City of Treynor: Pedestrian Infrastructure

CLR Engineers

- Project Scope
- Design Alternatives
- Traffic Study
- Final Design
- Environmental Impacts
- Project Cost Estimate

Outline

1

Redesign Intersection and High School Crosswalk

2

Redesign Street Parking

3

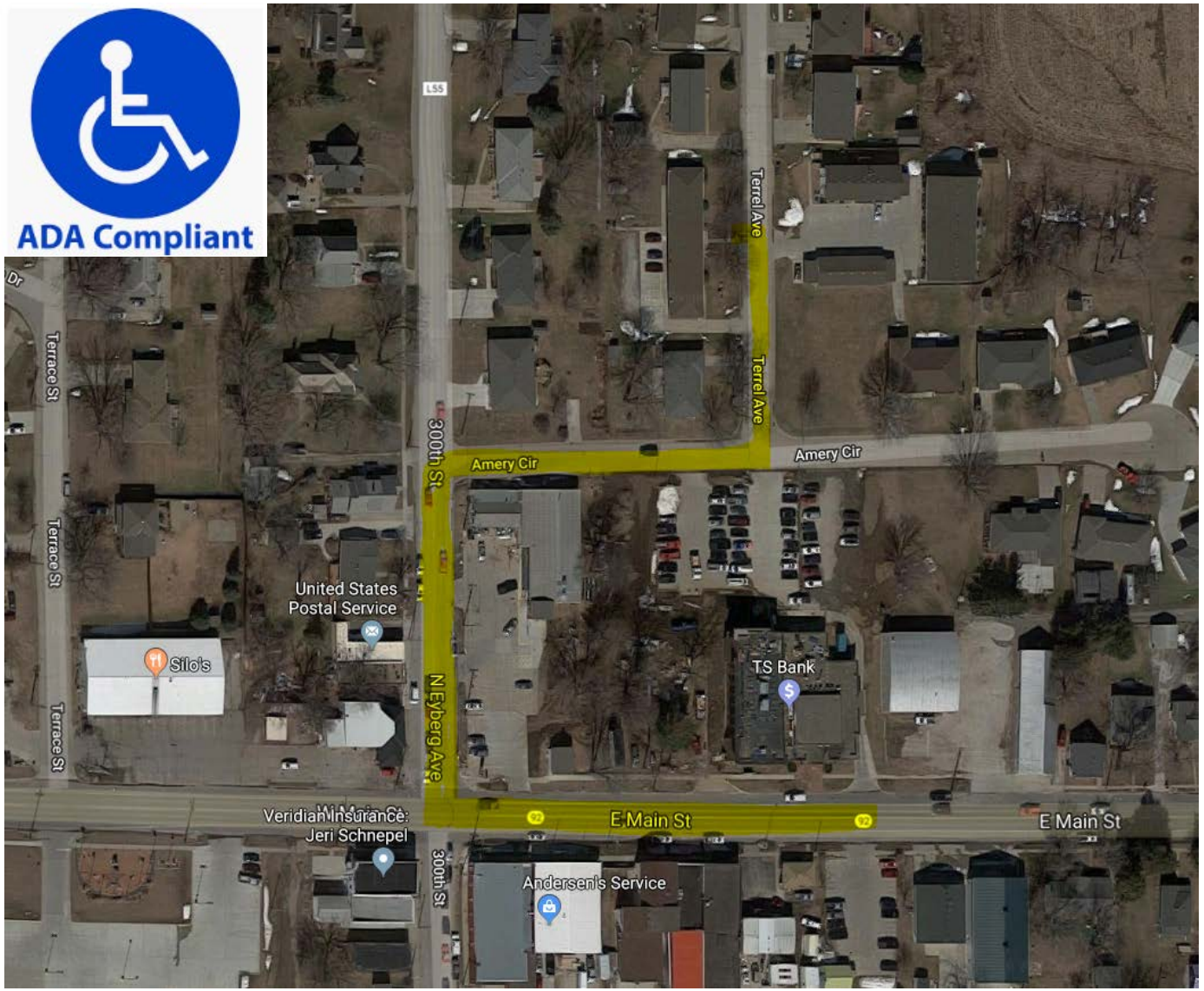
Improve Safety and Walkability

Scope of Work

1) Improve visibility for young drivers and prevent passing on road shoulder

2) Improve parking to help businesses thrive

3) Improve walkability for senior citizens



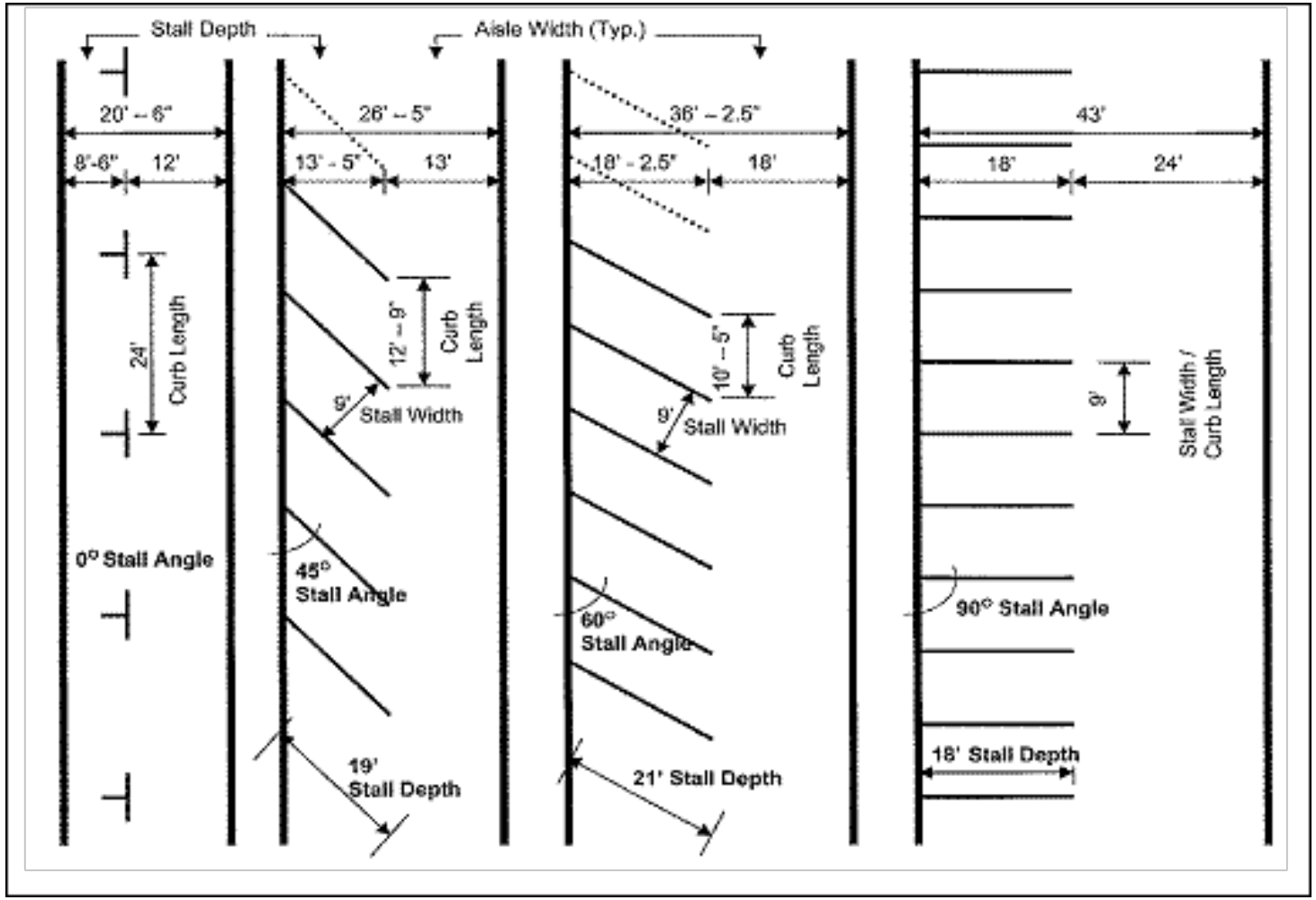
RETHINKING STREETS

Design Alternatives

Parking Locations and Alignment Options

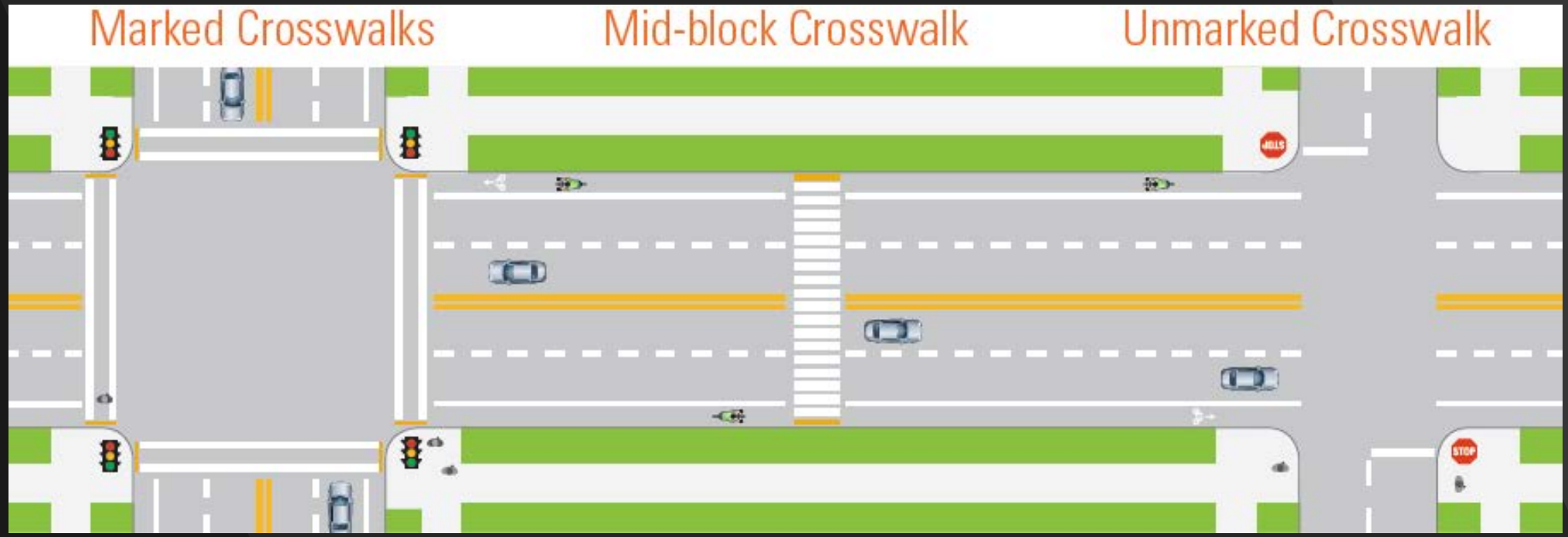
Narrow right of way

Parking Stall Angles



High School Crosswalk Orientation

High School Crosswalk Orientation



Traffic Study

Intersection of Route 92 and L-55

Traffic Study

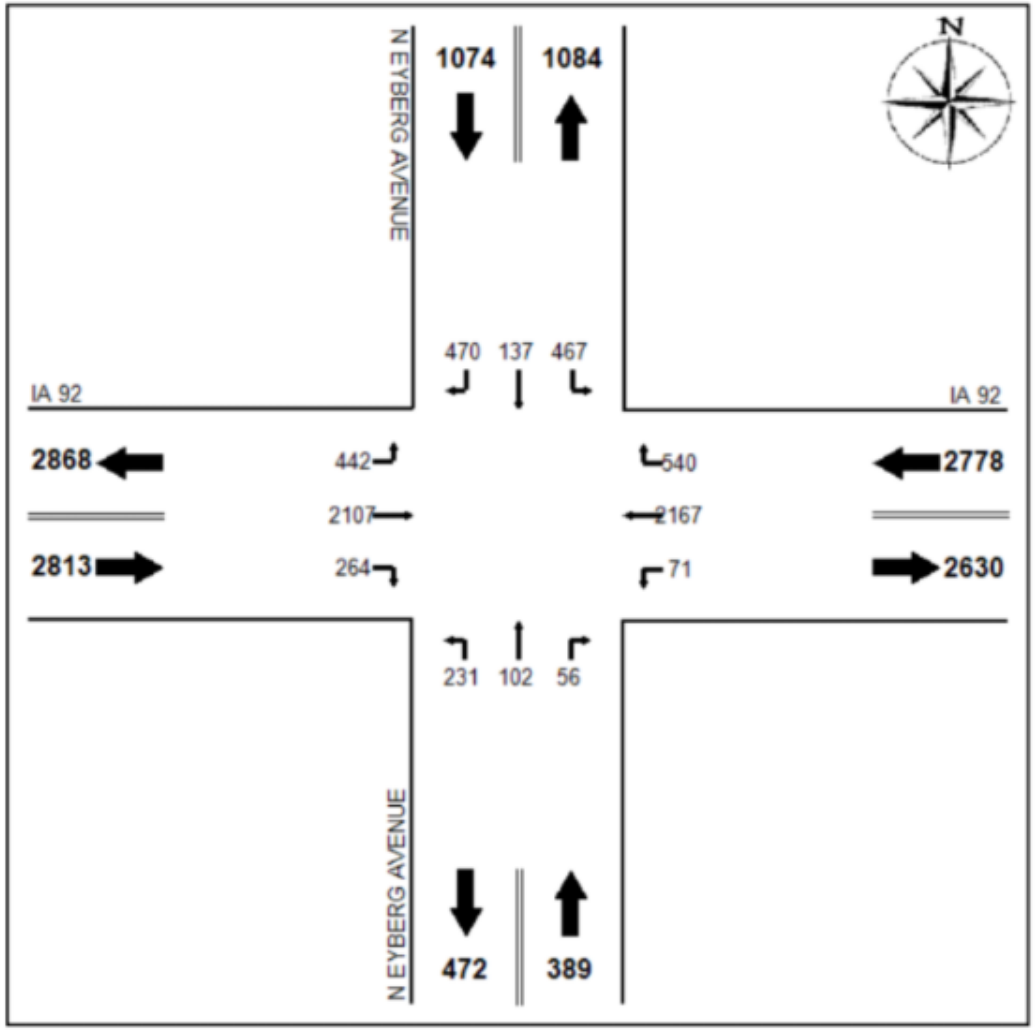


Figure 1. Annualized Daily Traffic for All Vehicles.

Existing Two-Way Stop versus Signalization


7 A.M.
