

Apartment Pass Program . Event Road Closures . Infrastructure Improvement Negotiations . Bus Shelters . Other Notes

Organization Cooperation

Empower associated organizations and municipalities to improve transit by advocating for rider priorities

Apartment Pass Program

Create apartment passes which allow unlimited rides on the entire CATA system and phase out existing single corridor-only passes.

Create ways residential towers downtown can support Loop service.

EXISTING CONDITIONS

Corridor passes offer riders access to 20% of the CATA system at 80% of the cost of unlimited service to CATA.¹⁰⁸ Riders with corridor passes would use a system-wide unlimited pass mostly to commute on their apartment's corridor routes during the peak, but a system-wide unlimited pass might allow them stop bringing a car to State College for the few times—probably off-peak—they need to travel elsewhere.

Residential towers downtown do not contribute to transit funding directly, but residents use White and Blue Loop

service extensively, leading to severe overcrowding.

NEW ADVANTAGES

Offering system-wide unlimited passes rather than corridor unlimited passes to apartment lessees would increase off-peak ridership, which is less expensive for CATA to provide,¹⁰⁹ and increase rider satisfaction. CATA could charge slightly more for system-wide rather than corridor passes, increasing revenue.

STRATEGY OPTIMIZATION

Introduce system-wide apartment passes as a premium apartment amenity, potentially at a discounted rate for parity with corridor passes at first, and slowly phase out corridor passes, transitioning all apartment landlords to system-wide passes.

Work with the State College Borough to revise parking minimum zoning regulations, to allow developers to reduce or eliminate parking in exchange for funding of some amount of White Loop service.

OPPORTUNITIES & POSSIBILITIES

Advocate for local ordinances which mandate that all landlords decouple parking prices from rent¹¹⁰ and provide transit passes to all renters, including landlords of housing on Southgate Dr and Aaron Dr, many of which were built before the apartment pass program was mandatory for new development.

Event Road Closures

CATA, in coordination with the State College Borough and Penn State, should create guidelines for which streets should be closed for different types of event, to minimize transit route changes.

EXISTING CONDITIONS

Moving bus routes for festivals and parades interrupts regular riders' commutes and decreases the chance

¹⁰⁸ A reference to the Pareto Principle. "Pareto Principle," Wikipedia, June 10, 2019.

¹⁰⁹ Alon Levy, "Base Train Service is Cheap, Peak Train Service is Expensive," Pedestrian Observations, January 22, 2018.

¹¹⁰ Angie Schmitt, "Landlords in Seattle Can't Force Renters to Pay for Parking Anymore," Streetsblog USA, April 3, 2018.

event attendees will use transit to get to the event.

Changes to routes for events are not abundantly clear to riders, and are sometimes not clear even to bus operators.



During the 2018 PSU Homecoming Parade when Curtin Rd and College Ave were closed, buses were rerouted on Park Ave, but eastbound buses could not stop without temporary bus stops; operators and riders had little information

NEW ADVANTAGES

During events with significant traffic, like concerts and football games, fast, reliable bus service, running on the same network as riders use daily and have memorized, with stops close to the event, gives event attendees a viable alternative to driving, even if temporary bus lanes increase vehicle congestion slightly.

STRATEGY OPTIMIZATION

Streets should be prioritized based on where road closures have the most impact to transit:

