Section 3

Minimize Impacts

Goal #2 – Minimize Impacts

Environmental Protection

Our design and construction approach reduces impacts to sensitive areas, landslide-prone slopes, and activities related to working in and above the Sammamish River. Additionally, we have invested in an Envision™ pre-assessment of your project and confirmed a Platinum rating is achievable (***See Appendix C***). Similar to LEED® for vertical construction, Envision is a third-party credentialing framework developed by the Institute for Sustainable Infrastructure that drives and quantifies sustainability outcomes. **We will work with WSDOT through design to commit to an Envision certification level.**

We will continue to develop solutions to protect the environment and maintain permit compliance. The following staff will evaluate impacts and support temporary work options during design development:

Bill Jordan Environmental Compliance Mgr.	**Seth Gentzler** Stream Design Engineer	**Ben Upsall** Geotechnical Group Manager

Reducing Impacts to Sensitive Areas

Our approach to reducing impacts to sensitive areas is broad and encompasses minimizing impacts to the Sammamish River and refinements to the fish passage construction. Highlights of our approach include:

Reduced Emissions | We use existing pavement in lieu of new pavement on SR 522, reducing associated trucking emissions by 40 percent. We will use conveyor belts to move materials to the median work zones at the BRT stations and fish passages, which minimizes idling caused by trucks entering and exiting the median. The majority of our operations will use low emissions Tier IV equipment.

Construction Methods | We commit to using lubricants composed of biodegradable base oils such as vegetable oils, synthetic esters, and polyalkylene glycols in equipment operated near water. All equipment will be clean and inspected before use within the creeks. During construction, we will direct lighting away from fish bearing waters and shield lights to minimize the amount of light cast toward the water's surface.

Reduced Project Footprint | We focused on reducing the project footprint in existing habitat whenever possible.

ATC 5 Our boldest reduction of impact is **ATC5** to realign the NB I-405 to SR 522 ramp away from the hillside, closer to the I-405 mainline. This realignment can reduce as much as two acres of impact, preserving trees and vegetation, and increases safety through stabilizing the localized landslide slip planes. We intend to aggressively pursue this concept post-award, once further geotechnical analysis is complete.

Impacts to Sammamish River | As illustrated in *Figure 3-1* and *3-2*, our approach to minimizing impacts to the Sammamish River includes:

- Controlled demolition to eliminate barges or temporary structures in the river and protect structures
- Physical barriers and debris netting to keep slurry and debris out of river
- Cement Deep Soil Mixing (CDSM) to minimize soil contamination
- Precasting, pre-fabricating, and pre-painting over-water work elements to reduce the construction durations that create risk to the Sammamish River.

Fish Passage Design | We have identified opportunities for a 10 percent reduction in the total length of the six fish passages. The refinement creates additional open channel, promoting natural habitat, and reduces impact to the stream buffer. We will continue this effort with WSDOT and the Muckleshoot tribe to secure final approval after award.

Fish Passage Construction | Fish passages will be constructed next to existing culverts, allowing construction to occur outside fish windows. We will connect gravity bypasses to existing streams during fish windows so construction staging areas can be set, and work can occur year round without impacting streams.

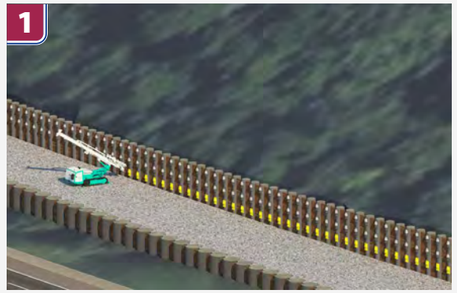
Shaft Foundations | ATC 1 **ATC1** uses two spread footings in lieu of four large diameter shafts foundations at 228th Street. Shaft construction is a high impact operation requiring a very large footprint for equipment and staging of rebar cages. It also requires a large amount of truck traffic to remove wet shaft spoils and deliver large quantities of concrete. Our spread footing design eliminates the need for a massive laydown space on 228th and will greatly reduce trucking and lane closures required for the bridge widening.

Figure 3-1 | Working on landslide prone slopes and construction of the I-405 NB to SR 522 Bridge over Sammamish River

Phase 1 – Walls 23.20 and 23.28 (Hillside Walls)

During Phase 1, Walls 23.20 and 23.28 (Hillside Walls) are constructed. These walls are on the critical path of work and must be completed prior to any other bridge demolition and construction at the I-405/SR 522 Interchange.

