CAPE COD COMMISSION

Joint Base Cape Cod 2013 Joint Land Use Study Update and Community – Military Partnerships Study Final Report

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Prepared by
Cape Cod Commission
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List of Acronyms

AICUZ – Air Installation Compatible Use Zones
AFCEC – Air Force Civil Engineering Center
ANG – Air National Guard
APZ – Accident Potential Zones
BRAC – Base Realignment and Closure
CCETP – Cape Cod Emergency Traffic Plan
CWMP – Comprehensive Wastewater Management Plan
CZ – Crash Zones
DoD – Department of Defense
EMC – Environmental Management Commission
FAA – Federal Aviation Administration
IMA – Inter – Municipal Agreement
IW – Intelligence Wing
JBCC – Joint Base Cape Cod
JLUS – Joint Land Use Study
JOG – Joint Oversight Group
kVA – Kilo Volt Amperes
LCP – Local Comprehensive Plan
MA – Massachusetts
MAANG – Massachusetts Air National Guard
MAARNG – Massachusetts Army National Guard
MassDEP – Massachusetts Department of Environmental Protection
MassDOT – Massachusetts Department of Transportation
MC3 – Military Civilian Community Council
MSW – Municipal Solid Waste
MW – Megawatt
PAVE PAWS - Precision Avionics Vectoring Equipment *P*hased *A*rray *W*arning *S*ystem
SAR – Search and Rescue
SEMASS – Southeastern Massachusetts Southeastern Massachusetts Resource Recovery Facility
UCRTS – Upper Cape Regional Transfer Station
WWTP – Wastewater Treatment Plant

Joint Base Cape Cod (JBCC)

Joint Land Use Study (JLUS) Update and Community – Military Partnerships Study Final Report

Executive Summary

In 2005, the Cape Cod Commission, through a grant provided by the U.S. Department of Defense Office of Economic Adjustment (OEA), prepared a Joint Land Use Study (JLUS) for the Massachusetts Military Reservation (hereinafter referred to as Joint Base Cape Cod (JBCC)) and the four Upper Cape towns of Bourne, Falmouth, Sandwich, and Mashpee. Many of the recommendations for strategies to address development that present a likely or existing challenge to military operations were adopted from this report. However, both as the character of development surrounding JBCC as well as the military missions it hosts changed, the Department of the Army determined that a second look at the dynamic between military and civilian activities on and surrounding the JBCC was in order.

In May 2011, the Army nominated once again the JBCC for a Joint Land Use Study (JLUS) program, and OEA began working again with the Cape Cod Commission to respond to the nomination. Factors prompting the Army's re-nomination of JBCC for a JLUS were changes to missions on the installation due to the 2005 Base Realignment and Closure (BRAC) round; an increase in the training population using JBCC's ranges; and concern about the compatibility of future civilian land uses surrounding JBCC.

An assessment completed by OEA evaluating the Army's nomination found sufficient evidence to conclude that encroachment of the civilian community is likely to impair the continued operational utility of the JBCC. The following specific encroachment concerns were assessed:

- Significant changes in mission and associated land use in part due to the passage in 2005 of the Base Realignment and Closure law (BRAC), including an increased training population and concerns about potential impacts on surrounding communities;

- Potential encroachment/land use conflicts on MAARNG and MAANG operations arising from existing or proposed development surrounding JBCC;
- Continued concern by military officials about unauthorized access to the JBCC training area by civilians for hunting, dumping, or other activities;
- The need for a more coherent and robust communication and coordination strategy/tool between tenants on the JBCC and surrounding communities;
- The need for development of policy and procedures concerning potential alternative energy development, both on- and off-base (and cognizant of published DoD alternative energy siting standards);
- Mutual interest between the JBCC and surrounding communities to investigate opportunities for shared utility service delivery to reduce costs and manage community growth through development of inter-governmental agreements.

OEA approved a grant request from the Cape Cod Commission in July 2012 to coordinate and complete the JLUS update.

JLUS UPDATE FINDINGS

Of the seven impact areas identified in the 2005 JLUS, this update determined that five of those impact areas continue to pose a likely future or existing challenge to JBCC mission sustainability. Those areas (based on the prior 2005 JLUS classifications) are: Land Use Restriction & Acquisition, Water Supply & Wastewater Infrastructure, Transportation, Communication, and Air Safety & Noise.

In the course of updating the 2005 JLUS analysis, this update has reclassified those prior impact area classifications based on a more holistic assessment of likely future and existing challenges to JBCC mission sustainability. This reclassification process yields the assessment that encroachment challenges remain in three impact areas:

1. Land Use
2. Adequacy of Public Facilities
3. Communication & Coordination

LAND USE

Due both to the increase in JBCC usage (specifically caused by an increase in the use of the Camp Edwards range) and the pace of residential, industrial and commercial development outside of the JBCC fence, there remains concern about the likelihood that future development may be incompatible either with current or possible future JBCC missions. A key recommendation from the 2005 JLUS was for a more defined and structured process whereby future development proposals are made available and reviewed by JBCC leadership prior to permitting by local jurisdictions. The need for this process and review is determined still to be a short-term, critical recommendation.

In addition to the recommendation for a more structured process for and review of future development, this JLUS update identifies two other related land use issues: the siting of alternative energy developments and the 2005 JLUS recommendation concerning fee simple or development right acquisition of parcels adjacent to specific JBCC areas, such as those proximate to the JBCC small arms ranges or developable land within the JBCC's AICUZ noise contours.

ADEQUACY OF PUBLIC FACILITIES

The linkage between the capacity of existing infrastructure ("public facilities"), its use by civilian and military parties, and the potential for incompatible future development is a direct if not subtle one. Examples of public facilities include water and wastewater treatment infrastructure, road and other transportation networks, energy generation and distribution, solid waste collection and disposal and many other both hard and soft infrastructure. Investments in future public facilities have the potential to guide future residential industrial and commercial development. Likewise with land use, a more structured process and review between military and civilian entities regarding those decisions presents an opportunity to ensure future military-civilian compatibility.

This JLUS update specifically recommends further assessment of this linkage in the areas of wastewater collection and treatment, solid waste, and renewable energy.

JLUS UPDATE STUDY AREA

At the initial kickoff meeting for the JLUS update in July 2013, the Policy Committee agreed that the study area identified for the 2005 JLUS, defined by noise contours, air safety zones and major roadways

surrounding the base continued to be an appropriate study area for the JLUS update and would allow a comparison of land use changes since the 2005 JLUS was completed.

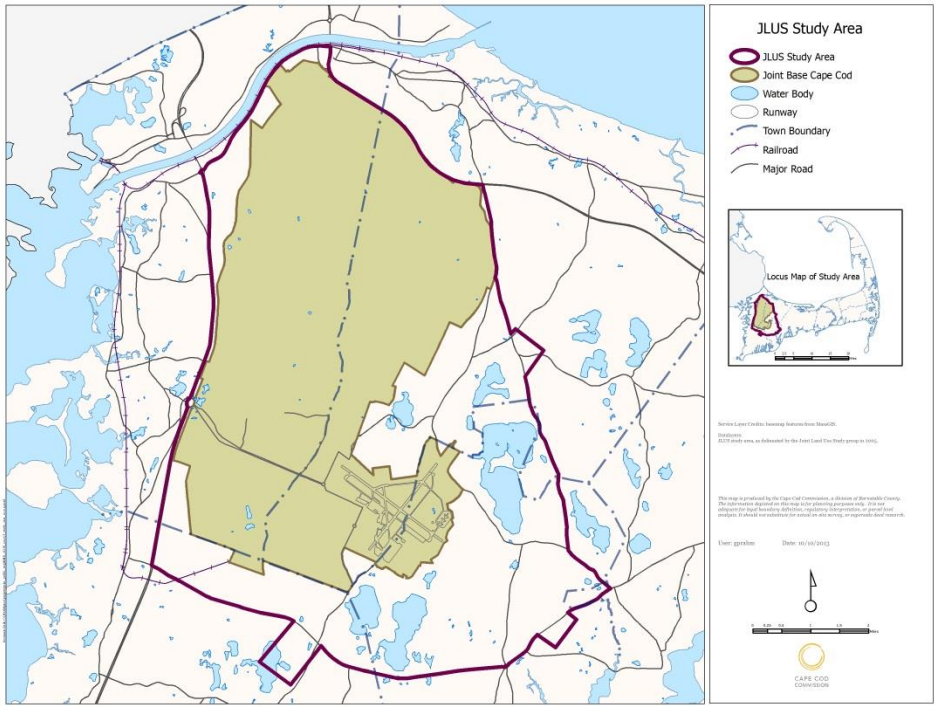


Fig. 1 - JLUS Study Area

2005 JLUS STUDY IMPLEMENTATION EFFORTS

Recommendations from the 2005 JLUS were grouped into seven categories;

1. Land Use Restriction & Acquisition (including affordable housing Chapter 40B residential development),
2. Water Supply & Wastewater Infrastructure,
3. Transportation,
4. Personal Wireless Communication Facilities,
5. Communication,
6. Base Access, and
7. Air Safety & Noise.

The following table summarizes the recommendations and their status. Additional information on each recommendation can be found in the full report.

Table 1 – 2005 MMR JLUS Recommendations - Status Summary				
Recommendation		**Priority**	**Implementation Status**	**Entity Responsible**
General Recommendations				
Land Use Restrictions/Acquisition				
1)	Local officials, Cape Cod Commission staff, and military officials should approach state housing agencies involved with M.G.L. Chapter 40B development regarding development restrictions in Otis Air National Guard safety zones and noise contours. Encourage state officials to consider application of restrictions to airfields statewide.	Medium	No changes to M.G.L. have been approved; CCC staff continues to monitor and comment on affordable housing developments proposed within air safety zones and noise contours to local boards	Towns, CCC, Military
2)	The Air Force should consider establishing a compatible-use buffer program for lands adjacent to the Otis Air National Guard Base, similar to the Army's program established in 2002 under 10 U.S.C. 2684a. Under applicable programs, priorities for acquisitions should be vacant lands within airfield safety zones and within areas of high airfield noise identified on the Otis Air Installation Compatible Use Zone	High	No action	U.S. Air Force

	study. Some land areas that correspond with the priorities include remaining developable land within the boundaries of the Mashpee National Wildlife Refuge that immediately abut base boundaries.			
3)	State agencies, the four Upper Cape Towns, and military officials should explore all available options for acquisition of properties that could have significant encroachment potential through fee-simple purchase, purchase of development rights, or restrictive use easements.	High	Mashpee: Pickerel Cove Recreation Area (former Camp Vinhaven) bought by Town. 11 acre property on Lovell's lane bought by Orenda Wildlife Trust with state funds from base settlement.	State conservation agencies, Towns, Military
4)	As recommended by Air Force policy (Air Force Instruction 32-7063 Air Installation Compatible Use Zone Program), the Air Force should acquire or seek restrictive use easements for vacant land or properties within the CZ in the towns of Mashpee and Sandwich, and consider acquisitions for land or properties within the APZ1 or noise contours greater than 70-75 dB Ldn.	High	No action	U.S. Air Force
Water Supply & Wastewater Infrastructure				
1)	Explore available options to develop additional water supply capacity to	High	Bourne added a new well on JBCC as mitigation for	

	supplement the Upper Cape Regional Water Supply Cooperative, including acquisition of undeveloped properties with water supply potential.		landfill plume	
2)	Taking into account future growth needs of the Air National Guard at Otis, the 102nd Fighter Wing and interested Upper cape municipalities should explore the feasibility of expanding capacity at the MMR's wastewater treatment facility to improve water quality within the MMR JLUS study area, including establishment of a quasi-public state entity.	High	Study by CH2MHill underway. Town CWMPs (Falmouth, Sandwich and Mashpee have identified MMR as a potential alternative wastewater treatment and disposal site	102nd IW, Towns
3)	To protect existing water quality for MMR users and the Upper Cape towns, environmental review of the Camp Edwards Site Consolidation Plan (which includes the Northeast Regional Center for Homeland Security) should address the following: update the Zone II areas for the Upper Cape Regional Water Supply Cooperative and consider alternatives to development in Zone II areas; contain a detailed description of threats to drinking water from proposed uses; describe emergency response, spill prevention, and mitigation strategies to protect water quality; and incorporate low-impact development strategies.	High	The Sagamore Lens Capacity study is underway with Sandwich the lead town from the UCWSC. The study is evaluating the sustainability of the Sagamore Lens for water supply. It is funded through the Textron NRDA	

4)	Future uses on JBCC should be connected to the 102nd's wastewater treatment facility.	High	New proposed JBCC uses to be evaluated for connection to the wastewater facility	102nd Intelligence Wing
Transportation Infrastructure				
1)	Base activities should be scheduled to avoid travel through access/egress points during peak periods of adjacent street traffic.	Ongoing	Standard practice for Camp Edwards training events	MAARNG
2)	Any new uses within the MMR or the JLUS study area that will result in a net increase in traffic should be offset by either purchase of vacant developable land within the study area (preferably residential land), or elimination of an existing use generating the same amount of traffic.	Low	Optional mitigation strategy for Developments of Regional Impact; not implemented for base activities	Towns, CCC, Military
Personal Wireless Communications Facilities				
1)	The towns of Mashpee, Sandwich, Falmouth, and Bourne should consider acting to protect navigable air space by requiring FAA Determinations of No-Hazard or evidence of exemption from the determination process for all new structures greater than 20 feet in height throughout their communities. To assist in this	Medium	Mashpee adopted FAA No-Hazard Determination requirement for structures over 40 feet in October 2006	Towns

	determination, an information worksheet should be developed for distribution by the building inspector's offices. Sample worksheets developed for Falmouth Airpark and Otis Air National Guard Base are included in Appendix 7			
2)	To provide a higher degree of safety and path predictability to U.S. Coast Guard and Army National Guard helicopter pilots to deviate from normal operational altitudes in emergencies during hostile weather, the towns of Mashpee, Sandwich, Falmouth, and Bourne should establish a 3,000-foot wide Search and Rescue ("SAR") Corridor District for the following roadways: Route 130 north of Runway 05; Sandwich Road, John Parker Road, and Shorewood Drive south of Runway 23; Route 28 south of the Otis Rotary Within these corridors, there should be an absolute height limit for all structures, including wireless communications facilities and wind turbines of 100 feet above ground, even if FAA says a greater height is not hazardous. Structures in this	High	Falmouth completed; No need to adopt in Mashpee as only 1 residential lot in SAR Corridor, with height limit of 35 ft for structures and 45 ft for cell towers. Town of Bourne adopted height restrictions on Route 28 in 2011. There has been no action by the town of Sandwich to adopt the SAR overlay district.	Towns

	district that exceed 60 feet in height should be required to be marked with a traditional red obstruction light, unless waived for good reason by the permit granting authority			
3)	Height limits established through local bylaws for all uses, including wireless, amateur, or other radio services, should be reviewed to ensure consistency with the new height regulations established for the SAR Corridor District	High	Falmouth & Mashpee completed	Towns
Communication				
1)	The four towns should provide an opportunity for military officials to comment on proposed zoning changes within the Accident Potential Zones or noise contours for Otis Air National Guard Base	Medium	Mashpee: None have occurred since 2005	Towns/Military
2)	The four towns and the Cape Cod Commission should provide a mechanism for military officials to comment on proposed development projects within the JLUS study area, even when the military is not a direct abutter to the project.	Medium	No action taken	Towns/CCC

3)	Mashpee town officials should encourage ongoing communication between military officials and Mashpee National Wildlife Refuge partners to ensure that any fencing associated with runway lighting maintains emergency access to MNWR lands.	Low	Not necessary to date, but Mashpee National Wildlife Refuge partners would welcome participation from JBCC , which owns land within the Refuge	Mashpee Town Planner
4)	Each community and the military should develop and maintain a JLUS link on its public web site that provides residents, developers, and businesses with information about military operations and an opportunity to comment about JLUS implementation efforts and any additional local measures to promote land-use compatibility around the MMR.	Medium	CCC webpage developed; MMR.org established with link to CCC JLUS	CCC; Town Planners/JBCC personnel
Base Access				
1)	The four Upper Cape towns should encourage implementation of the Army National Guard Base Consolidation Plan, which will reduce the impact of military training on surrounding land use, particularly the proposal to relocate the Sandwich gate farther into the base to better buffer adjacent residential	Low	No action taken	Towns/MAANG

	properties and improve base security. Preparation of a similar plan for Otis Air National Guard Base should be considered by the Air National Guard.			
2)	Military officials should continue to work with the Environmental Officer established through the Upper Cape Water Supply Reserve, local police departments, and the Massachusetts Environmental Police to address trespassing and illegal dumping activities to the MMR.	Medium	Based on anecdotal information, illegal dumping has decreased	JBCC Environmental Officer
Air Safety & Noise				
1)	Noise contours should be incorporated into the zoning bylaws for all four towns or an overlay district should be considered to restrict development in noise-sensitive areas.	Low	No action taken due to BRAC realignment	Towns
2)	Local officials for the four Upper Cape towns should adopt and enact local policies to promote disclosure of safety and noise hazards, including the recording of disclosure documents prior to land transactions and development or sale of property.	Low	No action taken due to BRAC realignment	Towns

3)	The four Upper Cape communities should develop sound-attenuation standards for new construction and retrofitting of existing buildings for those uses above the 65 dB Ldn noise contours based on U.S. Department of Housing and Urban Development (HUD) standards.	Low	No action taken due to BRAC realignment	Town Planners
4)	The four Upper Cape communities should pursue uniform building code modifications to mitigate noise for new structures built in high-noise areas.	Low	No action taken as State controls building code	Town Planners
5)	Land-use and build-out data provided in this MMR JLUS should be revised to reflect new Accident Potential Zones/noise contours when available.	Low	Not applicable; 2005 AICUZ still in effect	
Town-by-Town Recommendations				
Mashpee & Falmouth				
1)	Existing Accident Prevention Zone bylaws in the towns of Mashpee and Falmouth should incorporate Accident Potential Zones from the new AICUZ study when available.	Low	Not applicable; 2005 AICUZ still in effect	JBCC/Towns of Mashpee & Falmouth
Mashpee & Sandwich				

1)	The towns of Mashpee and Sandwich should explore the feasibility of crafting a local bylaw mandating cluster for developable residential land within the safety zones or noise contours to avoid these areas.	Low	Mashpee has adopted mandatory cluster throughout the town, though it doesn't reference safety or noise zones	Towns of Mashpee & Sandwich
2)	The towns of Mashpee and Sandwich should reconsider planned-production affordable housing sites within the APZ1 and APZ2 or noise contours, unless density is restricted to one or two units/acre or development is clustered to avoid these areas.	Medium	Mashpee; will be done as sites are reviewed for affordable housing use	Towns of Mashpee & Sandwich
Bourne				
1)	The town of Bourne's general bylaw should be amended to eliminate the Airport Approach Protection bylaw for Otis Air Force Base as the APZs for Bourne fall entirely within the boundaries of the MMR.	Low	Completed	Town of Bourne
Mashpee				
1)	The town of Mashpee should restrict use of vacant municipal property within the CZ to avoid residential uses, schools, hospitals/nursing homes, places of	Medium	No action taken	Town of Mashpee

	assembly, or commercial use.			
2)	The town of Mashpee's Accident Prevention Zone bylaw should be amended to exclude the NSTAR easement from the wireless overlay district, where wireless communications facilities up to 200 feet in height are allowed.	Low	Completed, October 2006	Town of Mashpee
Sandwich				
1)	The town of Sandwich should eliminate the Airport Approach Protection bylaw in the town's general bylaws and include an Accident Prevention Zone district into the town's zoning bylaws. At a minimum, this bylaw should be based on the town of Falmouth's or Mashpee's APZ bylaw, which restricts schools, hospitals, multi-family or public housing, or places of assembly with a height limit of 35 feet	Low	No action taken	Town of Sandwich
2)	The town of Sandwich should consider a zoning amendment to discourage conversion of recreational properties to residential use within the APZ2 or to prevent intensification of recreational uses,	Medium	No action taken	Town of Sandwich

	and should explore the feasibility of acquiring fee ownership or development rights on these properties to avoid incompatible uses.			
3)	To reduce conflicts with residential uses on Snake Pond Road, access at the Sandwich gate to the MMR should be restricted to regular employees of the base only and access to visitors and commercial traffic should be prohibited. Working with the MMR Environmental Management Commission to ensure protection of the MMR Upper Cape Water Supply Reserve, military officials and the town of Sandwich should also explore the feasibility and costs to the town, state, and the military associated with relocating the Sandwich gate to a less residential location along existing paved roadways, including the potential for upgrading the intersection and signal at the Sandwich Industrial Park (Jan Sebastian Drive) and Route 130 from a three-way to a four-way intersection.	Sandwich gate restrictions: High Relocation of Sandwich gate: Low	Traffic policy in place restricting visitor and commercial traffic through the Sandwich gate. The road network system is being studied to determined changes needed to accommodate new traffic patterns prior to decommissioning the current Sandwich gate.	Town of Sandwich /Army National Guard

4)	The town of Sandwich should review the Wireless Telecommunications Overlay District Plan document to eliminate any lots that are located within the proposed SAR Corridor Overlay District.	Medium	No action taken	Town of Sandwich

2013 JLUS UPDATE OBJECTIVES

The objectives of the 2013 JLUS update are as follows:

- Analyze land use changes since the 2005 JLUS was completed;
- Assess the impacts of these changes on current and future military operations;
- Assess the effectiveness of communication protocols and policies between JBCC and surrounding communities concerning proposed development projects, encroachment issues, and base access;
- Re-examine the capacity of existing infrastructure and future needs of both military and surrounding communities;
- Explore the potential for shared infrastructure and services between the military and surrounding communities to reduce costs and create efficiencies of scale;
- Recommend measures to reduce potential land use conflicts and next steps in creating opportunities for community – military partnerships.

JLUS UPDATE STUDY APPROACH

The JLUS update included a review of recent military master plans and planning documents for the surrounding communities to provide context for the study. Commission staff used Geographic Information Systems (GIS) to update maps displaying potential areas for commercial and residential development, affordable housing developments, proposed renewable energy projects, and protected open space within the study area. These maps were later used in completing an analysis of the 2005 JLUS study recommendations and potential land use conflicts for the 2013 update.

Commission staff gathered current information on community – military partnerships, base redevelopment, and alternative energy opportunities, including existing legislation and shared service agreements and attended 2012 Association of Defense Communities conference and through on-line research. This research effort resulted in a report on community – military partnerships that can be found in Appendix 3.

GIS mapping and staff review of existing traffic studies, wastewater and water supply reports were used to update the infrastructure capacity

analysis for wastewater and water supply, solid waste, and transportation infrastructure at key intersections within the study area.

The JBCC Military Civilian Community Council (MC3), which consists of representatives from the four Upper Cape towns, the Association to Preserve Cape Cod, the Cape Cod Commission, and base commanders from the Massachusetts Air National Guard (MAANG) 102nd Intelligence Wing, Massachusetts Army National Guard (MAARNG) and U.S. Coast Guard, served as the Policy Committee for the 2012 JLUS update. The Technical Advisory Committee, consisting of the four town planners and representatives from the 3 base commands, provided technical support and assistance as needed throughout the update process.

DEVELOPMENT ACTIVITY SINCE 2005

Since the 2005 JLUS, a number of development projects have been permitted or constructed within the study area. These projects include redevelopment, expansion, and new development. Significant projects identified by Commission staff since completion of the 2005 JLUS are presented in the following table:

Table 2 – Development in JBCC JLUS Study Area 2005 – 2012

Development Type	Description	Type	Size/Units	Town	Location
Expanded Development	Southport Expansion	Residential	n/a	Mashpee	Off of Old Barnstable Rd
Expanded Development	Upper Cape Tech Expansion	Institutional	n/a	Bourne	Upper Cape Tech Campus
Expanded Development	Schooner's Pass Subdivision Buildout	Residential	n/a	Bourne	Off of Sandwich Rd
New Development	Attaquin Acres Nursery	Commercial	n/a	Mashpee	28 Great Neck Rd
New Development	New Subdivision (Osprey Drive)	Residential	49 units	Barnstable	Noisy Hole Rd @ Rte 28
New Development	Brightside Lane	Chapter 40B Residential	40 units, 10 affordable	Sandwich	Off of Rte 130

New Development	Bank (Rockland Trust)	Commercial	3,500 SF	Sandwich	333 Cotuit Rd
Redevelopment	Market Basket Plaza	Commercial	101,600 SF	Bourne	Mid Cape Connector
New Development (proposed)	Quashnet Valley Country Club	Residential	64 units	Mashpee	Payamps Rd.
New Development (proposed)	Wampanoag Tribe	Residential	52 units	Mashpee	Meetinghouse Rd.
New Development	Baptist Church	Institutional	40,000 SF	Falmouth	Currier Rd @ Rt 151
New Development	New Subdivision (Cotuit Meadows)	Residential	124 ownership units, 31 affordable	Barnstable	Falmouth Road
New Development	Ashers Path senior housing-single building	Residential	56 affordable age-restricted	Mashpee	Carleton Circle
New Development	Canalside Commons	Commercial & 40B residential	85,000 s.f. commercial, 300 condominium units, 25% affordable	Bourne	MacArthur Boulevard/Sandwich Road
New Development	Annie's Pasture	40B residential	20 units, 5 affordable	Sandwich	Route 130
New Development	Habitat for Humanity	Residential	2 affordable s.f. homes	Mashpee	Fox Hill and Lakewood Roads

UPDATED BUILDOUT ANALYSIS

The 2005 JLUS completed a parcel-level buildout analysis with adjustments on a town-wide basis after discussion with the town planners in each surrounding community.

For the JLUS update, staff updated the buildout analysis within the JLUS study area using methodology completed for the 2012 Cape Cod Regional

Wastewater Management Plan. This analysis identified development potential in surrounding residential, commercial, and industrial zoning districts based on state zoning designations. Based on this methodology, the following is the residential and commercial development potential under existing zoning:

Table 3 – Development Potential under Existing Zoning

Town	Commercial Square Ft	Dwelling Units
Bourne	1,096,357	41
Falmouth	85,018	169
Mashpee	1,902,625	495
Sandwich	763,000	546

The updated buildout analysis indicates significant commercial development potential within the study area under existing zoning, particularly in the towns of Mashpee and Bourne. It should be noted that the commercial buildout does not differentiate between retail and industrial uses.

Residential development potential within the study area is also significant with potential to develop an additional 1,250 dwelling units.

Considering the limited size of the study area, the towns and the base should continue to pursue land acquisition/restrictions within the study area to reduce the impacts of commercial development on the surrounding transportation network, and to reduce conflicts between abutting uses and military operations and training.

UPDATED INFRASTRUCTURE CAPACITY ANALYSIS

TRANSPORTATION

Regional Roadways and Intersections

The regional roadway network surrounding JBCC includes the following roadways (starting at the Bourne Bridge and moving clockwise):

Sandwich Road, Route 6, Route 130, Great Neck Road, Route 151, and Route 28.
Three gates provide access to JBCC from the regional roadway network:

- Main Entrance: from Route 28 via Connery Avenue / the Otis Rotary
- Sandwich Gate: from Route 130 via Snake Pond Road
- Falmouth Gate: from Route 151 via Sandwich Road

Consistent with the July 2012 Scope of Work for the JLUS update, the transportation analysis was limited to a review of traffic operations and safety at the locations where the base access/egress intersects with the regional road system. This included the Otis Rotary, the intersection of Route 151 at Sandwich Road, and the intersection of Route 130 at Snake Pond Road. Of the three locations studied, the existing transportation infrastructure at the Otis Rotary poses the greatest future risk to JBCC operations. The high number of crashes, particularly injury crashes, at this location is of great concern and warrants short-term actions as well as consideration of long-term improvements.

Otis Rotary

According to Massachusetts Department of Transportation motor vehicle crash records, over the most recent 5 years on record (2006-2010) there have been 155 reported crashes including 1 fatal crash and 42 injury crashes at the Otis Rotary. Alternative configurations to the rotary to improve safety are proposed, with short-term improvements identified.

Table 4 – Summary of Otis Rotary Alternatives

Alternative	Relative Cost	Congestion Relief	Safety Improvement	Environmental/ ROW
Restriping	Low	Minimal	Minimal	None
Roundabout	Medium	Medium	Medium	Low
Signalized Intersection	Medium	Minimal	Minimal	Low
Diamond Interchange	High	High	High	Medium

The restriping alternative is low cost and its implementation should be considered in the short term. Providing lane designation and channelization through restriping and additional signage would help improve safety at this location while long term solutions are considered.

Route 151 at Sandwich Road and Route 130 at Snake Pond Road

Both of these intersections provide access between JBCC and the regional roadway network and also serve other regional and local traffic. Recent

signal upgrades have improved safety and operations at these intersections, however both are still considered high-crash locations.

Given the crash history at these intersections conducting Road Safety Audits should be considered to identify potential countermeasures that could be implemented to improve safety. The need is particularly pressing at the intersection of Route 151 at Sandwich Road given the fatal crash and high number of injury crashes.

Other Considerations

Accessing JBCC through the Sandwich Gate requires travel along Snake Pond Road. While this road is functionally classified as a regional road, the dense residential development along it gives the road a more local/residential feel. Use of the road as an entrance to JBCC is somewhat incompatible with this adjacent land use. A recommendation of this JLUS update is for the MAARNG to consider possible relocation of the Sandwich Gate in future planning to avoid this conflict.

WASTEWATER

Commission staff evaluated the potential for expanded JBCC-based wastewater treatment and disposal infrastructure to accommodate existing and future needs of the towns based in part on information contained in *Appraisal Consulting Services for the Wastewater Treatment System at the MMR* completed in December 2012 by CH2MHill for MassDevelopment. Additional information was obtained from Comprehensive Wastewater Management Plans (CWMP) either completed or currently in process by the four Upper Cape towns.

The JBCC wastewater system consists of the following:

Collection & Conveyance Conduits:	161,000 linear feet (lf)
Manholes:	595
Pump Stations:	11
Wastewater Treatment Plant:	360,000 gpd permitted capacity
12” Treated Effluent Force Main:	55,280 lf
Rapid Infiltration Disposal Beds:	4 cells; 6 acres
Composting Facilities:	25,290 square feet (ft2)
Monitoring Wells:	7

The general condition of the wastewater treatment plant was found to be “fair” since it was upgraded in 1996 with a number of part replacements in 2002. The condition of the collection system was “cautious” since it is over 50+ years old and no formal assessments have been completed. A 2001 inflow and infiltration study (I/I) indicated that it was a significant portion of the flow captured by the system.

The study reported that the replacement cost was $44 million, but that the replacement cost less depreciation[1] was $16 million. The existing and projected future flows at JBCC were reported as 140,000 and 147,000 gpd respectively.

The study attempted to gauge the wastewater needs of the surrounding communities. This effort made use of the best available information from the towns to reflect existing and potential wastewater needs. The total existing and future needs were 694,000 and 3,551,900 gpd respectively for treatment and total disposal needs as indicated by the table excerpt from the study.

Table 5 – Summary of Wastewater Treatment and Disposal Needs			
Entity	Near-Term Needs (gpd)	20-Year Needs (gpd)	Requirements
JBCC Users	140,040	147,300	Treatment and Disposal
Town of Falmouth	200,000	200,000	Disposal only
Bourne Landfill	40,000	80,000	Disposal only
Town of Bourne	0	1,836,000	Treatment and Disposal
Town of Sandwich	156,000	630,000	Treatment and Disposal
Town of Mashpee	158,000	658,600	Treatment and Disposal
Total: Treatment and Disposal	**454,040**	**3,271,900**	
Total: Disposal Only	**240,000**	**280,000**	

Table 4 – 1, *Appraisal Consulting Services for the Wastewater Treatment System at the MMR*, prepared for Mass Development, by CH2MHill, December 2012

The CH2MHill study evaluated the transport pipe cost for the towns to hook up to JBCC and expected revenue to be generated based upon an existing cost of $0.018 per gallon for treatment or $0.0053 per gallon for disposal as follows:

	Transport	**Treatment/Disposal**
Falmouth	$9,555,000	$6,889,000
Mashpee	$4,880,000	$9,487,000

[1] The replacement cost is the actual cost of the system while depreciation is the amount of value that was lost in the system over its useful life.

Sandwich $8,001,000 $9,367,000

The CH2MHill study evaluated two alternatives for the base case with no regional services, and two alternatives for either contract operation or sale of the facility, including exclusive service to JBCC tenants and regional service to Towns as follows:

A. Base Case – existing
B. Base Case – Optimize management procedures
C. JBCC Owned under Contract
D JBCC Owned under Contract with Services to the Towns
E. Sale of JBCC Facilities
F. Sale of JBCC Facilities with Services to the Towns

The study did not reach conclusions on a preferred alternative for JBCC and the towns. However, it did include a preliminary ranking of the alternatives that found the regional alternatives D and F as the highest and second highest based upon the highest level of use, access to regional disposal capacity and generation of revenue to fund upgrades and expansion.

The alternative involving a regional wastewater system was discussed at the tabletop exercises held during the JLUS update. Regional wastewater treatment could potentially meet long-term wastewater management needs of the Upper Cape communities and JBCC using the 102nd's treatment plant as the skeleton of an expanded, upgraded regional wastewater system.

A decision by the region or a local community to pursue possible integration with the JBCC's wastewater system has an impact on mission readiness. Specifically, there is a direct link between potential incompatible civilian development and the provision of public and municipal services (including hard infrastructure). A focus of this study effort was to examine the process by which investments in critical municipal services and infrastructure is made and assess whether greater integration of the JBCC in those processes has merit. This focus proceeded based on the understanding that—through dialogue (and potential partnership) between the military services and communities—it may be possible to guide new municipal and installation development to areas that achieve compatibility both for local growth and economic development objectives of the Cape communities as well as for the mission requirements of the military.

WATER SUPPLY

The water supply needs for JBCC and the Upper Cape communities has benefited from Department of Defense investment as mitigation for

previous contamination. As part of the Textron Natural Resources Damages Assessment, the Upper Cape Water Supply Cooperative (UCWSC) was awarded funds to evaluate the capacity and sustainability of the Sagamore Lens. The study, being conducted by Tata and Howard, should be completed in 2014. This study is evaluating tools to identify sustainable water supply sites to meet potential future demands. As previously discussed, the water supply potential of this portion of the Sagamore Lens is significant and will only increase as remediation systems achieve their cleanup goals.

SOLID WASTE

The transfer station has an estimated annual capacity of 40,000 tons. JBCC typically contributes approximately 5.5% of the waste shipped from the transfer facility.[2] Based on MassDEP annual reports for 2008, annual tonnages handled at the UCRTS from the three participating towns total 35,216 tons. The Town of Falmouth's MSW accounts for approximately one-third of the annual tonnage transferred to the UCRTS. Falmouth will be taking solid waste to Bourne at the expiration of the SEMASS contract.

BASE UTILITIES

The 102nd Intelligence Wing is the host for utilities at JBCC. The 102nd owns and maintains the electric distribution system including a 12,500 KVA substation; the water distribution system including a public water supply well; and the sewage collection system including the wastewater treatment plant. The telephone system for all agencies is also maintained by the 102nd Communications Flight. Each utility requires staff and funding to maintain.

