Infrastructure: An Investment in the Future

A Hudson Valley Perspective

HUDSON VALLEY **PATTERN** *for* **PROGRESS**

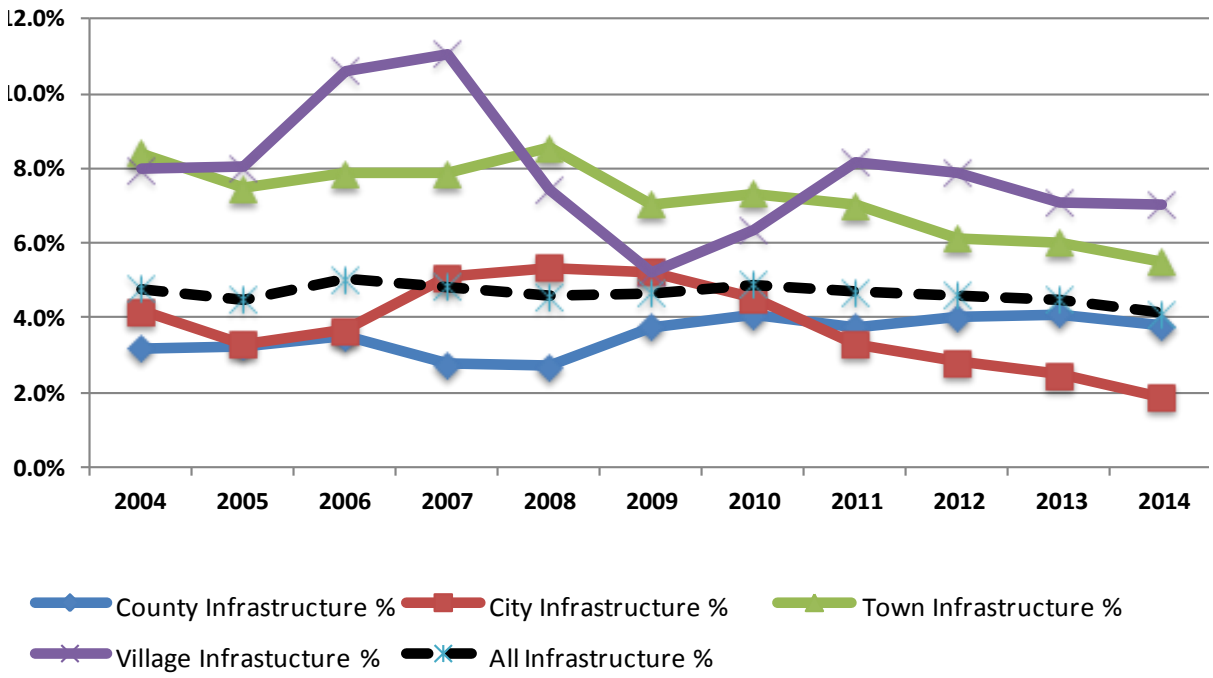
Hudson Valley Infrastructure Trends

The term infrastructure was first used in 19th century France in the context of railroad planning. During World War II, NATO Military planners adopted the term to signify any "fixed installations which [were] necessary for the effective deployment and operations of modern armed forces" (NATO archives). Adam Smith may have described infrastructure as "public goods" undersupplied by private markets; economists refer to roads, bridges, ports, and water systems as part of the "nation's physical capital"; in the early days of the Republic the Whigs would have called for more public support for "internal improvements" like canals and turnpikes. Today, President Obama might call for more investment in "nation-building at home"(Democracy Journal, 2016). The term infrastructure, as we know it today, finally made its way into public discourse in the late 20th century when it replaced "public works" and is used to describe the physical and organizational structures and facilities (e.g., buildings, roads, and power supplies) needed for the operation of a society or enterprise.

Hudson Valley Infrastructure Trends

Over the ten year period from 2004-2014, the counties, cities, towns, and villages of the Hudson Valley spent more than $4.47 billion on public infrastructure, an average of just under $407 million annually. Despite sustained public investment, the region's aging infrastructure requires routine maintenance, repairs, and in extreme cases, replacement. While the need for infrastructure investment remains high, spending on infrastructure shows a potentially troubling trend. Though infrastructure spending for the region's nine counties spiked in 2009-2010 (due to the influx of federal funds from the American Recovery and Reinvestment Act of 2009) and stayed above pre-recession levels through 2014, in inflation-adjusted dollars, infrastructure spending by cities, towns, and villages fell during the recession, and declined every year from 2011-2014. As a result, the region's counties, from 2004-2007 accounted for an average of 38% of regional infrastructure spending, averaged 51% of infrastructure spending from 2011-2014.