Impact Minimization Measures



Soldier pile walls with tie-backs

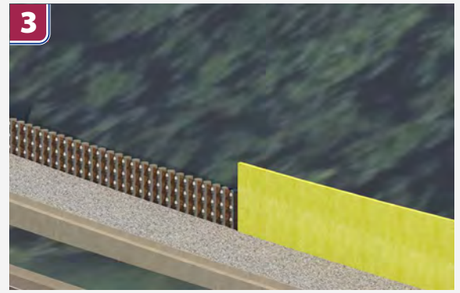
We have determined that soldier pile walls with high capacity tie-backs are the most effective method for mitigating landslide concerns in this area and application. Post-award, we will complete and implement an extensive geotechnical exploration plan and verification anchor testing program. Compared to secant pile walls, this solution:

- Reduces overall excavation, concrete, reinforcing, and temporary access quantities
- Uses smaller equipment, reducing surcharge loading to temporary access roads on the hillside

Bench access on slope for drilling rigs

We have evaluated the hillside requirements and developed a means and method that will use earthwork benches to provide access for construction equipment and staging. Benches will include structural backfill material including eco blocks and temporary slope stabilization to maintain local and global slope stability. Benefits include:

- Reduced impact to unstable slope
- Stable surface for construction equipment, staging, and access roads
- Minimal erosion and related environmental impacts
- Easily removed and reused



BIM to Plan the Work Effort

Our team commits to using BIM for design and construction of the hillside retaining walls. Our team has already begun mapping existing conditions to plan the work and will continue to use clash detection to place access roads, crane pads, shoring and drilling equipment. Our plan:

- Minimizes environmental impacts
- Reduces risk of damage to existing infrastructure
- Improves overall efficiency
- Minimizes clashes with the rock buttress drainage system on the hillside and under the roadway used as a landside mitigation measure

Slope Monitoring

Our **real-time monitoring system provides instant alerts** if vibration or settlement thresholds are exceeded and includes:

- Strategically placed vibration sensors to measure changes in vibration levels
- Regular site surveys to measure changes in ground settlement
- Inclinometers and other instruments to monitor slope stability and any movement
- Visual inspections to identify possible fault lines

Phase 2 – Bridge Foundations, Ground Improvements, and 405-522 Structure

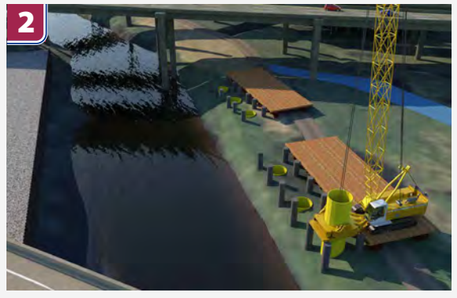
Phase 2 consists of ground improvements above Woodinville Drive, foundations, and construction of the superstructure, approaches, and tie-in ramps for I-405 northbound connection to SR 522.

Impact Minimization Measures

Cement Deep Soil Mixing (CDSM)

In lieu of jet grouting, we will use CDSM for soil improvements with a temporary protection wall for slurry containment at Zone 1. Benefits include:

- Less energy-intensive, less waste, and less likely to contaminate environmentally sensitive areas.
- Use of a robust spoils management systems to control High PH surface water similar to the system we will use for drilled shaft excavation.
- Shields drilled shafts from landslide forces, reducing structural deformation during a seismic event.



Foundation Construction

In lieu of coffer dams and earthen work platforms for foundations construction, we will install a temporary work platform outside the ordinary high water line with a containment system. Benefits include:

- Minimized disturbance to the riverbank associated with earth-moving and excavation.
- Shorter duration to install a trestle work platform than a cofferdam and earthen platform.
- Safer working environment by providing a more stable and secure temporary work structure.
- No environmental permit modifications.

I-405 NB to SR 522 Superstructure

Our plan uses the crane pads from the existing foundation to safely place girders for the superstructure. This design uses precast girders in lieu of cast-in-place concrete, reducing the volume of concrete pours over water by 1200 CY. Additionally, we will:

- Employ spill containment systems and water-tight form sealing measures prior to concrete placement over water.
- Monitor water quality during construction to expeditiously identify and address impacts.
- Reduce painting over the river by pre-painting new bridge girders prior to setting them in place.

Concrete Truck Washout

As on the L300 project, concrete trucks will be washed out offsite at the supplier's batch plant. Regularly serviced Eco pans, slurry drums, and concrete dumpsters will be used to contain smaller volumes of high PH waste concrete/water. **Our approach removes risks and management associated with large volumes of high-PH waste concrete/water.**

Figure 3-2 | Demolition over Sammamish River and construction of the new I-405 Northbound mainline and I-405/SR 522 Direct Access Ramp Bridges.

Phase 3 – Bridge Demolition

The Bridge Demolition work involves removing the existing bridge structures while minimizing the impacts to the Sammamish River and the I-405 mainline below.

Impact Minimization Measures

"Surgical" Demolition over Sammamish River

We will remove the superstructure by constructing a slurry tight temporary work platform directly beneath the existing superstructure. Our plan achieves the following:

- Utilizes 130' long falsework beams that allow support of demolition without encroaching on the river's OHW.
- Provides a slurry-tight, plastic-lined physical barrier between demolition and the river.
- Reduces environmental risks compared to alternate methods.
- Eliminates barges or temporary structures in the river.

