categories where incentives are determined on a case-by-case basis: Solar Thermal, Biomass, Advancing Renewable Energy, and Emerging Technologies.

The Foundation gives priority to projects that:

Feature a strong education and outreach component, including permanent educational signage, displays, and other publicity materials

“renewable energy resources” includes energy from wind, solar thermal energy, photovoltaic cells and panels,

Funding for Solar Thermal is limited to up to $100 per square foot of collector area or up to 50% of the project cost, whichever is less.

Smart Energy Design Assistance Center (SEDAC) – Reach out to SEDAC to see if they can help partner with Nicor or other utilities to see if funding can be secured for geothermal installations. They also have funding available for PV Panels.

Summary:	Estimated cost increase in Design Phase: (Minimal Design Cost Implications if any) Estimated capital cost change: (Increase in Cost) Estimated schedule change: (Minimal Schedule Impact Assuming a Modular "off the shelf" system is selected)
Review:	☐ **Accept and include in project** ☐ Further study needed ☐ Reject for this project

DuPage County Water Quality Improvement Program Grant

Water Quality Improvement Program (dupagecounty.gov)

Illinois Clean Energy Grant -

Other Renewables – Illinois Clean Energy Community Foundation

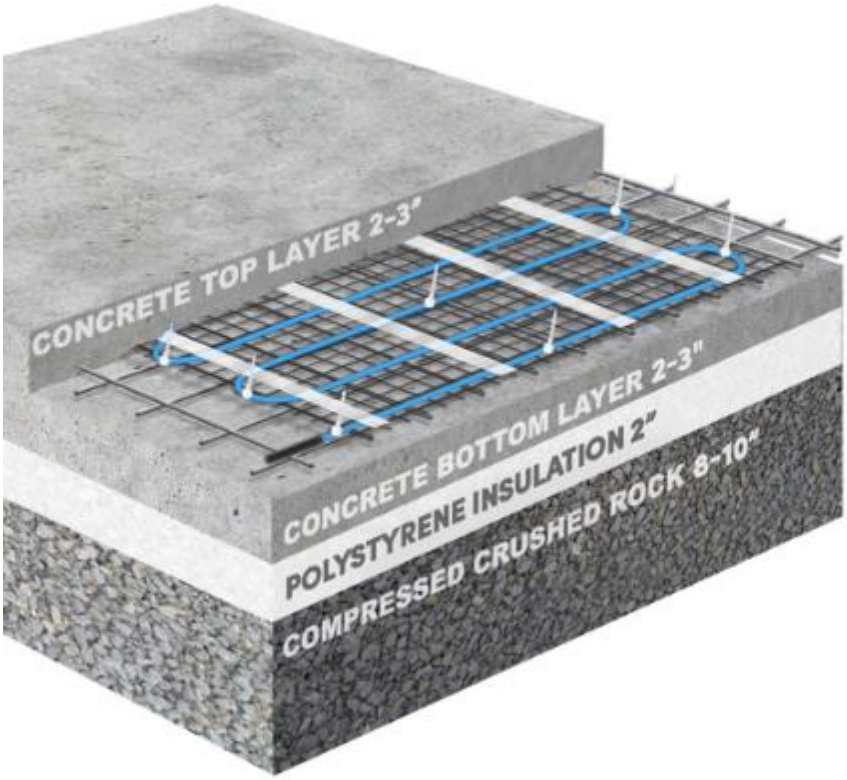
SEDAC

Incentives & Funding Opportunities – SEDAC | Smart Energy Design Assistance Center at The University of Illinois, Urbana-Champaign

Value Engineering Proposal No. 36 – Snowmelt Systems

Project:	Glen Ellyn Metra Station
Date:	June 16, 2023
Summary Description:	Snowmelt System for Stairs and Ramps
Description:	Installing Hydronic or Electric heating system at stairs and ramps.
Original Design:	No detail related to potential snowmelt at 10% design.
Alternate Design:	Add radiant floor heating systems at stairs and ramps. The intent is to increase safety (by preventing snow accumulation and refreeze of melt water), decrease the snow removal cost, and decrease salt damage to the concrete stairs, ramps, and adjacent walls. (Decreased salt usage also has an environmental benefit.)
Advantages:	1. Minimize accidents due to slippery surfaces. 2. Reduce snow removal - Lower maintenance labor cost. 3. Reduce the use of salt, sand and potentially the canopy coverage area.
Disadvantages:	1. Short life expectancy: only 15 – 20 years. 2. Increase cost of utility bills – more costly for Electric heated system. 3. Manual operation (on/off) before and after snowing (unless automated or partially automated). 4. Heating system is under pavement surfaces and hard to be replaced or repaired. 5. May create an issue where stairs or ramps transition to an unheated plaza or walkway. 6. Additional boiler and space are needed for Hydronic heated system. 7. With blowing snow, some snow removal is typically still required.
Discussion:	Clearly an added capital, operations, and future maintenance cost. Direct calculation of savings based on reduced snow removal cost, improved safety, and reduced concrete deterioration based on decreased salt use is not possible. Life expectancy of snowmelt systems is an issue since replacement means replacement of the stairs and ramps.
Summary:	Estimated cost increase in Design Phase: Minor change. Estimated capital cost change: May approach $1M (including all ADA ramps, stairs, and supporting boiler room and boiler system if the hydronic option is selected). Estimated schedule change: Some additional installation time, but not detrimental to the construction schedule.
Review:	☐ Accept and include in project ☐ **Further study needed** ☐ Reject for this project

Hydronic floor heated System – glycol is circulated in the tubes.



Electric floor heated System

Heated Railway Platforms tested to avoid ice accident (Minnesota case study)

UK Heated Eurostar Platform

Note that while there are multiple locations in Chicago with snowmelt systems, these systems tend to be at hotel or condo building entrances. These systems are ground level and have a much small area than platforms, stairs, ramps, and plazas at commuter rail stations. [There is a snowmelt system for an apartment building on Hubbard Street in Chicago. It is effective and generally can keep pace with the rate of snow fall. It is a ground-level system. However, no capital cost or energy cost information is available for this system for comparison.

Value Engineering Proposal No. 37 – Precast Box Culvert for Pedestrian Tunnel Construction

Project:	Glen Ellyn Metra Station
Date:	June 13, 2023
Summary Description:	Precast box culvert for tunnel (Cut and Cover)
Description:	A tunnel under the UPRR tracks will be constructed to serve as pedestrian crossing for the Project. One of the possible tunnel construction methods is to use precast box culvert method. The ground will be open cut; reinforced concrete box structures (segments) will be placed and assembled to form the tunnel; and tunnel will be backfilled; and the ground and surface will be restored.
Original Design:	The original design, at only 10%, does not have this level of detail.
Alternate Design:	None.
Advantages:	As the tunnel structure will be precast (pre-fabricated) off site, and the ground will be opened up, the construction can be performed rapidly. The cost will also be relatively low. Tunnel geometry can be designed to the requirements thus maximize the space use.
Disadvantages:	The open cut of ground for tunnel construction will very likely require the UPRR operations to be shut down during the construction; the project vicinity will also need to be closed.
Discussion:	A similar pedestrian underpass at Springfield MA was constructed using the precast box method. "*The precast underpass was installed over a six-day period between August 9–14, 2020 when the railroad line was taken out of service".* Unless UPRR operations can be shut down for several days for tunnel construction, this method will unlikely be acceptable. For this reason, a precast box using cut-and-cover is ***not recommended*** for this project. UPRR has indicated this sort of closure, even for just two days, would not be allowed. Three other options have been evaluated as options.
Summary:	Estimated cost increase in Design Phase: No. Estimated capital cost change: Minimal. Estimated schedule change: None.
Review:	*(Not recommended for consideration)* ☐ Accept and include in project ☐ Further study needed ☐ **Reject for this project**

The underpass at Springfield MA was constructed using the precast box method.

https://trainsinthevalley.org/springfield-underpass/

Value Engineering Proposal No. 38 – Box-Jacking Method for Pedestrian Tunnel Construction

Project:	Glen Ellyn Metra Station
Date:	June 14, 2023
Summary Description:	Box-jacking method for tunnel construction
Description:	The box-jacking tunneling method involves installation of precast reinforced concrete boxes as the tunnel, and the boxes are either made on-site or prefabricated and transported to the jobsite. The boxes are positioned where they will be installed and slowly pushed into place by high-powered hydraulic jacks. At the same time, excavation equipment is used from within the box to remove the soil in its path. To help it slide into place, each box section is lubricated on the outside.
Original Design:	Although not detailed in the 10% design, a technical memo had been prepared recommended the Sequential Excavation Method.
Alternate Design:	Box-jacking is the use of large jacks to push a precast concrete box through the embankment. This is similar to jack-and-bore for a steel pipe, except the concrete box is more substantial.
Advantages:	• Causes minimum disruption to UPRR traffic and operation. • The tunnel dimensions can be better matched to the desired internal size. (There is not excess space as with a cylindrical steel pipe.) • The inside finish can be prepared at the pre-casting plant. Additionally, conduits and insets for lighting can be cast into the box sections.
Disadvantages:	The logistics and equipment required for the method could be extensive; the areas to be used as construction platform (launch pit and receive pit) could be large. Special attention is required for the waterproofing of the joints. The jacking equipment required is larger than required for a jack-and-bore steel pipe.
Discussion:	Given the limited area in the project site available to be used as construction worksite, the method will need further evaluation. The existing loose/weak soils may pose challenges to maintain excavation face stability and mitigation measures may be required. This latter point is related to risk of settlement of the UPRR tracks during the box-jacking operation.
Summary:	Estimated cost increase in Design Phase: No. Estimated capital cost change: Minimal. Estimated schedule change: None.

