NC's Landfill Capacity Depletion

NC SWANA 2022 Fall Conference

October 25, 2022

Presenter:
John Fearrington, P.E., Smith Gardner, Inc.

Ed Mussler, P.E., NC DEQ

NORTH CAROLINA Department of Environmental Quality DEQ

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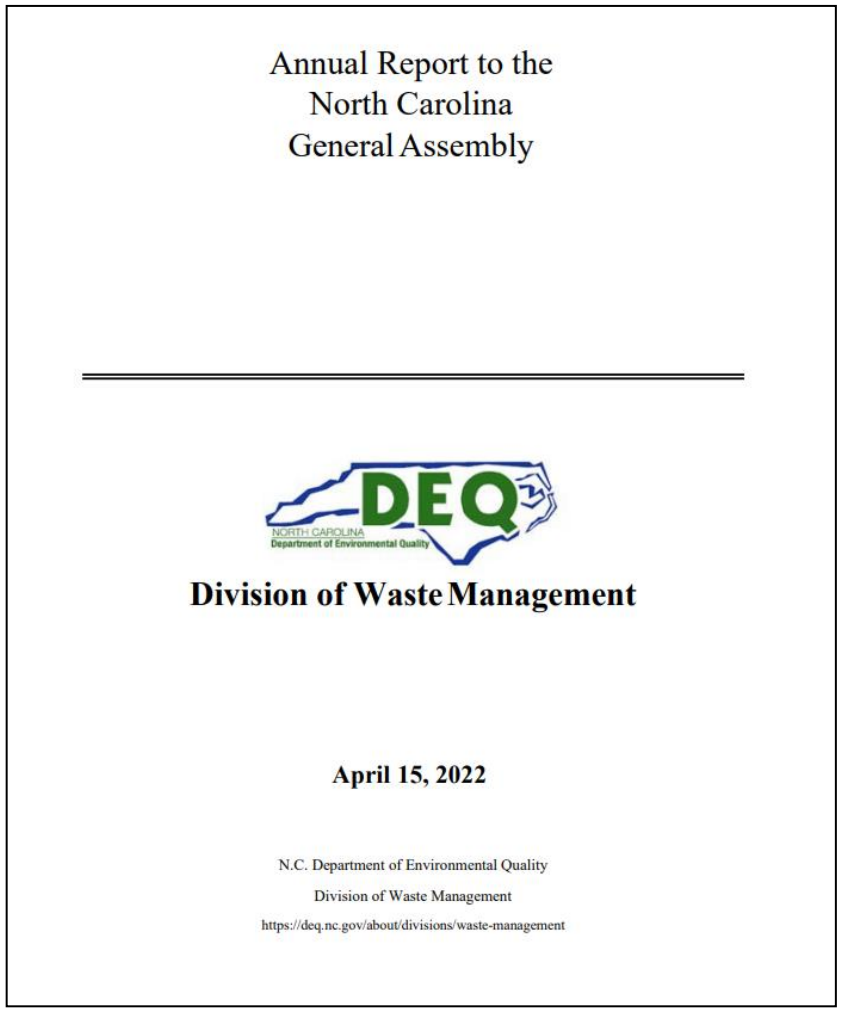
NCDEQ's Annual Report

Summary of Key Findings

- 13.1 Millions Tons of MSW and C&D were disposed in NC landfills in 2021.
- 417 Million Cubic Yards of MSW Landfill Capacity Remain.
- 25.7 Years of Landfill Capacity Remain in NC.


Annual Report to the
North Carolina
General Assembly

Division of Waste Management

April 15, 2022

N.C. Department of Environmental Quality
Division of Waste Management
https://deq.nc.gov/about/divisions/waste-management

**MSW life assumes FY20-21 disposal rate*

Objective for Further Study

1. **Landfill capacity restricted by service area.**
2. **Landfills approaching permitted waste acceptance limits (i.e., tonnage limits).**
3. **Population growth and waste disposal trends.**
4. **Counties impacted by depletion of permitted landfill capacity.**
5. **Considerations to future planning.**

MODELING LANDFILL CAPACITY DEPLETION AND IMPACTED COUNTIES

PRESENTER
JOHN FEARRINGTON, P.E.
SMITH GARDNER, INC.

Defining Local and Regional Landfills

Local Landfill

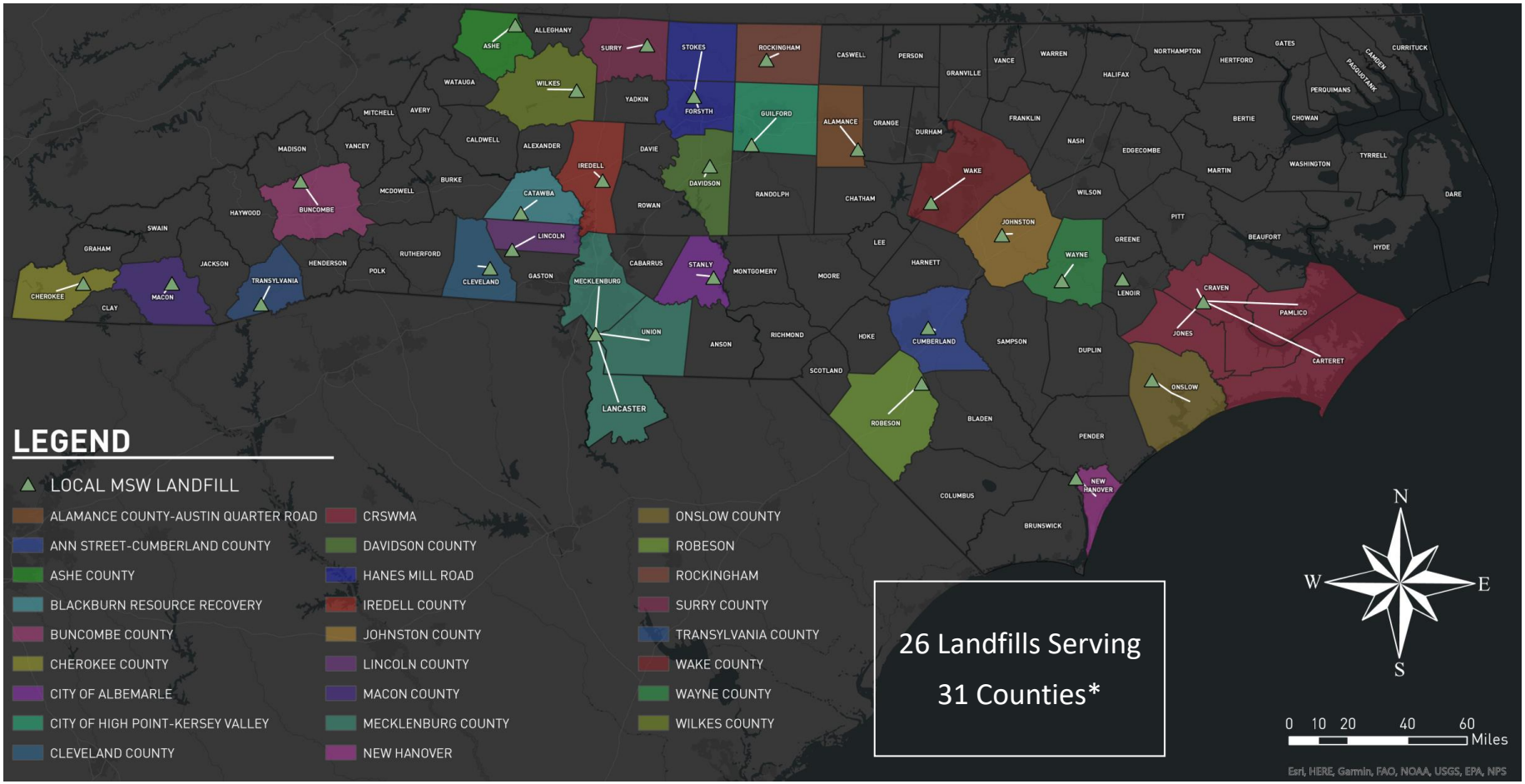
- Limited service area
- Typically county owned and operated

Regional Landfill

- Multi-county/state service area
- Typically privately owned and operated

Local landfill defined as accepting waste from four (4) or less counties in FY20-21

