

NANTUCKET CARRYING CAPACITY

AN INDEPENDENT PHASE 1 ASSESSMENT

**What the available data tells us, where the island
has already exceeded capacity, and what limits
the Town should adopt now**

BELOW DECK



— NANTUCKET —

August 2026

Carrying Capacity is defined by the World Tourism Organization as "The maximum number of people that may visit a tourist destination at the same time, without causing destruction of the physical, economic, socio-cultural environment and an unacceptable decrease in the quality of visitors' satisfaction". Whereas Middleton and Hawkins

Chamberlain (1997) define it as "the level of human activity an area can accommodate without the area deteriorating, the resident community being adversely affected or the quality of visitors experience declining."

What both these definitions pick up on is that the carrying capacity is the point at which a destination or attraction starts experiencing adverse effects as a result of the number of visitors.

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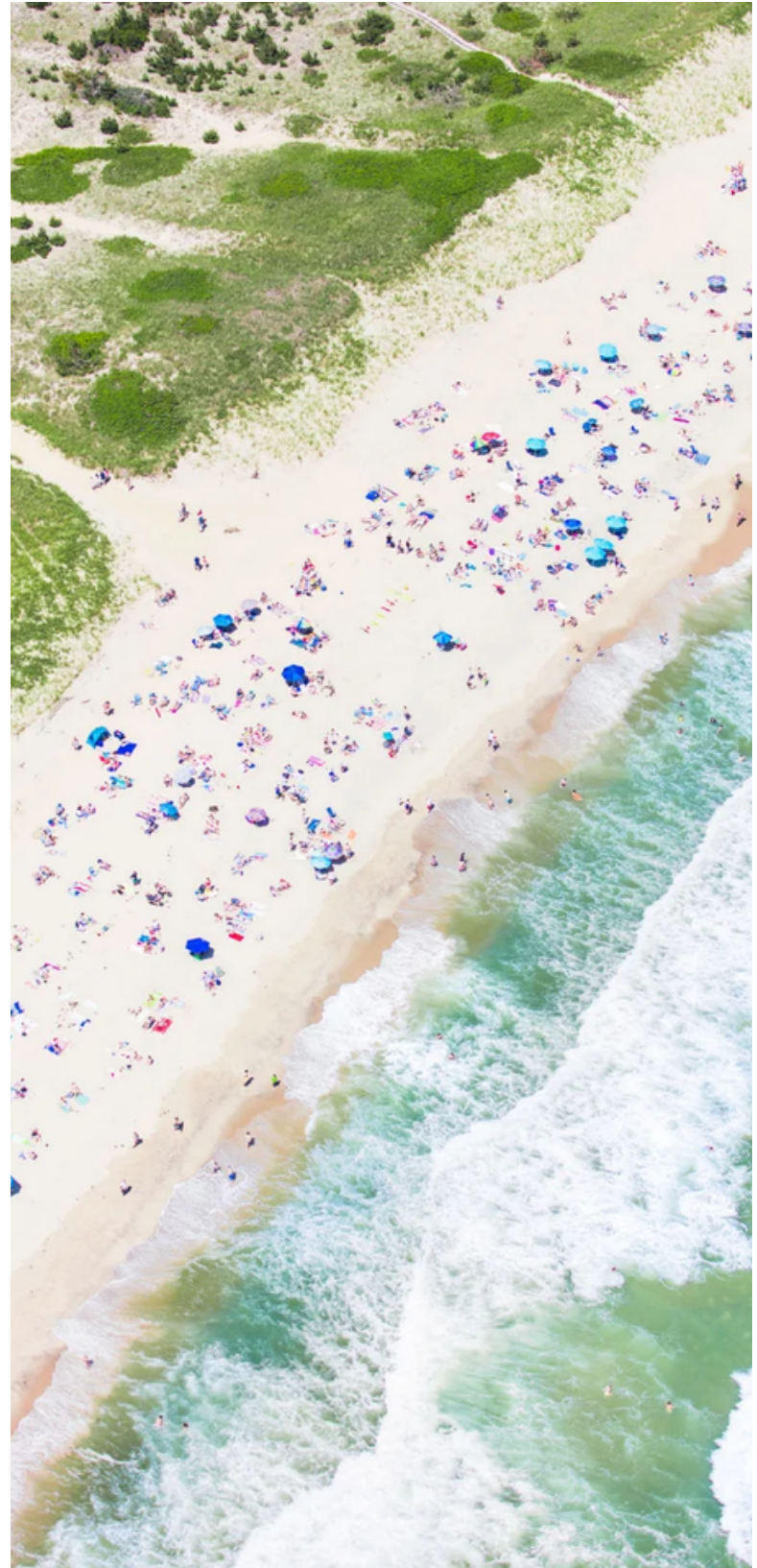
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Gray Malin



On Sunday, August 9, *Below Deck Nantucket* published an opinion arguing that Nantucket's capacity crisis was not simply something that happened to the island, but the cumulative result of years of zoning, development and infrastructure decisions made without first establishing how much growth Nantucket could reasonably sustain. **Nantucket Carrying Capacity: An Independent Phase I Assessment** examines the available data and addresses the question that should have guided those decisions all along: How much growth can Nantucket actually support?

Nantucket does not have one carrying-capacity number. It has several overlapping capacities: road capacity, water capacity, wastewater capacity, school capacity, public-safety capacity, solid-waste capacity, environmental capacity and, finally, social capacity — the point at which ordinary movement, access and daily life become persistently unreliable.

The island's practical capacity is determined by whichever of those systems reaches its limit first. On Nantucket, the evidence points overwhelmingly to one conclusion: **Transportation and Mid-Island circulation have already become the island's binding constraints.**

That doesn't mean Nantucket will run out of drinking water tomorrow, that no additional year-round housing can be built or that every part of the island is physically full. It means the Town should no longer approve development based solely on whether an individual property can accommodate another structure, septic system, sewer connection or parking space. The relevant question is whether the island can absorb the **combined demand** generated by that development.

This is a first-stage, public-data assessment. It uses Town planning documents, transportation studies, operating reports and state standards. It does not replace an updated traffic model, engineering analysis or review of utility operating records. In several important areas, the Town does not publicly provide enough current operational data to calculate a defensible final number. That absence is itself one of the study's most important findings.