Review:	☐ Accept and include in project ☐ Further study needed ☐ **Reject for this project**

Example: Workers execute the box-jacking method in Florida (03/28/2021). This is much larger in scale than would be used for a pedestrian tunnel.

Source: https://www.rtands.com/track-construction/watch-brightline-executes-box-jacking-method-under-s-r-528/ (accessed 06/14/2023)

Box jacking takes larger jacks and creates larger jacking forces that the jacking of a steel pipe.

Value Engineering Proposal No. 39 – Jack and Bore Method for Pedestrian Tunnel Construction

Project:	Glen Ellyn Metra Station
Date:	June 14, 2023
Summary Description:	Jack and bore pipe for tunnel construction
Description:	The jack and bore tunneling method is used to construct tunnels under existing structures like roadways and railways. Powerful hydraulic jacks push well designed pipes through the ground behind a shield. Whilst the pipe is pushed through the earth, excavation/boring takes place within the shield to remove the soils.
Original Design:	Although not detailed in the 10% design, a technical memo had been prepared recommended the Sequential Excavation Method.
Alternate Design:	Jack-and-bore a large (14' diameter) pipe from a jacking pit on one side of the railroad tracks to a receiving pit on the other side.
Advantages:	No disruption to traffic or pedestrians; minimum surface disruption above the tunnel.
Disadvantages:	The logistics and equipment required for the method could be extensive; the areas to be used as construction platform (launch pit and receive pit) could be large. The circular shape of the pipe (tunnel) may result in deeper tunnel and larger volume of soil to be removed, thus it will be less efficient for tunnel space use.
Discussion:	Given the limited area in the project site available to be used as construction worksite, the method will need further evaluation.
Summary:	Estimated cost increase in Design Phase: No. Estimated capital cost change: Minimal. Estimated schedule change: None.
Review:	☐ Accept and include in project ☐ Further study needed ☐ **Reject for this project**

Example: Fossil Creek Trail BNSF Pedestrian Tunnel (July 2016 – January 2017)
Source: https://www.fcgov.com/utilities/what-we-do/fossil-creek-tunnel (Accessed 06/14/2023)

The Taylor Avenue pedestrian tunnel placed using jack-and-bore.

From the start of jacking to the breakthrough was less than 48 hours.

Value Engineering Proposal No. N/A – SEM Method for Pedestrian Tunnel Construction

Project:	Glen Ellyn Metra Station
Date:	June 14, 2023
Summary Description:	Sequential Excavation Method (SEM) for tunnel construction

Although this is the proposed method at the time of the VE study (so not a VE idea), this description has been included in the report for comparison with the other methods.

Description:	The SEM tunnelling method is considered a mining or "hand" tunneling method. It is characterized by the sequential removal of ground material followed by the installation of initial tunnel support. Pre-support measures may often times need to be provided to protect the next advance before excavation and installation of initial support measures take place. Methods like pipe arch/canopy are among commonly used techniques for pre-support to improve the ground ahead.
Original Design:	Although not detailed in the 10% design, a technical memo had been prepared recommended the Sequential Excavation Method.
Alternate Design:	None.
Advantages:	The method would cause minimum disruption to UPRR traffic and operation and surroundings. The tunnel excavation geometry can be made of composite curves thus increase the efficiency of the tunnel cross section. Settlements can be under control through carefully designed construction methods and sequences. The logistics requirements would be less extensive than the jacking methods.
Disadvantages:	The construction duration may be relatively long. Cost can be relatively high.
Discussion:	The required areas for worksite may be smaller than those required for the jacking methods. The SEM is an "observational" method; versatile toolbox measures can be implemented when unfavorable ground conditions (such as soft/weak soils) are known to exist or encountered.
Summary:	Estimated cost increase in Design Phase: No. Estimated capital cost change: Some. Estimated schedule change: None.

Review:	☐ **Accept and include in project** ☐ Further study needed ☐ Reject for this project

SEM tunnel example: Virginia General Assembly Building Pedestrian Tunnel, Richmond, VA

Source: http://www.bradshawcc.com/projects/408/view/ (Accessed 06/14/2023)

Progress may be 1 to 3 days per 3-ft of advancement. As stated in the description above, the schedule for this method is relatively long. After completion of the tunnel, the finishing of the tunnel lining still would need to be completed. This method would likely take one to two months from the start of the sequence (not including preparatory work) to breakthrough.

Value Engineering Proposal No. 40 – Retaining Wall Options

Project:	Glen Ellyn Metra Station
Date:	June 14, 2023
Summary Description:	**Modular Block Walls for Retaining Walls**

Description: Retaining walls serve numerous purposes; erosion control, creating more usable space, and from a visual standpoint they add beauty. Modular Block walls opposed to natural stone or timber allows for more options (shapes, colors, sizes, textures, and patterns), easier installation, environmentally friendly, and they are long lasting.



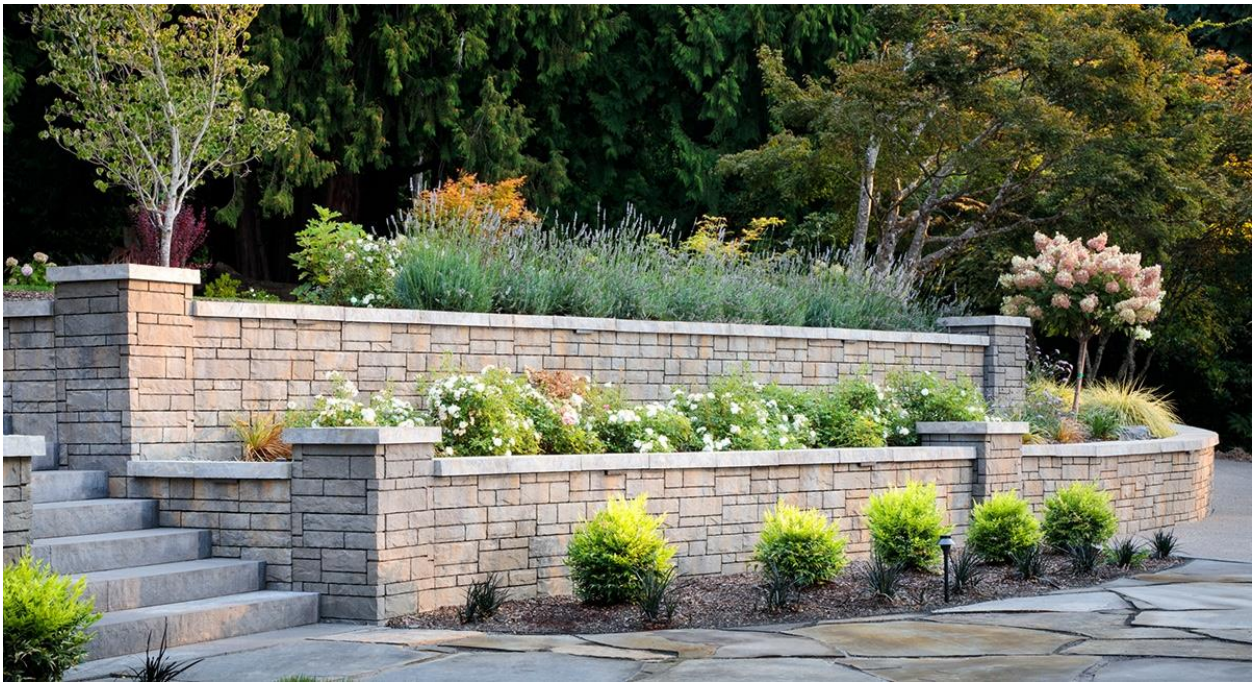
Original Design: The original design calls for the use of normal lateral retaining walls (cast in place). Typically, these walls would have a brick veneer and seating caps (meaning a level, concrete cap on the wall where people can sit).

