

Economic Goal

Preserve existing jobs and encourage small scale and large scale economic development where suitable\appropriate and feasible to foster a diverse local economy.

Strategy 1 - *Encourage the prosperity and expansion of small businesses and farm operations to preserve the area's unique character and heritage, to promote agriculture, recreation, and tourism for their related quality of life and economic benefits, and to preserve the integrity of the town's visual landscape and scenic qualities.*

Strategy 2 - *Encourage economic development in appropriate areas to encourage employment opportunities for current and future residents.*

Community Facility Goal

Expand municipal services, recreation and/or park opportunities where needed to address town and community needs.

Strategy 3 - *Prioritize municipal services, recreation areas and parks areas to identify where additional resources or facilities are needed.*

Transportation Goal

Enhance traffic flow in congested areas and address parking needs.

Strategy 4 - *Determine parking solutions in business areas and congested areas\time periods to alleviate congestion, to be used to improve traffic flow.*

Strategy 5 - *Identify existing and potential recreation areas, trails and pathways to locate needed recreation and support facilities.*

Strategy 6 - *Examine the need for buoys establishing no wake zones, additional boat launches, and public docks to identify potential marine related needs.*

Strategy 7 - *Address town highway design and shoulder construction, regarding recent trends in farm equipment toward heavier and wider machinery.*

Physical Conditions Goal

Enhance and protect lake, creek and wetland water quality.

Strategy 8 - *Foster compliance with NYS Health guidelines and pursue funding sources for municipal sewer services for waterfront businesses & dwellings that discharge effluent into the river or lake.*

Strategy 9 - *Weigh the density of development along the waterfront and other areas that lack municipal sewer service.*

Strategy 10 - *Use on-site soil types and their individual septic system placement limitations to help ensure residential structures have adequately sized lots.*

Scenic Resources Goal **Enhance and protect the priority character and scenic resource areas throughout the town.**

Strategy 11 - *Foster compatible development and mitigate potential visual impacts within priority character and scenic resource areas.*

Land Use and Buildings Goal **Foster development in suitable\appropriate areas that enhances town and community character, quality of life and preserves property values.**

Strategy 12 - *Encourage residential and business development in appropriate areas that is harmonious with or adds to community character while promoting compatibility between mixed uses.*

Strategy 13 - *Prioritize community areas and seek funding sources for municipal services to foster appropriate development levels.*

Strategy 14 - *Protect and promote waterfront businesses, agricultural areas and farms to ensure the character and scenic qualities of the waterfront, scenic highways, and community corridor areas are preserved.*

Strategy 15 - *Encourage the restoration and protection of historically significant sites, facilities and areas.*

Strategy 16 - *Ensure any necessary placement of tall structures occurs with as little visual impact on the community as possible within the priority corridor areas.*

Strategy 17 - *Consider and weigh the cumulative impact and safety implications of converting seasonal homes to year-round use on the environment and the demand for year-round services on private roads.*

Strategy 18 - *Protect agricultural areas, land and uses from incompatible uses such as dense residential and other types that offer potential conflicts with farms.*

Character Area Goal **Preserve and enhance the priority character areas throughout the Town by encouraging appropriate and compatible development in scale and type.**

RECOMMENDED ACTIONS - IMPLEMENTATION STEPS

- ACTION a:** Update the zoning law and zoning district map to protect existing land uses and encourage compatible development types to enhance the Town.
- ACTION b:** Catalogue and prioritize additional water and/or sewer projects, as well as recreation and/or park needs to capture additional funding sources.
- ACTION c:** Examine commercial and any congested areas, determine their parking needs and locate potential parking areas or other techniques for adding parking capacity.
- ACTION d:** Examine existing and potential recreation areas and trails throughout the Town, to attempt to identify potential future projects and related needs in the community.
- ACTION e:** Discuss farm equipment issue with Town Highway Superintendent for upcoming Town road and shoulder projects.
- ACTION f:** Consider issuing only the area variances that meet all the required tests, especially where small lots have poor soils, unless sufficient lot area exists for adequate well and on-site septic system treatment.
- ACTION g:** Draft suitable rural/historic character compatibility techniques including land use, landscaping, lighting, signage, lot coverage and building placement, for possible inclusion in the Zoning Law.
- ACTION h:** Update the zoning district map and zoning law to protect existing land uses and encourage compatible development in scale, type and character to enhance the community.
- ACTION i:** Identify historic structures and landmarks to be incorporated in the SEQRA and site plan review processes.
- ACTION j:** Create a wind facilities law to address the visual, noise, and associated impacts of industrial wind turbines and associated transmission facilities. The majority of respondents to the 2011 Town of Lyme Wind Survey indicated they are opposed to industrial wind development anywhere within the Town. (However, should industrial wind development be considered in the future, the following restrictions shall apply. (See the appendix for further details.))
- ACTION k:** Examine the trend of seasonal to year-round conversions along the waterfront to try to quantify the impact on the residences and the Town.
- ACTION l:** Weigh seasonal residence to year-round conversions in areas that have poor

soils unless sufficient lot sizes are present for adequate on-site septic system treatment, and where structures are located on private substandard roads that may not provide adequate year-round access for emergency vehicles.

ACTION m: Incorporate appropriate zoning law amendments to include the Priority Character Areas Overlay District within the zoning law.

ACTION n: Protect agricultural areas, land and uses from incompatible uses such as suburban residential and other types that offer potential conflicts.

ACTION o: Incorporate appropriate zoning law amendments to include the Priority Character Areas Overlay District within the zoning law.

ACTION p: Develop hamlet zoning district and zoning law amendments to address community hamlet land use character and residential density.

ACTION q: Examine options for publicity regarding waterfront resources in the Town.

Planning Project Considerations Introduction

The following Planning Project Considerations should be considered for use when reviewing development or redevelopment projects, updating the zoning regulation review criteria used to review projects, and establishing subdivision requirements which establish minimum standards for lot creation, road design, and ultimately, the pattern of development for generations. They are the product of extensive, open discussion and thought about how development can respect the area and be shaped to complement the character of the Town, its neighborhoods and hamlets and Village, and ultimately improve the quality of life for current and future residents.

Overall Town Planning Project Considerations

- √ **Future growth potential** - explore funding opportunities to expand sewer and water districts including local capacity. Identify appropriate areas within the Town and Hamlets for suitable population and employment growth.

For example, appropriate areas for residential, commercial, or mixed use zoning districts should be identified and established in order to enhance development opportunities, coordination and allow services to be provided to reinforce such areas to locate additional growth. The area to the east of Chaumont where several businesses are concentrated could be considered a business district. Similarly, certain areas where housing is concentrated and appropriate should be considered for establishment of residential zones, thus reinforcing and protecting such uses. This would also allow appropriate services to be examined for feasibility. Also, areas with services could be targeted for residential growth in suitable densities.

- √ **Attracting growth** - foster appropriate development and infill opportunities that interconnect with existing neighborhoods and business areas that improve the overall desirability and destination quality of the Town.

- √ **Curb cut/access management** - shared driveway accesses and internal access connections among adjacent businesses are favored over excessive numbers of individual curb cuts with no connections.

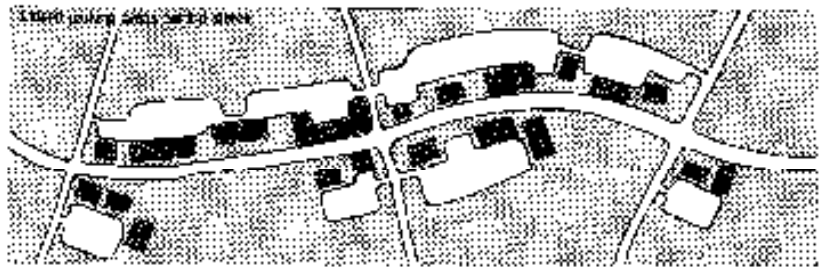
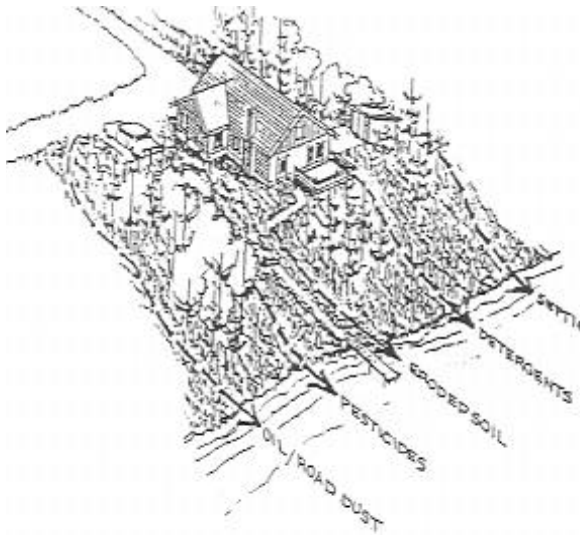


Figure 8-27. Connecting rear parking lots allows curbsides to drive through the strips of the corridor without entering the business and lower curb traffic flow. Such arrangements can be required for new development, expansion of existing buildings, and redevelopment.

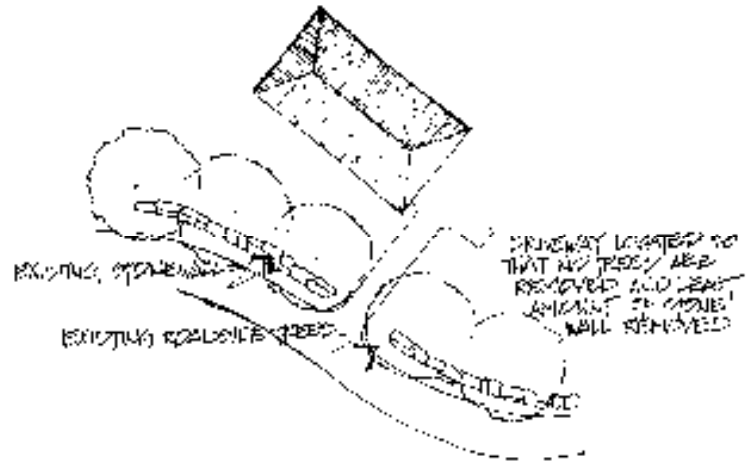
- √ **Promoting current businesses** - as new projects occur, foster traffic and pedestrian connections to existing business and residential areas and allow improvements that will improve existing business competitiveness and enhance aesthetics.