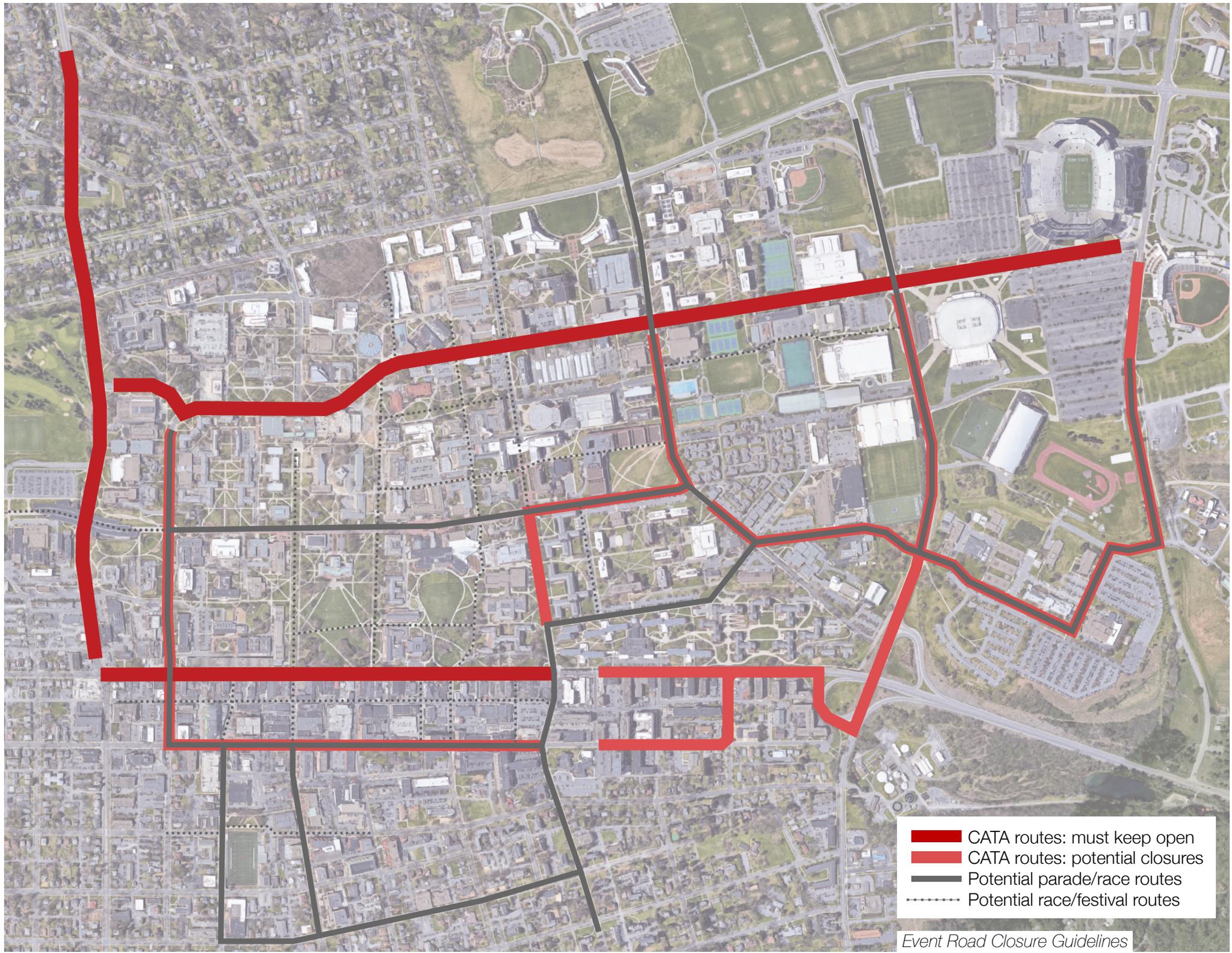
- **Curtin Rd, College Ave, and Atherton St should be kept open at all times, because each carries a significant number of buses, stops are the busiest in the system, and there are no comparable alternative routes, especially with any stop infrastructure**
- Beaver Ave should be closed only when absolutely necessary because of stops with significant ridership and no good alternate routings. Beaver Ave is only a candidate for closings because it can be closed to allow parades downtown, without the closure of College Ave. With the completion of a College Ave or Beaver Ave Transitway [[see Bus Lanes](#)], parades should use the other

street, allowing for undisturbed transit operations

- Burrowes Rd can be closed more easily because Atherton St provides a nearby alternate routing, although Atherton St does not have southbound stop infrastructure to replace stops with high ridership on Burrowes Rd. An Atherton Transitway [[see Atherton Transitway](#)] would create stops southbound on Atherton St and would allow all transit on Burrowes Rd to move to Atherton St permanently, allowing road closures



White Loops detouring through residential streets during a Beaver Ave emergency closure on October 7, 2016. Closure of Beaver Ave, and this detour, should be avoided.



