



## Green Economy & Freight Initiative projects

**Name of Project** Silicon Forest Green Signals

*(project name will be adjusted to comply with ODOT naming convention if necessary)*

### Project nomination narrative

Project nomination narratives provide in depth process, location and project definition details and serves as the nomination form for project funding consideration. **Project narratives should be kept to 12 pages total per project.** This narrative form is available electronically at:

<http://www.oregonmetro.gov/regionalflexiblefund>. Please complete the following:

### Project Definition

#### Base project information

1. Corresponding RTP project number(s) for the nominated project. 10185 (Cornell Road Signal Coordination), 10587 (Cornelius Pass Rd. Improvements), 10841 (Other Traffic Signals), 10605 (Cornell Rd. ATMS)
2. Project extent or area description. The project extends adaptive signal control along the following county-maintained arterial roadways in and alongside the City of Hillsboro: (A) Cornelius Pass Road from the Sunset Highway (US Route 26) interchange north to West Union Road (6 intersections); (B) Cornelius Pass Road from Baseline Road south to but not including Tualatin Valley Highway (Oregon Route 8) (4 intersections); (C) Baseline Road west of Cornelius Pass Road to Borwick Street (2 intersections); (D) Cornell Road from east of Cornelius Pass Road east to but not including 185th Avenue (7 intersections). The project also constructs one signalized mid-block crossing in corridor D at the Rock Creek Trail intersection with Cornell Road.
3. Purpose and need statement (The purpose and need statement should address the criteria as they apply to the project, for example: the project increases access and relieves congestion in to support development of the X industrial area that is forecasted to grow by 2,000 jobs in the priority job sector of Y). Adaptive signal control is a transportation system management and operations (TSMO) technology that uses real-time traffic information collected from camera or other sensors to coordinate and optimize signal timing at multiple signalized intersections in a corridor. The primary goal of adaptive signal control is to reduce congestion and delay in a specific roadway corridor without physically expanding roadway capacity. The proposed project would implement adaptive signal control on Cornell Road and Cornelius Pass Road and signal coordination on Baseline Road – arterial roadways owned and maintained by Washington County within a major employment area in Hillsboro. Sections of these roads carry daily traffic volumes exceeding 30,000 and truck percentages as high as 10%. The Regional Transportation System Management and Operations Plan recommends these corridors for “arterial corridor management,” including upgrading traffic signal equipment and timing. In 2011, with the help of an American Reinvestment and Recovery Act (ARRA) grant, Washington County and the City of Hillsboro successfully implemented adaptive signal

control at nine intersections on an adjacent segment of Cornell Road between Brookwood Parkway and Butler Street. The proposed project would build on these efforts, improving mobility and access to Hillsboro regional center, Tanasbourne-Amber Glen regional center, Hillsboro Airport, the Washington County Fairplex, the new Hillsboro minor league baseball stadium, and a number of existing and expanding businesses in the North Hillsboro employment area, where high-tech industry provides tens of thousands of high-wage skilled jobs. Improved access and mobility for freight and employees will enhance the economic vitality of this high-tech corridor and support additional economic development in the area. The project would extend the reach of the adaptive signal control system on Cornell Road and Cornelius Pass Road by 19 intersections. All of the traffic signals on Cornelius Pass Road from US Route 30 to US Route 26 to Oregon Route 8 would be connected, and all of the traffic signals on Cornell Road from the Hillsboro Airport to 185th Avenue would be connected. Within the proposed project, a signalized, mid-block crossing of the Rock Creek Trail is also proposed for construction. The Rock Creek Trail is the primary multi-use trail in Hillsboro and an important piece of the regional trail system on the west side. It begins in the Bethany area north of US 26 and will eventually extend over seven miles southwestward to the Tualatin River. The Rock Creek Trail links residential with employment and retail areas, parks, and MAX light rail stations. There is currently no crossing treatment at the busiest street crossing at Cornell Road, with 21,500 average daily traffic (ADT) and a 47 mph 85<sup>th</sup> percentile speed. Trail users choose between going 1/4 mile out-of-direction to use a signalized crossing at Aloclek Drive, or taking their chances by crossing at the unmarked location. Count data shows that 30% of trail users during peak commute times take the riskier approach by crossing at the unmarked location. Safe mid-block crossings are the most requested trail improvement in surveys conducted with trail users in 2008-2010. Business expansion and high density residential growth continue to fuel demand for safe active transportation. The 2012 extension of the Rock Creek Trail south to Wilkins Street and the nearby Quatama light rail station will likely generate even more users. A safe trail crossing at Cornell Road is a critical need and will be a complementary piece of the adaptive signal control system.