- √ **Drainage affects water quality** - drainage facilities should be incorporated onsite and existing drainage systems should be improved/ upgraded or maintained to limit storm water impacts downstream or on neighboring properties. Such drainage facilities should include detention and retention, bank stabilization, and safe practices for snow removal and lawn care to keep particulates and contaminants from draining into local water bodies.



For example, any substance within the watershed which can be transported by water (e.g. detergents, eroded soil, septic effluent, pesticides, & oil/road dust) can eventually reach the lake and affect water quality. It is not only shorelines uses, but activities anywhere within a lake or stream's watershed which affect water quality.

- √ **Existing features** – where existing character features occur such as roadside trees, stone walls, tree lines, fencerows (which often have trees and fences of some kind), they should be preserved (or at least disturbed as little as possible). Such features serve to retain the rural character of roads.



- √ **Historic character street layout** - consider requiring new development areas to extend the grid pattern with blocks and multiple connections to maintain traffic flow and access.

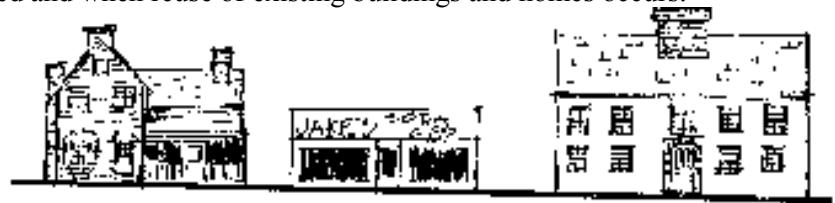
For example, a lack of a grid pattern can funnel too much traffic from a side road onto the main traffic artery which often creates a congestion point. However, extending the grid pattern allows flow from several side roads at once, which typically softens the overall traffic impact.



Figure 11-9. These three sketches show an existing village, developed with two alternatives in anticipation of new developments: a typical feature of unimproved suburban style of design, much more of the type than will be a way that begins to emulate the traditional fabric, compared with the historic alternative of simply extending the established pattern. The first is connected to side roads in a manner that softens village character. Source: Adapted from: Habibi et al., 1982.

- √ **Historic building form & styles** - Where appropriate, consider guidelines for historic compatibility when new developments are proposed and when reuse of existing buildings and homes occurs.

For example, within historic districts or areas with a predominant style, form or scale, new structures should be required that echo the scale, style, form, rhythm and character of the neighborhood. Don't put a one story building in a three story block or a concrete-sided building on a street of wooden sided buildings. Consider consistency with size and materials whenever a new building is proposed, or when renovations that could affect the appearance of an existing structure are proposed.



AN EXAMPLE OF A BUILDING DIFFER IN SCALE AND CHARACTER WITH THE EXISTING BUILDINGS ON EITHER SIDE.



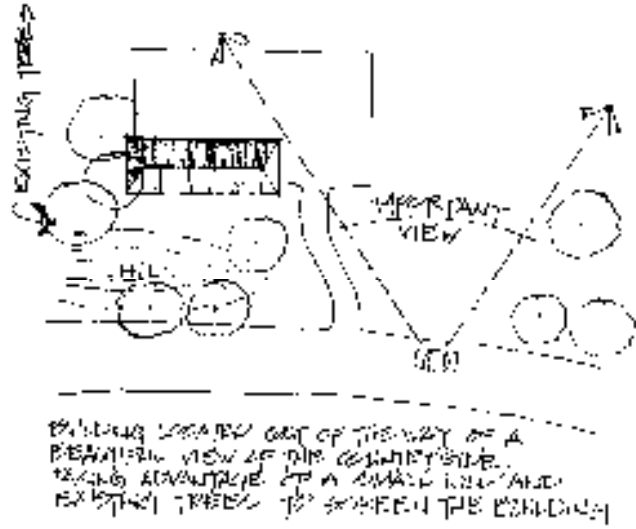
- √ **Mixed use buildings and projects** - Compatibility could include mixed use developments where feasible to include the historic pattern of services/employment centers with residences above or nearby, to allow enhanced pedestrian opportunities and decreased traffic congestion.

For example, interconnected mixed-use projects allow pedestrians to live and walk to nearby work and entertainment opportunities or to needed goods and services without having to drive distances to do so. This limits traffic congestion and parking demand.



Source: Andrew Duany and Elizabeth Plater-Zyberk

√ **Building placement** – Buildings should be sited so that obstruction of important or priority views from roadways, sidewalks, and parks will be minimized. This can be achieved by taking advantage of topographic changes or existing vegetation.



Residential Project Considerations

√ **Building setbacks vs build-to lines** - within the Town, rural setbacks should be set depending on the prevalent pattern in the area, in some cases shallower build-to lines that maintain the small historic front yard pattern with larger rear yards should be required to maintain historic residential and business patterns close to the street. In less dense areas where primary buildings are further from the road, larger setbacks could be maintained.

√ **Highway frontage development, vs new roads/streets** - strip development should be discouraged where possible, to maintain traffic carrying capacity of arterial and collector streets. Therefore, new streets or local streets should be used for new development where feasible.

For example, lots that are created one at a time along a main highway can slowly alter the function of the arterial road. As each fronting lot creates a subsequent driveway access, it allows another potential conflict point and reason that traffic must slow down or face either an oncoming automobile or exiting vehicle that may be decelerating or accelerating which ultimately affects traffic flow.

√ **Clustering** – clustering of businesses or homes should be encouraged where feasible to limit strip development and allow open space character to be preserved.

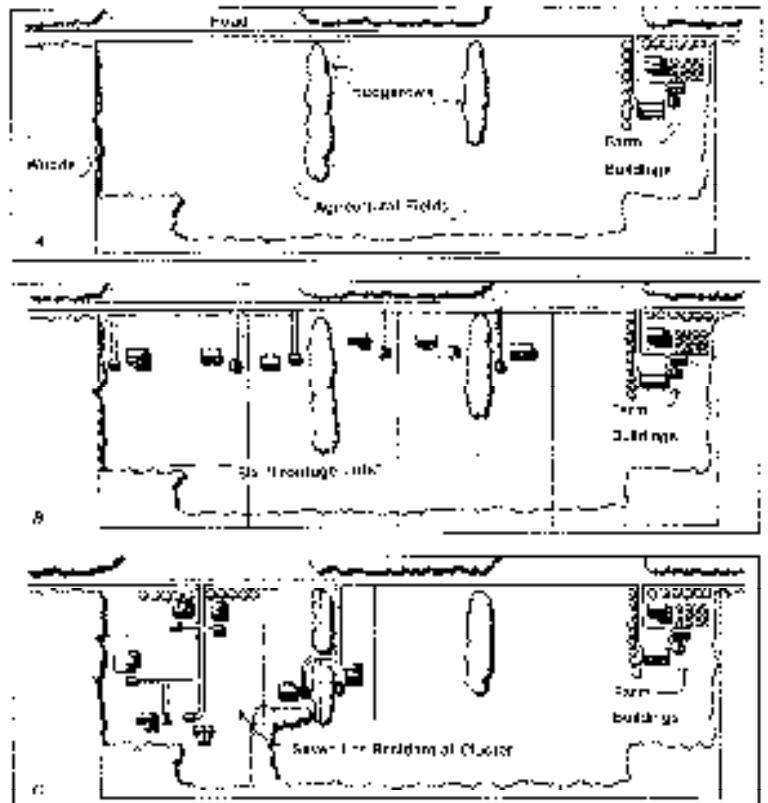


Figure 12-8: Clustered buildings and open fields preserve the rural character and provide for a range of required building uses. Strip development, on the other hand, reduces the amount of open space and provides for a range of uses, such as residential, commercial, and industrial. Clustering buildings along the road and preserving open space provide a range of uses, such as residential, commercial, and industrial. Clustering buildings along the road and preserving open space provide a range of uses, such as residential, commercial, and industrial. The example shows a rural area of agricultural fields, a strip development, and a cluster of buildings.

- √ **Pedestrian scale or walkable to/from** – where feasible, foster walkable projects that include sidewalks and pedestrian paths, within walking distance from other destinations, and are in scale with village businesses and residential areas.

For example, pedestrian scale typically balances pedestrian and vehicular needs while providing comfortable environments for people to assemble and associate with others. Community design should be human-scale with services within reasonable distance from one another. The following standards are recommended: homes within ¼ to ½ mile of most services; elementary schools within ¼ to ½ mile of homes; parks within an eighth to ¼ mile of homes; downtown should provide a balance of retail and commercial stores and services, e.g., hair salon, hardware store, pharmacy, grocery/deli, restaurants, clothing, post office, library, town/village offices within ¼ to ½ mile of the community center. Areas not being used by pedestrians should be assessed to determine possible reasons for lack of use.

- √ **Soil Conditions influencing development patterns** - based on existing soils, ensure projects address individual septic and drainage issues to limit contamination and off-site impacts.
- √ **Dead-end streets vs loop streets** - dead end streets should only be used to access a limited number of homes (less than twenty), after which a second connection should be provided to an arterial or collector road.

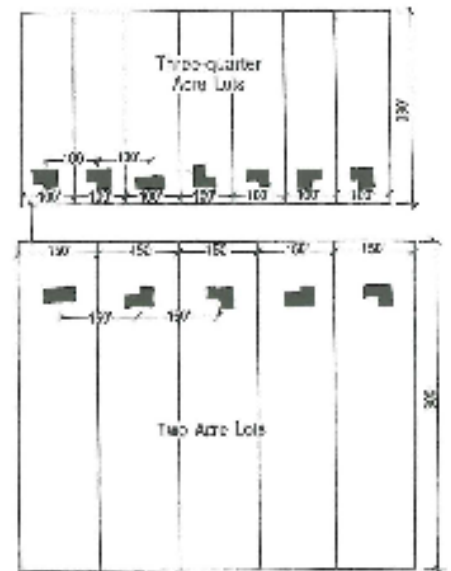
For example, if the single access became blocked by an accident or incident and an emergency occurred in a subsequent house further up the single access road, getting to the 2nd emergency could be delayed or even blocked off entirely for a period of time.

