

Map-a-THON

Granite Staters Drawing Fair Voting Maps



NH House
Maps
Coming Soon!

Proposed Voting District Maps for U.S. Congress, NH Executive Council, and NH Senate

About the NH Map-a-Thon Citizen-Drawn Mapping Project

In May 2021, Open Democracy, the Kent Street Coalition, Granite State Progress and the League of Women Voters New Hampshire launched the Map-a-Thon Citizen Mapping Project, to “crowdsource” fair voting maps for the Granite State. To date, over 200 people have participated in the data collection, mapping and presentation of alternative fair maps for the 2020 redistricting process.

Our Mapping Process is Fair & Transparent

The Map-a-Thon's project is a transparent process, including the software, criteria, data sources, maps, and analysis tools. Interested citizens and legislators can replicate our maps to verify our conclusions. We welcome your efforts to try to make even better maps!

Map-a-Thon maps also use “communities of interest” data when possible to determine what towns should – and should not – be districted together. (See explanation at right) These, and other techniques, should be a model for the tools a future independent redistricting commission would use to determine voting districts, replacing the current partisan model.

Our maps have already gone through two steps of review, and we encourage your input on our current proposals, which have been released weeks ahead of any final decision by the state legislature to give time for adequate review.

Send your comments & corrections to FairVoting@OpenDemocracyNH.org

What are Communities of Interest &

Why Are They Important to Fair Maps?

Communities of Interest can be any cultural, financial, geographic, historical or mutual benefit which connects towns together. The Map-a-Thon project's original survey included over 60 potential communities of interest, which was narrowed to the most important five:

- Regional High Schools & SAUs
- Shared Emergency Services
- Shared Municipal Water Systems
- Shared Issues (PFAS, Poverty, Addiction)
- - Regional Hospitals

After Constitutional, statute and court guidelines, the Map-a-Thon's maps employ this criteria whenever possible to sensibly connect towns.

Due to many links, this document best viewed as a PDF: OpenDemocracyNH.com/redistricting/mapathonreport1.pdf

Map-a-Thon Glossary

Community of Interest (COI)-- Communities of interest can take many forms, but generally refer to groups of people united by shared interests. In the context of redistricting, communities of interest are those communities that share policy concerns, such as similar economic interests, a shared school system, or common resources. Our maps use boundaries of shared high school districts, shared water systems, and shared police and fire protection -- in addition to the boundaries of towns and city wards-- to inform the redistricting process. More information about communities of interest can be found by visiting [NYU's Brennan Center](#).

Compactness – Compactness helps us measure the cohesiveness of a district. When drawing districts to represent a region, it is best practice to strive for a compact district, since non-compact districts are less likely to share communities of interests (2010's Executive Council & some 2020 NH Senate districts), and the wider area makes it harder for representatives to understand and serve the needs of constituents. Compactness is also used as a check against gerrymandering (see below), since gerrymandered districts tend to not be compact. The compactness scores reported in our analysis come from the [DRA compactness calculation described here](#):

Contiguity – Contiguity describes how municipalities in a voting district are geographically connected to each other. Contiguous districts are a requirement for all legislative districts in New Hampshire. This definition is sometimes stretched -- quite literally -- with the towns of Meredith and Gilford only connected in the middle of Lake Winnipesaukee, the towns of Strafford and New Durham connected in an inaccessible point in the woods, and the 2010 floterial district, Grafton 9, for which the elected rep has to travel out of the district to get to constituents on the other side of the district.

Dave's Redistricting Application (DRA) – Dave's Redistricting Application, hosted at <https://davesredistricting.org> is a free online tool for creating, viewing, sharing, and analyzing redistricting maps. The mission of Dave's Redistricting is to, "empower civic organizations and citizen activists to advocate for fair congressional and legislative districts and increased transparency in the redistricting process." Map-a-Thon's maps and most supporting data are located there for public inspection.

Deviation – Deviation refers to the degree to which districts have equal population. Ideally, every representative or other elected official in proportional representation will represent the same number of people, but a small amount of flexibility --deviation-- is permissible to account for unequal population distributions and compliance with other laws, such as the 1965 Voting Rights Act or the New Hampshire Constitution's mandate to keep town boundaries intact, and NH Supreme Court Rulings.

Gerrymandering – Gerrymandering is the practice of drawing district boundaries for partisan advantage. This leads to uncompetitive general elections and districts oriented toward party agendas rather than local interests. Gerrymandered districts often connect regions with little in common, leading to the splitting of cities, counties, and other communities of interest. The leading example of this in New Hampshire is 2010's Executive Council 2 and certain NH Senate districts

Splitting – Because our maps are drawn with the goal of avoiding gerrymandering while keeping communities of interest intact, many parts of our analysis examine the number of communities of interest divided, or "splits," contained within a district. The ideal map minimizes the number of districts which cross other administrative boundaries to hold communities of interest intact. Our analyses examine the number of geographical splits necessary. For example, a state senator representing the towns of Dublin and Peterborough would split county lines while keeping a school district intact. Another way of examining splitting is to weight splits by population, the approach taken in the DRA county-splitting metric.



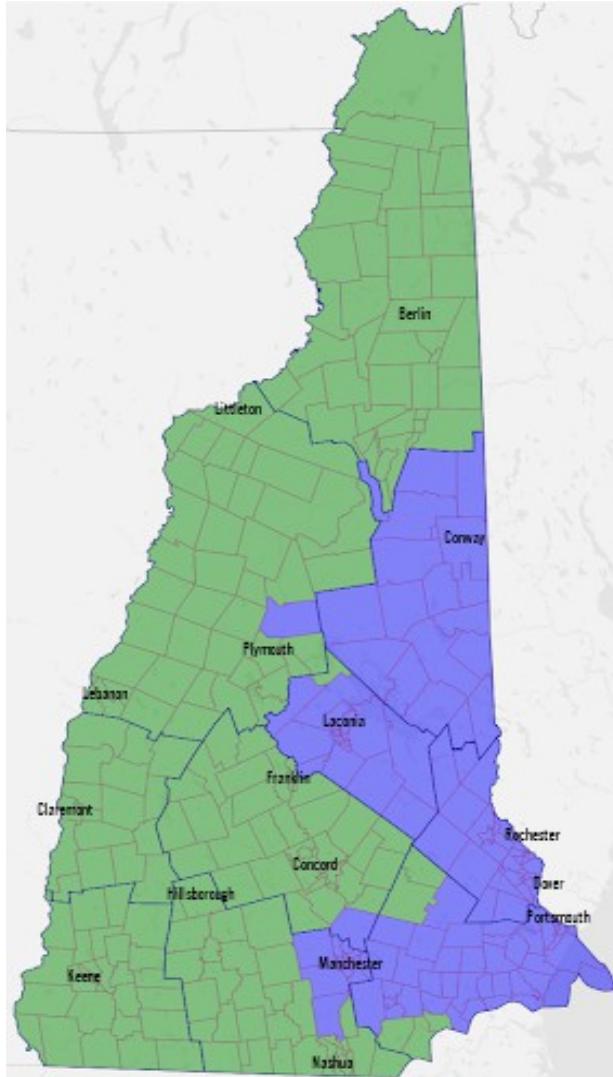
Map-a-Thon Communities of Interest Overlays

Communities of Interest (COIs) were prioritized by Map-a-Thon participants during a public meeting on 7/20/2021.

- The top 10 COIs are listed below; the top 5 were prioritized for mapping.
- Final COIs were modified based on data availability, identification of other data sources better suited to purpose, and need to consolidate.

