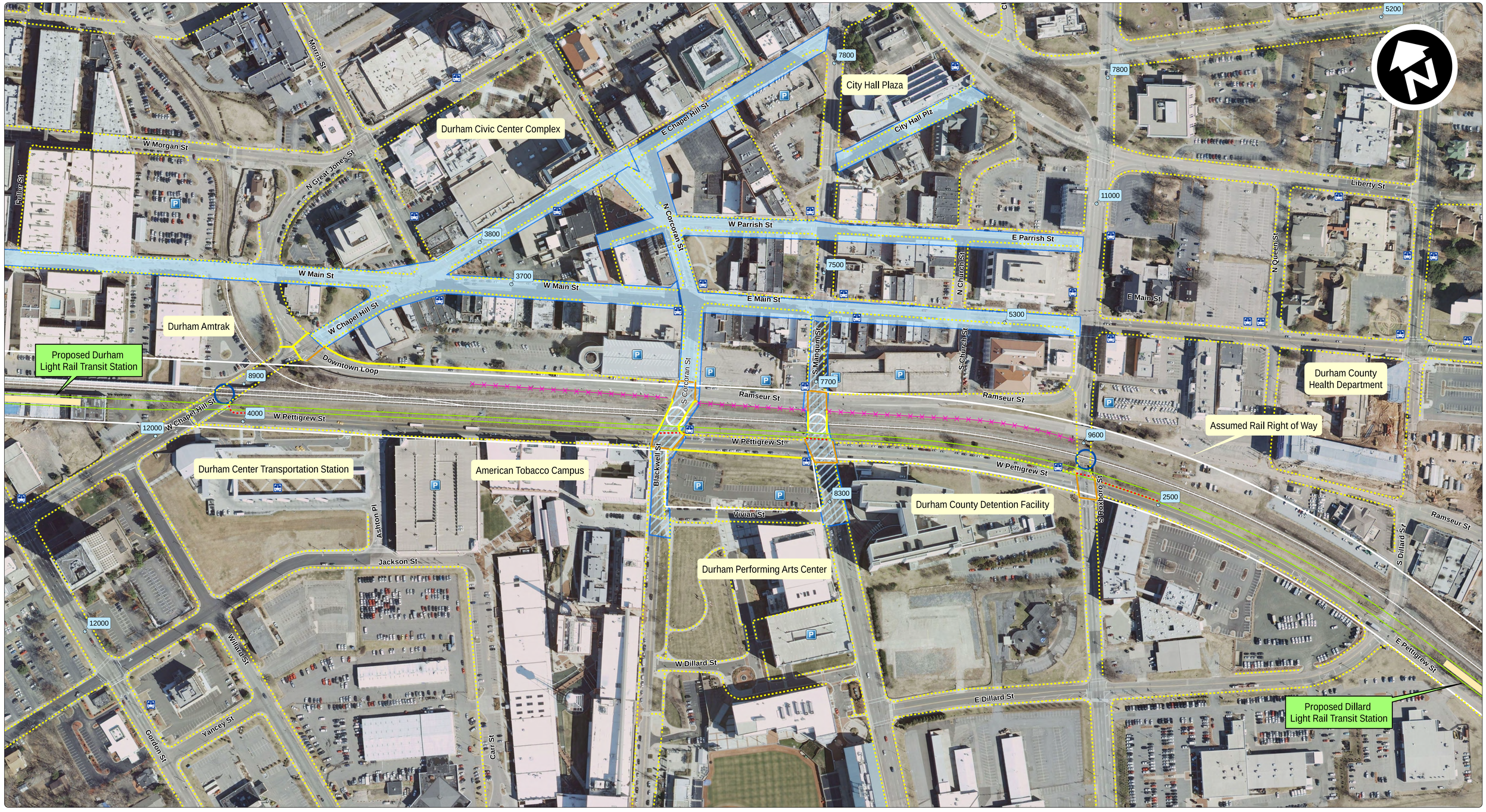
# Appendix H – Downtown Durham Pedestrian Alternatives




**Legend**

- Parking Lot
- Bus Stops
- Existing Railroad
- Assumed Rail Right of Way
- Existing Sidewalk/Crosswalk
- Proposed Sidewalk/Crosswalk
- Reapplied Crosswalk
- Remove Sidewalk/Crosswalk
- Proposed Decorative Fence
- Proposed TTA Light Rail
- Existing Streetscape
- Proposed Streetscape
- 1000 NCDOT 2009 AADT
- At-Grade Crossing
- Grade-Separated Crossing

# Durham Traffic Separation Study

## Downtown Overview

Durham County, North Carolina

February 27, 2012

0 250 500 Feet

NORFOLK SOUTHERN

DURHAM 1869 CITY OF MEDICINE

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

triangletransit

SERVICES FOR NCDOT Kimley-Horn and Associates, Inc.