- √ **Hamlet and Village lot sizes, smaller vs larger** - where feasible, smaller lots should be required to maintain the historic residential and business density with housing and business patterns close to the street to maintain pedestrian scale development.

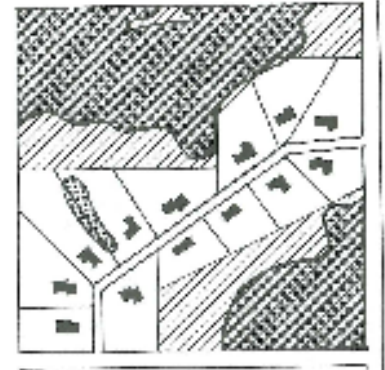
- √ **Cost effective services** – Infill projects should be encouraged where services exist, or where possible, municipal services should be laid out in a compact manner to limit future maintenance costs.



- √ **Future infrastructure needs** – Future infrastructure projects should be encouraged to maximize the number of users and should be located within desired growth areas.

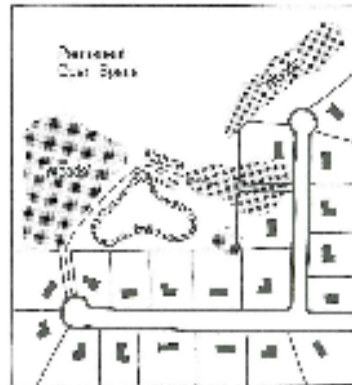
- √ **Connections between developments** – residential developments should be connected by internal road to limit trips onto the main traffic artery, also shared driveway accesses are favored over an excessive number of curb cuts. Refer to the curb cut/access management image.



- √ **Preserve open space/sensitive lands -**
Open space and sensitive lands can be preserved by requiring the project to identify and set aside such areas and allowing smaller house lots in those cases. This improved layout often leads to a more marketable project, with open space areas and trails often that can be shared by the residents.



 Sensitive area
 Restricted or deed restriction



(with) lots are with homes located on smaller lots (with) lots and, creating these sensitive areas, as encouraged by zoning regulations adopted by the Board.

Commercial Project Considerations

- √ **Connections between parking areas\developments & shared access**, - developments should be connected by street access or parking lot connectivity to limit trips onto the main traffic artery, also shared driveway accesses are favored over an excessive number of curb cuts.

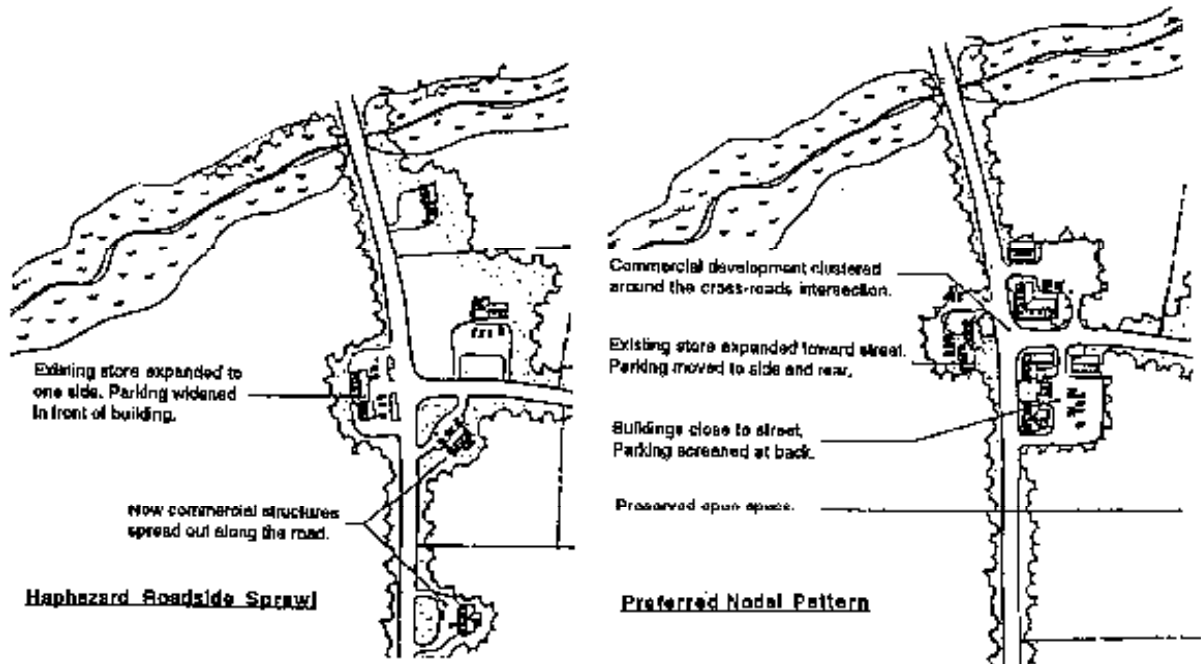
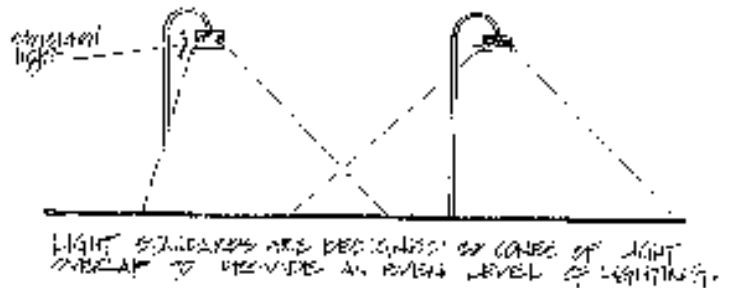


Figure 9-16. Two alternatives for arranging commercial development along a rural highway: strip versus nodes. Within the node, stores are located toward the front of their lots, with interconnected rear parking provision. Source: Dodson Associates.

- √ **Lighting** – Lighting should be used where appropriate, however, over-lighting and excess glare should be avoided, especially on neighboring properties and the public roads. Shielded or cutoff lights should be used to minimize lighting spill-over.



For example, lighting should be controlled in both height and intensity to maintain rural character. Light levels at the lot line should not exceed 0.2 foot-candles, measured at ground level. To achieve this, light fixtures should be fully shielded to prevent light shining beyond the lot lines onto neighboring properties or roadways.

- √ **Building setbacks** – Maintain current setbacks in business areas utilizing build-to lines.

For example, setbacks often push new buildings away from roads, fostering a contrasting character and anti-pedestrian pattern than historical patterns of development. Build-to lines require buildings to be placed closer to the street, allow parking to the side and rear, and create a pedestrian friendly streetscape.

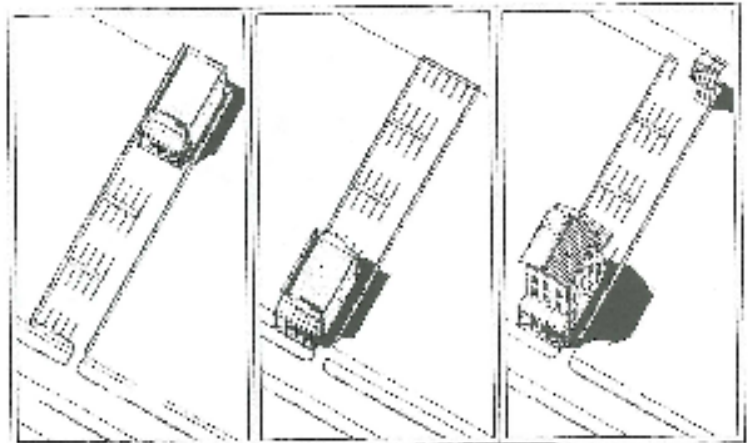
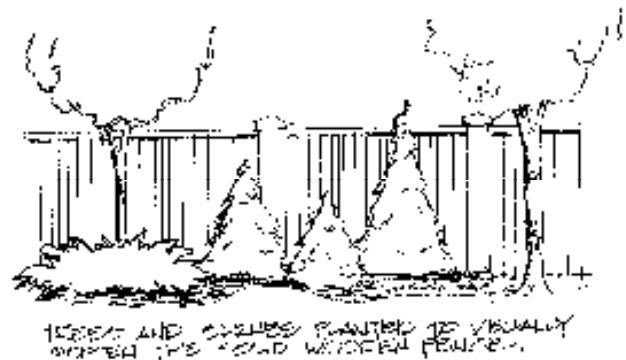
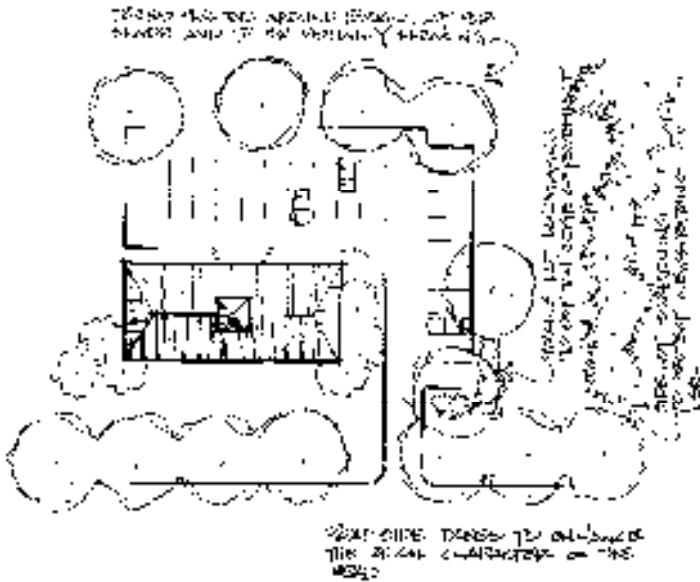


Figure 6-21. Various Patterns for Building, Parking, and Access. Urban Sketches, Board of County Commissioners, Denver, Colorado, 1991.

- ✓ **Parking to the side or rear** – the bulk of parking areas should be smaller distinct areas to the side or rear to allow closer building placement to the street in order to maintain community character, reinforce the visual presence of building as opposed to parked vehicles and the pattern of buildings along the roadside.

