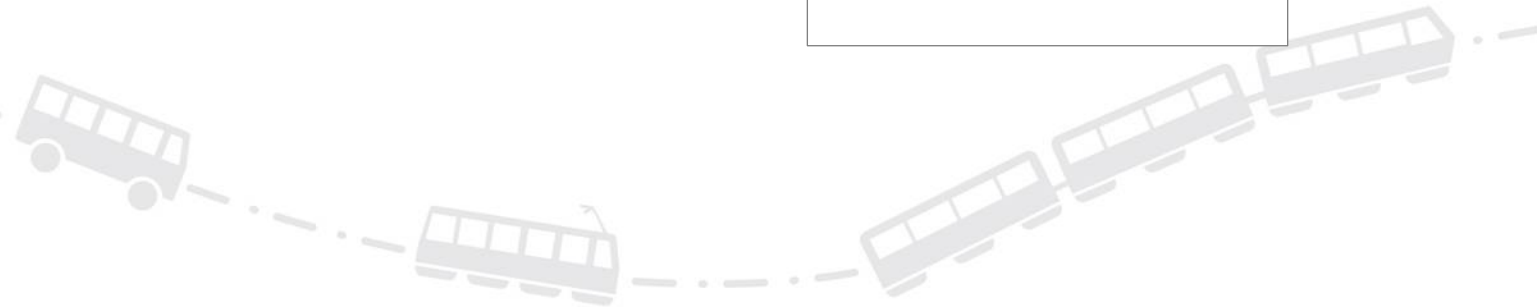
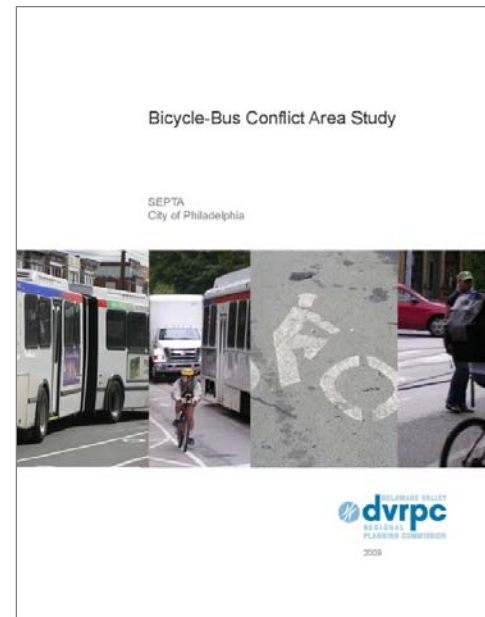