Alternate Design: Use of Modular block walls for retaining walls. (Note: There are locations where cast-in-place walls are still required including at the headwall area for the pedestrian tunnel.)

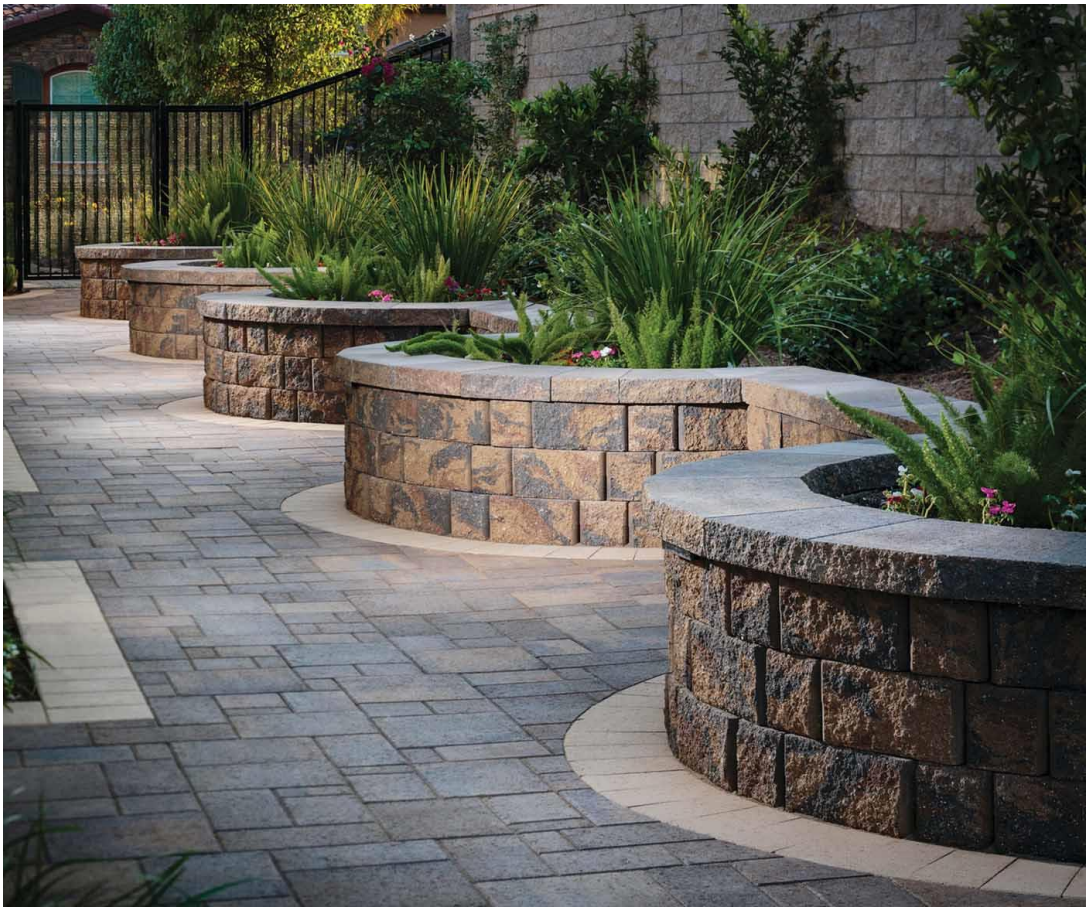
Advantages: Comparing Modular block retaining walls versus natural stone or rock; natural rock retaining walls are more labor intensive and costly to install. Comparing Modular to Timber, modular walls are not chemically treated whereas Timber releases chemicals into the ground that can end up harming surrounding vegetation. Timber has a much shorter life span compared to other wall options. Compared to cast-in-place walls, modular block walls typically cost less and take less time to install. Overall Modular construction offers better quality structures, while being less expensive and easier to install than other options.

Disadvantages: There may be an architectural mismatch between brick veneer seat walls and the modular block landscaping walls.

Discussion: The use of block walls will be limited. The walls may only be appropriate as low-height separation of landscaping from the plaza, although the following two example images show potential flexibility.



Modular block walls can include seat walls and can be adapted to various landscaping requirements.



Modular block walls can follow curved patterns in keeping with many desired landscaping requirements.

Summary:	Estimated cost increase in Design Phase: None expected. Estimated capital cost change: Modular block walls typically are lower cost than cast-in-place, brick-veneer walls. However, in small quantities, a significant reduction in cost may not be realized. Estimated schedule change: None.
Review:	☐ Accept and include in project ☐ **Further study needed** ☐ Reject for this project

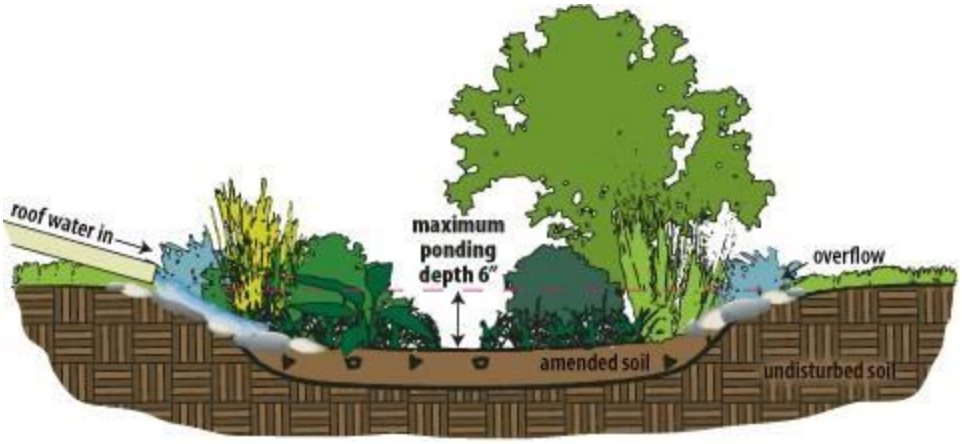
Note: The largest obstacle may be potential mismatch of wall appearances in different portions of the project area.

In combination with the option to reduce required excavation on the north side, modular block walls may be ideal if terracing is needed within the landscaping.

Value Engineering Proposal No. 41 – Landscape Stormwater Management Options

Project:	Glen Ellyn Metra Station
Date:	June 14, 2023
Summary Description:	Use Landscaping near Station Building for Stormwater Management
Description:	In residential applications, this idea is termed "rain gardens." It is the design and use of the landscaping to act as stormwater detention, allowing slow release, use of plants, evaporation, and infiltration to ground water (or slow release to the storm sewer system).
Original Design:	The 10% design concepts do not provide this level of detail.
Alternate Design:	Design of the landscaping to contribute to stormwater management to the practical extent possible. Planters would typically still have stormwater overflow inlets since, periodically, rainfall intensities will exceed the design storage possible at the site.
Advantages:	Some decrease in landscaping irrigation requirements. Decrease in release rate and potentially release volumes for stormwater management design. Cost is typically minimal to route roof drainage to the planters.
Disadvantages:	Few cited in literature review if well designed and built. Landscaping must be maintained and managed (as with all the streetscape landscaping).
Discussion:	Rain gardens are commonly promoted as a simple and aesthetic means for residential properties to be involved in sustainability related to stormwater management. Directing stormwater to the groundwater has multiple benefits compared to routing to a storm sewer system. See literature on the topic for more detail. This is an example of a sustainability ("Green") item which, nowadays, is typically important for public perception of the project and owner.
Summary:	Estimated cost increase in Design Phase: Minimal – may require involvement of Landscape Architect with experience in stormwater management. Estimated capital cost change: Minimal if used in landscaping adjacent to the station building. Estimated schedule change: None
Review:	☐ Accept and include in project ☐ **Further study needed** ☐ Reject for this project

Rain Garden Typical Section



Note that this can be accomplished within planter walls. Bottom must be open to the ground or have an underdrain feature to slowly release water to the storm sewer system.