- ✓ **Landscaping** – appropriate landscaped buffering should be used to soften parking area edges and buildings, including screening views between uses where needed and partially screen views of parking areas from public roads.



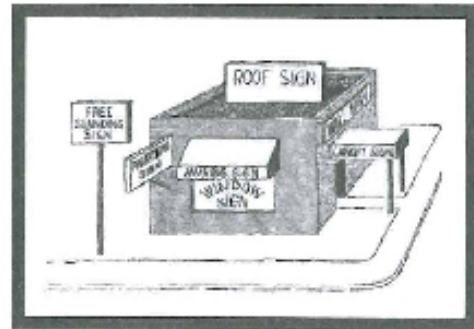
- ✓ **Mixed use development** – mixed use developments should be considered where feasible to include the historic pattern of services\employment centers with residences above or nearby, to allow enhanced pedestrian opportunities and decrease traffic congestion.

- ✓ **Pedestrian scale or walkable to/from** - foster walkable projects with buildings near the street that include sidewalks or pedestrian paths, are within walking distance from other destinations, and are in

scale with village businesses and residential areas. See above description of pedestrian scale in the overall considerations.

- √ **Business hours of operation** - for offices or businesses locating near or within primarily residential areas, consider compatible hours of operation (including hours that parking area lights are used).
- √ **Maximum building heights** – consider building heights compatible with current Village business and residential buildings to maintain historic patterns and community character.
- √ **Signage** – Where appropriate, only adequately sized signs should be used (font and total sign size based upon the speed limit), with a total size allowable limit to ensure efficient signage. Within hamlet areas and slower speed limit zones, smaller, lower, and externally lit signs should be used. Free standing signs should consider lower monument style. Internally lit signs should be constructed to limit glare. Glare from all signage should be minimized. Except for directional signage, limiting off premise signs along the Seaway Trail Scenic Byway should be considered.

For example, Saratoga Springs, New York, regulates freestanding signage based on speed limit: downtown area is limited to 12 feet in height, 12 square feet in area; other districts within areas of slower speeds such as those 44 mph and less, 12 feet in height and 24 square feet; district areas with speed limits of 45 mph or greater, 20 feet in height and 40 square feet in size.



Source: *Signage Made Simple* -
Monmouth, NJ County Planning
Board.

Alternative Energy Project Considerations

As sustainable energy sources offer options for local energy production, local requirements for such alternative energy projects should be developed. Similar to the above Planning Project Considerations, the following considerations should be used when reviewing alternative energy projects and/or updating the zoning regulation review criteria used to set standards for their review. Alternative energy systems may have an impact on adjacent properties or neighborhood aesthetics therefore municipalities should review their land use regulations to facilitate opportunities for promoting renewable energy in a way that reflects community values and planning. These considerations are designed to help shape a dialogue if alternative energy regulations are contemplated by the Town.

Such solar and wind turbine requirements should address potential impacts to protect the community, its long-term quality of life, and economic value. Currently the Town is not considering allowing industrial wind turbines or additional transmission lines. However, adequate standards should be put in place to protect the community from any future requests in or near the Town.

√ **Local Solar Energy Recommendation** - Solar panels that create electricity from sunlight can be placed on residential roof-tops, accessory buildings, or installed as free-standing, ground-mounted structures. As solar energy systems may have impacts on adjacent properties or neighborhoods, local solar energy standards should address the following types of installations:

<u>Roof Mounted Panels</u>	<u>Ground Mounted Panels</u>
Consider a roof vertical projection standard	Consider rear yard placement or within side yards if setbacks can be met
Bldg height limits – shouldn’t effect panels	Consider placement directly adjacent to building
Consider setting a maximum roof coverage	Consider setbacks from rear and side lines
	Consider a maximum height standard
	Maximum lot area – proportion of lot size
	Consider screening at the base of ground mounted systems with short fencing pruned vegetation
Shading: some municipalities prohibit new structures and landscaping from shading existing solar energy systems on adjacent lots which depend on exposure to the sun.	
As part of a site plan review project – the review should consider the location, arrangement, size, design and general site compatibility of proposed solar collectors.	

√ **Local Wind Turbine Recommendations** – Wind turbines that create electricity from wind can be constructed for distinct purposes: onsite use (residential, small business, or farm), municipal or commercial. As wind turbines have impacts on adjacent areas, neighborhoods, and the community at large, local turbine standards should address the following types of installations (on the following page):

<u>Private\Small Wind Turbines</u>	<u>Industrial Wind Turbines</u>	<u>Standard transmission lines</u>
Typical height: less than 100 ft.	Typical height: less than 500 ft.	Typical height: 110 ft. or less
Capacity: less than 100 kW	Capacity: less than 5 Megawatts	Capacity: 115 - 230 kV
Power use: for residential, small businesses, or farm use onsite	Power use: commercial for sale to the grid for profit	Use: transmit industrial wind project power to the grid
<u>Private\Small Wind Turbine Standards should address:</u>	<u>Industrial Wind Turbine Standards should address:</u>	<u>Transmission Line Standards should address:</u>
Noise standard at property line	Noise standard at property line and building for both audible and low frequency	Routes set back away from scenic highway corridors
Safety setbacks from roads & buildings	Safety setbacks from roads & buildings	Underground lines preferred by the Town
Compatibility with nearby uses	Compatibility with nearby uses	Use existing corridors
Limit "ice throw" by moving blades	Limit visual impacts in recognized scenic priority areas with adequate setbacks	Prefer underground installation with no visual impact.
	Limit shadow flicker affects, Limit "ice throw" by moving blades	Monopole or wood designs have less visual impact than least preferred steel lattice
Falling tower concern - setbacks	Falling tower concern - setbacks	
	Adequate setbacks from: buildings, off-site property lines, wildlife roost and habitat areas,	Adequate setbacks from: recognized scenic priority areas

Recommended Industrial Wind Standards

The majority of respondents to the 2011 Town of Lyme Wind Survey indicated they are opposed to industrial wind development anywhere within the Town of Lyme. However, should industrial wind development be considered in the future, the survey results shall apply as they appear in the attached appendix.

Zoning Considerations

Town Plan additional recommended zoning considerations:

The existing zoning law has specific use regulations for mobile homes, shopping centers, hotels\motels, mobile home parks, quarries, automobile service stations, junkyards, commercial campgrounds, satellite receivers, recreational vehicles, swimming pools, single family dwellings, RV parks, and cell towers.

- Therefore, the Plan recommends the Town examine inclusion of additional definitions where needed and specific use regulations for the following uses:
 - large retail,
 - small retail,
 - offices,
 - self storage facilities,
 - kennels,
 - multi-family residential,
 - boat storage & repair facilities,
 - marinas,
 - restaurants,
 - night clubs,
 - adult uses,
 - light industrial,
 - solar and wind energy facilities (personal, municipal, and industrial)

- Plan also recommends a consideration of establishing a distinct Hamlet Zoning District (To be applied in Three Mile Bay and perhaps Point Peninsula Village)

- The plan also recommends the Town consider some larger business uses be removed from the AR Zoning District into a Commercial or mixed use zone of some kind to allow a businesses to flourish in certain appropriate areas such as major intersections and perhaps a gateway zone for example.

- The plan also recommends the establishment of the priority character area identified on the Priority Character Areas Map of an overlay district that would provide additional review criteria or guidelines for projects within that portion of the Town.

- Lastly, the plan recommends that home occupations be defined, and a set of guidelines be established to allow the multitude of appropriate home occupations to flourish and to ensure they have little or no impact on neighboring areas and roads.

APPENDIX

REPORT

FOR THE

TOWN OF LYME - TOWN BOARD

**WIND SURVEY OF
RESIDENTS AND PROPERTY OWNERS**

PREPARED BY

**PROFESSOR PAUL G. CARR, PH.D., P.E.
CITIZENS' ENVIRONMENTAL, HEALTH AND SAFETY COMMITTEE**

SEPTEMBER 25, 2011

ABOUT THE CONTRIBUTORS:

Paul G. Carr is an Engineering Professor at Cornell University where he has taught for the last 12 years. Prior to that he was on the faculty at Virginia Tech. His family roots in the Town of Lyme go back over 75 years on Point Salubrious, where he spent his summers since 1952. He has been a resident and property owner in the Town for the last 30 years, where he and his wife now reside.

Dr. Carr holds degrees from Canton College [Associates in Applied Science], Rochester Institute of Technology [Bachelors in Civil Engineering], Cornell University [Masters of Engineering] and Virginia Tech [Doctor of Philosophy in Civil Engineering].

Professor Carr is the former CEO and Chairman of the Watertown engineering firm bearing his name, and has extensive experience in the planning, design and development of major engineering works, and currently conducts research on behavioral patterns in human performance and productivity.

Professor Carr may be reached at pgc3@cornell.edu

DATA AUDIT AND ENTRY VALIDATION:

Michael K. White, a resident and former Town Board Member, randomly generated 80-survey numbers (5% of the total) for an audit that the data entry was correct, which, with one small exception, it was. Based upon the results of the audit it was determined that there was no need to continue beyond the 80 surveys.

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AND
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September 21, 2011

Town of Lyme Town Board
Town Offices
Chaumont, New York 13622

Dear Members of the Board:

Per your request, I have performed an evaluation of the *Wind Survey for Residents and Property Owners* for the Town of Lyme. Mr. Michael White and I have performed a data entry, audit, and validation review to provide a level of assurance that the survey data used in the evaluation reflects that of the survey results, which it does. The analysis that follows provides the results of the survey.

EXECUTIVE SUMMARY

The survey follows a prior survey conducted in the Town of Lyme with similar questions. The questions in this year's survey replicated six of the questions from the prior survey, with minor adjustments to reflect the current inquiry of the Town Board.

As an example from the prior survey, Question 1, sought opinions on industrial wind turbines with possible responses: 1 – In favor; 2 - Not in favor; or, 3 – Need more information. It has been decided by the present Town Board to lead the Survey with a single important question. That Question is 1 on the current survey which asked:

“What is your opinion on industrial wind turbines in the Town of Lyme?”