- Thick Red Line** CATA routes: must keep open
- Thin Red Line** CATA routes: potential closures
- Thick Black Line** Potential parade/race routes
- Dotted Black Line** Potential race/festival routes

on Burrowes Rd without transit impacts

- Roads in east campus including University Dr, Hastings Rd, Bigler Rd, Pollock Rd, and Shortlidge Rd should be the first roads with transit impact closed, as they have many alternative routings and host stops with fewer passengers than elsewhere on campus

There are three types of events which should be treated differently:

- Parades require a long, single route on paved streets with staging areas at the beginning and a place for vehicles to exit at the end of the route. Road closures in east campus, on Beaver Ave, and on Burrowes Rd should be discouraged but generally accepted
- Races and walks require long, single routes on streets and wide pedestrian paths. Road closures in east campus and on Burrowes Rd should be discouraged but generally accepted
- Festivals require any assortment of routes on streets or wide pedestrian paths. Small festivals should have no road closures impacting CATA, and large festivals like Arts Fest should have minimal road closures impacting CATA

Use permanent and temporary bus lanes to maintain bus speed and reliability while maintaining proximity to

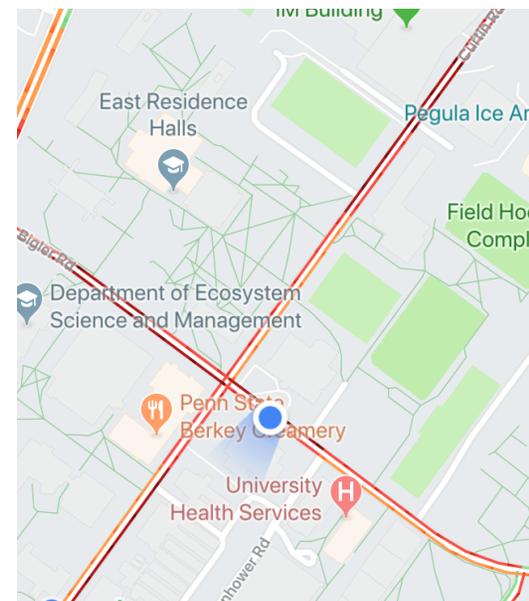
major events. Permanent bus lanes on Curtin Rd and temporary bus lanes southbound on Bigler Rd, Pollock Rd, and Shortlidge Rd would speed buses around the entire CATA network during football games and Bryce Jordan Center events. Roads which cross parade or race routes should become temporarily bus-only or have temporary bus lanes to allow buses to cross the route during gaps in the race or parade, without making buses wait behind queued cars.

When stops are moved, place free-standing signs conspicuously on the sidewalk next to the stop explaining the change and the best alternatives, at least one week before the change. Place temporary bus stop signs at locations on alternate routings to replace each stop lost during road closures.

Negotiate with Penn State Athletics to allow Blue and White Loops—and potentially all routes—to travel on their normal routings near Beaver Stadium during football games, increasing rider convenience and familiarity with routings. Buses could travel slowly, to integrate with the pedestrians using the Curtin Rd cartway. Loops could replace the Downtown Football Shuttle, and gains in ridership and rider satisfaction would be worth the reduction in revenue. Currently, even Uber pickups happen on Hastings Rd, closer to the stadium than either Loop travels. If



Buses stopped by football game congestion, impacting the entire system



Congestion from an October 20, 2018 Bryce Jordan Center event delayed buses with commuters and event attendees by 20 minutes; temporary bus lanes would have provided an alternative means of travel to the event

potential terrorism is an issue, temporary or permanent retractable bollards could be installed to allow only transit vehicles access.¹¹¹

OPPORTUNITIES & POSSIBILITIES

Advocate for an ordinance in State College Borough which requires approval by CATA for road closures impacting transit routes, similar to the current requirement that adjacent businesses agree to road closures.



A sign at Beaver Stadium for an Uber pickup zone on Hastings Rd during football games. Blue and White Loops should have signage and stops at least as close as Uber does to the stadium.

Infrastructure Improvement Negotiations

High political support for transit and low costs of improvements allow CATA to be more forceful in its requests to developers, municipalities, Penn State, and PennDOT for bus route improvements and bus stop amenities.

EXISTING CONDITIONS

Political leaders and to some extent developers generally want to support transit improvements, but do not know that makes transit work best. This can be true for bus stop amenities, but is especially true for fundamentally what makes a good bus route: walkability, density, proximity, and especially linearity.¹¹²

Improvements recommended by CATA are generally reactionary band-aids, like stops in parking lots and pedestrian connections, rather than

suggestions for creating the type of development which allows transit to thrive.