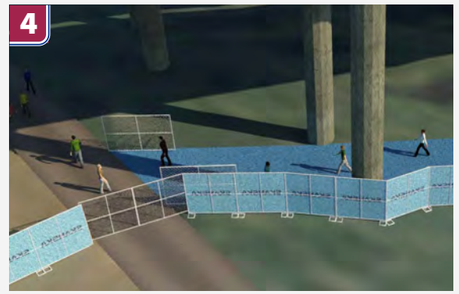
Superstructure Demolition Sequence

Our carefully planned removal sequence for the deck, soffit, and girders **uses the structural integrity of existing bridge hinges and columns to support the operation**. Throughout, we will use debris netting, shielding and temporary shoring to protect the river, the I-405 mainline structures, and the traveling public.

Column Demolition

Our controlled demolition approach for bridge columns near the river will install the column shell pressed into the mudline, demolish the columns and remove the shell **during one fish window.** Measures we will take to protect the river and safety include:

- Wire sawing in lieu of an impact hammer to make precise cuts on bridge columns, minimizing potential for debris contacting the river.
- Lateral bracing to support column structure during removal process.



Pedestrian Trail Phasing (Nights vs Days)

By maintaining a bi-directional two-way trail that is "gated" at each "Y," we will detour pedestrian traffic to the north while work occurs on the south, and visa versa. **Our phasing solution allows work to proceed during the day, minimizing loud operations during off-peak night hours and reducing overall impact to community.**

Phase 4 – New DAR and NB Mainline Construction

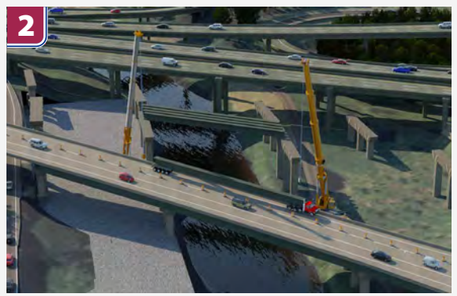
The new Direct Access Ramp (DAR) and the new I-405 Northbound mainline will be constructed off-line over Woodinville Drive, Sammamish River and Sammamish River Trail.

Impact Minimization Measures

Decant Pits for Shaft Spoils

We will load saturated drill spoils directly into an on-site truck to transport spoils into a decant pit. A sufficient number of decant pits will be set up in each work zone where drill spoils are expected. Once liquids and solids have separated, solids will be loaded into a highway truck/trailer to be disposed of off-site.

Our approach prevents trackout, leaky spoils trucks on public roads, and allows for proper treatment and disposal of shaft spoil liquids.



Bridge Superstructure Erection

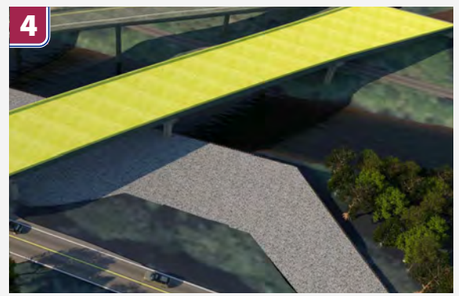
We will construct both bridges in sequence, erecting girders during off-peak hours from cranes on pads adjacent to the river and using debris netting for protection. Our approach:

- Maximizes the use of lane closures and optimizes work flow.
- Reduces traffic disruptions and impact to aquatic life.
- Prevents debris from entering the river.
- Provides water-tight sealing of all joints and formwork. including visual inspections via manlift during concrete placements to ensure no seepage.

Pigmented Sealer and Painting near River

We will employ the following measures for painted structures located over and adjacent to the river:

- Paint girders at the manufacturer's facility.
- Apply touch-up and patch work on-site in controlled manner.
- Dry finish and apply pigmented sealer/paint prior to removing overhang formwork.
- Provide protection measures such as protection diapers or shielding before painting in field.



Recycling Bridge Deck Cure Water

During the mandatory 14-day continuous wet cure, we will supply fresh water uphill from each pour. As the water flows over the bridge deck, we will collect the high-PH water and pump it back up the hill. All cure compounds will be water-based. This system will:

- Contain and recycle the high-PH cure water.
- Allow easy monitoring of leaks or water loss.
- Limit the amount of high-PH water required for treatment and disposal.

Traffic Management Strategy

Reducing construction impacts

The I-405 Brickyard project affects area residents, businesses, motorists, bicyclists, pedestrians, schools, transit operations, Washington State Patrol and first responders, as well as local, state and federal jurisdictions. **Skanska has brought on public relations firm Enviroissues to work with the community.** Enviroissues will coordinate the activities in ***Figure 3-3*** with WSDOT's public information staff and Work Zone Traffic Control group.