This question, per the Town Supervisor and the Board, now allowed two answers: 1 - In favor, and 2 – Not in favor. This is an example of how the Board has clarified, yet repeated the same inquiry as established in the Town Planning Board's 2007 survey. That survey underwent rigorous review for the content validity – soliciting the data through questions for which the Planning Board and the Town wanted answers. The same is true of the present Survey.

The Town again, after four years of study, with the public better informed of the benefits and questions surrounding industrial wind turbines, wanted to re-test the public's sentiment. What follows are the responses to those areas of inquiry.

* National Academy of Forensic Engineers
Diplomate - Forensic Engineering

THE SURVEY -

Approximately 5,000 surveys were mailed. Town Supervisor Aubertine oversaw the Survey mailing at volunteer work sessions, where those volunteers utilized several database records to cross-reference and identify potential respondents. The response resulted in an overall return of 1,621 surveys, for inclusion into the study results. As with the first townwide survey conducted in 2007, this is a very high percentage of response.

As before, there are several issues that come into play in the development and application of a survey instrument, which include the survey instrument's *validity* and *reliability*. The first survey, upon which this re-survey is based was determined to be both *valid and reliable*, a conclusion detailed in the first wind survey, which remains in the Town Records. Those elements were detailed in that document, in the section written by the primary author – and explained.

A second issue has arisen through numerous informal inquiries: “is the response to the current survey big enough to be indicative of the wishes of the community?” In the analysis of Question 1, it will be demonstrated that the response rate is dramatically larger than required to have a reliable indication of the wishes of the community.

Under normal circumstances, the determination of the survey size is a task performed before the survey is distributed. This is done to inform a researcher of the number of properly completed surveys that are necessary to have a particular confidence that the response number is adequate to provide accurate results. This is Hypothesis Testing, and you establish what is referred to as the Power of the Survey. Power analysis can be used to calculate the minimum sample size required for a certain level of confidence of accuracy of responses.

If this survey had been conducted under a Hypothesis testing inquiry, the minimum number of responses – or the Power of the Survey would be applicable. In that case, when using a target significance criteria of 95% [0.05; or 1 in 20], and a population size of 5,000 [maximum], with an acceptable margin of error of 5%, and a distribution skew between 50-50 and one third - two thirds; the minimum sample size would be estimated to be approximately 320 to 360.

In terms of the numbers established above, the sample size n is given by the following equations, where, N is the population size, r is the fraction of responses that you are interested in, and $Z(c/100)$ is the critical value for the confidence level c .

$$x = Z(c/100)^2 r(100-r)$$

$$n = N x / ((N-1)E^2 + x)$$

Given the high return rate, it is not unreasonable to include a margin of error as an indication of the accuracy of the resulting statistics.

$$\text{Margin of Error} = z_c \sqrt{\frac{p(1-p)}{n}}$$

1.96 is the correct number to use for z_c when the level of confidence $c = 95\%$. With n (lower case) as the sample size, and p is the percentage of the responses that favor a particular outcome. 50% or 0.5 leads to the largest margin of error [conservative assessment] and using it in the calculation yields a margin of error of 0.024, a finite population correction factor (0.8231 by calculation) can be reasonably applied to reduce the margin of error to 0.0201 or about 2%.

A caution to note is that 2% applies only to percentages that refer to the entire sample of 1621; or, Question No. 1. The percentages about subgroups sub-groups (such as the percentage of people for or against industrial wind towers, in a sub-area, D for example, with a smaller response number than the full 1,621) the margin of error would vary upwards. In the Area D subgroup “stand alone” with 124 responses, the margin of error would be 8.7%.

As such, the Margin of Error has been computed for each Area, and is presented in the following chart. This is simply offered as a guide when one looks at the results, within areas. For example, there is one result presented in the study that shows an anomaly from Area G. However, since the sample size is so small, with only 21 responses, the Margin of Error is 21.34%, too high for the stand-alone results to be considered reliable.

Area	Responses	Margin of Error
A. Point Peninsula	597	3.76%
B. Three Mille Pt & Pt. Salubrious	462	4.34%
C. Hamlet of Three Mille Bay	104	9.51%
D. East of Route 12 E North of River	124	8.69%
E. Chaumont River	93	10.07%
F. Case Road Area	36	16.28%
G. 12 E East of Chaumont	21	21.34%
1 to 5. Village of Chaumont	152	7.83%
No Identification of Area	32	17.27%
Overall	1621	2.00%

Figure 1

The computation, and validation using the Margin of Error, with a result of 2.00%, applies to the core question of the survey, Question number 1, with a simple consensus based, up or down vote on turbines in the Town of Lyme.

The independent audit of the input data also revealed that of the random survey questions selected, and 2,240 possible input points checked, there was only one questionable response – a respondent who answered Question 1 – No Turbines; then responded in favor of turbines in Area F, without this response recorded. Thus, the audit concluded an input error rate of less than 0.045%, in essence, no error whatsoever. There is no reason to question the data upon which the analysis is based.

The following sections of this report provide the summary of this Survey. The Report begins with Question 5, detailing the Areas and numbers of the respondents. The Report then follows each of the other questions in turn. It concludes with an overall Summary and Conclusions section. The raw data is available for further inquiry into any individual question and response pattern.

THE SURVEY RESULTS

Common to every Question in the Survey is reference to the Town Survey Area Map. The map below is a copy of that which was included as part of the Survey and may be used as reference in the study of this Report.

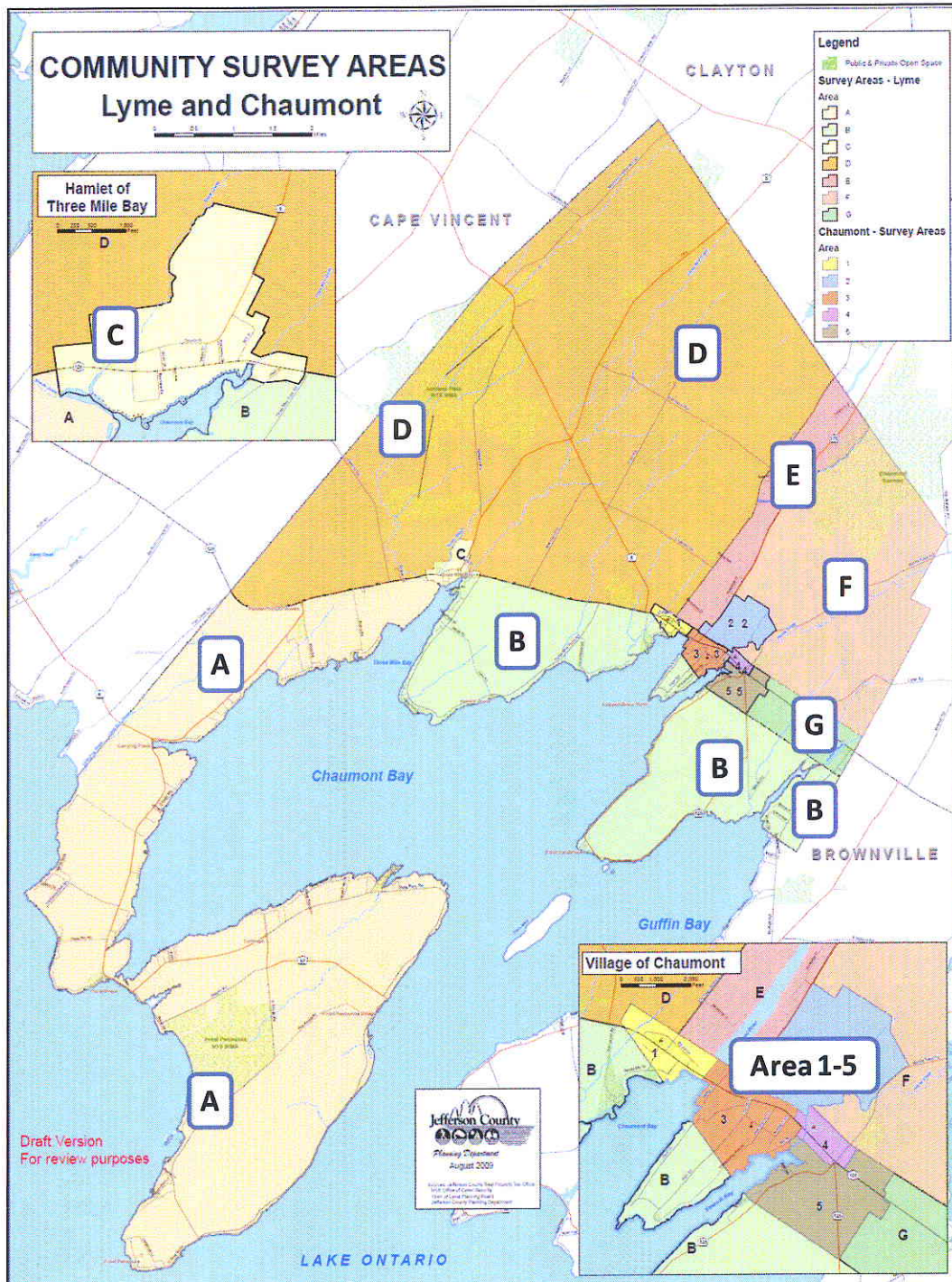
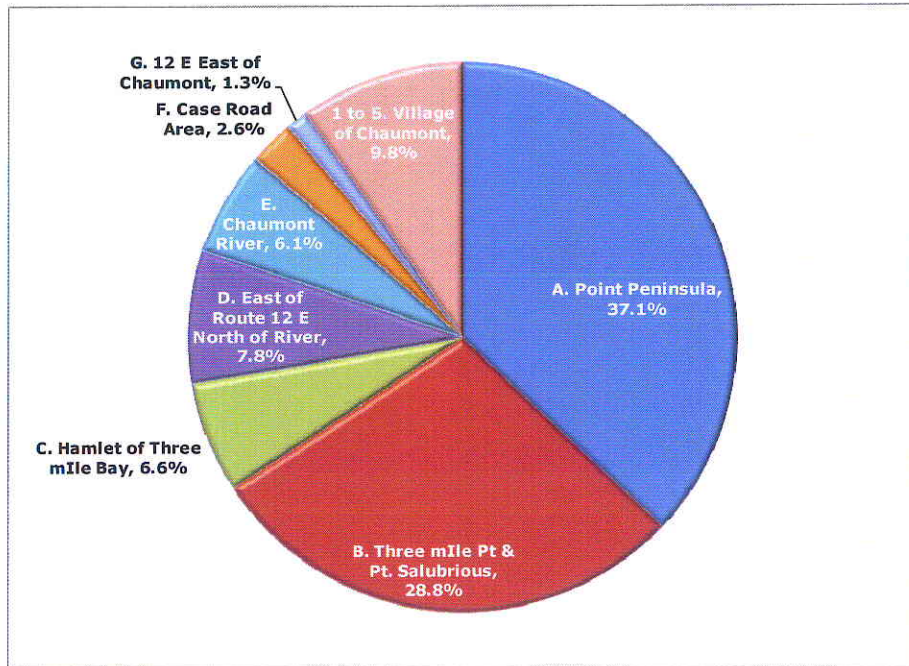


Figure 2 Survey Respondent Area Map

QUESTION 5 – FROM WHICH SURVEY AREA ARE YOU RESPONDING?

