

**PSPE PHILADELPHIA CHAPTER
OUTSTANDING ENGINEERING ACHIEVEMENT AWARD NOMINATION FORM – 2023**

Project Information:

Name of Project: _____

Location of Project: _____

Description of Project, Include specific details (use two additional pages if necessary):

Construction Cost: \$ _____ Completion Date: ___/___/___ Project or component must be complete in 2023

Primary Engineering Disciplines Represented by the Project (check those that apply):

Mechanical _____; Electrical _____; Civil _____; Structural _____; Chemical _____

Organizations/Firms That Contributed to the Project and are Responsible for the Achievement (provide additional sheets as required):

Names: _____ Phone: _____

Address: _____ Email: _____

Contact Person: _____ Title: _____

Client/Owner:

Names: _____ Phone: _____

Address: _____ Email: _____

Contact Person: _____ Title: _____

Submitted by:

Firm/Organization: _____ Phone: _____

Signature: *Y. L. C.* _____ Email: _____

To be Presented on December 5th by: _____

Email _____ Cell Phone: _____

A \$50 Entry Fee is required and is to be submitted with the Nomination Form.

The entry fee is to be made payable to PSPE, Philadelphia Chapter.

Nomination is due: November 17, 2023 Presentations: Thursday, December 7, 2023

Send by Email or Fax Nomination to: oea@pspe-philly.org or 215-885-3732

Payment of the Application Fee may be check or by credit card.

To pay by credit card, click to [PAYPAL BUYNOW](#) button on our website <http://www.pspe-philly.org/oea/entryfee.htm>

To pay by check please mail to:

Fredric L. Plotnick, Ph.D., Esq., P.E. Chairman, Outstanding Engineering Achievement Awards
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INTRODUCTION

In October 2009, the Providence Town Center began operations in Upper Providence Township, Montgomery County, Pennsylvania. The regional lifestyle center has been operating with 768,000 square feet of mixed-use space including a Wegmans, Best Buy, Dick's Sporting Goods, Movie Tavern, and a variety of other retail, medical and restaurant space. Despite opening during the Great Recession, the Town Center thrived and continues to serve as a primary regional meeting place for residents and visitors to live, work and play.



In conjunction with the development of the Town Center, numerous roadway and interchange improvements were completed along Route 29 near Route 422 to facilitate the flow of traffic and improve regional roadway conditions. Additionally, Arcola Road was extended around the rear of the Center to connect Route 29 with Route 113. Arcola Road was constructed as a five-lane roadway consisting of two thru lanes in each direction with auxiliary left and right turn lanes where appropriate. The speed limit along this section of Arcola Road is 35 mph, however motorists typically traveled at speeds greater than 50 mph. In the subject section of Arcola Road, a 1,200' long horizontal curve was provided, super elevated at 2-3%.

ENGINEERING CHALLENGES & INNOVATIVE SOLUTIONS

As part of one of the final phases of the Town Center development, Audubon Land Development (developer) and TPD (engineer) coordinated with Township staff and officials to determine the best traffic control for the existing intersection of Arcola Road and Water Loop Lane, which would serve as the main public access to the final development phase. The intersection existed as a T-intersection, with Arcola Road operating in free-flow conditions and Water Loop Lane operating under STOP-control. Also, there is an existing trail network which terminated just short of the existing intersection. The Township's planned vision for the comprehensive trail system involved ultimately extending a multi-use trail to Route 29 under this project's improvements. Also, The Township identified Arcola Road for future implementation of bike lanes to serve all users, thus shoulders, bicycle ramps and applicable roundabout treatments were provided to accommodate bicyclists.

Based on an evaluation of MUTCD signal warrants, a traffic signal could have been implemented at the Arcola Road/Water Loop Lane intersection. However, given the existing characteristics of the roadway and future plans for both trail connections and bike lanes along Arcola Road, stakeholders determined the best approach to intersection control would be the implementation of a modern roundabout. This would provide for safe and efficient access, while providing pedestrian, trail, bike lane connectivity, and an aesthetic continuity throughout the corridor.