Planning and Oversight | During design, Work Zone Traffic Engineering Manager Casey Brown will work directly with MOT/Roadway Manager Michelle Petterson through the TFG process to optimize the design and maintenance of traffic to further reduce lane closures. During construction, Michelle and Construction Manager Johnny Morgan will implement our public impact mitigation plan, monitoring progress and developing contingency plans for unexpected events.

Traffic Management Plan (TMP) | We will capture our approach to minimizing congestion during the phased bridge, mainline SR 522 and mainline I-405 construction in the TMP. We will provide info and technical resources to support the WSDOT outreach program and work with WSDOT to inform the public of closures, detours, traffic conditions, incidents and expected delays to mitigate issues and maintain positive public relations. Our primary goal is to keep the public informed and aware of multiple route options.

ROWs | Our public outreach staff will assist the construction management team in gaining rights of way to properties with easements. Advance communication and meetings with each owner before we gain access to their property will establish expectations and allow them to plan in advance, thereby avoiding impacts.

Local Businesses | We will work with WSDOT outreach to identify businesses that could be impacted by construction activities and develop strategies to maintain access. To mitigate impacts to businesses of concern on 220th St SE & 17th Ave SE and NE Woodinville Dr & Brickyard Rd NE, we will:

- **Host town hall meetings to listen to concerns**
- Transparently communicate work and impacts
- Maintain business access during peak hours

Impacted Residents | Our project team has identified locations most likely to be susceptible to construction impacts. Our approach includes:

- **Go door-to-door ahead of measurable traffic impacts**
- Ensure safe and clear access to and from residences
- Be honest about our presence and construction needs
- Provide flaggers, stop work and escort neighbors through work zones as needed

Noise and Vibration | Noise, vibration and dust will be monitored and controlled in accordance with all applicable laws and the Environmental Management Plan. All Skanska employees and subcontractors will be trained in the environmental protection prior to entering the job site. Skanska's Construction Noise and Vibration Monitoring and Mitigation Plan will be in place prior to the start of work that produces noise or vibration. We have made every effort to establish work-zones behind temporary construction staging to minimize the amount of work to occur on nightly lane closures. We will:

- Follow noise restrictions and keep roadways clean
- Use flaggers or community-friendly white noise back-up alarms in lieu of typical loud back-up alarms.

Figure 3-3 | **Construction-related coordination and communication to minimize construction impacts.**

We will...

Communicate accurate information for media relations regarding potential traffic impacts	Maintain and update the project database of impacted stakeholders and residents	Coordinate public meetings to explain the project schedule and gain feedback	Provide public information staff that are available to WSDOT 24 hours a day, 7 days a week
Schedule and support public outreach and related presentations	Furnish updated information for the project website and social media	Draft information for updates via e-mail	Draft construction notices to surrounding communities
Develop and maintain the Project Call List	Prepare crisis communications plans	Neighborhood introductions/ Individual stakeholder outreach	Pop-up events three months in advance of major changes

Reducing traffic impacts

Our approach reduces closures and related traffic impacts. ATC3 **ATC3** reduces the SR 522 mainline speed during construction to the final design speed of 35 MPH, which reduces the SR 522 construction duration by 10 months with only two major traffic shifts. **Our approach results in 43 percent fewer full weekend closures** (see *Figure 3-4)*. By evaluating the expected delay times and traffic volumes at $19.64 per hour of delay for each driver— based on a 2020 traffic study conducted by Texas A&M—we have estimated **$3.13 million in potential travel delay savings to the public**. A summary of ramp closures is included in *Appendix C - Concept Staging Plans*.

Traffic switches

Our fully refined, streamlined five-stage approach limits lane shifts and is illustrated in *Figure 3-5*. Our staging plan on I-405, for example, focuses on the outside widening work along the corridor, with the follow-on stages dedicated to inside widenings and stations construction. Our staging and sequencing strategy for the corridor and bridges maximizes efficiency, offering a substantial benefit to WSDOT. Per ATC3 **ATC3**, we shift traffic only twice on I-405, and twice on SR 522 for the majority of the corridor, minimizing impacts to drivers and maximizing safety for the public and crews.

Maintaining access for all vehicles and non-motorized users

We invested hundreds of hours in study and collaboration among our MOT engineering team and experts in field construction and created detailed, comprehensive MOT drawings included with this submittal. The following are key points in our approach:

Mainline I-405 Staging | The I-405 mainline will undergo several phases of construction including shifting traffic to the inside for widening and ramp construction; shifting north and southbound traffic to the newly widened roadways to begin construction of BRT stations; completing the new NBI405-EB522 bridge; shifting mainline traffic to the new bridge for DAR work; and completing minor traffic shifts for pavement tie-ins.

Fish Passages | Our plan employs tunneling at Juanita Creek and staged construction at all others to minimize full closures. The goal is to complete the necessary construction while minimizing traffic disruption. Further detail is provided in *Figure 3-6* Fish Passage Concept Staging Plans.

