

# Memorandum

To: Steve Wilson, Farr Associates  
From: Kelly Conolly, P.E., Project Manager  
Date: June 5, 2015 *Revised June 29, 2015*  
Re: Uptown Normal Plan  
Transportation Technical Analysis & Recommendations

Sam Schwartz Engineering contributed transportation recommendations to the Uptown Normal Master Plan. The purpose of this memorandum is to detail the technical analysis, recommendations and next steps related to traffic circulation, bike connectivity, pedestrian mobility and parking.

## **Traffic Circulation Alternatives**

Several traffic circulation alternatives were reviewed and vetted with the public and specific stakeholders throughout the planning process. The goal was to determine how traffic circulation could be improved for all modes, while supporting businesses and economic growth in Uptown. These circulation options included:

- Converting Mulberry Street & College Avenue to two-way streets
  - Variations of Mulberry & College as local streets with no access across the tracks
  - Various bike facilities and on-street combinations
- Roundabout at College/School intersection
- Various alignments of Mulberry Street at School Street
- Mulberry Street & College Avenue remain one-way; lanes reduced
- Beaufort Street becomes one-way southbound with back-in diagonal parking
- Connect Irving Street across the Constitution Trail at-grade
- Extend Parkinson Street southwest and south to connect to Phoenix Avenue
- Extend a frontage road south on one or both sides of Constitution Trail, south of the tracks, similar to Constitution Boulevard on the north side

The following sections, as well as the overall illustrative graphics, describe the preferred alternatives and the final recommendations.

## **College Avenue/Mulberry Street**

The existing one-way streets, College Avenue and Mulberry Street, through Uptown are uninviting to pedestrians and intimidating to cross, which creates a barrier for pedestrian travel in accessing Uptown. They also create an unwelcoming environment for

businesses, as one-way streets tend to encourage drivers to pass through quickly, rather than stop to frequent shops and restaurants. Converting both to two-way streets will maintain east-west vehicular circulation while improving pedestrian circulation and providing an opportunity for bike lanes on one of the streets. This will, in turn, create a more conducive environment for expansion of the business district north of College Avenue.

As only one of these streets will continue seamlessly across the railroad tracks to the east, one will become a through street, carrying traffic intending to travel longer distances. As this will put more traffic on one street over the other, it will in essence create a new northern boundary for Uptown. Given its location, Mulberry Street should be the two-way through street that provides the main at-grade railroad crossing and College Avenue should become a two-way local street. With an estimated 14,000-16,000 vehicles per day on Mulberry Street once it is converted to two-way, the cross section should provide one travel lane in each direction and right and left-turn lanes as needed at Linden Avenue, Constitution Boulevard, Fell Avenue, and School Street. Mulberry Street will also become the major east-west bike connector through Uptown and should be outfitted with a one-way protected bike lane on each side of the street. As Mulberry becomes a two-way through traffic and bike route, College Avenue should become a two-way local street with on-street parking on as much of the length as possible. Constitution Boulevard is envisioned as the gateway into Uptown from the east. The two-way conversion of both Mulberry Street and College Avenue provides an opportunity to extend the landscaped median several feet at Constitution Trail since left turns will no longer occur from the left-most lane.

Because future traffic projections on Mulberry Street exceed 15,000 ADT, which is the general threshold used to determine if further study is required, it is recommended that the next step in the process be a traffic circulation study that looks at peak hour intersection operations and capacity required to accommodate those traffic volumes. A traffic study would cost approximately \$30,000-45,000 and should be completed in less than 6 months. The scope of the study should include peak hour intersection counts, traffic reassignments, and capacity analyses.