Most of the electric distribution system was upgraded in 2001 (and the main transformer again in 2010) which was an upgrade from 5,000 KVA to 7,500 KVA. The system is in good condition and the upgraded substation is at about 60% capacity. This situation provides room for growth for all the agencies at JBCC.[3]

ANALYSIS OF POTENTIAL CONFLICTS

LAND USE

[2] USCG Air Station Cape Cod Master Plan, p. 2-38
[3] Otis Air National Guard General Plan for Space Re-Utilization, p. 10-11

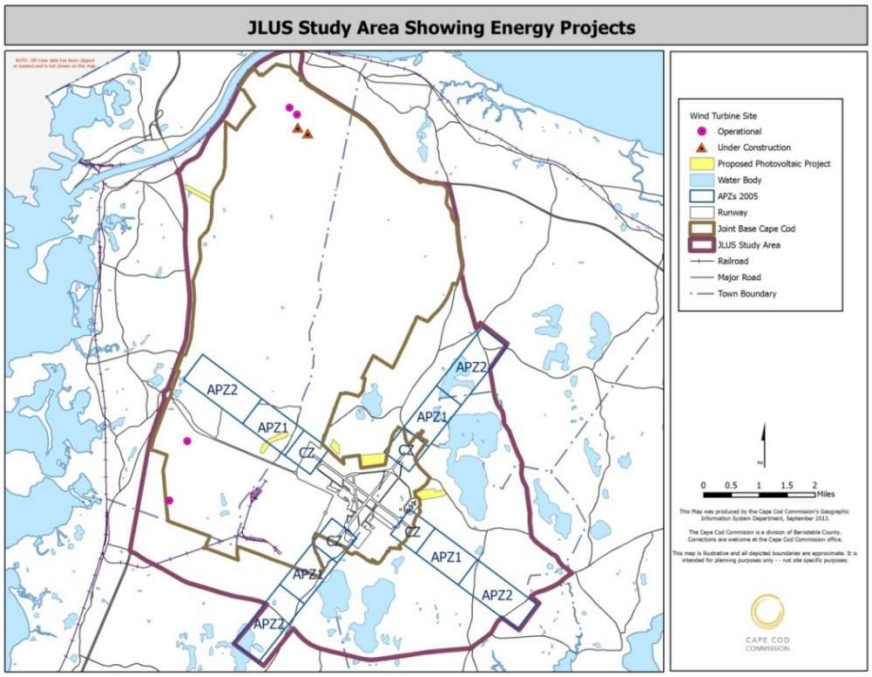
Despite the limited size of the study area and land protection efforts that have taken place since the 2005 JLUS, significant residential and commercial development potential remains within the towns surrounding JBCC. In particular, Chapter 40B residential developments within air safety zones and noise contours are not subject to the same land use controls available to towns under local zoning in Massachusetts. If not properly sited, dense residential development in proximity to JBCC could increase potential encroachment issues for military tenants and noise and public safety issues for residents. Residential and commercial development increases potential transportation and safety impacts on area roadways and adds nitrogen to impacted marine embayments. Therefore, land acquisition, easements or other measures should continue to be pursued by the surrounding communities and the military to reduce potential conflicts between residential uses and military operations and training as well as to reduce the impacts of commercial development on the surrounding transportation network.

RENEWABLE ENERGY DEVELOPMENT

JBCC has considerable interest in developing renewable energy to meet federal goals and mandates for renewable energy generation and to enhance operational efficiencies. In addition to wind energy projects, the JBCC has successfully installed two geothermal energy projects and is pursuing a large-scale solar array located on the capped landfill. In Bourne, a 2 MW array on 25 acres is proposed by a private developer as a community solar garden on property directly abutting the base. In Sandwich, a 16-acre solar array has been permitted as “Greenwood Meadows” on land formerly proposed as a Chapter 40B affordable housing development, directly abutting the base and a second array is proposed nearby. A fourth, 6MW array is proposed on a large parcel of land in Mashpee, also abutting the base.

Because of this high level of interest in renewable energy development and the potential scale of these types of development, coordination is needed both to ensure future alternative energy project development is compatible with JBCC military missions (and in compliance with DOD Clearinghouse protocols) and to protect the sensitive resources on and surrounding the base. A more transparent and coordinated review process will allow these projects to move forward under their own merits while minimizing potential conflicts.

Fig. 2 - JLUS Study Area Showing Renewable Energy Projects



To address potential conflicts surrounding renewable energy projects, the JLUS update facilitated the revival and reformation of a 2008 Alternative and Renewable Energy Policy letter that was developed, at that time, to address wind turbine development on JBCC. This Communication Protocol (see Appendix 1) is a mutually agreed-upon format for communicating renewable energy initiatives in the early planning stages between JBCC and the surrounding communities. This protocol is intended to supplement the Department of Defense Siting Clearinghouse requirements and standards for proposed projects on and surrounding the base.

NOISE

Realignment of the Air National Guard's 102nd Fighter Wing mission has relieved some of the concern relating to aircraft noise issues from the base. However, continued concern over training related noise, such as that from the firing ranges, remains. Expansion of firing ranges in the Reserve could also pose additional noise impacts to surrounding residential uses.

As previously noted, the JBCC's runways continue to provide critical value both in the Commonwealth's and the DoD's operational and training missions in their use as a location to bed down temporarily all types of aircraft; as a divert runway; as part of the newly-approved Northeast UAS

Airspace Integration test area approved by the FAA (as well as for other missions). For these reasons, recommendations pertaining to land use restrictions based on the AICUZ overlay from the 2005 JLUS continue to be appropriate measures to address potential noise impacts into the future.

SECURITY, ACCESS AND COMMUNICATION POLICIES

According to the 2012 State of the Reservation report, violations were reported in the ranges located within the Reserve. Well-established protocols have been in place since 2002 that include notification of local officials and the public in the event a violation as a result of training activity in the northern 15,000-acre reserve.

According to the Executive Officer, illegal dumping activity has decreased since the 2005 JLUS. However, illegal trespassing that includes ATV use continues to be a concern. Since the 2005 JLUS, access to the base by the public for hunting, birding, and other recreational activities has increased. These recreational opportunities provide an avenue for the Guard to increase the awareness by the public and local officials about the sensitivity of the natural resources on the base and could help reduce these encroachment issues.

As discussed in previous sections of this report, additional land within the study area has been developed for residential, commercial, and recreational use since the 2005 JLUS. The establishment of an Executive Director at JBCC provides a single point of contact on JBCC. Staff recommends development of a communication protocol through a Memorandum of Understanding between the towns and JBCC for proposed development to reduce the potential for land use conflicts and encroachment.

REGIONAL EVACUATION/EMERGENCY RESPONSE

The 2012 Cape Cod Emergency Traffic Plan (CCETP) was developed to facilitate the egress of a high volume of traffic from Cape Cod in the event of a hurricane or other potential hazard event, particularly during peak tourist season. The CCETP is not an evacuation plan. Rather, it is a tool that can be used to assist expediting traffic flow. The Plan was developed by the Massachusetts State Police and Massachusetts Emergency Management agency in cooperation with numerous other agencies, including representative from the military installations on the JBCC. The CCETP is intended to eliminate the causes of congestion and keep traffic flowing in the area of the Bourne and Sagamore Bridges and Routes 6 and 28. It suggests implementing four traffic pattern alterations to achieve this. Phase I includes detouring traffic from Route 6W at exit 2, through

the JBCC to Route 28N. Phase II of the Plan provides for temporary shelters on the JBCC at Camp Edwards in the event the Bourne and Sagamore bridges have been closed. The Plan states that this shelter scenario is capable of providing "parking for thousands of vehicles;" however, a much smaller sheltering capacity figure has been suggested by the Camp Edwards Commander through the course of this study.

CREATING COMMUNITY – MILITARY PARTNERSHIPS ON CAPE COD

INTRODUCTION

In recognition of the direct link between potential incompatible civilian development and the provision of public and municipal services (including hard infrastructure), a focus of this JLUS update is to explore how future military and community needs could be met and efficiencies gained through creation of community – military partnerships for shared infrastructure, utilities, and other services.

While the military services have been reviewing ways to expand sharing of public and municipal services between an installation and its surrounding communities for some years now, this issue has received increased focus as concern has grown about (a) the size of the overall Defense budget, and (b) the growth of the Federal Debt (compounded by growing budget deficits).

Inter-municipal shared service agreements between installations and their surrounding communities are viewed as tools that military services may use to help mitigate those risks. Some key developments have recently surfaced which further enable community –military partnerships. Specifically, the passage of the Defense Authorization Act of 2013 provides specific authorization for community-military partnerships.

RECOMMENDATIONS FOR SHARED SERVICES

Commission staff reviewed existing examples of other community – military partnerships and prepared a manual of best practices; reviewed existing shared service agreements on JBCC; conducted legal research on limitations under current federal and state laws; conducted two tabletop exercises with military and community officials to explore potential partnerships; and, prepared initial feasibility studies on the top priorities identified by workshop participants. As a result of these efforts,

Commission staff identified the following as potential community – military partnerships between JBCC and the surrounding communities:

- Public works/administrative services
- Regional wastewater treatment and disposal
- Re-use of Upper Cape regional transfer station

The following section provides an overview of the basis for selection of these potential partnerships for further consideration.

PUBLIC WORKS/ADMINISTRATIVE SERVICES

The 102nd IW is responsible for the majority of the existing infrastructure at JBCC, including the critical base road network, water distribution system, wastewater treatment plant, and electric distribution system, most of which is located in the cantonment area. The Coast Guard manages several facilities in the cantonment area including maintenance hangars, family housing, recreation, and other support facilities for approximately 2,000 year-round residents. In 2006, the Coast Guard assumed responsibility for maintaining the base airfield. While its training activities are concentrated in the Reserve, the Army National Guard has several facilities located in the cantonment area, including barracks for enlisted and officer personnel, a vehicle maintenance facility, and engineering services. Each of the military commands has military personnel assigned and/or contracts to maintain the facilities and infrastructure under their control, resulting in a duplication of services and personnel to maintain the various facilities and infrastructure that are not necessarily a military core competency.

At the tabletop exercises held during this JLUS update, military participants identified several opportunities to partner with surrounding communities to reduce costs by eliminating redundant public works and/or administrative services that could potentially be provided by one or more of the surrounding communities. At the same time, the communities identified the need for municipal recreational facilities that could potentially be exchanged for services offered by the towns to the military. A partnership agreement for one or more of these services could enhance existing relationships between community and military leaders and establish a framework by which more complex negotiations could take place for other shared service agreements.

The Coast Guard, Army National Guard and Air National Guard examined their current administrative service contracts with a focus upon what areas potentially may be considered for shared services with surrounding municipalities. Areas such as snow removal, landscaping, equipment sharing, elevator maintenance and certification, carpet cleaning, software

maintenance, and pest control were identified as having potential for further examination as a shared service. To assist with the initial feasibility analysis, 102nd IW and Coast Guard personnel provided Commission staff with a list of current administrative services that are contracted on JBCC. Information on Army National Guard contracts was not available at the time of this report.

SHARED SERVICES MODEL AGREEMENT

In accordance with the Scope of Work for the JLUS update, Commission staff prepared a model shared services agreement that provides a framework for a number of potential partnerships identified through this study.

This agreement is a model for the sharing of land by the installation in exchange for the maintenance and construction of facilities on that land. It appeared from tabletop discussions that Joint Base Cape Cod could benefit from the exchange of use of land on the base for a variety of services. Potentially, this agreement could be modified for different types of consideration received including administrative services or public works services.

The model agreement can be found in Appendix 4.

REGIONAL WASTEWATER TREATMENT AND DISPOSAL

In the 2012 draft General Plan for Space Re-Utilization, the 102nd IW indicated its intention to divest in all three utilities and purchase these services from a provider that would acquire these systems. A shared wastewater treatment facility was discussed at tabletop exercises during this study as a potential means of satisfying long-term wastewater management needs of the Upper Cape communities and JBCC using the existing treatment system operated by the 102nd IW as the skeleton of an expanded, upgraded regional wastewater system.

In a letter dated August 29, 2013, Brig Gen Gary Keefe, Executive Director of JBCC, indicated the Air National Guard's interest in exploring shared capabilities of the JBCC wastewater treatment facility with surrounding communities including ownership and operation of the base's water distribution system. See Appendix 2 for this letter of interest.

RE-USE OF UPPER CAPE REGIONAL TRANSFER STATION

The Upper Cape Regional Transfer Station (UCRTS) is jointly operated by the towns of Falmouth, Mashpee, Bourne, and Sandwich and serves as a

rail transfer facility for municipal solid waste (MSW) from the towns and private haulers. When the towns' contracts with Covanta SEMASS expire in 2015, the UCRTS will be faced with a decision to continue operating the facility, close the facility, or repurpose the facility for other regional solid waste needs.

Potential future uses of the UCRTS facility include the handling of recyclable materials, organic waste, or other difficult to management wastes. Workshop participants identified the potential re-use of the UCRTS as a top priority for further study to examine the potential costs and benefits of pursuing a regional facility, including sale of the facility to a private entity if the member towns do not continue to use the UCRTS.

RECOMMENDATIONS

Several recommendations from the 2005 JLUS study, particularly those related to land acquisition or land use restrictions to reduce potential encroachment and land use conflicts with military training, continue to apply and have therefore been incorporated into the recommendations for the 2013 JLUS update. Recommendations have been ranked according to the overall benefit, ease of implementation, and mission enhancement offered.

Benefit 1=short-term 2=mid-term 3=long-term	**Implementation** 1=Easy 2=Moderate 3=Difficult	**Mission Enhancement** 1=Low 2=Medium 3=High	
			Land Use Restrictions/Acquisition
3	1	2	Cape Cod Commission staff will continue to monitor and comment on proposed M.G.L. Chapter 40B developments to restrict and/or mitigate the impacts of residential development within air safety zones and noise contours.

Benefit 1=short-term 2=mid-term 3=long-term	**Implementation** 1=Easy 2=Moderate 3=Difficult	**Mission Enhancement** 1=Low 2=Medium 3=High	
3	3	3	State agencies, the four Upper Cape towns, and military officials should continue to pursue acquisition of properties that could have significant encroachment potential through fee-simple purchase, purchase of development rights, or restrictive use easements. Priorities for acquisition should be vacant lands within airfield safety zones, noise contours, buffer zones to training ranges, and lands within the boundaries of the Mashpee National Wildlife Refuge that immediately abut base boundaries. Utilize Army compatible use buffer program for land acquisition within the study area.
			Economic Development
1	3	1	Future use of the cantonment area of JBCC should enhance and support the economic development and infrastructure needs of the surrounding communities while reserving areas for current and future military essential mission activities prior to consideration of sale or lease to private development interests.
			Water Supply & Wastewater Infrastructure
3	3	3	Given the wastewater nutrient management needs of the region to achieve TMDL compliance and limited wastewater infrastructure on Cape Cod, existing capacity at the JBCC WWTP should be reserved for military and community needs.

Benefit 1=short-term 2=mid-term 3=long-term	**Implementation** 1=Easy 2=Moderate 3=Difficult	**Mission Enhancement** 1=Low 2=Medium 3=High	
1	2	3	Working with the 102nd Intelligence Wing, in concert with Joint Base Cape Cod leadership, the Cape Cod Commission should develop a scope of work and pursue funding for a feasibility study to explore shared wastewater treatment with the surrounding communities. The scope of the feasibility study should include but not be limited to the following: 1) Air Force ownership of the WWTP with excess capacity shared with surrounding communities in exchange for services in kind; 2) Municipal or private ownership, operation, improvements and maintenance and provision of wastewater to the 102nd Intelligence Wing at a fixed, discounted rate, with surplus utility capacity available to surrounding communities. Municipal or private ownership will also assume ownership and responsibility of the JBCC water distribution system. The study should also evaluate whether additional land may be required to expand the WWTP and/or leaching beds as necessary.
1	3	1	JBCC should consider reserving space in the cantonment area for piloting of alternative wastewater technologies.
			Transportation
1	1	2	Base activities should be scheduled to avoid travel through the access/egress points during peak periods of adjacent street traffic.
3	3	2	State agencies, the four Upper Cape towns, and military officials should continue to pursue acquisition of properties to reduce future trips within the study area.
2	2	3	Pursue funding for implementation of short-term safety improvements (striping and signage changes) to Otis Rotary while investigating long-term replacement alternatives
1	1	2	Pursue a Road Safety Audit for the intersection of Route 151 at Sandwich Road to identify potential countermeasures to address the high number of injury crashes and the fatal crash at this intersection
1	1	2	Consider a Road Safety Audit at the intersection of Route 130 at Snake Pond Road particularly if increased crashes are experienced
			Renewable Energy

Benefit 1=short-term 2=mid-term 3=long-term	**Implementation** 1=Easy 2=Moderate 3=Difficult	**Mission Enhancement** 1=Low 2=Medium 3=High	
1	1	2	Adopt Joint Base Cape Cod Joint Oversight Group (JOG) Renewable Energy Communication Protocol and implement w/towns.
3	2	3	JBCC should continue to seek opportunities base wide for energy reduction in existing and future development.
			Solid Waste
1	2	1	Working with Joint Base Cape Cod leadership, the Cape Cod Commission should develop a scope of work and pursue funding for a feasibility study to examine potential re-use of the UCRTS for a regional food waste, sludge composting or recycling facility or other options. The feasibility study should also evaluate the condition, cost and feasibility of expanded use of the rail spur for freight, food waste and/or recycling programs.
			Emergency Response/Regional Evacuation
1	3	3	MEMA should revisit the 2012 Cape Cod Emergency Traffic Plan (CCETP) with JBCC leadership to evaluate the shelter and roadway capacity of JBCC in the event of a disaster declaration by the Governor of the Commonwealth of Massachusetts or other emergency requiring closure of the Bourne and/or Sagamore Bridges.
			Base Access & Security
3	3	2	Consider long-term base access alternatives that minimize/eliminate trips through residential areas.
1	2	2	Complete relocation of Sandwich gate farther into the base to increase buffering to residential properties and improve base security.
1	2	2	Military officials should continue to work with the Environmental Officer of the Environmental Management Commission established through the Upper Cape Water Supply Reserve, local police departments, and the Massachusetts Environmental Police to address trespassing and illegal dumping activities on JBCC.
			Communication

Benefit 1=short-term 2=mid-term 3=long-term	**Implementation** 1=Easy 2=Moderate 3=Difficult	**Mission Enhancement** 1=Low 2=Medium 3=High	
1	1	1	The four Upper Cape towns, JBCC and the Cape Cod Commission should establish and maintain a JLUS link on its public website that provides current information about military operations and an opportunity to comment about JLUS implementation efforts and any additional local measures to promote land-use compatibility around JBCC.
3	2	2	The four Upper Cape towns, JBCC and the Cape Cod Commission should execute a Memorandum of Understanding establishing key contact(s) and procedures for commenting on proposed development projects within the JLUS study area.
1	1	1	The JBCC MC3 should continue to serve as the liaison between the Upper Cape communities and JBCC on proposed development activities within the cantonment area.
			Personal Wireless Service Facilities
3	2	3	As recommended by the 2005 JLUS, the towns of Sandwich and Bourne should establish a 3,000 – foot wide Search and Rescue ("SAR") Corridor District for the following roadways: 1) Route 130 north of Runway 05, and 2) Route 28 south of the Otis Rotary
			Fire Training Academy Relocation
3	3	2	While not recommended as a potential shared service agreement by the JLUS update at this time, future interest in relocating the Barnstable County fire training academy to enhance fire training opportunities on JBCC should begin with a water quality and site suitability assessment. These assessments should be conducted prior to initiating other recommendations identified in the feasibility analysis section of this report.
			Public Works

Benefit 1=short-term 2=mid-term 3=long-term	**Implementation** 1=Easy 2=Moderate 3=Difficult	**Mission Enhancement** 1=Low 2=Medium 3=High	
1 and 3	2	2	Working with the 102nd Intelligence Wing, in concert with Joint Base Cape Cod leadership, pursue implementation of a shared services agreement for solid waste, snow removal, or other public works function with one or more Upper Cape towns. Establish a working group consisting of JBCC leadership, 102nd IW, and appropriate town officials to identify priority services and pursue execution of a shared services agreement that can serve as a model for future agreements.
1 and 3	2	2	Continue to explore other shared services identified in the JLUS update.
			Air Safety & Noise
1	2	2	Future turbine development projects should take into account potential noise conflicts with sensitive receptors to ensure military-civilian conflicts do not arise.
1	3	1	As recommended by the 2005 JLUS, local officials for the four Upper Cape towns should adopt and enact local policies to promote disclosure of safety and noise hazards, including the recording of disclosure documents prior to land transactions and development or sale of property.
1	3	1	The four Upper Cape communities should develop sound-attenuation standards for new construction and retrofitting of existing buildings for those uses above the 65 dB Ldn noise contours based on U.S. Department of Housing and Urban Development (HUD) standards. For additional information, please refer to: http://www.hud.gov/offices/cpd/energyenviron/environment/compliance/qa/noise.cfm

Joint Base Cape Cod (JBCC)

Joint Land Use Study (JLUS) Update and Community – Military Partnerships Study Final Report

In 2005, the Cape Cod Commission, through a grant provided by the U.S. Department of Defense, Office of Economic Adjustment (OEA), prepared a Joint Land Use Study (JLUS) for the Massachusetts Military Reservation (hereinafter referred to as Joint Base Cape Cod) and the four Upper Cape towns of Bourne, Falmouth, Sandwich, and Mashpee.

Among the goals of the JLUS program are to ensure that future community growth and development are compatible with the training or operational missions of the installation and to seek ways to reduce the operational impacts of military installations on adjacent lands.

Joint Base Cape Cod (JBCC) was nominated for a JLUS in 2005 by the Army due to the rapid population growth and ongoing development pressures in Barnstable County, particularly in the four Upper Cape towns (Bourne, Falmouth, Mashpee, and Sandwich) surrounding JBCC.

2005 JLUS STUDY IMPLMENTATION EFFORTS

Recommendations from the 2005 JLUS were grouped into seven categories; Land Use Restriction & Acquisition (including affordable housing Chapter 40B residential development), Water Supply & Wastewater Infrastructure, Transportation, Personal Wireless Communication Facilities, Communication, Base Access, and Air Safety & Noise. A summary of implementation efforts from the 2005 JLUS study are provided below.

Table 1 – 2005 MMR JLUS Recommendations - Status Summary				
Recommendation		**Priority**	**Implementation Status**	**Entity Responsible**
General Recommendations				
Land Use Restrictions/Acquisition				
1)	Local officials, Cape Cod Commission staff, and military officials should approach state housing agencies involved with M.G.L. Chapter 40B development regarding development restrictions in Otis Air National Guard safety zones and noise contours. Encourage state officials to consider application of restrictions to airfields statewide.	Medium	No changes to M.G.L. have been approved; CCC staff continues to monitor and comment on affordable housing developments proposed within air safety zones and noise contours to local boards	Towns, CCC, Military
2)	The Air Force should consider establishing a compatible-use buffer program for lands adjacent to the Otis Air National Guard Base, similar to the Army's program established in 2002 under 10 U.S.C. 2684a. Under applicable programs, priorities for acquisitions should be vacant lands within airfield safety zones and within areas of high airfield noise identified on the Otis Air Installation Compatible Use Zone study. Some land areas that correspond with	High	No action	U.S. Air Force

	the priorities include remaining developable land within the boundaries of the Mashpee National Wildlife Refuge that immediately abut base boundaries.			
3)	State agencies, the four Upper Cape Towns, and military officials should explore all available options for acquisition of properties that could have significant encroachment potential through fee-simple purchase, purchase of development rights, or restrictive use easements.	High	Mashpee: Pickerel Cove Recreation Area (former Camp Vinhaven) bought by Town. 11 acre property on Lovell's lane bought by Orenda Wildlife Trust with state funds from base settlement.	State conservation agencies, Towns, Military
4)	As recommended by Air Force policy (Air Force Instruction 32-7063 Air Installation Compatible Use Zone Program), the Air Force should acquire or seek restrictive use easements for vacant land or properties within the CZ in the towns of Mashpee and Sandwich, and consider acquisitions for land or properties within the APZ1 or noise contours greater than 70-75 dB Ldn.	High	No action	U.S. Air Force
Water Supply & Wastewater Infrastructure				
1)	Explore available options to develop additional water supply capacity to supplement the Upper Cape Regional Water Supply Cooperative, including acquisition of	High	Bourne added a new well on JBCC as mitigation for landfill plume	

	undeveloped properties with water supply potential.			
2)	Taking into account future growth needs of the Air National Guard at Otis, the 102nd Fighter Wing and interested Upper cape municipalities should explore the feasibility of expanding capacity at the MMR's wastewater treatment facility to improve water quality within the MMR JLUS study area, including establishment of a quasi-public state entity.	High	Study by CH2MHill underway. Town CWMPs (Falmouth, Sandwich and Mashpee have identified MMR as a potential alternative wastewater treatment and disposal site	102nd IW, Towns
3)	To protect existing water quality for MMR users and the Upper Cape towns, environmental review of the Camp Edwards Site Consolidation Plan (which includes the Northeast Regional Center for Homeland Security) should address the following: update the Zone II areas for the Upper Cape Regional Water Supply Cooperative and consider alternatives to development in Zone II areas; contain a detailed description of threats to drinking water from proposed uses; describe emergency response, spill prevention, and mitigation strategies to protect water quality; and incorporate low-impact development strategies.	High	The Sagamore Lens Capacity study is underway with Sandwich the lead town from the UCWSC. The study is evaluating the sustainability of the Sagamore Lens for water supply. It is funded through the Textron NRDA	

4)	Future uses on JBCC should be connected to the 102nd's wastewater treatment facility.	High	New proposed JBCC uses to be evaluated for connection to the wastewater facility	102nd Intelligence Wing
Transportation Infrastructure				
1)	Base activities should be scheduled to avoid travel through access/egress points during peak periods of adjacent street traffic.	Ongoing	Standard practice for Camp Edwards training events	MAARNG
2)	Any new uses within the MMR or the JLUS study area that will result in a net increase in traffic should be offset by either purchase of vacant developable land within the study area (preferably residential land), or elimination of an existing use generating the same amount of traffic.	Low	Optional mitigation strategy for Developments of Regional Impact; not implemented for base activities	Towns, CCC, Military
Personal Wireless Communications Facilities				
1)	The towns of Mashpee, Sandwich, Falmouth, and Bourne should consider acting to protect navigable air space by requiring FAA Determinations of No-Hazard or evidence of exemption from the determination process for all new structures greater than 20 feet in height throughout their communities. To assist in this determination, an information worksheet	Medium	Mashpee adopted FAA No-Hazard Determination requirement for structures over 40 feet in October 2006	Towns

	should be developed for distribution by the building inspector's offices. Sample worksheets developed for Falmouth Airpark and Otis Air National Guard Base are included in Appendix 7			
2)	To provide a higher degree of safety and path predictability to U.S. Coast Guard and Army National Guard helicopter pilots to deviate from normal operational altitudes in emergencies during hostile weather, the towns of Mashpee, Sandwich, Falmouth, and Bourne should establish a 3,000-foot wide Search and Rescue ("SAR") Corridor District for the following roadways: Route 130 north of Runway 05; Sandwich Road, John Parker Road, and Shorewood Drive south of Runway 23; Route 28 south of the Otis Rotary Within these corridors, there should be an absolute height limit for all structures, including wireless communications facilities and wind turbines of 100 feet above ground, even if FAA says a greater height is not hazardous. Structures in this district that exceed 60 feet in height should be required to be marked with a	High	Falmouth completed; No need to adopt in Mashpee as only 1 residential lot in SAR Corridor, with height limit of 35 ft for structures and 45 ft for cell towers. Town of Bourne adopted height restrictions on Route 28 in 2011. There has been no action by the town of Sandwich to adopt the SAR overlay district.	Towns

	traditional red obstruction light, unless waived for good reason by the permit granting authority			
3)	Height limits established through local bylaws for all uses, including wireless, amateur, or other radio services, should be reviewed to ensure consistency with the new height regulations established for the SAR Corridor District	High	Falmouth & Mashpee completed	Towns
Communication				
1)	The four towns should provide an opportunity for military officials to comment on proposed zoning changes within the Accident Potential Zones or noise contours for Otis Air National Guard Base	Medium	Mashpee: None have occurred since 2005	Towns/Military
2)	The four towns and the Cape Cod Commission should provide a mechanism for military officials to comment on proposed development projects within the JLUS study area, even when the military is not a direct abutter to the project.	Medium	No action taken	Towns/CCC

3)	Mashpee town officials should encourage ongoing communication between military officials and Mashpee National Wildlife Refuge partners to ensure that any fencing associated with runway lighting maintains emergency access to MNWR lands.	Low	Not necessary to date, but Mashpee National Wildlife Refuge partners would welcome participation from JBCC , which owns land within the Refuge	Mashpee Town Planner
4)	Each community and the military should develop and maintain a JLUS link on its public web site that provides residents, developers, and businesses with information about military operations and an opportunity to comment about JLUS implementation efforts and any additional local measures to promote land-use compatibility around the MMR.	Medium	CCC webpage developed; MMR.org established with link to CCC JLUS	CCC; Town Planners/JBCC personnel
Base Access				
1)	The four Upper Cape towns should encourage implementation of the Army National Guard Base Consolidation Plan, which will reduce the impact of military training on surrounding land use, particularly the proposal to relocate the Sandwich gate farther into the base to better buffer adjacent residential	Low	No action taken	Towns/MAANG

	properties and improve base security. Preparation of a similar plan for Otis Air National Guard Base should be considered by the Air National Guard.			
2)	Military officials should continue to work with the Environmental Officer established through the Upper Cape Water Supply Reserve, local police departments, and the Massachusetts Environmental Police to address trespassing and illegal dumping activities to the MMR.	Medium	Based on anecdotal information, illegal dumping has decreased	JBCC Environmental Officer
Air Safety & Noise				
1)	Noise contours should be incorporated into the zoning bylaws for all four towns or an overlay district should be considered to restrict development in noise-sensitive areas.	Low	No action taken due to BRAC realignment	Towns
2)	Local officials for the four Upper Cape towns should adopt and enact local policies to promote disclosure of safety and noise hazards, including the recording of disclosure documents prior to land transactions and development or sale of property.	Low	No action taken due to BRAC realignment	Towns

3)	The four Upper Cape communities should develop sound-attenuation standards for new construction and retrofitting of existing buildings for those uses above the 65 dB Ldn noise contours based on U.S. Department of Housing and Urban Development (HUD) standards.	Low	No action taken due to BRAC realignment	Town Planners
4)	The four Upper Cape communities should pursue uniform building code modifications to mitigate noise for new structures built in high-noise areas.	Low	No action taken as State controls building code	Town Planners
5)	Land-use and build-out data provided in this MMR JLUS should be revised to reflect new Accident Potential Zones/noise contours when available.	Low	Not applicable; 2005 AICUZ still in effect	
Town-by-Town Recommendations				
Mashpee & Falmouth				
1)	Existing Accident Prevention Zone bylaws in the towns of Mashpee and Falmouth should incorporate Accident Potential Zones from the new AICUZ study when available.	Low	Not applicable; 2005 AICUZ still in effect	JBCC/Towns of Mashpee & Falmouth
Mashpee & Sandwich				

1)	The towns of Mashpee and Sandwich should explore the feasibility of crafting a local bylaw mandating cluster for developable residential land within the safety zones or noise contours to avoid these areas.	Low	Mashpee has adopted mandatory cluster throughout the town, though it doesn't reference safety or noise zones	Towns of Mashpee & Sandwich
2)	The towns of Mashpee and Sandwich should reconsider planned-production affordable housing sites within the APZ1 and APZ2 or noise contours, unless density is restricted to one or two units/acre or development is clustered to avoid these areas.	Medium	Mashpee; will be done as sites are reviewed for affordable housing use	Towns of Mashpee & Sandwich
Bourne				
1)	The town of Bourne's general bylaw should be amended to eliminate the Airport Approach Protection bylaw for Otis Air Force Base as the APZs for Bourne fall entirely within the boundaries of the MMR.	Low	Completed	Town of Bourne
Mashpee				
1)	The town of Mashpee should restrict use of vacant municipal property within the CZ to avoid residential uses, schools, hospitals/nursing homes, places of	Medium	No action taken	Town of Mashpee

	assembly, or commercial use.			
2)	The town of Mashpee's Accident Prevention Zone bylaw should be amended to exclude the NSTAR easement from the wireless overlay district, where wireless communications facilities up to 200 feet in height are allowed.	Low	Completed, October 2006	Town of Mashpee
Sandwich				
1)	The town of Sandwich should eliminate the Airport Approach Protection bylaw in the town's general bylaws and include an Accident Prevention Zone district into the town's zoning bylaws. At a minimum, this bylaw should be based on the town of Falmouth's or Mashpee's APZ bylaw, which restricts schools, hospitals, multi-family or public housing, or places of assembly with a height limit of 35 feet	Low	No action taken	Town of Sandwich
2)	The town of Sandwich should consider a zoning amendment to discourage conversion of recreational properties to residential use within the APZ2 or to prevent intensification of recreational uses,	Medium	No action taken	Town of Sandwich

	and should explore the feasibility of acquiring fee ownership or development rights on these properties to avoid incompatible uses.			
3)	To reduce conflicts with residential uses on Snake Pond Road, access at the Sandwich gate to the MMR should be restricted to regular employees of the base only and access to visitors and commercial traffic should be prohibited. Working with the MMR Environmental Management Commission to ensure protection of the MMR Upper Cape Water Supply Reserve, military officials and the town of Sandwich should also explore the feasibility and costs to the town, state, and the military associated with relocating the Sandwich gate to a less residential location along existing paved roadways, including the potential for upgrading the intersection and signal at the Sandwich Industrial Park (Jan Sebastian Drive) and Route 130 from a three-way to a four-way intersection.	Sandwich gate restrictions: High Relocation of Sandwich gate: Low	Traffic policy in place restricting visitor and commercial traffic through the Sandwich gate. The road network system is being studied to determined changes needed to accommodate new traffic patterns prior to decommissioning the current Sandwich gate.	Town of Sandwich /Army National Guard

4)	The town of Sandwich should review the Wireless Telecommunications Overlay District Plan document to eliminate any lots that are located within the proposed SAR Corridor Overlay District.	Medium	No action taken	Town of Sandwich

Additional discussion of the status of implementation efforts is provided below for each major category.

LAND USE RESTRICTIONS/ACQUISITION

The 2005 JLUS included several recommendations that State agencies, the four Upper Cape towns, and military officials should explore all available options through fee-simple purchase, purchase of development rights, or restrictive use easements for acquisition of both public and private lands in air safety zones or noise contours to reduce potential impacts on military training and/or encroachment.

The five towns surrounding JBCC have protected additional open space through conservation restriction or purchase since the 2005 JLUS was completed as summarized in the table below.

Table 2 –
JBCC JLUS Open Space Update-Additional Acreage Protected

	2005	**2013**
Bourne	343	382
Falmouth*	1831	1533
Sandwich	498	651
Mashpee	1147	1525
Barnstable	0	30
Total	3819	4121
Acres Protected Since 2005 (approx.)		302

* 2005 analysis based on town assessors data; 2013 excerpted from MassGIS protected open space data. Discrepancy result of methodology.

The 2005 JLUS utilized town assessor's data and grouped various open space land use types into the "Currently Protected Open Space" category (2005 JLUS, Figure 13, pg. 47). The methodology for identifying the land use codes that constituted this Protected Open Space category was unfortunately not included in the 2005 study, and therefore could not be replicated for the 2013 JLUS Update. The methodology used to complete the buildout analysis for the JLUS update was based on MassGIS protected open space data. A direct comparison of developable parcels

was not possible, however land conservation efforts are on-going in the study area, and additional land has been placed in permanent protection within the study area since 2005. Therefore, this recommendation has been implemented.

AFFORDABLE HOUSING

The 2005 JLUS recommended that efforts be made to restrict or mitigate certain types of land uses, including high-density housing allowed by M.G.L. Chapter 40B, in air safety zones and noise contours.

