

## APPENDIX 1 DEVELOPMENT SUITABILITY ANALYSIS<sup>80</sup>

A community's growth potential is limited by both physical constraints, areas where growth requires expensive engineering solutions to overcome obstacles, and by natural resources, where development may have significant consequences in degrading the environment. Map A-1 shows areas that are not suited to development and those that are better suited to development. Included in the areas not suited are wetlands, interim wellhead protection areas, zone II wellhead protection areas, floodways, one percent annual chance flood prone areas, BioMap2 core habitats, BioMap2 critical natural landscapes, areas of critical environmental concern, prime farmland soils, and farmlands of statewide or unique importance.

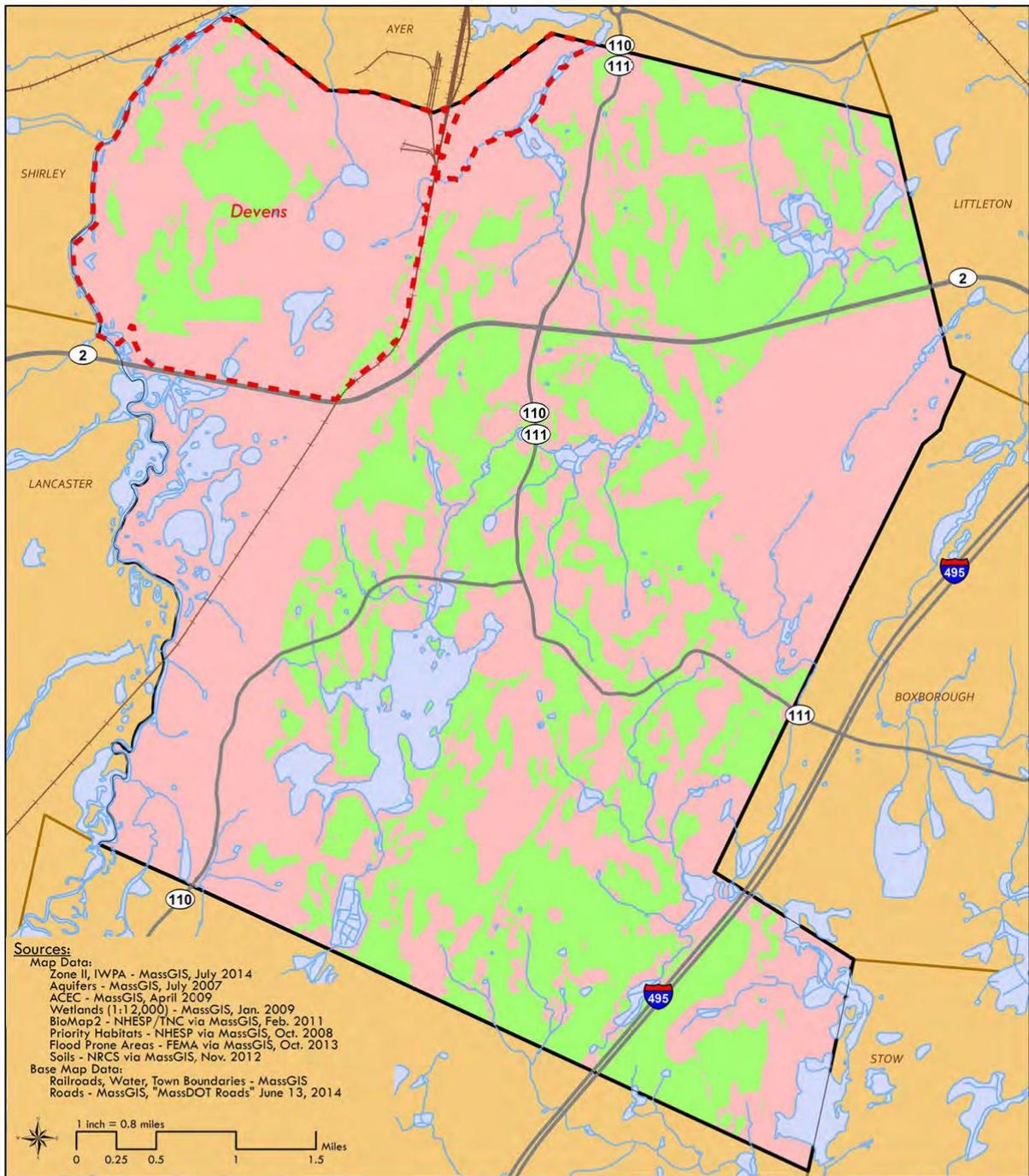
Another way to look at land availability is to examine the parcels in town that are already developed or protected from development. Map A-2 shows this analysis. The map also shows parcels in the Chapter 61 tax relief program as of 2008, which may or may not have buildings on them – houses, barns, etc. These Chapter 61 lands are all subject to development or additional development (through subdivision) and should not be considered protected. It should be noted that in this analysis, any parcel with a single family home on it, regardless of whether the parcel is one acre or a hundred, is shown as developed. Clearly, some of these parcels could be further developed either through the subdivision process to add additional housing units to the current parcel, or through redevelopment with demolition of the existing house and new development. Based on the limited commercial zoning, most of such redevelopment would be residential.

Map A-3 shows the land areas in Harvard that are not yet developed and are not protected from development either. A significant amount of this land lies within areas identified in the 2002 Master Plan<sup>81</sup> as important to preserve for their value as agricultural or historic landscape resources or where protection of groundwater resources or the Bare Hill Pond watershed is important. Map A-3 shows a total of 1,471 acres that are not currently developed, are not protected from development, do not have environmental constraints, and are potentially developable based on size and access. The majority (sixty eight percent, or 1,008 acres) of these areas are in the Chapter 61 program, which indicates some level of desire by the owner to keep the land in agriculture, recreation, or forestry uses. However, without permanent protection the land remains open to development. Based on the absence of wetland and floodplain areas, some of this land should be where efforts to increase development density should occur, as a means to increase housing diversity in town as well as to reduce pressure on other land areas which are not as suitable for development.

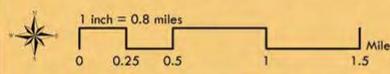
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<sup>80</sup> RKG Associates performed this Development Suitability Analysis, which appeared in the "Open Space and Natural Resources Working Paper", September 2014.

<sup>81</sup> Community Opportunities Group et. al, Harvard Massachusetts Master Plan, (November 2002), Map 4-A.



**Sources:**  
 Map Data:  
 Zone II, IWPA - MassGIS, July 2014  
 Aquifers - MassGIS, July 2007  
 ACEC - MassGIS, April 2009  
 Wetlands (1:12,000) - MassGIS, Jan. 2009  
 BioMap2 - NHESP/TNC via MassGIS, Feb. 2011  
 Priority Habitats - NHESP via MassGIS, Oct. 2008  
 Flood Prone Areas - FEMA via MassGIS, Oct. 2013  
 Soils - NRCS via MassGIS, Nov. 2012  
 Base Map Data:  
 Railroads, Water, Town Boundaries - MassGIS  
 Roads - MassGIS, "MassDOT Roads" June 13, 2014

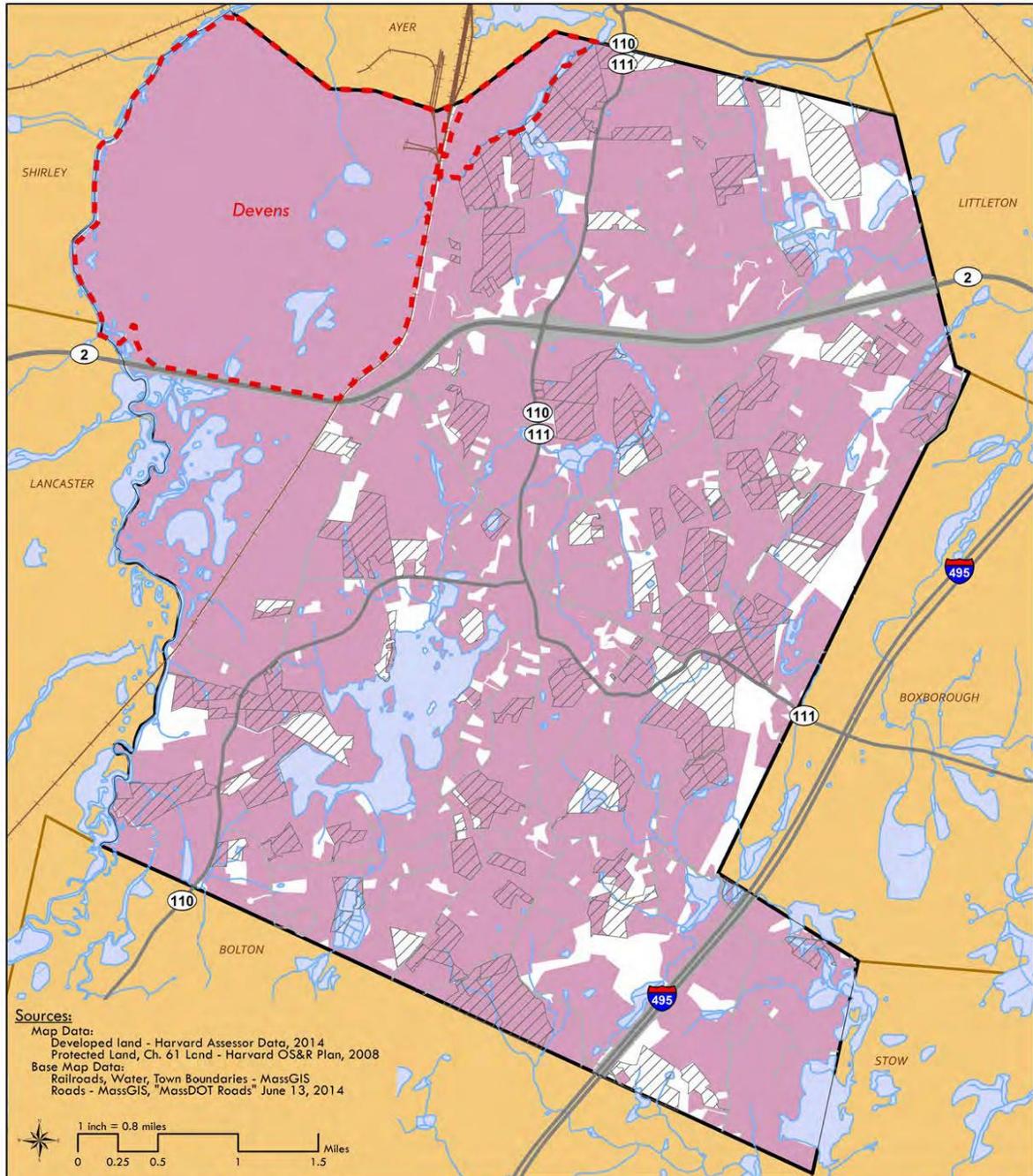



**Harvard Master Plan**  
 RKG Associates

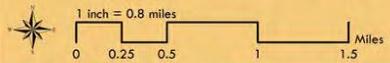
**Legend**

- Areas Better Suited to Development
- Areas Not Suited for Development  
*(Includes Wetlands, Interim Wellhead Protection Areas, Zone II Wellhead Protection Areas, 1% Flood Zones ("100 Year"), BioMap2 Core Habitats, BioMap2 Critical Natural Landscapes, Areas of Critical Environmental Concern, Prime Farmland Soils, and Farmland Soils of Statewide or Unique Importance.)*

**Natural Resources**  
 Development Potential  
 August 3, 2014  
 Map NR-8  
 Page #



**Sources:**  
 Map Data:  
 Developed land - Harvard Assessor Data, 2014  
 Protected Land, Ch. 61 Land - Harvard OS&R Plan, 2008  
 Base Map Data:  
 Railroads, Water, Town Boundaries - MassGIS  
 Roads - MassGIS, "MassDOT Roads" June 13, 2014