Traffic Flows
in SYNCRO

Table 1. Existing Levels of Service

Existing Levels of Service with Current Population				
Time	Eastbound	Westbound	Northbound	Southbound
7 A.M.	A	A	B	B
8 A.M.	A	A	C	C
11 A.M.	A	A	B	B
12 P.M.	A	A	B	B
5 P.M.	A	A	B	C
6 P.M.	A	A	C	C
7 P.M.	A	A	C	C

Table 2. 10% Increased Traffic Volume Levels of Service

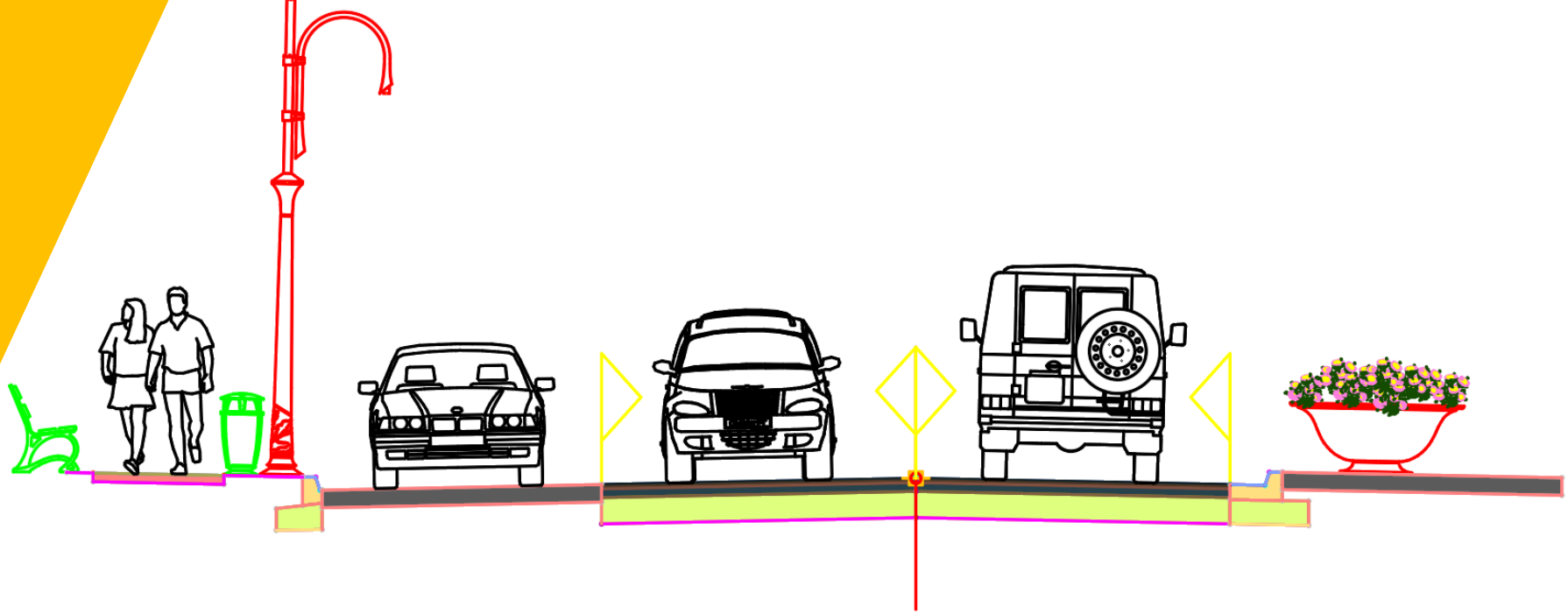
Existing Levels of Service with 10% Population Increase				
Time	Eastbound	Westbound	Northbound	Southbound
7 A.M.	A	A	B	C
8 A.M.	A	A	C	C
11 A.M.	A	A	B	B
12 P.M.	A	A	B	B
5 P.M.	A	A	C	C
6 P.M.	A	A	C	C
7 P.M.	A	A	C	C

Table 3. Level of Service Criteria

Level of Service	Average Control Delay (seconds/vehicle)	General Description
A	≤10	Free Flow
B	>10 – 20	Stable Flow (slight delays)
C	>20 – 35	Stable flow (acceptable delays)
D	>35 – 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55 – 80	Unstable flow (intolerable delay)
F[1]	>80	Forced flow (congested and queues fail to clear)

Source: *Highway Capacity Manual 2010*, Transportation Research Board, 2010.