4. Description of project design elements. Implementing adaptive signal control is primarily a technological solution, so “design elements” in the urban planning sense are few. Engineering tasks will comprise a bulk of the adaptive signal control project, including developing a concept of operations, systems engineering, specifying the adaptive equipment for each of the 19 traffic signals, identifying any communication gaps, and determining what modifications will be needed for detection or other inputs into the system. No right-of-way acquisition or earth disturbance will be required. For the Rock Creek Trail crossing, project design elements will likely include a marked crosswalk, median refuge island, bike lane ramps to accommodate two-stage left turns for bicyclists, landscaping, lighting, and a pedestrian-actuated traffic signal that is connected to the other signals in the corridor. No right-of-way acquisition is anticipated. Total cost for all elements is \$2,130,000, including \$1,895,700 in requested RFFA funds and a \$234,300 match from County funds/in-kind services.
5. Description of post implementation measurement of project effectiveness (Metro staff is available to help design measurement methodologies for post-construction project criteria performance). A project effectiveness analysis is included in the project budget, using methods similar to those used to test the 2011 Cornell Road adaptive signal control system. That included a robust before-after study that used temporary Machine Access Control (MAC)

address collectors to measure travel times on the arterial. Video analysis was also conducted at key intersections to measure side street delays to have a complete picture of project effectiveness. For this project, permanent MAC address collectors would be installed to support ongoing arterial performance measurement. These collection devices would supplement an ongoing regional effort to collect data and measures to support TSMO activities. Video analysis would also be used to observe how well pedestrians and cyclists are served by the project, both at the proposed trail crossing and at other locations throughout the project corridors.

#### **Map of project area**

1. Provide a map of the project consistent with instruction in Exhibit B

#### **Project sponsor agency**

1. Contact information (name, e-mail, phone number) for:
  - Application lead staff Clark Berry, clark\_berry@co.washington.or.us, 503.846.3876
  - Project Manager (or assigning manager) Joe Younkins, joe\_younkins@co.washington.or.us, 503.846.7832
  - Project Engineer (or assigning manager) Stacy Shetler PE, stacy\_shetler@co.washington.or.us, 503.846.7947
2. Describe whether the lead agency has recently led or failed to deliver a federal aid transportation project, and how the agency currently has the technical, administrative and budget capacity to deliver the project. Washington County has successfully completed several federally funded projects and is experienced in delivering projects with ODOT review and administration. Recent projects include an adaptive Safe Routes to School sidewalk projects, Banks-Vernonia Linear Trail and Trailhead, Highway 47 Bridge over Scoggins Creek, Oleson Road Bridge over Fanno Creek, and Tualatin Sherwood Road ITS. The County also completed nine ARRA projects including bridge guardrail, school flasher, flashing yellow arrow, pavement overlay, pedestrian countdown signal, and signal video detection. Washington County has the technical and administration capacity to manage federally funded projects. The County's Engineering and Construction Services Division delivers an estimated \$40 million in projects annually in various sizes and complexities. Washington County also has budget capacity to deliver the project. The standard federal-aid local agency match would be made through one of several locally-generated sources including the Transportation Development Tax and Major Streets Transportation Improvement Program (MSTIP). While FHWA reports that technology projects can be risky and have a higher rate of failure compared to other projects, the 2011 adaptive signal control project on Cornell Road demonstrates the County's ability to successfully deliver this type of project. Installation, integration, communications, and on-going maintenance issues have been successfully negotiated. In addition, expanding an existing system is much less risky than building a new system.