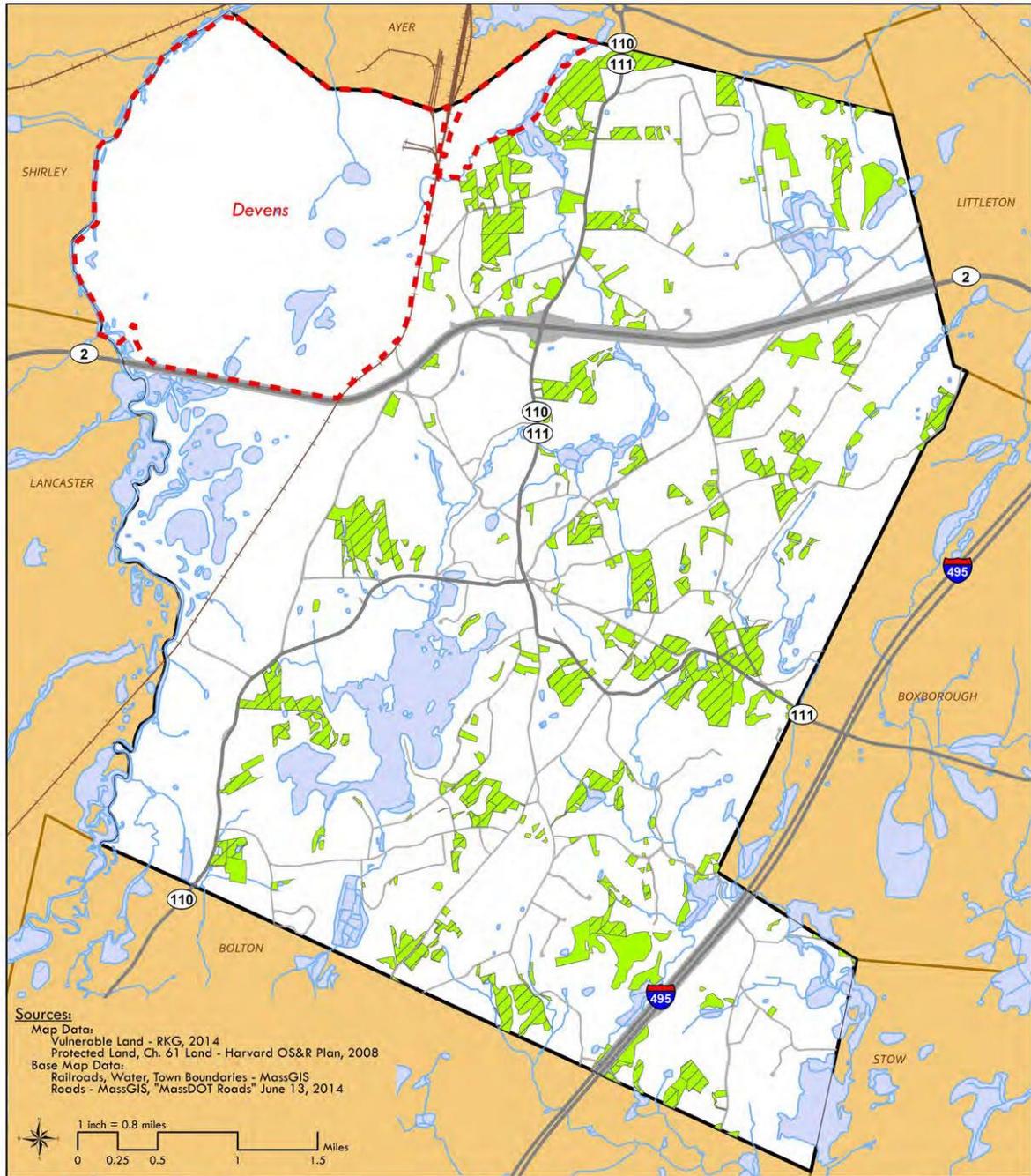

**Harvard Master Plan**  
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**Legend**

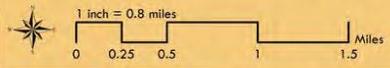
-  Land Available for Development\*
-  Developed or Protected\*\*
-  Land in Chapter 61, 2008

\* includes parcels in agricultural or recreational use that are not permanently protected.  
 \*\* includes land with buildings, land owned by public entities, and land protected from development.

**Natural Resources**  
 Land Available for Development  
 August 3, 2014  
 Map NR-9  
 Page #



**Sources:**  
 Map Data:  
 Vulnerable Land - RKG, 2014  
 Protected Land, Ch. 61 Land - Harvard OS&R Plan, 2008  
 Base Map Data:  
 Railroads, Water, Town Boundaries - MassGIS  
 Roads - MassGIS, "MassDOT Roads" June 13, 2014




**Harvard Master Plan**  
 RKG Associates

**Legend**

- Vulnerable Areas \*
- Areas in Chapter 61, 2008

\* Land areas (not parcels) that are undeveloped, unprotected, do not have environmental constraints, and are potentially developable based on size and access. Please see text for additional explanation.

**Natural Resources**  
 Land Vulnerable to Development  
 August 12, 2014  
 Map NR-10  
 Page #

Table A-1 shows the acreage of specific areas previously discussed, and their percentage of the town and of the vulnerable lands.

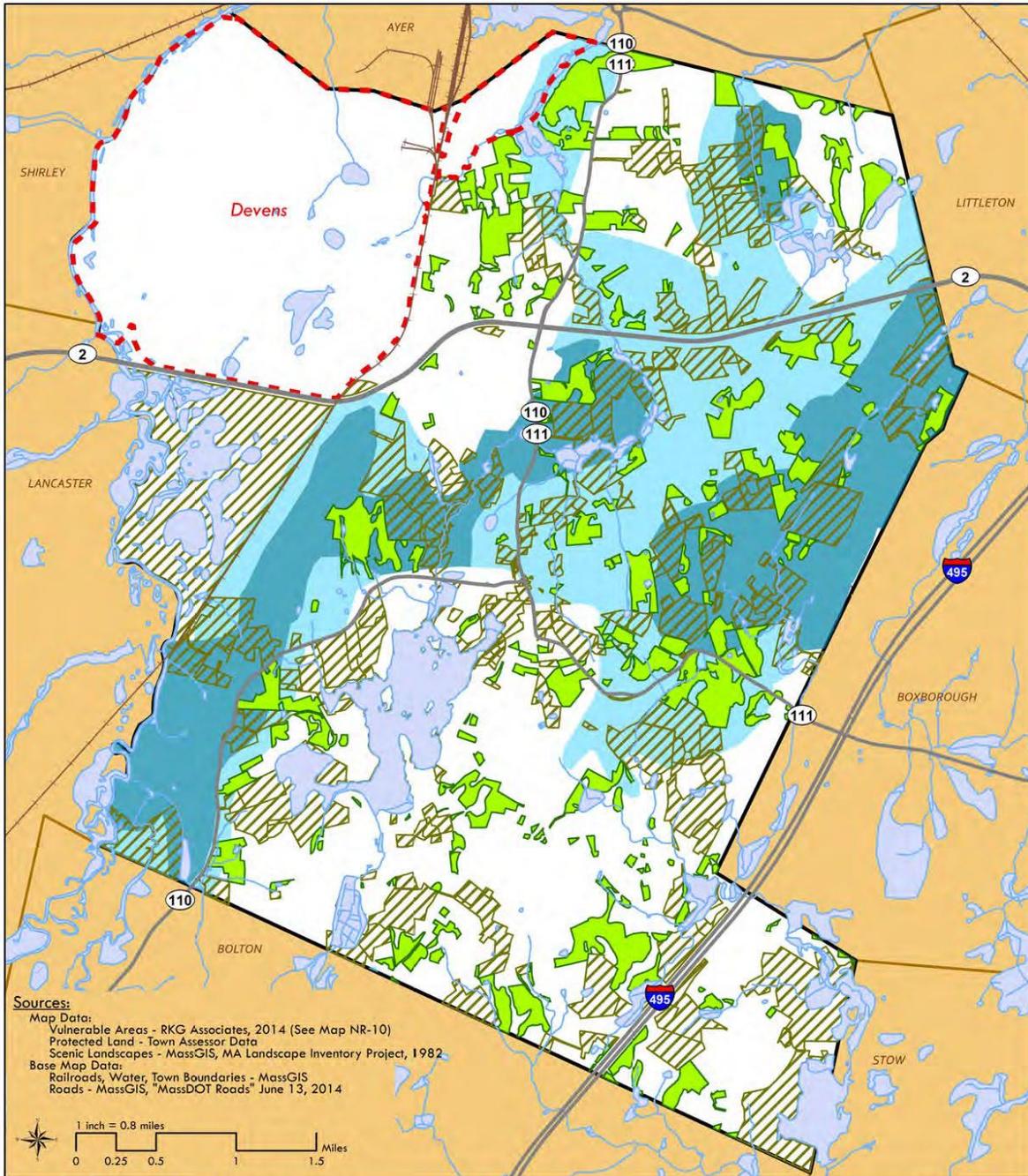
**Table A.1 - Vulnerable Land Statistics**

	<b>Total Acreage</b>	<b>Percent of Town*</b>	<b>Percent of Vulnerable Lands</b>
Aquifer Areas	3	0.02%	0.16%
Zone II Wellhead Protection Areas	100	0.62%	5.80%
Interim Wellhead Protection Areas	42	0.26%	2.43%
Environmentally Sensitive Areas**	287	1.78%	19.51%
Farmland Soils	859	5.32%	58.40%
Notes:			
* 16,144 acres, does not include water or rights-of-way			
** Includes Areas of Critical Environmental Concern (ACEC), BioMap2 Core Habitat, BioMap2 Critical Natural Landscape, and NHESP Priority Habitats of Rare Species.			
Note that the data in this table are not additive, many of these areas overlap each other.			
Source: Analysis of GIS data by RKG Associates, August 2014			

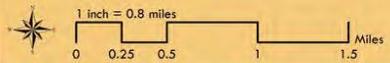
Given that it is unrealistic for the Town or any conservation organizations to preserve all – or even most of – the “vulnerable areas” shown in Map A-3, and the fact that previous plans have recommended that preservation efforts should continue in areas designated as scenic, Map A-4 shows the areas of Harvard that are vulnerable to development and the areas already protected, along with the 1982 designated scenic landscapes, which cover 41 percent of the town. Harvard is among a small handful of municipalities across the state with such a large percentage of the community so designated.

The more recent Heritage Landscape Inventory<sup>82</sup> project completed in June 2006 did not identify any priority landscapes, for participants felt that all of the seventy-six landscapes listed were equally important. Thus, Map A-4 relies on the older data in recognition that there should be a methodology to set priorities in land protection efforts. The vulnerable lands that are adjacent to protected lands and are within a distinctive scenic landscape would be a reasonable “top priority” for protection, followed by those vulnerable lands adjacent to protected lands within noteworthy scenic landscapes or those that would bridge gaps in otherwise protected corridors. There are ninety-one land areas with a total of 868 acres that fall within one of these scenic landscape designations. Harvard should prioritize areas for protection efforts and identify specific parcels for acquisition of the land or conservation restrictions.

<sup>82</sup> Massachusetts Department of Conservation and Recreation and Freedom’s Way Heritage Association, Harvard Reconnaissance Report, Freedom’s Way Landscape Inventory (June 2006), page 3



**Sources:**  
 Map Data:  
 Vulnerable Areas - RKG Associates, 2014 (See Map NR-10)  
 Protected Land - Town Assessor Data  
 Scenic Landscapes - MassGIS, MA Landscape Inventory Project, 1982  
 Base Map Data:  
 Railroads, Water, Town Boundaries - MassGIS  
 Roads - MassGIS, "MassDOT Roads" June 13, 2014



**Harvard Master Plan**  
 RKG Associates

Legend	
	Protected Land
	Vulnerable Areas
	Distinctive Scenic Landscapes
	Noteworthy Scenic Landscapes

**Natural Resources**  
 Preservation Priority Areas  
 August 27, 2014  
 Map # NR-11  
 Page #

## APPENDIX 2 HERITAGE LANDSCAPES<sup>83</sup>

This list was generated by local participants at the Heritage Landscape Identification meeting held in Harvard May 10, 2006 with follow-up fieldwork May 22, 2006. There are undoubtedly other heritage landscapes that were not identified at the HLI meeting noted above. The chart has two columns, the name and location of the resource are in the first; notes about the resource are in the second. Landscapes are grouped by land use category. Abbreviations used in this report are.

APR = Agricultural Preservation Restriction

CR = Conservation Restriction

LHD = Local Historic District

NR = National Register

PR = Preservation Restriction

\* = Priority Landscape

TTOR = The Trustees of Reservations

<i>Name &amp; Location</i>	<i>Description</i>
	<b>Agriculture</b>
<i>Arnold Farm</i> Old Mill Road	Sheep farm.
<i>Calkin Farm</i> 146 Littleton County Road	Historically known as the Hosmer-Calkin Farm it was sold to the Hermanns in 1945 and became part of Westward Orchards. Includes ca. 1830s Federal house, large New England barn, dormitory for seasonal workers, apple orchard, two ponds and streams. Sixty-seven acres of the orchard are in APR.
<i>Carlson Orchards</i> 115 Oak Hill Rd.	Active apple orchard with seasonal farmstand. Part is in APR.
<i>Charlie Brown Farm</i> Murray Lane	Also includes early grave. Located adjacent to conservation land.
<i>Dean's Hill Orchard</i> Prospect Hill Road	Adjacent to Dean's Hill, across from Fruitlands.
<i>Doe Orchards</i> Ayer Road	Active apple orchard, 63 acres in 61A.
<i>Double Stone Wall</i> Still River Road	Whitney Homestead, from Common to school parking lot. Was right-of-way for taking cows to Bare Hill Pond, now overgrown.
<i>Endicott Farm</i> Littleton County Road	Horse farm.
<i>Evans Farm</i> Still River Road	Pumpkins and other fall crops, 76 acres.