The USEPA has a website with links and resources:

https://www.epa.gov/soakuptherain/soak-rain-rain-gardens#:~:text=Planted%20with%20grasses%20and%20flowering,song%20birds%20and%20other%20wildlife.

Value Engineering Proposal No. 45 - Construction Engineering

Project:	Glen Ellyn Metra Station
Date:	June 14, 2023
Summary Description:	Evaluate the $4M placeholder for Construction Management
Description:	Construction Engineering was estimated at $4M. Revisit ways to reduce cost.
Original Design:	Assumed as 10% of construction cost
Alternate Design:	Estimate based on number of engaged professionals and time. Assume 1.0 FTE Con. Eng. 5 (say $65/Hr) and 1.0 FTE Asst. RE (say $40/Hr) for site civil, 1.0 FTE Con. Eng. 6 (say $70/Hr) and 1.0 FTE Asst. RE (say $40/Hr) for depot/shelters for 2.0 years of which that payroll with overhead and profit (2.8X payroll) would be ~$2.5M. Need to add in material testing allowance ($75K), part time project manager ($290K), vehicle charges ($135K), misc. reimbursables ($100K). Total would be ~$3.5M – 3.1M.
Advantages:	Reduced Phase III cost by $500-$900K.
Disadvantages:	Do not want to streamline staffing too much to the point where inspections and project management are compromised. Did not include items that some may want such as time lapse imagery, extensive PR, some firms may not like having limited senior management staff but this has worked for the Village on other projects.
Discussion:	TBD.
Summary:	Estimated cost increase in Design Phase: None. Estimated capital cost change: Significant could approach $900K. Estimated schedule change: None.
Review:	☐ **Accept and include in project** ☐ Further study needed ☐ Reject for this project

Value Engineering Proposal No. 46 & 47 - Construction Staging / Packaging Options

Project:	Glen Ellyn Metra Station
Date:	June 15, 2023
Summary Description:	Bidding Strategy and Packaging

Description: To accomplish the project at the lowest possible cost while maintaining quality and schedule.

Original Design: Package all work into one bid (except platforms by UPRR). The opinion of probable cost at 10% is $34.2M (Construction Only). At 10%, the actual cost is likely from 10% under to 25% over this opinion ($30.8M to $42.8M). These figures do not include reductions based on the VE workshop.

Alternate Design: The team should consider splitting the project into multiple bids, work packages, and methods of design, delivery, and construction.

Potential ways to split up the work are listed below:

1. Early Out package 1 could include utility work (water/sewer/fiber/electric) completed as part of a larger utility contract the Village typically puts out each year.
2. Package 2 could include platforms (by Metra/UP) completed separately from the main project
3. Package 3 could be the pedestrian tunnel, either standalone or with the ramps/stairs/etc. to be usable.
4. Package 4 could be building, warming shelters, remaining landscaping, retaining walls, etc.
5. Package 5 could be streets/parking lots.

Advantages: The advantage of doing this is cost, and potentially some overall savings on schedule.

Disadvantages: The disadvantages include:

1. Longer project overall, longer disruption to the area.
2. Multiple prime contracts would need to coordinate, and this usually leads to some “finger pointing” between them.
3. Construction Management would be more challenging and potentially more expensive.
4. There may be some final restoration work needed at the end of all of the contracts.
5. Funding would need to be reviewed to ensure this does not affect funding.
6. More time/money would be needed in design to package the projects this way, including time for front end specs, bidding, bid evaluations, etc.

Discussion: The VE team discussion stated:

- Because this has a federal funding component, all aspects using federal funding need to be one contract.

	• It would be possible to break out non-participating items is, by breaking them out separately, there was some advantage related to total cost, overall schedule, or decreasing disruption. • Advanced relocation of the fiberoptic cable is a possibility for a separate (advanced) work phase as this would decrease risk for the major work components.
Summary:	Estimated cost increase in Design Phase: This will increase design costs Estimated capital cost change: This could decrease capital costs Estimated schedule change: Schedule change to be determined. ***Recommendation:*** Use **one contract** except potential advanced utility relocation or separate non-federal components only if further examination during the design phase indicates a time, cost, or disruption advantage.
Review:	☐ Accept and include in project ☐ **Further study needed** ☐ Reject for this project

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Glen Ellyn Metra Station + Multimodal Access Improvements Program (MSMIP)

Value Engineering and Next Steps

September 11, 2023

CDM Smith

Value Engineering

VE Goals

- Reassess and confirm project needs and scope
- Increase the value of the project

$$Value = \frac{Function}{Cost}$$

Participants

- Glen Ellyn staff, Village officials
- CDM Smith core project team, subject matter experts

Value Engineering

$$Value = \frac{Function}{Cost}$$

Project Priorities

- Cost-efficient design
- Look and feel of the station as a focal point of downtown
- Future operations and maintenance costs
- Accessibility
- Sustainability
- Safety & Security
- Connection to downtown
- Shelter for passengers

Value Engineering

High Cost Components

- ❖ Station Building (including temp station)
- ❖ Platforms
- • Pedestrian Tunnel
- ❖ Site Work

High Worth Components

- • Pedestrian Tunnel
  - • Improves pedestrian accessibility, safety, connection to downtown, traffic patterns and economic development (coordination with US Bank site)
- ❖ Identified Value Mismatches

Value Engineering

Cost Reduction

- Align station square footage with new Metra Standards
- Reduce excavation at plaza
- Limit construction engineering scope
- Platform cost re-assessment

Cost-Neutral Value Adds

- Improve pedestrian interface at Crescent Boulevard
- Examine sustainable components related to stormwater management and natural lighting
- Use durable materials that decrease future maintenance costs

Value Engineering

VE related cost reduction summary

- Reduction of $8.4 million project cost
- Additional reductions are being explored

VE Related Cost Reductions

Item	10 PCT OPC	VE Adjustments	Cost Reduction
Station Depot - 2022 Cost	$9,127,000	$6,636,000	$2,491,000
Platform and Warming Shelters – 2022 Cost	$12,893,000	$8,636,000	$4,257,000
Plaza	$1,071,000	$1,026,000	$45,000
Underpass Inc. Ramps & Stairs	$12,261,000	$11,746,000	$515,000
Roadway, Parking, Site Work - 2022 Cost	$5,486,000	$4,916,000	$570,000
Construction Subtotals			**(*) $7,878,000**
Construction Engineering	$4,062,500	$3,500,000	$563,000
Project Totals			**$8,441,000**

** Approximately $3.3 million of the VE reductions is due to escalation and contingency reductions*

Value Engineering

Cost and Funding Comparison

- The total program funding gap was reduced by $11.4 million or 14%.
- A portion of the local funding is from the ICC-GCPF
- Village Staff and the Design Staff continue to work towards reducing the funding gap as the design progresses.

Program Costs		Current		Target	
Item	Total Cost	Outside Funding	Local Funding	Outside Funding	Local Funding
Station, Underpass, and Plaza	$24,864,498	$19,408,806	$5,455,692	$21,923,404	$2,941,094
Platforms & Shelters	$10,619,013	$4,000,000	$6,619,013	$7,583,111	$3,035,902
Streetscape and Utilities	$9,610,723	$0	$9,610,723	$2,000,000	$7,610,723
Totals	**$45,094,235**	**$23,408,806**	**(*)$21,685,429**	**$31,506,516**	**(*)$13,587,719**

** A portion of the local funding is from the ICC-GCPF*

Given the Village has been committed to funding design expenses for the project, another way to look at the funding level is based solely on construction and construction engineering costs. In this regard, outside project funding has increased from approximately 43% to 59%. This does not account for additional outside funding which the team is very optimistic in securing.