#### **Location**

1. Describe how you identified the travel corridor or general area for the project and how regional and local data relevant to the project criteria support this location as your top priority(s). (See

[Appendix D](#) of the Nomination Packet for criteria relevant to prioritizing project location) The Cornelius Pass Road and Cornell Road corridors were identified for several reasons including their location within or near the nationally significant North Hillsboro employment area (often referred to as the "Silicon Forest"), the Tanasbourne-Amber Glen regional center and other fast-growing areas of Washington County. In the traffic analysis zones (TAZs) adjacent to Cornell and Cornelius Pass roads are an estimated 21,800 existing jobs and a projected 40,180 jobs in 2035. The project connects or is adjacent to several Intel Corporation campuses including Ronler Acres, where the \$6 billion D1X research fabrication facility is under construction. Intel's expansions are anticipated to add 5,400 new permanent jobs, increasing Intel employment to approximately 17,000 in Hillsboro. The project also connects existing and future residential and commercial areas in Tanasbourne, Orenco and South Hillsboro. The project was also selected for its opportunity to leverage current and past transportation investments in the area, including the nearly complete Cornelius Pass Road multi-modal roadway expansion between Aloclek Drive and Quatama Road, the recent extension of the Rock Creek Trail from Orchard Park to Wilkins Street, and the adjacent Cornell Road and Cornelius Pass Road adaptive signal control projects. Additionally, Cornell and Cornelius Pass Roads are among the few continuous arterials in Washington County. Their role in hosting countywide and regional traffic will only increase with the development of South Hillsboro and increased economic development in North Hillsboro. The Rock Creek Trail mid-block crossing at Cornell Road was chosen because it is located within one of the proposed adaptive signal control corridors, and because it is the highest volume road crossing on the trail. The crossing is listed in the City of Hillsboro Transportation System Plan Multi-Use Trail Priority List. The City's Parks & Trails Master Plan identifies the need to ensure trail continuity, and to close gaps in the trail. Currently, no other funding has been identified for the trail crossing.

### **Highest priority criteria**

1. Describe how the project will reduce freight delay. The project reduces freight delay by improving arterial signal timing coordination, reducing the number of stops on the arterials, and avoiding delays due to crashes. By design, adaptive signal control reduces the number of stops on the arterial system, thus reducing the opportunity and frequency of rear-end crashes. Adaptive signal timing can also help manage traffic more efficiently to delay the onset of congestion and dissipate it more quickly than traditional timing systems. Improving the overall traffic flow will benefit trucks moving freight to, from and through Hillsboro. The 2011 implementation of the adaptive system at nine intersections on Cornell Road has demonstrated the value of an adaptive signal system in reducing delays and increasing system efficiency. Final results of the system evaluation demonstrated up to 15% reduction in travel time along the corridor with minimal impact to the side streets.
2. Describe how the project increases freight access to industrial lands, employment centers & local businesses, and/or rail facilities for regional shippers. All the traffic signals on Cornelius Pass Road from US Route 30 to US Route 26 to Oregon Route 8 would be connected. This route is an important north-south freight and commuting route and is listed as a connector route in the Regional Freight Plan. Many trucks traveling Cornelius Pass Road north over the Tualatin Mountains are destined for port facilities in Portland, St Helens or Kelso/Longview. Trucks carrying hazardous materials also use the route because of restrictions on the Vista Ridge Tunnel on US 26. On Cornell Road, all the traffic signals from Hillsboro Airport to 185th Avenue would be connected. This east-west route also carries significant local freight and commuter traffic. The western portion of this corridor is listed at a connector route in the

Regional Freight Plan. The project will improve access to the North Hillsboro employment area (home to Intel's largest campuses), Hillsboro regional center, Tanasbourne-Amber Glen regional center, Hillsboro Airport, the Washington County Fairplex, and the new Hillsboro minor league baseball stadium. The Rock Creek Trail crossing will improve the safety and convenience of biking or walking to work in the North Hillsboro employment area from neighborhoods to the north and south.

