Todo list

University of Southern California
Los Angeles
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6th December 2013

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To whom it may concern,

We are four students at University of Southern California expected to graduate next year, May of 2014. With each of us majoring in a different subfield/subject, we tried to see this project from various perspectives in order to seek what fits best for CHC.

After the insightful site visit, we decided to target ways in which we can improve pedestrian and biker safety as well as for mobility as a whole for the greater Los Angeles. With many traffic-calming techniques already available, we have narrowed down the list to eight specific techniques that we found to be the most reliable and efficient and analyzed them thoroughly. Those eight techniques are chokers, curb radius, raised crosswalks, curb extensions, textured pavements, dignified zones, traffic circles, and midblock crossings. After going deeply into each technique, we have ranked them from top to bottom for you to easily be able to see which ones are the most suitable for Los Angeles.

We have focused this project to cater to CHCs needs and we hope that you find this information helpful for your future plans and projects. Furthermore, we have included references for you to be able to easily find additional information on the given practices. Thank you so much for taking the time to answer our emails whenever we needed any clarifications.

Sincerely,

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Christine Noh

An Analysis of Best Practices in Complete Street Design

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6th December, 2013

Abstract

In order to improve mobility and safety in Los Angeles, we have looked upon eight distinctive traffic-calming practices. These include chokers, curb radius, raised crosswalks, curb extensions, textured pavements, dignified zones, traffic circles, and midblock crossings. We will go in detail for each of these techniques and in the end, discuss which one would be the better alternative for Los Angeles specifically.

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1 Executive Summary

John: Do this section

2 Introduction and Background

Community Health Councils (CHC) is producing a report for the City of Los Angeles that recommends and details guidelines for complete streets design to be included in the Mobility Element of the citys General Plan. This CHC report will be describing various best practices that can be implemented so that LA streets better adhere to the principles of complete streets. The following report details eight specific best practices that CHC may implement in their report to the City of Los Angeles. For each best practice, a general description is provided, as well as a discussion of its impact and cost. Additionally, each practice was evaluated based on its cost, impact, and ease of implementation to determine whether it is worth recommending as a design guideline in the Mobility Element. A usability index was created to more quantitatively evaluate these practices, and allowed for better comparison between them. In addition to complete street design, this report is also mindful of CHCs overarching goals of improving health in South LA.

John: Finish this section

3 Best Practices

3.1 Chokers

Chokers are curb extensions at midblock locations that narrow a street by ultimately creating wider sidewalks. They are also known as safe crosses when marked as crosswalks. Chokers can be made by widening one side of the curb or by bringing both curbs in, giving it the pinch point along the street (See Figure 1). The main purpose of chokers is to decrease speed of incoming vehicles at a mid-point along the streets, create a seamless transition between a commercial and a residential area, and to narrow exceedingly wide intersections [2].

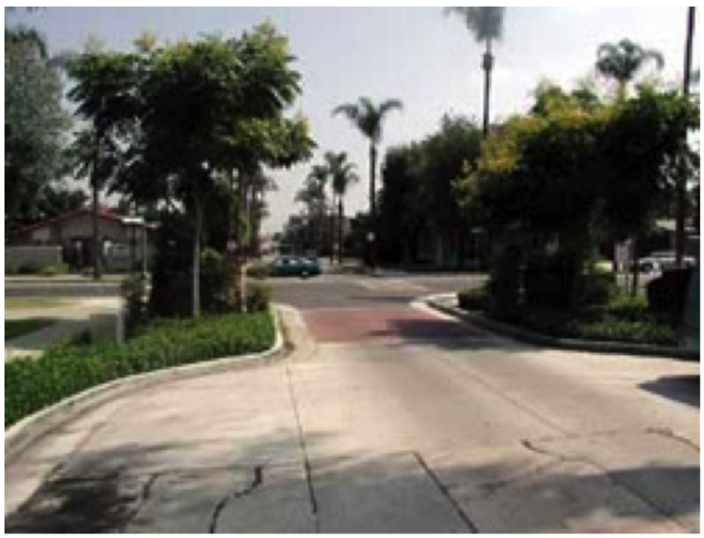


Figure 1: This choker requires drivers to yield upon entering

Two-lane chokers (See Figure 2) leave two lanes in the street cross section narrower than the width of a normal cross section, while one-lane chokers narrow the width to allow travel in only one direction at a time. These chokers are effective for areas with substantial speed problems and streets with minimum or no parking on-site.

3.1.1 Advantages and Disadvantages

The various advantages of chokers are:

- ability to reduce both speed and volume significantly
- easily negotiable by large vehicles (for example, fire trucks)
- improving aesthetic value when well designed

The disadvantages include:

Figure 2: Two-Lane Chokers

- Eliminates on-street parking
- Requires bicyclists to briefly merge with vehicular traffic
- Absence of vertical or horizontal deflation limiting the effect of chokers on vehicle speed.