Since the 2005 JLUS, Commission staff has continued to monitor and comment on proposed Chapter 40B developments within air safety zones and noise contours. There was some Chapter 40B permitting activity and construction from 2005-2008; however, after 2008 applications for Chapter 40B permits fundamentally ground to a halt in the region and projects that had been previously permitted were put on hold and have not proceeded to construction. New Chapter 40B requests to zoning boards started to emerge in 2012, and if the economy and housing market continue their slow improvement, it is likely that 40B permit requests will increase and formerly permitted projects will commence construction.

The Department of Housing and Community Development (DHCD) promulgated an extensive set of changes to the Chapter 40B regulations in 2008 and a more technical set of changes in 2012. The thrust of the 2008 changes was to provide communities with additional planning and regulatory options that would enable them to condition or deny Chapter 40B developments that had significant health, safety, or environmental impacts and also to provide more state oversight of the design and programmatic aspects- both prior to and after construction- of Chapter 40B developments.

All legislative efforts since 2005 to change or weaken Chapter 40B have failed, and a 2010 ballot initiative to repeal the law was defeated by about a 15 point margin. Based upon this history, it is staff's judgment that the 2005 recommendation to encourage state officials to modify Chapter 40B to consider development restrictions around airfields statewide would have little, if any, prospect of success.

The presumption with Chapter 40B applications is that the need for affordable housing in any community that has not achieved the 10% affordable housing goal outweighs local concerns. However, depending on the specific site characteristics, significant safety concerns about a development are a potential basis for a zoning board's either denial or conditioning a Chapter 40B application. For example, one of the built 40Bs- Ashers Path- is located in APZ 2. However, given the amount of existing residential development that abutted and surrounded the parcel,

all of which is also in APZ 2 it is staff's judgment that any denial of that project based upon safety considerations would likely have been overturned on appeal. Had the site not been surrounded by so much existing residential development, it is likely that a 40B denial would have withstood any challenge on appeal.

The Cape Cod Commission is considered a local board for Chapter 40B purposes, and the Commission is required to be notified of Chapter 40B applications by communities in the study area. As such, the Commission has an ongoing technical assistance role in reviewing Chapter 40B applications in all 15 towns on Cape Cod. As the changes to 40B recommended in the 2005 report were not adopted and are unlikely to occur, the Commission's attention to and recommendations for mitigation of 40b developments within or near air safety and noise contour zones ensures that the intent of the 2005 recommendations are being implemented. Based upon this analysis, this recommendation has been implemented.

WATER SUPPLY & WASTEWATER INFRASTRUCTURE

The 2005 JLUS included four recommendations for water supply and wastewater infrastructure. Water supply recommendations from the 2005 study are as follows:

- Explore available options to develop additional water supply capacity to supplement the Upper Cape Regional Water Supply Cooperative, including acquisition of undeveloped properties with water supply potential.

- Protect existing water quality for JBCC users and the Upper Cape towns through environmental review of the Camp Edwards Site Consolidation Plan (including the Northeast Regional Center for Homeland Security) which should address the following: update the Zone II areas for the Upper Cape Water Supply Cooperative and consider alternatives to development in Zone II areas; contain a detailed description of threats to drinking water from proposed uses; describe emergency response, spill-prevention, and mitigation strategies to protect water quality; and incorporate low-impact development strategies.

JBCC obtains its primary water supply from well J located near the Sandwich boundary south of Snake Pond on Herbert Road. It supplies nearly all the activities in the main cantonment area. The well pumps about 300,000 gallons per day and has excellent water quality according to the consumer confidence report. JBCC is also connected to the Upper Cape Water Supply Cooperative (UCWSC) for back-up supply. Recent civilian developments on the Base, such as the Barnstable County Jail and

House of Correction, are supplied directly from the UCWSC. There is an apparent abundance of water supply on JBCC as a result of DoD investment in water supply infrastructure and the establishment of the UCWSC.

No additional capacity has been sought by the UCWSC since the 2005 JLUS study, nor have additional acquisitions been identified. Water suppliers have independently pursued the water supply activities, including the permitting of a new well (#6) located on JBCC by the Bourne Water District. It is not known if the Environmental Readiness Center has incorporated the Zone II for this well into the Environmental Performance Standards for the Upper Cape Water Supply Reserve. Based on this analysis, these recommendations have been partially implemented.

The 2005 JLUS identified the following recommendations regarding wastewater capacity on JBCC:

- Taking into account future growth needs of the Air National Guard at Otis, the 102nd Intelligence Wing and interested Upper Cape municipalities should explore the feasibility of expanding capacity at JBCC's wastewater treatment facility to improve water quality within the JLUS study area, including establishment of a quasi-public state entity.

- Future uses of JBCC should be connected to the 102nd Intelligence Wing's wastewater treatment facility.

The 102nd IW's wastewater treatment facility is located in the southeast corner of the cantonment area. The facility was built in 1936. The facility was upgraded several times in the intervening years to accommodate the services during WWII, the Korean and Vietnam wars, and the Cold War. During its high use period during WWII, the facility treated on average approximately 1.5 million gallons per day (MGD) of effluent and was designed for 6 MGD. Its usage through the 60s and 80s ranged from ½ to ¾ MGD. In 1996, the plant was upgraded for nitrogen removal to 10 parts per million (ppm) and its effluent discharge was relocated to its current location in the Reserve adjacent to the Cape Cod Canal. The facility presently receives and treats an average of 143,000 gpd. The facility has a permitted capacity of 360,000 gallons per day (gpd) with a reported discharge site capacity of 670,000 gpd.

The 2005 JLUS recommended that additional uses (in the cantonment area) be tied to the treatment facility and to pursue shared service agreements with the surrounding communities for enhanced water resource protection. The MassDevelopment Finance Agency funded a study to evaluate the potential for expanded wastewater treatment and

disposal infrastructure to accommodate existing and potential JBCC activities and existing and future needs of the towns. The report "Appraisal Consulting Services for the Wastewater Treatment System at the MMR", was completed by CH2MHill in December 2012. Based on this analysis, these recommendations have been implemented.

The results of this study relative to the JLUS are discussed in the updated infrastructure capacity analysis.

PERSONAL WIRELESS & TELECOMMUNICATION FACILITIES

Consistent with the 2005 JLUS recommendation to protect navigable airspace, the town of Mashpee adopted FAA No Hazard Determination requirements for structures over 40 feet. Further, the town of Falmouth established a 3,000 foot wide Search and Rescue (SAR) Corridor District for roadways near or adjacent to U.S Coast Guard and Army National Guard runways 5 and 23. Within these corridors, height limits have been established for wireless communication facilities and wind turbines that are below thresholds for FAA hazard determinations. Local bylaws in both communities have been updated consistent with these requirements. The Town of Bourne also adopted height restrictions on Route 28 in 2011. There has been no action by the town of Sandwich to adopt the SAR overlay district. Based on this analysis, this recommendation has been substantially implemented.

COMMUNICATION

The 2005 JLUS made several recommendations to establish clear communications protocols and policies between the Towns and JBCC for issues related to local zoning changes and proposed development projects, and to establish a website for JLUS for communication of on-going JLUS implementation efforts. Frequent changes in base commanders and elimination of other civilian positions have resulted in less frequent communication between the base, the Commission, and surrounding communities.

The In 2012, an Executive Director position was established at JBCC to oversee and coordinate operations among the three main commands and to improve communication with outside agencies. The JBCC Military Civilian Community Council (MC3), a joint community – military advisory committee, meets on a quarterly basis to discuss issues and projects of mutual interest and concern. The Cape Cod Commission developed a webpage that includes information about the JLUS update process, announcements, and links to previous studies. Therefore, the 2005 JLUS recommendations have been substantially implemented. However, in light of continued encroachment concerns and /or land use

conflicts as a result of proposed development activity, and to enhance opportunities for future community – military partnerships, a Memorandum of Understanding that formalizes notification procedures and key personnel between JBCC, the Cape Cod Commission, and surrounding communities.

BASE ACCESS AND SECURITY

Base access and security recommendations included relocation of the Sandwich gate further into the base and preparation of a future land use plan by the Air National Guard, as well as measures to address trespassing and illegal dumping activities.

Since 2001, visitor and commercial access to the base has been restricted to authorized military personnel or through advance permission. The Falmouth/I-Gate is currently being redesigned and will be relocated in FY14. The Army National Guard is proposing to relocate the Sandwich gate further into the base to improve security and provide greater separation from adjacent residential uses. However, funding has not been appropriated for design or construction.

A Memorandum of Agreement (MOA) signed on October 4, 2001, by the Commonwealth of Massachusetts, the United States Army, and the National Guard Bureau (NGB), and Chapter 47 of the Acts of 2002 established an Environmental Officer (EO) for JBCC. The current EO[4] was appointed by the Environmental Management Commission (EMC) in December, 2002. In this capacity, this position provides monitoring of military and civilian activities on and uses of the Reserve and the impact of those activities and uses on the water supply and wildlife habitats. Working directly for the EMC, the EO has unrestricted access to all data and information from the various environmental and management programs and full access to all points in the Reserve for the purpose of conducting inspections in order to monitor, oversee, evaluate, and report to the EMC on the environmental impact of military training and other activities. This on-site monitoring occurs prior to, during and immediately following training and other activities and includes but is not limited to: training sites, pollution prevention and habitat protection activities for both military and contractors in the Reserve, and coordination/consultation with the Massachusetts National Guard Environmental & Readiness Center (E&RC) on various projects, initiatives and issues.

Town officials, the Massachusetts Environmental Police and the JBCC EO inspect the Reserve on a regular basis for illegal trespassing, dumping and

[4] The EO as of October, 2013, was Mr. Mark Begley.

other encroachment issues. Anecdotally, the EO has indicated that since the 2005 JLUS was completed, illegal dumping on JBCC has decreased.

Civilian use of the roads in the Reserve during the year, other than unauthorized All Terrain Vehicles (ATVs) and dirt bikes, was associated with groundwater investigation and remediation activities, with construction projects at the ranges, use of the training areas and during deer and turkey hunts. The 2013 State of the Reserve report did not contain any specific data on the number of incidents related to illegal trespass in the Reserve.

Based on this analysis, this recommendation has been substantially implemented.

AIR SAFETY & NOISE

Air safety and noise recommendations included adoption of local safety and noise disclosure policies and standards for new construction and retrofit of existing buildings in safety zones and high-noise areas.

The realignment of Otis ANG to the 102nd Intelligence Wing has substantially reduced the urgency by local officials to enact the recommendations of the 2005 study. However, Otis ANG continues to be critical to the Commonwealth's and DoD's operational and training missions; the airfield is used as a location to bed down temporarily all types of aircraft; as a divert runway; and for other missions. As noted above, high-density affordable housing development within air safety zones and high noise areas continues to be a concern.

Because of the BRAC 2005 realignment of Otis ANGB, specific recommendations to address noise impacts from airfield operations through changes in building codes/real estate disclosure have not been addressed. Therefore, Commission staff recommends that land acquisition and/or restrictive easements within safety zones continue to be pursued as an effective measure to address air safety and noise issues.

TRANSPORTATION

The 2005 JLUS recommended that any new uses on JBCC or within the study area that result in a net increase in traffic be offset by purchase of vacant developable land or elimination of an existing use generating the same amount of traffic.

To determine if increases in traffic from new development have been offset, staff completed an inventory of new development from 2005

through 2012 (see table on pg. 73-74). Three types of projects were identified and analyzed: (1) projects within the JBCC boundary, (2) regional projects outside of the JBCC boundary but inside of the JLUS study area reviewed by the Commission, and (3) local projects outside of the JBCC boundary but inside of the JLUS study area not reviewed by the Commission.

The nature of activities on JBCC makes it difficult to identify and quantify the impact of projects within the JBCC border. In recent years, military training at the JBCC has increased with the construction of new training facilities such as Tactical Training Base Kelley and Mobile Military Operations in Urban Terrain Training Site Calero. While there are extensive tracts of vacant land within JBCC, there is no evidence that additional land has been set aside to offset increases from new uses. Some of the traffic created by new uses has been offset by the elimination of some old uses. For example, the development of 102nd Intelligence Wing coincided with the discontinuation of the 102nd Fighter Wing. The realignment also resulted in the loss of 505 direct (62 military and 443 DoD civilian) and 365 indirect positions. This undoubtedly reduced traffic demand both on installation and off-installation facilities.

Within the 2005 to 2012 timeframe, there have been several regional projects that have triggered review by the Commission. However while these projects, some of which are very large, have received approval by the Commission, none have moved forward to actual construction. Had they moved forward these projects, to varying degrees, would have resulted in offsets to addition vehicle trips anticipated. These projects are referenced by the following project numbers HDEX11008, EX06021, TR98032, and TR20077. Copies of these decisions are available on the Commission website.

Overall, between 2005 and 2012, net increases in traffic from new uses within the JBCC JLUS study area have not be successfully offset by the purchase of vacant developable land or the elimination of existing use generating the same amount of traffic. While regulations are in place to at least partially require such offsets for certain large developments, most developments are not required to offset their new trip generation. Furthermore, the rate at which land is being preserved is not keeping up with new development. Based on this analysis, this recommendation has been partially implemented.

TOWN-BY-TOWN RECOMMENDATIONS

The 2005 JLUS study included recommendations for one or more surrounding towns to address potential land use conflicts within air safety zones/high noise areas through adoption of zoning amendments or land use restrictions.

Recommendations for the Towns of Falmouth and Mashpee to address local cluster development bylaws within the Accident Potential Zones (APZ), and a re-consideration of several proposed affordable housing sites within these areas, also became less of a priority after the 2005 BRAC mission change at Otis ANGB, although Mashpee did adopt a town-wide mandatory cluster bylaw.

The Town of Bourne eliminated an outdated Airport Approach Protection bylaw in 2011. A recommendation for the Town of Mashpee to restrict or avoid certain uses proposed within the CZ has not been completed. The town's Accident Prevention Zone bylaw was amended in 2006 to exclude utility easements.

The status of recommendations for the Town of Sandwich to eliminate the Airport Approach Protection bylaw and include an Accident Prevention Zone overlay, and to discourage conversion of recreational properties to residential uses within the APZs have not been implemented. Based on this analysis, these recommendations have not been implemented.

2013 JBCC JLUS UPDATE

BACKGROUND

On May 23, 2011, OEA received FY11 nominations from the Army for the Joint Land Use Study (JLUS) program. Factors prompting the Army's re-nomination of JBCC for a JLUS were changes to missions on the installation due to the 2005 Base Realignment and Closure (BRAC) round; an increase in the training population using JBCC's ranges; and concern about the compatibility of future civilian land uses surrounding JBCC

An assessment completed by OEA evaluation of the Army's nomination found sufficient evidence to conclude that encroachment of the civilian community is likely to impair the continued operational utility of the JBCC. The following specific encroachment concerns were assessed:

- Significant changes in mission and associated land use in part due to the passage in 2005 of the Base Realignment and Closure law (BRAC), including an increased training population and concerns about potential impacts on surrounding communities;
- Potential encroachment/land use conflicts on MAARNG and MAANG operations arising from existing or proposed development surrounding JBCC;

- Continued concern by military officials about unauthorized access to the JBCC training area by civilians for hunting, dumping, or other activities;
- The need for a more coherent and robust communication and coordination strategy/tool between tenants on the JBCC and surrounding communities;
- The need for development of policy and procedures concerning potential alternative energy development, both on- and off-base (and cognizant of published DoD alternative energy siting standards);
- Mutual interest between the JBCC and surrounding communities to investigate opportunities for shared utility service delivery to reduce costs and manage community growth through development of inter-governmental agreements.

Due to the complexity of the JBCC's ownership and lease structure and the Commission's role in preparing the 2005 JLUS, OEA approved a grant request from the Commission in July 2012 to coordinate and complete the JLUS update.

2013 JLUS UPDATE OBJECTIVES

The objectives of the 2013 JLUS update are as follows:

- Analyze land use changes since the 2005 JLUS was completed;
- Assess the impacts of these changes on current and future military operations;
- Assess the effectiveness of communication protocols and policies between JBCC and surrounding communities concerning proposed development projects, encroachment issues, and base access;
- Re-examine the capacity of existing infrastructure and future needs of both military and surrounding communities;
- Explore the potential for shared infrastructure and services between the military and surrounding communities to reduce costs and create efficiencies of scale;
- Recommend measures to reduce potential land use conflicts and next steps in creating opportunities for community – military partnerships.

JLUS UPDATE STUDY APPROACH

The JLUS update included a review of recent military master plans and planning documents for the surrounding communities to provide context for the study. Commission staff used Geographic Information Systems (GIS) to update commercial and residential development potential, affordable housing developments, proposed renewable energy projects, and protected open space within the study area. These maps were later used in completing an analysis of the 2005 JLUS study recommendations and potential land use conflicts for the 2013 update.

Commission staff gathered current information on community – military partnerships, base redevelopment, and alternative energy opportunities, including existing legislation and shared service agreements and attended 2012 Association of Defense Communities conference and through on-line research. This research effort resulted in a report on community – military partnerships that can be found in Appendix 3.

GIS mapping and staff review of existing traffic studies, wastewater and water supply reports were used to update the infrastructure capacity analysis for wastewater and water supply, solid waste, and transportation infrastructure at key intersections within the study area.

JLUS Update Committees

The JBCC Military Civilian Community Council (MC3), which consists of representatives from the four Upper Cape towns, the Association to Preserve Cape Cod, the Cape Cod Commission, and base commanders from the Massachusetts Air National Guard (MAANG) 102nd Intelligence Wing, Massachusetts Army National Guard (MAARNG) and U.S. Coast Guard served as the Policy Committee for the 2012 JLUS update.
The Technical Advisory Committee, consisting of the four town planners and representatives from the 3 base commands, provided technical support and assistance as needed throughout the update process.

The Policy Committee held meetings on July 12, 2012, November 28, 2012, and October 30, 2013 to review the final report. The Technical Advisory Committee met on September 7, 2012, and November 8, 2012, and reviewed electronic draft documents at the request of Commission staff during the process. Commission staff regularly participated in meetings of the JBCC Energy Committee to develop the Joint Base Cape Cod Joint Oversight Group (JOG) Renewable Energy Communication Protocol.

Policy and Technical Advisory Committee members as well as other local, regional and state officials participated in two tabletop exercises to

discuss community – military partnerships on February 27, 2012, and May 2, 2013.

Commission staff attended a conference in Monterey, CA on community – military partnerships sponsored by Association of Defense Communities in September, 2012.

Commission staff gave briefings on progress of the JLUS update and/or final report to the following boards and committees:

- MMR (JBCC) Community – Advisory Council – April 4, 2013, May 30, 2013, and October 1, 2013
- MMR (JBCC) Environmental Management Commission – April 11, 2013, October 9, 2013
- Mashpee Planning Board – June 19, 2013
- Falmouth Planning Board – July 23, 2013
- Bourne Planning Board – September 26, 2013
- JBCC Base Commanders – June 27, 2013, September 12, 2013
- MMR (JBCC) Science Advisory Council – October 2, 2013

SCOPE OF WORK

The scope of work for the 2013 JLUS update is as follows. Please note that references to MMR have been changed to JBCC throughout.

TASK 1 – COLLECT AND ANALYZE EXISTING DATA, PLANS, AND STUDIES

In consultation with the Technical Advisory Committee, Cape Cod Commission (Commission) staff will conduct a review of existing Local Comprehensive Plans (LCPs), Mass Development's Unified Plan for JBCC, the 2005 JBCC JLUS, prior JBCC master plans, Comprehensive Wastewater Management Plans (CWMPs), and other existing/ongoing wastewater, water supply and solid waste studies on JBCC and in the towns of Sandwich, Falmouth, Bourne, Mashpee, and Barnstable.

DELIVERABLES

- ✓ Summary of relevant issues, goals and policies from LCPs, CWMPs and JBCC master plans

- ✓ Status summary of 2005 JLUS recommendations
- ✓ Existing Land Use Map of JBCC

TASK 2 – COLLECT AND ANALYZE SHARED SERVICES AGREEMENTS

In recognition of the direct link between potential incompatible civilian development and the provision of public and municipal services (including hard infrastructure), a focus of this study effort will be to determine the process by which investments in critical municipal services and infrastructure is made. This focus proceeds based on the understanding that—through dialogue (and potential partnership) between the military services and communities—it may be possible to guide new municipal and installation development to areas that achieve compatibility both for local growth and economic development objectives of the Cape communities as well as for the mission requirements of the military.

Furthermore, this activity supports recommendations from the 2005 JLUS; notably those concerning local water and wastewater infrastructure and transportation infrastructure (pages 69 and 70), which references the need for additional water and wastewater capacity in particular as Upper Cape towns grow.

Preparing for its role understanding this linkage and fostering this eventual dialogue / supporting such partnerships, Commission staff will attend the 2012 Association of Defense Communities conference to gather the most current information and expand staff knowledge on military-community partnerships, base redevelopment, and alternative energy opportunities.

Commission staff will review examples of existing legislation and community-military shared service agreements, including the City of Monterey, CA Joint Powers Agency agreement.

DELIVERABLES

- ✓ Summary of best practices from existing Community-Military Partnership case studies (as it relates to promoting compatible use)
- ✓ Summary of policies that enable/disallow military-public shared services; recommendations identifying stakeholder roles,

responsibilities, and associated challenges with implementing military-community inter-municipal agreements (MC-IMA) (as they pertain to promoting compatible use).

TASK 3 – UPDATE EXISTING LAND USE/ZONING AND BUILDOUT ANALYSES

In consultation with the Technical Advisory Committee, Commission staff will provide an updated buildout analysis within the study area based on the 2012 Cape-wide buildout. The buildout analysis will identify development potential in surrounding residential, commercial, and industrial zoning districts based on state zoning designations. Commission staff will consult with Town Planners on any zoning changes and update existing land use and zoning maps, including any overlay zones adopted by towns since completion of the 2005 JLUS. In consultation with the Commission's Affordable Housing Specialist and Technical Advisory Committee, Commission staff will update maps of proposed/permitted Chapter 40B developments and other existing/planned affordable housing developments within the study area.

DELIVERABLES

- ✓ GIS maps/tables of Updated Land Use, Zoning and Buildout Analyses and summary report
- ✓ Updated Chapter 40B Comprehensive Permit/affordable housing map

TASK 4 – CONVENE POLICY COMMITTEE/TECHNICAL ADVISORY COMMITTEE MEETINGS

Commission staff will facilitate up to three (3) briefings for the Policy Committee at the following stages of the update process: project initiation; analysis and draft recommendations; and, to present the final report. The Policy Committee and/or JBCC base commanders will also convene in response to JLUS update progress on an as-needed basis. The Cape Cod Commission staff will also facilitate up to two (2) structured dialogue sessions with the Technical Advisory Committee to discuss specific opportunities for shared service provisions. Discussion will focus on, but not be limited to, the following categories:

- Transportation infrastructure (roadways, rail, air);
- Electric and gas utilities operation and maintenance (including renewable energy);
- Water supply and wastewater infrastructure;
- Solid waste and recycling (transfer station and SEMASS);
- Public safety facilities including fire and police;
- Ecological and conservation services.

PROCUREMENT

DELIVERABLES

- ✓ Recommendations for three (3) to five (5) opportunities for Community-Military Partnerships

TASK 5 – ANALYZE EXISTING INFRASTRUCTURE CAPACITY

Commensurate with the budget for the study and utilizing existing reports, Commission staff will update the analysis of existing infrastructure within the study area used for the 2005 JLUS (inclusive of the cantonment area). Infrastructure analysis will include the following: wastewater and water supply, solid waste, transportation and storm water utilities for nutrient management. Transportation analysis will be limited to a review of traffic operations and safety at locations where base access/egress intersects with the regional road system.

DELIVERABLES

- ✓ Summary of existing capacity of utilities and infrastructure on JBCC and within study area

TASK 6 – ANALYZE EXISTING/FUTURE LAND USE CONFLICTS

Based on review of MassDevelopment's unified plan for JBCC and discussion with Technical Advisory Committee, Commission staff will

identify issues related to existing and future land use on JBCC and within the study area, including noise, transportation, regional evacuation and emergency response options, and an alternative energy policy for the study area.

Alternative energy options will be studied mindful of the Department of Defense Siting Clearinghouse requirements and standards published in Title 32, Code of Federal Regulations, Part 211. Specifically, these regulations seek to advise and guide the process to facilitate the early submission of renewable energy project proposals to the Clearinghouse for military mission compatibility review.

DELIVERABLES

- ✓ Preliminary report on potential land use conflicts
- ✓ Draft alternative energy policy (in close coordination with the JBCC leadership)

TASK 7 – REVIEW SECURITY, ACCESS AND COMMUNICATION POLICIES/PROCEDURES

Commission staff will discuss ongoing JBCC security and access issues with the Technical Advisory Committee as well as existing communication policies and procedures between JBCC tenants and surrounding communities, including but not limited to the following: emergency management, training activity, violation notices, and proposed development projects.

DELIVERABLES

- ✓ Communication/coordination strategy between JBCC tenants and surrounding communities, including development of web-based tools

TASK 8 – REFINE INTERMUNICIPAL AGREEMENT OPPORTUNITIES

Using the data, analysis and dialogue generated in previous tasks, Commission staff will recommend up to four (4) Community-Military Partnership concepts based on technical assessments and feasibility evaluations (including financial pro-formas) by the Technical Advisory Committee. Each opportunity for a Community-Military Partnership will be evaluated based the following characteristics: operational and organizational structure (including the necessity of a Joint Powers Agreement/Authority); identification of necessary parties; other enabling legislation; base access and general use considerations; contracting and procurement considerations (i.e. 32 CFR Part 33 and OMB – A-87); financial feasibility; timeline for return on investment and milestones; and implementation costs, staffing, management, and required legal instruments.

DELIVERABLES

- ✓ Draft feasibility report with recommendations and implementation strategies
- ✓ Model agreement for Community – Military Partnership

TASK 9 – DRAFT RECOMMENDATIONS

Commission staff will prepare for Policy Committee review and approval draft recommendations concerning future land use and zoning within local jurisdictions, characterization of future land use on JBCC, and other strategies to address conflicts or needed implementation actions within the study area and identify the responsible party, i.e. local, regional, state or federal government for undertaking such actions.

DELIVERABLES

- ✓ Summary report on study recommendations

TASK 10 – CONDUCT COMMUNITY OUTREACH

In coordination with ongoing OEA technical assistance, Commission staff and JBCC personnel will jointly conduct meetings with military personnel, Planning Boards and Boards of Selectmen/Town Council in

the towns of Barnstable, Sandwich, Falmouth, Bourne and Mashpee to present the draft report.

DELIVERABLES

- ✓ Up to ten(10) briefings at Boards of Selectmen/Town Council/Planning Board meetings

TASK 11 – PREPARE FINAL REPORT

Based on comments received from the community and Technical Advisory Committee on the draft report, Commission staff will prepare a final report for presentation to the Policy Committee including final recommendations, maps and graphics as needed.

DELIVERABLES

- ✓ Final report

JLUS UPDATE STUDY AREA

At the initial kickoff meeting for the JLUS update in July 2013, the Policy Committee agreed that the study area identified for the 2005 JLUS, defined by noise contours, air safety zones and major roadways surrounding the base continued to be an appropriate study area for the JLUS update and would allow a comparison of land use changes since the 2005 JLUS was completed.

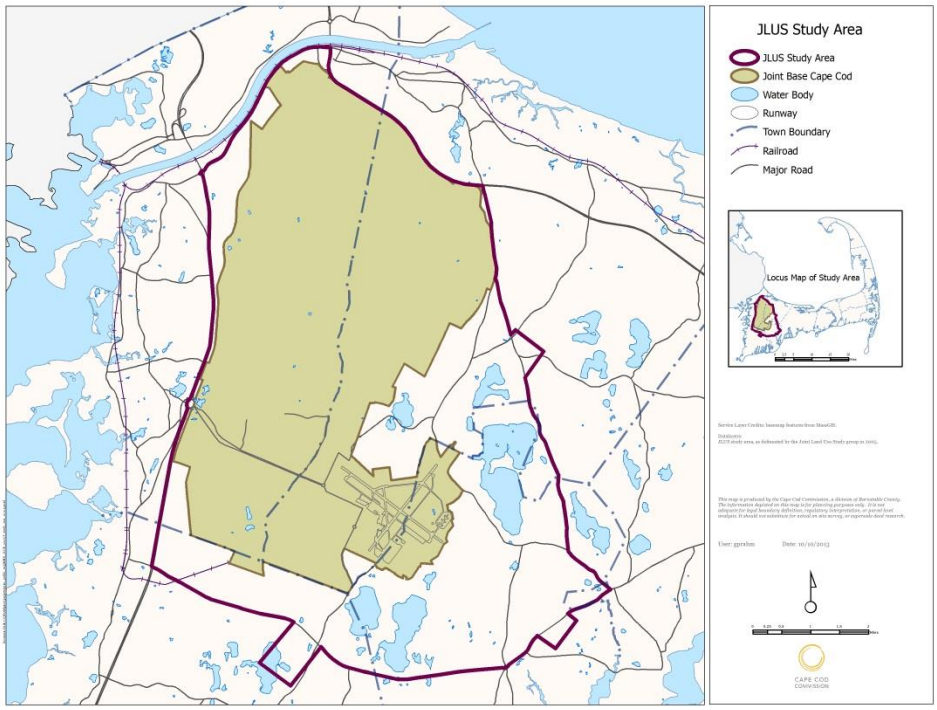


Fig. 1 – JLUS Study Area

JBCC OWNERSHIP AND LAND USE

At approximately 22,000 acres, JBCC is one of the largest contiguous properties in state or federal ownership on Cape Cod. Camp Edwards, principally used for Army National Guard training is comprised of approximately 15,000 acres in the northern portion of the base.

The cantonment area, which is substantially more developed with structures, roads and other infrastructure, is comprised of approximately 7,000 acres in the southern portion of the base. There are four military commands operating on the base, including the Massachusetts Army National Guard at Camp Edwards; the Massachusetts Air National Guard at Otis Air National Guard Base; the 6th Space Warning Squadron phased array radar site at Cape Cod Air Force Station; and the U.S. Coast Guard at Air Station Cape Cod.

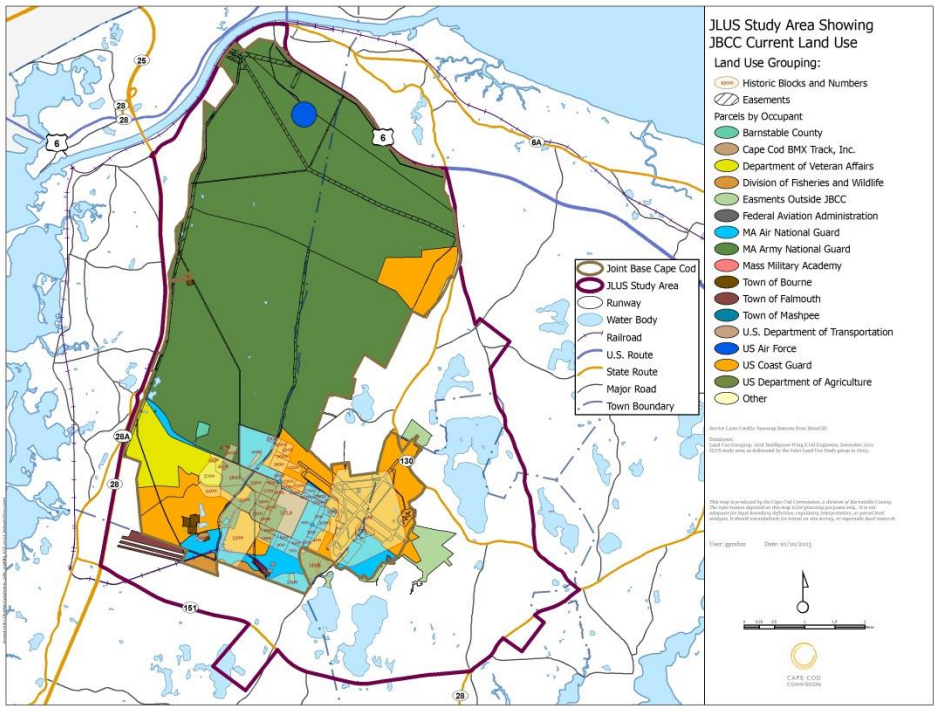


Fig. 2 – Joint Base Cape Cod Land Use

In 2005, the Base Realignment and Closure (BRAC) process resulted in redistribution of aviation resources to Barnes airfield in Westfield, MA and re-purposing the mission of Otis Air National Guard base to its current mission as the 102nd Intelligence Wing. Responsibility for airfield operations was transferred to the US Coast Guard in 2008. As a result of these mission changes, the Air National Guard's requirement for land and facilities was significantly reduced.

The MAANG has approximately 6,375 soldiers who train on average one weekend per month and one two-week cycle during a training year. Camp Edwards today is the largest of five major training facilities in the Commonwealth.

In addition to the major commands on JBCC, the base currently houses the Veteran's Administration (Massachusetts National Cemetery), Cape Cod Air Force Station and US Coast Guard Antenna Station, PAVE PAWS, Barnstable County Jail and House of Correction, and many smaller tenants from Federal, State and Local agencies.[5]

[5] See *Draft General Plan for Space Re-Utilization for the Otis Air National Guard Base* by the 102nd Intelligence Wing dated October 10, 2012, p. 4

SURROUNDING LAND USE

Land within the study area consists primarily of federal, state, or locally protected open space, existing residential development, and land available for residential or commercial development. In the Town of Bourne, approximately half of the study area is protected open space. Municipal facilities including a solid waste facility and regional technical school border the base boundary. In the Town of Falmouth, 80% of the study area consists of either federal or state landholdings or other protected open space. Recreational uses including public and private golf courses are within the study area.

In the Town of Sandwich, approximately one-third of the study area consists of existing residential development, and almost 25% of the study area is protected open space. Several fresh water ponds border the base in the towns of Mashpee and Sandwich. A majority of the air safety zones in the Town of Mashpee are owned by the Air Force under the control of the Air National Guard or consist of other protected open space.

DEVELOPMENT ACTIVITY SINCE 2005 JLUS

Since the 2005 JLUS, a number of development projects have been permitted or constructed within the study area. These projects include redevelopment, expansion, and new development. Significant projects identified by Commission staff permitted or developed since completion of the 2005 JLUS are presented in the following table:

Table 3 – Development in JBCC JLUS Study Area 2005 – 2012

Development Type	Description	Type	Size/Units	Town	Location
Expanded Development	Southport Expansion	Residential	n/a	Mashpee	Off of Old Barnstable Rd
Expanded Development	Upper Cape Tech Expansion	Institutional	n/a	Bourne	Upper Cape Tech Campus
Expanded Development	Schooner's Pass Subdivision Buildout	Residential	n/a	Bourne	Off of Sandwich Rd
New Development	New Nursery	Commercial	n/a	Mashpee	Great Neck Rd N @ Meetinghouse Rd

New Development	New Subdivision (Osprey Drive)	Residential	49 units	Barnstable	Noisy Hole Rd @ Rte 28
New Development	Brightside Lane	Chapter 40B Residential	40 units, 10 affordable	Sandwich	Off of Rte 130
New Development	Bank (Rockland Trust)	Commercial	3,500 s.f.	Sandwich	333 Cotuit Rd
Redevelopment	Market Basket Plaza	Commercial	101,600 s.f.	Bourne	Mid Cape Connector
New Development (proposed)	Quashnet Valley Country Club	Residential (64 units)	64 units	Mashpee	Payamps Rd.
New Development (proposed)	Wampanoag Tribe	Residential (52 units)	52 units	Mashpee	Meetinghouse Rd.
New Development	Baptist Church	Institutional	40,000 s.f.	Falmouth	Currier Rd @ Rt 151
New Development	New Subdivision (Cotuit Meadows)	Residential	124 ownership units, 31 affordable	Barnstable	Falmouth Road
New Development	Ashers Path senior housing-single building	Residential	56 affordable age-restricted	Mashpee	Carleton Circle
New Development	Canalside Commons	Commercial & 40B residential	85,000 s.f. commercial, 300 condominium units, 25% affordable	Bourne	MacArthur Boulevard/Sandwich Road
New Development	Annie's Pasture	40B residential	20 units, 5 affordable	Sandwich	Route 130
New Development	Habitat for Humanity	Residential	2 affordable s.f. homes	Mashpee	Fox Hill and Lakewood Roads

UPDATED BUILDOUT ANALYSIS

The 2005 JLUS completed a parcel-level buildout analysis with adjustments on a townwide basis after discussion with the town planners in each surrounding community.