## Chapel Hill Street / Norfolk Southern Railroad Crossing Preliminary Recommendations

All preliminary pedestrian recommendations at this location are near-term improvements. Near-term improvements may be phased into the mid-term depending on funding availability.

**Chapel Hill Street / Ramseur Street**

| Recommendation | Location |
|---|---|
| Apply new crosswalk markings | North/south across Chapel Hill Street between southwest corner and existing concrete median<br>East/west across Downtown Loop/Ramseur Street between concrete island and northeast corner<br>East/west across Downtown Loop/Ramseur Street right turn lane west onto Chapel Hill Street between northwest corner and existing concrete island |
| Mill pavement and resurface in and around crosswalk | East/west across Downtown Loop/Ramseur Street, south of the intersection |
| Reapply crosswalk markings | East/west across Downtown Loop/Ramseur Street, south of the intersection |
| Add raised concrete island as pedestrian refuge | On Downtown Loop/Ramseur Street, south side of the intersection in existing striped island |
| Construct pedestrian ramps | Northwest corner of intersection, facing east toward concrete median<br>North side of concrete median, facing west<br>North side of concrete median, facing east<br>Northeast corner of intersection, facing west<br>Southwest corner of intersection, facing north |
| Install pedestrian signal heads | On northwest corner facing new crosswalk to northeast corner across existing concrete island<br>On northeast corner facing new crosswalk to northwest corner across existing concrete island<br>On southwest corner facing new crosswalk to existing concrete island |

**Chapel Hill Street / Railroad Bridge**

| | |
|---|---|
| Sandblast and repaint | Walls, wingwalls, and bridges in active Norfolk Southern railroad tunnel |
| Repair support structure and wingwall | In active Norfolk Southern railroad tunnel |
| Repair sidewalk | In active Norfolk Southern railroad tunnel |
| Remove railroad tracks and bridges | For spur line and Duke Beltline |
| Improve landscaping | On east and west ends of railroad tunnels on top of the wingwalls |
| Add pedestrian lighting | In the railroad tunnel (the City is completing an agreement with NCRR and plans to install additional lights in the tunnel this spring) |