STRATEGY OPTIMIZATION

Review development plans earlier—before the sketch plan phase—to advocate for changes along routes to speed buses:

- Advocate for dense development along existing high frequency transit corridors, with retail entrances oriented toward— and adjacent to main streets, rather than behind parking
- In new developments, advocate for straight routes for transit which connect to the existing CATA network
- Propose locations where intersections with two-way stops can be reconfigured to give priority to streets with transit routes¹¹³

When reviewing plans for bus stop changes, ask for the optimal condition bus stop improvements could provide, then negotiate based on capital cost:

- Advocate for shelters at almost every stop not entirely surrounded by

¹¹¹ Jarrett Walker, “How (Not) to Wreck Your Transit System: Downtown Business Edition,” Human Transit, February 3, 2017.

¹¹² Jarrett Walker, “The Transit Ridership Recipe,” Human Transit, 2019.

¹¹³ Jarrett Walker + Associates, “Philadelphia Bus Network Choices Report: Improving Speed and Reliability: The Role of City Leadership,” Southeastern Pennsylvania Transportation Authority, June 2018, 48.

single-family housing [[see Bus Shelters](#)]

- Advocate strongly against bus pull-offs, except where buses are scheduled to wait for extended periods¹¹⁴
- Advocate for median treatments which disallow cars from swerving around stopped buses by entering the opposing traffic lane. This will improve safety for car drivers and for transit riders who cross the street in



Threadneedle St in Central London with median treatments to disallow cars from passing stopped buses; [Google Maps](#)

BUS PULL-OFFS DO NOT DECREASE DELAY

The Martin St corridor might be one of the most likely candidates for bus pull-offs in CATA's service area. However, an average of only 56.25 cars were delayed by buses over four, hour-long, single-direction, single-stop observations at morning and evening peaks.¹¹⁵ With a standard vehicle occupancy of 1.7,¹¹⁶ 95.625 people on average were delayed in cars, equivalent to two moderately crowded buses. If all six or more CATA buses in each direction passing each stop on Martin St each peak hour, carrying 300 or more people total, were forced to re-enter mixed-traffic lanes, significantly more people

would be delayed than the number delayed today. All-door boarding [[see Proof-of-Payment & All-Door Boarding](#)] would significantly decrease car delay caused by dwelling buses, further diminishing the benefits of bus pull-offs. Most bus pull-offs on campus can be maintained because the introduction of bus lanes [[see Bus Lanes](#)] will eliminate delay buses face from re-entering mixed-traffic lanes. Bus stops with adjacent parallel parking lanes should have bus stop bulb-outs,¹¹⁷ rather than pull-offs into the parking lane, to allow buses to remain in the mixed-traffic lane and to allow extra sidewalk space for waiting transit users.

¹¹⁴ Xiaodong Liu, Yao Yang, Meng Meng, & Andreas Rau, "Impact of Different Bus Stop Designs on Bus Operating Time Components," *Journal of Public Transportation* 20(1):104-118, DOI:10.5038/2375-0901.20.1.6, February 2017.

¹¹⁵ McCormick Taylor, "Northland Area Mobility Study Report," Ferguson Township, May 2019, 10.

¹¹⁶ "Average Vehicle Occupancy Factors for Computing Travel Time Reliability Measures and Total Peak Hour Excessive Delay Metrics," Federal Highway Administration, April 2018, 1.

¹¹⁷ "In-Lane Sidewalk Stop," *Transit Street Design Guide*, National Association of City Transportation Officials, April 2016.

front of stopped buses and who would not expect a car going the wrong way in the far lane. **Bus stops for immediate consideration include:**

- **Burrowes Rd southbound at Westgate Building, especially because of a crosswalk directly in front of the stop**
- 805 S Atherton St and S Atherton St at Pizza Hut, with potential removal of the center turn lane directly in front of the bus stops
- S Burrowes St at the James Elliott Building



Newly upgraded stop on N Atherton St at N Hills Pl, with concrete pad and bench but no shelter

Advocate for temporary improvements for transit riders during construction projects:

- Where two lanes of mixed traffic are merged into one, use one of the two lanes—the one which leads directly into the single lane, rather than the one which requires vehicles to merge—as a bus lane leading up to the single-lane section, allowing buses to bypass most of the traffic. For example, these lanes could be used for utilities and resurfacing work on Atherton St and for unloading residential tower construction equipment on College Ave
- Demand significant capital improvements or commitments when compromising for construction against the interests of riders. For example:
 - Removal of the pedestrian connection next to Curtin Hall to Blue and White Loop stops from the majority of East Halls during Martin Hall construction
 - Removal of the University Club stop for years due to residential tower construction across College Ave
 - Removal of N and W stops on Blue Course Dr for Northland Area Mobility Study bike improvements¹¹⁸



Congestion created by a residential tower construction-related lane closure on College Ave. A temporary bus lane before the closure would allow buses to bypass the congestion.