The same problem applies to population. Official planning documents continue to rely on Census-era baselines that appear to understate the number of people actually living on Nantucket year-round. For purposes of this assessment, **more than 20,000 year-round residents should be treated as the current working reality**, while the exact figure should be formally established by the Town.

No increase above a verified FY2025 baseline; reduce construction and demolition waste by 25% in five years. These are interim planning limits, not claims about the maximum number of people who can physically occupy Nantucket. Their purpose is to stop the Town from adding demand while it continues studying systems that already show signs of failure.

Don Costanzo

Publisher, Below Deck Nantucket



How Many Year-Round Residents Can Nantucket Support?

The Town's transportation plan uses a 2020 year-round population of 14,170 and forecasts an increase to 15,876 by 2030, 17,461 by 2040 and 19,250 by 2050. Those figures are useful as a record of the Town's planning assumptions, but they no longer appear to describe the island Nantucket is actually serving.

By 2026, it is broadly accepted locally that Nantucket's true year-round population **exceeds 20,000 people**. The exact number remains difficult to establish because Census counts, voter rolls, utility accounts, school enrollment, housing occupancy and other administrative measures capture different portions of the population. But for carrying-capacity purposes, the important fact is that the island is almost certainly supporting substantially more full-time residents than the official baseline used in major Town planning documents.

That changes the analysis.

A population level above 20,000 would mean Nantucket has already exceeded the Town transportation plan's **2050 projection of 19,250 residents** roughly a quarter-century early. The question is therefore no longer whether Nantucket should plan for growth from 14,000 toward 16,000. It's how an island already supporting more than 20,000 year-round residents should manage additional growth when several of its most important systems are already under visible strain.

The Town's own transportation planning acknowledges that population growth and increased density produce greater delays at key intersections, particularly within and approaching the Town Overlay District. Public-school enrollment reached 1,719 in October 2024, and the School Department has reported space pressure at Nantucket High School. A new middle school is already contemplated in the Town's capital planning. Fire and emergency operations are also expanding: Nantucket Fire Department handled 3,381 emergency calls in FY2025 while continuing to add staffing and paramedic capability.

None of those measures establishes a precise maximum year-round population. Together, however, they make one conclusion unavoidable: **Nantucket should not continue using a 14,000-person planning baseline when the population it is actually serving is already above 20,000.**



FINDING

The Town should immediately adopt **20,000-plus residents as its working year-round population baseline** until a comprehensive population estimate establishes a more precise number. That's not a recommended growth target or a declaration that 20,000 is sustainable, but a recognition of present conditions.

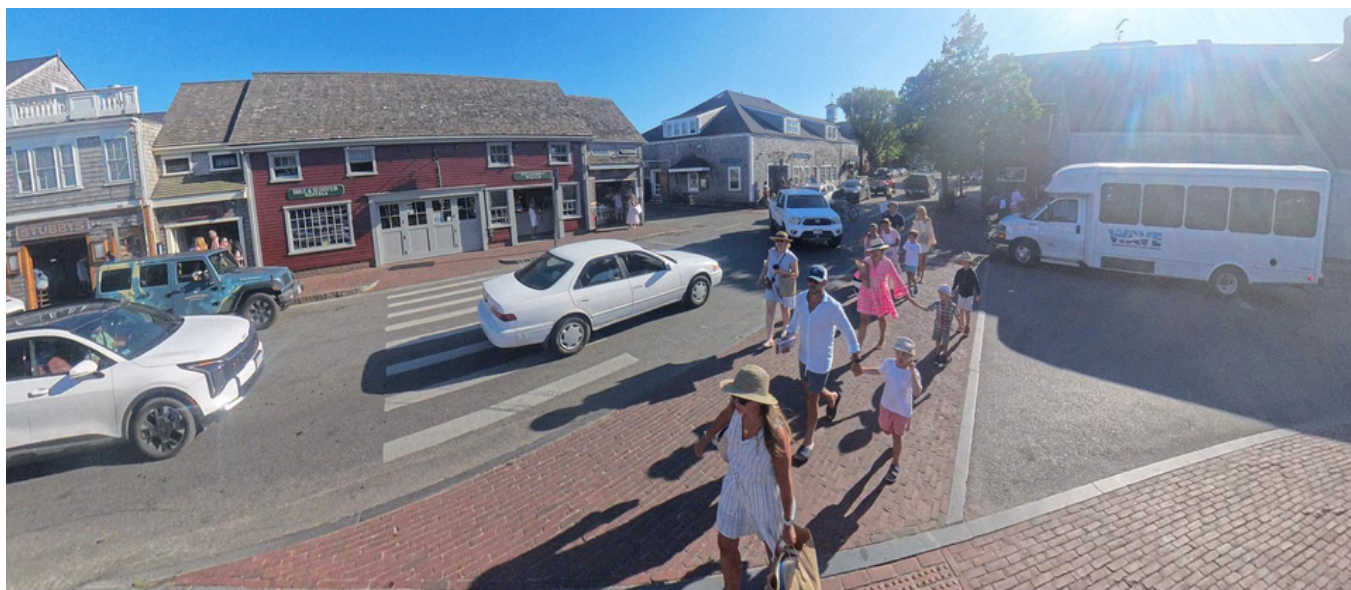
Because the island has already passed the population levels assumed in long-range planning, Nantucket should be considered in a **year-round population red-capacity condition now**. Additional population-generating development should not be treated as automatically absorbable.

Before permitting substantial net new demand, the Town should demonstrate that it has:

- Established a credible annual estimate of the actual year-round population.
- Completed or fully funded necessary school-capacity improvements.
- Demonstrated adequate fire, EMS and police staffing and response performance.
- Established reliable water and wastewater reserves under peak conditions.
- Reduced or offset additional peak vehicle demand.
- Shown that new development will not worsen already-constrained Mid-Island circulation.

The practical policy should therefore be **no assumed year-round population headroom**. New housing can and should still be created for Nantucket's existing workforce, overcrowded households and essential employees, but the Town should distinguish between housing that reorganizes or stabilizes the population already here and development that produces additional population, vehicles and infrastructure demand.