<sup>83</sup> From "Freedom's Way Landscape Inventory", Mass. DCR and Freedom's Way Heritage Association, 2006.

<i>Name &amp; Location</i>	<i>Description</i>
<i>Fire Fly Farm</i> E Bare Hill Road	Horse farm, 100 ac. 10-acre pasture on East Bare Hill Rd. is protected by a CR held by the Harvard Conservation Trust. Most of the remaining land is in c 61A.
<i>Great Elms Farm</i> Stow Road	House will be demolished in 2016 for a 9-unit affordable housing project.
<i>Hazel Farm</i> Ayer Road	Grows hay and Christmas trees. Very visible, a main gateway to the community.
<i>Hermann Orchards</i> Littleton County Road	Part is in APR. Hermann was the original owner, now owned by Conlin/Green family.
<i>Little Rascals Farm</i>	Ayer Road, Sean McLaughlin (under Camel Needle Eye Corporation) owns the adjacent former Hermann Orchard. APR land - 31 acres.
<i>Murray Lane Goat Farm</i> Murray Lane	CR. Located on dead end road.
<i>Oak Hill Orchards</i>	Includes orchards owned by Carlson family and Hermann descendants.
<i>Sheehan's Farm</i> 177 Mass Ave.	A commercial orchard with ca. 1900 farmhouse, barn and orchards that have been subdivided and sold for house lots.
<i>Westward Orchards</i> 90 Oak Hill Rd.	Part is in APR. Historically known as the Houghton-Hermann Farm on top of Oak Hill. The property has an 18th century center chimney farmhouse and many buildings associated with the apple growing business for which this farm now is well known. Roadside stand/store is on Mass. Avenue.
<i>Whitney Farm</i> Littleton County Road	The Harvard Conservation Trust holds a CR on 20.855 acres of this property, which was formerly Post, Georgaklis/Cahill, and now Barrett, who has horses. An old map has Whitney at this location.
<i>Whitney Lane Farm</i> Whitney Lane	Whitney Lane connects Mass. Ave. and Littleton County Road in the Oak Hill part of Harvard. Ca. 1802 brick Federal house. In late 19th century, pastures were planted with fruit trees and became a sizeable orchard. Now a horse farm.
<i>Willard-Watt Farm</i> 12 Depot Rd.	Federal house ca. 1800, dairy barn, outbuildings and fields. Most of the Watt dairy farm land is now in conservation except for the Watt homes. Willard farmed the land.
<i>Willard Farm</i> Still River Road	Seasonal vegetables, roadside stand.
<i>Williams Farm</i> Stow Road	Ca. 1790 Jonathan Sawyer house later known as the George E. Morse and later Alexander Williams house. Federal style house, farm was dairy and later orchard.
	<b>Archaeological</b>
<i>Mill</i> Sherry Road	Evidence of old water works. Age and ownership unknown.

<i>Name &amp; Location</i>	<i>Description</i>
<i>Mill Ruins</i> Mill Road	Along Bowers Brook. Very little is visible.
	<b>Burial Grounds and Cemeteries</b>
<i>Grave by Charlie Brown Farm</i> Murray Lane	There may be a headstone but location is not obvious.
<i>Harvard Center Cemetery</i> Massachusetts Ave.	NR, LHD. Established in 1734. Historic cemetery in Harvard Center, 3.5 acres, managed by Cemetery Commission.
<i>Shaker Cemetery</i> South Shaker Road	NR, LHD. Established 1792, .85 aces, managed by Cemetery Commission.
<i>Smallpox Grave</i> Poor Farm Hill Road	Grave with headstone is just off the road, enclosed with a fence.
	<b>Civic/Village</b>
<i>Harvard Center</i>	NR, LHD. The largest and most centrally located of Harvard's three villages. Includes town common, town hall, library, burial ground, general store, former inn, three churches (plus one former church now a residence), also views towards Bare Hill Pond.
<i>Hildreth House</i> 27 Ayer Road	NR, LHD. Town-owned historic building in Harvard Center adjacent to town hall. Property also includes six acres of landscaped grounds. Used for meetings.
<i>Shaker Village</i> Shaker Road	NR, LHD. The northernmost of Harvard's three villages which is one of two historic districts in Harvard. Site of religious community from late 18th to early 20th century. Well-preserved village includes 15 contributing buildings, 11 sites, five structures and nine non-contributing buildings.
<i>Still River Village</i> Still River Road	Another of Harvard's three villages, located in the southwestern part of town. Well-preserved 19th century houses, also the home of the St. Benedict's Abbey complex. Has been documented on MHC inventory forms.
<i>Town Common</i> Ayer Road	In Harvard Center NR district and LHD. Established 1733, was originally 30 acres, now is only nine. Includes town pound, powder house, and mill stone. The heart of the community.
<i>Town Hall</i> 13 Ayer Road	In Harvard Center NR district and LHD. Overlooking the common.
	<b>Institutional</b>
<i>Green Eyrie Girl Scout Camp</i> on Bare Hill Pond	47 acres between Bare Hill Pond and Still River Road owned by the Boy Scouts and used in the summer for camping. Once part of the Fiske Warren enclaves.
<i>Harvard Public Library</i> 7 Fairbank Street	In Harvard Center NR district and LHD. Soon to be vacant when library moves to Old Bromfield.

<i>Name &amp; Location</i>	<i>Description</i>
<i>Devens</i>	Camp Devens was established in 1917 and remained an active military base until 1995 when the area was designated as the Devens Enterprise Zone. Includes natural and historic resources. These include Colonel’s Row (housing), Vicksburg Square (former dormitories), Rogers Field (former parade grounds with viewing stand now used for recreation) and a military cemetery, as well as the Mirror Lakes, part of the Nashua River and a glacially formed esker. Small portions of Devens are in Ayer and Shirley. Traditional boundary makers still exist.
<i>Fruitlands Museums Prospect Hill Road</i>	NR district, PR. Private non-profit museum established by Clara Endicott Sears in 1914. Includes five collections: four museum buildings, trails and archaeological sites, a restaurant and a museum store. Also includes dramatic regional views that include the Harvard portion of Devens (Shabikin), Wachusett Mountain, Mount (or Mt.)Monadnock and the Pack Monadnocks, land south and west over the Nashua River.
<i>Holy Hill Ann Lee Road</i>	Part of Shaker Village, now town-owned conservation land.
<i>Oak Ridge Observatory 42 Pinnacle Road</i>	Owned by Harvard-Smithsonian Center for Astrophysics. Currently operating a new telescope by Harvard astrophysicist Paul Horowitz and the SETI program under Adam Dziewonski.
<i>Old Bromfield Massachusetts Avenue</i>	Originally known as Bromfield Academy, 1876. Was left to the town for educational purposes. Construction has begun on an extension and rehab that will incorporate the old building with a new town library.
<i>South Village House 101 S. Shaker Road</i>	One of two large communal houses in Harvard built by the Shakers. Now a private residence with adjacent stone barn ruins (which are under a preservation restriction). House is in the process of being preserved.
<i>Shaker Herb Drying Shed Shaker Road</i>	In Shaker Village NR district and LHD. Handsome stone building that was partially restored with CPA funds in 2002. Surrounding area is partially protected by conservation land. Town-owned.
<i>Shaker Spring House</i>	Town-owned on conservation land. Access is off Green Road.
<i>Shaker Stone Posts</i>	Rough cut granite fence posts located throughout Shaker Village.
<i>Shaker Whipping Stone S. Shaker Road</i>	Located at the driveway of 36 South Shaker Road on private land across from Glenview Drive. The engraved granite stone marks the place where Fathers James and Williams were whipped by local residents. Marker is visible from the road.
<i>Still River Baptist Church Still River Road</i>	NR, PR. 1832, now the home of the Harvard Historical Society.
<i>St. Benedict’s Abbey Complex Still River Road</i>	Religious community established in 1958 that includes three separate entities: monastery, convent, and retreat center. Collectively they own 175 acres of land as well as a variety of historic and contemporary buildings. Land is farmed and there is a small farm stand. Dramatic site with regional views over the Nashua River to the west.

<i>Name &amp; Location</i>	<i>Description</i>
	<b>Industrial</b>
<i>Slate Quarry Pin Hill</i>	Remains of a blasting project are visible from Mill Road.
	<b>Miscellaneous</b>
<i>Festivals</i>	Harvard has a strong tradition of festivals and special events that are important to the community. Apple Blossom Festival in Spring; Columbus Day Flea Market; Three Apples Storytelling.
<i>General Store 1 Still River Road</i>	In Harvard Center NR district and LHD. Originally called the Gale and Dickson Store, built 1896. Important visual, economic and social anchor in Harvard Center. Only marginally economically viable, may not continue as an active store.
<i>Horse Trough Ayer Road</i>	Late 19th century horse trough located northeast of town center. Overlooks adjacent conservation land to the east.
	<b>Natural</b>
<i>Dean's Hill</i>	360-degree view, unusually high hill for Harvard.
<i>Drumlin Stow Road</i>	On Williams conservation land.
<i>Magnetic Hill Stow Road</i>	Area on Stow Road where there is an optical illusion: by putting a car into neutral and gliding, it appears to travel uphill or down, depending upon direction of the hill.
<i>Shrewsbury Ridge</i>	Long escarpment underlying Oak Hill that extends from Littleton to Shrewsbury. It is an important feature because it limits development. Oak Hill elevation is 500-600 ft.
	<b>Open Space /Parks</b>
<i>Blomfelt Land Ann Lee Road</i>	This 29-acre town-owned conservation parcel connects Ann Lee Road with Ayer Road.
<i>Brown Parcel Murray Lane</i>	Located in southeastern part of town. 31 acres adjacent to the Great Elms conservation land and an 80-acre CR held by the Trust.
<i>Field Slough Road</i>	Visually important parcel at corner of Slough Road and Woodchuck Road. Will be preserved.
<i>Oxbow National Wildlife Refuge</i>	Along the eastern bank of the Nashua River and western edge of Harvard. 1,850 are within the Central Nashua River Valley ACEC. Also extends into adjacent communities. There are dramatic regional views of the refuge and Nashua River from Prospect Hill and Still River. Access in Harvard is from Still River Road.

<i>Name &amp; Location</i>	<i>Description</i>
	<b>Residential</b>
<i>Fiske Warren House</i> 42 Bolton Road	NR. Shingle style house built 1894. In the early 1900s Fiske Warren established a series of “enclaves,” encouraging communal land ownership that lasted until his death in 1938. One of these was Tahanto on Bare Hill Pond.
<i>Ralph Houghton Garrison House</i> 204 W. Bare Hill Road	Circa 1685. Located at West Bare Hill and Still River roads.
Old houses on east side of Bare Hill	Reportedly associated with Underground Railroad. Several houses (39, 74, and 90) on East Bare Hill are near the cave that was used, according to family stories, to hide runaways. (These stories come from an old Harvard family of African American and Native American heritage.) Living relatives of those who participated still relate oral history. No written record. As Carrie used to say, “when a stranger appeared at the table for dinner, you asked no questions. If asked, you said he/she was a cousin and never spoke of it again.”
<i>Pollard House</i> 327 Still River Road	Full name is Captain Thaddeus Pollard House/Isaac Marshall House, built circa 1800. Historic house adjacent to whipping tree.
	<b>Transportation</b>
<i>Ayer Road</i>	South of Route 2 – scenic gateway into town.
<i>Harvard Depot</i>	The Harvard Depot is at the end of the Depot Road that runs under Route 2. From there a resident could access the farms in Shabikin or the center of town. (one mile) Still River Depot is at the end of the road that leads to the Oxbow. Markers at each stop say “Harvard” and “Still River.”
<i>Littleton County Road</i>	Scenic road with farms and woodland, great views across orchards and open land. Tree canopy.
<i>Stow Road</i>	Scenic road with rolling meadows, open fields, stone walls. Includes Williams Pond and Great Elms Farm.
	<b>Waterbodies</b>
<i>Bare Hill Pond</i>	321 acres, Great Pond. Visible from town center, used for swimming, boating, fishing, ice skating, etc.
<i>Bennetts Brook</i>	In Shaker Village.
<i>Black Pond</i>	On conservation land. Accessible from Littleton County Road.
<i>Bowers Brook</i>	The entire Cold Spring Brook system, including wetlands.
<i>Golden’s Pond</i> Old Mill Road	Lovely mill pond on Old Mill Road.