For the JLUS update, staff updated the buildout analysis within the JLUS study area using methodology completed for the 2012 Cape Cod Regional Wastewater Management Plan. This analysis identified development potential in surrounding residential, commercial, and industrial zoning districts based on state zoning designations. Based on this methodology, the following is the residential and commercial development potential under existing zoning:

Table 4 – Development Potential under Existing Zoning

Town	Commercial Square Ft	Dwelling Units
Bourne	1,096,357	41
Falmouth	85,018	169
Mashpee	1,902,625	495
Sandwich	763,000	546

The updated buildout analysis indicates significant commercial development potential within the study area under existing zoning, particularly in the towns of Mashpee and Bourne. It should be noted that the commercial buildout does not differentiate between retail and industrial uses.

Residential development potential within the study area is also significant with over potentially over 1,250 dwelling units within the study area.

Considering the limited size of the study area, the towns and the base should continue to pursue land acquisition/restrictions within the study area to reduce the impacts of commercial development on the surrounding transportation network, and to reduce conflicts between abutting uses and military operations and training.

UPDATED INFRASTRUCTURE CAPACITY ANALYSIS

In recognition of the direct link between potential incompatible civilian development and the provision of public and municipal services (including hard infrastructure), a focus of this study effort was to determine the process by which investments in critical municipal services and infrastructure is made. This focus proceeds based on the understanding that – through dialogue (and potential partnership) between the military services and communities – it may be possible to guide new municipal and installation development to areas that achieve compatibility both for local growth and economic development objectives of Cape communities as well as for the mission requirements of the military.

Furthermore, this activity supports recommendations from the 2005 JLUS; notably those concerning local water and wastewater infrastructure and transportation infrastructure, which references the need for additional water and wastewater capacity in particular as the Upper Cape towns grow.

TRANSPORTATION

Regional Roadways and Intersections

The regional roadway network surrounding JBCC includes the following roadways (starting at the Bourne Bridge and moving clockwise): Sandwich Road, Route 6, Route 130, Great Neck Road, Route 151, and Route 28.

Three gates provide access to JBCC from the regional roadway network:

- Main Entrance: from Route 28 via Connery Avenue / the Otis Rotary
- Sandwich Gate: from Route 130 via Snake Pond Road
- Falmouth Gate: from Route 151 via Sandwich Road

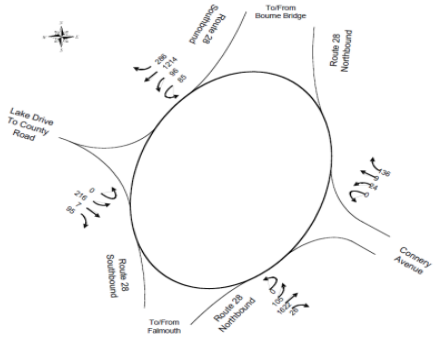
Consistent with the July 2012 Scope of Work for the JLUS update, the transportation analysis is limited to a review of traffic operations and safety at the locations where the base access/egress intersects with the regional road system. This includes the Otis Rotary, the intersection of Route 151 at Sandwich Road, and the intersection of Route 130 at Snake Pond Road. Of the three locations studied, the existing transportation infrastructure at the Otis Rotary poses the greatest future risk to JBCC operations. The high number of crashes, particularly injury crashes, at this location is of great concerns and warrants short-term corrective actions as well as consideration of long-term improvements.

Fig. 3 – Otis Rotary

Otis Rotary

The Otis rotary is a four-legged rotary located to the east of JBCC along Route 28 in Bourne. The north and south approaches to the rotary handle regional traffic along Route 28, the west approach handles mainly local traffic on Route 28A and County Road, and the east approach handles traffic to and from JBCC via Connery Avenue.

A noted congestion and safety problem, the Otis Rotary was one of three locations studied by Commission staff as part of the 2006 Transportation Safety Report. This report presented information on the operational and safety characteristics of the rotary along with recommendations for structural improvements.



Summer Weekday P.M. Traffic Volumes [Otis]

Source: adjusted traffic counts by VAI, Inc., summer 2005

Fig. 4 – Otis Rotary Traffic Volumes

Operations

The rotary serves approximately 28,000 entering vehicles per day on an annual average basis and 37,000 on an average summer day (based on June 2012 data).

The predominant flow direction is

north-south along Route 28 with a large seasonal variation. Volumes to and from Connery Avenue vary based on the level of activity within JBCC with notable spikes during large-scale training activities.

The unique geometry of the Otis Rotary provides both operational and safety challenges. The large radius and oval configuration allows Route 28 through-traffic to maintain a high rate of speed while the smaller radius of some of the rotary segments requires vehicles to slow considerably. The potential high-speed travel and large speed differential present a significant safety hazard to motorists.

Safety

According to Massachusetts Department of Transportation motor vehicle crash records, over the most recent 5 years on record (2006-2010) there have been 155 reported crashes including 1 fatal crash and 42 injury crashes at the Otis Rotary. The breakdown of crashes by crash severity and crash type are presented on the following page. This location is consistently ranked on list of high-crash locations on Cape Cod and a number of potential safety improvements have been considered at this location.

Fig. 5 - Otis Rotary Crash (April 2, 2010)

Table 4 – Otis Rotary Crash History

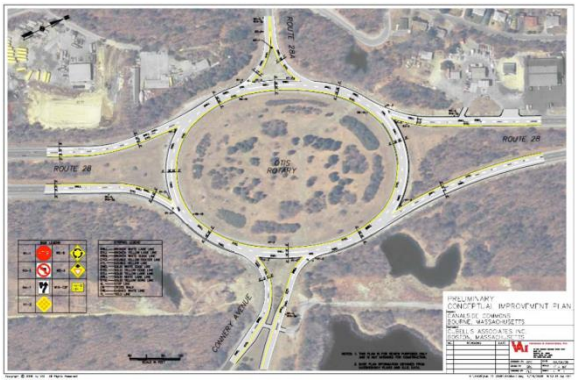
	Year					Total	Ave
	2006	2007	2008	2009	2010		
Crash Severity							
Fatal	0	0	0	1	0	1	0.2
Non-Fatal Injury	11	6	9	13	3	42	8.4
Property Only	18	22	23	21	20	104	20.8
Not Reported	3	4	0	1	0	8	1.6
Crash Type							
Angle	9	5	5	4	4	27	5.4
Rear-end	8	10	14	15	8	55	11
Sideswipe, same direction	6	5	3	8	8	30	6
Sideswipe, opposite direction	0	0	0	0	0	0	0
Head-on	0	0	0	1	0	1	0.2
Single vehicle crash	8	11	10	8	3	40	8
Not reported	1	1	0	0	0	2	0.4
Total	**32**	**32**	**32**	**36**	**23**	**155**	**31**

Potential Improvements
Several potential short-term and long-term improvements were developed as part of the 2006 study of the rotary and from earlier studies. Four potential alternatives will be discussed briefly with more detail available in the 2006 study.

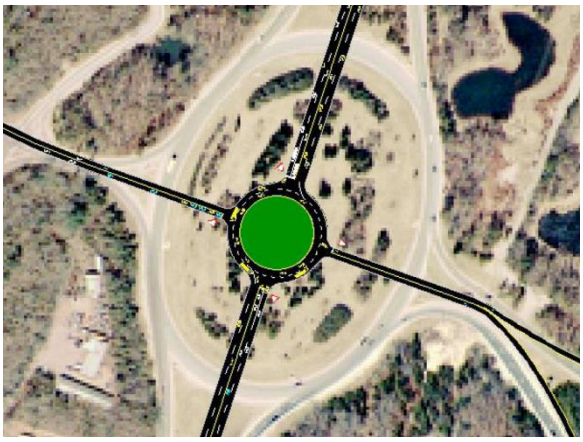
Alternative 1 would be to would be an attempt to add some features of modern roundabout design to the existing rotary. These changes include diagrammatical signage, entry lane markings, rotary striping, and maintaining sight lines. Alternatives 2-4 would involve replacement of the current large oval rotary with an at-grade signalized intersection, a smaller modern circular roundabout, or a grade-separated diamond interchange. The relative impacts of the rotary alternatives are presented in Table below and conceptual plans are presented on page ___.

Table 5 – Summary of Otis Rotary Alternatives

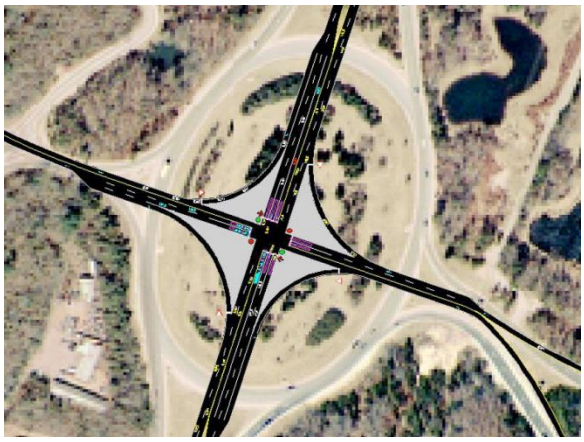
Alternative	Relative Cost	Congestion Relief	Safety Improvement	Environmental/ ROW
Restriping	Low	Minimal	Minimal	None
Roundabout	Medium	Medium	Medium	Low
Signalized Intersection	Medium	Minimal	Minimal	Low
Diamond Interchange	High	High	High	Medium



Alternative 1: Restriping *(Source: VAI, Inc.)*



Alternative 2: Modern Roundabout



Alternative 3: Signalized Intersection

Alternative 4: Diamond Interchange

Fig. 6 – Otis Rotary Alternative Concepts

As a short-term improvement, it is recommended that the rotary be restriped for 2-lanes with improved signage (Alternative 1). The grade-separation alternative (Alternative 4) is recommended for consideration as the long-term solution for this location due to its expected benefits to traffic flow and safety.

Route 151 at Sandwich Road and Route 130 at Snake Pond Road
Both of these intersections provide access between JBCC and the regional roadway network and also serve other regional and local traffic. Recent signal upgrades have improved safety and operations at these intersections, however both are still considered high-crash locations.

Operations
The MMR Master Plan Final Report (1998), prepared by the Cape Cod Commission in conjunction with the Community Working Group, included analyses of the Route 151 at Sandwich Road and the Route 130 at Snake Pond Road intersections. Both were calculated as operating at Level of Service F (failure conditions) based on stop-sign control. Since the 1998 study, both intersections were converted to full traffic-signal control (Route 151 at Sandwich Road in 2000 and Route 130 at Snake Pond Road in 2003). More recent analyses of these intersections suggest that both intersections are currently operating at Level of Service C (acceptable conditions) or better during summer

Fig. 7 – Route 130 at Snake Pond Road

month/peak-period conditions. Based on 2006 traffic count data and more recent site visits, it is estimated that the intersection of Route 151 at Sandwich Road operates at Level of Service C during summer month/peak-period conditions.

Based on 2011 traffic volumes, Level of Service B was estimated for summer month/peak-period conditions at the intersection of Route 130 and Snake Pond Road as presented in the for the 2012 Final Environmental Impact Report for the South Sandwich Village Center project prepared by Horsley Witten Group, Inc.

It appears that full traffic-signal control at these intersections has alleviated the past traffic congestion problems.

Fig. 7 – Route 151 at Sandwich Road (Facing East)

Safety

Massachusetts Department of Transportation motor vehicle crash records, over the most recent 5 years on record (2006-2010) were analyzed at both of these signalized intersections and the results are presented in tables on the following page.

Both intersections are considered high crash locations with 3 or more reported crashes per year for 3 years or more years. At the intersection of Route 151 at Sandwich Road there were 40 reported crashes including 1 fatal crash and 16 injury crashes between 2006 and 2010. At the intersection of Route 130 at Snake Pond Road Road there were 21 reported crashes including 2 injury crashes between 2006 and

2010. Given the crash history at these intersections conducting Road Safety Audits should be considered to identify potential countermeasures that could be implemented to improve safety. The need is particularly pressing at the intersection of Route 151 at Sandwich Road given the fatal crash and high number of injury crashes.

Table 6 – Route 151 at Sandwich Road Crash History

	Year					Total	Ave
	2006	2007	2008	2009	2010		
Crash Severity							
Fatal	0	1	0	0	0	1	0.2
Non-Fatal Injury	4	3	3	2	4	16	3.2
Property Only	3	1	8	6	4	22	4.4
Not Reported	0	0	1	0	0	1	0.2
Crash Type							
Angle	1	1	2	4	1	9	1.8
Rear-end	4	2	7	2	5	20	4
Rear-to-rear	0	0	0	0	1	1	0.2
Sideswipe, same direction	0	0	0	0	0	0	0
Sideswipe, opposite direction	0	0	0	0	0	0	0
Head-on	0	1	1	0	0	2	0.4
Single vehicle crash	0	0	1	2	1	4	0.8
Not reported	2	1	1	0	0	4	0.8
Total	**7**	**5**	**12**	**8**	**8**	**40**	**8**

Table 7 – Route 130 at Snake Pond Road Crash History

	Year					Total	Ave
	2006	2007	2008	2009	2010		
Crash Severity							
Fatal	0	0	0	0	0	0	0
Non-Fatal Injury	1	0	0	0	1	2	0.4
Property Only	3	5	4	3	4	19	3.8
Not Reported	0	0	0	0	0	0	0
Crash Type							
Angle	0	2	3	1	3	9	1.8
Rear-end	2	1	0	2	2	7	1.4
Sideswipe, same direction	0	0	0	0	0	0	0
Sideswipe, opposite direction	0	1	0	0	0	1	0.2
Head-on	0	1	0	0	0	1	0.2
Single vehicle crash	2	0	1	0	0	3	0.6
Not reported	0	0	0	0	0	0	0
Total	**4**	**5**	**4**	**3**	**5**	**21**	**4.2**

Other Considerations

Accessing JBCC through the Sandwich Gate requires travel along Snake Pond Road. While this road is functionally classified as a regional road, the dense residential development along it gives the road a more local/residential feel. Use of the road as an entrance to JBCC is somewhat incompatible with this adjacent land use. Commission staff recommends that the MAARNG consider possible relocation of the Sandwich Gate in future planning to avoid this conflict.

Possible locations for such a connection, further north on Route 130, would be at the convoy gate or at the intersection of Jan Sebastian Drive. The intersection of the convoy gate with Route 130 would need to be upgraded and a security checkpoint added if it were to see permanent use. Within the base the convoy gate already connects to Kiahs Way, Gibbs Road, and Georgia Road, but upgrades at this connection would be required. Currently a signalized T-intersection with Jan Sebastian Drive, the intersection could be converted into a signalized four-way intersection to allow for JBCC access. Upgrades to the JBCC internal roadway network would be required and a new security checkpoint would need to be located sufficiently far from the Route 130 / Jan Sebastian Drive intersection to avoid vehicle queue spillback.

Commission staff evaluated the potential for expanded JBCC-based wastewater treatment and disposal infrastructure to accommodate existing and future needs of the towns based in part on information contained in *Appraisal Consulting Services for the Wastewater Treatment System at the MMR* completed in December 2012 by CH2MHill for MassDevelopment. Additional information was obtained from Comprehensive Wastewater Management Plans (CWMP) either completed or currently in process by the four Upper Cape towns.

The following tasks were outlined in the scope of work defined by MassDevelopment:

- Appraise the value and condition of the system to include valuation of all equipment, infrastructure, and facilities currently providing wastewater treatment service to JBCC. This estimate of the value of the system is intended to be used in strategic planning, feasibility level comparisons, and evaluation of options for future treatment of sanitary wastewater produced on JBCC and the surrounding communities of Cape Cod.

- Determine and evaluate various courses of action for the management and operation of the system that would be projected to reduce or eliminate the costs to the Owner to operate the system, to include estimates of operational costs, costs to current and future users, future capital outlays, legal issues and management structure.

- Recommend a course of action for the future operation of the system projected to reduce or eliminate the costs to the Owner to operate and maintain the system. A secondary goal of the study is to define and evaluate Options for operating the system that would extend the service area or the use of the facilities in a regional wastewater scheme, providing benefits to the neighboring towns, which have near-term and long-term wastewater management needs.

A secondary goal of the study was to define and evaluate options for operating the system that would extend the service area or the use of the facilities in a regional wastewater scheme, providing benefits to the neighboring towns, which have near-term and long-term wastewater management needs.

The JBCC wastewater system consists of the following:

Collection & Conveyance Conduits:	161,000 linear feet (lf)
Manholes:	595
Pump Stations:	11

Wastewater Treatment Plant:	360,000 gpd permitted capacity
12" Treated Effluent Force Main:	55,280 lf
Rapid Infiltration Disposal Beds:	4 cells; 6 acres
Composting Facilities:	25,290 square feet (ft2)
Monitoring Wells:	7

The general condition of the wastewater treatment plant was found to be "fair" since it was upgraded in 1996 with a number of part replacements in 2002. The condition of the collection system was "cautious" since it is over 50+ years old and no formal assessments have been completed. A 2001 inflow and infiltration study (I/I) indicated that it was a significant portion of the flow captured by the system.

The study reported that the replacement cost was $44 million, but that the replacement cost less depreciation[6] was $16 million. The existing and projected future flows at JBCC were reported as 140,000 and 147,000 gpd respectively.

The study attempted to gauge the wastewater needs of the surrounding communities. This effort made use of the best available information from the towns to reflect existing and potential wastewater needs. The total existing and future needs were 694,000 and 3,551,900 gpd respectively for treatment and total disposal needs as indicated by the table excerpt from the study.

Table 8 – Summary of Wastewater Treatment and Disposal Needs

Entity	Near-Term Needs (gpd)	20-Year Needs (gpd)	Requirements
JBCC Users	140,040	147,300	Treatment and Disposal
Town of Falmouth	200,000	200,000	Disposal only
Bourne Landfill	40,000	80,000	Disposal only
Town of Bourne	0	1,836,000	Treatment and Disposal
Town of Sandwich	156,000	630,000	Treatment and Disposal
Town of Mashpee	158,000	658,600	Treatment and Disposal
Total: Treatment and Disposal	**454,040**	**3,271,900**	
Total: Disposal Only	**240,000**	**280,000**	

Table 4 – 1, *Appraisal Consulting Services for the Wastewater Treatment System at the MMR*, prepared for Mass Development, by CH2MHill, December 2012

[6] The replacement cost is the actual cost of the system while depreciation is the amount of value that was lost in the system over its useful life.

Based on information being compiled for the Section 208 Water Quality Plan update being prepared by the Cape Cod Commission, the needs of surrounding communities could be greatly modified. For example, Falmouth's total projected future wastewater flow needs identified in the CWMP are approximately 2.1 MGD and given the constraints on wastewater disposal options, JBCC could present a viable alternative. Also, the needs reflected by Bourne assume that the total town would be sewered, which is not likely to occur.

The amounts for the Towns of Sandwich and Mashpee are reasonable but timing is a major issue. Sandwich has just received additional funds from the Natural Resources Damages Assessment to further its CWMP and will likely address the benefits of a public private partnership with JBCC. The Mashpee CWMP indicates that wastewater disposal is a constraint and that regional solutions including JBCC are viable.

The CH2MHill study evaluated the transport pipe cost for the towns to hook up to JBCC and expected revenue to be generated based upon an existing cost of $0.018 per gallon for treatment or $0.0053 per gallon for disposal as follows:

	Transport	**Treatment/Disposal**
Falmouth	$9,555,000	$6,889,000
Mashpee	$4,880,000	$9,487,000
Sandwich	$8,001,000	$9,367,000

The CH2MHill study evaluated two alternatives for the base case with no regional services, and two alternatives for either contract operation or sale of the facility, including exclusive service to JBCC tenants and regional service to Towns as follows:

A. Base Case – existing
B. Base Case – Optimize management procedures
C. JBCC Owned under Contract
D JBCC Owned under Contract with Services to the Towns
E. Sale of JBCC Facilities
F. Sale of JBCC Facilities with Services to the Towns

The study did not reach conclusions on a preferred alternative for JBCC and the Towns. However, it did include a preliminary ranking of the alternatives that found the regional alternatives D and F as the highest and second highest based upon the highest level of use, access to regional disposal capacity and generation of revenue to fund upgrades and expansion.

The alternative involving a regional wastewater system was discussed at public meetings and with the towns during this study. The alternative is presented as a potential means of satisfying long-term wastewater

management needs of the Upper Cape communities and JBCC using the 102nd's system as the skeleton of an expanded, upgraded regional wastewater system.

This alternative recognizes the following factors:

- There is substantial need among the Upper Cape towns for wastewater treatment and disposal services beyond the near-term period addressed by the options outlined above.
- The JBCC wastewater system is centrally located among the Upper Cape towns.
- Regional wastewater would allow the military to focus on its primary missions and divest itself of the wastewater system.
- There has been and will continue to be substantial difficulty in siting and permitting new municipal wastewater treatment and disposal systems in the Upper Cape area.
- There has been substantial interest shown by the four Upper Cape towns in jointly considering regional solutions to their similar wastewater challenges.

The management, infrastructure and regulatory path to pursue these options are included in the Feasibility section of this report found in Appendix 3.

WATER SUPPLY

The water supply needs for JBCC and the Upper Cape communities has benefited from Department of Defense investment as mitigation for previous contamination. As part of the Textron Natural Resources Damages Assessment, the Upper Cape Water Supply Cooperative (UCWSC) was awarded funds to evaluate the capacity and sustainability of the Sagamore Lens. The study, being conducted by Tata and Howard, should be completed in 2014. This study is evaluating tools to identify sustainable water supply sites to meet potential future demands. As previously discussed, the water supply potential of this portion of the Sagamore Lens is significant and will only increase as remediation systems achieve their cleanup goals.

SOLID WASTE

The transfer station has an estimated annual capacity of 40,000 tons. JBCC typically contributes approximately 5.5% of the waste shipped from the transfer facility.[7] Based on MassDEP annual reports for 2008, annual tonnages handled at the UCRTS from the three participating towns total 35,216 tons. The Town of Falmouth's MSW accounts for approximately one-third of the annual tonnage transferred to the UCRTS. Falmouth will be taking solid waste to Bourne at the expiration of the SEMASS contract.

BASE UTILITIES

The 102nd Intelligence Wing is the host for utilities at JBCC. The 102nd owns and maintains the electric distribution system including a 12,500 KVA substation; the water distribution system including a public water supply well; and the sewage collection system including the wastewater treatment plant. The telephone system for all agencies is also maintained by the 102nd Communications Flight. Each utility requires staff and funding to maintain.

Most of the electric distribution system was upgraded in 2001 (and the main transformer again in 2010) which was an upgrade from 5,000 KVA to 7,500 KVA. The system is in good condition and the upgraded substation is at about 60% capacity. This situation provides room for growth for all the agencies at JBCC.[8]

ANALYSIS OF POTENTIAL CONFLICTS

LAND USE

Despite the limited size of the study area and land protection efforts that have taken place since the 2005 JLUS, significant residential and commercial development potential remains within the towns surrounding JBCC. In particular, Chapter 40B residential developments within air safety zones and noise contours are not subject to the same land use controls available to towns under local zoning in Massachusetts. If not properly sited, dense residential development in proximity to JBCC could increase potential encroachment issues for military tenants and noise and public safety issues for residents. Residential and commercial

[7] USCG Air Station Cape Cod Master Plan, p. 2-38
[8] Otis Air National Guard General Plan for Space Re-Utilization, p. 10-11

development increases potential transportation and safety impacts on area roadways and adds nitrogen to impacted marine embayments. Therefore, land acquisition, easements or other measures should continue to be pursued by the surrounding communities and the military to reduce potential conflicts between residential uses and military operations and training as well as to reduce the impacts of commercial development on the surrounding transportation network.

An example of encroachment includes recent clearing of wooded area by an abutting sportsman's club on property adjacent to the Base boundary to expand one of the club's shooting ranges. The cleared area abutted the Base boundary immediately adjacent to cleanup operations in the northern training area/Reserve.

Direction of fire from the sportsman's club is toward the Base boundary and directly impacts a large training area in the Reserve. While investigation by the Guard indicated that the sportsman's club had properly applied for local permits with the Town of Bourne and notified the Army National Guard at Camp Edward, the proper officials did not receive the notice of proposed clearing.

During a routine inspection of ongoing cleanup operations in the Reserve, base officials discovered the clearing activity and immediately ceased training activity. Guard officials designated the area a surface danger zone and are currently working with the owner of the sportsman's club to mitigate the risk from stray bullets to soldiers and cleanup personnel.

RENEWABLE ENERGY DEVELOPMENT

Federal and state authorities have established directives and guidelines that require military organizations to move toward renewable energy resources within certain timeframes. JBCC had previously developed an alternative energy planning policy specific to wind energy development and established a JBCC Energy Committee to initiate and monitor those efforts. Massachusetts communities have similar been tasked with developing renewable energy to meet certain state goals under the Green Communities Act, and private developers have been responsive to the "gold rush" of state and federal incentives to develop these projects on a large scale. The result of this fast moving industry is that there have been over 30 MW of combined wind and solar energy development projects discussed or formally proposed and/or permitted in the study area, including those proposed within the JBCC. Because of this high level of interest, coordination is needed to protect both the sensitive resources on and surrounding the base, and allow for these projects to move forward under their own merits while minimizing potential conflicts.

At the time of this report, four utility-scale wind energy conversion facilities have been erected within the northern 15,000 acres of JBCC . Two of these turbines power the groundwater clean-up efforts lead by the Air Force Civil Engineering Center (AFCEC), and two have been most recently erected to offset power needs of the Pave PAWS facility. The Army National Guard is proposing a fifth and final turbine in this location. Two smaller, commercial scale turbines are located in the southwest portion of the cantonment area. No additional turbines have been proposed.

In addition to wind energy projects, the JBCC has successfully installed two geothermal energy projects and is pursuing a large-scale solar array located on the capped landfill. Outside the JBCC boundary, utility scale solar project proposals have been numerous. In Bourne, a 2 MW array on 25 acres is proposed by a private developer as a community solar garden on property directly abutting the base. In Sandwich, a 16-acre solar array has been permitted as "Greenwood Meadows" on land formerly proposed as a Chapter 40B affordable housing development, directly abutting the base and a second array is proposed nearby. A fourth, 6MW array is proposed on a large parcel of land in Mashpee, also abutting the base.

The JBCC has considerable interest in renewable energy to meet federal goals and mandates for renewable energy generation and to enhance operational efficiencies. In addition to other opportunities, the JLUS Update examined whether there may be opportunities for the installation to partner with communities surrounding it to share the provision of public and municipal services ("shared service agreements") and/or including renewable energy development. The complex nature of power purchase agreements for these types of renewable energy projects did not lend itself to the shared service agreement model; however, these types of land uses within the study area were felt to be more appropriate than expanded residential or commercial development.

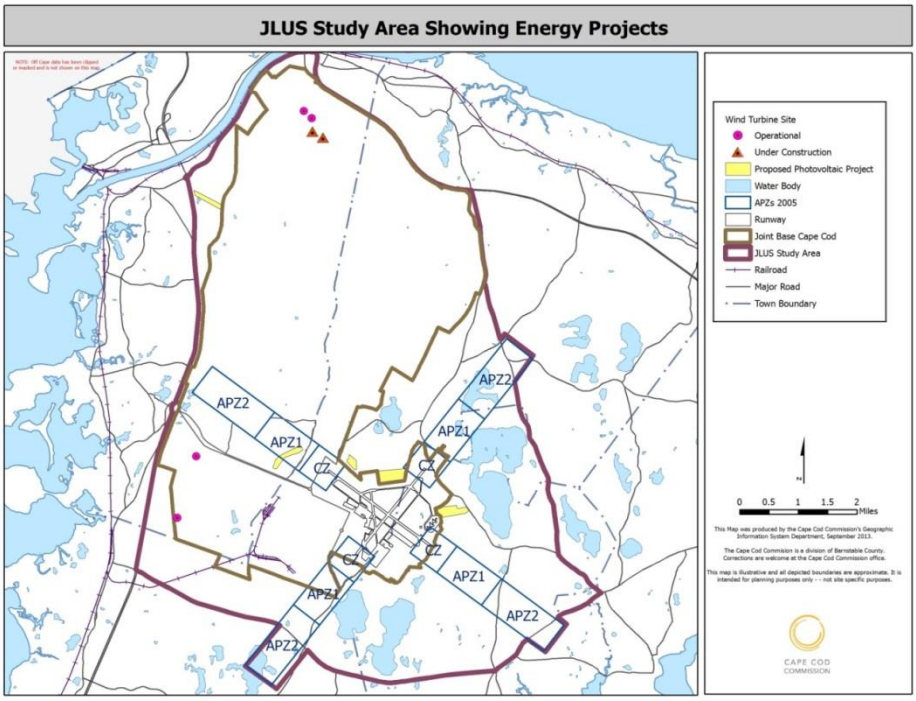


Fig. 8 – JLUS Study Area Showing Renewable Energy Projects

Since the 2005 JLUS, renewable energy opportunities, particularly solar, have intensified for military, municipal and private interests. Significant economic incentives in Massachusetts for solar energy development, paired with state and federal legislative mandates toward net zero energy, are primarily responsible for the numerous commercial scale solar PV projects proposed both on the JBCC and in the study area. Throughout the course of the JLUS Update, it became clear there would be no consensus on a renewable energy policy that was reflective of these varied interests.

To address potential conflicts surrounding renewable energy projects, the JLUS facilitated the revival and reformation of a 2008 Alternative and Renewable Energy Policy letter that was developed, at that time, to address wind turbine development on the JBCC. This Communication Protocol (see Appendix 1) is a mutually agreed-upon format for communicating renewable energy initiatives in the early planning stages between the JBCC and the surrounding communities.
Working through the MC3, the JBCC Joint Oversight Group and Renewable Energy Committee will provide regular updates on all JBCC renewable energy related initiatives. This protocol is intended to supplement the Department of Defense Siting Clearinghouse requirements and standards (Title 32, Code of Federal Regulations, Part 211) which address a project's potential military compatibility issues.

The surrounding communities, also represented through the MC3, will present updates on public and private renewable energy proposals in the study area. More transparent and timely communication in the early planning stages will ultimately yield better projects that are responsive to both community and JBCC interests.

NOISE

Realignment of the Air National Guard's 102nd Fighter Wing mission has relieved some of the concern relating to aircraft noise issues from the base. However, continued concern over training related noise, such as that from the firing ranges, remains. Expansion of firing ranges in the Reserve could also pose additional noise impacts to surrounding residential uses.

A new and potentially significant sound characteristic that has been introduced on the base is the sound generated by commercial scale wind energy facilities. The JBCC currently has three turbines operating and two in the construction phase. There have been no known complaints of wind turbine noise from these turbines; however, turbine noise has been an issue of significant concern within the region, especially in the Town of Falmouth, which abuts the JBCC. It is unclear whether the two turbines under construction will introduce any significant noise issues. However, future turbine development projects should take into account potential noise conflicts with sensitive receptors in order to assure military-civilian conflicts do not arise.

As previously noted, the JBCC's runways continue to provide critical value both in the Commonwealth's and the DoD's operational and training missions in their use as a location to bed down temporarily all types of aircraft; as a divert runway; and for other missions. For these reasons, recommendation pertaining to land use restrictions from the 2005 JLUS continue to be appropriate measures to address potential noise impacts .

SECURITY, ACCESS AND COMMUNICATION POLICIES

According to the 2012 State of the Reservation report, violations were reported in the ranges located within the Reserve. Well-established protocols have been in place since 2002 that include notification of local officials and the public in the event a violation as a result of training activity in the northern 15,000-acre Reserve.

According to the Executive Officer, illegal dumping activity has decreased since the 2005 JLUS. However, illegal trespassing including ATV use continues to be a concern. Since the 2005 JLUS, access to the base by the public for hunting, birding, and other recreational activities has increased.

These recreational opportunities provide an avenue for the Guard to increase the awareness by the public and local officials about the sensitivity of the natural resources on the base and could help reduce these encroachment issues.

As discussed in previous sections of this report, residential, commercial, and recreational development surrounding the base has continued to take place since the 2005 JLUS. The establishment of an Executive Director at JBCC provides a single point of contact on JBCC. Staff recommends development of a communication protocol between the towns and JBCC for proposed development to reduce the potential for land use conflicts and encroachment.

At the outset of the 2012 JLUS update, JBCC established a link to the JLUS on its website at http://states.ng.mil/sites/MA/JBCC/c-planning.html. The JBCC website has not been updated to include work products as a result of the JLUS update to date due to limited staffing.

The Cape Cod Commission also created a web page devoted to JBCC-related planning work and provided a calendar with meetings and draft materials for public review located at: http://www.capecodcommission.org/index.php?id=306&maincatid=4

REGIONAL EVACUATION/EMERGENCY RESPONSE

The 2012 Cape Cod Emergency Traffic Plan (CCETP) was developed to facilitate the egress of a high volume of traffic from Cape Cod in the event of a hurricane or other potential hazard event, particularly during peak tourist season. The CCETP however is not an evacuation plan. Rather, it is a tool that can be used to assist expediting traffic flow. The Plan was developed by the Massachusetts State Police and Massachusetts Emergency Management agency in cooperation with numerous other agencies, including representative from the military installations on the JBCC. The CCETP is intended to eliminate the causes of congestion and keep traffic flowing in the area of the Bourne and Sagamore Bridges and Routes 6 and 28. It suggests implementing 4 traffic pattern alterations to achieve this. Phase I includes detouring traffic from Route 6W at exit 2, through the JBCC to Route 28N. Phase II of the Plan provides for temporary shelters on the JBCC at Camp Edwards in the event the Bourne and Sagamore bridges have been closed. The Plan states that this shelter scenario is capable of providing "parking for thousands of vehicles", however a much smaller sheltering capacity figure has been suggested by the Camp Edwards Commander through the course of this study.

CREATING COMMUNITY – MILITARY PARTNERSHIPS ON CAPE COD

INTRODUCTION

In recognition of the direct link between potential incompatible civilian development and the provision of public and municipal services (including hard infrastructure), a focus of this JLUS update is to explore how future military and community needs could be met and efficiencies gained through creation of community – military partnerships for shared infrastructure, utilities, and other services.

While the military services have been reviewing ways to expand sharing of public and municipal services between an installation and its surrounding communities for some years now, this issue has received increased focus as concern has grown about (a) the size of the overall Defense budget, and (b) the growth of the Federal Debt (compounded by growing budget deficits).

Inter-municipal shared service agreements between installations and their surrounding communities are viewed as tools that military services may use to help mitigate those risks. Some key developments have recently surfaced which further enable community –military partnerships. Specifically, the passage of the Defense Authorization Act of 2013 provides specific authorization for community-military partnerships.

