

Potential Transit
Center Location

TRAFFIC DIVERTER

W 21st St

NO PARKING AREA

21st Street Corridor Traffic Calming: Public Engagement

Lawrence Transit Center Locational Analysis
Final Report | November 21, 2014



City of Lawrence
KANSAS



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Executive Summary

Three public meetings were held to engage the neighborhood around 21st Street and Stewart Avenue on what traffic-calming measures would be preferred to address the additional traffic that may be generated by a new traffic signal at 21st Street and Iowa Street. This traffic signal would be installed as part of a transit center being proposed on 21st Street and Stewart Avenue. The first meeting, held on August 21, 2014, introduced traffic-calming concepts to participants and identified select traffic-calming techniques to further develop. The second meeting, held on September 10, 2014, presented concepts that were developed from the input at the first meeting, and had participants compile their own corridor alternatives within small table groups. From this list of corridor alternatives, the group identified installing chicanes as a traffic-calming measure on the east side of the corridor, and realigning the 21st Street and Stewart Avenue intersection with a traffic diverter that would prevent traffic from traveling east on 21st Street past Stewart Avenue. In the third meeting, held on October 1, 2014, participants were presented with a final concept that incorporated their input from the previous two meetings.

The final alternative included a chicane structure along 21st Street between Ousdahl Road and Naismith Drive, and a realigned intersection at 21st Street and Stewart Avenue.

The chicanes would include 4-foot bike pathways between the chicane islands and the adjacent curb. The chicanes would accommodate a 19-foot two-way drive lane. This is the same width as the current drive lane when parking is present in the corridor. Implementing the chicanes would require some loss of current parking, which would affect two residential properties as currently sited. Both of these properties have two-car garages.

The second final concept is a realigned 21st Street and Stewart Avenue intersection that curves and creates a new “tee” intersection. This would require westbound cars on 21st Street to turn left to continue on 21st Street. In addition, a partial traffic diverter would not allow eastbound traffic to enter the neighborhood on 21st Street. A 4-foot bike pathway would allow eastbound cyclists into the neighborhood. Continuity between two single-family properties south of the realigned intersection and traffic diverter would be maintained through an access inlet area. The access inlet area would be large enough for cars to back out of driveways, as well as provide some limited additional parking spaces. This area would provide additional buffering between these residences and a transit center at 21st Street and Stewart Avenue.

The fire department had been consulted. Emergency vehicles would be able to navigate both ways through the traffic diverter on 21st Street at Stewart Avenue, as well as through the chicanes.

The set of chicanes is estimated to cost \$6,780. Realigning 21st Street and Stewart Avenue, installing a traffic diverter, and maintaining driveway access is estimated to cost \$502,741.

The neighborhood-preferred concepts are presented below.

Executive Summary Figure 1 Final Preferred Alternative – Chicanes



Executive Summary Figure 2 Realigned Intersection with Traffic Diverter and Driveway Access



Project Purpose

On June 3, 2014, Lawrence Transit staff presented to the Lawrence City Commission the outcome of the *Lawrence Transit Center Locational Analysis* project, which evaluated several potential sites to determine the best location for a new transit center. City staff asked for direction from the city commission on proceeding with the location of the northeast corner of 21st Street and Iowa Street for the site of a new transit transfer center. After a discussion, the city commission voted to receive the report, and they directed staff to evaluate how the additional traffic related to the transit center could be mitigated in a way amenable to the surrounding neighborhood.

Olsson Associates was directed by city staff to hold a series of three public meetings to engage the neighborhood along the 21st Street corridor to determine a neighborhood-based response to mitigate the potential additional traffic on 21st Street should a transit center and a traffic signal be installed at the 21st Street and Iowa Street intersection.

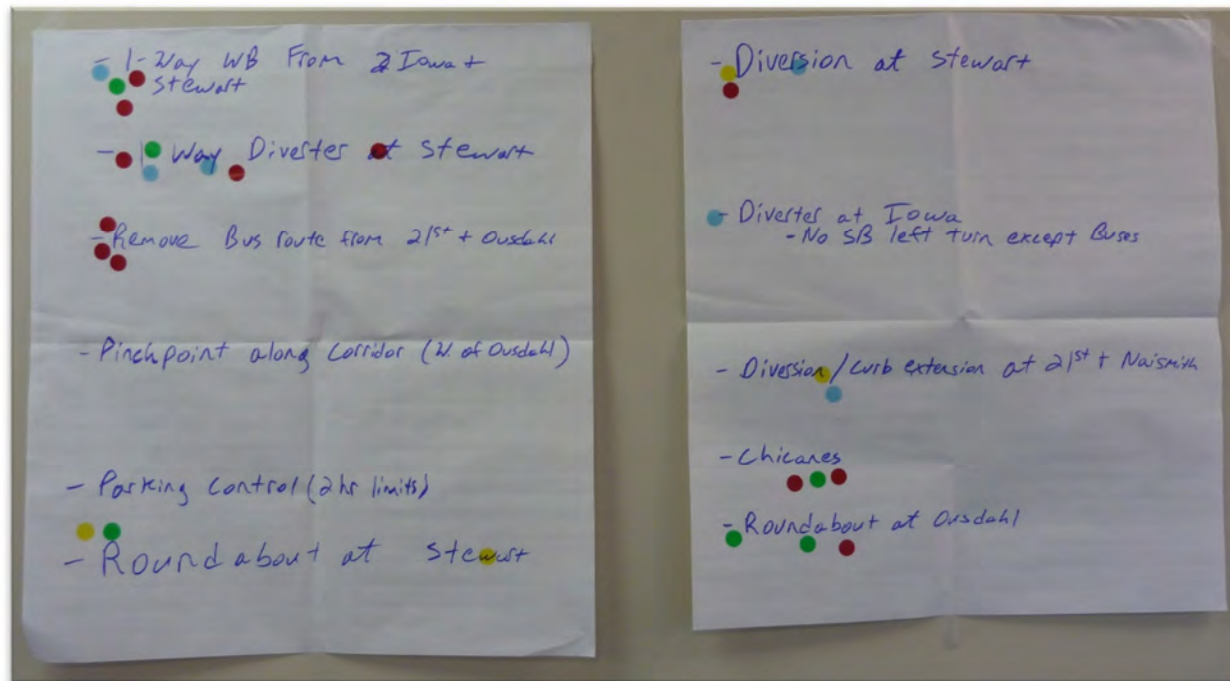
The city sent out a letter to approximately 400 property owners in the neighborhood bounded by 19th Street, 23rd Street, Iowa Street, and Naismith Avenue, inviting them to three public meetings. These public meetings were held between 6:30 p.m. and 8:00 p.m. on August 21, September 10, and October 1, 2014, at the Carnegie Building at 200 W. Ninth Street¹.

Meeting 1 – August 21, 2014

The first meeting was held on August 21 and was attended by eight neighborhood participants. The meeting introduced attendees to the purpose of a charrette, which is a participant-led design process, and introduced various traffic-calming strategies that could be employed in the corridor. Participants broke into groups at tables and discussed which strategies could be applicable in the corridor. Afterward, each group summarized their discussion to the larger group. Each distinct strategy mentioned was recorded onto large easel paper. After the groups each summarized their discussions, each resident used five sticker dots to vote for the strategies they saw as most applicable or preferred in the corridor. This visual aid enabled both the study team and the participants to generally see which strategies were preferred by participants to implement along the corridor.

¹ Attempts were made to hold meetings in the neighborhood, but a single location for all three meetings within the neighborhood was unable to be secured.

Figure 1 Voting Exercise on Proposed Corridor Enhancements



The top two most-popular enhancements were to

- Install a one-way diverter at Stewart Avenue and 21st Street
- Make 21st Street a one-way street from Stewart Drive to Iowa Street

Five other proposed enhancements garnered three votes each, including:

- Realigning bus routes travelling past Ousdahl Road and 21st Street
- Installing a roundabout at Stewart Avenue and 21st Street
- Installing a diverter at Stewart Avenue
- Installing chicanes throughout the 21st Street corridor
- Installing a roundabout at Ousdahl Road and 21st Street

As the meeting concluded, participants completed a survey to rank the goals of the corridor related to traffic calming or bicycle/pedestrian improvements. The top goal was:

- Reduce number of cars through the neighborhood

Followed closely by two other goals:

- Reduce access between the neighborhood and Iowa Street
- Reduce speed of cars through the neighborhood

Minutes and material from the first public meeting are included in Appendix A.

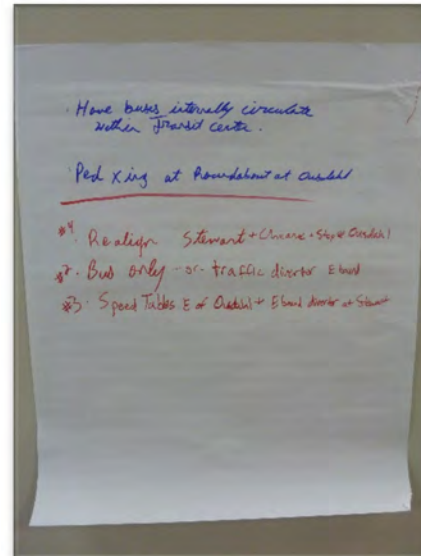
Meeting 2 – September 10, 2014

The second meeting was held on September 10 and was attended by 12 neighborhood participants. Concepts were drawn onto aerial maps of the corridor. These concepts were created from the activities at the first meeting, including the dot voting exercise of the preferred traffic-calming methods and the survey results. These concepts were cut out into puzzle pieces that participants at each table could place onto maps and create their own concept.

Figure 2 To-scale Cutouts of Each Element Concept



Figure 3 Main Idea of Each Table



After discussion within each table and as a group, the concepts were divided into those focused on the 21st Street and Stewart Avenue intersection, and those concepts that could be applied along the rest of the corridor. Participants were asked to vote their preferred concept for 21st Street and Stewart Avenue, and along the corridor, using dot stickers. Participants chose to realign the 21st Street and Stewart Avenue intersection and incorporate a traffic diverter to prevent traffic turning eastbound onto 21st Street at Stewart Avenue. Chicanes were chosen by participants as the preferred choice to calm traffic in the rest of the corridor.

Figure 4 Voting Results – 21st Street and Stewart (round 2)

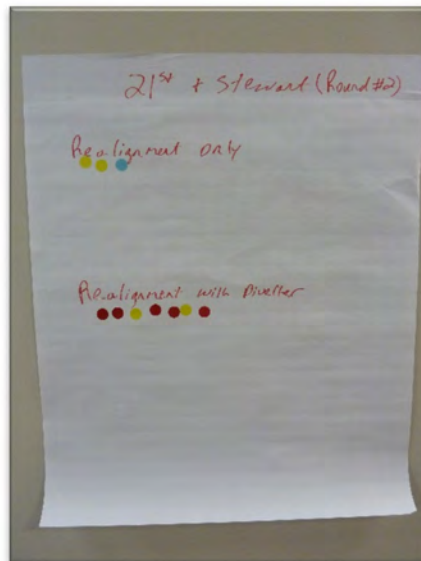


Figure 5 Voting Results – Corridor Improvements

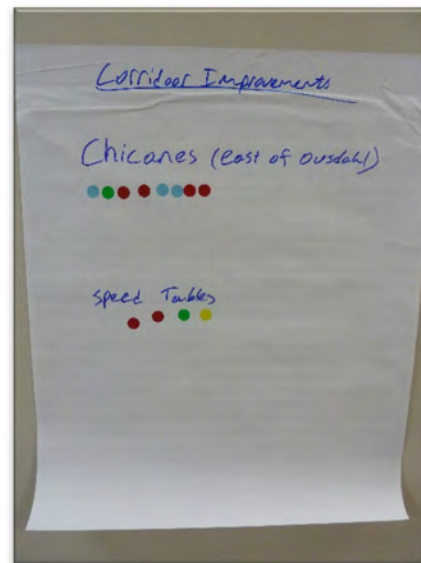


Figure 6 Traffic Diverter Example



Figure 7 Chicane Example



Minutes and material from the second public meeting are included in Appendix B.

Meeting 3 – October 1, 2014

The third meeting was held on October 1 and was attended by 10 neighborhood participants. The purpose of this meeting was to present “final” alternatives for the corridor that were created based on input and feedback gathered at the previous two public meetings. The city’s traffic-calming policy was distributed at the beginning of the meeting. Part of that policy says,

“TRAFFIC CALMING devices will only be constructed...if 70 percent of more of the property owners within 300 feet in each direction approve of the installation, or if directed by the city commission.” This policy was summarized for participants as “before a traffic diverter, or chicanes are installed, 70 percent of property owners within 300 feet of each direction along that street, would have to approve. For anything at 21st Street and Stewart Avenue, that would include property owners along Stewart.”

The final alternative included a chicane structure along 21st Street between Ousdahl Road and Naismith Drive, and a realigned intersection at 21st Street and Stewart Avenue.

The chicanes would include 4-foot bike pathways between the chicane islands and the adjacent curb. The chicanes would accommodate a 19-foot two-way drive lane. This is the same width as the current drive lane when parking is present in the corridor. Implementing the chicanes would require some loss of current parking, which would affect two residential properties as currently sited. Both of these properties have two-car garages. There was discussion about how a 5-foot bike lane would be preferable.

Figure 8 Final Preferred Alternative – Chicanes



The second final concept is a realigned 21st Street and Stewart Avenue intersection that curves and creates a new “tee” intersection. This would require westbound cars on 21st Street to turn left to continue on 21st Street. In addition, a partial traffic diverter would not allow eastbound

traffic to enter the neighborhood on 21st Street. A 4-foot bike pathway would allow eastbound cyclists into the neighborhood. Continuity between two single-family properties south of realigned intersection and traffic diverter would be maintained through an access inlet area. The access inlet area would be large enough for cars to back out of driveways, as well as provide some limited additional parking spaces. This area would provide additional buffering between these residences and a transit center at 21st Street and Stewart Avenue.

The fire department had been consulted. Emergency vehicles would be able to navigate both ways through the traffic diverter on 21st Street at Stewart Avenue, as well as through the chicanes.

Figure 9 Final Preferred Alternative – Realigned Intersection with Traffic Diverter and Driveway Access



PowerPoint slides showed the chicanes, realigned intersection with traffic diverter, and potential transit center concept drawn on the existing aerial map. In addition, the corridor-wide map with the drawn final concepts was printed out. Meeting participants noted general approval and acceptance of the final concept for traffic calming in the 21st Street corridor.

Minutes and material from the third public meeting are included in Appendix C.


Figure 10 Wider Extent of Realigned Intersection



Costing

Conceptual costs were determined for the realigned 21st Street and Stewart Avenue intersection, driveway access, and chicanes along the corridor. These costs are presented in Table 1. The set of chicanes is estimated to cost \$6,780. Realigning 21st Street and Stewart Avenue, installing a traffic diverter, and maintaining driveway access is estimated to cost \$502,741. More detailed costs are included in Appendix D.

