APWA Public Works

Project of the Year Award

August 31, 2017

Cornelius Pass Road: NW Cornell Road to US 26

WASHINGTON COUNTY OREGON

1. GENERAL DESCRIPTION OF THE PROJECT

The NW Cornelius Pass Road: NW Cornell Road to US 26 Project (the "Project") was a priority on Washington County's project improvement list. This project improved NW Cornelius Pass Road and intersecting roads for a total project length of approximately 2 miles. The project added a northbound and a southbound lane and required turn lanes to create a seven-lane facility that widens at the intersections. Dedicated bike and pedestrian facilities that include a two-way 12-foot wide bike path and a separate pedestrian sidewalk along the east side of Cornelius Pass Road were also provided. Originally conceived as three separate projects, Washington County, the City of Hillsboro, and Intel elected to combine the projects into one larger project, and for Washington County to handle project delivery using the combined funds for the benefit of providing continuity of construction and improvements within the corridor. The three project components are detailed below.

Washington County's Intersection Improvements at NW Cornelius Pass Road and NW Cornell Road

The intersection improvements project at the intersection of NW Cornelius Pass Road and NW Cornell Road was a priority on Washington County's MSTIP 3d Funding Program Summary list. The intersection was widened to match a seven-lane section to the north on NW Cornelius Pass Road and taper to match the existing five-lane section south of NW Cornell Road. Improvements extend 400-feet south from the intersection of NW Cornelius Pass Road and NW Cornell Road, and improvements to Cornell Road were made 675' west of and 910' east of NW Cornelius Pass Road.

Intel's Conditions of Approval

Intel requested Development Review approval for a new seven-story mixed use manufacturing, manufacturing support, and engineering research and development building approximately 1,020,200 square feet in size to directly support Intel D1X and D1X Mod 2 fabrication facilities at the Ronler Acres Campus off of Evergreen Road. Site improvements associated with this new facility included pedestrian connections, utility support buildings, parking, landscaping, loading docks and service yards, and emergency vehicle access. The conditions of approval generated a need for improvements to Cornelius Pass Road as well as Evergreen Parkway that were ultimately managed by Washington County. The improvements provided a seven-lane facility at NW Cornelius Pass Road.

Hillsboro's Immediate Opportunity Fund (IOF) Project at NW Imbrie Drive and US 26

The City of Hillsboro received grant money from the Immediate Opportunity Fund (IOF). The project provided traffic improvements to Cornelius Pass Road at the US 26 eastbound interchange (Imbrie Drive to east of the eastbound ramp termini) to support Intel's business expansion project. The IOF construction components included the addition of a second northbound right turn lane from Imbrie Drive to the eastbound entrance ramp to US 26, which was redesigned as a 3-lane on-ramp. The City also contributed Traffic Impact Fee and Transportation Development Tax funds to supplement the IOF grant monies.

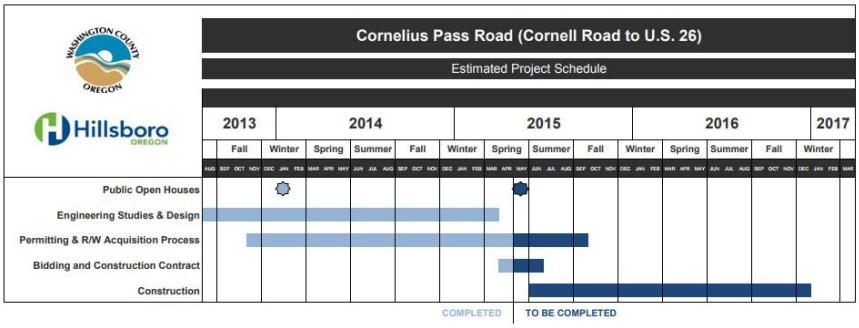
2. COMPLETION DATE CONTAINED IN CONTRACT. ANY TIME EXTENSIONS GRANTED SHOULD BE ADDRESSED IN THE SUBMITTAL.

The construction contract contained two completion dates. The first was to complete all paving no later than September 30th, 2016, and the second was to complete all work, except for seeding establishment and plant establishment, no later than December 31st, 2016.