To illustrate the response rate, the pie chart shows the percentage of the overall sample, by Area of response.



Area	Responses
A. Point Peninsula	597
B. Three Mile Pt & Pt. Salubrious	462
C. Hamlet of Three Mile Bay	104
D. East of Route 12 E North of River	124
E. Chaumont River	93
F. Case Road Area	36
G. 12 E East of Chaumont	21
1 to 5. Village of Chaumont	152
No Identification of Area	32
Overall	1621

Figure 3 Overall Respondent Locations, Numbers and Percentage by Area

The descriptors for the Areas A – G, plus 1-5 [Village of Chaumont] will be used throughout the report, they coincide with the survey and the map presented on the previous page.

QUESTION 1: WHAT IS YOUR OPINION OF INDUSTRIAL WIND TURBINES IN THE TOWN OF LYME?

This question seeks the overall opinion of the respondent on siting Industrial Wind Turbines within the Town of Lyme. The respondents’ answers were scored “In Favor” or “Not in Favor” - with the overall results for the Town as shown in the following figure. The responses

included: 566 In Favor; 1,041 Not in Favor; while 14 completed responses to other questions, but did not answer Question 1.

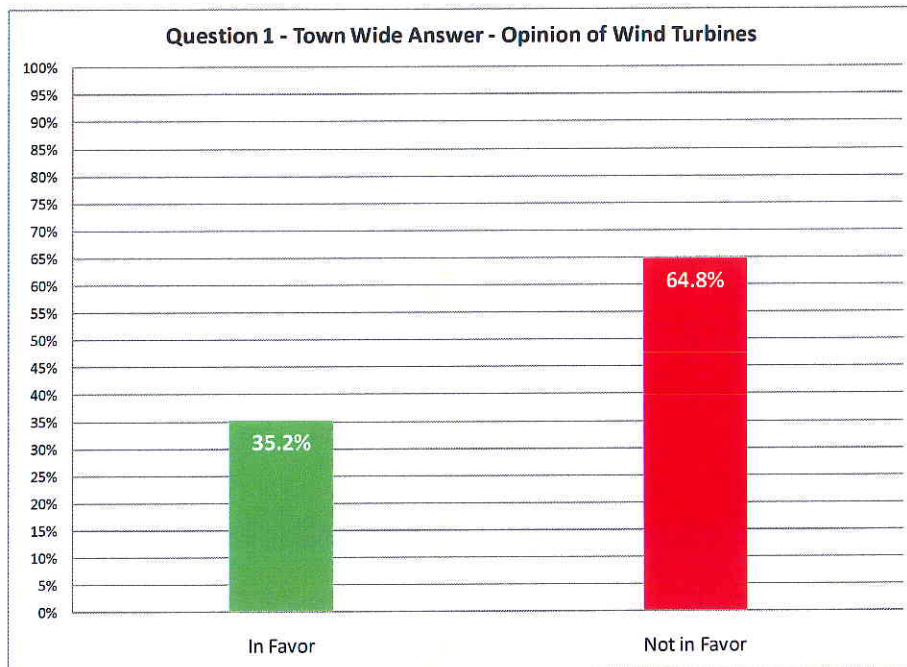


Figure 4 Overall Response to Industrial Wind Turbines Acceptability

The data for those who answered Question 1 is shown below, with 1,607 responses.

Overall Survey	In Favor	566	35.2%
	Not In Favor	1,041	64.8%
	Total	1,607	100.0%

Figure 5 Industrial Wind Turbines

The overall response ratio to Question 1, including those who did not answer that question is shown below, demonstrating no significant impact in the results.

Overall Survey	In Favor	566	34.9%
	Not In Favor	1,041	64.2%
	No Opinion	14	0.9%
		1,621	100.0%

Figure 6 Overall Response to Question 1

A. SAMPLE SIZE ADEQUACY EXAMPLE

The question has arisen, “is a response of 1,621 adequate?” Earlier in this study, it is reported that given the population size, a response rate of ~ 320 would provide reliable results that accurately reflected the overall response. Thus, to demonstrate this, with a response of ~1,600, the survey was broken into five [5] categories to validate the adequacy of a sample of

approximately 320. In other words, if a random selection of 320 potential respondents had been selected for the survey, would the results be considered reliable? The answer is yes.

Question No. 1 of the survey underwent five assessments, individually analyzing responses numbered from 1 to 1,000; 1001 to 2000; etc. with approximately 320 in each category. The results follow. A caution is that this breakdown is from those who answered the survey, instead of a random selection of the 5,000 potential respondents, but is offered nevertheless as a demonstration only, that the answers from any randomly selected group of ~300 will attain results similar to that of the full 1,621. 320 survey responses provide the answer.

As can be seen below, the data accounting for approximately 1/5th of the total responses received provides the same results. Each group of responses, ranging in counts of between 292 to 343, report a 1/3 to 2/3rd “in favor” versus “opposed” ratio. The overall response to the survey of 1,621 provides the Board with results that reflect the sentiments of the community.

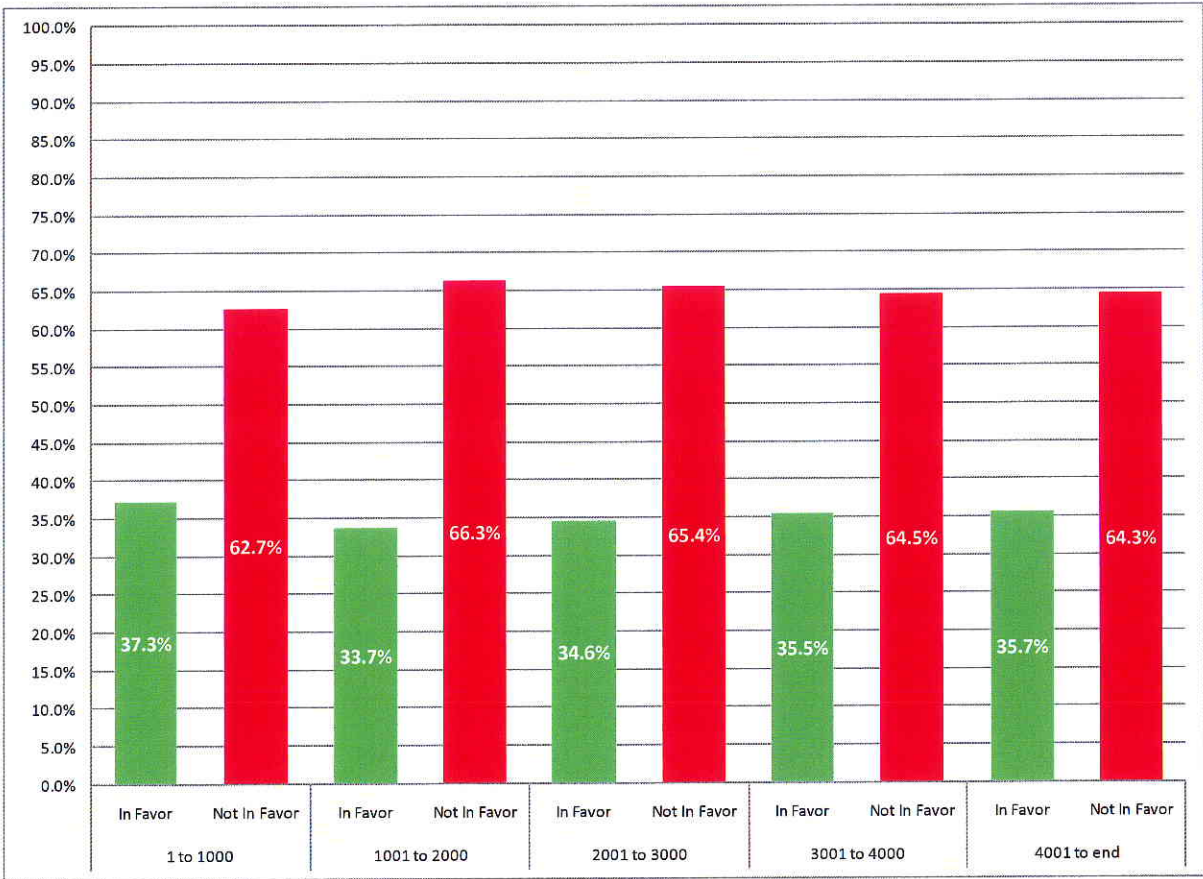


Figure 7 Sample Results Five Groups

Surveys	1 to 1000		1001 to 2000		2001 to 3000		3001 to 4000		4001 to end	
	In Favor	Not In Favor	In Favor	Not In Favor	In Favor	Not In Favor	In Favor	Not In Favor	In Favor	Not In Favor
Percentage	37.3%	62.7%	33.7%	66.3%	34.6%	65.4%	35.5%	64.5%	35.7%	64.3%
Number	129	217	115	226	101	191	119	216	106	191
Total Number	346		341		292		335		297	

Figure 8 Survey Evaluated with 1/5th Response Breakdown

B. RESPONSE BY AREA

The following figure shows the response by Area, beginning with Area A, and proceeding through the surveys that indicated No Identification of Area. Recalling the Margin of Error, only areas A and B have a sample size large enough to provide stand-alone results meeting the 5% maximum – even though an indication from the other areas is presented.

