### High Street A 'Complete' Street

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### The Pennsylvania Experience

- The first application of Back In or Reverse Angle Parking in the Commonwealth.
- Pre-dates the `complete streets' paradigm, but an example of a complete street.

# **Borough of Pottstown**

- 5.5 Square Miles (14.25 square kilometers)
- Population of 22,000
- 40 miles (64.4 kilometers) from downtown Philadelphia, Pennsylvania
- On the urban fringe of the Philadelphia metropolitan area

### **Borough of Pottstown**

- Former industrial/river town with declining industrial base
- Bypassed by limited access highway in 1970's
- Shift from 'downtown' shopping to regional malls
- Adverse impacts to the central business district

### **Borough of Pottstown**

- Central Business District over 1 mile (1.6 kilometers) long, centered on 'main' (High) Street.
- Wide street to support former trolley than four lanes of vehicle traffic after trolley
- With sidewalks, businesses on each side of street 100 feet (30.50 meters) apart.

# **Problem Statement**

- Two 11-foot (3.35 meter) travel lanes in each direction.
   Both no longer necessary
- Parallel parking not sufficiently meeting demand
- ADT 9000 vpd
- Due to linear nature of CBD, public parking lots not close to stores

# **Problem Statement**

- 68-foot (20.74 meter) curb to curb ped crossing distance
- 27 mph, (43.2 kilometers per hour) 85<sup>th</sup> percentile speed
- Ten, pre-timed, uncoordinated signals along corridor.
- 17 second ped crossing time
- Adverse impact to bus transit times
- Two phase operation, no advance phasing for turns





### Issues

- Lack of 'close in' parking and wide street were considered detrimental to Pottstown's revitalization
- Parking insufficient to meet demand
- Long ped crossing times
- Desire to accommodate bicycle use as part of County trail system.

# **First Study Effort**

- 1995
- Five possible scenarios

# Head in Parking/Both Sides

- 22.5 degree angle
- With 10 foot (3.05 meter) maneuver lane, only 18 feet (5.49 meters) left for travel lanes
- Not much more parking than currently provided
- Nine foot width insufficient for travel lane, busses, delivery vehicles, turning lanes, etc.

### Head in Parking one side, Parallel on the other

- 22.5 degree angle
- Not much more parking than existing
- Sufficient space for two 12-foot (3.6 meter) lanes, center turn lane and parallel parking lane
- Questionable cost vs. benefit

# Head In Parking down center of street

- 57-foot (17.38 meter) parking module necessary
- Only 11 feet (3.35 meters) left for <u>both</u> directions of travel

# Parallel Parking both sides/both directions

- Would `double' parking
- Would need beneficial (for peds) center median
- Sufficient space for wide travel lane in each direction
- Expected congestion from parking vehicles on both sides of the street
- Safety concerns/parking lot 'feel'
- How to handle turns

# **Exclusive bus lane**

- Make right lane exclusive bus lane
- Was the 'recommended' solution
- Did not address parking issues
- Did not address ped issues

# What the 1995 Study did confirm

- One lane of traffic in each direction was sufficient with coordinated signals
- LOS B could be achieved with only one lane and coordination

# **Back In Angle Study**

- Back in or reverse angle parking suggested by Borough Planning Commission
- 2001 Study
- Also now wanted to incorporate bike lane into cross section

# **Back In Angle Study**

- Established 11-foot (3.35 meter) travel lanes and 10-foot (3.05 meter) center turn lane as minimum acceptable
- 6 feet (1.83 meter) established as preferred bike lane width
- Remaining width insufficient to support angle parking on both sides

# **Back In Angle Study**

- 30 feet (9.15 meters) available for parking
- PennDOT statutes for angle parking dictate required width for angle parking along state highways:

" The parking and maneuver area adjacent to the near edge of the nearest travel lane equals or exceeds 30 feet for parking spaces at a 45 degree angle"