Table 1 Concept Level Costs

		ENGINEER'S ESTIMATE (CONSTRUCTION COSTS) (Concept Level)	
Client:		City of Lawrence	
Project:		21St. Street Traffic Calming Improvements Associated with New Transit Center	
Project Number:		013-0542	
Date:		10/27/2014	
SUMMARY OF COSTS			
Item	CHICANES ON 21ST STREET		
1	Installing 3 Chicanes on 21st Between Clifton and Hillview		
		SUBTOTAL	\$5,650.00
		CONTINGENCY 20%	\$1,130.00
		OPINION OF PROBABLE COST	\$6,780.00

TOTAL CONSTRUCTION COSTS OF CHICANES WITH CONTINGENCY \$6,780.00

21ST & STEWART AVE. REALIGNMENT			
2	REALIGN 21ST STREET & STEWART INTERSECTION		
		SUBTOTAL	\$396,151.00
		CONTINGENCY 20%	\$79,230.20
		OPINION OF PROBABLE COST	\$475,381.20
3	DIVERTER AT 21ST & STEWART		
		SUBTOTAL	\$3,005.00
		CONTINGENCY 20%	\$601.00
		OPINION OF PROBABLE COST	\$3,606.00
4	DRIVEWAY ACCESS OFF OF 21ST		
		SUBTOTAL	\$19,795.00
		CONTINGENCY 20%	\$3,959.00
		OPINION OF PROBABLE COST	\$23,754.00

TOTAL CONSTRUCTION COSTS FOR 21ST STREET REALIGNMENT WITH CONTINGENCY \$502,741.20

The Engineer, using his or her professional judgment, has developed this stated Opinion of Probable Construction Cost based upon the design status identified above. Development of this Opinion has included consideration of design input level; however, the circumstances under which the work is expected to be undertaken, the cost and availability of materials, labor and services, probable bidder response and the economic conditions at the time of bid solicitation are beyond the control of the Engineer and will impact actual bid costs. Should bidding be delayed, these costs should be reviewed and, if necessary, adjusted to a more applicable *Engineering News Record* Construction Cost Index.

Appendix A – August 21st Public Meeting Minutes and Materials

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Meeting Minutes

Project:	Lawrence Transit Center Location Analysis / 21 st Street Corridor Amendment
Location:	Carnegie Building, 200 W. 9 th Street
Date & Time:	Thursday, August 21 st , 2014. 6:30 pm to 8:00 pm
RE:	21 st Street Corridor Public Meeting #1
PROJECT #:	013-0542

This was the first of three public meetings intended to develop a neighborhood-preferred alternative for traffic calming or multi-modal enhancements of the 21st Street corridor between Iowa Street and Naismith Drive. A total of eight neighborhood residents participated in the August 21st meeting, along with three city staff members, and five Olsson Associates' employees.

Figure 1 Table Discussion



Figure 2 Table Discussion



Following a brief presentation by city staff on the project background, and a Power Point by Olsson Associates on the existing conditions and possible strategies to calm traffic or improve bicycle facilities along 21st Street, residents were invited to form into two groups and make notes on the provided aerial maps. Each table participant was asked to first identify the location of their residence on the map, then draw or make note of specific enhancements they would like to see along the corridor in relation to either traffic calming or bicycle facilities. Information packets were provided to remind participants of the strategies discussed in the presentation. As residents commented about the potential strategies within the corridor, Olsson staff members recorded the main ideas expressed.

After each table had sufficient time to include each person's comments on which strategies could be suitable in the corridor, a representative from each table summarized the table's discussion. Each distinct strategy mentioned was recorded onto large easel paper. After the tables each summarized their discussion, each resident used five sticker dots to vote for the strategies they saw as most applicable or preferred in the corridor. This visual aid enabled both the study team and the participants to generally see which strategies were preferred by participants to implement along the corridor.

Figure 3 Table One Aerial Map for Table Discussion



As the meeting concluded, participants completed a survey to rank the goals of the corridor related to traffic calming or bicycle/pedestrian improvements, as well as where they generally live in the neighborhood. These two questions not only will help determine what traffic calming / bicycle pedestrian goals residents value most, but also where those households are located in relation to 21st Street. Below are notes recorded on the aerial maps and the main ideas summarized from each table.

A summary of the results found from the survey instrument are detailed in Figure 10. Following the survey results is a sign-in sheet, the survey, the take-away, and the Power Point slides.

Figure 5 Table Five's Proposed Diverter at Iowa and 21st St.



Figure 4 Table One Proposed Bus-only Left Turn from Iowa to 21st Street.



Meeting #2 will invite residents from the same neighborhood to comment on the three corridor strategy alternatives produced by the study team, as a result of the comments received at the first meeting

Figure 6 Table Five's Proposed 21st Street realignment.



Figure 7 Table One Proposed Roundabout or Diverter at Stewart and 21st Street.



Figure 8 Notes from Discussions at Table Five & Table One

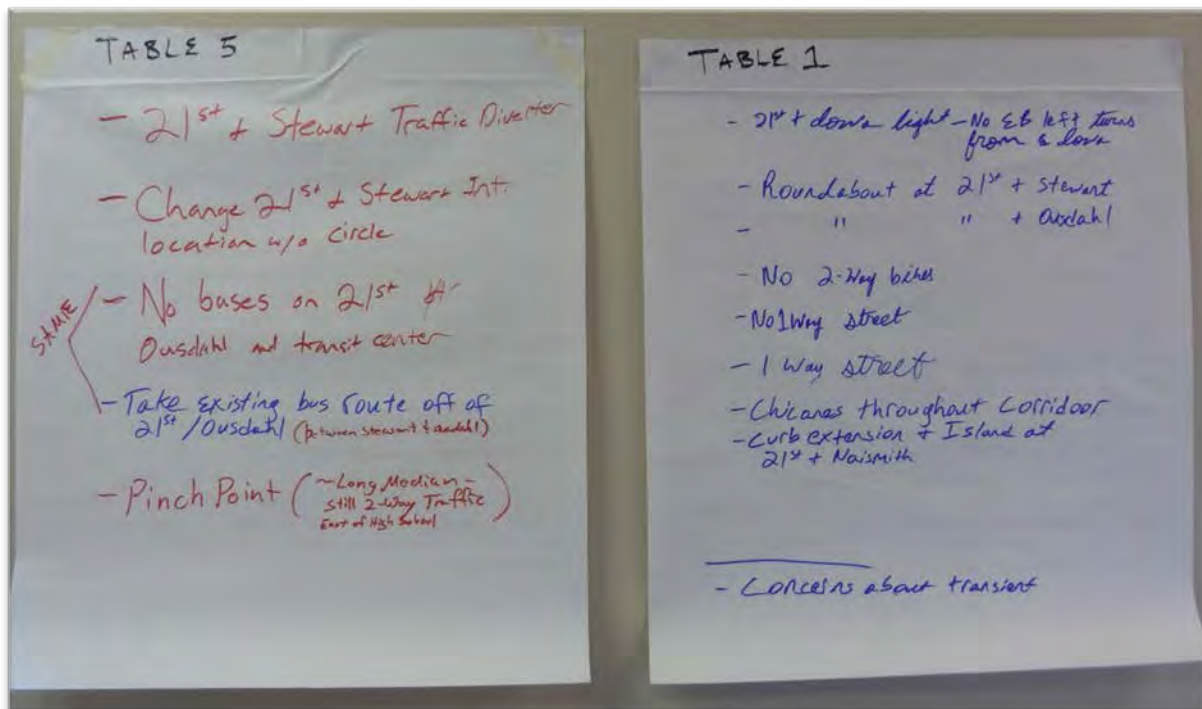
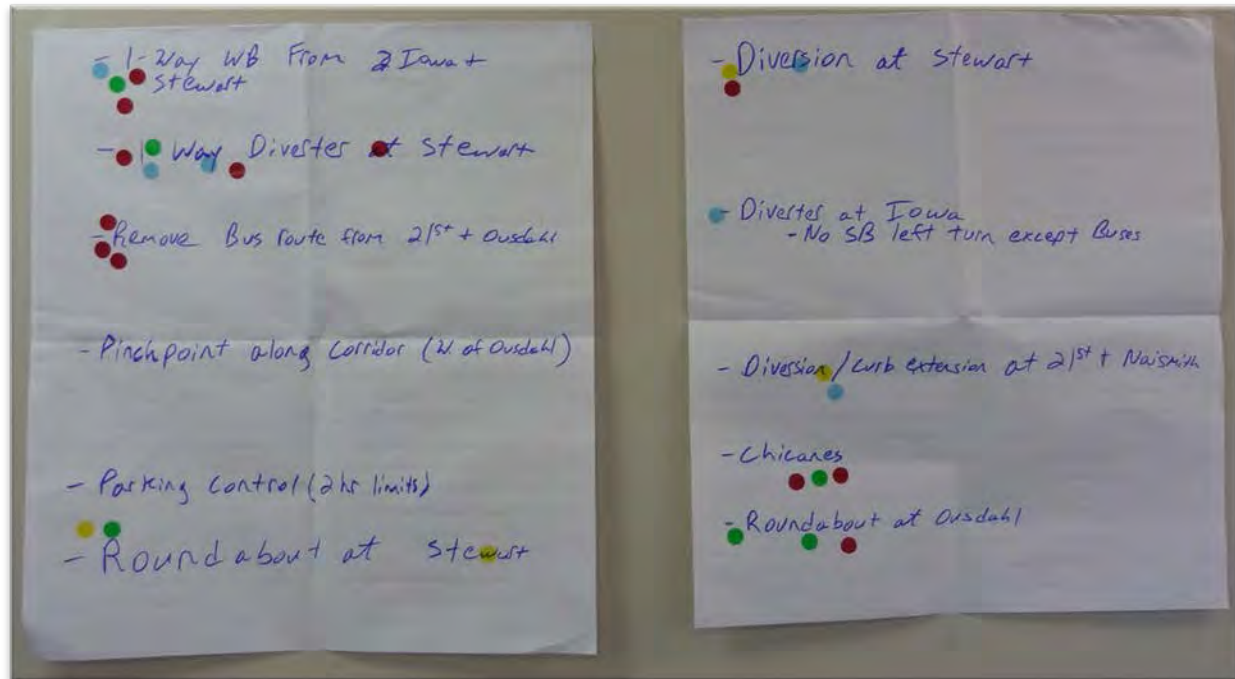


Figure 9 Voting Exercise on Proposed Corridor Enhancements



After tallying the results from the dot exercise shown in Figure 9, the top two most popular enhancements was to install a one-way diverter at Stewart and 21st Street and make 21st Street a one-way street from Stewart Drive to Iowa Street. Five other proposed enhancements garnered three votes each including:

- Re-aligning bus routes travelling past Ousdahl and 21st Street
- Installing a roundabout at Stewart and 21st Street
- Installing a diverter at Stewart
- Installing chicanes throughout the 21st Street corridor
- Installing a roundabout at Ousdahl and 21st Street

Figure 10 Results from the Survey Instrument

Survey ID	Residence	Maintain access in both directions between neighborhood and Iowa Street	Reduce access between the neighborhood and Iowa Street	Make 21 Street more comfortable for bicyclists	Make 21 Street more comfortable for pedestrians	Reduce speed of cars through neighborhood	Reduce number of cars through neighborhood	Comments
1	Ousdahl is the nearest access street to 21 Street	0	0	1	0	0	0	-
2	South of Ousdahl and 21 Street on 22 Street	0	0	1	1	1	1	-
3	21 Street and Ousdahl	4	2	5	6	3	1	-
4	1833 W 21 Street right across the street from proposed terminal	0	1	0	0	3	2	Please reconsider the placement of the bus station
5	1809 W 21 Street	6	3	5	4	2	1	-
6	Iowa and 21 Street next to Army Building	6	1	4	3	2	5	-
7	1732 W 21 Terrace/ 21 Terrace and Ousdahl	6	3	5	4	2	1	Anything that can preserve and improve the integrity o the neighborhood would be welcom.
8	Lawrence bicycle community	0	5	1	2	3	4	Use horizontal deflection to slow traffic speed. Use entry access controls to reduce volume. Make 21 Street and bicycle boulevard from Stewart Avenue to Barker Avenue.
TOTAL		22	15	22	20	16	15	Lower the number, higher the priority
Total 1s		0	2	3	1	1	4	-

CC: File

Date 8-21-14

[illegible]

Date 8-21-14

Date 8-21-14[illegible]

21st Street Corridor

Neighborhood Meeting

Thursday August 21st, 2014



 OLSSON
ASSOCIATES

Why we're talking tonight

 OLSSON
ASSOCIATES

- Possible cut-through traffic on 21st Street
- Travel speed on 21st Street
- 21st Street is on citywide bike plan – what bicycle enhancement is possible
- To get your ideas on possible improvements

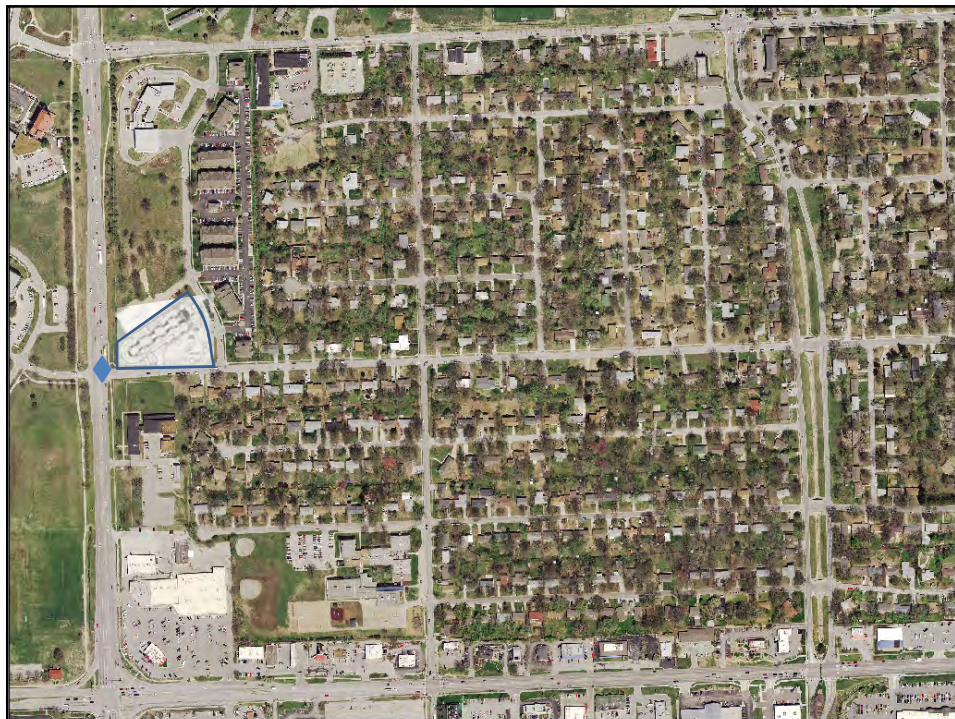
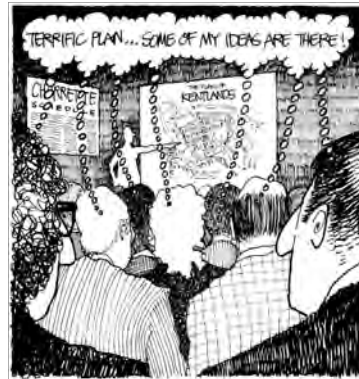
Charrette

A collaborative planning event that harnesses the talents and energies of affected parties to create and support a feasible plan.