**Chapel Hill Street / Pettigrew Street**

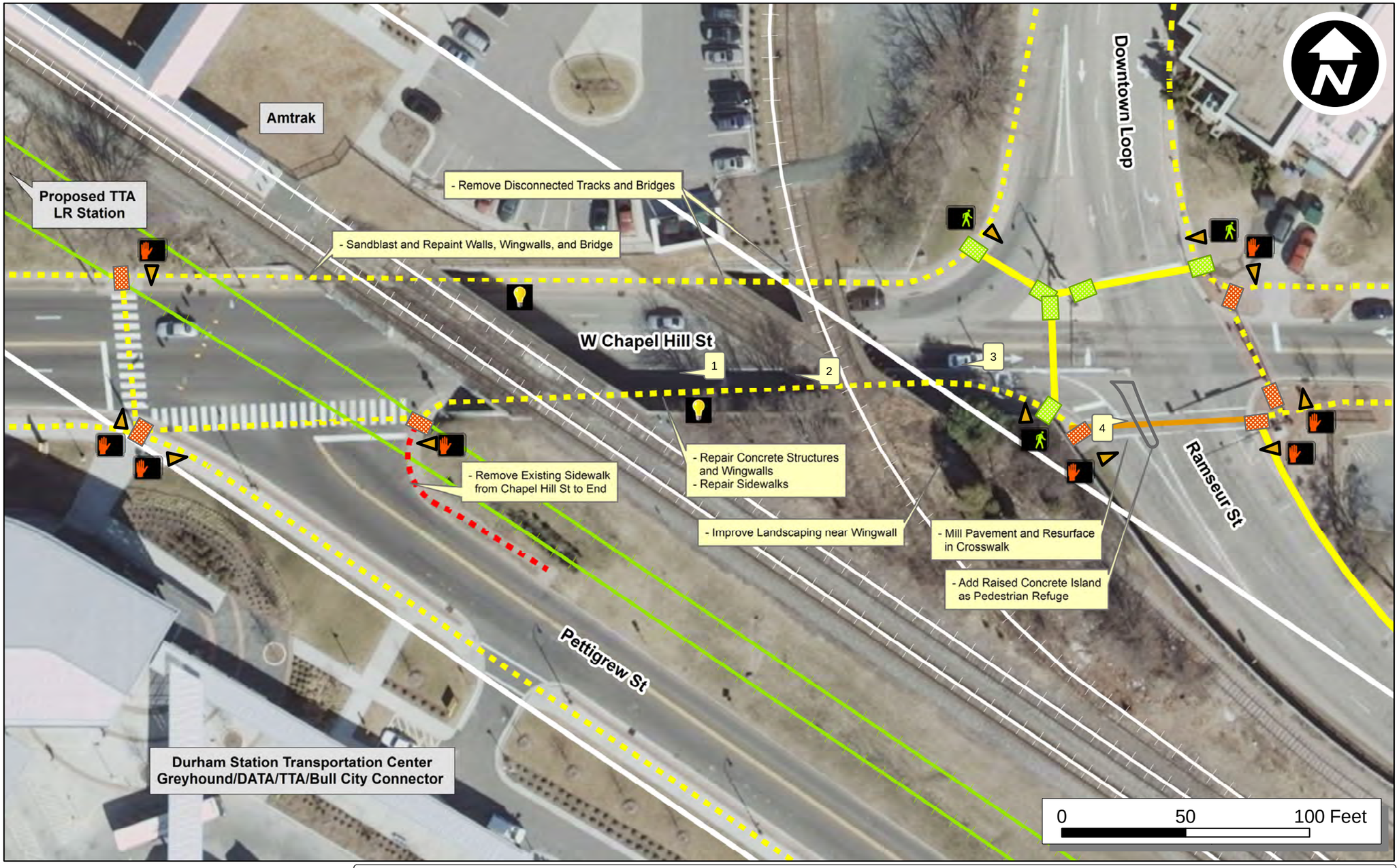
| | |
|---|---|
| Reconstruct pedestrian ramp | Southwest corner facing north across Chapel Hill Street<br>Southwest corner facing east across Pettigrew Street |
| Remove existing sidewalk | On north side of Pettigrew Street east of Chapel Hill Street to end of sidewalk |

Repair Concrete Bridge Structure over Sidewalks

Paint Pedestrian Tunnel, Bridge, and Wingwalls

Repair Sidewalk in Underpass

Mill Pavement and Resurface / Repaint Crosswalk




Durham Traffic Separation Study
Preliminary Pedestrian Recommendations
Chapel Hill / Norfolk Southern RR Crossing

Durham County, North Carolina

February 27, 2012

**Legend**

- Existing Pedestrian Signal
- Proposed Pedestrian Signal
- Remove Pedestrian Signal
- Pedestrian Signal Direction
- Proposed Streetscape Lighting
- Proposed Lighting in Tunnel
- Existing Pedestrian Ramp
- Proposed or Improved Pedestrian Ramp
- Remove Pedestrian Ramp/Rebuild Curb
- Existing Sidewalk/Crosswalk
- Proposed Sidewalk/Crosswalk
- Reapplied Crosswalk
- Remove Sidewalk/Crosswalk
- Proposed Decorative Fence
- Proposed TTA Light Rail
- Existing Railroad
- Assumed Rail Right of Way
- Parking Lot
- Bus Stops

# Blackwell/Corcoran Street / Norfolk Southern Railroad Crossing Preliminary Recommendations

All preliminary pedestrian recommendations listed below for this location are near-term improvements. Near-term improvements may be phased into the mid-term depending on funding availability.

**Corcoran Street / Ramseur Street**

| Recommendation | Location |
|---|---|
| Mill pavement and resurface with stamped asphalt | Corcoran Street / Pettigrew Street intersection |
| Construct pedestrian ramps | Southeast corner of intersection<br>Southwest corner of intersection |
| Reapply crosswalk markings<br>(stamped asphalt) | East/west across Corcoran Street, north side of the intersection<br>North/south across Ramseur Street, east side of the intersection<br>North/south across Ramseur Street, west side of the intersection |
| Install streetscape lighting | Southeast corner of intersection<br>Southwest corner of intersection |

