

TOWN OF VERNON
Planning & Zoning Commission (PZC)
Draft Minutes - Special Meeting Notice
Wednesday, February 3, 2010, 7:00 PM
Auditorium, 2nd Floor
Vernon Senior Center
26 Park Place
Rockville/Vernon, CT

RECEIVED
VERNON TOWN CLERK
10 MAY 10 PM 2:28

1. Call to Order & Roll Call

- **Meeting was called to order at 7:03 P.M.**
- **Regular members Present:** Lester Finkle, Chester Morgan, Francis Kaplan, Walter Mealy and Keith Lauzon.
- **Alternate Members Present:** Charles Bardes. Charles Bardes to sit for Watson Bellows.
- **Staff Present:** Leonard Tundermann, Town Planner, Terry McCarthy, Town Engineer, Craig Perry, Wetlands Agent and James Kenny, Chief of Police.
- **Recording Secretary:** James Krupienski

2. Public Hearings

2.1 Continued Hearing for Application [PZ-2009-26] of Ticket Network LLC for a Special Permit/Site Plan of Development for a Commercial Recreational Facility at #60 South Frontage Road (Assessor's ID: Map #29, Block #134, Lot/Parcel # 00001)

- **Walter Mealy questioned if any Town staff or residents were present during the testing. Also concerned with the height and the placement of speakers based on figures 2q & 2r of the Brooks Acoustics Report dated November 2, 2009.**
- **Attorney Dorian Famiglietti indicated there was no one present from the town during the sound testing on September 24, 2009. The night-time background test was conducted individually by Mr. Brooks.**
- **Chester Morgan questioned the specific regulations governing sound in Connecticut and specific requirements. (22a-69(1), 22a-69-3.5) Questioned if the Police department requested the sound testing to be discontinued.**
- **Attorney Dorian Famiglietti indicated that they have received copies of the audio recordings from the dispatch center regarding the sound testing and spoke to the Vernon dispatch recordings.**
- **Audio was played at 22 minute mark of Police Department dispatch call center.**
- **Chester Morgan questioned if the limits met the Class B standard.**
- **Attorney Dorian Famiglietti will have Mr. Brooks address questions at the next meeting.**
- **Craig Perry, Senior Engineering Technician, Inland Wetlands Officer, Wetlands Enforcement Agent.**
 - **Mr. Perry reviewed cease & desist orders previously issued and removal which occurred in December 2009.**
- **Donald Vaccaro commented on the previous wetlands violation.**
- **Attorney Dorian Famiglietti**
- **Eric Peterson, Gardner & Peterson Associates reviewed proposed site lighting for parking, seating and vendor areas including footpath for safety.**
 - **Designed for pedestrian and vehicular safety.**

- Metal Halide full cut-off fixture;
- Dark Sky Compliant;
- Flood lighting proposed for the seating area;
- Walter Mealy questioned the submission of a Photometric Plan.
- Attorney Dorian Famiglietti indicated that they would supply updated plans for venue and parking areas.
- John Alexopolous, Landscape Architect:
 - Presented proposed landscaping plan and recommended utilizing on-site mature plants by relocation.
- George Logan, REMA Ecological Associates, Manchester, CT;(Presentation Outline – Attachment)
 - Designed for protection of Tankerhoosen River Watershed Mitigation Area;
 - Reviewed State listed endangered species.
 - Reviewed Habitat Enhancement – enhancement to the upland wetland review area, removal of invasive species, plantings of shrub and tree clusters and establishment of walking trails
 - Reviewed Long-term Stormwater Quality – Designed based on Department of Environmental Protection (DEP) 2004 Stormwater Quality Manual. Utilizing gravel parking surfaces, two (2) Bio-Retention basins for water infiltration, extensive planting plan and perimeter swale installed for water quality.
 - Reviewed Erosion & Sediment Control Plan – Has determined the proposed plan provides adequate protection for the wetland area with minimal risk.
 - Reviewed Protection of State-Listed Species – Eastern Pearlshell and Wood Turtles were determined to be on site; Eastern Box Turtles are suspected on site. Water quality mitigation and barrier placement would provide adequate protection during and after construction.
 - Reviewed Water Quality Monitoring – Monitoring would be done based on Inland Wetlands Commission Approval pre and post construction.
 - Fertilizer and Pesticide Use Plan has been designed to limit additional nutrient inputs to the Tankerhoosen River and tributaries.
- Walter Mealy questioned the presence of cluster sedge on the site. Mr. Logan stated that he did not believe it was present on the site.
- Chester Morgan questioned if the identical presentation was given to the Inland Wetland and Conservation Commissions. Mr. Logan indicated both commissions had received similar presentations based on applicable review. Mr. Logan read the Conservation Commission application review memorandum.
- Attorney Dorian Famiglietti reviewed the issue of facility removal referenced by the Conservation Commission. Applicant would prefer to allow for placement during the entire venue season due to proposed security measures. Security would be in place to monitor the site year-round. Lighting would be on during concerts and lowered to appropriate levels for safety during the concerts.
- Attorney Dorian Famiglietti supplied copies of the Conservation and Inland Wetlands Commission memo dated August 21, 2009.

- Five (5) minutes recess at 8:35 P.M.
- Meeting reconvened at 8:50 P.M.

- Staff Comment:
- Leonard Tundermann, Town Planner:

- Reviewed the stipulations of the Inland Wetlands Approval dated September 22, 2009. (Stipulations #3-7)
- Received wetland re-designation;
- Traffic Authority approved on December 10, 2009. Still requires State Traffic Commission review and approval.
- Design Review Advisory Commission (DRC) approved with stipulation on December 7, 2010. (1.) Design of Trash Cans and Entry Booth Structure be reviewed 2.) signage plan and gate design plan be reviewed by the commission 3.) any additional changes to the plans be referred to the Design Review Advisory Commission (DRC)
- Compliance/Non-Compliance per Zoning Regulations checklist was supplied to the commission.
- Storage of Waste and refuse needs further explanation.
- Parking requirements – require one (1) space per employee and one (1) space for each four (4) patrons. Final numbers will need to be evaluated.
- Possible parking issue with adjacent business has been taken care of.
- Applicant has reviewed compliance with the Connecticut Storm Water Management Manual.
- Emergency access would be supplied by 135-137 Bolton Road property.
- Suggested placement of sidewalks would not be appropriate for installation.
- 17.3 – Special Permits – Commission must make findings:
 - ◆ The use shall not create a hazardous condition relative to health and safety;
 - ◆ It shall be compatible with neighboring uses;
 - ◆ It shall not create a nuisance;
 - ◆ It shall not hinder the future sound development of the community;
 - ◆ It shall conform to all applicable section of this ordinance (Zoning Regulations).
- Lester Finkle stated the parking has been revised from 828 spaces revised to 771 spaces during presentation.
- Francis Kaplan questioned the required Special Permits needed.
- Leonard Tundermann, Town Planner indicated that they would require:
 - For Commercial Recreation Facility
 - For parking in excess of forty (40) spaces
 - For a structure in excess of thirty-five (35') feet in height
 - In excess of ½ acre disturbed in an Aquifer Protection Area, and
 - For sale of alcohol on the premises.
- Terry McCarthy, Town Engineer reviewed a memorandum dated February 1, 2010 from James Bubaris, Bubaris Traffic Associates relative to questions posed after Traffic Study presentation. (Attachment B)
 - Discussed count comparison based on 2009 and 2008 counts;
 - Felt additional storage may be required on Exit 66 for vehicle queuing.
 - Felt stormwater plan was well designed.
- James Kenny, Chief of Police:
 - No parking areas erected around the venue;
 - Area businesses protected from overflow parking
 - Stipulation for crosswalk to be lighted on Bolton Road.
 - Concerned with impact to Route 30 Traffic
 - Has spoken to Manchester & South Windsor Police Departments and have a preliminary agreement for assistance.

- Chester Morgan questioned what would occur to staffing levels for officers at the venue.
- Chief Kenny indicated officers would be removed from the venue if it was determined that levels of present and on-call officers were not enough.
- Craig Perry, Inland Wetlands Agent:
 - Applicant has been requested to follow proper approval procedures and has made appropriate effort to comply;
 - Cease and desist order has been withdrawn.
- Chester Morgan questioned how many areas were affected during the violations.
- Mr. Perry indicated one area was adjacent to the Tankerhoosen River which the bulldozer was stuck. The second cease and desist order had eight (8) affected areas.

- Five minute recess at 9:30 P.M.
- Meeting reconvened at 9:40 P.M.

- Public Comment:
 - David McQuade, 20-13 Whitney Ferguson Road:
 - Opposed to the development;
 - Concerned with impact to residences from noise;
 - Traffic would be hazardous in the area;
 - Department of Environmental Protection (DEP) outlines the area as a Natural Diversity Area.
 - Opposed to the sale of alcohol at the venue.
 - Supplied additional packet impact of alcohol sales at the concert venues
 - Should reject based on 17.3.1.1 – would be hazardous to public health and safety.
 - Karen Wassell, 5 Pineview Drive:
 - Concerned with impact to existing wildlife in the area
 - Concerned with traffic impact to the surrounding residences;
 - Chapter 442 of the State Statutes allow for freedom from noise.
 - 17.3.1.1, 17.3.1.2, 17.3.1.3, 4.9.4.11, 17.3.1.4 – not compliant with Special Permit requirements and 20.1.1, 20.1.2 and 20.1.3 – impact to Aquifer.
 - Michelle Rossi, 85 Risley Road:
 - Concerned with excessive noise from concerts;
 - Concerned with impact from traffic in the area.
 - Janine Doucette, 85 Risley Road:
 - Concerned with noise and traffic from the venue.
 - Harold Carlson, 33 Deerfield Drive
 - Concerned with noise from the venue;
 - Traffic would have a major impact in the area.
- Attorney Dorian Famiglietti supplied:
 - Supplied revised Operation and Maintenance Program;
 - Supplied revised Security Report;
 - Supplied revised Site Plan added note to show easement over 135 Bolton Road will be required.
 - Parking lot breakdown in Zoning compliance table;
 - Revised based on North Central District Health Department (NCDHD);
 - Added crosswalk on Bolton Road and Trash cans at parking areas;
 - Supplied letters of support to Staff.

- **Chester Morgan, seconded by Walter Mealy moved a Motion to Continue the Application until the February 4, 2010 Special Meeting. Motion carried unanimously.**

3. **Adjournment.**

- **Keith Lauzon, seconded by Walter Mealy moved a Motion to Adjourn. Motion carried unanimously.**
- **Meeting adjourned at 10:27 P.M.**

James Krupiensi
Recording Secretary

Attachment A

PRESENTATION OUTLINE

for a

February 3, 2010

PUBLIC HEARING

before the

**TOWN OF VERNON
PLANNING AND ZONING COMMISSION**

regarding the

FOREST SUMMER STAGE CONCERT SERIES

**SOUTH FRONTAGE ROAD
VERNON, CONNECTICUT**



Attachment A (cont)

Forest Summer Stage Concert Series Planning and Zoning Commission

Introduction and Background

- Qualifications
- Have been involved with the site and the development proposal since June 2009.
- Produced extensive documentation, including an *Environmental Assessment* (part of the record).
- Conducted numerous field investigations in the Spring, Summer and Fall of 2009 to inventory natural resources.
- Field investigation included subsurface soil exploration vegetative and wildlife inventories, targeted searches for State-listed species, and baseline surface water monitoring.

Primary Ecological Factors Considered

- ◆ Tankerhoosen River and associated wetlands and tributary watercourses (considered objectives of Tankerhoosen River Watershed Management Plan, see attached).
- ◆ Presence of State-listed species (on-going coordination with CT DEP).
- ◆ Overall ecological integrity/wildlife habitat in the vicinity of site.

Proposed Mitigation Strategies

Habitat Enhancement

- ◆ Extensive upland habitat enhancement in the uplands within roughly 100 feet of the existing wooded edge. Enhancement of riparian wetland buffers (voluntary).
- ◆ Removal of invasive plant species (e.g. autumn olive, Asiatic bittersweet, etc.) (voluntary).