3.1.2 Effectiveness

Chokers can ultimately increase the visibility of pedestrians as well as to reduce pedestrian crossing width, while the speed of vehicles is reduced by 4 percent on average for two-lane chokers and 14 percent on average for one-lane chokers [14]. Also since chokers work well with speed humps, speed tables, and raised intersections, (See Figure 3) it can be created in many sites with no extreme difficulty.

3.1.3 Cost and Considerations

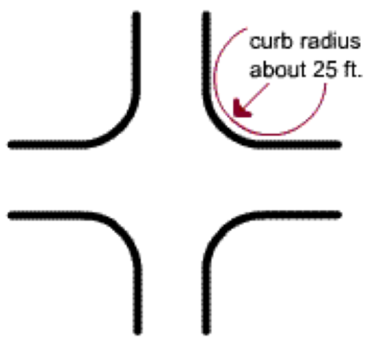
Factors to consider when creating chokers are to consult with the local fire and sanitation department before setting minimum width and to double check to make sure that the bicyclist safety and mobility are not diminished. Also when reducing two-lane street to one lane, the width of the travel way should not be wide enough for 2 cars to pass at the same time. This equals to the travel way not being wider than 4.9 meter, or 16 to 17 feet; by doing so, the effectiveness of

Figure 3: Speed Hump

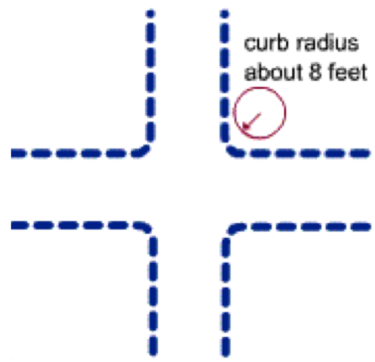
the chocker is maximized [2]. The cost to create chokers varies depending on the site and landscape but most are along the lines of $5,000 to $20,000 (drainage representing a significant amount).

3.2 Curb Radius

Curb radius is a traffic calming technique in which the grid of intersecting streets is reshaped and the radius of the curb is significantly reduced. As you can see in Figure 4a, a large curb radius will enable vehicles to go around corners faster while in Figure 4b, a smaller curb radius will slow vehicles down when turning into the corner.



(a) Large Curb Radius



(b) Small Curb Radius

Figure 4: Different curb radii

3.2.1 Effectiveness

The purpose of curb radii is to slow vehicles down by enabling them to make smaller turns, which ultimately reduces the risk of pedestrians being struck by vehicles when turning into a corner. Also, small curve radii can create safer intersections, improve the visibility between drivers and pedestrians, and lead to improved signal timing. By reducing the curb radii, not only will it slow down vehicles when turning, but it will also shorten the distance and time it takes for pedestrians to cross the street by nearly half of what it used to be (See Table 1 and Figures 5 and 6).

Curb Radius (ft)	Time (s)
10	7.9
15	9.8
25	14.1

Table 1: Average pedestrian crossing times for various curb radii

When streets have a large curb radius, motorists can make turns at relatively high speeds that decrease pedestrian safety. By contrast, 90-degree intersections and corners with tight curb radii tend to slow motorists down and

Figure 5: Change in Distance from 25ft. Radius to 8ft. Radius

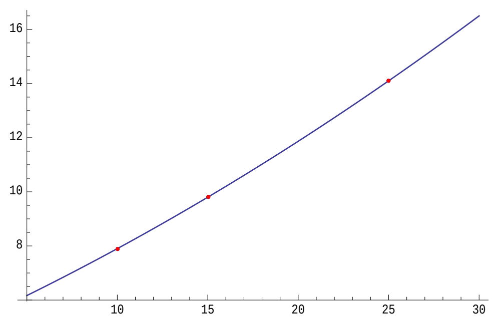


Figure 6: A plot of the data from Table 1

therefore increase pedestrian safety. Motorists turning right at high speed can cut off bicyclists/pedestrians traveling straight on the arterial street. In addition, pedestrians crossing the residential street adjacent to the arterial may not expect high-speed turning traffic, or they may have their backs facing the turning cars as you can see in Figure 7.

3.2.2 Cost and Considerations

The cost of reconstructing tighter turning radii is in between $5,000 to $40,000 per corner depending on the site locations/conditions. When considering curb radii, it is important to note that in order for it to be effective, the design should meet the needs of the design vehicles with consideration for nearby land uses and prevalence of roadway users. So if there are high volumes of large vehicles making turns in a given location, a poorly designed curb radius could potentially cause the vehicles to drive over the curb and onto the sidewalk endangering pedestrians. In addition, you should always accommodate emergency vehicles,

Figure 7: Pedestrian Facing Back Against the Car

as well as school buses, and public maintenance vehicles when designing curb radii [6].