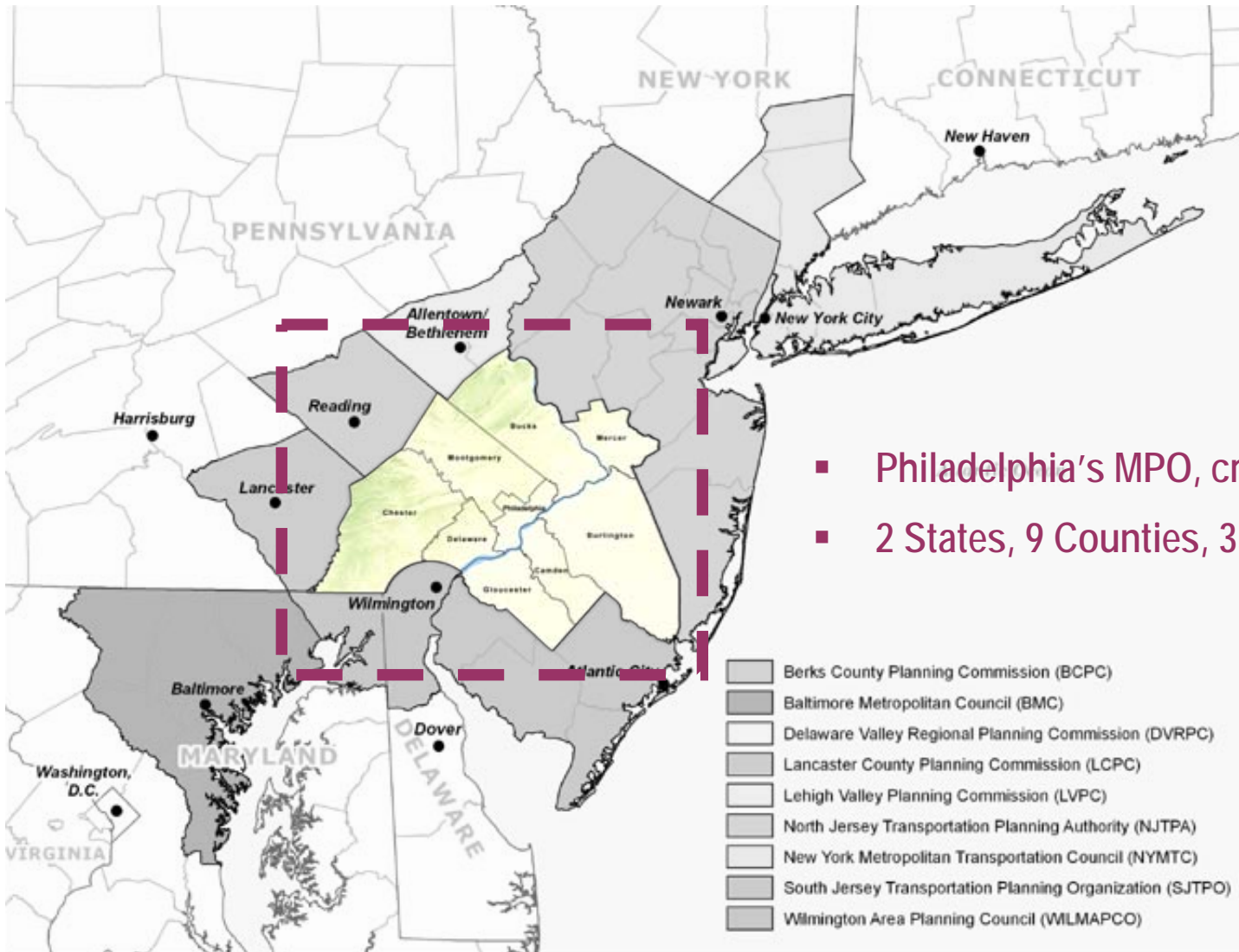
Bicycle/Bus Conflict Area Study

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DVRPC and the regional context



- Philadelphia's MPO, created in 1965
- 2 States, 9 Counties, 353 Municipalities



Philadelphia project context

- Growing “green” modes, but narrow streets
 - ➔ Bike share study
 - ➔ New bike/ped master plan
 - ➔ Transit First
- Question: how can we reduce conflicts between buses and bicyclists on city streets?
- DVRPC received a PennDOT research grant to explore the issue and potential solutions