Grant Status

Glen Ellyn has secured
$23.4M
in grant funding

Prior Funding Commitments

- $14.4M CMAQ
- $2M ICC
- $4M Metra

Additional Awards in 2023

- $3M ICC Grade Crossing Protection Program

Potential Future Funding

- CMAQ/Shared STP
  - Top scored transit facility in Shared STP
  - On contingency list for additional **$10.8M**
  - Reapply in 2025 once design is advanced
- Metra contribution alignment (UP force account work)

Value Engineering

Impact of delays

- Grant sunset dates (award by 9/30/2026)
- Adversely impacts “project readiness” which impacts funding opportunities
- Construction cost escalation
  - Currently +/- 5% to 6% per year
  - Negates some or all of cost reductions from VE Study

Costs assume moving forward efficiently through final design

Station Design

Board Input Needed

- Affirmation of Architectural Style and Reduced Station Size
- Opportunity for Additional Feedback

Next Steps

- 10% Design Package Review
  - Zoning process
  - Architectural Appearance Commission
  - Plan Commission
  - Village Board
  - Engage Historic Preservation Commission in reviews

Station Design

Project History

- Public Outreach
- Stakeholder Engagement
- Historic Preservation Committee Support

Value Engineering Revisions

- Align station square footage with new Metra Standards
- Improve pedestrian interface at Crescent Boulevard / Forest Ave
- Potential to reduce excavation at plaza

Next Steps

- 10% Design Package
- Zoning Process

Station Design

1926 Glen Ellyn Station – Design Inspiration

CDM Smith Conceptual Rendering

Project History

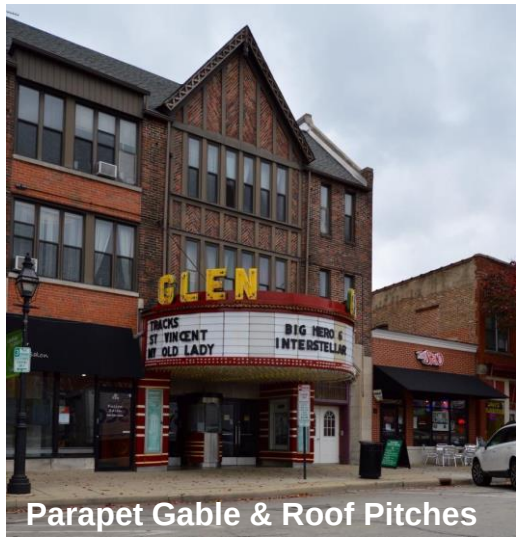
- Public Outreach
  - Public Workshop
  - Survey with over 800 responses
- Stakeholder Engagement
  - Capital Improvements Commission
  - Board of Trustees
  - Historic Preservation Commission provided letter of support noting the project will be more fitting than existing station within Glen Ellyn's Historic District
  - Consulting Parties