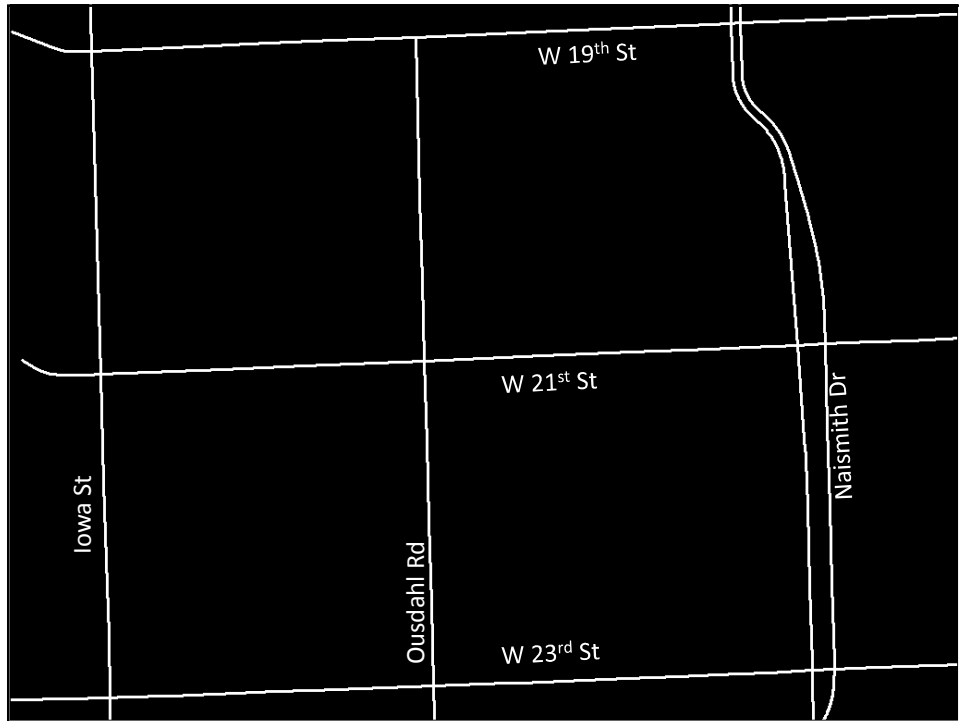
This is meeting #1: Idea Generation

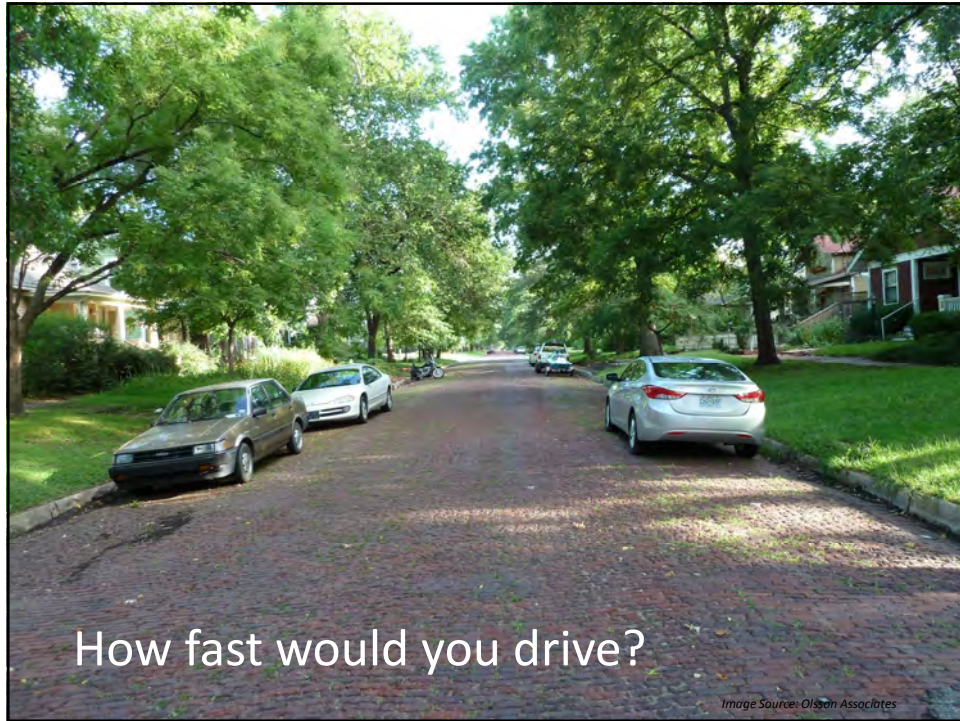
Meeting #2: We'll take the ideas and put them together into alternatives for your review.

Meeting #3: From your input we will present a recommendation that reflects your ideas.







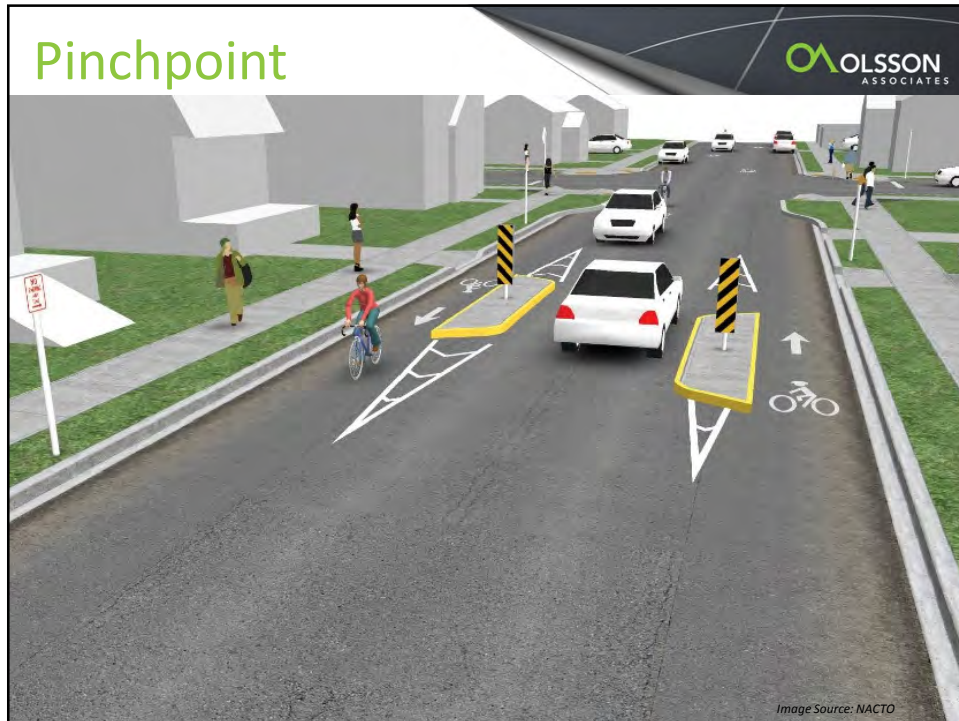




Strategies

- Traffic calming
- Complete streets

Pinchpoint



Chicanes





Images Source: www.pedbikeimages.org / Dan Burden



Curb Extensions



Images Source: www.pedbikeimages.org / Dan Burden

Entrance Islands

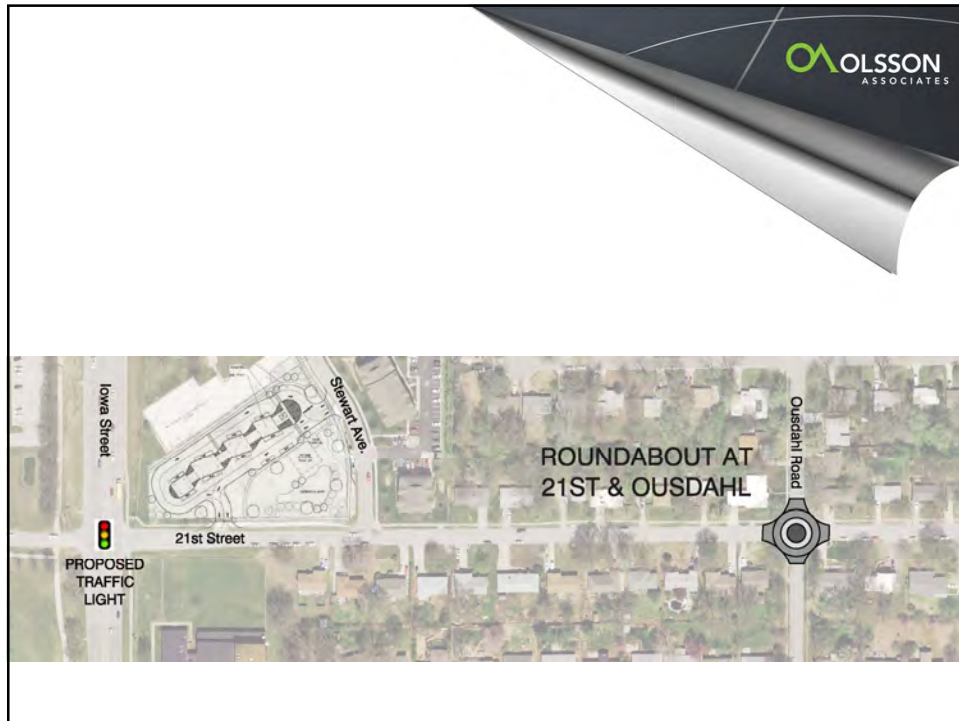


Image Source: Olsson Associates

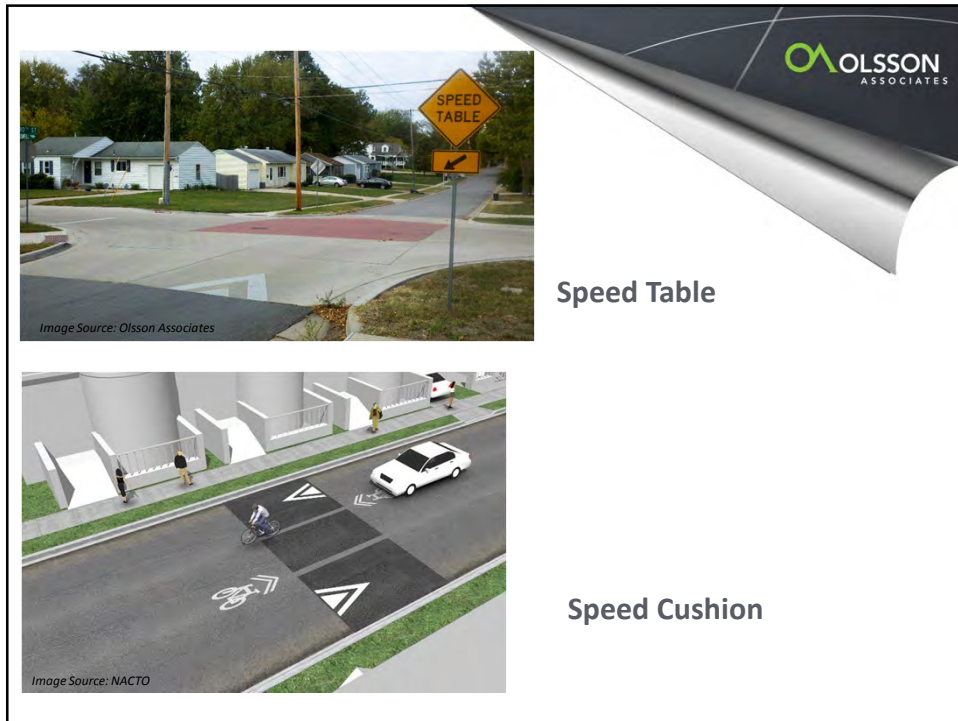


Image Source: Olsson Associates











Complete Streets



Buffered Bike Lane



Bike Lane

Images Source: Olsson Associates

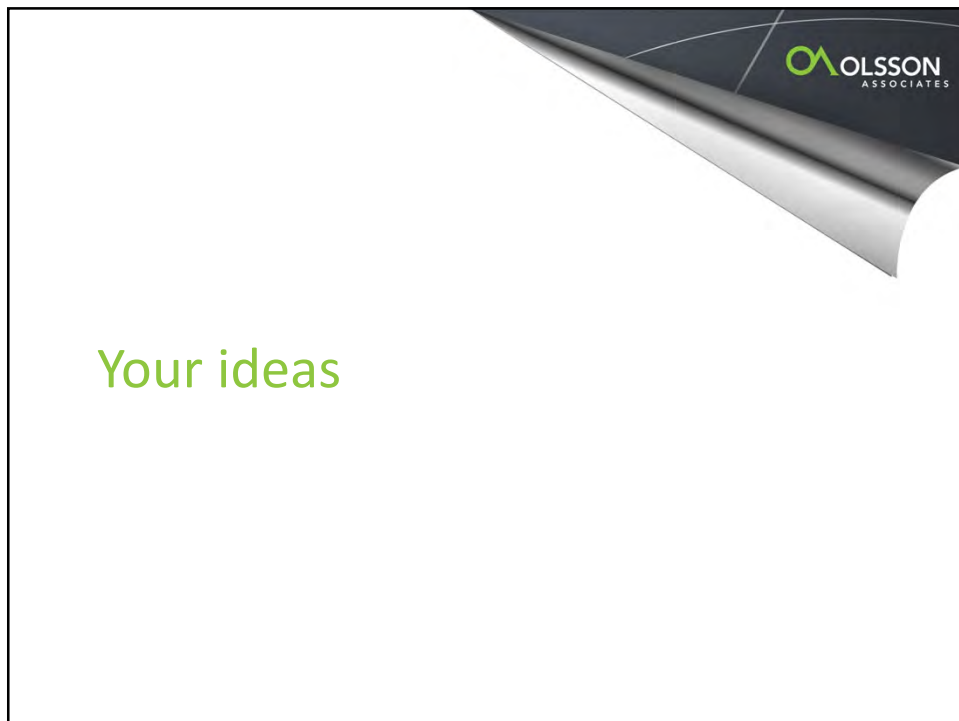


Image Source: Olsson Associates

Bike Sharrows



Image Source: Olsson Associates



For more information, contact

Casey Toomay, Asst. City Manager
785-832-3409
ctoomay@lawrenceks.org

Robert Nugent, Transit Administrator
785-832-3464
rnugent@lawrenceks.org

Tom Worker-Braddock, Olsson Associates
913-748-2619
tworkerbraddock@olssonassociates.com



21st Street Corridor

Please answer the questions below and return the survey before leaving the meeting.