Attachment A (cont)

*Forest Summer Stage Concert Series
Planning and Zoning Commission*

- ◆ Planting of shrub and tree clusters, herbaceous plant beds, establishment of productive native grassed areas, etc. (see attached tables and example of plan).
- ◆ Establishment of walking trail (increase passive recreation).
- ◆ Long-term maintenance.
- ◆ Also restoration of an old farm road stream crossing.
- ◆ **Goal:** to diversify and enhance habitat to attract a large number of wildlife and provide recreational opportunities for TicketNetwork employees and friends.

Long-term Stormwater Quality

- ◆ **Goal:** Maintenance and/or enhancement of surface water quality and groundwater quality.

Factors for Consideration in Selecting Appropriate BMPs:

- ◆ **Criteria:** *CT DEP SWQM, Water Quality Classification, Baseline Water Quality Data*
- ◆ **Sensitive Receptor:** *Tankerhoosen River.*
- ◆ **Specific Site Conditions:** *Soils, slopes, etc.*
- ◆ **Proposed Use:** *seasonal, low-intensity (i.e. axle miles) (1/6th to 1/8th of typical commercial establishment based on peaks)*

Selected Stormwater Management System (SMS):

- ◆ Gravel parking surfaces
- ◆ Two linear bioretention basins
- ◆ Perimeter water quality swale

Attachment A (cont)

*Forest Summer Stage Concert Series
Planning and Zoning Commission*

- ◆ Large, two-cell bio-infiltration basin with level spreader
- ◆ Extensive Planting Plan
- ◆ Long-Term Maintenance and Monitoring Plan
- ◆ +/- 100 feet of sheet flow from level spreader to wetlands, through wetlands to watercourse, to Tankerhoosen River.
- ◆ Maximizing of attenuation processes (e.g., infiltration, filtering, settling, photolysis, hydrolysis, microbial degradation, plant uptake, etc.)
- ◆ **Conclusion:** negligible risk to surface and groundwaters, and negligible risk to public health and safety.

Erosion and Sedimentation Control Plan

- ◆ Plan more than adequate to minimize risk to wetlands, tributaries, and Tankerhoosen River.
- ◆ Plan was reviewed by North Central Conservation District and was found to comply with 2002 CT DEP Erosion and Sedimentation Guidelines.
- ◆ Plan will be reviewed by the CT DEP as part of a submittal under a Stormwater General Permit.

Protection of State-Listed Species

- ◆ Ongoing coordination with CT DEP; final reports to be submitted with application for General Stormwater Permit.
- ◆ Eastern pearlshell population protected through water quality mitigation (long-term) and erosion & sedimentation control plan (short-term).

Attachment A (cont)

*Forest Summer Stage Concert Series
Planning and Zoning Commission*

- ◆ Wood Turtle population protected through water quality mitigation and protection of critical habitats.
- ◆ Eastern Box Turtles (if present) protected through additional screening prior to construction, and placement of sedimentation and erosion control barriers.

Water Quality Monitoring

- ◆ Provided baseline surface water quality monitoring for the Inland Wetlands Commission.
- ◆ As part of Inland Wetlands Permit to continue water quality monitoring during the post-construction phase at the same four (4) established stations (i.e. Tankerhoosen River and two tributaries).

Potential Impacts to Wildlife Populations

- ◆ Lack of area-sensitive species, particularly neotropical migrant birds.
- ◆ Protection and enhancement of all critical/valuable habitats.
- ◆ Seasonal and temporary use.
- ◆ Impacts are limited to minimal decrease in denning near the temporary stage during the concert season, and minimal decrease of foraging for crepuscular and nocturnal species during the actual concerts, mostly due to increased decibels within 100 feet of stage.
- ◆ Light impacts negligible to minimal, and temporary.
- ◆ Diversity and abundance of wildlife within the overall property will not measurably decrease.

Attachment A (cont)

*Forest Summer Stage Concert Series
Planning and Zoning Commission*

Conclusion

- *The site has been in some form of agriculture or under other anthropogenic influence for many decades. It is located adjacent to a major transportation corridor which has for years adversely impacted the habitat quality at the site. The proposal, through the proposed layout and mitigative strategies, will not have any adverse impacts upon significant, valuable and productive natural resources, including wildlife habitat and other productive natural communities, water resources, including surface waters and groundwater, soil resources, and, finally, upon any cultural resources.*

Attachment A (cont)

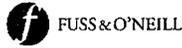


Table 6-1. Watershed Management Plan Recommendations Summary

Key Actions	Priority	Scale/Location	Who Should be Involved (L = lead, A = assist)														
			Watershed Towns	Friends of HRLP	Watershed Coalition	Landowners	NCCD	HRWA	Belding WMA	ConnDOT	CTDEP	NRCS	USEPA	Citizens/Volunteers			
Develop education/outreach materials	S	W			L			A									
Deliver education/outreach to the public	M	W	L					A									A
Increase watershed stewardship signage in commercial areas	M	W	L		A			A									
Objective 7. Implement Water Quality Monitoring Program																	
Develop and implement long-term monitoring program	S	W				L		A	A				A				A
Field monitoring study of LID effectiveness	M	W	A			L		A									
Objective 8. Protect Open Space																	
Priority land acquisitions	S/M	T	L			A	A				A						
Continue to implement municipal open space plans	S	T	L			A											
Seek alternative funding sources for open space acquisition	S/M	T	L			A					A						
Promote use of open space through trail maps and events	S/M	T	L			A					A						A
Develop and implement invasive species management plan	M	T	L			A					A						
Objective 9. Promote LID and Sustainable Site Design																	
Monitor effectiveness of LID regulations (Tolland)	S/M	W	L														
Revise Inland Wetland regulations for consistency (Tolland)	S	W	L														
Develop and implement new stormwater/LID regulations (Vernon)	S	W	L														
Form advisory committee	S	W	L														
Develop Town stormwater/LID manual and/or guidance	S	W	L														
Update existing zoning, subdivision, wetlands regulations	S	W	L														
Priority stormwater retrofits	M/L	S	A		L			A			A						
Incorporate LID into Town projects	M	W	L														
LID demonstration projects (green roads, public works, schools)	S	S	L			A		A					A				
Develop education/outreach materials	S	W	L			A		A									
Deliver education/outreach to the public	M	W	L			A		A									
Objective 10. Assess Additional Subwatersheds																	
Perform stream and upland assessments	S	T				L		A	A	A							A

Priority Abbreviations: S = short-term, M = mid-term, L = long-term
 Scale/Location Abbreviations: W = watershed-wide, T = targeted, S = site-specific
 HRLP – Hockanum River Linear Park, NCCD – North Central Conservation District, HRWA – Hockanum River Watershed Association, ConnDOT – Connecticut Department of Transportation, CTDEP – Connecticut Department of Environmental Protection, NRCS – Natural Resource Conservation Service, USGS – United States Geological Survey, USEPA – U.S. Environmental Protection Agency, Belding WMA – Belding Wildlife Management Area

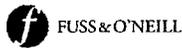


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Key Actions	Priority	Scale/Location	Who Should be Involved (L = lead, A = assist)														
			Watershed Towns	Friends of HRLP	Watershed Coalition	Landowners	NCCD	HRWA	Belding WMA	ConnDOT	CTDEP	NRCS	USEPA	Citizens/Volunteers			
Objective 1. Build a Foundation for Implementing the Plan																	
Form sustainable partnership or coalition	S	W	A	L				A	A	A	A	A	A				
Adopt watershed management plan	S	W	L		A		A	A	A	A	A	A	A				
Identify potential funding sources and submit grant applications	S	W	L		L	A	A	A	A	A	A	A	A				
Objective 2. Enhance In-Stream and Riparian Habitat																	
Conduct fish passage assessments	S	T	A		L			A	A								
Revise local stream crossing & stormwater design standards	S	W	L														
Belding Pond Dam removal feasibility evaluation	S	T			A	L						A		L			
Conduct aquatic invasive species study	S	S	A														
Priority stream restoration projects	M/L	S	A		L										A		
Objective 3. Protect/Restore Riparian Buffers																	
Priority riparian buffer restoration projects	M/L	S	A		L	A				A					A		
Adopt stream buffer regulations, pending enabling legislation	M	W	L														
Revise riparian buffer recommendations (Tolland)	S	W	L														
Incorporate invasive species management measures	M	T			L				A	A		A					
Objective 4. Identify and Eliminate Illicit Discharges																	
Targeted illicit discharge investigations	S	T	L		A			A									
Implement municipal IDDE programs	M	W	L														A
Priority stream cleanup efforts	S	S			L				A								
Develop education/outreach materials	S	W	L			L		A				A					
Deliver education/outreach to the public	M	W	L			L		A									
Objective 5. Residential Management Practices																	
Increase watershed stewardship signage in residential areas	M	W	L		A			A	A								A
Encourage disconnection of rooftop runoff	M	W	L		A			A	A								
Develop education/outreach materials	S	W	L		A			A									
Deliver education/outreach to the public	M	W	L		A			A									
Objective 6. Municipal and Business Management Practices																	
Review municipal facility compliance	S	W	L														
Improve municipal stormwater management programs	S/M	W	L														
Implement street sweeping and catch basin cleaning	M	W	L										L				

Attachment A (cont)

PLAN FOR
UPLAND HABITAT ENHANCEMENT
AND WETLAND RESTORATION/ENHANCEMENT
IMPLEMENTATION NOTES

1.0 INTRODUCTION

GENERAL NOTES ARE APPLICABLE THROUGHOUT THE HABITAT ENHANCEMENT AREA.

SITE-SPECIFIC NOTES FOLLOW. SECTIONS A THROUGH F ARE ON THE PERIMETER OF THE CENTRAL OPEN AREA, PROCEEDING FROM NORTHWEST TO SOUTHEAST; THEY DIFFER IN TERMS OF EXISTING PLANTS TO BE PRESERVED, DEBRIS TO BE REMOVED, AND PLANTING CONDITIONS (SOIL MOISTURE LEVEL AND AMOUNT OF DISTURBED SOIL).

IN ADDITION TO PROVIDING ENHANCED UPLAND HABITAT ONE OF THE PLAN'S GOALS IS TO PROTECT AND ENHANCE FUNCTIONS IN ADJACENT WETLANDS.

ONE WETLAND AREA, AT AN EXISTING WETLAND/WATERCOURSE CROSSING, SHALL BE RESTORED/ENHANCED (I.E. AREA 1).

IMPORTANT: ALL WORK SHALL BE SUPERVISED BY AN ECOLOGIST (OR WETLAND SCIENTIST). A PRE-IMPLEMENTATION MEETING SHALL TAKE PLACE AT LEAST ONE MONTH PRIOR TO PLAN IMPLEMENTATION BETWEEN, AT A MINIMUM, THE LANDSCAPER AND ECOLOGIST.

2.0 GENERAL NOTES

2.1 Debris Removal

REMOVE EXCESSIVE LOGGING SLASH, LEAVING ABOUT 5% COVER. SMALL BRUSH PILES MAY BE LEFT ALONG TREE LINE, NO LARGER THAN 4' X 8' X 3'.

2.2 Interplanting

1. LOCATIONS OF EXISTING NATIVE VEGETATION TO BE PRESERVED (E.G., FERNS ALONG WOODS EDGES, TREES, VINES/SHRUBS, & MEADOW AREAS) SHALL BE MARKED IN THE FIELD BY AN ECOLOGIST.
2. GRADING WITH MACHINERY SHALL TAKE PLACE ONLY OUTSIDE THESE AREAS.

Attachment A (cont)

Habitat Restoration/Enhancement
Implementation Notes

The Forest Summer Stage
Bolton and South Frontage Roads, Vernon, CT

3. WOODS EDGES WITH SHALLOW ROOTS, EXISTING TOPSOIL, AND FERNS SHALL BE SCARIFIED BY HAND. WEEDS AND INVASIVES SHALL BE PULLED BY HAND, OR SPOT TREATED WITH HERBICIDE PER NOTES BELOW.
4. AFTER GRADING, ECOLOGIST SHALL STAKE/FLAG IN THE FIELD THE LOCATIONS OF SHRUB AND TREE PLANTINGS, PLANTING BEDS FOR PERENNIALS AND LOCATIONS FOR WILDFLOWER MEADOW SEED MIXES.
5. TO PREPARE BEDS, LOOSEN SOIL TO DEPTH OF 18" AND INCORPORATE A 2" LAYER OF WELL-ROTTED COMPOST (2-YEAR, MINIMUM) AND SLOW RELEASE FERTILIZER (OSMACOTE OR EQUIVALENT).
6. GRASS AND WILDFLOWER SEED MIXES SHALL BE SEEDED IN REMAINING UNPLANTED AREAS, PER FIELD DEMARCATIONS.
7. ONE OR TWO SMALL CHRISTMAS TREE GROVES SHALL BE PLANTED IN EACH RESTORATION AREA IN LOCATIONS SPECIFIED BY ECOLOGIST, TO PROVIDE WILDLIFE COVER AND ECOLOGICAL SCREENING, WHILE REACHING SIZE FOR HARVEST, FOR EMPLOYEES. TREES SHALL BE SPACED SIX FEET APART. GRASS AND WEEDS BETWEEN TREES SHALL BE MOWED, NOT TREATED WITH HERBICIDES.

