# Appendix 5.2-A

# Economic Development Research Group, Inc. Net Change in Households in the South Coast Due to Development & Operation of the South Coast Rail

**Proposal/Report for:**

**Massachusetts Executive Office of Transportation**

# Net Change in Households in the South Coast Due to Development & Operation of the South Coast Rail

*Prepared for:*

**Executive Office of Transportation**
10 Park Plaza
Boston, Massachusetts 02116

*Prepared by:*

**Economic Development Research Group, Inc.**
2 Oliver Street, 9th Floor, Boston, MA 02109

**August, 7, 2009**

# Induced Households

**Purpose.** Estimate the net change in households that are likely to move or stay within the 31 city and town South Coast Rail region (SCR) by 2030 due to new jobs generated by developing and operating the South Coast Rail. This will be done with what is commonly referred to as a "Sketch Planning" approach.

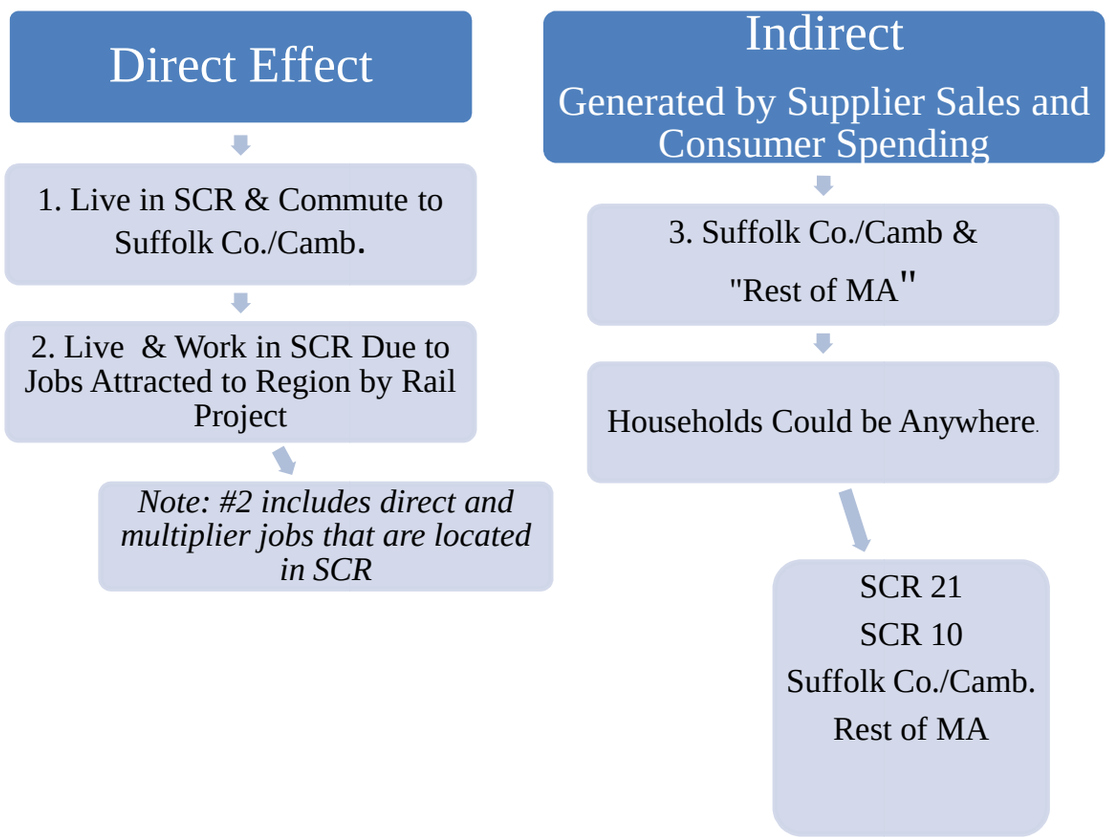
**The Bottom Line**. Operation of the South Coast Rail project as scheduled is expected to induce 1,100 – 1,800 more households within the SCR. The average for all alternatives analyzed is 1,500.

## Alternatives

- Stoughton Electric
- Stoughton Diesel
- Attleboro Electric
- Rapid Bus
- Average – Based on the average inputs , not the average results

Analysis Segmentation Based on New Jobs in 2030 Generated by Operation of SCR

- Analysis includes three methods.



## Method 1

## Direct Jobs in Suffolk County and Cambridge

- New direct jobs in Suffolk County & Cambridge are by definition created by the rail.
- At this level of analysis it is impossible to determine exactly how many of the new jobs will be taken by existing SCR regional residents and how many will be by taken by people who move to the SCR region.
- Actual new households in the SCR will depend on the mix of new jobs in Suffolk County/Cambridge and the labor force match in SCR 21 and SCR10.
- This analysis assumes 50% of new direct jobs created by the presence of the SCR.

| Direct Jobs In Suffolk County/ Cambridge | | 50% are assumed to result in new households in SCR<br><br>These new households are assigned to SCR 21 and SCR 10 according to the ratio of new transit trips forecast by CTPS ***from*** these two subregions ***to*** Suffolk County/Cambridge. The split is roughly two-thirds from SCR 21 and one-third from SCR 10 per alternative. |
|---|---|---|
| SLE | 460 | |
| SLD | 435 | |
| BRT | 269 | |
| ALE | 472 | |
| Average | 409 | |

Method 2

Attraction of New Households in SCR 21 and SCR 10 Based on Jobs Generated by the SCR in Each Region (p. 1 of 2)

This approach is based on comparing the types of jobs expected to be generated in the South Coast due to SCR with the existing mix of jobs in the region.

1. TREDIS output included expected employment by 2030 in 55 economic sectors for SC 21 and SC 10 generated by SCR operations.
2. Per subregion, each sector was divided by total 2030 employment. The resulting percentages show the concentration of each industry among the new jobs that are expected to be generated by the SCR in SCR 21 and SCR 10.

$$\frac{\text{New Employment Industry}_i}{\text{Total New Employment}} = \text{\% Concentration for Industry}$$

3. This same operation was performed for current (2006) SCR 21 and SCR 10 employment.
4. The percents of new jobs due to the SCR (#2) were divided by the current concentrations (#3). The result is commonly referred to as a location quotient (or LQ).

$$\frac{\text{\% Concentration for Industry New Jobs}}{\text{\% Concentration for Industry Existing Jobs}} = \text{SCR 10 and SCR 21 LQs}$$

## Jobs in SCR 21 and SCR 10 (p. 2 of 2)

5. An LQ of 1.0 indicates that the concentration of an industry in the South Coast due to the SCR is the same as its current strength. A higher LQ indicates that this is a relatively new industry (or strengthens a weak industry locally). We assume these industries are likely to attract new households. Interpretation is as follows.

| **Industry specific household formation in SCR 21 and SCR 10** | | | |
|---|---|---|---|
| **LQ** | | **Discussion** | **Percent of New Jobs that Result in New Households** |
| 1 | Below 0.8 | Current SCR labor force in terms of skills, education and numbers are generally adequate for the new jobs that will be generated in these in industries. New household formation will be minimal. | 10% |
| 2 | Above 1.2 | These industries have the potential to transform the SCR economies, and will require education and skills. Therefore significant new household formation should be expected for new workers in these industries. | 80% |
| 3 | 0.8 – 1.2 | These industries will be added to the SCR 21 and 10 economies at about the same levels as the current economies of each subregion. In terms of housing formation, a midpoint is assumed between high growth industries (#2) and minimal growth industries (#1) | 45% |

## Method 3 (1 of 2)

## Indirect and Induced Jobs in Suffolk County/Cambridge

The potential for new households in SCR was based on 2000 Journey to Work of the US Census (JTW), which shows that the commuting base for Suffolk County and Cambridge includes 1.6% representation from SCR10 and 4.0% from SCR 10.

| | | |
|---|---|---|
| Total workers in Suffolk County/Cambridge | 622,873 | |
| Suffolk/Cambridge workers who live in Suffolk-Cambridge | 262,127 | |
| Suffolk/Cambridge workers who commute from outside the region | 438,019 | |
| SCR21 commuters to Suffolk County-Cambridge | 7,144 | 1.6% |
| SCR10 commuters to Suffolk County-Cambridge | 17,579 | 4.0% |
| **Total South Coast** | **24,723** | **5.6%** |

**A. JTW Ratios for SCR**

**B.** To this percentage we added a "bump" based on the increased 60 minute employee-employer access calculated by CTPS per alternative compared to the base case.

- For SCR 21: Factors of 2.14 -2.25 above JTW
- For SCR 10: Factors of 1.10 – 1.04 above JTW

**C. Multiplying the JTW commuting percents (A) by the increase in access over a 60 minute transit ride (B)** leads to the estimate that new households will be established in South Coast at:

- SCR 21 – 3.5% to 3.7% of indirect/induced jobs located in Suffolk County/ Cambridge
- SCR 10 – 4.1% - 4.2% of indirect/induced jobs located in Suffolk County/ Cambridge

## Method 3 (2 of 2)

## Indirect and Induced Jobs in Rest of Massachusetts

The potential for new households in SCR was based on 2000 Journey to Work of the US Census (JTW), which shows that the commuting base for the Massachusetts excluding the SCR and Suffolk County and Cambridge includes 3.6% representation from the South Coast. This analysis assumes that the establishment of the SCR will not influence new jobs created due to supplier relationships or consumer spending beyond existing patterns. Therefore a flat 3.6% was assumed as the rate of households induced in SCR from the indirect/induced jobs anticipated in the "Rest of Massachusetts."

## Estimated Total New Households in SCR Region Due to Rail Project

| | SLE | SLD | ALE | RB | Average All Alternatives |
|---|---|---|---|---|---|
| **SCR21** | | | | | |
| From Direct New Jobs in Suffolk County/Cambridge | 150 | 140 | 150 | 100 | 140 |
| From Indirect & Induced New Jobs in Suffolk County/Cambridge | 10 | 10 | 10 | 10 | 10 |
| From New Jobs in SCR Region | 1,120 | 1,020 | 1,160 | 830 | 990 |
| From New Jobs in Rest of MA | 20 | 20 | 20 | 10 | 20 |
| ***Subtotal*** | 1,300 | 1,190 | 1,340 | 950 | ***1,150*** |
| **SCR10** | | | | | |
| From Direct New Jobs in Suffolk County/Cambridge | 80 | 70 | 80 | 40 | 70 |
| From Indirect & Induced New Jobs in Suffolk County/Cambridge | 10 | 10 | 10 | 10 | 10 |
| From New Jobs in SCR Region | 320 | 310 | 340 | 130 | 260 |
| From New Jobs in Rest of MA | - | - | - | - | - |
| ***Subtotal*** | ***420*** | ***400*** | ***440*** | ***170*** | ***350*** |
| **Total** | **1,720** | **1,590** | **1,780** | **1,130** | **1,500** |

Numbers are rounded to the nearest 10.
Columns may not add due to rounding.

Given the "sketch plan" nature of this analysis, the results should be assessed on the basis of orders of magnitude. SLE and ALE alternatives should be considered as equivalent, generating slightly more net households than SLD, which in turn generates more households than RB.