Nantucket should not respond to a carrying-capacity crisis by shutting out year-round workers and families. It should stop pretending that additional growth can simply be absorbed into systems that were planned for a population the island has already surpassed.





How Many Seasonal Residents and Visitors Can the Island Support?

Nantucket's summer population is substantially more difficult to measure than its year-round population. Census figures do not capture seasonal homeowners, short-term renters, hotel guests, day-trippers, seasonal employees, boaters and others who may be physically present on the island at the same time.

The Town's effective-population work is therefore more useful than ordinary Census data because it attempts to estimate the number of people actually present. Its 2021 analysis indicated that average weekday population approached approximately 44,000 in July and remained above 40,000 in August.

Those figures, however, should not be mistaken for a reliable estimate of Nantucket's maximum summer population today.

By 2026, estimates commonly used in public discussion place Nantucket's peak summer population somewhere between **60,000 and 80,000 people**, depending on the day, the measurement used and whether visitors arriving by ferry, private boat and aircraft are fully captured. The Town does not maintain a sufficiently precise real-time population count to establish exactly how many people are present on the island on its busiest days. That uncertainty is itself a carrying-capacity problem.

Continued





What can be established is that Nantucket is routinely operating at population levels substantially above those contemplated in earlier planning studies.

The earlier carrying-capacity analysis estimated that at approximately **29,700 vehicles and a summer population above 49,200**, eight of ten monitored intersections would fail. That did not identify 49,200 as a desirable population. It identified a level at which widespread transportation failure was expected.

If Nantucket is now reaching 60,000, 70,000 or even 80,000 people during portions of the summer, the island is not approaching that historical failure threshold. **It has exceeded it.**

That conclusion is consistent with what residents experience during peak season: recurring congestion through Mid-Island, long queues at major intersections, difficulty entering heavily traveled roads, pressure on parking and public facilities, increased emergency-service demand, freight and delivery conflicts, and a transportation network with very little ability to absorb an accident, road closure, ferry surge or other disruption.

A responsible carrying-capacity policy therefore cannot begin by selecting an arbitrary population ceiling somewhere above present conditions. Nor can it continue relying on a decade-old assumption that a summer population in the 40,000s represents Nantucket's current reality.

The first obligation is to determine how many people are actually here.

FINDING

Nantucket should be considered in a summer population red-capacity condition now.

The available evidence does not support establishing a precise sustainable summer-population ceiling until the Town develops a reliable method of measuring the population physically present on the island and correlates that population with traffic, water demand, wastewater flows, emergency calls, solid waste and other infrastructure loads.

Until that work is completed, the Town should use three interim policy benchmarks:

Preferred operating range: below 50,000

Earlier transportation modeling indicates that widespread intersection failure was already expected at approximately 49,200 people under the conditions studied at the time. Nantucket should therefore seek to reduce ordinary peak-season demand toward (and ultimately below) that level rather than treating today's substantially larger summer population as the new normal.

Continued



Red-capacity condition: 50,000–60,000

Above approximately 50,000 people, the Town should presume that significant portions of the island's transportation network are operating beyond comfortable capacity. Policies that generate additional peak-season demand should face a heightened burden of proof and should be required to demonstrate meaningful offsets.

Extreme-capacity condition: above 60,000

When estimated population reaches 60,000 or more, Nantucket should regard conditions as an exceptional peak rather than an acceptable planning baseline. The Town should avoid actions that deliberately add discretionary demand, including large new events, additional tourism promotion, avoidable construction activity and other uses that concentrate more people or vehicles on the island during already overloaded periods.

The often-cited possibility that Nantucket may reach **70,000 to 80,000 people on its busiest summer days should not become an argument for raising the island's carrying-capacity target.** It should be evidence of how far present demand may already exceed it.

The policy objective should therefore be **demand reduction, not accommodation of an ever-higher peak.**

The Town should establish a real-time or near-real-time effective-population system incorporating ferry passengers and vehicles, airport arrivals, transient accommodations, short-term rentals, seasonal housing occupancy, marina activity and other measurable indicators. Those population estimates should then be published alongside traffic volumes, emergency calls, water production and wastewater flows.

Only after Nantucket knows how many people are actually present, and what happens to its infrastructure at 45,000, 50,000, 60,000 and higher, can it establish a scientifically defensible long-term summer carrying-capacity limit.

For now, the evidence supports a more immediate conclusion: **Nantucket should stop planning as though today's peak summer population represents available capacity. It represents demand the island is already struggling to accommodate.**



How Many Vehicles Can Nantucket's Roads Accommodate?

This is the strongest and most measurable finding in the study.

The 2001 carrying-capacity analysis projected the number of failing "barometer" intersections as the number of vehicles increased:

- Approximately 27,145 vehicles: six monitored intersections failing.
- Approximately 28,798 vehicles: seven or eight failing.
- Approximately 29,662 vehicles: eight failing.
- Approximately 37,574 vehicles: nine failing.

The study specifically recommended that any working vehicle limit be established **significantly below 28,800**, not at the failure point. It also warned that vehicle controls would not work unless development and dwelling growth were addressed at the same time.

In 2024, Nantucket had nearly 22,000 locally registered vehicles. That was an increase every year since 2019, and the Town's 2025 Master Plan assessment states that the number of vehicles on the island had surpassed the old estimated capacity of its roads. The 22,000 figure does not fully represent the peak vehicle population because it does not capture all visitor vehicles, seasonal cars, commercial fleets and rental cars present at one time.

The 2025 Town Report also shows 564 rental-car medallions in FY2025. In addition, Steamship Authority automobile traffic on the Nantucket route was up 5.45% through June 2025 compared with the preceding period.

Continued





FINDING

Interim peak on-island vehicle ceiling: 25,000

This is approximately 13% below the earlier 28,800-vehicle failure benchmark. It provides a modest safety margin while recognizing that the island is unlikely to reduce its vehicle population immediately.

Nearly 22,000 registered vehicles would already consume approximately **88% of that capacity**, leaving room for only about 3,000 additional seasonal, rental, visitor and other vehicles at the same time. That strongly suggests the island may already exceed the proposed ceiling during peak periods.