Infrastructure Expenditures in Hudson Valley as a Percentage of Total Expenditures

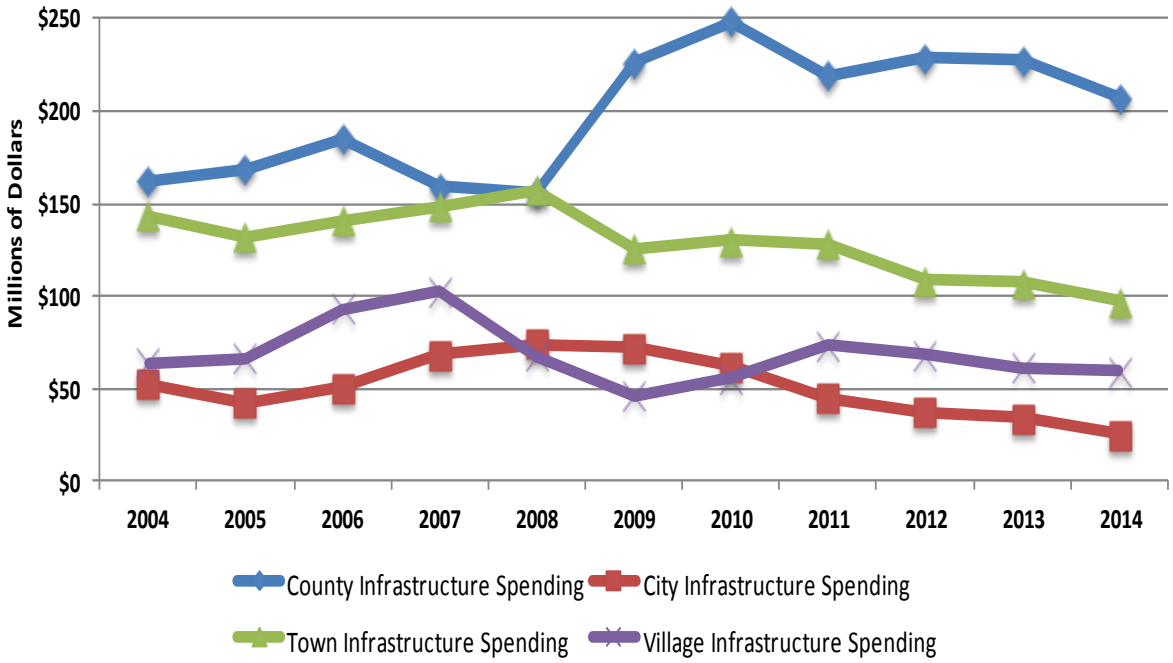


Source: Office of the NY State Comptroller

A Decline in Spending Noted

The cities of the Hudson Valley devoted only 2% of their budgets to infrastructure in 2014, down by half from 2004; towns devoted 5.5% of the budget to infrastructure in 2014, compared to 8.4% in 2004, and villages spent 7% in 2014 compared to 8% a decade earlier. In 2014, counties were the only level of government spending a higher percent of their budget on infrastructure than in 2004. The year-to-year change chart illustrates how infrastructure expenditure growth has slowed over the last decade in relation to non-infrastructure expenditures. Some of this decrease may have been caused by the waning of stimulus funding from the federal government; the statewide cap on the property tax levy established in 2011 and applicable to municipalities and school districts may also explain this decrease. Nevertheless, the trend since 2011 is a concern.

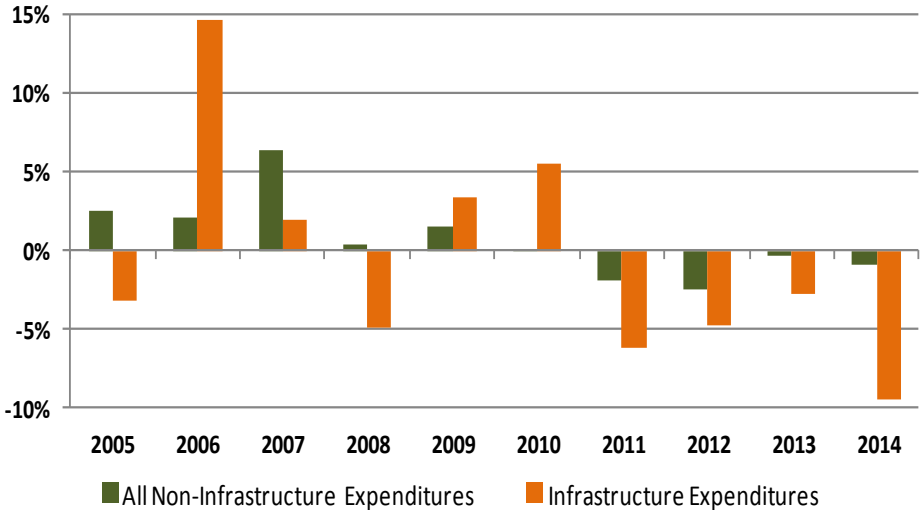
Hudson Valley Infrastructure Expenditures 2004-2014 (in inflation-adjusted 2014 dollars)



Source: Office of the NY State Comptroller

At $389 million, total regional infrastructure spending in 2014 was 8% lower than in 2004, and 21% below the 2010 peak, in inflation-adjusted dollars. Overall government expenditures in the region peaked in 2010 (at $10.13 billion) and have declined each year since, though unlike infrastructure, overall 2014 spending levels remain 7% above the 2004 figure. As a result, many levels of government are now spending a notably smaller share of their overall budget on infrastructure than in the middle of the last decade.