**Blackwell/Corcoran Street / Railroad Crossing**

| | |
|---|---|
| *Construct asphalt pedestrian crossing | East side of railroad crossing between gates<br>West side of railroad crossing between gates |
| *Construct 2'-6" curb & gutter and concrete sidewalk with brick trim (minimum 10' from rails) | East side of railroad crossings outside gates between Ramseur Street and Pettigrew Street<br>West side of railroad crossings outside gates between Ramseur Street and Pettigrew Street |
| *Install decorative fence | Along south side of Ramseur Street between Chapel Hill Street and Corcoran Street<br>Along south side of Ramseur Street between Corcoran Street and Mangum Street |
| Construct restricted access for rail maintenance Vehicles including "No Parking" and "Private Property" signs | Northeast corner of rail crossing near proposed decorative fence |
| Add interconnect between traffic signals | Between Pettigrew Street/Blackwell Street and Ramseur Street/Corcoran Street intersections |

Note: Provide restricted access for rail maintenance vehicles between decorative fence and railway

**Blackwell Street / Pettigrew Street**

| | |
|---|---|
| Mill pavement and resurface with stamped asphalt | Blackwell Street / Pettigrew Street intersection |
| Remove crosswalk markings | East/west across Blackwell Street, north side of the intersection |
| Remove pedestrian ramps | Northwest corner of intersection, facing east<br>Northeast corner of intersection, facing west |
| Remove pedestrian signals | Northwest corner of intersection, facing east<br>Northeast corner of intersection, facing west |
| Reapply crosswalk markings<br>(stamped asphalt) | North/south across Pettigrew Street, east side of the intersection<br>North/south across Pettigrew Street, west side of the intersection<br>East/west across Blackwell Street, south side of the intersection |
| Reconstruct pedestrian ramp | Northwest corner of intersection, facing south<br>Northeast corner of intersection, facing south |
| Install streetscape lighting | Northeast corner of intersection<br>Northwest corner of intersection |
| Construct sidewalk | South side of Pettigrew Street between Blackwell Street and Mangum Street |
| Street furniture: benches and trash cans | Along Blackwell Street between Pettigrew Street and Vivian Street, as appropriate |
| Retime traffic signals due to removed crosswalk | All directions |

* Rail safety improvements

1

Repair Pavement / Repaint Crosswalk

2

Install Sidewalk for High Traffic Trail

3

Install Standard Asphalt Pavement over Tracks for Sidewalk Connectivity

4

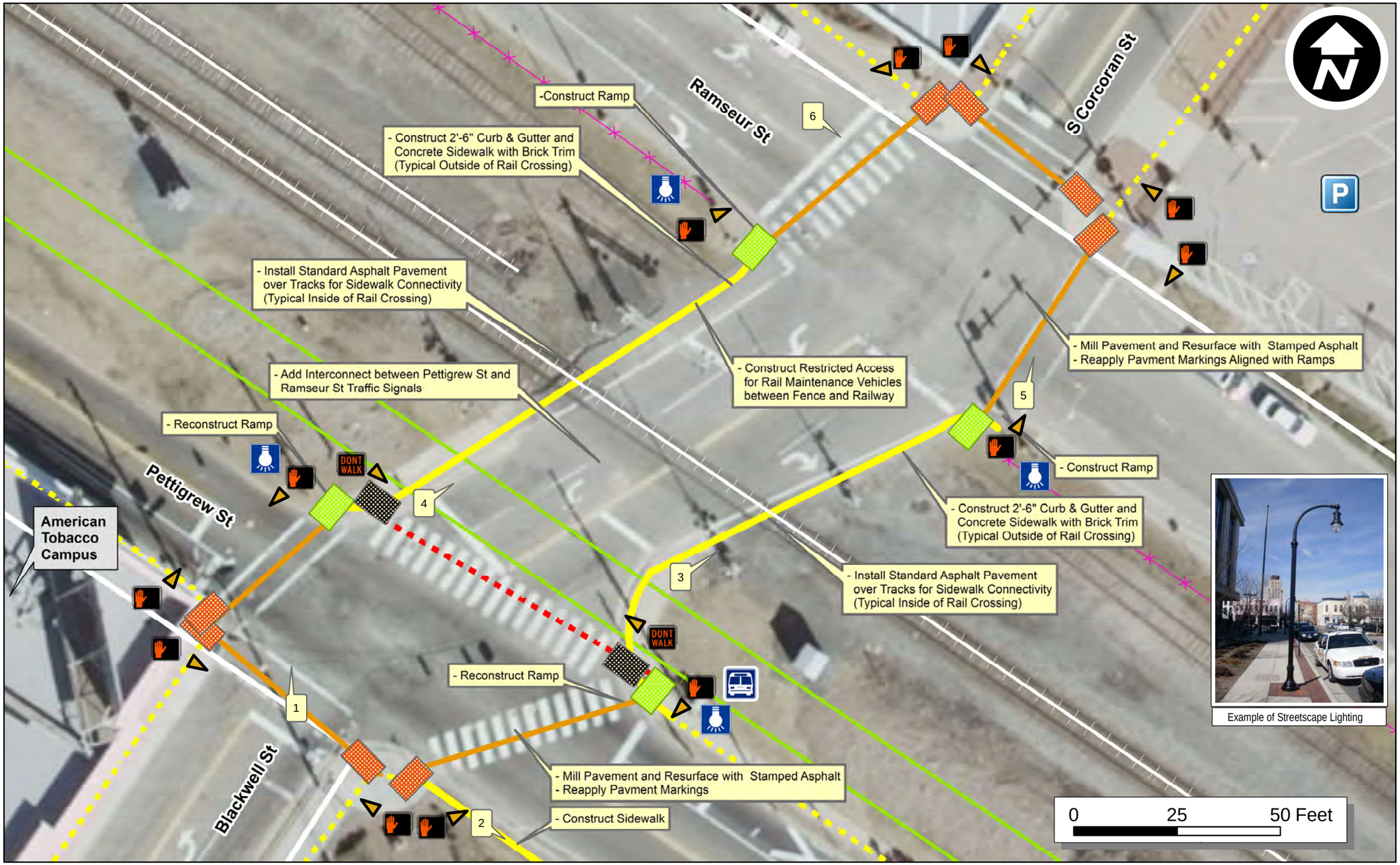
Construct 2'-6" Curb & Gutter and Concrete Sidewalk with Brick Trim