QUESTIONS

1. What is most important to you? Please rank these options
(1 being the most important, 6 being least important):

- ☐ Maintain access in both directions between the neighborhood and Iowa Street.
- ☐ Reduce access between the neighborhood and Iowa Street.
- ☐ Make 21st street more comfortable for bicyclists.
- ☐ Make 21st street more comfortable for pedestrians.
- ☐ Reduce speed of cars through neighborhood.
- ☐ Reduce number of cars through neighborhood.

2. Where do you live within the corridor? Please describe where you live based on the nearest cross street or intersection.

PLEASE WRITE ANY ADDITIONAL COMMENTS ON BACK OF PAGE

21st Street Corridor Public Meetings

Carnegie Building located at 200 West 9th Street

Thursday, August 21st
6:30 p.m. to 8:00 p.m.

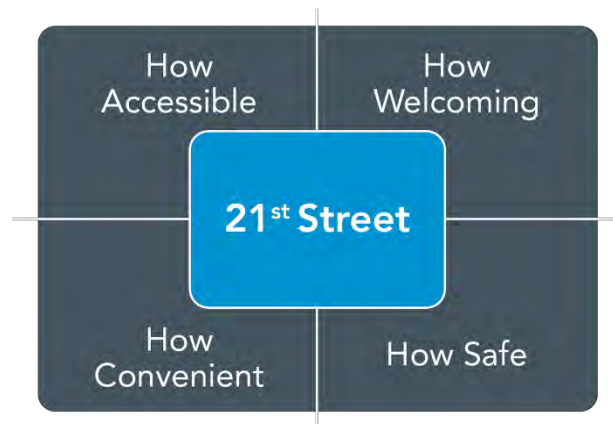
Wednesday, September 10th
6:30 p.m. to 8:00 p.m.

Wednesday, October 1st
6:30 p.m. to 8:00 p.m.

The purpose of these meetings are to develop a neighborhood-preferred alternative for multi-modal enhancement of the 21st Street Corridor between Iowa Street and Naismith Drive. These enhancements are to address possible traffic increases from a potential traffic signal at 21st Street and Iowa.

A total of three public meetings intend to collect input and feedback on how the corridor can be modified in a way that supports multimodal movement and reflects the needs of surrounding residents.

The City of Lawrence wants your input!



21st Street Corridor between Iowa and Naismith



Thank you for your participation during the public meeting. If you have any questions regarding these meetings please contact:

Casey Toomay | Assistant City Manager | 785-832-3409 | ctoomay@lawrenceks.org

Robert Nugent | Transit Administrator | 785-832-3464 | rnugent@lawrenceks.org

Tom Worker-Braddock | Olsson Associates | 913-381-1170 | tworkerbraddock@olssonassociates.com

Appendix B – September 10th Public Meeting Minutes and Materials

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Meeting Minutes

Project:	Lawrence Transit Center Location Analysis / 21 st Street Corridor Amendment
Location:	Carnegie Building, 200 W. 9 th Street
Date & Time:	Wednesday, September 10 th , 2014. 6:30 pm to 8:00 pm
RE:	21 st Street Corridor Public Meeting #2
PROJECT #:	013-0542

This was the second of three public meetings intended to develop a neighborhood-preferred alternative for traffic calming or multi-modal enhancements of the 21st Street corridor between Iowa Street and Naismith Drive. A total of twelve neighborhood participants attended the September 10th meeting, along with two city staff members, and four Olsson Associates' employees.

Figure 1 Table Discussion



Figure 2 Table Discussion



Tom Worker-Braddock of Olsson Associates presented an overview of the project and summarized the participation from the first public meeting held on August 21st. In the August 21st public meeting, the most popular concepts, by voting, were:

- One-way traffic diverter at Stewart
- Diversion/realignment at 21st Street
- Roundabout at Ousdahl
- Make 21st street one-way westbound between Iowa and Stewart
- Roundabout at Stewart
- Chicanes along the corridor
- Curb extension at Naismith

The results of a survey distributed and collected at the first public meeting were summarized. The survey identified the most important goals of the corridor as:

- “Reduce the number of cars through the neighborhood”, follow closely by
- “Reduce access between the neighborhood and Iowa Street”, and
- “Reduce speed of cars through neighborhood.”

After the public input received at the first public meeting was reviewed, Todd Fredericksen, traffic engineer from Olsson Associates, went over traffic calming concepts that were created using feedback from the first public meeting and survey. These concepts were drawn onto aerials and presented in the powerpoint presentation:

- Eastbound Traffic Diverter at Stewart
- Westbound Traffic Diverter at Ousdahl
- Roundabout at Ousdahl
- Realign Stewart and 21st Street – Curve Only
- Realign Stewart and 21st Street – Curve With Roundabout
- Realign Stewart and 21st Street – Curve With Roundabout and Traffic Diverter
- Chicanes along the Corridor
- Curb Extension at Naismith
- 21st Street Bus Only Eastbound

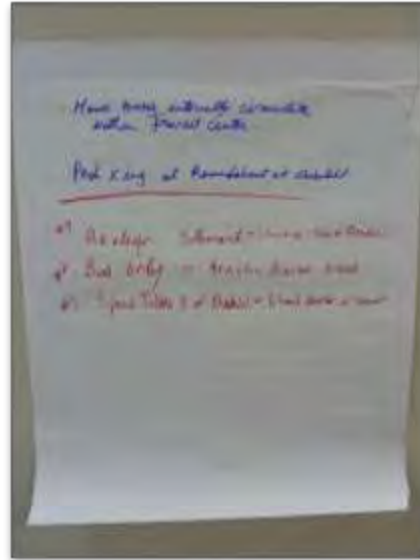
There was open discussion as each concept was presented. Participants were concerned about pedestrian crossing safety at a roundabout at Ousdahl. There was also concern about traffic diverters impact on neighborhood continuity if neighbors wouldn't be able to drive from one house in the neighborhood to another. After Todd Fredericksen reviewed each concept and answered questions, participants broke into 3 groups and created their own alternative. This was done using aerial map print-outs on each table, and cardboard cut-outs of each alternative that was scaled to the map print-out. This allowed participants to choose and place any number of elements along the corridor. These cut-outs are displayed in Figure 3.

After each table discussed which concepts were appropriate for their corridor, the table reported the concepts that they chose for the corridor. These concepts were recorded on an easel, and displayed on Figure 4.

Figure 3 To-scale cut outs of each element concept



Figure 4 Main Idea of Each Table



After discussion, the concepts were divided into those focused on the 21st Street and Stewart Avenue intersection, and those concepts that could be applied along the rest of the corridor. Participants were asked to vote using dot stickers their preferred concept for 21st Street and Stewart Avenue, and along the corridor. Figure 5 and Figure 6 display pictures of participants voting. These votes are displayed in Figure 7 and Figure 8.

Figure 5 Voting on 21st and Stewart



Figure 6 Voting on Corridor Options



Figure 7 Voting Results - Corridor Improvements

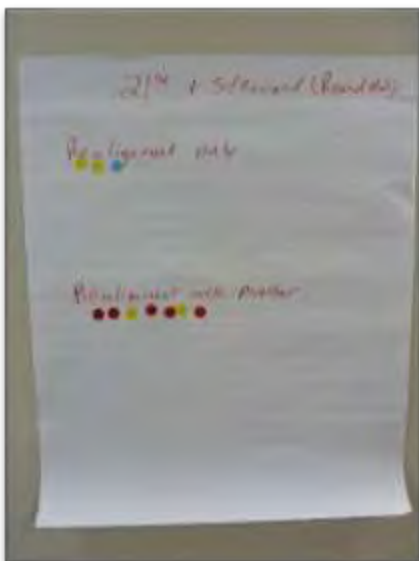


Figure 8 Voting Results - 21st and Stewart (round 1)



Participants chose chicanes for the broader corridor improvement. The options of “Realign 21st” and “Traffic Diverter” both received a high number of votes for the 21st Street intersection. A second vote was held to further clarify participants intention on whether they preferred to only realign 21st street, or to realign 21st street and include a traffic diverter. As displayed in Figure 9, participants voted to include a traffic diverter while realigning 21st street.

Figure 9 Voting Results - 21st and Stewart (round 2)



The vote was summarized and discussed with participants, and then the next steps were explained. Participants were reminded of the third public meeting to be held on October 1st. At that meeting, concepts would be presented that would be drawn up from the discussions and input held at the first two public meetings. A summary of the public meeting process and outcomes would be presented to the city commission sometime after the third public meeting.

CC: File

City of Lawrence

Date 9-12-14

[illegible]

21st Street Corridor

Neighborhood Meeting #2

Meeting #1
Thursday,
August 21st

Meeting #2
Wednesday
September 10th

Meeting #3
Wednesday
October 1st



 **OLSSON**
ASSOCIATES

Agenda for Tonight

- Review of last meeting.
- Refined Concepts
- Create Corridor Alternatives
 - First, each table.
 - Then, as a single group.
- Vote (through dots) on your favorite alternative.

 **OLSSON**
ASSOCIATES



TABLE 5

- 21st + Stewart Traffic Diversion
- Change 21st + Stewart Int. location w/o circle
- No buses on 21st at Ousdahl and transit center
- Take existing bus route off of 21st / Ousdahl (between Stewart + Ousdahl)
- Pinch Point (Long, Medium, Small 2-way Traffic East of High School)



TABLE 1

- 21st + down light - No S.B. left turns from S down
- Roundabout at 21st + Stewart
- " " + Ousdahl
- No 2-Way bikes
- No 1-Way street
- 1 Way street
- Chicanes throughout Corridor
- Curb extension + Island at 21st + Naismith
- Concerns about transient

- 1-Way WB From Iowa + Stewart
- Remove Bus route from 21st + Ousdahl
- Pinch point along corridor (near Ousdahl)
- Parking control
- Roundabout at Stewart

One-way traffic diverter at Stewart

Diversion / realign 21st Street at Stewart

Roundabout at Ousdahl

Make 21st Street one-way westbound between Iowa and Stewart

Roundabout at Stewart

Chicanes along corridor

Curb extension at Naismith

- Diversion / Curb extension at 21st + Naismith
- Roundabout at Ousdahl

21st Street Corridor

Please answer the questions below and return the survey before leaving the meeting.

QUESTIONS

1. What is most important to you? Please rank these options
(1 being the most important, 6 being least important):

- ☐ Maintain access in both directions between the neighborhood and Iowa Street.
- ☐ Reduce access between the neighborhood and Iowa Street.
- ☐ Make 21st street more comfortable for bicyclists.
- ☐ Make 21st street more comfortable for pedestrians.
- ☐ Reduce speed of cars through neighborhood.
- ☐ Reduce number of cars through neighborhood.

2. Where do you live within the corridor? Please describe where you live based on the nearest cross street or intersection.
- _____

PLEASE WRITE ANY ADDITIONAL COMMENTS ON BACK OF PAGE

Please answer the questions below

QUESTIONS

1. What is most important to you?
(1 being the most important, 6 being least important):

- ☐ Maintain access in both directions between the neighborhood and Iowa Street.
- ☐ Reduce access between the neighborhood and Iowa Street.
- ☐ Make 21st street more comfortable for bicyclists.
- ☐ Make 21st street more comfortable for pedestrians.
- ☐ Reduce speed of cars through neighborhood.
- ☐ Reduce number of cars through neighborhood.

2. Where do you live within the corridor?
the nearest cross street or intersection.
- _____

	Maintain access in both directions between the neighborhood and Iowa Street	Reduce access between the neighborhood and Iowa Street	Make 21 st Street more comfortable for bicyclists	Make 21 st Street more comfortable for pedestrians	Reduce speed of cars through neighborhood	Reduce number of cars through neighborhood	Comments
	0	0	1	0	0	0	-
	0	0	1	1	1	1	-
<input type="checkbox"/> Maintain access in both directions between the neighborhood and Iowa Street	4	2	5	6	3	1	-
<input type="checkbox"/> Reduce access between the neighborhood and Iowa Street	0	1	0	0	3	2	Please reconsider the placement of the bus station
<input type="checkbox"/> Make 21 st street more comfortable for bicyclists	6	3	5	4	2	1	-
<input type="checkbox"/> Make 21 st street more comfortable for pedestrians	6	1	4	3	2	5	-
<input type="checkbox"/> Reduce speed of cars through neighborhood	6	3	5	4	2	1	Anything that can preserve and improve the integrity of the neighborhood would be welcome.
<input type="checkbox"/> Reduce number of cars through neighborhood	0	5	1	2	3	4	Use horizontal deflection to slow traffic speed. Use entry access controls to reduce volume. Make 21 Street and bicycle boulevard from Stewart Avenue to Barker Avenue.
	22	15	22	20	16	15	Lower the number, higher the priority
	0	2	3	1	1	4	-

PLEASE WRITE ANY ADDITIONAL COMMENTS ON BACK OF PAGE

Please answer the question

QUESTIONS

1. What is most important to you in choosing a neighborhood? (1 being the most important)

Reduce number of cars through neighborhood.

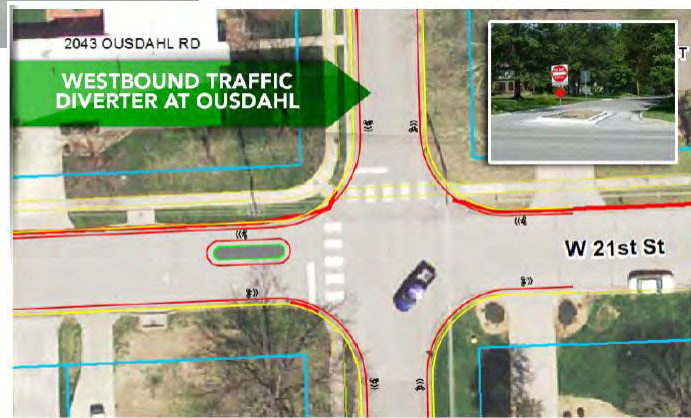
2. Where do you live?