When the Project's pre-pave meeting occurred in September 2016, it was believed the paving completion date was still achievable based on available work days and anticipated paving production. However, the paving operation was not as productive as anticipated and then the abnormal rainfall seen in October 2016 really hindered paving progress. While some work activities were not held up by the late paving completion, some were, including permanent striping. The outstanding work items did not preclude the ability to fully open the facility to all users, which occurred by December 31, 2016. The work that extended into 2017 was not significant enough to not consider the project having met the spirit of the schedule, and therefore, the County intends to issue a no-cost change order extending these two completion dates retroactively.

3. CONSTRUCTION SCHEDULE, MANAGEMENT, AND CONTROL TECHNIQUES USED.

The Notice to Proceed for the construction contract was issued June 2, 2015, followed by the commencement of construction activity on July 6, 2015. Work started with clearing and grubbing, erosion control measure installation, and general excavation. Given the large geographic boundary of the project and the work components involved, the location of work and when it occurred varied depending on many factors including weather conditions and utility conflicts. However, the overall construction staging was such that the road was widened on the east side first, and once traffic was switched over to the widened area work on the west side began. Upon completing the west side work, the center of the roadway was then undertaken. Installation of the storm sewer, traffic signals, illumination, communications, and sidewalks were ongoing. Base course paving occurred during the summer of 2016 followed by top lift paving primarily in October and early November 2016. All travel lanes and pedestrian ways were open to the public by December 31st, 2016. Some landscaping work and permanent striping carried over into 2017, where substantial completion was reached on July 5, 2017.



The project required extra attention for cooperation and coordination between the County and various federal, state, and local regulatory agencies, each having its own land use and/or permitting regulations. Because the project came into contact with a state highway interchange, close coordination with representatives from ODOT was also required. In addition, the project affected over ten utility providers that were required to identify and relocate impacted facilities.

Utility conflict resolution was identified as being critical to the project's success early on. Efforts to avoid construction delays due to utility conflicts were undertaken during the design process, including extensive preconstruction potholing. Utility relocation work was an ongoing activity throughout the project's construction, beginning approximately the same time that Kerr broke ground in July 2015 and continued throughout the project depending on what project work was underway and where it was taking place. Utility relocation work varied from minor manhole and valve adjustments to relocating segments of a 115kV transmission line with steel poles. With numerous contractors and subcontractors performing work to relocate utilities as well as to construct the project, close coordination between all entities was paramount to the safety of not only workers, but also to the traveling public.

To aid in Kerr's work progress, the County provided Kerr with a full Digital Terrain Model to upload into Kerr's GPS equipped machines. This allowed Kerr to accelerate their construction schedule and reduced the overall survey staking required.

NW Evergreen Parkway view North during construction

Construction project meetings were held on a weekly basis to provide a forum for the project team to discuss project issues and challenges, stay coordinated on the tight schedules, various work locations, multiple road closures, travel and lane restrictions and the necessary coordination with the utility providers, agencies, and area stakeholders. In attendance at the weekly construction field meetings were the County's Project Manager, supervising inspector, project inspector, and representatives of the contractor's team including subcontractors, as well as ODOT's field representative. The meetings included reviewing two-week look ahead schedules and the status of material submittals, with a heavy emphasis on work zone safety and traffic control.

When applicable, based on the current construction stage that week, representatives from the design engineering firm, utility providers, and/or local jurisdictions would also attend.

4. SAFETY PERFORMANCE INCLUDING NUMBER OF LOST-TIME INJURIES PER 1,000 MAN HOURS WORKED AND OVERALL SAFETY PROGRAM EMPLOYED DURING THE CONSTRUCTION PHASE.

In 23,888 hours worked, there was only one (1) recordable injury that resulted in modified duty and there were no lost-time injuries. The Project had a strong team environment where raising and discussing safety concerns was encouraged and promoted through open communication. In addition, Kerr's ongoing safety efforts included weekly safety meetings as well as job hazard analysis and discussion prior to the start of daily work. Kerr also institutionalized the importance of safety by holding a yearly company wide event called "Safety Days" in which training classes are provided emphasizing a variety of different topics.

5. COMMUNITY NEED – A SUMMARY OF HOW THE PROJECT MET THE COMMUNITY NEEDS AS RELATED TO ECONOMIC CHALLENGES, VALUE ENGINEERING, CREATIVE USE OF RESOURCES, TO THE MEASURABLE BENEFIT TO THE COMMUNITY.