5

Reapply Crosswalk Marking to Align with Pedestrian Ramp

6

Mill Pavement and Resurface with Stamped Asphalt






Example of Streetscape Lighting

Durham Traffic Separation Study
Preliminary Pedestrian Recommendations
Blackwell / Norfolk Southern RR Crossing

Durham County, North Carolina

February 27, 2012

**Legend**

- Existing Pedestrian Signal
- Proposed Pedestrian Signal
- Remove Pedestrian Signal
- Pedestrian Signal Direction
- Proposed Streetscape Lighting
- Proposed Lighting in Tunnel
- Existing Pedestrian Ramp
- Proposed or Improved Pedestrian Ramp
- Remove Pedestrian Ramp/Rebuild Curb
- Existing Sidewalk/Crosswalk
- Proposed Sidewalk/Crosswalk
- Reapplied Crosswalk
- Remove Sidewalk/Crosswalk
- Proposed Decorative Fence
- Proposed TTA Light Rail
- Existing Railroad
- Assumed Rail Right of Way
- Parking Lot
- Bus Stops

# Mangum Street / Norfolk Southern Railroad Crossing Preliminary Recommendations

All preliminary pedestrian recommendations listed below for this location are near-term improvements. Near-term improvements may be phased into the mid-term depending on funding availability.

**Mangum Street / Ramseur Street**

| Recommendation | Location |
|---|---|
| Mill pavement and resurface with stamped asphalt | Mangum Street / Ramseur Street intersection |
| Reapply crosswalk markings | North/south across Ramseur Street, east side of the intersection<br>North/south across Ramseur Street, west side of the intersection<br>East/west across Mangum Street, north side of the intersection |
| Construct pedestrian ramps | Southeast corner of intersection, facing north<br>Southwest corner of intersection, facing north |
| Upgrade bus stop: replace shelter | Northwest corner of intersection |
| Install streetscape lighting | Southeast corner of intersection<br>Southwest corner of intersection |
| Realign crosswalk to match pedestrian ramps | East/west crosswalk across Mangum Street, north side of the intersection |

**Mangum Street / Railroad Crossing**

| | |
|---|---|
| *Construct concrete pedestrian pathway | East side of railroad crossing between gates<br>West side of railroad crossing between gates |
| *Construct 2'-6" curb & gutter and concrete sidewalk with brick trim | East side of railroad crossings outside gates between Ramseur Street and Pettigrew Street<br>West side of railroad crossings outside gates between Ramseur Street and Pettigrew Street |
| *Remove pedestrian path and railing | East of Mangum Street |
| *Install decorative fence | Along south side of Ramseur Street between Corcoran Street and Mangum Street<br>Along south side of Ramseur Street between Mangum Street and Roxboro Street |

Note: Provide restricted access for rail maintenance vehicles between decorative fence and railway