Year to Year Change in Expenditures (inflation adjusted 2014 dollars)



Source: Office of the NY State Comptroller

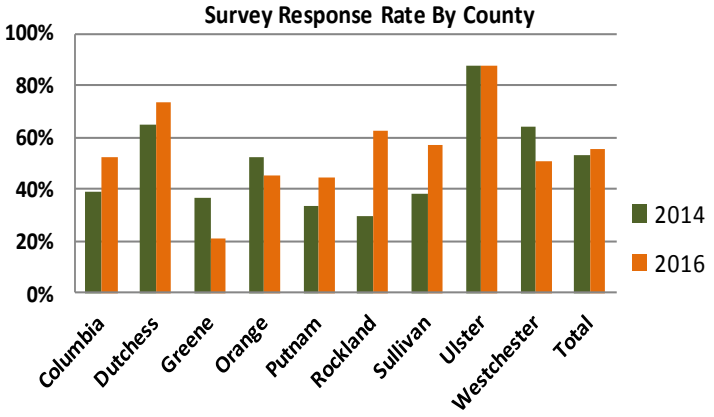
Pattern Surveys The Region

To assess the durability and longevity of existing infrastructure in the Hudson Valley, Pattern for Progress surveyed municipal officials from the nine county region about aspects of their water supply, sewer systems, roads, bridges, public facilities, annual maintenance, funding preferences, and efforts to share services with neighboring municipalities. This report defines infrastructure as encompassing aspects of public works such as transportation infrastructure (roads and bridges) and public services (water supply and sewage) in addition to natural gas distribution and broadband and cellular service availability.

2014 Survey: A Sense of Urgency

In 2014, Pattern published a report detailing the condition of infrastructure in 126 out of the 238 municipalities within the Hudson Valley. In addition to the overall condition of existing infrastructure, the report assessed whether or not natural gas distribution, broadband availability, or cellular service availability were of immediate concern within each municipality. Finally, the survey determined the extent to which municipalities had been impacted by Hurricanes Sandy and Irene, and Tropical Storm Lee and how many of these municipalities have updated Hazard Mitigation and Capital Improvement Plans. The information provided in the 2014 report was based on the sentiments expressed by municipal officials within the nine county region as well as data from the Office of the New York State Comptroller, the Federal Highway Administration, and the Federal Bureau of Economic Analysis.

Overall, 53% of Hudson Valley municipalities responded to the 2014 survey, with the highest participation coming from Ulster County, where 88% of municipalities participated, and the lowest in Rockland, where only 29% participated. The results conveyed a feeling of urgency, especially in regard to water and sewer infrastructure. More than half of respondents believed that their water distribution systems needed major work in the next three years. Municipal officials felt that limitations (imposed by the inability to meet future needs) were "constraining economic development opportunities" and that "new development would overtax already strained systems." Road conditions were considered to be "in good shape" by 58% of respondents, though 5-7% of respondents felt that their community's roads, bridges, water, and sewer infrastructure were at risk of imminent failure. Notably, more than one in five respondents felt that their water and sewer systems were unable to meet future needs, while 23% of respondents felt that their current water supply and wastewater treatment facilities would not meet future demand.



Source: Hudson Valley Pattern for Progress, 2014 & 2016

2016 Survey: Concerns Continue

This year, Pattern replicated the 2014 survey with the exception of one additional question about the potential for municipalities to host an educational workshop. The overall response rate was 56% (132) of the 238 municipalities in the Hudson Valley. Though participation rates varied widely between counties, Ulster (88%), Dutchess (73%) and Rockland (62.5%) had the highest response rates, and more than half of municipalities in Columbia, Sullivan, and Westchester completed the survey, while in Greene, Orange, and Putnam less than 50% of municipalities responded.

Despite the high response rate, one main observation should be noted when examining the 2014 and 2016 survey results. In many cases, the same individual did not respond to the survey in both years, and different areas may have been prioritized. Therefore, these surveys should be regarded as snapshots in time. See "methodology" on page 10 for further information.

Evaluating Present Needs

Survey respondents were asked to rate the overall conditions of their existing roads, bridges, and public buildings as either good (requires only routine maintenance), fair (will require substantial work in the next three years), or poor (at risk of imminent failure). Responses indicate that the state of the region's bridges and roads remains an area of concern. Of the 83 municipalities that answered the question about bridges, only 37% described the state of their community's bridges as "good", while 41% responded that at least some bridges would require

substantial work in the next three years. In another area of concern, 18 communities (22%) reported that at least some bridges were at risk of imminent failure. For road infrastructure, the picture is somewhat better. Just 6% of the 122 municipalities that answered this question listed the state of their road infrastructure as "poor," and at least 50% of respondents in Columbia, Greene, Orange, Ulster, and Westchester listed the condition of their roads as "good." Despite these bright spots, however, with 55% of respondents listing road conditions as either poor or fair, it is clear that significant ongoing maintenance is required for the road system in most Hudson Valley counties.

Concern about the condition of public buildings was less widespread; 58% of the 122 respondents to this question listed the state of their public buildings as "good," with Orange, Sullivan, and Westchester reporting the highest percentages of "good" responses. Several municipalities indicated that new town/village halls or other public buildings had recently been constructed. However, the responses received from some of the 42% of communities who rated the state of their public buildings as “fair” or “poor” give a good indication of the types of infrastructure issues that some municipalities are confronting. "Buildings are old, outdated, too small for their use and substandard," responded one Dutchess County town. "The structure of both City Hall and the Public Safety building were recently found to be significantly deficient, requiring immediate emergency shoring to prevent the collapse of both structures," wrote one Mid-Hudson city. "All buildings that the town owns are in poor condition," concluded one Ulster County respondent.

