

## INTERNAL DRAFT – PHASE III PRELIMINARY STRATEGIES FOR FURTHER DISCUSSION

Updated August 20, 2012

### BIDDEFORD INTERCHANGE AREA

Implement adaptive traffic control on Route 111

Adaptive traffic control (ATC) involves state-of-the art, computer controlled operation of traffic signal timing. ATC allows traffic signals to monitor traffic conditions in real time and adjust traffic signal timing instantaneously. Each signal is operated considering the local traffic conditions as well as conditions and signal operations at upstream and downstream intersections. Upgrading to ATC would require addition of video traffic detection, upgrading traffic signal controllers, interconnecting signals along the Route 111 corridor, and developing and testing signal timing parameters.

ATC is recommended on the Route 111 segment extending from the western Biddeford Crossing entrance to the Shaw's supermarket entrance east of Exit 32, Precourt Street (five signalized intersections over a nearly-mile long segment). Should this initial implementation prove successful, ATP could be extended to the east toward Route 1.

- *Benefits:* Maximize operating efficiency of existing highway capacity, reduce travel delay/congestion, reduces stops at signalized intersections. Some ATP systems can also positively affect intersection safety by extending green time to avoid changing from green to yellow when a vehicle is entering the intersection.
- *Cost:* Approximately \$250,000 to \$500,000 for upgrading five intersections (assumes existing signals retained with controller and detection upgrades).
- *Natural and physical resources potentially impacted:* No adverse impacts expected.
- *Implementation timeframe:* Near- to mid-term. Could be implemented as a test corridor to study effectiveness and gauge potential for implementation elsewhere in Maine.

Biddeford Route 111 to Exit 32 interchange connector

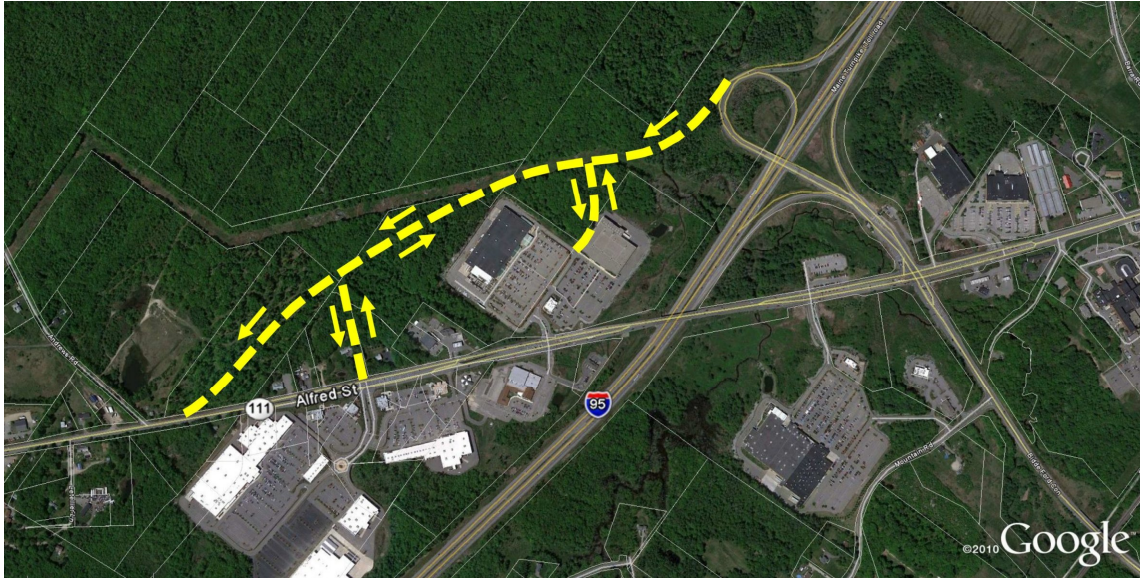
Expand the Exit 32 interchange and construct a new connecting highway north of Route 111 to allow traffic destined for Sanford, Alfred, Lyman and other points north/west of I-95 to avoid the Route 111/Precourt intersection.

Two options have been identified. A Partial Exit 32 Connection would involve construction of the new highway corridor north of Route 111 in the Biddeford Crossing area and a connection from the SB offramp only. A second option – Full Exit 32 Connection – would reconfigure the interchange to include access from the new connecting highway to the southbound onramp and northbound onramp as well. This second option may not be