Area	Responses	In favor of Turbines		No Opinion	Margin of Error
		Yes	No		
A. Point Peninsula	597	25.3%	74.2%	0.5%	3.76%
B. Three Mlle Pt & Pt. Salubrious	462	26.2%	73.6%	0.2%	4.34%
C. Hamlet of Three Mlle Bay	104	51.9%	44.2%	3.8%	9.51%
D. East of Route 12 E North of River	124	58.9%	41.1%	0.0%	8.69%
E. Chaumont River	93	39.8%	60.2%	0.0%	10.07%
F. Case Road Area	36	72.2%	25.0%	2.8%	16.28%
G. 12 E East of Chaumont	21	81.0%	19.0%	0.0%	21.34%
1 to 5. Village of Chaumont	152	54.6%	43.4%	2.0%	7.83%
No Identification of Area	32	12.5%	81.3%	6.3%	17.27%
Overall	1621	34.92%	64.22%	0.86%	2.00%
Overall with an Opinion	1607	35.22%	64.78%		

Figure 9 Question 1 Response By Area

QUESTION 2: IF WIND TURBINES WERE TO BE ALLOWED IN THE TOWN OF LYME, WHERE DO YOU FEEL THEY SHOULD BE PLACED?

This question seeks the opinion of the respondents as to where they believe wind turbines, if allowed, should be located within the Town of Lyme. The Town Board has previously promised the Town that no turbines would be considered west of Route 12E. As such, the Town sought responses as to the suitability of turbines within Area D and/or Area F. In addition, the respondents were able to state that nowhere in the Town is suitable for wind turbines. The respondents were allowed to provide multiple answers to this question [i.e. they could choose Area D, or Area F, or both Areas D and F].

There are a number of ways to look at this response. Some respondents who were not in favor of turbines did identify where [if they were to be in the Town of Lyme] turbines should be located. In evaluating this response, it is found that 57.9% of the respondents want turbines “*Nowhere in the Town*”. Only 35.3% of the respondents are in favor turbines in Area D, while 64.7% are opposed. When we consider the responses to Area F, there are 23.4% “in favor” of locating turbines there, while 76.6% are opposed to turbines located in F.

Area D	Area F	Nowhere
35.3%	23.4%	57.9%

Figure 10

The response to this Question is presented in the following chart. Clearly, the results favor turbines in neither Area D nor F.

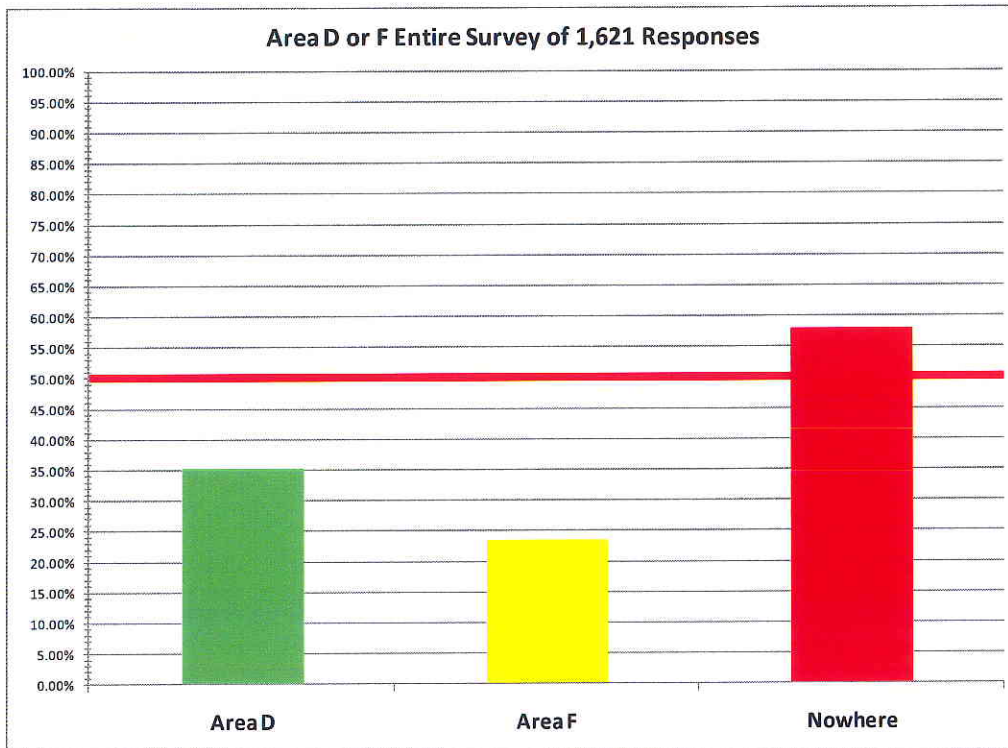


Figure 11 Opinion of Acceptability of Turbines in Area D or F

It would not be unreasonable to ask the question, what is the opinion of the respondents, excluding the waterfront Areas of A and B – since these are Areas that are not being considered for turbines. Considering only the responses of those in the target area for turbines – East of 12E, *is there a widespread support for turbines in either of these Areas?*

There are several reasons for looking at this. First, these are the Areas targeted for consideration. Secondly, by collapsing the data to include all of these remaining areas [excluding A, B and no ID] the sample size is large enough to provide a Margin of Error of 4.03%, better than the 5% significance level, thus providing confidence in the results.

This allows the Board to test whether those living in close proximity wish to have turbines in Area D or F.

The following chart presents the results considering only the respondents East of 12 E [in other words excluding Areas A and B, and those who provided no identification of their Area].

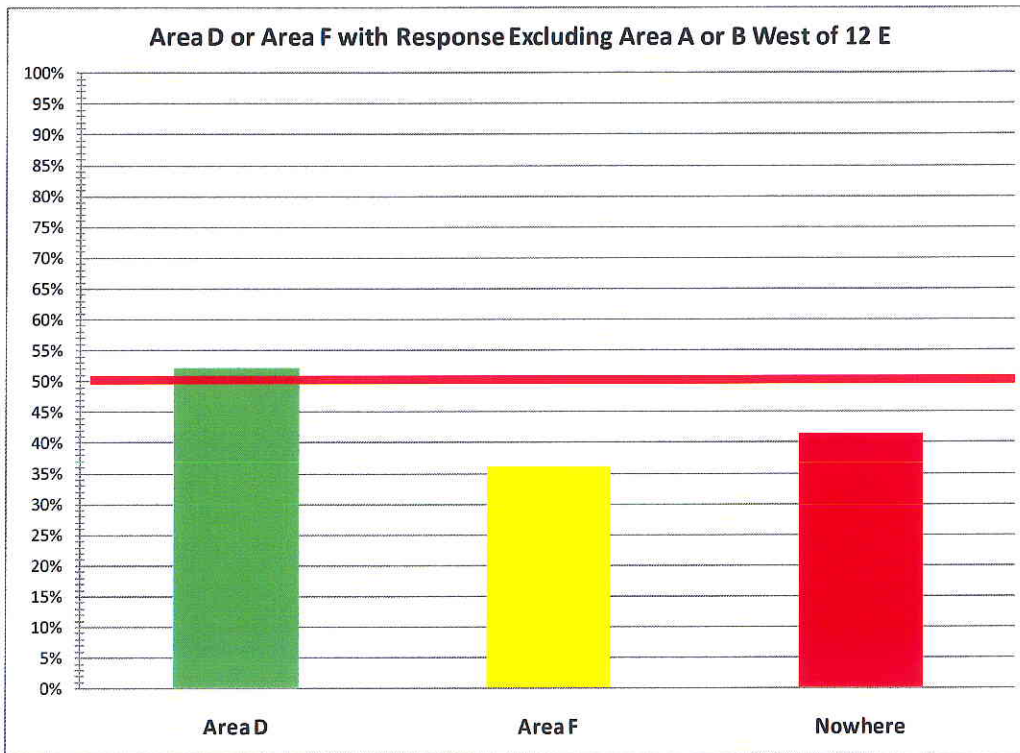


Figure 12 Percentage “In Favor” of Turbines in Area D [Green] and Area F [Yellow]

	Area D	Area F	Nowhere
Excluding Area A, B & no ID	52.08%	36.04%	41.5%

Figure 13 Support for Area D or F Excluding A and B

Even under these subdivided conditions, there is only minor support for Area D, with 52.08% in favor and 47.9% in opposition to turbines.

There is no support for turbines in Area F – with support at only 36.04%.

In essence, the response to this Question is that 57.7% of the people object to turbines anywhere within the Town. 64.6% of the respondents oppose Turbines in Area D, and 76.6% of the respondents oppose turbines in Area F.

QUESTION 3 AND 4: SETBACKS FROM THE WATERFRONT AND POPULATION CENTERS

These questions ask the respondents to provide their opinion on the setbacks that would be acceptable to keep turbines away from the waterfront and population centers.

These questions were included in the 2011 Survey, which allows a comparison with the results of the 2007 Survey. In the prior Survey, the question stated the distances, and as a final choice, it stated “nowhere near...” without a distance, which was interpreted in that Report as greater than 4,500 feet. [Caution, this is offered as a rough comparison only, since the population was different in the 2007 survey from that of the 2011 survey].

The objection from certain members of the community had been that they held an opinion that “nowhere near...” meant “less than” the closest distance of 1,500 feet, not “greater than” the greatest distance of 4,500 feet. The inquiry of this topic is repeated in the 2011 Survey to clarify the prior results and inform the Board as to the Setbacks desired by the respondents.

The response reported in 2007 survey was that 63% wanted greater than 4,500 from the waterfront, while 68% wanted greater than 4,500 feet from the population centers.

Setbacks from Waterfront			Setbacks from Population Centers		
177	1500 feet	20.61%	148	1,500 feet	17.25%
136	3000 feet	15.83%	118	3,000 feet	13.75%
67	4500 feet	7.80%	97	4,500 feet	11.31%
479	Not Near	55.76%	495	> 4,500 feet	57.69%
859		100.00%	858		100.00%

Figure 14 2007 Survey Results for Setbacks from Waterfront and Population Centers

The 2011 Survey found similar, yet somewhat stronger results, with 71.4% in favor of at least 4,500 feet setbacks from the waterfront; and 72.4% in favor of at least 4,500 feet from the population centers. The respondents want, as a condition of turbines being considered for the Town, setbacks of greater than 4,500 feet from the waterfront of Lake Ontario and the Chaumont River, as well as 4,500 from the border of both the hamlet of Three Mile Bay and the Village of Chaumont.