## **Back In Angle Study**

- Theoretically could provide head in angle parking, but only on one side of street with no parking on the other side
- Would not solve parking problem
- Could not fairly decide which side of street to install it

# **Back In Angle Study**

- PennDOT, however had no standards for Back In Angle Parking
- Successfully argued the merits of Back In Angle Parking with PennDOT to permit installation

# Advantages

No maneuver space necessary since backing into space is similar to backing into parallel parking space, only with one less movement

# **Advantages/Entering**

### Parallel Parking

- 1. Pull past space
- angle
- 3. Pull forward and turn wheel to straighten parallel to curb

### Back In Angle Parking

- 1. Pull past space
- 2. Back into space on 2. Back into space on angle



# Advantages/Exiting

- Parallel Parking
- 1. Generally must back up first
- 2. Driver must turn 180 degrees to see approaching traffic

### Back In Angle Parking

- 1. Just pull forward
- 2. Driver only needs to turn 135 degrees to see approaching traffic
- 3. Quicker entry into traffic flow

# Advantages

- Easy and safe exit from space
- No 'blind' backing into traffic or bike lane
- Bike lane could be used as maneuver lane
- Exiting drivers field of view within bike operators stopping sight distance from 10 mph (16 kilometers per hour)





# Experience of Others

# Wilmington, Delaware, USA

- Six blocks of Back In Angle Parking
- Over 50 years old
- All angle parking required to be Back In Angle by ordinance
- 19-foot (5.79 meter) space and 11foot (3.35 meter) travel lane standard

# Seattle, Washington, USA

- 280 blocks of angle parking
- Majority: Back In Angle
- Utilized for 30 years

# Seattle, Washington





# Washington, D. C., USA

- Six blocks of Back In Angle parking
- 15 to 20 years old
- Two lanes of traffic in each direction with ADT over 9,000 vpd

# Washington, D. C.



# Indianapolis, IN, USA

- One block of Back In Angle parking
- 15 years old
- One way, three lanes of traffic
- ADT of 13,000 vpd

# Montreal, Quebec

- Increased parking by 40%
- 43 degree angle
- Has traffic calming benefit

# Montreal, Quebec





# Portland, OR, USA



# New York (Brooklyn), USA





# New York (Brooklyn)



# New York (Brooklyn), USA



# Kelowna, BC



# Vancouver, BC



# Unloading Curbside



# With Bike Lane





# **View from vehicle**



# Pottstown, PA

- Approved by Borough Council, PennDOT and Montgomery County
- Endorsed by three downtown organizations
- Recommended by Walkable Communities
- Received grant from DVRPC for design
- Construction in Spring, 2003



### Pottstown, PA



# Pottstown, PA

- After brief, initial reluctance, has met with general acceptance
- Businesses generally pleased with results
- Most drivers able to properly place car in space

### Pottstown, PA

- Increased parking by 21%
- Placed more vehicles closer to stores
- Decreased ped crossing times by 12%
- Gives perception of a more 'intimate' street environment
- Supports bicycle use

# Pottstown, PA

 Permits installation of accessible space in each block









### Pottstown, PA

Inspiration or Idiocy



**Everyone Gets Into the Act** 



### US Cities w/ Back In Angle Parking

- •Scattle, WA
- Tacoma, WA
- Vancouver, WA
- •Portland, OR
- •Salem, OR
- •Tucson, AZ
- •Salt Lake, UT
- •Denver, CO

- •Indianapolis, IN
- Washington, DC
- •New York, NY
- Wilmington, DE
- •Potistown, PA
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- •Conshohocken, PA
- •Philadelphia, PA

# Accepted Standard

 PennDOT Publication 46

 Traffic Engineering Manual, March 2008



















# **Other Findings**

- 25% reduction in the number of crashes and 43% reduction in injuries from crashes
- No measurable vehicle speed reduction, but average speeds below posted speeds (signals now coordinated)
- Consider installation of center median
- Marked increase in Bike Usage, noted on County, and Greater Philadelphia area Bike Maps and Guides