Station Design

Harmonious design elements and materials with other notable downtown buildings

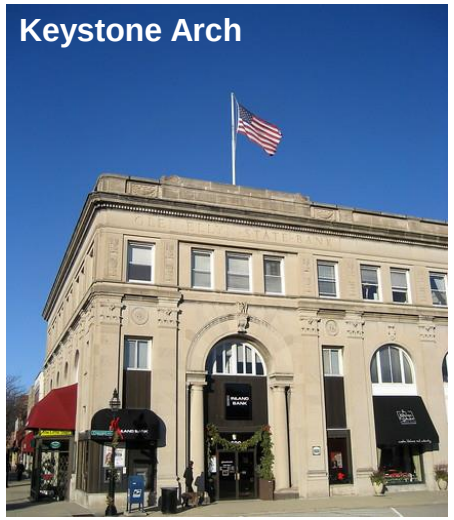
CDM Smith Conceptual Rendering

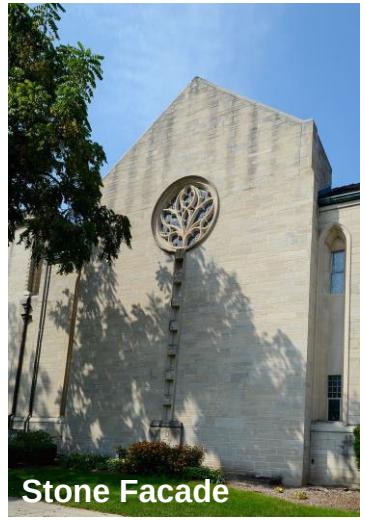
Design References

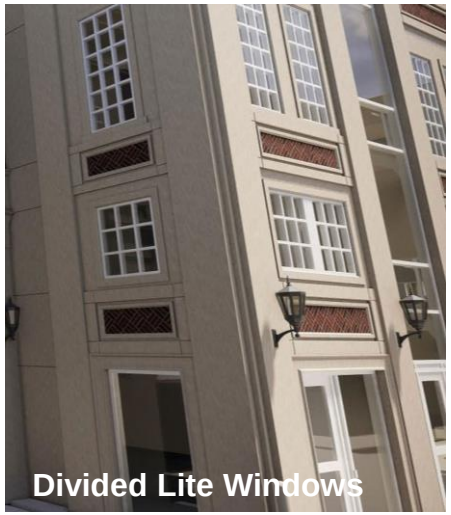


Parapet Gable & Roof Pitches

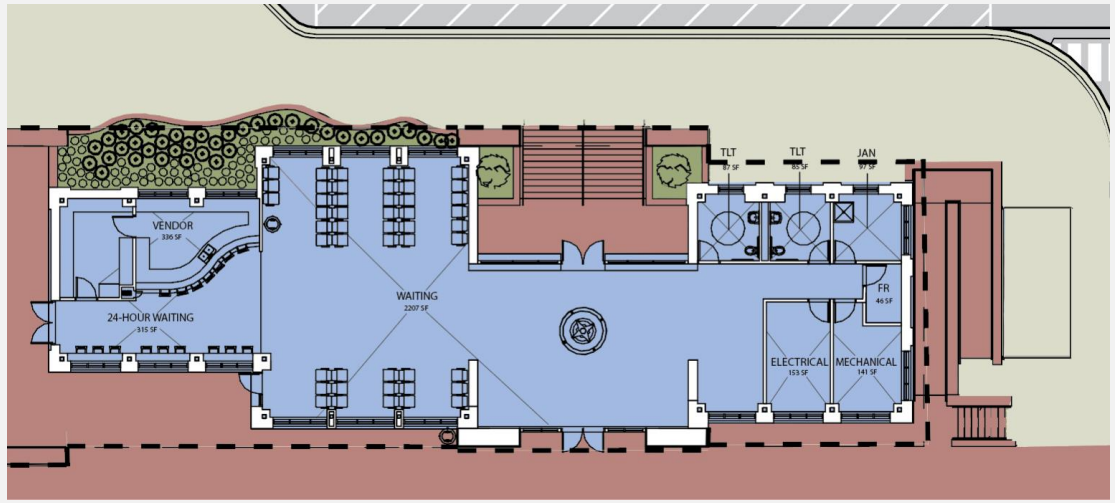

Limestone & Brick


Keystone Arch

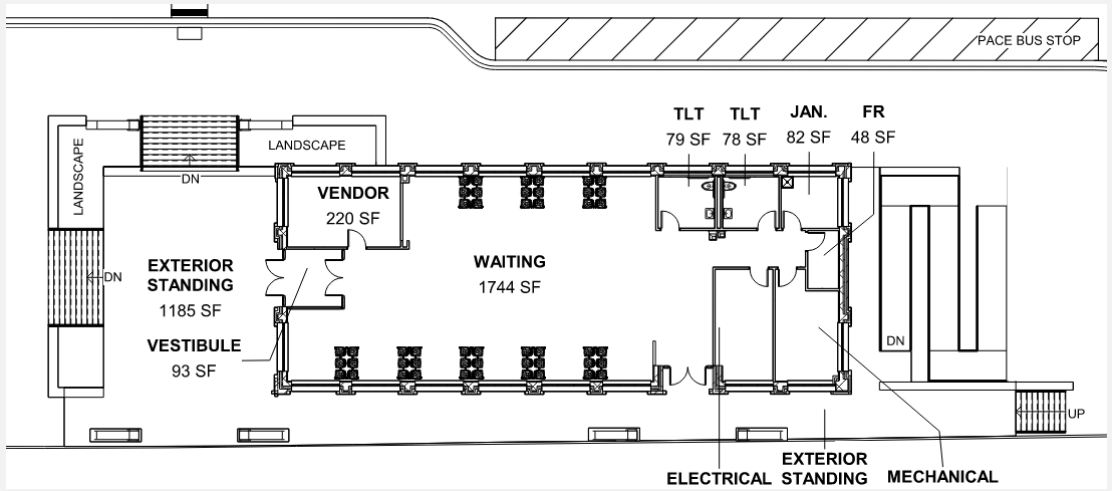

Stone Facade


Divided Lite Windows

Station Design



Previous conceptual station layout – Approx. 3,600 SF



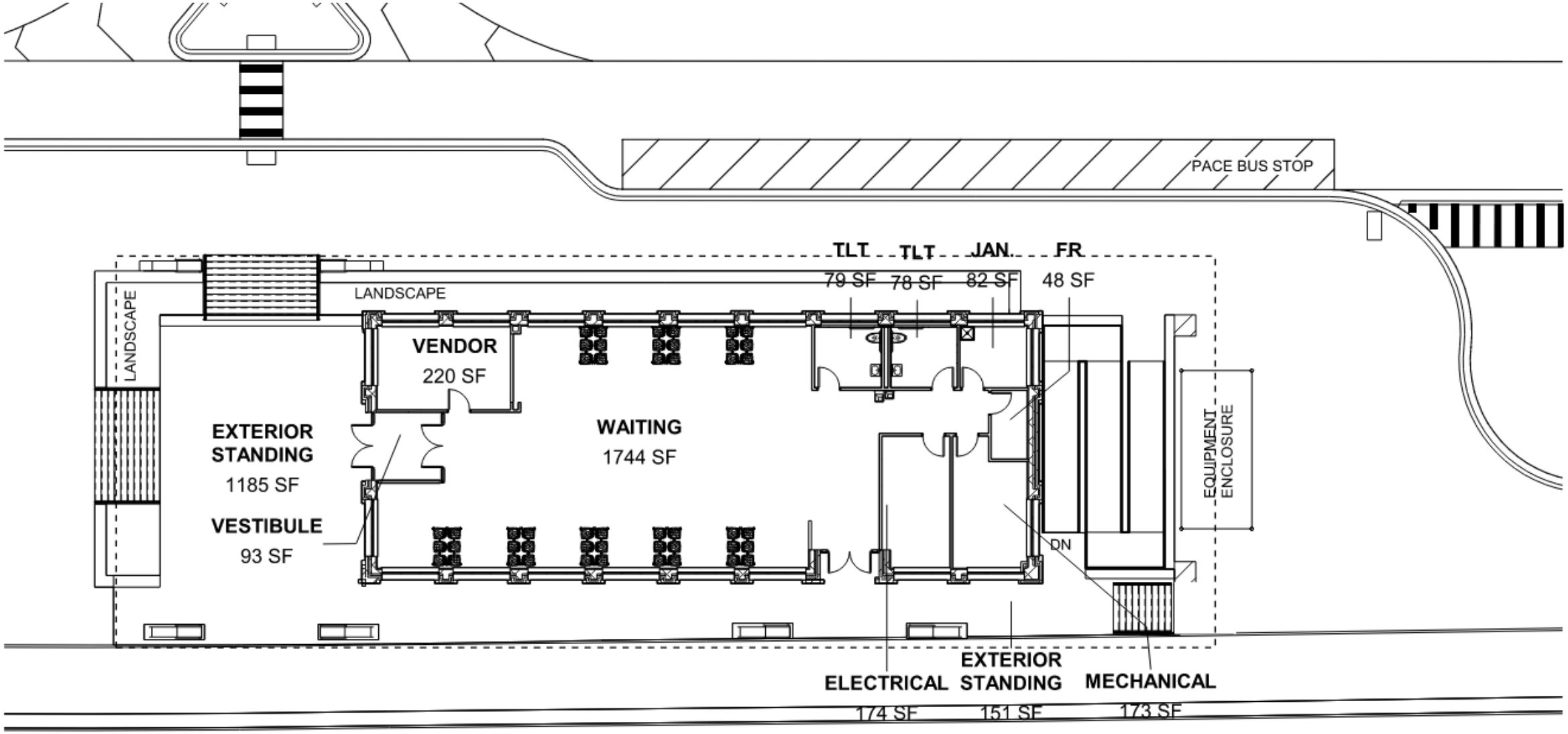
Conceptual reduced station layout – Approx 3,000 SF

Value Engineering Revisions

- Alignment with new Metra Standards
  - Waiting area requirements published post-pandemic in 2022, using current growth projections from Metra
  - Reduction of 600 SF and a simplified footprint in the same architectural style result in $2.5M savings
- Improve pedestrian interface at Crescent Boulevard / Forest Ave
  - Align entrance with Forest Ave
  - Improved access from Pace Bus stop