2.3 Invasive Plant and Weed Removal

1. MANY WEEDS & INVASIVES WILL BE REMOVED DURING GRADING/PLANTING BED PREPARATION, THOUGH SOME WILL RESPROUT LATER FROM ROOT FRAGMENTS.
2. EARLY FALL 2009: REMOVE INVASIVE PLANTS AND WEEDS FROM THE MARKED AREAS NOT TO BE GRADED, WHERE THEY ARE INTERMIXED WITH DESIRABLE NATIVE PLANTS, ESPECIALLY ALONG WOODS EDGES, AND ALSO ALONG PROPOSED TRAILS.
3. PRIOR TO ANY REMOVAL WORK, ECOLOGIST SHALL TRAIN PERSONNEL TO IDENTIFY TARGET INVASIVE PLANT SPECIES.
4. YOUNG PLANTS: PULL OUT BY HAND; TARGET INVASIVE BITTERSWEET, AUTUMN OLIVE SEEDLINGS & YOUNG AMERICAN POKEWEED. PULL AFTER HEAVY RAIN, SO ROOTS DO NOT BREAK OFF. PULLING IS FEASIBLE FROM SANDY SOIL.
5. LARGER WOODY PLANTS: CUT OFF CLOSE TO GROUND AND IMMEDIATELY (WITHIN 10 MINUTES) APPLY TRICLOPYR (BRUSH-B-GON) IN EARLY FALL (BEFORE OCTOBER 15TH) TO THE FRESHLY CUT STUMPS/STEMS (ROOTS MAY NOT BE KILLED IF HERBICIDE USED EARLIER IN THE GROWING SEASON). THIS IS MOST EFFICIENTLY DONE BY A PAIR OF WORKERS.
6. A WALK-THROUGH FOR FOLLOW-UP CONTROL WILL BE NEEDED FOR THREE (3) YEARS (UNTIL 2012), AS INVASIVES AND WEEDS WILL CONTINUE TO SPROUT FROM

Attachment A (cont)

Habitat Restoration/Enhancement
Implementation Notes

The Forest Summer Stage
Bolton and South Frontage Roads, Vernon, CT

THE SEED BANK AND ROOT FRAGMENTS. PERFORM SYSTEMATIC WEEDING IN EARLY SUMMER, WITH HAND-PULLING OF ALL TARGET SEEDLINGS & SPROUTS.

2.4 Target Plant Species

- A. **BITTERSWEET (BS)**, STRANGLING INVASIVE VINE; MANY SEEDLINGS ALONG WOODS EDGES INTERMIXED WITH FERNS & GOLDENRODS, SCATTERED IN OPEN AREAS. ONLY A FEW LARGER VINES. IN ALL SECTIONS.
- B. **AUTUMN OLIVE (OL)**, SEEDLINGS IN INNER, DRIER PORTION OF RESTORATION ZONE, MOSTLY SECTIONS A, B, & E; A FEW LARGE SHRUBS IN SECTION D.
- C. **MORROW'S HONEYSUCKLE (MH)**, LARGER SHRUBS, SCATTERED PATCHES, IN ALL SECTIONS EXCEPT F.
- D. **MULTIFLORA ROSE (MR)** THICKETS ALONG WOODS EDGE IN SECTIONS B, E, & NORTH SIDE OF F.
- E. **POKEWEED (PW)**: COMMON IN SECTIONS A, B, C, AND D, IN OPEN AREAS, SMALL FIRST YEAR PLANTS. PERENNIAL WEED IS POISONOUS AND SPREADS VIRUS DISEASE, WITH A THICK ROOT THAT SURVIVES TILLING, SPROUTS FROM FRAGMENTS. HANDPULLING WORKS IN FIRST YEAR.
- F. **CLIMBING BUCKWHEAT (BW)**, NATIVE PERENNIAL WEED. REDUCE COVER WITH MOWING AND WEED WACKING.
- G. **WILD GRAPE (GR)**, ABUNDANT IN SECTION D, SOME IN SECTION A, B & C. NATIVE VINE CAN SMOTHER OTHER PLANTS. CUT VINES BACK. ERECT SIMPLE ARBOR WHERE VINES ARE CONCENTRATED (SECTION D).

3.0 SITE SPECIFIC GUIDANCE

Section A: Northwest Corner of Western Buffer (soils moist to well-drained, narrow strip)

1. HAND-RAKE, INSTEAD OF GRADING, ALONG ROW OF RED MAPLES TO AVOID DAMAGE TO SHALLOW ROOTS.
2. REMOVE INVASIVES AND PLANT SHRUBS ALONG EDGE OF WATER QUALITY SWALE.
3. ELSEWHERE, GRADE FOR SEEDING OF NO-MOW SEEDMIX.

Section B: North Side of Western Buffer (Soils well-drained to moist)

1. PLANT THREE (3) TREES & REMOVE INVASIVE SEEDLINGS IN CLEARED, MOIST SECTION OF BUFFER, BY WETLAND FLAG (WF) #114.
2. REMOVE EXCESSIVE WOODY DEBRIS.

Attachment A (cont)

Habitat Restoration/Enhancement
Implementation Notes

The Forest Summer Stage
Bolton and South Frontage Roads, Vernon, CT

3. MARK AREAS WITH GOOD QUALITY MEADOW VEGETATION (GOLDENROD, DAISY FLEABANE, ETC.).
4. ELSEWHERE, GRADE AND CLEAR VEGETATION, FOR PLANTING BEDS AND SEEDING.

Section C: Southwest Corner of Buffer (soils moist to well-drained)

1. LARGE LOGS ALONG FOREST EDGE MAY REMAIN, BUT GAPS SHALL BE OPENED BETWEEN THEM.
2. REMOVE OTHER DEPOSITED MATERIALS.
3. MARK WOODS EDGE AREAS WITH NATIVE FERNS AND NUMEROUS INVASIVE SEEDLINGS.
4. PULL INVASIVES ALONG WOODS EDGE AND SCARIFY FOR SEEDING, AVOIDING FERNS.
5. ELSEWHERE GRADE AND CLEAR VEGETATION, FOR PLANTING BEDS AND SEEDING.
6. PLANT THREE (3) TREES IN CORNER AS WELL AS SHRUB GROUPINGS AND PERENNIALS.
7. ERECT SIMPLE ARBOR (SWING SET OR TEEPEE STYLE) FOR NATIVE WILD GRAPE PATCH.

Section D: West End of Southern Buffer (sloping section with well-drained soils)

1. MARK & TAKE CARE TO PRESERVE NATIVE FERNS ALONG WOODS EDGE.
2. ERECT TWO SIMPLE ARBORS (SWING SET OR TEEPEE STYLE) FOR LARGE NATIVE WILD GRAPE PATCH.
3. GRADE ELSEWHERE, ON BARE ROADWAY AND IN POKEWEEED AND BINDWEED STANDS.
4. ESTABLISH PLANTING BEDS AND PLANT TREES AND SHRUB GROUPINGS.

Section E: Central Section of Southern Buffer (moist to wet soils, broad area)

1. REMOVE EXCESSIVE WOOD CHIP AND DEBRIS PILES.
2. PRESERVE COTTONWOOD GROVE AT NORTH EDGE OF BUFFER AREA AND TWO AMERICAN ELM TREES.
3. MARK EXISTING WET MEADOW AREAS WITH SENSITIVE FERN AND DO NOT GRADE THERE (WETLAND BOUNDARY FLAGS SHALL BE REHUNG HERE PRIOR TO IMPLEMENTATION OF PLAN).
4. GRADE, SEED, AND PLANT TREES, SHRUBS AND PERENNIALS IN DISTURBED PORTIONS WITH POKEWEEED.

Attachment A (cont)

Habitat Restoration/Enhancement
Implementation Notes

The Forest Summer Stage
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5. CONTROL TWO LARGE AUTUMN OLIVE BUSHES & MULTIFLORA ROSE ALONG WOODS EDGE.

Section F: Eastern Section of Southern Buffer (moist to well-drained soils)

1. MARK LIMITED AREAS TO BE GRADED (MOST OF VEGETATION IN THIS SECTION IS TO BE PRESERVED: UPLAND MEADOW, NATIVE SHRUBS, AND EVERGREEN SAPLINGS).
2. REMOVE INVASIVES FROM AREAS TO BE PRESERVED.
3. GRADE SEVERAL SMALL PLANTING BEDS AND PLANT SHRUBS AND HERBACEOUS PERENNIALS.

Wetlands Restoration/Enhancement Area 1 (poorly drained soils and intermittent stream bed)

1. PERFORM WORK DURING THE DRY SEASON (I.E. AUGUST, EARLY SEPTEMBER) AND AT LEAST THREE DAYS BEFORE ANY FORECAST OF SUBSTANTIAL RAIN (I.E. MORE THAN 0.5").
2. INSTALL TWO DOUBLE HAY-BALE CHECK DAMS BOTH ABOVE AND BELOW THE AREA OF WORK WITHIN THE EXISTING STREAMBED.
3. INSTALL SILT FENCE SECTIONS UPGRADIENT OF WORK AREAS ON BOTH SIDE OF THE STREAM CROSSING. CREATE GAPS IN SILT FENCE BARRIERS, WITH A DOUBLE ROW OF REMOVABLE HAY BALES FOR EQUIPMENT ACCESS.
4. USING HAND TOOLS AND FIVE GALLON BUCKETS, REMOVE SAND DEPOSITS FROM STREAMBED IN THE STREAM SECTION 30-40 FEET DOWNGRADIENT OF EXISTING CROSSING (NO OTHER DISTURBANCE EXISTS HERE).
5. USING A SMALL MACHINE (E.G. BOBCAT), AND ASSISTED BY HAND TOOLS, CAREFULLY REMOVE SAND DEPOSITS FROM STREAMBED IN AREA OF EXISTING WOODS ROAD CROSSING, TO EXPOSE ORIGINAL ROCKY STREAMBED. THIS IS A 35-40 FOOT STREAM SECTION.
6. AGAIN USING SMALL MACHINE, CREATE A NEW STREAM CHANNEL (OR ENLARGE/ENHANCE EXISTING) 6-8 FEET WIDE, ON AVERAGE, WITH GENTLE SIDE SLOPES (3:1 OR GENTLER).
7. CREATE A PEDESTRIAN CROSSING OF BROOK USING LARGE FLAT TOPPED BOULDERS EMBEDDED WITHIN STREAM BANKS. WITHIN THE STREAM BOULDERS SHOULD BE 10" TO 12" HIGH, PLACED DIAGONALLY ACROSS THE FLOW AXIS LEAVING 2-3 FOOT GAPS. AT THE CROSSING THE BROOK CHANNEL SHOULD BE THE WIDEST (I.E. 8'-10').
8. SMOOTH OUT TIRE TRACKS AND OTHER SIGNIFICANT SOIL SURFACE IRREGULARITIES.
9. PLANT 3 TREES AND 35 SHRUBS (SEE TABLE 1A) UNDER THE DIRECTION OF AN ECOLOGIST OR WETLAND SCIENTIST, ALLOWING FOR A PEDESTRIAN FOOT PATH FROM ONE SIDE OF THE BROOK TO THE OTHER.
10. INSTALL TWO NEW SILT FENCE BARRIERS PARRALLEL TO STREAM AT ABOUT 8 FEET OF STREAM EDGE.