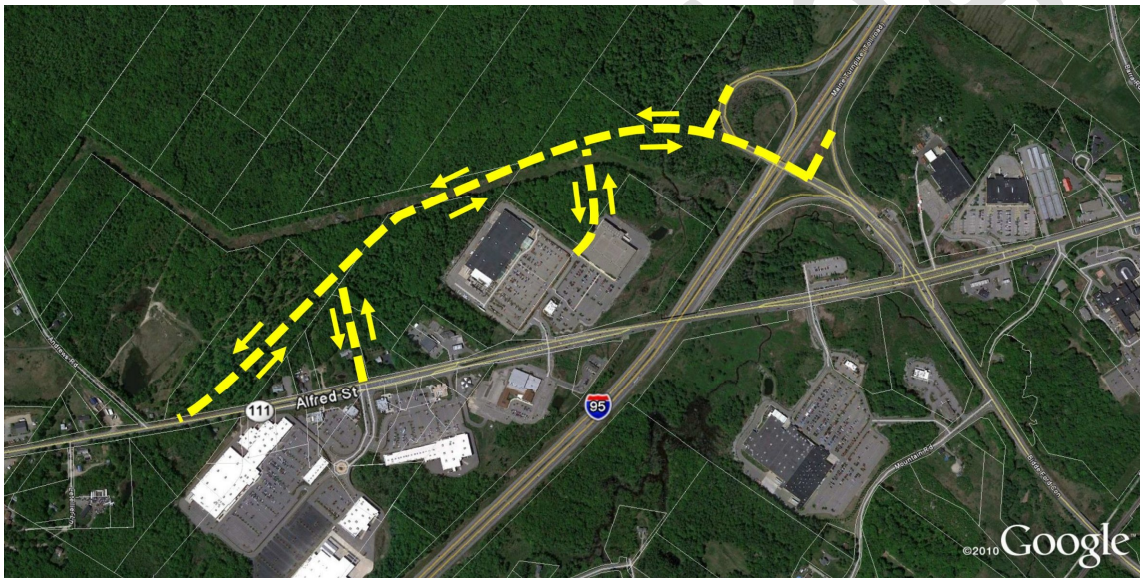
feasible unless MTA toll collection systems evolve to not require toll booths at ramps (e.g. – all electronic tolling or mainline only tolling). The options could potentially be phased (partial implemented initially, and the full connection at a later time).

Under either option, the southbound channelization from Exit 32 could be modified to allow two dedicated left turn lanes, two through lanes, and a single right turn lane, since either option would divert much of the former right-turning traffic to the new connector roadway.

- *Benefits:* Reduce delay and congestion on Route 111 at Precourt (details below). Additional circulation in the Biddeford Crossing area. Possibly opens new development opportunities (depending on access controls and zoning).
  - Partial Connection:
    - Daily traffic: Traffic on Route 111 reduced by about 14 percent (Biddeford Crossing to Precourt St/Exit 32).
    - AM Peak: Minor improvement in delay for traffic exiting the Turnpike during the AM Peak, but other traffic movements not improved.
    - PM Peak: Reduces delay at the Rte 111/Precourt intersection by 12 percent during the PM Peak. All intersection movements improved to LOS D or better (three LOS E movements for the baseline), and intersection to LOS C (from LOS D baseline).
  - Full Connection (potential second phase):
    - Daily traffic: Traffic on Route 111 reduced by about 28 percent (Biddeford Crossing to Precourt St/Exit 32).
    - AM Peak: Reduces delay at the Rte 111/Precourt intersection by 28 percent during the PM Peak. All intersection movements improved to LOS D or better (westbound through movements are LOS F for the baseline), and intersection to LOS C (from LOS D baseline).
    - PM Peak: Additional 10 percent reduction in delay at Rte 111/Precourt intersection during the PM Peak.
- *Cost:* Approximately \$8 to \$10 million, depending on alignment.
- *Natural and physical resources potentially impacted:* Would impact undeveloped lands between Route 111 and existing utility corridor to the north. Would impact residential property on north side of Route 111 at the western entrance to the Shops at Biddeford Crossing if a connection is provided at that location, as shown on concept sketches.
- *Implementation timeframe:* Long-term. Adaptive signal control should be implemented first as a lower-cost method of managing traffic on the Route 111 corridor approaching Exit 32. Additionally, improvements in toll collection may reduce toll-booth induced congestion and lessen the need for capacity improvements such as these. The Full Exit 32 Connections option may be infeasible as long as manual toll collection is needed at this interchange.



Partial Exit 32 Connection (southbound off only)



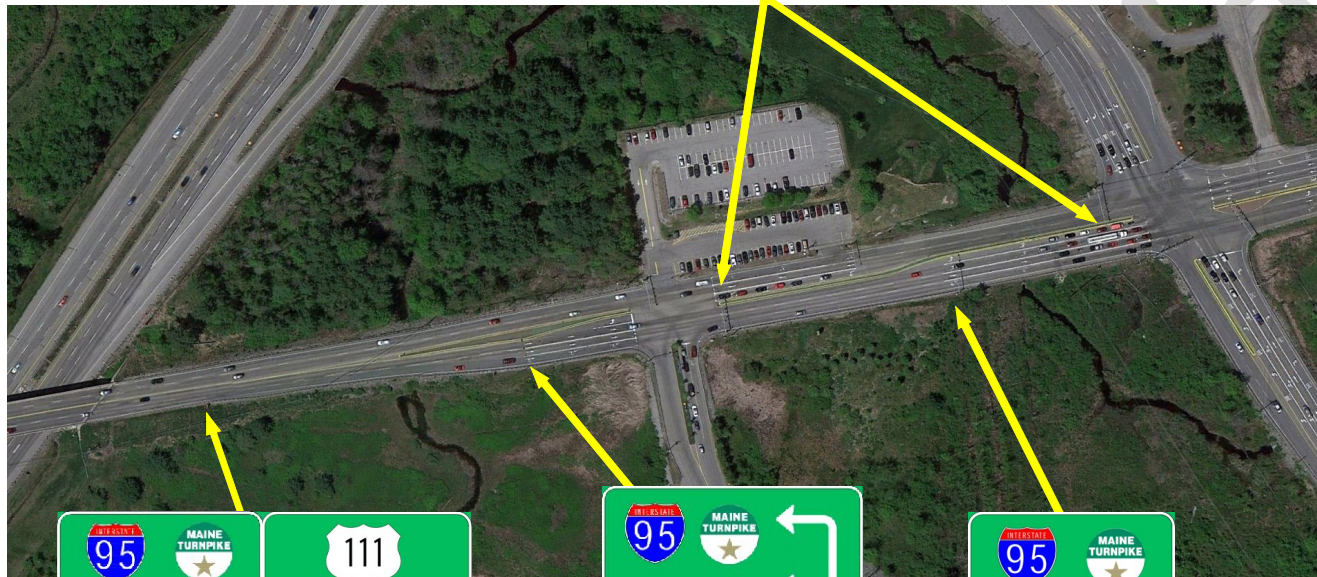
Full Exit 32 Connection (southbound off, northbound and southbound on)