1. If the volume-to-capacity (v/c) ratio for a lane group exceeds 1.0 LOS F is assigned to the individual lane group. LOS for overall approach or intersection is determined solely by the control delay.

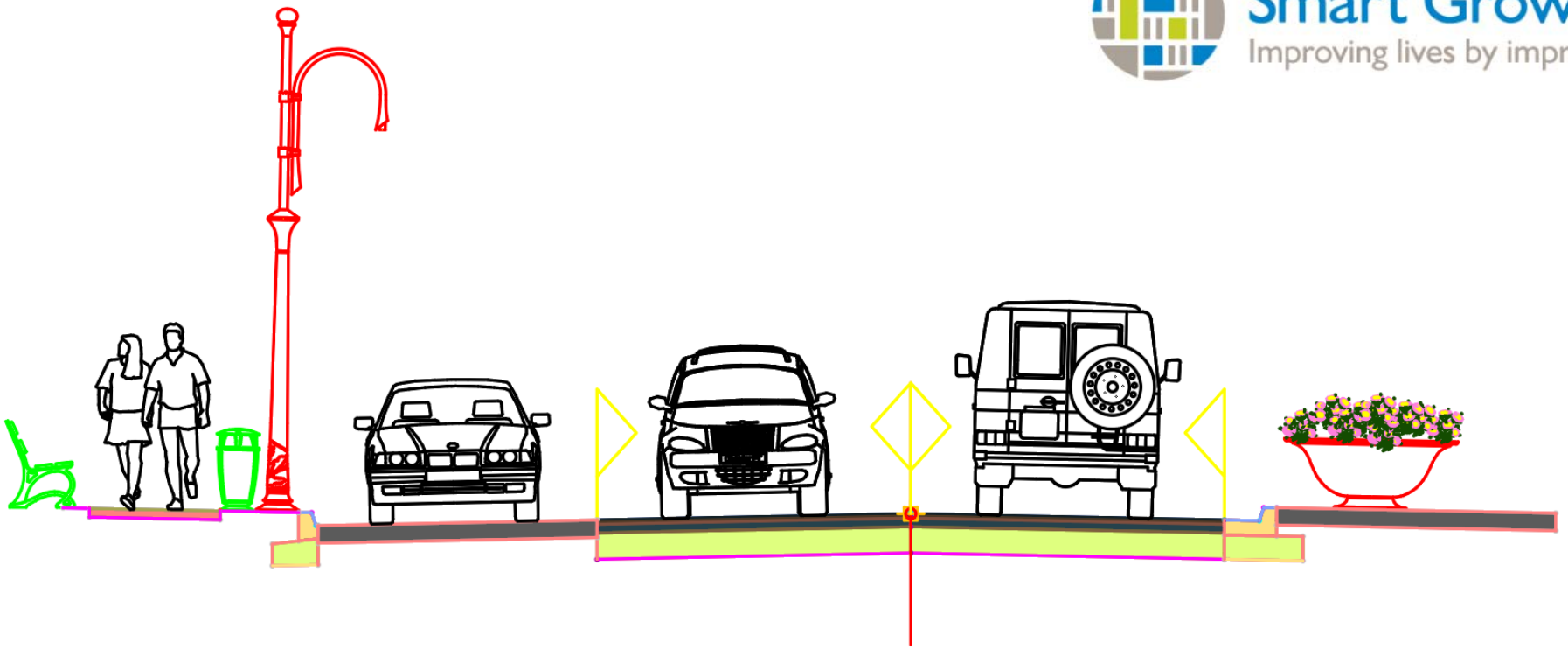


Section Outline

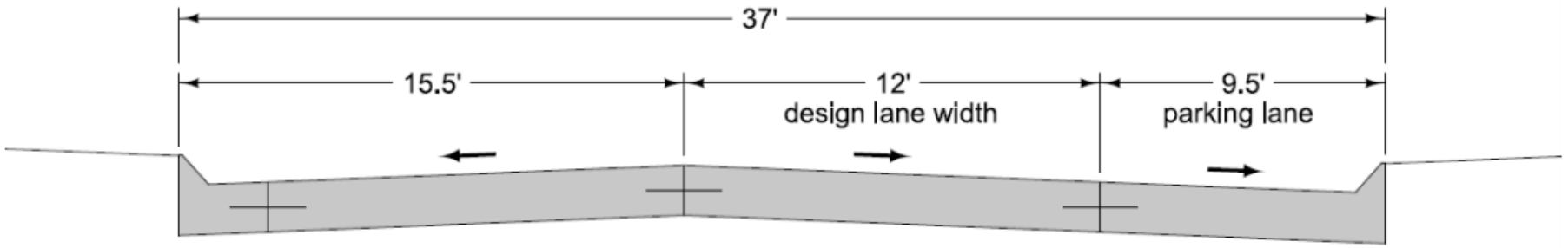
- Updated Streetscape
- Intersection Improvements
- High School Crosswalk Relocation
- Meandered Alignment
- Parallel Parking