# Appendix 5.3-A

# Indirect and Cumulative Impacts Tables

**Table A-1: Projected Change in Housing Unit & Employment Growth by Community, 2000 to 2035**

| | | Households | | | | | | | Employment | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2035 | | | | | | | 2035 | | | | | |
| | | | No-Build | | Scenario 1 | | Scenario 2 | | | No-Build | | Scenario 1 | | Scenario 2 | |
| Municipality | RPA | 2000 | Projection | Growth | Projection | Growth | Projection | Growth | 2000 | Projection | Growth | Projection | Growth | Projection | Growth |
| Acushnet | SPREDD | 3,792 | 4,757 | 965 | 4,784 | 992 | 4,798 | 1,006 | 1,922 | 1,406 | (516) | 1,417 | (505) | 1,379 | (543) |
| Attleboro | SPREDD | 16,020 | 18,926 | 2,906 | 18,940 | 2,920 | 19,128 | 3,108 | 22,174 | 19,423 | (2,751) | 19,470 | (2,704) | 19,441 | (2,733) |
| Berkley | SPREDD | 1,848 | 2,654 | 806 | 2,685 | 837 | 2,645 | 797 | 498 | 671 | 173 | 680 | 182 | 640 | 142 |
| Bridgewater | OCPC | 7,526 | 9,256 | 1,730 | 9,286 | 1,760 | 9,521 | 1,995 | 7,211 | 9,040 | 1,829 | 9,062 | 1,851 | 9,339 | 2,128 |
| Canton | MAPC | 7,952 | 10,600 | 2,648 | 10,614 | 2,662 | 10,680 | 2,728 | 19,947 | 23,316 | 3,369 | 23,360 | 3,413 | 23,353 | 3,406 |
| Dartmouth | SPREDD | 10,543 | 14,248 | 3,705 | 14,315 | 3,772 | 14,260 | 3,717 | 13,344 | 18,535 | 5,191 | 18,635 | 5,291 | 18,469 | 5,125 |
| Dighton | SPREDD | 2,196 | 3,188 | 992 | 3,252 | 1,056 | 3,165 | 969 | 2,084 | 2,039 | (45) | 2,042 | (42) | 2,005 | (79) |
| Easton | OCPC | 7,489 | 8,751 | 1,262 | 8,776 | 1,287 | 8,895 | 1,406 | 9,347 | 10,815 | 1,468 | 10,962 | 1,615 | 11,258 | 1,911 |
| Fairhaven | SPREDD | 6,631 | 8,153 | 1,522 | 8,514 | 1,883 | 8,228 | 1,597 | 7,107 | 6,513 | (594) | 6,529 | (578) | 6,501 | (606) |
| Fall River | SPREDD | 38,775 | 46,011 | 7,236 | 46,544 | 7,769 | 46,404 | 7,629 | 40,264 | 38,746 | (1,518) | 38,940 | (1,324) | 38,782 | (1,482) |
| Foxborough | MAPC | 6,141 | 7,656 | 1,515 | 7,665 | 1,524 | 8,405 | 2,264 | 9,148 | 13,706 | 4,558 | 13,766 | 4,618 | 14,840 | 5,692 |
| Freetown | SPREDD | 2,921 | 3,856 | 935 | 3,915 | 994 | 3,851 | 930 | 2,088 | 5,066 | 2,978 | 5,113 | 3,025 | 4,953 | 2,865 |
| Lakeville | SPREDD | 3,292 | 4,725 | 1,433 | 4,754 | 1,462 | 4,670 | 1,378 | 2,828 | 3,818 | 990 | 3,835 | 1,007 | 3,751 | 923 |
| Mansfield | SPREDD | 7,942 | 10,126 | 2,184 | 10,133 | 2,191 | 10,147 | 2,205 | 12,105 | 12,811 | 706 | 12,815 | 710 | 12,813 | 708 |
| Marion | SPREDD | 1,990 | 2,275 | 285 | 2,288 | 298 | 2,302 | 312 | 2,063 | 2,333 | 270 | 2,339 | 276 | 2,298 | 235 |
| Mattapoisett | SPREDD | 2,530 | 3,262 | 732 | 3,315 | 785 | 3,265 | 735 | 1,827 | 1,924 | 97 | 1,926 | 99 | 1,891 | 64 |
| Middleborough | SPREDD | 6,981 | 9,893 | 2,912 | 9,919 | 2,938 | 9,953 | 2,972 | 7,543 | 10,043 | 2,500 | 10,068 | 2,525 | 10,023 | 2,480 |
| New Bedford | SPREDD | 38,240 | 43,530 | 5,290 | 43,979 | 5,739 | 43,864 | 5,624 | 37,206 | 38,467 | 1,261 | 38,608 | 1,402 | 38,517 | 1,311 |
| N Attleborough | SPREDD | 10,231 | 13,984 | 3,753 | 14,003 | 3,772 | 14,095 | 3,864 | 12,676 | 12,974 | 298 | 12,975 | 299 | 12,986 | 310 |
| Norton | SPREDD | 5,872 | 7,518 | 1,646 | 7,546 | 1,674 | 7,503 | 1,631 | 6,208 | 7,058 | 850 | 7,063 | 855 | 7,011 | 803 |
| Raynham | SPREDD | 4,143 | 6,461 | 2,318 | 6,549 | 2,406 | 6,434 | 2,291 | 6,773 | 9,868 | 3,095 | 9,943 | 3,170 | 9,840 | 3,067 |
| Rehoboth | SPREDD | 3,518 | 5,587 | 2,069 | 5,625 | 2,107 | 5,564 | 2,046 | 1,508 | 1,870 | 362 | 1,881 | 373 | 1,841 | 333 |
| Rochester | SPREDD | 1,578 | 2,572 | 994 | 2,600 | 1,022 | 2,534 | 956 | 980 | 829 | (151) | 831 | (149) | 800 | (180) |
| Seekonk | SPREDD | 4,830 | 6,132 | 1,302 | 6,145 | 1,315 | 6,160 | 1,330 | 8,223 | 9,414 | 1,191 | 9,429 | 1,206 | 9,420 | 1,197 |
| Sharon | MAPC | 5,934 | 6,961 | 1,027 | 6,967 | 1,033 | 7,038 | 1,104 | 3,194 | 3,328 | 134 | 3,331 | 137 | 3,313 | 119 |
| Somerset | SPREDD | 6,976 | 7,654 | 678 | 7,690 | 714 | 7,694 | 718 | 4,212 | 4,920 | 708 | 4,955 | 743 | 4,894 | 682 |
| Stoughton | OCPC | 10,254 | 12,521 | 2,267 | 12,593 | 2,339 | 12,677 | 2,423 | 12,602 | 13,444 | 842 | 13,474 | 872 | 13,457 | 855 |
| Swansea | SPREDD | 5,913 | 7,290 | 1,377 | 7,330 | 1,417 | 7,295 | 1,382 | 5,576 | 6,177 | 601 | 6,188 | 612 | 6,141 | 565 |
| Taunton | SPREDD | 22,044 | 27,106 | 5,062 | 27,221 | 5,177 | 27,258 | 5,214 | 24,307 | 28,460 | 4,153 | 28,597 | 4,290 | 28,461 | 4,154 |
| Wareham | SPREDD | 8,210 | 11,254 | 3,044 | 11,306 | 3,096 | 11,253 | 3,043 | 6,602 | 9,941 | 3,339 | 10,003 | 3,401 | 9,868 | 3,266 |
| Westport | SPREDD | 5,381 | 8,800 | 3,419 | 9,005 | 3,624 | 8,570 | 3,189 | 3,027 | 3,478 | 451 | 3,500 | 473 | 3,450 | 423 |
| Bristol RI | RI | NA | NA | 1,943 | NA | 1,999 | NA | 1,999 | NA | NA | 640 | NA | 652 | NA | 652 |
| Portsmouth RI | RI | NA | NA | 2,386 | NA | 2,455 | NA | 2,455 | NA | NA | 902 | NA | 919 | NA | 919 |
| Tiverton RI | RI | NA | NA | 1,976 | NA | 2,095 | NA | 2,095 | NA | NA | 249 | NA | 254 | NA | 254 |
| Warren RI | RI | NA | NA | 893 | NA | 902 | NA | 902 | NA | NA | 235 | NA | 238 | NA | 238 |
| **TOTAL** | | **267,693** | **335,707** | **75,212** | **338,258** | **78,016** | **338,258** | **78,016** | **294,594** | **330,432** | **37,864** | **331,737** | **39,206** | **331,737** | **39,206** |

Data Sources: MAPC, OCPC, SRPEDD

Note: RI values are carried forward from DEIS/DEIR.

**Table A-2: Projected Change in Land Use Impacts by Community, 2000 to 2035**

| Municipality | Conversion (acres / household) | Additional Land Use Impacts in 2035 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | No-Build & Scenario 1 | | | | Scenario 2 | | | | |
| | | No-Build | | Scenario 1 | | Conversion | | | Low | High |
| | | Additional Households | Acres | Additional Households | Acres | Low | High | Additional Households | Acres | Acres |
| Acushnet | 0.59 | 965 | 569.3 | 992 | 585 | 0 | 0 | 1,006 | 473 | 412 |
| Attleboro | 0.29 | 2,906 | 842.7 | 2,920 | 847 | 0 | 0 | 3,108 | 715 | 622 |
| Berkley | 0.85 | 806 | 685.1 | 837 | 711 | 1 | 1 | 797 | 534 | 478 |
| Bridgewater | 0.37 | 1,730 | 640.1 | 1,760 | 651 | 0 | 0 | 1,995 | 579 | 519 |
| Canton | 0.14 | 2,648 | 370.7 | 2,662 | 373 | 0 | 0 | 2,728 | 300 | 273 |
| Dartmouth | 0.57 | 3,705 | 2,111.8 | 3,772 | 2,150 | 0 | 0 | 3,717 | 1,673 | 1,487 |
| Dighton | 0.83 | 992 | 823.4 | 1,056 | 877 | 1 | 1 | 969 | 640 | 562 |
| Easton | 0.35 | 1,262 | 441.7 | 1,287 | 451 | 0 | 0 | 1,406 | 394 | 352 |
| Fairhaven | 0.45 | 1,522 | 684.9 | 1,883 | 848 | 0 | 0 | 1,597 | 575 | 511 |
| Fall River | 0.16 | 7,236 | 1,157.8 | 7,769 | 1,243 | 0 | 0 | 7,629 | 992 | 839 |
| Foxborough | 0.50 | 1,515 | 757.6 | 1,524 | 762 | 0 | 0 | 2,264 | 905 | 792 |
| Freetown | 0.96 | 935 | 897.6 | 994 | 954 | 1 | 1 | 930 | 707 | 623 |
| Lakeville | 1.23 | 1,433 | 1,762.6 | 1,462 | 1,799 | 1 | 1 | 1,378 | 1,337 | 1,185 |
| Mansfield | 0.43 | 2,184 | 939.1 | 2,191 | 942 | 0 | 0 | 2,205 | 750 | 662 |
| Marion | 0.59 | 285 | 168.2 | 298 | 176 | 0 | 0 | 312 | 147 | 128 |
| Mattapoisett | 0.59 | 732 | 431.9 | 785 | 463 | 0 | 0 | 735 | 346 | 301 |
| Middleborough | 0.75 | 2,912 | 2,184.0 | 2,938 | 2,203 | 1 | 1 | 2,972 | 1,753 | 1,575 |
| New Bedford | 0.22 | 5,290 | 1,163.8 | 5,739 | 1,263 | 0 | 0 | 5,624 | 956 | 844 |
| N Attleborough | 0.39 | 3,753 | 1,463.7 | 3,772 | 1,471 | 0 | 0 | 3,864 | 1,198 | 1,043 |
| Norton | 0.50 | 1,646 | 823.0 | 1,674 | 837 | 0 | 0 | 1,631 | 653 | 571 |
| Raynham | 0.39 | 2,318 | 904.0 | 2,406 | 938 | 0 | 0 | 2,291 | 710 | 619 |
| Rehoboth | 0.96 | 2,069 | 1,986.2 | 2,107 | 2,023 | 1 | 1 | 2,046 | 1,555 | 1,371 |
| Rochester | 0.94 | 994 | 934.4 | 1,022 | 960 | 1 | 1 | 956 | 707 | 631 |
| Seekonk | 1.04 | 1,302 | 1,354.1 | 1,315 | 1,368 | 1 | 1 | 1,330 | 1,091 | 971 |
| Sharon | 0.48 | 1,027 | 493.0 | 1,033 | 496 | 0 | 0 | 1,104 | 419 | 375 |
| Somerset | 0.40 | 678 | 271.2 | 714 | 286 | 0 | 0 | 718 | 230 | 201 |
| Stoughton | 0.57 | 2,267 | 1,292.2 | 2,339 | 1,333 | 0 | 0 | 2,423 | 1,090 | 969 |
| Swansea | 0.83 | 1,377 | 1,142.9 | 1,417 | 1,176 | 1 | 1 | 1,382 | 912 | 802 |
| Taunton | 0.45 | 5,062 | 2,277.9 | 5,177 | 2,330 | 0 | 0 | 5,214 | 1,877 | 1,669 |
| Wareham | 0.37 | 3,044 | 1,126.3 | 3,096 | 1,145 | 0 | 0 | 3,043 | 882 | 791 |
| Westport | 0.68 | 3,419 | 2,324.9 | 3,624 | 2,464 | 1 | 0 | 3,189 | 1,722 | 1,531 |
| Bristol RI | 0.83 | 1,943 | 1,612.7 | 1,999 | 1,659 | 1 | 1 | 1,999 | 1,319 | 1,159 |
| Portsmouth RI | 0.83 | 2,386 | 1,980.4 | 2,455 | 2,038 | 1 | 1 | 2,455 | 1,620 | 1,424 |
| Tiverton RI | 0.68 | 1,976 | 1,343.7 | 2,095 | 1,425 | 1 | 0 | 2,095 | 1,131 | 1,006 |
| Warren RI | 1.04 | 893 | 928.7 | 902 | 938 | 1 | 1 | 902 | 740 | 658 |
| **TOTAL** | | **75,212** | **38,892** | **78,016** | **40,184** | | | **78,016** | **31,631** | **27,955** |

Note: Households from Table A-1

**Table A-3: Projected Change in Forest Land Impacts by Community, 2000 to 2035**

| Municipality | Conversion (acres / household) | Additional Forest Land Impacts in 2035 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | No-Build & Scenario 1 | | | | Scenario 2 | | | | |
| | | No-Build | | Scenario 1 | | Conversion | | Additional Households | Low | High |
| | | Additional Households | Acres | Additional Households | Acres | Low | High | | Acres | Acres |
| Acushnet | 0.24 | 965 | 232 | 992 | 238 | 0.19 | 0.17 | 1,006 | 191 | 171 |
| Attleboro | 0.19 | 2,906 | 552 | 2,920 | 555 | 0.15 | 0.13 | 3,108 | 466 | 404 |
| Berkley | 0.48 | 806 | 387 | 837 | 402 | 0.38 | 0.34 | 797 | 303 | 271 |
| Bridgewater | 0.20 | 1,730 | 346 | 1,760 | 352 | 0.16 | 0.14 | 1,995 | 319 | 279 |
| Canton | 0.06 | 2,648 | 159 | 2,662 | 160 | 0.05 | 0.04 | 2,728 | 136 | 109 |
| Dartmouth | 0.29 | 3,705 | 1,074 | 3,772 | 1,094 | 0.23 | 0.20 | 3,717 | 855 | 743 |
| Dighton | 0.36 | 992 | 357 | 1,056 | 380 | 0.28 | 0.25 | 969 | 271 | 242 |
| Easton | 0.21 | 1,262 | 265 | 1,287 | 270 | 0.17 | 0.15 | 1,406 | 239 | 211 |
| Fairhaven | 0.17 | 1,522 | 259 | 1,883 | 320 | 0.13 | 0.12 | 1,597 | 208 | 192 |
| Fall River | 0.08 | 7,236 | 579 | 7,769 | 621 | 0.06 | 0.06 | 7,629 | 458 | 458 |
| Foxborough | 0.36 | 1,515 | 545 | 1,524 | 549 | 0.28 | 0.25 | 2,264 | 634 | 566 |
| Freetown | 0.56 | 935 | 524 | 994 | 557 | 0.44 | 0.39 | 930 | 409 | 363 |
| Lakeville | 0.60 | 1,433 | 860 | 1,462 | 877 | 0.47 | 0.42 | 1,378 | 648 | 579 |
| Mansfield | 0.30 | 2,184 | 655 | 2,191 | 657 | 0.24 | 0.21 | 2,205 | 529 | 463 |
| Marion | 0.47 | 285 | 134 | 298 | 140 | 0.37 | 0.33 | 312 | 116 | 103 |
| Mattapoisett | 0.39 | 732 | 285 | 785 | 306 | 0.31 | 0.27 | 735 | 228 | 199 |
| Middleborough | 0.43 | 2,912 | 1,252 | 2,938 | 1,263 | 0.34 | 0.30 | 2,972 | 1,010 | 891 |
| New Bedford | 0.09 | 5,290 | 476 | 5,739 | 517 | 0.07 | 0.06 | 5,624 | 394 | 337 |
| N Attleborough | 0.23 | 3,753 | 863 | 3,772 | 867 | 0.18 | 0.16 | 3,864 | 696 | 618 |
| Norton | 0.32 | 1,646 | 527 | 1,674 | 536 | 0.25 | 0.22 | 1,631 | 408 | 359 |
| Raynham | 0.23 | 2,318 | 533 | 2,406 | 553 | 0.18 | 0.16 | 2,291 | 412 | 367 |
| Rehoboth | 0.14 | 2,069 | 290 | 2,107 | 295 | 0.11 | 0.10 | 2,046 | 225 | 205 |
| Rochester | 0.45 | 994 | 447 | 1,022 | 460 | 0.36 | 0.32 | 956 | 344 | 306 |
| Seekonk | 0.47 | 1,302 | 612 | 1,315 | 618 | 0.37 | 0.33 | 1,330 | 492 | 439 |
| Sharon | 0.38 | 1,027 | 390 | 1,033 | 393 | 0.30 | 0.27 | 1,104 | 331 | 298 |
| Somerset | 0.12 | 678 | 81 | 714 | 86 | 0.09 | 0.08 | 718 | 65 | 57 |
| Stoughton | 0.39 | 2,267 | 884 | 2,339 | 912 | 0.31 | 0.27 | 2,423 | 751 | 654 |
| Swansea | 0.36 | 1,377 | 496 | 1,417 | 510 | 0.28 | 0.25 | 1,382 | 387 | 346 |
| Taunton | 0.27 | 5,062 | 1,367 | 5,177 | 1,398 | 0.21 | 0.19 | 5,214 | 1,095 | 991 |
| Wareham | 0.29 | 3,044 | 883 | 3,096 | 898 | 0.23 | 0.20 | 3,043 | 700 | 609 |
| Westport | 0.31 | 3,419 | 1,060 | 3,624 | 1,124 | 0.24 | 0.22 | 3,189 | 765 | 701 |
| Bristol RI | 0.36 | 1,943 | 699 | 1,999 | 720 | 0.28 | 0.25 | 1,999 | 560 | 500 |
| Portsmouth RI | 0.36 | 2,386 | 859 | 2,455 | 884 | 0.28 | 0.25 | 2,455 | 687 | 614 |
| Tiverton RI | 0.31 | 1,976 | 613 | 2,095 | 649 | 0.24 | 0.22 | 2,095 | 503 | 461 |
| Warren RI | 0.47 | 893 | 420 | 902 | 424 | 0.37 | 0.33 | 902 | 334 | 298 |
| **TOTAL** | | **75,212** | **19,965** | **78,016** | **20,584** | | | **78,016** | **16,169** | **14,403** |