Setback from Water			Combined	71.4%	Setback from Populations			Combined	72.4%
<1500	>1500	>3000	>4500	Nowhere	<1500	>1500	>3000	>4500	Nowhere
9.6%	12.3%	6.7%	11.4%	60.0%	8.8%	10.7%	8.1%	12.3%	60.1%

Figure 15 2011 Survey Results for Setbacks from Waterfront and Population Centers

As with the overall Survey results of 64% opposed to turbines in the Town, this Question reflects that approximately 60% of respondents are opposed to the presence of turbines, regardless of setbacks.

QUESTION 6 WHAT NOISE INCREASE WOULD YOU BE WILLING TO ACCEPT FROM AN INDUSTRIAL WIND PROJECT?

As with the 2007 Survey, this present survey re-tests the question that recognizes that a certain noise from the turbines will be generated. Through the use of the excerpt from the New York State guidelines for “Assessing and Mitigating Noise Impact” the Town again asks the respondents to identify the sound level increase that would be acceptable with the installation and operation of wind turbines in the Town of Lyme.

Certain members of the community had suggested the 2007 survey question was leading, in that it included an additional statement drafted by the Planning Board. It was believed this statement may have skewed the results, therefore the Question is repeated in the 2011 Survey, without information beyond that which is presented in the New York State guideline document.

It was reported in the 2007 Report that the “question received universal support for a noise limit of less than a 5 decibel increase over ambient sound levels” – this result is repeated in the 2011 Survey.

The overall townwide results in 2011 are 83.0% of the respondents either wrote in “no sound increase is acceptable” or selected the “less than 5 decibel” sound increase. No area of the Town has a majority that would accept any sound increase over 5-dBA above existing background levels.

Area	<5 dBA	5 to 10	10 to 15	15 to 20	>20
A. Point Peninsula	90.7%	4.8%	1.6%	0.9%	2.0%
B. Three Mile Pt & Pt. Salubrious	87.2%	8.0%	2.5%	0.5%	1.8%
C. Hamlet of Three Mile Bay	72.5%	14.3%	9.9%	0.0%	3.3%
D. East of Route 12 E North of River	59.5%	15.5%	10.3%	7.8%	6.9%
E. Chaumont River	80.5%	5.7%	3.4%	0.0%	10.3%
F. Case Road Area	57.6%	18.2%	6.1%	6.1%	12.1%
G. 12 E East of Chaumont	66.7%	16.7%	16.7%	0.0%	0.0%
1 to 5. Village of Chaumont	72.2%	15.3%	6.3%	0.7%	5.6%
No Identification of Area	96.2%	0.0%	3.8%	0.0%	0.0%
Overall	83.0%	8.5%	3.9%	1.3%	3.4%

Figure 16 2011 Survey Results for the Acceptable Sound Increase

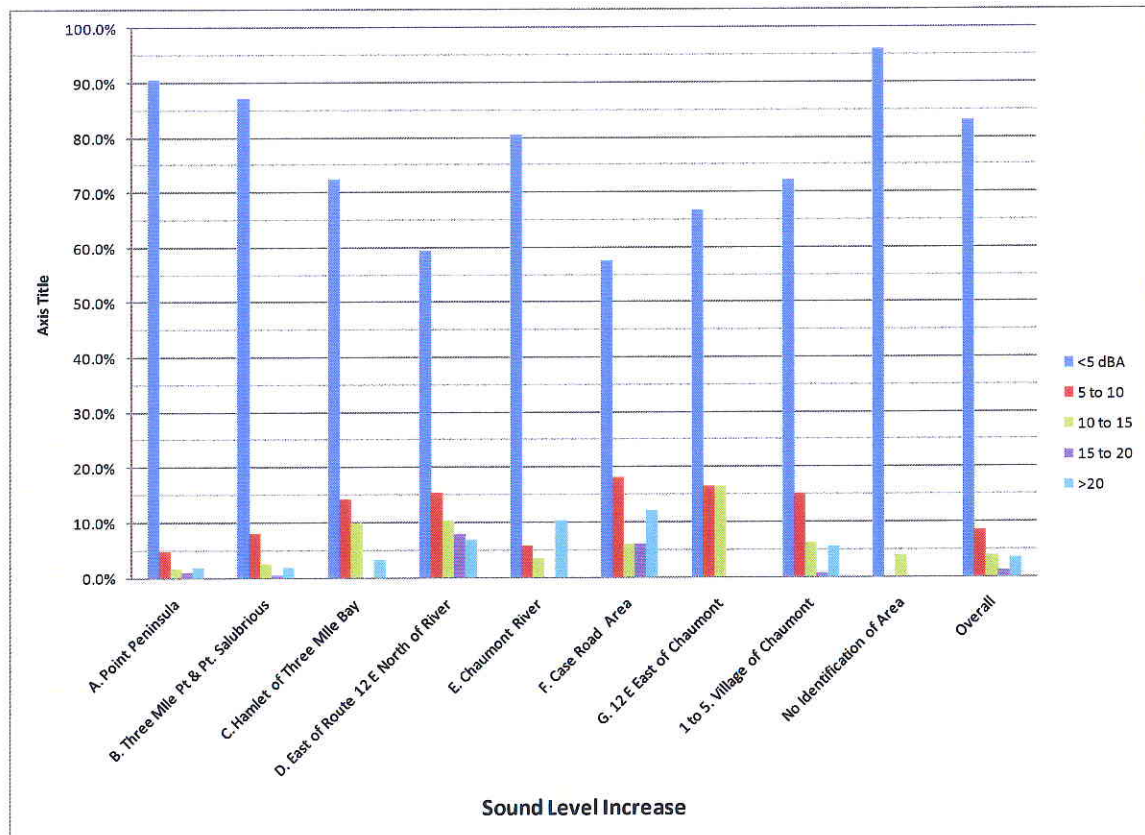


Figure 17 Response to Noise Limitation above Existing by Area

SUMMARY and CONCLUSIONS

It appears that the community is “*not in favor*” of Industrial Wind Turbines within the Town of Lyme [Q1 = 64.22%], yet there is a group that is “*in favor*” [34.92%], while one in one hundred neither supported nor opposed turbines [0.86%] leaving the answer blank.

Q2 inquired as to where the turbines should be located if they were to be in Lyme. The majority of respondents *opposed wind turbine development* in either Area D or Area F. For those who responded from Areas in close proximity to the targeted Area, there is no clear majority of respondents *in favor of wind turbines* in F, and only minor support for Area D.

Q3 and Q4 sought input on setbacks from the waterfront and population centers, with the response being that 71.4% and 72.4% of the respondents are *opposed to turbines* located within 4,500 feet from the water, and 4,500 feet from the population center boundaries, respectively. The majority reported that the turbines should not be within the Town at all [60%] while 11.4% and 12.3% opine they must be greater than 4,500 feet away if they are to be found in the Town. Less than 10% believe they should be allowed closer than 1,500 feet from those boundaries.

Q6 was the question on noise limits on the sound generated from the Industrial Wind Turbines. The overwhelming answer to the survey question from the townwide respondents was that the sound levels should be kept to less than 5 decibels above ambient.

This response, regardless of the Area, answered that all respondents want protection from sound increases.

Even when the sample is broken between those who are “*in favor*” of wind turbines, versus those who are “*opposed*”, considering only those “*in favor*” - the noise limit increase of less than 5 dBA above ambient has a majority who favor of this limit.

CONCLUSIONS

The Survey demonstrates that unlike the 2007 Survey where 52.2% of the respondents were in favor of turbines, only 34.9% of the current respondents are now in favor of turbines. This drop in support may be due to the increased education and debate which has taken place over the last four years since the prior survey. No doubt, the “*moratorium*” put in place by the Board to investigate, study and allow the public to become educated on the appropriateness of turbines in the community has afforded the time to do a second survey.

It is also clear that in all other aspects [i.e. setbacks, sound limits etc.] the results of the current 2011 Survey are consistent with the prior Survey. The respondents want the protections of both setbacks from waterfront and population centers. The majority of the community is in favor of greater than 4,500 feet setbacks from the waterfront, the Chaumont River and the population centers.

In addition, “*the respondents overwhelmingly seek protection from noise intrusion,*” whether they are in a turbine designated Area or not [Area D or F]. 31.1% of the respondents

report that no noise level increase is acceptable, while 51.9% respond that the limit of less than 5 decibels above ambient should be the maximum limit. Overall, 83.0% of the respondents want protection against noise intrusion of greater than 5-dBA, and the majority of those from the target Areas also want this protection [58.4%].

At the outset, it seemed to be the position of the Board that if the results indicated a majority of respondents were against turbines within the Town, an outright ban would be enacted. However, regardless of such action, the results of this Survey are clear – and that is:

1. The respondents to the Survey are against the placement of industrial winds turbines within the Town of Lyme by an approximately 2 to 1 margin.
2. There is no majority support for turbines in either Area D or Area F, with 64.7% *opposed to Area D, and 76.6% opposed to Area F.*
3. The overall response is that setbacks from the waterfront and the population centers must be at a minimum of 4,500 feet, if allowed at all. *The majority [60%] are opposed to turbines being located anywhere within the Town.*
4. A strict noise ordinance, restricting sound level increases to less than 5 decibels above ambient is required. This limit is the response not only of those who are *opposed* to wind turbines, but also a majority of those who responded that they were *in favor* of turbines. The mandate for this protection is unequivocal.

In the event that an outright ban of industrial wind turbines is not pursued, it is clear that strict setbacks and strict sound limits must be considered for the Town if the Board is to respect the results of the 2011 Survey.

As questions arise, I would be pleased to try to provide answers.

Respectfully submitted,

A handwritten signature in black ink that reads "Paul G Carr". The signature is written in a cursive, slightly slanted style.

Paul G. Carr, Ph.D., P.E.