Summary:

- College cross-section:
  - Constitution – School (30-33' c-c): (2) 11-12' travel lanes, (1) 8-9' parking lane
  - Linden– Constitution (38' c-c): (2) 11' travel lanes, (2) 8' parking lane
  - @ Constitution Trail: Extend median on north leg, test truck turns
- Mulberry Cross-section:
  - School – Fell (28' c-c, **WIDEN** to 38' c-c): (2) 11' travel lanes, (2) 3' buffer, (2) 5' bike lane
  - Constitution – Fell (38'c-c): (2) 11' travel lanes, (2) 3' buffer, (2) 5' bike lane
  - “College” – Constitution (28' c-c, **WIDEN** to 38' c-c): (2) 11' travel lanes, (2) 3' buffer, (2) 5' bike lane
  - @ Linden, Fell, School: Left-turn lane required
  - @ Constitution Trail: Extend median on south leg, test truck turns

- Needs further study; a traffic circulation study should be conducted that includes peak hour intersection counts, traffic reassignments and capacity analyses; approximately \$30-45k

### **Vernon Avenue**

At the southern boundary of the study area, Vernon Avenue currently carries 10,000-12,000 vehicles per day between Linden Street and Beaufort Street with two travel lanes in each direction. The roadway has substantial excess capacity and is an excellent candidate for a conversion from four lanes to three – one travel lane in each direction with a center turn lane, as well as a bike lane in each direction. Vernon Avenue would then serve as an east-west on-street bike route connecting People’s Park on the west end to Linden Avenue on the east end and provide a connection for residents to the Constitution Trail. Vernon Avenue was cited as a difficult crossing for those traveling on the Constitution Trail. This roadway conversion would provide an opportunity to introduce pedestrian refuge medians to simplify this crossing, making it significantly safer.

The volume of traffic is well under 15,000 ADT threshold, so further study is not necessary as a stand-alone project. However, this project, in conjunction with the proposed changes on College/Mulberry, combines two major east-west traffic capacity reductions through town. SSE recommends the proposed configuration of Vernon Avenue be included in the traffic study mentioned above. Note that our preliminary review of Vernon Avenue did not include any segments east of Linden Street but IDOT ADT indicates similar daily traffic volumes both east and west of Linden.

#### Summary:

- Vernon Cross-section:
  - Linden – Beaufort (42’ c-c): (2) 11’ travel lanes, (2) 5’ bike lanes, (1) 10’ center turn lane
  - @ Constitution Trail: 8-10’ refuge island within the center turn lane
- Designate Vernon an on-street bike route
- Include segment in Uptown traffic circulation study
- Implementation can be done within existing pavement width

### **Linden Street**

Linden Street carries approximately 11,500 vehicles per day between Mulberry Street and Vernon Avenue and less on the segments to the north and south of those streets. It currently provides four travel lanes, two in each direction. Similar to Vernon Street, it has substantial excess capacity and is also an excellent candidate for a conversion from four lanes to three – one travel lane in each direction with a center turn lane or median, as well as a bike lane in each direction. Linden Street would become a north-south on-street bike route paralleling Constitution Trail, serving as both an interim route until the trail underpass is constructed and a longer term alternate for bicyclists who would prefer to bypass Uptown and the core station area.

The three-lane roadway configuration will also provide the opportunity to install pedestrian refuge islands at key locations, making it easier for pedestrians to access the Uptown area on foot.

Summary:

- Linden Cross-section:
  - Mulberry – Vernon (42' c-c): (2) 11' travel lanes, (2) 5' bike lanes, (1) 10' center turn lane or raised median
  - @ key ped crossings: 8-10' refuge island within the center turn lane
- Designate Linden an on-street bike route
- Include segment in Uptown traffic circulation study
- Implementation can be completed within existing pavement width

**Broadway/Beaufort Intersection**

The intersection of Broadway Street and Beaufort Street is a large intersection with wide crossing distances and inconvenient pedestrian travel paths due to the skewed geometry of the intersection. According to the City of Normal and other stakeholders, there is not a history of crashes to indicate a safety issue, but based on observations, pedestrians tend to cross diagonally instead of using the crosswalks. Several bus routes pass through this intersection, but buses do not make turns using the north leg of the intersection, which opens up an opportunity to significantly reduce those corner radii. To address the pedestrian comfort level and calm traffic, special pavement treatments and even raised crosswalks should be explored, particularly in the northeast and southwest quadrants of the intersection where the turning radius is largest. Raised crosswalks could be implemented across a channelized turn lane so as to allow buses and larger vehicles to mount the crosswalk when necessary to turn right but give visibility and priority to the pedestrian. Additionally, the northwest corner radius is very large for use by what appears to be a small number of large vehicles and no buses. It is recommended that turning movements be evaluated in this location to determine if the radius can be reduced.