Note: Households from Table A-1

**Table A-4: Projected Change in Farmland Impacts by Community, 2000 to 2035**

| Municipality | Conversion (acres per household) | Additional Farmland Impacts in 2035 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | No-Build & Scenario 1 | | | | Scenario 2 | | | | |
| | | No-Build | | Scenario 1 | | Conversion | | Additional Households | Low | High |
| | | Additional Households | Acres | Additional Households | Acres | Low | High | | Acres | Acres |
| Acushnet | 0.22 | 965.0 | 212 | 992 | 218 | 0.17 | 0.15 | 1,006 | 171 | 150.9 |
| Attleboro | 0.03 | 2,906.0 | 87 | 2,920 | 88 | 0.02 | 0.02 | 3,108 | 62 | 62.2 |
| Berkley | 0.22 | 806.0 | 177 | 837 | 184 | 0.17 | 0.15 | 797 | 135 | 119.6 |
| Bridgewater | 0.11 | 1,730.0 | 190 | 1,760 | 194 | 0.09 | 0.08 | 1,995 | 180 | 159.6 |
| Canton | 0.02 | 2,648.0 | 53 | 2,662 | 53 | 0.02 | 0.01 | 2,728 | 55 | 27.3 |
| Dartmouth | 0.18 | 3,705.0 | 667 | 3,772 | 679 | 0.14 | 0.13 | 3,717 | 520 | 483.3 |
| Dighton | 0.30 | 992.0 | 298 | 1,056 | 317 | 0.24 | 0.21 | 969 | 233 | 203.5 |
| Easton | 0.07 | 1,262.0 | 88 | 1,287 | 90 | 0.06 | 0.05 | 1,406 | 84 | 70.3 |
| Fairhaven | 0.13 | 1,522.0 | 198 | 1,883 | 245 | 0.10 | 0.09 | 1,597 | 160 | 143.8 |
| Fall River | 0.01 | 7,236.0 | 72 | 7,769 | 78 | 0.01 | 0.01 | 7,629 | 76 | 76.3 |
| Foxborough | 0.06 | 1,515.2 | 91 | 1,524 | 91 | 0.05 | 0.04 | 2,264 | 113 | 90.5 |
| Freetown | 0.17 | 935.0 | 159 | 994 | 169 | 0.13 | 0.12 | 930 | 121 | 111.6 |
| Lakeville | 0.38 | 1,433.0 | 545 | 1,462 | 556 | 0.30 | 0.27 | 1,378 | 414 | 372.2 |
| Mansfield | 0.05 | 2,184.0 | 109 | 2,191 | 110 | 0.04 | 0.04 | 2,205 | 88 | 88.2 |
| Marion | 0.02 | 285.0 | 6 | 298 | 6 | 0.02 | 0.01 | 312 | 6 | 3.1 |
| Mattapoisett | 0.11 | 732.0 | 81 | 785 | 86 | 0.09 | 0.08 | 735 | 66 | 58.8 |
| Middleborough | 0.23 | 2,912.0 | 670 | 2,938 | 676 | 0.18 | 0.16 | 2,972 | 535 | 475.4 |
| New Bedford | 0.01 | 5,290.0 | 53 | 5,739 | 57 | 0.01 | 0.01 | 5,624 | 56 | 56.2 |
| N Attleborough | 0.08 | 3,753.0 | 300 | 3,772 | 302 | 0.06 | 0.06 | 3,864 | 232 | 231.9 |
| Norton | 0.08 | 1,646.0 | 132 | 1,674 | 134 | 0.06 | 0.06 | 1,631 | 98 | 97.9 |
| Raynham | 0.08 | 2,318.0 | 185 | 2,406 | 192 | 0.06 | 0.06 | 2,291 | 137 | 137.5 |
| Rehoboth | 0.36 | 2,069.0 | 745 | 2,107 | 759 | 0.28 | 0.25 | 2,046 | 573 | 511.4 |
| Rochester | 0.34 | 994.0 | 338 | 1,022 | 347 | 0.27 | 0.24 | 956 | 258 | 229.4 |
| Seekonk | 0.29 | 1,302.0 | 378 | 1,315 | 381 | 0.23 | 0.20 | 1,330 | 306 | 266.0 |
| Sharon | 0.03 | 1,027.0 | 31 | 1,033 | 31 | 0.02 | 0.02 | 1,104 | 22 | 22.1 |
| Somerset | 0.09 | 678.0 | 61 | 714 | 64 | 0.07 | 0.06 | 718 | 50 | 43.1 |
| Stoughton | 0.03 | 2,267.0 | 68 | 2,339 | 70 | 0.02 | 0.02 | 2,423 | 48 | 48.5 |
| Swansea | 0.28 | 1,377.0 | 386 | 1,417 | 397 | 0.22 | 0.20 | 1,382 | 304 | 276.4 |
| Taunton | 0.07 | 5,062.0 | 354 | 5,177 | 362 | 0.06 | 0.05 | 5,214 | 313 | 260.7 |
| Wareham | 0.01 | 3,044.0 | 30 | 3,096 | 31 | 0.01 | 0.01 | 3,043 | 30 | 30.4 |
| Westport | 0.31 | 3,419.0 | 1,060 | 3,624 | 1,124 | 0.24 | 0.22 | 3,189 | 765 | 701.5 |
| Bristol RI | 0.28 | 1,943.0 | 544 | 1,999 | 560 | 0.22 | 0.20 | 1,999 | 440 | 399.8 |
| Portsmouth RI | 0.28 | 2,386.0 | 668 | 2,455 | 687 | 0.22 | 0.20 | 2,455 | 540 | 491.0 |
| Tiverton RI | 0.31 | 1,976.0 | 613 | 2,095 | 649 | 0.24 | 0.22 | 2,095 | 503 | 460.9 |
| Warren RI | 0.29 | 893.0 | 259 | 902 | 262 | 0.23 | 0.20 | 902 | 207 | 180.4 |
| **TOTAL** | | **75,212** | **9,907** | **78,016** | **10,249** | | | **78,016** | **7,903** | **7,142** |

Note: Households from Table A-1

**Table A-5: Projected Change in Wetland Impacts by Community, 2000 to 2035**

| Municipality | Additional Wetland Impacts in 2035 | | | | | | |
|---|---|---|---|---|---|---|---|
| | No-Build & Scenario 1 (0.00017 conversion) | | | | Scenario 2 | | |
| | No-Build | | Scenario 1 | | | Low (0.00013 conversion) | High (0.00012 conversion) |
| | Additional Households | Acres | Additional Households | Acres | Additional Households | Acres | Acres |
| Acushnet | 965 | 0.16 | 992 | 0.17 | 1,006 | 0.13 | 0.12 |
| Attleboro | 2,906 | 0.49 | 2,920 | 0.50 | 3,108 | 0.40 | 0.37 |
| Berkley | 806 | 0.14 | 837 | 0.14 | 797 | 0.10 | 0.10 |
| Bridgewater | 1,730 | 0.29 | 1,760 | 0.30 | 1,995 | 0.26 | 0.24 |
| Canton | 2,648 | 0.45 | 2,662 | 0.45 | 2,728 | 0.35 | 0.33 |
| Dartmouth | 3,705 | 0.63 | 3,772 | 0.64 | 3,717 | 0.48 | 0.45 |
| Dighton | 992 | 0.17 | 1,056 | 0.18 | 969 | 0.13 | 0.12 |
| Easton | 1,262 | 0.21 | 1,287 | 0.22 | 1,406 | 0.18 | 0.17 |
| Fairhaven | 1,522 | 0.26 | 1,883 | 0.32 | 1,597 | 0.21 | 0.19 |
| Fall River | 7,236 | 1.23 | 7,769 | 1.32 | 7,629 | 0.99 | 0.92 |
| Foxborough | 1,515 | 0.26 | 1,524 | 0.26 | 2,264 | 0.29 | 0.27 |
| Freetown | 935 | 0.16 | 994 | 0.17 | 930 | 0.12 | 0.11 |
| Lakeville | 1,433 | 0.24 | 1,462 | 0.25 | 1,378 | 0.18 | 0.17 |
| Mansfield | 2,184 | 0.37 | 2,191 | 0.37 | 2,205 | 0.29 | 0.26 |
| Marion | 285 | 0.05 | 298 | 0.05 | 312 | 0.04 | 0.04 |
| Mattapoisett | 732 | 0.12 | 785 | 0.13 | 735 | 0.10 | 0.09 |
| Middleborough | 2,912 | 0.50 | 2,938 | 0.50 | 2,972 | 0.39 | 0.36 |
| New Bedford | 5,290 | 0.90 | 5,739 | 0.98 | 5,624 | 0.73 | 0.67 |
| N Attleborough | 3,753 | 0.64 | 3,772 | 0.64 | 3,864 | 0.50 | 0.46 |
| Norton | 1,646 | 0.28 | 1,674 | 0.28 | 1,631 | 0.21 | 0.20 |
| Raynham | 2,318 | 0.39 | 2,406 | 0.41 | 2,291 | 0.30 | 0.27 |
| Rehoboth | 2,069 | 0.35 | 2,107 | 0.36 | 2,046 | 0.27 | 0.25 |
| Rochester | 994 | 0.17 | 1,022 | 0.17 | 956 | 0.12 | 0.11 |
| Seekonk | 1,302 | 0.22 | 1,315 | 0.22 | 1,330 | 0.17 | 0.16 |
| Sharon | 1,027 | 0.17 | 1,033 | 0.18 | 1,104 | 0.14 | 0.13 |
| Somerset | 678 | 0.12 | 714 | 0.12 | 718 | 0.09 | 0.09 |
| Stoughton | 2,267 | 0.39 | 2,339 | 0.40 | 2,423 | 0.31 | 0.29 |
| Swansea | 1,377 | 0.23 | 1,417 | 0.24 | 1,382 | 0.18 | 0.17 |
| Taunton | 5,062 | 0.86 | 5,177 | 0.88 | 5,214 | 0.68 | 0.63 |
| Wareham | 3,044 | 0.52 | 3,096 | 0.53 | 3,043 | 0.40 | 0.37 |
| Westport | 3,419 | 0.58 | 3,624 | 0.62 | 3,189 | 0.41 | 0.38 |
| Bristol RI | 1,943 | 0.33 | 1,999 | 0.34 | 1,999 | 0.26 | 0.24 |
| Portsmouth RI | 2,386 | 0.41 | 2,455 | 0.42 | 2,455 | 0.32 | 0.29 |
| Tiverton RI | 1,976 | 0.34 | 2,095 | 0.36 | 2,095 | 0.27 | 0.25 |
| Warren RI | 893 | 0.15 | 902 | 0.15 | 902 | 0.12 | 0.11 |
| **TOTAL** | **75,212** | **12.8** | **78,016** | **13.3** | **78,016** | **10.1** | **9.4** |