There are few limitations on this authority. The intergovernmental support agreement "may only be used when the secretary concerned or the state or local government…providing the installation support services already provides such services for its own use". Further, the secretary concerned must ensure that these agreements are not used to circumvent the requirements of the Office of Management and Budget circular A-76 regarding private-public competitions.[9]

RECOMMENDATIONS FOR SHARED SERVICES

Commission staff reviewed existing examples of other community – military partnerships and prepared a manual of best practices; reviewed existing shared service agreements on JBCC; conducted legal research on limitations under current federal and state laws; conducted two tabletop exercises with military and community officials to explore potential

[9] Id.

partnerships; and, prepared initial feasibility studies on the top priorities identified by workshop participants. As a result of these efforts, Commission staff identified the following as potential community – military partnerships between JBCC and the surrounding communities:

- Public works/administrative services
- Regional wastewater treatment and disposal
- Re-use of Upper Cape regional transfer station

Other potential partnerships examined but not recommended included the following:

- Relocation of regional fire and rescue training academy
- Bourne police station re-location and paving/maintenance of Connery Avenue

The following sections describe the process by which potential partnerships were identified; the basis for the recommendation, and the approach used in determining feasibility.

PROCESS USED TO IDENTIFY POTENTIAL PARTNERSHIPS

The Cape Cod Commission conducted two tabletop exercises during the JLUS update to identify and prioritize potential opportunities for community – military partnerships between JBCC and the surrounding towns. The workshops were very well attended by local, regional, and state officials, Cape Cod Chamber of Commerce, Barnstable County Sheriff's office, and military personnel from the Coast Guard, Air National Guard, and Army National Guard.

The purpose of the first workshop held on February 27, 2013 was to identify potential community-military partnership concepts. Commission staff gave a presentation on community-military partnerships and an overview of the current federal funding environment. Military representatives provided a summary of current master planning efforts focused on consolidation and mission objectives.

The full group brainstorming session resulted in creation of three major categories of potential partnerships: infrastructure, facilities, and services.

Infrastructure – included discussion of wastewater, energy, telecommunications, solid waste/recycling, transportation (air, rail, road, canal).

Facilities – included discussion of housing, recreation (golf, hunting, BMX, bike, ecotourism, soccer, etc.), emergency shelters, visitor facilities (conference center, theater, hotel/motel, museum/heritage facilities), educational facilities.

Services – included discussion of fire/police/emergency response, security/1st responder training, DPW, janitorial/grounds maintenance, education/workforce training, healthcare, research/testing/training, procurement, animal welfare, religious services, defensive driver training, social services.

Following the full group exercise, participants were divided into three groups based on their interests and expertise to discuss each of the potential partnerships in more detail. Participants were asked to discuss the following questions for each type of partnership:

- Could this partnership happen on Cape Cod?
- Who should participate?
- What resources are available?
- What value/benefit gained?
- Timeframe (short/long)
- Issues/obstacles

Following the small group exercise, the full group reconvened to identify those shared services that warranted further consideration. Following a ranking exercise, the following categories were identified by participants as top priorities for the region (in descending order):

1. Public works
2. Wastewater
3. Renewable energy
4. Solid waste and recycling
5. Fire/emergency services
6. Training/higher education
7. Rail spur, janitorial services, emergency shelter, recreational facilities
8. Air freight
9. Long-term housing
10. Healthcare services

POTENTIAL SHARED SERVICES IDENTIFIED IN TABLETOP EXERCISES

Project Title	Project Type	Project Goal	Description of Shared Service	Area Served	Potential Partners to Agreement	Obstacles/ Alternatives	Land/Space Requirements	Estimated Cost Reduction or Efficiency Gained	Community - Military Benefits
Joint DPW Facility	facility / services	multi-town and military shared-use DPW facility	facility that would house equipment for municipal / military use	Upper Cape/regional	towns / ANG / ARNG / Coast Guard	base access for municipal workers, cost of new/expanded facility		reduced cost of snow removal, paving, etc. equipment and services	efficiencies gained through shared facility and equipment
Bourne Police - Connery Ave	facility / infrastructure	Bourne police station relocation outside of floodplain / repaving of Connery Ave.	land swap for municipal police station in exchange for repair and maintenance of __ mile base access roadway	Bourne /MMR	town of Bourne, Army or Air National Guard?	base access for municipal workers, changes to secure area needed	15 - 20 acres outside secure area	land cost for new facility, reduced maintenance costs for military to maintain roadway	public safety facility outside of floodplain, improved roadway infrastructure

Project Title	Project Type	Project Goal	Description of Shared Service	Area Served	Potential Partners to Agreement	Obstacles/ Alternatives	Land/Space Requirements	Estimated Cost Reduction or Efficiency Gained	Community - Military Benefits
Regional Wastewater R&D Treatment Facility	facility / infrastructure	shared municipal/military wastewater disposal and treatment facility and resource recovery R&D	shared wastewater treatment and disposal with re-use or expansion of UCRTS for sludge and/or food waste processing	Upper Cape and MMR tenants	towns / ANG / ARNG / Coast Guard, MassDev, EMC, Federal Delegation, EOEEA/Governor of MA, State Delegation	approval of MMR Exec Dir., funding, evaluation of disposal capacity/flushing study of Canal needed, creation of institutional regional entity, commitment from DoD		reduced operational costs, increased wastewater treatment capacity, and waste reduction/economic benefits	reduction of Nitrogen to meet TMDLs, reduced costs for wastewater treatment for towns, cost savings for military

Project Title	Project Type	Project Goal	Description of Shared Service	Area Served	Potential Partners to Agreement	Obstacles/ Alternatives	Land/Space Requirements	Estimated Cost Reduction or Efficiency Gained	Community - Military Benefits
Regional Wastewater Treatment and Disposal Facility	infrastructure	shared regional / military wastewater disposal and treatment facility	shared wastewater treatment and disposal	Upper Cape and MMR tenants	towns / ANG / ARNG / Coast Guard, MassDev, EMC, Federal Delegation, EOEEA/Governor of MA, State Delegation	approval of MMR Exec Dir., funding, evaluation of disposal capacity/flushing study of Canal needed, creation of institutional regional entity, commitment from DoD		single treatment facility reducing redundancies and operational cost savings for military	acceptable site for treatment and disposal of wastewater
Renewable Energy Development	infrastructure	renewable energy development to reduce dependence on fossil fuels and GHGs	solar/wind renewable energy development on MMR for community / military benefit	Upper Cape/MMR tenants	ANG, ARNG, Coast Guard, MassDev, CVEC, CLC, Nstar, private developer, MA Clean Energy Center	mission changes could affect use of land, procurement policies	varies depending on technology	revenue for undeveloped or underutilized land, reduction in use of fossil fuels, net metering	more renewable energy within region, CVEC/CLC rate payer improvements

Project Title	Project Type	Project Goal	Description of Shared Service	Area Served	Potential Partners to Agreement	Obstacles/ Alternatives	Land/Space Requirements	Estimated Cost Reduction or Efficiency Gained	Community - Military Benefits
UCRTS anerobic digestion	infrastr ucture / facility	reduce waste and create energy and economic opportunities through use of waste by-products	use of rail spur/transfer station for food waste/recycling /anaerobic digestion	regional	Mashpee, Falmouth, Sandwich, MMR users	Bourne, MassDev, private companies, ANG		waste by-products provide economic opportunities	effciencies of scale
Solid waste and recycling	services	extension of IMA for use of UCRTS and potential expansion/re-use of UCRTS and rail spur as regional recycling / food waste processing facility	regional solid waste facility	regional	Cape-wide	Bourne, MassDev, private companies, ANG			efficiencies of scale

Project Title	Project Type	Project Goal	Description of Shared Service	Area Served	Potential Partners to Agreement	Obstacles/ Alternatives	Land/Space Requirements	Estimated Cost Reduction or Efficiency Gained	Community - Military Benefits
Regional Fire Training Academy	facility	Re-locate existing facility; enhance fire training capabilities/opportunities for county & military	Shared fire and emergency response training facility	Barnstable / Dukes and Nantucket County; New England Region	Barnstable County; ANG, ARNG, Coast Guard, Barnstable County Sheriff's Office, Comm of MA	Cost, environmental impacts-needs a champion to lead effort for state of the art facility		enhanced fire and emergency response training	continued and enhanced regional training, potential controlled burn training for military personnel
Northeast Offshore Renewable Energy Training Program	services /facility	certification and training for offshore wind energy development and other renewable energy technologies	ISO certification and incubator training program for offshore renewable energy development	SE Mass., future U.S. scope	ANG (training facility), ARNG (housing), Mashpee Wampanoag, CCCC or tech schools, Self-Reliance, Office of Veterans Affairs, MassDev	funding, purchase equipment, base access, changes to mission	meeting space		veterans training

Project Title	Project Type	Project Goal	Description of Shared Service	Area Served	Potential Partners to Agreement	Obstacles/ Alternatives	Land/Space Requirements	Estimated Cost Reduction or Efficiency Gained	Community - Military Benefits
Rail Spur	infrastructure	Opportunities for additional use of rail infrastructure	Solid waste, recycling, sludge processing, septage	Regional	Executive Office of Transportation Public Works, Mass Coastal Railroad, MAANG	Condition of rail/railroad bridge			re-use facilities on JBCC, potential public/private initiatives requiring rail
Janitorial Services	services								
Emergency Shelter	facility								
Recreation	facility	provide additional municipal recreational opportunities for communities surrounding MMR and reduced costs of operation for military	municipal recreational use of military land and/or facilities	Upper Cape/regional	towns / ANG / ARNG / Coast Guard	base access, conflicts with military training needs	land for ballfields, public use of golf course?	potential for exchange in return for municipal operation in other shared services	recreational benefits, enhanced military/public relationships
Air freight	facility / infrastr								

Project Title	Project Type	Project Goal	Description of Shared Service	Area Served	Potential Partners to Agreement	Obstacles/ Alternatives	Land/Space Requirements	Estimated Cost Reduction or Efficiency Gained	Community - Military Benefits
	ucture								
Long-term housing	facility								
Healthcare	services								
Civilian Unmanned Aerial Systems (UAS)	services	Develop additional applications for UAS on MMR	UAS use for traffic, fire-fighting, marine mammal i.d., and mapping purposes	regional	MassDev, ARNG, ANG, Coast Guard, FAA, MIT Lincoln Labs, Raytheon, Aero Vironment, CCCC, AV Watch, marine science institutions	privacy issues of surrounding communities, groundwater issue? Airspace rights, security issues - short-term agreements to use airspace, community involvement and education needed; control of data an		can enhance cleanup operations (UXO); enhances military value, assistance with Coast Guard SAR	increased public safety through reduced trips by humans into hazardous or remote environments, multiple civilian applications and potential manufacturing-sensor development

Project Title	Project Type	Project Goal	Description of Shared Service	Area Served	Potential Partners to Agreement	Obstacles/ Alternatives	Land/Space Requirements	Estimated Cost Reduction or Efficiency Gained	Community - Military Benefits
						issue			
Administrative/Engineering	services	cost savings associated with shared DPW admin and / or engineering services	shared public works/engineering services	Upper Cape/MMR	towns / ANG / ARNG / Coast Guard				

Project Title	Project Type	Project Goal	Description of Shared Service	Area Served	Potential Partners to Agreement	Obstacles/ Alternatives	Land/Space Requirements	Estimated Cost Reduction or Efficiency Gained	Community - Military Benefits
Paving	services	sharing of services to provide paving to MMR and/or municipalities	sharing of services to provide paving to MMR and/or municipalities	Upper Cape/MMR	towns / ANG / ARNG / Coast Guard	base access for municipal workers	None	reduced cost for personnel and equipment	efficiencies gained through shared facility and equipment
Equipment to Clean Catch Basins	services	shared public works equipment	shared use of equipment/trucks to clean catch basins	Upper Cape/MMR	towns / ANG / ARNG / Coast Guard	base access for municipal workers	None	reduced cost for personnel and equipment	efficiencies gained through shared facility and equipment
Joint Salt Shed	facility	cost savings through multi-town / military shared-use salt shed and increase buying power	joint facility for road salt use on MMR and local/state highways	Upper Cape/MMR	MADOT /towns / ANG / ARNG / Coast Guard	base access for municipal workers		reduced cost for road salt and equipment	efficiencies gained through shared facility and equipment
Tree Removal	services	cost savings through multi-town / military shared tree removal services	shared equipment and personnel for tree removal services	Upper Cape / regional / MMR	towns / ANG / ARNG / Coast Guard	base access for municipal workers	None	reduced cost for personnel and equipment	efficiencies gained through shared facility and equipment

Project Title	Project Type	Project Goal	Description of Shared Service	Area Served	Potential Partners to Agreement	Obstacles/ Alternatives	Land/Space Requirements	Estimated Cost Reduction or Efficiency Gained	Community - Military Benefits
Snow Removal	services	cost savings through multi-town / military shared snow removal services	shared equipment and personnel for snow removal services	Upper Cape / regional / MMR	towns / ANG / ARNG / Coast Guard	base access for municipal workers	None	reduced cost for personnel and equipment	efficiencies gained through shared facility and equipment

As the Cape towns have existing mutual aid agreements with JBCC for emergencies and the language of the Defense Authorization Act specifically limits firefighting functions, fire/emergency services was eliminated from further consideration as a shared service agreement.

At the second tabletop exercise held on May 2, 2013, participants focused on refining the top five general categories further through discussion of concept plans, major obstacles, and key stakeholders. Additional participants were invited to this workshop based on their specific expertise or interest areas.

As a result of this second tabletop exercise, staff completed an initial feasibility analysis for the following potential partnerships:

- Relocation of the Bourne police station/re-paving of Connery Avenue
- Public works/administrative shared services
- Relocation of regional fire & rescue training academy
- Regional wastewater treatment facility
- Re-use of Upper Cape regional transfer station

Based on the initial feasibility analysis, staff identified the following potential partnerships that warrant further consideration.

PUBLIC WORKS/ADMINISTRATIVE SERVICES

The 102nd IW is responsible for the majority of the existing infrastructure at JBCC, including the critical base road network, water distribution system, wastewater treatment plant, and electric distribution system, most of which is located in the cantonment area of JBCC. The Coast Guard manages several facilities in the cantonment area including maintenance hangars, family housing, recreation, and other support facilities for approximately 2,000 year-round residents. In 2006, the Coast Guard assumed responsibility for maintaining the base airfield. While its training activities are concentrated in the Reserve, the Army National Guard has several facilities located in the cantonment area, including barracks for enlisted and officer personnel, a vehicle maintenance facility, and engineering services. Each of the military commands has military personnel assigned and/or contracts to maintain the facilities and infrastructure under their control, resulting in a duplication of services and personnel to maintain the various facilities and infrastructure that are not necessarily a military core competency.

At the tabletop exercises held during this JLUS update, military participants identified several opportunities to partner with surrounding

communities to reduce costs by eliminating redundant public works and/or administrative services that could potentially be provided by one or more of the surrounding communities. At the same time, the communities identified the need for municipal recreational facilities that could potentially be exchanged for services offered by the towns to the military. A partnership agreement for one or more of these services could enhance existing relationships between community and military leaders and establish a framework by which more complex negotiations could take place for other shared service agreements.

Workshop participants identified the potential for a joint DPW facility that could house equipment for shared municipal/military use and increase buying power by the communities and JBCC. The duplication of services, equipment and personnel could be reduced and efficiencies gained through shared services and equipment. At the same time, each municipality has its own public works department with trained personnel and equipment. While the scope of this study did not examine the capacity of the surrounding towns to absorb these functions, workshop participants were enthusiastic about the feasibility of undertaking an initial shared service partnership for one or more public works and/or administrative services.

The Coast Guard, Army National Guard and Air National Guard examined their current administrative service contracts with a focus on what areas potentially may be considered as shared service opportunities with surrounding municipalities. Areas such as snow removal, landscaping, equipment sharing, elevator maintenance and certification, carpet cleaning, software maintenance, and pest control were identified as having potential for further examination as a shared service. To assist with the initial feasibility analysis, 102nd IW and Coast Guard personnel provided Commission staff with a list of current administrative services that are contracted on JBCC. Information on Army National Guard contracts was not available at the time of this report.

SHARED SERVICES MODEL AGREEMENT

In accordance with the Scope of Work for the JLUS update, Commission staff prepared a model shared services agreement that provides a framework for a number of potential partnerships identified through this study.

This agreement is a model for the sharing of land by the installation in exchange for the maintenance and construction of facilities on that land. It appeared from tabletop discussions that Joint Base Cape Cod could benefit from the exchange of use of land on the base in exchange for a variety of services. Potentially, this agreement could be modified for

different types of consideration received including administrative services or public works services.

The model agreement can be found in Appendix 4.

REGIONAL WASTEWATER TREATMENT AND DISPOSAL

In the 2012 draft General Plan for Space Re-Utilization, the 102nd IW indicated its intention to divest in all three utilities and purchase these services from a provider that would acquire these systems. A shared wastewater treatment facility was discussed at tabletop exercises during this study as a potential means of satisfying long-term wastewater management needs of the Upper Cape communities and JBCC using the existing treatment system operated by the 102nd IW as the skeleton of an expanded, upgraded regional wastewater system. This shared service potential was based on the following factors:

- There is substantial need among the Upper Cape towns for wastewater treatment and disposal services beyond the near-term period addressed by the options outlined above.

- The JBCC wastewater system is centrally located among the Upper Cape towns.

- The military wishes to focus on its primary missions and divest itself of the wastewater system.

- There has been and will continue to be substantial difficulty in siting and permitting new municipal wastewater treatment and disposal systems in the Upper Cape area.

- There has been substantial interest shown by the four Upper Cape towns in jointly considering regional solutions to their shared wastewater challenges.

- At the public meetings, separate meetings with the town staff and at meetings with the Cape Cod Commission, there was substantial interest expressed by the towns and other parties in investigating the feasibility and economic benefits of a publically-owned regional wastewater system for the Upper Cape.

- Such a system could serve JBCC and the four towns for the flows shown in Section 4, Table 4-1 of this report. Connecting facilities would be as shown in previous figures for each town and as combined in Figure 1. Such a system would serve the 20-year needs of the areas of the towns that are reasonably close to the base's WWTP or effluent disposal force main. The areas adjacent to the southern embayments of Falmouth and Mashpee, areas in Bourne north of the Canal, and areas of Sandwich draining to

Cape Cod Bay may require other wastewater management solutions.

- The Barnstable County Alternative Septic System Test Center at JBCC provides a service to the towns of Cape Cod and the Commonwealth. Recent amendments to DEP regulations indicate that the testing and evaluations of innovative septic systems will be provided by a third party other than the State. The potential exists for JBCC to work with Barnstable County to further develop and potentially expand the use of the present facility.

In a letter dated August 29, 2013, Brig Gen Gary Keefe, Executive Director of JBCC, indicated the Air National Guard's interest in exploring shared capabilities of the JBCC wastewater treatment facility with surrounding communities including ownership and operation of the base's water distribution system. See Appendix 2 for this letter of interest.

RE-USE OF UPPER CAPE REGIONAL TRANSFER STATION

The Upper Cape Regional Transfer Station (UCRTS) is jointly operated by the towns of Falmouth, Mashpee, Bourne, and Sandwich and serves as a rail transfer facility for municipal solid waste (MSW) from the towns and private haulers. When the towns' contracts with Covanta SEMASS expire in 2015, the UCRTS will be faced with a decision to continue operating the facility, close the facility, or repurpose the facility for other regional solid waste needs.

Potential future uses of the UCRTS facility include the handling of recyclable materials, organic waste, or other difficult to management wastes. In 2011, the fifteen towns on Cape Cod collected approximately 20,000 tons of household recyclables (paper, plastic, glass, tin/aluminum cans, and textiles) from residents.[10]

As a result of priorities identified through the tabletop exercises conducted as part of this JLUS update, the following potential alternatives for future use or retrofit of the UCRTS were examined:

- Regional food waste facility: Starting in July 2014, food waste and other organic material will be added to the State's list of items banned for disposal. The ban will apply only to locations that generate more than one ton of food waste per week, such as hospitals, universities, hotels, large restaurants, and other large

[10] MassDEP. 2011 Municipal Solid Waste and Recycling Data. http://www.mass.gov/eea/agencies/massdep/recycle/reports/waste-reduction-and-recycling.html

businesses and institutions. In this alternative concept, the UCRTS could be retrofitted to transfer food waste for disposal at a suitable facility or combined with an anaerobic digester with potential for an organic fertilizer by-product that could be sold to offset costs.

- Regional recycling facility: Costs for disposal of MSW are expected to increase significantly in 2015 when most of the Cape towns' current long-term contracts with SEMASS expire. This alternative examines the challenges and opportunities for a regional recycling facility to process and transfer recyclables to off-Cape markets.

- Waste-to-Energy facility: Workshop participants identified the potential for a facility at JBCC to process sludge generated from wastewater treatment facilities with a fertilizer-like by-product.

- MSW composting: Workshop participants identified the potential for a regional facility to compost municipal solid waste.

While a detailed examination of waste-to-energy and composting facilities are beyond the scope of this study, staff recommends these alternatives be included in a more detailed evaluation of regional wastewater treatment discussed elsewhere in this report.

The potential re-use of the UCRTS presents both an opportunity as well as challenges. These include the following:

- The communities and ANG that participated in the IMA made a substantial investment in the UCRTS in the form of buildings and equipment.

- Potential energy generation from food waste and solid waste processed by an anaerobic digester can help offset electricity costs to run the wastewater treatment plant at JBCC.

- Energy would be used on-site, reducing transportation costs.

- Net metering could allow sale of any excess electricity generated to be sold back to NStar to offset electricity costs to JBCC.

- Multi-purpose wastewater treatment and resource recovery facilities could generate revenue through food waste processing, wastewater residuals processing, septage processing, water reuse and energy generation.

- Policies concerning access to the base for haulers would need to be examined and reviewed by the ANG.

- Distance to UCRTS from U.S. Route 6 could limit the potential market for Cape towns. Currently all MSW transfer must go through the Falmouth gate. Gate restrictions would need to be re-evaluated.

- The site has value as a MassDEP site-assigned property for MSW.

- Additional study would be needed to determine if there is enough volume for an anaerobic digester or composting.

- Assessment of the capacity and condition of the rail spur from JBCC and limitations posed by the railroad bridge would need to be assessed and included in a feasibility assessment.

Workshop participants identified the potential re-use of the UCRTS as a top priority for further study to examine the potential costs and benefits of pursuing a regional facility, including sale of the facility to a private entity if the member towns do not continue to use the UCRTS.

APPROACH USED IN DETERMINING FEASIBILITY

Commission staff completed an initial feasibility analysis for the top five priority partnerships through a combination of the following: interviews with military and municipal personnel; information provided by military personnel; review of previous studies and reports; data provided by other county departments; and, review of existing IMAs and other agreements.

The analysis of regional wastewater disposal and treatment relied heavily on the report *Appraisal Consulting Services for the Wastewater Treatment System at the MMR*, completed in December 2012 by CH2MHill for MassDevelopment. The MassDevelopment study examined options for disposition of utility systems on JBCC. Commission staff participated in regional and community meetings that provided input for the report and provided technical support to the consulting engineer.

The potential re-use of the Upper Cape regional transfer station was examined through a review of the IMA and other agreements, previous reports on solid waste management in the region, and interviews with the Mashpee Director of Public Works, Cape Cod Commission staff, and Barnstable County Municipal Waste Reduction Coordinator. A preliminary analysis of challenges and opportunities associated with several alternatives was completed. Preliminary recommendations are

based on the potential for mutual benefit to the military and community and long-term goals and needs for the region.

The regional fire training academy relocation feasibility study was primarily conducted through interviews with the main parties involved in any potential future relocation of the Academy, including officials from the Town of Barnstable, Barnstable County, Cape Cod Commission, Regional Association of Fire Chiefs and the JBCC Fire Department. A preliminary analysis of the challenges and opportunities, including environmental concerns and general costs, was conducted.

The potential relocation of the Bourne police station was reviewed by the Town of Bourne's public safety, police, fire, and public works department\ personnel. Based on this review, town officials concluded that the JBCC was not a viable location for either a police or fire station for the town due to the distance from the area to be served by an additional station.

RECOMMENDATIONS

Many of the recommendations from the 2005 JLUS, particularly those related to land acquisition or land use restrictions to reduce potential encroachment and land use conflicts with military training, continue to apply to this update. For this update, recommendations are also ranked according to the overall benefit, ease of implementation, and mission enhancement offered.

Benefit 1=short-term 2=mid-term 3=long-term	**Implementation** 1=Easy 2=Moderate 3=Difficult	**Mission Enhancement** 1=Low 2=Medium 3=High	
			Land Use Restrictions/Acquisition
3	1	2	Cape Cod Commission staff will continue to monitor and comment on proposed M.G.L. Chapter 40B developments to restrict and/or mitigate the impacts of residential development within air safety zones and noise contours.

Benefit 1=short-term 2=mid-term 3=long-term	**Implementation** 1=Easy 2=Moderate 3=Difficult	**Mission Enhancement** 1=Low 2=Medium 3=High	
3	3	3	State agencies, the four Upper Cape towns, and military officials should continue to pursue acquisition of properties that could have significant encroachment potential through fee-simple purchase, purchase of development rights, or restrictive use easements. Priorities for acquisition should be vacant lands within airfield safety zones, noise contours, buffer zones to training ranges, and lands within the boundaries of the Mashpee National Wildlife Refuge that immediately abut base boundaries. Utilize Army compatible use buffer program for land acquisition within the study area.
			Economic Development
1	3	1	Future use of the cantonment area of JBCC should enhance and support the economic development and infrastructure needs of the surrounding communities while reserving areas for current and future military essential mission activities prior to consideration of sale or lease to private development interests.
			Water Supply & Wastewater Infrastructure
3	3	3	Given the wastewater nutrient management needs of the region to achieve TMDL compliance and limited wastewater infrastructure on Cape Cod, existing capacity at the JBCC WWTP should be reserved for military and community needs.

Benefit 1=short-term 2=mid-term 3=long-term	**Implementation** 1=Easy 2=Moderate 3=Difficult	**Mission Enhancement** 1=Low 2=Medium 3=High	
1	2	3	Working with the 102nd Intelligence Wing, in concert with Joint Base Cape Cod leadership, the Cape Cod Commission should develop a scope of work and pursue funding for a feasibility study to explore shared wastewater treatment with the surrounding communities. The scope of the feasibility study should include but not be limited to the following: 1) Air Force ownership of the WWTP with excess capacity shared with surrounding communities in exchange for services in kind; 2) Municipal or private ownership, operation, improvements and maintenance and provision of wastewater to the 102nd Intelligence Wing at a fixed, discounted rate, with surplus utility capacity available to surrounding communities. Municipal or private ownership will also assume ownership and responsibility of the JBCC water distribution system. The study should also evaluate whether additional land may be required to expand the WWTP and/or leaching beds as necessary.
1	3	1	JBCC should consider reserving space in the cantonment area for piloting of alternative wastewater technologies.
			Transportation
1	1	2	Base activities should be scheduled to avoid travel through the access/egress points during peak periods of adjacent street traffic.
3	3	2	State agencies, the four Upper Cape towns, and military officials should continue to pursue acquisition of properties to reduce future trips within the study area.
2	2	3	Pursue funding for implementation of short-term safety improvements (striping and signage changes) to Otis Rotary while investigating long-term replacement alternatives
1	1	2	Pursue a Road Safety Audit for the intersection of Route 151 at Sandwich Road to identify potential countermeasures to address the high number of injury crashes and the fatal crash at this intersection
1	1	2	Consider a Road Safety Audit at the intersection of Route 130 at Snake Pond Road particularly if increased crashes are experienced
			Renewable Energy

Benefit 1=short-term 2=mid-term 3=long-term	**Implementation** 1=Easy 2=Moderate 3=Difficult	**Mission Enhancement** 1=Low 2=Medium 3=High	
1	1	2	Adopt Joint Base Cape Cod Joint Oversight Group (JOG) Renewable Energy Communication Protocol and implement w/towns.
3	2	3	JBCC should continue to seek opportunities base wide for energy reduction in existing and future development.
			Solid Waste
1	2	1	Working with Joint Base Cape Cod leadership, the Cape Cod Commission should develop a scope of work and pursue funding for a feasibility study to examine potential re-use of the UCRTS for a regional food waste, sludge composting or recycling facility or other options. The feasibility study should also evaluate the condition, cost and feasibility of expanded use of the rail spur for freight, food waste and/or recycling programs.
			Emergency Response/Regional Evacuation
1	3	3	MEMA should revisit the 2012 Cape Cod Emergency Traffic Plan (CCETP) with JBCC leadership to evaluate the shelter and roadway capacity of JBCC in the event of a disaster declaration by the Governor of the Commonwealth of Massachusetts or other emergency requiring closure of the Bourne and/or Sagamore Bridges.
			Base Access & Security
3	3	2	Consider long-term base access alternatives that minimize/eliminate trips through residential areas.
1	2	2	Complete relocation of Sandwich gate farther into the base to increase buffering to residential properties and improve base security.
1	2	2	Military officials should continue to work with the Environmental Officer of the Environmental Management Commission established through the Upper Cape Water Supply Reserve, local police departments, and the Massachusetts Environmental Police to address trespassing and illegal dumping activities on JBCC.
			Communication

Benefit 1=short-term 2=mid-term 3=long-term	**Implementation** 1=Easy 2=Moderate 3=Difficult	**Mission Enhancement** 1=Low 2=Medium 3=High	
1	1	1	The four Upper Cape towns, JBCC and the Cape Cod Commission should establish and maintain a JLUS link on its public website that provides current information about military operations and an opportunity to comment about JLUS implementation efforts and any additional local measures to promote land-use compatibility around JBCC.
3	2	2	The four Upper Cape towns, JBCC and the Cape Cod Commission should execute a Memorandum of Understanding establishing key contact(s) and procedures for commenting on proposed development projects within the JLUS study area.
1	1	1	The JBCC MC3 should continue to serve as the liaison between the Upper Cape communities and JBCC on proposed development activities within the cantonment area.
			Personal Wireless Service Facilities
3	2	3	As recommended by the 2005 JLUS, the towns of Sandwich and Bourne should establish a 3,000 – foot wide Search and Rescue ("SAR") Corridor District for the following roadways: 1) Route 130 north of Runway 05, and 2) Route 28 south of the Otis Rotary
			Fire Training Academy Relocation
3	3	2	While not recommended as a potential shared service agreement by the JLUS update at this time, future interest in relocating the Barnstable County fire training academy to enhance fire training opportunities on JBCC should begin with a water quality and site suitability assessment. These assessments should be conducted prior to initiating other recommendations identified in the feasibility analysis section of this report.
			Public Works

Benefit 1=short-term 2=mid-term 3=long-term	**Implementation** 1=Easy 2=Moderate 3=Difficult	**Mission Enhancement** 1=Low 2=Medium 3=High	
1 and 3	2	2	Working with the 102nd Intelligence Wing, in concert with Joint Base Cape Cod leadership, pursue implementation of a shared services agreement for solid waste, snow removal, or other public works function with one or more Upper Cape towns. Establish a working group consisting of JBCC leadership, 102nd IW, and appropriate town officials to identify priority services and pursue execution of a shared services agreement that can serve as a model for future agreements.
1 and 3	2	2	Continue to explore other shared services identified in the JLUS update.
			Air Safety & Noise
1	2	2	Future turbine development projects should take into account potential noise conflicts with sensitive receptors to ensure military-civilian conflicts do not arise.
1	3	1	As recommended by the 2005 JLUS, local officials for the four Upper Cape towns should adopt and enact local policies to promote disclosure of safety and noise hazards, including the recording of disclosure documents prior to land transactions and development or sale of property.
1	3	1	The four Upper Cape communities should develop sound-attenuation standards for new construction and retrofitting of existing buildings for those uses above the 65 dB Ldn noise contours based on U.S. Department of Housing and Urban Development (HUD) standards. For additional information, please refer to: http://www.hud.gov/offices/cpd/energyenviron/environment/compliance/qa/noise.cfm

APPENDIX 1 JOINT BASE CAPE COD JOINT OVERSIGHT GROUP (JOG) RENEWABLE ENERGY COMMUNICATION PROTOCOL

Purpose: Joint Base Cape Cod (JBCC) has formalized a communication protocol to complement on-going renewable energy initiatives at the JBCC. The purpose of this protocol is to enhance communication and transparency around significant renewable energy projects on the JBCC and in surrounding communities. This protocol outlines the progression of coordination for pursuing renewable energy projects on the JBCC and also suggests a communication approach for sharing renewable energy project information between the JBCC and the surrounding towns of Bourne, Falmouth, Mashpee and Sandwich. This protocol is a step toward preserving and enhancing the military's mission and goals to develop renewable energy, while protecting similar civilian land use interests in the Joint Land Use Study (JLUS) area surrounding the JBCC. This protocol is not intended to address the specific details of these projects.

Background: The 2005 JLUS identified undeveloped or underdeveloped land in the JLUS study area (see Figure 1), which includes land surrounding the base within the towns of Falmouth, Bourne, Mashpee and Sandwich. Much of the study area is residentially zoned. Affordable housing developments, or "40 Bs," were frequently proposed within the study area, as well as wireless telecommunication facilities. Concerns over the compatibility of these land uses with both the military's mission and the protection of the natural resources in the surrounding area were raised. Recently, commercial scale solar and wind energy projects proposed in the study area have raised similar compatibility concerns. The 2013 JLUS Update was tasked with balancing military-civilian interests in developing these projects and other land uses in the study area. Rather than attempt to consolidate a wide range of renewable energy goals and mandates at the federal, state and local level into one guiding policy, this communication protocol approach was recommended by the JLUS update as the preferred method for addressing potential land use conflicts over renewable energy development on the JBCC and in the study area.

JBCC Energy Committee & JOG: JBCC renewable and alternative energy projects are proposed and reviewed through the JBCC's Energy Committee. The surrounding communities and private parties may also choose to present their projects to the JBCC Energy Committee.

Energy Committee members represent each of the JBCC agencies including:

- United States Coast Guard (USCG), Air Station Cape Cod
- Army National Guard (ARNG), Camp Edwards
- Air National Guard (ANG), Otis ANG Base, 102nd Intelligence Wing (IW)
- Air Force Space Command (AFSPC), Cape Cod Air Force Station, 6th Space Warning Squadron (SWS) PAVE PAWS
- Veterans Affairs National Cemetery
- Environmental & Readiness Center (E&RC)
- Air Force Civil Engineer Center (AFCEC)
- United States Department of Agriculture (USDA)
- Environmental Management Commission (EMC)
- Mass Development

Projects are recommended by the Energy Committee to the Joint Oversight Group (JOG), led by the four base Commanders (USCG, ARNG, ANG, AFSPC) and the Executive Director will have a period of review and comment for changes by the JOG.

MCCC: The mission of the Joint Base Cape Cod's Military-Civilian Community Council ("MCCC") is to provide all interested parties, including the JBCC military and civilian tenants and local and regional communities and organizations, with information in an open forum to discuss and comment upon proposed military and civilian projects within the JBCC Cantonment Area and civilian projects in the surrounding communities, in an effort to assist the project proponents in their review and decision-making process. The JBCC MCCC encourages a broad understanding of potential effects of these projects in the Cantonment Area and surrounding communities knowing that this will enhance the interactions and interrelationships between the Cantonment Area military and civilian tenants, and the surrounding communities, while providing a greater understanding of the conditions necessary to sustain the various environmental and training requirements of the entire JBCC. Once JBCC renewable energy projects are vetted through the JBCC Energy Committee and approved by the JOG, the project proponent may attend the MCCC as an optional venue for communicating military, civilian, and private renewable energy projects and initiatives. The surrounding communities and private parties may also choose to present their projects at an MCCC meeting.

Project Notification Protocol: All JBCC renewable energy projects and initiatives requiring review under the National Environmental Policy Act (NEPA) or the Massachusetts Environmental Policy Act (MEPA) that

are approved to initiate the permitting process by the JOG should provide written notification of the project to the Town Planner and Energy Committee Chair in each of the surrounding communities of Bourne, Falmouth, Sandwich and Mashpee.