Rank	Preliminary COI	# Votes	Final COI	Rationale for Modifications	Data Source
1	Cooperative School Districts and Regional High Schools	79	High School Service Areas	Regional high schools usually encompassed cooperative school districts. Grouping towns by shared high schools allowed the shared interest of a high school to be mapped without the need to differentiate between regional SAUs, cooperative agreements, and other school administrative formats.	NH Department of Education
2	Shared Police, Fire & Ambulance Services or Dispatch area	72	Shared Police and/or Fire Departments (<i>excluding Mutual Aid</i>)	Mutual aid service areas and some shared ambulance & dispatch areas were quite large and did not seem to capture the intent of this COI.	NH Economic & Labor Market Information Bureau (with calls to towns as needed)
3	Shared Water System	71	Shared Water and/or Sanitation System	Shared Water & Sanitation (Sewer) Systems had common concerns, & the data source included both.	NH Department of Environmental Services
4	Special issues identified in COI survey (including PFAS, homelessness, opioids, traffic, etc.)	66	Social Vulnerability Index (SVI)	There were far too many potential issues identified in the survey and no method to prioritize. SVI includes 16 indicators and is used by NH DHHS & CDC to identify the most vulnerable communities. Towns or cities with 1 or more census tracts with $SVI \geq 5$ were identified.	NH Department of Health and Human Services
5	Hospitals serving a region	65	Regional Public Health Networks	Hospital Service Areas differ by type of service provided (primary care, specialty care, mental health care, etc.). NH DHHS seeks & directs funding and other resources to 13 Regional Public Health Networks	NH Department of Health and Human Services
6	Town & Cultural Centers	64	Regional Planning Commissions	Nine Regional Planning Commissions help citizens and municipal governments identify problems and implement solutions on all these topics (plus several listed in #4 above).	NH Association of Regional Planning Commissions
7	Large employers	61			
8	Bodies of water / Conserved land / Dams	61			
9	Major roadways - commuting corridors	61			NH Association of Regional Planning Commissions
10*	Housing - Workforce, affordable, low-income,etc	*Added by consensus			

U.S. Congressional Districts 2010 vs. 2020



NH 2010 (Current) Congressional Map w/Counties

[Link on DRA mapping software](#)

<<<2010<<<

Pros:

Very low deviation in 2010 (<.01%)
Good balance of rural and urban
Competitive districts

Cons:

8 split High School SAUs
5 split Public Health regions
5 split Counties
(Would be 2.6% deviation in using 2020 census)

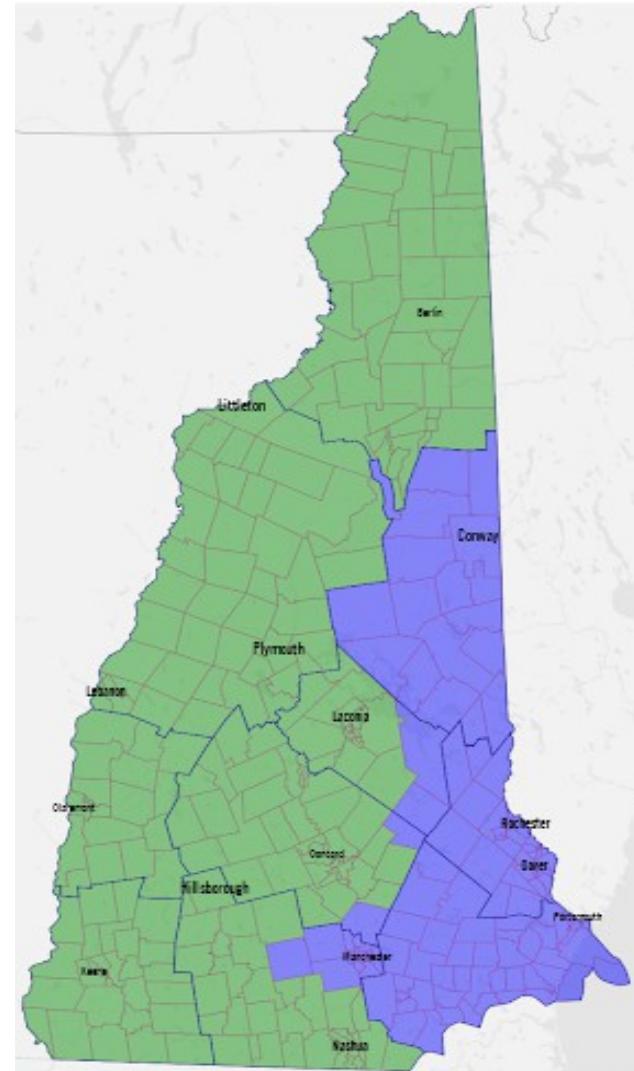
>>>2020>>>

Pros:

Very Low deviation (.05%)
Good balance of rural and urban
Competitive districts
2 split HS SAUs
Keeps Manchester suburbs together
2 split Public Health regions
3 split Counties

Cons:

Less adhesion to prior districts

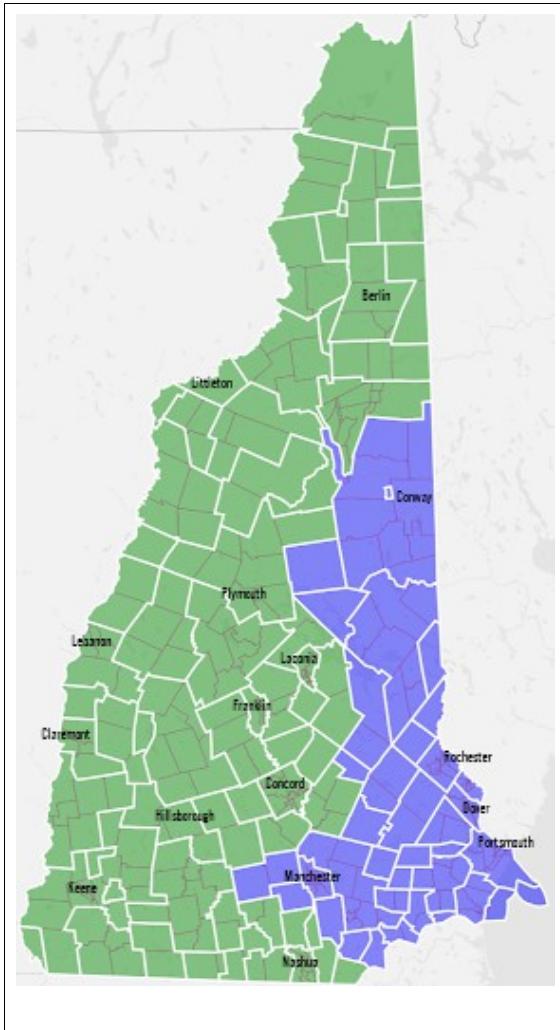


M-A-T 2020 Congressional Map w/Counties

[Link on DRA mapping software](#)