Traffic studies confirmed that Cornelius Pass Road was failing Level of Service standards before the project was constructed and that the Level of Service would continue to get worse in the future if nothing was done. Prior to the project, traffic was backing up several blocks during peak hours and was causing delays to auto traffic and freight. One of the main traffic generators is Intel, and because of their continued success and growth, traffic volumes are expected to increase over the next 20 years. This Project provides a facility that adequately meets the traffic needs for this arterial now and through the next 20 years. In addition to improvements for automobile traffic, the project provides benefit to freight, transit, bicyclist, and pedestrian traffic – reducing congestion and improving the transportation facilities for all modes of traffic.

Bicycle Path

One of the main improvements includes the bicycle path on the east side. Prior to construction, there were limited bicycle and pedestrian facilities; there was only a sidewalk on the west side of the road. With the completion of this project, a two-way bike path with a separate sidewalk is provided with a vegetated buffer separating the walkway and path from the roadway. The concept was a result of an alternative analysis that looked at many options. The benefits of this include the limited conflict points on the east side with no driveway crossings. The accommodations for cyclists include the current best management practices for traffic control, which include the use of bicycle signals and detection at the street crossings, directional delineation on the bicycle path and bicycle boxes for left turning cyclists at the street intersections.

One of the creative applications of engineering involved incorporating walls into the design to avoid significant impacts to major utility services. AT&T and Verizon interstate main fiber lines run down the old railroad right-of-way and with the use of a wall behind the bike and pedestrian facilities, costly relocations were avoided and therefore potential increases in costs to the rate payers. Walls were also incorporated in the design on Evergreen Parkway to avoid PGE power vaults servicing the adjacent data center that were outside of the public right-of-way. The County elected to implement the wall design as on overall cost and schedule savings to the project as compared to being required to pay for the relocation of these vaults had they been brought into the expanded public right-of-way with a cut slope design.

Existing looking North at Imbire Drive

The use of underground water quality and storage facilities was another approach employed to reduce cost to the public. The conventional approach would have been to treat runoff in swales or ponds above ground and detain runoff in large ponds, which would have required costly acquisitions of prime developable properties in the area as well as impacting the aforementioned interstate fiber utilities.

US26 ramp paving

A major component of the construction cost was the pavement. In order to be as efficient as possible, the County directed the design team to perform a complex and thorough analysis of the existing pavement section to determine which areas could be reused, and which areas needed to be rebuilt. The design that was developed relied on this information and facilitated the optimization of the vertical geometry.

6. SUSTAINABLE PRACTICES – USE OF ALTERNATIVE MATERIALS, PRACTICES, OR FUNDING THAT DEMONSTRATES A COMMITMENT TO SUSTAINABILITY.

Materials

One of the components of sustainable materials in the project was the use of Portland cement concrete pavement on Cornell Road and Ronler Drive. Concrete is durable, which leads to a better lifecycle cost than other materials. In addition, it is fully recyclable and can be constructed with local recycled materials eliminating reliance on imports. It is light reflective, so it reduces the heat island effect associated with urban areas; and it has a lower rolling resistance than other materials, so it reduces the energy need for vehicles that drive on it.

For other areas built with asphalt concrete pavement (ACP), sustainable elements in the design included affording the contractor the option to include up to 30% reclaimed asphalt pavement (RAP) for base courses and up to 20% RAP in wearing courses. In addition, the specifications allowed for the use of "warm" ACP mix designs under select criteria, which would have reduced the energy needed to prepare the ACP.

Cornell Road View North

As a standard practice, inefficient high pressure sodium (HPS) light fixtures within the corridor were removed and replaced with high efficient light emitting diode (LED) light fixtures. LED light fixtures were installed for all the new luminaires and the reuse of existing luminaire poles was required wherever possible.

Reuse of existing materials also extended to signs, sign supports and signal equipment wherever it was feasible and the existing materials were in serviceable condition. Existing aggregate base was also reused where deemed acceptable by visual inspection, including under a majority of the curb and gutter and sidewalk on the west side of the road.

This project was one of first locations in which methyl methacrylate (MMA) was installed for bike markings on a County project. This pavement marking material is more durable than thermoplastic striping and is highly skid resistant.

Practices

Sustainable practice was demonstrated in a number of ways. With regard to the transportation design, the access provided was considered (not just mobility), movement of people and goods (not just vehicles), and provision of transportation choices, such as safe and comfortable routes for walking, bicycling, and transit.