Note: Households from Table A-1

**Table A-6: Projected Change in Biodiversity Impacts by Community, 2000 to 2035**

| | Additional Biodiversity Impacts in 2035 | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No-Build & Scenario 1 | | | | | | | Scenario 2 | | | | | | |
| | | No-Build | | | Scenario 1 | | | Conversion | | Scenario 2: Low | | | | |
| Municipality | Conversion | Additional Households | Land Impact (acres) | Acres of Biodiversity Impact (3:1 ratio) | Additional Households | Land Impact (acres) | Acres of Biodiversity Impact (3:1 ratio) | Low | High | Additional Households | Land Impact (acres) | Acres of Biodiversity Impact (2.37:1 ratio) | Land Impact | Acres of Biodiversity Impact (2.10:1 ratio) |
| Acushnet | 0.59 | 965 | 569 | 1,708 | 992 | 585 | 1,756 | 0.47 | 0.41 | 1,006 | 473 | 1,121 | 412 | 866 |
| Attleboro | 0.29 | 2,906 | 843 | 2,528 | 2,920 | 847 | 2,541 | 0.23 | 0.20 | 3,108 | 715 | 1,694 | 622 | 1,305 |
| Berkley | 0.85 | 806 | 685 | 2,055 | 837 | 711 | 2,133 | 0.67 | 0.60 | 797 | 534 | 1,266 | 478 | 1,004 |
| Bridgewater | 0.37 | 1,730 | 640 | 1,920 | 1,760 | 651 | 1,953 | 0.29 | 0.26 | 1,995 | 579 | 1,371 | 519 | 1,089 |
| Canton | 0.14 | 2,648 | 371 | 1,112 | 2,662 | 373 | 1,118 | 0.11 | 0.10 | 2,728 | 300 | 711 | 273 | 573 |
| Dartmouth | 0.57 | 3,705 | 2,112 | 6,336 | 3,772 | 2,150 | 6,450 | 0.45 | 0.40 | 3,717 | 1,673 | 3,965 | 1,487 | 3,123 |
| Dighton | 0.83 | 992 | 823 | 2,470 | 1,056 | 877 | 2,630 | 0.66 | 0.58 | 969 | 640 | 1,516 | 562 | 1,181 |
| Easton | 0.35 | 1,262 | 442 | 1,325 | 1,287 | 451 | 1,352 | 0.28 | 0.25 | 1,406 | 394 | 933 | 352 | 738 |
| Fairhaven | 0.45 | 1,522 | 685 | 2,055 | 1,883 | 848 | 2,543 | 0.36 | 0.32 | 1,597 | 575 | 1,363 | 511 | 1,074 |
| Fall River | 0.16 | 7,236 | 1,158 | 3,473 | 7,769 | 1,243 | 3,729 | 0.13 | 0.11 | 7,629 | 992 | 2,350 | 839 | 1,762 |
| Foxborough | 0.50 | 1,515 | 758 | 2,273 | 1,524 | 762 | 2,286 | 0.40 | 0.35 | 2,264 | 905 | 2,146 | 792 | 1,664 |
| Freetown | 0.96 | 935 | 898 | 2,693 | 994 | 954 | 2,862 | 0.76 | 0.67 | 930 | 707 | 1,676 | 623 | 1,309 |
| Lakeville | 1.23 | 1,433 | 1,763 | 5,288 | 1,462 | 1,799 | 5,396 | 0.97 | 0.86 | 1,378 | 1,337 | 3,169 | 1,185 | 2,489 |
| Mansfield | 0.43 | 2,184 | 939 | 2,817 | 2,191 | 942 | 2,826 | 0.34 | 0.30 | 2,205 | 750 | 1,777 | 662 | 1,389 |
| Marion | 0.59 | 285 | 168 | 504 | 298 | 176 | 527 | 0.47 | 0.41 | 312 | 147 | 348 | 128 | 269 |
| Mattapoisett | 0.59 | 732 | 432 | 1,296 | 785 | 463 | 1,389 | 0.47 | 0.41 | 735 | 346 | 819 | 301 | 633 |
| Middleborough | 0.75 | 2,912 | 2,184 | 6,552 | 2,938 | 2,203 | 6,610 | 0.59 | 0.53 | 2,972 | 1,753 | 4,155 | 1,575 | 3,307 |
| New Bedford | 0.22 | 5,290 | 1,164 | 3,491 | 5,739 | 1,263 | 3,788 | 0.17 | 0.15 | 5,624 | 956 | 2,266 | 844 | 1,771 |
| N Attleborough | 0.39 | 3,753 | 1,464 | 4,391 | 3,772 | 1,471 | 4,413 | 0.31 | 0.27 | 3,864 | 1,198 | 2,839 | 1,043 | 2,191 |
| Norton | 0.50 | 1,646 | 823 | 2,469 | 1,674 | 837 | 2,512 | 0.40 | 0.35 | 1,631 | 653 | 1,547 | 571 | 1,199 |
| Raynham | 0.39 | 2,318 | 904 | 2,712 | 2,406 | 938 | 2,815 | 0.31 | 0.27 | 2,291 | 710 | 1,683 | 619 | 1,299 |
| Rehoboth | 0.96 | 2,069 | 1,986 | 5,959 | 2,107 | 2,023 | 6,069 | 0.76 | 0.67 | 2,046 | 1,555 | 3,685 | 1,371 | 2,878 |
| Rochester | 0.94 | 994 | 934 | 2,803 | 1,022 | 960 | 2,881 | 0.74 | 0.66 | 956 | 707 | 1,676 | 631 | 1,325 |
| Seekonk | 1.04 | 1,302 | 1,354 | 4,062 | 1,315 | 1,368 | 4,104 | 0.82 | 0.73 | 1,330 | 1,091 | 2,585 | 971 | 2,039 |
| Sharon | 0.48 | 1,027 | 493 | 1,479 | 1,033 | 496 | 1,488 | 0.38 | 0.34 | 1,104 | 419 | 994 | 375 | 788 |
| Somerset | 0.40 | 678 | 271 | 814 | 714 | 286 | 857 | 0.32 | 0.28 | 718 | 230 | 545 | 201 | 422 |
| Stoughton | 0.57 | 2,267 | 1,292 | 3,877 | 2,339 | 1,333 | 4,000 | 0.45 | 0.40 | 2,423 | 1,090 | 2,584 | 969 | 2,035 |
| Swansea | 0.83 | 1,377 | 1,143 | 3,429 | 1,417 | 1,176 | 3,527 | 0.66 | 0.58 | 1,382 | 912 | 2,162 | 802 | 1,684 |
| Taunton | 0.45 | 5,062 | 2,278 | 6,834 | 5,177 | 2,330 | 6,989 | 0.36 | 0.32 | 5,214 | 1,877 | 4,449 | 1,669 | 3,504 |
| Wareham | 0.37 | 3,044 | 1,126 | 3,379 | 3,096 | 1,145 | 3,436 | 0.29 | 0.26 | 3,043 | 882 | 2,091 | 791 | 1,661 |
| Westport | 0.68 | 3,419 | 2,325 | 6,975 | 3,624 | 2,464 | 7,393 | 0.54 | 0.48 | 3,189 | 1,722 | 4,081 | 1,531 | 3,214 |
| Bristol RI | 0.83 | 1,943 | 1,613 | 4,838 | 1,999 | 1,659 | 4,978 | 0.66 | 0.58 | 1,999 | 1,319 | 3,127 | 1,159 | 2,435 |
| Portsmouth RI | 0.83 | 2,386 | 1,980 | 5,941 | 2,455 | 2,038 | 6,113 | 0.66 | 0.58 | 2,455 | 1,620 | 3,840 | 1,424 | 2,990 |
| Tiverton RI | 0.68 | 1,976 | 1,344 | 4,031 | 2,095 | 1,425 | 4,274 | 0.54 | 0.48 | 2,095 | 1,131 | 2,681 | 1,006 | 2,112 |
| Warren RI | 1.04 | 893 | 929 | 2,786 | 902 | 938 | 2,814 | 0.82 | 0.73 | 902 | 740 | 1,753 | 658 | 1,383 |
| **TOTAL** | | **75,212** | **38,892** | **116,675** | **78,016** | **40,184** | **120,551** | | | **78,016** | **31,631** | **74,967** | **27,955** | **58,706** |

Note: Households from Table A-1. Conversion factors and land impact from Land Use Table A-2

**Table A-7: Projected Change in Water Demand by Community, 2000 to 2035**

| Municipality | Additional Water Demand in 2035 | | | | | |
|---|---|---|---|---|---|---|
| | No-Build | | Scenario 1 | | Scenario 2 | |
| | Additional Households | Total Gallons (162.5/HH) | Additional Households | Total Gallons (162.5/HH) | Additional Households | Total Gallons (141.38/HH) |
| Acushnet | 965 | 156,812 | 992 | 161,188 | 1,006 | 142,238 |
| Attleboro | 2,906 | 472,225 | 2,920 | 474,576 | 3,108 | 439,391 |
| Berkley | 806 | 130,975 | 837 | 135,932 | 797 | 112,682 |
| Bridgewater | 1,730 | 281,125 | 1,760 | 285,980 | 1,995 | 282,092 |
| Canton | 2,648 | 430,308 | 2,662 | 432,545 | 2,728 | 385,726 |
| Dartmouth | 3,705 | 602,062 | 3,772 | 612,924 | 3,717 | 525,577 |
| Dighton | 992 | 161,200 | 1,056 | 171,669 | 969 | 137,036 |
| Easton | 1,262 | 205,075 | 1,287 | 209,183 | 1,406 | 198,821 |
| Fairhaven | 1,522 | 247,325 | 1,883 | 306,065 | 1,597 | 225,852 |
| Fall River | 7,236 | 1,175,850 | 7,769 | 1,262,391 | 7,629 | 1,078,576 |
| Foxborough | 1,515 | 246,226 | 1,524 | 247,628 | 2,264 | 320,033 |
| Freetown | 935 | 151,938 | 994 | 161,512 | 930 | 131,530 |
| Lakeville | 1,433 | 232,862 | 1,462 | 237,633 | 1,378 | 194,879 |
| Mansfield | 2,184 | 354,900 | 2,191 | 356,033 | 2,205 | 311,761 |
| Marion | 285 | 46,313 | 298 | 48,407 | 312 | 44,138 |
| Mattapoisett | 732 | 118,950 | 785 | 127,534 | 735 | 103,949 |
| Middleborough | 2,912 | 473,200 | 2,938 | 477,413 | 2,972 | 420,113 |
| New Bedford | 5,290 | 859,625 | 5,739 | 932,656 | 5,624 | 795,085 |
| N Attleborough | 3,753 | 609,862 | 3,772 | 612,874 | 3,864 | 546,352 |
| Norton | 1,646 | 267,475 | 1,674 | 272,093 | 1,631 | 230,651 |
| Raynham | 2,318 | 376,675 | 2,406 | 390,964 | 2,291 | 323,885 |
| Rehoboth | 2,069 | 336,212 | 2,107 | 342,434 | 2,046 | 289,210 |
| Rochester | 994 | 161,525 | 1,022 | 165,996 | 956 | 135,141 |
| Seekonk | 1,302 | 211,575 | 1,315 | 213,747 | 1,330 | 188,020 |
| Sharon | 1,027 | 166,885 | 1,033 | 167,870 | 1,104 | 156,034 |
| Somerset | 678 | 110,175 | 714 | 116,025 | 718 | 101,536 |
| Stoughton | 2,267 | 368,388 | 2,339 | 380,081 | 2,423 | 342,545 |
| Swansea | 1,377 | 223,762 | 1,417 | 230,192 | 1,382 | 195,421 |
| Taunton | 5,062 | 822,575 | 5,177 | 841,276 | 5,214 | 737,187 |
| Wareham | 3,044 | 494,650 | 3,096 | 503,053 | 3,043 | 430,223 |
| Westport | 3,419 | 555,587 | 3,624 | 588,938 | 3,189 | 450,796 |
| Bristol RI | 1,943 | 315,738 | 1,999 | 324,838 | 1,999 | 282,619 |
| Portsmouth RI | 2,386 | 387,725 | 2,455 | 398,938 | 2,455 | 347,088 |
| Tiverton RI | 1,976 | 321,100 | 2,095 | 340,438 | 2,095 | 296,191 |
| Warren RI | 893 | 145,113 | 902 | 146,575 | 902 | 127,525 |
| **TOTAL** | **75,212** | **12,221,993** | **78,016** | **12,677,600** | **78,016** | **11,029,902** |

Note: Households from Table A-1

**Table A-8: Projected Change in Stationary Source GHG Emissions by Community, 2000 to 2035**

| Municipality | Additional Greenhouse Gas Emissions in 2035 | | | | | |
|---|---|---|---|---|---|---|
| | No-Build | | Scenario 1 | | Scenario 2 | |
| | Additional Households | Tons per Year (11.83/HH) | Additional Households | Tons per Year (11.83/HH) | Additional Households | Tons per Year (11.83/HH) |
| Acushnet | 965 | 11,416 | 992 | 11,735 | 1,006 | 11,902 |
| Attleboro | 2,906 | 34,378 | 2,920 | 34,549 | 3,108 | 36,766 |
| Berkley | 806 | 9,535 | 837 | 9,896 | 797 | 9,429 |
| Bridgewater | 1,730 | 20,466 | 1,760 | 20,819 | 1,995 | 23,604 |
| Canton | 2,648 | 31,326 | 2,662 | 31,489 | 2,728 | 32,276 |
| Dartmouth | 3,705 | 43,830 | 3,772 | 44,621 | 3,717 | 43,978 |
| Dighton | 992 | 11,735 | 1,056 | 12,498 | 969 | 11,467 |
| Easton | 1,262 | 14,929 | 1,287 | 15,229 | 1,406 | 16,636 |
| Fairhaven | 1,522 | 18,005 | 1,883 | 22,282 | 1,597 | 18,898 |
| Fall River | 7,236 | 85,602 | 7,769 | 91,902 | 7,629 | 90,250 |
| Foxborough | 1,515 | 17,925 | 1,524 | 18,027 | 2,264 | 26,779 |
| Freetown | 935 | 11,061 | 994 | 11,758 | 930 | 11,006 |
| Lakeville | 1,433 | 16,952 | 1,462 | 17,300 | 1,378 | 16,307 |
| Mansfield | 2,184 | 25,837 | 2,191 | 25,919 | 2,205 | 26,087 |
| Marion | 285 | 3,372 | 298 | 3,524 | 312 | 3,693 |
| Mattapoisett | 732 | 8,660 | 785 | 9,284 | 735 | 8,698 |
| Middleborough | 2,912 | 34,449 | 2,938 | 34,756 | 2,972 | 35,153 |
| New Bedford | 5,290 | 62,581 | 5,739 | 67,897 | 5,624 | 66,529 |
| N Attleborough | 3,753 | 44,398 | 3,772 | 44,617 | 3,864 | 45,716 |
| Norton | 1,646 | 19,472 | 1,674 | 19,808 | 1,631 | 19,300 |
| Raynham | 2,318 | 27,422 | 2,406 | 28,462 | 2,291 | 27,101 |
| Rehoboth | 2,069 | 24,476 | 2,107 | 24,929 | 2,046 | 24,200 |
| Rochester | 994 | 11,759 | 1,022 | 12,085 | 956 | 11,308 |
| Seekonk | 1,302 | 15,403 | 1,315 | 15,561 | 1,330 | 15,733 |
| Sharon | 1,027 | 12,149 | 1,033 | 12,221 | 1,104 | 13,056 |
| Somerset | 678 | 8,021 | 714 | 8,447 | 718 | 8,496 |
| Stoughton | 2,267 | 26,819 | 2,339 | 27,670 | 2,423 | 28,663 |
| Swansea | 1,377 | 16,290 | 1,417 | 16,758 | 1,382 | 16,352 |
| Taunton | 5,062 | 59,883 | 5,177 | 61,245 | 5,214 | 61,684 |
| Wareham | 3,044 | 36,011 | 3,096 | 36,622 | 3,043 | 35,999 |
| Westport | 3,419 | 40,447 | 3,624 | 42,875 | 3,189 | 37,720 |
| Bristol RI | 1,943 | 22,986 | 1,999 | 23,648 | 1,999 | 23,648 |
| Portsmouth RI | 2,386 | 28,226 | 2,455 | 29,043 | 2,455 | 29,043 |
| Tiverton RI | 1,976 | 23,376 | 2,095 | 24,784 | 2,095 | 24,784 |
| Warren RI | 893 | 10,564 | 902 | 10,671 | 902 | 10,671 |
| **TOTAL** | **75,212** | **889,761** | **78,016** | **922,929** | **78,016** | **922,929** |

