

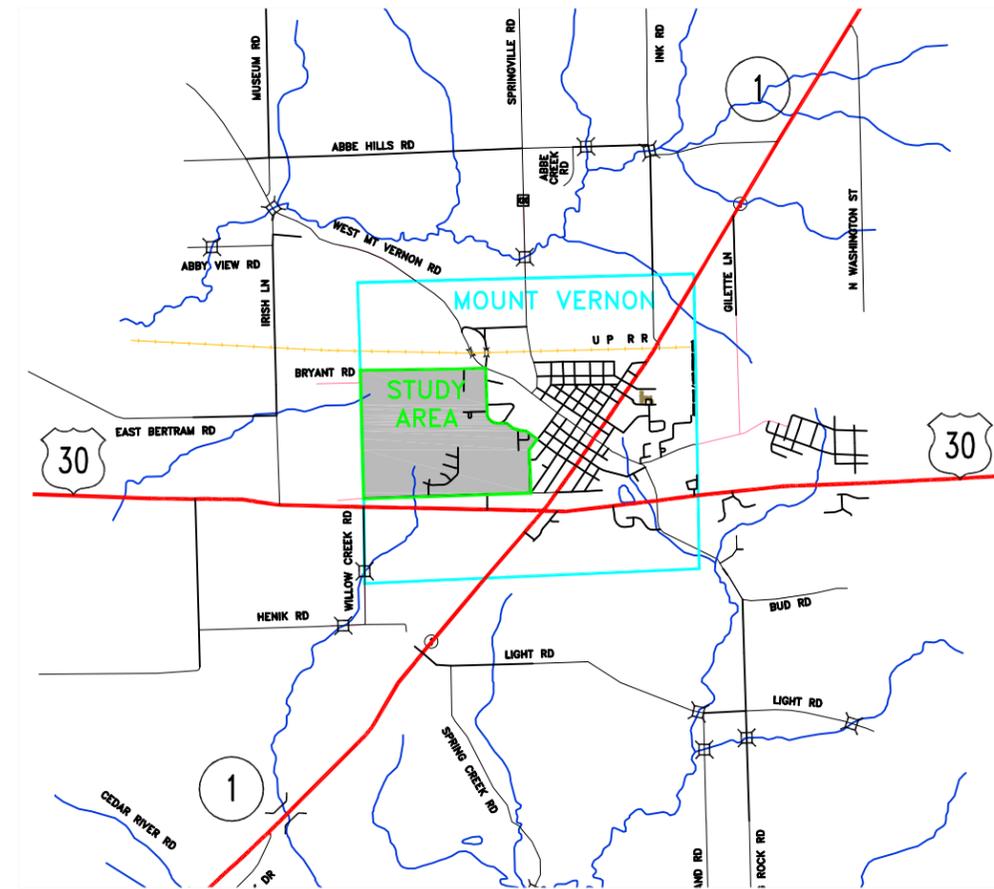
# West Side Long Range Transportation Plan

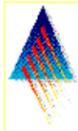
prepared for

City of Mount Vernon, Iowa

MARCH 30, 2007

## FINAL REPORT



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# West Side Long Range Transportation Plan (LRTP)

## City of Mount Vernon, Iowa

### PROJECT OBJECTIVE

The objective of this project is to provide a long range transportation plan to the City leaders for planning of arterial and collector streets with future development on the west side Mt Vernon.

### BACKGROUND

Recent residential and institutional development in the western area of Mount Vernon has raised concern on how the existing streets will handle the increased traffic and where potential arterial and collector streets should be located. Due to the relatively few number of access points to the ongoing development in the Stonebrook Subdivisions, a new forward-looking plan to help define logical and efficient street network was needed prior to the approval of more subdivision plats. Traffic circulation in the vicinity of both the Cornell College and Mt Vernon Community School campuses was also to be a major consideration in the creation of the West Side LRTP.

An earlier long range transportation plan was prepared with the 1995 comprehensive plan for the entire City that showed the west area as a “grid system” with arterials along the section lines with no consideration for the terrain. Citizens of Mount Vernon have voiced they want a connection from 10th Avenue South to Palisades Road in the near future which may not occur for a significant amount of time if the “grid system” was implemented. It was decided by City leaders that a cooperative effort involving the city, developers, local school and college representatives was needed to prepare a new LRTP for West Mount Vernon.

### STUDY AREA

The project study limits are bounded by Bryant Road on the north, Willow Creek Road on the west, Palisades Road on the south, and South 5th Avenue on the east. There is approximately 235 acres of undeveloped land, 100 acres of existing residential development and 150 acres of school/college property within the study limits. The study limits are depicted on graphic sheet A1.



Undeveloped Land North of Palisades Road

### TASK FORCE MEETING PARTICIPATION

The City created a Task Force of key property owners in the area and representatives from the City, Mount Vernon Community School and Cornell College. A total of three meetings were held to obtain information, review alternatives and to review the draft report. The following are some concerns that were asked to be addressed by the report:

- A street plan/design that is to be largely relied upon, if not followed completely, for future development in the study area.
- A plan that does not just draw some lines on map but to develop a system that makes sense and can be implemented.
- Develop an alternative that considered use of the existing terrain and storm water management.
- Cost-effective approach to move traffic safely, not necessary the fastest.
- Recommendations concerning the long-term improvements needed to Bryant Road, 10th Avenue South and Palisades Road.
- Possible location of connection to Highway 30.
- Safety of pedestrians along major streets.
- Technical recommendations for arterials and collectors including pavement cross section and right-of-way widths.
- How to implement the plan with the current Traditional Zoning requirements.
- Address how the proposed arterials and collectors will be financed and staging of the construction.

## **EXISTING TRAFFIC ISSUES**

A traffic destination plan is shown on graphic sheet A1. This exhibit shows a representation of how the current traffic flows through Mt Vernon to reach three specific locations: Mount Vernon Community Schools, Cornell College and the Central Business District. Currently 10th Avenue South from 1<sup>st</sup> Street carries a significant amount of traffic from the north side of Mount Vernon to the Schools or for travelers going west onto Highway 30. During peak hours the intersections of 4<sup>th</sup> Street South and 5<sup>th</sup> Avenue South, 5<sup>th</sup> Avenue South and Palisades Road and 10th Avenue South and Palisades Road all have considerable traffic volumes.

An arterial street from Bryant Road SW to Palisades or Highway 30 would alleviate some of the traffic congestion by using 10th Avenue South and at the above mentioned intersections. If no connection is made between Bryant Road, Palisades Road and Highway 30 and more development occurs, traffic on 10th Avenue South and at the corresponding intersections would continue to increase creating more distress to the neighborhood.

The following table depicts the 2005 Annual Average Daily Traffic on select streets as prepared by the Iowa DOT:

<b>Street</b>	<b>Amount (vpd)</b>
1 <sup>st</sup> Street (east of 10 <sup>th</sup> Avenue South)	3,850
5 <sup>th</sup> Avenue South (south of 1 <sup>st</sup> Street)	1,100
4 <sup>th</sup> Street South (east of 4 <sup>th</sup> Avenue South)	1,050
Palisades Road (east of 10 <sup>th</sup> Ave South)	1,350
Highway 30 (west of Highway 1)	10,000

## **ALTERNATIVES EVALUATED**

Two alternatives were evaluated for the proposed arterials and collectors. The first alternative is a modified plan of the “grid system” fit to correspond with the new development and school infrastructure. The second alternative is similar to the grid system but the alignments are curvilinear and respond to the existing terrain. Both alternatives have a north/south minor arterial street approximately midway in the undeveloped area within the study limits. This proposed minor arterial street is to be called 20<sup>th</sup> Avenue South for purposes of this report.

## **ALTERNATIVE #1**

Alternative #1 is shown on graphic sheet A3 and represents a modification of the “grid system.” A minor arterial is shown along the section line between Zehms and Mt Vernon Development Group, LLC properties. This arterial may be shifted either east or west as needed to accommodate development. Though it does not follow existing ridge lines of the natural ground, the centerline profile does not appear to be too extreme for construction, as shown on graphic sheet A7. Advantages and disadvantages to this street network are listed below:

### **Advantages**

- Less complicated to organize and stage construction between multiple property owners.
- A better fit with the existing Traditional Zoning.

### **Disadvantages**

- Straight connection may promote increased speeds.
- Does not support tee intersections.
- More difficult to implement storm water management.
- Modern development practices desire more appealing curvilinear streets.