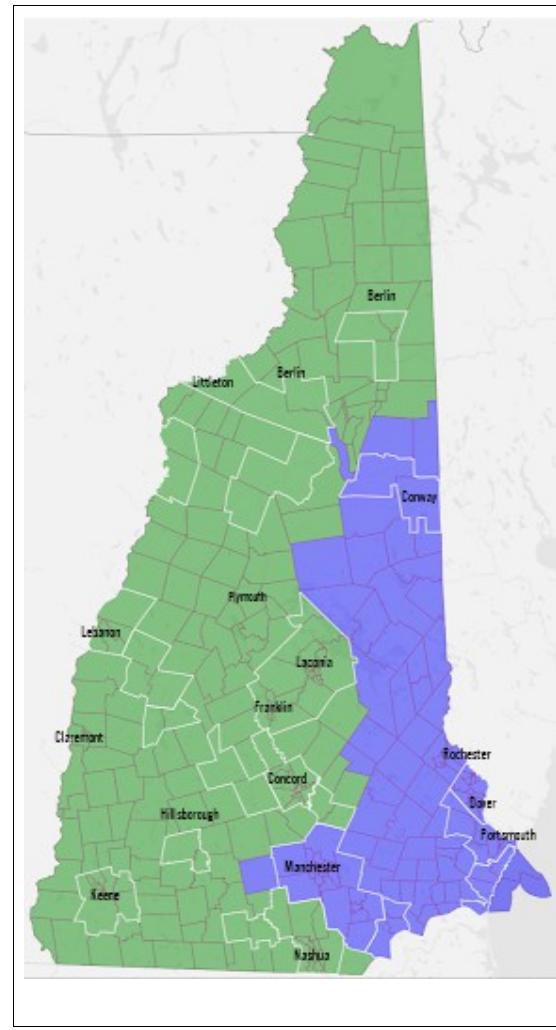
M-A-T 2020 Congressional Maps with Communities of Interest Overlays

Map-a-THON



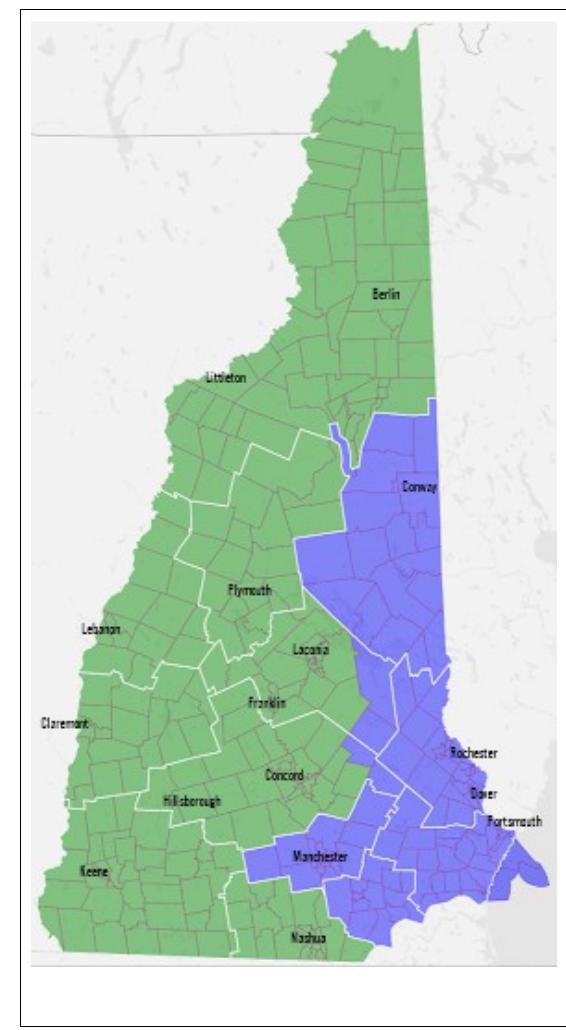
M-A-T 2020 Congressional Reg High Schools

[Link to map on mapping software](#); Select
“Custom Overlay”



M-A-T 2020 Congressional w Shared Water Systems

[Link to map on mapping software](#) Select
“Custom Overlay”

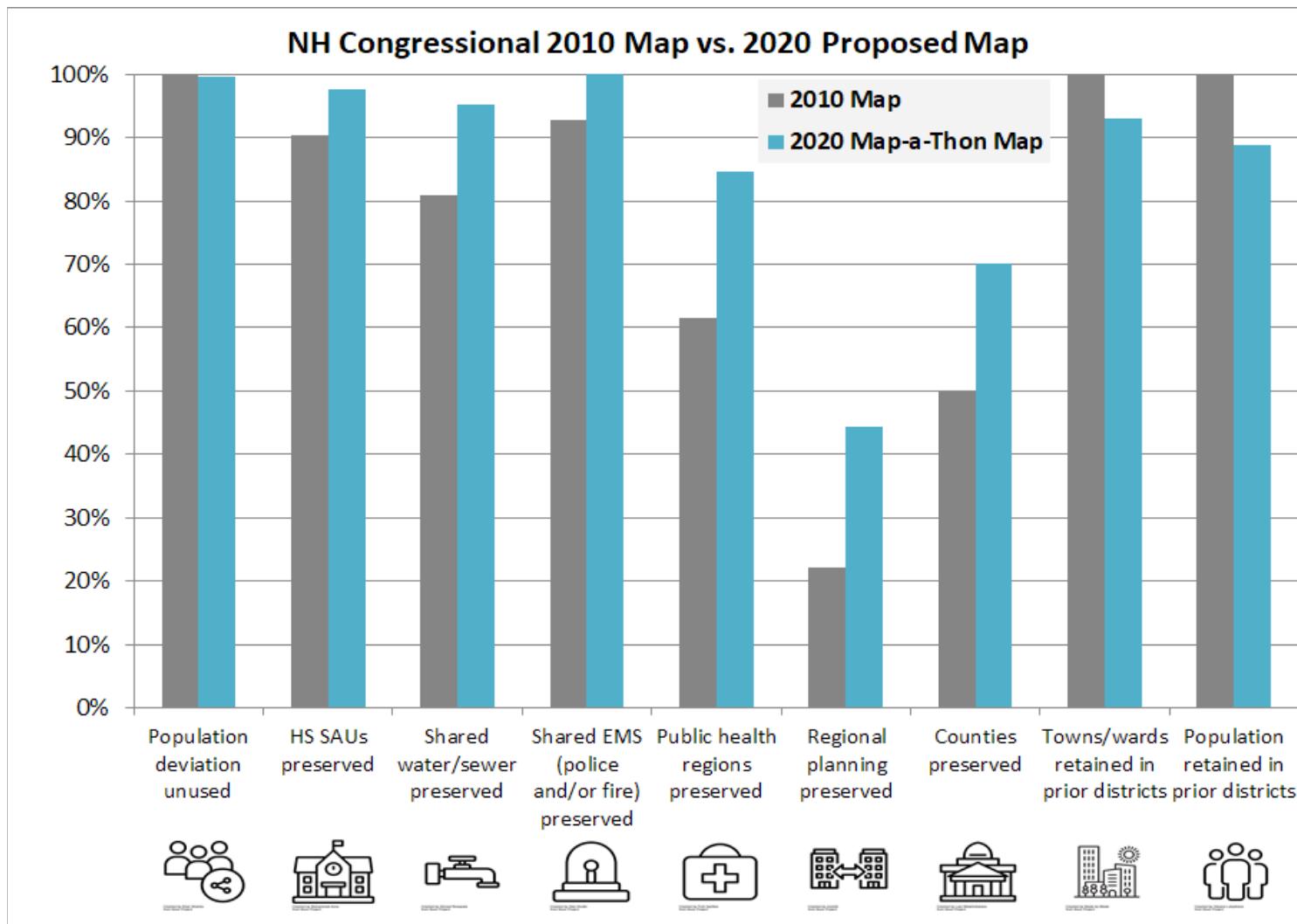


M-A-T 2020 Congressional w Public Health Regions

[Link to map on mapping software](#) Select
“Custom Overlay”

Analysis of 2010 vs. 2020 Congressional Maps **Map-a-Thon**

This chart compares the official 2010 and the proposed 2020 M-A-T Congressional district using communities of interest measures, as well as population deviation and preservation of counties. Note: "Population deviation unused" is a reverse: to include it on the chart. Good = High unused/low used. See the Glossary for deviation definition.



