Crash Analysis Studio

Session 17: State College, Pennsylvania
Held on May 31, 2024

Session Participants:

- **Dean Chamberlain**, Engineering Group Manager at Toole Design; former City Engineer in the Twin Cities metropolitan area
- **Ethan Dean**, Graduate student in Entomology; former Americorps service member; daily cyclist commuter; concerned citizen and safety advocate
- **Nicholas Rizzio**, Pittsburgh resident; 2023 Penn State graduate; former member of Strong Towns Happy Valley; concerned citizen and safety advocate
- **Charles Marohn**, President of Strong Towns
- **Tony Harris** (moderator), Action Team Coordinator at Strong Towns

Summary of Crash Event

- The crash occurred at 7:57 p.m. on September 12, 2023 near the intersection of East Park Avenue and McKee Street in State College, Pennsylvania.

- Lovisa Arnesson-Cronhamre, a 25-year-old enrolled as a student at The Pennsylvania State University, was jogging westbound along the south sidewalk of East Park Avenue when she was struck by a motorist.

- The motorist, identified as 20-year-old Penn State student Ahmed Alqubaisi, was driving westbound at an unsafe speed when he lost control of his BMW.
    - His vehicle crossed into the eastbound lane and traveled up onto the sidewalk.
    - First he hit a standpipe, next he knocked down a light pole, then he hit Lovisa, and finally collided with a tree before coming to a complete stop.
    - He was driving with a learner's permit without a licensed driver in the car.

- Lovisa was first transported to Mount Nittany Medical Center and then to University of Pittsburgh Medical Center-Altoona (UPMC-Altoona); she passed away from her injuries around 2 a.m. on September 13, 2023.

- Ahmed was arrested and charged with third-degree felony homicide by vehicle, involuntary manslaughter, and recklessly endangering another person.
    - Ahmed was released after a $3 million bail was posted.
    - Ahmed pled guilty in mid-March to one felony count of accident involving death, and he received a sentence of 33 days to 23.5 months in prison with 5 years probation.

- Law enforcement did not believe drugs or alcohol were factors in this collision, and weather reports indicate it was partly cloudy with light showers in State College the evening of the crash.

- The speed limit on East Park Avenue in this particular area is 35 miles per hour (mph).

Primary Contributing Factors

The current design of East Park Avenue aims to move a large amount of vehicle traffic at speed and also aims to allow for the movement of pedestrians and cyclists. These two goals are fundamentally incompatible. This section of roadway prioritizes high-volume traffic flow over the safety of motorists, cyclists, and pedestrians.

Roadway designers and transportation professionals acknowledge the existence of pedestrians and cyclists at this location by constructing sidewalks, pedestrian crossings, and displaying signage to alert motorists to the presence of cyclists and pedestrians. Pedestrian traffic is high throughout the school year due to proximity to the Penn State Campus and adjacent housing.

These same professional parties have elected to use design standards near the crash location that cater to high traffic volume, including excessively wide through travel lanes, the inclusion of an uncontrolled pedestrian crossing, and a posted speed of 35 mph. Vehicular traffic in this area typically only reaches the volume the roadway has been designed for during college football home game days. These design elements create an environment where motorists are more likely to surpass the 35 mph speed limit.

Speed was a contributing factor in the examined crash; officials stated that Ahmed Alqubaisi was traveling at “an unsafe speed” when he lost control of his vehicle, though documents did not confirm the speed at which he was traveling. Speeding was recognized as common through speed data collection conducted specifically for the purpose of this crash analysis.

The absence of physical barriers or buffers between travel lanes along eastbound Park Avenue and its sidewalk also contribute to the deprioritization of pedestrian safety and usability. The westbound side of the road includes mature street trees and an 8 foot wide planting strip that buffers the traffic lane from pedestrians and the sidewalk from moving vehicles.

Designers have recognized that motorists are fallible and provided margin for error through forgiving design features, but do not create a similar margin for error for pedestrians. These features conflict with the land use pattern in the area, as East Park Avenue runs directly alongside the highly walkable and bikeable Penn State campus. Pedestrians and locals leaving campus frequently cross East Park Avenue to access the many neighborhoods and residential properties that line the opposite side of the avenue. The choice to place a roadway with a design speed that substantively surpasses the posted limit within a complex urban environment illustrates disregard for non-motorist safety.