<i>Name &amp; Location</i>	<i>Description</i>
<i>Wetlands</i>	Extensive wetlands on the Littleton/Harvard border – former Underwood land & Rogers and Sizer land - 54 ac.; wetlands throughout town contain development.
<i>Williams Pond</i>	Pond with lilies – donated by Peggy Williams for conservation.

## APPENDIX 3 DEVENS ACCEPTANCE CRITERIA

The following are criteria which need to be assessed and met prior to the Town of Harvard being willing to accept jurisdiction over Devens property under the current jurisdiction of MassDevelopment per Chapter 498 of the Acts of 1993.

### 1. Financial

- A. All expenses, including capital plan costs, related to the administration and provision of public services for Devens, including education, must be balanced by revenues originating from Devens on an annual basis.
- B. Taxation of commercial and industrial activities on Devens must raise revenues at a level so as to cover all costs stated in the first bullet as well as generating enough revenue to develop a capitalization and stabilization fund which will be sufficient to maintain public infrastructure and defer other expenses related to their presence on the site.

### 2. Environmental

- A. All areas of concern regarding contamination and landfills must be clearly identified.
- B. All sites requiring remediation must have a plan that includes a timetable for completion and a guarantee of funding adequate to complete the remediation task in place.
- C. All recreation and natural resource areas must have a plan for their maintenance in place with funding and responsibility for the maintenance clearly identified and secured.
- D. Determination that remaining contamination could have no adverse impact on the Town of Harvard (operations, legal or otherwise).
- E. Must have an agreement as to how future identification of contamination will be resolved to protect the Town of Harvard from liability.

### 3. Schools

- A. Issue of where children will be schooled should be resolved for at least a 10 year period moving forward from time of turnover.
- B. Levels of reimbursement and financial support must be determined and be made legally binding with the State.
- C. If schooling is to be provided by Harvard, must have an acceptable plan which accommodates the increased population. This plan must be acceptable from a financial as well as a community viewpoint as to whether new schools will be built, where and for which grades.

### 4. Character

- A. Adequate and sustainable buffers/barriers must be in place between incompatible uses within Devens and the surrounding community.
- B. Opportunities should be present for the establishment of commercial activities that support the resident population of the site and provide commercial services not now present in the Town of Harvard.

- C. Access to Devens must be pre-determined and constructed so that all functions and circles of interaction (schools, Town-center access, social, cultural) are provided for.

5. Infrastructure

- A. Land must be made available on Devens, free and clear of contamination (or with capped remediation costs), in order to provide for all Town needs and operation (schools, public works, public safety, etc.)
- B. A plan for the maintenance of all roads, recreation areas, and public facilities by the Town of Harvard must be in place with all necessary equipment, buildings, and yard facilities transitioned to the town in good operating condition.
- C. Ownership of all public facilities, roads, etc. to be maintained by the Town of Harvard must be transferred to the Town of Harvard.
- D. Adequate equipment, facilities, and access must be in place to provide public safety services (police, fire, ambulance) to the site.
- E. Sewer, water and other necessary regional districts must be established for the operation and maintenance of regional facilities.
- F. Sewage and water facilities must be in good operating condition and adequately capitalized to make any needed improvements.
- G. An aquifer protection plan must be established and funded to protect the water supply
- H. a self-supporting plan for trash disposal must be established.
- H. A self-supporting plan for trash disposal must be established.

6. Land Ownership

- A. Determine ownership of all properties on Devens and develop a plan as to how records can be developed and transferred so that the Town of Harvard can assess and tax in accordance with current operations.
- B. Ownership of all structures and parcels on the site must be clearly established and agreed to including all property still owned by the State.
- C. Those structures not in use or without a clearly identified reuse and a funded plan in place for their reuse must be removed from the site.
- D. A plan must be developed by which current land owners on Devens are informed and transitioned into the new system of operations with the Town of Harvard.

7. Reuse Plan

- A. The Joint Boards of Selectmen must agree that the goals of the Reuse Plan have been met.
- B. Zoning control must be transferred to the Town of Harvard subject to an Memorandum of Understanding between the state and town that provides stability to those currently on the site or seeking to locate on the site

## APPENDIX 4 RESULTS OF 2014 MASTER PLAN SURVEY

Question and Responses				Comments
<b>Demographic Questions</b>				
1	What is your age?			
	75 and over	10	4%	❖ Very few younger residents took the survey; only 4% of respondents were under the age of 35.
	65 to 74	43	18%	
	55 to 64	54	23%	
	45 to 54	68	28%	
	35 to 44	55	23%	
	25 to 34	7	3%	
	18 to 24	2	1%	
	Under 18	0	0%	
	Total	239	100%	
2	How long have you lived in Harvard?			
	Less than 1 year	17	7%	❖ This appears to be a reasonable allocation of length of residency. One would expect that first year residents would be a small number.
	1 to 4 years	43	18%	
	5 to 9 years	21	9%	
	10 to 14 years	53	22%	
	15 to 20 years	27	11%	
	20 to 29 years	43	18%	
	Over 30 years	35	15%	
	Total	239	100%	
3	How many people are in your household?			
	1 (you live alone)	10	4%	❖ About half of the households have 3 or fewer people, and about half have 4 or more people.
	2	76	32%	
	3	31	13%	
	4	84	35%	
	5 or more	38	16%	
	Total	239	100%	
4	Do you currently have children attending Harvard Public Schools?			
	Yes	107	45%	❖ Households with school children may be slightly over-represented. In 2010, 41% of households had children under 18.
	No	132	55%	
	Total	239	100%	

Question and Responses				Comments
5	Do you currently serve, or have you served within the past five years, on a Town of Harvard board, commission, or committee?			
	Yes	65	27%	❖ It appears that people who have served on a board continue to follow town affairs.
	No	174	73%	
	Total	239	100%	
6	Please look at this map and identify the number that corresponds to the area of Harvard where you live.			
	1 - Devens	10	4%	❖ Devens and the west side have smaller populations and thus have fewer households to participate.
	2 - North	66	28%	
	3 - West	12	5%	❖ North and Southeast Harvard have the greatest representation in the survey.
	4 - East	31	13%	
	5 - Center	26	11%	
	6 - Southwest	39	16%	
	7 - Southeast	55	23%	
	Total	239	100%	

**Housing Questions**

7	Harvard needs a more diversified housing stock.			
	Strongly Agree	41	19%	❖ 50% of respondents agree or strongly agree that Harvard needs a more diversified housing stock.
	Agree	69	31%	
	Neither Agree Nor Disagree	50	23%	❖ 27% disagree that Harvard needs a more diversified housing stock.
	Disagree	44	20%	
	Strongly Disagree	16	7%	
	Total	220	100%	
8	Encouraging housing in mixed-use developments in the Commercial District (C District) on Ayer Road is appropriate.			
	Strongly Agree	29	14%	❖ Over half of respondents (55%) feel that mixed use development is appropriate in the C District.
	Agree	86	41%	
	Neither Agree Nor Disagree	40	19%	
	Disagree	40	19%	
	Strongly Disagree	17	8%	
	Total	212	100%	

Question and Responses				Comments
9	Seniors would downsize and stay in town if Harvard had more types of housing.			
	Strongly Agree	43	20%	❖ Only 15% of respondents disagree that Harvard should have more types of housing to allow seniors to downsize.
	Agree	84	38%	
	Neither Agree Nor Disagree	58	26%	
	Disagree	25	11%	
	Strongly Disagree	9	4%	
	Total	219	100%	
10	Harvard's zoning should encourage smaller housing units, affordable housing, and senior-friendly homes, even if it means allowing more density in some locations.			
	Strongly Agree	41	19%	❖ Support exists (54%) for alternative housing types, although 31% disagree.
	Agree	77	35%	
	Neither Agree Nor Disagree	32	15%	
	Disagree	39	18%	
	Strongly Disagree	28	13%	
	Total	217	100%	
11	Harvard needs more affordable housing.			
	Strongly Agree	34	16%	❖ A majority of respondents (53%) agree that Harvard needs more affordable housing.
	Agree	80	37%	
	Neither Agree Nor Disagree	43	20%	
	Disagree	35	16%	
	Strongly Disagree	24	11%	
	Total	216	100%	
12	Harvard needs housing for people with special needs.			
	Strongly Agree	15	7%	❖ Only 30% of respondents agree that Harvard needs housing for people with special needs, but nearly half have no opinion on the matter.
	Agree	49	23%	
	Neither Agree Nor Disagree	104	48%	
	Disagree	38	18%	
	Strongly Disagree	10	5%	
	Total	216	100%	

Question and Responses				Comments
13	The variety of housing at Devens makes an important contribution to Harvard's existing housing stock.			
	Strongly Agree	34	16%	❖ 58% of respondents believe that Devens makes an important contribution to Harvard's housing stock.
	Agree	90	42%	
	Neither Agree Nor Disagree	50	23%	
	Disagree	26	12%	
	Strongly Disagree	16	7%	
	Total	216	100%	
14	Harvard's tax levy is based almost entirely on residential property taxes.			
	Strongly Agree	92	42%	❖ It is clear to a large majority (83%) that Harvard relies heavily on residential property to fund municipal services.
	Agree	90	41%	
	Neither Agree Nor Disagree	33	15%	
	Disagree	2	1%	
	Strongly Disagree	0	0%	
	Total	217	100%	
15	Harvard needs a more robust commercial tax base.			
	Strongly Agree	53	24%	❖ 62% of respondents would like Harvard to have a larger commercial tax base. Just 19% disagree.
	Agree	82	38%	
	Neither Agree Nor Disagree	40	18%	
	Disagree	29	13%	
	Strongly Disagree	13	6%	
	Total	217	100%	
16	Ethnic, generational, and economic diversity are important for the health and vitality of all communities, including Harvard.			
	Strongly Agree	69	32%	❖ 74% of respondents believe diversity is important to the vitality of Harvard.
	Agree	90	42%	
	Neither Agree Nor Disagree	32	15%	
	Disagree	16	7%	
	Strongly Disagree	9	4%	
	Total	216	100%	

Question and Responses				Comments
<b>C District Questions</b>				
17	Harvard needs a more business-friendly approach to commercial development in the C District.			
	Strongly Agree	62	29%	❖ 55% of respondents favor fewer restrictions on commercial development in the C District. ❖ 25% of respondents disagree with a more business-friendly approach.
	Agree	56	26%	
	Neither Agree Nor Disagree	44	20%	
	Disagree	30	14%	
	Strongly Disagree	23	11%	
	Total	215	100%	
18	More business development in the C District could threaten Harvard's town character.			
	Strongly Agree	36	17%	❖ While about 1/3 of respondents have concerns of a possible loss of town character from more business development in the C district, 1/2 do not think this will occur.
	Agree	39	18%	
	Neither Agree Nor Disagree	34	16%	
	Disagree	72	33%	
	Strongly Disagree	37	17%	
	Total	218	100%	
19	The economic benefits of more business development in the C District would outweigh the potential impact on surrounding neighborhoods.			
	Strongly Agree	22	10%	❖ Respondents are divided about this question; 42% agree that the economic benefits of business development outweigh the potential impacts on surrounding neighborhoods, but 35% disagree.
	Agree	69	32%	
	Neither Agree Nor Disagree	51	23%	
	Disagree	31	14%	
	Strongly Disagree	45	21%	
	Total	218	100%	
20	Harvard should focus more on the physical appearance of development in the C District rather than controlling the types of uses (office or retail, for example) that are allowed there.			
	Strongly Agree	24	11%	❖ It seems that residents want both to change the physical appearance of development in the C District and to control the types of uses allowed.
	Agree	73	34%	
	Neither Agree Nor Disagree	51	24%	
	Disagree	55	26%	
	Strongly Disagree	12	6%	
	Total	215	100%	