**Mangum Street / Pettigrew Street**

| | |
|---|---|
| Mill pavement and resurface with stamped asphalt | Mangum Street / Pettigrew Street intersection |
| Remove crosswalk markings | East/west across Mangum Street, north side of the intersection |
| Remove pedestrian ramps | Northwest corner of intersection, facing east<br>Northeast corner of intersection, facing west |
| Remove pedestrian signals | Northwest corner of intersection, facing east<br>Northeast corner of intersection, facing west |
| Reapply crosswalk markings | East/west across Mangum Street, north side of the intersection<br>East/west across Mangum Street, south side of the intersection<br>North/south across Pettigrew Street, east side of the intersection<br>North/south across Pettigrew Street, west side of the intersection |
| Reconstruct pedestrian ramp | Northwest corner of intersection, facing south<br>Northeast corner of intersection, facing south<br>Southeast corner of intersection, facing north and west<br>Southwest corner of intersection, facing north and east |
| Install streetscape lighting | Northeast corner of intersection<br>Northwest corner of intersection |
| Street furniture: benches and trash cans | Along Mangum Street between Pettigrew Street and Vivian Street, as appropriate |
| Construct sidewalk | Along south side of Pettigrew street between Blackwell Street and Mangum Street |
| Remove pedestrian path and railing | Northeast of intersection between Pettigrew Street and Norfolk Southern railroad |
| Upgrade bus stop: add shelter and bench | Southwest corner of intersection |
| Retime traffic signals due to removed crosswalk | All directions |

* Rail safety improvements

1

Install Standard Asphalt Pavement over Tracks for Sidewalk Connectivity

2

Mill and Repave Crosswalk and Reapply Pavement Markings

3

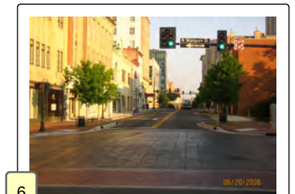
Upgrade Bus Stop

4

Install Standard Asphalt Pavement over Tracks for Sidewalk Connectivity

5

Remove Pedestrian Path and Railing



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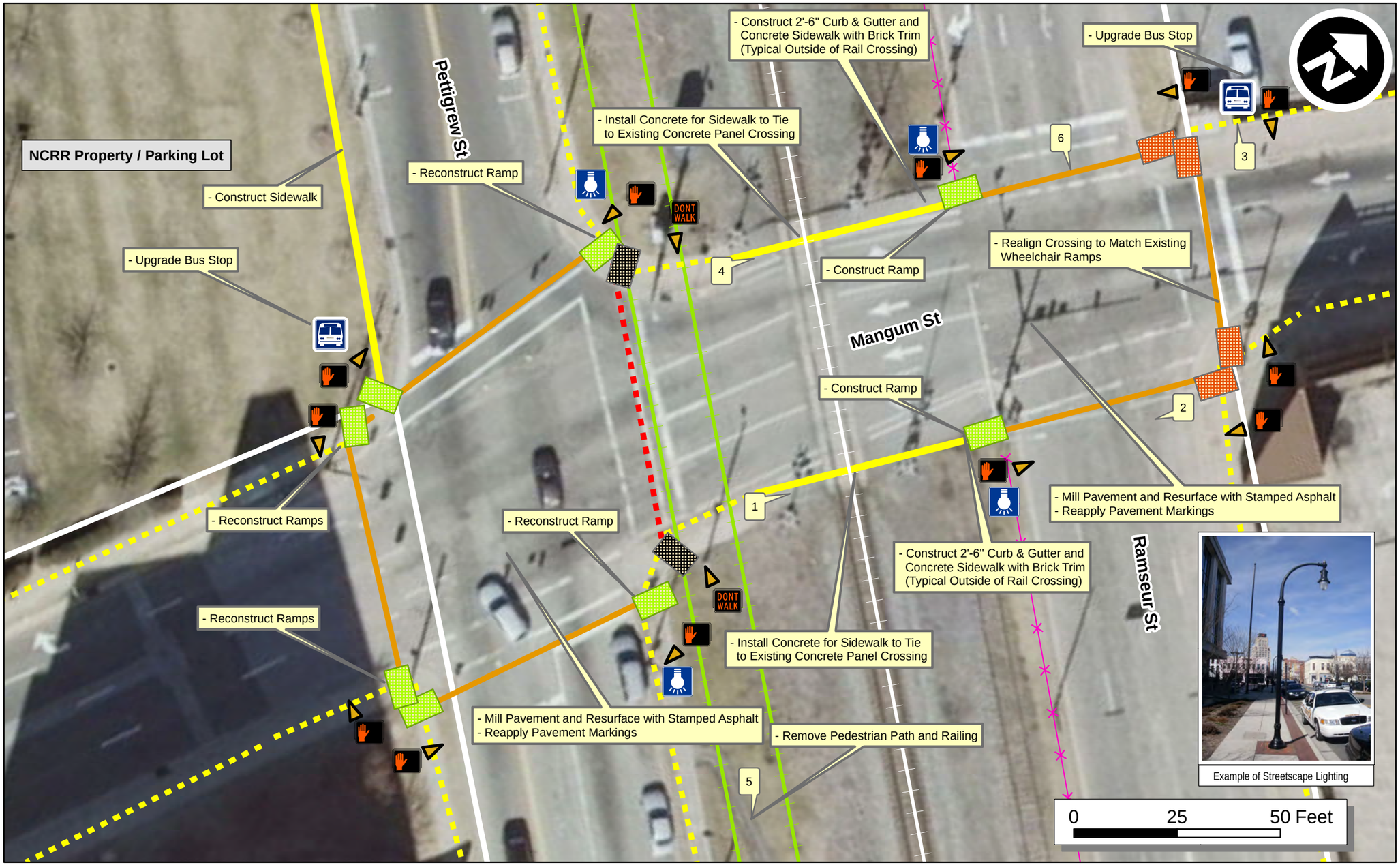
Mill Pavement and Resurface with Stamped Asphalt