## **ALTERNATIVE #2**

Alternative #2 is shown on graphic sheet A4 and represents a curvilinear alignment which follows the existing terrain. The main arterial is shown winding along the section line between Zehms and Mt Vernon Development Group, LLC properties. This arterial may be shifted either east or west as needed to accommodate development. Advantages and disadvantages to this street network are listed below:

### **Advantages**

- One advantage of Alternative #2 is a curvilinear alignment promotes traffic calming and reduced speeds.
- Tee intersections are safer than four-way intersections.
- Better implementation of storm water management.
- Follows the existing terrain for a more aesthetically appealing street.

### **Disadvantages**

- Organizing and staging of construction may be more difficult between the multiple property owners.

**RECOMMENDED HYBRID ALTERNATIVE**

The recommended alignment is a hybrid of both alternatives and is shown on graphic sheet A5. This alignment is shown as straight north from Palisades Road similar to Alternative #1 and then becomes curvilinear midway, similar to Alternative #2. The advantages of this alignment are it can be constructed with development of future Stonebridge Additions and incorporates all the other advantages of Alternative #2. Arterial streets at Irish Lane and Bryant Road are also shown for consideration for a future arterial network.

**Connection to Highway 30**

A meeting was held with Iowa DOT representatives to discuss the possible connection of the proposed minor arterial with Highway 30. The Iowa DOT provided the current concept for the Highway 30 Bypass south of Mt Vernon. This is shown on graphic sheet A6. The Iowa DOT representatives were open to the idea of a connection of the proposed minor arterial street to existing Highway 30. The street would need to be built like a true minor arterial street per the recommendations included in this report for Iowa DOT to consider the connection. Additional study and coordination with the Iowa DOT will be needed.

As shown, a future connection of the major arterial to Highway 30 would be achievable only by acquisition of the house at 1804 Palisades Road. The connection may be delayed until property becomes available for purchase. Until this connection is made, traffic would use Palisades Road to the Willow Creek Road connection which is an adequate route. It is recommended the City begin studying and planning the connection to Highway 30 at this time. This will be a vital link which can alleviate the traffic using the less desirable 10<sup>th</sup> Avenue South connection.

**East/West Extension at School Property**

In the past, school and City officials have discussed the possibility of constructing an east/west extension north of the high school through Cornell College and the Mount Vernon Community School properties from the Stonebrook subdivision to 7<sup>th</sup> Avenue South. No east/west connection is recommended at this time. Intrusion of public access into a school site is not compatible with school function and safety.

This extension should be constructed and financed at the school districts’ discretion. This road may be gated depending on the service needed. It is recommended that a 60-foot right-of-way be dedicated with the future Stonebrook subdivision to accommodate an access for this entrance or street off 13<sup>th</sup> Avenue South. The location

of this right-of-way dedication shall be negotiated in the future with the Preliminary Plat submittal.

**Traffic Forecast**

An estimate of the forecasted traffic for the proposed arterial street was completed assuming the following conditions:

- 235 Acres of undeveloped land developed at 2.5 units per acre with 10 trips per unit.
- 100 Acres of existing residential at 2.5 units per acre with 10 trips per unit.
- 40% will be going north with 60% going south on proposed arterial street.
- 25% of traffic on 1<sup>st</sup> Street will use proposed arterial street.
- 5% of traffic on Highway 30 will use proposed arterial street.
- Total school trip generation is 900 vpd with 30% using proposed arterial street.
- College will generate 500 vpd using proposed arterial street.

<b>Forecasted Average Daily Traffic</b>	
<b>Traffic Source</b>	<b>Amount (vpd)</b>
Existing residential	1,500
Proposed residential	3,500
1 <sup>st</sup> Street	1,000
Highway 30	500
Schools & College	800
<b>Total</b>	<b>7,300</b>

Note: 2.5 units per acre for future land use is conservative compared to the 2.2 units per acre in the existing Stonebrook additions. If a higher density of up to 4.0 units per acre is developed, this results in a total ADT of 8,600 vpd which is 80% of the capacity of a minor arterial constructed as recommended in this report.

**Arterial Street Design Recommendations**

It is recommended the arterial street to be named South 20<sup>th</sup> Avenue be designed at minimum per the Iowa Statewide Urban Design and Specifications for a minor arterial. The follow are some recommended design criteria:

- Design speed of at least 35 mph with posted speed of 30 mph (final posted speed to be determined by the jurisdiction).
- Right-of-way width minimum of 80-feet.
- 31-foot wide, 2-lane street with left turn lanes at collector intersections only.
- No direct residential driveway access (i.e., no driveways to back onto arterial).
- No parking allowed.
- Consideration of 10-foot bikeway on one side with a minimum 4-foot sidewalk on the other.

**Collector Tee Intersections**

The “collector tee” intersections are recommended at all major intersections along the arterial street in lieu of the standard four-way intersection. Tee intersections, by their nature, have a simplified traffic operation by limiting the number of opposing traffic conflicts when compared with a conventional four-way intersection. As a result, the intersection is safer and the prospect for future traffic signalization is diminished. The proper balance between property access and roadway capacity is also preserved.

A proposed “collector tee” intersection plan is shown on graphic sheet A8. This plan shows each leg of the intersection to be divided with a median and short left-turn lane. The configuration provides a pedestrian refuge area for the two approaches intended for pedestrian crossing activity. The traffic calming and aesthetic elements of this plan are definite strengths. Truck turning provisions have also been made for all approaches.

**Bikeway and Sidewalk**

It is recommended that a 10-foot bikeway be considered on the one side of the arterial street with a 4-foot sidewalk on the opposite side. The bikeway will provide a neighborhood connectivity and accessibility. This bikeway may be eventually combined with the proposed Palisades Trail and connect to Bryant Park and the school.

If the developer can generate interest from the westerly property owner, it may be possible to construct the arterial along the section line splitting the cost between the two. It is not recommended for the City to condemn or assess costs to the westerly property if development is not being considered at this time.

The section of the arterial to be constructed through Neff/Prichard property is a key segment to complete the arterial network. The City and property owner will need future cooperation to accomplish how and when this segment is constructed.

**EXISTING STREET IMPROVEMENTS**

There is a need to improve some key existing streets to implement the proposed arterial and collector street system. The following table depicts the typical volume thresholds for various streets, widths are based upon SUDAS Design standards.

Street	Width	Additional Notes	Capacity (vpd)
Minor Arterial	31-ft.	No direct driveway access	10,000 – 12,000
Collector	28-ft. to 31-ft.	Parking & driveways allowed	7,000 – 9,000
Local	28-ft.	Parking & driveways allowed	5,000 – 8,000

**Bryant Road**

Bryant Road from 1<sup>st</sup> Street to the arterial connection will be considered a minor arterial and will need to be widened to a minimum of 31-feet. A “collector tee” intersection is recommended at Bryant and the proposed arterial. The intersection with 1<sup>st</sup> Street and 10th Avenue South will need to be reconstructed with possibly a realignment of the streets. This will be a major project for Mount Vernon and should be planned and programmed accordingly.

**CONSTRUCTION STAGING AND FINANCING**

Construction of the arterial street should begin with the next phase of the Stonebrook subdivision. It is recommended the developer/property owner incorporate the general location of the arterial as shown on the recommended hybrid alternative and entirely fund the arterial as part of his overall plan. A new connection to Palisades Road is recommended for the initial phase with completion of a new internal “loop” from Highway 30 to Bryant Road as the primary objective. The developer has voiced concern regarding how to construct houses with no direct driveway access to the arterial. An example of a possible lot layouts and driveway construction is shown on graphic sheet A9.

This arterial may be constructed in stages as needed but should be done prior to any other final platting of the property. A new preliminary plat for the area would be required and a phasing plan may be necessary to ensure construction is completed as recommended. Citizens of Mt Vernon have voiced concern that a connection be made from 3<sup>rd</sup> Street South to 15<sup>th</sup> Avenue South to allow for an immediate connection from 10th Avenue South to Palisades Road. City leaders may allow construction of this section prior to completion the arterial.



Bryant Road just west of 1<sup>st</sup> Street

### 10th Avenue South

Once the arterial street is complete to Bryant Road and Bryant Road has been improved, the traffic should decrease on 10th Avenue South. Though, there will be a temporary situation where the arterial is constructed to 3<sup>rd</sup> Street South and traffic would increase on 10th Avenue South from 1<sup>st</sup> Street to 3<sup>rd</sup> Street South until the final stage of the arterial street is complete. Due to the current amount of traffic and to handle the temporary additional traffic, it is recommended that 10<sup>th</sup> Avenue South be widened to a minimum of 28-feet between 1<sup>st</sup> Street and Summit Avenue. This widening with no parking should accommodate the future use of this critical connection for the community.