See the COI analysis spreadsheet for this chart: [2010 Congressional](#) [2020 M-A-T Congressional](#)

Using the DRA platform to Inspect Our Maps

Map-a-Thon

Directions for Using the DRA 2020 Software to view base maps & overlays

The Map-a-Thon team uses Dave's Redistricting Application (DRA), an open source software platform for citizen mapping groups and the general public. Please inspect our maps and overlays, and more importantly, the numbers behind the maps. You'll find our maps to be fair, and our process open & transparent. Think you can do better? Citizens can draw their own community's maps using this platform, and are more than welcome to use our communities of interest overlays.

The screenshot shows the DRA 2020 software interface. On the left, there's a sidebar with options for 'New Hampshire' (population: 688,578, -187), 'Map Colors' (checked), and 'Partisan Lean' (unchecked). Under 'Overlays', 'Background Map' and 'District Lines' are unchecked, while 'Precinct Lines' and 'County Lines' are checked. A red circle highlights the 'Overlays' section. A red arrow labeled 'Choosing an Overlay' points from the sidebar to the 'Custom Overlays' section. In the 'Custom Overlays' dropdown, 'Public Health Regions' and 'Regional Planning Com.' are listed, with 'SAU_Map_DRA' currently selected. A red circle highlights the 'Custom Overlays' section. A red arrow labeled 'Click 1' points to the 'Custom Overlays' dropdown. Another red arrow labeled 'Click 2' points to a 'Visual Properties' icon (paint bucket) on the right side of the screen. The main area shows a map of New Hampshire with various overlays applied, including green shaded areas and blue/purple county boundaries. A legend on the right shows 'Apply to All Overlays' with icons for Precinct Lines, County Lines, and City Lines, and a 'Click 2' label next to it. Below the legend are controls for 'Line Width' (1.5), 'Line Color' (dropdown), 'Line Opacity' (1), 'Fill Color' (dropdown), and 'Fill Opacity' (0.25).

To view our Communities of Interest overlays:

- Click on the link underneath any of our maps.
- After you enter DRA 2020 you will see the map in the center and the boxes shown in the photo on the bottom left side of the screen.
- Click "Overlays" or "Custom Overlays" to expand.
- For "Overlays," simply check the box.
- For "Custom Overlays" click the custom overlay's 'Visual Properties' paint bucket icon.
- In a moment, the overlay will load. At peak times the software will be slower to respond.
- Feel free to experiment

Criteria we used to draw Congressional Districts

- 1 Population(<1%) *
- 2 Preserve towns/wards****
- 3 Contiguity****
- 4 Preservation of Cities****
- 5 Preservation of COI's
- 6 Preservation of Counties
- 7 Preservation of prior districts****

* Required by U.S. Constitution

** Required by the NH Constitution

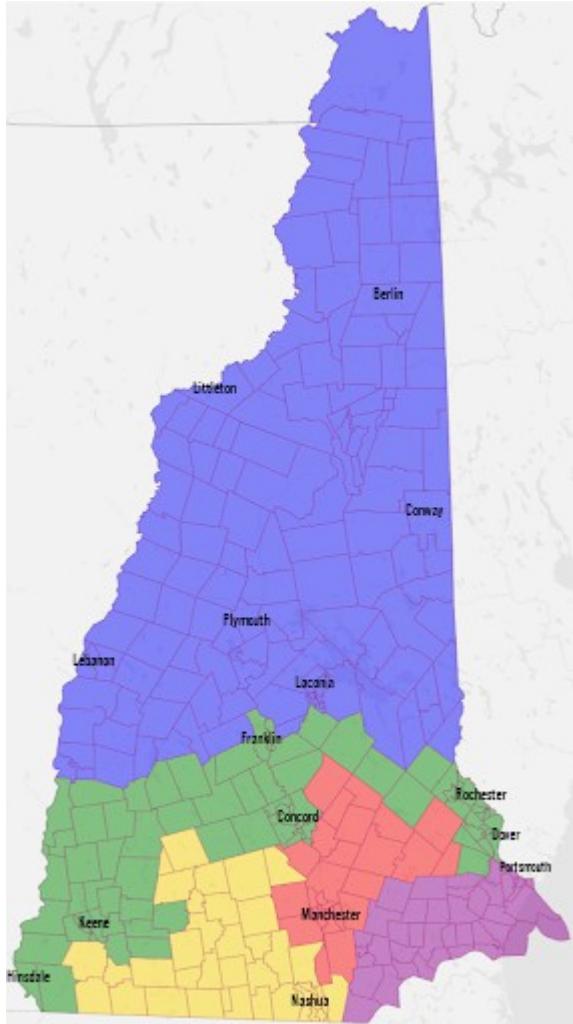
*** NH Statute

**** Tradition

See more criteria details on [this Google Sheet](#)

NH Executive Council 2010 vs. 2020

Map-a-THON



NH 2010 (Current) Executive Council Map

[Link to map on DRA mapping software](#)

<<<2010<<<

Pros:

Somewhat low population deviation in 2010 (4.01%)
Manchester, Nashua, Concord in their own districts

Cons:

19 split High School SAUs
7 split Counties
Not competitive in 2010
37 Compactness score (DRA)
Gerrymandered!

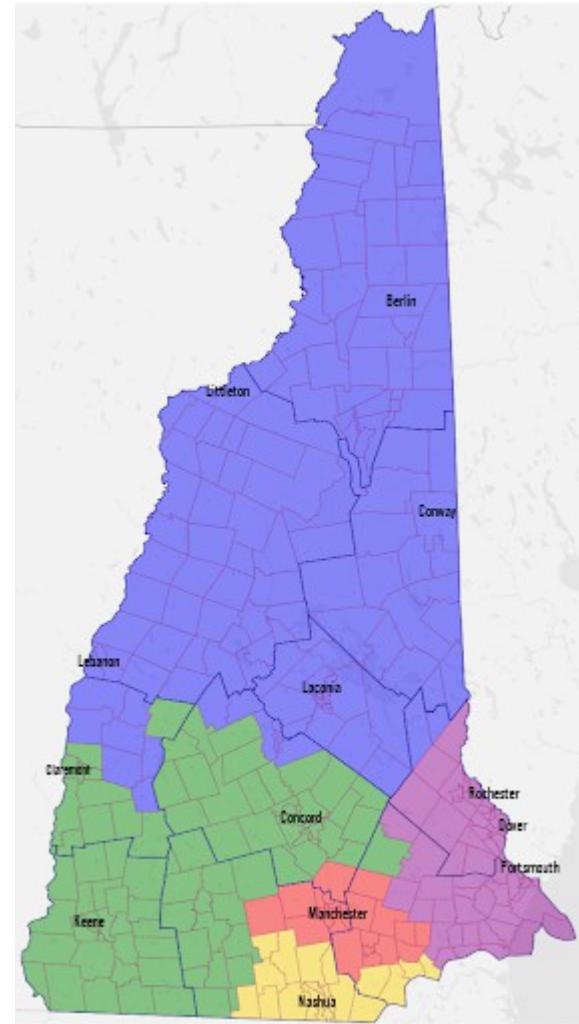
>>>2020>>>

Pros:

Low pop.deviation (2.47%)
1 Competitive districts
3 split High School SAUs
Manchester, Nashua, Concord in own districts
49 Compactness score (DRA)

Cons:

5 split Counties

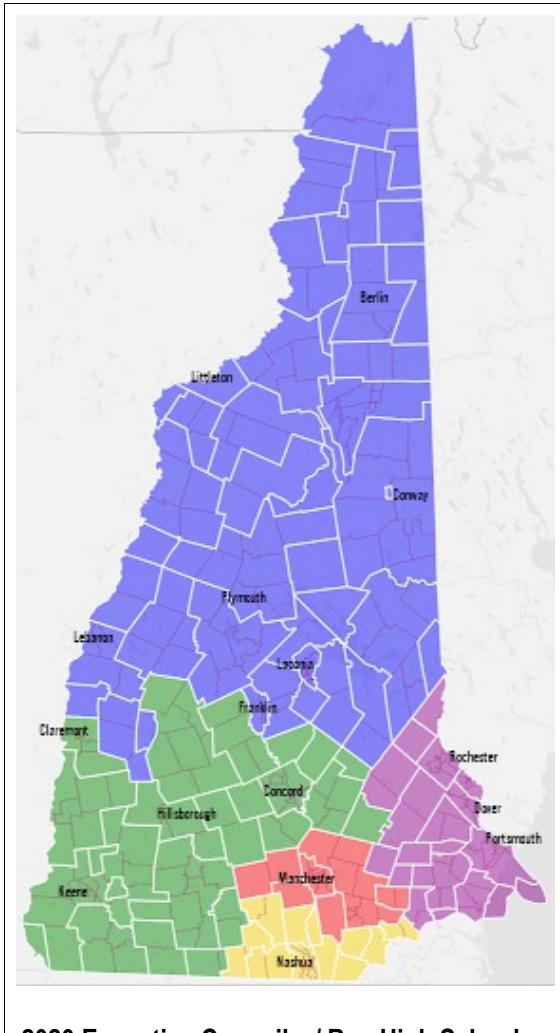


M-A-T 2020 Executive Council Map

[Link to map in DRA mapping software](#)

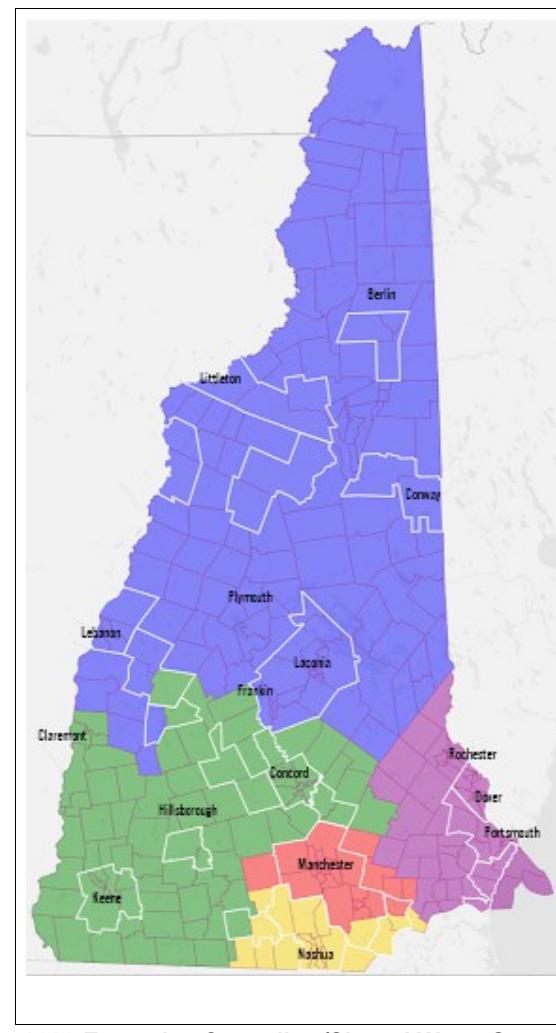
M-A-T 2020 Executive Council Maps with Communities of Interest Overlays

Map-a-THON



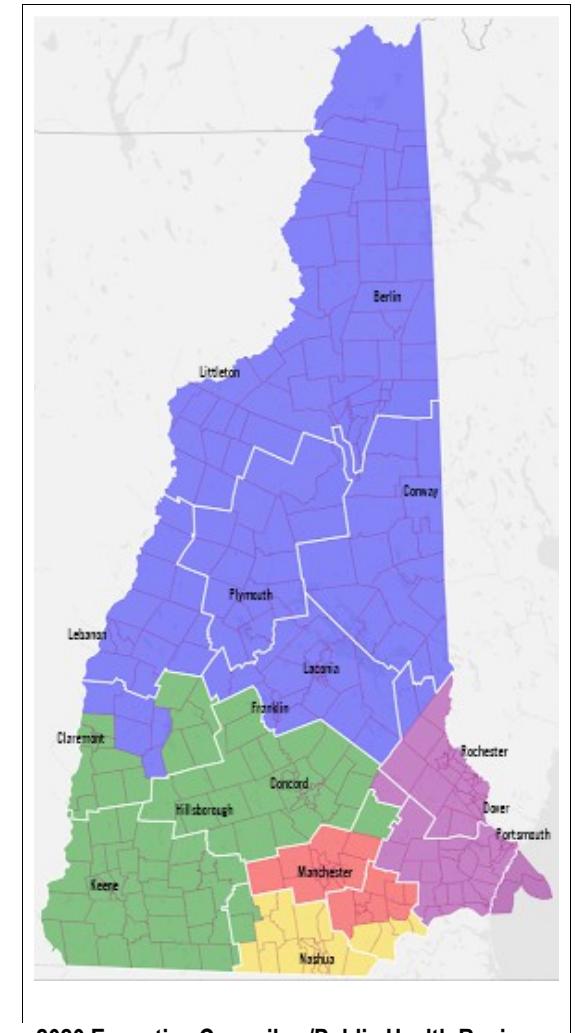
2020 Executive Council w/ Reg High Schools

[Link to map on DRA mapping software](#). Select
“custom overlay”



2020 Executive Council w/Shared Water System

[Link to map on DRA mapping software](#); select
“custom overlay”