Likewise, when a commercial scale alternative or renewable energy project is proposed by one of the four towns within the study area (see Figure 1), the Town Planner and/or Energy Committee Chair should provide written notification of the project to the JBCC Energy Committee Chairperson. This notification should occur no later than application for a local permit, but may occur at any time during pre-permitting, as appropriate. The JBCC Energy Committee Chairperson will distribute the notification to the Energy Committee members for review.

Joint Oversight Group Members:
Brigadier General Gary Keefe, Commander, Massachusetts Air National Guard
Colonel Patrick Cobb, Commander, 102nd Intelligence Wing, Massachusetts Air National Guard
Colonel Greg McDonald, Commander, Camp Edwards, Massachusetts Army National Guard
Captain Stephen Torpey, Commanding Officer, US Coast Guard Air Station Cape Cod
Lt Col Walter Jackim, Commander, 6th Space Warning Squadron, US Air Force

Town Planners	Energy Committee Chairpersons
Brian Currie, Town of Falmouth bcurrie@falmouthmass.us T: 508-495-7440	Rose Forbes, JBCC rose.forbes@us.af.mil T: 508-968-4670 x 5613
Coreen Moore, Town of Bourne CMoore@townofbourne.com T: 508-759-0615	Megan Amsler, Town of Falmouth energy@falmouthmass.us T: 508.548.7611
Nathan Jones, Town of Sandwich njones@townofsandwich.net T: (508) 833-8001	Richard Elrick, Town of Bourne RElrick@townofbourne.com T: 508-759-0600
Tom Fudala, Town of Mashpee tfudala@mashpeema.gov T: 508-539-1400	Tom Mayo, Town of Mashpee tmayo@mashpeema.gov T: 508-539-1400 x8572
	Sarah Cote, Town of Sandwich townhall@townofsandwich.net T: (TBD)

Joint Oversight Group Signatures:

Brigadier General Gary W. Keefe

Colonel Patrick J. Cobb, Commander

Colonel Gregory T. McDonald

Captain Stephen H. Torpey

Lt Col Z. Walter Jackim

APPENDIX 2 - JOINT BASE CAPE COD SHARED WASTEWATER TREATMENT FEASIBILITY STUDY LETTER

The Commonwealth of Massachusetts
Joint Force Base Cape Cod
Executive Office
3132 Richardson Rd
Camp Edwards, Massachusetts 02542
Tel: (508) 968-7111
www.mass.gov/guard

Deval L. Patrick
Governor

Andrea Cabral
Secretary of Public Saftey

Major General L. Scott Rice
Adjutant General

Brigadier General Gary W. Keefe
The Executive Director

29 October 2013

Cape Cod Commission
Ms. Sharon Rooney
PO BOX 226
Barnstable, MA 02630

Dear Ms. Sharon Rooney

The 102d Intelligence Wing, in concert with Joint Base Cape Cod (JBCC) leadership, is interested in exploring shared capabilities of our waste water treatment plant with surrounding communities. The following two approaches should be included in any shared utility feasibility study.

1. The Air Force would retain ownership of the waste water treatment plant and provide surrounding communities with excess capacity in exchange for services-in-kind.

2. A public entity municipality or private organization would assume ownership, operation, capital improvements and maintenance of the treatment plant. The municipal, public or private entity would provide continued wastewater and water distribution service to the 102d Intelligence Wing (IW) at a fixed, discounted rate, and sell surplus utility capability to surrounding communities. This should be a cost effective solution for both the 102IW and the private/public/municipal entity.

If a public, municipal or private organization takes ownership of the WWTP, they must also assume ownership and responsibility of the JBCC Water Distribution System. This factor should be included in any feasibility and cost study. Also, current Waste Water Treatment and Water Distribution employees will be given first hiring preference for their same jobs under any privatization initiative.

If you need any additional information regarding the shared utility approaches outlined above, my POC is Mr. Bob Blair who can be reached at 508-968-4238 or robert.blair@ang.af.mil.

Sincerely,

GARY W. KEEFE, Brig Gen, JBCC
Executive Director

Cc:
Lt Col Christopher Hurley
Mr. Robert Blair

APPENDIX 3 – SHARED SERVICES FEASIBILITY STUDIES

REGIONAL WASTEWATER TREATMENT FACILITY

OVERVIEW

The wastewater treatment system (the system) serving JBCC is owned by the United States Air Force. Operations and maintenance (O&M) of the system is the responsibility of the 102nd Intelligence Wing, Massachusetts Air National Guard (ANG)[11], which is not the preferred mission for the MANG. At the same time, Cape Cod Communities are in the process of developing wastewater management plans to restore water quality of their coastal embayments. The need to restore these surface water bodies is also a requirement of the Clean Water Act. The conventional means to restore water quality requires vast areas of residential development presently serviced by on-site septic systems be provided a sewer system to remove the nitrogen that emanates from on-site systems. This approach will result in the collection of significant volumes of wastewater that will need to be treated and disposed of.

The JBCC wastewater treatment facility is centrally located among the four towns of the upper Cape. Therefore, a regional approach to wastewater problems for the Upper Cape has identified regional wastewater treatment facility at JBCC as a viable option. This feasibility study provides a preliminary evaluation of the potential advantages and disadvantages of using the JBCC facility in a regional wastewater solution for the Upper Cape. A study completed in December 2012 by CH2MHill for MassDevelopment, a quasi-public state agency responsible for economic development, examined the options for disposition of utility systems on JBCC.

SCOPE

This feasibility study will evaluate the advantages and disadvantages of using the JBCC wastewater treatment facility as part of a regional wastewater solution for the Upper Cape.

ASSUMPTIONS AND CONSTRAINTS

[11] MMR WWTS Report, CH2MHill p. 1-1

The study was constrained by the level of wastewater planning in the surrounding communities. Although each community has been engaged in wastewater planning, the Upper Cape communities are at different stages of compiling their needs, alternatives and selection strategies. Furthermore, the significant cost of conventional wastewater solutions and need to look at new approaches has resulted in a new 208 Regional Water Quality Management Planning effort now underway by the Cape Cod Commission. Therefore, the feasibility study is intended to provide a snapshot in time of issues and opportunities facing the communities and the region that is in the midst of major planning efforts on the regional and local level.

STUDY APPROACH

This feasibility study will rely heavily on the report *Appraisal Consulting Services for the Wastewater Treatment System at the MMR*, completed in December 2012 by CH2MHill for MassDevelopment. As a quasi-public state agency responsible for economic development, the scope of that study examined the options for disposition of utility systems on JBCC. Commission staff participated in regional and community meetings that provided input for the report and provided technical support to the consulting engineer.

EVALUATION CRITERIA

Criteria to evaluate options include:

- Constructability: The engineering complexity or difficulty expected related to the design and construction of the required facilities.
- Ease of Implementation (legal, institutional): The anticipated complexity and difficulty in defining and negotiating the various federal, state and local agreements and contracts necessary for implementation of the plan.
- Commercial Viability: The financial attractiveness of various sale, lease or contract options to potential private or public parties.
- Regulatory Acceptability: The probability that required projects can be designed to comply with Massachusetts DEP, EPA or other state or federal agencies' regulatory requirements.
- Meets JBCC Cost Objectives: The economic benefits of the option with respect to lowering operating costs to JBCC.

- Environmental Benefits: The effectiveness of the option in achieving or expediting water quality improvements intended by regulatory requirements and desired by the communities, including JBCC.

- Meets Community Needs: The degree to which the option meets wastewater management needs of the neighboring towns from a public health and economic growth perspective.

- Public Acceptance: The level of support for the options that could be anticipated from Upper Cape stakeholders, abutters or other public parties.

REFERENCES

Provide a list of the references that were used in preparation of this document.

- *Appraisal Consulting Services for the Wastewater Treatment System at the MMR*, prepared for Mass Development, by CH2MHill, December 2012
- Town of Falmouth Comprehensive Wastewater Management Plan (CWMP)
- Town of Sandwich Needs Assessment
- Town of Mashpee CWMP
- Town of Bourne Needs Assessment
- Sagamore Lens Sustainability Study

POINTS OF CONTACT

The following contacts were identified during the community-military partnerships tabletop exercises held during preparation of the JLUS Update:

Name	Title	Department	Contact Information
Virginia Valiela		Town of Falmouth	
Wesley Ewell		Town of Bourne	wesleyewell@comcast.net

Name	Title	Department	Contact Information
Tom Fudala	Town Planner/Sewer Commissioner	Town of Mashpee	townplanner@ci.mashpee.ma.us
Paul Gobell	Sewer Commissioner	Town of Mashpee	PGobell@mashpeema.gov
Ed Dewitt	Executive Director	Association to Preserve Cape Cod	
Tom Cambareri	Water Resources Program Manager	Cape Cod Commission	(508) 362-3828 tcambareri@capecodcommission.org
Mary Ellen Wilczynski		U.S. Coast Guard	
Robert G. Blair	Acting Base Civil Engineer	Otis Air National Guard	(508) 968-4238 Robert.blair@ang.af.mil
Ray Jack	Director of Public Works	Town of Falmouth	rjack@falmouthmass.us

CONSIDERATIONS

The management, infrastructure, and regulatory requirements of a shared wastewater treatment system are listed below.

MANAGEMENT REQUIREMENTS

- Chartering under state law of a regional management entity composed of representatives from the towns and JBCC.
- Establishment of bonding, rate setting, and revenue collection authority with the new regional entity.

- Establishment of a board of directors or other management structures capable of implementation of necessary tasks.

- Establishment of management policies and procedures.

- Provision of administrative, engineering, financial, and technical capacity to manage infrastructure planning, design, and construction on behalf of the regional entity.

- Provision of O&M capacity.

INFRASTRUCTURE REQUIREMENTS

- Planning and environmental studies necessary to site new treatment and disposal (or discharge) facilities.

- Expansion or replacement of the existing WWTP with a 3.7 mgd (ADF) plant, designed to meet effluent limitations as determined by the location and environmental requirements of the discharge.

- The WWTP would be built in the following two phases:
  - Phase 1: 1.8 mgd capacity
  - Phase 2: 1.9 mgd capacity

- Expansion of the existing disposal beds or construction of additional capacity to meet flow requirements with required redundancy.

- Replacement of the existing effluent disposal force main (or construction of a parallel force main) to the discharge location.

- Connecting conduits and force mains to convey flows to the WWTP or disposal beds.

- Appropriate metering and monitoring stations.

REGULATORY REQUIREMENTS

- Application for a new discharge permit, either for groundwater or surface water discharges.

- MEPA and other filings, including associated environmental studies.

- Development of associated sewer use ordinances, industrial pretreatment ordinances, metering.

- Environmental monitoring programs.

- Approval of sewer connections from participating towns.

There are, of course, numerous steps involving legal issues, town meeting approvals, town funding authorizations, and other institutional requirements, in addition to transfer or ownership processes involving the state and federal government. While it is beyond the scope of this study to identify all of these requirements, several important issues would need to be addressed as a regional entity is established or soon thereafter.

RECOMMENDATIONS

The ranked alternatives favored options for a shared regional facility. Commission staff recommends a more detailed feasibility study be conducted to evaluate the costs and benefits of sale of the JBCC facility to another entity to own and operate it apart from the ANG and provide regional services to the military and communities. The following reasons support this approach:

This alternative involving a regional wastewater system was discussed at the public meetings and with the towns during this study. The alternative is presented as a potential means of satisfying long-term wastewater management needs of the Upper Cape communities and JBCC using the treatment system as the skeleton of an expanded, upgraded regional wastewater system. This alternative recognizes the following factors:

- There is substantial need among the Upper Cape towns for wastewater treatment and disposal services beyond the near-term period addressed by the options outlined above.

- The JBCC wastewater system is centrally located among the Upper Cape towns.

- The military wishes to focus on its primary missions and divest itself of the wastewater system.

- There has been and will continue to be substantial difficulty in siting and permitting new municipal wastewater treatment and disposal systems in the Upper Cape area.

- There has been substantial interest shown by the four Upper Cape towns in jointly considering regional solutions to their shared wastewater challenges.

- At the public meetings, separate meetings with the town staff and at meetings with the Cape Cod Commission, there was substantial interest expressed by the towns and other parties in investigating the feasibility and economic benefits of a publically-owned regional wastewater system for the Upper Cape.

- Such a system could serve JBCC and the four towns for the flows shown in Section 4, Table 4-1 of this report. Connecting facilities would be as shown in previous figures for each town and as combined in Figure 1. Such a system would serve the 20-year needs of the areas of the towns that are reasonably close to the base's WWTP or effluent disposal force main. The areas adjacent to the southern embayments of Falmouth and Mashpee, areas in Bourne north of the Canal, and areas of Sandwich draining to Cape Cod Bay may require other wastewater management solutions.

The Barnstable County Alternative Septic System Test Center at JBCC provides a service to the towns of Cape Cod and the Commonwealth. Recent amendments to DEP regulations indicate that the testing and evaluations of innovative septic systems will be provided by a third party other than the State. It is recommended that the JBCC work with Barnstable County to further develop and potentially expand the use of the present facility.

In a letter dated August 29, 2013, Brig Gen Gary Keefe, Executive Director of JBCC, indicated the Air National Guard's interest in exploring shared capabilities of the JBCC wastewater treatment facility with surrounding communities including ownership and operation of the base's water distribution system. See Appendix 2 for this letter of interest.

JBCC and MassDevelopment representatives should review and comment on the report methodology and conclusions. Depending on the conclusions of the review by JBCC and MassDevelopment, a Memorandum of Understanding (MOU) should be developed between JBCC, MassDevelopment, and the interested Upper Cape towns for the purpose of conducting more detailed engineering, legal, financial, funding, and other studies necessary for decision-making.

Meetings with potential contract operations vendors to gain understanding of the key criteria that would drive the commercial viability of the "privatization" options and help refine tender terms and conditions to be more favorable in the private marketplace and to JBCC.

Follow-up meetings with Falmouth and more detailed financial analysis regarding the interest expressed by the town in considering the alternative of Falmouth assuming responsibility under agreement for O&M of the JBCC system.

Consideration of a phased approach that moves through the sequence of options from optimization of the Base Case (Option B) to contract operations providing service to neighboring towns, and eventual sale of the system and establishment of a regional management entity. Each subsequent step would be informed by the lessons learned in previous steps.

RE-USE OF UPPER CAPE REGIONAL TRANSFER STATION

OVERVIEW

The Upper Cape Regional Transfer Station (UCRTS) is a regional facility for the collection and transfer of solid waste located on a rail spur within the Otis Air National Guard base. The site is owned by the Commonwealth of Massachusetts and leased to the Air Force (Air National Guard). Since 1989, solid waste generated at JBCC and the Towns of Falmouth, Mashpee, Sandwich, and Bourne has been hauled to the UCRTS and shipped by rail over the Cape Cod Canal to the SEMASS waste-to-energy plant in Rochester, MA.

The transfer station has an estimated annual capacity of 40,000 tons. JBCC typically contributes approximately 5.5% of the waste shipped from the transfer facility.[12] The transfer station has a rail transportation contract with Massachusetts Coastal Railroad to provide the rail cars and hauling from their facility to the SEMASS facility.[13] Massachusetts Coastal Railroad is a common carrier railroad which has a License & Operating Agreement with the Executive Office of Transportation and Public Works of the Commonwealth of Massachusetts. The Agreement continues to be in effect until either the expiration of the Towns' and Otis' current contracts with SEMASS; or the expiration of the IMA. The Town of Falmouth has a Consent Agreement with the U.S. Department of the Air Force covering the property on which the UCRTS operates and over which access rights are granted. [14]

[12] USCG Air Station Cape Cod Master Plan, p. 2-38
[13] CDM 2010 Report, p. 2-6
[14] Massachusetts Coastal Railroad Rail Transportation Contract No. MC-C-810

The UCRTS was constructed and is operated through an Inter-Municipal Agreement (IMA) executed in 1987 among the Towns of Falmouth, Sandwich, Mashpee, Bourne, and the Air National Guard that expires on June 30, 2015. Falmouth will be taking solid waste to Bourne at the expiration of the SEMASS contract. Without Falmouth's contribution to the annual tonnage required through the Mass Coastal Agreement, the continued operation of the UCRTS may not be viable for the remaining towns and JBCC tenants.

At tabletop exercises held as part of this JLUS Update, participants identified several options for re-use of the UCRTS that could mutually benefit the region and JBCC. This study therefore provides additional information on these options and examines whether any of the concepts could be appropriate for a shared community-military services agreement.

SCOPE

This feasibility study will explore several options identified by workshop participants for re-use and/or expansion of the UCRTS and whether any of the options would be appropriate for a community-military partnership/shared services agreement. The types of shared benefits associated with re-use of the facility will be discussed. Challenges and opportunities relating to environmental concerns, infrastructure capacity of the UCRTS and related infrastructure, access to JBCC, economic development potential, and potential shared services opportunities, will be examined. The study will offer recommendations further study if re-use of the facility is pursued by any of the parties to the IMA.

BACKGROUND

In the late 1980s, communities in Southeastern Massachusetts (MA) were faced with the closure of their unlined landfills under MA Department of Environmental Protection (MassDEP) regulations. Many of these communities entered into long-term agreements with the SEMASS waste-to-energy facility (SEMASS) in Rochester, MA for disposal of their municipal solid waste (MSW). The communities constructed an infrastructure including local and regional transfer stations to transport their MSW to the SEMASS facility. The infrastructure and SEMASS agreements have provided reliable, cost-effective and environmentally sound disposal of the communities' MSW for over 20 years.[15]

[15] CDM 2010 Report, p. 1-1

The UCRTS was constructed by and for the Upper Cape towns and JBCC through an Inter-Municipal Agreement executed in 2008. Located on an approximately 18.9-acre site adjacent to an existing rail spur on Otis ANG base, the UCRTS is a pre-engineered steel structure that was built in the late 1980's. It houses a tipping floor and material is pushed from the floor to a below-grade rail car. An electric hoist mechanism is above the rail car port and lifts covers off/on the rail car. A small office area is also contained within the building.

A Fairbanks truck scale system is outside the building (in front). Trucks ride onto the scale and the weight is recorded by a computer within the office area. There is also an underground storage tank for diesel fuel with a "Gasboy" dispenser. This fuel is for the heavy-equipment loader. A radioactivity sensor system is installed at the scale area to detect "hot" loads.

Peak daily and weekly usage of the transfer station typically occurs in July or August. Daily transfer amounts range from 120 to 275 tons from all sources.

Falmouth serves as the lead community for the IMA and as such holds title to the facility in its name, has the authority to enter into contracts, acts as custodian of all funds, and hire employees. The Town of Bourne is a party to the IMA but does not currently send MSW to the facility, having a site-assigned municipal landfill (Integrated Solid Waste Management or ISWM) with at least 12 years of remaining capacity (e.g. until 2022).[16] All capital costs are apportioned and shared by the remaining member towns based on the town's share of tonnage shipments to SEMASS plus a share of annual operating costs. The UCRTS is managed by a Board of Managers appointed by each town's Board of Selectmen with a non-voting advisory member designated by JBCC.

The UCRTS has an agreement with Mass Coastal Railroad to provide the rail cars and hauling from their facilities to the SEMASS facility. The SEMASS facility has been in operation for over twenty years.

The SEMASS facility has a specialized dumping area to accept the rail cars and unload them onto their tipping floor. The UCRTS can be modified to load transfer trailers should the rail not be available or if hauling by truck is determined to be preferable.

The Towns of Falmouth, Mashpee, and Sandwich currently haul their MSW from local transfer stations (or from Falmouth curbside collection vehicles) to the UCRTS where the waste is hauled by rail to the SEMASS

[16] CDM 2010 Report, p. 2-14

waste to energy facility in Rochester, MA. Private haulers for the participating towns also use the UCRTS.

Falmouth's MSW accounts for approximately one-third of the annual tonnage transferred to the UCRTS. The collected MSW is hauled by rail a short distance to the SEMASS facility where it is unloaded onto the tipping floor by a specialized piece of equipment. The UCRTS could be retrofitted to accommodate a variety of larger rail cars as well as other modes of transporting waste by rail or large truck transfer facilities.[17] The disposal contract expires on January 1, 2015, at which time the SEMASS facility will have been in operation for approximately 26 years.[18]

The IMA stipulates that any Town may withdraw from the Agreement at the end of any fiscal year with at least one year prior notice given to the other towns. In addition, the IMA provides that in the event the parties do not extend the term of the Agreement or if it becomes impossible to operate the facility for reasons beyond the control of the parties, the Board of Managers shall obtain an appraisal of the structures, equipment and supplies, excluding the land for disposal. Any member town has the right of first refusal to purchase the assets of the UCRTS at the appraised value within 120 days of the Managers' acceptance of the appraisal.

STUDY APPROACH

This alternatives study was conducted through a review of the IMA and other agreements, previous reports on solid waste management in the region, and interviews with the Mashpee Director of Public Works, Cape Cod Commission staff, and Barnstable County Municipal Waste Reduction Coordinator. A preliminary analysis of challenges and opportunities associated with several alternatives was completed. Preliminary recommendations are based on the potential for mutual benefit to the military and community and long-term goals and needs for the region.

REGIONAL WASTE REDUCTION GOALS

The Waste Management section of the Cape Cod Regional Policy Plan (RPP) sets forth a vision of managing solid waste in a cost-effective and environmentally responsible way. This means first reducing, at the source of production or purchase, the total amount of solid waste created. For organic wastes such as food or yard waste, the plan promotes composting. Collection and marketing of recyclables are regarded as an essential

[17] Ibid.
[18] Ibid.

element in reducing the waste stream. Incineration of wastes should be used only when all of the previously mentioned options have been exhausted. The highest priority should be for waste reduction and composting.

Like other regions of New England, Cape Cod faces the challenge of managing its solid and hazardous wastes in an environmentally sound manner. Environmental regulations require increasingly sophisticated waste management strategies and administrative arrangements to ensure compliance.

Cape Cod citizens support efforts to protect the environment from the adverse impacts of solid waste collection, transport, and disposal. The RPP Solid Waste Management goal of the RPP sets a goal to manage solid waste using an integrated solid waste management system that includes waste reduction, recycling, and composting, and to divert 60% of municipal solid waste from incinerator and landfill facilities through recycling and composting programs by 2012.[19]

ALTERNATIVES IDENTIFIED AT SHARED SERVICES WORKSHOPS

As a result of priorities identified through the tabletop exercises conducted as part of this JLUS update, the following potential alternatives for future use or retrofit of the UCRTS were examined:

- Regional food waste facility: Starting in July 2014, food waste and other organic material will be added to the State's list of items banned for disposal. The ban will apply only to locations that generate more than one ton of food waste per week, such as hospitals, universities, hotels, large restaurants, and other large businesses and institutions. In this alternative concept, the UCRTS could be retrofitted to transfer food waste for disposal at a suitable facility or combined with an anaerobic digester with potential for an organic fertilizer by-product that could be sold to offset costs.

- Regional recycling facility: Costs for disposal of MSW are expected to increase significantly in 2015 when most of the Cape towns' current long-term contracts with SEMASS expire. This alternative examines the challenges and opportunities for a regional recycling facility to process and transfer recyclables to off-Cape markets.

[19] Cape Cod Regional Policy Plan, p. 68-71

- Waste-to-Energy facility: Workshop participants identified the potential for a facility at JBCC to process sludge generated from wastewater treatment facilities with a fertilizer-like by-product.

- MSW composting: Workshop participants identified the potential for a regional facility to compost municipal solid waste.

While a detailed examination of waste-to-energy and composting facilities are beyond the scope of this study, staff recommends these alternatives be included in a more detailed evaluation of regional wastewater treatment discussed elsewhere in this report.

EVALUATION CRITERIA

The primary focus of this feasibility study is an examination of potential options for re-use and/or expansion of the UCRTS based on the following criteria:

1) Regional need for proposed alternative
2) Infrastructure capacity
3) Environmental issues
4) Access considerations
5) Economic development potential
6) Shared services potential

REFERENCES

The following references were used in preparation of this report:

- Evaluation of Future Disposal Alternatives for Municipal Solid Waste – Camp Dresser and McKee, 2010
- USCG Air Station Cape Cod Master Plan, 2012
- Covanta SEMASS Waste Characterization Study, 2011
- MA DEP Solid Waste Master Plan, December 2012
- Inter-Municipal Agreement among the towns of Falmouth, Sandwich, Mashpee and Bourne, MA dated May 16, 2008
- Department of the Air Force consent to cross U.S. Government leased area at Otis ANG Base, MA #07-10
- Massachusetts Coastal Railroad Rail Transportation Contract #MC-C-810
- MA DEP Regulations: http://www.mass.gov/dep/recycle/laws/regulati.htm#organics
- Town of Bourne website: http://www.townofbourne.com/Departments/PUBLICWORKS/I

ntegratedSolidWasteManagment/RecyclingArticles/tabid/548/ItemId/1473/Default.aspx

- 2009 Cape Cod Regional Policy Plan: http://www.capecodcommission.org/index.php?id=342

POINTS OF CONTACT

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REGIONAL FOOD WASTE FACILITY

Commission staff would like to thank David Quinn, Municipal Waste Reduction Coordinator for the Barnstable County Cooperative Extension for preparing this section of the report.

BACKGROUND

The diversion of organic material from our waste stream is an important regional issue for Barnstable County. A 2011 waste characterization study conducted at the region's waste-to-energy facility, Covanta SEMASS, revealed that food waste and other organic material make up more than 21% of all trash, after recycling.

Results of Covanta/SEMASS Waste Characterization Study, 2011

Material	Percent of MSW
Paper	23.7%
Plastics	13.4%
Metals	5.5%
Glass	1.7%
Organic Materials	21.3%
Construction and Demolition	13.2%
Household Hazardous Waste	2.9%
Electronics	4.1%
Other Materials	14.2%

When food waste and other recyclable materials are included with municipal solid waste (MSW), it creates unnecessary costs to the Cape's towns in the form of hauling and disposal expenses. These costs are expected to increase significantly in 2015 when most of Cape Cod town's current long-term contracts with SEMASS expire. From an environmental perspective, the high moisture content of MSW containing large quantities of food waste results in less efficient energy production at waste-to-energy facilities. In addition, when food waste is disposed in landfills it decomposes and releases methane, a potent greenhouse gas than contributes to climate change. Overall, Cape Cod communities can benefit from the diversion of organic material from our waste stream through reduced costs and lessened environmental impacts.

EXPECTED CHANGES TO MASSDEP REGULATIONS

The Massachusetts Department of Environmental Protection (MassDEP) is aggressively promoting efforts to divert food waste and encourage technologies to process organic material in a more efficient and clean way. Through its updated Solid Waste Master Plan, released in December 2012, MassDEP seeks to increase the diversion of source separated organics from 100,000 to 350,000 tons per year. The following measures are being pursued to achieve this goal:

- Food Waste Ban – Starting in July 2014, food waste and other organic material will be added to the State's list of items banned for disposal. The ban will only apply to locations that generate more than one ton of food waste per week, such as hospitals, universities, hotels, large restaurants, and other big businesses and institutions.

- Modified Siting Regulations – To support the development of additional organics processing facilities, MassDEP modified its solid waste regulations in November 2012 to streamline the siting of facilities that take in source separated organic materials for composting or biological processes such as anaerobic digestion. See http://www.mass.gov/dep/recycle/laws/regulati.htm#organics for more information.

ORGANICS DIVERSION PROJECTS IN BARNSTABLE COUNTY

Several projects are planned or underway in Barnstable County to begin to address the issue of food waste diversion:

Proposed Anaerobic Digestion Facility at the Bourne Integrated Solid Waste Management Facility

The Town of Bourne is working to develop an anaerobic digestion facility on an area of land adjacent to its landfill (off Route 28). The Town sought bids for use of the 25-acre parcel this past year and is now working with Harvest Power, a Waltham-based company, to permit and develop an anaerobic digestion facility. If built, the facility would accept organic waste and biosolids and then break them down to create methane and generate electricity. The facility would be able accept between 300 to 400 tons per day* of organic matter and may serve as a disposal location for additional material diverted from businesses and residents as the result of MassDEP's anticipated Food Waste Ban and other diversion efforts. In November 2012, Bourne was awarded $30,000 in grant funding by MassDEP to assist with the permitting phase of this project. However, before any facility is built or becomes operational, substantial permitting and engineering will have to be done including modifying the site assignment at ISWM which is overseen by the Bourne Board of Health in a public hearing. To learn more about this proposal, see: Bourne landfill alternative energy venture seems reasonable - - The Bourne Courier http://www.wickedlocal.com/bourne/news/x1107412435/Bourne-landfill-alternative-energy-venture-seems-reasonable#ixzz2IivEMjJz

Outer Cape Pilot Food Waste Diversion Project

In November 2012, the Town of Wellfleet was awarded $17,250 to develop a program to encourage local restaurants, businesses and schools to divert food scraps from their trash for composting. The project was put together by the Wellfleet Recycling Committee, with support from the Town's Health Department and Town Administrator and in collaboration with the Watts Family Farm in Sandwich, a local organic waste hauler. Through the project, participating businesses (and schools) will relieve a free food waste "toter" to collect material as well as technical support and educational material. The project will be implemented as a small pilot program in 2013 and lessons learned will be used to develop a set of replicable best practice that can adopted by other businesses throughout the Cape.

Food Waste Collection at the Chatham Transfer Station

The Town of Chatham is running a pilot program to collect food scraps from residents at the Transfer Station. Two large food waste toters are now available next to the recycling area and for residents who want to divert food waste but can't compost at home for one reason or another. The food waste dropped off by residents and then picked up and hauled by the Watts Family Farm in Sandwich. The Town is charged a fee for this served. Chatham DPW staff plan to monitor the program to determine if it is a cost effective method for divert food waste. If successful, other town's on Cape Cod may be interested in a similar food waste collection program.

Waste-to-Energy Conversion Facility

A regional food waste facility could serve to reduce waste, meet the MA DEP waste ban, as well as create energy and economic opportunities. For example, in Oakland, California, the East Bay Municipal Utility District (MUD), a public agency that provides water and wastewater treatment for the city and surrounding area, uses food scraps and biosolids to create methane gas that is burned to generate electricity. The East Bay MUD anaerobic digester is a first-wave project that has evolved as its resources have changed. The agency has used anaerobic digesters since the 1950s. At first, the methane produced was simply burned. Energy generation was added in 1985. At the time, yeast producers, potato chip and cookie manufacturers, and vegetable canning made up a thriving food processing industry in Oakland. But as the food processing plants closed, East Bay MUD had to decide whether to let its infrastructure sit idle or find another source of organic waste to fuel its digesters. Today, restaurants' food scraps and solid waste from the wastewater treatment plant both feed the digesters. East Bay MUD now sells power to the neighboring port of Oakland resulting in total annual sales revenue of over $0.5 million.[20]

[20] Renewable Energy Gets Real, Planning Magazine, July 2013

REGIONAL RECYCLING FACILITY

Cape residents strongly support recycling efforts. Every town on Cape Cod has a recycling program, and six towns have mandatory recycling bylaws. In 2006, residential recycling rates here varied by town from 15 to 50 percent, with the Cape-wide average being approximately 30 percent.

As noted above, the Upper Cape Regional Transfer Station (UCRTS) is jointly operated by the towns of Falmouth, Mashpee, Bourne, and Sandwich and serves as a rail transfer facility for municipal solid waste (MSW) from the towns and private haulers. When the towns' contracts with Covanta SEMASS expire in 2015, the UCRTS will be faced with a decision to continue operating the facility, close the facility, or repurpose the facility for other regional solid waste needs.

Potential future uses of the UCRTS facility include the handling of recyclable materials, organic waste, or other difficult to management wastes. In 2011, the fifteen towns on Cape Cod collected approximately 20,000 tons of household recyclables (paper, plastic, glass, tin/aluminum cans, and textiles) from residents.[21]

Municipality Name	Households Served by Municipal Trash Program	TOTAL Recyclables (TONS)	Trash Disposal Tonnage
BARNSTABLE	9180	2672	9589
BOURNE	7656	1326	5743
BREWSTER		849	2700
CHATHAM	4488	907	5436
DENNIS	7200	1188	6615
EASTHAM	3735	855	3073
FALMOUTH	15409	3395	11509
HARWICH	6000	1090	4800
MASHPEE	4236	909	3863
ORLEANS*		1200	2000
PROVINCETOWN	3100	1270	2200

[21] MassDEP. 2011 Municipal Solid Waste and Recycling Data. http://www.mass.gov/eea/agencies/massdep/recycle/reports/waste-reduction-and-recycling.html

Municipality Name	Households Served by Municipal Trash Program	TOTAL Recyclables (TONS)	Trash Disposal Tonnage
SANDWICH	5500	1235.4	4905
TRURO	1000	392	1526
WELLFLEET	3300	444	1780
YARMOUTH	9000	1508	8934
TOTAL	**79804**	**19240.4**	**74673**

* no data - estimated.
All other data from MassDEP CY2011 Recycling and Solid Waste Survey

While the specific collection and hauling methods vary (i.e. source separated, dual stream, or single stream), the majority of this recyclable material collected at transfer stations or curbside is hauled long distances to off-Cape vendors, at considerable expense. As towns continue to encourage their residents to recycle more, through waste reduction programs such as Pay-As-You-Throw, the recycling tonnage is likely to increase.

In addition, a large portion of Cape Cod's residents and visitors rely on the services of private subscription haulers to pick up and dispose of their trash and recyclables. For these haulers, single stream recycling (SSR) is typically the most cost effective and simple method of collecting and transporting recyclables because it eliminates the needs for multiple trucks and collection containers. The added convenience that SSR collection provided to residents encourages recycling because it eliminates the need to sort multiple categories of recyclables. However, there are few solid waste facilities that accept SSR on Cape Cod and local haulers are forced to travel long distances to "tip" SSR material at locations off Cape Cod. The added transportation costs for SSR drives up the costs of providing the services and, as a result, many residents choose to purchase trash collection services only and decline recycling services.

A local facility to process or transfer recyclable materials to market may help towns and haulers on the Cape reduce their transportation costs and encourage more recycling. However, in order to determine the most-desired use of the UCRTS a more in-depth feasibility study would be needed to understand market conditions, material supply, and develop an RFP to operate the facility.

CHALLENGES AND OPPORTUNITIES

The potential re-use of the UCRTS presents both an opportunity as well as challenges. These including the following:

- The communities and ANG that participated in the IMA made a substantial investment in the UCRTS in the form of buildings and equipment.

- Potential energy generation from food waste and solid waste processed by an anaerobic digester can help offset electricity costs to run the wastewater treatment plant at JBCC.

- Energy would be used on-site, reducing transportation costs.

- Net metering could allow sale of any excess electricity generated to be sold back to NStar to offset electricity costs to JBCC.

- Advance the development of multi-purpose wastewater treatment and resource recovery facilities to generate revenue through food waste processing, wastewater residuals processing, septage processing, water reuse and energy generation.

- Policies concerning access to the base for haulers would need to be examined and reviewed by the ANG.

- Distance to UCRTS from U.S. Route 6 could limit the potential market for Cape towns. Currently all MSW transfer must go through the Falmouth gate. Gate restrictions would need to be re-evaluated.

- The site has value as a MassDEP site-assigned property for MSW.

- Additional study is needed to determine if there is enough volume for an anaerobic digester or composting.

- Assessment of the capacity and condition of the rail spur from JBCC and limitations posed by the railroad bridge would need to be assessed and included in a feasibility assessment.