Final Design

Smart Growth America
Improving lives by improving communities

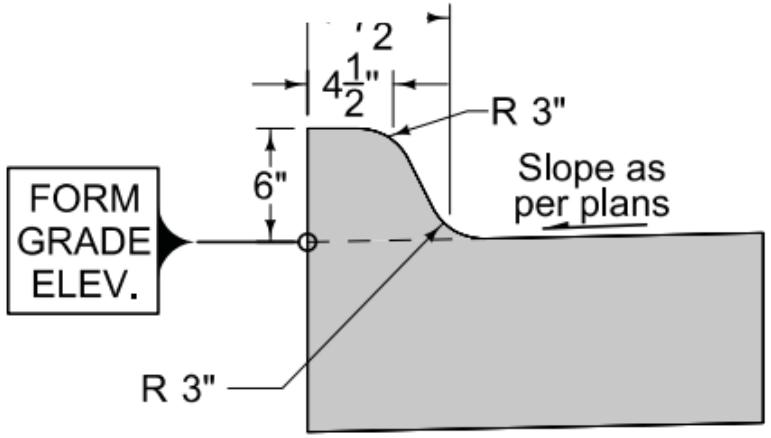


Updated Streetscape

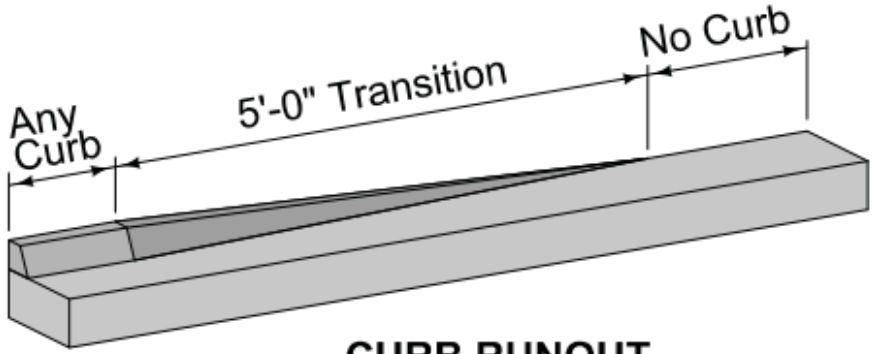


Updated Streetscape

Iowa DOT Design Manual Chapter 3A-1 Typical Roadway Section



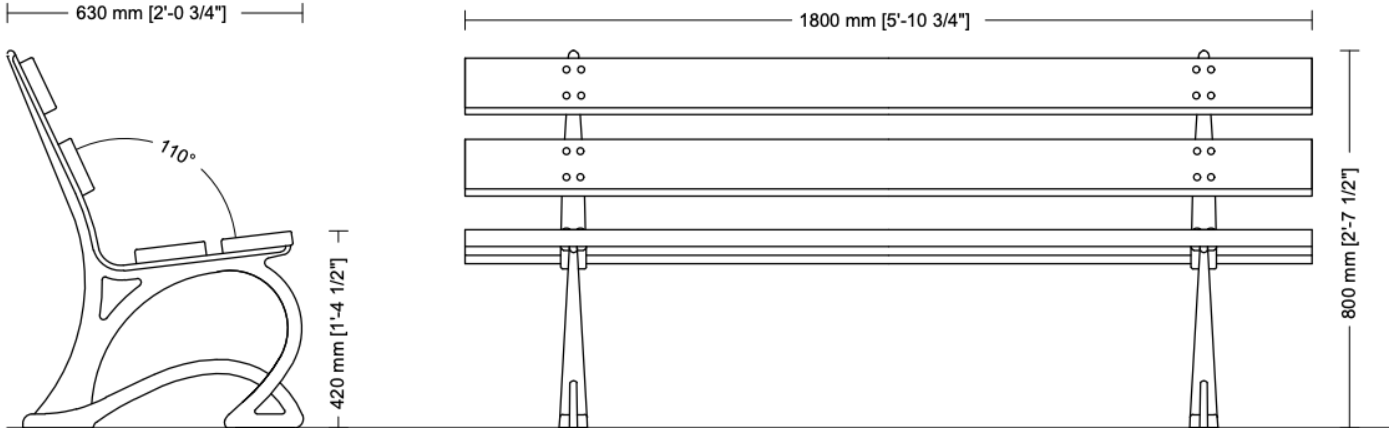
6" STANDARD CURB



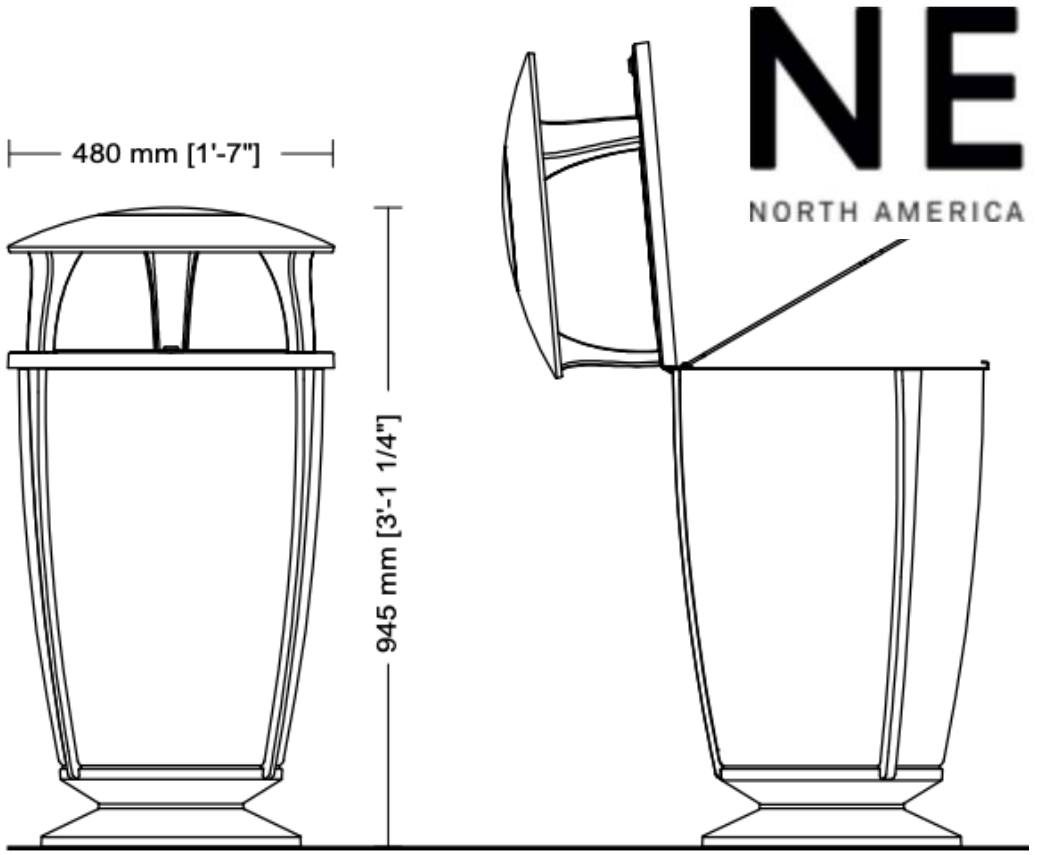
CURB RUNOUT
FOR ALL CURBS

Updated Streetscape

NERI
NORTH AMERICA



Updated Streetscape

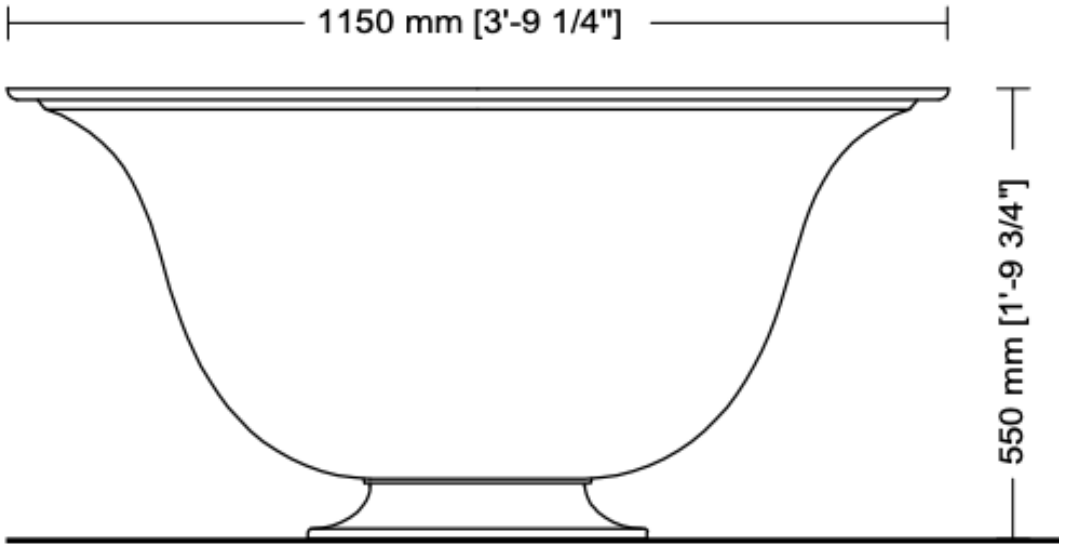