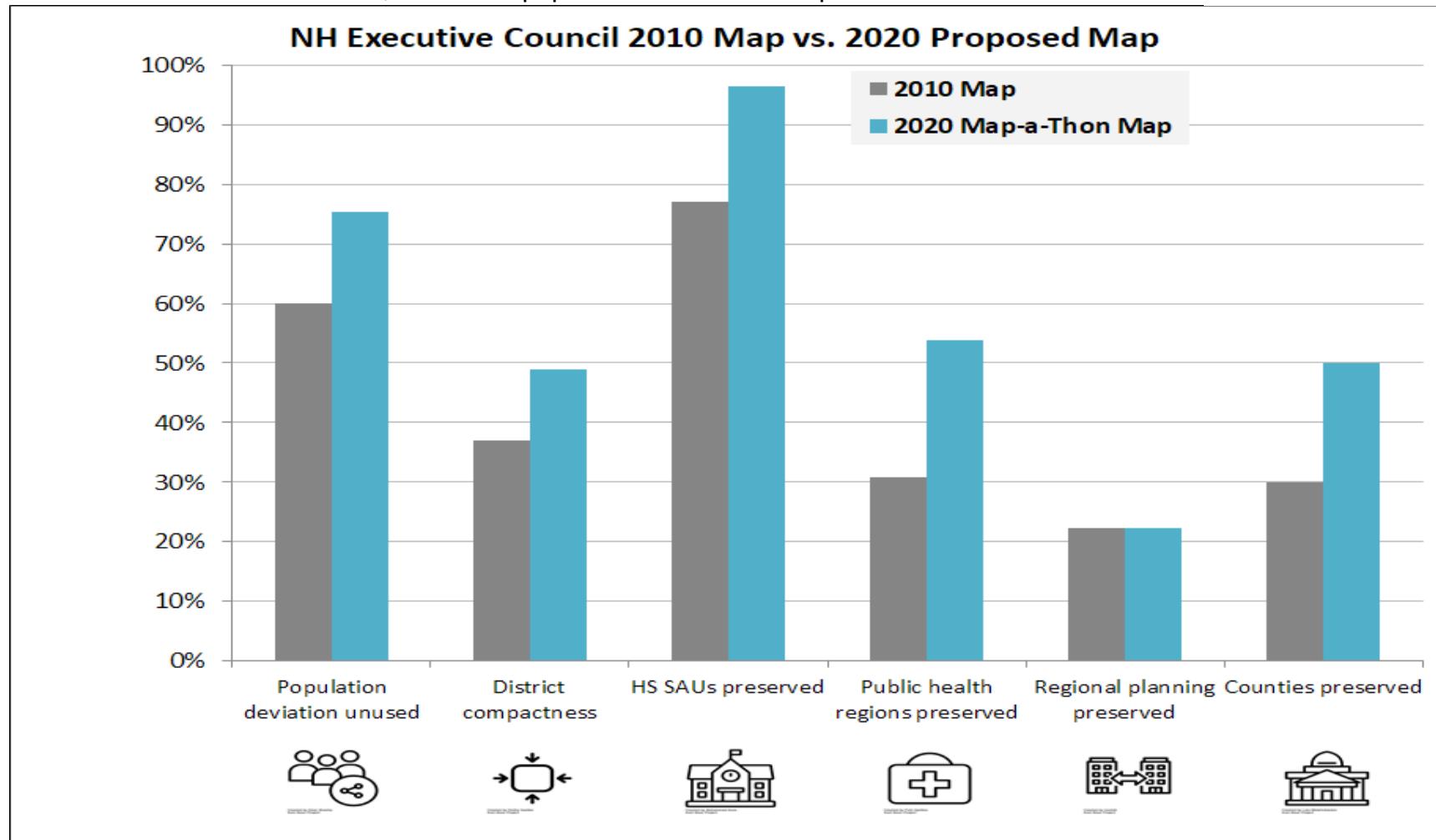
2020 Executive Council w/Public Health Regions

[Link to map on DRA mapping software](#); select
“custom overlay”

Analysis of 2010 vs. 2020 NH Executive Council Maps

This chart compares the official 2010 and the proposed 2020 M-A-T Executive Council districts using communities of interest measures, as well as population deviation and preservation of counties.

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See the COI analysis spreadsheets for this chart: [2010 Exec. Council](#) [2020 M-A-T Exec. Council](#)

Map-a-Thon's NH Redistricting Criteria

Guidelines from the National Association of State Legislatures (NASL) and the Brennan Center for Justice strongly recommend a publicly stated criteria for the redistricting process. [To cite the NASL](#): "When redistricting, state legislatures or redistricting commissions are provided certain criteria with which to draw the lines. These criteria are intended to make the districts easy to identify and understand, and to ensure fairness and consistency."

In the Brennan Center's "[Creating Strong Rules for Drawing Maps](#)," it implores: "Providing clear rules in order of priority can go a long way in ensuring that maps reflect community input and preferences, protect minority communities, and are free from political manipulation. That's good news for America."

Executive Council Map Criteria

- 1 Population(<4%)**
- 2 Preserve towns/wards****
- 3 Contiguity****
- 4 Preservation of Cities****
- 5 Preservation of COI's
- 6 Preservation of Counties
- 7 Compactness

* Required by U.S. Constitution

** Required by the NH Constitution

*** NH Statute

**** Tradition

See more criteria details on [this Google Sheet](#)

NH Senate Map Criteria

- 1 Population(<8.9%)**
- 2 Preservation of towns/wards
(unless town OKs split)**
- 3 Contiguity**
- 4 Preservation of Cities
- 5 Preservation of COI's
- 6 Compactness

Required by U.S. Constitution

** Required by the NH Constitution

*** NH Statute

**** Tradition

See more criteria details on [this Google Sheet](#)

Congressional Map Criteria

- 1 Population(<1%) *
- 2 Preserve towns/wards****
- 3 Contiguity****
- 4 Preservation of Cities****
- 5 Preservation of COI's
- 6 Preservation of Counties
- 7 Preservation of prior districts****

* Required by U.S. Constitution

** Required by the NH Constitution

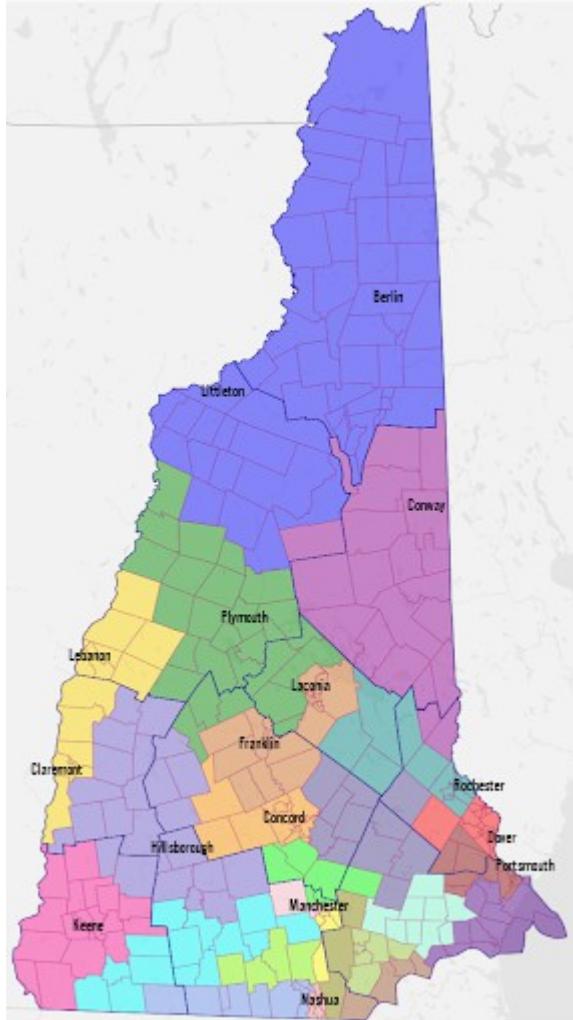
*** NH Statute

**** Tradition

See more criteria details on [this Google Sheet](#)

Map-a-THON

NH Senate 2010 vs. 2020



<<<2010<<<

Pros:

Under 10% deviation in 2010 - (8.88%)
,

Cons:

33 split High School SAUs
Some sprawling districts like 5, 9, and 12.
44 Compactness score (DRA)