Question and Responses				Comments
21	The C District is an ideal area for Harvard to create more affordable housing.			
	Strongly Agree	14	7%	❖ Respondents are split on this question; 34% are in favor of building more affordable housing in the C District, 33% are not in favor, and 33% are unsure.
	Agree	57	27%	
	Neither Agree Nor Disagree	72	33%	
	Disagree	41	19%	
	Strongly Disagree	31	14%	
	Total	215	100%	
22	If Ayer Road had the infrastructure to support growth, the C District could be a significant economic engine and revenue generator for the Town.			
	Strongly Agree	32	15%	❖ A majority of respondents (54%) think that bringing infrastructure to Ayer Road would spur economic growth and provide revenue for the Town.
	Agree	84	39%	
	Neither Agree Nor Disagree	43	20%	
	Disagree	35	16%	
	Strongly Disagree	23	11%	
	Total	217	100%	
23	The C District should provide the services residents want irrespective of revenue benefits to the town.			
	Strongly Agree	17	8%	❖ Respondents do not favor commercial growth just to generate revenue, but also want services to meet their needs.
	Agree	57	26%	
	Neither Agree Nor Disagree	59	27%	
	Disagree	58	27%	
	Strongly Disagree	25	12%	
	Total	216	100%	
24	The C District should provide the services residents want irrespective of the potential negative impact on surrounding neighborhoods (for example, traffic impacts).			
	Strongly Agree	14	6%	❖ 56% of respondents wish to insure that new development in the C district does not negatively impact surrounding neighborhoods.
	Agree	47	22%	
	Neither Agree Nor Disagree	35	16%	
	Disagree	61	28%	
	Strongly Disagree	61	28%	
	Total	218	100%	

Question and Responses				Comments
<b>Public Facilities Questions</b>				
25	Harvard should designate a site for additional space outside of the Town Center if the current school facilities become too small to serve the student population.			
	Strongly Agree	22	10%	❖ Respondents are split on this question. 38% are in favor of looking outside of the Town Center for a school expansion site, while 37% favor keeping schools in the Town Center.
	Agree	62	28%	
	Neither Agree Nor Disagree	54	25%	
	Disagree	57	26%	
	Strongly Disagree	23	11%	
	Total	218	100%	
26	Harvard should identify and explore options for providing water and sewer service to properties in the C District on Ayer Road.			
	Strongly Agree	39	18%	❖ Strong support (58%) exists for exploring ways to bring water and sewer services to the C district.
	Agree	85	40%	
	Neither Agree Nor Disagree	52	24%	
	Disagree	25	12%	
	Strongly Disagree	14	7%	
	Total	215	100%	
27	The Town should invest in single-stream recycling.			
	Strongly Agree	24	11%	❖ Single-stream recycling is not widely supported. Nearly half of respondents have no opinion. Only 35% are in favor.
	Agree	52	24%	
	Neither Agree Nor Disagree	105	48%	
	Disagree	30	14%	
	Strongly Disagree	6	3%	
	Total	217	100%	
28	The Town's municipal buildings should have ongoing annual maintenance, even if doing so means higher taxes.			
	Strongly Agree	48	22%	❖ Respondents strongly support (63%) maintaining town buildings even if it means higher taxes.
	Agree	89	41%	
	Neither Agree Nor Disagree	46	21%	
	Disagree	26	12%	
	Strongly Disagree	8	4%	
	Total	217	100%	

Question and Responses				Comments
29	Harvard should have a qualified, full-time person responsible for managing the Town's municipal buildings and overseeing maintenance, renovation, and energy efficiency projects.			
	Strongly Agree	34	16%	❖ 54% of respondents favor hiring a full-time person to look after town buildings; only 19% disagree with such a hire.
	Agree	83	38%	
	Neither Agree Nor Disagree	60	28%	
	Disagree	31	14%	
	Strongly Disagree	10	5%	
	Total	218	100%	
30	There is poor communications and a lack of collaboration among boards, committees, and the general public in Harvard.			
	Strongly Agree	54	25%	❖ By and large, the public perceives that there is poor communication and a lack of collaboration among town boards; only 9% disagree.
	Agree	81	37%	
	Neither Agree Nor Disagree	62	29%	
	Disagree	16	7%	
	Strongly Disagree	4	2%	
	Total	217	100%	
31	People would recycle more if Harvard adopted pay-per-bag for trash disposal.			
	Strongly Agree	26	12%	❖ More respondents (42%) disagree than agree (34%) that recycling would increase if Harvard adopted a pay-per-bag system. ❖ This may also mean that there is a lack of support in general for a pay-per-bag system.
	Agree	49	22%	
	Neither Agree Nor Disagree	54	25%	
	Disagree	59	27%	
	Strongly Disagree	32	15%	
	Total	220	100%	
32	The benefits of preserving historic public buildings outweigh the added cost involved.			
	Strongly Agree	44	20%	❖ Over half of respondents believe that preserving historic public buildings is worth the added cost.
	Agree	67	31%	
	Neither Agree Nor Disagree	42	19%	
	Disagree	47	21%	
	Strongly Disagree	19	9%	
	Total	219	100%	

Question and Responses				Comments
<b>Town Center Questions</b>				
33	Harvard's primary municipal and school facilities should remain in the Town Center (e.g. schools, town offices, senior center, library, public safety).			
	Strongly Agree	65	30%	❖ Respondents are heavily in favor (74%) of keeping town facilities in Harvard Center.
	Agree	96	44%	
	Neither Agree Nor Disagree	35	16%	
	Disagree	16	7%	
	Strongly Disagree	5	2%	
	Total	217	100%	
34	The Town Center water and sewer districts should be enlarged to accommodate growth of civic, institutional, residential, and commercial activities within the Town Center.			
	Strongly Agree	23	11%	❖ Nearly half (48%) of respondents agree that the Town Center is an appropriate location for growth and that the Town should expand water and sewer districts to accommodate it.
	Agree	82	37%	
	Neither Agree Nor Disagree	53	24%	
	Disagree	50	23%	
	Strongly Disagree	11	5%	
	Total	219	100%	
35	Harvard should make it a priority to develop a common walkway connecting the Town Beach to McCurdy Track.			
	Strongly Agree	32	15%	❖ Modest support (44%) exists for developing a walkway to connect the Town Beach with McCurdy Track; 26% disagree with the proposal.
	Agree	63	29%	
	Neither Agree Nor Disagree	69	31%	
	Disagree	35	16%	
	Strongly Disagree	21	10%	
	Total	220	100%	
36	A pub/restaurant in the Town Center would be a welcome addition to the community.			
	Strongly Agree	68	31%	❖ A pub or restaurant is the kind of business that respondents highly support (71%) for the Town Center.
	Agree	89	40%	
	Neither Agree Nor Disagree	28	13%	
	Disagree	23	10%	
	Strongly Disagree	12	5%	
	Total	220	100%	

Question and Responses				Comments
37	Some higher-density housing should be allowed in the Town Center, including affordable housing.			
	Strongly Agree	19	9%	❖ 47% of respondents did not support increasing housing density or allowing affordable housing in the Town Center. ❖ 38% are in favor of higher density/affordable housing in the Center.
	Agree	63	29%	
	Neither Agree Nor Disagree	33	15%	
	Disagree	60	28%	
	Strongly Disagree	40	19%	
	Total	215	100%	
38	The Town needs to implement its comprehensive plan for parking, traffic and pedestrian circulation in the Town Center.			
	Strongly Agree	29	13%	❖ 48% of respondents would like to see the Town implement a comprehensive circulation plan for the Town Center, while 17% disagree with the need.
	Agree	76	35%	
	Neither Agree Nor Disagree	76	35%	
	Disagree	31	14%	
	Strongly Disagree	6	3%	
	Total	218	100%	

**Transportation Questions**

39	If Harvard reclaimed jurisdiction over all or a portion of Devens, the roads that once connected Devens with Harvard should be reopened.			
	Strongly Agree	35	16%	❖ Strong support (60%) exists for re-opening the roads to Devens if the Town resumes jurisdiction.
	Agree	94	44%	
	Neither Agree Nor Disagree	34	16%	
	Disagree	32	15%	
	Strongly Disagree	21	10%	
	Total	216	100%	
40	Harvard police officers should target high-speed routes around town with more vigilance, automated speed enforcement, flashing speed signs, and similar enforcement methods.			
	Strongly Agree	24	11%	❖ Respondents do not necessarily agree that police should be more vigilant in enforcing speed limits; 34% agree, 37% disagree, and 29% have no opinion.
	Agree	49	23%	
	Neither Agree Nor Disagree	64	29%	
	Disagree	63	29%	
	Strongly Disagree	17	8%	
	Total	217	100%	

Question and Responses				Comments
41	Cut-through traffic is responsible for most of the speeding problems on Harvard's roads.			
	Strongly Agree	14	6%	❖ Only 28% of respondents agree that the culprit for speeding problems in Harvard is cut-through traffic.
	Agree	49	22%	
	Neither Agree Nor Disagree	75	34%	
	Disagree	69	32%	
	Strongly Disagree	11	5%	
	Total	218	100%	
42	The Town should maintain its existing policy of designating every local road as a scenic road because all roads in Harvard have the same scenic value and historical importance.			
	Strongly Agree	22	10%	❖ No clear conclusions can be drawn about how respondents feel about Harvard's scenic roads.
	Agree	59	27%	
	Neither Agree Nor Disagree	72	33%	
	Disagree	51	23%	
	Strongly Disagree	14	6%	
	Total	218	100%	
43	Harvard needs more paths so that pedestrians and cyclists can circulate safely throughout the town.			
	Strongly Agree	81	37%	❖ This question yielded one of the strongest findings of the survey; 74% of respondents support a policy of providing more paths for pedestrian and bicyclist safety.
	Agree	82	37%	
	Neither Agree Nor Disagree	24	11%	
	Disagree	28	13%	
	Strongly Disagree	5	2%	
	Total	220	100%	
44	Harvard should do a better job of maintaining the roads, even if it means spending more on road maintenance each year.			
	Strongly Agree	28	13%	❖ There is modest support for increasing local spending on road maintenance; 42% agree and 24% disagree.
	Agree	62	29%	
	Neither Agree Nor Disagree	74	34%	
	Disagree	46	21%	
	Strongly Disagree	7	3%	
	Total	217	100%	

Question and Responses				Comments
<b>Devens Questions</b>				
45	Harvard should not resume jurisdiction over Devens unless the revenues from Devens can pay the full cost of municipal and school services used by Devens businesses and residents.			
	Strongly Agree	66	30%	❖ Two-thirds of respondents agree that revenues from Devens must exceed service costs in order for the Town to resume jurisdiction.
	Agree	81	37%	
	Neither Agree Nor Disagree	43	20%	
	Disagree	21	10%	
	Strongly Disagree	7	3%	
	Total	218	100%	
46	Resuming jurisdiction over Devens would require Harvard to have more paid professionals to assist local boards.			
	Strongly Agree	39	18%	❖ A majority (56%) of respondents believe that the Town would need to hire more professional help to run Devens. Only 11% disagree, but 33% are unsure.
	Agree	82	38%	
	Neither Agree Nor Disagree	71	33%	
	Disagree	20	9%	
	Strongly Disagree	4	2%	
	Total	216	100%	
47	Resuming jurisdiction of Devens would increase the availability of conservation land and recreational facilities for use by all Harvard residents.			
	Strongly Agree	25	12%	❖ Nearly half (47%) of respondents agree that Devens would increase the supply of conservation land and recreation facilities for use by Harvard residents
	Agree	75	35%	
	Neither Agree Nor Disagree	75	35%	
	Disagree	25	12%	
	Strongly Disagree	17	8%	
	Total	217	100%	
48	If Harvard reclaimed jurisdiction over all or a portion of Devens, Harvard's small-town, semi-rural character would change.			
	Strongly Agree	38	17%	❖ More respondents agree (44%) than disagree (35%) that Harvard's small town character would change by resuming jurisdiction over Devens.
	Agree	59	27%	
	Neither Agree Nor Disagree	46	21%	
	Disagree	58	27%	
	Strongly Disagree	17	8%	
	Total	218	100%	

Question and Responses				Comments
49	Harvard should secure access to the aquifer at Devens as a future source of public water for Harvard.			
	Strongly Agree	41	19%	❖ A majority of respondents agree (56%) that the aquifer at Devens could serve as a future water source for the Town.
	Agree	81	37%	
	Neither Agree Nor Disagree	74	34%	
	Disagree	17	8%	
	Strongly Disagree	6	3%	
	Total	219	100%	
50	One benefit of Harvard having jurisdiction over Devens is that town boards will have control over protecting natural resources.			
	Strongly Agree	30	14%	❖ A majority of respondents (52%) believe that Harvard boards can do a good job of protecting the natural resources at Devens. Only 18% disagree.
	Agree	83	38%	
	Neither Agree Nor Disagree	66	30%	
	Disagree	27	12%	
	Strongly Disagree	12	6%	
	Total	218	100%	
51	Devens will become fiscally self-supporting (with revenues exceeding expenses) within the next decade.			
	Strongly Agree	18	8%	❖ There is uncertainty over whether Devens will become fiscally self-supporting within the next decade. Over half of respondents seem unsure.
	Agree	46	21%	
	Neither Agree Nor Disagree	115	53%	
	Disagree	21	10%	
	Strongly Disagree	17	8%	
	Total	217	100%	