Funding Infrastructure Improvements

Respondents were asked how their municipality planned to pay for four types of infrastructure (water, sewer, roads, and bridges) and given the option to select any or all of four funding options (the municipality's general fund budget, user fees, municipal bonds, or federal/state loans or grants). For water and sewer systems, federal or state funding, municipal bonding, and user fees were the most commonly cited funding sources. Just 16% and 13% of respondents said they planned to use general fund revenues for sewer infrastructure, and water infrastructure, respectively. For roads and bridges, in contrast, general fund revenues appear to be the most widely used source of funding. 64% of communities said they would use general fund revenues to pay for roads, well above the second most popular funding source, federal/state loans or grants, which 46% of communities planned to use; 38% of respondents said they would use municipal bonds to help pay for new road infrastructure. Fewer communities listed their plans to fund bridges, but those that did cited general fund revenues more often than other funding sources.

Planning For the Future

Capital Improvement Plans are an important way to anticipate future infrastructure needs. Survey responses indicate, however, that the use of a Capital Improvement Plan (CIP) separate from the annual budget process to identify infrastructure priorities and projects is not wide-spread throughout the Hudson Valley. Though 91% of respondents in Westchester and 54% in Rockland said their municipality used a CIP, only 42% of survey respondents overall had them, and less than 20% of respondents in Greene, Putnam, Sullivan, and Ulster had CIP’s. Among the 50 municipalities with CIPs, the most common features included in the plans were roads/bridges, and public buildings, with stormwater and parks/open spaces also cited as a component of at least half of CIPs.

Hazard Mitigation Plans (HMP) appear to be much more commonly used. 82% of survey respondents indicated that their municipality has a HMP and in eight of the nine counties (all except Columbia) at least two thirds of respondents said their municipality has an HMP. Though no question asked when municipalities had first adopted their HMP, it is possible that the damaging impact of recent extreme weather may have led to the more widespread use of HMPs; more than three quarters of respondents indicated that their community had suffered local flooding, damage to roads, or extended power outages due to Hurricanes Sandy, Irene, or Tropical Storm Lee. More than one third of communities (36%) reported that residents had been displaced as a result of these weather events.

Inter-municipal sharing of services has been a topic of increasing discussion, as communities look to find ways to save money and find efficiencies in order to stay within the NY State Tax Cap. Pattern's survey asked whether respondents' municipalities shared services with another municipality, with their county, or with New York State, and whether, if they did not share services, they would be interested in sharing services in the future. 78% of 109 respondents indicated that their municipality already shared services with at least one other municipality and an additional 20% were interested; 56% of 95 respondents said they shared services with the county and 38% said they were interested in sharing services. Notably, though only 19 municipalities (25% of the 75 who responded) said they shared services with New York State, 48 communities (64%) indicated they were interested in doing so.

National Infrastructure Trends

In 2013, Gallup poll data showed that 77% of respondents were in favor of infrastructure programs that would put people to work on urgent infrastructure repairs. The percentage of respondents in favor of this proposal declined only slightly (72%) when respondents were asked if they favored spending government money to pay for the infrastructure program (Gallup, 2013).

Two years after President Obama reinforced his commitment to improving the nation's infrastructure in his 2014 State of the Union speech, infrastructure investment has resurfaced as a major campaign platform in this year's election. This year "Gallup asked Americans about [the candidates'] proposals on infrastructure investment." The results show that 75% of Americans believe that we *should* spend more federal money to improve infrastructure, including roads, buildings and waterways (Gallup, 2016). The water crisis in Flint, Michigan is just one example of long-term setbacks that can result from short-term savings on infrastructure. This crisis has also called attention to the importance of governmental accountability, and the severity of aging infrastructure and disinvestment.

Many experts argue that infrastructure investment has a multiplier effect on the economy. According to Business Insider, Sylvain Leduc, Vice President of the Federal Reserve Bank of San Francisco and Daniel Wilson, Research Advisor for the Federal Reserve Bank of San Francisco, published a working paper that studied the effect of unexpected infrastructure grants on state GDPs (GSPs) since 1990. Their findings indicate that, "on average, each dollar of infrastructure spending increases the GSP by at least two dollars." (Business Insider, 2012).

The American Society of Civil Engineers (ASCE) measures the quality of national and statewide infrastructure. Nationally, the United States received a D+; New York State received a C–, with the highest grade for parks and open space. According to the ASCE, each letter grade denotes an overall assessment of *capacity, condition, funding, future need, operation and maintenance, public safety, resilience, and innovation*; C and D letter grades equate to 'mediocre' and 'poor' respectively. Although the cost of improving and restoring our infrastructure may run high, the cost of inertia will be much greater.

Water, Water Everywhere

In addition to terrorism, the U.S. Office of the Director of National Intelligence now considers water scarcity to be a major threat to national security. The issue of water scarcity, and the crisis in Flint, Michigan, has also brought *water quality* into public debate, globally as well as locally. According to a May 2016 Times Herald-Record article, Ulster County Executive Mike Hein and the County's Health Commissioner Dr. Carol Smith recently pushed for lead testing in county-owned and leased facilities in Ulster County buildings. Of the 29 outlets sampled, 20 tested above the "federal action level" (or 0.015 mgs). The highest level was detected at Development Court (0.79 mgs) and high levels were also detected in the County Office Building, the County Courthouse, and the Family Court Buildings.