Local Landfills Service Area



** Four (4) landfills permitted as a "Regional" landfill that accept waste from one (1) county.*

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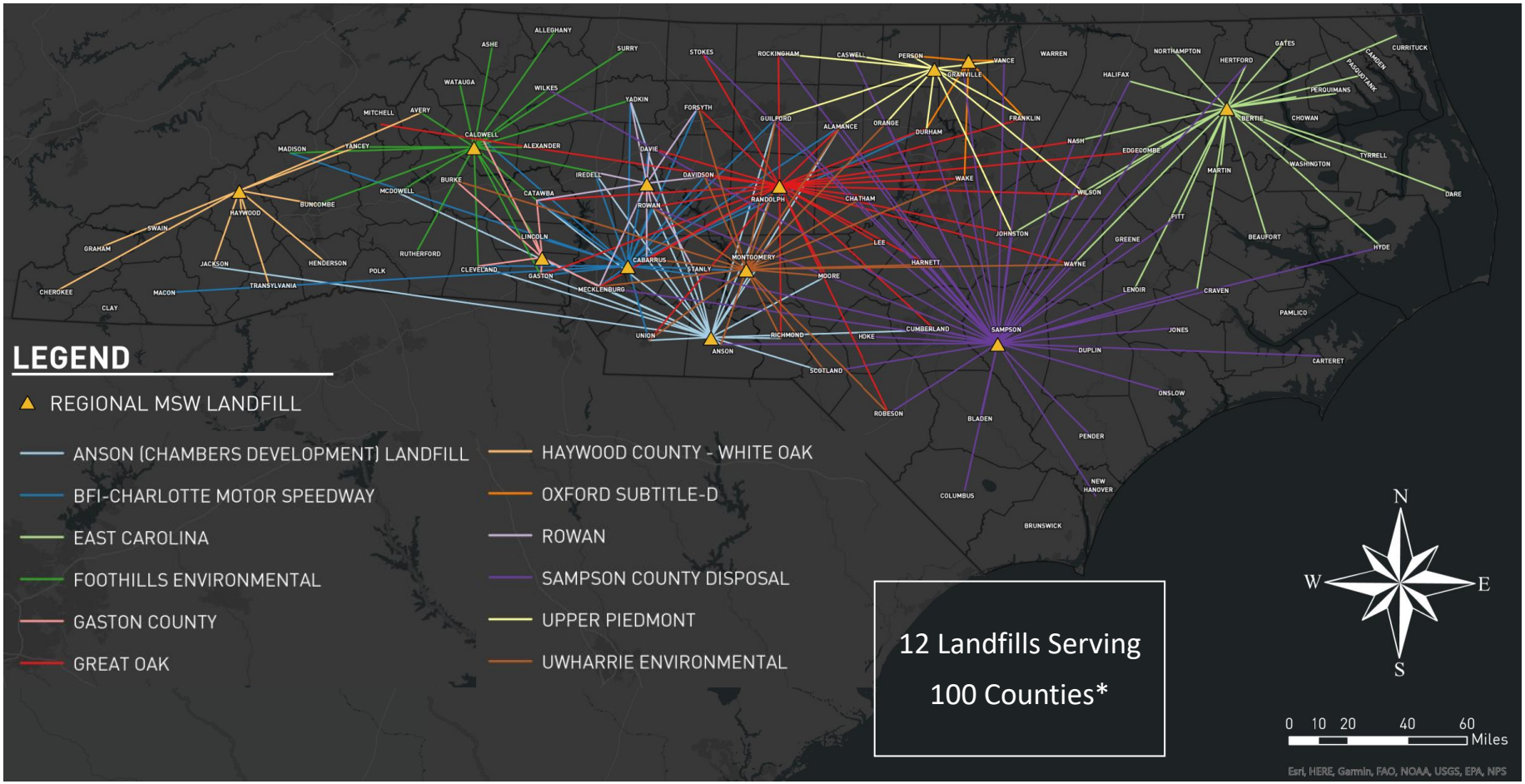
Regional Landfills Service Area



**Not all landfills may accept waste from all 100 counties. Regional LFs as a whole may serve all NC*

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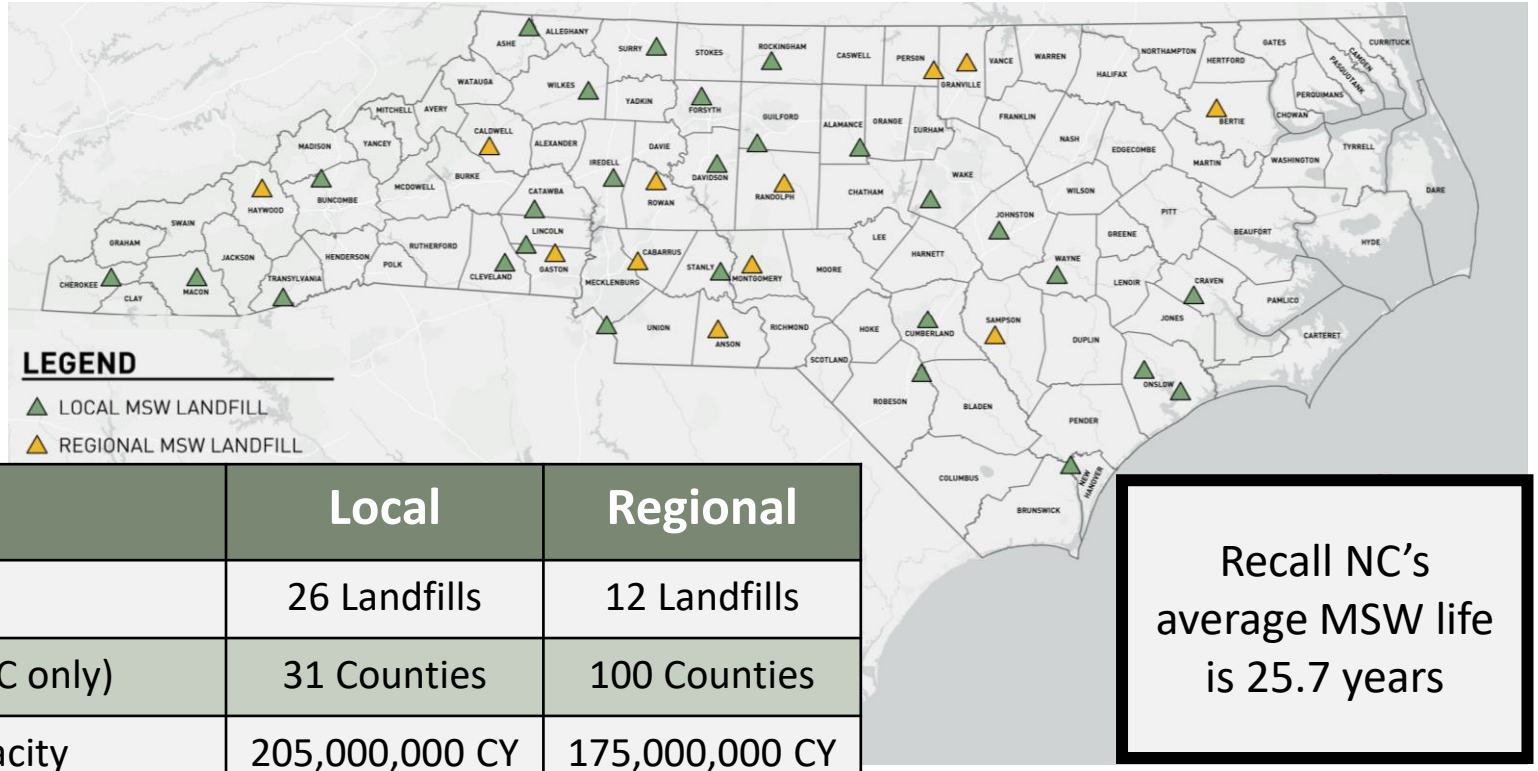
Statistics of Local and Regional Landfills



	Local	Regional
Quantity	26 Landfills	12 Landfills
Service Area (NC only)	31 Counties	100 Counties
Remaining Capacity	205,000,000 CY	175,000,000 CY
FY20-21 Waste Acceptance	3,900,000 TN	6,650,000 TN
Remaining Life	32 YR	20 YR