These design choices increase the risk for all users when compounded with normal environmental conditions–specifically darkness and precipitation–that may decrease visibility or reduce response time in the crash location and heighten the risk of danger for motorists and pedestrians alike.

Design and transportation professionals have elected to expose non-motorists to unnecessary major risk by placing them in an atmosphere constructed to prioritize high traffic volume that may only actually be present on the days[1] Penn State hosts football games. Substantive changes to East Park Avenue are necessary to reduce both traumatic injuries and fatalities.

Session participants identified the following primary factors that contributed to this crash:

1. **Ahmed Alqubaisi engaged in reckless driving behavior by operating a motor vehicle at an unsafe speed while on a learner's permit without a licensed driver in the car.**
    a. Inexperienced drivers are more prone to misjudgements and making errors.
    b. Excessive speed contributed to reckless driving and the loss of control.
    c. This risk was further heightened by the challenging environmental conditions present on the evening of September 12, 2023.

2. **Motorists traveling at night during rainy weather along East Park Avenue may be at heightened risk of a crash due to the interplay of environmental conditions and road design realities.**
    a. There is only one readily apparent drainage structure along East Park Avenue within a three block stretch from the approximate crash location.
        i. A lack of drainage may cause additional water to accumulate along the road surface, making it slicker and more dangerous for motorist users.
        ii. Motorists driving at high speeds or unsafe rates of speed may be more likely to hydroplane and lose control of their vehicles.
    b. Rainy weather under dark conditions typically decreases motorist sightlines and visibility of pedestrians.
        i. These conditions slow driver response times and increase the need for longer stopping distances.

3. **Both the documented travel speed and the design speed of East Park Avenue are fatal speeds; they are incompatible with the high volume of pedestrian traffic generated by the Avenue's proximity to the Penn State Campus and adjacent housing.**
    a. The current speed limit on this section of East Park Avenue is 35 mph; a speed study indicated that 52% of motorists exceed the posted limit.

[1] According to one article, Penn State will host five football games at home in 2024.

b. The study illustrated the 85th percentile speed, or the speed which 85% of drivers were traveling at or below, to be 40 mph.
c. The Insurance Institute for Highway Safety states that fatality rates climb for automobile collisions involving pedestrians at 25 mph. When automobile speeds exceed 40 mph, pedestrian collisions are likely to be fatal. It follows that a 35 mph speed limit subjects pedestrians to automobile travel that is dangerous and often lethal.
d. At least six drivers were recorded to be traveling faster than 45 mph in this study. This data distribution indicates that 165 drivers–or 50% of motorists tracked–were driving between 35 mph and 45 mph; this space may be communicating to motorists that traveling up to ten miles over the speed limit is an acceptable–or even low-risk– behavior in this environment.
e. By design, vehicle travel speeds on East Park Avenue subject both non-motorist users–including pedestrians, cyclists, and public transit riders–and motorists to substantive danger.

4. **The location of East Park Avenue within the larger transportation network situates it between multiple jurisdictional controls resulting in varying designs and vision for the full length of Park Avenue.**
    a. East Park Avenue lies within both State College Borough and College Township; different bodies at the state and local level are responsible for the planning, maintenance, and funding of this stretch of road.
    b. Distributed ownership and oversight of East Park Avenue further complicates approaches to fund or champion change on this roadway.
    c. Traffic enforcement on East Park Avenue falls under the primary jurisdiction of the State College Police Department, though it is surrounded by the Penn State University Police patrol zone.
        i. The awkward jurisdictional enclave of East Park Avenue can frustrate the ability for State College officers to police driver behavior on this stretch of road; this could falsely communicate to drivers that speeding in this area is a low-risk or risk-free behavior.