Note: Households from Table A-1

**Table A-9: Projected Change in VMT by Community, 2000 to 2035**

| Municipality | Additional Vehicle Miles Traveled per Day in 2035 | | | | | | |
|---|---|---|---|---|---|---|---|
| | No-Build | | | Scenario 1 | | Scenario 2 | |
| | Additional Households | Passenger Vehicle Mileage per Household (VMT per HH) | VMT | Additional Households | VMT | Additional Households | VMT |
| Acushnet | 965 | 67 | 65,041 | 992 | 66,856 | 1,006 | 67,809 |
| Attleboro | 2,906 | 65 | 189,471 | 2,920 | 190,414 | 3,108 | 202,633 |
| Berkley | 806 | 106 | 85,678 | 837 | 88,920 | 797 | 84,723 |
| Bridgewater | 1,730 | 82 | 141,860 | 1,760 | 144,310 | 1,995 | 163,613 |
| Canton | 2,648 | 63 | 166,033 | 2,662 | 166,896 | 2,728 | 171,064 |
| Dartmouth | 3,705 | 69 | 257,127 | 3,772 | 261,766 | 3,717 | 257,993 |
| Dighton | 992 | 90 | 89,181 | 1,056 | 94,973 | 969 | 87,138 |
| Easton | 1,262 | 79 | 99,824 | 1,287 | 101,824 | 1,406 | 111,237 |
| Fairhaven | 1,522 | 55 | 83,710 | 1,883 | 103,591 | 1,597 | 87,861 |
| Fall River | 7,236 | 38 | 273,521 | 7,769 | 293,652 | 7,629 | 288,373 |
| Foxborough | 1,515 | 75 | 113,037 | 1,524 | 113,680 | 2,264 | 168,867 |
| Freetown | 935 | 96 | 89,854 | 994 | 95,516 | 930 | 89,405 |
| Lakeville | 1,433 | 99 | 141,867 | 1,462 | 144,773 | 1,378 | 136,462 |
| Mansfield | 2,184 | 78 | 170,570 | 2,191 | 171,115 | 2,205 | 172,221 |
| Marion | 285 | 76 | 21,746 | 298 | 22,729 | 312 | 23,821 |
| Mattapoisett | 732 | 73 | 53,656 | 785 | 57,528 | 735 | 53,894 |
| Middleborough | 2,912 | 93 | 271,981 | 2,938 | 274,402 | 2,972 | 277,540 |
| New Bedford | 5,290 | 38 | 201,549 | 5,739 | 218,672 | 5,624 | 214,265 |
| N Attleborough | 3,753 | 71 | 265,337 | 3,772 | 266,647 | 3,864 | 273,215 |
| Norton | 1,646 | 88 | 144,354 | 1,674 | 146,847 | 1,631 | 143,076 |
| Raynham | 2,318 | 82 | 190,308 | 2,406 | 197,527 | 2,291 | 188,081 |
| Rehoboth | 2,069 | 86 | 178,555 | 2,107 | 181,859 | 2,046 | 176,537 |
| Rochester | 994 | 111 | 110,632 | 1,022 | 113,695 | 956 | 106,389 |
| Seekonk | 1,302 | 67 | 87,104 | 1,315 | 87,998 | 1,330 | 88,970 |
| Sharon | 1,027 | 73 | 75,278 | 1,033 | 75,722 | 1,104 | 80,897 |
| Somerset | 678 | 64 | 43,392 | 714 | 45,696 | 718 | 45,964 |
| Stoughton | 2,267 | 60 | 135,113 | 2,339 | 139,402 | 2,423 | 144,403 |
| Swansea | 1,377 | 71 | 97,354 | 1,417 | 100,151 | 1,382 | 97,724 |
| Taunton | 5,062 | 58 | 291,571 | 5,177 | 298,200 | 5,214 | 300,339 |
| Wareham | 3,044 | 77 | 232,866 | 3,096 | 236,822 | 3,043 | 232,792 |
| Westport | 3,419 | 83 | 284,119 | 3,624 | 301,174 | 3,189 | 264,968 |
| Bristol RI | 1,943 | 43 | 83,549 | 1,999 | 85,957 | 1,999 | 85,957 |
| Portsmouth RI | 2,386 | 43 | 102,598 | 2,455 | 105,565 | 2,455 | 105,565 |
| Tiverton RI | 1,976 | 43 | 84,968 | 2,095 | 90,085 | 2,095 | 90,085 |
| Warren RI | 893 | 43 | 38,399 | 902 | 38,786 | 902 | 38,786 |
| **TOTAL** | **75,212** | | **4,961,201** | **78,016** | **5,123,749** | **78,016** | **5,122,664** |

Note: Households from Table A-1

VMT for MA communities from MAPC

VMT for RI communities from DEIS

# Appendix 5.5-A

# Smart Growth Literature Review

# 2

# Literature Review

## 2.1 Introduction

This chapter provides a summary of the *Corridor Plan* and a review of experience in monitoring smart growth from relevant regional planning examples.

## 2.2 Summary of the South Coast Rail Economic Development and Corridor Plan

The *Corridor Plan*, prepared in June 2009, was developed as part of the proposed South Coast Rail project.[2] The Plan was developed through a collaborative process which resulted in a "blueprint for clustering jobs and homes around stations, maximizing the economic benefits or rail investment, minimizing sprawl development, and preserving the farms, fields, and forests of the South Coast." The *Corridor Plan* seeks to:

- Advance the Commonwealth of Massachusetts' Sustainable Development Principles;
- Advance a robust effort to preserve critical environmental resources as the region's population grows;
- Optimize development around train stations;
- Target investment in places where infrastructure is already in place;
- Encourage collaborative land use planning across municipal boundaries; and

2 Commonwealth of Massachusetts. *South Coast Rail Economic Development and Land Use Corridor Plan.* June 2009.

- Provide supportive state policies and investments to cities and towns.

The *Corridor Plan* is comprised of three elements: Priority Development Areas (PDAs), Priority Protection Areas (PPAs), and Station Area Development. PDAs include major downtowns, large employment centers, locations around future South Coast Rail stations, and other areas that have been identified as having the potential to support business or residential growth. The PPAs include farmlands, sensitive habitat and environmental resource areas, potential linkages between existing open space resources, and places of cultural or historic significance. The *Corridor Plan* also evaluates the potential for TOD around future stations.

As described in the *Corridor Plan*, the locations of new South Coast Rail stations were selected and designed to address several key public goals: to serve existing residential and employment centers within the region; to foster new development around stations; to accommodate people arriving by a range of different modes including car, bus, foot and bike; and to address the operational needs of the rail system and provide access for future riders. These new stations fall into four basic categories: multimodal hub, new center, village station, and park-and-ride station. The *Corridor Plan* sets forth a number of goals for station and station area development:

- Approach each station site as a unique design opportunity to achieve the site's highest potential while optimizing development and parking potential system-wide;
- Plan for economic and housing development at station sites and catalyze smart-growth investments within the one-mile station radii;
- Provide adequate and equitable parking options that respect the community character;
- Provide safe, convenient access to and from the stations for all modes of transportation; and
- Design station areas and station parking to be environmentally-friendly and energy-efficient.

The *Corridor Plan* also includes a number of policies, tools, and strategies that offer municipalities and public agencies a range of tactics to implement the *Corridor Plan*. Although the *Corridor Plan* focuses primarily on the involved state agencies and the South Coast region municipalities, technical assistance from the Regional Planning Agencies (Southeastern Regional Planning and Economic Development District [SRPEDD], the Metropolitan Area Planning Council [MAPC], and the Old Colony Planning Council [OCPC]) to the local municipalities will be required for successful implementation of these policies, tools, and strategies. The *Corridor Plan's* suggested policies, tools, and strategies include the following.

State Agencies

- Maximize use of TOD to create great places at the station areas by:
  - Creating multimodal and public-realm connections to stations, including investments in bicycle and pedestrian access;
  - Incorporating solar, photovoltaic, wind, district energy, and energy-efficient technologies and green building standards for stations, parking facilities, and station areas;
  - Planning for short- and long-term TOD opportunities and seek out public ownership of land for station areas; and
  - Coordinating job creation, green job incubators, and employer-attraction initiatives with station area development.
- Direct discretionary state funding to encourage zoning and land use changes in support of sustainable development.
- Steer their own investments in state infrastructure, buildings, and office leases to station areas and priority development areas.
- Provide technical assistance to expand affordable housing opportunities within the PDAs.
- Create a Transfer of Development Rights (TDR) program to steer growth away from PPAs and other sensitive locations to PDAs.
- Capture new tax revenue from growth around new stations for reinvestment.

State Agencies and Regional Planning Agencies

- Provide technical assistance to municipalities.

Municipalities

- Create a foundation for sustainability community development through planning. This could be accomplished by creating:
  - Master or Comprehensive Plans;
  - Community Development Plans (CDP);
  - Open Space and Recreation Plans;
  - Housing Production Plans;
  - Water and Sewer Plans;
  - Watershed Protection Plan; and
  - Specific Station-Area Plans.
- Utilize strategies and tools to achieve preservation including:
  - Adopting the Community Preservation Act;

- Protecting agricultural land and activities through adoption of agricultural zoning or right-to-farm bylaws, conservation subdivision bylaws (cluster development), TDR bylaws, and scenic road bylaws.
- Preserving historic resources through adoption of demolition delay bylaws and establishing historic districts or designating landmarks;
- Protecting other sensitive areas through the adoption of design review bylaws; and
- Protecting wetlands through adoption of local wetland protection bylaws, use of low impact development techniques, and development of stormwater management plans.

- Utilize strategies and tools for the promotion of development including:
  - Using Chapter 43D[3] to promote development in the PDAs;
  - Redeveloping contaminated sites using the technical and financial assistance from brownfields redevelopment programs;
  - Using Chapters 40R and 40S[4] and tax-increment financing and district-improvement financing to support private development;
  - Adopting zoning changes that support TOD, higher densities, and mixed use developments;
  - Developing parking-management strategies and allow shared parking; and
  - Adopting housing-related policies including inclusionary zoning, accessory dwelling units, multi-family housing, Chapter 40B[5], and the Community Preservation Act.

Table 2-1 outlines the responsibilities of the state agencies, the regional planning agencies, and the municipalities in achieving the goals set out in the *Corridor Plan*.

3 Massachusetts General Law Chapter 43D offers communities a tool for targeted economic development. Also known as local expedited permitting, if a municipality opts in, Chapter 43D provides a transparent and efficient process for municipal permitting; guarantees local permitting decisions on priority development sites within 180 days; and increases the visibility of the community and target development sites.

4 Chapter 40R of the Massachusetts General Laws encourages cities and towns to establish new overlay zoning districts to promote housing production and, more generally, smart growth development. Chapters 40R and 40S both provide financial incentives to communities to adopt these new zoning districts.

5 Massachusetts General Law Chapter 40B enables local Zoning Boards of Appeals to approve affordable housing developments under flexible rules in 20 to 25 percent of the units have long-term affordability restrictions.

Table 2-1 Implementation Responsibilities of the South Coast Rail Corridor Plan

| Action | Responsible Entity |
|---|---|
| Technical assistance, funding, regulation, and legislative proposals to implement the state agency actions. | State – Development Cabinet |
| Update the *Corridor Plan* each year and refine the implementation strategies. | State – All agencies |
| Provide technical assistance to communities for smart growth implementation and to advance PPA and PDA goals. | State – All agencies |
| Develop more detailed station-area plans and station-area zoning. | State – MassDOT, EOHED, MBTA<br>Regional Planning Agencies<br>Municipalities |
| Continue civic engagement activities to foster public dialogue and discussion of the *Corridor Plan*, incorporating public input into design of South Coast Rail Project. | State – MassDOT |
| Continue to work with Regional Planning Agencies using Direct Local Technical Assistance funding to support implementation of actions at the local level. | State – EOHED<br>Regional Planning Agencies |
| Continue to provide technical assistance to corridor communities to enhance smart growth planning, encourage TOD in station areas, and assist corridor communities with implementation of PPAs and PDAs. | State – EOHED<br>Regional Planning Agencies |
| Build on and advance planning for PDAs and PPAs within the Corridor Map and other regionally and locally identified PDAs and PPAs. | State – All agencies<br>Municipalities |
| Draw on technical assistance to explore potential application of smart growth tools and ordinances consistent with community goals and the *Corridor Plan*. | Municipalities |
| Prepare station area plans to guide investment around future stations through additional analysis and planning, as well as through engagement of the public, property owners, and developers. | Municipalities |
| Consider revisions in local regulations, including zoning where necessary, in order to reposition station areas to attract appropriate development. | Municipalities |

Source: Commonwealth of Massachusetts. *South Coast Rail Economic Development and Land Use Corridor Plan*. June 2009.
Notes:
EOHED Executive Office of Housing and Economic Development
MassDOT Massachusetts Department of Transportation
MBTA Massachusetts Bay Transportation Authority
TOD Transit Oriented Development
PPA Priority Preservation Areas
PDA Priority Development Areas

The *Corridor Plan* does not identify metrics that would measure the success of the implementation strategies identified in Table 2-1. The Secretary of EOEEA, in his Certificate on the Draft Environmental Impact Report for the South Coast Rail project, required that MassDOT develop metrics that would serve to determine the effectiveness of the plan implementation. The metrics should monitor and measure

the potential smart growth and environmental benefits from the *Corridor Plan* implementation. Specifically, based on the goals outlined in the *Corridor Plan*, detailed metrics are required for the following categories:

- EIS/EIR and General metrics;
- Priority Development Area metrics;
- Transit Oriented Development metrics;
- Conservation and Priority Preservation Area metrics;
- Social Equity metrics.