Recall NC's average MSW life is 25.7 years

**Closure timelines assume FY20-21 reported acceptance (i.e., straight-line).*

***Remaining capacity does not include Lenoir, White Street, or Camp Lejeune*

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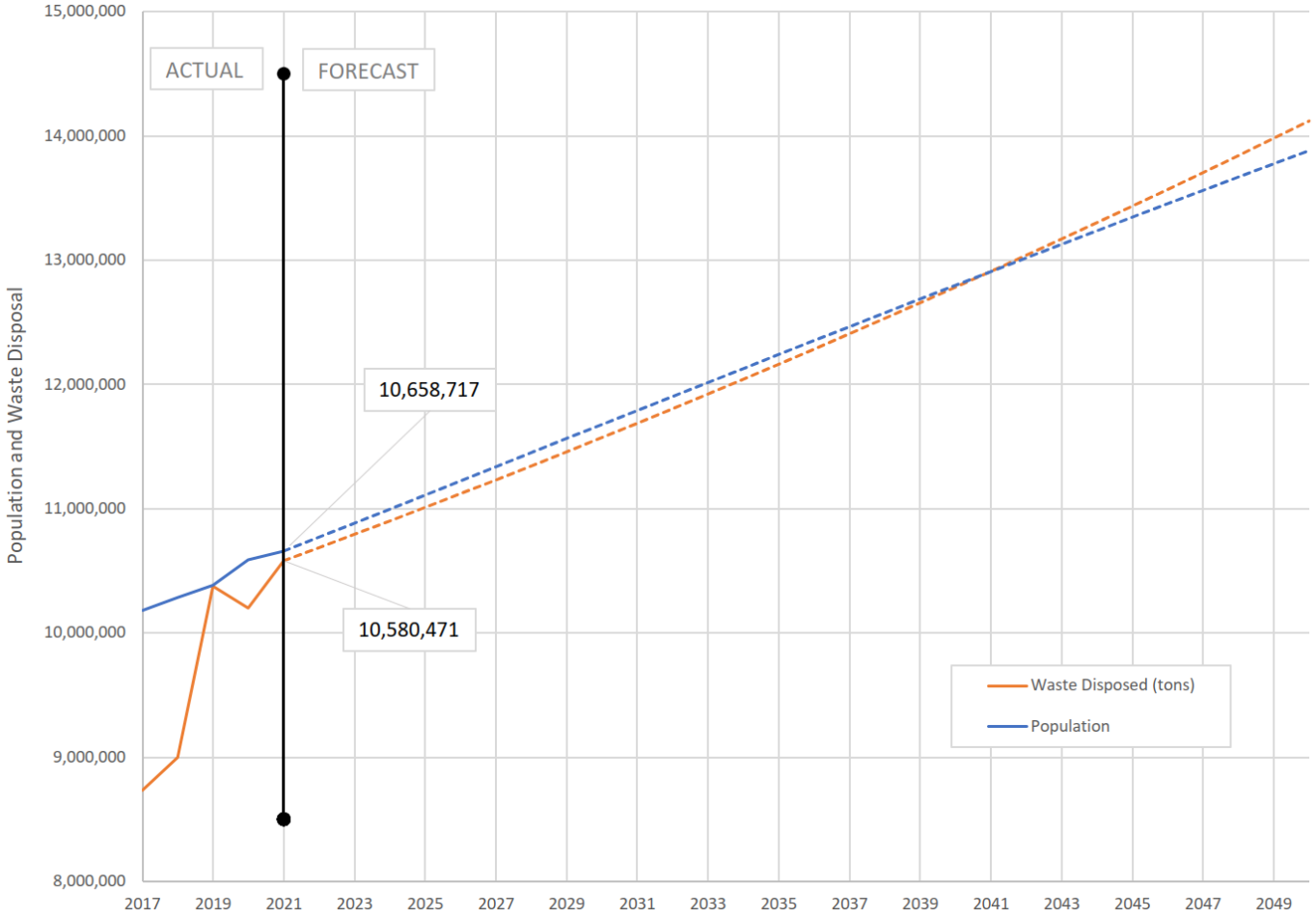
MSW Disposal Trends in Landfills



**Projections w/in presentation assume 1% increase in MSW waste disposal*

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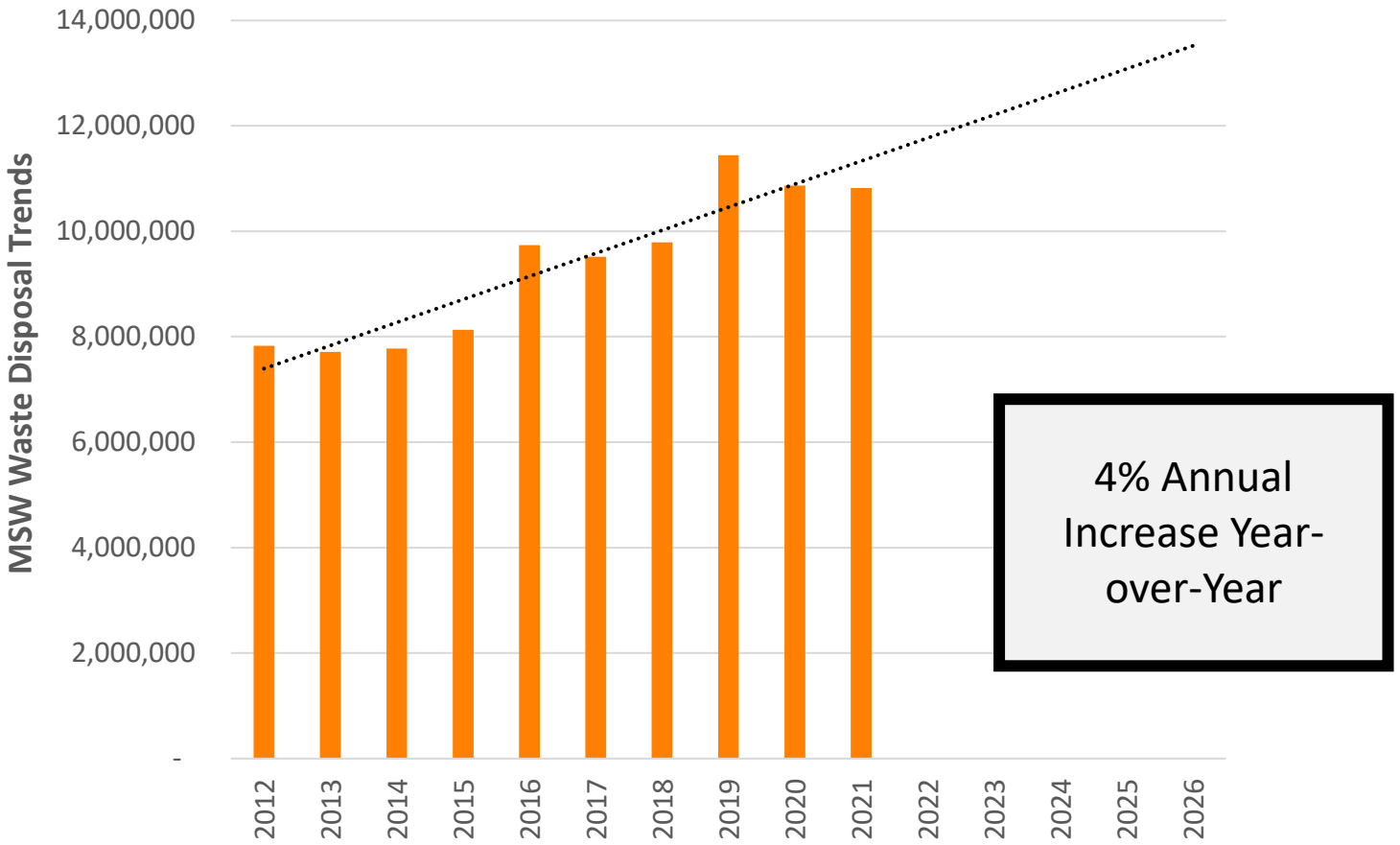
MSW Disposal Trends in Landfills