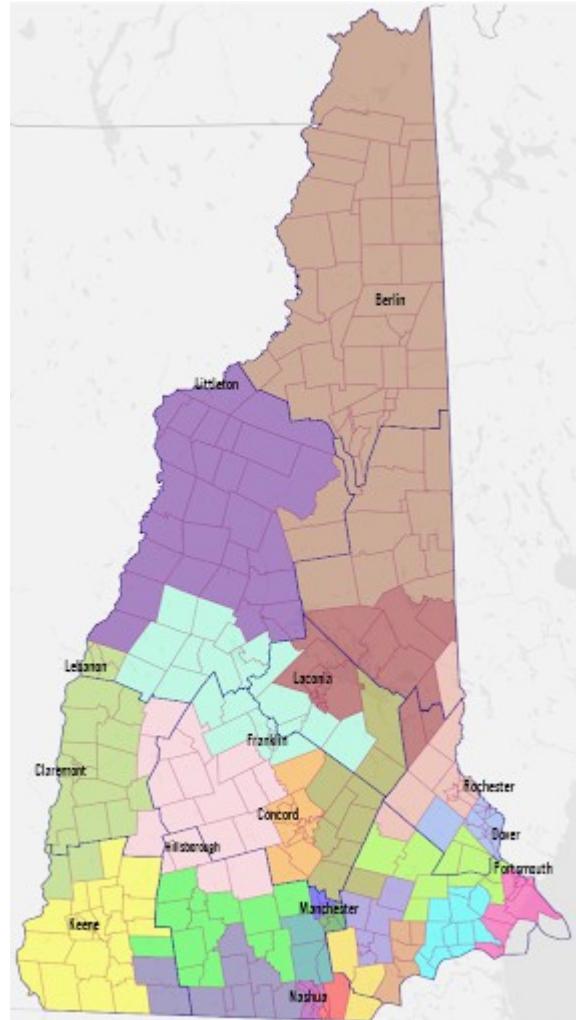
>>>2020>>>

Pros:

Low deviation (5.11%)
60 Compactness score(DRA)
5 Competitive districts

Cons:

15 High School SAUs splits



NH 2010 (Current) NH Senate Map w/County

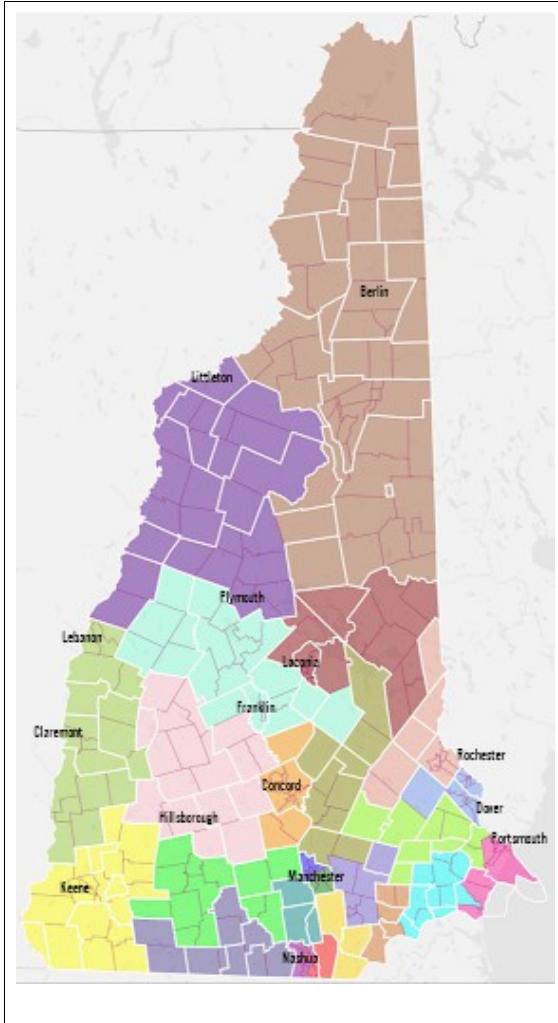
[Link on DRA mapping software](#)

M-A-T 2020 NH Senate Map w/County

[Link: on DRA mapping software](#)

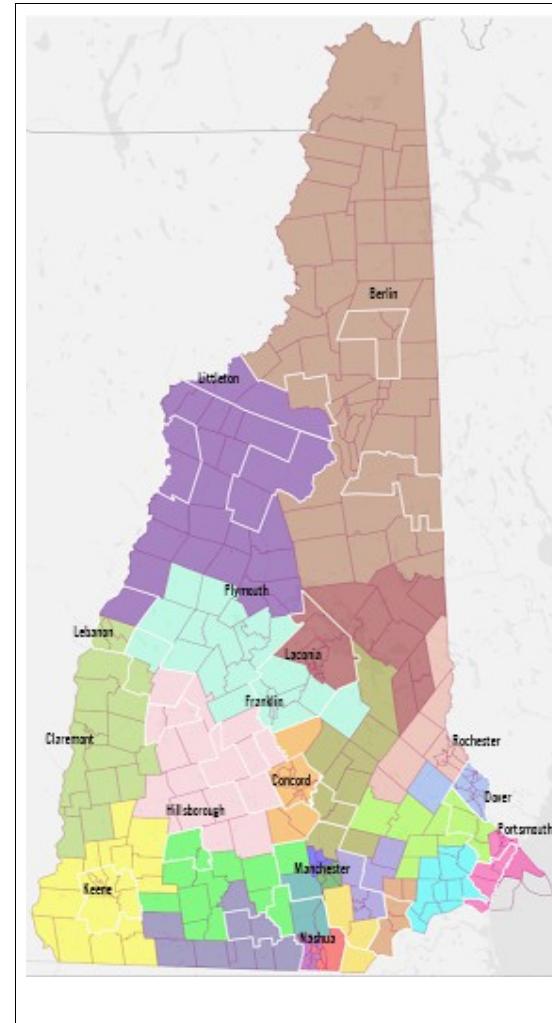
Map-a-Thon 2020 NH Senate Maps with Communities of Interest Overlays