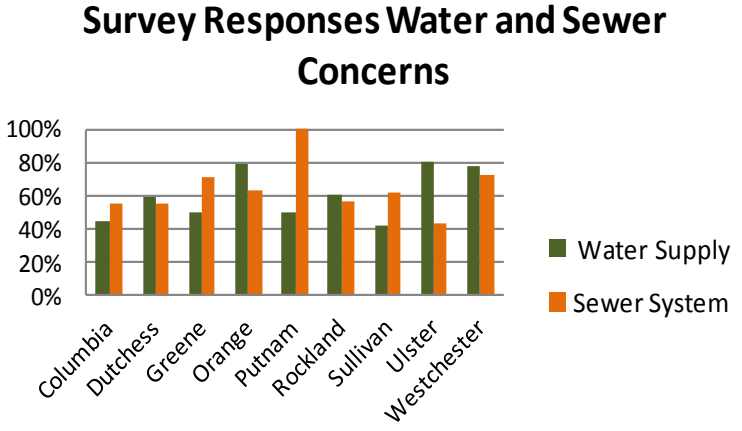
Recently, the City of Newburgh has switched its water supply to Brown's Pond over concerns about the original source, Washington Lake, showing high levels of the pollutant perfluorooctane sulfonate (PFOS) which were first detected in 2013. Alternative methods have been discussed by the Department of Environmental Conservation (DEC) and the Department of Health (DOH) to allow Newburgh to draw water from the lake; these methods include "alternative filtration methods, [and] diverting Silver Stream away from the lake and diluting the lake's water away with water from Brown's Pond." Although Orange County is not testing water outlets for lead levels, they are assisting the City of Newburgh with changing the filtration type of material and the way that these filtration systems remove PFOS (in some cases the city is considering using a filtration method called granular activated carbon which absorbs natural organic compounds, taste and odor compounds, and synthetic organic chemicals in drinking water). The levels in the lake are below the Environmental Protection Agency's advisory guidelines of 200 parts per trillion (PPT), but the presence of PFOS is considered a sign of "emerging" contamination.

This year Governor Andrew Cuomo announced $26.3 million in grants and interest free loans to support water infrastructure projects across the state. The funding is divided between grants ($6.5 million) and no-interest loans ($19.8 million), which were approved in January by the New York State Environmental Facilities Corporation's (EFC) Board of Directors. This funding is part of the $75 million awarded by Governor Cuomo for 45 statewide drinking water and wastewater infrastructure projects across New York. Similarly, The Drinking Water State Revolving Fund (DWSRF) was enacted in 1996 by both the federal and New York State governments. The fund is designed to provide grants and low-interest loans for water infrastructure improvement projects. Since the fund's inception, nearly $2.4 billion has been invested into drinking water facilities across the state.

...and Not a Drop to Drink

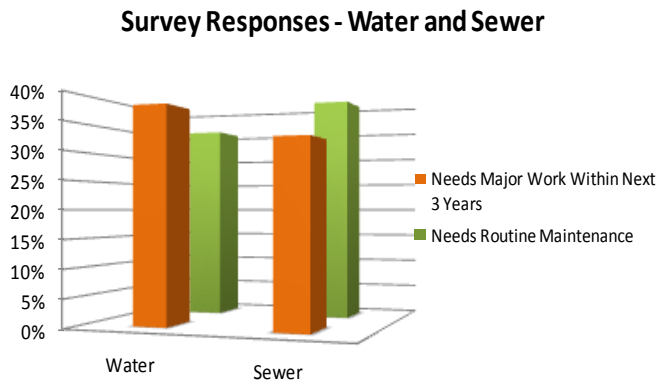
The New York State Water Infrastructure Improvement Act was put in place as a part of the 2015-2016 New York State Budget. Over the next three years a total of $200 million will be issued in grants by the EFC and the DEC and DOH. According to the DEC, roughly $36 billion will need to be invested into the state's water infrastructure over the next 20 years, totaling $1.8 billion annually. Currently, state and federal investment in the 610 water facilities in the state is nowhere near the projected mark; however, more than $1 billion is invested into New York state water quality improvements by the EFC through the Clean Water and Drinking Water State Revolving Fund each year.

In Pattern's 2016 survey, municipal officials were asked how they intend to fund their infrastructure needs: 43% of respondents said they would fund their water infrastructure with federal and state loans and grants. Similarly, 42% of municipal officials said they would fund their sewer infrastructure with federal state loans and grants. A small percentage said they would use local funds for their water infrastructure (13%) and sewer infrastructure (16%.)



Source: Pattern for Progress 2016 survey

Sewer Systems, Sewage Pollution and the Right to Know Act

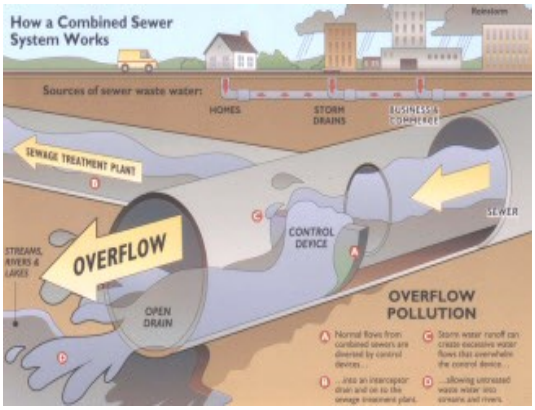


Source: Pattern for Progress 2016 survey

The majority of municipalities surveyed by Pattern this year (77 out of 132 or 58%) expressed concern over the sustainability of their sanitary sewer systems. In Westchester County alone 52% of respondents stated that they were 'concerned' or 'very concerned' about their sewer system. Because the majority of respondents surveyed confirmed that 76% to 100% of their population is served by a water system or district, the potential failure of these systems would have a significant impact on the overall population.