**Projections w/in presentation assume 1% increase in MSW waste disposal*

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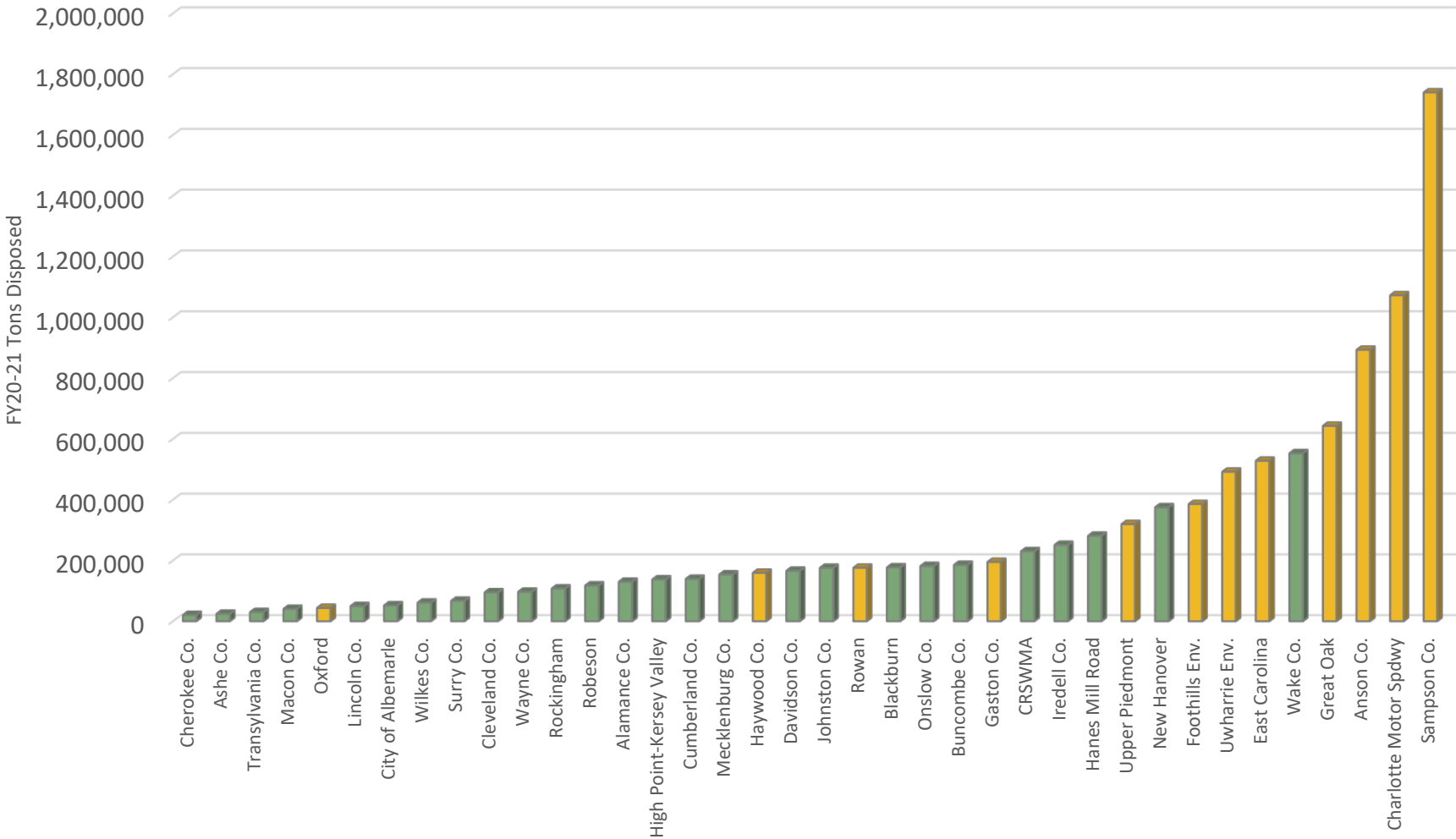
FY20-21 Accepted Tons



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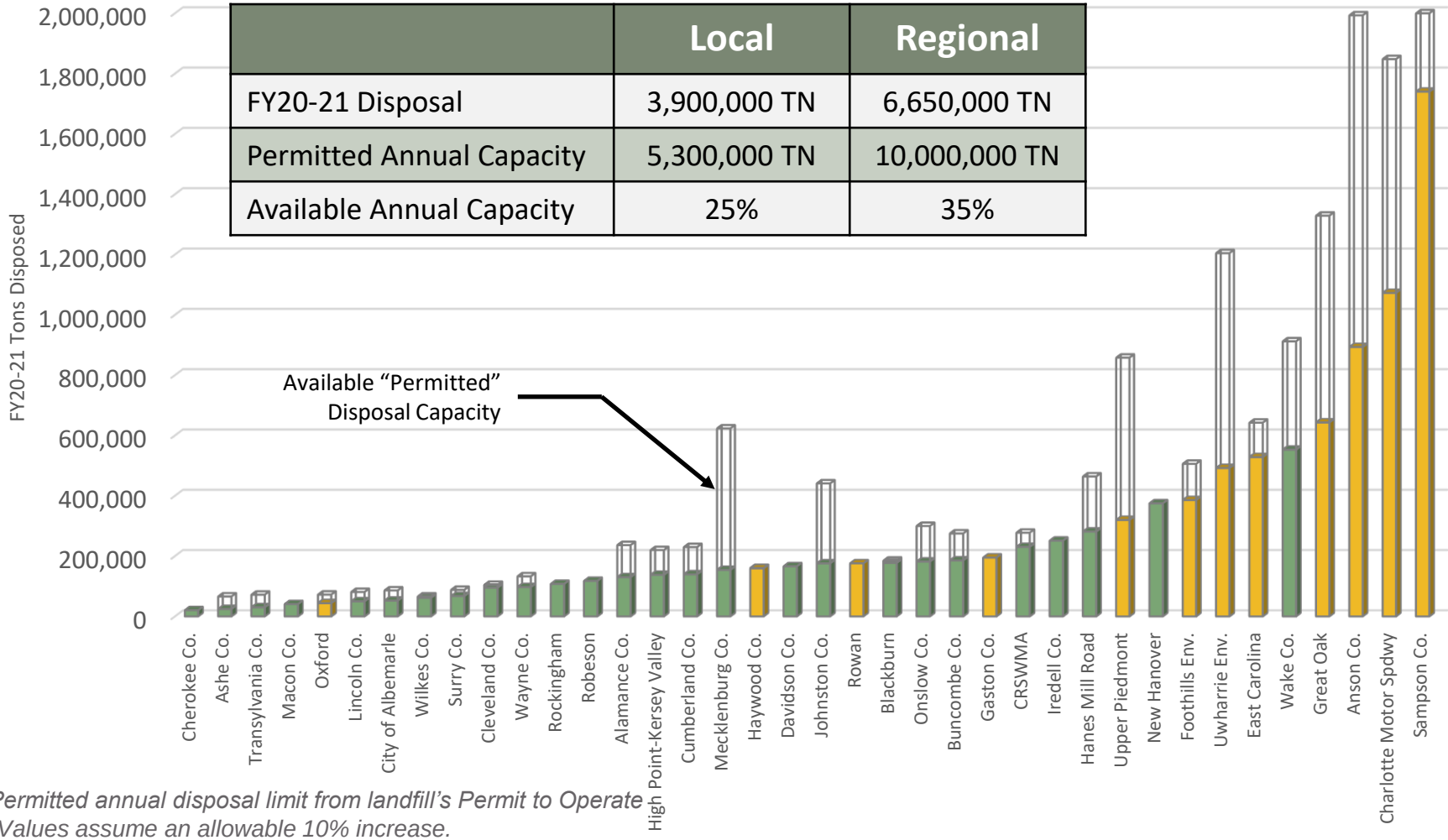
Available Annual Disposal Capacity

	Local	Regional
FY20-21 Disposal	3,900,000 TN	6,650,000 TN
Permitted Annual Capacity	5,300,000 TN	10,000,000 TN
Available Annual Capacity	25%	35%