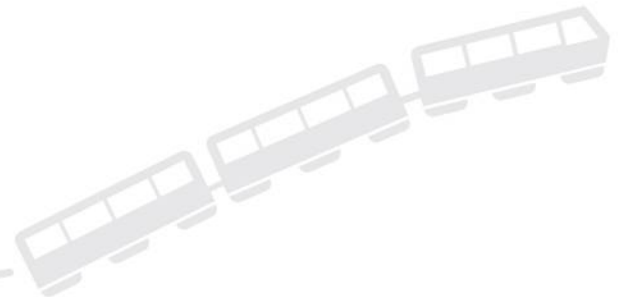


Nature of the problem

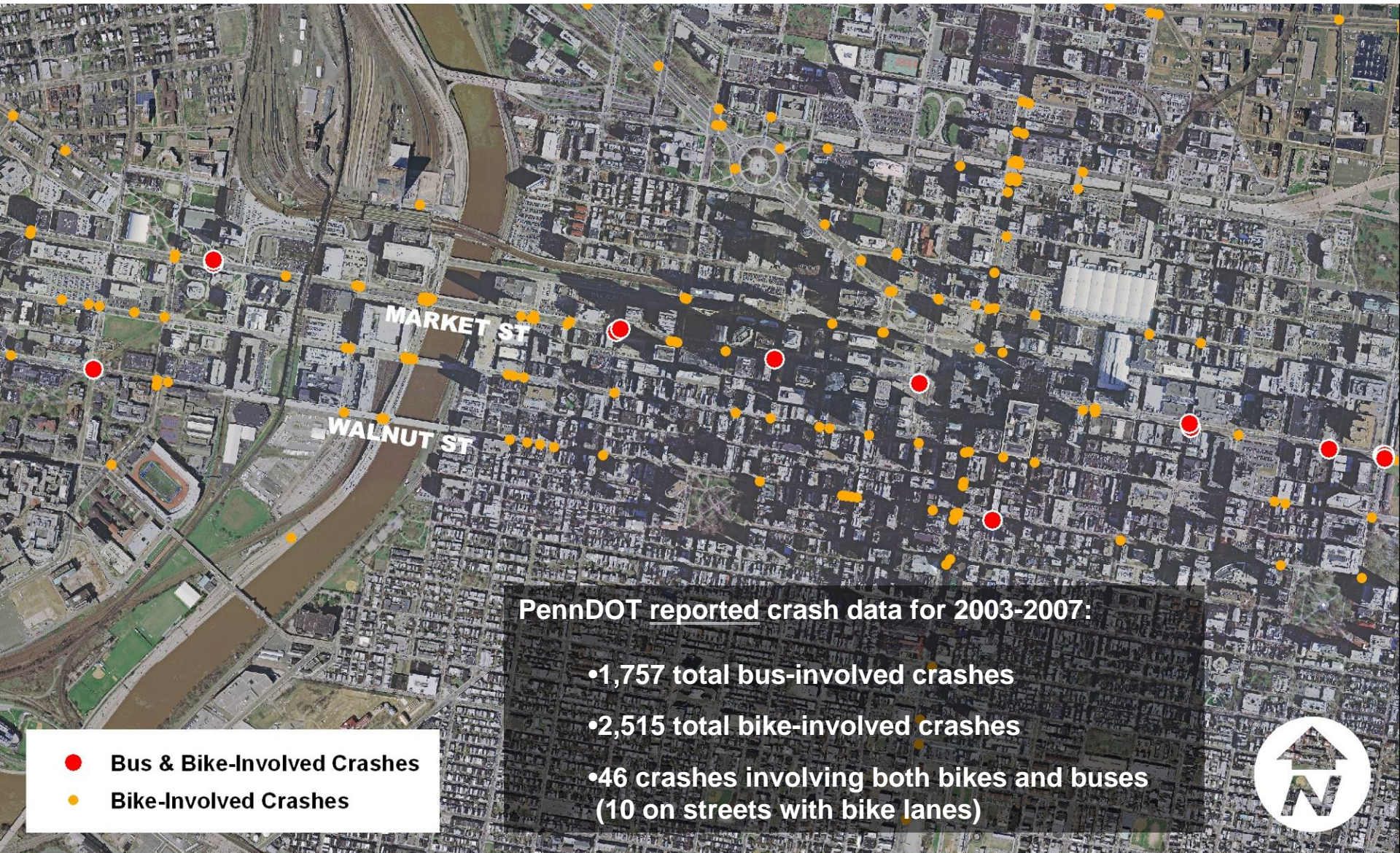
- Core problem: Conflicts particularly occur when SEPTA buses cross bike lanes to curb at bus stops
 - Cyclists can be “squeezed”/sideswiped, or make unsafe movements into travel lanes
- The law: “Rules of the Road” - Neither vehicle has universal priority; vehicle being overtaken has the ROW
 - Buses should not accelerate around a bicyclist and then cut them off while curbing
 - Bicyclists should not overtake a bus as it approaches an intersection and expect the bus to yield
 - *In short* – this is a unique conflict where both parties can be confused: special treatment may be necessary

Key Tasks

- Collect data to document and identify the nature of the problem
 - PennDOT crash data (2003-2007)
 - Study area videologging to discern nature of conflicts
- Explore national/international “best practices” for similar conflicts:
 - Current practice in Philadelphia
 - Literature review of best practices
- Recommend local solutions



Select reported Bus & Bike-Involved Crashes, 2003-2007



PennDOT reported crash data for 2003-2007:

- 1,757 total bus-involved crashes
- 2,515 total bike-involved crashes
- 46 crashes involving both bikes and buses (10 on streets with bike lanes)

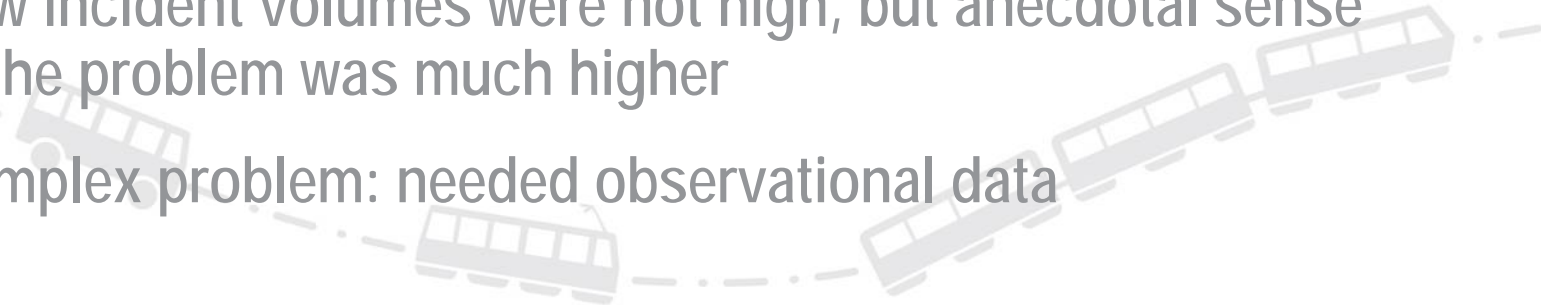
- Bus & Bike-Involved Crashes
- Bike-Involved Crashes