**Conservation Questions**

52	Preserving historic lands, sites, stone fences, objects, and areas is just as important as preserving historic buildings.			
	Strongly Agree	67	31%	❖ A large majority (73%) of respondents support preserving Harvard’s historic landscapes.
	Agree	91	42%	
	Neither Agree Nor Disagree	41	19%	
	Disagree	12	6%	
	Strongly Disagree	5	2%	
	Total	216	100%	

Question and Responses				Comments
53	Since local agriculture is very important to Harvard's character and economy, the preservation of agricultural land should be encouraged.			
	Strongly Agree	114	52%	❖ Preserving agricultural land received the greatest support (90%) in the entire survey.
	Agree	84	38%	
	Neither Agree Nor Disagree	19	9%	
	Disagree	1	0%	
	Strongly Disagree	2	1%	
	Total	220	100%	
54	Harvard needs to do more to protect its natural, historic, and cultural resources and landscapes for future generations, even if it means spending more on conservation and resource protection activities.			
	Strongly Agree	44	20%	❖ A large majority of respondents (62%) are willing to spend more to preserve important resources. Only 16% would oppose such action.
	Agree	90	42%	
	Neither Agree Nor Disagree	48	22%	
	Disagree	21	10%	
	Strongly Disagree	12	6%	
	Total	215	100%	
55	Harvard should do more to require open space-conservation residential cluster developments.			
	Strongly Agree	33	15%	❖ While 44% of respondents favor greater use of open space cluster developments, a large percentage (37%) are unsure.
	Agree	63	29%	
	Neither Agree Nor Disagree	80	37%	
	Disagree	26	12%	
	Strongly Disagree	14	6%	
	Total	216	100%	
56	Both existing and new conservation lands need better access, signage, management and maintenance, and a reliable source of funds to conduct that work.			
	Strongly Agree	34	16%	❖ Respondents agree (54%) that it is a good thing to maintain and improve conservation lands.
	Agree	82	38%	
	Neither Agree Nor Disagree	58	27%	
	Disagree	38	17%	
	Strongly Disagree	6	3%	
	Total	218	100%	

<b>Question and Responses</b>		<b>Comments</b>	
57	Harvard should expand existing historic districts and create new historic districts such as Still River Village.		
	Strongly Agree	15	7%
	Agree	70	32%
	Neither Agree Nor Disagree	73	34%
	Disagree	43	20%
	Strongly Disagree	15	7%
	Total	216	100%

❖ Respondents are split on whether or not to create new historic districts; 39% agree, 27% disagree, and 34% are unsure.

## APPENDIX 5 DEAT REPORT, NOVEMBER 2015

### Town of Harvard Devens Economic Analysis Team Report to Selectmen

November 3, 2015

Membership

Victor Normand, Chairman

Steve Finnegan, Paul Green, Noyan Kinayman, Christopher Roy

#### **Introduction**

This is the fifth report prepared by the Devens Economic Analysis Team (DEAT) on the economic condition at Devens. The reports have used actual property tax assessments along with modeled municipal expenses to analyze the economic viability of Harvard resuming jurisdiction over the portions of Devens that lie within its historic town boundaries. All of the income and expense analysis in this report relate only to that portion of Devens within the historic town boundaries.

#### **Scope of Work**

The Harvard Board of Selectmen charged the DEAT with analyzing Devens finances, analyzing the financial impact of current commercial tax policies at Devens, determining whether commercial and industrial development at Devens can benefit Harvard and the region, examining the financial impact of the educational agreement between Harvard and Mass Development for the education of students who live in Devens, defining regional opportunities for municipal services between Devens and the host communities, and identifying the financial impact of proposed changes to the Devens Reuse Plan, zoning, or by-laws.

#### **History of DEAT Activities**

In our Vicksburg Square Report (issued September 2011), we analyzed the financial impact of a proposal for housing at Vicksburg Square. The voters ultimately rejected this proposal.

We presented an update of our work to Annual Town Meeting in April 2012. We previewed the conclusions that would appear in our Annual Report for 2012, as noted in the next item.

In our Annual Report for 2012 (issued October 2012), we analyzed Devens finances and introduced a model for estimating municipal operating expenses. We also summarized the current state of municipal regionalization efforts and suggested several additional opportunities for further municipal regionalization. We compared the task of managing the Devens Industrial Park to other nearby industrial parks, and noted that a small, 2- to-3 person staff could manage the day-to-day operations. We summarized the operation of Devens Utilities, described the competitive advantage and financial benefit that it provides to Devens, and recommended that the Towns ask Mass Development to conduct an open and transparent process for the disposition of Devens Utilities. We also summarized the operation of the Devens Department of Public Works.

In our Annual Report for 2013 (issued March 2014), we updated our model for estimating municipal operating expenses and noted that the projected operating deficit had remained fairly constant, despite the ongoing recession. For the first time, we estimated the revenues that could be expected from non-tax sources. We documented two fundamental questions that we had posted to MassDevelopment, on the need to have an open and transparent disposition process, and on the need to have clear criteria for declaring that its redevelopment work is finished.

This document is our Annual Report for 2014 (issued October 2015). We focus on Devens tax revenues and operating expenses, the impact of commercial development on tax revenues, and projects the impact of Devens finances on the a hypothetical resumption of jurisdiction of Harvard over its historic portions of Devens.

### **Summary of Current Financial Status**

As shown in Exhibit B, the gap between income and expense of a recombined Harvard and Devens has diminished over the last 5 years. An operating deficit remains through FY 2015 assuming all property at Devens is taxed using the Harvard single tax rate. The split tax rate currently used at Devens eliminates the shortfall.

The data supplied with this report supports the premise that the economic viability of Devens is no longer an uncertainty. We have consistently used conservative assumptions in our models and thus have a high degree of confidence in this prediction. The only uncertainty is determining exactly when economic viability will happen, as the timing is dependent upon local, state, and national economic conditions.

### **Devens Property Assessments and Projected Deficit**

Exhibit A shows the history of property assessments in Harvard and Devens since FY 2010. The effects of the recession of 2008 begin to show up in declining property values by FY 2012. Despite several significant business downturns at Devens; most notably the bankruptcy of Evergreen Solar, the general decline in value was approximately 20%; less than the larger regional market, and values have been recovering for the past three years. Considering that this recession was the worst economic decline since the Great Depression, it is worth noting the resilience of the businesses at Devens, due, in part, to their diverse nature.

### **Potential for Economic Growth**

This report discusses three areas of economic growth that have the realistic potential to bring the full 8 million square feet of development envisioned by the Reuse Plan. Those areas are:

- Development Sites for Sale - Exhibit C
- Development Sites Pending for Sale - Exhibit D
- Sold Sites with Planned Development Potential - Exhibit E

Three quarters of the development at Devens has occurred on land still recordable as being in the Town of Harvard, and all of the developments sites contained in the exhibits to this report are within the historic Harvard boundaries.

We believe that it is realistic to expect development to occur on many of the sites shown in Exhibits C, D, and E, all of which are appropriately zoned and most of which are pad ready. In fact, the DEC has already issued permits for significant development and construction is underway on at least three of those sites.

### **Effect of TIFs on Property Tax Receipts**

In addition to the development potential shown in the exhibits, the maturing of the Bristol Myers Squibb tax agreement (known as a TIF, for Tax Increment Financing) adds significant value to the tax base each year for the next 14 years. As Exhibit C shows, beginning in FY 2015 (July 2014 to June 2015) the percentage of taxable building value begins to steadily increase. Over the next five years of the agreement, yearly tax revenues (based on Harvard's tax rate) will increase to \$750,000 and continue to grow until they reach over \$1.6 million dollars in FY 2029.

## Devens Utilities

As for the capital budget, the DEAT has previously proposed (in our Report of March, 2014) the creation of a municipal super utility to manage electric power, natural gas distribution, fresh water and waste water, as well as storm water, and possibly telecommunications. This could serve to ensure that future funding is in place as the existing utility infrastructure depreciates. MassDevelopment has structured and operated its Utility Department in a manner as to make its transformation into a municipal utility feasible.

There are other significant municipal capital items that we have not studied, but which will need to be assessed as a part of any realistic analysis. These include the municipal buildings, roads, green spaces, recreation areas, and other public places. While many of these items are fairly new, and thus at an early stage in their usable lifecycle, nonetheless, a plan must be created to tackle renewal of them as they age.

Other Issues All this is not to suggest that there are no other issues to be addressed. Some of those issues are not economic, most are a combination of social and cultural issues with an economic component. The work of the DEAT has always been limited to economic issues. The hope has been that the reports will serve to take the economic concerns off the table and in this way allow a more fruitful debate to take place on the merits of those other issues that affect "the character of the Town.

## FY2015 Projected Municipal Income and Expense

The analysis projects a deficit of approximately \$468,000 (Exhibit B) using the current Harvard single tax rate. While this is not an insignificant number, taken in the context the potential growth in assessed valuation that amount will continue to fall. Since the first properties began generating tax revenue, Devens has added an average of approximately \$12.3 million in value annually which would yield over \$200,000 in tax revenue using the current Harvard Tax rate. Nearly 75% of all current value at Devens is within the historic Harvard Town boundaries. An even higher percentage of future development is within the Harvard sector.

Together with the maturation of the TIFs that are in place, we believe it is reasonable to project that the operating deficit will continue decline over the next few years even with the conservative methodologies used throughout this report.

## Analysis of Development Potential

All of the exhibits are sourced from the Devens Assessor's records and various reports and public information prepared by MassDevelopment. While some of the source documents are several years old, updating them would likely produce more favorable economic projections, due to the recovery of the overall economy. Mass Development determined the development potential of each parcel using past experience and actual site characteristics. In every instance the development potential is less than that allowed by existing zoning; in some cases significantly less.

The follow conservative assessed values metrics have been used in every chart:

Land: \$75,000 per acre

Building Value: \$50.00 per square foot

Tax Rate: \$17.79 per thousand (Harvard's current tax rate)

## Parcels Currently on Market

Exhibit C shows 11 parcels of land deeded in Harvard which are currently being marketed by MassDevelopment. They range in size from 2 acres to over 22 acres and have the development potential of 1.3 million square feet.

### **Sites to be Prepared for Market**

Exhibit D shows parcels that are not for sale, due to various reasons. They are zoned for development but are not ready for sale. The reasons may be strategic, related to infrastructure needs, or some sites may require other improvements to make them pad ready. The parcels, which may include existing buildings, range in size from 1.3 acres to 87.1 acres and represent over 1.5 million square feet of development.

### **Expansion on Sold Parcels**

Exhibit E shows parcels that have already been sold and which include additional land planned for future expansion. The most notable example is the land sold to Bristol Myers Squibb which is presently undergoing such an expansion. The total expansion, some of which is underway but not yet assessed for taxation is over 1.6 million square feet.

### **Other Issues to be Studied Not Exclusively Economic**

- Public Education
- Police and Fire Contracts
- Permitting/DEC
- Vicksburg Square
- Managing Open Space and Recreational assets
- Access o Special Needs / Affordable Housing
- Split Tax Rate
- Impact on the nature of local government

### **Conclusion**

With this report the DEAT has concluded its assigned task. Going forward the Selectmen should request an annual report from the Devens Assessor on changes to property valuations focused on new growth.

The analysis herein shows that Devens would be economically sustainable as part of the Town of Harvard should that be the preference of the Town, and that Devens has considerable additional economic potential. The report also shows that by extension MassDevelopment has considerable work yet to be undertaken, primarily in the area of land sales and tasks associated with those land sales.

The DEAT hopes that there will be consensus on the larger economic issue based on these findings and further hopes that the Town will begin a comprehensive planning process, with assistance from professional planning consultants that will address all other issues so that the Town can come together on a vision for the future of Devens.

Similarly, Ayer, Shirley and MassDevelopment, including Devens residents should plan for and reach consensus on what serves their individual best interests. Only then can everyone come together for meaningful deliberations on the final disposition of Devens.

While MassDevelopment has much to be done at Devens, someday they will be done and Harvard should be prepared.