**Permitted annual disposal limit from landfill's Permit to Operate*
***Values assume an allowable 10% increase.*

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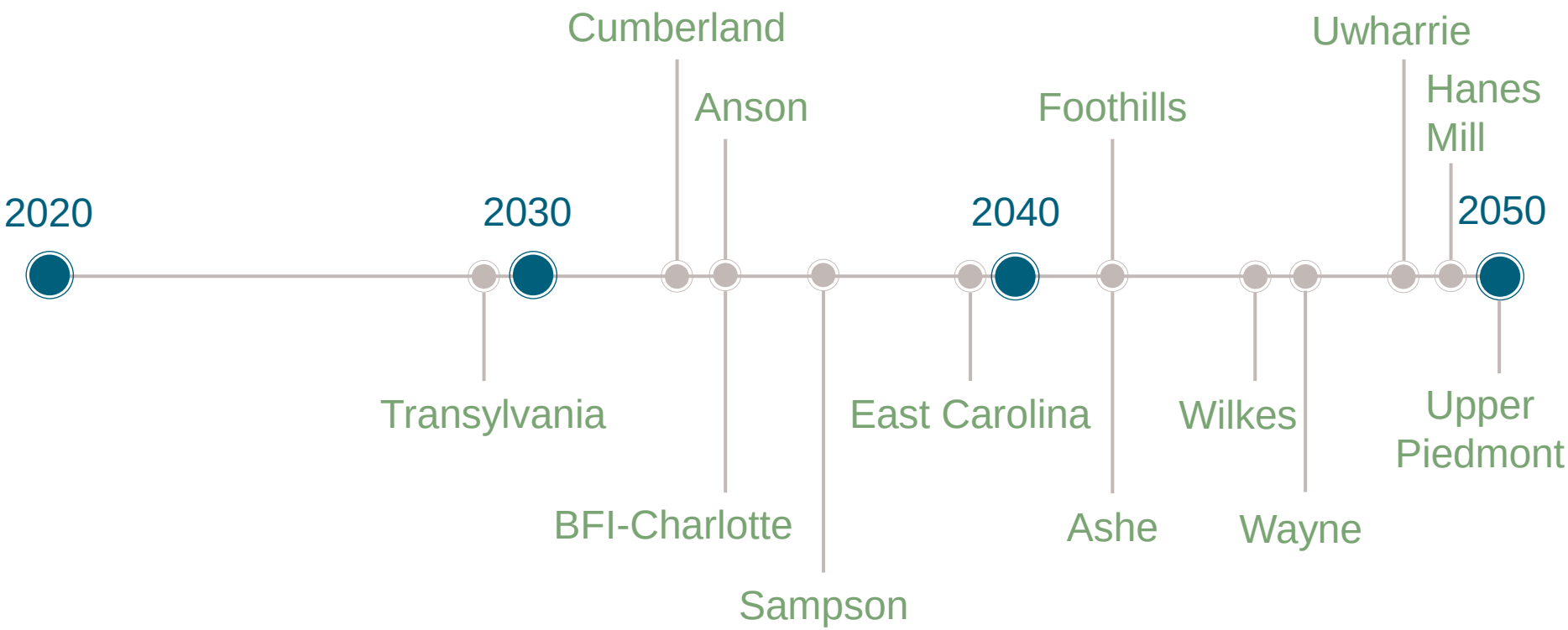
Projecting Landfill Capacity Depletion

- **Assumptions**
  - 1% tonnage increase
  - Landfills cannot accept over 10% of permitted disposal rate
  - Constant landfill density (reported in Annual Report)
  - No expansions assumed

Depletion of Capacity of MSW Landfills



*Closure timelines assume 1% year-over-year tonnage increase from FY20-21 reported acceptance.
**Schedule does not reflect current expansion efforts that are not permitted.

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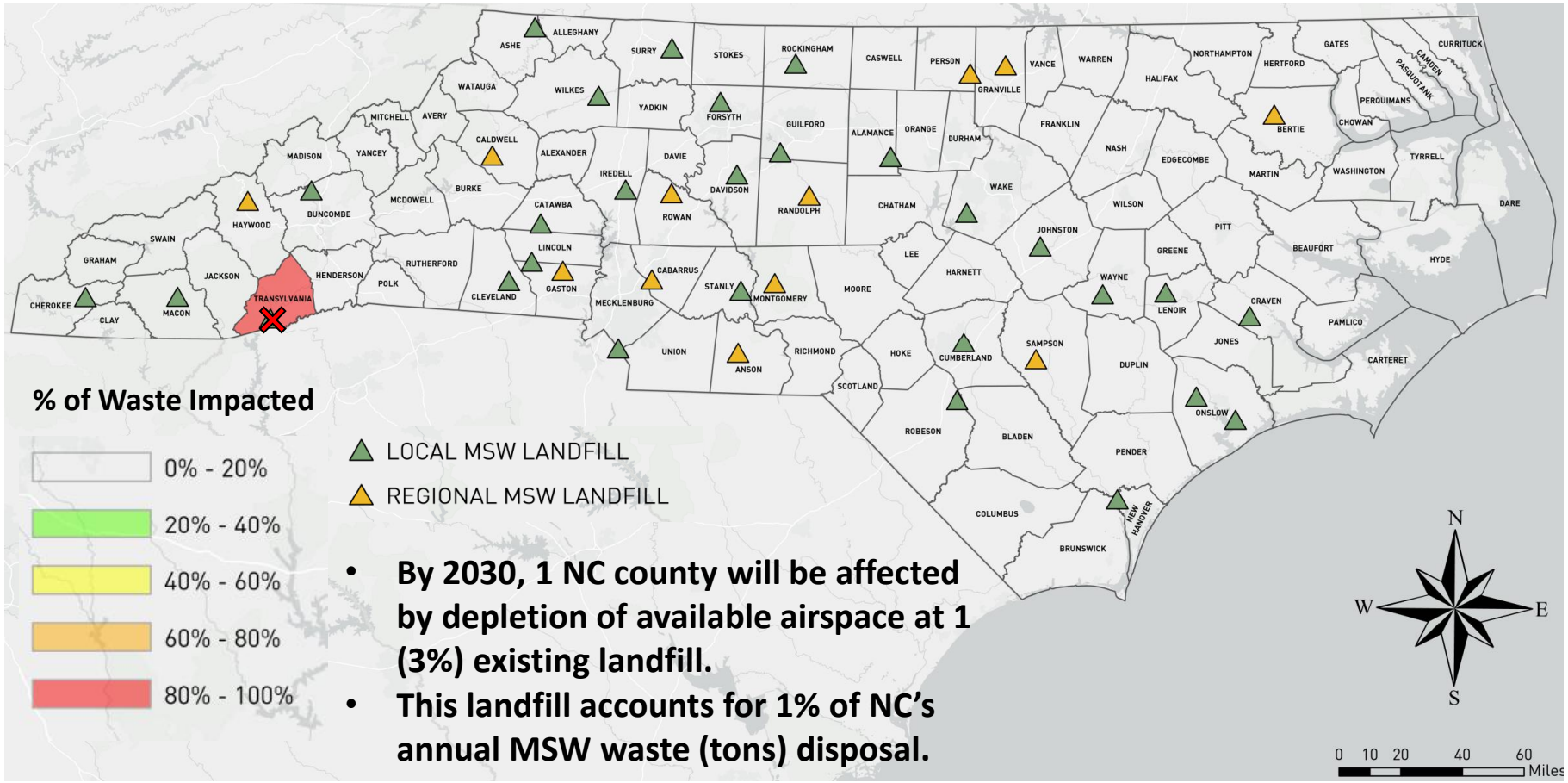
Counties that Would be Impacted by Closures

2030



- **By 2030, 1 NC county will be affected by depletion of available airspace at 1 (3%) existing landfill.**
- **This landfill accounts for 1% of NC's annual MSW waste (tons) disposal.**