This balanced approach to design provided an overall energy savings especially through the mitigation of congestion (with traffic signals or by widening the shoulders in case of an emergency). Reducing road congestion reduces the energy consumed and emissions released by vehicles. This was further enhanced with the use of interconnect fiber in the project to provide signal progression and smooth traffic flow capacity including tying into the County's existing backhaul fiber on US 26. Additional communications infrastructure was installed for future use and for sharing with other jurisdictions, including providing fiber-ready conduit to tie-into a Washington County and ODOT project that received US DOT Transportation Improvements Generating Economic Recovery (TIGER) grant funding to provide advanced traffic management systems to a number of area corridors, including Cornelius Pass Road between Cornell Road and Tualatin Valley Highway (OR 8).

NW Evergreen Parkway view North during construction

In the pavement design, variable depth grind and inlay was detailed in the plans so the removal of existing materials was minimized. In addition, the pavement section specified along with the maintenance practices of the County will virtually result in a perpetual life pavement.

The development of the horizontal and vertical alignment also contributed to the promotion of sustainable practices by limiting the amount of reconstruction and minimizing the impacts to the adjacent improvements. One of the unique characteristics of this project was the acquisition of a former railroad right-of-way, which allowed for the construction of

a 2-way bike path and landscaping, similar to a “rails to trails” concept. This linear corridor, which contained areas of contaminated soil exempt from use as clean fill, likely had limited value or functionality for other uses.

During construction, a number of the signal pole foundation placements were redesigned to avoid utilities that were discovered where the County could have required costly relocations, resulting in potential rate increases to the utility users. Requiring the utilities to relocate would have also had associated schedule impacts, thereby extending project-related traffic impacts associated with staged construction.

In the area of stormwater management and design, sustainability was advanced through the use of the best management practices including the redesign and reconstruction of the existing Wishing Well pond facility. As a result of this work, this poorly functioning facility was repurposed and retrofitted to avoid the use of valuable developable land for a new facility. Underground detention and water quality facilities were also designed with the goal of allowing the surface areas to be used for other things, such as the water quality filter vault at Evergreen Parkway and 215th Avenue, which was incorporated into the TriMet bus pad. The flow control structure at the southwest quadrant of the Cornelius Pass Road intersection with the US26 ramps was designed with this same goal in mind, allowing for a future City of Hillsboro trail or parking lot. Generally, the reuse of the existing storm sewer system was attempted as much as possible but when new infrastructure was necessary, the new lines were placed within the existing storm alignments to reduce the number of utility conflicts and minimize utility disruption. Another design feature included the approval of a design exception to allow storm lateral tees into the storm main where normally manholes would have been required.

Wishing well existing

The County also practices the act of purchasing wetland mitigation credits where it makes sense. In this project, small isolated low value wetlands were impacted and on-site mitigation would have provide little to no value to environmental habitat enhancement. Instead mitigation credits were purchased where the value of the mitigation could be leveraged with a much larger habitat system improvement investment.

Water Quality Vault in Bus Pad on Evergreen Parkway

Funding

The creative and cooperative approach of the participating partners in funding this project allowed for a realization of the old Greek maxim, “the whole that is greater than the simple sum of its parts.” In this case, the three projects by themselves would have had certain elements required regardless of size but with the combination of the projects, some of the overall elements were reduced and the benefits of synergy were applied. This included such things as overall management, startup efforts, notices to the public, open houses, public involvement, traffic control, mobilization, etc.

7. ENVIRONMENTAL CONSIDERATIONS INCLUDING SPECIAL STEPS TAKEN TO PRESERVE AND PROTECT THE ENVIRONMENT, ENDANGERED SPECIES, ETC., DURING THE CONSTRUCTION PHASE.

Early in the project development, the risk of contaminated soils discovery along the old railroad corridor was identified. Steps were then taken to test the soils, confirm contamination existence and delineate those areas. Furthermore, the grading design was developed to minimize disruption to the areas identified. In the areas that were disturbed, a plan was prepared for the proper monitoring, handling and disposal of the materials. Also, ODOT generally considers the top 18 inches of soil adjacent to its roadways as exceeding DEQ's clean fill guidance. Between the contaminated soil zones in the former rail corridor and those along the US 26 eastbound on ramp improvements, just shy of 7,900 tons of contaminated soil was excavated, hauled off, and properly disposed of as part of this Project.