RECOMMENDATION AND NEXT STEPS

Workshop participants identified the potential re-use of the UCRTS as a top priority for further study. This report identifies initial opportunities as well as challenges posed by potential re-use of the facility for a regional food waste, recycling, or wastewater/septage residuals processing facility. Additional study is recommended to examine the potential costs and benefits of pursuing a regional facility, including sale of the facility to a private entity if the member towns do not continue to use the UCRTS.

RELOCATION OF BOURNE POLICE STATION/RE-PAVING CONNERY AVENUE

As part of the tabletop exercises, the feasibility of the relocation of the Bourne police station/repaving of Connery Avenue was identified as a potential shared service opportunity. Town planner Coreen Moore identified the relocation of the Bourne police station as a priority for the Town of Bourne. The military identified the repaving of Connery Avenue as an expense that could possibly be met by the Town of Bourne in exchange for potentially use of land on Joint Base Cape Cod. Feasibility was examined by the Town of Bourne, who had meetings with its public safety, police, fire, and public works departments.

Ultimately, the Town of Bourne determined that they did not think there would be a viable location for a police or fire station based upon the needs of the town. They identified the current existence of the mutual aid agreement with the base for services. The area studies they conducted resulted in a need for a location in the Monument Beach/ Pocasset area for a Fire Station and the Buzzards Bay area for a Police Station. For this reason, the conclusion was that this shared service opportunity was not a viable one.

REGIONAL FIRE & RESCUE TRAINING ACADEMY RELOCATION

GENERAL INFORMATION

PURPOSE

The Barnstable County Fire & Rescue Training Academy ("Academy") is a regional facility for fire, technical rescue, emergency medical services, incident management, regional emergency planning, and police specialty training located in the Town of Barnstable. The facility, owned and operated by Barnstable County, also provides federally mandated ICS (Incident Command System) and NIMS (National Incident Management System) training for all the Towns of Barnstable, Nantucket and Dukes Counties. In fiscal year 2011, the Academy offered 24 classes, had 503

students and graduated 34 Firefighter I & II recruits. Industrial programs offered, include; Advanced Marine Firefighting, Basic Marine Firefighting, Entergy Nuclear Operation, Fire Safety for Cape Air and Fire Safety for Correctional Officers.

There is interest in exploring the relocation of this facility because of its existing location within the Town of Barnstable's water supply area, immediately up gradient from the Mary Dunn well field, which supplies drinking water to the Hyannis Water District. This relocation concept was raised during a workshop held at JBCC where concepts for shared service agreements between the military installations and surrounding communities were explored as part of the 2013 Joint Land Use Study (JLUS) Update, facilitated by the Cape Cod Commission. This feasibility study explores the relocation concept in more detail, whether relocation is appropriate as a shared service agreement.

SCOPE

This feasibility study will explore the Academy relocation concept and investigate whether relocation to a site on JBCC would be appropriate for a military-civilian shared service agreement, as described through the JLUS update. The types of shared benefits between the military and the surrounding communities that relocation of this facility could provide will also be discussed. Challenges and opportunities relating to environmental concerns, regional fire training capacity, JBCC access, ownership & operation, and funding for a new facility will be explored, including recommendations for next steps should interested parties want to explore this concept further.

OVERVIEW

The Academy has been owned and operated by Barnstable County on approximately 6 acres within the Town of Barnstable since the 1960's. The site is currently located adjacent to Independence Park, a large industrially zoned area within the Town of Barnstable, and up gradient from the Mary Dunn wells; four wells which supply drinking water to the Hyannis Water District. Groundwater contamination beneath the site from historical fire training practices was discovered in 1986. The Phase II Site Assessment of 1990 documented the extent of contamination and found that one of the four wells was impacted and , and as a result shut down for many years while remediation occurred. Through the implementation of several aggressive remedial actions, the petroleum hydrocarbon plume has been remediated and the well is operational again.

Presently, contamination issues from past fire training practices, both at the Academy and nationally, have changed how fire training exercises are conducted. The Academy currently operates using water only for straw fires, and sodium bicarbonate for gas fires. There are no hazardous chemicals or fuels stored on site accept for the diesel fuel contained in vehicles. Live fire training exercises using straw occur less than 50 times per year and events using propane less than 15. A double walled tank and containment dike was installed for the facility's heating oil storage. All floor drains have been capped, and washing of vehicles is not permitted on site. Annual hazardous materials inspections are conducted by the Town of Barnstable and inventoried, and the facility is consistently found to be compliant. The Academy's operations have been responsive to the environmental damage caused in the past. Although residual soil contamination at depth continues to leach trace amounts of petroleum hydrocarbons into the groundwater as water tables rise and fall, these quantities are naturally attenuated and a condition of no imminent threat and no substantial hazard to public health or the environment as documented in a 2001 Class C1 Response Action Outcome, continues to be met based upon required monitoring and reporting , according the site's Licensed Site Professional (LSP) and Commission Water Resources Program Manager, Tom Cambareri. Regardless of the clean-ups, on-going monitoring, and the many changes that have occurred in the Academy's fire training practices, the long history of contamination and the continued perception of a contamination threat to the Mary Dunn well field, continue to be a concern for the Town of Barnstable.

STUDY APPROACH

This feasibility study was primarily conducted through interviews with the main parties involved in any potential future relocation of the Academy, including officials from the Town of Barnstable, Barnstable County, Cape Cod Commission, Regional Association of Fire Chiefs and the JBCC Fire Department. A preliminary analysis of the challenges and opportunities, including environmental concerns and general costs, was conducted. Recommendations for whether relocation of the Academy would serve the shared service concept explored through the JLUS update are presented.

EVALUATION CRITERIA

Given the level of environmental review presumed necessary to relocate a facility of this type from one sensitive water resource area to another, and the capital cost for a new facility, the primary focus of this feasibility study is on these two challenges. Additional training capacity, ownership & operation and base access concerns, while discussed in this study, would require further exploration should the facility find a suitable site on JBCC, and funding for a new facility become available.

REFERENCES

Provide a list of the references that were used in preparation of this document.

Northeast Regional Training Center Homeland defense/Homeland Security Feasibility Study (2004)
2005 MMR JLUS
Barnstable County Annual Report (FY 2011)
Massachusetts Department of Fire Services website

POINTS OF CONTACT

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CHALLENGES & OPPORTUNITIES

The objective of this feasibility study is to examine initial considerations for the relocation of the existing fire training facility from its current site to JBCC. This study will also assess whether this relocation is appropriate for a military-civilian shared service agreement.

ENVIRONMENTAL CONCERNS

Critical to this re-location concept is an examination of the risk a facility of this type poses to drinking water supply areas. The original JBCC Fire Training Academy, located near the wastewater treatment facility, was closed as a result of the discovery of wide-spread groundwater contamination. The Upper Cape Water Supply Reserve located primarily on JBCC is a critical drinking water supply area for the entire upper cape region. This resource also has a long history of contamination and clean-up. Relocation of the Academy from one water sensitive area to another requires a thorough examination of risk. Even if a contamination threat is one of perception, these issues must be properly explored and vetted. Opportunities to remediate the current site, and return it to protected open space would serve the Town of Barnstable's water quality improvement goals. A site assessment for any new facility at JBCC must accompany any environmental risk assessment so that potential impacts could be identified and appropriately mitigated in the new facility's design should this concept be explored further. A thorough risk assessment is beyond the scope of this feasibility study. Rather, a water quality risk assessment is a recommendation of this report should the parties involved choose to pursue this concept further.

REGIONAL FIRE TRAINING CAPACITY

Training at the Academy in its present location is limited, in part, due to inadequate classroom space. An expansion of classroom space, either at

the current site, or at a location on JBCC, could enhance the range of fire training programs for both civilian and military training interests. Presently, National Wildland Fire Training is available on JBCC, but is not offered through the Academy's list of training programs. Similarly, Mass Maritime utilizes the Academy for cadet fire training services, rather than the JBCC Fire Department. Consolidation of these programs into one facility equipped with the classroom space and training equipment offers regional efficiencies in fire training. Enhanced regional efficiencies and the expansion of current regional fire training course offerings could be mutually beneficial to both civilian and military fire training interests.

County resources for a new facility are limited and the Town of Barnstable has indicated no interest in financially contributing to the facility's relocation. Furthermore, within the past 5 years the state has made two significant investments in fire training facilities in Stow and Springfield. The military may consider an investment in a facility of this type if it were an opportunity to enhance the training mission of JBCC; however, Barnstable County has indicated their interest in continued ownership and operation of the Academy regardless of relocation. This study suggests that military benefits may be limited to financial gains through a land lease agreement for a new facility, and increased access to low cost fire training opportunities.

JBCC ACCESS

Current users of the Academy in its present location have expressed concerns with access to JBCC where the Academy to relocate, and the loss of the Academy's current, more centralized location. Since 9/11, access to the base has changed significantly. Presently, civilian access to the base is restricted to the Falmouth and Sandwich gates and must be coordinated in advance. Coordination of access is often not seamless and civilians experience delays at the two gates, however this is not a permanent barrier to the Academy's relocation. Similar to how Barnstable County Correctional Facility visits are coordinated; a system for fire training access could be identified.

OWNERSHIP & OPERATION

Barnstable County has not expressed an interest in divesting of the ownership and operation of the Academy, but would rather continue to operate the facility and enhance its programmatic capabilities to include a regional emergency planning center with a centralized 911 dispatch, in addition to the fire and rescue training program. Barnstable County has identified an interest in a combined Regional Emergency Planning Command Center, 911 Dispatch, and Fire & Rescue Training Academy.

COST & FUNDING

In 2011, the Massachusetts Department of Fire Services completed their headquarters facility in Stow, MA at a cost of $43.5 million dollars. The new facility includes a water recovery and treatment system capable of capturing, treating and recycling up to 75 percent of the water used during training. It also uses energy efficient lighting to take maximum advantage of natural light to reduce reliance on electrical energy. Given the sensitivity of the water resources on JBCC, and the attention to energy use, a similar design would be required.

The MA Department of Fire Services has also begun construction of a new fire straining facility located on 6 acres in Springfield, MA. These two improvements in fire training within the state should be measured against the need for additional investment in expanded fire training capacity in Barnstable County.

The approximate cost of a new training facility is dependent upon the level to which Barnstable County Fire and Rescue Training Academy and JBCC personnel are interested in expanding existing training programs. Opportunities to further expand the recently upgraded JBCC Fire Department facility could reduce overall costs for a new facility and should be explored.

NECESSARY PARTIES TO AN AGREEMENT

Through the course of the information gathering for this feasibility study, several owner/operator scenarios for a new Academy facility emerged. The preferred scenario maintains Barnstable County as the owner and operator of the new facility, while the military installations and JBCC Fire Department continue as subsidized or zero-cost users of the academy's training services. This scenario would require a land lease agreement between the County and the military installation that controls the land where the facility would be sited, and is the preferred recommendation of this report. Similar agreements have been executed at JBCC for the Barnstable County Sheriff's department. One possible alternative scenario includes a facility owned and operated by one of the JBCC military installations, or the MA Fire Department. This scenario would require a more in depth analysis of the parties involved and, subsequently, the types of agreements that would be necessary.

SHARED SERVICE AGREEMENT

Ownership and operation relationships should be explored. Barnstable County has expressed a preliminary interest in continuing the ownership and operation of the Academy under a new location.

Mutual Benefits
A state-of-the-art code compliant facility with expanded classroom and training space would significantly enhance the revenue potential of the Academy. Furthermore, expanded fire training opportunities could be aligned with JBCC's training mission. There are many different possible scenarios for subsided training that could be mutually beneficial and should be explored further as part of future relocation feasibility efforts.

Avenues for Shared Services
At a minimum an Enhanced Use Lease would be an appropriate tool for JBCC to host a new facility of this type without retaining an ownership or operational control. This type of lease agreement the military would realize modest revenue in the form of a land lease payments for land within JBCC for civilian use. Further investigation of owner/operator scenarios may result in other opportunities for shared services.

CONCLUSION

This feasibility study concludes that a relocation of the Academy to JBCC is not appropriate for consideration as a shared service agreement at this time. There are opportunities for JBCC installations to enhance their training mission and benefit from an Enhanced Use Lease (EUL) relationship by hosting a facility of this type, as other county departments have been a party to at JBCC (i.e County Sherrif's office). However, several steps beyond the scope of this study are required to: 1) determine the feasibility of relocation in terms of risk to sensitive resources 2) ownership and operation of a new facility and 3) funding for construction of a new facility. These are areas that require considerable future study, and therefore do not readily suit the shared service agreement concept this feasibility set out to explore. Several necessary steps for future consideration of this relocation effort are outlined in the following recommendations section, should interested parties wish to explore this concept further.

RECOMMENDATIONS

Should regional civilian-military interest in relocating the Academy from its current site to a location on JBCC continue, the following steps are recommended:

- Conduct a water quality risk assessment to determine potential impacts to the Upper Cape Water Supply Reserve from relocating the Barnstable Fire & Rescue Training Academy to JBCC.

- Conduct a site suitability assessment to determine whether the Barnstable Fire & Rescue Training Academy classroom and field training needs could be relocated and integrated with the existing JBCC fire station.

- Explore owner/operator arrangements that would support relocation of the Barnstable Fire & Rescue Training Academy to JBCC.

- Explore financial aspects of an Enhanced Use Lease agreement between JBCC, MA Fire Department and Barnstable County.

APPENDIX 4 – CREATING COMMUNITY – MILITARY PARTNERSHIPS ON CAPE COD

INTRODUCTION/BACKGROUND

In 2005, The Cape Cod Commission (CCC) completed a Massachusetts Military Reservation (MMR) Joint Land Use Study (JLUS). The study was completed under contract with the Town of Sandwich through funding from the Department of Defense, Office of Economic Adjustment (OEA). In response to a nomination by the Army in 2011 to update this 2005 JLUS, OEA awarded funding in July, 2012, to the CCC to complete this update. Included among the update elements approved as part of OEA's grant to the CCC was an examination of the potential for shared services by the installations located on the Massachusetts Military Reservation and the surrounding towns.

BUDGET CONSIDERATIONS AND SEQUESTRATION

While the military services have been reviewing ways to expand sharing of public and municipal services between an installation and its surrounding communities for some years now, this issue has received increased focus as concern has grown about (a) the size of the overall Defense budget, and (b) the growth of the Federal Debt (compounded by growing budget deficits).

Current political and economic issues surrounding the passage of a US Federal 2013 Fiscal Year budget also bear on this issue. In accordance with the Budget Control Act of 2011, Congress mandated that the federal government cut $1.2 trillion dollars in defense and non-defense spending by January 2, 2013. The federal government was facing "sequestration", a term used to describe a new fiscal policy procedure originally provided for in the Gramm-Rudman-Hollings Deficit Reduction Act (Reduction Act) of 1985. The Reduction Act was an effort to reform Congressional voting procedures concerning the federal government deficit. Basically, if appropriation bills passed separately by Congress provide for total government spending in excess of the limits Congress earlier laid down for itself in the annual Budget Resolution, and if Congress cannot agree on ways to cut back the total (or does not pass a new, higher Budget

Resolution), then an "automatic" form of spending cutback takes place, known as "sequestration."

Under sequestration, an amount of money equal to the difference between the cap set in the Budget Resolution and the amount actually appropriated is "sequestered" by the Treasury and not handed over to the agencies to which it was originally appropriated by Congress.

On January 1, 2013, Congress passed the American Taxpayer Relief Act, a measure which averted the fiscal cliff and reversed $24 billion in government-wide spending reductions that were triggered by sequestration. The measure moved the time frame for sequestration back to March 1, 2013.

The potential effect this measure may have on the Defense budget is significant. The Department of Defense's current FY13 Continuing Resolution (CR) provides $557 billion for the fiscal year. This amount exceeds the Defense spending cap imposed by the Budget Control Act by $11 billion, potentially requiring a retroactive cut to DoD's current FY13 budget should sequestration go into effect on March 1, 2013.

Exacerbating this issue is the requirement for Congress to pass a budget appropriation for the remainder of the FY13 fiscal year by March 27, 2013. Should Congress be unable to pass a FY13 appropriation, DoD will be put on another CR for the remainder of FY13. The challenge this scenario presents for DoD is significant. Comparative levels of Defense spending between its investment (e.g. funding for weapons programs and other investment contracts) and operation & maintenance (O&M) accounts is "lumpy;" meaning, that it fluctuates from fiscal year to fiscal year. Accordingly, the FY12 DoD budget, the budget authorization approved for FY13 DoD CRs authorized more spending for DoD under its investment accounts than from its O&M accounts.[22] However, for FY13, DoD requested (and received, through the passage of the FY13 National Defense Authorization Act (NDAA)) authorization to spend more for O&M than for investment, anticipating greater O&M costs due to (among other events) the withdrawal of troops from Afghanistan and an overall US defense posture "pivot" to Asia. Since the start of the FY13 fiscal year (October 1, 2012) DoD has been expending its CR funding based on the spending authorities prioritized in the approved FY13 NDAA.

Due to the mismatch between these investment and O&M costs created by conflicting FY12 and FY13 authorizations and compounded by Federal budget effects such as sequestration, the Budget Control Act, and the

[22] U.S. Federal Budget 101: all budgets include two things: an authorization act and an appropriation. Without either, federal agencies cannot spend federal funding for that fiscal year.

Taxpayers Relief Act, should all of these effects come to pass (and all on March 27, 2013), DoD will be faced with a roughly $11 billion budget shortfall.[23]

In a memorandum issued by the Deputy Secretary of Defense on January 10, 2013, Ashton Carter advised all Secretaries and Directors for the Department of Defense that "given the overall budgetary uncertainty faced by the Department, and in particular the immediate operational issues…it is prudent to take steps now to help avoid serious future problems. I thereby authorize all Defense Components to begin implementing measures that will help mitigate our budget execution risks."[24]

ARMED FORCES RENEWABLE ENERGY INITIATIVES

In addition to these budget reduction measures, the Armed Services have set individual goals to reduce energy costs and increase energy security on military installations. The mission of the Army Energy Initiatives Task Force (AEITF) is to "Strengthen Army energy security and sustainability by developing a comprehensive capability, and planning and executing a cost-effective portfolio of large-scale renewable energy projects by leveraging private sector financing."[25] In accordance with Public Law 110-140, Section 431, Energy Independence and Security Act (EISA) established in December, 2007 the AEITF sets annual energy intensity reduction goals for federal buildings at 3% per year for FY 2008 through FY 2015. The overall goal is 30% reduction by FY 2015 using FY 2003 as a baseline year. While each installation should meet this goal individually, commands are responsible for meeting this goal on a command-wide basis and encouraged to exceed these minimum goals.[26] The goal of the Task Force is to implement 1 GW of renewable energy by 2020 through solar, wind, biomass and geothermal projects on military installations to increase energy security without adding to the Defense Department budget.

The Department of the Air Force is facing a $478B budget reduction including retiring aircraft and airmen with a pause in military construction. The Air Force has set a $5 billion Enhanced Use Leasing

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[23] Panetta: Fiscal Crisis Poses Biggest Immediate Threat to DOD, Parish, Karen, American Forces Press Service, January 10, 2013
[24] Memorandum, Handling Budget Uncertainty in Fiscal Year 2013, Carter, Ashton, January 10, 2013
[25] http://www.armyeitf.com/index.php/about-eitf/mission-and-vision
[26]http://www.armyeitf.com/downloads/ASA(IEE)%20energy%20goal%20attainment%20policy%20(24%20Aug%202012).pdf

goal to implement 1000 MW of alternative energy by 2016. The Department of the Navy has closed over 50% of its installations since the first BRAC in 1988.

GOVERNOR'S TASK FORCE ON MASSACHUSETTS MILITARY INSTALLATIONS

On February 27, 2012 as Acting Governor, Lt. Governor Tim Murray signed an Executive Order to create a Military Asset and Security Strategy Task Force. The Task Force to be chaired by the Lt. Governor formalizes the informal working group he has led over the last year, and calls for a long term initiative to support all military installations in Massachusetts in order to both protect them and explore opportunities to bring in new missions.

Among the six subcommittees established by the Task Force is to explore opportunities and efficiencies on military installations in the Commonwealth, including opportunities to share services and support renewable energy projects[27]. The role of the Task Force is to "analyze our military installations to determine where there are opportunities to fill vacant spaces, upgrade aging infrastructure, become more energy efficient, identify new missions, and build partnerships to bring more jobs and economic development at and around each site."[28] MassDevelopment is leading the effort statewide to explore opportunities and efficiencies on military installations across the Commonwealth, and has funded a Master Coordination Plan for the MMR to be completed concurrent with the MMR Joint Land Use Update and Community-Military Partnerships Study.

MMR – OWNERSHIP AND LAND USE HISTORY

The MMR has been subject to significant land use and ownership changes throughout its nearly 80-year history. The Commonwealth of Massachusetts established the MMR in 1935 as a National Guard training camp (Camp Edwards) with a landing strip and runways. Although the occupants and property boundaries have changed a number of times since MMR was established, the primary mission has always been to provide training and housing to Air Force or Army units.[29]

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[27] http://www.mass.gov/governor/administration/ltgov/lgcommittee/military/
[28] Id.
[29] See *USCG Air Station Cape Cod Master Plan* dated September, 2012, p. 1-7

The Department of the Army leased the property in 1940, constructing buildings, roads, utilities, and ranges, in order to prepare for World War II (WWII), during which the airfield was expanded and dormitories for 70,000 troops were built. After WWII, the Department of the Air Force assumed control of the airfield, certain Army facilities, and site utilities to create Otis Air Force Base at the southern end of the original Camp Edwards.[30] After the war, most of the previous need for pre-deployment training and staging had evaporated. With the exception of Otis Air Force Base's use for long-range surveillance flights, the MMR was mostly vacant. Many of the wood-framed buildings fell into disrepair, leaving a patchwork of decaying infrastructure and antiquated facilities scattered across a large plot of land.[31]

In 1976, the Army granted a license to the Commonwealth of Massachusetts to use the land it leases from the Commonwealth to the Army National Guard.

Otis Air Force Base continued to expand during the Cold War with runway expansion and construction of 1,193 units of family housing. In 1968, the DoD agreed to allow the Coast Guard to utilize Otis Air Force Base on Cape Cod for a new USCG Air Station. From 1970 until 2005, the Massachusetts Air National Guard maintained a significant aviation presence on the airfield and managed all aspects of airfield operations[32], as well as the Base's wastewater treatment plant, water supplies, base roadways and other infrastructure. The 2005 Base Realignment and Closure (BRAC) resulted in redistribution of aviation resources to Barnes airfield in Westfield, MA and re-purposing the mission of Otis Air National Guard base to its current mission as the 102nd Intelligence Wing. Responsibility for airfield operations was transferred to the US Coast Guard in 2008. As a result of these mission changes, the Air National Guard's requirement for land and facilities has been significantly reduced.

As the DoD tenants of Otis Air Base realigned over the past 30 years, Coast Guard presence on the MMR continued to grow, emerging in the early 2000s as the largest active duty military representation on the MMR.[33] The US Coast Guard is changing its airframe at Air Station Cape Cod resulting in a new hangar, new fueling station and improvements to the airfield.

The force structure of the Massachusetts Army National Guard has changed considerably since the publication of the Community Working Group Master Plan [in 1998]. Since that time the force structure has

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[30] See *USCG AirStation Cape Cod Master Plan* dated September, 2012, p. 1-7
[31] See Preliminary Draft Camp Edwards Site Consolidation Plan 2012 - 2017
[32] See *USCG AirStation Cape Cod Master Plan* dated September, 2012, p. 1-7
[33] Id.

changed from a predominantly mechanized force to a lighter force capable of deploying anywhere here in the commonwealth, across the nation, and overseas in a shortened amount of time. This lighter force structure almost eliminated track vehicles from the inventory. This has allowed units to train more frequently on more diverse mission sets at Camp Edwards with reduced environmental impact in the Upper Cape Water Supply Reserve/Training Area.[34]

The MAARNG has approximately 6,375 soldiers who train on average one weekend per month and one two-week cycle during a training year. Units start planning their training several years in advance of the year in which they actually conduct their training. The unit leadership assesses the strengths and limitations of its personnel and begins to schedule training sites and resources to best support the training their units require. During the year prior (Training Year (TY) 2011) to the year of execution (TY 2012) units confirm geographical areas and training sites within those areas.

Camp Edwards today is the largest of five major training facilities in the Commonwealth. Military training activities in the Reserve [Camp Edwards] are tracked by Range Control based on training events and the number of personnel participating in each training event. This method records the number of times each training area is utilized and the number of personnel and vehicles utilizing the areas for each event. The table below shows the utilization of training areas and ranges in the Reserve as well as use of training support areas in the Cantonment Area of Camp Edwards. [35]

OVERVIEW OF TRAINING USE - TY 2012			
		PERSONNEL	
Area	**Training Days / Events**	**Military Personnel**	**Civilian Personnel**
Ranges	61	2,003	53
Training Areas	232	13,532	122
Training Support Areas	824	63,210	691
TOTAL	**1,117**	**78,745**	**866**

In addition to the major commands on MMR, the base currently houses the Veteran's Administration (Massachusetts National Cemetery), Cape Cod Air Force Station and US Coast Guard Antenna Station, PAVE PAWS,

[34] See *Preliminary Draft Camp Edwards Site Consolidation Plan 2012 – 2017*, MA Army National Guard

[35] See *Final State of the Reservation Report - Training Year 2012,* Massachusetts National Guard Environmental & Readiness Center, p. 61-62

Barnstable County Jail and House of Correction, and many smaller tenants from Federal, State and Local agencies.[36]

OWNERSHIP/LAND USE CHANGES PRESENT OPPORTUNITIES FOR SHARED SERVICES

The Air National Guard, in its role as host tenant on the MMR, provides basic services to all MMR tenants, including electricity, water sewerage, communications infrastructure, fire protection, and maintenance of main roads. The Air National Guard maintains 70 miles of electric utility lines, 2,068 utility poles and 610 transformers, as well as 57 miles of sewage lines and a wastewater treatment facility. In addition, the Air National Guard personnel maintain 27 miles of MMR roadways. As part of its strategic reduction, the Air National Guard will be divesting of its utility and public works responsibilities.[37]

As a result of changes in mission, land transfer, and current training requirements, the US Coast Guard, Air National Guard, and Army National Guard have completed or are in the process of preparing master plans to address future needs and space requirements. In addition, the DoD Office of Economic Adjustment funded an assessment in 2012 of future options for the Base's wastewater treatment facility, including 3rd party contract operation providing service to MMR and wholesale service to towns, and sale/transfer of the existing system and service to MMR and towns.

Base planning efforts completed or underway at MMR present a variety of opportunities for shared services among tenants, private developers, and/or communities. For example, the Otis ANG plan includes consideration of an Enhanced Use Lease (EUL) that would allow a private developer to lease available federal land and/or facilities.[38] One such project is a proposed photovoltaic array on the capped landfill site. The Brightfield Solar Project, proposed for the capped landfill at MMR, will connect to the base's grid behind the meter, and will be used to provide cheap, renewable electrical power to the base reducing the base's dependence on commercial power. The contract will be for a Power Purchase Agreement, where the land will be leased to a private developer

[36] See *Draft General Plan for Space Re-Utilization for the Otis Air National Guard Base* by the 102nd Intelligence Wing dated October 10, 2012, p. 4
[37] See *USCG AirStation Cape Cod Master Plan* dated September, 2012, p. 2-36
[38] See *Draft General Plan for Space Re-Utilization for the Otis Air National Guard Base* by the 102nd Intelligence Wing dated October 10, 2012, p. 20

who will install, own, and operate the system, with Otis ANGB being the sole customer.[39]

Options for creative agreements and projects between the ANG, Commonwealth of Massachusetts, local communities and the private sector extend beyond EULs. The ANG is also considering alternatives to their current transportation access to the base to divest in the road network and/or consider an enhanced use lease that provides public works services.[40] The Army National Guard draft plan proposes to acquire lands and other property declared excess by the Air National Guard to support installation and training needs.

The US Coast Guard master plan is focused on the most effective and efficient use of land and facilities to provide the greatest program benefit while minimizing cost. This requires maximizing the use of existing on-site land and facilities. Opportunities for reuse of existing facilities, including MMR partner facilities should also be explored.[41] The Coast Guard master plan includes an inventory of existing facilities, including housing and recreational facilities that may be consolidated, repurposed or demolished for other uses.

These and other existing and ongoing planning efforts indicate a willingness on the part of the 3 major tenants on MMR to explore how future military and community needs could be met and efficiencies created through exploration of community-military partnerships for shared infrastructure, utilities, and other services.

FUTURE BRAC ROUNDS AND IMPLICATIONS FOR REALIGNMENT AND/OR CLOSURE

Although the last rounds of BRAC, or Base Realignment and Closure, occurred in 2005, installations must be mindful and active in planning for the future. "In the current environment of fiscal constraints (both in DoD and in local and state government), mission encroachment due to urban sprawl, [endangered] species issues, the new boom in renewable energy, and rapidly evolving national security threats, installations and their host communities can no longer afford NOT to communicate. Robust sharing of information, active cooperation in master planning activities inside and

[39] Memorandum, Massachusetts Air National Guard/Defense Logistics Agency, Brightfield Solar Project, undated
[40] Id.
[41] See *USCG AirStation Cape Cod Master Plan* dated September, 2012, p. 1-1

outside of fence lines and partnership to deliver facilities and services are the new imperatives of military/community interaction".[42]

MILITARY FOCUS ON CORE MISSIONS

An additional consideration to the pursuit of community-military partnerships is the fact that the engagement of the communities in the provision of services allows the military to focus its resources, both monetary and manpower, on its core missions. This falls directly in line with guidance issued by the Deputy Director of Defense, who notes that operating portions of the budget should:

- Exempt all military personnel from sequestration reductions
- Fully protect funding for wartime operations;
- Fully protect Wounded Warrior programs
- Protect programs most associated with the new defense strategy.[43]

GOAL OF THIS REPORT – ECONOMIES OF SCALE

With the knowledge that the goal of the Department of Defense is the exploration of the economies of scale that shared services may provide, the purpose of this report is to:

- Examine what comprises a community-military partnership;
- Examine policies that enable or disallow community – military partnerships;
- Provide examples of existing community – military partnerships in the U.S.;
- Provide examples of existing partnerships/shared services on MMR;
- Identify stakeholder roles, responsibilities and challenges of implementing military – community inter-municipal agreements;
- Identify initial opportunities for further discussion in workshops for shared services on MMR.

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[42] Association of Defense Communities BRAC Workshop: Using Lessons Learned to Address the Resource Challenges of Today, August 7, 2012
[43] Memorandum, Department of Defense Handling Budget Uncertainty in Fiscal Year 2013, Carter, Ashton, January 10, 2013

WHAT IS A COMMUNITY-MILITARY (PUBLIC - PUBLIC) PARTNERSHIP?

A community-military partnership is a construct between two or more parties that combines resources, either monetary or in-kind to achieve common goals and objectives. A partnership should include the following elements:

- Create mutual value that is greater than partners could achieve on their own;
- Leverage resources;
- Address common issues; and,
- Share the risk associated with these resources.

COMMON TYPES OF PUBLIC - PUBLIC PARTNERSHIPS

The most common types of partnerships include the following:

- Inter-local support agreements between military and civilian fire and police forces;
- Facility-use agreements for the sharing of facilities;
- Provision of water, sewer and energy utility infrastructure; and,
- Use of real property resources for renewable energy.

Shared services are important to consider because common interests exist between military installations and surrounding communities, and redundancy is no longer affordable. In today's military, a garrison commander is tasked with many responsibilities that are also served by towns. Both have the goals of serving their populations while being cost effective. Some examples include the following:

- Maintenance of infrastructure such as streets, buildings and sewer treatment facilities;
- Maintenance of personnel to maintain that infrastructure;
- Redundant contracting services such as custodial cleaning and telecommunications.

POLICIES THAT ENABLE OR DISCOURAGE COMMUNITY-MILITARY PARTNERSHIPS

There are several policies and initiatives that affect community-military partnerships, including the recent passage of the Defense Authorization

Act of 2013, force protection/antiterrorism requirements, encroachment and the existing legal and land use framework on the MMR.

DEFENSE AUTHORIZATION ACT OF 2013

Some key developments have recently surfaced which further enable community –military partnerships. Specifically, the recent passage of the Defense Authorization Act of 2013 provides specific authorization for community-military partnerships.

Section 331, entitled "Intergovernmental Support agreements with State and Local Governments", amended chapter 137 of 15 Title 10, United States Code, provides the following:

> The secretary concerned may enter into an intergovernmental support agreement with a state or local government to provide, receive or share installation-support services if the secretary determines that the agreement will serve the best interests of the department by enhancing mission effectiveness or creating efficiencies or economies of scale, including by reducing costs.[44]

The section further provides that "notwithstanding any other provision of law, an intergovernmental support agreement…

- May be entered into on a sole-source basis;
- May be for a term not to exceed five years; and
- May use, for installation-support services provided by a state or local government, wage grades normally paid by that state or local government.[45]

There are few limitations on this authority. The intergovernmental support agreement "may only be used when the secretary concerned or the state or local government…providing the installation support services already provides such services for its own use". Further, the secretary concerned must ensure that these agreements are not used to circumvent the requirements of the Office of Management and Budget circular A-76 regarding private-public competitions. [46]

The measure specifically states that this authority is not intended to revoke, preclude or interfere with existing or proposed mutual-aid agreements or arrangements.[47]

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[44] 15 United States Code 10, Chapter 137, section 1226.
[45] Id.
[46] Id.
[47] Id.

These agreements are required to be paid out of funds available for operation and maintenance. The costs of agreements may be paid using annual appropriations made available for that year. Funds received by the secretary on behalf of an installation must be credited to the appropriation or account charged with providing installation support.[48]

The term "installation-support services" is defined as "those services, supplies, resources and support typically provided by a local government for its own needs and without regard to whether such services, supplies, resources and support are provided to its residents generally, except that the term does not include security guard or fire-fighting functions.[49]

The term local government is also broadly defined as "includ(ing) a county, parish, municipality, city, town, township, local public authority, school district, special district and any agency or instrumentality of a local government.[50]

FORCE PROTECTION/ANTITERRORISM

Force protection or *FP* is a term used by the United States military to describe preventive measures taken to mitigate hostile actions in specific areas or against a specific population, usually Department of Defense (including, but not limited to, family members and chaplains), resources, facilities, and critical information. [51]

Force protection/antiterrorism standoffs refer to setback requirements for inhabited structures and gathering places from the installation's exterior boundary to reduce the vulnerability of service personnel to terrorist attacks. Force protection can also include procedures as basic as checking identification cards at the entrance to an installation and requiring credentials to get inside a building. However, when necessary, force protection procedures can become as stringent as inspecting every vehicle, person and bag entering an installation.

There are four levels of force protection applied to every military installation. The Commander of the US Northern Command determines what the minimum level of force protection that will be applied for installations in the continental United States. Individual facility and

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[48] Id.
[49] Id.
[50] Id.
[51] Department of Defense Dictionary of Military and Associated Terms, 12 April 2001, as amended through 12 July 2007

installation commanders may increase their force protection levels as they feel is necessary.[52]

Further, the Department of Defense Antiterrorism standards require Terrorism Vulnerability Assessments and use of the Joint Antiterrorism Guide in planning. Tenants on installations are also required to coordinate their AT program and plan requirements with the host installation.[53]

MMR is a secure Federal military facility, and public access is limited. MMR is open to those with military IDs, military dependent IDs, and retired military IDs. Facilities open to these ID holders include the Falcon Golf Course, movie theater, Kaehler Clinic, Exchange, Mini-mart, Chapel, and bowling alley. Other limited facilities are available for use with prior authorization and coordination.[54]

The Department of Defense Antiterrorism Force Protection Policies and Standoff Distances are a key consideration when considering intergovernmental support agreements because they may restrict both the location of development on the Massachusetts Military Reservation as well as public access to it.[55]

ENCROACHMENT

Encroachment is a term to describe a deliberate action by any governmental or non-governmental entity or individual that does, or is likely to inhibit, curtail or impede current or future military activities within the installation complex or mission footprint or is likely to be incompatible with the use of a community's resources.