Road construction blocking the Atherton St at Walker Building bus stop, without alternatives for— or future benefits to riders

¹¹⁸ McCormick Taylor, "Northland Area Mobility Study Report," Ferguson Township, May 2019, 24.



Removal of the College Ave at University Club stop for potential impacts to traffic from residential tower construction across the street, without substantial future benefits to riders



Prolonged sidewalk and bus stop closures along N Atherton St due to construction; few future benefits to riders

OPPORTUNITIES & POSSIBILITIES

Explore implementation of near-level boarding at high-ridership stops to decrease dwell times, especially downtown and on campus.

Bus Shelters

CATA should establish a goal to install a shelter at every stop on campus and downtown, at every inbound stop with any development more dense than exclusively single-family housing, and at every outbound stop on routes which serve commercial destinations farther outbound.

EXISTING CONDITIONS

Only about 78 stops in the CATA system have bus stop shelters or overhangs from buildings directly adjacent to stops.

Shelters provide so much benefit at so little cost that any bus stop with more than 2.5 weekday boardings should receive one.¹¹⁹

NEW ADVANTAGES

All new developments which are not small, exclusively single-family home developments should be required to install shelters at every stop covered by CATA's new shelter goal.

CATA should seek funding to vastly expand the number of shelters currently installed.

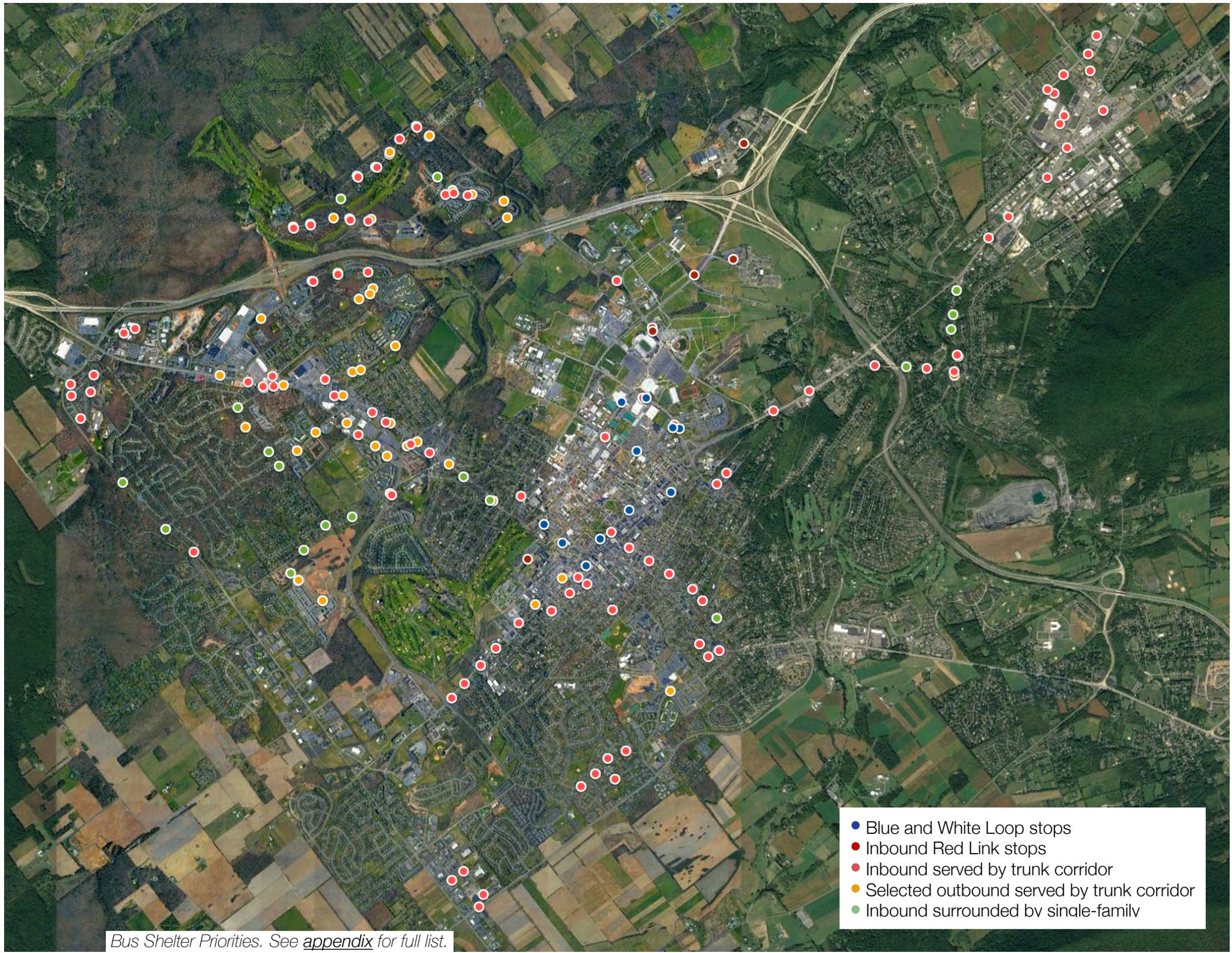
STRATEGY OPTIMIZATION

Until the goal is met, shelter additions by CATA should be prioritized based on boardings and direction. Generally: (approximate number of stops in group)

- Blue and White Loop stops¹²⁰ (13)
- Inbound Red Link stops (5)
- Stops downtown and on campus and inbound stops served by trunk, adjunct, or circulator routes [[see Hierarchic Color Scheme](#)] with nearby non-single-family housing development (90)
- Select outbound stops served by trunk, adjunct, or circulator routes which serve commercial destinations farther outbound (46)
- Inbound stops served by trunk, adjunct, or circulator routes with only single-family housing development nearby (18)

¹¹⁹ Alon Levy, "Little Things That Matter: Bus Shelter," [Pedestrian Observations](#), April 12, 2019.

¹²⁰ "Centre County Long Range Transportation Plan 2044," [Centre Regional Planning Agency](#), July 31, 2018, X-12.



Bus Shelter Priorities. See [appendix](#) for full list.

- Other stops, with a preference for inbound stops with higher frequency routes surrounded by more dense land uses (567)

All shelters should include a poster frame for a system map.