Attachment A (cont)

Habitat Restoration/Enhancement
Implementation Notes

The Forest Summer Stage
Bolton and South Frontage Roads, Vernon, CT

11. GENTLY SCARIFY BARE GROUND AND SEED GRADED AREAS WITH FOWL MEADOW GRASS, WOOD REEDGRASS, RED TOP, AND VIRGINIA RYE (30/20/20/30), AT A RATE OF 1.5 LB/1,000 SQUARE FEET (FORBS, GRASSES, AND FERNS IN THE EXISTING SEEDBANK, INCLUDING FROM LIVE PROPAGULES WITHIN BARE TOPSOIL ARE EXPECTED TO SPROUT).
12. COVER ALL SEEDED AREAS WITH A THIN LAYER OF STRAW.
13. WATER EVERY FEW DAYS, IF THERE IS NO RAIN FOR MORE THAN 10 DAYS.
14. CREATE A DEFINED 4-6 FOOT WIDE FOOT PATH TO THE EDGE OF BROOK, AND BOULDERS, USING A 2-3 INCH LAYER OF BARK MULCH.
15. INSTALL TWO SECTIONS OF POST & RAIL FENCE AT EACH SIDE OF THE STREAM CROSSING, LEAVING A 2-3 FOOT GAP FOR PEDESTRIAN ACCESS.
16. POST THE AREA WITH CLEAR SIGNAGE PROHIBITING VEHICULAR ACCESS.

4.0 LONG-TERM MANAGEMENT

1. MOW TRAIL FREQUENTLY TO MAINTAIN PLEASANT, TICK-FREE WALKING TRAIL.
2. IN "LOW MOW" ZONE, MOW NOT MORE THAN TWICE A YEAR, MOWING AROUND SHRUBS, PERENNIALS, AND TREES AND ADJACENT TO WALKING TRAIL.
3. IN MEADOW PORTIONS OF "NOW MOW" ZONE AND ALSO WITHIN PERENNIAL BEDS, BRUSHHOGGING AND WEEDWACKING MAY BE USED EVERY TWO TO THREE YEARS TO CONTROL EXCESSIVE WOODY GROWTH, INCLUDING WOODY INVASIVES. TIMING: MOW IN LATE SPRING TO ALLOW SUMMER AND FALL WILDFLOWERS AND GRASSES TO BLOOM AND SET SEED.
4. TO CONTROL WOODY INVASIVES ON WOODS EDGES AND MIXED WITH NATIVE SHRUBS, USE THE "CUT AND PAINT" METHOD IN EARLY FALL AS DESCRIBED IN SECTION 2.3.5.

Attachment A (cont)

Table 1a: SHRUBS	Code	Planted Form	Nos.	Spacing	Upland Habitat Enhancement Sections						Wetlands Enhancement Area	Shade Tolerant?	Properties
					A	B	C	D	E	F			
Winterberry (<i>Ilex verticillata</i>)	WB	Potted, 18-24"	32	5'-8' apart	6	4	2	2	6	4	8	Y	Tall (to 15 feet), red, persistent winter fruit
Highbush blueberry (<i>Vaccinium corymbosum</i>)	HB	Potted, 18-24"	26	6'-8' apart	4		3	4	5	4	6	Y	Medium-tall, nectar, summer fruit, colorful fall foliage, symmetrical shape
Arrowwood (<i>Viburnum dentatum</i>)	AW	Potted, 18-24"	26	4'-6' apart	2	4	3	4	5	4	4	Y	Tall (to 20 feet), showy white flowers, dark blue summer fruit, multiple stems, good screen
Elderberry (<i>Sambucus americana</i>)	EB	Potted, 18-24"	4	6'-8' apart					2		2	N	Wide, flat, white flower clusters, abundant summer fruit, spreading, rounded shape, low-medium height
Sweet pepperbush (<i>Clethra alnifolia</i>)	SP	Potted, 18-24"	31	4'-6' apart	10	3	4		4		10	N	Medium height, fragrant showy white flowers in early summer, nectar source, fall seeds, patch-forming
Silky Dogwood (<i>Cornus amomum</i>)	SD	Potted, 18-24"	14	6'-8' apart	3	3			8			N	Rounded, spreading shape, fall blue fruit, red twigs and branches, white flower clusters
Gray dogwood (<i>Cornus racemosa</i>)	GD	Potted, 18-24"	33	4'-6' apart	10	4	4	6	5	4		N	Medium height, white flowers, white summer fruit, light gray twigs, dense, patch-forming
Hazelnut (<i>Corylus americana</i>)	HN	Potted, 18-24"	39	6'-8' apart	7	4	8	11	9			Y	Dense, multiple-stems, good screen, nuts for wildlife
Hawthorn (<i>Crataegus spp.</i>)	HT	Potted, 18-24"	16	6'-8' apart		4	2	4	6			N	Showy white flowers, yellow or red fruit, long, widely spaced thorns, interesting shape.
Pink azalea (<i>Rhododendron nudicaulis</i>)	PA	Potted, 18-24"	9	6'-8' apart			2	2			5		Showy pink flowers in early spring, attractive foliage
Meadowsweet (<i>Spiraea latifolia</i>)	MS	Potted, 6-12"	40	2'-4' apart	0	5	0		30	5		N	Meadows, very low shrub (<4 feet), white flower clusters, seeds & cover for wildlife.
Steeplebush (<i>Spirea tomentosa</i>)	SB	Potted, 18-24"	33	2'-4' apart		3			20	10			Meadows, very low shrub (<4 feet), showy pink flower spires, seeds & for wildlife.

Total Shrubs: 303 42 34 28 33 100 31 35

Table 1b: TREES	Code	Planted Form	Nos.	Spacing (feet)	Upland Habitat Enhancement Sections						Wetlands Enhancement Area	Shade Tolerant?	Properties
					A	B	C	D	E	F			
Sycamore (<i>Platanus occidentalis</i>)	SC	Potted or balled (2'-3')	2	25					2			N	Tall, nutritious nuts, spreading shape, floodplain species
Tulip Tree (<i>Liriodendron tulipifera</i>)	TT	Potted or balled (2'-3')	4	20	1	1			2			N	Tall, fast-growing, very straight trunk, tulip-like flowers and leaf shape, seeds are wildlife food
Ironwood (<i>Carpinus caroliniana</i>)	IW	Potted or balled (6'-8')	9	15		2	2	2		2	1	N	Tall tree, fast growing, den sites, floodplain species
Green ash (<i>Fraxinus pennsylvanica</i>)	GA	Potted or balled (2'-3')	6	20					3	3		Y	Keys preferred by wildlife; tall tree, tolerates flooding
Pin Oak (<i>Quercus palustris</i>)	PO	Potted or balled (6'-8')	4	20	1	1	1				1	Y	Tall, wide range of hydrologic tolerance, acorn source, finely lobed leaves
White Pine (<i>Pinus strobus</i>)	WP	Potted or balled (6'-8')	4	15		1			3			N	Evergreen, winter cover; fast growing
Red Cedar (<i>Juniperus virginiana</i>)	RC	Potted or balled (3'-4')	18	15			7	5	6			N	Evergreen, winter cover; blue winter berries
Pignut hickory (<i>Carya glabra</i>)	PH	Potted or balled, (18"-2')	12	20	2	3	2	2		3		Y	Columnar form, nuts for wildlife, dark green & attractive, no tree throw risk
Tupelo (<i>Nyssa sylvatica</i>)	TO	Potted or balled (6'-8')	2	20	1						1	Y	Brilliant fall color, shiny dark green leaves, columnar shape, nutritious red berries
White Spruce (<i>Picea glauca</i>)	WP	Bare root or power plugs, 10" 18"	56	6	18	12		20					Dense winter cover for birds, windbreak
Douglas Fir (<i>Pseudotsuga menziesii</i>)	DF	Bare root or power plugs, 10" 18"	38	6			20		12	18			Dense winter cover for birds & other small wildlife, disturbance screen
White Pine (<i>Pinus strobus</i>)	WP	Bare root or power plugs, 10" 18"	32	6					26	24			Native to northeast, dense winter cover for birds, disturbance screen

Total Trees: 60 5 8 12 9 16 8 2
 Total Christmas Trees 150 18 12 20 20 38 42

Attachment A (cont)

Table 1d: HERBS	Code	Planted Form	Nos.	Spacing	Hydrologic Preference	Upland Habitat Enhancement Sections						Shade Tolerant?	Properties
						A	B	C	D	E	F		
Joe Pye (<i>Eupatorium maculatum</i>)	JP	plug	100	1.5 ft. OC	W-M		30			50	20	N	Patch-forming, hardy perennial, pale purple flowers, good nectar plant, needs sun.
Bergamot, LI variety (<i>Monarda</i> spp.)	BG	plug	108	1.5 ft. OC	M-WD	36	18	16	18		20	N	Perennial, clonal, excellent nectar source
Big blue stem (<i>Andropogon gerardii</i>)	BBS	plug	36	1.5 ft. OC	M-WD		6	6	8	8	8	N	Heavy seed producer, good wildlife value, hardy, self seeds and spreads, striking seed-heads.
Indian Grass (<i>Sorghastrum nutans</i>)	IG	plug	144	1.5 ft. OC	M-WD		12	24	36	36	36	N	Good wildlife value, hardy, attractive seed spikes & purple fall color, self seeds and spreads.
Switch grass, LI variety (<i>Panicum virgatum</i>)	SG	plug	108	1.5 ft. OC	M-D	36	16	16	12	12	16	N	Heavy seed producer, good wildlife value, hardy, spreading, dense, moderate height.
Early goldenrod (<i>Solidago juncea</i>)	EG	plug	108	1.5 ft. OC	M-D		36	16	20	20	16	N	Clonal perennial. Pollen & nectar used by many insects. Golden color complements purple wildflowers of fall and late summer
Vernonia (<i>Vernonia noveboracensis</i>)	VE	plug	100	1.5 ft. OC	W-WD		25			50	25	N	Tall perennial, deep purple flowers, patch-forming, nectar source. Blooms late summer to early fall.

Total Herbs: 704 72 143 78 94 176 141

Area of Planting Beds (sf): 162 322 176 212 396 317

Soil Moisture Tolerance Categories: W = wet; M = moist; WD = well-drained; D = Dry

AREAS OF PLANTING BEDS	
total areas (approx.)	
Section A:	160 sf, e.g. two 5' X 10' beds, one 6X 10 bed
Section B:	320 sf, e.g. two 6' X 20' beds, one 10' X 20' bed
Section C:	180 sf, e.g. one 10' X 18' bed
Section D:	200 sf, e.g. four 5' X 10' beds
Section E:	400 sf, e.g. two 10' X 20' beds, four 5' X 10' beds
Section F:	320 sf, e.g. four 5' X 10' beds, one 10' X 20' bed

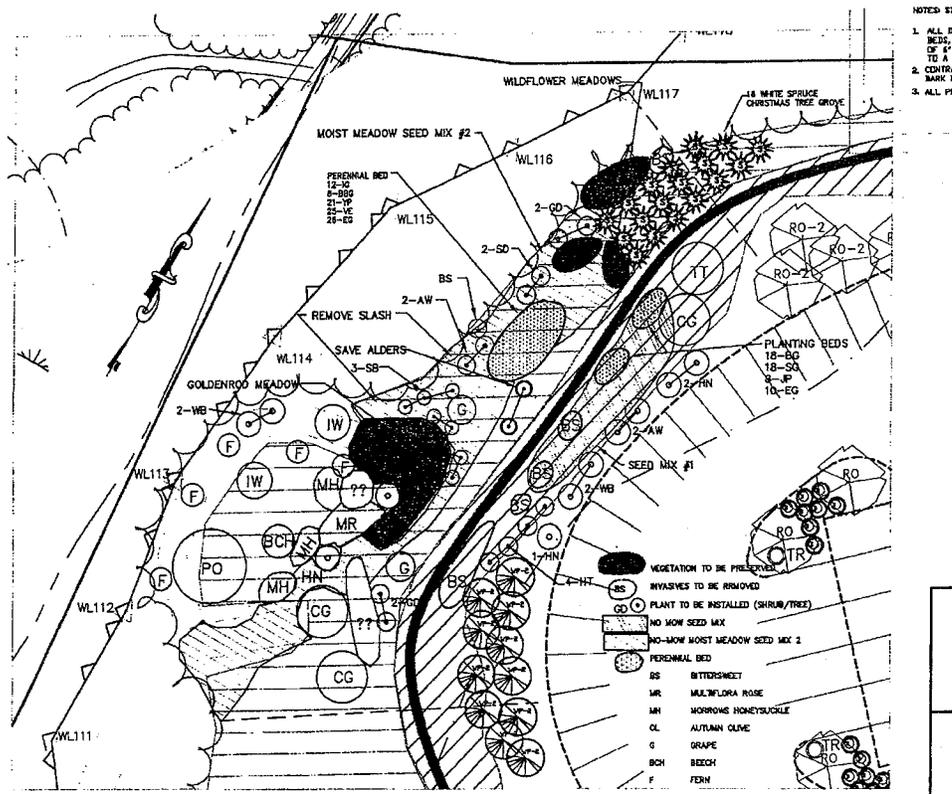
Native Seed Mixes Seed at a rate of 1/2 lb/1000 s f, in designated wildflower meadow areas within low-mow and no-mow zones.