5. **The design of East Park Avenue facilitates high automobile speeds unsafe for non-motorist users.**
    a. Both the eastbound and westbound through traffic lanes exceed 12 feet in width; each of these lanes were measured to be 12.5 feet wide. These dimensions are commonly used on highways and are inappropriate for streets that run parallel to a walkable urban environment such as the Penn State campus.
        i. The Federal Highway Administration (FHA) and the American Association of State Highway and Transportation Officials (AASHTO) indicate neighborhood streets should adhere to standard lane widths between nine and twelve feet.

    ii. The placement of East Park Avenue adjacent to multiple neighborhoods and multiple residential driveways makes narrower lane widths along this roadway more appropriate.
  b. The excessive lane widths are converted into a mid-block crossing with a pedestrian refuge island near McKee St.
    i. A mid-block crossing and narrowed lanes are not compatible with a design that prioritizes throughput and speed.
    ii. The posting of flashing overhead lights, signage, and reflective delineators for drivers demonstrate that this element would not be expected by motorists.
  c. Segments of East Park Avenue outside of the immediate crash location feature a third lane dedicated to turning traffic.
    i. Dedicated turn lanes are intended to move vehicles that obstruct through travel out of the traffic stream.
    ii. This turn lane is regularly utilized to redirect excess traffic volume on days with football games; it is regularly underutilized when this volume is absent.
    iii. East Park Avenue has been designed to accommodate high traffic volumes that are only present a handful of days each year; this design enables excessive speeding the vast majority of the time.

6. **East Park Avenue exhibits usage features for motorists that invite unsafe driving behavior, making the avenue into an environment incompatible with the walkable Penn State college campus.**
  a. The east and southeast side of East Park Avenue lacks street trees, consistent parking, and other sources of friction or substantive protection for pedestrians.
  b. The absence of friction and congestion impacts motorists in the following ways:
    i. Automobile traffic is not effectively forced to yield for crossing pedestrians and cyclists, even at the designated crosswalk with a pedestrian refuge area and constantly blinking lights intended to increase motorist awareness of other road users.
    ii. Drivers may have a false sense of security to drive at speeds faster than both the posted speed limit and the 20 mph rate that is likely safe for this environment.

7. **East Park Avenue, particularly the segment where the crash occurred, provides little to no physical separation between its sidewalks and vehicle travel lanes.**
  a. Locals indicate students, rideshare vehicles, and emergency service providers still routinely stop in the lane next to eastbound through traffic where “No Parking” signs have been posted.
    i. The absence of physical buffers in this space may cause drivers to perceive their allotted lane width to be larger than its actual size.
    ii. The white lines painted onto the roadway to indicate the area should not be used for parking have faded.

b. The eastbound side of the road lacks street trees and vegetation that may help narrow driver perception of road width.

Recommendations

The Borough of State College, The Pennsylvania State University, and the Pennsylvania Department of Transportation (PennDOT) should agree upon desired user behavior along East Park Avenue regardless of maintenance. At a minimum, the same design objectives shall be applied between the traffic signal at Shortlidge Road and North Allen Street. Substantive consideration should be given to the high volume of pedestrian traffic that will continue to use this roadway throughout the year to access the Penn State campus.

Safety on this corridor will continue to be a community concern for as long as this roadway simultaneously tries to move large volumes of vehicles and accommodate pedestrian and cyclist usage. Public investment should focus on designing conditions that make pedestrians feel safe as they walk along–and cross–the street. The crash that took Lovisa Arnesson-Cronhamre's life is representative of outcomes produced by the current design approach.

The design character and objective for East Park Avenue needs to be made clear by the elected leadership of State College. To make adequate provisions for the safety of all users traveling on East Park Avenue, specifically at the location of this crash, a policy-level decision should be made regarding the goals and intent of this specific corridor. Elected officials must provide direction and guidance to technical staff on whether the design intent of East Park Avenue prioritizes safety for all users, or if this avenue is a connector designed to prioritize the efficient throughput of vehicles over all other design objectives. This direction and guidance from official leadership may also inform how Penn State leadership interacts with this corridor.

If the safety of all users of East Park Avenue is to be prioritized over all other design objectives, the following practices and recommendations should be adopted.