Station Design

Alternate #1

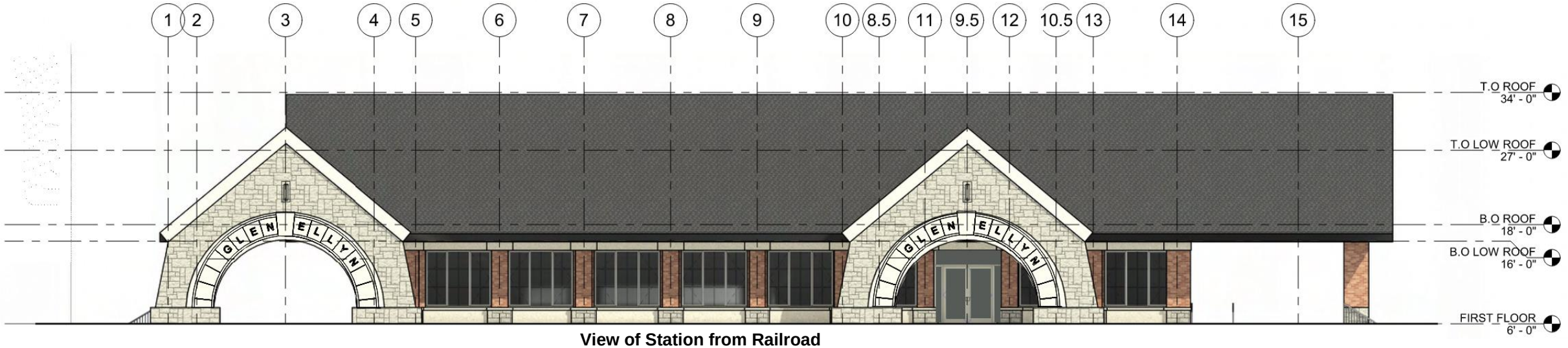


Station Design

Alternate #1a

3 NORTH EXTERIOR ELEVATION - PRESENTATION - VE OPTION 1
1/8" = 1'-0"

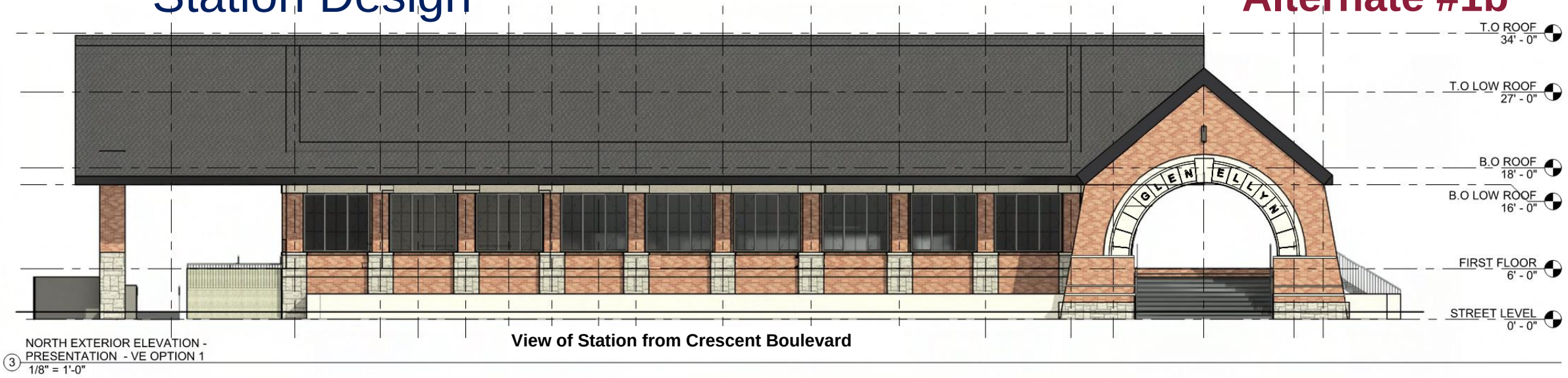
View of Station from Crescent Boulevard



View of Station from Railroad

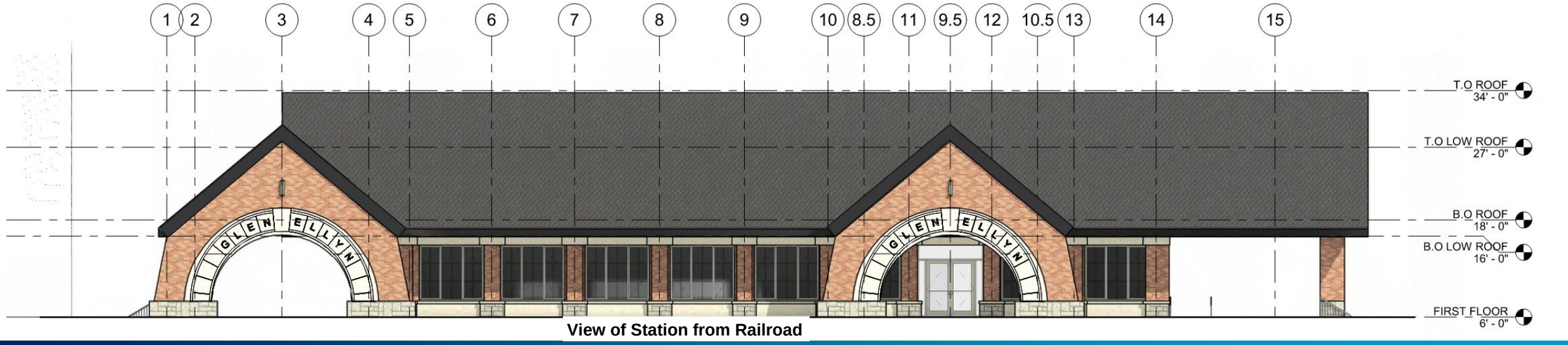
Station Design

Alternate #1b



3 NORTH EXTERIOR ELEVATION - PRESENTATION - VE OPTION 1
1/8" = 1'-0"

View of Station from Crescent Boulevard



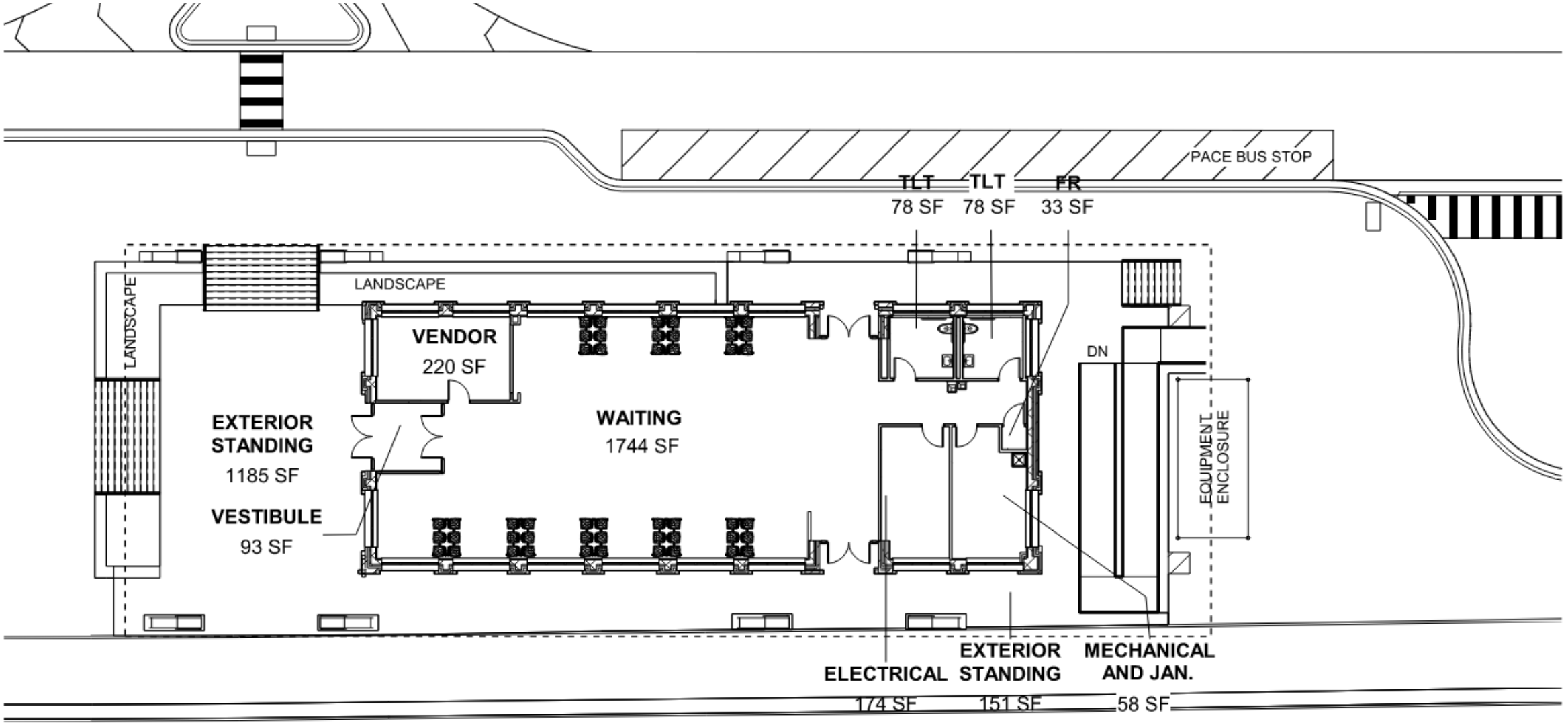
View of Station from Railroad

Station Design

Alternate #1a

Station Design

Alternate #2

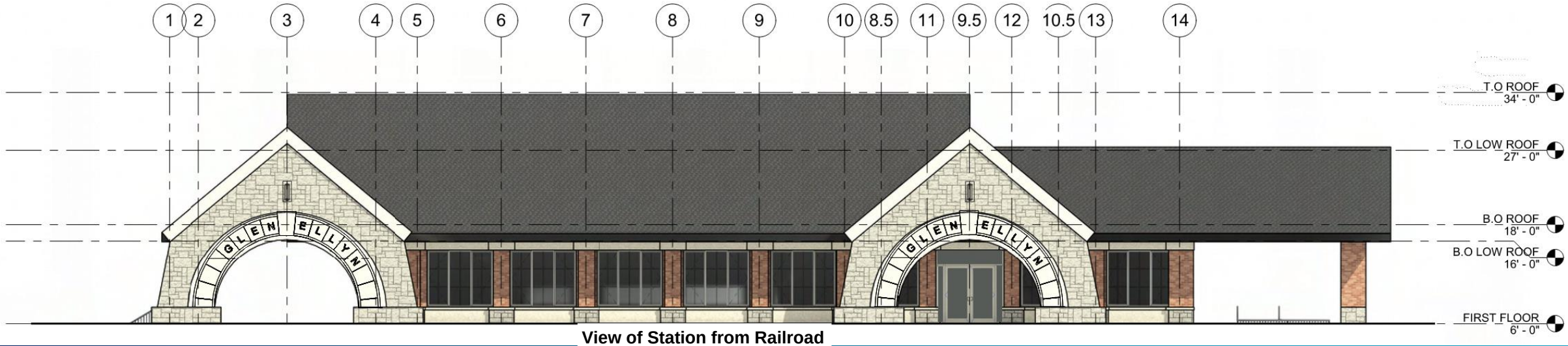


Station Design

Alternate #2a

NORTH EXTERIOR ELEVATION - PRESENTATION - VE OPTION 2
1/8" = 1'-0"