There is no magic number for the appropriate curb radius because it differs case by case depending on where it is located (See Figure 8). The length of the curb radius that should be used wherever possible is 5 to 10 feet, whereas an effective radius for urban streets with high volumes of pedestrians is 15 to 20 ft. For arterial streets with a substantial volume of turning buses/trucks, an appropriate effective curb radius is about 25 to 30 ft.; and the maximum desired effective curb radius is typically 35 feet for large vehicles [6].

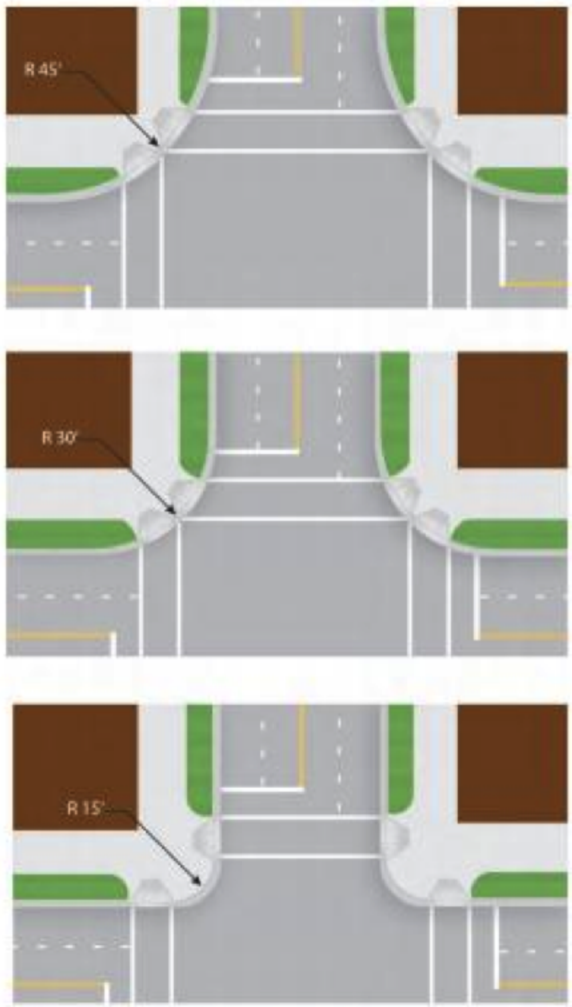


Figure 8: Different Curb Radii Depending on the Location

3.3 Raised Crosswalks

A raised crosswalk (Figure 9) is a designated street crossing that simulatneously acts as a speed hump by bringing the level of the roadway to that of the sidewalk.

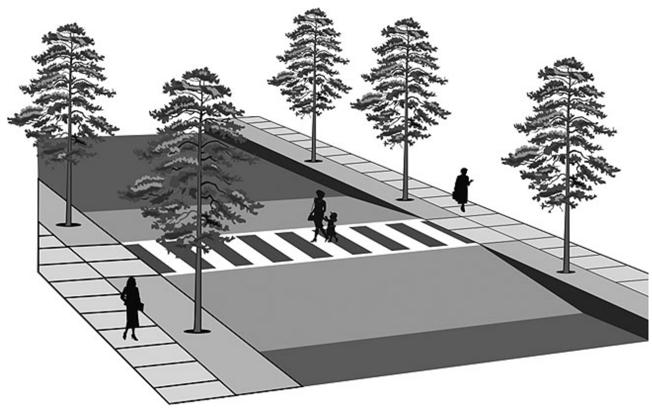


Figure 9: A raised crosswalk [21]

3.3.1 Advantages and Disadvantages

The advantages of such a traffic calming measure include:

- Forces traffic to slow down, improving pedestrian safety.
- Draws attention to the pedestrian, especially when combined with signage and markings.
- Makes crossing the street easier for those on wheelchairs.

The drawbacks are:

- The textured materials used tend to be expensive.
- Not suitable for emergency or bus routes.
- Drainage, especially in snowy or rainy areas, requires additional management.

3.3.2 Effectiveness

Raised crosswalks are an effective traffic calming technique in that they can reduce vehicular speed (See Table 2). Further, they have also been shown effective at encouraging pedestrians to use the crosswalk instead of crossing the road elsewhere. One study [18] found that raising the crosswalk increased the percentage of pedestrians using it from 11.5% to 38.3%.

City and Measure	50th percentile speed (km/h)		Speed reduction (km/h)
	Treatment Site	Control Site	
Durham, NC Research Drive *Raised crosswalk*	33.3	39.8	6.5
Durham, NC Towerview Drive *Raised crosswalk, overhead flasher*	18.5	38.4	19.3
Montgomery County, MD *Raised Crosswalk*	34.6	38.6	4.0

Table 2: Speed reduction due to raised crosswalks (Data from [18])

According to PEDSAFE [18], raised crosswalks can mitigate dart-and-dash type incidents in which the driver was unable to see the pedestrian until just before impact. They also prevent vehicles from 'trapping' pedestrians. Raised crosswalks are best used in areas of low-volume, low-speed traffic where safety of pedestrians takes a priority, such as residential areas and near schools. As a side benefit, they make crossings much easier for the elderly, the disabled, and the young in these areas.

