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City Administrator Report to Mayor & City Council

August 05, 2016, Edition No. 231

WEEKLY UPDATE:

- RAGBRAI: I would like to thank all those involved in making RAGBRAI Muscatine a great event! A special thank you to staff, the Chamber, the committees, and the many volunteers! See more below…
- ATEs: Attached is an article provided by Asst. Chief Sargent - *With cameras gone on Grand Avenue in El Mirage, speeding increases 178 percent.* The article can be found at: http://www.azcentral.com/story/news/local/surprise/2016/08/01/cameras-gone-grand-avenue-el-mirage-speeding-increases/86880718/.
- Mississippi Drive: Bolton & Mink will be returning on August 18th to review the Carver Corner intersection and Mulberry & 2nd Street intersections. Public works is preparing to stripe Linn Street for back-in angled parking as a downtown trial area. Attached are several information sheets from the internet as well as sample signage. There is lots of information on the web as well. Feel free to search back-in angled parking on the web. Here is a link to a video as well: https://www.youtube.com/watch?v=HddkCbsWHlk. This area on Linn Street is an area that we would like to clean up and add additional downtown parking. Andrew is preparing a map to discuss with Council as to where we can add additional parking throughout the downtown.
- RAGBRAI: Please see the following note from T.J. Juskiewicz, RAGBRAI® Director: To the most unbelievable RAGBRAI Committees that just put on the GREATEST RAGBRAI ever: WOW!!!!!!! What an amazing week! What a great RAGBRAI. BEST RAGBRAI…. EVER! I heard over and over! I am so proud of the work that each and every community put forth on RAGBRAI. Congratulations on the splendid job of hosting RAGBRAI. Tons of letters, calls and emails continue to roll into our office singing the praises of all of the towns. The participants agree that this year's event was truly an enjoyable one. We thank you for the hospitality and kindness you showed during RAGBRAI's stay in your town. We appreciate the hard work and dedication that your community put in to make it all happen. Your town should be very proud of the tremendous achievement. It was the best that it could possibly be!
- CSO: Attached please find the July 2016 West Hill Projects progress report provide by Karmen K. Heim, P.E., Senior Environmental Engineer, Stanley Consultants. We continue to work through some contract and quantity related issues related to the CSO contract with Haggerty and Stanleys. Hope to provide an formal update on those issues in the near future.
- Landfill: Staff will work with Mr. Buelow to find the best time to return to Council for an update. Please see the following information per Tim Buelow: We just completed the 5th of 5 sampling events in the two new off-set wells, one of which is on the Winter's property. Once we receive the lab results (should be in a couple of weeks), we will begin the statistical analysis, which will determine what constituents require bracketing. With that determined, we will develop a proposal for the next round of bracketing drilling to occur this fall. Once the plumes are

fully bracketed, then we will have the area of impact defined which should help determine the extent of property under consideration.

- Second Saturday: Two interesting testimonies regarding the Second Saturday Events provided by downtown retailers follow. We hope that more businesses can track the impact of these and similar events. (1) Melissa Osborne, of Creations by Oz downtown, reported that during the first Second Saturday event (June 11, 2016) she had seen the same amount of business during event hours (5-8 p.m.) as she had all day before that (10 a.m.-5 p.m.). Also, 85% of the customers who bought from her during the event were new customers, with 68% of those new customers being from outside of the Muscatine zip code. Osborne reported that during the second Second Saturday event (July 9, 2016), she had done 10 times as much business during event hours as she had during the first event and that 80% of the business during the second event was from outside of the Muscatine zip code. (2) Flynn Collier, of We Can Frame That in downtown, reported good sales during the second Second Saturday event (July 9, 2016) and reported that attendees who discovered his store during that event have since come back and spent money there.

What is it?

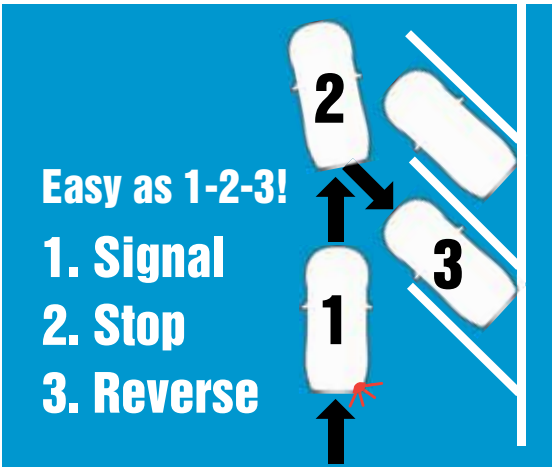
Back-in diagonal parking is where drivers reverse into an angled parking space to park their vehicle.

Why is back-in diagonal parking used?

Back-in diagonal parking is used to increase the safety of on-street parking spaces.

Benefits include:

- Drivers can see approaching traffic better when pulling out of the space.
- The back-in parking maneuver is simpler than parallel parking.
- It eliminates the "door zone" for passing cyclists.
- The rear of the vehicle is placed toward the sidewalk, making loading and unloading of cargo easier.
- Unloading children from the vehicle is safer because they are directed to the sidewalk and shielded by a vehicle door from the travel lane.
- Positions drivers requiring handicap accessible stalls closer to sidewalk curb ramps and out of the travel lane.



What does back-in angle parking mean for drivers and bicyclists?

Drivers:

1. Signal: slow down and signal to traffic that you are about to turn into the parking stall.

2. Stop: stop at a point just past the parking stall you want to occupy. Usually your rear bumper should be about even with the painted parking stall line.

3. Reverse: put your vehicle in reverse and turn the steering wheel in the direction the car needs to go to back into the space. Check your mirrors and look over each shoulder as you back up. Straighten the steering wheel when the car is between the parking lines.

Bicyclists:

▲ On streets with bank-in angle parking, ride a safe distance from parked cars.

▲ Be courteous and safe when drivers are parking their cars. Wait a safe distance behind the car until they are stopped in the parking spot.

For more information go to eugene-or.gov/trafficsafety

E-mail trafficsafety@ci.eugene.or.us
or call 541-682-5291

Back-in/Head-out Angle Parking

Nelson\Nygaard Consulting Associates
785 Market Street, Suite 1300
San Francisco, CA 94103

January 2005

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Introduction

In recent years the use of back-in/head-out angle parking has increased steadily in cities across North America. There are several reasons for this development. Kulash and Lockwood (2003) state that:

"Back-in/head-out diagonal parking is superior to conventional head-in/back-out diagonal parking. Both types of diagonal parking have common dimensions, but the back-in/head-out is superior for safety reasons due to better visibility when leaving. This is particularly important on busy streets or where drivers find their views blocked by large vehicles, tinted windows, etc., in adjacent vehicles in the case of head-in/back-out angled parking. In other words, drivers do not back blindly into an active traffic lane. The back-in maneuver is simpler than a parallel parking maneuver. Furthermore, with back-in/head-out parking, the open doors of the vehicle block pedestrian access to the travel lane and guide pedestrians to the sidewalk, which is a safety benefit, particularly for children. Further, back-in/head-out parking puts most cargo loading (into trunks, tailgates) on the curb, rather than in the street."