10th Avenue South

### Palisades Road

Palisades Road will have increased traffic from Willow Creek Road to 10th Avenue South as a result of development and construction of the arterial street. The existing pavement width with no parking is sufficient to handle the increased traffic though resurfacing and curb and gutter improvements are recommended.



Palisades Road Looking East

### OBSTACLES TO OVERCOME

The following are some obstacles to overcome to implement the proposed LRTP:

#### **Zoned Traditional Residential**

The arterial street with collector tees and no driveway access does not fit into the Traditional Zoning requirements. Also, in order for development to be cost effective along the arterial street, rezoning may need to be considered. When performing the traffic forecast, 2.5 units per acre for future land use is purposely higher than existing Stonebrook additions (approximately 2.2 units per acre) to be conservative. If a higher density of up to 4.0 units per acre is implemented, this results in a total average daily traffic load of 8,600 vpd which is 80% of the capacity of a minor arterial constructed as recommended in this report.

#### **Cooperation Between Property Owners and City**

The final segment of the arterial will be constructed through Richard Shirley Hertz Farm Management property. This is a key segment to complete the arterial network. The City and property owner will need to cooperate to determine how and when this is constructed.

### **No Driveway Access Along Arterial Street**

It may be difficult to develop along the proposed arterial street using similar lot layout and construction done in other Stonebrook Additions. The developer and their Engineer will need to be creative in how best to lay out the lots while not allowing driveways to back onto the arterial street. A few examples of possible development are shown on graphic sheet A9 for the developer's reference. These examples include development of townhouses with a frontage drive, bulbouts serving multiple lots, shared driveways with ability to turnaround, and others.

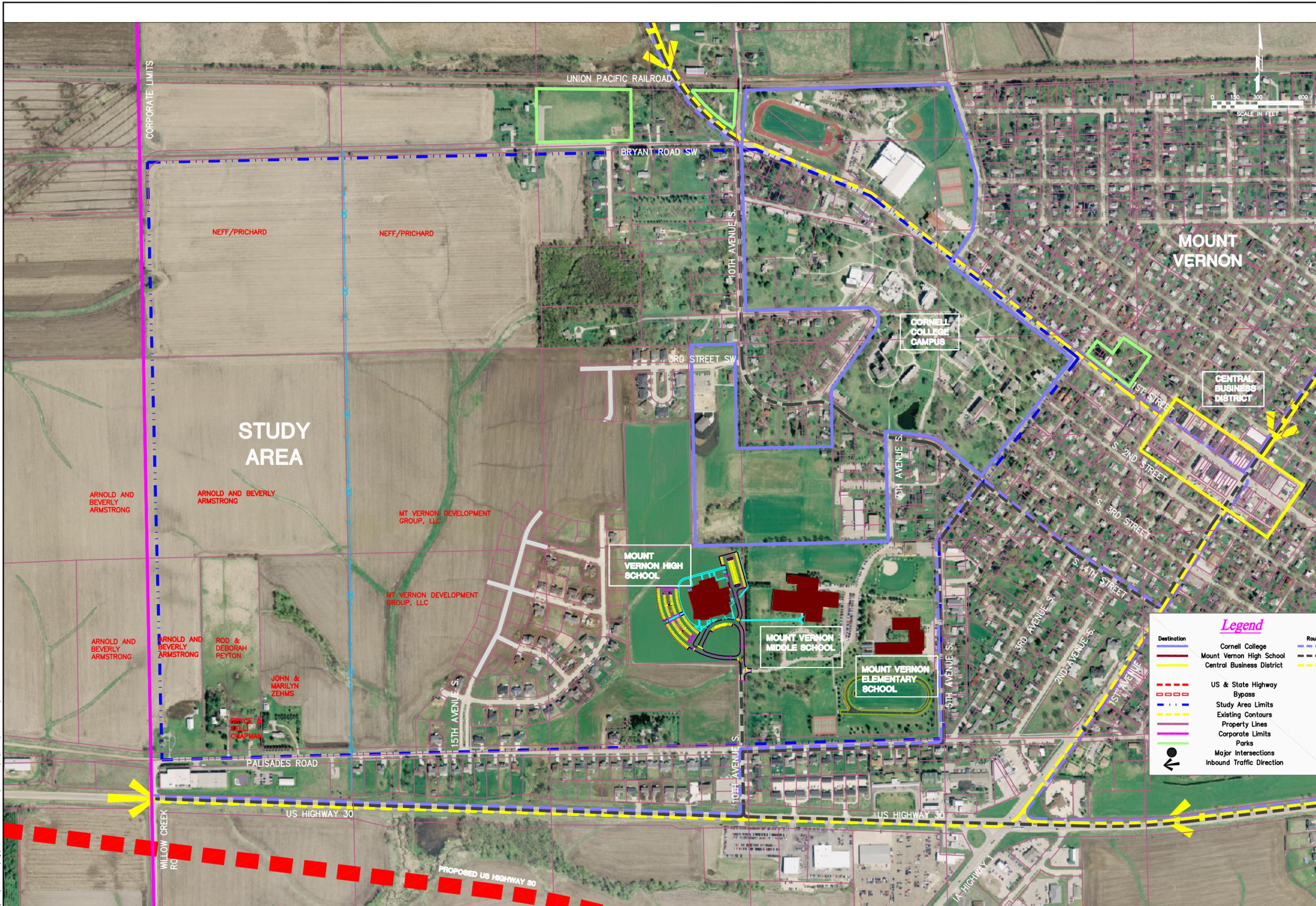
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A9	Hybrid Alternative Plan and Profile
A10	Examples of Driveway Access Along Arterial Street
A11	Collector Tee Intersection

### **IMPLEMENTATION STRATEGY**

Listed below are the steps envisioned for implementation of the report recommendations. This strategy involves a hands-on approach to completing the West Side LRTP and responding to initiatives for future development:

- Presentation of the Final Report by Council.
- Adoption of the West Side LRTP Report.
- Subsequent meetings for City staff and developers / property owners to create an awareness of the plan provisions.
- Submittal of a revised preliminary plat by the developer for the Stonebrook Additions which address items recommended in this report.
- Potential rezoning in the area around the proposed arterial street.