WQ filter vault

As mentioned in previous sections the stormwater management incorporated a full range of best management practices. This included a combination of both below and above ground water quality treatment facilities, which, consisted of a water quality bioslope, water quality filter cartridges, and the retrofit of an existing water quality pond. In all the project provided water quality treatment for an additional 1.9 acres of impervious surface compared to the 20.9 acres required by National Marine Fisheries Service and an additional 7.4 acres of impervious surface compared to the 15.5 acres required by Clean Water Services. Both of these credits will be available to the County to apply to other projects in the area that are unable to meet their onsite water quality requirements.

Flow control facility at US26

The stormwater management also included flow control facilities designed to meet requirements outlined in the Standard Local Operating Procedures for Endangered Species otherwise known as SLOPES V. The result is that when stormwater is released from the Project site to the Rock Creek watershed, it is controlled to match "pre-development" flows and thus avoids impact to Rock Creek and the degradation of fish habitat regulated by the Endangered Species Act.

Other environmental consideration included the following measures during construction:

- Fencing off unaffected wetland and buffer areas adjacent to the work zone to avoid impacts during construction.
- Early tree removal for those trees requiring removal in order to avoid nesting season during construction
- Obtaining noise variances from the City of Hillsboro when performing work outside of normal daytime hours

8. COMMUNITY RELATIONS – A SUMMARY OF THE EFFORTS BY THE AGENCY, CONSULTANT AND CONTRACTOR TO PROTECT PUBLIC LIVES AND PROPERTY, MINIMIZE PUBLIC INCONVENIENCE AND IMPROVE RELATIONS.

Positive community relations were fostered with a robust public involvement program. As mentioned previously one of the benefits to combining the three projects was the minimization of disruption to the public and the efficiency in having a central source for public notices, open houses, and public engagement.

During the project design phase, two (2) open houses were conducted. There was ongoing updates throughout project made available via project web page, e-newsletters, mailers, media releases, and portable changeable message signs.

05.04.15

The Department of Land Use & Transportation
Engineering and Construction Services

CORNELIUS PASS ROAD
Project Newsletter - May 2015

Cornelius Pass Road Project Interested Parties:

Thank you for your interest in the Cornelius Pass Road (Cornell to U.S. 26) improvement project!

Special attention was given to events at the Hillsboro Stadium through coordinating with the City of Hillsboro and the Hillsboro Hops minor league baseball team to try to limit the impacts to the people traveling to events at the stadium. Special attention was also given to the commercial businesses when the concrete driveway approach to Fred Meyer was closed for reconstruction. The County went door-to-door with flyers and spoke with the impacted businesses to inform them of the work and answer any questions they had.

Other general efforts to minimize impacts to public included the following measures:

- Combining MSTIP/Intel/IOF projects so only one ongoing project to deal with rather than individual projects over a longer period of time
- Provision for night work to avoid peak hour impacts and the high volume of traffic during the day
- Closing Evergreen Parkway between Cornelius Pass Road and 215th Avenue to lower old railroad grade rather than following original plan of staged construction
- Closing Ronler Drive between 229th and Cornelius Pass Road to rebuild the Portland Cement Concrete Pavement approach to Cornelius Pass Road rather than following the original plan of staged construction
- Constructing the 3-lane entrance ramp to US26, so it would tie-in seamlessly with the 26 widening project that followed this project
- Staging the project in a way that allowed multiple lanes of traffic to remain open during active construction work

9. UNUSUAL ACCOMPLISHMENTS UNDER ADVERSE CONDITIONS, INCLUDING BUT NOT LIMITED TO, ADVERSE WEATHER, SOIL OR SITE CONDITIONS, OR OTHER OCCURRENCES OVER WHICH THERE WAS NO CONTROL.

Some of the unique adverse conditions that this project had to overcome included an unusually wet fall of 2015 and fall/winter of 2016. In early 2016, when PGE was about to implement a scheduled 115kV outage to allow its crews to switch power over to the new transmission line poles constructed for this roadway widening, winter storms caused an off-site transformer to fail, resulting in emergency repairs that delayed the Project outage. The old poles were in the middle of the roadway widening and had to continue to be worked around for a longer period of time until a new outage could be scheduled.