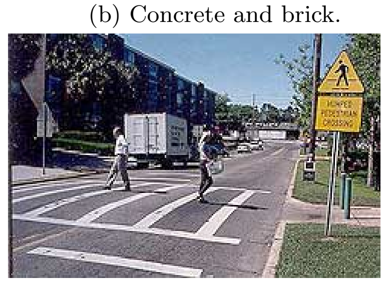
3.3.3 Cost and Considerations

The cost of such a crosswalk varies from $,2000 to $15,000, with typical cost estimate for one unit being $4000 [10]. However, this might be significantly increased if a drainage system has to be added.

(a) Asphalt and highly-visible paint.

(b) Concrete and brick.

(c) Tapering at the curbs to allow drainage.



(d) Higher profile crosswalk, almost resembling a speed hump.

Figure 10: Various raised crosswalk styles. [10]

3.4 Curb Extensions

A curb extension (Figure 11) is an extension of the curb onto the roadway. As a traffic calming measure, they are primarily used to assist pedestrians by reducing crossing distance and slowing traffic down.

Figure 11: Curb extension

3.4.1 Advantages and Disadvantages

Curb extensions are thought to have the following advantages:

- Reduce the time that pedestrians are exposed to traffic.
- Increase the visibility of pedestrians attempting to cross.
- Shield parking lanes from oncoming traffic and prevent drivers from using them as right turn lanes.

The various drawbacks are:

- They pose a threat to bicyclists, who are forced into a narrowed gap along with traffic.
- Like raised crosswalks, they complicate drainage since they obstruct the gutter.
- Reduce the availibility of parking spaces, which can hurt local businesses.

3.4.2 Effectiveness

One study [20] found that curb extensions significantly reduced the number of vehicles pedestrians had to wait for before one yielded. The same study also found minor increases in percents of crossings where a motorist yielded, and of vehicles yielding at advance stop bars. These results are shown in Tables 3, 4 and 5.

Lane	Non-curb extension	Curb extension	Difference	Sample Size
Near	2.58	1.81	-42.7 %	219
Far	2.36	1.76	-33.9 %	214

Table 3: Average number of vehicles passing before a pedestrian-cross. Results found significant by the t-test.

Lane	Non-curb extension	Curb extension	% difference	Sample Size
Near	64.9%	66.7%	2.7%	234
Far	58.6%	63.4%	7.7%	234

Table 4: Percents of pedestrian crossings with yield. The results were found insignificant by the t-test.

Lane	Non-curb extension	Curb extension	% difference	Sample Size
Near	42.6%	53.8%	21.0%	99
Far	42.6%	51.9%	18.0%	99

Table 5: Percent of vehicles yielding at advance stop bar. The results were found insignificant by the t-test.

3.4.3 Cost and Considerations

Curb extensions cost between $5,000 and $25,000 per corner [4]. As with most sidewalk retrofitting, a large portion of the cost goes to drainage. If it is also necessary to remove a utility pole or other such existing infrastructure element, costs can become much higher.

3.5 Textured Pavements

Textured and colored pavements refers to the use of varied pavement materials to alter the color or texture of a street surface. This practice can be used as a traffic calming measure or as a way to distinguish special areas of the street.

Changes in pavement texture from normal concrete or asphalt surfaces can cause a change in audible road noise inside the car body. This effect can be utilized to alert drivers to slow down or take notice of potential hazards. Textured or colored pavements can also be used to visually distinguish special areas of the street, such as crosswalks or bike lanes, to make drivers more aware of their location [?].

Altered pavement textures and colors have been found to cause reductions in vehicle speed, though there is limited data available to quantify this [?]. This practice can be used in combination with other practices to produce a traffic calming effect, such as raised crosswalks, speed tables, or raised intersections.

3.5.1 Materials

Cobblestones Cobblestone roads are paved with quarried stone with rounded tops. The advantages of this material are that it will create a significant audible disturbance to drivers and can provide a unique aesthetic appeal; however, cyclists and wheelchair users might find this pavement difficult to navigate. Additionally, the unevenness of the pavement makes it more difficult to remove snow and ice [?].

Figure 12: Cobblestone street in Lymm Cross, Cheshire, England

Setts and Bricks Setts are quarried stone blocks that are flat-topped (in contrast with round-topped cobblestones). They are typically arranged in a uniform matter, as pictured in Figure 13. Bricks are used and placed in a similar nature, but come from a different source material. The road texture of sett-paved roads can vary depending on the evenness of the selected setts [**?**].

