



MEMORANDUM

Date: March 22, 2018

To: Steve Norcini, P.E., Radnor Township Engineer

From: Amy Kaminski, P.E., PTOE, Gilmore & Associates, Inc.

cc: Kevin Kochanski, RLA, CZO – Radnor Township Director of Community Development
Ray Daly, Radnor Township Codes Official
Patricia Sherwin, Radnor Township Engineering Department
John Rice, Esq. – Grim, Biehn & Thatcher
Peter Nelson, Esq. – Grim, Biehn & Thatcher
Roger Phillips, P.E. – Gannett Fleming, Inc.
Damon Drummond, P.E., PTOE – Gilmore & Associates, Inc.

Reference: 145 King of Prussia Road – The University of Pennsylvania Health Systems
Radnor Township No. 2016-D-04
Final Land Development Review 1
Radnor Township, Delaware County, PA
G&A # 15-12020

Gilmore & Associates, Inc. (G&A) has completed a transportation review for the above referenced project and offers the following transportation comments for Radnor Township consideration:

I. BACKGROUND

The University of Pennsylvania Health Systems is proposing the re-development of a 26 acre parcel, located at 145 King of Prussia Road, in Radnor Township, Delaware County. The project includes a total proposed gross floor area of 475,000 sf. The proposed development will consist of a 250,000 square foot Mixed Medical Use building with two parking structures (1,000 and 850 spaces), a four-story 150,000 square foot general office building, a four-story 75,000 square foot (120 room) hotel and an associated 850 space parking garage. The site is expected to generate a total of 731 AM peak hour trips, 583 PM peak hour trips, and 7,518 weekday trips without any trip reductions for internal or transit trips. The Average Daily Traffic in both directions of travel along King of Prussia Road is 10,283 vehicles.

II. DOCUMENTS REVIEWED

- A. Final Land Development Plans for Penn Medicine at Radnor consisting of 34 sheets, prepared for the University of Pennsylvania Health Systems, prepared by Pennoni Associates, Inc., dated September 29, 2017, last revised March 2, 2018.
- B. Code Analysis Life Safety plans (Garage Plans) consisting of 1 sheet (PG-A0.3), prepared for the University of Pennsylvania Health Systems, prepared by Ballinger. The plan sheet is undated.

- C. Ground Tier Architectural Plans consisting of 1 sheet (PG-A1.1), prepared for the University of Pennsylvania Health Systems, prepared by Ballinger. The plan sheet is undated.

III. IDENTIFIED IMPROVEMENTS

- A. A bus shelter will be constructed on King of Prussia Road southeast of the SEPTA Access/Northern Site Access to the extent that it is approved by SEPTA.
- B. Traffic Signal Timing Optimization at the following intersections:
 - 1. King of Prussia Road and Matson Ford Road/Park Driveway.
 - 2. King of Prussia Road and Radnor-Chester Road.
 - 3. Lancaster Avenue and I-476 SB Off-Ramp.
 - 4. Lancaster Avenue and Radnor-Chester Road.
 - 5. Lancaster Avenue and I-476 NB On-Ramp/Hillside Circle.
- C. King of Prussia Road and SEPTA Station Driveway:
 - 1. Restripe southbound King of Prussia Road to provide a dedicated left turn lane.
 - 2. Coordinate with SEPTA to construct bus shelter.
- D. King of Prussia Road and Raider Road/Site Driveway:
 - 1. Construct a new traffic signal.
 - 2. Provide left turn lanes on both approaches of King of Prussia Road.
 - 3. Widen east side of King of Prussia Road to provide two continuous northbound lanes from Lancaster Avenue to the signalized intersection at Main Site Driveway/Raider Road.
- E. King of Prussia Road and Southern Site Driveway:
 - 1. Restripe northbound King of Prussia Road to provide a shared through/right turn lane.
 - 2. Widen the east side of King of Prussia Road to provide two continuous northbound lanes from the south driveway to Main Site Driveway/Raider Road, with a transition into a dedicated right turn lane.
- F. King of Prussia Road and Lancaster Avenue (U.S. Lancaster Avenue (S.R. 30))/NB Off-Ramp:
Restripe the northbound I-476 off-ramp at Lancaster Avenue to provide a shared through/right turn lane.
- G. Partnership with Radnor Township to install a Traffic Adaptive Signal System at the following intersections:
 - 1. Lancaster Avenue (S.R. 30) & I-476 Northbound On Ramps
 - 2. Lancaster Avenue (S.R. 30) & I-476 Off Ramps /King of Prussia Road
 - 3. Lancaster Avenue (S.R. 30) & I-476 Southbound Ramps
 - 4. Lancaster Avenue (S.R. 30) & Radnor-Chester Road
 - 5. Lancaster Avenue (S.R. 30) & Radnor Financial Center Eastern Driveway
 - 6. Lancaster Avenue (S.R. 30) & Radnor Financial Center Western Driveway
 - 7. King of Prussia Road & Radnor-Chester Road
 - 8. King of Prussia Road & Matson Ford Road
 - 9. Matson Ford Road & South Centennial Drive
 - 10. Matson Ford Road & North Centennial Drive

11. King of Prussia Road & Raider Road
12. Radnor-Chester Road & Raider Road
13. Radnor-Chester Road & Radnor Financial Center

IV. APPROVED WAIVERS

§255-21.A(6) – The Applicant received a waiver from providing the maximum plan sheet size of 24 inches by 34 inches during the conditions of approval during the Preliminary Plan Development phase.