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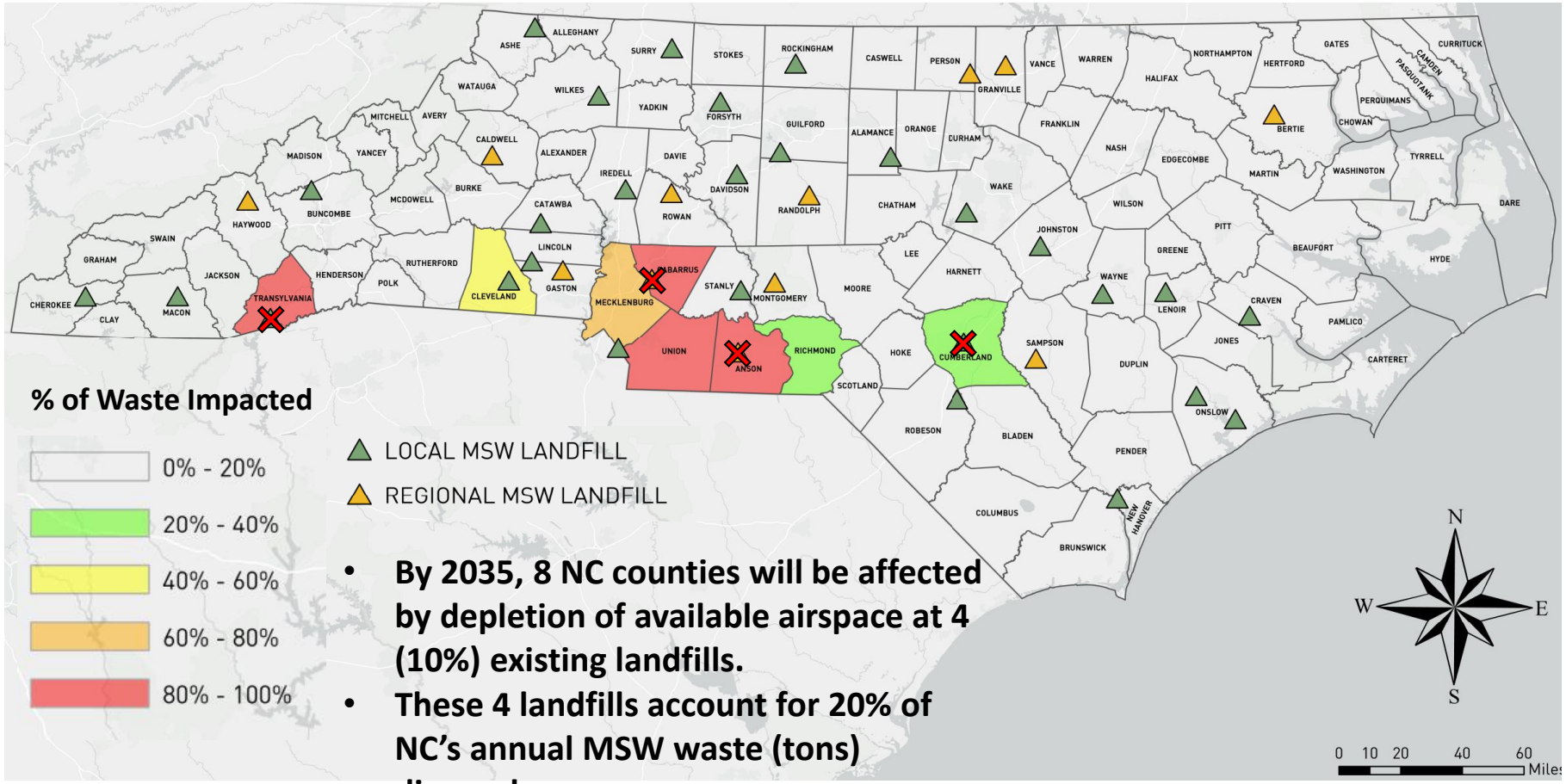
Counties that Could be Impacted by Closures

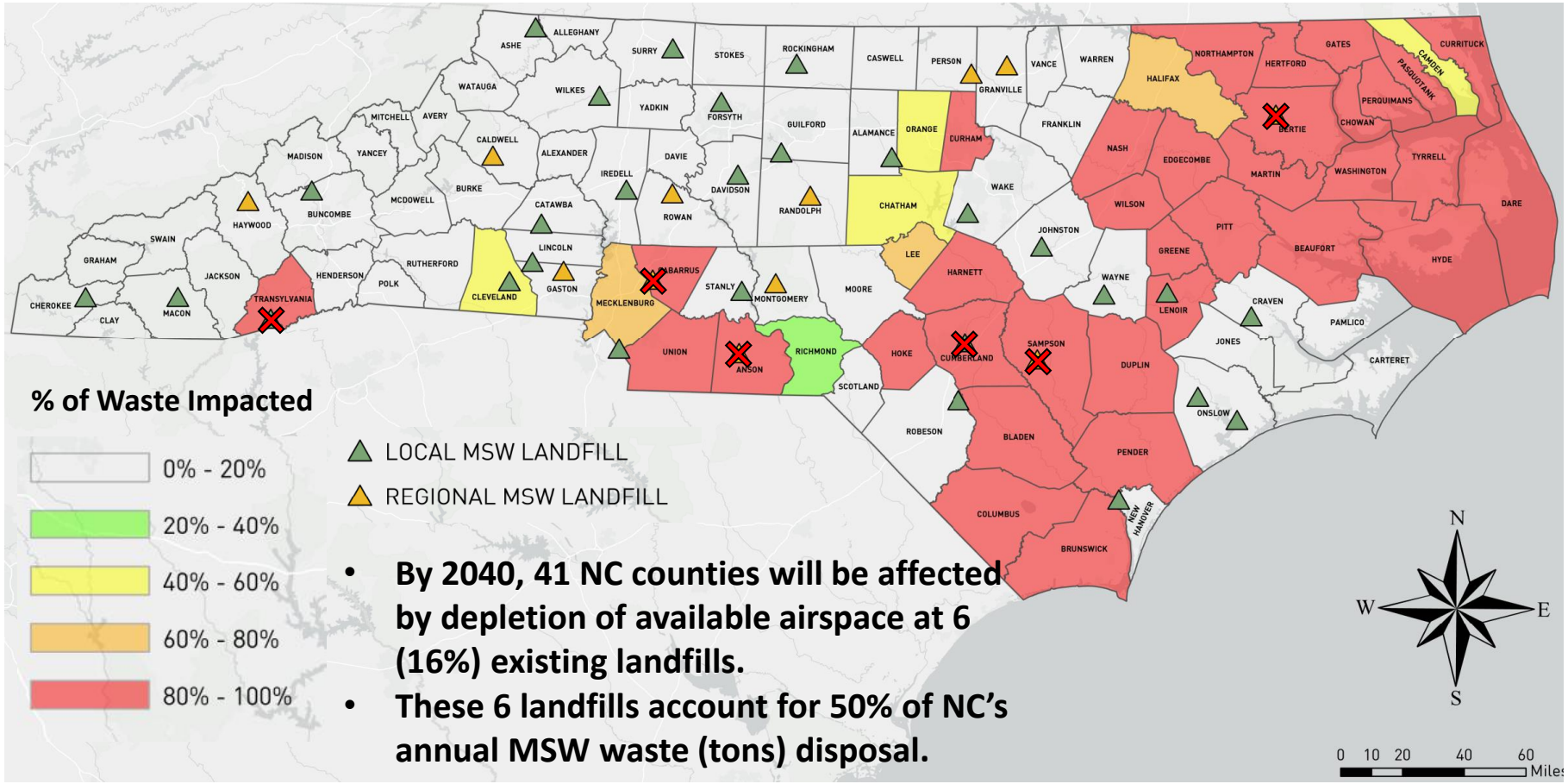
2035



- **By 2035, 8 NC counties will be affected by depletion of available airspace at 4 (10%) existing landfills.**
- **These 4 landfills account for 20% of NC's annual MSW waste (tons) disposal.**

Counties that Could be Impacted by Closures

2040



- **By 2040, 41 NC counties will be affected by depletion of available airspace at 6 (16%) existing landfills.**
- **These 6 landfills account for 50% of NC's annual MSW waste (tons) disposal.**