Figure 3-4 | Reduced closures leads to public travel delay savings

Mainline Full Weekend Closures			
Northbound or Southbound	Optimization		Travel Delay Savings for the General Public
	Before (Allotted in Form P)	After	
Total I-405 Mainline Directional Full weekend closures	17	8	$2,885,787
Total SR 522 Mainline Directional Full weekend closures	4	2	$172,211
Total SR 527 Mainline Directional Full weekend closures	2	1	$68,841

Mainline SR 522 | ATC3 Through use of **ATC3**, we have optimized staging on SR 522 to reduce traffic shifts from eight to only two, reducing driver confusion and reducing the SR 522 construction duration by 10 months. See *Figure 3-7* SR 522 Concept Staging Plans for our approach.

BRT Mainline Stations | Two mainline stations are elevated, while the transit hub is off-line. ATC9 Brickyard BRT station (**ATC9**) is elevated. As demonstrated in Appendix C, BIM/VDC Sequencing for Brickyard BRT Station, at the elevated stations, overhead conveyors will transport materials, improving safety and reducing truck weaving to the median. At Canyon Park, our long-term detour reroutes pedestrians to the 527 overpass, providing a dedicated path with positive protection.

Bridge Structure Demolition | We have developed a surgical approach to demolition that allows for quick removal of the bridge structure using only one of the four allowable full freeway closures while eliminating impacts to the Sammamish River and I-405 mainline structure below.

Surface Streets and Pedestrian Movements | We will communicate with local businesses and residents, minimize impacts on their operations, control traffic, post clear signage, coordinate with local transit agencies, and consider alternative transportation methods to reduce disruptions. Additionally, we will maintain a reversible pedestrian path to maintain access along Sammamish River Trail. Additionally, ATC9 **ATC9** creates a 50 percent reduction to vertical circulation at Brickyard station.

Figure 3-5 | Project-wide traffic management strategy to reduce or eliminate construction impacts by minimizing the number of traffic switches and reduce the number of closures for vehicles and non motorized users.

An approach that improves mobility for vehicles and non-motorized users

Stage 1

I-405 Outside Work with traffic minor shift inside; SR 522 Traffic is shifted to Eastbound alignment while constructing Westbound.

Stage 2

I-405 Inside median work with traffic shifted to the outside; SR 522 Traffic on Westbound alignment while constructing Eastbound.

Stage 3

No shift to I-405 traffic with median work continuing; SR 522 connector ramps open and begin flyover structures demo.

Stage 4

I-405 traffic uses the new NB bridge, and work continues on the Direct Access ramps.

Stage 5

I-405 SB traffic is shifted for the last time in this segment to complete pavement reconstruction at the SR-522 bridge.

1 Brickyard BRT Station Optimization

ATC 9 Constructing MSE walls in the median for mainline BRT access reduces the need for roadway widening and lane shifting at the Brickyard BRT station. This reduces construction duration and impacts to traffic. The long-term benefit is improved pedestrian access by eliminating travel time for BRT users to access the center platform.

2 Overhead Materials Conveyor

Our plan greatly improves safety by using an overhead material conveyor to provide fill material to the median, **reducing haul truck weaving across the mainline to access the median by 1,750 trucks** at the Brickyard and Canyon Park BRT Stations.

3 Ramps at NE 160th Street

The construction of ramps at 160th will occur in two stages. First, we will widen the outside. To accomplish this, we will provide a temporary ramp lane and work with King County Metro to temporarily relocate the bus stop. Additionally, we will coordinate with the WSDOT traffic system to maintain the existing ramp traffic loops.

4 Staging on the SR 522

ATC 3 Reducing the speed of SR 522 during construction to the final design speed of 35 MPH allows safer driver transition through construction. Use of **ACT3** enables optimized staging that limits lane shifts from eight to two, while eliminating 10 months of schedule (see *Figure 3-7* on *page 20*).

5 Optimize NB I-405 Bridge Profile

ATC 6 Through the use of **ATC6**, we raised the profile of the NB I-405 bridge structure to reduce the construction duration of impacts and maintain vertical clearance for final and temporary roadway configurations on SR522 under the new NB I-405 bridge.

6 Maintaining Sammamish River Trail

Skanska plans to build an alternate route for pedestrians and bicycles during the Slope and Sammamish intersection construction. This will ensure safety and minimize traffic congestion. The route will provide positive protection from overhead construction activities and ensure public safety with minimal trail traffic disruptions.

7 Ramps at NE 195th Street

During construction, ramp access will be maintained. However, there will be nightly lane closures to install new electrical and ITS infrastructure. The final loops and pavement overlay will also be completed during nightly lane closures.

8 228th Street Seismic Retrofit

ATC 1 **ATC1** reduces (4) shafts and uses only spread footings, freeing up traffic space. The foundation substructure for retrofitting and widening the 228th bridge will be built with infill walls on one side at a time, while pedestrian traffic will be rerouted behind existing columns. Girder placement and concrete pours will require closures, and night lane closures on 228th will be necessary for shoring.