### Adjust signage westbound Route 111 approaching Precourt/I-95 exit 32

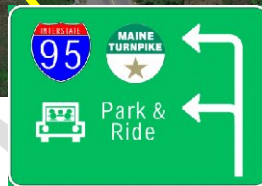
To help drivers select the appropriate lane while approaching the entrance to the Maine Turnpike at exit 32, add additional signing designating the left lane for Turnpike and Park-and-Ride traffic, and the right lane for Biddeford/Rte 111 traffic. Signs to clarify that the Turnpike entrance is the second left, after the Biddeford park-and-ride, are recommended too.

### Eastbound Route 111 Signage Concept Plan

Maintain existing overhead lane arrow signs at intersections



Add additional signs to indicate proper lane choice



Replace existing overhead sign



New sign

- *Benefits:* Reduce driver confusion; potentially reduce collisions approaching Precourt Street.
- *Cost:* Approximately Under \$25,000, unless additional overhead sign supports needed.
- *Natural and physical resources potentially impacted:* No adverse impacts.
- *Implementation timeframe:* Near-term.

Other signage improvements.

Add speed limit signs on Route 111 following intersections with major crossroads (where missing).

Verify locations where icing occurs and add MUTDC W8-5 with W8-5aP (“Ice”) signs.

- *Benefits:* Improve driver awareness of conditions.
- *Cost:* Minimal.
- *Natural and physical resources potentially impacted:* No adverse impacts.
- *Implementation timeframe:* Near-term.



MUTCD W8-5 with W8-5aP

## OTHER BIDDEFORD AREA ACTIONS

Recommended city-led actions

- Develop additional local roadways connecting Route 111 to Route 1 to improve local circulation and access, and reduce traffic at key highway intersections (concept map under development). Corridor development would be a city-led action; the links shown are suggestions for further consideration by the City. They include:
  - Connect W Cole Road to Cole Road (requires grade separated crossing of railroad track).
  - Realign Edwards Road to avoid St Demetrios Cemetery and extend to connect to Route 1 or Precourt Street.
  - Connect Mountain Road with Medical Center Drive
  - Extend Mariner Way (Biddeford Crossing) to Old Alfred Road
  - Connect Old Alfred Road/Mountain Road to Route 1
- Access management approaches (see Access Management section of final report for options).

## ROUTE 111/202 CORRIDOR (BIDDEFORD – SANFORD)

Passing Lanes

Traffic volumes on the Route 111 corridor are highest to the east in Arundel and Biddeford. In Arundel, the two-lane highway section operates at LOS E conditions in the peak direction of travel during the PM peak period today (westbound), while all other two-lane segments operate at LOS D. By 2035, both directions in Arundel and westbound traffic in Lyman, Alfred and Sanford are projected to degrade to LOS E conditions. The poor level of service is largely driven by lack of passing opportunities during peak periods. Passing lanes provide opportunities to pass slower moving traffic and could maintain LOS C/D conditions through 2035 on the corridor.

A total of two passing lane segments are recommended in each direction. Preferred passing lane locations have relatively few driveways and cross streets (especially those requiring left turns) and are a minimum of ½-mile in length. As practical, they should be located exiting from built up areas or speed zones. Recommended locations on the Route 111 corridor are:

- Westbound starting at Route 35 (Lyman) and extending 1-mile to the east (currently programmed for construction).
- Westbound New Rd (Arundel) to Drew’s Mill Rd (0.5 miles), as recommended in prior Route 111 study.
- Eastbound EITHER starting at Howitt Road (Lyman) and extending 1-mile east to beyond Boulder Lane, OR starting near Down/Clark/Blueberry Lane (Alfred) and extending 1-mile east to near Graves Road (Lyman), as recommended in prior Route 111 study.
- Eastbound from Route 35 extending 1-mile to near Thompson/Trout Brook Road, as recommended in the prior Route 111 study.

Should any of the segments between Route 35 and Biddeford prove infeasible in the future, other potential viable passing lane options are:

- Thompson/Trout Brook Road to Hill Road.
- Hill Rd to Limerick Road.

While full shoulders (8 feet) do not need to be provided in the direction of the passing lane, adequate paved shoulders should be maintained for safety purposes and to allow for bicycle use. Five-foot minimum shoulders are therefore recommended adjacent to passing lanes.

- *Benefits:* Allows traffic to pass slower moving vehicles, reduced delay and improved travel reliability; improved peak level of service to LOS C/D (from projected LOS E in 2035); reduces incidence of head-on collisions.
- *Costs and impacts:* Approximately \$2.2 million per mile.
- *Natural and physical resources potentially impacted:* Could be accommodated within existing right-of-way, but may require modification of access at some locations (e.g. driveway relocations or adjustments).
- *Implementation timeframe:* Near to mid-term. Segments east of Route 35 are the most congested and merit initial consideration.