The growing presence on American streets of sport utility vehicles (SUVs), with their bulky rear ends and (frequently) tinted windows may have spurred the trend toward back-in/head-out angle parking: when using conventional angle parking, drivers increasingly find themselves beside an SUV, with more difficult sightlines.

This report briefly discusses the design and benefits of back-in/head-out angle parking and shows where the design has already been implemented.

Some examples

In Tucson, AZ, two blocks of reverse diagonal parking have been installed along the University Boulevard Bikeway (see Figure 1), which leads into the west entrance of the University of Arizona (~36,000 students). In the two years of reverse diagonal parking, there have been no accidents along the segment, despite the large number of cyclists using the bikeway.

Figures 2-4 illustrate some of the benefits of back-in/head-out angle parking. In Figure 2 the driver is able access her trunk from the curb rather than from the street. Figures 3 and 4 show that the driver can have eye contact with oncoming traffic, in this case a bicyclist.

Figure 5 shows typical signage used to introduce drivers to back-in/head-out angle parking. For more examples on back-in/head-out angle parking, see Appendices A and B.

Figure 1 Back-in/Head-out parking in Tucson, AZ.

Source: T. Boulanger, Transportation Services, City of Vancouver, WA.

Figure 2 With back-in angle parking you can load your car on the curb, rather than in the street (Vancouver, WA).

Source: T. Boulanger, Transportation Services, City of Vancouver, WA.

Figure 3 **An 'eye-to-eye' line of sight between parker and approaching road-user (Vancouver, WA).**

Source: T. Boulanger, Transportation Services, City of Vancouver, WA.

Figure 4 **The parker's view of the on-coming traffic (Vancouver, WA).**

Source: T. Boulanger, Transportation Services, City of Vancouver, WA.

Figure 5 **A traffic sign showing the three steps of back-in angle parking, in Kelowna, BC, Canada.**

Source: City of Kelowna, British Columbia, Canada.

Advantages

Back-in/head-out angle parking is similar to both parallel and standard angle parking. As with parallel parking, the driver enters the stall by stopping and backing, but need not maneuver the front of the vehicle against the curb. When leaving the stall, the driver can simply pull out of the stall, and has a better view of the oncoming traffic.

Bicyclists

This type of parking provides a safer environment for bicyclists using the roadways. The driver is able to see the cyclist easily when exiting the stall. Several cities where back-in angle parking has been implemented have seen a reduction in number of accidents compared to the number of accidents at regular parallel parking schemes. Matt Zoll at

Tucson-Pima County Bicycle Advisory Committee says that after implementing the back-in/head-out angle parking scheme in Tucson they "went from an average of 3-4 bike/car accidents per month to no reported accidents for 4 years following implementation."

Visibility

In contrast to standard angle parking the visibility while exiting a back-in/head-out angle parking into traffic is much improved. When the driver is backing up (into the stall), the driver is in control of his lane: traffic behind either waits, or changes lanes.

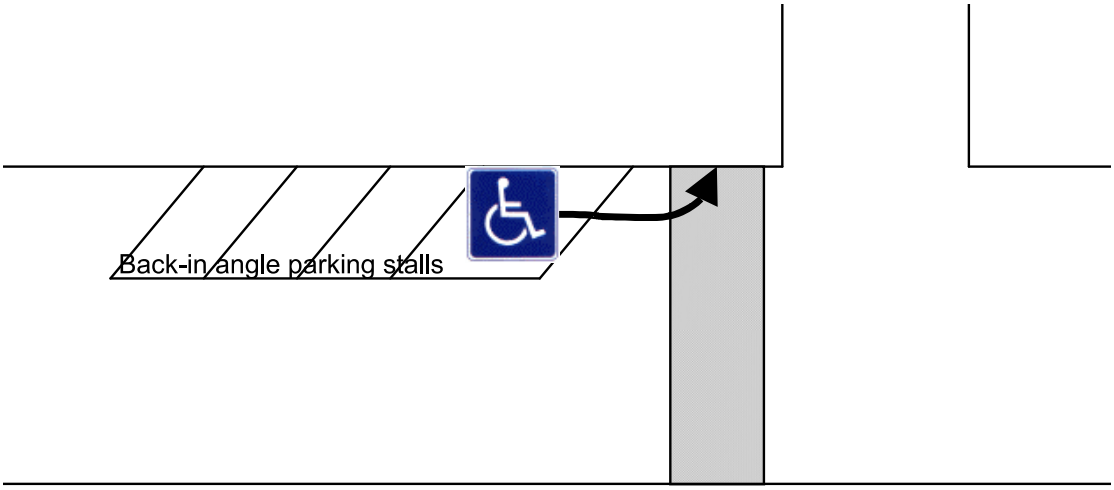
Steep terrain

Back-in angle parking can also be useful on steep terrain: if used on the correct side of the street, it causes drivers to automatically curb their wheels, which in turn prevents runaway autos. Used on the wrong side of a steep street, however, it is likely to cause more runaways.

Disabled parking

In Pottstown, PE, a 13-foot wide handicap accessible stall has been incorporated into the angle parking as the last space, intersection nearside, of each block. This places each disabled parking stall close to the existing curb ramps, and allows the wheelchair-using drivers to unload out of the way of traffic (see Figure 6). By contrast, the street's previous parallel parking arrangement could not be safely used for disabled parking, and conventional angle parking raised safety concerns for the street's proposed bicycle lanes.

Figure 6 A disabled parking stall located right next to the pedestrian crossing and the curb ramp.



Safety

As SLCTrans (2004) states, "one of the most common causes of accidents is people backing out of standard angled parking without being able to see on-coming traffic. Reverse angled parking removes this difficulty." It also improves safety for cyclists, and for loading/and unloading the trunk of the car. Similarly, the *Urban Transportation Monitor*'s recent article on back-in angle parking reported reduced accidents and benefits for bicyclists in several communities. In all, back-in/head-out angle parking is a good choice when compared to conventional head-in angle/back-out parking and parallel parking.

Cities using back-in/head-out angle parking

The list of cities in North America that use back-in/head-out angle parking is growing. Figure 7 lists some of these communities.