Governor Andrew Cuomo enacted the Sewage Pollution Right to Know Act in 2013 to increase public awareness about the occurrence and location of sewage overflow pollution in New York state water bodies. Because discharge of sewer pollution must be reported "within two hours of discovery to the [Department of Environmental Conservation] and within four hours of discovery to the public and adjoining municipalities" this law can "help document wastewater infrastructure needs and help the public avoid contact with water bodies that may contain bacteria that can cause illness while boating, fishing or swimming" (NYSDEC). Environmental Advocates of New York State (EANY), a leading environmental advocacy group located in Albany, issued a report this year stating "approximately 1.2 billion gallons of combined storm-water and sewage is discharged into the Hudson River annually from combined sewer systems in the Capital Region."

With this law in place, 620 Publicly Owned Treatment Works (POTWs) and the operators of 300 Publicly Owned Sewer Systems (POSSs) must report to the DEC and the local health department, creating more transparency and increasing governmental accountability. According the EANY's March 2016 report, Tapped Out, the DEC Sewage Pollution Right to Know database reported that from May 2014 through June 2015, 234 overflow events were reported in the Hudson Valley amounting to an estimated 2.6 million gallons of sewage overflow pollution. These estimates cannot accurately reveal the true number of sewage discharges, or accurately depict volume overflow, but these numbers do reflect a degree of compliance to the law within the Hudson Valley.



Source: NYS Department of Environmental Conservation

A Long and Winding Road

According to our survey of municipal sentiment on infrastructure, municipally owned and maintained roads in the Hudson Valley are mostly in fair condition. Of all the respondents, 60% said road infrastructure is in fair condition, meaning the roads require substantial work in the next three years. Following closely behind is the impression that roads are in good condition, meaning they will require routine maintenance. Only a small percentage of respondents said their roads are in poor condition, meaning some aspect of the road infrastructure is at risk of imminent failure.

As many in the public works field will attest, delaying maintenance on public infrastructure such as roads, bridges, water, and sewer facilities can lead to high replacement costs in the future. Lack of preventative maintenance and lack of planning for the useful life of assets can have costly consequences. While many responding municipalities across the Hudson Valley said they will seek to fund maintenance through tax-generated highway funds, large numbers also said they may go into debt or seek grants to maintain their roads.

Evaluation of the Condition of Municipality Owned Roads in the Hudson Valley

Counties	Poor	% of Total Responses	Fair	% of Total Responses	Good	% of Total Responses	Total Surveys	% of Total Responses
Columbia	0	0%	4	50%	4	50%	11	73%
Dutchess	1	4.3%	11	47.8%	11	47.8%	23	100%
Greene	0	0%	1	33.3%	2	66.7%	4	75%
Orange	2	10.5%	7	36.8%	10	52.6%	19	100%
Putnam	0	0%	3	75%	1	25%	4	100%
Rockland	1	7.1%	9	64.3%	4	28.6%	15	93.3%
Sullivan	2	18.2%	6	54.5%	3	27.3%	12	91.7%
Ulster	0	0%	9	50%	9	50%	21	85.7%
Westchester	1	4.5%	10	45.5%	11	50%	23	95.7%
Total	**7**	**5.7%**	**60**	**49.2%**	**55**	**45.1%**	**132**	**92.4%**

Source: Pattern for Progress 2016 survey

Along these lines, the Consolidated Local Street and Highway Improvement Program (CHIPS) conducted by New York State has been instrumental in the planning process and in actual reconstruction, paving and most maintenance work. For many small municipalities, as one highway superintendent put it, CHIPS is the lifeblood of the local road system, many small towns and villages only have CHIPS funding for road repair. CHIPS has always been a reimbursement program, for which the State has tightened up the rules. This year the Governor added "Pave NY", a $100 million a year program for five years, a net gain of $50 million dollars over last year's funding.

How Do You Propose to Fund your Road Infrastructure Needs? *

Municipalities	Highway Fund budget	% of Total Responses	User Fees	% of Total Responses	Municipal Bonds (including special districts)	% of Total Responses	Federal/State Loans or Grants	% of Total Responses
Columbia	5	41.7%	0	0%	1	8.3%	2	16.7%
Dutchess	17	77.3%	1	4.5%	9	40.9%	12	54.5%
Greene	2	50%	0	0%	0	0%	0	0%
Orange	14	73.7%	0	0%	6	31.6%	11	57.9%
Putnam	3	75%	0	0%	2	50%	1	25%
Rockland	5	33.3%	0	0%	6	40%	8	53.3%
Sullivan	6	50%	1	8.3%	3	25%	5	41.7%
Ulster	15	71.4%	0	0%	7	33.3%	9	42.9%
Westchester	17	73.9%	0	0%	16	69.6%	12	52.2%
Total	**84**	**63.6%**	**2**	**1.5%**	**50**	**37.9%**	**60**	**45.5%**

Source: Pattern for Progress 2016 survey **Respondents were asked to check all categories that apply*

BRIDGES

The resilience and strength of bridges across the Hudson Valley was put to the test in the past decade after a series of punishing storms, severe temperature swings, and floods affected the region. Drivers across the region know, however, that road crews have been repairing and replacing bridges in the months and years since such severe weather events as Hurricanes Irene and Tropical Storm Lee and the winter of 2014-15. It stands to reason that even more bridges would be viewed as being in poor condition had those repairs not taken place. However, only 22% of bridges in the Hudson Valley were deemed to be in "poor" condition by respondents in the Pattern for Progress 2016 infrastructure survey.