The specific metrics will measure how well the goals of the *Corridor Plan* are being implemented by the South Coast region municipalities, regional planning agencies, and state agencies through the policies, tools, and strategies identified in the *Corridor Plan*.

## 2.3 Literature Review

As there are no metrics or indicators included in the *Corridor Plan*, MassDOT undertook a literature review as directed by the Secretary's Certificate on the DEIS/DEIR. Beginning with existing models and performance metrics in Massachusetts, MassDOT reviewed the effectiveness of these models and metrics in evaluating smart growth and environmental protection strategies. MassDOT also reviewed examples from across the nation for applicability to the South Coast Rail project.

Massachusetts does not have any state-wide legislative mandate to utilize smart growth principles. While there are no state-wide legislative mandates, Executive Order 525 mandates that state agencies implement the commitments identified in the *Corridor Plan.* Executive Order 525, issued by Governor Deval Patrick in September 2010, provides for the implementation of the *Corridor Plan*.[6] Executive Order 525 directs state agencies to make infrastructure and land protection investments consistent with the priority areas identified on the Corridor Map of the *Corridor Plan*. The priority areas include 33 priority development areas (PDAs) and 72 priority protection areas (PPA) and one combined PDA/PPA. Massachusetts' state agencies are now using the *Corridor Plan* to guide investments in infrastructure and land protection, and to target technical assistance where it is most needed. In order to facilitate smart growth planning efforts by communities in the South Coast Region, a total of $300,000 per year has already been provided over four years in technical assistance to plan for smart growth in South Coast communities. The Executive

6 Commonwealth of Massachusetts. *Executive Order 525: Providing for the Implementation of the South Coast Rail Corridor Plan.* September 29, 2010.

Order mandates policy commitments made in the *Corridor Plan* for "Strategic Investments" by committing the Commonwealth to use its discretionary grant funds and its investments in state buildings and infrastructure to support the recommendations of the *Corridor Plan*.

In order to provide technical assistance to all communities throughout the Commonwealth, the Massachusetts Executive Office of Energy and Environmental Affairs has developed a Smart Growth/Smart Energy Toolkit[7] which provides information and technical assistance to a variety of users, including planners, developers, and designers, who are interested in implementing smart growth principles for individual projects or communities. The Smart Growth/Smart Energy Toolkit provides examples of Massachusetts communities utilizing the individual tools identified in the toolkit to implement smart growth principles, but no examples are provided of comprehensive smart growth planning linked to specific metrics to monitor the implementation of smart growth principles.

As there were no other state-wide examples or regional examples of existing models and performance metrics, the research included states across the nation. Five case studies were examined in further detail:

- San Diego's *Regional Comprehensive Plan*
- *Maryland Smart Growth Indicators Project*
- Puget Sound Regional Council's *VISION 2040* and Growing Transit Communities
- Atlanta Regional Commission's Livable Centers Initiative
- New Jersey Transit Village Initiative

This selection of case studies provides some context for the performance metrics that were later developed for the South Coast Rail project. In some cases, follow-up phone interviews with planners involved with the implementation of these plans were completed. The purpose of phone interviews was to get more detailed information on the status of the case studies and on the metrics used to measure the success of these plans.

In addition to the study of select regional plans and performance metrics, reports and guidance documents from federal agencies, transportation research organizations, and non-profits such as the Center for Neighborhood Technology and the Brookings Institute were reviewed. A full list of the sources consulted is provided in Chapter 7, *References*.

7 Massachusetts Smart Growth/Smart Energy Toolkit. Available: http://www.mass.gov/envir/smart_growth_toolkit/index.html

### 2.3.1 San Diego's *Regional Comprehensive Plan*

The *Regional Comprehensive Plan* (RCP) serves as the long-term planning framework for the San Diego region.[8] While the RCP is not specifically a corridor plan, there is a strong smart growth component which focuses development within Smart Growth Opportunity Areas and promotes habitat conservation within designated preserve areas. The RCP was adopted by the San Diego Association of Governments (SANDAG) Board of Directors in June 2004. The RCP defined a vision and identified goals, key issues, and needed actions in areas ranging from urban form and transportation to public facilities and borders. The RCP characterized the state of the region at the time of adoption, where the region aims to be by 2030, and what the region needs to do to achieve this vision of the future.

The RCP specifically required ongoing monitoring to track progress toward meeting the goals outlined in the plan. The Annual Indicators for Monitoring included metrics to measure the progress related to urban form and transportation, housing, healthy environment, economic prosperity, public facilities, and borders. Many of the strategies and actions recommended in the RCP will take years to develop and fund. Therefore, SANDAG staff indicated it is important to have a consistent and valid set of indicators that can reflect sometimes subtle changes that occur over the long run.[9] Performance monitoring reports on these indicators will assess how the RCP is influencing the quality of life in the San Diego region.

The RCP Baseline report for Performance Monitoring was completed in late 2006 and it established the benchmark for future annual monitoring. The 2009 RCP Monitoring Report was the third report to be published and was distributed in September 2010.[10] SANDAG had been reporting annually, but it became an intensive task for the SANDAG staff prompting the decision to report findings bi-annually rather than annually.[11] The changes that were seen in the data were quite small and did not necessarily show any trends from year to year. It is not expected that reporting bi-annually will show any trends either from report to report but over the long term the monitoring will reveal trends.

The RCP reports on approximately 35 to 40 indicators currently (Table 2-2). The list of indicators is revised periodically as new plans are adopted, to reflect indicators included in those plans. As described in the 2009 Monitoring Report, many of the indicators use the American Community Survey (ACS) as the data source. The ACS program of the U.S. Census Bureau collects and disseminates demographic, socioeconomic, and housing data on an annual basis. Data are collected from one of every 40 addresses, or approximately 2.5 percent of the population, for a total of about three million addresses a year. Other indicators are based on data that

8 The San Diego Association of Governments (SANDAG). *Regional Comprehensive Plan for the San Diego Region*. July 2004.
9 Early, Christine, Planner, San Diego Association of Governments. Personal Communication. February 28, 2012.
10 The San Diego Association of Governments (SANDAG). Regional Comprehensive Plan 2009 Annual Performance Monitoring Report. 2009.
11 Early, Christine, Planner, San Diego Association of Governments. Personal Communication. February 28, 2012.

SANDAG routinely collects in order to limit the burden on staff and regional communities. Still other indicators were removed since attempts to identify data sources have not been successful. The RCP will be updated in 2014/2015. At that time, the indicators will be revisited.

Table 2-2 SANDAG Indicators for Monitoring the *Regional Comprehensive Plan*

| Topic | Indicator | Data Source |
|---|---|---|
| Urban Form and Transportation | Share of new housing units and jobs located in Smart Growth Opportunity Areas | SANDAG |
| | Share of new housing units within County Water Authority water service boundary | SANDAG |
| | Annual transit ridership | Metropolitan Transit System<br>North County Transit System<br>SANDAG |
| | Commute mode shares | ACS, U.S. Census Bureau |
| | Travel times and volumes for key transportation corridors | Caltrans |
| | Annual hours of traffic delay per traveler | Texas Transportation Institute |
| | Regional crime rate | Local law enforcement agencies |
| Housing | Housing Opportunity Index | National Association of Home Builders |
| | Percent of households with housing costs greater than 35 percent of income | ACS, U.S. Census Bureau<br>National Low-Income Housing Coalition |
| | Ratio of new jobs to new housing units | SANDAG<br>California Employment Development Department |
| | Share of new and existing housing units by structure type and income category | Local Jurisdictions (building permits) |
| | Vacancy rates | ACS, U.S. Census Bureau |
| | Percent of households living in overcrowded conditions | ACS, U.S. Census Bureau |
| | Number of households on the waiting list for Section 8 vouchers | Local jurisdictions |
| Healthy Environment | Habitat conserved within designated preserve areas | Local jurisdictions |
| | Percent of preserve areas actively maintained | SANDAG |
| | Number of beach mile closure days | County of San Diego Department of Environmental Health<br>Western Regional Climate Center |
| | Impaired waterbodies | San Diego Regional Water Quality Control Board |
| | Beach widths | SANDAG |
| | EPA's Air Quality Index | San Diego Air Pollution Control District |

Table 2-2 SANDAG Indicators for Monitoring the Regional Comprehensive Plan (continued)

| Topic | Indicator | Data Source |
|---|---|---|
| Economic Prosperity | Labor force educational attainment | ACS, U.S. Census Bureau |
| | Employment growth in high-wage economic clusters | SANDAG |
| | Regional unemployment rate compared to California and the United States | California Employment Development Department<br>U.S. Department of Labor<br>Bureau of Labor Statistics |
| | Real per capita income compared to California and the United States | U.S. Bureau of Economic Analysis<br>SANDAG<br>U.S. Census Bureau |
| | Regional poverty rate compared to California and the United States | ACS, U.S. Census Bureau |
| Public Facilities | Total water consumption | San Diego County Water Authority |
| | Diversity of water supply | San Diego County Water Authority |
| | Recycled water use | San Diego County Water Authority |
| | Regional energy by source | San Diego Gas & Electric |
| | Share of energy produced from renewable resources | San Diego Gas & Electric |
| | Per capita peak demand for electricity | San Diego Gas & Electric |
| | Electricity consumption by sector | San Diego Gas & Electric |
| | Natural gas consumption by sector | Energy Policy Initiatives Center, University of San Diego |
| | Percent of solid waste that is recycled | California Integrated Waste Management Board |
| | Landfill space available | California Integrated Waste Management Board |
| Borders | Interregional traffic volumes into San Diego from surrounding counties and Baja California | Caltrans Traffic Census<br>SANDAG |
| | Border wait times | U.S. Customs and Border Protection |
| | Participation in SENTRI Lanes | SANDAG |

Source: The San Diego Association of Governments (SANDAG). *Regional Comprehensive Plan 2009 Annual Performance Monitoring Report*. 2009.

Notes:

ACS U.S. Census Bureau's American Community Survey
Caltrans California Department of Transportation
EPA U.S. Environmental Protection Agency
SANDAG San Diego Association of Governments
SENTRI Secure Electronic Network for Travelers Rapid Inspections

### 2.3.2 *Maryland Smart Growth Indicators Project*

The Maryland Smart Growth Program was introduced by former Governor Parris Glendening in 1997 and passed by the Maryland General Assembly. The program has two main parts: the Smart Growth Areas Act and the Rural Legacy Program. The program encourages new growth in already developed areas, where adequate infrastructure and public facilities currently exist, and thus protects natural resources, farmland, and forests. The program is usually referred to as an incentive-based, rather than a regulatory, program: it provides state funds for infrastructure development in designated Priority Funding Areas (PFAs), and funding and other incentives for the protection of land outside of PFAs. The goals of Maryland's Smart Growth initiative are expressed in broad terms. The general goals of the program are:

- To support and enhance existing communities; and
- To save taxpayers from the cost of building new and often redundant infrastructure.

In 2009, as part of the Smart, Green, and Growing Planning Legislation, the Maryland General Assembly passed two major updates to the state's Smart Growth Program that are relevant to the question of performance measurement.[12] The Planning Visions bill (SB 273/HB 294) revised the State's growth visions to 12, which more comprehensively address the broad impacts of growth and collectively describe an integrated vision for sustainable development in Maryland. These 12 visions could logically be used as categories of areas that the State wants to influence and, thus, wants to measure to see if it is in fact having any influence. The second, the Smart Growth Goals, Measures, and Indicators and Implementation of Planning Visions bill (SB276/HB295), requires counties in Maryland to report certain data relating to the visions on an annual basis to the Maryland Department of Planning (MDP). MDP, in turn, is required to work with the National Center for Smart Growth Research and Education (NCSG) at the University of Maryland to gather additional data from state and federal sources and annually report on these measures and indicators of growth to the Governor and General Assembly. The legislation established a goal of increasing the percentage of growth within PFAs statewide, and required counties to set their own goal for the percentage of future growth that would occur within their PFAs.