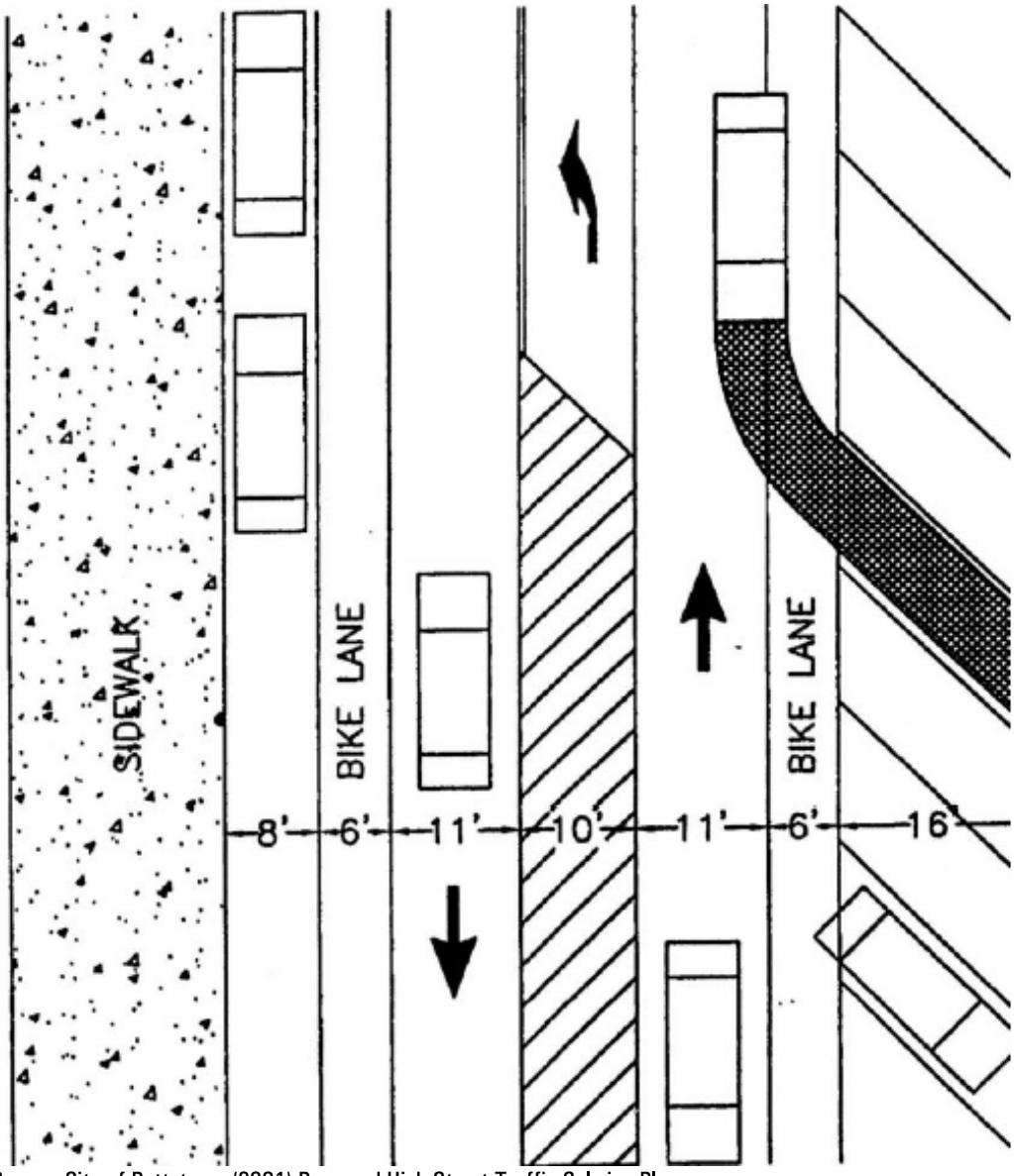
Figure 7 Cities using back-in/head-out angle parking.

City	Source	
Arlington, VI	Dan Burden	Walkable Communities, Inc.
Birmingham, AL	Russ Soyring	City of Traverse City, MI
Burnaby, Canada	Dan Burden	Walkable Communities, Inc.
Charlotte, NC	Dan Burden	Walkable Communities, Inc.
Chico, CA	Patrick Siegman	Nelson\Nygaard
Everett, WA	Michael M. Moule	Livable Streets, Inc
Honolulu, HI	Dan Burden	Walkable Communities, Inc.
Indianapolis, IN	Michael M. Moule	Livable Streets, Inc
Knoxville, TN	Michael M. Moule	Livable Streets, Inc
Marquette, MI	Russ Soyring	City of Traverse City, MI
Montreal, Canada	Michael M. Moule	Livable Streets, Inc
New York, NY	Dan Burden	Walkable Communities, Inc.
Olympia, WA	Dan Burden	Walkable Communities, Inc.
Plattsburgh, NY	Dan Burden	Walkable Communities, Inc.
Portland, OR	Michael M. Moule	Livable Streets, Inc
Pottstown, PA	Michael M. Moule	Livable Streets, Inc
Salem, OR	Todd Boulanger	City of Vancouver, WA
Salt Lake City, UT	Dan Burden	Walkable Communities, Inc.
San Francisco, CA	Michael M. Moule	Livable Streets, Inc
Seattle, WA	Dan Burden	Walkable Communities, Inc.
Tacoma, WA	Dan Burden	Walkable Communities, Inc.
Tucson, AZ	Michael M. Moule	Livable Streets, Inc
Vancouver, WA	Todd Boulanger	City of Vancouver, WA
Ventura, CA	Todd Boulanger	City of Vancouver, WA
Washington, DC	Dan Burden	Walkable Communities, Inc.
Wilmington, DE	Michael M. Moule	Livable Streets, Inc

Typical dimensions

Particularly when accommodating bike lanes within the roadway, back-in/head-out angle parking is useful. Figure 8 shows the cross-section of such a roadway in Pottstown, PA. Appendix C and D shows Vancouver's, WA, and Seattle's, WA, choices of dimensions for this type of parking.

Figure 8 Cross-section of a roadway accommodating both bike lanes and back-in/head-out angle parking.



Source: City of Pottstown (2001) Proposed High Street Traffic Calming Plan.

References

City of Pottstown (2001) Proposed High Street Traffic Calming Plan.

City of Pottstown (2004) Back In Angle as a Way to Improve Pedestrian Circulation in the Central Business District High Street, Pottstown Borough, Montgomery County, Pennsylvania, USA.

City of Vancouver, WA (2004) Angle Back In Parking Striping. Standard Plan Number T29-62.

Kulash, W. M. and Lockwood, I.M. (2003) *Time-saver Standards for Urban Design*, 7.2—5, McGraw-Hill Professional, New York, New York.

Nawn, J. (2003) Central Business District Back In Angle Parking. November/December *PE Reporter*, pages 11-13.

SLCTrans, Salt Lake City, UT (2004) Back-in or Reverse Angle Parking - FAQ. http://www.slcgov.com/transportation/Aboutus/FAQ.htm.

Urban Transportation Monitor. Back-in Angle Parking. June 11, 2004, page 1.

APPENDIX A

NAWN, J.A. (2003) CENTRAL BUSINESS DISTRICT BACK IN ANGLE PARKING. *PE REPORTER*, NOVEMBER/DECEMBER ISSUE, P. 11-13.

Central Business District Back In Angle Parking

John A. Nawn, P.E., PTOE

In August 2003, the Pottstown borough completed back in angle parking along the main street thorough its central business district (CBD). This is the first such application of back in angle parking in the Commonwealth of Pennsylvania.