Five-year operating target: 22,000–23,000 vehicles

The objective should not merely be to remain beneath 25,000. It should be to restore enough headroom that an accident, road closure or ferry surge does not destabilize the entire network.

Recommended controls

The Town should pursue:

- A continuously updated count of vehicles physically present on Nantucket.
- A seasonal vehicle-permit or registration system, subject to legal review and any required state authorization.
- Caps on rental fleets and commercial vehicles stored on-island.
- Higher fees for second, third and seasonal household vehicles.
- Guaranteed ferry priority for year-round residents and essential businesses.
- Limits on visitor vehicle reservations during the most congested periods.
- Incentives for seasonal homeowners to remove vehicles from the island during the off-season rather than storing them permanently.
- Employer transportation plans for major developments and businesses.
- Consolidated freight and delivery schedules.

The Town cannot accomplish every measure alone. Steamship Authority cooperation and, for some controls, state legislation may be necessary. **That's a reason to begin the process, not a reason to avoid it.**

How Much More Development Can Mid-Island Absorb?

In conventional traffic terms, the answer is: **None that produces additional peak-hour vehicle trips.** That doesn't mean no building can ever occur in Mid-Island. It means every new project must avoid or offset its transportation demand.

The 2017 Old South Road study analyzed current conditions and projected 2024 conditions that included background growth and the Richmond development.

At Milestone Road and Nobadeer Farm Road, morning peak delay was projected to rise from 89 seconds to 179 seconds. At the James Coffin Rotary (Old South, Milestone, Orange & Sparks), average morning delay was projected to rise from 49 seconds to 89 seconds, while queues increased from approximately 804 feet to 1,903 feet. Several side-road approaches at Fairgrounds Road, Amelia Drive, Young's Way, Lovers Lane and New Road were projected to operate at Level of Service F, with some movements exceeding 300 seconds of delay.

The Town's 2025 Master Plan assessment also notes that areas of Mid-Island were already found to be at or above capacity in a 2005 study and that conditions have apparently worsened since then.

The important nuance is that every through lane is not necessarily failing at every hour. The crisis is often found at side streets, turning movements, commercial entrances and the intersections through which residents must enter or cross the main corridor. A road can appear to move while still being functionally inaccessible to the people trying to enter it.

Continued





FINDING

Mid-Island should be designated a Transportation Capacity Red Zone.

Within that zone:

1. No major development should be approved if it creates a net increase in morning or afternoon peak-hour vehicle trips.
2. Traffic studies should no longer be allowed to conclude that a project is acceptable merely because its individual contribution is small. Where the baseline is already failing, any increase worsens an existing failure.
3. New projects must produce trip reductions or purchase verifiable trip-capacity credits from another use that permanently reduces its traffic.
4. Housing should receive preferential treatment only when it is deed-restricted for year-round occupancy and accompanied by enforceable vehicle limitations, transit access and reduced parking.
5. Parking maximums should replace parking minimums. Requiring every new unit or business to build more parking encourages the very vehicle demand the Town says it wants to reduce.
6. New commercial approvals should include delivery scheduling, employee transportation and freight-consolidation plans.
7. Large projects should be required to fund operational improvements, not merely construction projects. A turning lane does little if every new development eventually fills the capacity it creates.

Mid-Island should not be expected to absorb every housing, municipal, institutional and commercial need simply because it contains sewer, water and relatively dense zoning. Infrastructure availability does not make road capacity infinite.





How Many Additional Bedrooms Can Nantucket Support?

This is the question the Town is least prepared to answer.

Nantucket's zoning theoretically allows as many as **9,615 additional dwellings on existing lots outside the Sewer Master Plan study area**, even though the island is approaching buildout in terms of newly subdividable lots. Existing lots are using only about 41% of the dwelling-unit capacity permitted under current zoning.

That number exposes an enormous disconnect: **Legal zoning capacity is dramatically greater than practical infrastructure capacity.**

Even if only a fraction of those dwellings were built, the resulting bedrooms, vehicles, water use, septic flow, construction traffic, deliveries and waste generation would overwhelm the limits identified elsewhere in this assessment.

Massachusetts Title 5 generally uses **110 gallons per day per bedroom** as a residential wastewater design standard. That makes the bedroom, not merely the dwelling unit, a common measurement for capacity planning.

But a wastewater-design figure alone cannot determine island capacity. A bedroom in a year-round apartment, a bedroom in a seasonal estate and a bedroom in a short-term rental have very different patterns of occupancy, vehicle use and community value.

FINDING

The Town should create a **Bedroom Equivalent Growth Budget**.

For the first five years:

Maximum new allocation: 1,000 bedroom equivalents

That would average no more than 200 new bedrooms per year and should be available only when all relevant capacity systems remain outside the red zone.

This is deliberately conservative. It's not a finding that Nantucket's pipes have room for exactly 1,000 bedrooms. It's a temporary growth budget designed to prevent the Town from issuing thousands of new development rights before it knows the systems can support them.

Continued



Priority for those bedroom equivalents

The limited allocation should be distributed in this order:

1. Permanently affordable and year-round-restricted housing.
2. Housing for essential municipal, medical, educational and public-safety employees.
3. Replacement of unsafe, illegal or severely overcrowded year-round housing.
4. Senior and disability-accessible housing.
5. Ordinary year-round housing carrying enforceable occupancy and short-term-rental restrictions.
6. Unrestricted seasonal or investment housing only after higher-priority needs are met and capacity is offset elsewhere.

A bedroom should not qualify as “workforce housing” based on the applicant’s stated intention. The benefit must be secured through a durable deed restriction, occupancy rule, affordability covenant or similar enforceable instrument.

Unrestricted seasonal bedrooms

In a transportation red zone, the net allowance should be: **Zero**

A new unrestricted bedroom could still be approved if the applicant permanently retires or restricts equivalent existing development capacity. The Town should consider requiring a **150% capacity offset** for seasonal or short-term-rental bedrooms: for every new unrestricted bedroom, 1.5 existing bedroom equivalents must be removed from seasonal use, permanently converted to year-round housing or offset through a capacity bank.

That stronger ratio reflects the fact that seasonal development consumes scarce summer capacity while doing little to resolve the year-round housing shortage.





