

CSX Project

- ❖ Task: Find a Way to Connect Shrewsbury Street to Franklin Street
- ❖ Summary of options to connect Shrewsbury St to Franklin St
 - 6 Bridge options offered by CSX
 - 3 Tunnel options offered by MDOT/COW
 - 5 Additional bridge options offered by MDOT/COW

Required Minimum Design Standards

1. Roadway Classification: Urban Arterial Connector
2. Design Speed 30 mph (40 mph would be preferred but not achievable)
3. 100' level area with 3%± grade at each end to provide for safe entrance
4. 30' curb to curb width; 50' ROW
5. Minimum vertical clearance over tracks is 23'

Design Standards (continued)

- Desired grade: less than or equal to 6%
- Maximum grade: 9%
- Horizontal alignment must be capable of safely accommodating speeds of 30mph
- Road to accommodate full range of vehicles

Design References

- A policy for Geometric Design of Highways and Streets (AASHTO 1990)
- Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways
- Roadside Design Guide (AASHTO)
- 2006 Project Development & Design Guide (MDOT)
- Zoning Ordinance (City of Worcester)

Examples of Grades

- Hamilton St (Coburn to Lake) = 9%
- Putnam Lane = 10%
- Dorchester (Providence to Vernon) = 11%
- Adams St (Belmont to Creston) = 12%
- George St = 17%