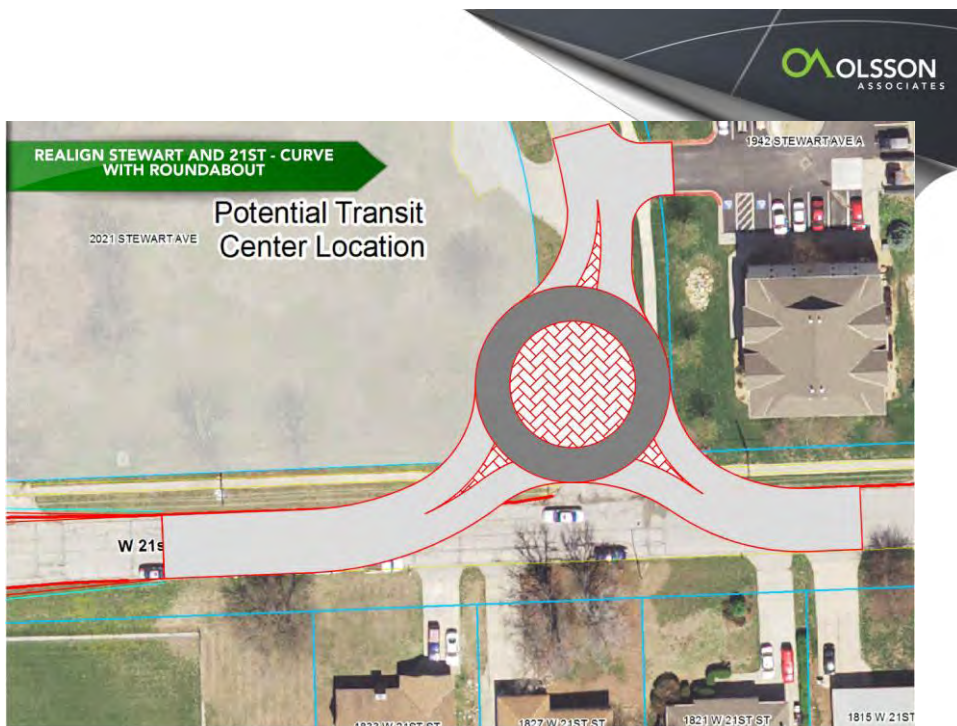
Reduce access between the neighborhood and Iowa Street.

Reduce speed of cars through neighborhood.

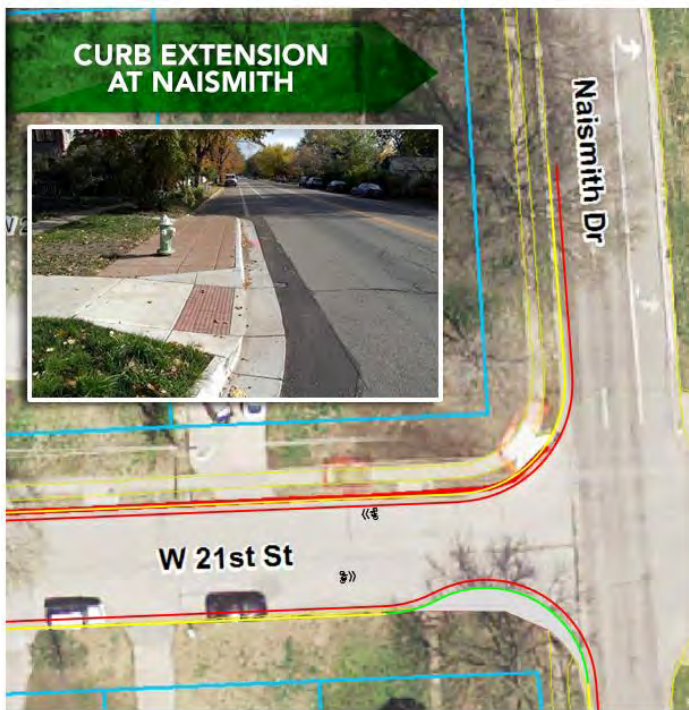
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Next steps for tonight

- Each table will craft their own alternative using the pieces provided.
- We'll discuss each alternative as a group.
- Group will create another alternative together.
- At the end, use dots to indicate your favorite alternative.

Next steps

Public Meeting #3
Wednesday, October 1st, 6:30 – 8:00
Carnegie Building.

For More information, contact:

Casey Toomay, Asst. City Manager
785-832-3409
ctoomay@lawrenceks.org

Robert Nugent, Transit Administrator
785-832-3464
rnugent@lawrenceks.org

Tom Worker-Braddock, Olsson Associates
913-748-2619
tworkerbraddock@olssonassociates.com