#1 Well-drained areas: Northeastern U.S. Roadside Native Seed Mix, ERNMIX 105

#2 Moist Areas: FACW Wetland Meadow Mix. ERNMIX 122

Available from Ernst Conservation Seeds in Meadville, PA www.Ernstseed.com

Note: Native grasses, goldenrod & bergamot available from LINGI (Long Island Native Grass Initiative), Riverhead, N.Y. Phone: (631) 727-2315 x 3 (Attn Polly Wiegand) in flats of 36 plugs. Joe Pye and Vernonia available from NEWP (New England Wetland Plants), www.NEWP.com, flats of 50.



Attachment A (cont)

GUIDELINES FOR FERTILIZER AND PESTICIDE USE
The Forest Summer Stage
South Frontage Road, Vernon, Connecticut

GOAL FOR FERTILIZER USE: *Avoid any additional nutrient inputs to the Tankerhoosen River or its on-site tributaries, because the Tankerhoosen River currently has excellent water quality; both nitrogen and phosphorus concentrations are low.*

FERTILIZER RECOMMENDATIONS for the concert seating area (about 61,000 square feet) and the "low mow" area next to the parking lot.

- 1) *Use only slow-release fertilizers, of organic origin,* derived from materials such as kelp, corn, and manure. Slow release fertilizers will keep nitrogen out of the groundwater, which seeps into the river and streams. Organic fertilizers promote microbe-rich soil that resists disease. Note that because new organic fertilizer products are constantly being developed, we do not provide a full list of possible brands.
- 2) Fertilizers should have *no phosphorus or low phosphorus* content, such that *less than 5 pounds is applied per acre per year,* based on the annual application rate and % phosphorus (see example below). Apply at correct rate; rate recommended on bag may be modified based on soil test results.

Example of calculation of application rate: Aggrand 4-3-3 Fish Emulsion and Kelp Liquid Fertilizer is applied at a rate of 1 quart (2.5 pounds)/8,000 square feet to a fescue lawn, four times a year. One acre (43,560 square feet)/8,000 square feet = 5.4. Total fertilizer applied per year, per acre = 2.5 lbs X 4 X 5.4 = 54 lbs. Amount phosphorus applied per acre per year = 3 % of total (54 pounds) = 1.6 lbs/acre/yr. This is less than five pounds Phosphorus per acre, per year and is acceptable.

- 3) Use a grass seed mix dominated by *tall and hard fescues, with white clover,* tolerant of drought and traffic, with low to

Attachment A (cont)

moderate fertilizer needs, not a mix dominated by blue grass varieties. Clover will fix atmospheric nitrogen, and bees will not be a problem on summer evenings.

- 4) Test a soil sample prior to initial turf establishment, and again each spring, following the instructions on the web site of the Soil Analysis Lab at the University of Connecticut (www.soiltest.uconn.edu). Collect a composite soil sample; mix 10 subsamples from all over the area in a bucket; put two cups in a zip lock bag; & take/mail to lab.
- 5) Incorporate ground phosphate rock (10-0-0) into the top six inches of soil before turf is first established in the amount recommended by the lab, based on soil test results. This will supply phosphorus for many years, so very little need be surface applied, where it could be washed off towards the river.

FERTILIZER RECOMMENDATIONS for the upland restoration area (URA) and the "no mow zone."

- 6) Limit fertilizer applications to slow release fertilizer pellets or granules placed in planting beds or tree planting holes. Lush weed growth indicates that these areas are already quite fertile.

GOALS FOR LIMITED PESTICIDE USE: Prevent any soluble chemicals from reaching soil where they could leach into groundwater or wash into surface water, potentially affecting wetlands or watercourses. Preserve diversity of native herbaceous plants that provide seeds, nectar and other wildlife values. Preserve the insect life at the base of the food chain, for viable ecological communities on the perimeter of the parking lot, and a living soil community in the grassed concert seating area. Soils rich in microbes have been shown to be more resistant to turf disease than chemically treated lawns. Protect public health.

Attachment A (cont)

WEED CONTROL

- 1) In the seating area maintain healthy turf that resists weed colonization by adequate watering and fertilization; top dress with compost (2-year, minimum) and overseed, to fill in thin areas before weeds get started.
- 2) Use a pre-emergent natural herbicide, *corn gluten meal*, to deal with serious crab grass or other weed problems; tolerate low weed levels.
- 3) Hand pull small invasives and hoe weeds in planting beds and on gravel paths. Use mulch or groundcovers to minimize need for weeding.
- 4) Treat invasive bittersweet, Morrow's honeysuckle, barberry, and autumn olive, in such a way as to minimize the amount of herbicide used, and avoid herbicide contact with the ground. After several years the need for invasive treatment will become much lower. The only methods to be used for applying selected chemical herbicides (under supervision of a certified applicator) are: (1) cut-stump treatment, or (2) spot-foliar application to *small resprouts* of cut shrubs or vines. Apply full-strength 8% triclopyr to cut stumps, and dilute 4 fluid oz/gallon for foliar application. Dilute 41% glyphosate, 1:1 with water for cut stump treatment. Use Agridex as the surfactant. Dilute at a rate of 2 fluid oz per gallon, for foliar treatment. No drippings should reach the ground. Do cut stump treatment in September and for bittersweet only, also in May. Treat resprouts in early summer or *early fall*.
- 5) Poison ivy near trails can be pulled out (if one wears gloves and protective clothes) and/or or spot treat with herbicide (i.e. Roundup), rather than broad-cast sprayed, in the same way that invasive plants are treated.

Attachment A (cont)

- 6) Maintain the broad paths on the parking lot perimeter and through other natural areas by mowing. Control tree and shrub growth in meadow areas, by mowing every one or two years, not with herbicide application.

INSECT AND TICK CONTROL

- 7) Rather than broadcast spraying of insecticide for tick control, post frequent signs to stay on the broad mowed trail, to minimize contact with ticks. For a severe tick infestation consult the Connecticut Agricultural Experiment Station, explaining that the Tankerhoosen is a priority watershed. Several alternatives to broadcast spraying may be available, including deer-feeding devices that apply insecticide to deer necks, and insecticide-impregnated cotton wool that deer mice and white-footed mice take into their nests.
- 8) Dormant oil spray may be used to control certain tree insects.
- 9) For hazardous wasp nests in or near the path, short-lasting organophosphate pesticide sprays may be used. Bees on clover in grassed areas will not be active in the evening hours when concert-goers are present. Research of the active pesticide ingredient should be conducted, to find out several key pesticide properties, which affect its persistence and its mobility in soil: half life, solubility in water, affinity for soil particles (KOC or Sorption coefficient), as well as assorted toxicity measures. Do not use any insecticide product with a half life longer than five days, solubility greater than 10 mg/l, or a KOC less than 1,000.
- 10) Do *not* use systemic, long-lasting, broad spectrum insecticides, such as imidacloprid, in many over-the-counter grub control products. These products do disrupt ecosystems; they move through the soil and will affect adjacent natural areas. They are particularly harmful to bees at very low concentrations. They will not meet the quantitative criteria in Item 7. The sandy soil at this site is not conducive to Japanese beetle grubs. In the

Attachment A (cont)

unlikely event that grubs do reach high densities, try natural controls such as milky spore disease and predaceous nematodes.

- 11) We recommend tolerating most fungal disease and/or insect herbivory on native plant species in the restoration area or adjacent forest. In the event of a severe problem on over 20% of vegetation, consult the Connecticut Agricultural Experiment Station in New Haven or Windsor. The arborist should be informed that any pesticides used at this site should have a very short half-life and should also have low mobility in soil, if there will be any contact with soil, and that extensive broad spectrum insecticide use would not be acceptable; other native species would over time replace the affected ones.
- 12) If mosquitoes become a problem in the concert seating area, we recommend locating the closest ponded breeding areas, and placing BT larvacide pellets only in those ponds. Almost all inland wetland mosquito species travel only short distances. Wetland buffers are large enough and the elevation differential large enough that mosquitoes should not be a problem. The pellets are less harmful than a broad spectrum insecticide, but do kill juveniles of all insect species in the fly order, including crane flies and beneficial predaceous midges. Use of broad spectrum sprays to kill adult mosquitoes will not be acceptable.

Attachment B



Memo

To: Terry McCarthy, P.E., Town Engineer, Town of Vernon

From: James G. Bubaris, P.F.

e-mail: tmccarthy@vernon-ct.gov Pages: Twenty (20)

Date: February 1, 2010

Re: Response to Traffic Comments, TicketNetwork, Vernon, CT

CC: File

We offer the following in response to the comments you have asked us to address with reference made to the attached tables and data:

1. Table A – Comparison of Friday Traffic Volumes:

The question was raised whether the traffic counts we conducted in July 2009 for this the subject traffic study are representative of the other "summer" months (i.e., June through October) when the proposed facility is expected to operate.

Table A summarizes the expansion factors provided by ConnDOT Planning for this subject area in projecting a given month's Friday count to the average annual daily traffic volume for the year. (See ConnDOT's data following our Table A.)

As shown in last column of our Table A, if July is assigned an index of "1.00", June (index of 1.01) would only be 1 percent higher, whereas August (index of 0.99) would be 1 percent lower, and both September and October (indices of 0.98) would be 2 percent lower.

Therefore, our July counts are within 1 percent and considered statistically representative of traffic volume conditions for the subject development study area.

Attachment B (cont)

2:

2. Table B – Comparison of ConnDOT and our traffic volume data for subject study area:

As evidence that the July 2009 data we collected and evaluated for the subject study area represent a "worst case" condition, we compared the ConnDOT March 2008 "weekday" data provided to us by ConnDOT Planning to the data we collected in July 2009 on a typical Friday. (See the two 6 to 7 pm traffic volume graphics following our Table B.)

As shown in Table B, after adjusting both sets of data to the same time frame (i.e., July 2009, Friday, 6 to 7 pm peak arrival period), a review of the last column of our Table B shows that our data is substantially higher than what would be derived from ConnDOT's data...in fact, by a ratio of 1.39 for the study area taken as a whole.

Therefore, our analyses certainly evaluate a "worst case" traffic volume condition for the subject study area.

3. Table C – Comparison of Study Analysis Traffic Volumes to Recent Turning Movement Counts:

It was indicated that at the time of our turning movements counts in July 2009 for the subject traffic study, various sections of lower Bolton Road were under construction and the required traffic detours may have skewed or altered the "typical" traffic volumes passing through the intersections of South Frontage Road at Bolton Road and South Frontage Road at Tunnel Road.

Our Table C compares the 2010 projection of our July 2009 counts for these two intersections to recent turning movement counts conducted at these two intersections on Friday, January 22, 2010 (See the January 22, 2010 count summaries for these two intersections following our Table C.), with both sets of data brought to the same time period.

A review of our Table C indicates that our projected 2010 study traffic volumes evaluated in our traffic study are substantially higher (index of 1.00) than the recent counts for these two intersections adjusted to the same time period (index of 0.66).

Therefore, our analyses certainly evaluate a "worst case" traffic volume condition for the Bolton Road and Tunnel Road intersections on South Frontage Road.

Attachment B (cont)

3

4. Table D – Queue Analysis for the "tunnel" on Tunnel Road:

Concern was raised about the impact that concert traffic arriving from the south via Tunnel Road (i.e., about 7 percent of the total) would have on the northbound and southbound queues that form at each end of the tunnel stopping for their respective stop signs in waiting their turn to use the alternating one-lane, one-way roadway section through the tunnel.