**WEST SIDE LONG RANGE  
 TRANSPORTATION PLAN**  
 MOUNT VERNON, IOWA  
 CITY OF MOUNT VERNON

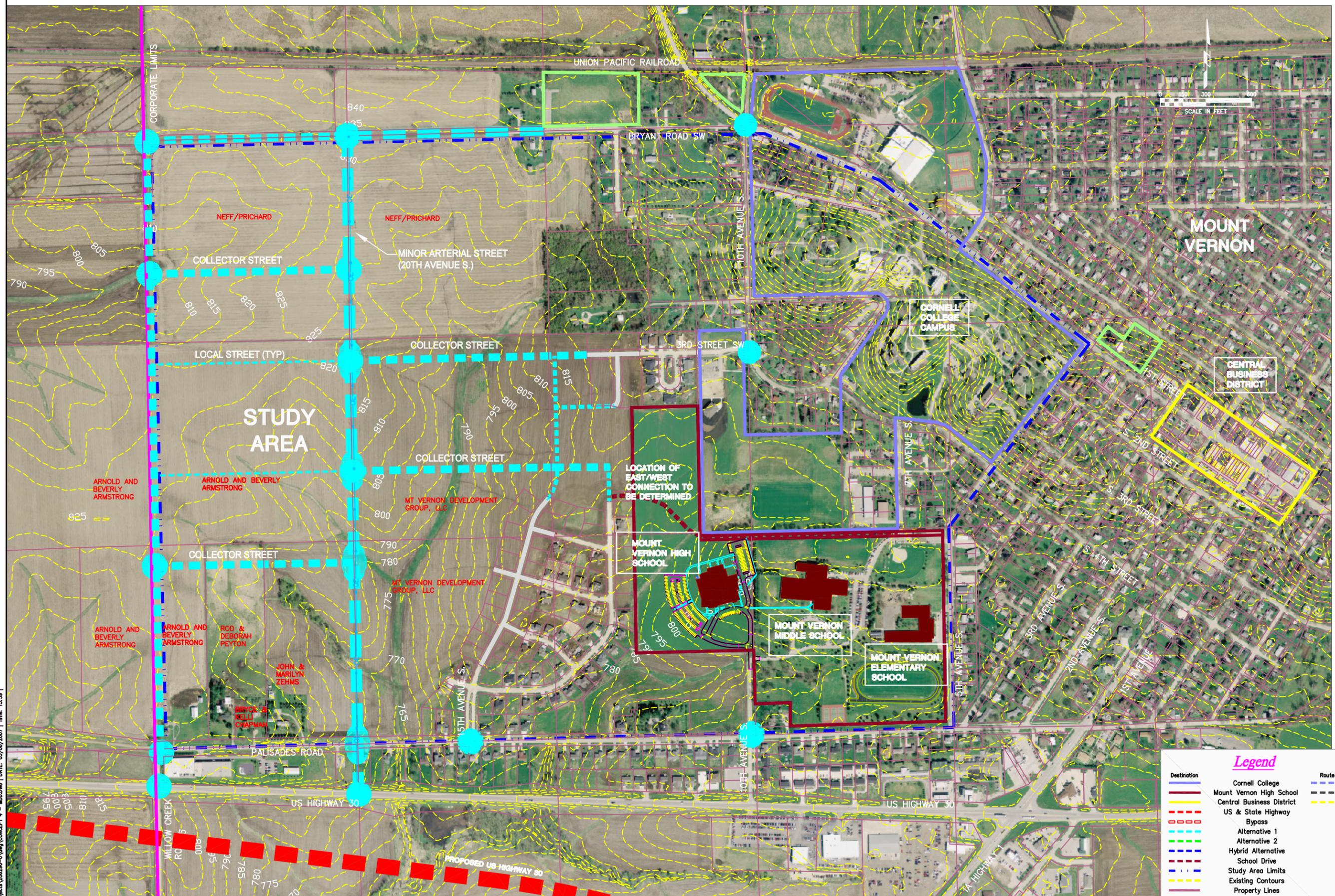
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SHEET NAME  
**DESTINATION  
 PLAN  
 MAP**  
 PROJECT NO. 206290-0  
 SHEET NO.  
**A1**



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**Legend**

	Destination		Route
	Cornell College		Route
	Mount Vernon High School		Route
	Central Business District		Route
	US & State Highway		Route
	Bypass		Route
	Alternative 1		Route
	Alternative 2		Route
	Hybrid Alternative		Route
	School Drive		Route
	Study Area Limits		Route
	Existing Contours		Route
	Property Lines		Route
	Corporate Limits		Route
	Parks		Route
	Major Intersections		Route
	Collector Tee Intersections		Route

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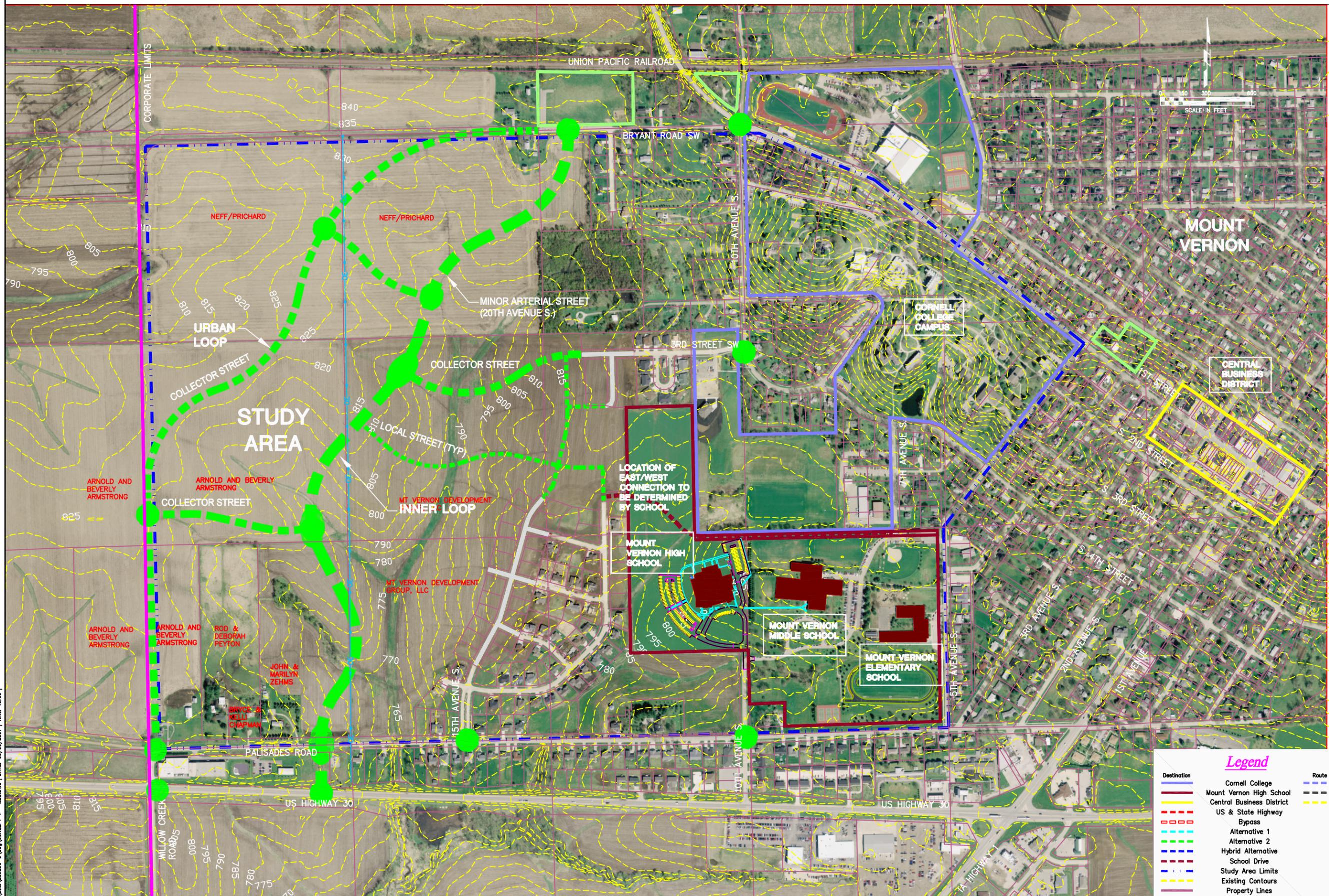
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SHEET NAME  
**ALTERNATIVE 1  
 ROADWAY  
 SYSTEM  
 LAYOUT**

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 SHEET NO.  
**A3**



**Legend**

	Destination		Route
	Cornell College		Central Business District
	Mount Vernon High School		US & State Highway
	Central Business District		Bypass
	US & State Highway		Alternative 1
	Bypass		Alternative 2
	Alternative 1		Hybrid Alternative
	Alternative 2		School Drive
	Hybrid Alternative		Study Area Limits
	School Drive		Existing Contours
	Study Area Limits		Property Lines
	Existing Contours		Corporate Limits
	Property Lines		Parks
	Corporate Limits		Major Intersections
	Parks		Collector Tee Intersections
	Major Intersections		
	Collector Tee Intersections		