3. Describe how the project contributes to "greening the economy" and how the project helps expand economic opportunities to Environmental Justice/underserved communities. (For the purposes of this allocation we are defining "greening the economy" to be initiatives that contribute to creating a low carbon, resource efficient, and socially inclusive economy) The project helps to green the economy by improving traffic flow, which reduces fuel consumption and greenhouse gas emissions otherwise caused by idling traffic in congested conditions. The Rock Creek Trail crossing on Cornell Road provides greater connectivity and safety for commuting by active transportation to jobs in North Hillsboro. Both project components are a good fit for the "Silicon Forest," home to high-tech and green energy businesses.

#### **High priority criteria**

1. Describe any conflicts with freight/active transportation you've identified in your project area. How does the project design mitigate these conflicts? This area of Hillsboro has a typical suburban street network with heavily travelled arterials, large blocks and poorly connected local streets, often forcing pedestrians and cyclists onto the arterial network to compete with cars and trucks. This project will mitigate freight/active transportation conflicts in three ways: (1) The adaptive signal control component will install modern controller equipment that has more features, more flexibility, and the ability to implement "control logic." This logic can increase pedestrian safety by eliminating the pedestrian walk and flashing yellow arrow conflict. These benefits would accrue along all of the affected segments of Cornell Road and Cornelius Pass Road. (2) The trail crossing component will address a major safety concern, installing a traffic signal at the busiest road crossing on the entire Rock Creek Trail. This location experiences 21,500 ADT and a 47 mph 85th percentile speed (posted speed is 45 mph). The crossing will drastically improve safety and convenience for all users, especially families, older users and people with disabilities. Trail user counts conducted in 2008-2010 as part of the National Pedestrian and Bicycle Documentation Program estimated usage of the Rock Creek Trail at 450-500 users per average weekday. Observers noted that up to 30% of trail users crossed at the unmarked location at Cornell Road rather than travel a quarter mile out-of-direction to the nearest signal. (3) The trail crossing will improve the continuity and viability of a regional trail that provides a much needed off-road connection between residential neighborhoods, employment and retail centers, recreational areas, and transit. The Rock Creek Trail's existing undercrossing of US 26 offers cyclists and pedestrians traveling to or from the Rock Creek and Bethany areas a low-stress alternative to biking or walking on busy Cornelius Pass Road and 185th Avenue.
2. Does the project help reduce air toxics or particulate matter? Please explain. Effective signal timing can significantly increase system efficiency and reduce the number of vehicle stops, thereby reducing vehicle congestion and delay, fuel consumption, pavement deterioration,

and the emission of greenhouse gases, air toxics and particulate matter. Reducing vehicle emissions is particularly important in Hillsboro, which was identified in an April 2012 Oregon Department of Environmental Quality report as a top problem area in the state for air toxics and particulates.

3. Does the project help reduce impacts, such as noise, land use conflicts, emissions, etc. to Environmental Justice communities? Please explain. Fewer vehicle stops will result in reduced vehicle emissions and noise that would otherwise occur when trucks accelerate from a stop, as well as reduced “jake brake” noise pollution from engine-assisted truck deceleration. These benefits would be experienced by adjacent medium- and high-density residential communities in Tanasbourne-Amber Glen regional center, as well as single-family neighborhoods in the Reedville and West Union areas. Tanasbourne-Amber Glen has above-average concentrations of non-White and youth populations. An efficient arterial system also causes less traffic to cut through neighborhoods which results in fewer safety and livability conflicts.
4. Describe how the project increases freight reliability. The project would improve system reliability for all vehicle types – including trucks hauling freight – by improving arterial signal timing coordination, reducing the number of stops on the arterials, avoiding delays due to crashes, delaying the onset of congestion, and helping congestion dissipate more quickly.