#### Center and Edge-Line Rumble Strips on Route 111/202

Route 111/202 has the highest rate of head-on crashes of major highways within the CYCCS study area, and a relatively high rate of run off the road crashes. Add rumble strips on Route 111/Route 202 corridor at the center line (double yellow line locations only) and edge line. Edge lines should be located under the painted edge line, or immediately adjacent to preserve shoulder width for use by bicyclists. Rumble strips should be avoided in more densely populated areas, and are not recommended where the posted speed is 35 mph or under.

- *Benefits:* Reduces incidence of head-on collisions (center rumble strip) and run off the road crashes or crashes related to over-correction (edge line).

- *Cost:* Minimal cost.
- *Natural and physical resources potentially impacted:* Increased noise for abutters when vehicles cross center or edge line, which can be minimized by temporarily interrupting rumble strips in front of residential properties that are located near the roadway and in more densely developed areas.
- *Implementation timeframe:* Near-term (with next scheduled line painting maintenance).

#### Reconstruct Route 202 near Goodall Hospital

The existing crest on Route 202 at the entrance to the Sanford Hospital impacts sight distance for westbound vehicles turning into or existing the hospital. This is compounded by the lack of a left turn pocket, which means turning traffic must slow or come to a stop in the through travel lane.

Reconstruction of the roadway to create a left turn pocket and minor regrading of the vertical profile to improve sight distance and separate turning traffic is recommended. The two existing driveways should be consolidated to a single driveway, with the easternmost entrance closed or restricted to right-turn in/out only. Additional access is provided to June Street. A walkway is recommended on the south side of the highway bordering the hospital property.

- *Benefits:* Reduce potential for crashes at the Sanford Hospital; improve access to the hospital, extend pedestrian network..
- *Costs and impacts:* TBD.
- *Natural and physical resources potentially impacted:* Some grading may affect undeveloped areas of adjacent parcels. Walkway may require some undeveloped hospital property bordering the roadway.
- *Implementation timeframe:* Longer-term. This is a lower priority improvement, as the location is not a current high crash location. This improvement could be deferred until major maintenance/reconstruction of the roadway is needed.

#### Reconstruct Route 202 between Brook Street and River Street

This segment of US Route 202 is a narrow, downhill stretch of two-lane highway entering central Sanford. Sidewalks are poorly defined and utility poles are located on the edge of the south side of the roadway (in front of the sidewalk). The right-of-way is constrained to 40 feet here, and abutting houses are located close to the roadway.

(Option 1) Per applicable standards, the current 40-foot right-of-way allows for five foot wide sidewalks directly abutting the highway, with two eleven foot travel lanes and four foot shoulders. Further narrowing is not recommended due to truck use of the corridor, the grade, and to allow space for bicyclists. In either case, raised curbs would provide better separation of pedestrians and traffic. Utilities should be relocated underground (preferred) or on the sidewalk (maintaining a minimum four-foot clear walk zone). This approach would not allow for the introduction of landscaping or street trees, though decorative period streetlighting and other hardscaping such as colored crosswalks at River Street and Brook Street could potentially be incorporated into the design.

(Option 2) Introducing street trees or other landscaping here would help establish a gateway into town and better buffer both pedestrians and adjacent residences from the highway. However, a right-of-way acquisition of six additional feet would be necessary to provide space needed to establish a planting strip between the sidewalk and roadway. While adjacent dwellings would not be directly impacted, a three-foot taking on either side of the roadway would further reduce front yard sizes and necessitate reconstructing a number of private retaining walls. The resulting 46-foot right-of-way would allow this segment to be reconfigured as a gateway to the town, with the following elements:

- Two 15-foot travel lanes (same as existing)
  - 8-foot sidewalk/planting strip on each side of the roadway. The increased width would better separate pedestrians from traffic, create a more visually appealing gateway, and allow for plantings that would have a traffic calming effect. Street trees could be introduced in four-foot wide tree wells, or a continuous four-foot wide planting strip.
  - Utility poles should be located in line with the landscaping strip, or (preferable) located underground for this segment. If above ground wires are maintained, street tree selection should be limited to shorter, decorative varieties.
- *Benefits:* Improved definition of vehicle, bicycle (shoulder) and pedestrian (sidewalk) space. Removal of obstructions from the edge of the roadway. Improved separation of travel way and sidewalk, especially under Option 2. Landscaping under Option 2 would further provide some traffic calming effect and improved visual appearance, forming an eastern gateway to town.
  - *Costs:* TBD.
  - *Natural and physical resources potentially impacted:* Option 1 would be constructed within the existing right-of-way. Utility connections to abutting properties would need to be relocated if utilities are undergrounded. Option 2 would require acquisition of 3 feet of right-of-way from front yards of abutting properties. Several yards have short retaining walls that would need to be replaced or modified.
  - *Implementation timeframe:* Mid- to Longer-term. Potential candidate for grant funded programs. Should be coordinated with Route 202/River Street intersection improvements.

#### Reconstruct Route 202/River Street intersection

Widen intersection to create left turn pockets on Route 202 at the intersection. Ensure safe pedestrian crossings are included in the intersection improvements.