Summary:

- Explore the use of special pavement treatments and raised crosswalks to improve pedestrian comfort (see image)
- Evaluate southbound to westbound turning movements to determine how much the northwest corner radius can be reduced



Raised crosswalk condition at an intersection in Boulder, CO that allows wide turning movements while giving priority to the pedestrian.

## **Bike Network**

The Constitution Trail is widely popular, as was evidenced through the public outreach. Having this regional trail run through Uptown is an asset to the residents and businesses alike. However, with the trail being diverted to the railroad crossing at Linden and back to the Circle, the route has become disjointed. Building an underpass will create a smooth transition from the south side of the tracks to the north side for trail users.

In addition, better bicycle circulation throughout the study area is needed, particularly in the east-west direction. Currently, the Constitution Trail is the only dedicated bicycle facility within the study area. Completing a network of facilities will improve access to Uptown businesses and the Trail from all directions. As mentioned in the previous section, on-street, marked bike lanes are recommended along Mulberry Street, Vernon Street, and Linden Street. A second alternate connection across the tracks should be provided at Broadway Street with a connection to the Constitution Trail at Phoenix Avenue, through marked bike lanes and/or shared lanes. A bike route should also be marked along Beaufort Street between Linden Street and School Street, making connections to the Linden Street bike lanes, and on-campus paths at School Street.

### Summary:

- Constitution Trail underpass
- (2) 5' bike lanes along Mulberry Street
- (2) 5' bike lanes along Linden Street
- (2) 5' bike lanes along Vernon Street
- Marked shared lanes along Broadway Avenue
- Marked shared lanes along Phoenix Avenue
- Marked shared lanes along Beaufort Avenue

## **Bike Share**

Bike share is a point to point transit system that provides a mobility option that is flexible, fun, and affordable. In larger cities, such as New York and Chicago, bike share has changed how people get around the city and expanded the amount of destinations they can get to in a short amount of time. Bike share essentially allows people to cover a larger walkshed in a shorter amount of time. In Bloomington-Normal, Illinois State and Illinois Wesleyan each have a campus bike share system which consists of students checking out school bikes according to Normal staff.

The challenge that most cities have faced is building a bike share system and structure that is attractive to demographics of people that don't normally bike during the day. A successful bike share system requires building a membership that encompasses all demographics that are willing to use it to make short point to point trips. Achieving this goal requires a dense system of bike share stations as well as a membership/cost structure that does not create any barriers to entry.

A bike share system in Normal should initially cover an area that includes Uptown and ISU campus area, and expansion should occur from there. The University should be considered a partner in the planning process. It is recommended that the town complete a 12-month bike share feasibility study as the next step in implementation. The study would cost \$25,000-\$40,000 and would include bike share station siting, identification of the best structure of the system and potential vendors. If the study were completed in 2016, an initial bike share system could be installed in 2017.

It is strongly recommended that the system be as dense as possible, while covering as much area. The initial startup cost of the system will likely be in the range of \$500,000 to \$1,000,000 depending on the number of stations and the type of technology used. This startup cost can be covered either through a public/private collaboration or grants. It is recommended that the system and operating structure be designed to cover annual operating costs after year two. Sponsorship should be considered for a revenue stream, but it is unlikely that it will cover the initial capital expenses.

### Summary:

- 12-month bike share feasibility study \$25-40k
- Partner with ISU initially, expand outward from Uptown/campus
- Initial system up and running in 2017

## **Parking**

Uptown has many parking options for use by visitors, Amtrak travelers, customers and employees, including on-street parking and several public parking facilities. SSE conducted a review of the on- and off-street parking facilities in the study area to establish a base parking overview. Hourly parking occupancy counts over a two-week period were reviewed in each of the three parking structures. Sample parking occupancy surveys and parking duration/turnover surveys were also collected for on-street parking spaces in the study area. The results of the parking surveys yielded parking demand ratios that were used to project future parking needs.

### **Off-Street Decks**

Three parking structures are located in Uptown: Beaufort Street, College Avenue and Uptown Station. Parking is free on the Beaufort Street deck and free for the first hour in the other two decks. SSE obtained parking count information from the Town for a two week period in October 2014. The below table summarizes the information showing the capacity and the maximum utilization of the decks overall which is a snap shot of the parking demand at the peak time during the day which generally occurs on a Thursday or Friday between 11:00 AM and 2:00 PM. It also shows maximum utilization of each facility which did not necessarily occur on the same day or during the same hour.