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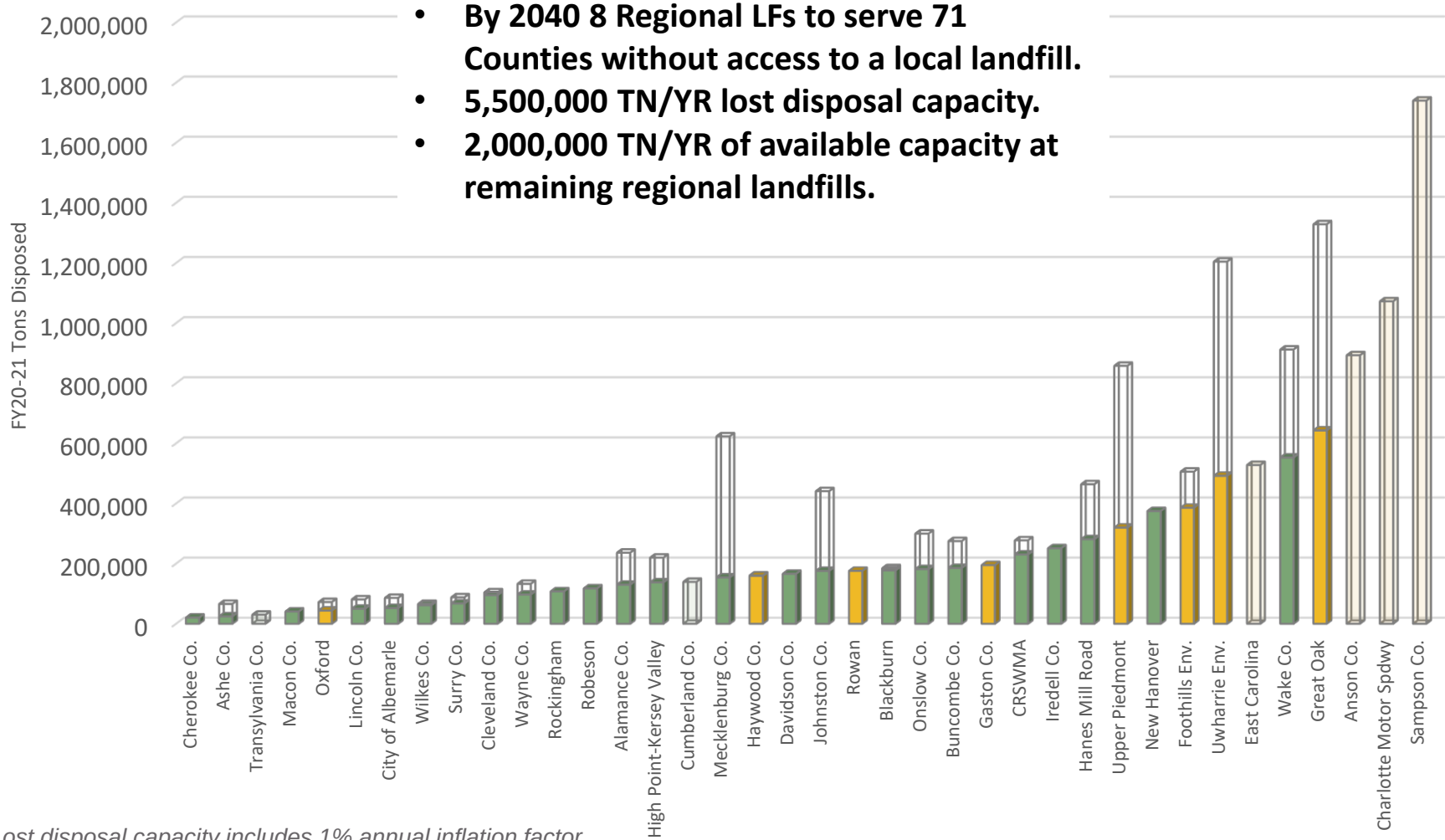
Available Disposal Capacity in 2040

- **By 2040 8 Regional LFs to serve 71 Counties without access to a local landfill.**
- **5,500,000 TN/YR lost disposal capacity.**
- **2,000,000 TN/YR of available capacity at remaining regional landfills.**



**Lost disposal capacity includes 1% annual inflation factor.*

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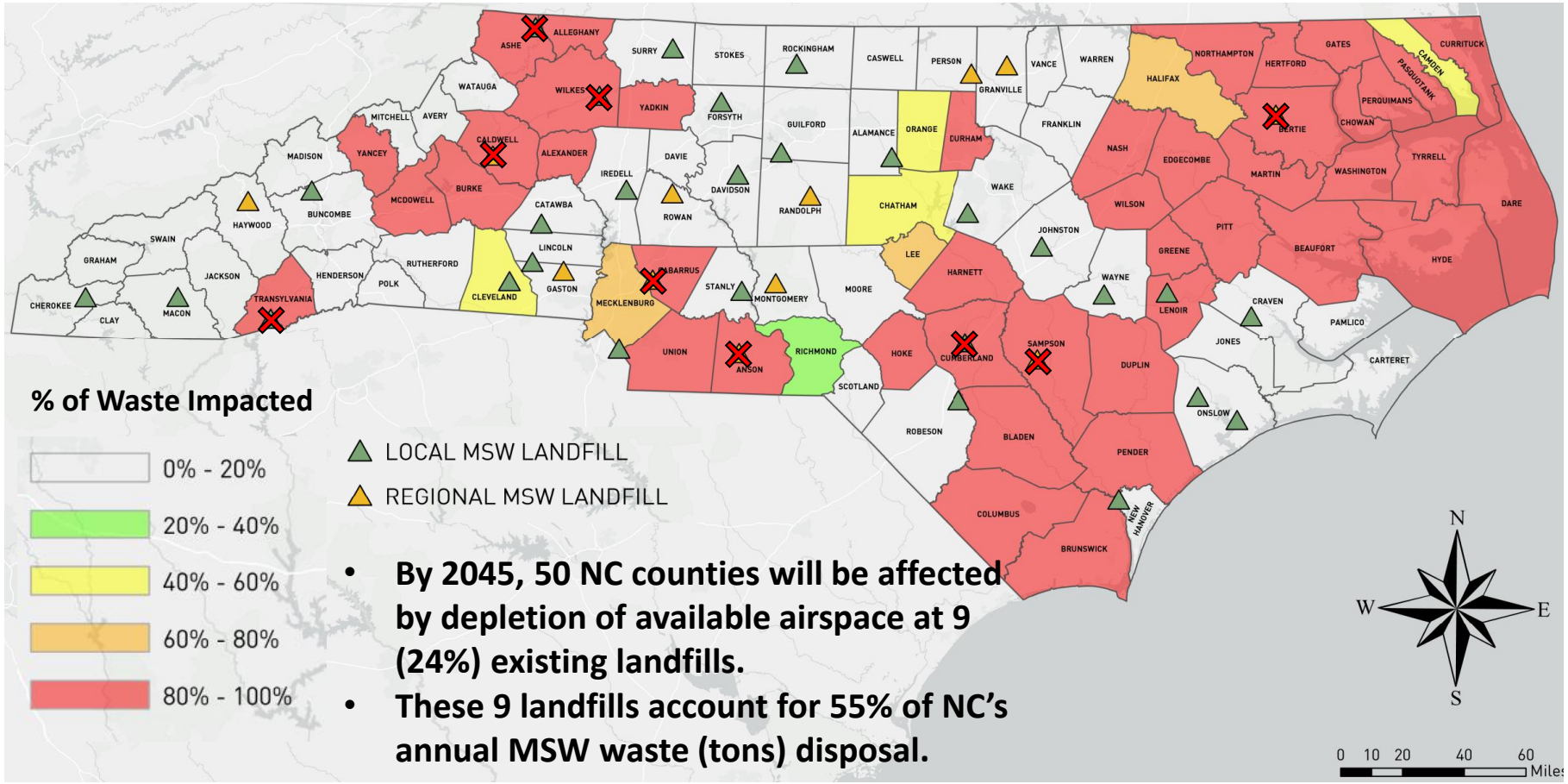
Counties that Could be Impacted by Closures

2045



- **By 2045, 50 NC counties will be affected by depletion of available airspace at 9 (24%) existing landfills.**
- **These 9 landfills account for 55% of NC's annual MSW waste (tons) disposal.**