- *Benefits:* Increased capacity at Route 202/River Street. Reduced potential for crashes on US Route 202 due to separation of left turning traffic.
- *Costs:* TBD
- *Natural and physical resources potentially impacted:* Would require 52-foot right-of-way, likely requiring the taking of the property on the northeast corner of the intersection and undeveloped land on the northwest corner. Based on aerial photography, a two to four foot strip



of property would be needed to the northwest, while a wider 12-foot strip would be needed to the northeast (taking the existing three story building). The historic eligibility of the northeast property (currently vacant) will be investigated.

- *Implementation timeframe:* Medium-term to long-term. This is a moderate priority improvement, but the potential right-of-way needed on the northwest property should be preserved should abutting properties redevelop (approximately 2 feet needed on the northwest side, and up to 12 feet on the northeast side).

Reconstruct Route 202/Route 109 intersection in downtown Sanford

Widen and realign US Route 202 to improve intersection alignment and add an eastbound left turn pocket. Also add a narrow center island on the south leg of Route 109 to enforce right-in/right/out turns at Twombly Road. Provide well-marked, safe pedestrian crossings through the intersection.

- *Benefits:* Reduced congestion and LOS improved from LOS D to LOS C. Two AM peak and three PM peak LOS E movements improved to LOS D or better. Reduced potential for crashes on US Route 202 due to separation of left turning traffic. Reduced incidence of collisions on Route 109 near Twombly Road (current high crash location).
- *Costs:* Approximately \$1.1 million
- *Natural and physical resources potentially impacted:* Would require acquisition of right of way to the south of Route 202 (currently a vacant restaurant and parking) and elimination of onstreet parking in front of the church at the northwest corner of the intersection.
- *Implementation timeframe:* Near- to Mid-term. This is a moderate priority improvement. Property should be acquired while undeveloped/unused.

Spot safety improvements at Rte 111/Day Rd/Kennebunk Pond Road (Lyman)

Install curbing/landscape to formalize access to developed property on the northwest corner of intersection, creating one driveway on Kennebunk Pond Rd, and one on Route 111. Clear vegetation in right-of-way to improve sight lines. Relocate stop sign on Kennebunk Pond Road from utility pole to a free standing sign. Install “stop ahead” signs on cross street (MUTCD WB-3) or (preferred) flashing beacon at intersection (red for side streets, yellow for Route 111).

- *Benefits:* Reduced potential for crashes at this current High Crash Location.
- *Cost:* Approximately \$50k.
- *Natural and physical resources potentially impacted:* None.
- *Implementation timeframe:* Near-term.

Improve and formalize U-turn at Rte 111/Rte 35 intersection (Lyman).

An informal U-turn space has been constructed for eastbound traffic that wishes to reverse direction east of Route 35. U-turns are currently prohibited at the intersection itself, and traffic exiting adjacent developments is restricted to right-out exit maneuvers today.

Ideally, backage roads or side streets would provide the necessary additional access to accommodate these movements. Establishment of a local roadway bordering the rear of existing developments would provide this access and open additional land near the highway to development.

Short of constructing a new local road(s), modification of the existing informal U-turn is recommended. This would shifting the eastbound travel lane to the right to maintain sufficient width for a left turn lane, and reconfiguring the center island to extend the existing left turn pocket. The paved receiving area on the north side of the roadway is limited in depth by the highway right-of-way, but could be widened to 125 feet long to provide more turn around space for vehicles (currently 75 feet). A sign prohibited trucks from using the U-turn should be considered.

- *Benefits:* Improves access from adjacent properties. Reduced potential for crashes compared to existing configuration.
- *Cost:* Approximately \$50,000 to \$75,000 to formalize the U-turn route.
- *Natural and physical resources potentially impacted:* None.
- *Implementation timeframe:* Near-term.

## OTHER SANFORD AREA RECOMMENDATIONS

### Rehabilitation and shoulder widening on Route 11A and Route 224

Routes 11A and 224 are supplemental highway connections linking Route 202 with Routes 11/109 in Springvale, allowing traffic traveling north to bypass downtown Sanford. Average daily traffic on Rte 11A (Oak St) is about 2500 vehicles. Route 11A has unpaved shoulders, and travel lanes vary between 10 and 11 feet in width. As the highway enters Springvale near Whipple street, the cross section widens and incorporates sidewalks.

Rte 224 carries between 6,600 to 8,800 vehicles daily. Route 224 typically has unpaved shoulders, although some 4-foot shoulder sections are present. Travel lanes on Route 224 are typically 11 feet. Sidewalks are provided north of Railroad Avenue into Springvale.

Maintenance of these routes should be given high priority given the potential for these routes to relieve and supplement Route 202. Repaving/rehabilitating pavement on these highways should include widening travel lanes to 11 feet minimum (12 feet preferred), and shoulder paving is recommended (four-foot minimum). The Route 224 intersection with River Street/Carl Lamb Elementary School should be improved to reduce the current skew of River St and provide pedestrian crosswalks. Sidewalks should be provided north to Railroad Avenue.

- *Benefits:* Improved accommodation of traffic. Improved safety. Shoulders provide space for bicycle use.
- *Cost:* TBD
- *Natural and physical resources potentially impacted:* Work to be conducted in right-of-way.
- *Implementation timeframe:* Near- to medium-term. Pedestrian aspects may be eligible for Safe Routes to Schools funding programs.