V. ZONING COMMENTS

§280-63.D(5) – Revise the Parking Garage stall size to provide a minimum stall not less than nine feet in width by 19 feet in depth, exclusive of the aisles, for each motor vehicle. The comment must be addressed or a variance requested.

VI. SUBDIVISION AND LAND DEVELOPMENT ORDINANCE

The following comments must be addressed or a waiver requested:

- A. §255-20.B(5) – The Applicant is required to provide a comprehensive Final Transportation Impact Study to the Township incorporating all sections provided during preliminary land development. Additional documents were provided to the Township separate from the Transportation Impact Study (TIS) must be a complete standalone document.
- B. §255-21 – The Applicant is responsible for providing roadway improvement plans including the following documents prior to Final Land Development approval:
 1. Construction details related to ADA curb ramps, including spot elevations, dimensions and slopes; including ADA complaint curb ramps on all corners of Raider Road and King of Prussia Road at the proposed traffic signal.
 2. Traffic Signal Construction Plans, new and modified Traffic Signal Permit Plans, Traffic Signal System Plans, AutoCAD files of As-Built Plans, and a Traffic Signal Design Report must be provided to the Township and PennDOT for review and approval.
 3. All new or modified signal permit plans and system plans require a completed PennDOT Traffic Engineering Form 160 (TE-160) *Application for Traffic Signal Approval* and resolution.
 4. Include a separate Pavement Marking and Signing Plan in the plan set:
 - i. Provide traffic control signage including existing, removed and proposed; we note that no signs were included in this plan set for the new auxiliary turn lanes on King of Prussia Road or the accesses to King of Prussia Road.
 - ii. Provide the geometry of the proposed (final) traffic lane patterns including the location and color of all pavement markings, the lane assignment and proposed signage.
 - iii. Eliminate from the Pavement Marking and Signing Plan any existing pavement markings that are to be removed.
 - iv. Include a key identifying line geometry, color indication and dimensions or if clarity permits, the line color and geometry may be identified on the Pavement Marking and Signing Plan.

- v. Dimension all lane widths and lane and bay taper lengths along with crosswalks and stop bars.
5. Provide plans for the timber bridge and supporting documentation.
 6. Note 8 under GENERAL CONSTRUCTION AND GRADING NOTES does not adequately address the required Maintenance and Protection of Traffic plans for work along King of Prussia Road. It must be stated on the plan that "Maintenance and Protection of Traffic during construction shall be in accordance in PennDOT Publication 213, "Work Zone Traffic Control Guidelines", amended June 6, 2014, and Title 67 PA Code, Chapter 212, "Official Traffic Control Devices", dated February 4, 2006 or most current." A sequence of construction narrative must be added to the plans. Reference the appropriate MPT figures accordingly. If long-term traffic control is required, the narrative must also address the construction staging and differentiate between the use of short term and long term traffic control patterns.
- C. §255-21B.(1)(I) – Sheet CS0901, identify the owner of the property between the two Legal Right-of-Way Lines at the southern property line and SR 0476. Clearly label which parcel is APN 36-02-01234-00 Block 16; it is currently shown within the SR 0476 right-of-way.
 - D. §255-29(C)5) – Revise the Parking Garage Plans to identify the proposed aisle widths for all levels of the Parking Garage Plans.
 - E. §255-30.A – Identify the area adjacent to the parking garage that is west of the loading area wall and is approximately 10'x 60'. If this area is intended for loading, it must meet the requirements for this section.
 - F. §255-37 – Sidewalks and pedestrians paths. Provide spot elevations, widths and slopes to show the connection from the proposed on-site sidewalk to the existing SEPTA facilities is ADA accessible. Provide ADA facilities for the trail crossing at the southern driveway.
 - G. §255-37.C – Provide an easement for the proposed pedestrian trail from driveway opposite of Raider Road to the southern property line.
 - H. §255-37.D - Provide curb cuts at the southern driveway at King of Prussia Road.
 - I. §255-37.E – Sidewalks and pedestrian paths shall be adequately lighted, if required by the Board of Commissioners. Revise the lighting plan for consistency between the proposed lights and illumination levels shown on Sheet CS2201.
 - J. §255-37.H – Where sidewalk grades exceed 5%, a nonslip surface texture shall be used. The Final Land Development plans should provide additional details regarding any proposed walking paths or sidewalks to ensure compliance with this section. Verify that the sidewalk connection at the rear of the site to the SEPTA station does not exceed a slope of 5% and does not require pedestrians to cross into parking stalls.