Bike/bus crash type summary

Collision Type	Crashes	Percentage
Sideswipe (same direction)	21	45.7%
Angle	15	32.6%
Hit pedestrian	5	10.9%
Rear-end	2	4.3%
Head-on	2	4.3%
Sideswipe (opposite direction)	1	2.2%
Total	46	100.0%

- Crash data alone did not shed light on the problem
- Raw incident volumes were not high, but anecdotal sense of the problem was much higher
- Complex problem: needed observational data



Videologs

- Used to document degree of conflict between SEPTA and bicycles
 - 3 locations along Walnut St (bike/bus traffic + bike lane + bus zone)
 - AM Peak (7 – 10 AM) Midday (11 – 2 PM) conducted mid-week, March 2009
 - 1,000 cyclists / 130 buses
 - 47 'incidents' (whenever modes met)



- **Unexpected conclusion:** the most problematic conflicts were between bicyclists and boarding/alighting bus passengers

Peer city review seeking “best practice” solutions

- Reviewed related strategies elsewhere
 - Soft improvements (painting/striping/signage, \$\$-)
 - Hard improvements (construction, \$\$+)
- Strategies considered:

Strategy 1: Colored bike lanes in conflict hotspots, including transit stop areas

Strategy 2: Discontinue bike lanes at transit stops

Strategy 3: Physical re-routing of bike lane around stop location

Strategy 4: Left-side bicycle lanes

Strategy 5: Unique pavement markings and/or signage

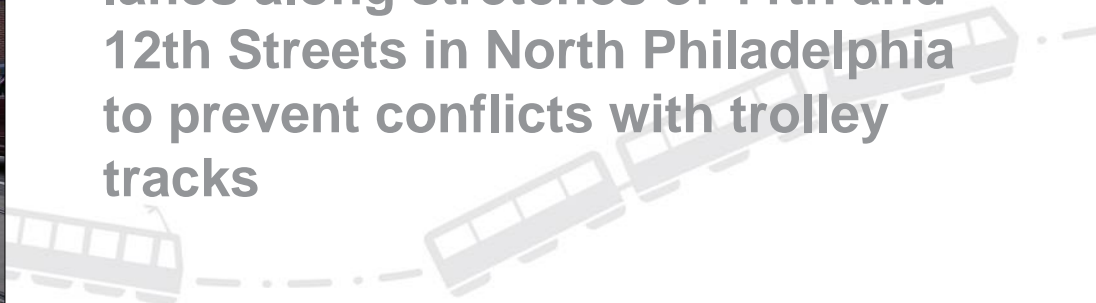


Peer city scan: left-side bike lanes

- Examples of left side bicycle lanes from Minneapolis (left) and New York (right)

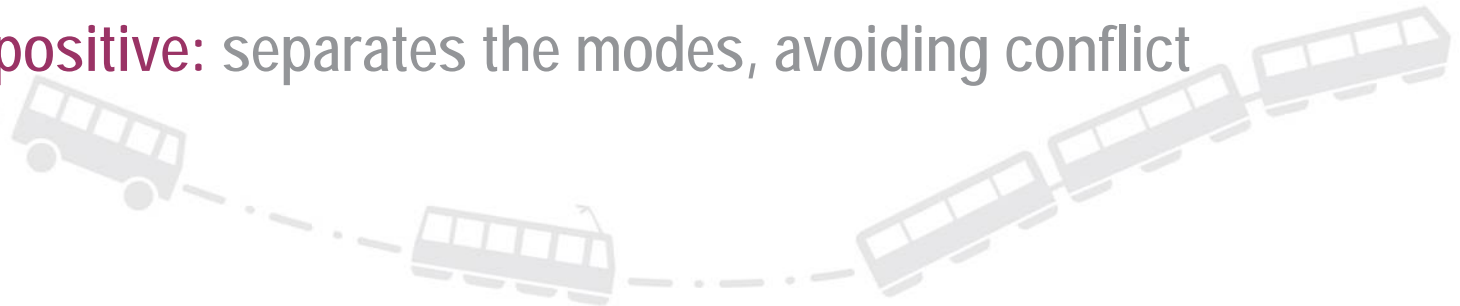


- Philadelphia uses left-side bicycle lanes along stretches of 11th and 12th Streets in North Philadelphia to prevent conflicts with trolley tracks