Automatic traffic recorder measurements were conducted to measure northbound and southbound hourly traffic volumes traveling through the tunnel from mid-Thursday, January 21 through mid-Thursday, January 28, 2010 as summarized in the tables following our Table D, pages 1 and 2.

Additionally, actual northbound and southbound queues were measured at each end of the tunnel at 1-minute intervals during the period from 5:00 to 7:00 pm on Friday, January 22, 2010 and are summarized in our Table D representing the two-hour arrival period for a typical Friday concert.

As indicated in our traffic study, about 10 vehicles per hour of concert traffic would travel northbound through the tunnel between 5:00 to 6:00 pm, and about 46 vehicles per hour of concert traffic would travel through the tunnel between 6:00 and 7:00 pm on a typical summer Friday evening.

A review of the bottom of our Table D shows the total, average and maximum northbound and southbound queues and corresponding vehicles per hour for each of these two one-hour arrival periods under January no-build, July no-build, and July build conditions.

The last column of Table D (page 1 for the 5:00 to 6:00 pm period and page 2 for the 6:00 to 7:00 pm period) show that although the number of queues would increase (where the number and length of queues is in direct proportion to the total approaching traffic) for both time periods (i.e., 6 more vehicles during the 5:00 to 6:00 pm period and 42 more vehicles during the 6:00 to 7:00 pm period), the maximum queues should not increase for the 5:00 to 6:00 pm period, and only increase by 1 vehicle in each direction for the 6:00 to 7:00 pm period.

It is doubtful that STC will require the subject development to make improvements to these tunnel operations since the concert impact would be seasonal (i.e., June through October) and occasional (i.e., a maximum of about 20). It is also doubtful that the STC would consider the installation of a traffic signal to control the required alternating one-way operation, although such should reduce overall delay by moving more than one vehicle through in each direction at a time.

Attachment B (cont)

4

However, given that Tunnel Road is a state highway and under the state's jurisdiction, the Town may wish to request the State to consider the addition of a supplementary plaque on each of the two stop signs indicating ("Up to 3 Vehicles at a Time), similar to what I saw at a bridge construction site in Pomfret where traffic was reduced to alternating one-way traffic at a site on Route 44. Such should reduce the queues significantly.

5. Tables E and F, Concert Operations assuming non-uniform arrivals:

The traffic operations analysis in our traffic study assumed uniform arrivals during the course of each of the two arrival hours which we believe to be a reasonable assumption.

The question has arisen as to what the impact would be if traffic arriving during the 6:00 to 7:00 pm hour immediately preceding the beginning of the concert were to arrive within the last 30 minutes versus being uniformly distributed over the full 60-minutes.

Please refer to our Tables E and F which compare the levels of service and 95th -percentile queues for the arrival period assumed to be uniformly distributed as in our submitted analyses versus concentrated into 30 minutes as suggested.

A review of our Tables E and F shows that levels of service would basically be the same under both scenarios, with the following exceptions:

- a. Tunnel Road at South Frontage Road: westbound approach would be LOS C instead of LOS B
- b. South Frontage Road at I-84 Eastbound Off Ramp: off ramp approach would be LOS C instead of LOS B and MAY require the lengthening of the "right-turn" section of the ramp (i.e., queue of 280 feet versus 200 feet). Hopefully it should suffice for now to say that ConnDOT and STC will be taking a very close look at this ramp and will certainly consider any changes in widths and/or lengths of approaches should they deem such necessary.
- c. Route 30 at Center Road/Bolton Road: Route 30 westbound approach would be LOS E instead of LOS D, although overall level of service remains at LOS D.

We trust that the foregoing satisfactorily respond to your concerns.

Please let us know if you have any questions.

Very truly yours,

James G. Subaris, P.E.

Attachment B (cont)

Table A
Comparison of Friday Traffic Volumes
Based on ConnDOT Data

Month	Factor to Expand Month's Friday to Annual Average Day	Month's Friday as Compared to Annual Average Day	Month's Friday Compared to July's Friday
January	0.93	1.08	0.91
February	0.94	1.06	0.90
March	0.90	1.11	0.94
April	0.88	1.14	0.97
May	0.85	1.18	1.00
June	0.84	1.19	1.01
July	0.85	1.18	1.00
August	0.86	1.16	0.99
September	0.87	1.15	0.98
October	0.87	1.15	0.98
November	0.89	1.12	0.96
December	0.96	1.04	0.89

Bubaris Traffic Associates
 February 1, 2010

Attachment B (cont)

REVISED 02/4/2009

CONNECTICUT DEPARTMENT OF TRANSPORTATION
 BUREAU OF POLICY & PLANNING - SYSTEMS INFORMATION
 TRAFFIC MONITORING & DATA ANALYSIS SECTION

FACTORS FOR EXPANDING 24-HOUR COUNTS TO
 ANNUAL AVERAGE DAILY TRAFFIC VOLUMES
 (BASED ON 2007 & 2008 CONTINUOUS COUNT STATION DATA)

GROUP - 4 **URBAN**

STATION(S): 2, 11, 15, 17, 19, 22, 23, 28, 47, 48, 62

	AVG.	WEEKDAY	FRIDAY	SATURDAY	SUNDAY
JANUARY		1.00	0.93	1.15	1.47
FEBRUARY		1.02	0.94	1.15	1.44
MARCH		0.97	0.90	1.12	1.37
APRIL		0.94	0.88	1.07	1.35
MAY		0.90	0.85	1.04	1.22
JUNE		0.90	0.84	1.03	1.24
JULY		0.92	0.85	1.02	1.28
AUGUST		0.93	0.86	1.06	1.24
SEPTEMBER		0.93	0.87	1.09	1.27
OCTOBER		0.94	0.87	1.05	1.25
NOVEMBER		0.95	0.89	1.11	1.35
DECEMBER		0.95	0.95	1.10	1.43

GROUP - 5 **NORTHWEST RECREATIONAL**

STATION(S): 18

	AVG.	WEEKDAY	FRIDAY	SATURDAY	SUNDAY
JANUARY		1.47	1.16	1.14	1.13
FEBRUARY		1.49	1.00	1.17	1.05
MARCH		1.43	1.10	1.18	1.09
APRIL		1.30	0.98	0.95	1.02
MAY		1.17	0.85	0.86	0.75
JUNE		1.10	0.77	0.76	0.65
JULY		0.98	0.67	0.59	0.55
AUGUST		0.94	0.67	0.60	0.54
SEPTEMBER		1.15	0.87	0.88	0.66
OCTOBER		1.25	0.78	0.75	0.67
NOVEMBER		1.38	0.97	1.04	0.91
DECEMBER		1.42	1.13	1.08	1.10

GROUP - 6 **SOUTHEAST RECREATIONAL**

STATION(S): 5, 33, 44, 46

	AVG.	WEEKDAY	FRIDAY	SATURDAY	SUNDAY
JANUARY		1.15	1.01	1.10	1.27
FEBRUARY		1.14	0.99	1.04	1.21
MARCH		1.09	0.95	1.03	1.15
APRIL		1.04	0.90	0.95	1.10
MAY		1.00	0.86	0.91	1.04
JUNE		0.97	0.84	0.89	0.98
JULY		0.90	0.78	0.83	0.92
AUGUST		0.90	0.79	0.82	0.88
SEPTEMBER		1.02	0.88	0.95	1.04
OCTOBER		1.05	0.89	0.96	1.06
NOVEMBER		1.11	0.95	1.05	1.14
DECEMBER		1.10	0.99	1.08	1.27

Attachment B (cont)

Table B
 Comparison of Department of Transportation with Bubaris Traffic Associates Peak Hour Traffic Volumes
 TicketNetwork Study Area
 Vernon, Connecticut

No.	Roadway Section	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5
		DOT March 2008 Weekday 6-7 PM Volume	(Col. 1 x 0.88) DOT Adjusted to July 2008 Friday 6-7 PM Volume	(Col. 2 x 1.02) DOT Adjusted to July 2009 Friday 6-7 PM Volume	BTA July 2009 Friday 6-7 PM Volume	Ratio of BTA to DOT July 2009 Friday 6-7 PM Volume
1	West Street north of Route 30:	345	303	366	1,175	1.91
2	Route 30 west of Tunnel Road:	583	599	610	365	1.42
3	Route 30 between Tunnel Road and Bolton Road:	862	755	770	3,051	1.28
4	Route 30 between Bolton Road and West Street:	1,327	1,158	1,132	1,504	1.27
5	Route 30 east of West Street:	605	530	541	1,049	1.54
6	Tunnel Road between Route 30 and Ferguson Road:	259	227	231	353	1.57
7	Bolton Road between Route 30 and Ferguson Road:	704	617	529	876	1.39
8	Ferguson Road between Tunnel Road and I-84 WB Ramps:	95	83	85	158	1.86
9	Ferguson Road between I-84 WB Ramps and Bolton Road:	249	219	223	398	1.79
10	I-84 Westbound On Ramp:	351	308	314	323	1.03
11	I-84 Westbound Off Ramp:	121	106	108	93	0.86
12	Tunnel Road between Ferguson Road and South Frontage Road:	543	474	484	416	0.86
13	Bolton Road between Ferguson Road and South Frontage Road:	567	497	507	554	1.31
14	I-84 Eastbound Off Ramp:	500	438	447	493	1.10
15	I-84 Eastbound On Ramp:	126	110	113	148	1.31
16	South Frontage Road between Tunnel Road and I-84 EB Off Ramp:	128	112	114	157	1.37
17	South Frontage Road between I-84 EB Off Ramp and Bolton Road:	419	367	375	517	1.38
18	Tunnel Road south of South Frontage Road:	426	373	381	473	1.24
Total:		8,703	7,626	7,779	10,834	1.29

Bubaris Traffic Associates
 February 1, 2010

Attachment B (cont)

Table C
 Comparison of Traffic Study Analysis Traffic Volumes to Recent Turning Movement Counts
 TicketNetwork Forest Summer Concert Series
 Vernon, Connecticut

Site	Traffic Volume Series		Northbound		Southbound		Eastbound		Westbound		All		Subtotal		All		Ratio to Study									
	1 Projected July 2010 in Study	2A January 2010 Count	Thru	Peak	Thru	Peak	Thru	Peak	Thru	Peak	Thru	Peak	Thru	Peak	Thru	Peak		Thru	Peak							
1	180	87	58	245	20	186	206	31	31	82	534	15	133	15	138	79	61	11	151	703	59	32	514	600	1337	1.00
2A		87	28	110	2	83	85	28	19	47	242	13	71	10	81	15	33	4	23	304	40	45	389	554	506	0.80
2B		95	25	120	2	96	92	20	21	51	283	17	77	11	100	54	35	4	10	330	43	49	423	613	876	0.66

Debar's Traffic Associates
 February 1, 2010

Attachment B (cont)

JAN 29, 2010 04:10P

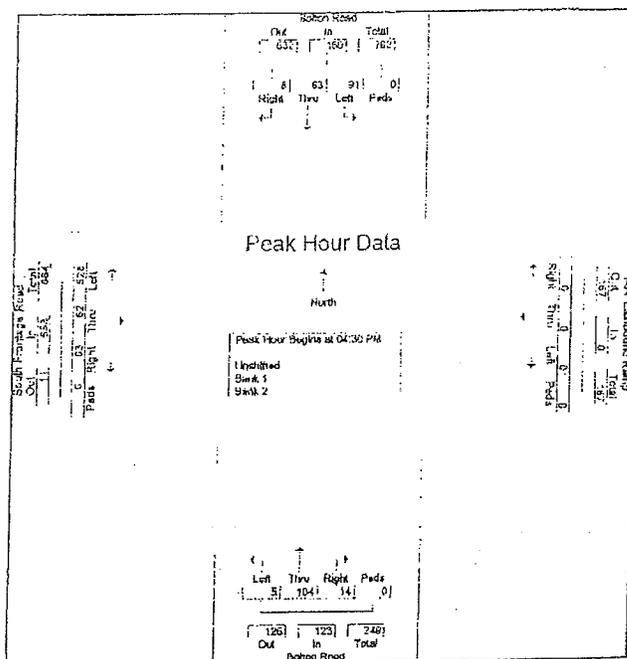
8608281693

page 3

Connecticut Counts Inc.
Kensington, Connecticut 06037
(860) 828-1693

File Name : 9348
Site Code : 9348
Start Date : 1/22/2010
Page No : 2

Start Time	Bolton Road From North				I-94 Eastbound Ramp From East				Bolton Road From South				South Frontage Road From West				Total			
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds				
04:30 PM	3	15	30	0	45	0	0	0	0	3	24	2	0	29	17	15	131	0	153	240
04:45 PM	1	10	19	0	30	0	0	0	0	3	22	1	0	26	16	17	123	0	156	218
05:00 PM	0	14	19	0	33	0	0	0	0	0	31	2	0	33	16	13	132	0	161	227
05:15 PM	2	18	23	0	43	0	0	0	0	8	27	0	0	35	14	17	142	0	173	251
Total Volume	6	53	91	0	160	0	0	0	0	14	104	5	0	123	63	62	528	0	553	936
%App Total	3.8	30.4	58.9	0	100	0	0	0	0	11.4	64.8	4.1	0	9.6	9.5	80.9	0			
PHIF	.500	.875	.758	.000	.833	.000	.000	.000	.000	.438	.839	.625	.000	.578	.928	.912	.930	.000	.644	.932