**WEST SIDE LONG RANGE  
 TRANSPORTATION PLAN**  
 MOUNT VERNON, IOWA  
 CITY OF MOUNT VERNON

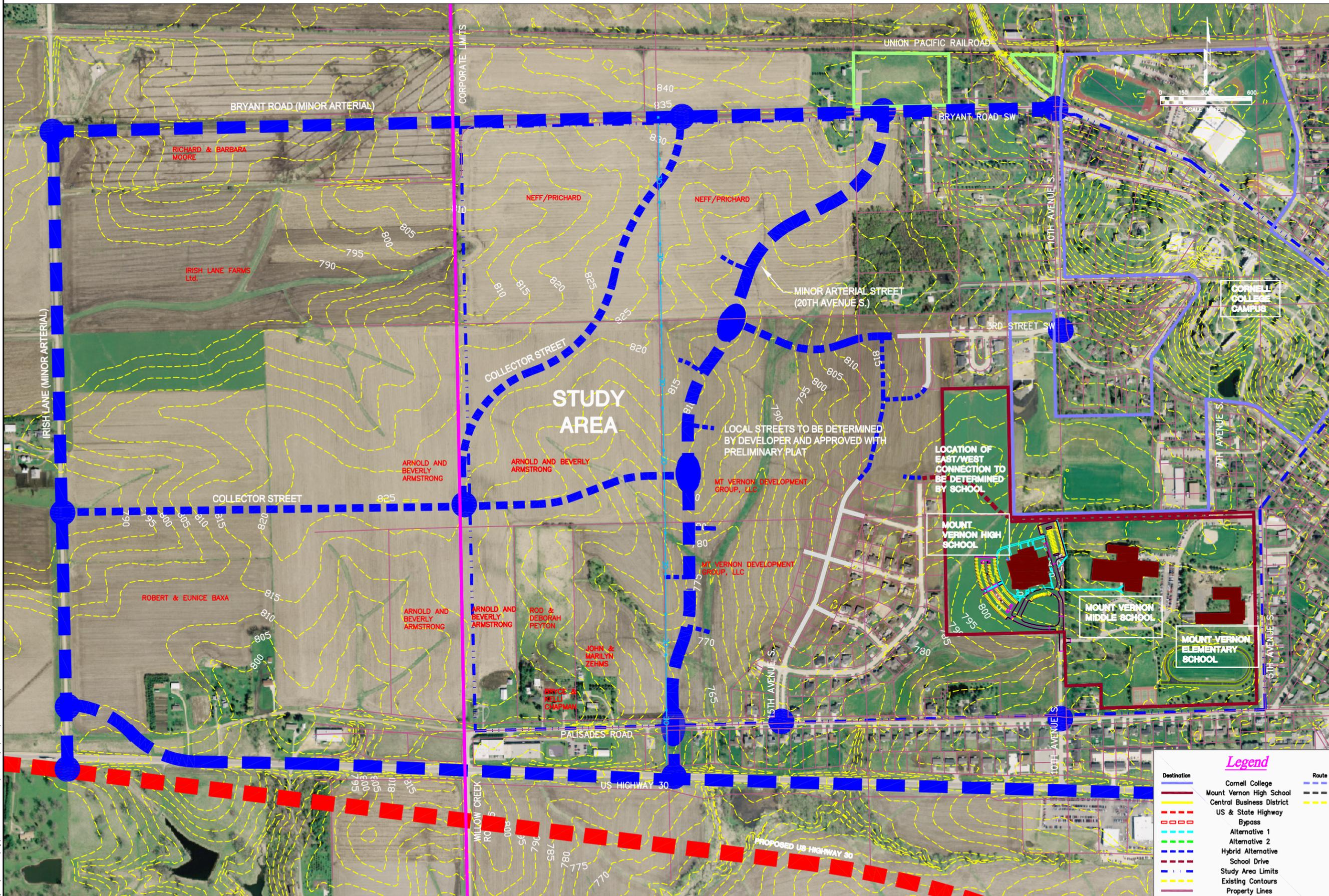
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SHEET NAME  
**ALTERNATIVE 2  
 ROADWAY  
 SYSTEM  
 LAYOUT**

PROJECT NO. 206290-0  
 SHEET NO. **A4**

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**Legend**

	Destination		Route
	Cornell College		Route
	Mount Vernon High School		Route
	Central Business District		Route
	US & State Highway		Route
	Bypass		Route
	Alternative 1		Route
	Alternative 2		Route
	Hybrid Alternative		Route
	School Drive		Route
	Study Area Limits		Route
	Existing Contours		Route
	Property Lines		Route
	Corporate Limits		Route
	Parks		Route
	Major Intersections		Route
	Collector Tee Intersections		Route

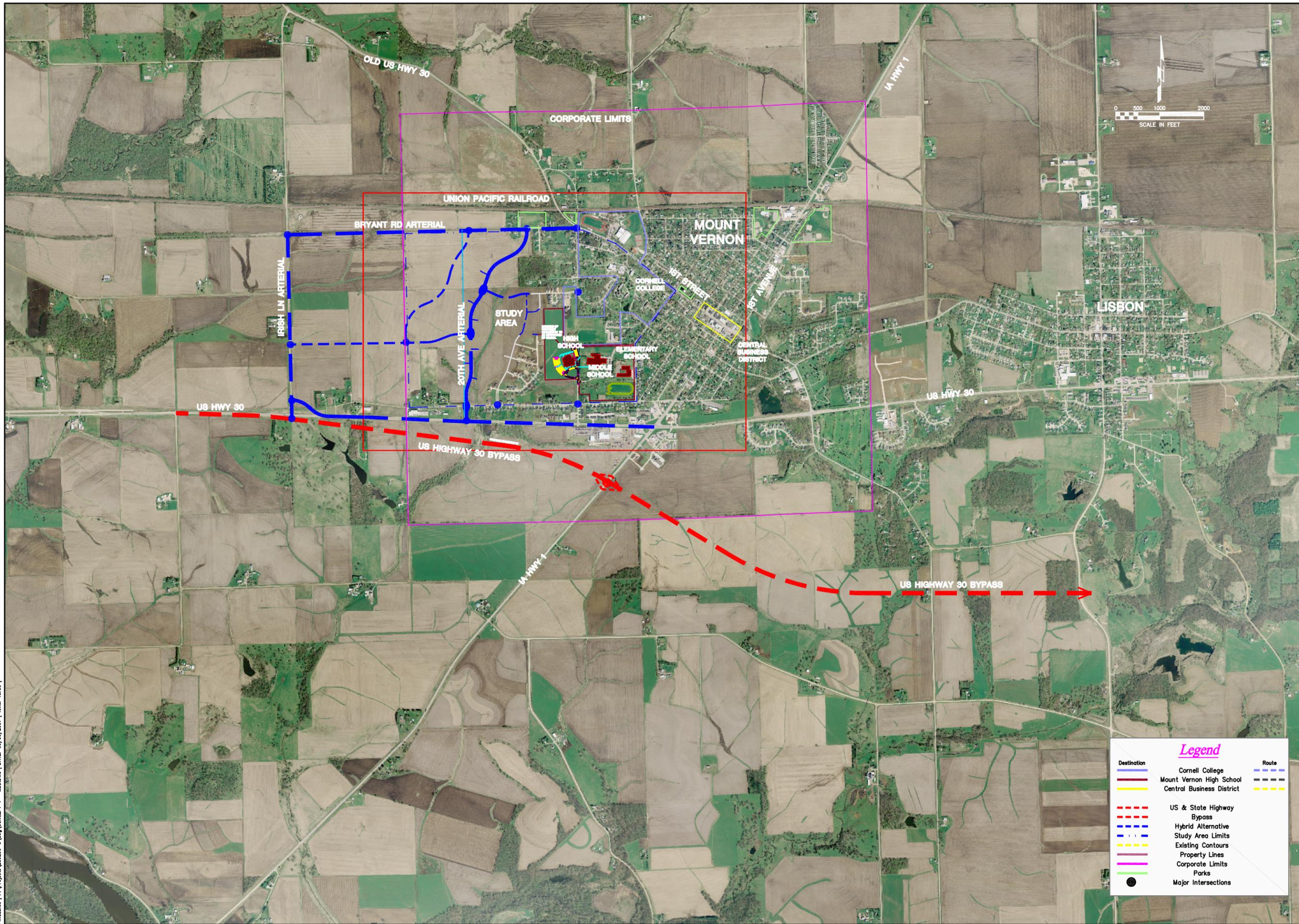
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SHEET NAME  
**HYBRID ALTERNATIVE ROADWAY SYSTEM LAYOUT**  
 PROJECT NO. 206290-0  
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**A5**

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**Legend**

	US & State Highway Bypass		Route
	Hybrid Alternative Study Area Limits		Route
	Existing Contours		Major Intersections
	Property Lines		
	Corporate Limits		
	Parks		
	Major Intersections		