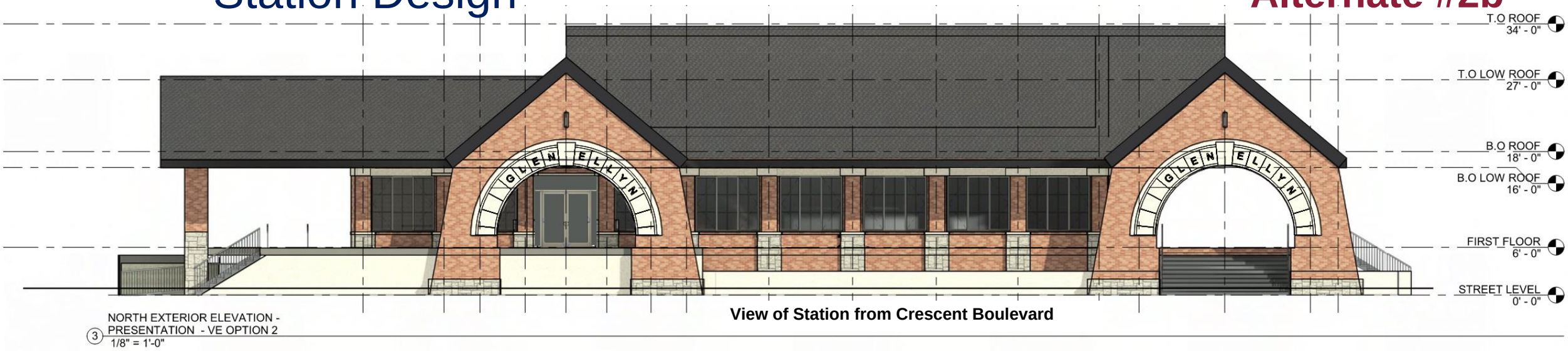
View of Station from Crescent Boulevard



View of Station from Railroad

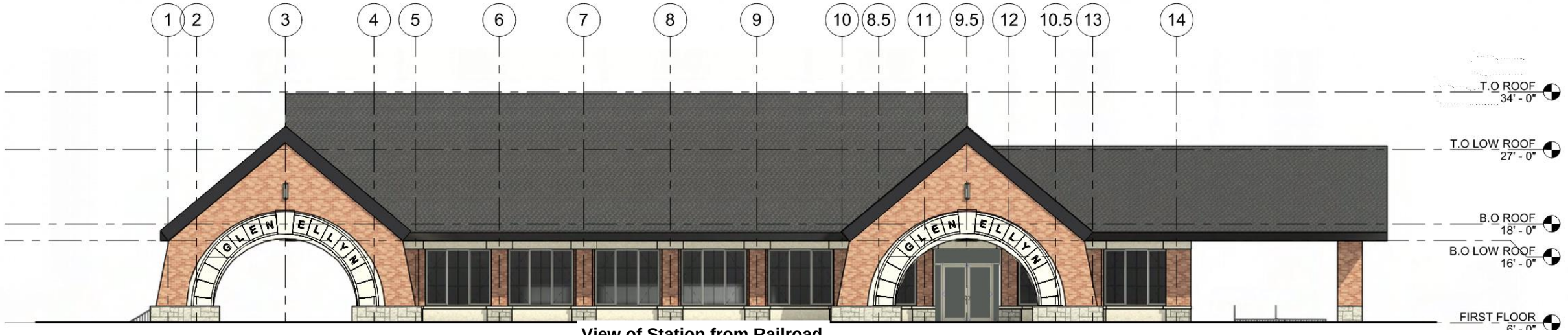
Station Design

Alternate #2b



3 NORTH EXTERIOR ELEVATION - PRESENTATION - VE OPTION 2
1/8" = 1'-0"

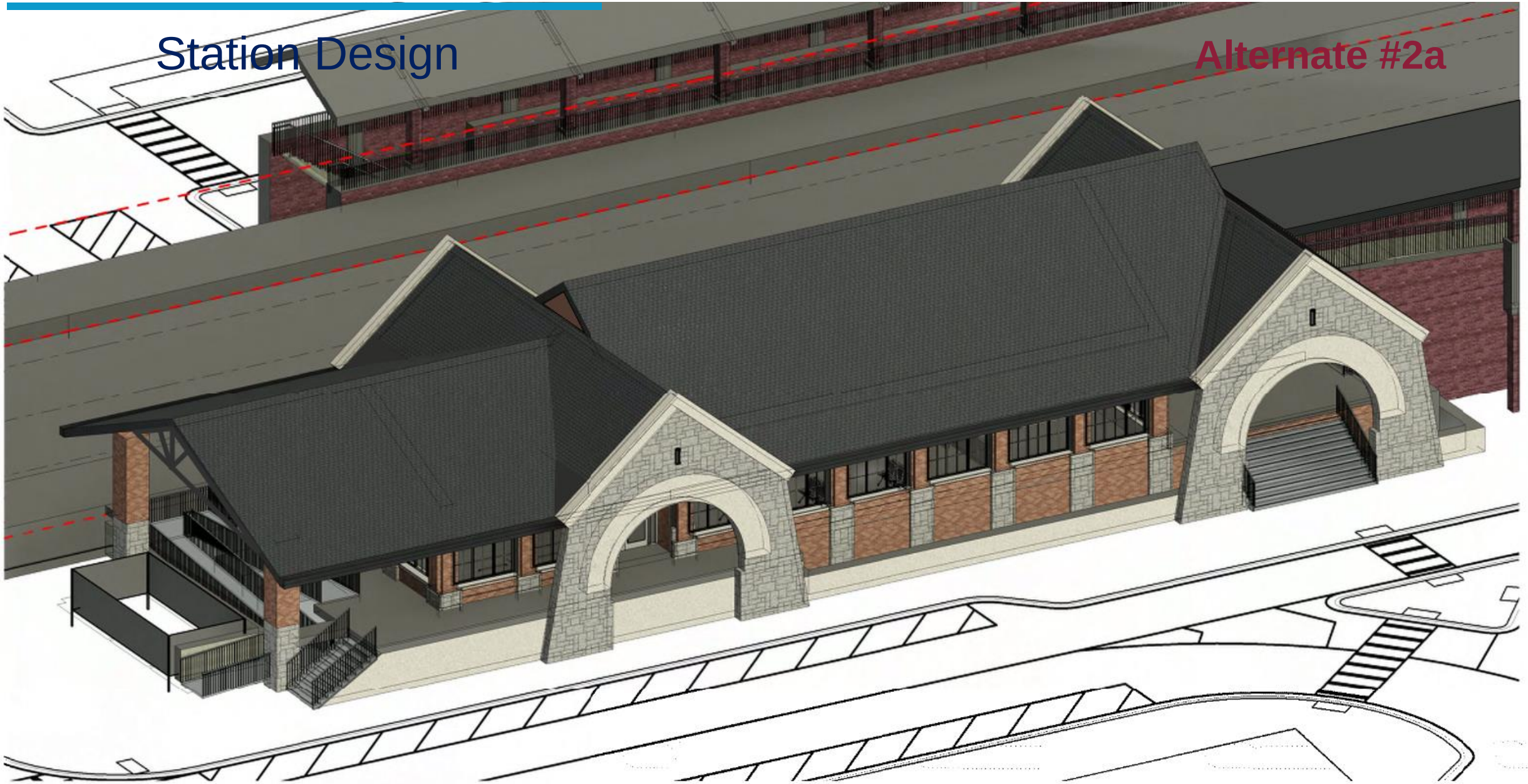
View of Station from Crescent Boulevard



View of Station from Railroad

Station Design

Alternate #2a

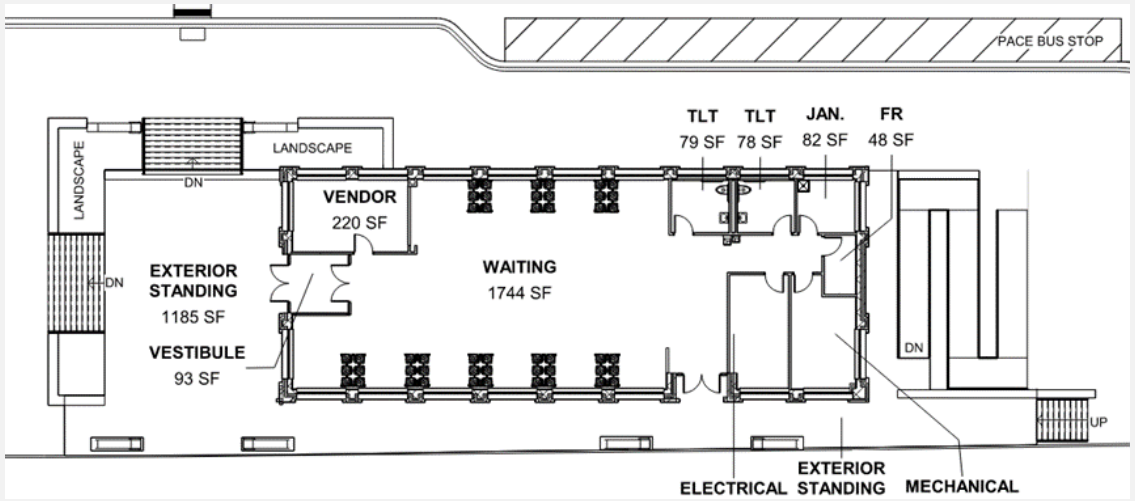


CIC Summary

CIC Recommendation

- Value Engineering Acceptance
- Move forward with same design style
- Support for safety and connectivity improvements

Next Steps



Next Steps

- VE acceptance and direction will allow completion of 30% design
- Future decision points / review throughout design
- Complete engineering
  - 2024 budget includes balance of final design costs
  - Recommend approving contract by end of year