All shelters, or potentially all bus stop signs [see [Stop Info Panels](#)], should also receive real-time bus location information, as the benefit provided makes these even easier to justify, at only 1.25 weekday boardings per stop.¹²¹

OPPORTUNITIES & POSSIBILITIES

Explore introducing zoning regulations which encourage new developments, especially downtown and on campus, to include climate-controlled sheltered space with real-time bus location information adjacent to bus stops in lobby areas open all the time, as the CATA office at Schlow does today. This should not be a substitute for shelters from rain directly adjacent to stops, as riders must be visible as their bus approaches to signal the operator to stop.

Other Notes

Negotiate with the State College Borough to create a free transit program in parity with the free parking program downtown during winter break and other holidays. Additionally, businesses which offer parking validation should also offer transit fare validation.

Negotiate with the State College Borough and other municipalities to ensure bus stops, including the vicinity of where the rear door stops, are

cleared of snow with increased enforcement.

Advocate for adoption of a priority merge rule, to mandate that mixed traffic yields to buses exiting bus pull-offs.¹²² Post signs at all bus pull-offs notifying car drivers that they must yield to merging buses.

Work with Penn State to turn the Blue Loop or White Loop into the Parents' Weekend Trolley and other special event shuttles on campus, with additional signage and tour guides on each bus. The route should remain unchanged, to allow frequent users to ride the Loop as they normally would.



A free transit program should be created to match the free parking program downtown



A White Loop at S Burrowes St at the James Elliott Building: the sidewalk around the rear door is covered by snow

¹²¹ [Alon Levy, "Little Things."](#)

¹²² ["Stops, Spacing, Location, and Design," Federal Transit Administration, U.S. Department of Transportation, March 16, 2016.](#)



A Parents' Weekend Trolley Stop. Many stops are located directly adjacent to existing Blue Loop stops.

between the festival, parking, and downtown, on the normal route [[see Event Road Closures](#)].

Work with the State College Area School District and Bellefonte Area School District to travel to middle and high schools and email parents to pitch the benefits of transit and the discounted youth pass.

When a second CATA bus depot is warranted, explore locating it near the OPP facilities on campus, to be near the center of the CATA system. Combination of the Loops and Links and Campus Shuttles [[see Campus Network](#)] could begin a partnership with PSU Transportation.

Work with the Central PA 4th Fest to find sponsors to fund Blue Loop service during the event for movement