Attachment B (cont)

JAN 29, 2010 04:10P

8608281693

page 4

Connecticut Counts Inc.
Kensington, Connecticut 06037
(860) 828-1693

Tunnel Road at South Frontage Road
Vernon, Connecticut

File Name : 9349
Site Code : 9349
Start Date : 1/22/2010
Page No : 1

Groups Printed: Unshifted - Bank 1 - Bank 2

Start Time	Tunnel Road From North				South Frontage Road From East				Tunnel Road From South								No. Total		
	Thru	Left	Right	App. Total	Right	Thru	Left	App. Total	Peds	Peds	Peds	Peds	Peds	Peds	Peds	Peds		Peds	App. Total
04:30 PM	37	4	0	41	0	0	0	0	15	35	0	0	0	0	0	0	0	50	109
04:45 PM	47	5	0	48	6	0	0	14	11	33	0	0	0	0	0	0	0	44	106
Total	79	10	0	89	15	17	0	32	26	68	0	0	0	0	0	0	0	94	215
05:00 PM	43	1	0	44	4	13	0	17	15	42	0	0	0	0	0	0	0	57	115
05:15 PM	39	2	0	41	5	13	0	18	12	30	0	0	0	0	0	0	0	42	101
05:30 PM	38	1	0	39	5	12	0	17	7	28	0	0	0	0	0	0	0	35	91
05:45 PM	39	3	0	42	3	12	0	21	16	31	0	0	0	0	0	0	0	47	110
Total	159	7	0	163	23	50	0	73	50	131	0	0	0	0	0	0	0	191	420
05:00 PM	27	2	0	29	5	7	0	13	8	28	0	0	0	0	0	0	0	36	78
05:15 PM	21	0	0	21	5	8	0	11	2	15	0	0	0	0	0	0	0	21	53
05:30 PM	22	0	0	22	5	7	0	12	3	15	0	0	0	0	0	0	0	19	53
05:45 PM	12	0	0	13	3	8	0	11	10	24	0	0	0	0	0	0	0	34	58
Total	83	2	0	85	19	28	0	47	23	87	0	0	0	0	0	0	0	110	242
07:00 PM	22	0	0	22	3	7	0	7	9	19	0	0	0	0	0	0	0	28	57
07:15 PM	25	2	0	27	1	4	0	5	2	15	0	0	0	0	0	0	0	17	49
Grand Total	368	21	0	389	58	108	0	164	110	320	0	0	0	0	0	0	0	430	983
Approp %	94.6	5.4	0	94.6	35.4	84.6	0	25.6	74.4	0	0	0	0	0	0	0	0	0	0
Total %	37.4	2.1	0	39.6	5.9	10.8	0	16.7	11.2	32.6	0	0	0	0	0	0	0	43.7	98.2
Unshifted	368	21	0	389	58	108	0	164	110	319	0	0	0	0	0	0	0	429	982
% Unshifted	100	100	0	100	100	100	0	100	99.7	99.7	0	0	0	0	0	0	0	99.8	99.9
Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bank 2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1
% Bank 2	0	0	0	0	0	0	0	0	0	0.3	0	0	0	0	0	0	0	0.2	0.1

Attachment B (cont)

JAN 29, 2010 04:11P

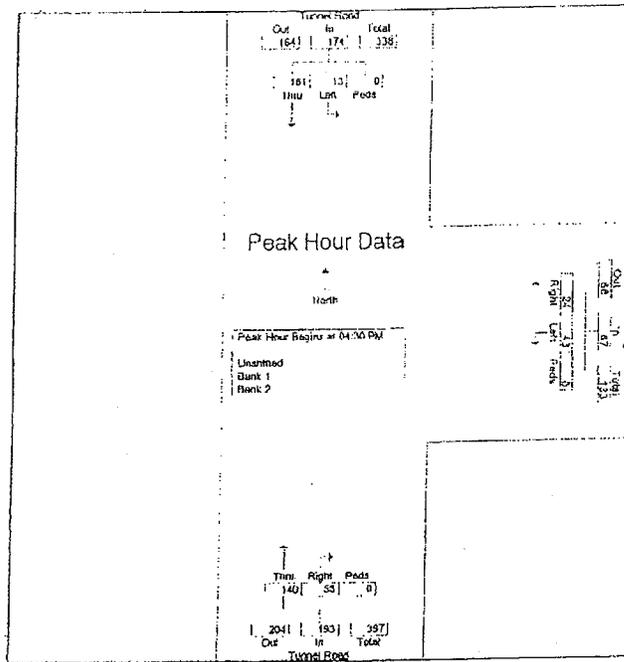
8608281693

page 5

Connecticut Counts Inc.
Kensington, Connecticut 06037
(860) 828-1693

File Name : 9349
Site Code : 9349
Start Date : 1/22/2010
Page No : 2

Start Time	Tunnel Road From North				South Frontage Road From East				Tunnel Road Front South								App. Tot	Incl. Total	
	Thru	Left	Right	Peds	Thru	Left	Right	Peds	Thru	Left	Right	Peds	Peds	Peds	Peds	Peds			Peds
Peak Hour Analysis from 04:30 PM to 07:15 PM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 04:30 PM																			
04:30 PM	37	4	0	41	9	9	0	18	15	35	0	0	0	0	0	0	0	50	109
04:45 PM	42	8	0	48	6	8	0	14	11	33	0	0	0	0	0	0	0	44	105
05:00 PM	43	1	0	44	4	13	0	17	15	42	0	0	0	0	0	0	0	57	118
05:15 PM	39	2	0	41	5	13	0	18	12	30	0	0	0	0	0	0	0	42	101
Total Volume	161	13	0	174	24	43	0	67	53	140	0	0	0	0	0	0	0	193	434
% App. Total	92.5	7.5	0	100	13.8	24.2	0	37.5	27.5	72.5	0	0	0	0	0	0	0	84.6	91.9
PHF	.936	.542	.000	.906	.657	.627	.000	.931	.883	.835	.000	.000	.000	.000	.000	.000	.000	.846	.919



Attachment B (cont)

Table D
Queue Analysis at Tunnel on Tunnel Road
TicketNetwork Forest Summer Concert Series
Vernon, Connecticut

Page 1 of 2

Time	(1) Based on January 2010 Volumes			(2) Based on July 2010 Volumes (Case 1 X 1.00/0.99)			(3) With Concert Traffic (Add 10 VPH NB to Case 1)			(3) less (2) Difference Due to Concerts		
	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total
	Queue	Queue	Queue	Queue	Queue	Queue	Queue	Queue	Queue	Queue	Queue	Queue
5:00	0	0	0	0	0	0	0	0	0	0	0	0
5:01	0	0	0	0	0	0	0	0	0	0	0	0
5:02	0	0	0	0	0	0	0	0	0	0	0	0
5:03	0	0	0	0	0	0	0	0	0	0	0	0
5:04	0	0	0	0	0	0	0	0	0	0	0	0
5:05	1	0	1	1	0	1	1	0	1	0	0	0
5:06	2	0	2	2	0	2	2	0	2	0	0	0
5:07	2	1	3	2	1	3	2	1	3	0	0	0
5:08	3	2	5	3	2	5	3	2	5	0	0	0
5:09	3	3	6	3	3	6	3	3	6	0	0	0
5:10	3	3	6	3	3	6	3	3	6	0	0	0
5:11	2	2	4	2	2	4	2	2	4	0	0	0
5:12	1	2	3	1	2	3	1	2	3	0	0	0
5:13	1	2	3	1	2	3	1	2	3	0	0	0
5:14	2	3	5	2	3	5	2	3	5	0	0	0
5:15	3	3	6	3	3	6	3	3	6	0	0	0
5:16	3	3	6	3	3	6	3	3	6	0	0	0
5:17	4	3	7	4	3	7	4	3	7	0	0	0
5:18	5	3	8	5	3	8	5	3	8	0	0	0
5:19	4	2	6	4	2	6	4	2	6	0	0	0
5:20	3	1	4	3	1	4	3	1	4	0	0	0
5:21	3	1	4	2	1	3	2	1	3	0	0	0
5:22	2	1	3	2	1	3	2	1	3	0	0	0
5:23	1	0	1	1	0	1	1	0	1	0	0	0
5:24	1	0	1	1	0	1	1	0	1	0	0	0
5:25	1	0	1	1	0	1	1	0	1	0	0	0
5:26	2	1	3	2	1	3	2	1	3	0	0	0
5:27	2	2	4	2	2	4	2	2	4	0	0	0
5:28	2	2	4	2	2	4	2	2	4	0	0	0
5:29	1	1	2	1	1	2	1	1	2	0	0	0
5:30	0	1	1	0	1	1	0	1	1	0	0	0
5:31	0	1	1	0	1	1	0	1	1	0	0	0
5:32	0	2	2	0	2	2	0	2	2	0	0	0
5:33	0	2	2	0	2	2	0	2	2	0	0	0
5:34	0	2	2	0	2	2	0	2	2	0	0	0
5:35	1	1	2	1	1	2	1	1	2	0	0	0
5:36	1	1	2	1	1	2	1	1	2	0	0	0
5:37	1	1	2	1	1	2	1	1	2	0	0	0
5:38	1	1	2	1	1	2	1	1	2	0	0	0
5:39	1	1	2	1	1	2	1	1	2	0	0	0
5:40	1	2	3	1	2	3	1	2	3	0	0	0
5:41	2	3	5	2	3	5	2	3	5	0	0	0
5:42	2	4	6	2	4	6	2	4	6	0	0	0
5:43	2	4	6	2	4	6	2	4	6	0	0	0
5:44	3	3	6	3	3	6	3	3	6	0	0	0
5:45	3	3	6	3	3	6	3	3	6	0	0	0
5:46	3	3	6	3	3	6	3	3	6	0	0	0
5:47	4	2	6	4	2	6	4	2	6	0	0	0
5:48	4	2	6	4	2	6	4	2	6	0	0	0
5:49	4	2	6	4	2	6	4	2	6	0	0	0
5:50	3	2	5	3	2	5	3	2	5	0	0	0
5:51	3	2	5	3	2	5	3	2	5	0	0	0
5:52	3	2	5	3	2	5	3	2	5	0	0	0
5:53	4	2	6	4	2	6	4	2	6	0	0	0
5:54	4	2	6	4	2	6	4	2	6	0	0	0
5:55	4	2	6	4	2	6	4	2	6	0	0	0
5:56	3	3	6	3	3	6	3	3	6	0	0	0
5:57	3	3	6	3	3	6	3	3	6	0	0	0
5:58	2	3	5	2	3	5	2	3	5	0	0	0
5:59	1	3	4	1	3	4	1	3	4	0	0	0
Totals:	125	106	225	129	115	245	135	118	251	3	3	6
Average:	2	2	4	2	2	4	2	2	4	0	0	0
Maximum:	5	4	8	5	4	8	6	4	9	0	0	0
VPH:	166	188	354	180	204	385	190	204	395	10	0	10

Attachment B (cont)

Table O
Queue Analysis at Tunnel on Tunnel Road
TicketNetwork Forest Summer Concert Series
Vernon, Connecticut