Example of Streetscape Lighting

Durham Traffic Separation Study
Preliminary Pedestrian Recommendations
Mangum / Norfolk Southern RR Crossing

Durham County, North Carolina

February 27, 2012

**Legend**

- Existing Pedestrian Signal
- Proposed Pedestrian Signal
- Remove Pedestrian Signal
- Pedestrian Signal Direction
- Proposed Streetscape Lighting
- Proposed Lighting in Tunnel
- Existing Pedestrian Ramp
- Proposed or Improved Pedestrian Ramp
- Remove Pedestrian Ramp/Rebuild Curb
- Existing Sidewalk/Crosswalk
- Proposed Sidewalk/Crosswalk
- Reapplied Crosswalk
- Remove Sidewalk/Crosswalk
- Proposed Decorative Fence
- Proposed TTA Light Rail
- Existing Railroad
- Assumed Rail Right of Way
- Parking Lot
- Bus Stops

## Roxboro Street / Norfolk Southern Railroad Crossing Preliminary Recommendations

All preliminary pedestrian recommendations at this location are near-term improvements. Near-term improvements may be phased into the mid-term depending on funding availability.

**Roxboro Street / Railroad Bridge**

| | |
|---|---|
| Sandblast and paint | Walls, wingwalls, and bridges in Norfolk Southern railroad tunnel |
| Mill pavement and resurface | Roxboro Street under Norfolk Southern railroad |
| Repair support structure and wingwall | In Norfolk Southern railroad tunnel |
| Improve landscaping | On north and south ends of railroad tunnels on top of the wingwalls |
| Remove existing chain link fence | South of Norfolk Southern railroad |
| *Install decorative fence | Along south side of Ramseur Street between Mangum Street and Roxboro Street |
| Add pedestrian lighting | In the railroad tunnel (the City is completing an agreement with NCRR and plans to install additional lights in the tunnel this spring) |

**Roxboro Street / Pettigrew Street**

| | |
|---|---|
| Mill pavement and resurface | Roxboro Street / Pettigrew Street intersection |
| Remove crosswalk markings | East/west across Roxboro Street, north side of the intersection |
| Remove pedestrian ramps | Northwest corner of intersection, facing east<br>Northeast corner of intersection, facing west |
| Remove pedestrian signals | Northwest corner of intersection, facing east<br>Northeast corner of intersection, facing west |
| Reapply crosswalk markings | North/south across Pettigrew Street, west side of intersection<br>North/south across Pettigrew Street, east side of intersection<br>East/west across Roxboro Street, south side of intersection |
| Reconstruct pedestrian ramp | Northwest corner of intersection, facing south<br>Northeast corner of intersection, facing south<br>Southeast corner of intersection, facing north and west<br>Southwest corner of intersection, facing north and east |
| Remove existing sidewalk | On north side of Pettigrew Street east of Roxboro Street to end of sidewalk |