VII. GENERAL COMMENTS

- A. Truck Turning Templates:
1. The Applicant has demonstrated a WB-40 truck can adequately navigate turns into and out of the Northern/SEPTA driveway; however, the Applicant must verify the WB-40 truck is the largest truck anticipated to utilize this access and include a note and appropriate truck restriction signage restricting this driveway for vehicles no larger than a WB-40.
 2. Sheet CS9801 (Sheet 33): Provide WB-67 exit movements (left and right turns) and southbound left turns into the Southern Site Driveway at King of Prussia Road.
 3. The Applicant did not include a truck turning template for the intersection of King of Prussia Road and the proposed Center Driveway/Raider Road.
 - a. If no trucks will be utilizing the Center Driveway, truck restriction signage must be provided.
 - b. Minimally, bus turning templates must be provided for the Raider Road access to King of Prussia Road to ensure busses can enter and exit Raider Road without encroaching into opposing traffic lanes. Stop bars may need to be staggered on both Raider Road and King of Prussia Road to ensure maneuvers can be safely accommodated.
- B. Show the location of the proposed bus shelter provided on King of Prussia Road southeast of the SEPTA Access/Northern Site Access. ADA accommodations must also be provided for access to the bus stop.
- C. Show the full extent of the proposed dedicated left turn lane on King of Prussia Road at the Northern Access/SEPTA Station Driveway. If necessary, provide a match line similar to the one included on Sheet CS1701 (sheet 11).
- D. Sheet CS0002: Under GENERAL CONSTRUCTION AND GRADING NOTES; verify and update as need all dates and references included in note number 2.
- E. The following signage and striping revisions should be provided on the parking garages plans:
1. Provide ONE WAY and/or DO NOT ENTER signs at the locations where appropriate.
 2. Provide traffic flow left-turn or right-turn arrows where traffic must turn in only one direction.
 3. Provide clearance height signs where appropriate.
 4. Provide wayfinding guidance including additional parking signs along with exit signs where appropriate.
- F. For consistency, verify the number of parking spaces available in both garages. The Northern Garage (Sheet PG-AO.3) indicates 857 spaces in the top right diagram while the chart on the same sheet indicates 850 spaces. The Southern Garage (Sheet PG-A1.1) indicates 955 spaces and Sheet CS1001 of the land development plan set indicates 1,000 spaces. The number of parking spaces must be consistent.

- G. Per *PennDOT Publication 111 Traffic Control – Pavement Markings and Signing Standards TC-8600 and TC8700 Series*, the following signage and striping revisions must be verified or updated in future submissions:
1. Include a detail for the “ARROW/ONLY” pavement marking legend indicating the top of the arrow 60’ (20’ minimum) from the stop bar/stop location and the top of the “ONLY” spaced 32’ from the bottom of the arrow. A note must also be added indicating that the dimensions may be modified slightly in order to meet field conditions.
 2. All stopbars are to be located a minimum 4 feet offset from crosswalks.
 3. All crosswalks are to be a minimum width of 6’ feet. The crosswalks near the northern garage appear to be less than 6’ wide.
- H. Include R7-302 NO PARKING SYMBOL/ARROW signs along the north side of the Northern/SEPTA driveway. Parking should not be permitted along this driveway.
- I. Relocate the sign tabulation included on Sheet CS0002 to the required *Pavement Marking and Signage* sheet discussed above; exclude any unused signs from the sign tabulation set.
- J. The trail indicates a permeable walkway. If the trail is intended for ADA use, the applicant should verify and note the surface will be ADA compliant.
- K. Prior to Final Approval, the Applicant is required to coordinate with Radnor Township School District to eliminate parking along the south side of Raider Road near King of Prussia Road. The onstreet parking along the south side of Raider Road will conflict with stacked vehicles awaiting a green traffic signal and this area must remain free of parked vehicles for a minimum of 150 feet unless additional information is provided to support a reduced parking prohibition.
- L. All turn lanes should be revised and designed to meet whichever is the greater of the Turn Lane Warrant analysis or the 95th percentile queues.
- M. To assist the contractor during construction, modify the plan to include stationing on King of Prussia Road
- N. Revise the proposed 25 foot bay tapers to 75 foot minimum bay tapers.
- O. Provide spot elevations at the bottom of curb, top of curb, edge of pavement, and grade break locations at minimum 50’ intervals along areas of widening, new curbing and at minimum 10’ intervals along radius returns.
- P. Given the extent of the roadway modifications and pavement marking revisions, the Township may want to request the Applicant provide a mill and overlay along the entire site frontage of King of Prussia Road.

If you have any questions regarding the above, please contact this office.