#### Town led actions

- Widen shoulders on Old Mill (1800 AADT)/Mt Hope Road (3700 AADT). Similar to Route 11A and Route 224, this corridor provides a supplemental route for trips between Route 202 (west of Sanford) and the 109 corridor in South Sanford. The demand for this movement is fairly low, which is reflected in the existing traffic volumes (1,800 to 3,700 vehicles daily, depending on location). Mt Hope Road has a High Crash Location segment east of its intersection with Route 202. These roads were recently repaved. Nonetheless, expanding the existing cross section (generally 20 feet) to provide 11 foot minimum lanes with 4-foot shoulders (30 foot cross section) is recommended over the longer-term. Additionally, the intersections of these roads with Twombly Road should be realigned to create a four-way intersection.
- Develop local grid (Concept map under development). As described below, the capacity of Route 109 through downtown is constrained by existing development. Therefore, further development of the local street grid is needed to provide additional route choices for local circulation and traffic relief for the Route 109 corridor. Corridor development would be a town-led action; the links shown are suggestions for further consideration by the town. They include:
  - New road linking Jagger Mill Rd to Route 109 at Old Mill Road, possibly extending to School Street.
  - New road linking Route 109/Old Mill Rd to School Street and possibly High Street (access to Route 4).
  - Other new streets parallel to Route 109.
  - Emphasize River Street for access to Route 202 eastbound and eastern areas of the town.

## ROUTE 109 CORRIDOR (SANFORD – WELLS)

### Plan for ultimate Cross Sections of Route 109 in Sanford

#### Two/Three lanes between Downtown Sanford and Old Mill Road

North of Old Mill Road, existing development essentially constrains the highway to a 2-lane cross section, with turn lanes provided at some intersections. Sufficient space exists to add additional turn lanes as needed; either at intersections or major driveway entrances. Where left turn lanes are not needed, raised medians could be established at crosswalk locations to provide pedestrians with safe refuge when crossing the highway. Candidate locations include Route 109 intersections with; Park St/Jackson St, Avon St/Berwick Rd, Schuler St, or other intersection locations where new crosswalks are merited.

#### Five lanes between Old Mill Road and Route 4

### *Old Mill Road and Westview Drive*

Two northbound and one southbound lane are provided from approximately Old Mill Road to Westview Drive, in addition to a left turn lane. Ultimately, a second southbound lane could be constructed to create a continuous 5-lane section between Old Mill Road and Route 4. The existing traffic signal at Marden's may be relocated to the Old Mill Road intersection, and the performance of this intersection over time would determine the need for an additional southbound lane. Should congestion in the future here warrant a second southbound lane at the Old Mill intersection, it should be continue to Westview Drive.

### *Westview Drive and Route 4*

The existing cross section between Westview Drive and Route 4 is four lanes, with left turn lanes provided north of the Sanford Center for Shopping. Right-of-way should be preserved to accommodate a left turn lane (5-lane cross section) between the Center for Shopping and Route 4 as well, which could be constructed when needed as adjacent parcels develop.

### Three lanes between Route 4 and Route 99

A 3-lane section (with center turn lane) should be constructed between Route 4 and Airport Road to reduce conflicts with turning vehicles on this segment, and right-of-way preserved to extend to the current 3-lane section near Route 99 should future development warrant it. Roadway widen can be completed concurrent with future development projects, with missing segments ultimately constructed without developer participation to complete a continuous 5-lane segment. Inclusion of sidewalks and should shoulders (or bike lane) is recommended as these segments are improved.

- *Benefits:* Reduced congestion and queuing on the exit ramp. LOS improved from LOS D to LOS C. Eliminates projected LOS E and LOS F movements.
- *Cost:* Varies depending on phasing and developer participation. Typically \$2 to 2.5 million per lane-mile.
- *Natural and physical resources potentially impacted:* TBD.
- *Implementation timeframe:* Near-term.

Add second left turn lane from Exit 19 to southbound Route 109 (Wells).

Add a second left turn lane from Maine Turnpike exit 19 to Route 109 and extend the existing two-lane receiving segment beyond the I-95 bridge.

- *Benefits:* Reduced congestion and queuing on the exit ramp. LOS improved from LOS D to LOS C. Eliminates projected LOS E and LOS F movements. Allows some green time to be reallocated to the left turn from Route 109 to the Exit 19 toll booth.
- *Cost:* Approximately \$1 million.

- *Natural and physical resources potentially impacted:* None.
- *Implementation timeframe:* Near-term.

Extend right-turn lane on Route 9 at Route 109 (Wells).

Lengthen the right turn lane by 300 feet on eastbound Route 9 at Route 109 to eliminate queuing impacts from left turning vehicles.

- *Benefits:* Reduced congestion for the predominate eastbound right turn movement (LOS F improved to LOS D).
- *Cost:* Approximately \$150k
- *Natural and physical resources potentially impacted:* Could be accommodated within existing right-of-way.
- *Implementation timeframe:* Near-term.

Construct passing lanes on Route 109.

Passing lane placement is complicated by intersections and driveways. Two 1-mile segments are recommended as being potentially feasible:

- Northbound starting near Route 9A and extending approximately 1-mile.
- Southbound starting near Route 99 and extending approximately 1-mile.

The segment between Meetinghouse Road and Bragdon Road is another option for a shorter (0.5 mile) southbound passing lane.