Study of Alternates Relative to Putnam Lane

Options	Cost	Description	Pros	Cons	Recommendation
1	\$7.9M	155' single lane bridge tunnel extends current or similar size bridge. Ties into Franklin near current connection of Putnam Lane.	Maintains connection between Franklin and Shrewsbury St. No major land takings	Very severe grades from Franklin to bridge (17-22%). One lane width is unsafe. Significant retaining walls needed.	Reject
2	\$20.9M	705' bridge tunnel extending from current bridge under Franklin St with jug handle connection on S side of Franklin St	Maintains connection between Franklin and Shrewsbury St.	Severe grades. Requires 4 major land takings. Only 1 lane. Will require a traffic signal.	Reject
3	\$14.2M	600' bridge over tacks connecting Shrewsbury St to Franklin St along same corridor as Putnam Lane	Maintains connection between Franklin and Shrewsbury St. No major land takings. 2 lanes of traffic. Sidewalk incl.	Severe grade from Shrewsbury St (13-18%). Retaining wall along both sides of Putnam Lane from Shrewsbury St to Nebraska St will restrict access to abutters. Access to all properties along PL will be from Nebraska St	Reject
4	\$4.3M	Connect from Shrewsbury St to Atlanta bridge with 80' bridge	Maintains connection between Franklin and Shrewsbury St.	Takes 1 property along Shrewsbury St. Severe grade from Shrewsbury St end (13-18%). Puts significant traffic volume on Atlanta St. Close to Atchison St	Reject
5	\$21.4M	800' bridge from Fantasia Dr to Franklin St with jug handle connection on S side of Franklin St	Maintains connection between Franklin and Shrewsbury St.	Severe grades at both ends (10-15%). Property takings along E. Worcester St and Franklin St. Very visible structure. Prevents access from Fantasia Dr to E. Worcester St. Maintenance of bridge expensive.	Reject
6	\$13.3M	330' bridge connection from Shrewsbury St along Hecla to Foch St to Plantation St	Provides a connection from Shrewsbury to Plantation	At least 5 land takings on Hecla. Severe grades 14-15%. Will require traffic signal on Shrewsbury St at Hecla creating 2 signals in close proximity. Relatively close to Atchison St	Reject
7	\$15.0M	City/MDOT option. Construct 2 lane tunnel from existing tunnel and emerge near Foch Avenue	Maintains connection from Shrewsbury St to Franklin St. 2 lanes of traffic. Sidewalk incl. No major land takings. Provides alternate access to the proposed CSX maintenance facility.	The Franklin St. approach exceeds maximum allowed grade set forth by AASHTO Standards. Doesn't meet horizontal geometry for 30 MPH design speed. Requires construction of high retaining walls and/or minor relocation of Franklin Street. High maintenance cost.	Reject
8	30.0M	City/MDOT option. Construct 2 lane tunnel from Envelope Terrace and emerge near Foch St.	Maintains connection from Shrewsbury St to Franklin St. 2 lanes of traffic. Sidewalk incl. Provides alternate access to the proposed CSX maintenance facility.	At least 1 ROW taking. Doesn't meet horizontal geometry for 30 MPH design speed. Requires construction of high retaining walls and/or minor relocation of Franklin Street. Will not accommodate all truck traffic. High maintenance cost.	Reject
9	30.0M	City/MDOT option. Construct 2 lane tunnel from Muskego Street emerge near Foch St.	Maintains connection from Shrewsbury St to Franklin St. 2 lanes of traffic. Sidewalk incl. Provides alternate access to the proposed CSX maintenance facility.	At least 1 ROW taking. Doesn't meet horizontal geometry for 30 MPH design speed. Will not accommodate all truck traffic. High maintenance cost.	Reject
10	15.5M	City/MDOT option. Construct 2 lane bridge from 339 Shrewsbury St. to Franklin St. at old Putnam lane	Maintains connection from Shrewsbury St to Franklin St. 2 lanes of traffic. Sidewalk incl. Provides alternate access to the proposed CSX maintenance facility.	At least 3 ROW takings. The Shrewsbury St. approach conceptual profile shows grades that exceeds the AASHTO maximum design grade. Doesn't meet horizontal geometry for 30 MPH design speed. Results in significant increase in traffic volumes that potentially will impact traffic patterns on Franklin Street.	Reject
11	17.0M	City/MDOT option. Construct 2 lane bridge from the Adams St. Intersection to Franklin St. at old Putnam lane	Maintains connection from Shrewsbury St. to Franklin St. 2 lanes of traffic. Sidewalk incl. Provides alternate access to the proposed CSX maintenance facility.	At least 1 ROW taking. The Shrewsbury St. approach conceptual profile grade exceeds the AASHTO maximum design grade. Involves taking and relocation of a major business. Doesn't meet horizontal geometry for 30 MPH design speed. Results in significant increase in traffic volumes that potentially will impact traffic patterns on Franklin Street.	Reject
12	14.0M	City/MDOT option. Construct 2 lane bridge from Nebraska St. to Foch St.	Maintains connection from Shrewsbury St. to Franklin St. 2 lanes of traffic. Sidewalk incl. Provides alternate access to the proposed CSX maintenance facility. Potentially will eliminate need for a signal at Putnam and Shrewsbury St.	At least 2 ROW takings. Impacts the Coca Cola building which has some historic significance, inventoried on MHC Cultural Resource Information System. Severe grades for the Nebraska St. approach. The conceptual profile grade for the Nebraska approach exceeds AASHTO design maximum grade. Doesn't meet horizontal geometry for 30 MPH design speed. Results in significant increase in traffic volumes that potentially will impact traffic patterns on Franklin Street.	Reject
13	15.6M	City/MDOT option. Construct 2 lane bridge from the Adams St. Intersection to Franklin St. at Foch Ave.	Maintains connection from Shrewsbury St to Franklin St. 2 lanes of traffic. Sidewalk incl. Provides alternate access to the proposed CSX maintenance facility.	At least 2 ROW takings. Involves taking and relocation of a major business. The Shrewsbury St. approach conceptual profile grade exceeds the AASHTO maximum design grade. Doesn't meet horizontal geometry for 30 MPH design speed. Results in significant increase in traffic volumes that potentially will impact traffic patterns on Franklin Street.	Reject
14	17.0M	City/MDOT option. Construct 2 lane bridge from the Adams St. Intersection to Franklin St. at Foch Ave.	Maintains connection from Shrewsbury St. to Franklin St. 2 lanes of traffic. Sidewalk incl. Provides alternate access to the proposed CSX maintenance facility. Will meet 40 MPH required for horizontal geometry.	At least 2 ROW takings. Involves taking and relocation of a major business. The Shrewsbury St. approach conceptual profile grade exceeds the AASHTO maximum design grade. This improved connection is expected to result in significant increase in traffic volumes that potentially will impact traffic patterns on Franklin Street.	Reject