Map-a-Thon



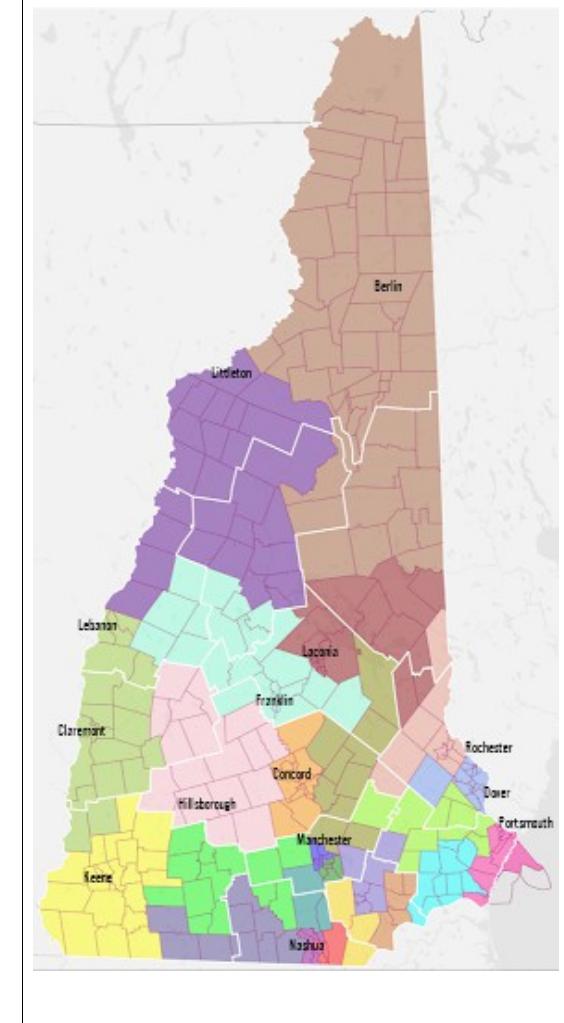
2020 NH Senate Reg High Schools

[Link to map on DRA mapping software](#) select overlay



2020 NH Senate w/Shared Water Systems

[Link to map on DRA mapping software](#) select overlay



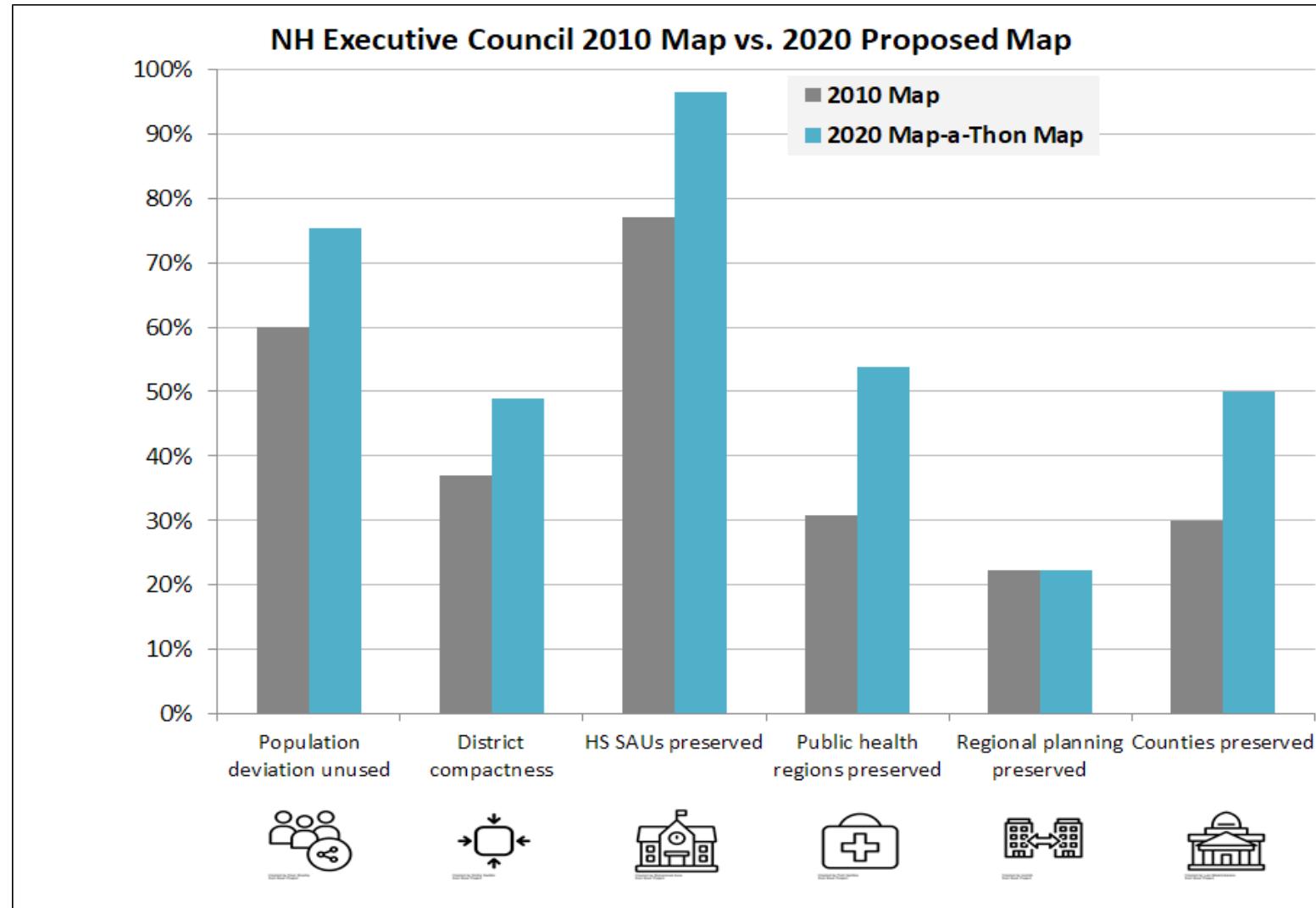
2020 NH Senate w/Public Health Regions

[Link to map on DRA mapping software](#) select overlay

Analysis of 2010 vs. 2020 NH Senate Maps

Map-a-Thon

This chart compares the official 2010 and the proposed 2020 M-A-T NH Senate districts using communities of interest measures, as well as population deviation and preservation of counties.



See the COI analysis spreadsheets for this chart: [2010 Senate](#) [M-A-T 2020 Senate](#)

Links to Map-a-Thon Resources

Map-a-Thon

[DRA 2020 – Dave's Redistricting](#) – One of the major open-source mapping applications

Map-a-Thon's early [NH Communities of Interest Survey](#)

Map-a-Thon's [sources for overlay data](#); Google Sheet with 21 sources of mapping data for overlays.

Map-a-Thon's [working spreadsheet for ranking criteria](#)

[Map-a-Thon's analysis spreadsheets](#), used for verifying and comparing Communities of Interest data can be found in our Google Drive

[Map-a-Thon's Fair Redistricting Workshop](#), featuring Yurij Rudensky of the Brennan Center, one of the nation's leading experts on fair redistricting

[Map-a-Thon IV](#) – Input and discussion on preliminary maps

Map-a-Thon's [Overlay Data](#) (



The Map-a-Thon Mapping & Technical Team

Map-a-THON

David Andrews is a UNH-trained electrical engineer living in Chichester with a passion for data analysis. He is currently a fellow with the Redistricting Data Hub, a national nonprofit assisting governments & organizations with redistricting data. He is lead mapper for the Map-a-Thon project and developed and proposed the Alternative Component Method for calculating floterial districts.



John Cross is an engineer with over 23 years of experience ranging from fundamental physics research to development of complex spacecraft and robot systems for national security missions. He has several advanced and undergraduate degrees in engineering and physics from Johns Hopkins University and Santa Clara University. John led development of the Map-a-Thon map analysis tool.

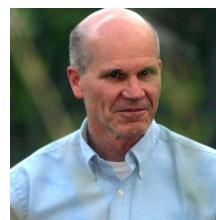


Jeffrey Smith spent 30 years as a financial executive with various global information services and software companies in the U.S. and U.K. A New Hampshire resident since 2009, he is a volunteer consultant for area nonprofit organizations, and an adjunct instructor and course designer for Southern New Hampshire University. Jeff has an A.B. in economics from Dartmouth College and a finance MBA from Cornell University. He provided assistance building the Map-a-Thon analysis tool.



Phil Hatcher retired from UNH after 33 years as a computer science professor, including 10 years as department head. He is a 35-year resident of Dover. He wrote software to aid in the drawing of NH House districts.

Bill Brown is a graduate of the US Naval Academy and has his MBA from the Tuck School of Business. Initially serving as a Navy nuclear engineer and nuclear submarine officer he has also worked for companies such as General Electric working performing statistical analysis of large data sets to optimize operations. He holds a Lean Six Sigma Black Belt for business process improvement.



Kim Frost is Managing Director of Makana Consulting, a firm that specializes in value-for-money analytics for global health and development organizations. She has an undergraduate degree in philosophy and government from Harvard University and a doctoral degree in epidemiology from University at Buffalo. Kim led the team that collected and analyzed data on communities of interest.



Ian Burke is a research, evaluation, and survey design consultant living in Keene. He grew up in southwestern New Hampshire, and moved back to the region in 2019.

Brian Beihl is deputy director of Open Democracy & Open Democracy Action. He is a 36-year resident of New Hampshire, and recently moved to Alton Bay after decades in the Monadnock Region. He has a degree in Journalism from Michigan State University, and has been responsible for organizing and communications for the Map-a-Thon coalition.



Over 200 Granite Staters participated in the full Map-a-Thon project, helping collect data, making phone calls and assisting in the preparation of surveys, ranking criteria and finally deciding which map options should go forward. We are grateful for everyone's contribution to a fair, nonpartisan and transparent project.