NERI
NORTH AMERICA

Updated Streetscape

NERI

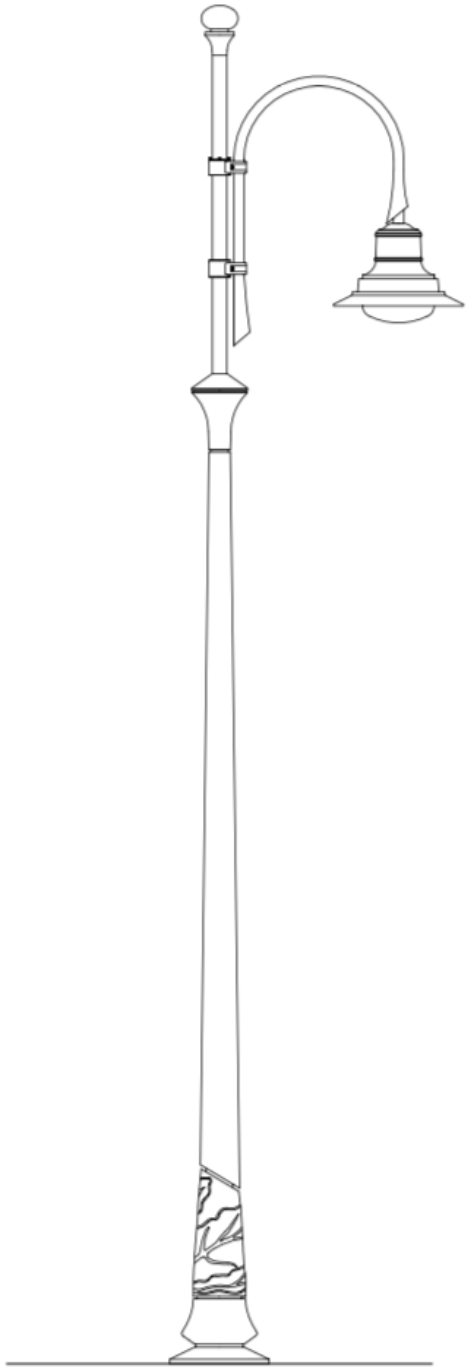
NORTH AMERICA



Updated Streetscape

Updated Streetscape

NERI



POSTS

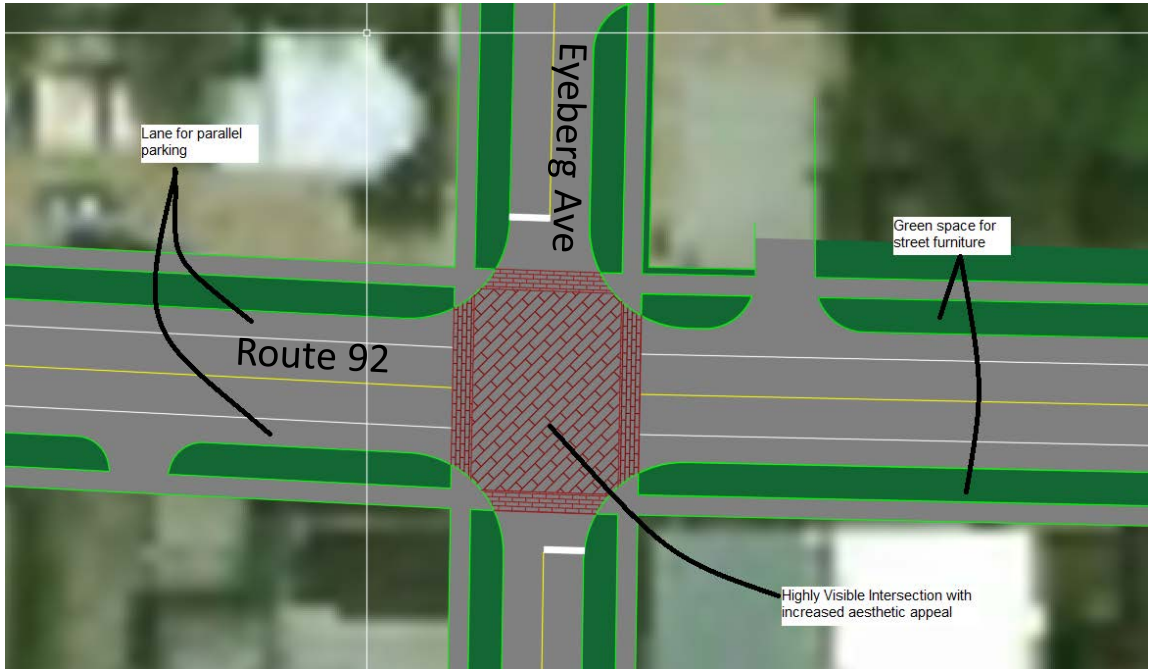
Models

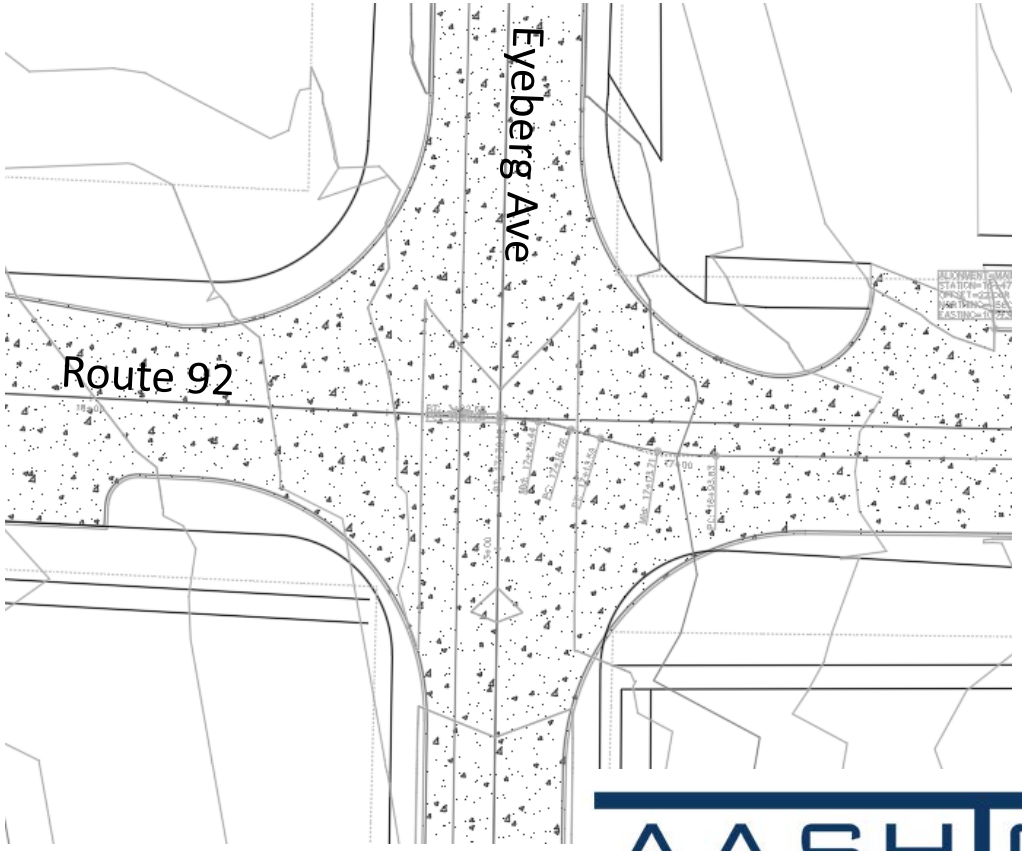
Post: 8160.001
Top: 4102.175
Lantern: S211

Dimensions

Total height: 20' 2 ¾"
Light point height: 14' 8 ½"
Pole height: 13' 6 ¼"
Projection: 29 ½"
Scale 1:25

Improvements to Major Intersection (L55 and I92)