In many community's central business districts, lack of parking close to retail and commercial establishments is seen as a deterrent to continued retail development and reinvestment into the CBD. In many instances, the CBD is also bisected by an urban arterial, or "Main Street." Competing needs of parking versus efficient vehicle movement can impede mobility and sometimes compromise safety.

Since the middle 1990's, the Borough of Pottstown, Montgomery County, Pennsylvania, has struggled to revitalize and reinvigorate its downtown core. The Borough's 1994 Downtown Comprehensive Plan identified several goals for revitalization, specifically dealing with creation of a pedestrian friendly, multi-modal environment while maximizing the amount of parking and its proximity to retail establishments that line the downtown core. Through leveraging of and improvement to the existing transportation infrastructure, the community attempted to realize these goals.

Located in the Philadelphia, Pennsylvania metropolitan area and situated on the Schuylkill River, the Borough of Pottstown traces its routes to 1752. As the Borough developed, the CBD developed centered along High Street, making High Street the Borough's main street. At 5.5 square miles, Pottstown population is 21,859 (2000 census). Following the increase in automobile traffic after World War II, the High Street cross section was reconfigured to maximize automobile mobility. With 68 feet available between the curb lines, two 11-foot through lanes and a 7-foot parallel parking lane were created in each direction along with a 10-foot wide center turn lane/ painted median. Combined with a 16-foot sidewalk on each side, the face of the buildings on each side of the street are 100 feet apart, creating a very wide corridor through the CBD. The width of the corridor is visually perceived by some to be a deterrent to downtown redevelopment.

As a highway facility, High Street was an operational success... however, High Street was failing to meet more recent and progressive economic development and transportation goals.

In 1972, a four lane, grade separated, limited access freeway, U.S. Route 422, was constructed along the opposite side of the river from the Borough, essentially bypassing the CBD and drawing large amounts of the existing through traffic volume from High Street. High Street quickly became an underutilized transportation asset.

As a highway facility, High Street was an operational success. The 85th percentile speeds were within 5 miles per hour of the posted speeds and an attractive level of service was maintained for vehicles. However, High Street was failing to meet more recent and progressive economic development and transportation goals endorsed at local, state, and national levels.

Increasing pedestrian traffic is one of the key objectives in the Borough's efforts to revitalize the CBD. However, High Street's configuration impeded these efforts. With four lanes of rapidly moving traffic, it was neither pedestrian nor shopper friendly. High Street's 68-foot cross-section was intimidating and discouraged pedestrians and shoppers from crossing the street. Pedestrian injuries and deaths were not uncommon. In addition, vehicle traffic along High Street moved too quickly to allow passengers adequate time to identify shopping opportunities and find a parking space.

Downtown business owners identified a perceived lack of parking as a concern. Although metered, parallel parking was available on both sides of High Street throughout the CBD, it was generally 50%

"Back-in" continued on p. 12

"Back-in" continued from p. 11

utilized and, therefore, considered to be insufficient in addressing the potential needs of the downtown businesses, considering the number of vacancies. While a number of small surface lots had been created along High Street, the linear nature of the CBD makes this parking convenient to only adjacent businesses with long walks necessary for all other businesses.

One of the region's transportation goals is to encourage the use of bicycles as an alternative to the automobile. High Street had been designated by Montgomery County as an official Bicycle Route connecting Pottstown with other communities along the Schuylkill River corridor. But, in its former configuration, High Street was not conducive to bicycle travel with no dedicated bike lanes and swiftly moving vehicular traffic.

State and regional plans recognize the connection between revitalizing older communities and solving the problems of traffic congestion on our roads and highways. Encouraging people to live, work and shop in denser, walkable communities fosters the use of existing public transportation, helps reduce sprawl and relieves the pressure on our road system. Creating vibrant downtowns in our cities and smaller urban communities ensures a growing demand for public transportation. Therefore, the general thinking was that reconfiguring and calming traffic on High Street would address Pottstown's own economic development goals and have a positive impact on regional transportation and growth issues.

Clearly if the Borough was to increase pedestrian traffic and attract new business to the CBD, while not reducing available parking, the existing automobile and truck traffic would have to be calmed. The CBD study area generally encompassed a 1.1-mile corridor centered along High Street. Within this corridor, there are 10 signalized intersections. Of those, only two were equipped with pedestrian push buttons; side streets were not actuated; and all signals were uncoordinated, operating on fixed time cycles with side street phases sufficient to also support lengthy pedestrian times required to cross High Street. Improvements would include coordination of the signals and the addition of pedestrian push buttons to improve mobility and support the thorough lane reduction necessary to support additional angle parking.

One method used to provide more parking is creation of traditional, pull-in angle parking. However, in order to properly implement traditional angle parking, a substantial amount of right-of-way is necessary to provide the proper maneuver space for vehicles to back out of the spaces without impeding traffic flow on the adjacent roadway. With traditional angle parking in place on both sides of a main street, the width of the street and subsequently pedestrian crossing distances become excessive, creating a non-unified downtown unattractive to pedestrians; pedestrians who are critical to the success of the retail and commercial establishments in the CBD. At signalized intersections, pedestrian crossing times can be excessive, leading to decreased vehicle mobility and progression. More typically, the width of available right-of-way is insufficient to support angle parking. While the angle of the parking can be reduced to narrow the required width of street, as the parking angle becomes more acute, the angle-parking yield becomes not much more than that with parallel parking. Ideally, angle parking without the wide maneuver space would address the problem.

It was clear that if the Borough wished to leverage additional parking and a friendlier pedestrian environment as a means to revitalize the downtown area, that conventional methods and thinking would not likely meet those goals. The concept of employing reverse angle or back in angle parking was initiated by the Borough's Planning Commission and upon request from the Commission, the Borough commissioned a new study to evaluate the appropriateness of back in angle parking on High Street.

The initial plan was to establish minimum required lane widths for the conventional elements of the roadway cross-section. In accordance with PennDOT's criteria for an urban arterial, the minimum acceptable width for through lanes is 11 feet. The center median/turn lane would remain, as it was critical to maintaining the necessary levels of service. PennDOT's minimum criterion for auxiliary lanes is 10 feet, therefore leaving 36 feet of the 68-foot width available to support the parking and bicycle lanes.

PennDOT has detailed regulations governing implementation of angle parking on state highways and specifies a minimum width for parking and maneuver space. With 36 feet available, it would be possible to implement angle parking on one side of the street only, with 6 feet available for a single bike lane. Downtown stakeholders were not inclined to limit parking to one side of the street. Furthermore, with parking provided on only one side of the street, the question was raised as to how drivers proceeding in the opposite direction would be able to utilize the spaces. There was little interest in reducing the angle of the spaces as the additional yield, as noted previously, was not sufficient to justify the installation of the angled spaces.