9 Canyon Park Pedestrian Bridge

To construct the new BRT station and pedestrian bridge, pedestrians will need to take a temporary detour across SR 527. A dedicated, positively protected path to the park and ride on the east side of I-405 will be provided. Additionally, we have refined the new bridge to create a single, forward-compatible bridge over Southbound I-405 to reduce the construction duration and future maintenance requirements.

10 Ramps at SR 527

The SR 527 ramps will be reconstructed in the early stages of the project to accommodate the widening of I-405 for the BRT station. Skanska will ensure appropriate communication, signage, and safety measures are implemented to maintain the mobility of buses and pedestrians throughout construction.

11 17th Street Improvements

Installation of BRT utilities will occur during off-peak hours using a flexible approach to traffic management. Methods will include directional boring and trenching, with roadway plating to maintain traffic movements. During roadway reconstruction, access to all businesses will be maintained by providing additional signage or temporary driveway access points.

12 ATC8 17th Ave SE Multi-Modal Imp.

ATC 8 **ATC8** proposes to construct a single two-way cycle track from SR 527 to the Canyon Park Park and Ride to provide multi-modal benefits, reduce environmental impact, and enhance safety. This will replace the existing bike lane and shared bike and pedestrian path to optimize non-motorized traffic flow.

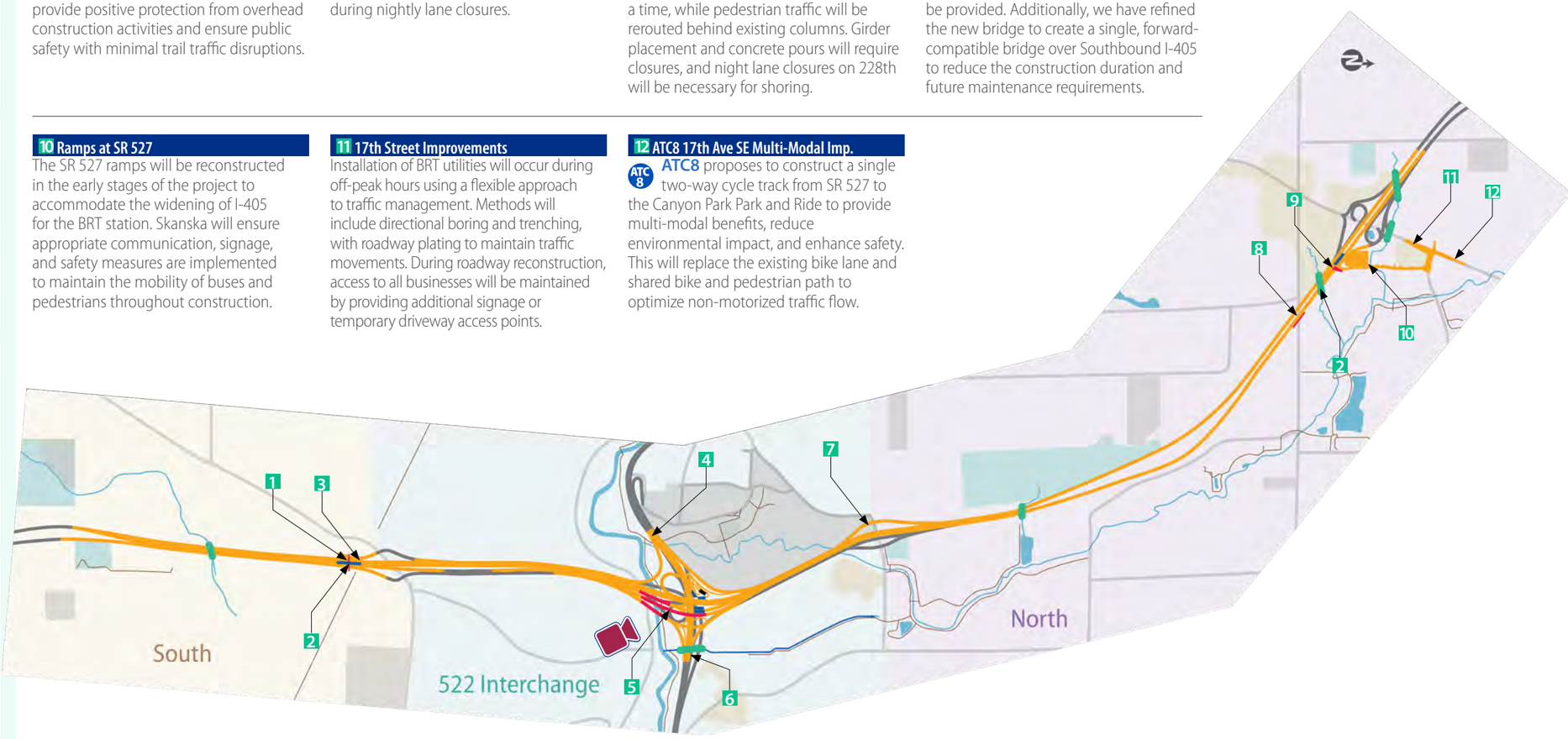


Figure 3-6 | Concept Staging Plans for the fish passage work. **Skanska has developed an approach to the fish passage phasing that reduces allowable closures by 92 percent.**