A key consideration of any community-military partnership should always be whether the proposal, either on its face or by implication, would result in encroachment upon any of the military missions located on the MMR. An example of encroachment at MMR is residential development in close proximity to the base boundary, in particular active firing ranges. The

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[52] USNORTHCOM sets force protection for military installations , Brayman, Gail, NORAD and USNORTHCOM Public Affairs, July 3, 2007
[53] DOD Instruction, DoD Antiterrorism (AT) Standards, Number 2000.16, October 16, 2006
[54] See *USCG AirStation Cape Cod Master Plan* dated September, 2012, p.1-25
[55] See *Draft General Plan for Space Re-Utilization* for the Otis Air National Guard Base by the 102d Intelligence Wing dated October 10, 2012 (identifying Department of Defense Antiterrorism Force Protection Standoff Distances at figure 18 and 19; USCG AirStation Cape Cod Master Plan dated September, 2012;

2005 MMR Joint Land Use Study also examined the potential conflict of personal wireless services or other tall structures within flight paths of US Coast Guard search-and-rescue missions. This study recommended adoption of a wireless facility corridor overlay district by the towns to limit the height of these facilities to reduce potential conflicts.

CURRENT LICENSES, LEASES AND ENCUMBRANCES ON THE LAND AT THE MASSACHUSETTS MILITARY RESERVATION (MMR)

A key consideration in any and all planning discussions for the MMR must be the current licenses, leases, encumbrances and legal constraints that exist for that property. Discussed below is a brief summary of those requirements.

Of the 22,000 acres on the MMR, 19,000 acres are owned by the Commonwealth of Massachusetts, leased to the federal government, and then licensed back to the Commonwealth of Massachusetts for National Guard training and support.[56] The portions of MMR subject to the licensing agreements are primarily between the U.S. Air Force and U.S. Army for the National Guard units on MMR. The National Guard is both a federal and state entity subject to the authority of both the Governor and federal officers. It is funded by the federal government and subject to federal regulation.

In 1976, the Army granted a license to the Commonwealth to use the land it leases from the Commonwealth for "year round training and support of the Massachusetts Army National Guard". The license is for the entire term of the Army's lease. The license is "revocable at will" by the Army and the Commonwealth may relinquish the license with thirty days' notice. The Air National Guard also holds a similar license.

The MMR also includes 1,100 acres owned in fee by the U.S. Air Force at Otis Air National Guard base. The Veterans Administration owns 749.29 acres, upon which the National Cemetery is located.

The northern 15,000 acres of the base, also called the Upper Cape Water Supply Reserve, where the majority of the Army National Guard training occurs, was protected through a Memorandum of Agreement (MOA) and an Executive Order in 2001. The MOA was codified into law in 2002. Activities in the Reserve are subject to Environmental Performance Standards that were enacted to ensure the permanent protection of the Cape's drinking water supply and wildlife habitat in that area.[57] The

[56] See Report on Legal Control Over Land Use at the MMR, Harshbarger, Scott, March 1998 and July 1998
[57] Chapter 47 of the Acts of 2002

Environmental Management Commission ("EMC") of the MMR consists of three members: the Commissioner of the Department of Fish and Game, the Commissioner of Department of Conservation and Recreation, and the Commissioner of the Department of Environmental Protection. Their responsibility is to ensure the permanent protection of the drinking water supply and wildlife habitat of the reserve and to ensure all military and other activities in those 15,000 acres are consistent with the Environmental Performance Standards.[58]

The EMC is assisted by the Community Advisory Council ("CAC"), which consists of the following members: one from Falmouth, Bourne, Sandwich and Mashpee; one family member resident of the MMR; two representatives from the military, one from the Cape Cod Commission, one from the Wampanoag Tribe and five other members. All members are appointed by the Governor. [59]

The EMC is also advised by the Science Advisory Council ("SAC"), which consists of between five and nine scientists/engineers who are experts in public health, water protection, wildlife habitat management and land use management. The EMC is also supported by the Environmental Officer, who is a state employee and whose role is to monitor the impact of activities and uses of the northern 15,000 acres.[60]

A significant portion of the northern training area of the MMR was once part of the Shawme-Crowell State Forest and was initially leased to the federal government in 1940. The original statutes transferred most of the state forest to the Military Reservation Commission (MRC) and subsequently the care, custody, and control of the land was transferred to the Massachusetts Division of Fisheries and Wildlife in accordance with Chapter 47.[61]

Each lease to the federal government, as represented by their relevant armed service maintains the right to the use the MMR "for such military use as the Government may require and such other Governmental uses as the parties hereto from time to time mutually agree in writing".[62] Subject to certain restrictions in the Reserve associated with the MOA and Chapter 47, the federal government also has broad rights to construct buildings or make improvements on the property. It also owns those

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[58] Id.
[59] Id.
[60] Id.
[61] Id.
[62]- See Report on Legal Control Over Land Use at the MMR, Harshbarger, Scott, March 1998 and July 1998

buildings and may remove, abandon or dispose of them at their option at the conclusion of the agreement.

The Air Force lease assigns responsibility for "maintenance, management and operation" of the leased property to the federal government to be carried out by a single designated federal "host agency". The Coast Guard lease designates the Commander, First Coast Guard district, as the federal officer in charge of managing the leased property. The lease also allows the federal host agency to contract with the Commonwealth to maintain/operate the premises.

Changes in the lease arrangements between the Commonwealth and its federal lessees would require either an action by Congress, consent by the Air Force, Army or Coast Guard, or federal consent at the request of the Commonwealth.

POLICIES FOR COMMUNITIES IN MASSACHUSETTS THAT PROHIBIT OR ENABLE SHARED SERVICES

Home Rule

Massachusetts is subject to the home rule amendment to its constitution. The purpose of the Home Rule Amendment is to preserve the right of municipalities to self-government in essentially local matters by allowing them to adopt and amend their own charters, while preserving Commonwealth's right to legislate with respect to state, regional and general matters.[63]

Under the Home Rule Amendment, the legislature is restricted from passing a special law, i.e., statute that is applicable to only one city or town, unless affected municipality requests legislature to do so by means of petition approved either by its voters or its mayor and city council, or unless legislature acts on recommendation by governor with two-thirds vote of each branch of legislature. [64]

While the Home Rule Amendment was not intended to prevent the Legislature from "reassign[ing] functions among levels of government as changing times may require,"[65] it is a consideration when examining a town's ability to enter into some aspects of shared service agreements and the source of legislative authority to do so.

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[63] M.G.L.A. Const.Amend. Art. 2, § 8 as amended by Amend. Art. 89.
[64] Id.
[65] First Report of the Special Commission on Implementation of the Municipal Home Rule Amendment to the State Constitution, 1966 Sen.Doc. No. 846, at 9.

Chapter 188 of the Acts of 2008

In 2008, the Massachusetts Legislature amended Chapter 40, § 4A (the "inter-municipal agreement law") by shifting the authority necessary to approve such agreements in municipalities with a town form of government from town meeting to the board of selectmen. Cities are still required to obtain the approval of the city council and mayor.

This change makes it easier for the Commonwealth's municipalities to enter into these agreements and, thus, reap the benefits of collaboration – which can include reduced costs, improved service delivery, increased efficiencies, and the availability of services, equipment and personnel that a municipality could not otherwise obtain on its own.

As a result, inter-municipal agreements are becoming a popular tool for sharing resources between municipalities and other governmental units. With some foresight and careful planning, municipal leaders can use these agreements to improve services and reduce costs while also promoting collaboration and regionalization.

Types of Inter-Municipal Agreements

There are three basic types of inter-municipal agreements: (1) formal contracts; (2) joint service agreements, and (3) service exchange arrangements.

Formal contracts

The most common method of intergovernmental contracting, these are written contracts between two or more municipalities, under which one local government agrees to provide a service to another local government for an agreed upon price.

An example of a formal contract is the sharing of personnel, such as an animal control officer, traffic engineer, or public health official.

Joint service agreements

These are agreements between two or more municipalities to join forces to plan, finance and/or deliver a service within the boundaries of all participating communities. A joint service agreement gives local

governments the broad flexibility to tailor the agreement to reflect the unique needs of the service provided.

Public works is the most common subject of joint service agreements; for example, joint ownership of new equipment and shared solid waste disposal/refuse districts.

Service exchange arrangements

These are agreements under which local governments agree to lend services to one another, generally without any payment required.

The most common example of a service exchange arrangement is mutual aid for emergency services, often used by municipal police and fire departments faced with limited time and constraints on budget and staff. [66]

EXAMPLES OF EXISTING COMMUNITY – MILITARY PARTNERSHIPS

THE MONTEREY MODEL – JOINT POWERS AGREEMENT

A successful community-military partnership was established between the Cities of Monterey and Seaside, California, and the Army Defense Language Institute at the Presidio and the Naval Postgraduate School. Proposed for closure under 2005 BRAC, the Army sought ways to reduce costs on its military base.

The partnership was initially enabled by FY04 Defense Authorization Bill, which enabled "public works, utility and other municipal services needed for the operation of any department of Defense asset in Monterey County, California, to be purchased from government agencies in that county".[67]

In 2004, the cities of Monterey and Seaside, California entered into a Joint Powers agreement (JPA) and formed the Presidio Municipal Service Agency (PMSA) as a non-profit organization. The City of Monterey provides service to the Presidio of Monterey, while the City of Seaside provides service to the Fort Ord Military community. The purpose of

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[66] Metropolitan Area Planning Council, *Inter-Municipal Agreements Resource Guide,* http://www.mapc.org/resources/intermunicipal-agreements
[67] H.R. 1588, as reported (FY04 Defense Authorization Bill)

these agreements by the Monterey City Council was to reduce costs to operate the military base.

The City entered into a contract for base operations and maintenance. The City's maintenance philosophy was to "improve – save-innovate"; improve the quality of life and enhance mission, save taxpayer dollars, and introduce new ideas and thinking.

The City provides the Garrison commander full access to any city service on a cost-reimbursable basis. These services include the following:

- Facility maintenance and repair;
- Fire detection and alarm system;
- Street and storm water system maintenance;
- Elevator, generator, HVAC system repairs;
- Capital improvement projects;
- Locksmith;
- Pest control;
- Tree maintenance.

The FY 2012 contract is for approximately $8.2 million. Installation customers submit "service orders" directly to PMSA, through its DPW. As it is a cost reimbursable contract, the Army only pays for its actual costs and services.

Today, the City maintains 2.2 million square feet of the Presidio, including 160 facilities in Monterey and 24 facilities on Camp Roberts. They process 19,000 work orders annually. By providing all materials and supplies to the installation at cost, the city has saved the installation over $500,000 over the life of its contract. Through warranty tracking on everything from roofs, boilers, generators to materials used for DPW projects, the City has estimated its cost savings to be more than $1,500,000. The City has been successful in obtaining energy rebates totaling $1,577,310 to date.

Through the use of its dashboard technology, which is both a work and asset management system, the City is able to provide real-time cost data to the installation on an as needed basis. This ability to measure both progress and savings has enabled both the City of Monterey and the Army to quantify a 41% savings compared to previous federal and private service providers.[68]

OTHER PARTNERSHIPS WITH THE CITY OF MONTEREY

[68] 2000 Triple A audit findings

The city of Monterey also entered into a lease agreement with the Army for a historic park and nature preserve within the Presidio. As consideration for the use of this land, the City of Monterey maintained the historic properties and walking trails on the land, as well as provided police patrol and fire protection, cost of utilities, insurance and pesticide, water and sanitary maintenance.

There is also a license granted from the Army to the City of Monterey for the development, improvement and joint use of three baseball fields, a running track and a soccer field at the Presidio of Monterey. The consideration was the construction, operation and maintenance of the premises for the general public for use of those fields, payment of utilities, and insurance costs.

The Army also leased the Presidio of Monterey child care facility to the City of Monterey. Consideration for this lease included the reservation of 41 child care slots exclusively for children of the Army.

OTHER EXAMPLES OF COMMUNITY – MILITARY PARTNERSHIPS

The following are examples of other types of community – military partnerships illustrating the various types of services, utilities, and infrastructure that are currently shared in the U.S. between military installations and host communities.

TRANSPORTATION INFRASTRUCTURE

Libby Army Airfield

Located at Fort Huachuca, Libby Army Airfield consisted of three runways on 900 acres of military land. The city of Sierra Vista, Arizona became a partner with the Army when it leased 29 acres of land adjacent to the airfield. This partnership has enabled the city to secure grant funding for safety and capacity improvements to Libby Army Airfield, including: a $250,000 automated weather observation system, a $1 million fiber optic cable between the city's taxiway lights and the Army's lighting system, and construction of a $2million, 100 foot wide, 1400 long reinforced concrete taxiway from the Army's main runway to the city's side of the airfield.

Brooks City-Base Redevelopment

The United States Air Force partnered with the City of Antonio through a cooperative agreement between the Air Force and the city's Brooks Development Authority (BDA). The high operating costs of Brooks AFB made it vulnerable when it was placed on the 1995 BRAC list of recommendations. Installation and local officials sought ways to reduce operating costs and build public-public and public-private partnerships.[69]

In the Fiscal Year 200 Defense Appropriations Act, the Air Force was authorized to conduct a demonstration project at Brooks AFB allowing conveyance of the Brooks AFB property. Texas Senate Bill 911 (amended Chapter 378) allowed for the creation of economic development authorities at base efficiency project locations. The San Antonio City Council enacted an ordinance establishing Brooks Development Authority to manage, lease and sell the real property of Brooks City-Base.

In July 2002, all of the Brooks property was conveyed by deed to the BDA. The Air Force leased back only the property it needed to accomplish its missions, through a 20 year lease with four 20-year extension options. Through legislation, the property had to be transferred at Fair Market Value (FMV), which was established through a joint appraisal to be worth $ 64.24 million dollars. The parties agreed FMV was reached through the Air Force's rent abatement over the term of the lease; the Air Force sharing its future development revenues; and the municipal services that the BDA would provide in support of the Air Force's missions.

Utility transfers were accomplished through a Bill of Sale. BDA then transferred electric and gas utilities to the city's municipally owned electric and gas company, City Public Service. BDA transferred the water and sanitary sewer systems to the San Antonio water system. Upgrades continue to be made to the water and wastewater systems and improvements have been made to the campus storm drainage system by the City of San Antonio.

From the land not needed for Air Force missions, the BDA sold 28 acres upon which a state of the art, 81 bed hospital resides. The City of San Antonio constructed a 40,000 square foot Fire and Police Emergency Dispatch (911) center. The BDA is jointly developing a $27 million dollar apartment project on campus.

[69] Association of Defense Communities Annual Conference: Navigating Change, August 8, 2012

South Dakota Ellsworth Development Authority (SDEDA)

SDEDA has been working to reduce encroachment surrounding the Ellsworth Air Force base. In addition to building a multi-use development to house residents and businesses currently incompatible with Ellsworth Air Force Base, SDEDA is building a regional wastewater treatment plant that will serve both Ellsworth and the City of Box Elder, saving the Air Force an estimated $8 million dollars.[70]

Nellis Air Force Base

The Nellis Air Force base in Nevada and City of North Las Vegas is another successful public-public partnership. In this case, enhanced use leasing authority was utilized for 41 acres. On this land, the City of North Las Vegas redeveloped land on the base for a water reclamation facility. As consideration for the land, the city provided in-kind facilities including a fitness center and water supply infrastructure. In return, the city was provided space to build a 25 million gallon/per/day facility as well as the ability to expand (double its size) for future growth.

Tyndall Air Force Base

Bay County, Florida was in need of an area to handle future capacity for its wastewater treatment facilities. Tyndall Air Force base had a 40 acre site where a new advanced wastewater treatment facility could be built. Together, they formed a partnership in which Tyndall leased the land to Bay County. The area municipalities were the joint owners of the plant and charged users for use of the plant. Tyndall AFB received the benefit of the plant as a customer and also used the effluent to water the base's golf course.

US Army Fort Huachuca

The Army has entered into a partnership agreement with the city in which the Army is replacing the post's outdated and under-resourced library with the City's modern, state of the art facility.
Also underway is a partnership between the Army and Huachuca City, in which untreated effluent from the city is being pumped to the post's

[70] Association of Defense Communities Annual Conference: Navigating Change, August 8, 2012.

wastewater treatment plant, reducing municipal treatment costs and contributing 65 million gallons to the annual recharge effort.[71]

RENEWABLE ENERGY

Joint Military Base McGuire-Dix Lakehurst in New Jersey

In January, 2013, the U.S. military announced approval of a 12.3 MW installation at the Joint Military Base McGuire-Dix Lakehurst in New Jersey. This project would be the largest military community-based solar installation across the roofs of privatized family housing on the joint military base.[72]

The U.S. Air Force granted its support and consent for the solar power plant to provide electricity at a reduced rate for a period of 20 years to the privatized military family housing community at Joint Base McGuire-Dix-Lakehurst, the U.S. military's only tri-service installation, consisting of McGuire Air Force Base, Fort Dix and neighboring Naval Air Station Lakehurst. With 12.3 megawatts of rooftop power generation, the solar plant will establish Joint Base McGuire-Dix-Lakehurst as one of the largest solar-powered military communities in the nation.[73]

SOLID WASTE AND RECYCLING

The Fort Hood Recycling Program was first started in 1992 and has developed and improved so much that it now boasts the largest recycling facility in the U.S. Army. The program has outgrown its original 17,500 square foot processing facility and in recent years added an abundance of

[71] Id.

[72] http://www.pv-magazine.com/news/details/beitrag/us-military-continues-to-invest-in-pv_100009780/#axzz2Lev5mziw

[73] http://www.prnewswire.com/news-releases/true-green-capital-management-brings-123-megawatts-of-solar-energy-to-joint-base-mcguire-dix-lakehurst-185862372.html

high tech recycling equipment, which has in turn saved the installation thousands of dollars and gained Fort Hood positive national attention.

Housed under the Directorate of Public Works, Fort Hood's Recycling Program is executed by an environmental division of 40 personnel, who focus their efforts primarily on recycling and solid waste diversion. At the beginning of the recycling program in 1992, Fort Hood sold a total of 600 tons of recyclable material. In fiscal 2008 and 2009, Fort Hood upped that to 17,132 tons of recyclable material, nearly 30 times more than their starting levels. The program uses a large indoor storage capacity to collect raw materials, process and market them after quality assurance. The team has also carefully mapped out several collection routes to maximize the amount of recycling on the installation. The goal of the program is to collect 100 percent of all cardboard generated annually on Fort Hood, including cardboard generated during permanent change or station move-ins.

The team's goal is to educate and inform those living and working on and off the installation to pitch in with the recycling program and Fort Hood's other environmental initiatives. The team's success is now being recognized nationwide as they are being asked to reach out to other Army installations in hopes of helping them improve their recycling programs.[74]

EXISTING PARTNERSHIPS/SHARED SERVICES ON JBCC

Currently, there are existing shared services on the MMR in the form of a mutual aid agreement among all the towns of Cape Cod for major emergencies and fire-rescue assistance.

On December 22, 2006, a Memorandum of Agreement was entered into between the United States Coast Guard, National Guard Bureau and the Commonwealth of Massachusetts establishing the Massachusetts Military Reservation Installation Partnership.

This agreement recognized that at the time of endorsement, the United States Coast Guard Air Station Cape Cod, Otis Air National Guard Base (Otis ANGB) of the Massachusetts Air National Guard, and Camp Edwards of the Massachusetts Army National Guard together comprise nearly 20,000 acres of contiguous Department of Homeland Security and Department of Defense facilities at the MMR. It also recognized that Air Force policy to align real property resources to support military operational requirements. As a result of this agreement, management of

[74] http://www.army.mil/article/43563/fort-hood-asks-have-you-recycled-lately/

the MMR Airfield, utilities and fire and emergency services was transitioned to three stakeholders: United States Coast Guard, the Massachusetts Air National Guard and the Commonwealth of Massachusetts.

The airfield was transferred by permit to the United States Coast Guard, which is responsible for airfield management services, including necessary maintenance or repair and utility infrastructure.

The Massachusetts Air National Guard assumed operation of the common utility services for the MMR of electricity, water, sewage, and telecommunications as required supporting its operational facilities and operational facilities of tenant users.

The Commonwealth of Massachusetts ensures the maintenance, operation and support of a fully functioning Fire Department that provides fire and emergency services to local, state and federal users of the MMR.

The partnership also delegated authority to their subordinated Commanders and Agencies to enter into Memoranda of Agreement, and Interagency Support Agreements to accomplish the shared goals of the agreement.

STAKEHOLDER ROLES/RESPONSIBILITIES AND CHALLENGES IN EXECUTING PARTNERSHIPS

While there are many challenges to executing partnerships, this should not deter stakeholders from pursuing these advantageous opportunities. Practices which have overcome obstacles in the past include the following:

- Consistent and clear communication about real needs among multiple levels of local and state government and base personnel from a variety of functions;

- Full understanding by the communities of the needs of military missions by its host communities and the place of the mission in the fabric of the community by the base;
- Full understanding by the military of the capabilities and functions available in the communities, which can result in unnecessary duplication on the installations;

- No assumption on the part of the communities and state that the “base will always be there”;

- Tie base master planning processes with local and state government planning with an emphasis on capacity planning; and

- Creation of creative partnerships to address needs.

Some questions that should be examined for discussion include:

- How can communities and installations make each other more sustainable?

- What obstacles prevent closer communication, cooperation and partnerships between installations and municipalities?

- How can the Master Planning process facilitate increased coordination between installation and communities?

- How can installations best partner with municipalities and states to address resource limitations and mutual needs?[75]

NEXT STEPS

The Cape Cod Commission completed a tabletop exercise in February 2013 between local and state officials and MMR Technical Advisory Committee members to explore potential public-public partnerships on the MMR. A second workshop is scheduled for May 2, 2013 to explore the top priority partnerships in further detail. Based on these workshops, the Commission will develop preliminary recommendations for 3 -5 potential community-military partnerships for further analysis.

[75] ADC BRAC Workshop: Using Lessons to Address the Resource Challenges of Today, August 7, 2012

APPENDIX 5 – MODEL MEMORANDUM OF AGREMENT FOR SHARED SERVICES

MODEL
MEMORANDUM OF AGREEMENT
BETWEEN THE
[IDENTIFY THE INSTALLATION ENTERING]
AND THE MUNICIPALITY OF [INSERT CAPE TOWN]
CONCERNING
JOINT BASE CAPE COD

REGARDING THE LICENSE TO THE TOWN OF [NAME] FOR THE OPERATION OF [X] FIELD AS A RECREATIONAL FACILITY.

THIS LICENSE IS GRANTED SUBJECT TO THE FOLLOWING CONDITIONS:

1. PARTIES.
   The parties to this Memorandum of Agreement (MOA) are the United States [identify installation] and the municipality of [town].

2. TERM.
   This license is granted for a term of [ ] years, beginning [month], [day], [year], and ending [month], [day], [year], but revocable at will by the Secretary.

3. AUTHORIZED REPRESENTATIVES.
   Except as otherwise provided, any reference to "[Army, Air Force, Coast Guard…], "District Engineer", "Installation Commander" or "said officer" shall include their duly authorized representatives.

4. CONSIDERATION.
   The consideration for this license shall be the construction, operation and maintenance of the premises for the benefit of the general public in accordance with the terms and conditions hereinafter set forth. The Grantee shall at its own expense

design, construct, operate and maintain three ball fields and a running track as set forth. The improvements shall become the property of the United States upon satisfactory completion of those improvements. The improvements shall remain on the premises upon revocation, expiration, termination or relinquishment of this license, notwithstanding the restoration requirements by the provisions of the Condition identified as RESTORATION.

5. IMPROVEMENTS.

   The Grantee will coordinate the construction of the improvements as set forth with the [Installation], so as to minimize the disruption to any installation activities.

6. NOTICES.

   All notices and correspondence to be given pursuant to this license shall be addressed, if to the Grantee to the Town of [ ], Town Hall, Town, Massachusetts, and if to the Installation, to the District Engineer, Bourne, MA. Notice must be given by either registered mail, return receipt requested, or by certified mail, return receipt requested. The service of the notice shall be deemed complete upon the receipt of said notice, or the refusal thereof, by the applicable party.

7. SUPERVISION BY THE INSTALLATION COMMANDER.

   The use and occupation of the premises shall be subject to the general supervision and approval of the Commander, [installation], Bourne, MA hereinafter referred to as said officer, and to such rules and regulations prescribed by said officer.

8. APPLICABLE LAWS AND REGULATIONS.

   The Grantee shall comply with all applicable Federal, state, county and municipal laws, ordinances and regulations wherein the premises are located, including but not limited to, those regarding construction, health, safety, food service, historic properties, water supply, sanitation, use of pesticides, and licenses or permits to do business. The Grantee as a municipality shall make and enforce such regulations as are necessary and within its legal authority in exercising its privileges granted in this license,

provided that such regulations are not inconsistent with those issued by the Secretary of the [Installation].

9. CONDITIONAL USE BY GRANTEE.
   The exercise of the privileges herein granted shall be:

   a) Without cost or expense to the United States;

   b) Subject to the right of the United States to improve, use or maintain the premises;

   c) Personal to the Grantee, and this license, or any interest therein, may not be transferred or assigned;

   d) Shall not interfere with [Installation] security or mission requirements.

10. CONDITION OF PREMISES.
    The Grantee acknowledges that it has inspected the premises, knows its condition, and understands that the same is granted without any representations or warranties whatsoever and without any obligation on the part of the United States.

11. COST OF UTILITIES.
    The Grantee shall pay the cost of producing and/or supplying any utilities and other services furnished by the Secretary or through Government-owned facilities for the use of the Grantee, including the Grantee's proportionate share of the cost of the operation and maintenance of the Government-owned facilities by which such utilities or services are produced or supplied.

12. PROTECTION OF PROPERTY.
    a) The Grantee shall keep the premises in good order and in a clean, safe condition by and at the expenses of the Grantee. The Grantee shall be responsible for any damage that may be caused to the property of the United States by the activities of the Grantee, its contractors, employees, agents, and invitees under this license and shall exercise due diligence in the

protection of all property located on the premises against fire or damage from any and all other causes. Any property of the United States damaged or destroyed by the Grantee incident to the exercise of the privileges herein shall be promptly repaired or replaced by the Grantee to a condition satisfactory to said officer and the District Engineer, or at the election of said officer and District Engineer, reimbursement made thereof by the Grantee in an amount necessary to restore or replace the property to a condition satisfactory to both.

b) The Grantee shall provide trash/litter removal and traffic/pedestrian control at its own expense.

13. RESTORATION

On or before the expiration of this license or its termination by the Grantee, the Grantee shall vacate the premises, remove the property of the Grantee, and restore the premises to a condition satisfactory to said officer and the District Engineer. If, however, this license is revoked, the Grantee shall vacate the premises, remove said property and restore the premises to the aforesaid condition within such time as the District Engineer may designate.

14. NON-DISCRIMINATION.

The Grantee shall not discriminate against any person or persons or exclude them from participation in the Grantee's operations, programs or activities because of race, color, religion, sex, age, handicap or national origin in the conduct of operations on the premises. The Grantee will comply with the Americans with Disabilities Act and attendant guidelines.

15. COMPLIANCE, CLOSURE, REVOCATION AND RELINQUISHMENT.

a) The Secretary, within his/her sole discretion, may revoke or terminate this license at will. In addition, the Secretary, within his/her sole discretion, reserves the right to modify or suspend this license.

b) This license may be relinquished to the Grantee by giving six months prior written notice to the District Engineer in the manner prescribed in the Condition on NOTICES.

16. ENVIRONMENTAL PROTECTION.

a) Within the limits of their respective legal powers, the parties to this license shall protect the premises against pollution of its air, ground and water. The Grantee shall comply with any laws, regulations, conditions, or instructions affecting the activity hereby authorized if and when issued by the Environmental Protection Agency, or any Federal, state, interstate or local governmental agency having jurisdiction to abate or prevent pollution. The disposal of any toxic or hazardous materials within the premises is specifically prohibited. Such regulations, conditions, or instructions in effect or prescribed by said Environmental Protection Agency, or any Federal, state, interstate or local government agency are hereby made a condition of this license.

b) The Grantee must obtain approval in writing from said officer before any pesticides or herbicides are applied to the premises.

c) The Grantee is responsible for paying all administrative and /or judicial fines, fees, assessments and penalties for violations of environmental laws and regulations occurring on the licensed premises caused by the actions, omissions, or fault of the Grantee.

17. INSURANCE.

a) At the commencement of this license, the Grantee shall obtain liability insurance. The insurance shall provide an amount not less than that which is prudent, reasonable and consistent with sound business practices or a minimum Combined Single Limit of $ 1,500,000.00, for any number of persons or claims arising from any one incident with respect to bodily injuries or

death resulting therefrom, property damage or both, suffered or alleged to have been suffered by any person or persons resulting from the operations of the Grantee under the terms of this license.

b) The liability insurance policy shall insure the hazards of the Licensed premises and operations conducted in or on the Licensed Premises, independent contractors, contractual liability (covering the indemnity included in this license), and shall name the United States of America as a party. Each policy will provide that any losses shall be payable notwithstanding any act or failure to act or negligence of the Grantee or the United States of America or any other person; provided that the insurer will have no right of subrogation against the United States of America; and be reasonably satisfactory to the United States of America in all respects. The Grantee shall require that this insurance company give the Installation Commander and District Engineer thirty (30) days written notice of any cancellation or change in such insurance. The Installation Commander and District Engineer may require closure of any and all of the licensed premises during any period for which any or all of the licensed premises does not have the required insurance coverage. The Grantee shall require the insurance company to furnish to the Installation Commander and District Engineer, certificates of insurance evidencing the purchase of such insurance. The minimum amount of liability insurance coverage is subject to revision by the Installation Commander and District Engineer every three (3) years or upon renewal or modification of this license.

c) In the event the Grantee is self-insured, the Grantee shall certify such self-insurance in writing in the minimum amount specified above to the District Engineer.

18. <u>INDEMNIFICATION.</u>

a) The Grantee agrees to assume all risks of loss or damage to property and injury or death to persons by reason of or incident to its possession and/or use of the premises by reason of or incident to its possession and/or use of the premises or the activities conducted under this license. The Grantee expressly waives all claims against the United States of America for any such loss, damage, personal injury or death caused by or occurring as a consequence of such possession and/or use of the premises by the Grantee, or the conduct of activities or the performance of responsibilities under this license by the Grantee. The Grantee further agrees to indemnify and hold harmless the [Installation], its officers, agents and employees, from any and all suits, claims, demands or actions, liabilities, judgments, costs and attorneys' fees arising out of, or in any manner predicated upon, personal injury death or property damage resulting from, related to, caused by or arising out of the possession and/or use of the premises by the Grantee.

b) The Government's liability under this license for damage to property and injury or death to persons by reason of or incident to its use of the licensed premises or the activities contracted by [Installation] under this license is only to the extent provided by Congress in the Federal Tort Claims Act and may not exceed appropriations available for such payment. Nothing contained in this agreement may be considered as an expansion of liability as defined in the Tort Claims Act.

c) The Grantee shall indemnify and hold harmless the United States of America from any costs, expenses, liabilities, fines, or penalties resulting from the discharges, releases, emissions, spills, storage, disposal or any other action by the Grantee giving rise to the United States of America liability, civil or criminal, or responsibility under Federal, state or local environmental laws.

d) The Condition Indemnification and the obligations of the Grantee shall survive the expiration or termination of the license and any conveyance of the premises to the Grantee. The Grantee's obligation hereunder shall apply whenever the United States of America incurs costs or liabilities for the Grantee's actions giving rise to liability under this condition.

19. OPERATIONAL AND RECREATIONAL USE REQUIREMENTS.

a) The Grantee will maintain the scheduling of the fields, giving priority to military physical training and ceremonies.

b) The Installation Commander may close the premises to public use and access when deemed necessary to protect life, health, property and for reasons of security or military mission.

20. DISCLAIMER

This license is effective only insofar as the rights of the United States in the premises are concerned; and the Grantee shall obtain any permit or license which may be required by Federal, state or local statute in connection with the use of the premises.

21. INCOME RESTRICTION

Grantee shall not derive income from the use of the premises.

In witness whereof, I have hereunto set my hand by authority of the Secretary of the [Installation], this _____ day of _____, 20__.

By:_____
_

Reviewed as to form and content

_____

This license is also executed by the Grantee this _____ day of _____, 20___.

_____

APPENDIX 6 - JLUS POLICY/TECHNICAL ADVISORY COMMITTEE MEMBERS

- JBCC Executive Director, Brig Gen Gary Keefe
- 102nd Intelligence Wing: Col James Lefavor; alt. Col Virginia Doona
- 6th Space Warning Squadron: Lt.Col. Z. Walter Jackim
- U.S. Coast Guard Air Station Cape Cod: CAPT Stephen Torpey
- Camp Edwards Training Site: COL Gregory McDonald
- Mashpee Wampanoag Tribe: Mark Harding
- Town of Bourne Selectmen: Earl Baldwin
- Town of Sandwich Administrator: George Dunham
- Town of Falmouth Selectmen: Mary Pat Flynn
- Town of Mashpee Selectman: Michael Richardson
- Barnstable County Commissioners: Sheila Lyons
- Mashpee Fire Chief/First Responders: Chief George Baker
- Barnstable County Sheriff: Sheriff James Cummings
- Cape Cod Commission: Paul Niedzwiecki
- Association to Preserve Cape Cod: Ed DeWitt
- Cape Cod Chamber of Commerce: Matt Lee
- At Large Member: Mimi McConnell
- Barnstable Planning Board: Jo Anne Miller Buntich (Director of Growth Management)
- Bourne Planning Board: Dan Doucette
- Sandwich Planning Board: TBD
- Falmouth Planning Board: TBD
- Mashpee Planning Board: David Kooharian; Mary Waygan, alternate

JLUS TECHNICAL ADVISORY COMMITTEE

102nd Intelligence Wing
- LtCol Christopher Hurley

On-Call for technical expertise
- Mr. Kevin Bartsch (CE/GIS),
- Thurman Deane (Environmental),
- Col Tim Mullen (Legal)

U.S. Coast Guard Air Station Cape Cod
- CDR Rendon, CDR Husted

On-Call for technical expertise

- Airport issues (i.e. Noise, airspace restrictions, etc): Kurt Carlson,Pete Jamieson, CDR Husted
- Environmental issues (i.e. Endangered Species, Clean Water, etc.): Elizabeth Kirkpatrick,
- Alternative Energy issues: FE, AFE, Elizabeth Kirkpatrick
- Utilities: CDR Rendon, LT Masson, LCDR Eldridge
- Real Property: Mary-Ellen Wilzcski:
- Legal rep from CG as required for review

Camp Edwards Training Site

- LTC Thomas Harrop, Construction Facility Management Officer MANG Joint Force Headquarters
- LTC Richard Bertone, Deputy Commander MAARNG Training Site Camp Edwards
- Bill Sullivan, Operations Manager Camp Edwards Environmental & Readiness Center
- CPT John Carney, Director Facilities Management MAARNG Training Site Camp Edwards
- Lynda Wadsworth, Community Outreach Camp Edwards Environmental & Readiness Center
- Town planners from Barnstable, Sandwich, Bourne, Mashpee, Falmouth
- Sean O'Brien, Coordinator, Barnstable County Emergency Planning Committee
- George Heufelder, Director, Barnstable County Department of Health and Environment