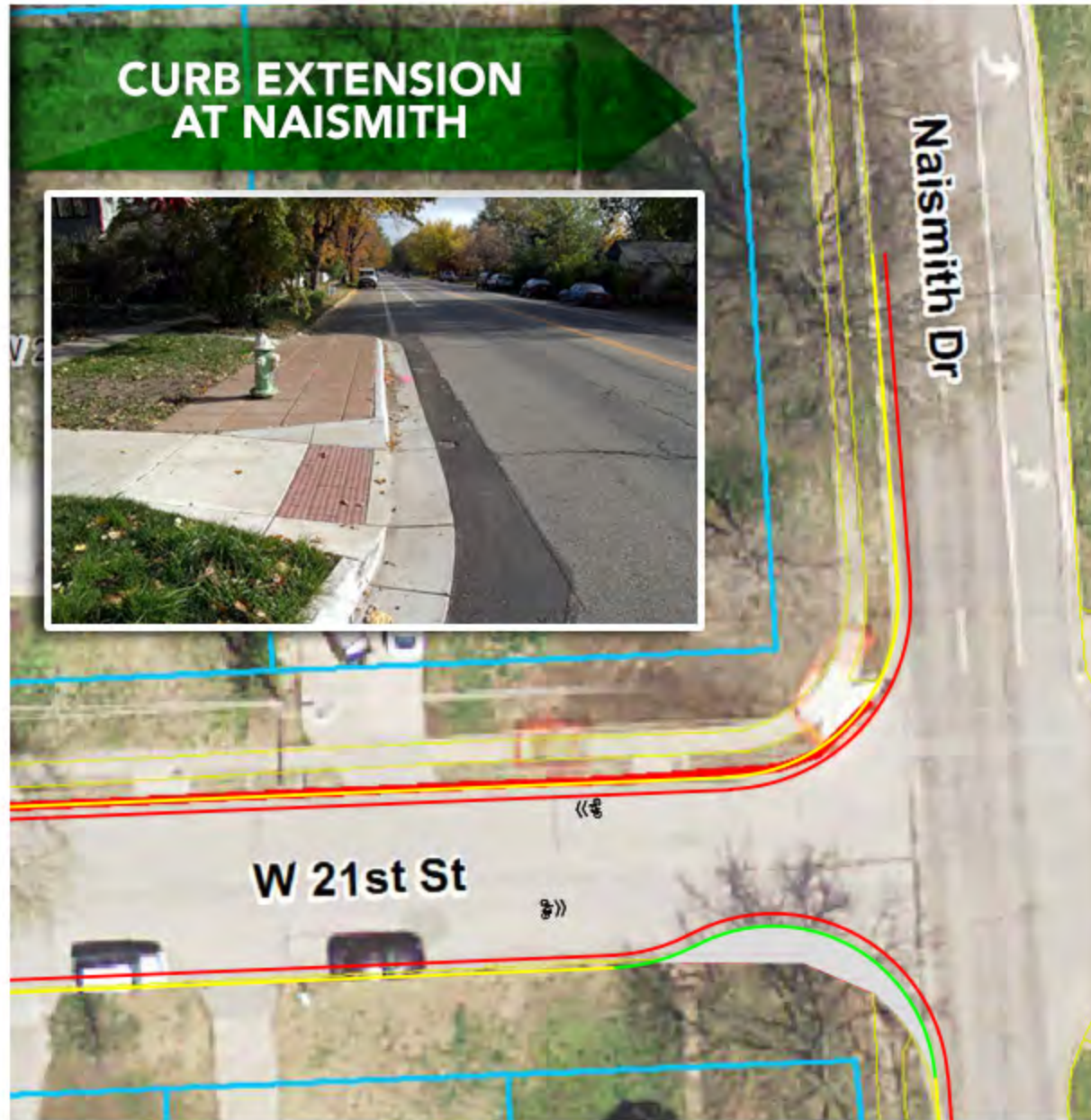
**CHICANES ALONG
THE CORRIDOR**

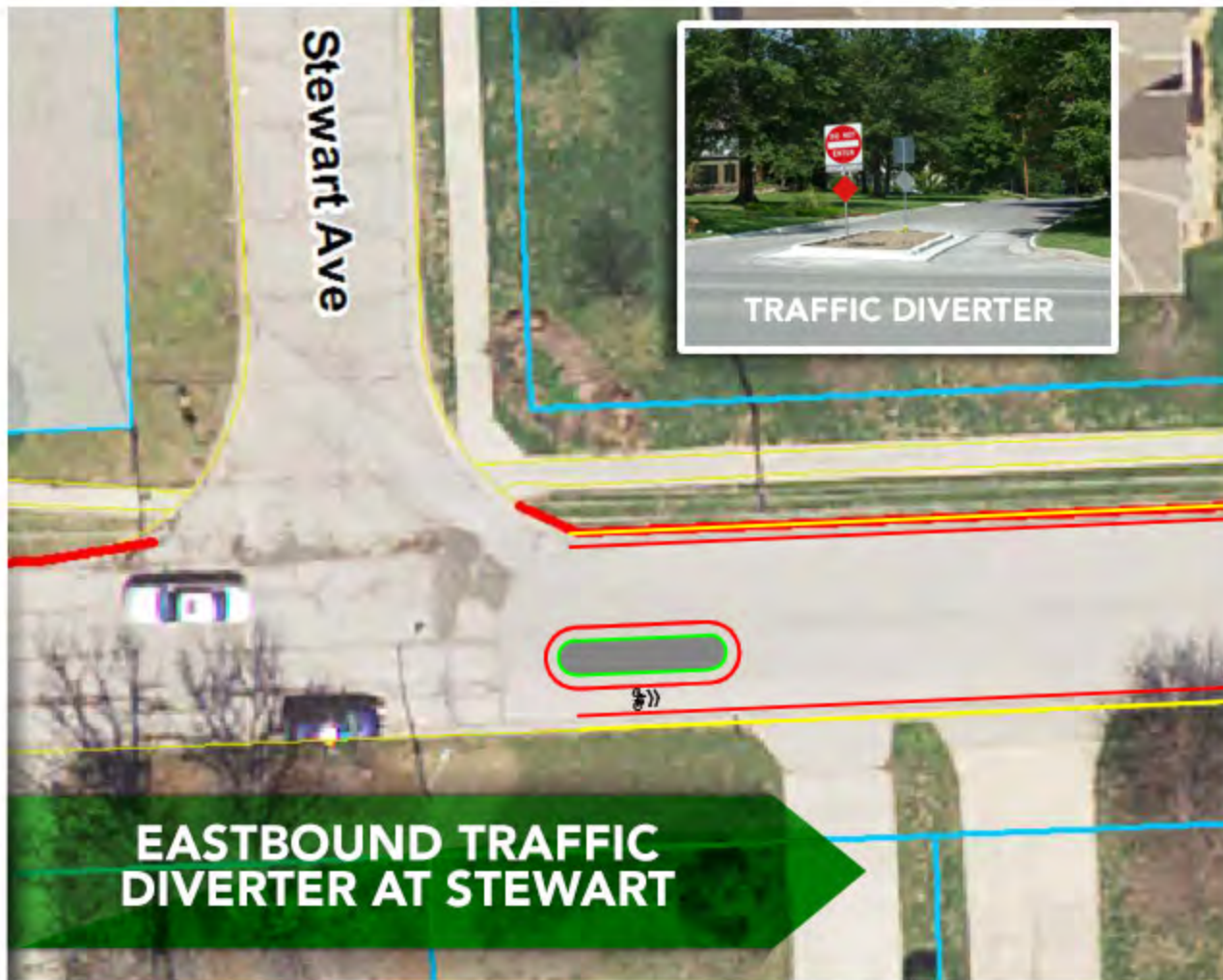
2000 TREEVIEW RD

CHICANES ALONG THE CORRIDOR



CURB EXTENSION AT NAISMITH





REALIGN STEWART AND 21ST -
CURVE ONLY

Potential Transit Center Location

2021 STEWART AVE

1942 STEWART AVE A

Stewart Ave

W 21st

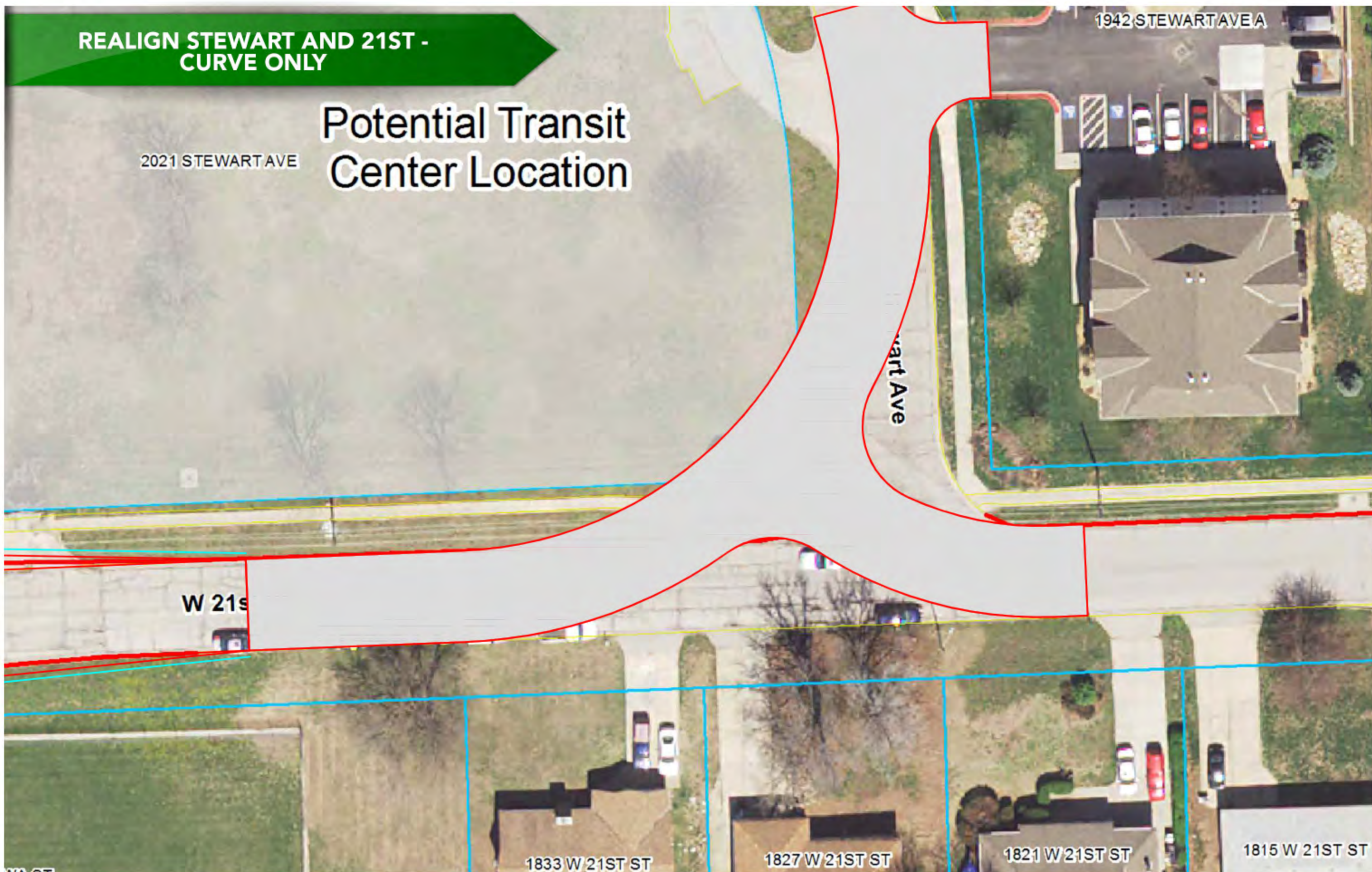
1833 W 21ST ST

1827 W 21ST ST

1821 W 21ST ST

1815 W 21ST ST

W 21st



REALIGN STEWART AND 21ST -
CURVE WITH ROUNDABOUT AND
TRAFFIC DIVERTER

Potential Transit Center Location

2021 STEWART AVE

1942 STEWART AVE A

ACCESSIBLE TO EMERGENCY
VEHICLES AND BIKES ONLY

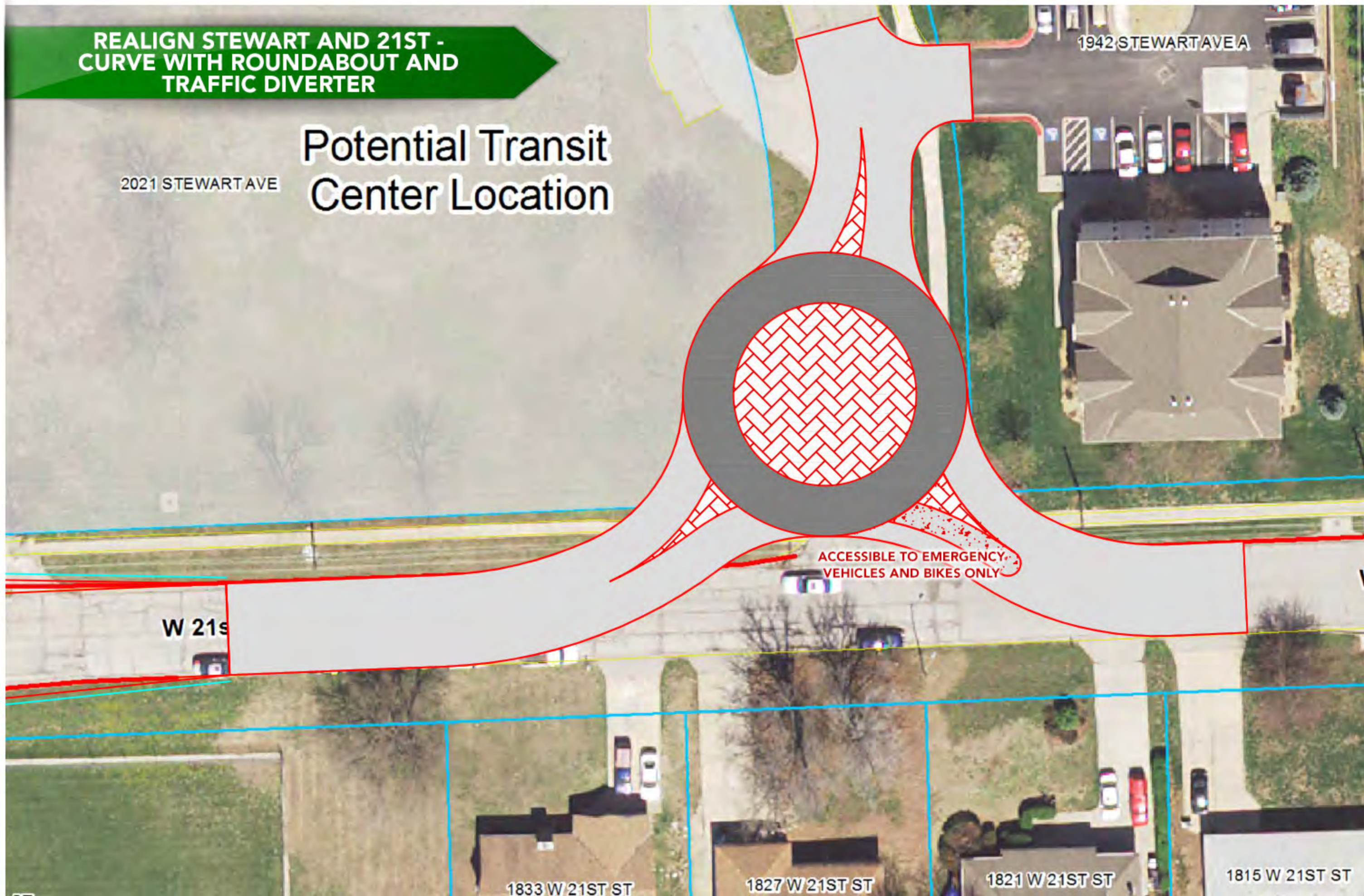
W 21st

1833 W 21ST ST

1827 W 21ST ST

1821 W 21ST ST

1815 W 21ST ST



REALIGN STEWART AND 21ST - CURVE
WITH ROUNDABOUT

Potential Transit
Center Location

2021 STEWART AVE

1942 STEWART AVE A

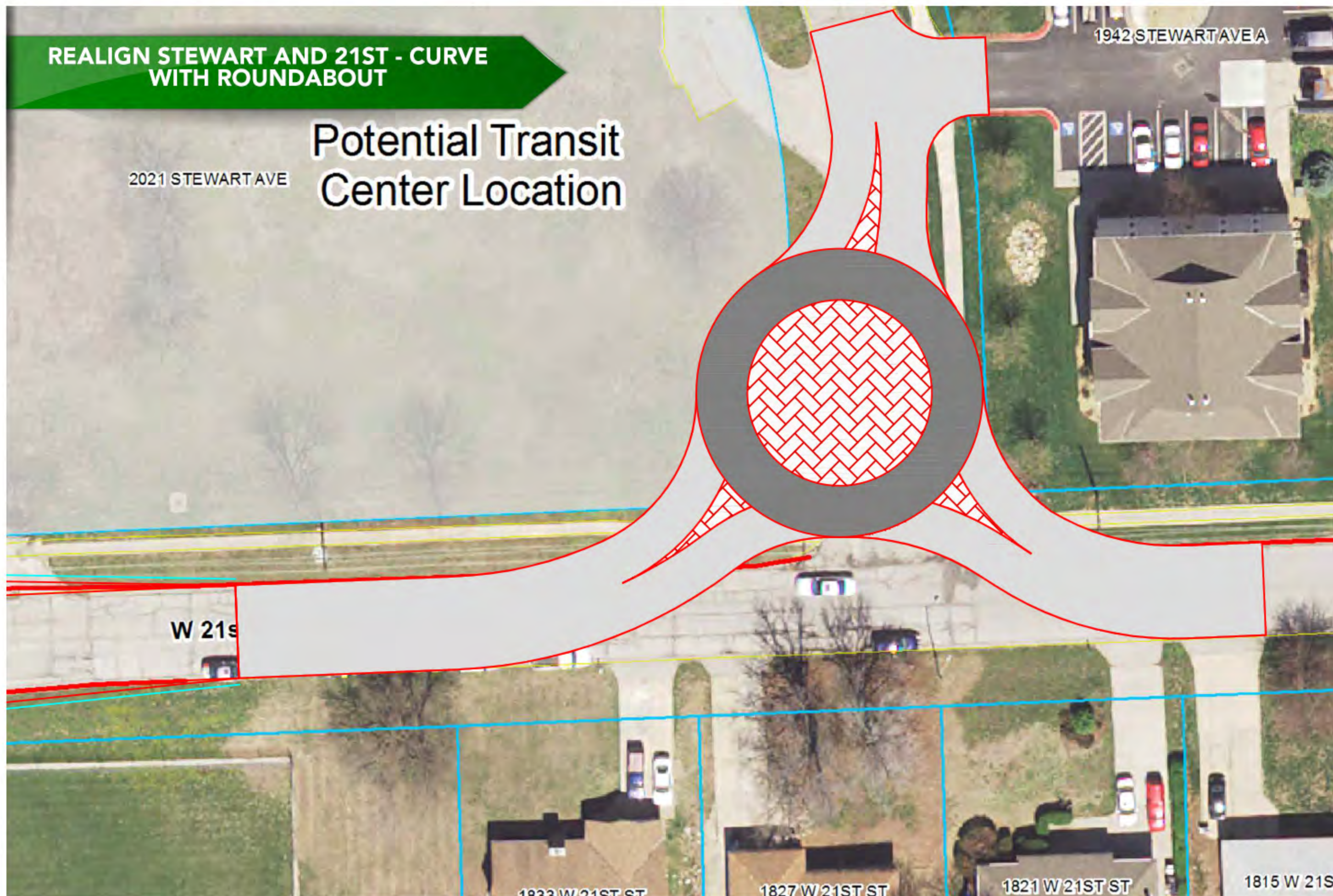
W 21st

1833 W 21ST ST

1827 W 21ST ST

1821 W 21ST ST

1815 W 21ST



43 OUSDAHL RD

ROUNDAABOUT AT OUSDAHL



W 21st St

sdahl Rd

1629 W 21ST ST

2043 OUSDAHL RD

**WESTBOUND TRAFFIC
DIVERTER AT OUSDAHL**

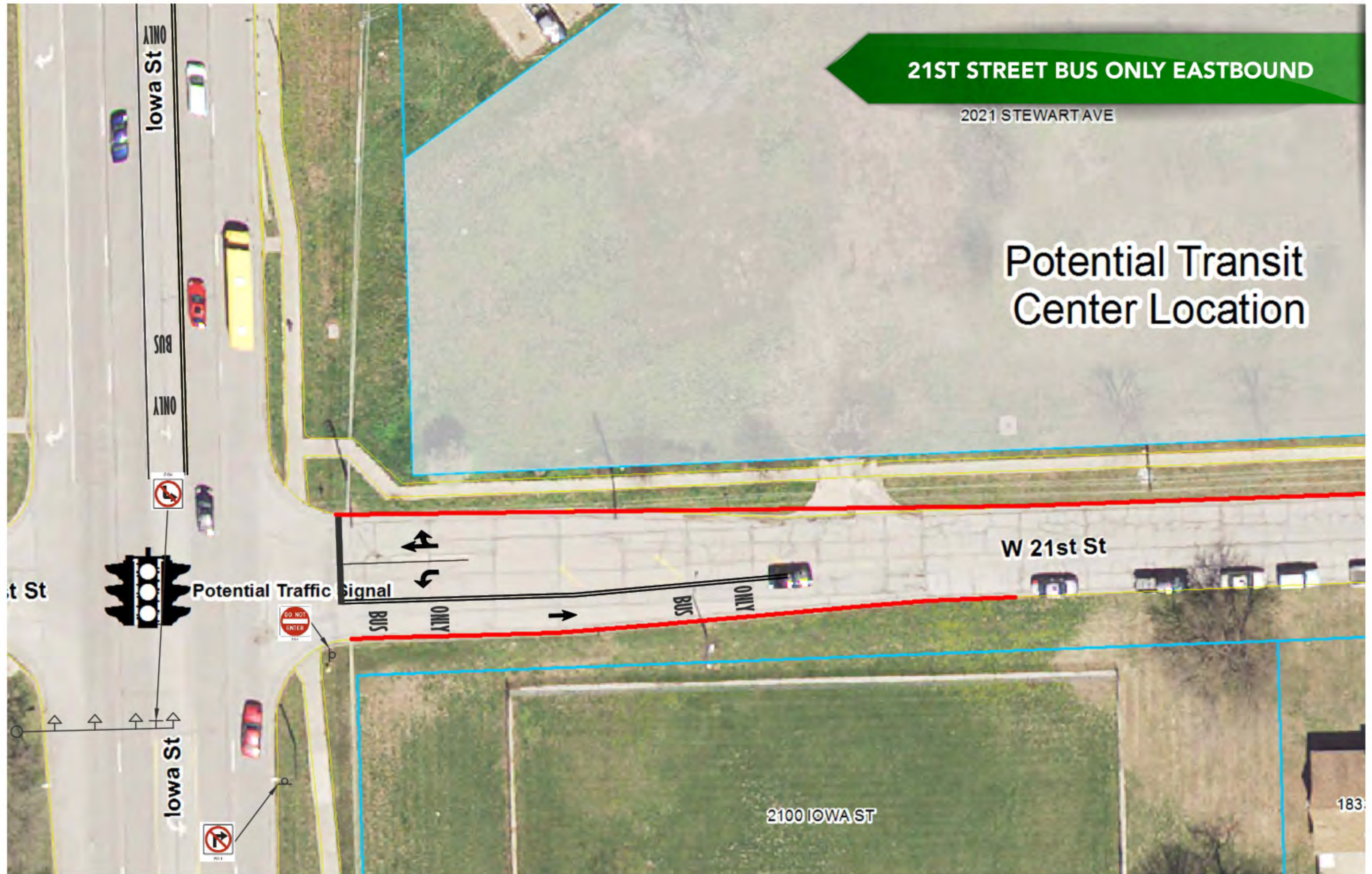


W 21st St

21ST STREET BUS ONLY EASTBOUND

2021 STEWART AVE

Potential Transit
Center Location



2100 IOWA ST

183

Appendix C – October 1st Public Meeting Minutes and Materials

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Meeting Minutes

Project:	Lawrence Transit Center Location Analysis / 21 st Street Corridor Amendment
Location:	Carnegie Building, 200 W. 9 th Street
Date & Time:	Wednesday, October 1 st , 2014. 6:30 pm to 8:00 pm
RE:	21 st Street Corridor Public Meeting #3
PROJECT #:	013-0542

This was the last of three public meetings intended to develop a neighborhood-preferred alternative for traffic calming or multi-modal enhancements of the 21st Street corridor between Iowa Street and Naismith Drive. A total of ten neighborhood residents participated in the October 1st meeting, along with three city staff members, and four Olsson Associates' employees.

Figure 1 Table Discussion



Figure 2 Table Discussion



Tom Worker-Braddock of Olsson Associates presented an overview of the project and summarized the participation from the first two public meetings held on August 21st and September 10th. In the August 21st public meeting, participants voted on which ideas they liked best. These were:

- One-way traffic diverter at Stewart
- Diversion/realignment at 21st Street
- Roundabout at Ousdahl
- Make 21st street one-way westbound between Iowa and Stewart
- Roundabout at Stewart
- Chicanes along the corridor
- Curb extension at Naismith

The results of a survey administered at the first public meeting were summarized. The survey identified the most important goals of the corridor as:

- “Reduce the number of cars through the neighborhood”, follow closely by
- “Reduce access between the neighborhood and Iowa Street”, and
- “Reduce speed of cars through neighborhood.”