In the survey, a condition seen as "poor," means a bridge is perceived to be at risk of imminent failure. A bridge seen to be in "fair" condition is one that requires substantial work in the next three years. A bridge perceived to be in "good" condition is one that requires routine maintenance.

2016 Evaluation of the Condition of Municipality Owned Bridges in the Hudson Valley

Counties	Poor	% of Total Responses	Fair	% of Total Responses	Good	% of Total Responses	Total Responses	% of Total Responses
Columbia	1	25%	2	50%	1	25%	11	36.4%
Dutchess	1	6.3%	8	50%	7	43.8%	23	69.6%
Greene	0	0%	0	0%	2	100%	4	50%
Orange	4	28.6%	6	42.9%	4	28.6%	19	73.7%
Putnam	3	0%	0	0%	0	0%	4	75%
Rockland	0	0%	4	50%	4	50%	15	53.3%
Sullivan	3	37.5%	2	25%	3	37.5%	12	66.7%
Ulster	5	35.7%	5	35.7%	4	28.6%	21	66.7%
Westchester	1	7.1%	7	50%	6	42.9%	23	60.9%
Total	**18**	**21.7%**	**34**	**41%**	**31**	**37.3%**	**132**	**62.9%**

Source: Pattern for Progress 2016 survey. *Note: 37% of respondents (11) left this item blank*

National Bridge Inventory 2015 Ratings

Counties	# of Bridges	% Structurally Deficient	% Functionally Obsolete	% Total Deficient
Columbia	242	18.2%	23.6%	41.7%
Dutchess	336	13.4%	33%	46.4%
Greene	227	11%	21.1%	32.2%
Orange	471	13.4%	24.8%	38.2%
Putnam	104	9.6%	35.6%	45.2%
Rockland	243	8.2%	42.4%	50.6%
Sullivan	358	9.8%	13.4%	23.2%
Ulster	384	17.4%	25.5%	43.0%
Westchester	767	6.1%	50.7%	56.8%
HV Total	**3,132**	**11.4%**	**32.2%**	**43.6%**
NYS Total*	**17,461**	**11.4%**	**26.9%**	**38.3%**

Source: United States Department of Transportation Federal Highway Administration.
** Excludes federal bridges*

These perceptual evaluations among those in charge of the region's municipally owned bridge infrastructure is not far off from the ratings assigned to the Hudson Valley's bridges (including county and state) by the National Bridge Inventory (NBI) program of the Federal Highway Administration, especially when keeping in mind the very specific definition of the NBIs rating system (see below). According to the NBI, 44% of all bridges except federal bridges in the Hudson Valley are considered either structurally deficient or functionally obsolete. Under either measurement – the 2016 Pattern survey or the NBI rating system as of 2015 – numerous bridges in the Hudson Valley are in need of attention.

In terms of the National Bridge Inventory, "structurally deficient" is a status used to describe a bridge that has one or more structural defects that require attention. This status does not indicate the severity of the defect but rather that a defect is present. Please see the Structural Evaluation and the Condition ratings of each bridge deck, substructure, and superstructure for details of the nature and severity of the defect(s). In the NBI, "Functionally obsolete" is a status used to describe a bridge that is no longer, by design, functionally adequate for its task. Reasons for this status include that the bridge doesn't have enough lanes to accommodate the traffic flow, it may be a drawbridge on a congested highway, or it may not have space for emergency shoulders. Functionally Obsolete does not communicate anything of a structural nature. A Functionally Obsolete bridge may be perfectly safe and structurally sound, but may be the source of traffic jams or may not have a high enough clearance to allow for an oversized vehicle.

Regardless of the measurement being used additional investment in bridge repair would be a wise decision.

Conclusion

In both 2014 and 2016, municipalities across the Hudson Valley expressed significant concern over the condition of infrastructure and, in the case of water, the quality and availability of the supply. In addition, spending on infrastructure, particularly at the local level of cities, town and villages, shows a downward trend at a time when aging systems, increased demands and concern over viability call for more.

Funding will continue to be a major obstacle for smaller municipalities. In 2014, only the region's counties were spending a higher percent of their budget on infrastructure than they had in 2004 while the cities of the Hudson Valley devoted only 2% of their budgets to infrastructure in 2014.

Presidential candidates from both parties have emphasized the importance of infrastructure investment. Their proposals advocate for different kinds of infrastructure (green infrastructure such as solar and wind installation, and hydroelectric power or traditional infrastructure such as bridges, water and sewer systems, airports, mass transit, public buildings and broadband), but every proposal includes a plan for financing new structures and repairing existing ones.

Before cities follow in the footsteps of Flint, Michigan, every proposal for infrastructure investment needs to be more than the content that makes up campaign platforms– these proposals need to be grounded in reality. At the Pattern for Progress annual County Leaders Breakfast in March 2016, Ulster County Executive Mike Hein emphasized how industrialization and growth have changed the way the U.S. uses infrastructure and how much supply is necessary to sustain current and future generations. Leaders across the Hudson Valley have called for different approaches to planning and investing in infrastructure. The findings reflected in this report also underscore the need for greater vision. Infrastructure in all its forms is the classic scenario where the sum is greater than the parts. Without a functioning and well-maintained system of infrastructure the Hudson Valley as a whole cannot expect to attract the growth in population and economy it depends on to sustain the vibrant way of life for which the region is known.