- *Benefits:* Improves travel speed and reliability, and reduced peak LOS from LOS D/E to LOS C/D. Potentially reduces crash rates, particularly for head-on collisions.
- *Costs:* Approximately \$2.2 million each.
- *Natural and physical resources potentially impacted:* Could be accommodated within existing right-of-way, but may require modification of access at some locations (e.g. driveway relocations or adjustments).
- *Implementation timeframe:* Long-term.

## ROUTE 4/US ROUTE 202 (WATERBORO TO NORTH BERWICK)

Construct passing lanes on Route 4.

Most segments of Route 4 are forecast to operate at LOS D or better through 2035. The segment between Grammar Road and Route 109 is more congested, however, and is projected to degrade to LOS E conditions in the peak (eastbound) direction. Passing lane placement is complicated by intersections and driveways; two segments are recommended as being potentially feasible:

- Northbound starting at Grammar Road and extending approximately 1-mile.
- Southbound starting at Old Post Road and extending to Rustic Lane (approximately 0.65 miles)
  
- *Benefits:* Improves travel speed and reliability, and reduced peak LOS from LOS E to LOS C/D. Potentially reduces crash rates, particularly for head-on collisions (note that crash rates on Route 4 are relative low, however).
- *Costs:* Approximately \$2.2 million for northbound lane, \$1.5 million for southbound lane.
- *Natural and physical resources potentially impacted:* Could be accommodated within existing right-of-way, but may require modification of access at some locations (e.g. driveway adjustments).
- *Implementation timeframe:* Long-term. Lower priority than passing lanes on Route 111/202 or Route 109.

#### Spot safety improvements and monitor School Street/Gravel Road

Sight distance is limited from School Street and Gravel Road, which meets Route 4 at the crest of a vertical curve. Electronic warning signs have been implemented to warn drivers of approaching traffic, but this location remains a High Crash Location with high degree of severity. Further improving the safety of this intersection would require regarding Route 4 to reduce its profile, as well as grading to increase the clear zones on either side of the highway to improve sight distance from School Street and Gravel Road.

- *Benefits:* Improve safety and reduce potential for crashes at this current High Crash Location.
- *Cost:* TBD.
- *Natural and physical resources potentially impacted:* Would require considerable regrading and modification of access to property on the northeast corner of the intersection. Further engineering study needed to determine extent of work.
- *Implementation timeframe:* Long-term. If future development in Sanford increases traffic on School Street, this may become a higher priority improvement.