Figure 13: Streets paved with setts

Figure 14: Speed hump utilizing brick paving

Concrete Blocks Concrete blocks are pre-cast, individual blocks of concrete that are placed similarly to bricks or setts. An advantage of using concrete blocks is that they can be shaped and colored in different ways to create a desired appearance. For example, concrete blocks can be made to look like setts and bricks by casting them in a certain size and applying the proper coloring. An additional advantage of concrete blocks is their reduced cost [**?**].

Figure 15: Concrete block paving

Colored Pavement Pavement can be colored through the use of pavement striping paint, as similarly used to make normal pavement markings. While textured pavements generally are made up of more earthen tones, bright colors can be used to create a very noticeable visual effect, as demonstrated by the green bike lanes in Figure 16.

Figure 16: Green-colored bike lanes in Portland

3.5.2 Cost

The cost of utilizing textured or color pavements is dependent on a) the material used and b) the total area of the pavement. The Victoria Transport Policy Institute estimates a cost range of \$5–\$16 per square foot [?]. A crosswalk 10 feet in width crossing a four-lane road, for example, would have a total material cost ranging from \$2400–\$7680.

Figure 17: Brown coloring used to distinguish a bike path crossing in the Netherlands

3.6 Pedestrian & Restricted Traffic Zones

3.6.1 Pedestrian Zones

A pedestrian zone is an urban area in which motorized vehicle access is disallowed. In some instances, all wheeled vehicles (including bicycles) are banned from the zone. Barriers are typically put in place to physically obstruct motorized vehicles from entering. These barriers typically come in the form of bollards (pictured below) and can be either permanent or removable, if access is required for certain motorized vehicles. Pedestrian zones can be created temporarily by closing off a normal street to motorized traffic by placing temporary barriers. Alternatively, permanent pedestrian zones can be designed without motorized traffic in mind. Figure 18, Figure 20, and Figure 21 illustrate examples of permanent pedestrian zones [**?**].

Figure 18: Example of pedestrian zone design: enough space allowed in the middle for essential motor vehicles, textured pavements to indicate an alternative purpose for the space, and bike racks in place to encourage bicycle use.

Figure 19: Bollards restricting access to a pedestrian area

Pedestrians zones make land that was previously used for roads or parking available for gathering space or green space. Pedestrian zones increase the local

Figure 20: A temporary pedestrian zone in Tokyo, created by placing temporary barriers in front of a normal street

populations use of walking as a mode of transportation, which in turn decreases usage of automobiles, as businesses in the zone have increased their accessibility to pedestrians. Additionally, these zones are also known to increase rates of physical activity, particularly amongst children [**?**].

Figure 21: A pedestrian zone

3.6.2 Restricted Traffic Zone

Restricted Traffic Zones are urban areas where non-essential motorized traffic is disallowed. This is a practice most commonly found in Italy, known as a *zona traffico limatato*. The practice is used to reduce congestion and pollution in historical city centers. Cameras are placed at strategic checkpoints entering the zone to check control access. A picture is taken of every vehicle, and its license plate is cross-referenced against a list of permitted vehicles. Prohibited vehicles are fined. Depending on the characteristic of the restricted zone, other vehicles can be allowed as well, such as merchant vehicles, taxis, emergency vehicles, maintenance vehicles, and diplomats [**?**]. In combination with the closure of these zones to non-essential traffic, Italian cities increased public transit services to improve mobility. In Milan, for example, this practice proved to reduce automobile traffic in the zone by 50%. In Freiburg, Germany, traffic restriction and public transit improvements caused bicycle usage to double from 1976 to 1986 and led 18% of drivers to switch to public transit [?].

Figure 22: *Zona traffico limatato* warning sign and accompanying cameras

3.6.3 Costs and Considerations

The primary costs of a restricted traffic zone are the construction and maintenance of the monitoring equipment; however, the fines (starting at an equivalent of $50 in Italy) collected due to violations would make up the difference [?]. One problem with these fines is that it is a nuisance to unsuspecting tourists who are not aware of the laws and fines. Additionally, if measures arent taken to reduce total automobile traffic through public transit improvements, the traffic that is redirected due to these restrictions could cause significant congestion in other city zones.

The cost of introducing a pedestrian zone to an urban area depends on its design. Table 6 lists selected pedestrian improvements that could potentially be implemented in a pedestrian zone, and their estimated costs based on data from the San Francisco Bay Areas Metropolitan Transportation Commission [?].

Total maintenance costs would also be dependent on the particular facilities. For an example of these costs, one can look to Corona Plaza in New York City. This proposed plaza is currently a dilapidated access road and parking lot, and is planned to be converted to a 13,000 square foot pedestrian public space [?]. It is estimated that it will cost between $50,000 and $75,000 a year to maintain this plaza [?].