Peer city scan: left-side bike lanes

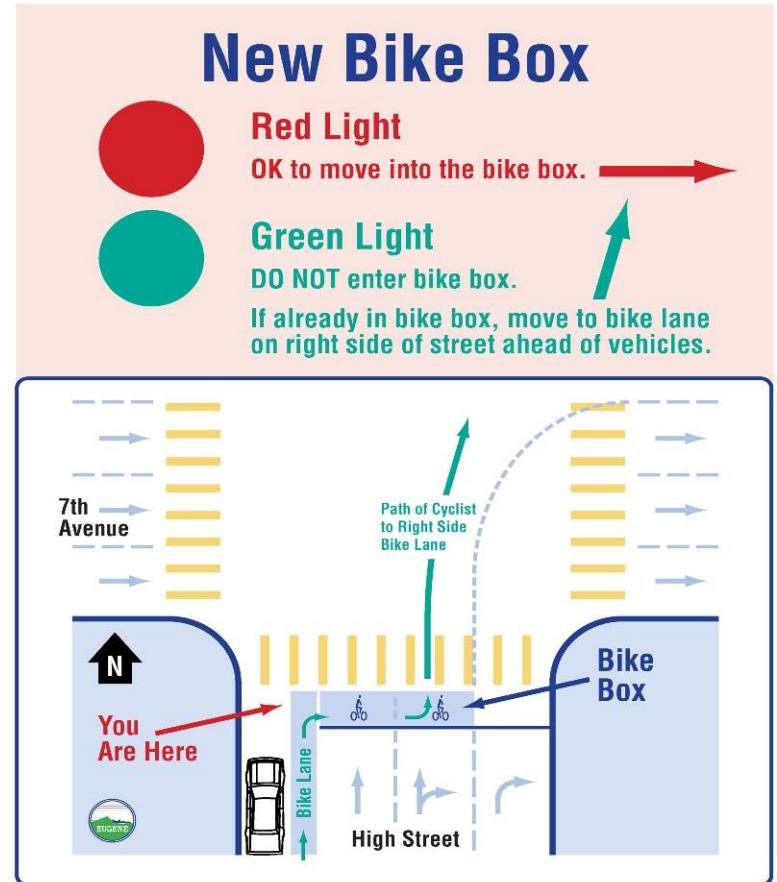
- Should be considered in certain situations:
 - One-way streets with frequent bus/trolley stops
 - Locations with high numbers of right-turning motor vehicles
 - Locations where there are a high number of left-turning bicyclists
 - High parking turnover (New York City)
 - Continuity of street
- **Key positive:** separates the modes, avoiding conflict



Peer city scan: left-side bike lanes

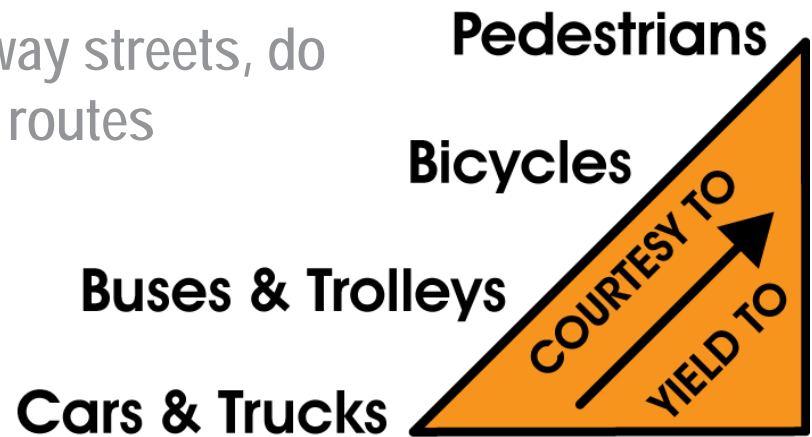
Potential issues with left-side bicycle lanes:

- Unfamiliarity on the part of drivers and cyclists
- Accommodations must be made in situations where cyclists must switch from the left to the right side



Conclusions/Recommendations

- Stripe/restripe **left-side bicycle lanes** on one-way streets where transit conflicts exist
- Where this is impossible, or for two-way streets, do not locate bike facilities along transit routes (pursue **complete corridors** vs. complete streets)
- Pursue a citywide **“yield pyramid”** to clarify roles and responsibilities
- One “responsibilities” proposal: **‘Do not pass bus/trolley on the right’** sign on rear of vehicle



Next Steps

- The City's updated Bike/Ped Master Plan (Summer 2010) will include the left-side lane concept
- Recommendations were adopted as official SEPTA policy for bike-related street design along transit routes

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