Having determined that angle parking would likely only be possible on one side of the street, the decision was made retain parallel parking on the opposite side. It was also determined at this point to set a minimum width for the bicycle lane, in accordance with AASHTO criteria, which

recommend a width for two directional travel of 12 feet. This width was also consistent with PennDOT's criteria. With all the other minimum widths established and agreed upon, this left 18 feet for angle parking.

In order to maximize the amount of parking, it was decided to utilize an 8 foot, 6 inch (2.59 meter) wide space, which is consistent with National Parking Association (NPA) criteria for a 45-degree angle space. The available 18-foot width, however did not meet PennDOT's minimum criteria. The design team, lead by John A. Nawn, P.E., PTOE, in meetings with the Department, pointed out that PennDOT standards did not specify whether the angle parking criteria applied to traditional pull in or back in angle parking, and since there were no examples of back in angle parking in Pennsylvania, it was clear that the PennDOT criteria only applied to pull in angle parking. It was agreed that a maneuver area was necessary for traditional pull in angle spaces so vehicles can re-enter the roadway safely. When backing up from a pull in angle space, an operator temporarily has no view of approaching traffic dependent upon the length of his or her vehicle and the length and composition of the vehicle to the right. The maneuver area is necessary to provide the operator a safe place to back into during this essentially blind reverse maneuver. However, with back in angle parking, it was argued that no such maneuver area was necessary since vehicles exit forward.

The human biomechanical motion necessary to enter a back in angle parking space is similar too, if not easier than entering a parallel parking space. The prescribed method for entering a parallel parking space entails three distinct steps. First, the operator pulls past the parking space. Second, the operator proceeds in reverse into the space, on a diagonal, as far as possible. Third, the operator pulls forward while turning toward the right to bring the vehicle parallel to the curb. The second step, wherein the operator pulls backwards into the parallel space, typically places the vehicle at an approximate 45-degree angle with the travel lane. For a 45 degree back in angle space therefore, the operator only needs to complete the first two steps of the typical parallel parking maneuver wherein the operator pulls past the space, than proceeds in reverse into the space, completing the move. When leaving the space to re-enter the highway, the back in angle space has a clear advantage over the parallel parking space. When exiting a parallel parking space, an operator must turn his or her field of vision up to 180 degrees and look backward to be able to view approaching vehicles and identify gaps in which to re-enter the traffic stream. In pulling out from a 45 degree angle space, the maximum that the operator must turn his field of vision is 135 degrees to be able to see approaching vehicles from his left. This movement requires only that the operator turn sideways, not backwards presenting a slightly more 'comfortable' position for the operator.

Based on the above discussion, it was successfully presented to the Department that given the fact that it is theoretically easier to enter and exit a back in angle parking space than a parallel parking space, and no maneuver area is typically required for parallel parking lanes in an urban zone, accordingly, no additional maneuver area would be necessary nor should be required for back in angle parking.

The proposed layout was approved by the Borough Council and endorsed by three local, downtown organizations, and the County. The plan was also conditionally approved by PennDOT. Design of the project was funded partially by a grant from the Delaware Valley Regional Planning Commission (DVRPC), through their competitive Transportation and Community Development Initiative (TCDI) program. Implementation of the re-designed striping was carefully orchestrated to follow a planned maintenance resurfacing of High Street.

The decision as to which side of the street to locate the back in angle parking on was cause for much discussion among the stakeholders. Ultimately, the decision was based entirely on which side would yield the biggest increase in parking, and that was found to be the north side of High Street. The additional parking yield over the existing parallel parking, per block, varied greatly depending on the location of driveways, no parking zones and the like, with some blocks gaining as many as 23 spaces and some blocks as few as 2 spaces. Overall, the downtown area gained a total of 95 new spaces, a 21% increase over existing conditions.

In addition to parking changes, existing electromechanical signal controllers were replaced with new, solid state controllers and coordinated with each other to accommodate the through lane reduction necessary to accommodate the new parking and bike lane.

This context sensitive solution demonstrates that back in angle parking can be effectively integrated into the downtown environment and co-exist along an arterial highway employing current, minimum design standards. In addition to creating more parking over traditional parallel parking, back in angle parking can also be used as a traffic calming/street narrowing tool, can enhance pedestrian functionality and walk-ability within the downtown area and can work harmoniously with bicycle lanes, all resulting in a more attractive and intimate downtown corridor enhancing the downtown experience and leading to increased economic investment. ■

John A. Nawn, P.E., PTOE was the Project Manager for the Back In Angle Parking design and installation and had been associated with the project and the Borough's efforts since 1995. Mr. Nawn holds a Bachelor of Science Degree from Drexel University, and is currently employed by URS Corporation the Branch Manager of their Philadelphia Office. John, a licensed professional engineer in four states and a certified professional traffic operations engineer, has over 16 years experience in traffic engineering and has been a member of PSPE since 1990. John is currently the President of the Delaware County Chapter of the Pennsylvania Society of Professional Engineers.

The project was presented at and appears in the proceedings of both the Second Urban Street Symposium (a Transportation Research Board conference) and the 2003 Institute of Transportation Engineers Annual Conference.

For more information please contact Mr. Nawn at, 215-587-9000 x3000 or john_nawn@urscorp.com.

APPENDIX B

CITY OF POTTSTOWN (2001) PROPOSED HIGH-STREET TRAFFIC CALMING PLAN.

1. Wilmington, Delaware

Contact person: Thomas Warrington
Department of Public Works
900 E 11th ST
Wilmington, DE 19802
302.571.4233

The City of Wilmington, Delaware, has six blocks of 60 and 90-degree back-in angle parking dating back about 50 years. By city ordinance, Wilmington requires all angle parking to be back-in because of the safety factor.

For 60-degree angle parking, regulations require 19 feet out from the curb for parking spaces, to allow for vehicles with extended cabs, plus a minimum of 11 feet for a travel lane, for a total of 30 feet for traffic going in one direction.

The highest average daily traffic for any block with angle parking is the 1000 block of Market Street, with an ADT of 6,500 vehicles.

Wilmington has not experienced any significant problems with accidents or impediments to travel flow with angle parking.

(See attached letter from Thomas Warrington.)

2. Seattle, Washington

Contact person: Bill Jack
Seattle Transportation
Municipal Building, Room 410
600 Fourth Avenue
Seattle, WA 98104
206.684.8329.

The City of Seattle, Washington, has about 280 blocks of angle parking spaces, most of which are back-in. Seattle also has pull-in angle parking, but prefers back-in angle parking because it is safer, especially for pedestrians.

North Queen Anne Street, shown above, is one of the higher volume traffic streets, with about 6,500 ADT.

Seattle has had back-in angle parking for more than 30 years.

(See attached letter from Bill Jack.)

3. Washington, D.C.

Contact person: Rashid Sleemi
202.671.1573

Washington, D.C. has six blocks of back-in angle parking going back 15 to 20 years.

The busiest thoroughfare is the 2400 block of 18th Street NW, which has an ADT of 9,200. The street has two lanes of traffic going in each direction with no maneuver lane in front of the parking spaces.