Element	Estimate	
	Lower	Upper
Paving (textured or non-textured) (per square foot)	$5	$16
Concrete Sidewalk Removal and Replacement (per square foot)	$20	
Pedestrian-Level Street Lights (ea.)	$3000	$5000
Cobra Head Standard Lights (ea.)	$10000	
6 Wide Bench (ea.)	$1500	$3000
Bike Rack (ea.)	$600	$1200
Bollards (ea.)	$500	$750
24 Box Trees (ea.)	$1820	
Trash Cans (ea.)	$800	$1500
Water Fountain (Aesthetic) (ea.)	$15,000	$50,000
Tree Grates (ea.)	$680	$750
60 Day Maintenance for mile of street (lump sum)	$3000	$4000
Signage (Standard vs. High Visibility) (ea.)	$300	$400

Table 6: Cost estimates of various elements of pedestrian zones [?].

3.7 Traffic Circles

A traffic circle is a type of circular intersection. It contains a center island, around which traffic flows in one direction. A traffic circle can have one or multiple lanes inside of it, concentric about its center island. Also referred to as a rotary or roundabout, it is capable of handling multiple street inputs. They are commonly utilized throughout New England and Europe.

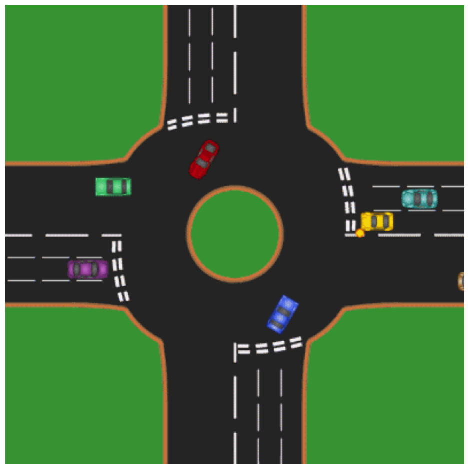


Figure 23: A typical traffic circle for a four way intersection [11]

Unlike a traditional intersection between two perpendicular streets, traffic circles generally do not have traffic lights controlling the flow of traffic. Rather, traffic is controlled by right of way rules. Typically, cars already in the traffic circle have right of way over cars seeking to enter into the traffic circle [17]. Thus, they are designed to slow traffic. Entering traffic typically yields to traffic already in the rotary, and allows for continuous flow of traffic to multiple exits.

Roads can enter a traffic circle radially or tangentially. Roads that enter radially require slowing down of speed and making a turn, thus acting as a traffic calming measure. Roads that enter tangentially do not require as much reduction in speed or turn angle, so traffic is not slowed down as much [12]. Though not as common, entry into traffic circles can also be regulated by traffic lights or stop signs.

Another advantage of roundabouts is that they allow for easy exit to any of the roadways that connect to it. With a normal perpendicular intersection, vehicles wanting to make left or right hand turns instead of continuing straight must wait for specific light signals to turn onto the desire road. With a roundabout, a vehicle simply stays in the traffic circle until reaching its desired exit, which even allows for legal u-turns [11].

Figure 24: Entering traffic must slow and yield to vehicles already in the circle

3.7.1 Advantages and Disadvantages

The advantages of roundabouts are:

- Eliminates T-bone (perpendicular) crashes and head on collisions
- Allows for continuous entering and exiting of traffic to any street
- Improved flow over traffic lights
- Calms traffic by reducing speed without complete stops

Roundabouts come with the following drawbacks:

- Lacks computerized traffic control features
- Can become congested
- Not efficient at moving high volumes of vehicles
- Confusing for inexperienced drivers
- Require driver decision making and timing

3.7.2 Capacity

The capacity of a roundabout is dependent upon the number of lanes within the circle, as well as the diameter of the circle. Most modern roundabouts are less than 250 feet in diameter [11]. Since it does not necessarily require a full stop by entering vehicles, traffic circles can provide less delay than light controlled intersections. When the volume of entering traffic is unequal between the different roads (unbalanced), there can be inefficiencies. Traffic lights are optimized to maximize the traffic throughput by giving more green lights to a busier road, whereas with a roundabout all roads must slow down and yield to traffic within the roundabout, regardless of the amount of traffic on any particular road [19]. On the other hand, when all of the entering roads experience constant and balanced traffic, a traffic circle can reduce wait times by eliminating red lights.

Figure 25: Perhaps the most well-known traffic circle is the Place de lEtoile around the Arc de Triomphe in Paris, which has eight lanes with twelve avenues feeding into it.

3.7.3 Mini-roundabouts

One specific type of traffic circle is a mini-roundabout. Mini-roundabouts can be built in places where there is not enough space for a traditional roundabout. They are used in place of a four way stop or traffic light controlled intersection. They improve efficiency by eliminating the delay caused by stop signs and traffic signals.