### **Post Script**

This year the MassDevelopment Board will meet at Devens in November. In 2013 when the Board came to Devens the DEAT on behalf of the town offered these comments:

- Given the importance of managing and maintaining the Utility systems at Devens successfully for the long term, MassDevelopment should only undertake changes in the current operation with complete public transparency.
- While the conclusion of the Devens redevelopment project is many years away, MassDevelopment should establish and make known its criteria for substantial completion

## Exhibit A Assessed Values

	Harvard Valuation	Devens/ Harvard Valuation	Combined Valuation
<b>FY 2010</b>	\$ 1,138,995,512	\$ 194,916,126	\$ 1,333,911,638
<b>FY 2011</b>	\$ 1,082,829,559	\$ 214,916,126	\$ 1,297,745,685
<b>FY 2012</b>	\$ 1,053,042,141	\$ 211,081,766	\$ 1,264,123,907
<b>FY 2013</b>	\$ 1,056,647,413	\$ 170,140,878	\$ 1,226,788,291
<b>FY 2014</b>	\$ 1,060,081,431	\$ 161,890,820	\$ 1,221,972,251
<b>FY 2015</b>	\$ 1,063,093,393	\$ 182,101,118	\$ 1,245,194,511

## Exhibit B Municipal Budget

	Harvard Actual	Devens/ Harvard Estimate	Combined Budget	Projected Shortfall
<b>FY 2010</b>	\$ 19,742,928	\$ 3,801,816	\$ 23,544,744	\$ 1,500,000
<b>FY 2011</b>	\$ 19,922,263	\$ 4,286,197	\$ 24,208,460	\$ 1,100,000
<b>FY 2012</b>	\$ 20,103,790	\$ 4,322,377	\$ 24,426,167	\$ 850,000
<b>FY 2013</b>	\$ 20,710,819	\$ 4,582,658	\$ 25,293,477	\$ 863,683
<b>FY 2014</b>	\$ 21,279,523	\$ 4,708,494	\$ 25,988,017	\$ 972,525
<b>FY 2015</b>	\$ 21,963,828	\$ 4,859,910	\$ 26,823,738	\$ 468,545

	Devens Valuation		Tax Rates		Tax Revenues	
			Devens	Harvard	Devens	Harvard
<b>Residential</b>	\$ 19,806,100	\$ 16.71	\$ 17.79	\$ 330,960	\$ 352,351	
<b>Commercial</b>	\$ 162,295,018	\$ 22.60	\$ 17.79	\$ 3,667,867	\$ 2,887,228	
<b>Total</b>	\$ 182,101,118			\$ 3,998,827	\$ 3,239,579	

**Additional Tax Revenue using the Current Devens Tax Rates - \$759,248.45**

## Exhibit C

### Development Sites for Sale - (Harvard)

Street No.	Property Location	Description	Acres	Land Value <sup>1</sup>	Development Potential (SF) <sup>2</sup>	Building Value <sup>3</sup>	Total Value	Projected Property Tax <sup>4</sup>
249	Barnum Road	CMTC	2.0		9,700	\$485,000	\$635,000	\$11,297
151	Barnum Road	Lot 1D	5.0	\$375,000	60,000	\$3,000,000	\$3,375,000	\$60,041
19	Buena Vista Street	Willard Field	2.0	\$150,000	30,000	\$1,500,000	\$1,650,000	\$29,354
10	Bulge Road	Davao	18.5	\$1,220,300	185,000	\$9,250,000	\$10,470,300	\$186,267
75	Jackson Road	Lot 14	11.0	\$942,400	150,000	\$7,500,000	\$8,442,400	\$150,190
45	Jackson Road	Lot 16	22.3	\$2,193,200	325,000	\$16,250,000	\$18,443,200	\$328,105
33	Lake George	MDFA Vacant	2.0	\$157,100	20,000	\$1,000,000	\$1,157,100	\$20,585
85	Patton Road	Lot 19	7.6	\$661,300	50,000	\$2,500,000	\$3,161,300	\$56,240
33	Saratoga Boulevard	Lot 1C	9.0	\$1,036,800	100,000	\$5,000,000	\$6,036,800	\$107,395
109	Sherman Avenue	Hornet Field	5.0	\$1,068,700	350,000	\$17,500,000	\$18,568,700	\$330,337
101	Sherman Avenue	Washington Hall	4.5	\$186,600	20,000	\$1,000,000	\$1,186,600	\$21,110
<b>Totals</b>			<b>88.9</b>	<b>\$8,141,400</b>	<b>1,299,700</b>	<b>\$64,985,000</b>	<b>\$73,126,400</b>	<b>\$1,300,919</b>

**Footnotes**

- 1 Assessed Value \$75,000 per acre or actual assessed value, if available
- 2 Development Potential Planned but not permitted future building area on developed/taxable parcels, and likely building area allowed by zoning and existing conditions
- 3 Assessed Building Value \$50 per sq. ft.
- 4 Tax Rate (FY 2015) \$17.79 Single Tax Rate, Town of Harvard

**Other Notes:**

42 Buena Vista Street, Vicksburg Square, 16.0 acres (split between Ayer and Harvard) is for sale but not included in this chart.

### Exhibit D Development Sites - Pending (Harvard)

Street No.	Property Location	Description	Acres	Land Value <sup>1</sup>	Development Potential (SF) <sup>2</sup>	Building Value <sup>3</sup>	Total Value	Projected Property Tax <sup>4</sup>
0	Balls Bluff Street	MDFA	2.8	\$ 240,200	52,500	\$ 2,625,000	\$ 2,865,200	\$ 50,972
0	Buena Vista Street	Tennis Courts	3.2	\$ 400,000	90,000	\$ 4,500,000	\$ 4,900,000	\$ 87,171
0	Buena Vista Street	MDFA (76th Division to Balls Bluff)	10.7	\$ 926,600	80,000	\$ 4,000,000	\$ 4,926,600	\$ 87,644
0	Grant Road	MDFA (corner Jackson & Grant)	3.7	\$ 270,800	20,000	\$ 1,000,000	\$ 1,270,800	\$ 22,608
0	Grant Road	Former Sports Arena site	8	\$ 584,000	75,000	\$ 3,750,000	\$ 4,334,000	\$ 77,102
0	Maple Street	Maple	14	\$ 1,022,000	225,500	\$11,275,000	\$ 12,297,000	\$ 218,764
0	Oak Street	Lot 12 Oak	11.5	\$ 840,200	150,000	\$ 7,500,000	\$ 8,340,200	\$ 148,372
0	Pine Street	MDFA (adjacent to Comrex)	3.1	\$ 227,200	9,399	\$ 469,950	\$ 697,150	\$ 12,402
0	Salerno Circle	Salerno Circle	87.1	\$ 6,360,800	750,000	\$37,500,000	\$ 43,860,800	\$ 780,284
0	Sherman Avenue	MDFA (Devens Dr.)	1.3	\$ 111,400	28,800	\$ 1,440,000	\$ 1,551,400	\$ 27,599
93	Sherman Avenue	BOQ's	3.5	\$ 301,700	30,000	\$ 1,500,000	\$ 1,801,700	\$ 32,052
<b>Totals</b>			<b>148.9</b>	<b>\$ 11,284,900</b>	<b>1,511,199</b>	<b>\$75,559,950</b>	<b>\$ 86,844,850</b>	<b>\$ 1,544,970</b>
<b>Footnotes</b>								
1 Assessed Value			75,000 Per acre or actual assessed value if available					
2 Development Potential			Planned but not permitted future building area on					
3 Assessed Building Value			\$50 per sq. ft.					
4 Tax Rate (FY 2015)			\$17.79 Single Tax Rate, Town of Harvard					
<b>Other Notes:</b>								
42 Bneua Vista Street, Vicksburg Square, 16.0 acres (split between Ayer and Harvard) is for sale but is not included in this chart.								

## Exhibit E Sold Sites with Expansion (Harvard)

Street #	Property Location	Description	Building SF		Expansion Value <sup>2</sup>	Projected Property Tax <sup>3</sup>
			Existing Building	Expansion Potential <sup>1</sup>		
58	Barnum Road	Cambrooke Foods	22,256	17,744	\$ 887,200	\$ 15,783
78	Barnum Road	Media News	59,852	10,000	\$ 500,000	\$ 8,895
53	Jackson Road	Xinetics (Walden Spor	58,750	30,000	\$ 1,500,000	\$ 26,685
115	Jackson Road	Xinetics (Main Buildin	32,236	105,000	\$ 5,250,000	\$ 93,398
0	Lake George	Clemente	-	40,000	\$ 2,000,000	\$ 35,580
18	Saratoga Boulevard	Walteco	18,000	35,120	\$ 1,756,000	\$ 31,239
29	Saratoga Boulevard	Integra	28,440	25,000	\$ 1,250,000	\$ 22,238
36	Saratoga Boulevard	North American Logis	162,000	110,000	\$ 5,500,000	\$ 97,845
45	Saratoga Boulevard	Ryerson	140,318	63,000	\$ 3,150,000	\$ 56,039
7	Jackson Road	Bopnostics	43,977	59,000	\$ 2,950,000	\$ 52,481
38	Jackson Road	BMS	400,000	1,107,830	\$ 55,391,500	\$ 985,415
		<b>Total</b>	<b>965,829</b>	<b>1,602,694</b>	<b>\$ 80,134,700</b>	<b>\$ 1,425,596</b>
<b>Footnotes</b>						
1	Expansion Potential	Planned but not permitted future building area on developed/taxable parcels, and likely building area allowed by zoning and existing conditions				
2	Assessed Building Value	\$50 per sq. ft.				
3	Tax Rate (FY 2015)	\$17.79 Single Tax Rate, Town of Harvard				

**Exhibit F**  
**Bristol Myers Squibb - TIF**

<b>Tax Year</b>	<b>Assessed Land Value</b>	<b>TIF Benefit on Buildings<sup>1</sup></b>	<b>Taxable Building Value</b>	<b>Total Taxable Value</b>	<b>Property Tax<sup>2</sup></b>	<b>Annual Increase in Tax Revenue</b>
2008	\$ 6,435,900	0%	\$ -	\$ -	\$ -	\$ -
2009	\$ 6,435,900	100%	\$ -	\$ 6,435,900	\$ 114,494.66	\$ 114,495
2010	\$ 6,435,900	100%	\$ -	\$ 6,435,900	\$ 114,494.66	\$ -
2011	\$ 6,435,900	100%	\$ -	\$ 6,435,900	\$ 114,494.66	\$ -
2012	\$ 6,435,900	100%	\$ -	\$ 6,435,900	\$ 114,494.66	\$ -
2013	\$ 6,435,900	100%	\$ -	\$ 6,435,900	\$ 114,494.66	\$ -
2014	\$ 6,435,900	100%	\$ -	\$ 6,435,900	\$ 114,494.66	\$ -
2015	\$ 6,435,900	90%	\$ 8,636,100	\$ 15,072,000	\$ 268,130.88	\$ 153,636
2016	\$ 6,435,900	80%	\$ 17,272,200	\$ 23,708,100	\$ 421,767.10	\$ 153,636
2017	\$ 6,435,900	70%	\$ 25,908,300	\$ 32,344,200	\$ 575,403.32	\$ 153,636
2018	\$ 6,435,900	60%	\$ 34,544,400	\$ 40,980,300	\$ 729,039.54	\$ 153,636
2019	\$ 6,435,900	50%	\$ 43,180,500	\$ 49,616,400	\$ 882,675.76	\$ 153,636
2020	\$ 6,435,900	45%	\$ 47,498,550	\$ 53,934,450	\$ 959,493.87	\$ 76,818
2021	\$ 6,435,900	40%	\$ 51,816,600	\$ 58,252,500	\$ 1,036,311.98	\$ 76,818
2022	\$ 6,435,900	35%	\$ 56,134,650	\$ 62,570,550	\$ 1,113,130.08	\$ 76,818
2023	\$ 6,435,900	30%	\$ 60,452,700	\$ 66,888,600	\$ 1,189,948.19	\$ 76,818
2024	\$ 6,435,900	25%	\$ 64,770,750	\$ 71,206,650	\$ 1,266,766.30	\$ 76,818
2025	\$ 6,435,900	20%	\$ 69,088,800	\$ 75,524,700	\$ 1,343,584.41	\$ 76,818
2026	\$ 6,435,900	15%	\$ 73,406,850	\$ 79,842,750	\$ 1,420,402.52	\$ 76,818
2027	\$ 6,435,900	10%	\$ 77,724,900	\$ 84,160,800	\$ 1,497,220.63	\$ 76,818
2028	\$ 6,435,900	5%	\$ 82,042,950	\$ 88,478,850	\$ 1,574,038.74	\$ 76,818
2029	\$ 6,435,900	0%	\$ 86,361,000	\$ 92,796,900	\$ 1,650,856.85	\$ 76,818
Tax Exemptions apply to buildings only, land values are fully taxed.						
<b>Footnotes</b> 1. Percentage of buildings exempt from property tax						
2. Tax Rate (FY 2015): \$ 17.79 Single rate, Town of Harvard						
<b>Other Notes:</b> All values are as of FY 2015						