City/MDOT Tunnel Options



WORCESTER - CSX EXPANSION

OPTION 10

SHREWSBURY STREET TO FRANKLIN STREET BRIDGE ALTERNATIVE

CONCEPTUAL PLAN - MAY, 2010

APPROXIMATE BRIDGE LENGTH: 300 FEET

Option 10

- Construct 2 lane bridge from 339 Shrewsbury St to Franklin St at old Putnam Lane
- Cons
 - Min. of 3 takings including Coca-Cola property
 - Grades at Shrewsbury St (12% to 13%) exceed maximum allowable grade
 - Horizontal curves < 30 mph design speed
 - Creates dangerous “off-set” intersection (e.g. Wall St/Cutler St)



OVERPASS CROSS-SECTION:
TWO TRAVEL LANES AND A 4' WIDE SIDEWALK
TOTAL WIDTH = 40 FEET

ROW ACQUISITION
REQUIRED

LIGHT POLE (TYP)

PROP. ELEV. = 819 FEET

PROP. ELEV. = 820 FEET

TO MAINTENANCE
BUILDING

ROW ACQUISITION
REQUIRED

ELEV. = 844 FEET

RETAINING WALL

EXISTING TREES
TO REMAIN

4' IF WARRANTED

10,000 GAL ABOVE
GROUND FUEL
STORAGE TANK

MAINTENANCE PAD

ROCK AVENUE

FRANKLIN STREET

WORCESTER - CSX EXPANSION
OPTION 11
SHREWSBURY / ADAMS
STREETS TO FRANKLIN STREET
BRIDGE ALTERNATIVE
CONCEPTUAL PLAN - MAY, 2010
APPROXIMATE BRIDGE LENGTH:
330 FEET



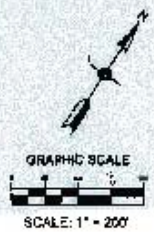
Option 11

- Construct 2 lane bridge from Adams St to old Putnam Lane
- Cons
 - Requires taking of Universal Metals
 - Grades at Shrewsbury St (12% to 13%) exceed maximum allowable grade
 - Horizontal curves < 30 mph design speed
 - Likely to substantially increase traffic along corridor since it will as a cut-through between Belmont and Franklin St