Immediate:

1. Elected officials from the adjacent municipalities and Penn State's Office of Physical Plant should provide direction and guidance that East Park Avenue is to be treated as a local neighborhood street safe for all users. This will provide design direction to technical staff and roadway designers.
2. To enhance pedestrian conspicuity and increase driver awareness:
    a. Modify the signage of the marked crossing at McKee Street from bicycle signage to pedestrian signage[2] to better inform drivers of the presence of pedestrians.
    b. Add pedestrian actuated rapid flashing beacons at the intersection; similar beacons or illuminated signage could be added prior to the crossing.

[2] According to a Right-To-Know Law public records request to PennDOT, engineers may be considering this sign replacement as the primary intervention for this intersection. While this intervention may have positive results, it is not sufficient to make this road safe.

3. Implement temporary measures to both visually and physically narrow the travel lanes on East Park Avenue. These measures should be consistent with the crosswalk width and local streets that achieve desired driver speeds.
    a. Add an edge line with paint on the west side of the street that will optically narrow the 12' lanes to 10'
    b. Add temporary bollards or concrete planters along the east side of East Park Avenue where there is an extra lane and no parking. This would create a buffer zone that provides immediate physical separation between pedestrians and traffic to reduce the risk of pedestrian injuries.
    c. Add additional paint or bollards in the center island created when approaching the crosswalk.
4. Initiate a pilot project for reducing the speed limit on East Park Avenue to either 20 mph or 25 mph, as either of these reduced speed limits align better with an urban context and pedestrian traffic than the current 35 mph speed limit.
5. Encourage the planting of street trees near Beam Hall consistent with the platings on this portion of East Park Avenue.
6. Form an interdisciplinary team of staff from multiple Borough departments–and potentially from University Police and Public Safety–to act as rapid responders[3] to automobile collisions. This team should be responsible for documenting contributing factors of a crash; grant responders agency to immediately implement short term or temporary improvements to the street. For this crash, charge the team with immediate recommendations from this report as well as recommendations for systematic, long-term changes.

Near Term (within the next 12 months):

7. Review the current drainage systems and stormwater conveyance around the crash location to identify any deficiencies in the stormwater system that would result in standing water on the roadway.
8. Review the findings of the pilot project for reducing the speed limit on East Park Avenue and make these posted speeds permanent.
9. Evaluate the effectiveness of temporary measures to both optically and physically narrow the travel lanes on East Park Avenue with the newly formed rapid responders team.
    a. Make temporary measures that produce desired outcomes permanent.
    b. Adjust and modify temporary measures that failed to meet design objectives for safety with alternate temporary measures.
10. Explore installing raised crosswalks or intersections at high-volume pedestrian crossing points, such as the intersection between McKee Street and East Park Avenue, as these crossings will make pedestrians more visible and effectively slow down traffic.
11. Explore permanently removing excessive asphalt and lanes where parking is prohibited; determine how to utilize these areas for stormwater, landscaping, and buffering for sidewalks.

[3] For more information on rapid response models, see Pedestrian Safety Gets Big Boost From New Cincinnati Initiative (January 2023).

Long Term and Systematic:

12. Permanently narrow the road by reducing the amount of impervious surfaces by adding low-impact stormwater features, landscaping, and buffering for sidewalks.
13. Further modify the road with landscaped buffers, protected bike lanes, and by bringing in the curbs.
14. Invest in additional public transportation options–such as high speed rail or trains–to better connect Penn State with the rest of the borough while reducing reliance on transportation via private automobiles.

Concluding Statement

The series of design flaws present along East Park Avenue and at the crash location are problematic and commonplace, both within and beyond State College. Design emphasis that prioritizes traffic flow at high speeds over the safety of all road users–including both pedestrians and motorists–has caused injuries and deaths in settings nearby college campuses and in communities throughout North America.

This particular corridor is more complicated due to municipal boundaries, the university's presence, ownership by PennDOT, roadway maintenance, and enforcement; these factors require a higher level of coordination and consensus. The desire to create safety for all users should be a goal that all parties can agree to champion on this small segment of street.

By evaluating the many factors that contribute to crashes, we believe that decision-makers, the public, and designers can move beyond assigning blame to a model that changes how these spaces are designed, developed, and maintained. In State College, we believe ongoing changes to this location should focus on improving systematic safeguards for all road users.