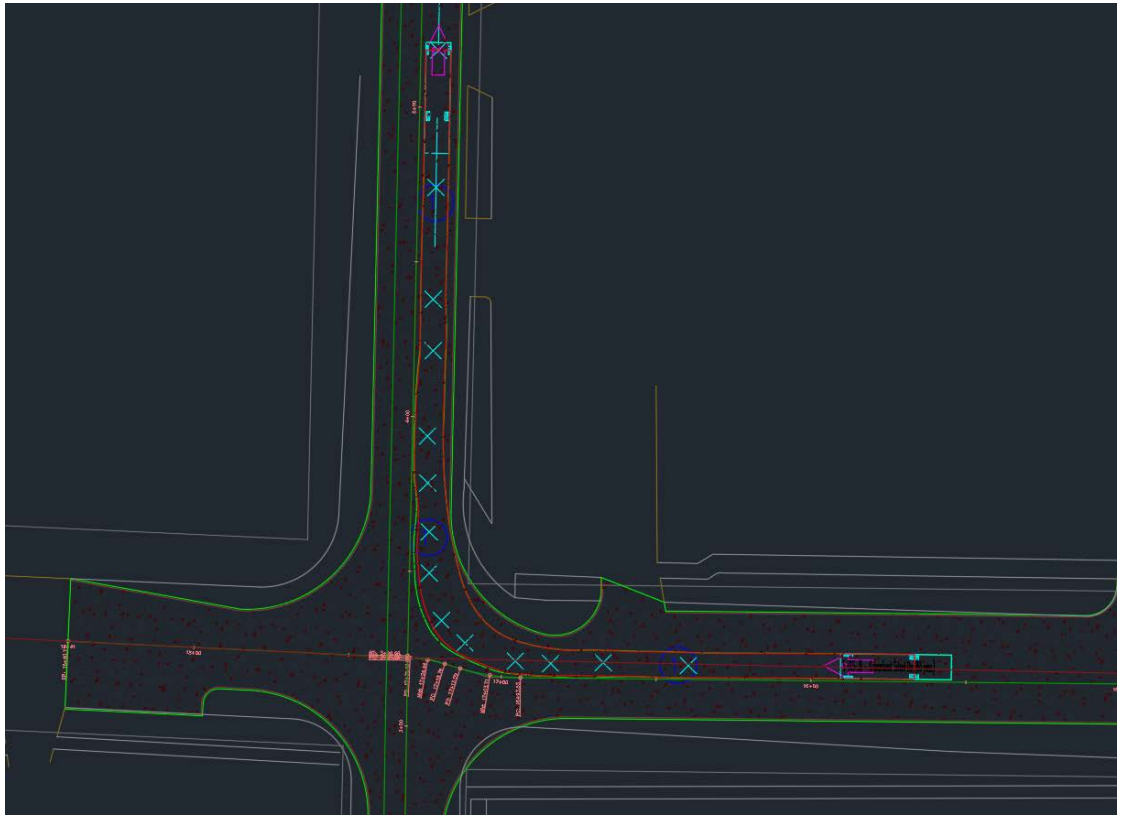


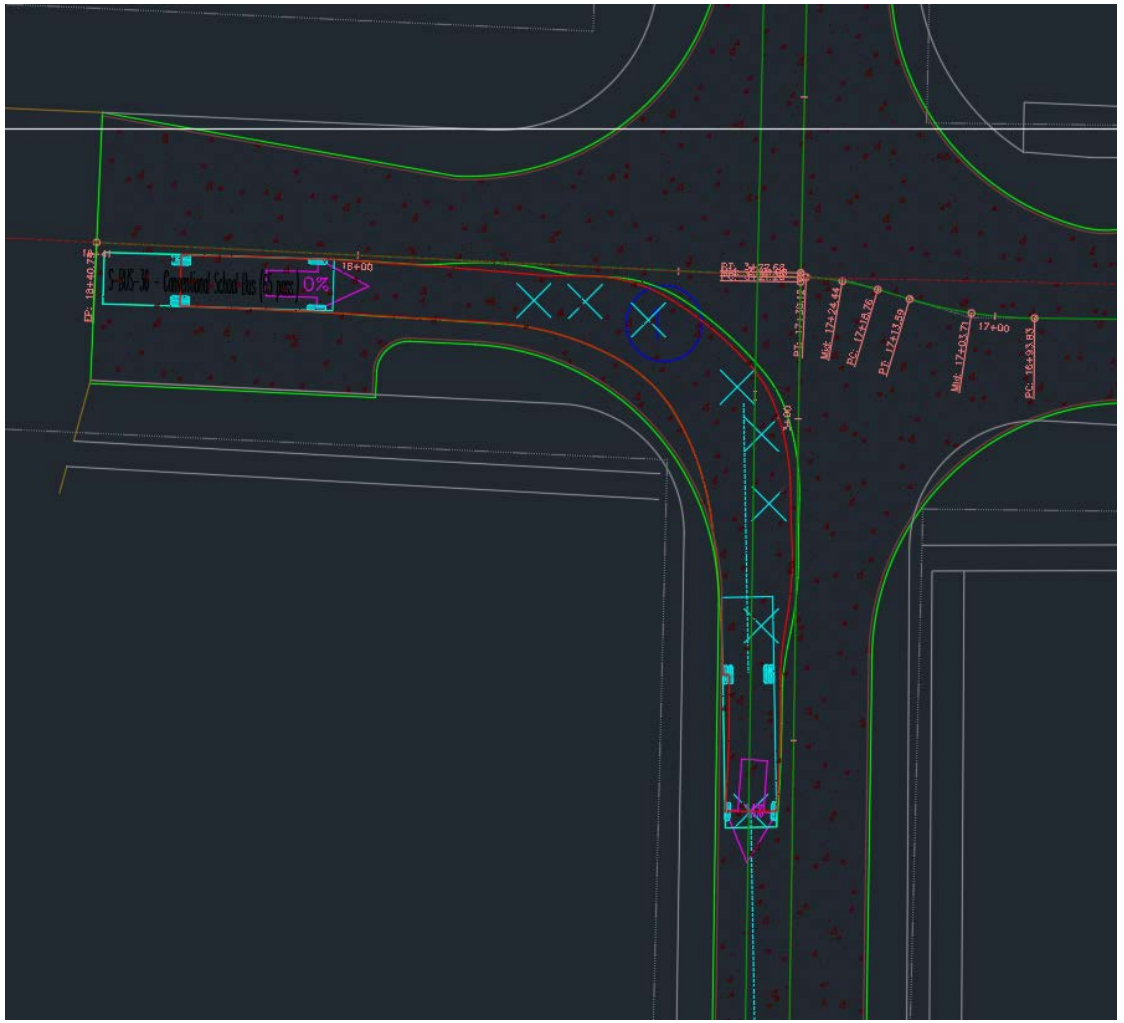


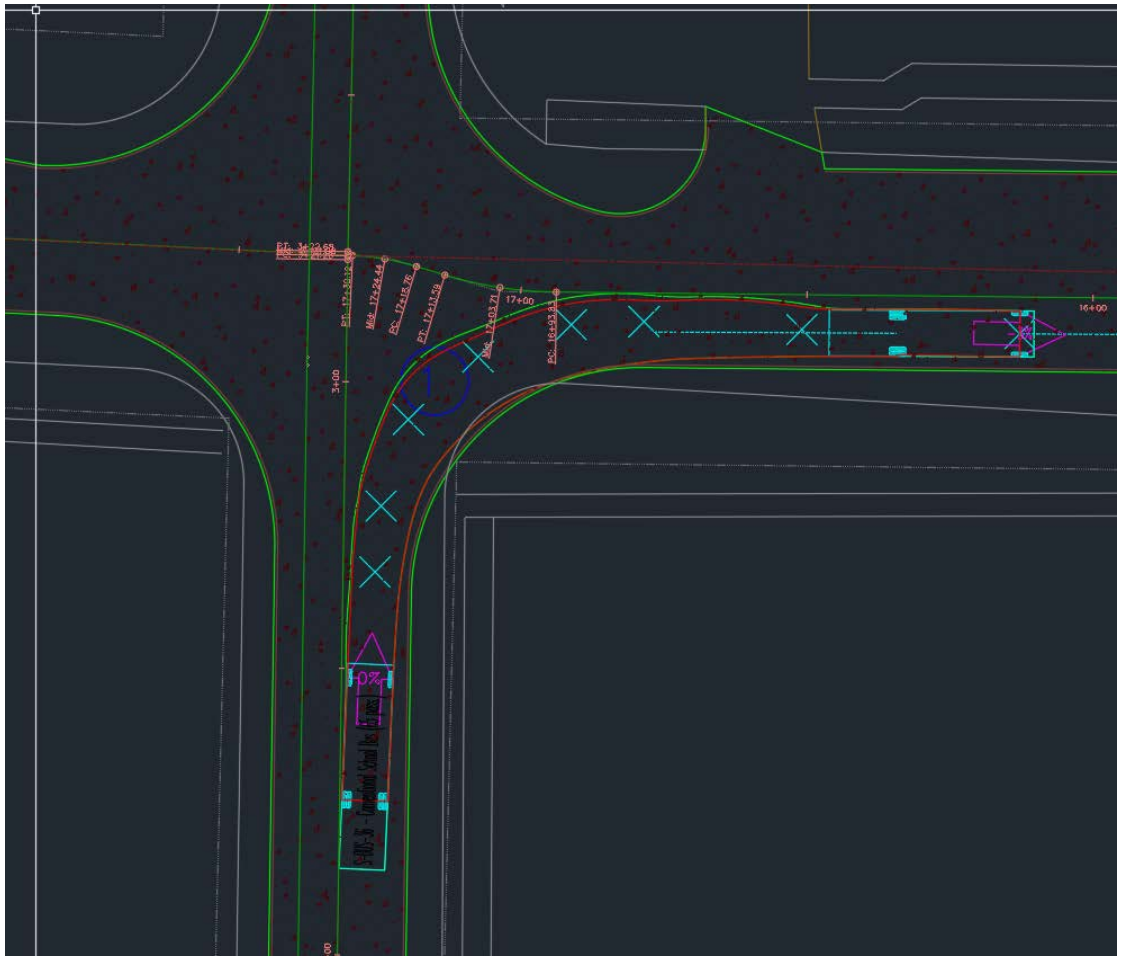
AASHTO

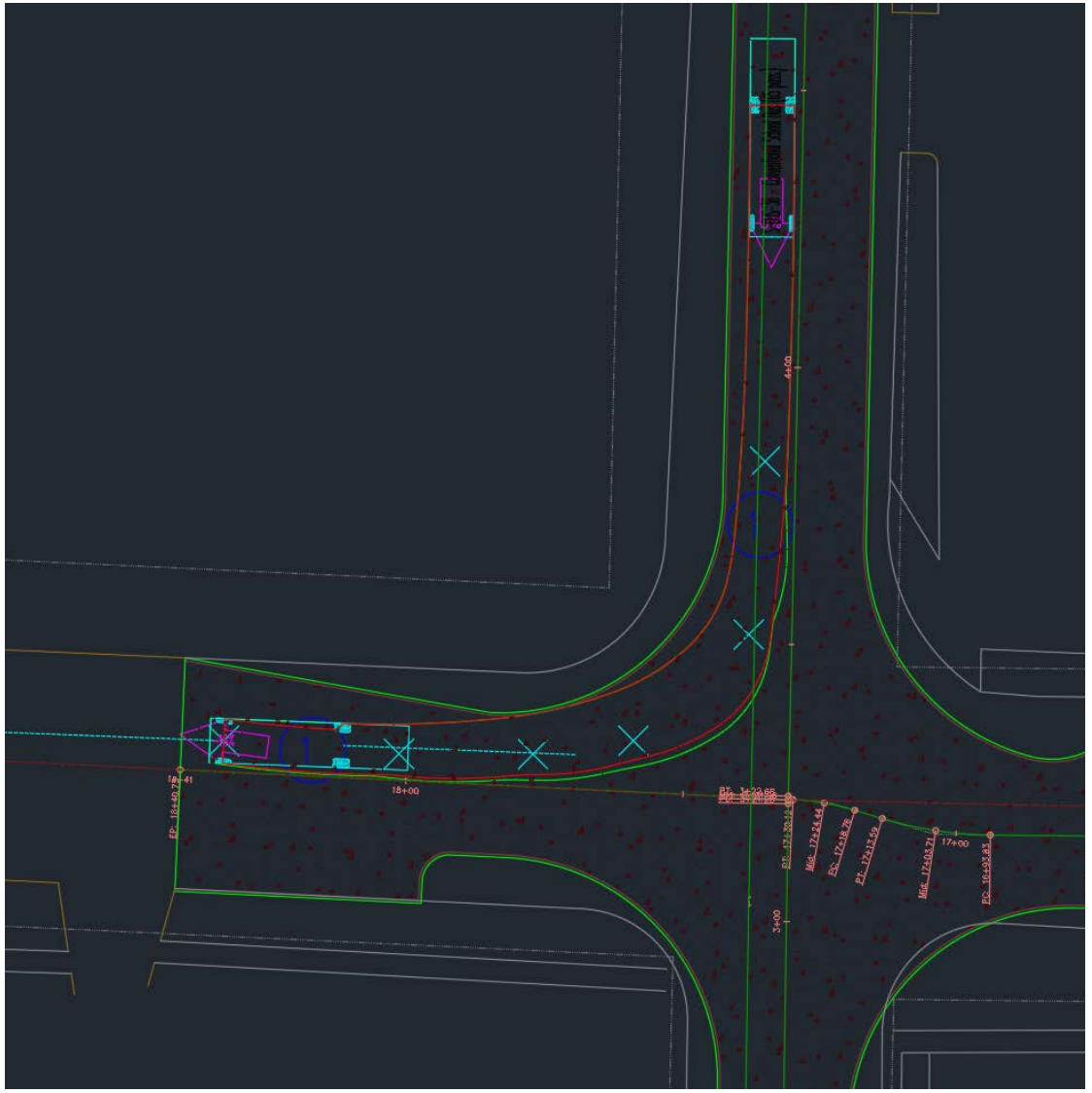
Swept Path Analysis

from	onto	design vehicle
freeway ramps	other facilities	WB-67 (Interstate semitrailer)
other facilities	freeway ramps	
state highways	state highways	WB-67
collectors ADT ≥ 400		WB-67
collectors ADT < 400		S-Bus-36 (conventional school bus)
local (gravel roads)		