In an effort to continue this conversation and bring the topic of infrastructure onto a local level, Pattern's survey provides a snapshot of Hudson Valley infrastructure from the perspective of municipal officials. While national infrastructure trends should not go underreported, the needs of Hudson Valley municipalities warrant unabated attention. This survey can provide insight into the needs of each community individually, and for the Hudson Valley as a whole.

Survey Methodology

Pattern utilized Survey Monkey, an online research instrument, as the main platform for collecting survey responses. Some municipalities chose to complete the survey manually.

Distribution of % of Respondents		
County	**2014 % (126)**	**2016 % (132)**
Columbia	7.1%	9.1%
Dutchess	15.9%	16.7%
Greene	5.6%	3%
Orange	17.5%	14.4%
Putnam	2.4%	3%
Rockland	5.6%	11.4%
Sullivan	6.3%	9.1%
Ulster	16.7%	15.9%
Westchester	23.0%	17.4%
Total	**100%**	**100%**

Source: Pattern for Progress, 2014 & 2016

In addition to the survey data collected from municipal mayors, supervisors, and public works officials in the nine-county region, Pattern utilized data from the Office of the New York State Comptroller and the United States Department of Transportation Federal Highway Administration.

Responses were received from 132 municipalities out of the 238 surveyed. 60% of 2016 responses came from municipalities that participated in 2014, while 40% were from municipalities not represented in the 2014. Although 79 municipalities responded to both surveys in 2014 and 2016; 58% of responses were not from the same individual, making a year to year comparison problematic (in addition to skipped survey questions). Based on these findings, Pattern does not claim that any trend (upward or downward) has occurred between 2016 and 2014; rather, our reports serve to provide individual snapshots of the region. Given these limitations, it should be emphasized that our survey results are not representative of a county-wide sentiment; rather they represent sentiment expressed by individual municipalities from within that county in that year.

Without disclosing the identity of those respondents that requested anonymity, the above chart shows a distribution of respondents from each county for both years. In 2014 the majority of respondents were from Westchester, Ulster and Orange County. In 2016 the majority of respondents remained in Ulster County and Westchester County with Dutchess replacing Orange, while the percentage of respondents in Rockland County more than doubled.

RECOMMENDATIONS

1. Use private capital wisely: As municipalities seek additional resources that fall outside of the tax cap, they should consider public-private partnerships. These agreements must ensure that privately developed infrastructure protects taxpayers
2. Leverage private capital and expertise to enhance and expand infrastructure; partnerships between the public and private sector incentivize long-term thinking about a project's operations and maintenance (Detroit Free Press, 2016)
3. Establish reporting system in exchange for state or federal funds. Municipalities should be required to provide an annual assessment of infrastructure conditions to the Office of the NYS Comptroller
4. Increase the percentage of grant money provided by New York State Environmental Facilities Corporation (EFC) funds; to prevent municipalities from going into debt, an option they cannot afford. Likewise, utilize EFC funding that provides low -interest loans with the potential for no-interest loans based on level of economic distress and needs of community (additional funding provided for wastewater)
5. Increase Consolidated Local Street and Highway Improvement Program (CHIPS) state and federal funding and create greater access to it so that communities can reduce the cost of maintenance as well as the replacement rate on all road and bridge infrastructure
6. Encourage United States Department of Agriculture (USDA) rural development funding in eligible communities for grants and loan programs with favorable interest rates
7. Encourage applications for US Department of Commerce Economic Development Administration (USEDA) funds for expansions/extensions/upgrades for water and sewer infrastructure that accommodate job creation and training (EDA) will match funding 50:50 and will increase grant share based on economic distress; documents included with the grant application that show 24 months of employment statistics from Stats America can be utilized to show a community is economically distressed and may provide eligibility for additional funding
8. Conduct build-out analyses as part of long-term capital planning based on major project pipe-lines and on current and projected capacities (see regional capacity map in the 2015 Pattern for Progress report, Hudson Valley Infrastructure: Is it safe? Is it fair? Is it informed?)
9. Create and fund long-term planning efforts. One example: In the Dutchess County Partnership for Manageable Growth (PMG), $1 million was made available for Open Space and Farmland Protection Grants or Water and Wastewater Facility Planning and Development Grants
10. Continue the prioritization of funding for projects that encourage smart growth and reduce sprawl in a program that helps rebuild urban areas. Existing infrastructure in small cities and population centers can help attract new residents and incentivize growth

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This report represents a snapshot in time and is based upon available information and the analysis of existing markets, demographics, data and statistics. The report is not meant to be used as a financial forecasting model or for any financial decisions now or in the future.

Pattern for Progress is the Hudson Valley's public policy and planning organization that creates regional solutions to quality-of-life issues by bringing together business, nonprofit, academic and government leaders from across nine counties to collaborate on regional approaches to affordable/workforce housing, municipal sharing and local government efficiency, land use policy, transportation and other infrastructure issues that most impact the growth and vitality of the regional economy.

Join Pattern and be part of the solution!

HUDSON VALLEY PATTERN FOR PROGRESS

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