Water Capacity

Nantucket relies on a sole-source aquifer. That means the relevant water question is not simply how much water can be pumped on an ideal summer day, it is how much can be supplied safely during drought, peak demand, contamination, equipment failure or the temporary loss of a major well.

In FY2025, Wannacomet produced more than 739 million gallons and added 147 new connections. Its peak production day was July 27 when it pumped 4.36 million gallons, more than twice its average daily production over the year. Siasconset produced 73.7 million gallons and reached a peak day of 590,000 gallons. Combined annual production was 812.7 million gallons.

Average annual production was approximately 2.23 million gallons per day, but summer peak demand was substantially higher. That means annual averages cannot safely be used to approve future development.

The Water Department's report does not provide, in one publicly accessible capacity table:

- Reliable water-production capacity during peak summer demand, assuming the system's largest well is temporarily out of service.
- Drought-adjusted sustainable withdrawal.
- Peak-hour demand and Fire-flow reserve.
- Available permitted withdrawal.
- Capacity committed to approved but unbuilt development.

Without those figures, no outside analyst or Town Meeting voter can calculate a reliable number of remaining bedroom equivalents.

RECOMMENDATION

The Town should reserve at least **20% of drought-adjusted firm water capacity.**

Capacity should be calculated under:

- Peak summer demand.
- One major well unavailable.
- Required fire-flow reserve intact.
- Applicable drought restrictions.
- Approved but unbuilt projects included.

No unrestricted development allocation should be made from the final 20%. **New pools, extensive irrigation and ornamental water use should not compete equally with drinking water and workforce housing. Development approvals should require separate irrigation sources, captured rainwater, native landscaping or strict seasonal limits where feasible.**



Sewer and Septic Capacity

Nantucket operates two municipal wastewater-treatment facilities, 17 pump stations and more than 85 miles of sewer mains; properties outside the municipal sewer system rely on onsite wastewater systems.

The Surfside plant was designed to treat 3.5 million gallons on a maximum day and has a permitted maximum daily discharge of four million gallons. But the Town's own procurement documents state that plant staff have had limited success fully utilizing portions of the upgraded system and that additional work is needed for future capacity and reliability.

The distinction between **permitted capacity** and **reliable capacity** is critical.

A permit saying the plant may discharge four million gallons does not establish that the collection system, pump stations, treatment process and disposal system can reliably handle that amount during peak summer conditions.

RECOMMENDATION

The Town should define available sewer capacity as: **Reliable demonstrated maximum-day capacity, minus existing peak flow, committed development, infiltration and inflow, emergency reserve and a 20% operating margin.**

Until the Town publishes those figures, it should not claim that the sewer system has a specific amount of growth capacity. Any bedroom allocation should also account for the collection system. A treatment plant may have theoretical capacity while a downstream pump station or sewer main does not.

For septic areas, the Town should not view a passing Title 5 design as proof that unrestricted cumulative growth is environmentally sustainable. Individual compliance does not measure the combined effect of thousands of systems on groundwater, ponds and harbors



Environmental Capacity

How Much More Stress Can Nantucket's Natural Systems Absorb?

Nantucket's carrying capacity is not determined only by the point at which roads stop moving, wells cannot meet demand or a wastewater plant reaches its operating limit. The island's natural systems have capacity limits of their own.

Groundwater, ponds, harbors, wetlands, eelgrass beds, dunes and other habitats can absorb only so much wastewater, nutrient loading, stormwater, impervious surface, shoreline disturbance and human activity before their condition begins to deteriorate. Unlike a sewer main or school building, many of these systems cannot simply be enlarged when demand increases.

Environmental capacity can be exceeded long before a municipal system technically "fails", and the Town already has evidence that this is occurring in parts of Nantucket.

The Natural Resources Department's 2024 island-wide water-quality assessment found an encouraging overall trend in several major estuaries, but the picture is far from uniform. Nantucket Harbor has been improving and is approaching its nitrogen target, while Madaket Harbor generally supports comparatively high water and habitat quality. Long Pond has also shown improvement.

Other systems remain substantially more stressed. The Town classified **Hummock Pond and Miacomet Pond as significantly impaired**, while Sesachacha Pond was classified as impaired. The report identifies continuing nutrient and habitat problems requiring active intervention, including pond openings, dredging, sewerage, fertilizer controls and other restoration measures.

This matters because nitrogen and phosphorus are not abstract environmental measurements. Excess nutrients contribute to algal growth, reduced water clarity and depleted dissolved oxygen, which in turn affect fish, shellfish, aquatic vegetation and the larger ecological system. The Town identifies wastewater disposal, septic systems, fertilizer and runoff among the important human-related sources of nutrient loading.

The regulatory thresholds already established for several Nantucket water bodies provide something especially important for a carrying-capacity study: **measurable environmental limits**.

Continued



Current nitrogen thresholds include:

- Nantucket Harbor: 0.35 mg/L
- Madaket Harbor: 0.45 mg/L
- Long Pond: 0.80 mg/L
- Sesachacha Pond: 0.60 mg/L
- Hummock Pond: 0.50 mg/L
- Miacomet Pond: 0.60 mg/L, although this is not presently a regulated TMDL threshold.

These numbers should be treated as capacity indicators in the same way that intersection performance, sewer flow or well yield are treated elsewhere in this assessment.

If a watershed is already impaired or struggling to meet its nutrient threshold, additional development cannot reasonably be considered environmentally neutral simply because each individual lot complies with zoning, Title 5 or other minimum regulatory requirements. **Individual compliance does not establish cumulative capacity.**

Eelgrass provides another measurable indication of environmental stress. The Town's Eelgrass Management Plan notes that Nantucket lost approximately **30% of its eelgrass between 1995 and 2015**, leaving an estimated 2,000 acres. Eelgrass supports marine biodiversity, improves water quality and stabilizes sediments and shorelines, but it is vulnerable to nutrient enrichment, turbidity, algal growth and physical disturbance.

That makes eelgrass acreage an unusually useful carrying-capacity indicator. If population and development continue increasing while eelgrass habitat continues contracting, the island cannot reasonably claim that environmental capacity is remaining unchanged

The goal should not merely be to slow the rate of loss. It should be to **stop the loss and ultimately restore habitat.**

Continued





Stormwater Adds Another Cumulative Pressure

Development also changes the island through what happens on the surface. Every additional roof, roadway, driveway and parking area increases impervious coverage. Instead of rainfall filtering naturally through vegetation and soil, more water moves rapidly across developed surfaces, carrying sediment, nutrients and other pollutants toward wetlands, ponds, harbors and drainage systems.