S-BUS-36 - Compliant School Bus (3 pass) 0%
18+00
17+00

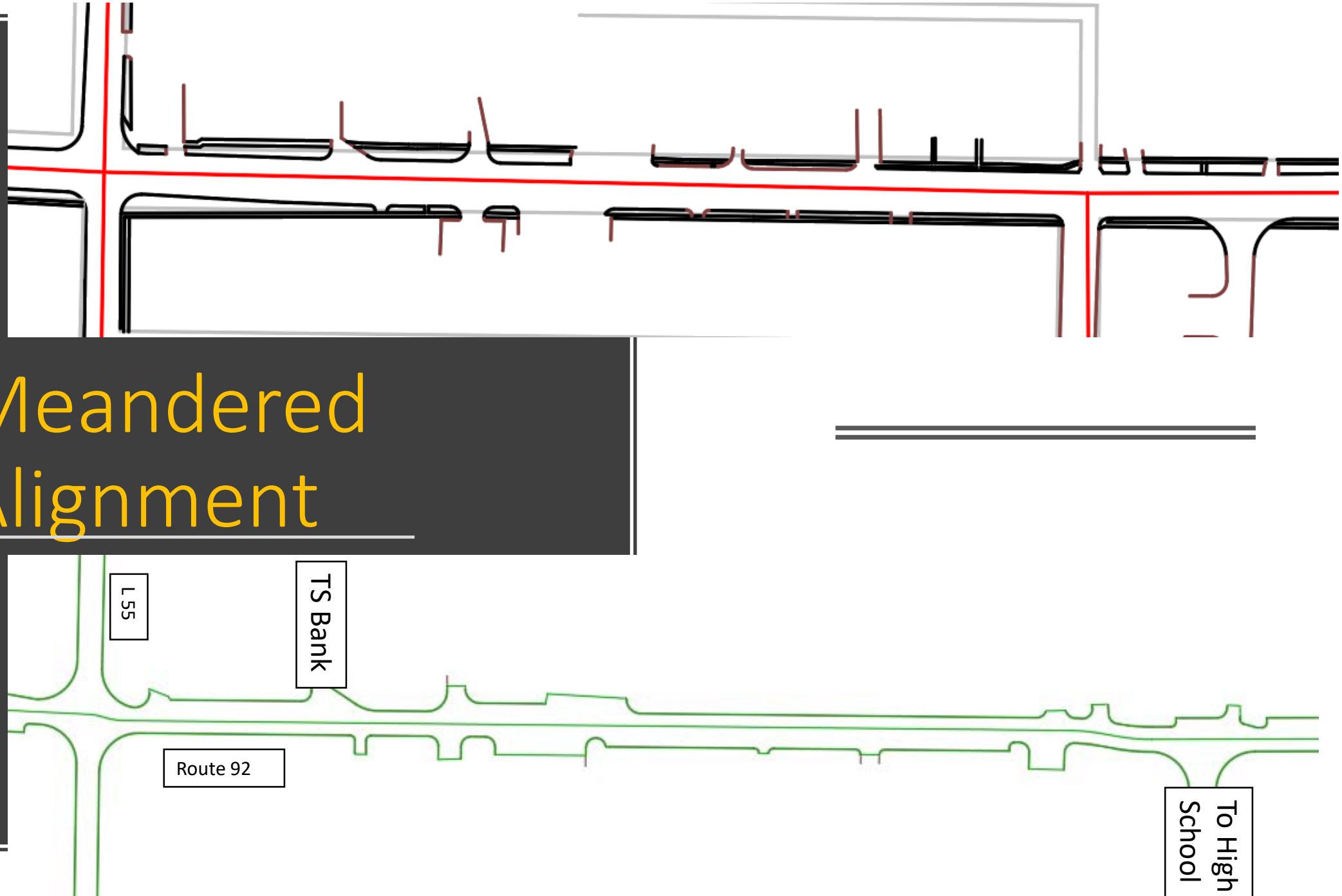




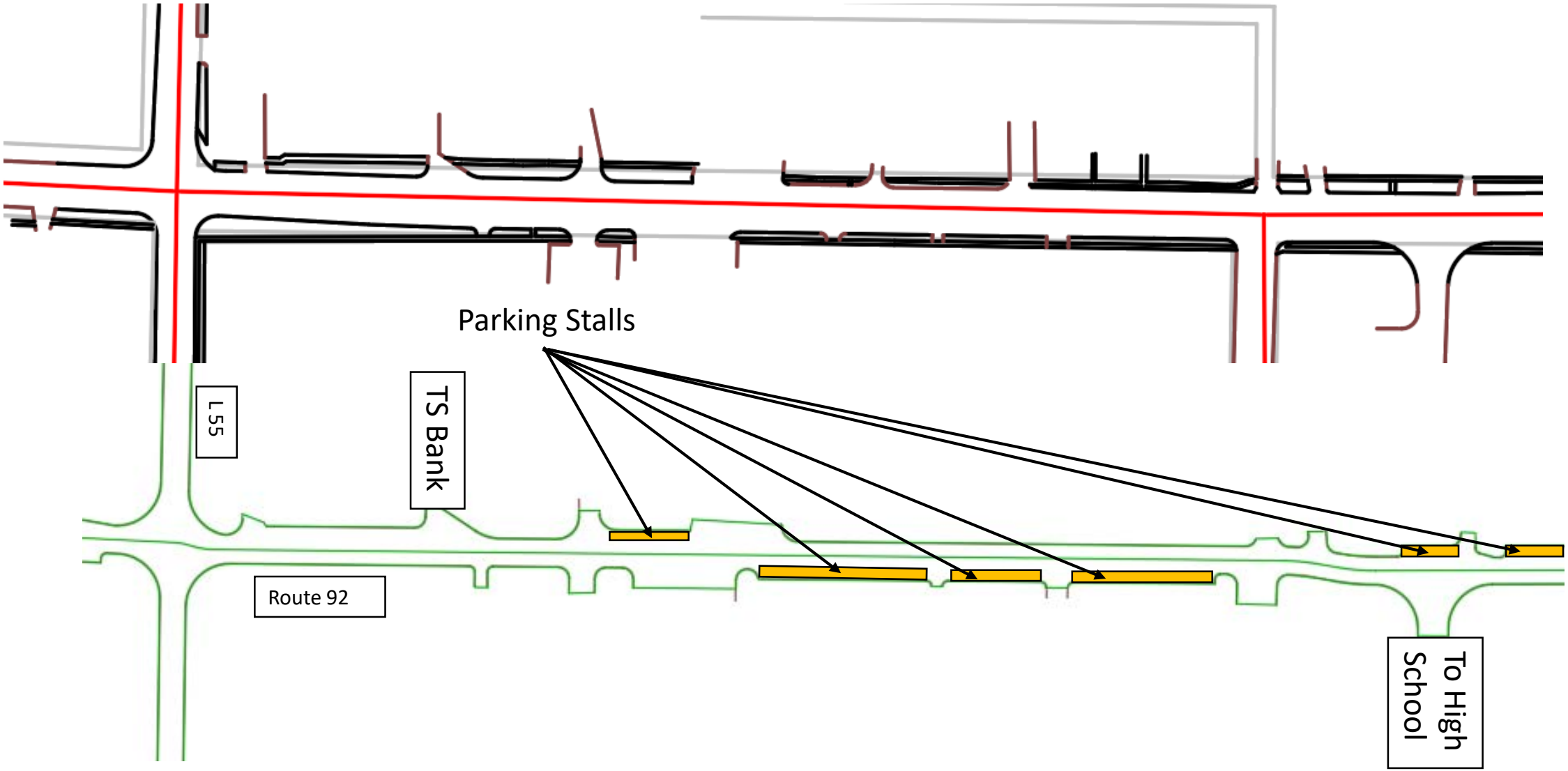
Crosswalk for Treynor High School

- HAWK Beacon and Retroflective Pavement Markings
- No Changes to Sight Distance
- Improved Safety for Both Pedestrians and Drivers