**WEST SIDE LONG RANGE TRANSPORTATION PLAN**  
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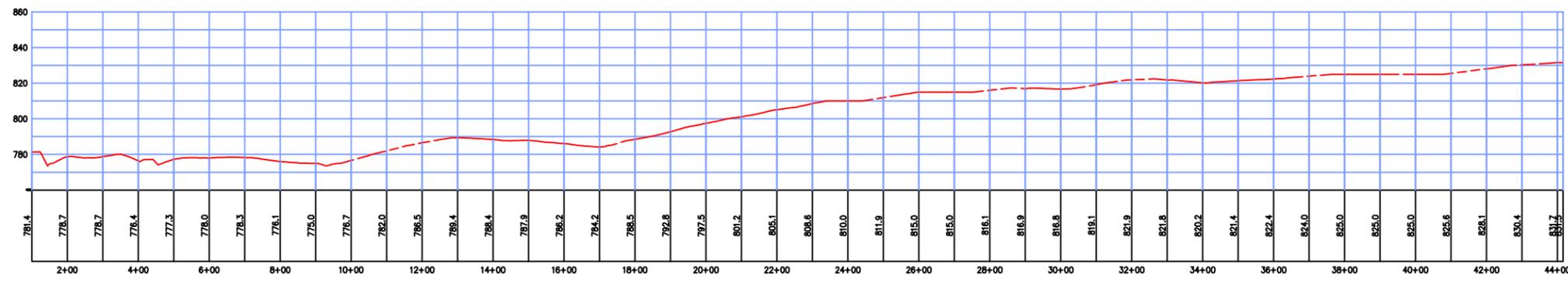
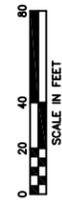
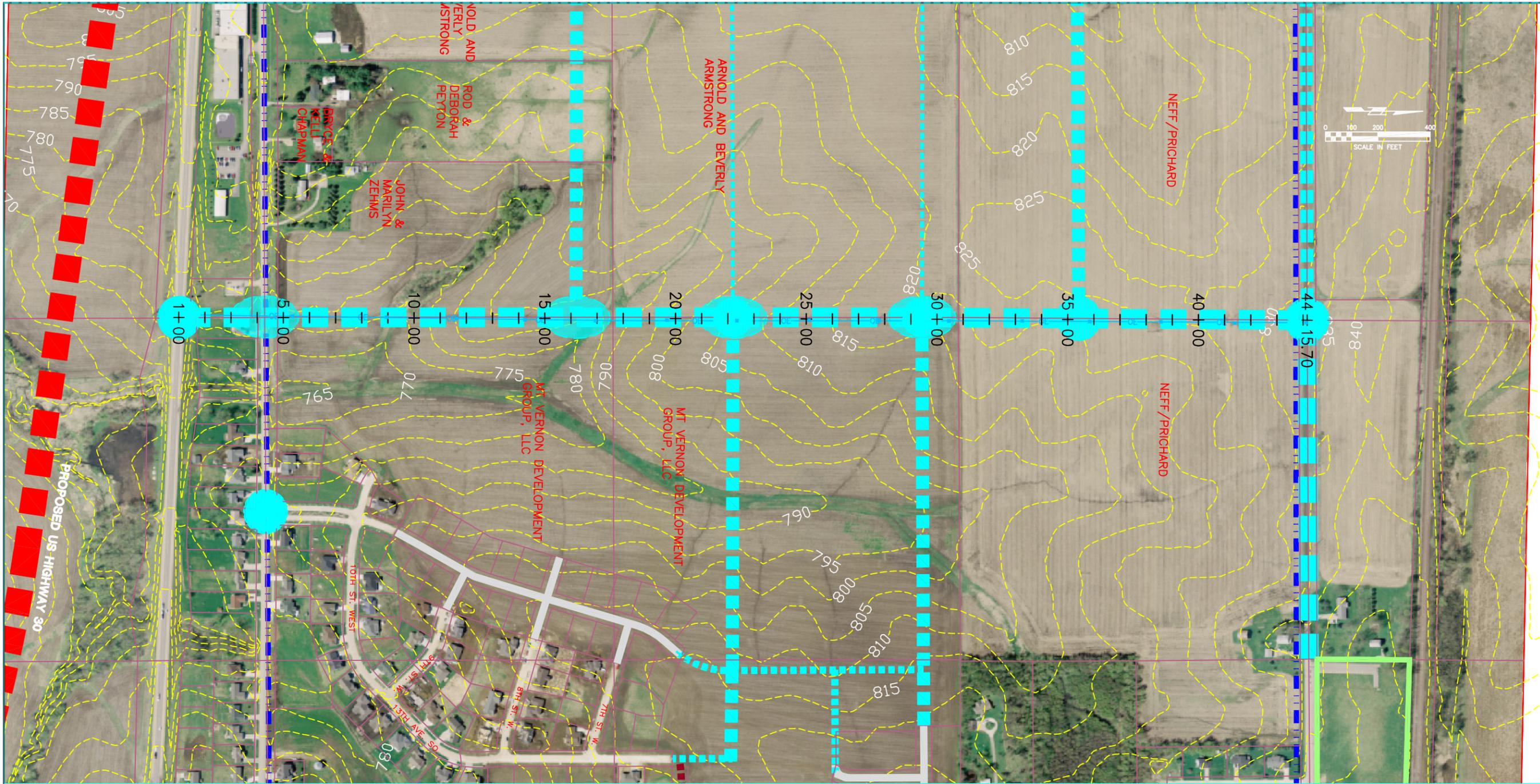
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**OVERALL TRANSPORTATION SYSTEM LAYOUT**

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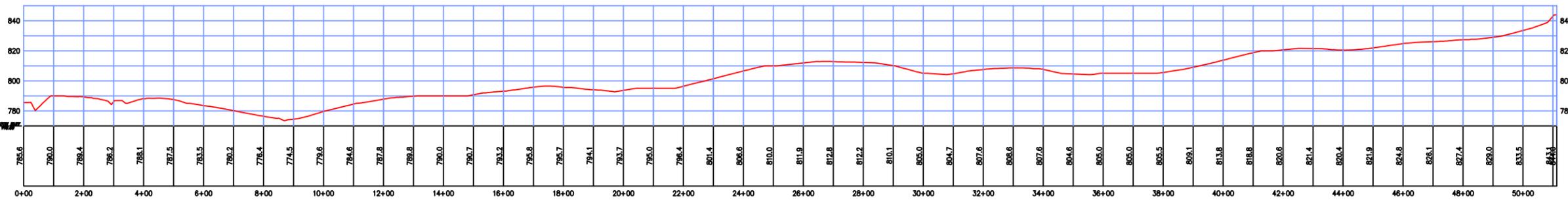
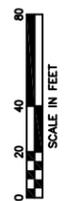
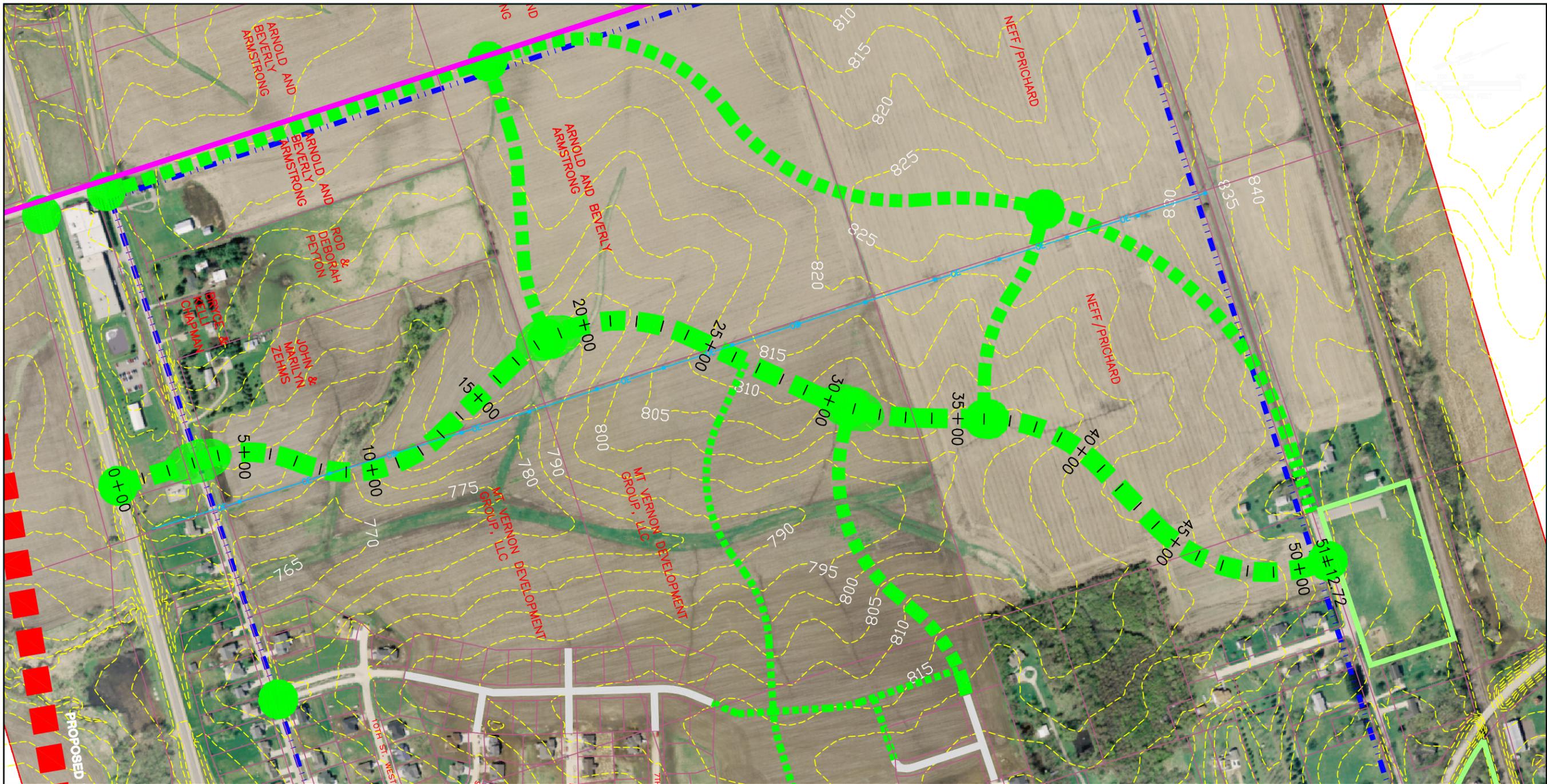