The Town itself acknowledged the scale of this problem in its 2026 Town Meeting materials, stating that much of Nantucket's existing stormwater infrastructure is below standard, aging or in need of repair. The Town specifically identified increased runoff from roofs, roads and parking areas as contributing to water-quality impairment, reduced groundwater recharge, erosion, habitat damage and flooding.

This creates another important relationship between development and carrying capacity: **The environmental impact of growth is not limited to the number of people occupying a building. The physical development itself changes how the island handles water.**

A large seasonal house occupied for ten weeks may place relatively little demand on the school system, but its bedrooms, lawn, driveway, pool, irrigation system, septic load and impervious surface can create environmental demand nonetheless.

Continued





Recommendation

Nantucket should establish an **Environmental Capacity Budget** for each major watershed and incorporate it into the island-wide annual capacity budget recommended by this assessment.

As an interim policy:

- **No net increase in controllable nutrient loading should be allowed in a watershed that is impaired or failing to meet its established environmental threshold.**
- Development in an impaired watershed should be required to demonstrate a net environmental improvement, through sewer connection, advanced septic treatment, nutrient reduction, stormwater improvements or another measurable mitigation.
- The Town should adopt a goal of **no net loss of wetlands, eelgrass or other critical aquatic** habitat attributable to discretionary development approvals.
- Impervious surface and stormwater generation should become measurable components of major-development review.
- Approved but unbuilt development should be included when calculating future watershed loads.
- Water-quality thresholds should be treated as capacity limits, not merely environmental monitoring statistics.

A watershed that is already impaired should not be treated as though it possesses unused environmental capacity simply because additional development remains legally permissible under zoning. That's the larger point.

Nantucket's environmental carrying capacity is not the amount of development the island can legally accommodate. It is the amount of human activity its natural systems can absorb while remaining healthy, functional and recoverable.

In several parts of the island, the evidence indicates that this threshold has already been crossed.

The appropriate response is therefore not to wait for visible ecological failure before acting. It is to recognize environmental capacity as a finite resource and begin allocating it with the same seriousness Nantucket should apply to roads, water, sewer and every other system upon which the island depends.



Schools and Public Safety

School capacity should not be measured only by the number of desks that can physically fit inside a building.

Functional capacity includes:

- Class size, Special-education space, English-language instruction.
- Cafeterias and common areas.
- Transportation.
- Athletic facilities.
- Counselors and support staff, Teacher recruitment and housing.
- Building condition.

Nantucket's district enrollment rose to 1,719 in October 2024. The School Department says the high school is already experiencing space pressure, while the Town is contemplating a future middle-school project.

Recommended trigger

The Town should conduct a complete school-capacity review when either:

- Total district enrollment reaches **1,850**, or
- Any individual school reaches **90% of its functional capacity**.

The second standard is essential because available space at the elementary school cannot solve crowding at the high school. For public safety, raw population is not the best capacity measure. The relevant tests are response time, concurrent incidents and minimum on-duty staffing.

The Town should establish and publish:

- Median and 90th-percentile police, fire and EMS response times.
- Response times by neighborhood and season.
- Number of occasions when multiple simultaneous calls exhaust available crews.
- Number of calls delayed by traffic.
- Minimum staffing achieved versus minimum staffing required.
- Off-island transport and MedFlight availability.

As an interim local goal, this study recommends a 90th-percentile first-response target of **eight minutes in Town and Mid-Island and 12 minutes in outlying areas**, with separate standards for fire suppression and advanced life support. These would be local policy targets requiring professional review, not claims about current performance. When response standards are missed consistently, the affected service area should enter a red-capacity condition and new demand should not be approved without mitigation.



Solid Waste

Nantucket has effectively extended its waste capacity by processing, transferring and shipping much of its waste off-island. That avoids an immediate local disposal ceiling, but it does not eliminate the cost, truck traffic, freight demand or environmental burden.

The Town provided approximately **\$11.6 million** from general tax revenue to support landfill operations in FY2025. The same annual report discusses new waste agreements and diversion programs but does not provide a clear comprehensive table showing current annual tonnage by waste stream.

That data should be central to any carrying-capacity program.

Recommendation

The Town should adopt:

- No increase in total annual waste tonnage above a verified FY2025 baseline.
- A 10% reduction in municipal solid waste per effective-population day within five years.
- A 25% reduction in construction and demolition waste within five years.
- Mandatory waste plans for major construction and demolition projects.
- Deconstruction and material-salvage requirements where feasible.
- Disposal or impact fees reflecting the true off-island cost of bulky, construction and seasonal waste.
- Quarterly reporting by waste stream.

A development that adds buildings, bedrooms and seasonal occupancy but does not account for demolition debris and continuing waste generation has not fully mitigated its impact.





How the Town Should Distinguish Beneficial Growth from Seasonal Consumption

Not all growth imposes the same cost, and not all growth creates the same public value. The Town should score proposed development against five questions:

1. Who will occupy it?

A permanently year-round home serves a different community purpose from an unrestricted seasonal compound.

2. When will its demand occur?

Demand added in January may be manageable. Demand concentrated in July and August worsens the period when systems are already failing.

3. How many vehicle trips will it generate?

A centrally located apartment occupied by a year-round worker without a car may create less traffic than a seasonal house with six bedrooms, six vehicles, daily landscaping and frequent deliveries.

4. Is the public benefit enforceable?

Promises do not count as mitigation. The benefit must survive a sale, refinancing or change in ownership.

5. Does it reduce another burden?

A project should receive greater priority if it replaces unsafe housing, removes vehicles, reduces septic loading, restores land, consolidates deliveries or converts seasonal housing to year-round use.

Continued





Recommended classification

Tier One: Capacity-positive growth

These should receive first access to limited development capacity.

- Permanent affordable housing.
- Year-round-restricted workforce housing.
- Essential public facilities.
- Adaptive reuse without increased peak demand.
- Projects that remove more traffic, wastewater or seasonal bedrooms than they create.