An optimized approach to fish passage work

A | Juanita Creek

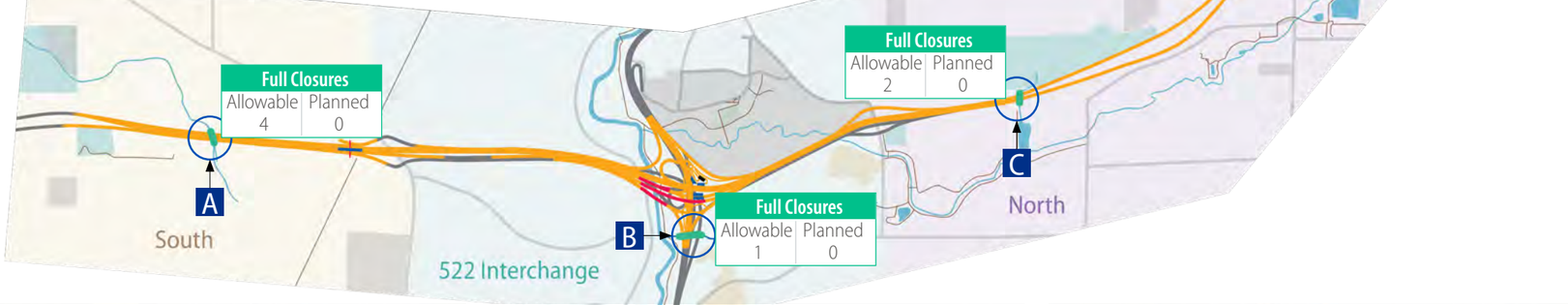
Construction of the fish passage structure will occur after relocation of the Puget Sound Energy gas line and the Northshore Utility District sewer line. Skanska will use Sequential Excavation Method (SEM) tunneling. This method eliminates the need for full freeway closures and minimizes waste and impacts on driver safety by avoiding top-down construction. ATC10 **ATC10** will speed up tunnel lining installation, allowing for the Juanita Creek fish passage to be completed one month earlier.

B | Par Creek

The fish culvert will be constructed in four stages, utilizing traffic shifts to avoid the need for a full closure of Eastbound and Westbound SR 522. Poor soil conditions at the site pose a risk for unsuitable soils for a traditional spread footing structure, so the foundation and walls will consist of soldier piles to mitigate this issue. The culvert lid will be made of precast concrete.

C | Stream 25.0L

The fish culvert will be built in three stages using temporary shoring and traffic shifts to widen the road. This eliminates the need for two full closures of Northbound I-405 and Southbound I-405. Due to poor soil conditions, the foundation and walls will be made of soldier piles, while the culvert lid will be precast concrete. Construction will start after relocating the City of Bothell water line, Frontier buried telecom line, and Northshore School District buried telecom line.



Fish Passage Commitments

We will

- reduce mainline full-weekend traffic closures associated with Fish Passage construction by 92 percent over RFP allowable closures.
- work with the local tribes, inviting their representatives to visit each fish passage construction site before, during and after construction to demonstrate our good stewardship of the local environment.
- pursue a reduction in cumulative length of all the fish passages to provide 10 percent more open channel natural habitat through the practical and final design process.

D | North Fork Perry Creek

The fish culvert will be constructed in three stages, utilizing traffic shifts to eliminate the need for a full closure of Northbound I-405 and Southbound I-405. Poor soil conditions may render traditional spread footing structures unsuitable. To mitigate this risk, the foundation and walls will consist of soldier piles. The culvert lid will be made of precast concrete.

E | Queensborough SR 527 Creek

To limit impacts on the signaled intersection of the I-405 ramps and SR 527, construction will happen during a weekend closure of SR 527. Soldier piles will be drilled and placed during nightly lane closures before the weekend closure. A modular metal arch system will be used for the culvert structure, which will be preassembled on site before the weekend closure. This approach reduces required work during the closure and mitigates risk.

F | Queensborough I-405 Creek

The construction process will take place in three stages, utilizing traffic shifts to eliminate the need for a full closure of Northbound I-405 and Southbound I-405. Poor soil conditions at the site increase the risk of unsuitable soils for a traditional spread footing structure. To mitigate this risk, soldier piles will be used for the foundation and walls. The culvert lid will be constructed using precast concrete.