Other areas with back-in angle parking are several blocks on Water Street, NW, a low volume traffic area, and Vermont Avenue, NW, between 14th and Q streets, with an ADT of 5,000.

Although no traffic records are available, Mr. Sleemi reports the perception is that back-in angle parking does not create any traffic hazards.

4. Indianapolis, Indiana

Contact person: John Burkhardt
Administrator, Traffic Division
1725 S. West Street
Indianapolis, IN 46225
317. 327.2903

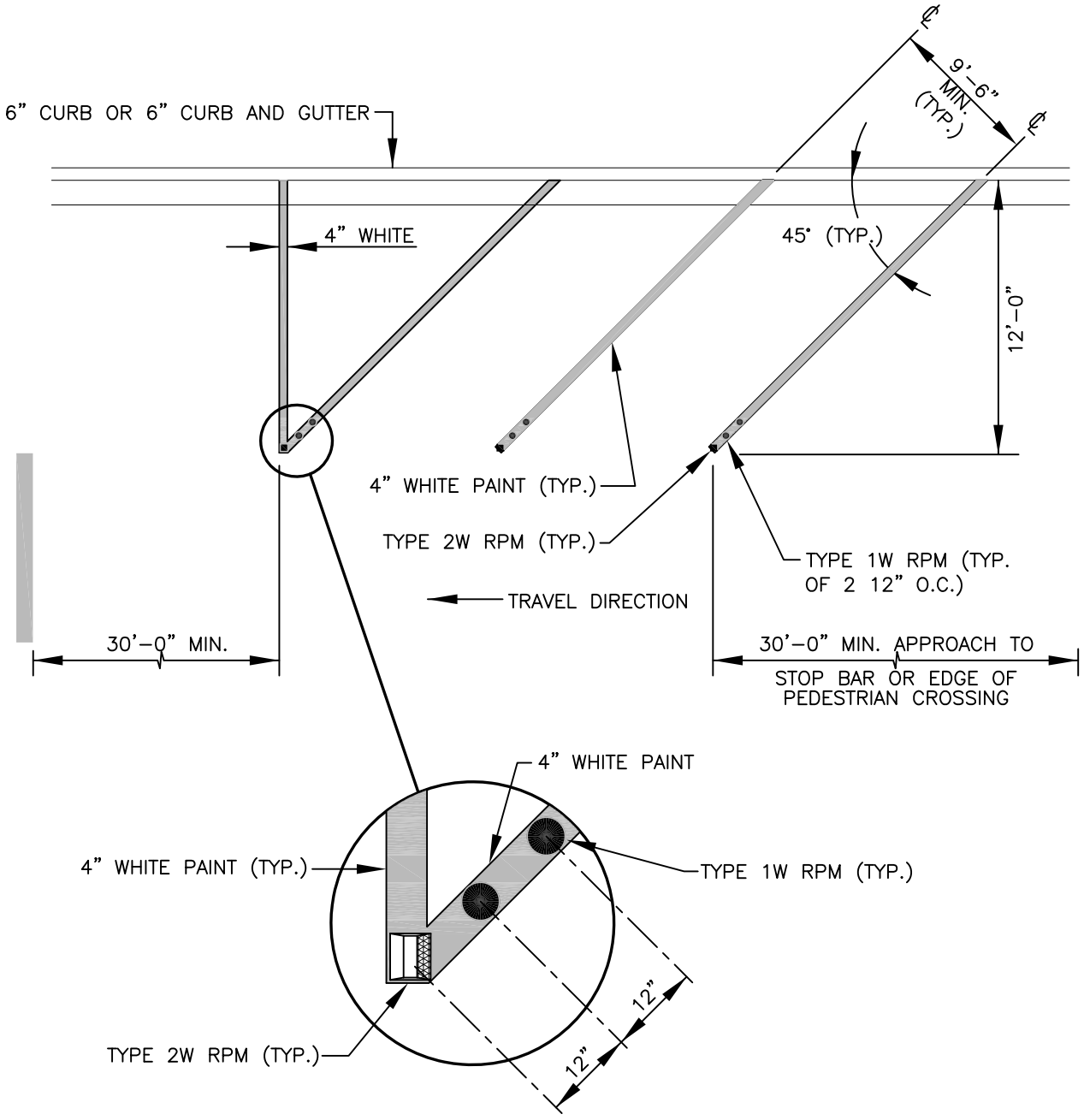
Indianapolis has one block of back-in angle parking, along the federal courthouse on New York Avenue, going back at least 15 years.

New York Avenue is a one-way street consisting of a north parallel parking lane, three traffic lanes, a right turn lane, and angle parking. The right turn lane is directly adjacent to the angle parking. Average daily traffic is 13,800.

The latest traffic records, for the years 1999-2000, reflect there were a total of two accidents over two years at the nearest intersection. They do not know if those accidents had anything to do with the angle parking.

APPENDIX C

CITY OF VANCOUVER (2004) ANGLE BACK IN PARKING STRIPING.