### Exhibit G Summary of Development Potential

	Acres	Land Value	Development Potential (SF)	Building Value	Total Value	Projected Property Tax
Development Sites for Sale	88.9	\$ 8,141,400	1,299,700	\$ 64,985,000	\$ 73,126,400	\$ 1,300,919
Development Sites Pending	148.9	\$ 11,284,900	1,511,199	\$ 75,559,950	\$ 86,844,850	\$ 1,544,970
Sold Sites with Expansion			1,602,694	\$ 80,134,700	\$ 80,134,700	\$ 1,425,596
<b>Total Development Potential</b>			<b>4,413,593</b>	<b>\$ 220,679,650</b>	<b>\$ 240,105,950</b>	<b>\$ 4,271,485</b>

### Tax Increment Financing and Special Tax Agreements October 2015

Company Name	Address	TIF/STA	Duration	Start Date	End Date	Investment	Sq. Ft.	# New Full-Time Jobs (Note 1)	# New Part-Time Jobs (Note 2)	Total # Jobs (Note 3)
E. R. Squibb & Sons (Phase I)	38 Jackson Rd	TIF	20 years	7/1/2008	6/30/2028	\$ 650,000,000	NS	350 FTE	NA	350 FTE
E. R. Squibb & Sons (Phase II)	38 Jackson Rd	TIF	13 years	7/1/2015	6/30/2028	NS	NS	550 FTE	NA	550 FTE
Magnemotion	139&141 Baruum Rd	TIF	10 years	7/1/2009	6/30/2019	\$ 7,000,000	48,500	41	NA	137
Ozark Automotive Distributors	15 Independence Dr.	STA	4 years	10/1/2013	9/30/2017	\$ 32,900,000	370,000	80	40	NS
SMC	18 Independence Dr.	TIF	10 years			\$ 14,000,000	200,000	100	NA	412

Note 1: This column lists the minimum number of new, full-time (or full-time equivalent), permanent jobs that the applicant has promised to create.

Note 2: This column lists the minimum number of new, part-time, permanent jobs that the applicant has promised to create within a specified period.

Note 3: This column lists the total number of jobs that the applicant has promised to provide.

NOTE: The SMC TIF does not explicitly state the start date. I've made a reasonable assumption here.

## APPENDIX 6 HARVARD'S ENERGY USE AND REDUCTION EFFORTS

Review of Past/Present & Recommendations for the Future

Submitted to Master Plan Steering Committee by HEAC - January 2016

### **1. History**

At the Annual Town Meeting in 2008, the Town voted to appoint an Energy Advisory Committee, in order to better understand energy use and energy-related expenditures, and to reduce them where possible.

In 2009, the Harvard Energy Advisory Committee (HEAC) proposed to the Board of Selectman that the town pursue the Green Communities program as a means to help the Town achieve these goals. The Green Communities program provides assistance and grants to qualifying towns, to be used for projects that reduce energy consumption and/or reduce emissions. The qualification criteria included a key mechanism for achieving this: *a requirement to develop a plan to reduce overall energy consumption by 20% over a 5-year period from a baseline year*. As part of this commitment, towns were required to gather energy use/cost information and tabulate it to establish benchmark energy consumption numbers for municipal/school buildings, operations, vehicles, streetlights, etc. Assistance was provided by DOER in the creation and promulgation of *Mass Energy Insight*, a system designed to track and understand energy usage and costs. Previous assistance from DOER came in the form of a series of building audits; these audits helped focus our grant-funded projects on the most cost-effective ways to improve building/system efficiency.

### **2. Past and Present Efforts**

HEAC lead the effort to educate residents on the requirements and benefits of the program during 2010-2011, assisted in the procedural aspects of obtaining Town Meeting votes on necessary bylaw changes in 2011, and submitted a successful grant application in 2012. HEAC has recently focused on carrying out the specific projects approved in two successful rounds of Green Community grants:

2012 grant funding: \$141,200 for 5 projects

- Harvard Center Fire Station Boiler Replacement
- Harvard Police Station Boiler Replacement
- Hildreth Elementary School Demand-Control Ventilation and Building Automation System
- Harvard Town Hall Energy Modeling

2015 grant funding: \$225,914 for 9 projects and administrative support

- Bromfield/Hildreth School Complex - Retro-commissioning
- Public Library - Retro-commissioning
- Department of Public Works - Exterior LED Lighting Retrofit
- Police Department - Exterior LED Lighting Retrofit
- Hildreth House Senior Center - Furnace
- Bromfield School - Lighting Controls for Hallways
- Bromfield School - Exterior LED Lighting Retrofit
- Library - Interior LED Lighting Retrofit

- Building Operator Certification Training for Bromfield School Facilities Staff
- Project Administration Support

In addition to leading the Town's participation in the Green Community program, HEAC has served as a resource for a number of studies and projects to help Harvard reduce energy use and save money:

- Investigate biomass & ground-sourced heat-pump systems for town/school buildings
- Investigate feasibility of and assisting in the coordination of upgrades to Bromfield boilers to allow the use natural gas as well as oil
- Investigate feasibility of upgrading electrical service to Bare Hill Pond pumps for energy conservation when not in use
- Investigate feasibility of upgrading streetlights to LED fixtures
- Investigate feasibility of deep-energy retrofits at Bromfield House, the Old Library, and the Old Town Hall
- Investigate feasibility of weatherization and thermal envelope enhancements at Still River Fire Station, Cemetery building, DPW building, Old Library, Bromfield House, etc.
- Investigate feasibility of town-owned Battery-Electric/Plug-In Electric/Hybrid vehicle(s) & charging station(s)
- Investigate snow-removal & street cleaning route planning
- Qualification and administrative assistance for Solarize Mass campaign in Harvard
- Qualification and administrative assistance for US-DOE Rooftop Solar Challenge grant
- Work with school/town officials and vendors to formulate proposals for PV solar systems on Bromfield School
- Manage the Town's Clean Energy Choice Funds and oversee the installation of 5kW solar PV array and DAS at Hildreth Elementary School
- Work with Bromfield students on specific energy/efficiency projects
  - temperature/comfort surveys in Bromfield school
  - water-saving fixtures in town buildings
  - off-grid solar at McCurdy Track fieldhouse (in process)
- Public forums on residential energy efficiency
- Participate in Town Hall and Hildreth House building/improvement committees
- Advise DPW staff on energy-saving roof/envelope enhancements
- Advise on and support municipal electricity procurement (RFPs, contracts)

### 3. Results

The initial gains from Harvard's participation in the Green Communities program have been important, allowing the Energy Advisory Committee to:

- ✓ *gain an understanding of our significant energy costs and usage across town/school buildings*
- ✓ *access 5 years of energy use/cost data for town buildings and other energy consumption centers (e.g. vehicles)*
- ✓ *propose and execute projects aimed at reducing energy usage by 20% over 5 years*
- ✓ *put in place a multi-phase process of gathering detailed (per-room or system) environmental and usage data to support in-depth analysis and understanding of energy use in our school buildings - which comprise over half the town's energy consumption, to be followed by a process of identifying components for retrofit / upgrade / replacement.*

As a result of these and other efforts, energy consumption in the first several years decreased dramatically, falling by nearly 30% at one point. However, consumption over the last three years has rebounded starting in FY 2013, although it is still down 8.5% from the baseline year. This highlights the importance of the efforts mentioned above to more closely monitor usage in the schools, where the bulk of the Town's energy is consumed.

#### **4. Critical Review of HEAC and Town Energy-Related Efforts**

While benefits resulting from cost and emissions reductions are enjoyed (albeit indirectly) by all Harvard residents, the efforts to gain them and the knowledge accrued has largely been localized in the Energy Advisory Committee, without significant public participation by town or school staff, elected or appointed officials, or other committees. A dedicated energy committee undoubtedly helps to drive initiatives, but it has shifted discussion and planning away from the many committees and offices where it should be taking place if Harvard is to really take its Green Community status to heart and work systematically to reduce energy consumption.

Overall, the projects and initiatives listed above have helped HEAC to understand potential opportunities for energy efficiency and to reduce energy usage and costs, with reduced greenhouse gas (GHG) emissions as an accompanying benefit. HEAC continues to identify areas where effort is necessary to achieve these goals; however, aside from the goal of lowering costs and where deemed economical within a constrained timeframe, reducing energy consumption, Harvard does not yet have a strategic plan or policy aiming the Town towards sustainable buildings, emission-reduction targets, pathways for transitioning from fossil fuels to renewable energy sources, enhanced resiliency, or other similar programs and policies that recognize and prepare for impending energy and climate-related challenges. These kinds of efforts have so far been outside the charge of the committee, and may well be tasks for an adjunct but separate "Sustainability Commission" or committee, working in cooperation with HEAC, town officials, residents, businesses, and organizations.

#### **5. Potential Future Directions**

HEAC believes that beyond our past and presently planned work, a number of other studies and initiatives could yield benefits for the town:

- Understanding and ultimately maximizing the opportunities presented by Devens Disposition, including a municipal electric utility, expanded water district, potential tax revenues, housing, etc.
- Understanding the energy and environmental impacts of traffic and access patterns around schools, commercial areas, and commuting routes, and reviewing ways to create safer pedestrian pathways to ease traffic and parking pressures, reduce vehicular emissions, and improve public health.
- Understanding the energy-related aspects of town landscapes and infrastructure: DPW facilities, transfer station, town sewer/water distribution systems, Pond systems and related infrastructure, Park & Rec fields, open space, etc.
- Potentially expanding HEAC's portfolio beyond the purely municipal would allow it to address residential energy efficiency issues, such as:
  - Residential Heating/Cooling System Efficiency
  - Home Appliance and Lighting Efficiency
  - Weatherization and Thermal Envelope Enhancements

Most of the above initiatives have both energy and sustainability components, i.e. taking into

consideration whether existing or new procedures and behaviors can continue into the future or must change in order to be efficient, economical, and environmentally safe and sound. Just as the global community has recently come together in Paris and recognized that energy and economic systems must change in order to ensure a viable future, Harvard's energy sourcing and usage can no longer be viewed only through a cost lens.

### **6. Issues for Discussion**

HEAC proposes the following as significant issues & questions to be raised and discussed as part of planning for a sustainable energy future for Harvard:

- Should Harvard have an overall Energy Policy that reflects new global awareness and commitments to reduce GHG emissions and transition to sustainable energy sources? (*For example, currently our municipal energy procurement contracts remain cost-driven decisions; should we instead endeavor to use renewable energy where feasible?*)
- How can energy savings and reduced GHG emissions become part of operational practices vs. one-time initiatives?
- Many town buildings are old and require better maintenance or enhancement to improve efficiency; should the ongoing operation and maintenance procedures incorporate sustainable practices?
- For new construction and building retrofits/upgrades, should we endeavor to lock in higher efficiency and longer-term cost-savings through better insulation and higher-cost and higher-quality components, vs. compromising future gains by minimizing upfront investment?

Recognizing that some aspects of energy use are dictated by behavior, and some are structural or systems-related, the following suggestions for potential changes or areas of study are divided into two categories.

#### **HEAC Suggestions – Behavior/Policy Related**

- Make energy a line-item on departmental budgets, with goals for reduction set on a 5-year basis.
- Identify clear lines of responsibility among building/facilities managers & town staff for energy reduction and guideline/policy enforcement. Make "Building Administrator" a formal part of title or job description.
- Alternatively, create a funded energy-manager position on town staff to serve the town/school buildings, with designated responsibilities for energy-use awareness and reduction efforts.
- Monitoring is key: Building Administrators (or Energy Manager) required to track and report quarterly on energy-use, with unexplained or systemic increases triggering closer monitoring with HEAC assistance as necessary.
- Establish "continuous commissioning" and preventive maintenance practices vs. reactive repairs.

#### **HEAC Suggestions – Structural/Systems Related**

Harvard's existing natural systems and built infrastructure must be characterized and analyzed from an energy and resources perspective, in order to formulate a more comprehensive long-term energy and sustainability plan. So far HEAC has begun to characterize and analyze town and school buildings, but other areas could be better understood, such as:

- Electrical grid and gas pipeline topology, proximity of feeder lines, off-takers, and juxtaposition of Devens and other municipal utility infrastructure. Understanding these components may assist the Town in future disaster resiliency initiatives, such as the establishment of off-grid-capable emergency response facilities able to be powered with a combination of renewable energy and battery storage.
- Bare Hill Pond and watershed dynamics
- Proximity of DPW facilities to major work/activity areas, maximize efficiency of coverage and routes for plows, sanders, sweeps, pickups
- Transfer station usage, systems and operational practices, vendor policies and practices
- Town sewer/water topology and usage patterns
- School and town-center traffic patterns