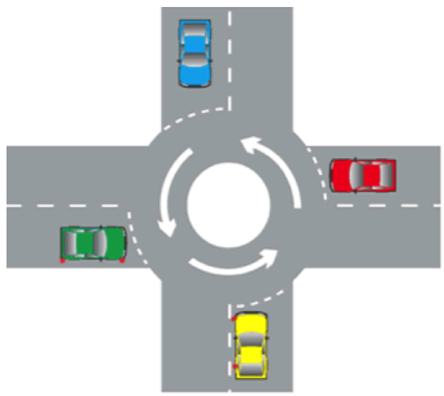


Figure 26: Mini-roundabouts offer greater efficiency than stop signs or lights for intersections with single lane roads [?].

3.8 Midblock Crossings

John: Add the midblock crossings section

4 Analysis

4.1 Methodology

Jake: Talk about the methodology we used

4.2 Rankings

Jake: Rank the practices

4.3 Discussion

Jake: Discuss the results

5 Conclusion

Nakul: Conclude

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EDUCATION

University of Southern California, Los Angeles, CA
Viterbi School of Engineering
Bachelor of Science, Civil Engineering — Expected May 2014
Cumulative GPA: 3.668
Honors: Viterbi Dean's List, Presidential Scholar, Chi Epsilon Honor Society, Rusch Engineering Honors Program

Thomas Jefferson High School for Science and Technology, Alexandria, VA — June 2010
GPA: 4.319

EXPERIENCE

Arup, Los Angeles, CA — Summer 2012, Summer 2013
Infrastructure Intern
- Modeled light rail underground guideways to perform soil settlement analyses.
- Produced horizontal and vertical roadway alignments for the Gerald Desmond Bridge Replacement Project.
- Chaired civil engineering group task force meetings and took minutes.
- Coordinated with the NOAA PORTS program to determine design constraints for bridge air gap sensor.
- Created utility routing plan for pipes servicing Gerald Desmond Bridge maintenance vehicles.
- Produced potholing and CCTV surveying exhibits for utility upgrading projects.

Dominion Virginia Power, Woodbridge, VA — Summer 2011
Design Intern
- Designed new service lines to connect businesses and residencies requesting electricity to the power grid.
- Communicated with customers to configure power line designs to individual needs.

American Society of Civil Engineers, USC Chapter — January 2011 - Present
Concrete Canoe Co-Captain (August 2011 – Present)
- Manage a team of 30 students to design and construct a concrete canoe to be raced against other universities in the Pacific southwest.
- Coordinate team paddling practices, design and construction meetings.
- Developed concrete mix design using lightweight aggregates to design a concrete mix that floats in water while staying within ASCE rules and regulations.
- Composed technical write-ups of the design and construction of the canoe.

Troy Camp, USC — September 2012 – Present
Counselor
- Assisted in the organization of specialized programming for students at West Vernon Elementary in musical theater and leadership programming for middle school students in the Leaders In Training program.

Institute of Transportation Engineers, USC Chapter — April 2011 - Present
Publicity Chair (August 2011 – August 2012)
- Helped establish newly formed chapter of ITE.
- Maintain communication with member base concerning ITE events.

SKILLS

Software: MS Office (Word, Excel, Powerpoint), AutoCAD, Revit Architecture, SolidWorks, SAP2000, MicroStation (+InRoads)
Languages: Conversational German

Nakul Joshi

(213) 610 6105 nakul.joshi@usc.edu 3335 S Figueroa St, Apt 629 Los Angeles, CA 90007

EDUCATION

B.S. Computer Engineering/Computer Science
University of Southern California GPA: 3.575/4 *Expected Graduation May 2014*
Relevant Coursework

Data Structures	Computer Architecture	Object-oriented Programming	Software Engineering
Web Publishing	Calculus & Statistics	Artificial Intelligence	Digital Forensics

TECHNICAL SKILLS

Languages	Java, C/C++, Python, HTML, JavaScript, Verilog
Tools	Eclipse, NetBeans, SVN, Git, Mathematica, Xilinx ISE
Packages	Microsoft Office, LaTeX

WORK EXPERIENCE

Viterbi School of Engineering January 2013 - Present
Undergraduate Teaching Assistant, Data Structures *Los Angeles, CA*

- Led lab sections for the course.
- Graded assignments and tests.
- Held office hours during which I answered students' questions.

University of Paderborn May 2012 - July 2012
Research Intern *Paderborn, Germany*

- Co-authored a paper on Digital Rights Management (DRM) with a Ph.D. student.
- Gained a background in cryptography through research and applied it to develop a protocol for a cloud-based DRM solution.