The reporting required from Maryland counties under the Smart Growth Goals, Measures, and Indicators and Implementation of Planning Visions bill began in July 2011; however, the NCSG began to collect and report on a variety of indicators more recently to permit a better understanding of where smart growth in Maryland was succeeding and where it needed improvement. The indicators are grouped into

12 2009 Smart, Green & Growing Planning Legislation including the Smart and Sustainable Growth Act of 2009 (SB 280/HB297), the Smart Growth Measures and Markers (SB276/HB295), and Planning Visions (SB273/HB294).

eight categories: Population, Economy, Environment, Land Preservation, Infrastructure, Transportation, Housing, and Land Use. Most of the data came from readily available sources, such as the U.S. Census Bureau and various Maryland state agencies (Table 2-3). The NCSG attempted to choose meaningful data that tell a story without over simplifying or creating unnecessary complexity.[13]

The NCSG reported its findings on the *Maryland Smart Growth Indicators* website.[14] While the website compiles historical data for each indicator as available, there are no firm plans for the publication of the indicators in the future due to funding constraints. Looking back to the historical data, the NCSG cautions that change happens slowly over time, and it will be difficult to truly evaluate how Maryland's smart growth legislation has had a measurable impact on development.[15]

Table 2-3 Maryland Smart Growth Indicators

| Topic | Indicator | Data Source |
|---|---|---|
| Population | Historic Population | U.S. Census Bureau |
| | Projected Population | U.S. Census Bureau |
| | Foreign Born Population | U.S. Census Bureau |
| | Minority Population | U.S. Census Bureau |
| | Elderly Population | U.S. Census Bureau |
| | Youth Population | U.S. Census Bureau |
| | Level of Education | MDP |
| | Population Inside Priority Funding Areas (PFA) | MDP |
| | Population Outside PFA | MDP |
| Economy | Job Density | U.S. Census Bureau |
| | Median Household Income | U.S. Census Bureau |
| | Families in Poverty | U.S. Census Bureau |
| | Total Wages by Industry Type | U.S. Department of Labor |
| | Average Weekly Wages per Worker | U.S. Department of Labor |
| | Annual Average Employment | U.S. Department of Labor |
| | Average Number of Establishments | U.S. Department of Labor |
| Environment | Green Infrastructure Acres | Maryland Department of Natural Resources |
| | Tree Coverage | U.S. Forest Service |
| | LEED® Registered Projects | U.S. Green Building Council |
| | Phosphorous Contributions to the Bay | Chesapeake Bay Program Water Quality Database |
| | Nitrogen Contributions to the Bay | CBP Water Quality Database |

13 Santori, Jason. Research Associate, The National Center for Smart Growth Research and Education at the University of Maryland. Personal Communication. March 2, 2012.
14 Maryland Smart Growth Indicators Project, http://www.indicatorproject.com/. Accessed February 2012.
15 Santori, Jason. Research Associate, The National Center for Smart Growth Research and Education at the University of Maryland. Personal Communication. March 2, 2012.

Table 2-3 Maryland Smart Growth Indicators (continued)

| Topic | Indicator | Data Source |
|---|---|---|
| Land Preservation | Rural Legacy Acres | MDP |
| | Private Conservation Organization Acres | MDP |
| | Maryland Environmental Trust Easement Acres | MDP |
| | Maryland Agricultural Land Preservation Foundation Acres | MDP<br>Maryland Department of Natural Resources |
| Infrastructure | Pupils Transported by School Bus | Maryland Department of Education |
| | School Bus Expenditures | Maryland Department of Education |
| | Bus Route Miles Traveled | Maryland Department of Education |
| | Projected Public School Enrollment | Maryland Department of Education |
| Transportation | Roadway Capacity Utilization | Maryland Department of Transportation |
| | Lane Miles | Maryland Department of Transportation |
| | Vehicle Registrations | Maryland Motor Vehicle Administration |
| | Vehicle Registrations per Capita | Maryland Motor Vehicle Administration<br>U.S. Census Bureau<br>MDP |
| | Vehicle Miles Traveled | Maryland State Highway Administration |
| | Transportation Enhancement Spending | National Transportation Enhancements Clearinghouse |
| | County Land Area in Transit Shed | MTA<br>WMATA |
| | Percent County Land Area in Transit Shed | MTA<br>WMATA |
| | County Population in Transit Shed | U.S. Census Bureau |
| | Percent County Population in Transit Shed | U.S. Census Bureau |
| | County Jobs in Transit Shed | Maryland Department of Labor |
| | Percent County Jobs in Transit Shed | Maryland Department of Labor |
| | Population in Transit Shed | U.S. Census Bureau |
| | Transit Shed Population Density | U.S. Census Bureau |
| | Transit Shed Percent of Average County Population Density | U.S. Census Bureau |
| | Jobs in Transit Shed | Maryland Department of Labor |
| | Ridership | MTA<br>WMATA |
| | Parking Spaces | MTA<br>WMATA |
| | Number of Trains | MTA |

Table 2-3 Maryland Smart Growth Indicators (continued)

| Topic | Indicator | Data Source |
|---|---|---|
| Housing | Housing Affordability | Maryland Association of Realtors<br>U.S. Census Bureau |
| | Homeownership Rate | DataPlace by KnowledgePlex |
| | Ratio of Jobs to Housing | U.S. Census Bureau |
| | Median Price of Housing Units | Maryland Association of Realtors |
| | New Housing Units Authorized for Construction | U.S. Census Bureau |
| | Percentage of New Housing Units Authorized for Construction | U.S. Census Bureau |
| | Number of Residential Sales Inside PFAs | Maryland Property Sales Data |
| | Number of Residential Sales Outside PFAs | Maryland Property Sales Data |
| | Housing Vacancy Rate | U.S. Census Bureau |
| | Residential Home Starts Inside PFAs | MDP |
| | Residential Home Starts Outside PFAs | MDP |
| Land Use | Percent of Land Developed | MDP |
| | Improved Single Family Lots (acres) Inside PFAs | MDP |
| | Improved Single Family Lots (acres) Outside PFAs | MDP |
| | Improved Single Family Lots (parcels) Inside PFAs | MDP |
| | Improved Single Family Lots (parcels) Outside PFAs | MDP |
| | Percentage of Land by Use | MDP |

Source: Maryland Smart Growth Indicators, www.indicatorsproject.com, Accessed February 2012.
Notes:
MDP Maryland Department of Planning
MTA Maryland Transit Administration
WMATA Washington Metropolitan Area Transit Authority

### 2.3.3 Puget Sound Regional Council's *VISION 2040* and Growing Transit Communities

In April 2008, the central Puget Sound region in Washington state adopted one of the most detailed and far-reaching sustainability strategies for an urban region in the United States. *VISION 2040* is the long-range, integrated, environmental, land use, economic development, and transportation strategy for a four-county region.[16] *VISION 2040* was developed through a public scenario planning and evaluation process over a three-and-a-half-year period. Under the state growth management planning framework, *VISION 2040*'s policies guide the development of regional implementation plans, local comprehensive plans, and their implementing development regulations. *VISION 2040* includes a monitoring plan to provide policymakers and the public with answers to the following four key questions:

- Is our region developing in a manner that is consistent with our Regional Growth Strategy?

16 Puget Sound Regional Council. VISION 2040. December 2009.

- Do our activities in this region minimize harm to and protect and sustain the natural environment?
- Is our economy strong, and does it provide opportunity for all?
- Do we have a variety of efficient and safe transportation choices that support our growth strategy and offer greater options and better mobility?

Regional monitoring is based upon two major components: implementation monitoring and performance monitoring. Implementation monitoring assesses whether what was committed to is being done. Performance monitoring assesses whether the plan is achieving the desired results. The regional monitoring measures include metrics related to environment, development patterns, housing, economy, transportation, and public services (Table 2-4).

Table 2-4 PSRC's *VISION 2040* Implementation and Performance Monitoring Measures

| Topic | Type | Monitoring Measure | Data Source |
|---|---|---|---|
| Environment | IM | Existence of a coordinating mechanism and environmental strategy | Local jurisdictions |
| | PM | Change in type and distribution of land cover, and related to designated critical areas | Aerial photography<br>Impervious surface analysis |
| | PM | Water quality and impaired waters designations, by county | Washington Department of Ecology Water Quality Assessment |
| | PM | Number of unhealthy air days | Puget Sound Clean Air Agency |
| | PM | Annual average emissions of greenhouse gases | Puget Sound Clean Air Agency |
| | PM | Track local jurisdictions' efforts to address climate change and other environmental policies | PSRC |
| Development Patterns | IM | Adopted local population/housing unit and employment growth targets in countywide planning policies | Local jurisdictions |
| | PM | Development densities and distribution and quantity of designated urban, rural, agriculture, forest, and mineral resource lands. This includes distribution of new issued permits by regional geography | County urban, rural and resource land comprehensive plan designations<br>PSRC |
| | PM | Body Mass Index, by sex and race, by county | Washington State Department of Health<br>U.S. Centers for Disease Control |
| Housing | IM | Existence of a coordinating mechanism and housing strategy | PSRC |
| | PM | Distribution of issued housing permits by regional geography and by county, in order to assess jobs-housing balance and other issues | PSRC |
| | PM | Supply and distribution of ownership and rental housing units at all income levels by regional geography and by county; affordable housing availability by amount and location; review of local housing elements and plans; tracking of implementation and outcomes; reporting on successes and challenges | U.S. Census<br>Private consultants |

Table 2-4 PSRC's VISION 2040 Implementation and Performance Monitoring Measures (continued)

| Topic | Type | Monitoring Measure | Data Source |
|---|---|---|---|
| Economy | IM | Demonstrated progress in addressing foundation and cluster initiatives, action items; employer and job locations | Review of Washington's Prosperity Partnership<br>PSRC<br>Local comprehensive plans |
| | PM | Number of jobs and real wages per worker by employment/industry categories and economic clusters by county, and unemployment rates at subarea level matching state database | Washington State Employment Security Department<br>PSRC |
| | PM | Number of post-secondary degrees awarded per 1,000 individuals of targeted population groups, and high school completion rates | National Center for Education Statistics<br>Washington State Board for Community and Technical Colleges<br>Office of the Superintendent for Public Instruction |
| Transportation | IM | Metropolitan Transportation Plan project priorities, funded projects, and completed projects | PSRC<br>Transportation Improvement Program databases |
| | PM | Travel mode splits, travel times, and delay by county and major corridor, and by regional geography (including designated centers) | U.S. Census<br>PSRC<br>Washington State Department of Transportation |
| | PM | Traffic volumes, transit boardings, and delay by major corridor, by county and regional geography (including designated centers) | U.S. Census<br>PSRC<br>Washington State Department of Transportation |
| | PM | Total and per capita vehicle miles traveled, by region, county and major corridor, and by regional geography (including designated centers) | U.S. Census<br>PSRC<br>Washington State Department of Transportation |
| Public Services | PM | Adequacy of infrastructure capital and operating financial resources | Washington State Department of Transportation<br>PSRC<br>Association of Washington Cities |

Source: Puget Sound Regional Council. *VISION 2040*. December 2009.
IM Implementation Measure
PM Performance Measure
PRSC Puget Sound Regional Council

With funding provided by the U.S. Department of Housing and Urban Development Sustainable Communities Regional Planning Grant Program, the PSRC implemented Growing Transit Communities to address the barriers to implementation of the *VISION 2040* plan.[17] With the addition of three new Sound Transit light rail lines, Growing Transit Communities will help local communities to take advantage of the new light rail service, bus rapid transit and other transit investments, with the goal of

17 Bakkenta, Ben. Program Manager, Puget Sound Regional Council. Personal Communication. March 6, 2012.

locating jobs and opportunity closer to where people live. A major product of Growing Transit Communities will be Corridor Action Strategies which will detail the actions and tools needed to make it easier to develop jobs and housing in areas associated with transit investments. Acknowledging the need for safe, secure, quality affordable housing in the region, Growing Transit Communities will develop funding and finance tools and offer technical assistance to housing providers and local jurisdictions. Catalyst demonstration and case study projects in the corridor neighborhoods will implement existing plans and serve as templates for the region's sustainable development.

At this time, the PRSC and its partners are completing an existing conditions report. By the end of 2012, the Corridor Action Strategies will be developed creating a common vision of the unique roles and opportunities at each of the station areas within the corridors, and identify specific issues, priorities, and potential projects. Work elements will include data-based analyses of existing transit and demographic conditions in the corridors, and the development and transmittal of recommendations for how to accelerate the scope and scale of TOD. PSRC will identify regionally significant development opportunities and strategies for catalyzing high quality, equitable TOD in these areas. Grants given out by PSRC will provide jurisdictions, transit agencies, and other stakeholders support in determining how best to use high capacity transit to link residential communities with regional employment centers, and support participating jurisdictions in adopting land use policies that encourage equitable TOD and the preservation and development of affordable housing and commercial space.[18] Activities will result in the development of corridor-based compacts among affected jurisdictions, communities, agencies, and other stakeholders. The corridor compacts and strategies will be the basis for that common vision.

The PSRC's Growing Transit Communities is a strong example of how technical assistance from regional planning commissions can support the planning for new transit corridors. PSRC has given small equity grants to non-profit groups and other community groups active in the proposed rapid transit corridors. With a focus on capacity building, these funded projects will gather information on community values and needs, engage underrepresented communities to help inform the Corridor Action Strategies, and help ensure existing and future communities around transit provide opportunities for diverse populations. To date, there have been no publicly accessible performance metrics for PSRC's Growing Transit Communities program.

18 Bakkenta, Ben. Program Manager, Puget Sound Regional Council. Personal Communication. March 6, 2012.

### 2.3.4 Atlanta Regional Commission's Livable Centers Initiative

The Atlanta Regional Commission (ARC) adopted the Livable Centers Initiative (LCI) in 1999, with the purpose to help planners and governments more effectively link current and future land use planning to existing or planned transportation infrastructure.[19] The program has enabled the ARC communities to proactively plan for enhanced employment centers, town centers, and transportation centers improving these area's livability. The LCI program has also been able to reduce vehicle miles traveled within the ARC's service area by locating the LCI areas near existing transportation centers.[20] Through the LCI program, local governments and other organizations compete for planning grants to fund studies of future development strategies. Those communities that have adopted the LCI plans are then also eligible to receive design and construction funds for the transportation projects that help implement the plans. There are approximately 111 LCI areas, including town centers, and employment and activity centers.

In addition to the preparation of LCI plans, each LCI community must reassess the LCI with a five-year and ten-year update. This evaluation component is a report on the accomplishments of the LCI community based on goals identified in the LCI plan. The evaluation plans also allow the ARC to gauge which LCI communities need additional technical assistance.[21]

The ARC uses biannual implementation surveys to gather information from each local government that has completed an LCI study in order to track and evaluate the successes and challenges experienced within the LCI community. The 2010 survey included a development inventory and a questionnaire on five topics: built developments, policies, transportation, livability, and LCI plan components. Each biannual survey has two parts: a development matrix and a set of survey questions. The development matrix is used to track development numbers, such as the number of residential units, number of hotel rooms, and commercial square footage, based on the new projects in each LCI. The survey is used to track perceptions and the process. This two-pronged approach allows the ARC to track how well the LCI program is doing in both numbers and through attitudes thereby assessing the effects of the LCI program on development.[22] Each new survey is updated and builds upon the previous year's survey. A sample of the survey questions from 2010 is provided in Table 2-5.