49 ANGLE BACK IN PARKING STRIPING AND MARKINGS

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REV NO.	DATE	BY	APPR

TRANSPORTATION SERVICES

APPROVED BY: TRAFFIC ENGINEER MANAGER

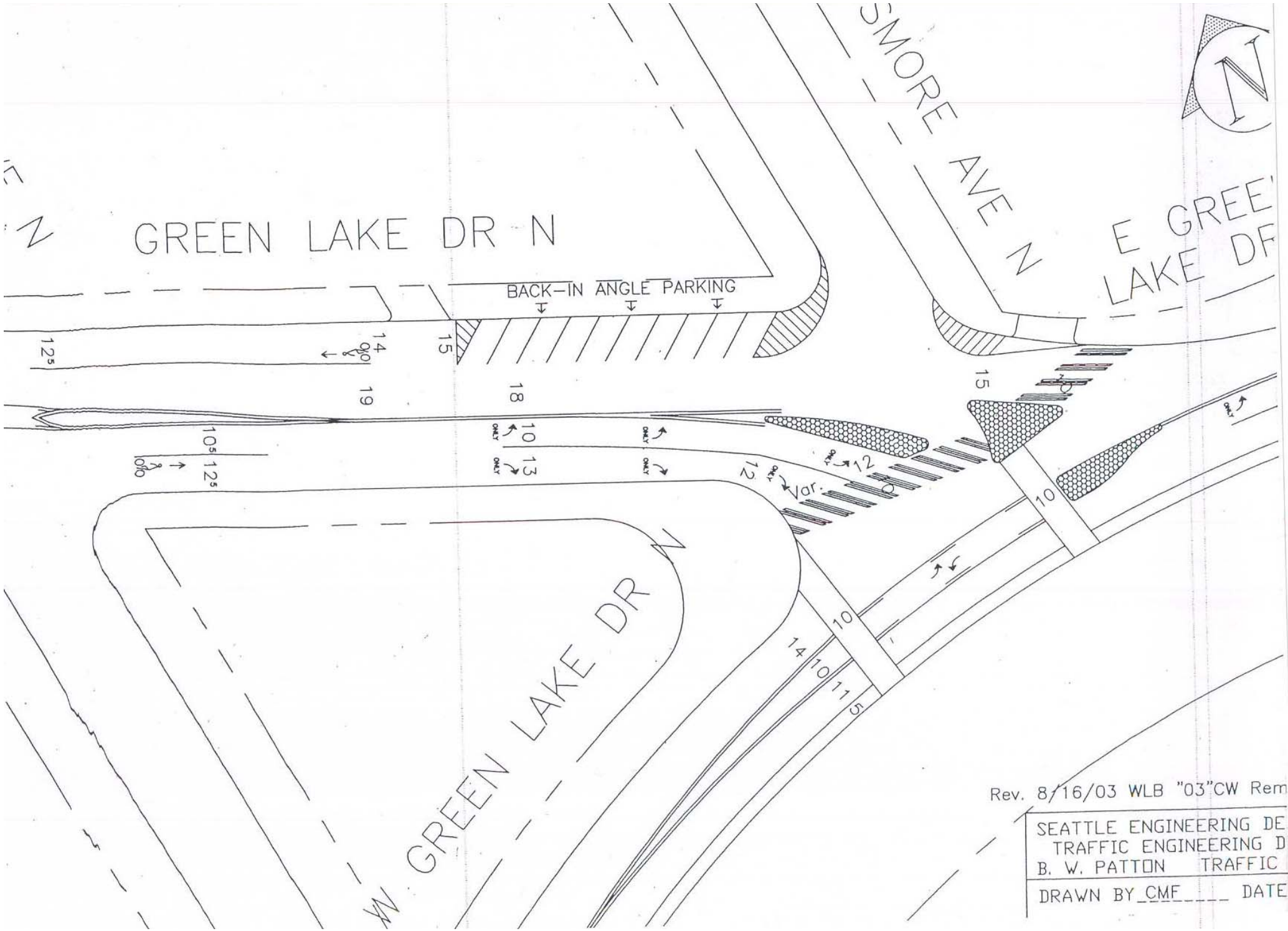
DATE: 8/30/2004

CITY OF VANCOUVER WASHINGTON

CITY OF VANCOUVER	STANDARD PLAN NUMBER
ANGLE BACK IN PARKING STRIPING	T29-62

APPENDIX D

CITY OF SEATTLE (2005) ANGLE BACK IN PARKING DIMENSIONS (SOURCE: FRANK NELSON, SEATTLE TRANSPORTATION DEPARTMENT).


GREEN LAKE DR N
BACK-IN ANGLE PARKING
SMORE AVE N
E GREE
LAKE DR
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ONLY
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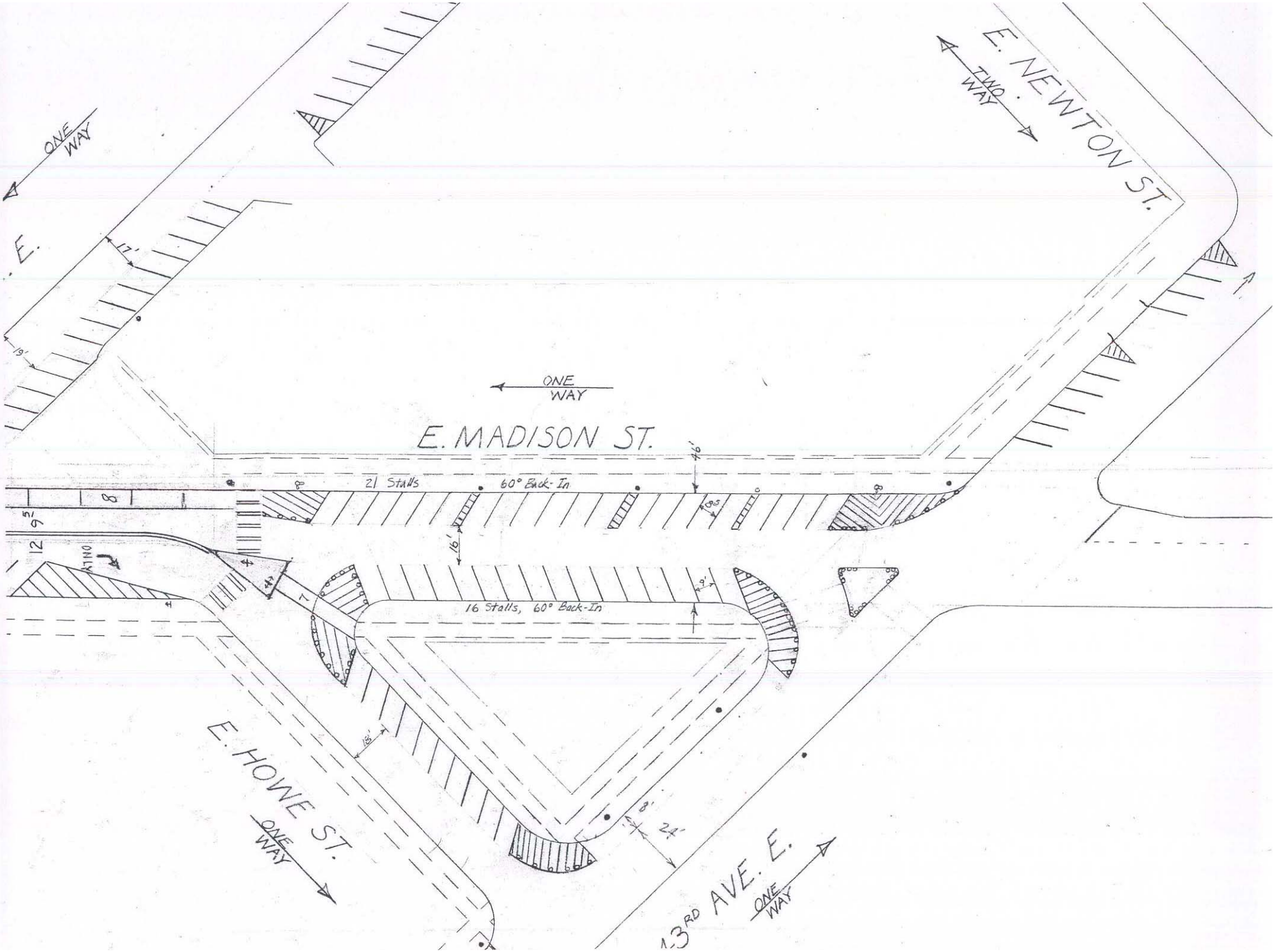
SEATTLE ENGINEERING DE
TRAFFIC ENGINEERING D
B. W. PATTON TRAFFIC
DRAWN BY CMF DATE


E. NEWTON ST.
TWO WAY
ONE WAY
E.
ONE WAY
E. MADISON ST.
46'
8'
21 Stalls
60° Back-In
8'
9.5'
8'
12'
ONLY
16'
16 Stalls, 60° Back-In
18.5'
E. HOWE ST.
ONE WAY
8'
24'
13TH AVE. E.
ONE WAY


BACK-IN ONLY
ANGLE PARKING
1 Signal right
2 Pull forward; stop
3 Reverse to park
2
3
1


BACK-IN ONLY
ANGLE PARKING
1 - SIGNAL
2 - STOP
3 - REVERSE
2
1
3

Reverse Angle Parking

Easy as 1-2-3!