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PROFILE**

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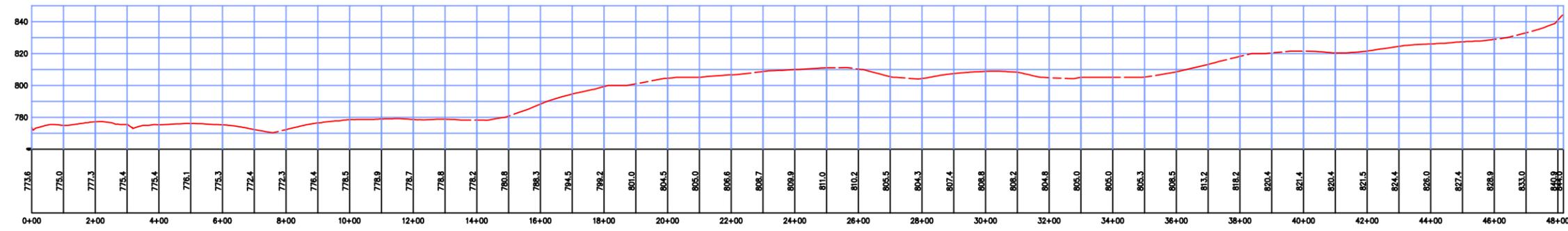
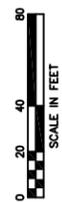
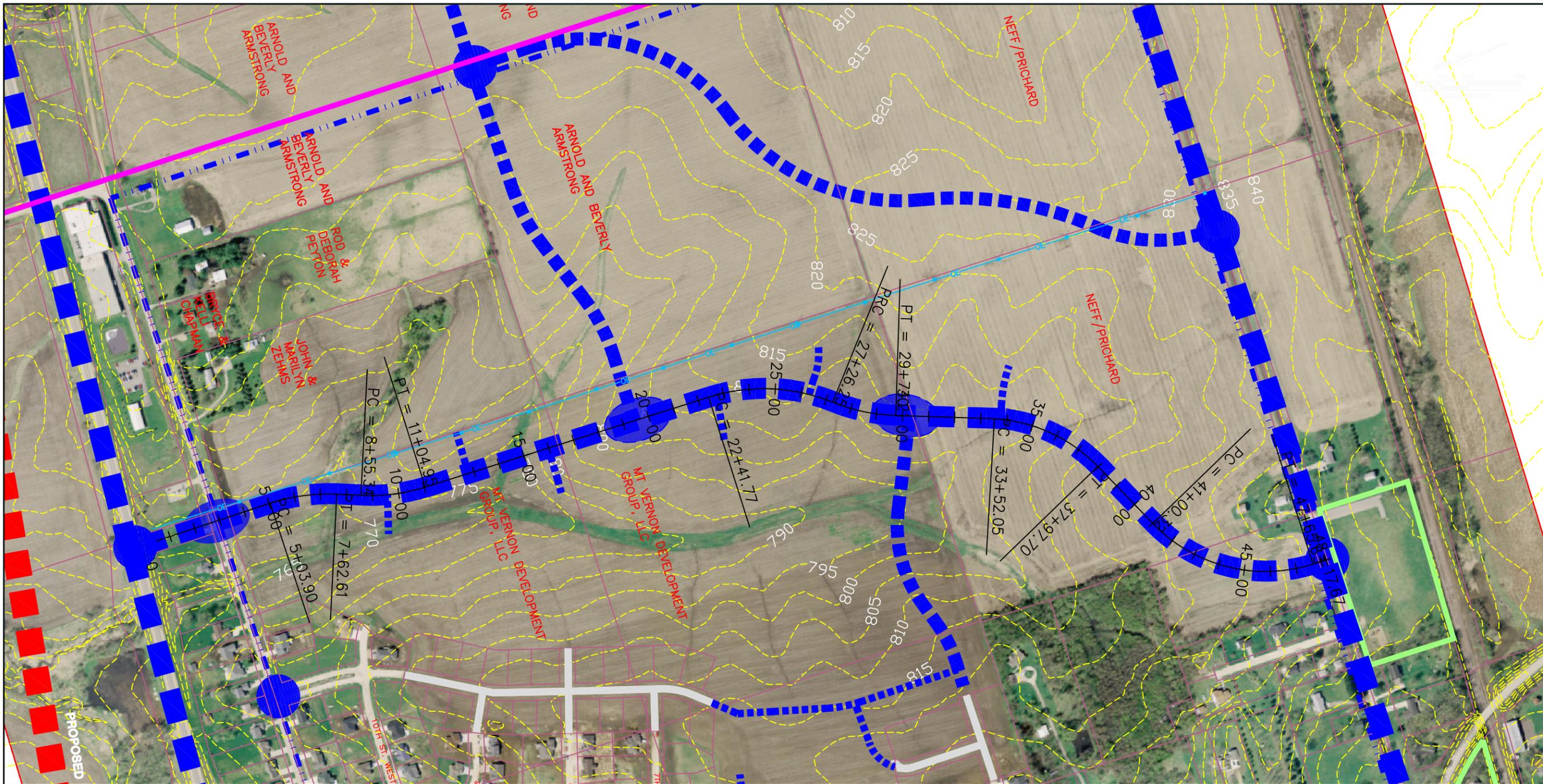