**Table 1: Parking Deck Utilization**

	<b>Capacity</b>	<b>Peak Hour Max Demand</b>	<b>Peak Hour Max Utilization</b>	<b>Individual Max Utilization</b>
Beaufort Street	473	284	60%	68%
College Avenue	683	371	54%	54%
Uptown Station	381	120	18%	30%
Total	1537	775	50%	--
Effective Supply (85%)	1306	775	60%	--

The data indicates that at least 760 spaces are available at any given time in the three parking garages together. Even taking into account a factor for lost spaces (15%) due to snow pile, double parking, circulation convenience or any other reason that reduces the effective supply, at least 500 spaces are available at any given time.

### **On-Street Turnover**

Several blocks in Uptown were identified to have issues with low parking turnover. In order to quantify parking durations and turnover rates, SSE conducted a survey of on-street parking for key blocks in the CBD from 9:00 AM to 6:00 PM in January 2015. Most of the spaces surveyed had 1-hour time limits with the exception of North Street which has some 15-minute parking between Broadway Avenue and Fell Avenue.

**Table 2: Parking Duration & Turnover**

Street	No Parked Cars	<30 min	31 min – 1 hr	+1 – 2 hrs	>2 hrs
Beaufort (Linden- Constitution)	20	53%	12%	23%	12%
Beaufort (Constitution – Broadway)	Under Construction				
North (Constitution – Broadway)	37	66%	17%	14%	3%
North (Broadway – Fell)	29	61%	14%	21%	4%
Constitution (College – North)	10	67%	22%	11%	0%
Broadway (College – North)	38	83%	11%	6%	0%
Fell (College – North)	7	43%	29%	14%	14%

- Approximately 16 percent of parkers overall were in violation of the 1-hour time limit.
- Highest turnover of spaces occurs on the block of Broadway between College and North where over 80 percent of parkers are there for less than 30 minutes.
- Turnover should be improved on the blocks of Beaufort between Linden and Constitution and Fell between College and North. Both blocks serve active commercial storefronts and may benefit from stricter enforcement, shorter time limits or metered parking.
- Both blocks of North Street have good levels of turnover, parking 66 vehicles over the day.
- Very low turnover over the course of the day on Constitution as buses parked there much of the day.
- SSE noted that several on-street parking areas were inefficiently used as individually marked spaces left additional storage for 1-2 more vehicles. Perhaps restriping parking as one continuous lane may create more efficient use of space.

As the results of both the existing parking demand and turnover conditions show, Uptown does not generally have a lack of parking supply that makes it difficult for people to park their vehicles, but it does experience issues with a lack of turnover of on-street parking spaces on the most popular blocks, similar to many downtown business districts across the country. As is often the case, the issues with parking supply, demand, and turnover are overshadowed by the public's perception that parking is difficult. As parking becomes a larger public issue, a comprehensive downtown parking study may be beneficial to develop a comprehensive parking management strategy to support the long-term economic vitality of Uptown Normal. Recommendations may include adjustments to the pricing structure to rebalance the fees of parking in the parking decks with free on-street parking. A study of this nature should not only address parking policy such as costs, time limits, and fines, but also financing, technology, enforcement, Town responsibilities, coordination and shared opportunities with ISU, and car share.

### Future Parking

As development occurs in Uptown, parking will continue to be provided to accommodate customers, employees and travelers and should be provided at a rate that is sized appropriately without costly excess supply that is never used. SSE conducted a review of parking rates for use in determining future parking supply strategies. The following table summarizes our review and suggests, for planning purposes within the business district, a blended overall parking supply rate of 2.75 spaces per 1,000 sf.

**Table 3: Parking Supply Rate Review**

Type	Unit	Code	Aggressive	Suggested	Blended
Ground Floor Retail	Per 1,000 sf	3.333	0	1	2.75
Standard Retail	Per 1,000 sf	3.333	1.5	2.5	
Office	Per 1,000 sf	3.5	2	3	
Library	Per 1,000 sf	5	2.5	3.5	