19 Atlanta Regional Commission. 2011. Livable Centers Initiative Implementation Report. (http://www.atlantaregional.com/land-use/livable-centers-initiative) Accessed March 2012.
20 Goodwin, Amy, Principal Planner, Atlanta Regional Commission. Personal Communication, May 17, 2012.
21 Ibid.
22 Ibid.

Table 2-5 ARC 2010 Livable Communities Initiative Implementation Survey Questions and Details

| Survey Topic | Requested Information |
|---|---|
| New Projects | Completed; Planned; Under Construction; Not Specified |
| Development Inventory | Number of Areas; Number of Projects; Residential Units; Hotel Rooms; Commercial Space; Office Space |
| Development Density | Acres; Number of Projects; Residential Units; Units per Acre; Hotel Rooms; Hotel Rooms per Acre; Commercial Square Footage; Commercial Square Footage per Acre; Office Square Footage; Office Square Footage per Acre |
| Residential Development Summary | Residential Units; Projects including Residential Units; Percent of All Projects; Average Number of Residential Units per Project |
| Commercial Development Summary | Total Commercial Square Footage; Commercial Projects; Percent of All Projects; Average Commercial Square Footage per Project |
| Office Development Summary | Total Office Square Footage; Office Projects; Percent of All Projects; Average Office Square Footage per Project |
| Hotel Development Summary | Hotel Rooms; Projects including Hotel Rooms; Percent of All Projects; Average Number of Hotel Rooms per Project |
| New Civic Features | Type of New Civic Feature |
| Affordable and Special Needs Housing | Existence of Affordable Housing; Policies or Development Initiatives |
| Plan Adoption | Adoption of LCI Plan; Incorporation of LCI Plan into Local Comprehensive Plan |
| Regulation Changes | Development Regulations Utilized; Recent Regulation Changes Made |
| Design Standards and Architectural Guidelines | Existence of Design Standards and Architectural Guidelines |
| Greenspace | Existence and Type of Greenspace |
| LCI Implementation | Establishment of Implementation Organization and Type |
| LCI Funding | Establishment of Additional Funding Sources and Type |
| Livability Components | Agreement with a Series of Questions on Livability |
| Plan Components | Usefulness of Required LCI Plan Components |

Source: Atlanta Regional Commission. 2011. Livable Centers Initiative Implementation Report. (http://www.atlantaregional.com/land-use/livable-centers-initiative) Accessed March 2012.
LCI: Livable Centers Initiative

The implementation reports that the ARC prepares biannually seek to determine, among other things, the forms of development that are taking place in LCI areas, and how policies and regulations have changed in LCI communities to reflect the goals of the LCI program. They also examine the benefits and impacts the LCI plans, policies and resulting projects might have on the region as a whole. The implementation reports are available through the ARC website at: http://www.atlantaregional.com/land-use/livable-centers-initiative/.

### 2.3.5 New Jersey Transit Village Initiative

The New Jersey Transit Village Initiative is a state-based program to promote TOD in New Jersey. The program is staffed and directed by the New Jersey Department of Transportation (NJDOT), and has a task force made up of other state agencies to guide the direction of the initiative. To be designated as a Transit Village, a community would apply to the Transit Village Task Force and demonstrate through experience and planning that it supports the principles of the Transit Village Initiative, including compact development, transit-supportive land uses, and a high-quality pedestrian environment.[23] The Transit Village is designated as the half-mile area around the transit facility. Its aim is to reduce traffic congestion and improve air quality by promoting increased transit ridership, pedestrian activity, and bicycle use. In addition, the goals of economic revitalization and increasing the housing stock are part of an overall effort to create vibrant, enjoyable, and exciting areas around major transit nodes. The benefit of being a Transit Village is that this designation not only gives these municipalities priority consideration for state grants but also allows the municipalities to have direct contact with the representatives of these agencies. As of 2012, there are 24 Transit Villages located on the various transit lines in the state.

In early 2005, the NJDOT worked with the Voorhees Transportation Center (VTC) at Rutgers University to prepare an Annual Municipal Reporting Form for the Transit Village Initiative Program.[24] The purpose of the form is to gauge development activities in the Transit Village District and to assess the strengths and weaknesses of each municipality in finding and reporting development data. The form has four sections: construction activity, grants and incentive programs, other Transit Village activity, and additional comments and suggestions. When the Reporting Form was originally presented to Transit Villages, the VTC and NJDOT found that many of the host communities did not have the staff to gather and provide the requested information, and therefore, reduced the number of indicators that would monitor progress. These indicators are presented in Table 2-6. As of 2005, NJDOT had not implemented the monitoring process recommended by the VTC.[25]

23 New Jersey Department of Transportation (NJDOT). *Transit Village Initiative.* (http://www.nj.gov/transportation/community/village/index.shtml). Accessed April 2012.
24 Voorhees Transportation Center, Rutgers University. *Transit Village Monitoring Research*. October 2005.
25 Transportation Research Board. *Research Results Digest 294, Transit-Oriented Development: Developing a Strategy to Measure Success.* February 2005.

Table 2-6 VTC-Recommended Indicators for Assessing NJDOT's Transit Village Initiative

| Indicator | Data Source |
|---|---|
| Net Increase in Dwelling Units | DCA |
| Total Construction Activity | DCA |
| Residential Construction Activity | DCA |
| Affordable Housing Units Created | DCA |
| Total Businesses in Transit Village | Local jurisdictions |
| Number of Automobile-Dependent Establishments | Local jurisdictions |
| Number of Transit-Supportive Shops | Local jurisdictions |
| Parking Spaces | Local jurisdictions |
| Acres of Brownfields Reclaimed | Local jurisdictions |
| Transit Ridership Counts | New Jersey Transit |
| Pedestrian Activity Counts | Local jurisdictions |
| | NJDOT |
| Public Perceptions | NJDOT |
| Public Investment | Local jurisdictions |
| Other Infrastructure or Transportation Improvements | Local jurisdictions |

Source: Transportation Research Board. *Research Results Digest 294, Transit-Oriented Development: Developing a Strategy to Measure Success.* February 2005.
Notes:
DCA New Jersey Department of Community Affairs
NJDOT New Jersey Department of Transportation
VTC Voorhees Transportation Center

## 2.4 Summary

As directed in the Secretary's Certificate on the DEIS/DEIR for the South Coast Rail Project, existing plans smart growth and monitoring programs from across the United States were identified and reviewed for applicability to the proposed project. The purpose of the review was to identify metrics or indicators that may be used to evaluate implementation of the *Corridor Plan* with respect to PDAs, the PPAs, and the Station Areas. A total of five existing plans/programs were reviewed; three in depth including interviews, and two based on a review of existing, readily available materials.

A significant difference between the plans and programs review and the South Coast Rail Project is that there is no legislative mandate in Massachusetts that controls growth through the planning process. However, this does not mean that the goals and objectives of the *Corridor Plan* cannot be implemented; only that participation by the local communities would be voluntary rather than compulsory. Data collection to support the metrics and indicators would be accomplished through cooperation between state agencies, regional planning agencies, and local governments.

A number of commonalities were evident in the literature review and subsequent interviews. Data were typically collected every two years. In the case of SANDAG's RCP monitoring, the SANDAG staff had begun by collecting and reporting data every year. Collecting and reporting on the RCP progress every year became an extremely staff- and time-intensive task prompting SANDAG to revise the reporting

timeframe to every two years. As noted by other interviewees, reporting every year will not show any major trends. Change happens slowly and therefore, the performance metrics or evaluation indicators chosen should be descriptive without being overly complicated or too simplified. A number of well-developed metrics or indicators under a high level category may be needed to describe trends as illustrated by the large number of measures used by SANDAG and the PSRC for their *VISION 2040*.

Many of the metrics and indicators reviewed are simple metrics that could be reported with numbers. Others are more complex to report. Through the interviews completed, it was clear that metrics and indicators that reveal the performance trends without being too complex or overly simplistic are ideal. Similarly, data that are readily available is the simplest way to track metrics and indicators. The U.S. Census Bureau was often used due to the large amounts of data that are collected. In the case of the San Diego's *Regional Comprehensive Plan* and the Puget Sound Regional Council's *VISION 2040* and *Growing Transit Communities*, the regional planning agencies were the source of the data used to fulfill the metric or indicator. Other government agencies, and in very few cases, independent entities outside of the government, supplied data as well.

# Appendix 9.3-A

# Cooperating Agency Letters

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
REGION 1
1 CONGRESS STREET, SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023

OFFICE OF THE
REGIONAL ADMINISTRATOR

March 31, 2009

Colonel Philip T. Feir, District Engineer
Department of the Army
New England District, Corps of Engineers
696 Virginia Road
Concord, Massachusetts 01742-2751

RE: Request to be a Cooperating Agency for the preparation of an Environmental Impact Statement for the South Coast Rail Project in Massachusetts

Dear Colonel Feir:

This letter responds to your March 17, 2009 request for the Environmental Protection Agency (EPA) to participate as a cooperating agency during the preparation of the Environmental Impact Statement (EIS) for the South Coast Rail Project proposed by Massachusetts Executive Office of Transportation and Public Works. EPA New England agrees to participate as a cooperating agency during the preparation of the EIS for the project.

EPA intends to work as a cooperating agency within the limit of our resources to help define the scope of analysis, identify sources of information and to offer input on how specific issues should be addressed in the EIS. We encourage the Corps to continue to coordinate closely with local, state and federal agency representatives throughout the NEPA process.

If you have any questions about this letter or EPA's involvement in the EIS process, please contact Timothy Timmermann at 617-918-1025.

Sincerely,

Elizabeth A. Higgins, Director
Office of Environmental Review

RECEIVED
APR - 7 2009

U.S. Department
of Transportation
**Federal Highway
Administration**

**Massachusetts Division**

55 Broadway, 10th Floor
Cambridge, MA 02142-1093
617.494.3657
617.494.3355 fax
www.fhwa.dot.gov/madiv

April 14, 2009

In Reply Refer To:
HPE-MA

Philip T. Feir, District Engineer
Regulatory Division (CENAE-R)
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742

***Subject: South Coast Rail Project***

Dear Mr. Feir:

We are writing to respond to your March 17, 2009 request for the Federal Highway Administration (FHWA) to participate as cooperating agency during the preparation of the Environmental Impacts Statement (EIS) for the South Coast Rail Project. The project intends to link Boston with the cities of New Bedford and Fall River, Massachusetts. The US Army Corps of Engineers (COE) is the lead agency for the preparation of the EIS pursuant to section 102(2)(c) of the National Environmental Policy Act (NEPA) of 1969 and its implementing regulations contained in 40CFR 1500-1508.

The FHWA hereby accepts your invitation to participate as a cooperating agency. In particular, we will be providing input within our expertise and jurisdiction in the development of alternatives that satisfy the purpose and need of the project.

Please contact Damaris Santiago at (617) 494-2419 should you have any comments or questions.

Sincerely,

Lucy Garliauskas
Division Administrator

By: John McVann
Director of Project Delivery

MOVING THE AMERICAN ECONOMY

cc: Kristina Egan, South Coast Rail Project Manager, EOT
Alicia Barton, MEPA Director, EOEEA

U.S. Department
of Transportation
**Federal Transit
Administration**

REGION I
Connecticut, Maine,
Massachusetts,
New Hampshire,
Rhode Island, Vermont

Volpe Center
55 Broadway, Suite 920
Cambridge, MA 02142-1093
617-494-2055
617-494-2865 (fax)

MAY 15 2009

Philip T. Feir, Colonel
Department of the Army
New England District, Corps of Engineers
696 Virginia Road
Concord, MA 01742

Attn: Alan R. Anacheka-Nasemann, PWS

Re: **South Coast Rail Environmental Impact Statement**

Dear Colonel Feir:

The Federal Transit Administration (FTA) has reviewed the letter from the Army Corps of Engineers dated March 17, 2009 inviting the FTA to be a Cooperating Agency in the preparation of a Federal Environmental Impact Statement for the proposed South Coast Rail project. The FTA looks forward to participating in the environmental review process. The FTA Region I's point of contact is Peter Butler. Peter can be reached at 617-494-2729 or peter.butler@dot.gov.

Sincerely,

Mary Beth Mello

for Richard H. Doyle
Regional Administrator

**From:** david.valenstein@dot.gov

**Sent:** Tuesday, March 02, 2010 1:45 PM

**To:** Alan.R.Anacheka-nasemann@usace.army.mil; richard.cogswell@dot.gov

**Cc:** Katherine.Kauffman@dot.gov; randall.dickinson@dot.gov; janet.lee@dot.gov; Karen.K.Adams@usace.army.mil; Veraart, Nicolaas; les.fiorenzo@dot.gov; John.P.Almeida@usace.army.mil; Susan.E.Holtham@usace.army.mil; Kathleen.A.Atwood@usace.army.mil

**Subject:** RE: Federal EIS - South Coast Rail, Massachusetts

**Sensitivity:** Confidential

Dear Mr. Anacheka-Nasemann:

FRA belatedly accepts your invitation to serve as a cooperating agency for the South Coast Rail EIS. We apologize for the delaying in responding. FRA will serve as a cooperating agency to lend our special expertise related to railroad planning and due to the potential for impact to the Northeast Corridor intercity rail service operated by Amtrak. Mr. Cogswell will provide comments to you regarding the technical railroad planning and operations analysis that have been prepared for this project.

The FRA HQ Office of Railroad Development is responsible for all planning and environmental activities and all EIS coordination should be conducted through this office. It is appropriate for the Cambridge office to be consulted on safety issues.

Sincerely,

David Valenstein

Environmental Team Leader
Office of Passenger and Freight Programs
USDOT Federal Railroad Administration
1200 New Jersey Avenue SE, MS-20, W38-303
Washington, DC 20590

Office: (202) 493-6368 - Fax: (202) 493-6330