In the September 10th public meeting, refined concepts were presented along with scale cut-outs that could actually be laid on top of an aerial map. These included:

- Eastbound Traffic Diverter at Stewart
- Westbound Traffic Diverter at Ousdahl
- Roundabout at Ousdahl
- Realign Stewart and 21st Street – Curve Only
- Realign Stewart and 21st Street – Curve With Roundabout
- Realign Stewart and 21st Street – Curve With Roundabout and Traffic Diverter
- Chicanes along the Corridor
- Curb Extension at Naismith
- 21st Street Bus Only Eastbound

After discussions at tables, participants voted on the alternatives they liked best in the corridor. These preferred concepts were:

- Realign the 21st Street and Stewart Avenue intersection and incorporate a traffic diverter, and
- Install chicanes along the corridor east of Ousdahl

After the outcomes of the previous two public meetings were summarized, Tom Worker-Braddock discussed the process where any traffic calming measures might get built. The city commission will be presented with the outcomes of the public meetings at the same time they’re deciding whether or not to build a transit center at 21st Street and Stewart Avenue. Regarding traffic calming measures the city will refer to the city’s traffic calming policy. This policy was distributed to participants as a handout at the beginning of the meeting. Part of that policy says *“TRAFFIC CALMING devices will only be constructed...if 70 percent of more of the property owners within 300 feet in each direction approve of the installation, or if directed by the city commission.”* Tom rephrased the policy as meaning “before a traffic diverter, or chicanes are installed, 70 percent of property owners within 300 feet of each direction along that street, would have to approve. For anything at 21st and Stewart, that would include property owners along Stewart.”

There was discussion about the traffic calming policy, including the prevalence of renter-occupied homes along 21st Street, and the ability of City Commission to implement traffic calming measures if seventy percent of the property owners didn't approve of the installation. Neighborhood residences would be responsible for collecting signatures from property owners to approve the installation of traffic calming.

Todd Fredericksen presented the final concepts for traffic calming along 21st Street that was developed with input based on discussion and input from the previous two public meetings. One concept is installing a set of chicanes along 21st Street between Ousdahl Road and Naismith Drive. The chicanes would include four foot bike pathways between the chicane islands and the adjacent curb. The chicanes would accommodate a 19 foot two-way drive lane. This is the same width as the current drive lane when parking is present in the corridor. Implementing the chicanes would require some loss of current parking which would affect two residential properties as currently sited. Both of these properties have two-car garages. There was discussion about how a five foot bike lane would be preferable.

Figure 3 Final Concept Drawing: Chicanes



The second final concept is a realigned 21st street and Stewart avenue intersection that curves and creates a new “tee” intersection. This would require westbound cars on 21st Street to turn left to continue on 21st Street. In addition, a partial traffic diverter would not allow eastbound traffic to enter the neighborhood on 21st Street. A four foot bike pathway would allow eastbound cyclists into the

neighborhood. Continuity between two single family properties south of realigned intersection and traffic diverter would be maintain through an access inlet area. The access inlet area would be large enough for cars to back out of driveways, as well as provide some limited additional parking spaces. This area would provide additional buffering between these residences and a transit center at 21st Street and Stewart Avenue.

The Fire Department had been consulted. Emergency vehicles would be able to navigate both ways through the traffic diverter on 21st Street at Stewart Avenue, as well as through the chicanes.

Figure 4 Final Concept Drawing: Realigned 21st Street and Stewart Avenue Intersection with Traffic Diverter



PowerPoint slides showed the chicanes, realigned intersection with traffic diverter, and potential transit center concept drawn on the existing aerial map. In addition, the corridor-wide map with the drawn final concepts was printed out. Meeting participants noted general approval and acceptance of the final concept for traffic calming in the 21st street corridor.

City officials described the next steps in the process. The final report and outcome of the public meetings will be presented to the city commission sometime in mid- to late-November.

CC: File

Date 10-1-14

[illegible]

City of Lawrence

Date 10-1-14

[illegible]

21st Street Corridor

Neighborhood Meeting #3

Meeting #1
Thursday,
August 21st

Meeting #2
Wednesday
September 10th

Meeting #3
Wednesday
October 1st

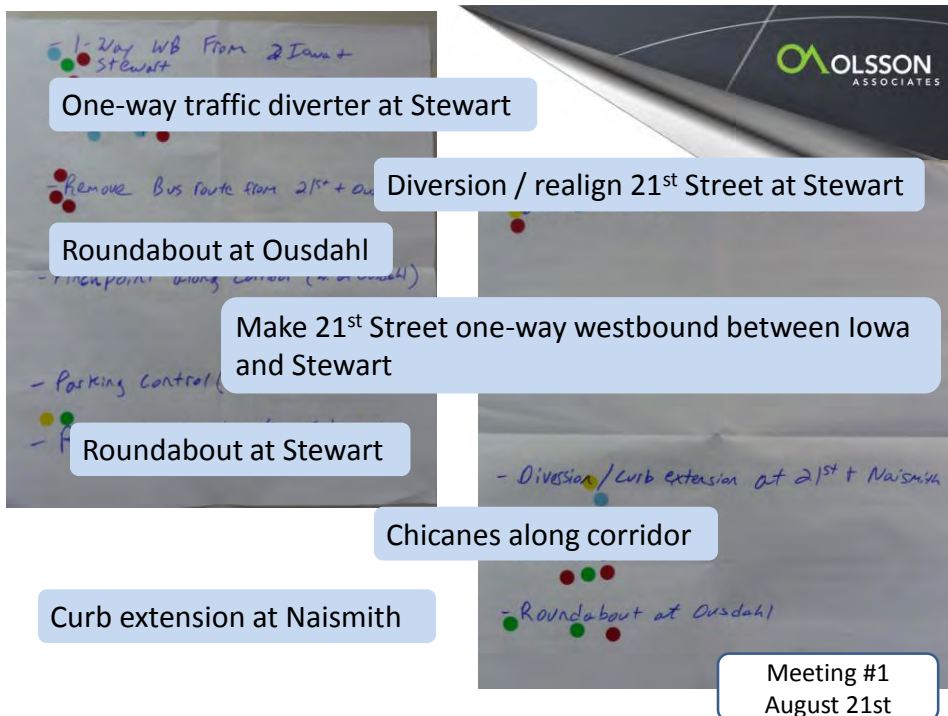


OLSSON
ASSOCIATES

Agenda for Tonight

- Review of previous meetings.
- Review city's Traffic Calming Policy
- Discuss Refined Concept
- Next steps

OLSSON
ASSOCIATES



OLSSON ASSOCIATES

21st Street Corridor

Please answer the questions below and return the survey before leaving the meeting.

QUESTIONS

1. What is most important to you? Please rank these options (1 being the most important, 6 being least important):

☐ Iowa Street.
☐ Reduce access between the neighborhood and Iowa Street.
☐ Make 21st street more comfortable for bicyclists.

2. Where do you live within the corridor? Please describe where you live based on

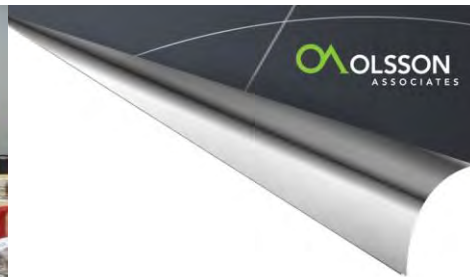
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Meeting #1
August 21st

Reduce number of cars through neighborhood.

Reduce access between the neighborhood and Iowa Street.

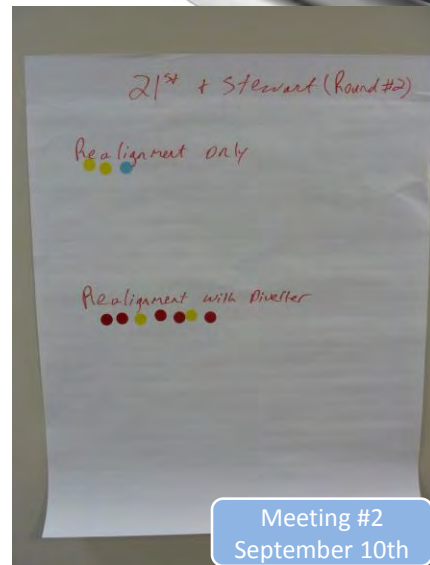
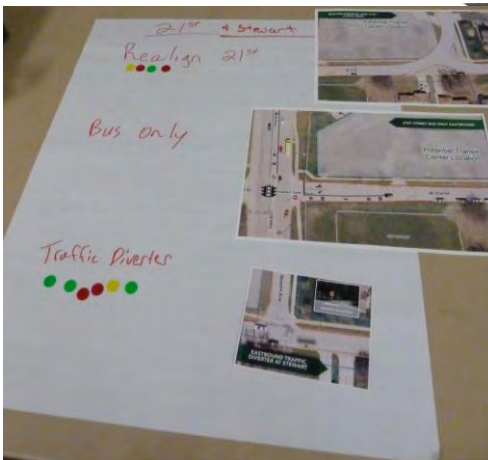
Reduce speed of cars through neighborhood.



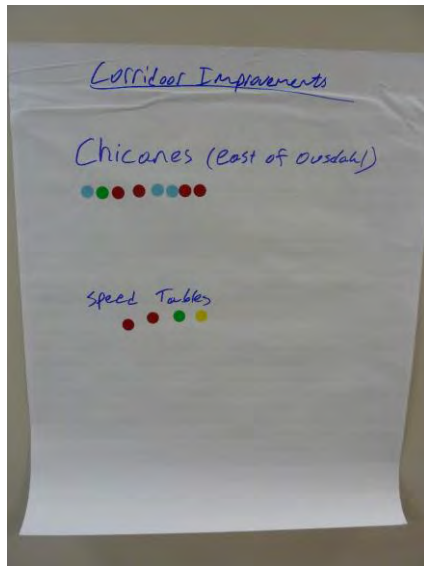
Meeting #2
September 10th







Meeting #2
September 10th



TRAFFIC CALMING POLICY

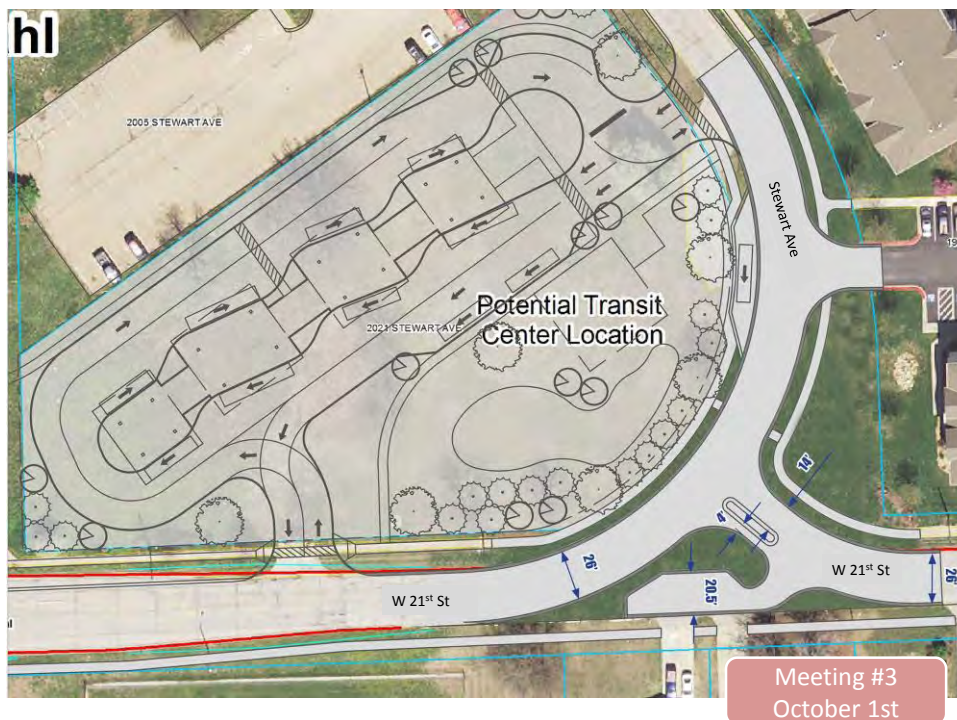
Resolution No. 6602, August 23, 2005

1. TRAFFIC-CALMING DEVICES may include but are not limited to Traffic-Calming Circles, Speed Humps and Speed Cushions, Speed Tables, Partial Dividers, Full Dividers, Center Island Narrowing, Chokers, and Road Closures; however, roundabouts are traffic management devices and are not subject to this policy.
2. TRAFFIC-CALMING DEVICES may be permitted on "local" streets as designated by the City's Major Thoroughfares Map, and under any one of the following conditions:
 - A. The 85th percentile speed of traffic is 5 mph or greater over the speed limit, or
 - B. The 24-hour two-way traffic volume is greater than 1000, or
 - C. Cut-through traffic comprises more than 50% of the traffic during the peak hour of the day, or
 - D. Where no single condition is satisfied, but where any two of A, B or C above are satisfied to the extent of 80 percent or more of the stated values.
3. TRAFFIC-CALMING DEVICES (except SPEED HUMPS) may be permitted on "collector" streets as designated by the City's Major Thoroughfares Map, under any one of the following conditions:
 - A. The 85th percentile speed of traffic is 5 mph or greater over the speed limit, or
 - B. The 24-hour two-way traffic volume is greater than 3000, or
 - C. Cut-through traffic comprises more than 50% of the traffic during the peak hour of the day, or
 - D. More than 50% of the frontage of the roadway consists of residential lots with the houses facing the roadway in question, or
 - E. Where no single condition is satisfied, but where any two of A, B, C or D above are satisfied to the extent of 80 percent or more of the stated values.
4. Traffic data will be collected with city personnel using city equipment only. In the event that a requested

7. ...TRAFFIC CALMING devices will only be constructed...if 70 percent of more of the property owners within 300 feet in each direction approve of the installation, or if directed by the city commission.

7. After a project is approved and funded by the City Commission, TRAFFIC-CALMING DEVICES will only be constructed at a location if 70% or more of the property owners within 300 feet measured along the centerline of the street in each direction approve of the installation or if directed by the City Commission. The individual, group or neighborhood making the request shall be responsible for obtaining the property owners' and residents' approval in writing and submitting it to the city.
8. Once installed, TRAFFIC-CALMING DEVICES may only be removed at a location if more than 70% of the property owners and residents within 300 feet measured along the centerline of the street in each direction approve of the removal or if directed by the City Commission. The individual, group or neighborhood making the request shall be responsible for obtaining the property owners' and residents' approval in writing and submitting it to the city.
9. TRAFFIC CALMING DEVICES may initially be landscaped (if appropriate) by the city, provided that the group or neighborhood making the request agrees in writing to maintain the landscaping or pursuant to the payment of a landscape maintenance fee. No privately installed landscaping is permitted unless approved by the city in writing.