WORCESTER - CSX EXPANSION
OPTION 12
NEBRASKA STREET TO
FOCH AVENUE
BRIDGE ALTERNATIVE

CONCEPTUAL PLAN - MAY, 2010
APPROXIMATE BRIDGE LENGTH:
300 FEET



Option 12

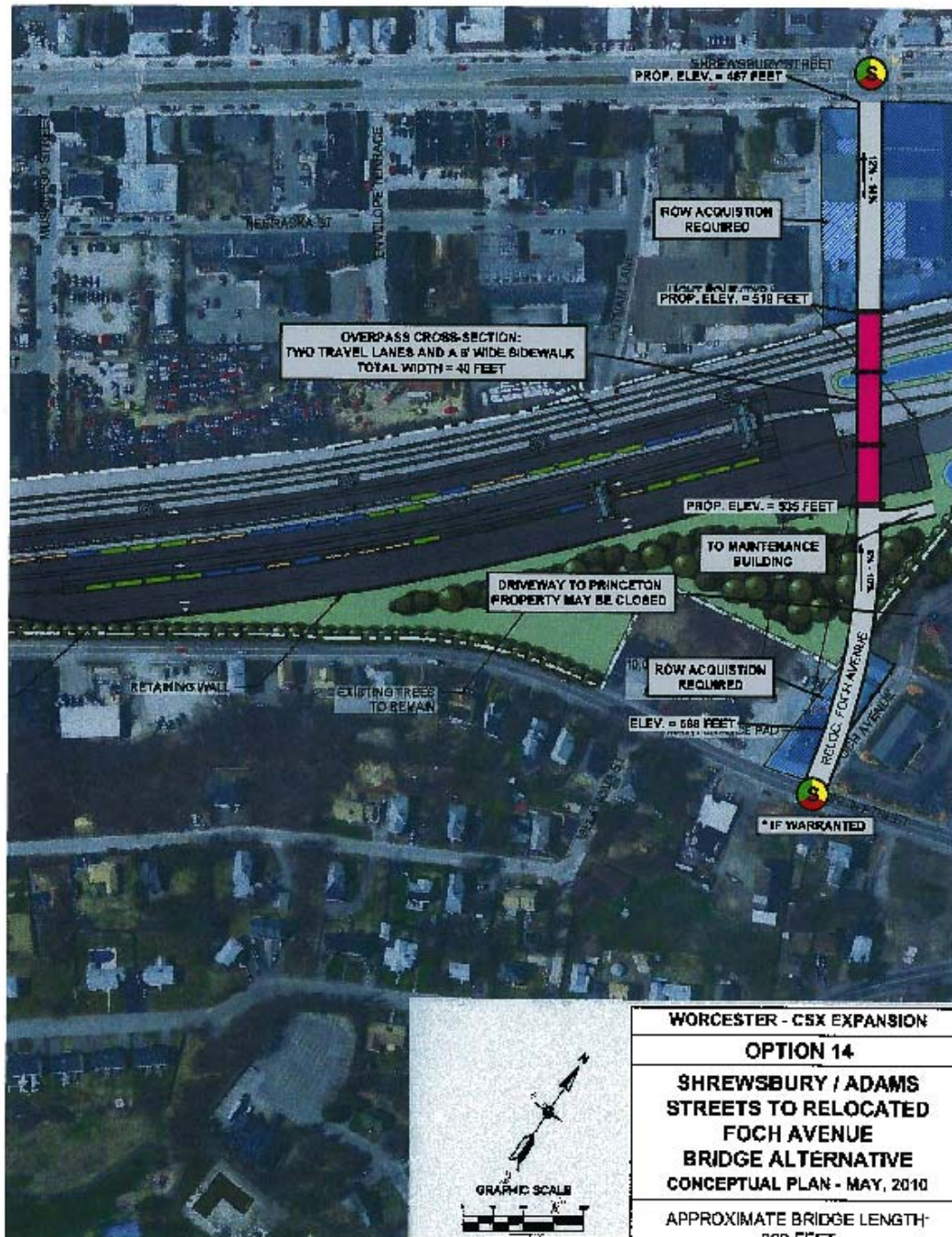
- Construct 2 lane bridge from Nebraska at Putnam to Foch Ave
- Cons
 - At least 2 property takings: Coca-Cola property and Brown Sq Civic Club
 - Could negatively impact properties on Putnam Lane south of Nebraska
 - Grades at Putnam Lane (17% to 18%) far exceed maximum allowable grade
 - Horizontal curves < 30 mph design speed



WORCESTER - CSX EXPANSION
OPTION 13
SHREWSBURY / ADAMS STREETS TO FOCH AVENUE BRIDGE ALTERNATIVE
CONCEPTUAL PLAN - MAY, 2010
APPROXIMATE BRIDGE LENGTH: 320 FEET

Option 13

- Connect Adams St at Shrewsbury St with Foch Ave
- Cons
 - Requires at least 2 takings: Universal Metals and Brown Sq. civic Club
 - Grades at Shrewsbury St (12% to 13%) exceed maximum allowable grade
 - Horizontal curve < 30 mph design speed
 - Likely to substantially increase traffic along corridor since it will act as a cut-through between Belmont and Franklin St



Option 14

- Connect Adams at Shrewsbury St with a relocated Foch Ave
- Cons
 - Requires at least 2 takings: Universal Metals and Brown Sq. civic Club
 - Grades at Shrewsbury St (12% to 13%) exceed maximum allowable grade
 - Likely to substantially increase traffic along corridor since it will be a cut-through between Belmont and Franklin St