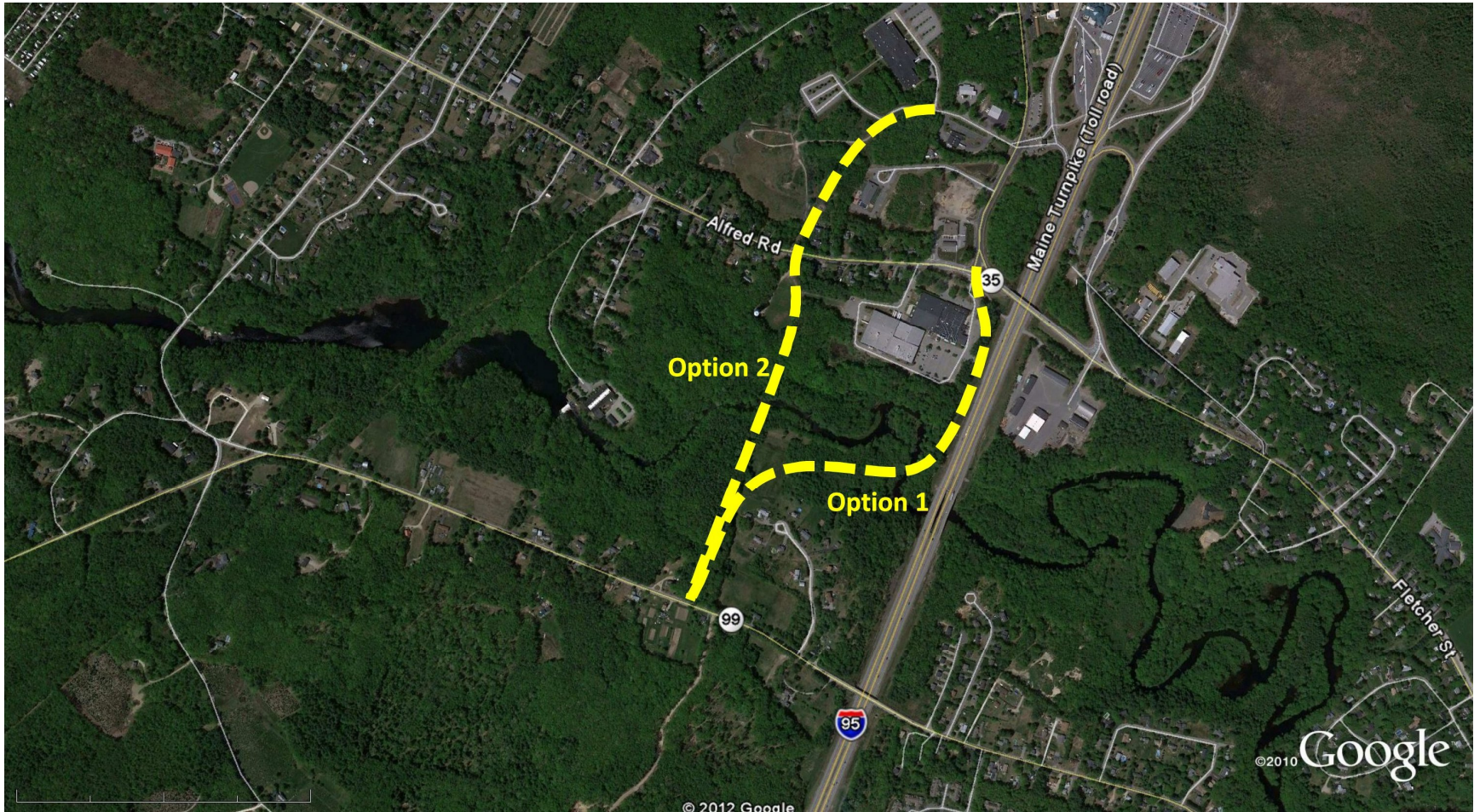
## ROUTE 99 AND KENNEBUNK EXIT 25 AREA

### New Connection between Route 99 and Route 35

Construct a new roadway connecting Route 35 with Route 99 in Kennebunk, including a new bridge over the Cat Mousam River. Two potential alignments have been identified; (Option 1) Intersect Route 35 at the current Route 35 (Alewife Rd)/Alfred Road intersection and cross the river just north of the I-95 bridge, or (Option 2) extend Alewife Park Rd to Alfred Road, and continue across the river to Route 99.

The new connection is forecast to attract about 9,200 daily trips. Most of these divert from Alfred Road/Mill St (about 4,500) or Main St (3,600), though the more direct connection would attract an estimated 1,100 additional daily trips from the Sanford area.

- *Benefits:* Creates a more direct connection between Rte 99, Rte 35, and Maine Turnpike exit 25. Reduces traffic through the center of West Kennebunk (50 percent reduction in traffic on Alfred Road, 80 percent reduction on Mill St). Reduces traffic on Route 1 in downtown Kennebunk (17 percent). Additional river crossing improves local circulation in Kennebunk. Economic analysis conducted previously indicated a positive BC ratio.
- *Costs:* Approximately \$7.6M to \$7.9M.
- *Natural and physical resources potentially impacted:* Option 1 would require reconfiguration of the access and parking area at Corning. Option 2 passes near a recreational field. Both options would introduce a new river crossing and pass through undeveloped habitat areas near the river.
- *Implementation timeframe:* Long-term.



New Route 35 to Route 99 Connection



## TRANSIT SERVICE IMPROVEMENTS

Recommendations are being finalized with participation transit agencies and will be detailed in the Transit Chapter of Final Report (under development). Options being discussed are listed below.

### Access to Transit

- Establish a downtown Sanford Transit Center
- Establish a park-and-ride lot near transit center
- Lease-lot arrangements elsewhere in Sanford (Springvale).
- Park and Ride (lease lot) in Alfred.
- Covered Shelters and formalized stops
- Satellite Hub at Exit 32 P&R (Covered waiting area and consolidation of services).
- Bike lockers/parking at transit centers and park-and-rides.
- Bike provisions on buses

### Route-Specific Service Improvements

- WAVE
  - Increase service frequency on the WAVE to every hour.
  - Transition WAVE service from a demand response service to either a fixed route/demand response hybrid or a standard fixed route service running along the Route 111 corridor from Sanford to Biddeford and Saco.
  - Create timed transfer to ZOOM Turnpike Express and ShuttleBus Intercity/Portland service so that WAVE riders can more easily access service to Portland.
- Sanford Transit
  - Coordinate with other services at the newly created Sanford Transit Center
  - Consider targeted increases in service frequency, along with extending service to run later in the afternoon and early evening.
- Sanford Ocean Shuttle
  - Provide increased service frequency.
- ShuttleBus ZOOM
  - New shuttle service connecting York County Community College, Wells Transportation Center, and Kennebunk park-and-ride to ZOOM Turnpike Express service at Biddeford .
- ShuttleBus Intercity/Portland

- Extend ShuttleBus Intercity/Portland service a short distance from the current terminal at Southern Maine Medical Center to the Biddeford park-and-ride at Exit 32 on the Maine Turnpike/I-95.

#### Public Information/TDM

- Make greater use of real-time information throughout the Central York County transit network. Availability of real-time information is increasingly becoming an expectation for transit passengers, particularly with the growth of smartphone and text message based tools for distributing information. In an environment such as Central York County, where transit services operate on a relatively limited schedule and long headways, having access to real-time information is critical, since missing the bus could result in a two hour wait in some cases. Providing enhanced real-time information could also allow for the creation of a hybrid demand response/fixed-route version of the WAVE, as described in Recommendation 1.
- Building on the service recommendations, create a new transit hub at the Biddeford park-and-ride, where the enhanced WAVE/Route 111 service, the ZOOM Turnpike Express, and the extended ShuttleBus Intercity/Portland service can interface. With the various service improvements proposed above, this will become a critical link in the transit network within the study area, with a variety of transfers available to different destinations.
- Improve transit information for Central York County, to create a single clearing house for transit service information. With multiple operators providing differing types of service (demand response, route deviation, fixed-route local, fixed-route express), the transit service options within York County can be somewhat difficult to understand. Creating a single source for transit information will make the services more legible, particularly for new or occasional users.

#### LAND USE AND ACCESS MANAGEMENT

##### Town led actions

- Options detailed in Access Management chapter of final report. To include segment-by-segment options.