Managing the sheer volume of traffic through this project is not normally encountered with County arterial projects. Cornelius Pass Road has an average daily trip count of 40,000 vehicles, which equates to volumes carried by some freeway and highway facilities. The truck percentage is relatively high as well, at 16 percent. In addition to the high auto and truck volume, five signalized intersections had to be managed - 1 being a freeway interchange intersection, 2 arterials, 1 collector and 1 neighborhood route. In all of this,

traffic control was paramount to providing safety and efficiency to the traveling public, construction crews, and inspection staff.

Management of groundwater became an issue for the Contractor to overcome. High groundwater was encountered and threatened to delay progress and a section of the Wishing Well Pond slope had to be repaired when it began to fail because of groundwater piping through the slope.

Flow control facility at US26

10. ADDITIONAL CONSIDERATIONS YOU WOULD LIKE TO BRING TO THE ATTENTION OF THE PROJECT REVIEW PANEL SUCH AS INNOVATIONS IN TECHNOLOGY AND/OR MANAGEMENT APPLICATIONS DURING THE PROJECT. INCLUDE A DESCRIPTION OF SPECIAL ASPECTS OF THE PROJECT.

Innovations in Technology

The County provided Kerr with a full Digital Terrain Model to upload into Kerr's GPS equipped machines. This allowed Kerr to accelerate their construction schedule and reduced the overall survey staking required.

The use of underground detention and water quality filter vaults – taking advantage of the latest in stormwater management technology is unique to this project and atypical for County projects. In addition, with luminaires located within the clear zone space, breakaway light pole base technology was utilized.

To counteract the effects of heavy truck traffic, the ACP mix design used the latest in pavement design technology employing the use of a Level 4 design with an ER designated binder (polymer modified).

Work related to widening and grade changes that removed signal detection loops at the intersections of Cornelius Pass Road at Cornell Road and Evergreen Parkway proved challenging for maintaining active vehicle detection for the traffic signals. Rather than adjusting the horizontal placement of detection cameras on each signal mast arm every time lanes shifted with staged construction, "smart" fish-eye cameras were connected to the signal system with Cat5 cable. They were strategically mounted in the intersections in positions that allowed for little to no manual field adjustment being required during the entirety of the construction timeline.

NW Evergreen view North

Special Aspects

While not a Public Private Partnership by conventional definition such as what may be established for a toll road or bridge, this project was delivered under a partnership between Washington County, the City of Hillsboro, and Intel Corporation. This partnership was formalized through a Tri-Party Agreement, which laid out roles, responsibilities, timelines, and funding. This project model allowed leveraging of the funding and commitment of all three entities so that the combined improvements could be realized sooner than it could have otherwise. This Tri-Party Agreement has already been used as a template for another project and could streamline the development of future projects as well.

With the combination of three projects into one, the range of work involved was very large. The roadway work included both PCC pavement and ACP. Stormwater management included both onsite and offsite facilities and a range of best management practices employed. The cross street work was extensive with over a mile of work on the 5 main intersecting roadways and included the installation of 18 new traffic signals. Because of the size of the facility, some of the new traffic signals required custom mast arms. Two mast arms in particular at Evergreen Parkway were 65' long, which is longer than the longest standard mast. Normally this length would be handled using span wires but because the facility is in an urban environment, special mast arms were designed.

Ronler Drive view North

This project also is providing a premier bicycle path along the east side – 12' in width, with the latest in best management practices for bicycle facilities. Prior to construction, there were limited bicycle and pedestrian facilities; there was only a sidewalk on the west side of the road. With the completion of this project, a two-way bike path with a separate sidewalk is provided with a vegetated buffer separating the walkway and path from the roadway. The concept was a result of an alternative analysis that looked at many options. The benefits of this include the limited conflict points on the eastside with no driveway crossings. The accommodations for cyclists include the current best management practices for traffic control, which include the use of bicycle signals and detection at the street crossings, directional delineation on the bicycle path, and bicycle boxes for left turning cyclists at the street intersections. This bicycle path section has the potential to be expanded in inclusion with a larger regional trail system extending north of US26.

APPENDIX

PROJECT PICTURES

US26 Ramp Paving

NW Evergreen Parkway South

Ronler Drive view North

Existing looking South at Imbrie Drive

Evergreen view North during construction

Evergreen view North after

Flow control facility ground

Flow control facility perspective