CHARLOTTE.
TRANSPORTATION

There is a new way to park in Charlotte. With the new parking style called reverse angle parking or back-in parking, you will back into a space so that the front of your car is facing the street. This method has been used across the country. Reverse angle parking will be coming to Commonwealth Avenue between Pecan Street and The Plaza.

How to Reverse Angle Park:

Reverse angle parking is easy as 1-2-3!

1. SIGNAL right to park.
2. Pull forward and STOP.
3. REVERSE and back-in to the space.

Benefits of Reverse Angle Parking:

Improved Driver Visibility:

- When leaving a parking space, drivers are facing forward allowing a better view of traffic and cyclists.
- Drivers do not have to back-in to traffic blindly when leaving. This makes departures safer, quicker and easier.

Easier Loading/Unloading

- When vehicle doors are open, they block pedestrian access to the travel lane and guide them back to the sidewalk.
- The vehicle's trunk is accessed from the sidewalk, making it safer and more convenient to load/unload items.

Accessible Parking and Curb Ramps

- Accessible parking spaces are provided with direct access to the sidewalk.
- Wheel chair users can load/unload from the vehicle's side or rear, away from the traffic lane.

Traffic Calming

- On-street parking visually narrows the roadway lane width, contributing to slower speeds and enhancing driver alertness.

Proposed road with reverse angle parking.

For more information, please contact the Charlotte Department of Transportation at 704-336-4119 or visit http://cdot.charmeck.org

Back-in Angle Parking

What is Back-in Angle Parking?

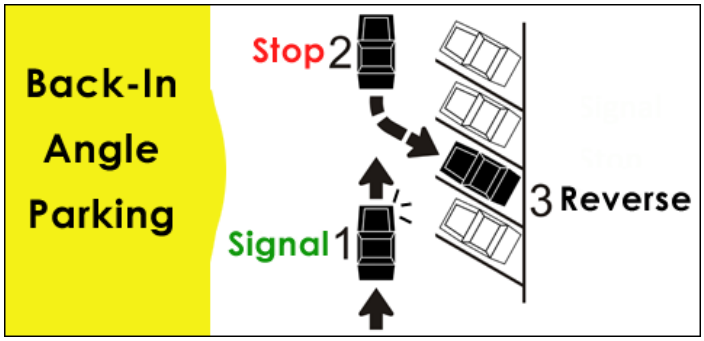
Back-in angle parking is a safer form of the traditional nose-in angle parking. It is sometimes referred to as reverse-angle or reverse diagonal parking. Instead of pulling into the parking spot, drivers, back into their spot. This allows them to make eye contact with oncoming traffic when exiting the parking spot.

With back-in angle parking, the parking lines are reversed or angled in the opposite direction indicating that a driver is to back into the spot. Signage may also be added to indicate that drivers are to back in.

How back-in angle parking works

Back-in angle parking has the same initial steps as parallel parking:

1. Signal a right turn to warn other drivers.
2. Pull past the parking spot and stop.
3. Reverse into the parking spot.



Benefits

Back-in angle parking has multiple safety and operational benefits for vehicles as well as pedestrians and bicyclists, such as:

- Provides motorists with better vision of bicyclists, pedestrians, cars and trucks as they exit a parking space and enter moving traffic.
- Eliminates the risk of a bicyclist being 'doored' when the bicyclist is traveling in a bicycle lane next to a parallel parked car.
- Removes the difficulty that drivers, particularly older drivers, have when backing into moving traffic.
- Positions the trunk or back of the vehicle to the sidewalk, enabling easier loading/ unloading of items.

- Positions the driver and passengers to enter/ exit the vehicle towards the sidewalk instead of into moving traffic.
- Increases parking capacity (10 to 12 feet of lateral curb per vehicle, versus 22 feet per vehicle for parallel parking).
- Is easier than parallel parking.

Back-in Angle Parking, continued...

Considerations before Installation

As a general rule, back-in angle parking should be installed on side streets first. This will enable drivers to become familiar and comfortable with the parking change. Over time and with community acceptance, it may be expanded to major streets.

Prior to installation, the change should be publicized so that people understand and accept the change. A learning curve should be expected, thus parking a vehicle in one of the spaces each morning can help drivers understand the action.

Appropriate signage will also help to educate drivers on how to park.

Other considerations include:

- Vehicles overhanging the sidewalk or backing into trees or street furniture. This can be eliminated with proper design and placement.
- Vehicles may enter the spaces head-in from the opposite side of the street. This can be alleviated with signage and enforcement.
- Potential Congestion: As with parallel parking, backing in may cause some congestion.

Overall, back-in angle parking improves the safety of cyclists and drivers by increasing visibility, and makes accessing your car easier and safer.

BIKE WALK MONTANA
MONTANA'S VOICE FOR BICYCLISTS AND PEDESTRIANS

www.bikewalkmontana.org

PROJECT STATUS REPORT

Project Name: City of Muscatine - West Hill Sewer Separation **Month:** July 2016

Prepared By: Stanley Consultants **Project Number:** SCI: 17660.30.02, 17660.40.00

"PHASE" refers to Design Package/Construction Contract

Progress for Last Month (July 2016):

PHASE 3 (Phase 3A, 3B, 3C):
Phase 3A/3B – Construction:

- Project coordination as needed
- Attended Phase 3B weekly progress meetings
- Met on Aug 2 to discuss construction topics.
- Preparation of ITC No. 2 (Sod) and 3 (Aggregate Base beyond curb) for City's consideration.

GENERAL AND PHASE 4 Planning:

- Completed EPA annual West Hill update letter and mailed to EPA.
- Project planning tasks – Completed updated future costs as requested from April 6th meeting.

Work Items for Coming Month (August 2016):

PHASE 3 (3A, 3B, 3C) - Construction:

- Address any Phase 3B construction coordination topics
- Attend future contractor/city coordination meetings
- Assist as requested with Phase 3A contractor closeout and 3A remaining topics.
- Attend August Utility Meeting

PHASE 4 – Planning:

- Schedule and meet with City to share information on updated future construction costs and discuss schedule.

- Revised Planning Schedule for Phase 4
  - Authorize Phase 4 for Survey – Aug –Sept 2016
  - Survey to be Completed – Oct 2016 – March 2017
  - Concept Design and Estimate – March 2017-June 2017
  - Final Design – June 2017 – February 2018
  - Bid and Construction – 2018

Key Issues & Information Required

- Establish an agreed upon schedule for Phase 4.

Critical Information

- Authorization to proceed with Phase 4 survey to allow adequate time to complete Phase 4 design to achieve bidding and construction in 2018.