Viterbi Academic Resource Center January 2012 - Present
Peer Tutor/Supplemental Instruction Leader *Los Angeles, CA*

- Assisted students with engineering classes in one-on-one sessions.
- Led weekly group sessions to supplement introductory computer science lectures.

PUBLICATIONS

Towards practical privacy-preserving Digital Rights Management for Cloud Computing IEEE CCNC 2013
Co-author

- Created a cryptographic protocol that protected the copyright on cloud-based software.
- The protocol specifically protected the privacy and anonymity of users in the system.

ACADEMIC PROJECTS

Factory simulation Fall 2011

- Collaborated with seventeen students to simulate a multi-agent system.
- Designed and implemented the user interface.

Constraint Satisfier Fall 2012

- Wrote a program that found boolean assignments that satisfied a given set of logical statements.
- Applied the program to create a Sudoku-style puzzle solver.

HONORS AND ACHIEVEMENTS

Dean's List Fall 2010, Spring 2011, Fall 2011, Spring 2012

Engineering Honors Colloquium

Southern California Regional International Collegiate Programming Contest Fall 2010
Placed 6^{th} out of over 90 teams

IEEE Eta Kappa Nu Honors Society Member since Spring 2012

JOHN TIMOTHY LALLY

325 W Adams Blvd, Apt 5002, Los Angeles, CA 90007 ▪ 781-462-8120 ▪ lally@usc.edu

BS in Mechanical Engineering Expected 12/2014
Minor in Engineering Management
Viterbi School of Engineering
University of Southern California

Relevant Coursework:

Fundamentals of Physics I, II, III	Strength of Materials
Technical Entrepreneurship	Statics, Dynamics
Introduction to Computational Methods	Engineering Statistics
Probability Concepts in Engineering	Thermodynamics
Fluid Dynamics	Materials Science
Mechoptronics Laboratory	Heat Transfer
Computational Solutions to Eng. Problems	Aero-Mechanical CAD
Linear Control Systems	Flight Mechanics

Work Experience:

Co-op Mechanical Engineer 5/2013 – 8/2013
Carlisle Interconnect Technologies Cerritos, CA
- Utilized engineering principles, processes, and methods to satisfy project objectives related to manufacturing support/development of connectors/cable process
- Created plant and equipment layouts, wrote manufacturing procedures and specifications, investigated and corrected process and tooling abnormalities
- Led investigation and implementation of SPC program on five production lines
- Trained in ITAR and EAR compliance for aerospace and military technology

Student Associate 5/2013 – Present
USC Stevens Center for Innovation Los Angeles, CA
- Member of Operations Team for technology licensing and commercialization
- Reviewed technology disclosures from professors and graduate students in Viterbi School of Engineering, Information Sciences Institute, and Keck School of Medicine
- Improved and developed business processes, reviewed data accuracy and metric reporting, and provided input on projects and strategic decisions

Construction Manager 5/2008 – 8/2012
Summer Real Estate Boston, MA
- Maintained and updated Boston-area residential properties
- Designed and led remodeling and renovation projects
- Carpentry, roofing, flooring, heating, electrical, plumbing

Valet Attendant 5/2012 – 8/2012
Chatham Bars Inn Resort and Spa Chatham, MA
- Provided valet, bellman, and chauffer services to resort guests
- Managed department operations as bell captain during evening shifts

Affiliations/Leadership:

Delta Chi Fraternity – House Manager 1/2011 – Present
- Developed projects with Alumni Board of Trustees and USC Housing officials
- Led 10 member committee in planning and executing construction projects

National Organization for Business and Engineering – Officer of Investments 1/2011 – Present
- Planned guest speakers, networking events, and professional workshops

Rocket Propulsion Laboratory – Junior Member 9/2010 – 5/2012
- Cut carbon fiber and constructed wet-layup fiberglass body

Christine Noh

CN

E-Mail: cnoh@usc.edu; christinenoh@gmail.com

Education

Smith College, Northampton, MA.

Date Attended: August 2010 – May 2011

University of Southern California, Los Angeles, CA.

Expected Graduation Date: May 16, 2014

Major: *Bachelor of Arts* – International Relations

Skills/Qualifications Summary

- Bilingual; Ability to speak and write English and Korean fluently with no grammatical errors.
- Avid user of Microsoft Word, PowerPoint, and Excel.
- Experience with both PC and Macintosh computers
- Able to work calmly with various groups of people under difficult situations and communicate well with others.

Professional Experience

Paralegal at Law Offices of Kyung Hee Lee, PC (March 2013 – August 2013)

- Assisted an attorney with various types of immigration cases, and accumulated extensive experience in the areas of B-1; E-1/2; F-1; employment-based immigration petitions (1st, 2nd and 3rd preferences); H-1B; L-1; TN; NIW; all family-based immigration petitions; and extensions/transfers for the aforementioned nonimmigrant visas - strong background in E-2, EB-1, 2 and 3, H-1B and L-1