Tier Two: Capacity-neutral growth

These may proceed while capacity standards are maintained.

- Development that fully offsets its vehicle trips, water, wastewater, waste and seasonal occupancy.
- Replacement projects with no increase in bedrooms or intensity.
- Year-round commercial uses that do not increase peak-season demand.

Tier Three: Capacity-consuming growth

These should proceed only when capacity exists after Tier One needs are met, and only with substantial offsets.

- Unrestricted seasonal dwellings.
- New short-term-rental capacity.
- Luxury expansions adding bedrooms, pools and vehicle demand.
- Hotels and visitor accommodations.
- Commercial uses dependent primarily on peak-season volume.
- Projects requiring additional roadway, utility or municipal capacity.





The Central Recommendation: Adopt an Annual Capacity Budget

The Town should stop treating carrying capacity as another study that can remain on a shelf.

Each year, before Town Meeting, the Select Board and Planning Board should jointly issue a **Nantucket Capacity Statement** establishing:

- Peak effective population.
- Peak on-island vehicle count.
- Vehicle trips and delay at designated intersections.
- Water production and reliable reserve.
- Wastewater flow and reliable reserve.
- School enrollment and functional building capacity.
- Police, fire and EMS calls and response times.
- Solid-waste tonnage.
- New dwellings and bedrooms permitted.
- New dwellings and bedrooms completed.
- Number permanently restricted to year-round occupancy.
- Number entering short-term or seasonal use.
- Capacity already committed to approved but unbuilt projects.

Each system would receive a status:

- **Green:** less than 75% of adopted capacity.
- **Yellow:** 75% to 85%; mitigation and offsets required.
- **Red:** above 85%, or an adopted service standard is already failing; no net new unrestricted demand.
- **Emergency:** capacity exceeded; active demand reduction required.

Based on the available evidence, Nantucket's transportation system and parts of Mid-Island should be considered red now. That determination changes the burden of proof.

The question should no longer be: Can this individual project technically be approved?

It should be: What scarce island capacity will this project consume, who benefits from that consumption, and what existing demand will be reduced to make room for it?



The Final Finding

Nantucket still has land on which another structure can be built, and it may still have pipes capable of carrying another gallon, classrooms capable of holding another student and roads capable of accommodating another vehicle at certain hours. That's not the same as having sustainable capacity.

A community reaches practical capacity before every physical system collapses. It reaches capacity when ordinary movement becomes unreliable, when infrastructure must be expanded continually to chase development, when emergency services are delayed by traffic, when housing growth fails to house the workforce, and when each solution creates the demand for the next expensive solution.

By that standard, Nantucket has already exceeded capacity in important parts of the island. The responsible answer is not a permanent prohibition on growth. It's an immediate transition from **unbudgeted growth to allocated growth**.

The island should recognize **20,000-plus residents as its current working year-round baseline and assume no additional population headroom until capacity is demonstrated**, restore summer population toward an average-weekday target of 42,000, cap peak vehicles initially at 25,000, permit no net increase in Mid-Island peak-hour trips and reserve the next limited block of development capacity primarily for permanently year-round housing.

Anything less would repeat the error that created the present crisis: Approving development first, and asking whether Nantucket can sustain it afterward.





Nantucket Carrying Capacity

PHASE 1 ASSESSMENT — KEY FINDINGS

What the available data shows, where the island has already exceeded capacity, and what limits the Town should adopt now.



Core Finding

Nantucket has already exceeded capacity in important parts of the island — especially transportation and Mid-Island circulation. The report calls for a shift from unbudgeted growth to allocated growth.

- **Year-Round Population**
20,000+ residents
Use 20,000-plus as the working year-round baseline now. No assumed population-bedroom ratio until capacity is demonstrated.
- **Peak Summer Population**
60,000–80,000
Commonly cited peak summer population today. The study says Nantucket is already in a summer red-capacity condition.
- **Peak Vehicles**
25,000 interim ceiling
Registered vehicles were already nearly 22,000 in 2024. The five-year operating target is 22,000–23,000 vehicles.
- **Mid-Island**
Transportation Red Zone
No major development should be approved if it creates a net increase in peak-hour vehicle trips.
- **Bedroom Growth**
1,000 bedroom equivalents
Recommended five-year growth budget. Prioritize permanently affordable and year-round-restricted housing.
- **Seasonal Bedrooms**
Net allowance: Zero
In a transportation red zone, no net new unrestricted seasonal bedroom unless equivalent capacity is retired or offset.
- **Water**
Reserve 20%
Reserve at least 20% of drought-adjusted firm water capacity under peak-demand conditions.
- **Sewer & Septic**
Use reliable capacity
Do not rely on theoretical capacity. Available sewer capacity should be based on reliable demonstrated maximum-day performance, minus reserves and committed growth.
- **Environmental Capacity**
Protect impaired watersheds
No net increase in controllable nutrient loading in impaired watersheds. Require measurable mitigation or net environmental improvement.
- **Schools & Public Safety**
Trigger review at 1,850 students
Also review when any school reaches 90% of functional capacity. Response times and staffing should guide public-safety capacity.
- **Solid Waste**
No increase in total annual waste tonnage above a verified FY2025 baseline. Reduce municipal solid waste per effective-population day by 10% in five years and construction/demolition waste by 25%.



Central Recommendation

Adopt an Annual Capacity Budget. Each year, the Town should publish the island's status on population, vehicles, traffic delay, water, wastewater, environmental capacity, schools, public safety, solid waste, and new dwellings/bedrooms.



Source: *Below Deck Nantucket — Nantucket Carrying Capacity: An Independent Phase 1 Assessment (August 2026).*



Sources/Methodology

This Phase I assessment relies primarily on public records and studies produced by the Town of Nantucket, Nantucket Planning & Economic Development Commission (NP&EDC), Nantucket Public Schools, Massachusetts Department of Environmental Protection and U.S. Environmental Protection Agency. Where the assessment proposes operating limits, reserve requirements, growth budgets or capacity classifications, those figures are recommendations of this assessment unless specifically attributed to another source.

Town of Nantucket / NP&EDC — 2024 Long-Range Transportation Plan.