**Priority criteria**

1. Is the project of an innovative or unique nature such that it is not eligible or typically funded with large, traditional transportation funding sources such as state trust fund pass through to local agencies, local bridge program, or large state funding programs or have any other significant sources of funds? Please explain. The project is innovative in its use of cutting edge intelligent transportation systems (ITS) technology. ITS and TSMO projects such as adaptive signal control do not fit well into the typical mold of capital improvement funding, which tends to be more construction-focused. Technology projects are sometimes overlooked for funding because they have elements that are not universally understood, such as systems engineering, networking and communications. The benefits for such projects are real and measurable, but sometimes not as tangible as a new road or bridge.
2. Will this nomination leverage other funds or prepare a project to compete for discretionary funding that may otherwise not come to the region? Describe any opportunities you have identified. The County and City have secured \$400,000 from the Metropolitan Transportation Improvement Program (MTIP) to perform systems engineering and to extend adaptive signal timing to 11 intersections on Cornell Road and Cornelius Pass Road. This is in addition to the nine intersections on Cornell Road where adaptive signal control was successfully implemented in 2011. The proposed RFFA project would extend the reach of the adaptive signal system on Cornell Road and Cornelius Pass Road by 19 additional intersections, bringing the total number of timed signals to 39. Matching funds would also be available from several locally-generated sources including the countywide Transportation Development Tax and Major Streets Transportation Improvement Program (MSTIP). This broad base of existing and potential funding makes the project scalable based on future funding outcomes.

3. Describe how the project may help reduce the need for highway expansion. Adaptive signal control increases the efficiency of the existing transportation system, reducing or delaying the need for costly and controversial capacity improvements. Pursuing TSMO solutions is consistent with the FHWA Everyday Counts initiative and Regional Transportation Functional Plan section 3.08.220 – Transportation Solutions. Efficient travel on Cornelius Pass Road is particularly important to serve north-south countywide and regional travel demand, reducing the need for more expensive limited access treatments. The trail crossing enhances the Rock Creek Trail as a viable active transportation corridor between the North Hillsboro employment area and residential areas north of US 26, potentially moving some trips from auto to pedestrian/bicycle in the project area.
4. Describe any multi-modal elements included in the design of your project. The Rock Creek Trail crossing is a true multi-modal element that will help pedestrians and bicyclists cross a busy auto, freight and transit route. The trail provides a major north-south active transportation connection in an area of Washington County with poor pedestrian/bicycle connectivity. The crossing will drastically improve safety for trail users who currently cross Cornell Road at an unmarked location due to the inconvenience of nearby crossings. Cornell Road has a posted speed of 45 mph and traffic volumes continue to increase with growth of residential, retail and employment areas nearby. Major improvements to the Rock Creek Trail have occurred in 2012-2013 including southward extension of the trail to Wilkins Street, development of trailhead facilities at Cherry Lane and Wilkins Street, and mid-block crossings at Evergreen Parkway and 185th Avenue. These improvements will likely boost trail usage, increasing the need for a safe crossing at Cornell Road.

#### **Process**

1. Describe the planning process that led to the identification of this project and the process used to identify the project to be put forward for funding consideration. (Answer should demonstrate that the process met minimum public involvement requirements for project applications per [Appendix A](#)) Each of the proposed projects is identified in existing studies and plans that were developed with considerable public involvement. The County public involvement process seeks out and engages affected community members providing an opportunity to participate in decisions about proposed activities that will affect their environment and/or health. The County has renewed efforts to remove barriers and engage citizens through a variety of formats including open houses, event information tables, website-internet presence, and mailings. Washington County planners, construction and engineering staff, traffic engineer, and bicycle and pedestrian coordinator met together to review priority projects from existing plans and studies for candidates projects. Impact and benefit to underserved populations was considered along with the other priority criteria to help staff focus on the select projects for nomination.
2. Describe how you coordinated with regional or other transportation agencies (e.g. Transit, Port, ODOT, Metro, Freight Rail operators, ODOT Region 1, Regional Safety Workgroup, and Utilities if critical to use of right-of-way) and how it impacted the project location and design. The County coordinated with City of Hillsboro staff to determine the locations proposed for the expansion of adaptive signal control. The City had initially planned to pursue its own RFFA

nomination to implement the concept, but ultimately decided to partner with the County on a singular project for reasons of efficiency and practicality. The County also coordinated with the City of Hillsboro and Tualatin Hills Park & Recreation District (THPRD) on the location and design elements of the Rock Creek Trail crossing. The County and THPRD have been working together on numerous mid-block trail crossing throughout northern Washington County.