***** Rail safety improvements

1

Improve Landcaping on Top of Wingwalls

2

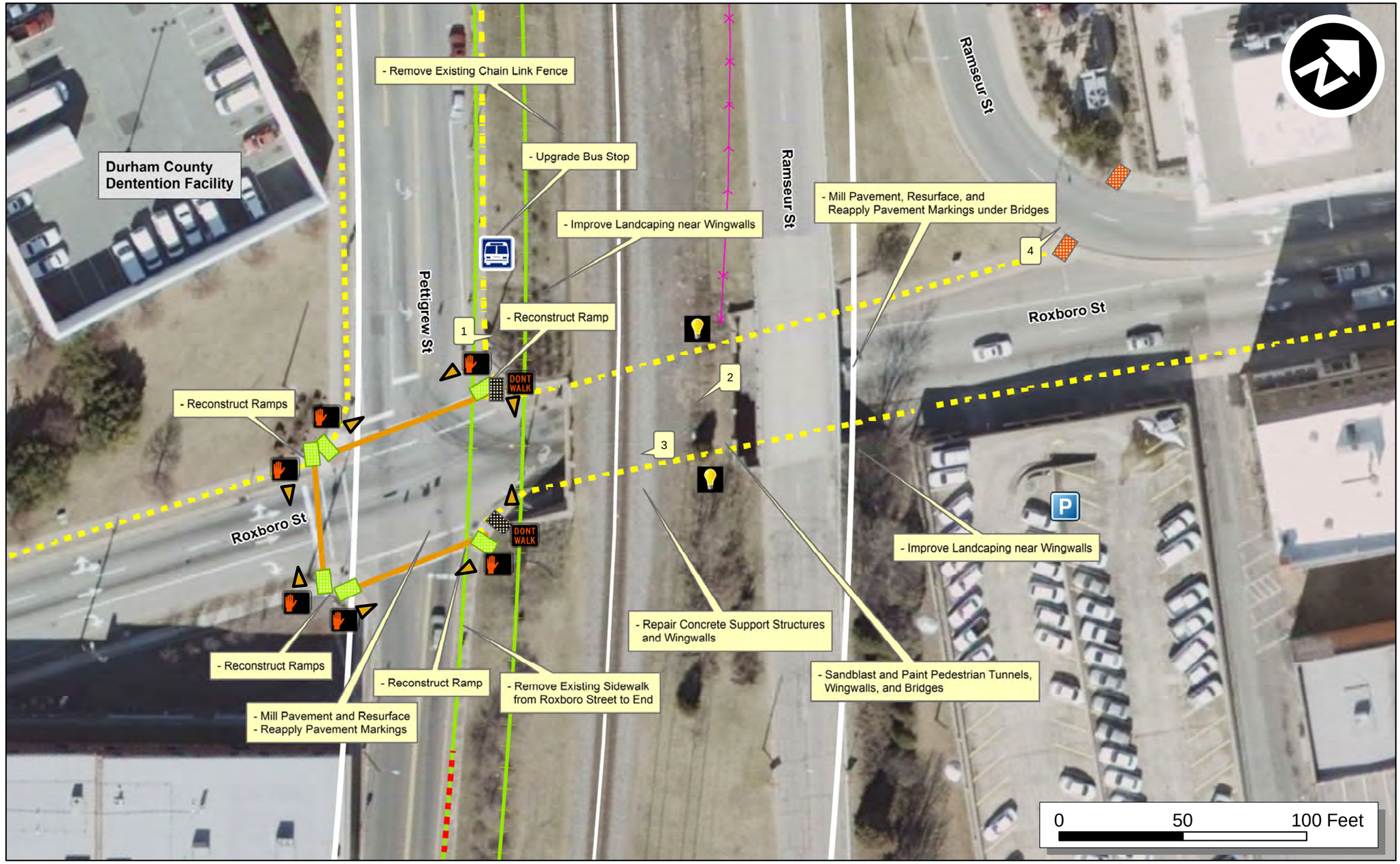
Mill and Resurface Roadway and Reapply Pavement Markings

3

Repair Concrete Support Structures and Wingwalls

4

Apply Crosswalk Markings




Durham Traffic Separation Study
Preliminary Pedestrian Recommendations
Roxboro / Norfolk Southern RR Crossing

Durham County, North Carolina

February 13, 2012

**Legend**

- Existing Pedestrian Signal
- Proposed Pedestrian Signal
- Remove Pedestrian Signal
- Pedestrian Signal Direction
- Proposed Streetscape Lighting
- Proposed Lighting in Tunnel
- Existing Pedestrian Ramp
- Proposed or Improved Pedestrian Ramp
- Remove Pedestrian Ramp/Rebuild Curb
- Existing Sidewalk/Crosswalk
- Proposed Sidewalk/Crosswalk
- Reapplied Crosswalk
- Remove Sidewalk/Crosswalk
- Proposed Decorative Fence
- Proposed TTA Light Rail
- Existing Railroad
- Assumed Rail Right of Way
- Parking Lot
- Bus Stops