Used for the Town's 2020 planning population of 14,170; projections of 15,876 in 2030, 17,461 in 2040 and 19,250 in 2050; the 2021 effective-population estimates showing average weekday population approaching approximately 44,000 in July; and the relationship between additional population, density and transportation delay. The plan also identifies vehicle limitation, travel-demand modeling and an updated optimal vehicle-capacity study as transportation priorities.

Town of Nantucket / Nantucket Public Schools — 2026 Owner's Project Manager Request for Qualifications.

Provides an important contemporary Town population estimate: "over 22,000" year-round residents and "approximately 80,000" seasonal residents. This is the strongest current Town source supporting the assessment's use of 20,000-plus as the year-round working population and the upper end of the 60,000–80,000 summer range.

Earlier Town procurement documents, including 2023 solicitations, described Nantucket as having more than 14,000 year-round residents and approximately 60,000 seasonal residents, providing additional support for using 60,000–80,000 as the range found in recent Town documents rather than treating it simply as anecdotal local opinion.

NP&EDC — 2001 Optimal Transportation Carrying Capacity Study.

The principal historical source for the assessment's vehicle-capacity analysis, including the modeled relationship among total vehicles, effective summer population and the number of failing "barometer" intersections. It is the source for the approximately 27,145-, 28,798-, 29,662- and 37,574-vehicle scenarios and the finding that a working vehicle limit should be established significantly below the level at which widespread intersection failure occurs. The Town continues to maintain the complete 118-page study in its current Long-Range Transportation Plan archive.

NP&EDC / Greenman-Pedersen Inc. — 2005 Traffic Study and Strategy for the Mid-Island Area.

Used for historical Mid-Island traffic conditions, intersection performance and the finding that portions of the Mid-Island network were already experiencing unacceptable congestion approximately two decades ago. The Town maintains the study's executive summary, existing conditions, projections, analysis, findings and recommendations as part of its transportation archive.

NP&EDC / BETA Group — 2017 Old South Road Corridor Study, including subsequent traffic updates.

Used for the analysis of Old South Road, Milestone Road, the James Coffin Rotary, Nobadeer Farm Road, Fairgrounds Road, Amelia Drive, Young's Way, Lovers Lane and related Mid-Island approaches. The study specifically evaluated 2017 conditions and projected 2024 traffic volumes and levels of service; subsequent analysis continued that work using updated traffic data.

Continued



Town of Nantucket — 2025 Master Plan Inventory & Assessment.

Used for two of the assessment's most important development findings: that existing lots outside the Sewer Master Plan study area have substantial unused zoning capacity — including the theoretical potential for approximately 9,615 additional dwellings — and that existing lots are using only about 41% of the dwelling-unit capacity permitted under current zoning. The same assessment reports that Nantucket had nearly 22,000 locally registered vehicles in 2024 and states that the number of vehicles on the island had surpassed the road system's earlier estimated capacity. It also revisits the longstanding Mid-Island congestion findings

Town of Nantucket — Fiscal Year 2025 Annual Town Report.

This is the principal operating-data source for several sections of the assessment. It reports:

Water: Wannacomet produced more than 739 million gallons, added 147 connections and reached a peak production day of 4.36 million gallons on July 27, 2024; Siasconset produced 73.7 million gallons and peaked at 590,000 gallons; combined production was 812.7 million gallons. **Fire and EMS:** Nantucket Fire Department handled 3,381 emergency calls in FY2025, including 1,915 fire calls and 1,466 EMS calls. **Schools:** District enrollment reached 1,719 students in October 2024, and the School Department specifically reported that space was a challenge at Nantucket High School. **Rental vehicles:** The Town issued 564 rental-car medallions in FY2025. **Steamship Authority:** Through June 2025, automobile traffic on the Nantucket route was up 5.45%, or 1,042 vehicles. **Sewer infrastructure:** The Sewer Department reports operating two wastewater-treatment facilities, 17 pump stations and more than 85 miles of sewer mains. **Solid waste:** The Town provided \$11,588,710 in general tax revenue to support landfill operations in FY2025.

Town of Nantucket — Major Capital Projects: Debt and Tax Impacts, November 20, 2024.

Used to establish that a new Nantucket Public Schools middle school is already included among the Town's contemplated major out-year capital projects, with a planning estimate of approximately \$120 million and a connection to the School Master Plan.

Town of Nantucket — Surfside Wastewater Treatment Facility Phase II Improvements Request for Qualifications.

Used for the Surfside plant's design and permitted capacity figures. The Town states that the 2009 membrane-bioreactor upgrade was designed for 3.5 million gallons per day maximum daily flow, with 7.7 MGD peak-hour capability, while the current MassDEP groundwater-discharge permit allows 4.0 MGD maximum daily flow. The same Town document states that plant staff have had limited success fully utilizing portions of the Phase I improvements and identifies additional work necessary for future capacity, reliability and efficiency.

Massachusetts Department of Environmental Protection — Title 5, 310 CMR 15.000 and related guidance.

Used for the residential wastewater design-flow standard. MassDEP states that 310 CMR 15.203 assigns a design flow of 110 gallons per day per bedroom for single-family and multiple-family residential dwellings. This design standard is used in the assessment as a common unit of comparison; it is not presented as a determination of Nantucket's actual remaining wastewater capacity.

U.S. Environmental Protection Agency / Town of Nantucket — Nantucket Sole Source Aquifer.

EPA formally designated the Nantucket Island aquifer as the island's sole or principal source of drinking water. Current Town water documents likewise identify Nantucket's public supply as groundwater drawn from the island's Sole Source Aquifer. These sources support the assessment's treatment of groundwater protection and water-supply reliability as islandwide carrying-capacity considerations.

Below Deck Nantucket — "Nantucket's Capacity Crisis Was a Policy Choice."

Published Sunday, August 9, the opinion piece provides the editorial context for undertaking the Phase I study. It is not used as an evidentiary source for the numerical findings in this assessment.

With additional guidance from Cesare Micheletti, Scientific Consultant for the UNESCO Dolomites Foundation. We would also like to thank Andy Lowell who broached the question, "what is the capacity of Nantucket?" during an "Unscripted" interview with Charley Walters on May 27, 2026.