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REVISIONS

NO.	DATE	DESCRIPTION

DRAWN JHC  
 APPROVED  
 ISSUED FOR FINAL REPORT  
 DATE 3/8/07  
 FIELD BOOK

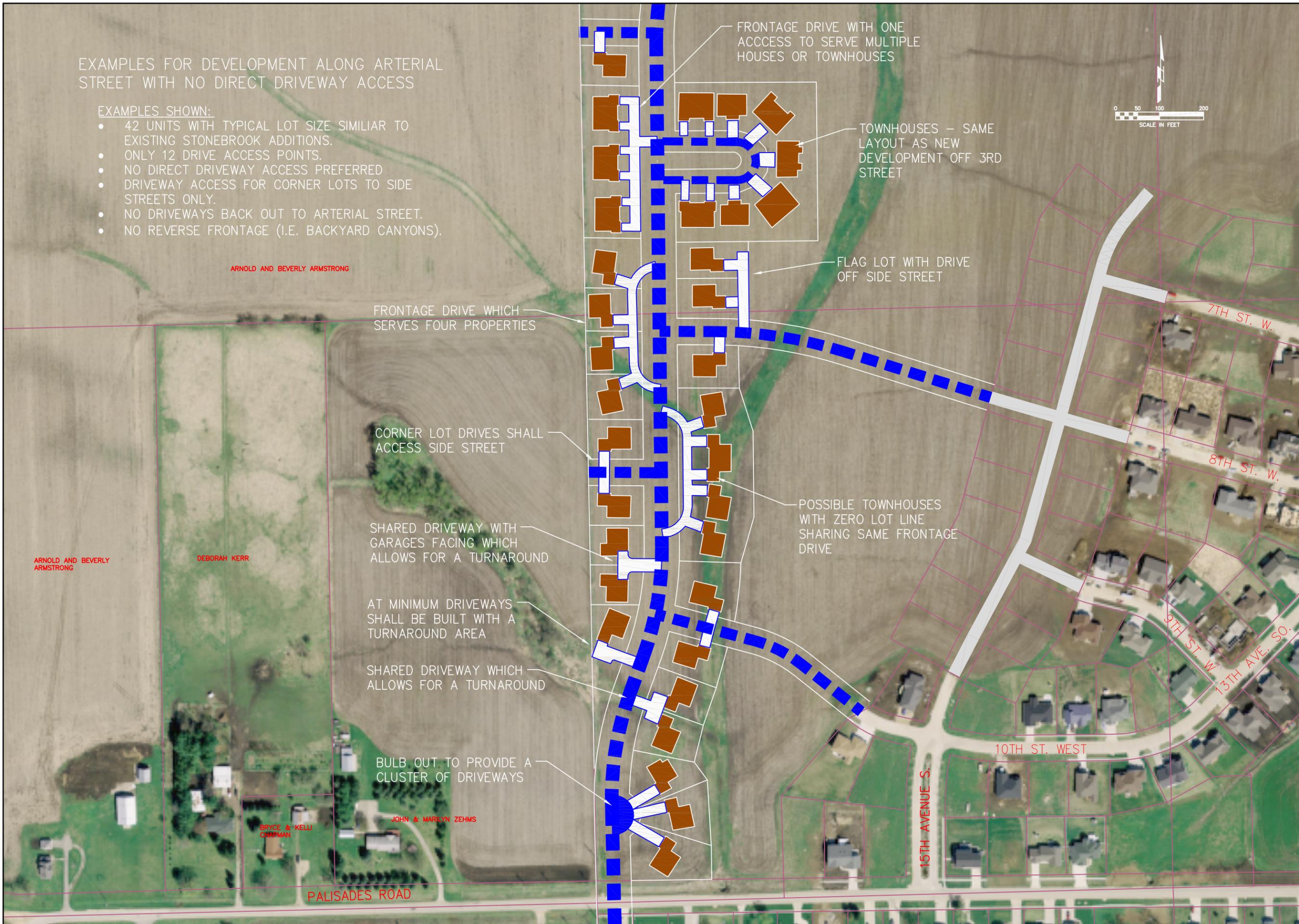
SHEET NAME  
**HYBRID  
 ALTERNATIVE  
 PLAN AND  
 PROFILE**

PROJECT NO. 206290-0  
 SHEET NO.

EXAMPLES FOR DEVELOPMENT ALONG ARTERIAL STREET WITH NO DIRECT DRIVEWAY ACCESS

EXAMPLES SHOWN:

- 42 UNITS WITH TYPICAL LOT SIZE SIMILIAR TO EXISTING STONEBROOK ADDITIONS.
- ONLY 12 DRIVE ACCESS POINTS.
- NO DIRECT DRIVEWAY ACCESS PREFERRED
- DRIVEWAY ACCESS FOR CORNER LOTS TO SIDE STREETS ONLY.
- NO DRIVEWAYS BACK OUT TO ARTERIAL STREET.
- NO REVERSE FRONTAGE (I.E. BACKYARD CANYONS).



**SHIVE-HATTERY**  
 Cedar Rapids, IA • Iowa City, IA • Des Moines, IA  
 Moline, IL • Bloomington, IL • Chicago, IL  
 SHIVE-HATTERY, INC. 201 THIRD AVENUE SE, SUITE 500, CEDAR RAPIDS, IOWA 52401  
 PHONE (319) 364-0227 FAX (319) 364-4251  
<http://www.shive-hattery.com>

**WEST SIDE LONG RANGE  
 TRANSPORTATION PLAN**  
 MOUNT VERNON, IOWA  
 CITY OF MOUNT VERNON

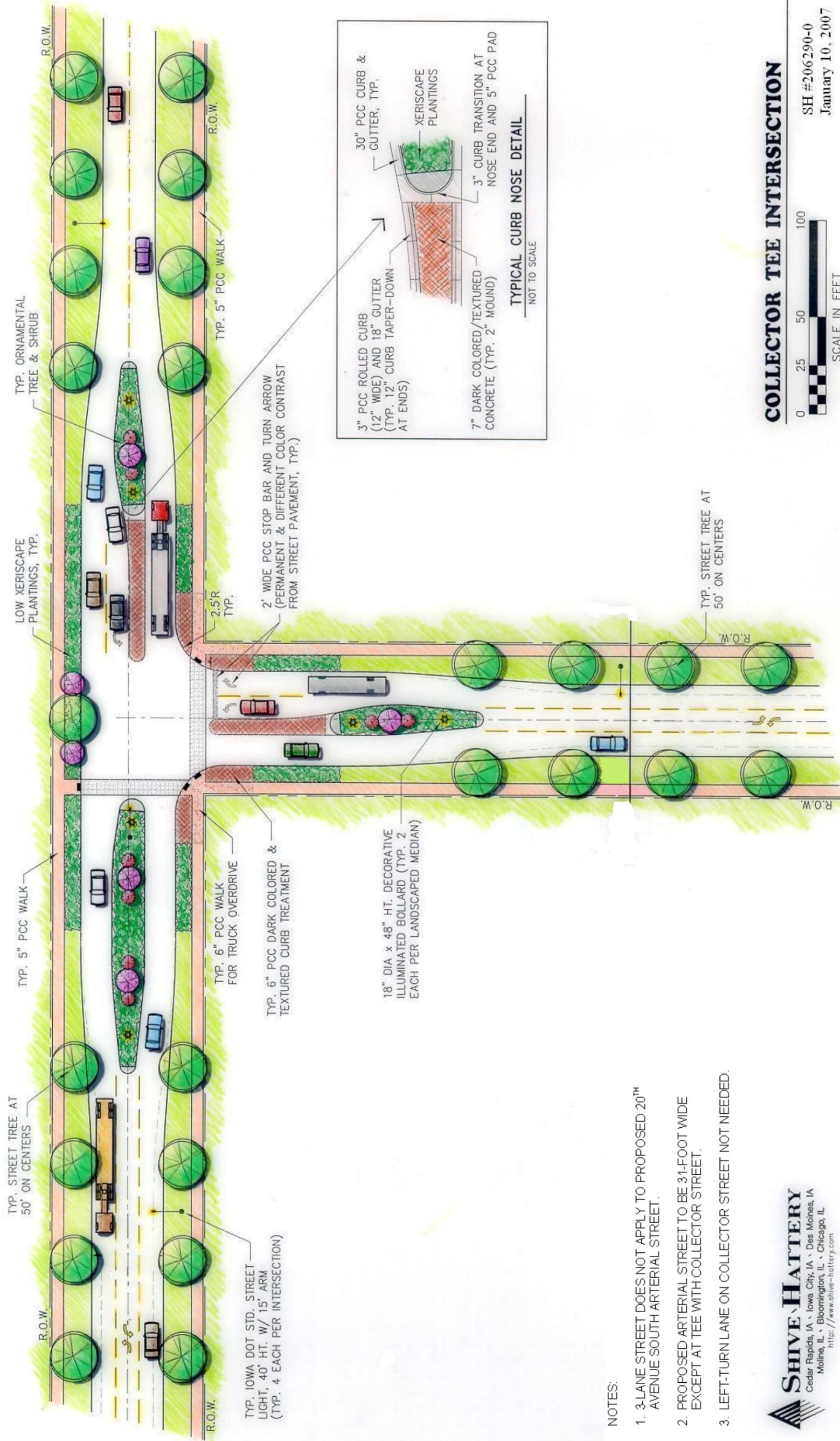
REVISIONS


DRAWN MDD  
 APPROVED  
 ISSUED FOR FINAL REPORT DATE 3/8/07  
 FIELD BOOK

SHEET NAME  
**EXAMPLES OF DRIVEWAY ACCESS ALONG ARTERIAL STREET**

PROJECT NO. 206290-0  
 SHEET NO. **A10**

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NOTES:

1. 3-LANE STREET DOES NOT APPLY TO PROPOSED 20<sup>TH</sup> AVENUE SOUTH ARTERIAL STREET.
2. PROPOSED ARTERIAL STREET TO BE 31-FOOT WIDE EXCEPT AT TEE WITH COLLECTOR STREET.
3. LEFT-TURN LANE ON COLLECTOR STREET NOT NEEDED.



**COLLECTOR TEE INTERSECTION**



SH #206290-0  
January 10, 2007