Page 2 of 2

600 to 7:00 PM Friday Arrival Period

Time	(1) Based on January 2010 Volumes			(2) Based on July 2010 Volumes (Case 1 X 1.00/D.52)			(3) With Concert Traffic (Add 46 VPH NB to Case 1)			(3) less (2) Difference Due to Concert		
	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total
	Queue	Queue	Queue	Queue	Queue	Queue	Queue	Queue	Queue	Queue	Queue	Queue
:00	1	3	4	1	3	4	1	4	5	0	0	1
:01	1	2	3	1	2	3	1	2	4	0	0	0
:02	2	1	3	2	1	3	2	1	4	0	0	0
:03	2	0	2	1	0	2	2	0	3	0	0	0
:04	2	2	4	2	2	4	2	2	5	0	0	1
:05	1	3	4	1	3	4	1	4	5	0	0	1
:06	0	4	4	0	4	4	0	5	5	0	1	1
:07	1	4	5	1	4	5	1	5	6	0	1	1
:08	2	3	5	2	3	5	2	4	6	0	0	1
:09	3	3	6	3	3	7	4	4	7	0	0	1
:10	2	2	4	2	2	4	2	2	5	0	0	1
:11	1	1	2	1	1	2	1	1	2	0	0	0
:12	1	1	2	1	1	2	1	1	2	0	0	0
:13	1	2	3	1	2	3	1	2	4	0	0	0
:14	1	3	4	1	3	4	1	4	5	0	0	1
:15	1	4	5	1	4	5	1	5	6	0	1	1
:16	1	4	5	1	4	5	1	5	6	0	1	1
:17	2	5	7	2	5	8	2	6	9	0	1	1
:18	3	5	8	3	5	9	4	6	10	0	1	1
:19	3	5	8	3	5	9	4	6	10	0	1	1
:20	2	4	6	2	4	7	2	5	7	0	1	1
:21	2	4	6	2	4	7	2	5	7	0	1	1
:22	2	3	5	2	3	5	2	4	6	0	0	1
:23	2	2	4	2	2	4	2	2	5	0	0	1
:24	2	0	2	2	0	2	2	0	2	0	0	0
:25	3	0	3	3	0	3	4	0	4	0	0	0
:26	4	1	5	4	1	5	5	1	6	1	0	1
:27	4	1	5	4	1	5	5	1	6	1	0	1
:28	3	1	4	3	1	4	4	1	5	0	0	1
:29	2	0	2	2	0	2	2	0	2	0	0	0
:30	2	0	2	2	0	2	2	0	2	0	0	0
:31	3	1	4	3	1	4	4	1	5	0	0	1
:32	4	2	6	4	2	7	5	2	7	1	0	1
:33	4	2	6	4	2	7	5	2	7	1	0	1
:34	4	2	6	4	2	7	5	2	7	1	0	1
:35	3	1	4	3	1	4	4	1	5	0	0	1
:36	3	1	4	3	1	4	4	1	5	0	0	1
:37	3	3	6	3	3	7	4	4	7	0	0	1
:38	2	4	5	2	4	7	2	5	7	0	1	1
:39	2	5	7	2	5	8	2	6	9	0	1	1
:40	2	5	7	2	5	8	2	6	9	0	1	1
:41	2	5	7	2	5	8	2	6	9	0	1	1
:42	2	5	7	2	5	8	2	6	9	0	1	1
:43	2	5	7	2	5	8	2	6	9	0	1	1
:44	3	4	6	2	4	7	2	5	7	0	1	1
:45	2	4	6	2	4	7	2	5	7	0	1	1
:46	2	3	5	2	3	5	2	4	6	0	0	1
:47	1	2	3	1	2	3	1	2	4	0	0	0
:48	0	0	0	0	0	0	0	0	0	0	0	0
:49	0	2	2	0	2	2	0	2	2	0	0	0
:50	1	3	4	1	3	4	1	4	5	0	0	1
:51	1	4	5	1	4	5	1	5	6	0	1	1
:52	1	4	5	1	4	5	1	5	6	0	1	1
:53	2	3	5	2	3	5	2	4	6	0	0	1
:54	2	3	5	2	3	5	2	4	6	0	0	1
:55	2	2	4	2	2	4	2	2	5	0	0	1
:56	3	1	4	3	1	4	4	1	5	0	0	1
:57	3	0	3	3	0	3	4	0	4	0	0	0
:58	2	1	3	2	1	3	2	1	4	0	0	0
:59	2	2	4	2	2	4	2	2	5	0	0	1
Totals:	121	152	273	137	163	297	150	168	338	18	23	42
Average:	2	3	5	2	3	5	3	3	6	0	0	1
Maximum:	4	5	8	4	5	9	5	6	10	1	1	1
VPH:	146	155	301	159	168	327	205	168	373	46	0	46

Attachment B (cont)

Table E
Comparison of Traffic Operations Analyses
Levels of Service
TicketNetwork Forest Summer Concert Series
Vernon, Connecticut

	2010 Combined	
	Friday Arrival (over 60 minutes)	Friday Arrival (over 30 minutes)
1. Tunnel Road at South Frontage Road:		
Tunnel Road southbound left	LOS A	LOS A
South Frontage Road westbound approach	LOS B	[LOS C]
2. South Frontage Road at Proposed Main Site Drive:		
South Frontage Road westbound left	LOS A	LOS A
Main Site Drive northbound approach	LOS C	LOS C
3. South Frontage Road at Interstate 84 Eastbound Off Ramp and Office Drive:		
South Frontage Road westbound left	LOS A	LOS A
Office Site Drive northbound approach	LOS A	[LOS C]
Interstate 84 eastbound Off Ramp southbound approach	LOS B	[LOS C]
4. Bolton Road at 140 Bolton Road (Off-Site Drive):		
Bolton Road southbound left	LOS A	LOS A
Off-Site Drive westbound approach	LOS B	LOS B
5. Bolton Road at East Site Drive and Clark Road:		
Bolton Road northbound left	LOS A	LOS A
Bolton Road southbound left	LOS A	LOS A
East Site Drive eastbound approach	LOS B	LOS B
Clark Road westbound approach	LOS B	LOS B
6. Bolton Road at South Frontage Road and Interstate 84 Eastbound On Ramp:		
Bolton Road northbound approach	LOS B	LOS B
Bolton Road southbound approach	LOS B	LOS B
South Frontage Road eastbound approach	LOS C	LOS C
OVERALL	- LOS C -	- LOS C -
7. Bolton Road at Ferguson Road:		
Bolton Road northbound left	LOS A	LOS A
Ferguson Road eastbound approach	LOS C	LOS C
8. Ferguson Road at Interstate 84 Westbound On/Off Ramps:		
Ferguson Road westbound left	LOS A	LOS A
Interstate 84 Westbound Off Ramp northbound approach	LOS C	LOS C
9. Tunnel Road at Keynote Drive and Ferguson Road:		
Tunnel Road northbound left	LOS A	LOS A
Tunnel Road southbound left	LOS A	LOS A
Keynote Drive eastbound approach	LOS B	LOS B
Ferguson Road westbound approach	LOS B	LOS B
10. Hartford Turnpike (Route 30) at Tunnel Road:		
Route 30 westbound left	LOS A	LOS A
Tunnel Road northbound approach	LOS D	LOS D
11. Hartford Turnpike (Route 30) at Center Road and Bolton Road:		
Route 30 eastbound approach	LOS D	LOS D
Route 30 westbound approach	LOS D	[LOS E]
Bolton Road northbound approach	LOS D	LOS D
Center Road southbound approach	LOS C	LOS C
OVERALL	- LOS D -	- LOS D -
12. Hartford Turnpike (Route 30) at West Street:		
Route 30 eastbound left	LOS C	LOS C
West Street southbound approach	LOS F	LOS F

NOTE: [XXX] CHANGES IN LEVELS OF SERVICE.

Bubaris Traffic Associates
February 1, 2010

Attachment B (cont)

Table F
Comparison of 95th Percentile Queuing Analyses
TicketNetwork Forest Summer Concert Series
Vernon, Connecticut

	2010 Combined		Available Storage	Status
	Friday Arrival	Friday Arrival		
	(over 60 minutes)	(over 30 minutes)		
1. Tunnel Road at South Frontage Road:				
Tunnel Road northbound thru/left	0'	0'	600'	OK
Tunnel Road southbound left/thru	5'	10'	1300'	OK
South Frontage Road westbound left	11'	15'	500'	OK
South Frontage Road westbound right	0'	2'	500'	OK
2. South Frontage Road at Proposed Main Site Drive:				
South Frontage Road eastbound thru/right	0'	0'	800'	OK
South Frontage Road westbound left/thru	31'	123'	150'	OK
Main Site Drive northbound approach	1'	4'	110'	OK
3. South Frontage Road at Interstate 84 Eastbound Off Ramp and Office Drive:				
South Frontage Road eastbound thru/right	0'	0'	500'	OK
South Frontage Road westbound left/thru	0'	0'	1000'	OK
Office Site Drive northbound left/right	0'	1'	100'	OK
Interstate 84 Eastbound Off Ramp southbound left/thru	134'	280'	600'	OK
Interstate 84 Eastbound Off Ramp northbound right	134'	280'	500' (4)	* see note
4. Bolton Road at 149 Bolton Road (Off-Site Site Drive):				
Bolton Road northbound thru/left	0'	0'	1500'	OK
Bolton Road southbound left/thru	1'	6'	140'	OK
Off-Site Site Drive westbound left/right	0'	0'	50'	OK
5. Bolton Road at East Site Drive and Clark Road:				
Bolton Road northbound left/thru/right	0'	0'	140'	OK
Bolton Road southbound left/thru/right	0'	0'	400'	OK
East Site Drive eastbound left/thru/right	0'	0'	50'	OK
Clark Road westbound left/thru/right	0'	0'	250'	OK
6. Bolton Road at South Frontage Road and Interstate 84 Eastbound On Ramp:				
Bolton Road northbound left/thru/right	n/a	n/a	500'	OK
Bolton Road southbound left/thru/right	n/a	n/a	1800'	OK
South Frontage Road left	n/a	n/a	250'	OK
South Frontage Road eastbound thru/right	n/a	n/a	1800'	OK
7. Bolton Road at Ferguson Road:				
Bolton Road northbound left/thru	0'	2'	1500'	OK
Bolton Road southbound thru/right	0'	0'	400'	OK
Ferguson Road eastbound left	20'	29'	800'	OK
Ferguson Road eastbound right	2'	2'	100'	OK
8. Ferguson Road at Interstate 84 Westbound On/Off Ramps:				
Ferguson Road eastbound thru/right	0'	0'	800'	OK
Ferguson Road westbound left/thru	15'	18'	800'	OK
Interstate 84 Westbound Off Ramp northbound left/right	31'	45'	900'	OK
9. Tunnel Road at Keynote Drive and Ferguson Road:				
Tunnel Road northbound left/thru/right	0'	0'	1800'	OK
Tunnel Road southbound left/thru/right	0'	0'	1200'	OK
Keynote Drive eastbound left/thru/right	3'	3'	200'	OK
Ferguson Road westbound left/thru	13'	20'	800'	OK
Ferguson Road westbound right	5'	5'	150'	OK
10. Hartford Turnpike (Route 30) at Tunnel Road:				
Route 30 eastbound thru/right	0'	0'	1300'	OK
Route 30 westbound left	12'	13'	175'	OK
Route 30 westbound thru	0'	0'	475'	OK
Tunnel Road northbound left/right	103'	108'	1700'	OK
11. Hartford Turnpike (Route 30) at Canter Road and Bolton Road:				
Route 30 eastbound left	82'	82'	185'	OK
Route 30 eastbound thru/right	543' (3)	563' (1)	475'	* see note
Route 30 westbound left	313' (2)	364' (4)	225'	* see note
Route 30 westbound thru/right	332'	332'	500'	OK
Bolton Road northbound left/thru/right	511'	511'	800'	OK
Canter Road southbound left/thru/right	123'	132'	900'	OK
12. Hartford Turnpike (Route 30) at West Street:				
Route 30 eastbound left	104'	109'	175'	OK
Route 30 eastbound thru	0'	0'	500'	OK
Route 30 westbound thru/right	0'	0'	600'	OK
West Street southbound left/right	248' (3)	289' (3)	500'	* see note

* Notes:

- (1) 305' for 50th percentile queue
- (2) 227' for 50th percentile queue; (4) 201' for 50th percentile queue
- (3) extends past first street intersection
- (5) consider widening ramp to 2 lanes