Meeting #3
October 1st





Meeting #3
October 1st



ELEVATION FROM 21st STREET & STEWART AVE. LOOKING NORTHWEST

Disclaimer:
Elevation drawings are based on conceptual site plan created for costing and conceptualization purpose only. Eventual design details and elements may differ.



Meeting #3
October 1st

Disclaimer:

Elevation drawings are based on conceptual site plan created for costing and conceptualization purpose only. Eventual design details and elements may differ.



ELEVATION CUT at 21ST STREET LOOKING NORTH



ELEVATION FROM 21st STREET & STEWART AVE. LOOKING NORTHWEST

Meeting #3
October 1st

Next Steps

For More information, contact:

Casey Toomay, Asst. City Manager

785-832-3409

ctoomay@lawrenceks.org

Robert Nugent, Transit Administrator

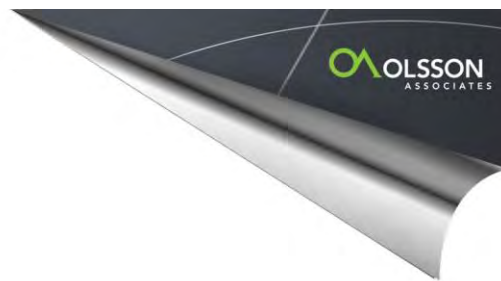
785-832-3464

rnugent@lawrenceks.org

Tom Worker-Braddock, Olsson Associates

913-748-2619

tworkerbraddock@olssonassociates.com







TRAFFIC CALMING POLICY

Resolution No. 6602, August 23, 2005

1. TRAFFIC-CALMING DEVICES may include but are not limited to Traffic-Calming Circles, Speed Humps and Speed Cushions, Speed Tables, Partial Diverters, Full Diverters, Center Island Narrowing, Chokers, and Road Closures; however, roundabouts are traffic management devices and are not subject to this policy.
2. TRAFFIC-CALMING DEVICES may be permitted on "local" streets as designated by the City's Major Thoroughfares Map, and under any one of the following conditions:
 - A. The 85th percentile speed of traffic is 5 mph or greater over the speed limit, or
 - B. The 24-hour two-way traffic volume is greater than 1000, or
 - C. Cut-through traffic comprises more than 50% of the traffic during the peak hour of the day, or
 - D. Where no single condition is satisfied, but where any two of A, B or C above are satisfied to the extent of 80 percent or more of the stated values.
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 - B. The 24-hour two-way traffic volume is greater than 3000, or
 - C. Cut-through traffic comprises more than 50% of the traffic during the peak hour of the day, or
 - D. More than 50% of the frontage of the roadway consists of residential lots with the houses facing the roadway in question, or
 - E. Where no single condition is satisfied, but where any two of A, B, C or D above are satisfied to the extent of 80 percent or more of the stated values.
4. Traffic data will be collected with city personnel using city equipment only. In the event that a requested location does not meet the minimum requirements as stated in 2 or 3 above, subsequent requests will not be considered for a minimum of one year.
5. The Lawrence-Douglas County Fire & Medical Department, the Police Department, the Public Works Department and the Traffic Safety Commission must review all requests for TRAFFIC-CALMING DEVICES before being presented to the City Commission.
6. If a project is approved by the City Commission, the City Commission will determine financing of the construction. The City Commission may require 0-100% of the costs to be paid by the group or neighborhood making the request.
7. After a project is approved and funded by the City Commission, TRAFFIC-CALMING DEVICES will only be constructed at a location if 70% or more of the property owners within 300 feet measured along the centerline of the street in each direction approve of the installation or if directed by the City Commission. The individual, group or neighborhood making the request shall be responsible for obtaining the property owners' and residents' approval in writing and submitting it to the city.
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Appendix D – Construction Costs Estimates (Concept Level)

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ENGINEER'S ESTIMATE (CONSTRUCTION COSTS)

(Concept Level)

Client: City of Lawrence

Project: Lawrence Transit Center Location Analysis

Project Number: 013-0542

Date: 2/25/2014

	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST \$	COST \$
EXISTING PLUS TRANSIT CENTER - 9TH ST & ROCKLEDGE ROAD					
Replacing the pavement on 9th between Rockledge and Iowa as well as the N. leg of Rockledge in order to install a left turn lane					
1	Removal of Existing Structures	1	Lump Sum	\$25,000.00	\$25,000.00
2	Unclassified Excavation	5500	Cu. Yd.	\$25.00	\$137,500.00
3	Compaction of Earthwork (All types)	4000	Cu. Yd.	\$18.00	\$72,000.00
4	Fly Ash	385	Ton	\$45.00	\$17,325.00
5	Manipulation for Fly Ash Treated Subgrade (9")	6914	Sq. Yd.	\$5.50	\$38,027.00
6	Concrete Pavement (8")(NRDI)	5775	Sq. Yd.	\$80.00	\$462,000.00
7	Concrete Driveway (6")	561	Sq. Yd.	\$55.00	\$30,855.00
8	Curb and Gutter Combined	3034	Lin. Ft.	\$25.00	\$75,850.00
9	Sidewalk Construction (4")	7951	Sq. Ft.	\$5.00	\$39,755.00
10	Sidewalk Ramp	25	Each	\$2,500.00	\$62,500.00
11	Inlet (Curb)(6'x4')(Complete)	10	Each	\$5,000.00	\$50,000.00
12	Inlet (Curb)(6'x6')(Complete)	4	Each	\$6,500.00	\$26,000.00
13	Junction Box (5'x5')(Complete)	4	Each	\$5,000.00	\$20,000.00
14	15" Storm Sewer (RCP Class III)	250	Lin. Ft.	\$75.00	\$18,750.00
15	24" Storm Sewer (RCP Class III)	470	Lin. Ft.	\$110.00	\$51,700.00
16	30" Storm Sewer (RCP Class III)	500	Lin. Ft.	\$130.00	\$65,000.00
17	36" Storm Sewer (RCP Class III)	500	Lin. Ft.	\$165.00	\$82,500.00
18	Modification of Storm Structure	4	Each	\$2,500.00	\$10,000.00
19	Sod	3700	Sq. Yd.	\$4.50	\$16,650.00
20	Pavement Marking & Signing	1	Lump Sum	\$25,000.00	\$25,000.00
21	Traffic Control	1	Lump Sum	\$10,000.00	\$10,000.00
22	Contractor Construction Staking	1	Lump Sum	\$20,000.00	\$20,000.00
23	Erosion Control	1	Lump Sum	\$20,000.00	\$20,000.00
			SUBTOTAL		\$1,376,412.00
			CONTINGENCY	25%	\$344,103.00
			OPINION OF PROBABLE COST		\$1,720,515.00
EXISTING PLUS TRANSIT CENTER - 21ST ST & IOWA STREET					
Extend Westbound Left turn lane from 50' to 150' plus taper					
1	Removal of Existing Structures	1	Lump Sum	\$2,000.00	\$2,000.00
2	Unclassified Excavation	53	Cu. Yd.	\$36.00	\$1,908.00
3	Compaction of Earthwork (All types)	50.00	Cu. Yd.	\$18.00	\$900.00
4	Aggregate for base (AB-3)	66	Ton	\$35.00	\$2,310.00
5	Milling (2.5")	1042	Sq. Yd.	\$2.50	\$2,605.00
6	Asphalt Surface Course 2.5"	158	Ton	\$70.00	\$11,060.00
7	Concrete Pavement (7")	70	Sq. Yd.	\$75.00	\$5,250.00
8	Curb and Gutter Combined	318	Lin. Ft.	\$25.00	\$7,950.00
9	Pavement Marking	1	Lump Sum	\$1,000.00	\$1,000.00
10	Traffic Control	1	Lump Sum	\$2,500.00	\$2,500.00
11	Contractor Construction Staking	1	Lump Sum	\$1,500.00	\$1,500.00
12	Erosion Control	1	Lump Sum	\$1,000.00	\$1,000.00
			SUBTOTAL		\$39,983.00
			CONTINGENCY	20%	\$7,996.60
			OPINION OF PROBABLE COST		\$47,979.60



ENGINEER'S ESTIMATE (CONSTRUCTION COSTS)

(Concept Level)

Client: City of Lawrence

Project: Lawrence Transit Center Location Analysis

Project Number: 013-0542

Date: 2/25/2014

	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST \$	COST \$
	Add Left Turn Lane to the West Leg of 21st & Iowa				
1	Removal of Existing Structures	1	Lump Sum		
2	Unclassified Excavation	324	Cu. Yd.	\$36.00	\$11,664.00
3	Compaction of Earthwork (All types)	324	Cu. Yd.	\$18.00	\$5,832.00
4	Aggregate for base (AB-3)	167	Ton	\$35.00	\$5,845.00
5	Milling (2.5")	758	Sq. Yd.	\$2.50	\$1,895.00
6	Asphalt Surface Course 2.5"	147	Ton	\$70.00	\$10,290.00
7	Concrete Pavement (7")	292	Sq. Yd.	\$75.00	\$21,900.00
8	Curb and Gutter Combined	546	Lin. Ft.	\$25.00	\$13,650.00
9	Sidewalk Construction (4")	100	Sq. Ft.	\$5.00	\$500.00
10	Sidewalk Ramp	2	Each	\$2,500.00	\$5,000.00
11	Pavement Marking	1	Lump Sum	\$1,500.00	\$1,500.00
12	Traffic Control	1	Lump Sum	\$1,000.00	\$1,000.00
13	Contractor Construction Staking	1	Lump Sum	\$1,500.00	\$1,500.00
14	Erosion Control	1	Lump Sum	\$1,500.00	\$1,500.00
			SUBTOTAL		\$82,076.00
			CONTINGENCY	20%	\$16,415.20
			OPINION OF PROBABLE COST		\$98,491.20
	Add NB Right Turn Lane to 21st & Iowa				
1	Removal of Existing Structures	1	Lump Sum	\$1,000.00	\$1,000.00
2	Unclassified Excavation	327	Cu. Yd.	\$36.00	\$11,772.00
3	Compaction of Earthwork (All types)	300	Cu. Yd.	\$18.00	\$5,400.00
4	Aggregate for base (AB-3)	163	Ton	\$35.00	\$5,705.00
6	Asphalt Surface Course 2.5"	50	Ton	\$70.00	\$3,500.00
7	Concrete Pavement (7")	356	Sq. Yd.	\$75.00	\$26,700.00
8	Curb and Gutter Combined	327	Lin. Ft.	\$25.00	\$8,175.00
9	Sidewalk Construction (4")	1465	Sq. Ft.	\$5.00	\$7,325.00
10	Sidewalk Ramp	1	Each	\$2,500.00	\$2,500.00
11	Inlet (Curb)(6'x4')(Complete)	2	Each	\$5,000.00	\$10,000.00
12	18" Storm Sewer (RCP Class III)	20	Lin. Ft.	\$90.00	\$1,800.00
13	Modification of Storm Structure	2	Each	\$2,500.00	\$5,000.00
14	Pavement Marking	1	Lump Sum	\$500.00	\$500.00
15	Traffic Control	1	Lump Sum	\$1,000.00	\$1,000.00
16	Contractor Construction Staking	1	Lump Sum	\$1,000.00	\$1,000.00
17	Erosion Control	1	Lump Sum	\$1,500.00	\$1,500.00
			SUBTOTAL		\$92,877.00
			CONTINGENCY	20%	\$18,575.40
			OPINION OF PROBABLE COST		\$111,452.40



ENGINEER'S ESTIMATE (CONSTRUCTION COSTS)

(Concept Level)

Client: City of Lawrence

Project: Lawrence Transit Center Location Analysis

Project Number: 013-0542

Date: 2/25/2014

	ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST \$	COST \$
	Replace W. 21st St. from Iowa to Stewart and Stewart St from 21st St. to North Transit Center Entrance				
1	Removal of Existing Structures	1	Lump Sum	\$5,000.00	\$5,000.00
2	Unclassified Excavation	3266	Cu. Yd.	\$25.00	\$81,650.00
3	Compaction of Earthwork (All types)	980	Cu. Yd.	\$18.00	\$17,640.00
4	Fly Ash	182	Ton	\$45.00	\$8,190.00
5	Manipulation for Fly Ash Treated Subgrade (9")	3266	Sq. Yd.	\$5.50	\$17,963.00
6	Concrete Pavement (8")(NRDJ)	1870	Sq. Yd.	\$80.00	\$149,600.00
7	Concrete Driveway (6")	97	Sq. Yd.	\$55.00	\$5,335.00
8	Curb and Gutter Combined	1673	Lin. Ft.	\$25.00	\$41,825.00
9	Sidewalk Construction (4")	5269	Sq. Ft.	\$5.00	\$26,345.00
10	Sidewalk Ramp	8	Each	\$2,500.00	\$20,000.00
11	Inlet (Curb)(6'x4')(Complete)	6	Each	\$5,000.00	\$30,000.00
12	18" Storm Sewer (RCP Class III)	100	Lin. Ft.	\$90.00	\$9,000.00
13	24" Storm Sewer (RCP Class III)	680	Lin. Ft.	\$110.00	\$74,800.00
14	30" Storm Sewer (RCP Class III)	30	Lin. Ft.	\$130.00	\$3,900.00
15	Modification of Storm Structure	1	Each	\$2,500.00	\$2,500.00
16	Sod	1900	Sq. Yd.	\$4.50	\$8,550.00
17	Pavement Marking	1	Lump Sum	\$2,000.00	\$2,000.00
18	Traffic Control	1	Lump Sum	\$10,000.00	\$10,000.00
19	Contractor Construction Staking	1	Lump Sum	\$2,500.00	\$2,500.00
20	Erosion Control	1	Lump Sum	\$5,000.00	\$5,000.00
			SUBTOTAL		\$521,798.00
			CONTINGENCY	25%	\$130,449.50
			OPINION OF PROBABLE COST		\$652,247.50
	Install Traffic Signal at 21st St. & Iowa and Restripe the South Leg to Include a 150' Left-Turn Lane				
1	Traffic Signal and Pavement Markings	1	Lump Sum	\$165,000.00	\$165,000.00
			SUBTOTAL		\$165,000.00
			CONTINGENCY	20%	\$33,000.00
			OPINION OF PROBABLE COST		\$198,000.00

The Engineer, using his or her professional judgment, has developed this stated Opinion of Probable Construction Cost based upon the design status identified above. Development of this Opinion has included consideration of design input level; however, the circumstances under which the work is expected to be undertaken, the cost and availability of materials, labor and services, probable bidder response and the economic conditions at the time of bid solicitation are beyond the control of the Engineer and will impact actual bid costs. Should bidding be delayed, these costs should be reviewed and, if necessary, adjusted to a more applicable *Engineering News Record* Construction Cost Index.