Figure 3-7 | Concept Staging Plans for the SR 522 work. We recognize that construction projects can cause significant inconvenience to drivers, and our team is committed to doing everything we can to mitigate these issues. As a result, we are taking a proactive approach to maintaining traffic flow during the construction of SR 522. By minimizing disruptions to existing ramp traffic movements, we aim to make the construction process as smooth and efficient as possible.

Optimized SR 522 staging to just three stages and two major traffic shifts

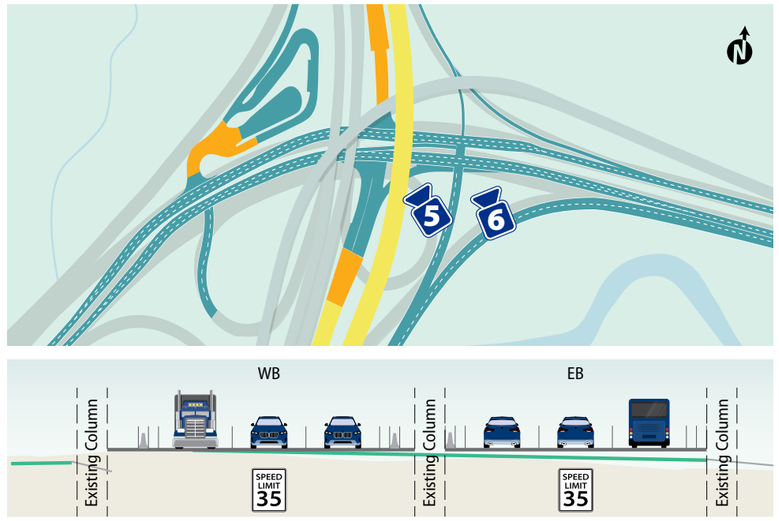
Legend: Construction | Temporary MOT | Bridge/Approach Construction | Final Construction

Stage 1

Shift traffic to the Eastbound alignment to reconstruct and widen the Westbound alignment, construct the new Westbound-Eastbound SR 522 to Northbound I-405 ramps, begin construction of the new Bothell HUB, and construct the northern half of the Par Creek Fish Passage.

Stage 2

Shift both directions of traffic to the new Westbound alignment to reconstruct the Eastbound alignment, begin construction of the DAR ramps north to SR 522, construct the last half of the of the Par Creek Fish Passage in 2 stages, and continue construction of the Bothell HUB.



Stage 3

Open the newly constructed Northbound I-405 to Eastbound SR 522 bridge in the hillside area, allowing demolition of the Northbound I-405 to Westbound SR 522 bridge. Begin construction of structural elements in conflict with this demolished ramp, allowing unimpeded construction progress of Northbound I-405 Bridge, the DAR Bridge and completion of the left turn movement from Northbound 405 to Westbound SR 522. Complete construction of the Bothell HUB to hand over for completion of Milestone B – Charging Yard Handover.

Construction Staging Area

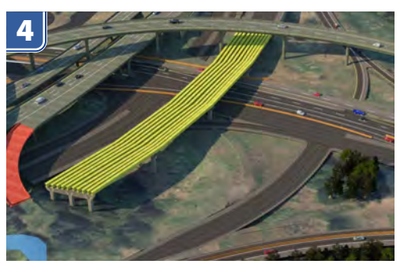
Skanska has identified two areas at this location to support construction staging: under the existing bridges and loop ramps, and the infield area for the new bus charging facility. These locations will facilitate the two-stage approach to SR 522 construction while allowing for efficient workflow in the charging station construction and bridge demolition.

Maintaining SR 522 Mainline Connectivity

To construct both SR 522 and Par Creek fish passage, a temporary re-route for Westbound to Northbound traffic movement will be constructed, eliminating the need for a full weekend closure.

Maintaining SR 522 EB/WB Connectivity

During the construction of 522, we will prioritize maintaining existing ramp traffic movements in order to reduce driver confusion. Our goal is to ensure that drivers can still navigate the area with ease, despite the ongoing construction. This approach will also minimize traffic disruptions and delays.



I-405 NB Mainline Bridge Construction

We raised the profile of Northbound 405 via **ATC6** to ensure that Northbound 405 spans could maintain clearance during construction of the profile and cross-slopes of SR 522 to maintain mobility during SR 522 two major stages. We also optimized the spans to avoid conflicts with existing ramp movements and temporary MOT widenings. This allows the north half of the bridge to be constructed as early as possible.

Bridge Demolition over SR 522

During the demolition of the SR 522 bridge, we will have a full weekend closure. We will track the closure using an hour-by-hour schedule to ensure public safety and meet our target opening time. To absorb any impact from debris, we will use steel plating and sand piles. This method will allow for easy cleanup.

Completing Signalized Intersections

Skanska will open the new ramp movements and signalized intersections once construction of SR522 is completed. This will be possible without introducing additional lanes or movements. The ramps and intersections will be maintained until the DAR bridges are in their final condition and toll commencement is completed and ready for use.