DETAILS AND IMPORTANCE OF ENGINEERING IMPROVEMENTS

Since the roundabout was being provided at an existing intersection, there were several complex design considerations to be taken into account. Due to the travel speeds along Arcola Road, a high-speed roundabout approach geometry needed to be provided in order to help slow traffic to an appropriate entry speed. Additionally, in order to incorporate proper cross-slopes, accommodate pedestrian crossings, and provide adequate stormwater conveyance while tying into the existing roadway configuration, there was intense coordination with the Township Traffic Engineer regarding roadway layout, reprofiling of approach roadways, tilted plane design of the roundabout's inscribed circle diameter (ICD), and stormwater management facilities.

Since Arcola Road consists of two lanes in each direction, a hybrid multi-lane roundabout design was required, including a dedicated westbound "left turn" lane and an eastbound right turn by-pass lane. Prior to committing the roundabout geometry to

plan, performance checks were completed to verify that the performance objectives were being met. These checks included fastest path analysis, path alignments for multi-lane approaches, sight distance analysis and angles of visibility for entering vehicles. Planning for applicable advance warning signage on each roundabout approach, shared use trailways, as well as at the roundabout approach entrances were meticulously identified and placed per industry guidance and Municipal preferences. Design vehicles, Public Transportation vehicles, and Emergency vehicles were also taken into consideration for the roundabout geometry design.

Since the Providence Town Center, and thus Arcola Road and Water Loop Lane, were recently constructed, the existing aesthetics of the area needed to be considered and incorporated into the final design. These included incorporating the existing street lighting into not only the repositioning of impacted lights, but extended to provide roundabout-specific roadway lighting with both a look and feel that was agreeable to the stakeholders. The extension of the existing pedestrian facilities also incorporated ADA-compliant access points, shared use trail extensions, median/splitter island refuge areas, and colored crosswalks. Bicycle access along Arcola Road and the surrounding shared use trails was extensively coordinated to provide a solution for access to meet expectations of bicyclists in the region. Lastly, the existing landscaping along Arcola Road and Water Loop Lane was incorporated into the design, while maintaining appropriate sight lines specific to a roundabout.

Once the design issues were coordinated with the stakeholders, the next major hurdle was to address construction of the roundabout, as Arcola Road serves a vital function in the Township by connecting two State roadways and provides access to the Providence Town Center. As such, a solution was needed to address the inability to detour Arcola Road during construction and keep Water Loop Lane open to adhere to existing lease obligations within the Town Center. To facilitate traffic on Arcola Road and maintain access, Traffic Planning and Design, Inc., in conjunction with the Township staff, designed a 7-stage construction phasing plan that met not only the travel way needs, but also the mobilization requirements of the construction contractor.

IMPACT TO DELAWARE VALLEY REGION

Throughout the lifecycle of this project, the developer and design team continually kept the end goal in mind by identifying the initial concerns of the municipality that Arcola Road served as a bypass route to residents that invited high speeds and did not provide any sense of entry to the Township. As a result, this roundabout, that can accommodate all transportation system users, is the ideal solution to keep end users safe, maintain traffic flowing, reduce speeding, keep nearby homes, businesses and trails accessible and serve as a gateway to the Township. This project plans to provide the Township and all stakeholders with an aesthetic and final conditions in line with future planning for the corridor, as well as uniformity throughout the proposed site and the adjacent developments, the Town Center Site and future development along the Arcola Road corridor.



ADDITIONAL TEAM MEMBERS

Site Engineer

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General Contractor

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2052 Lucon Road, P.O. Box 196, Skippack, PA 19474
Bob Heacock | Project Manager
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Inspection Agency

Upper Providence Township
1286 Black Rock Road, Phoenixville, PA 19460
Via. Gilmore & Associates, Inc. (Township Engineer)
184 W. Main Street, Suite 300, Trappe, PA 19426
Michael Coyne | Project Manager
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