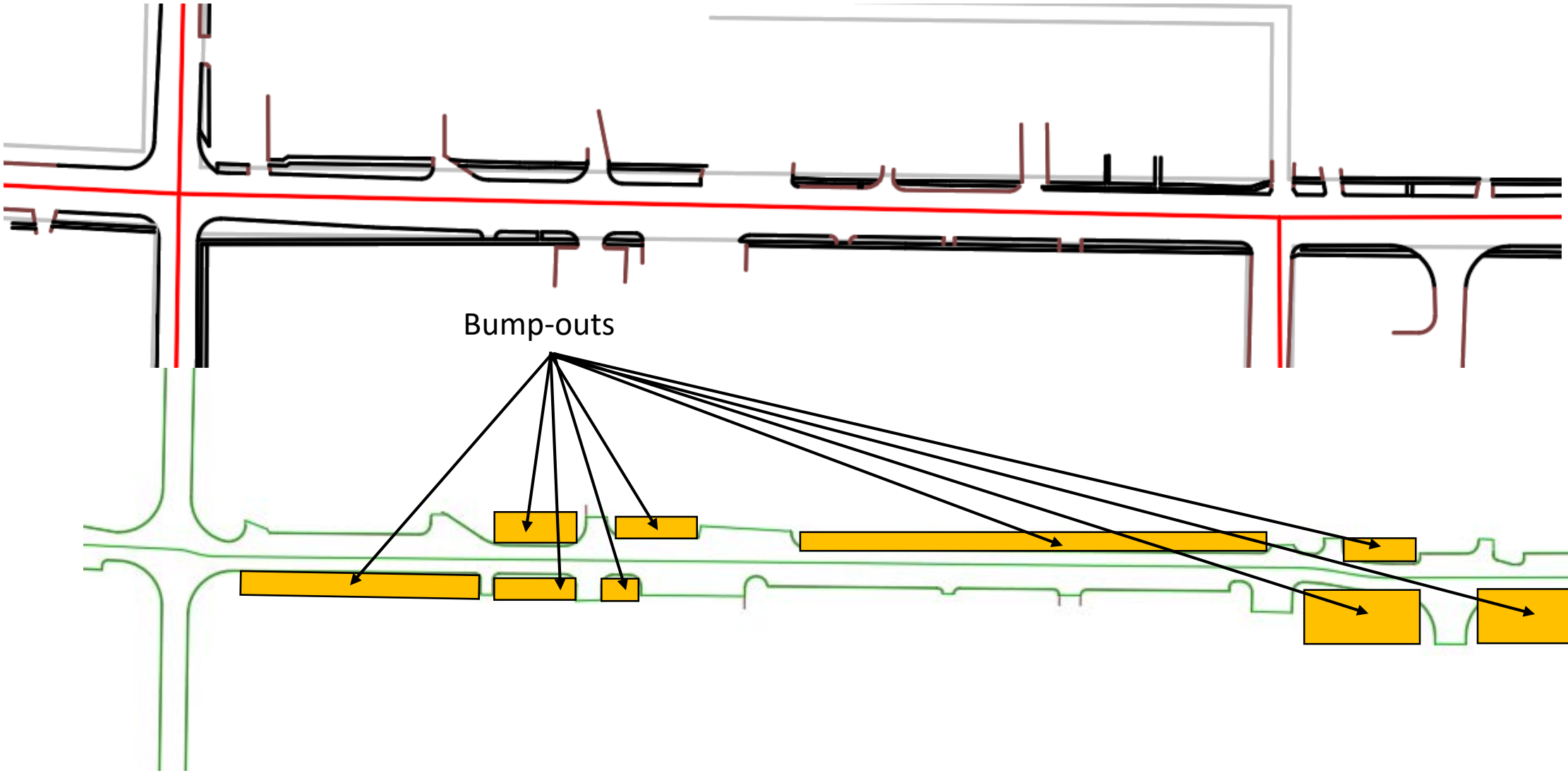
Meandered Alignment



Parallel Parking Locations

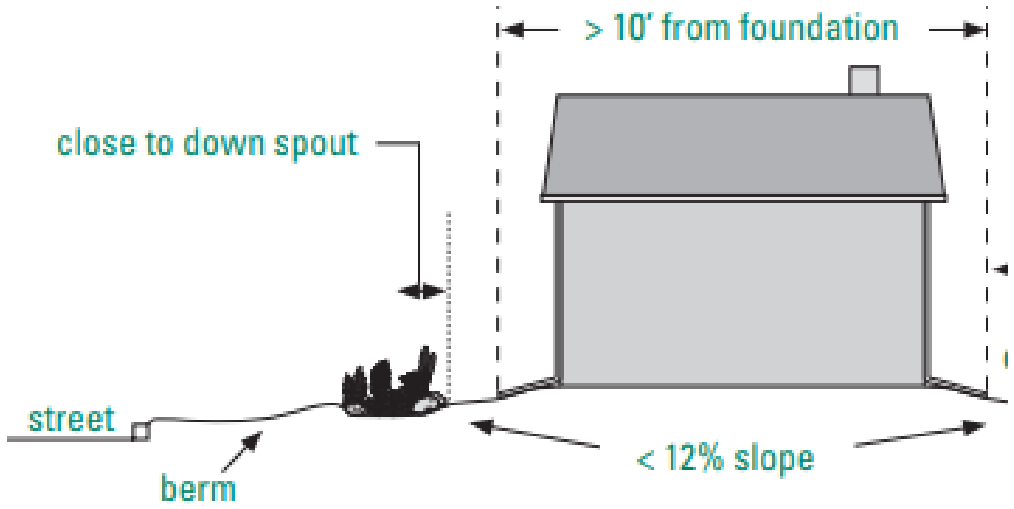


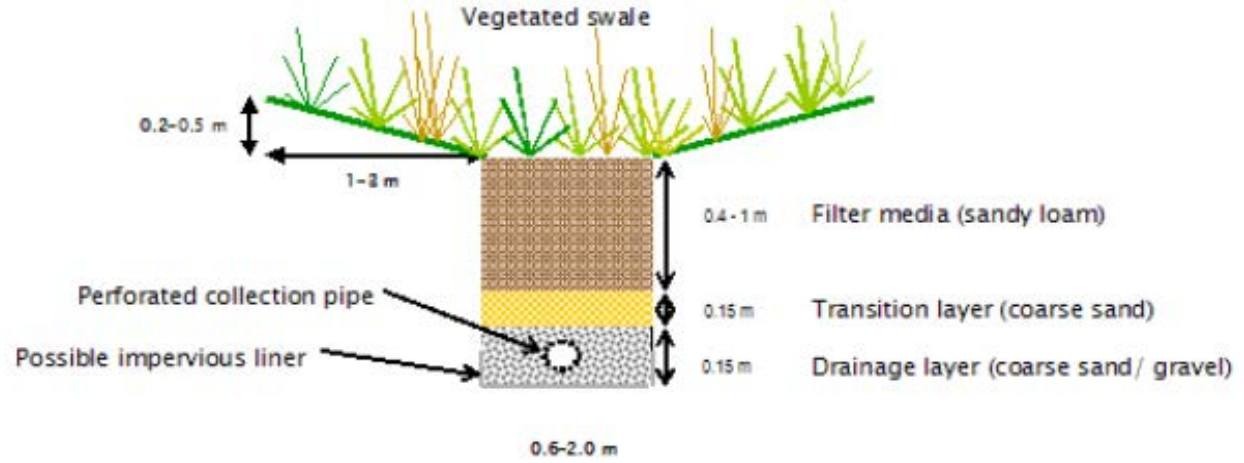
Bump-out Locations



Environmental Impacts

Rain Gardens on Bump-Outs


> 10' from foundation
close to down spout
street
berm
< 12% slope


Vegetated swale
0.2-0.5 m
1-3 m
0.4 - 1 m
Filter media (sandy loam)
Perforated collection pipe
0.15 m
Transition layer (coarse sand)
Possible impervious liner
0.15 m
Drainage layer (coarse sand/ gravel)
0.6-2.0 m

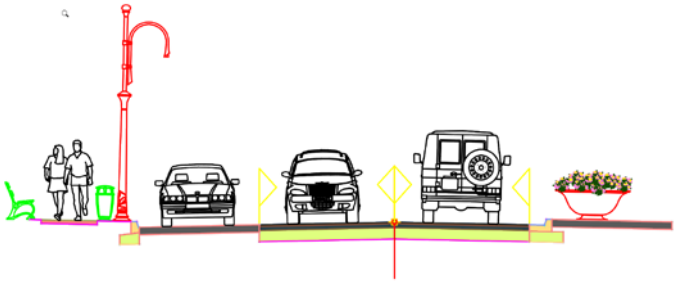
HAWK Beacons - High intensity Activated Crosswalk

Solar Panels on HAWK Beacon

Payback period of about 6 – 8 years

Project Cost Estimate

Project Item	Cost
Demolition & Clean up	$97,000.00
Intersection	$62,400.00
Street Redesign	$386,000.00
Aesthetics	$66,600.00
Total	$612,000.00



Questions