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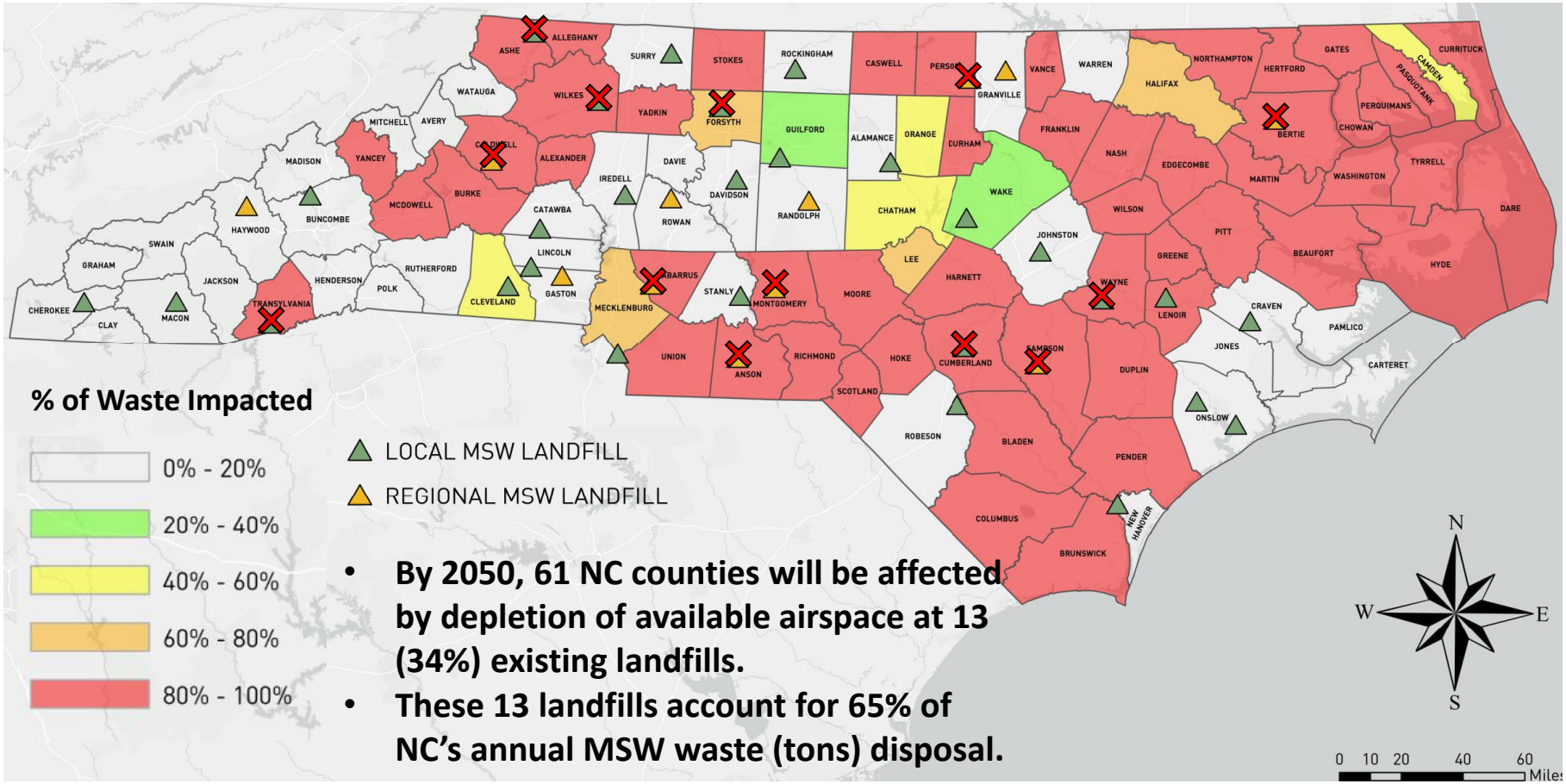
Counties that Would be Impacted by Closures

2050



- **By 2050, 61 NC counties will be affected by depletion of available airspace at 13 (34%) existing landfills.**
- **These 13 landfills account for 65% of NC's annual MSW waste (tons) disposal.**

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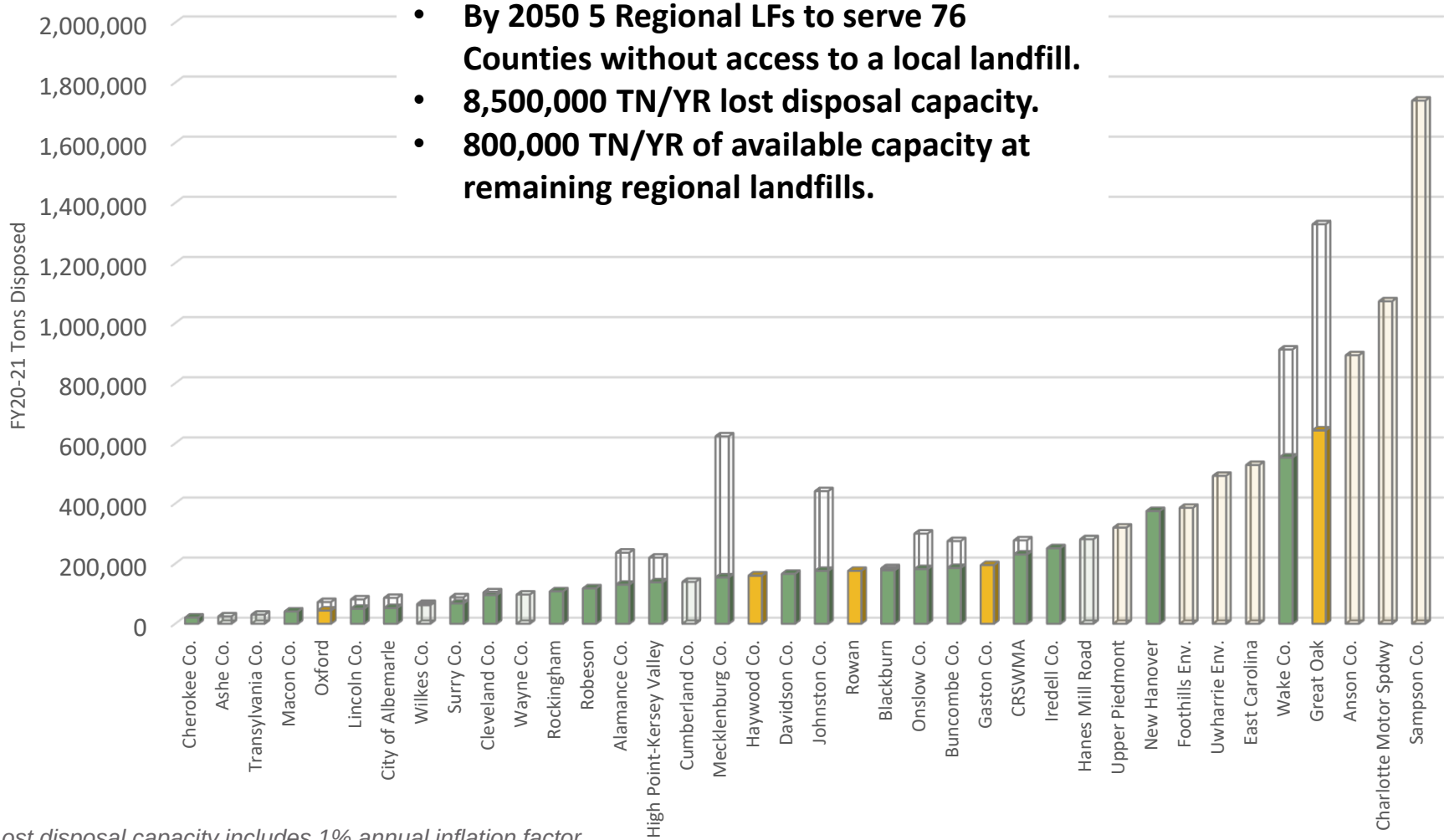
Available Disposal Capacity in 2050

- **By 2050 5 Regional LFs to serve 76 Counties without access to a local landfill.**
- **8,500,000 TN/YR lost disposal capacity.**
- **800,000 TN/YR of available capacity at remaining regional landfills.**



**Lost disposal capacity includes 1% annual inflation factor.*

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Limitations to this Projection

- Projects 1% increase in waste acceptance from FY20-21;
  - Recent trends show 4% increase state-wide;
  - Does not factor regional variability in disposal trends.
- Once a landfill depletes capacity the waste is not diverted to another landfill; and
- No considerations for expansions of existing facility or development of new landfills.

Conclusion

These projections depict a best case scenario. Depletion of airspace will occur quicker after 2035.

CONSIDERATIONS FOR FUTURE PLANNING

PRESENTER
ED MUSSLER, P.E.
NC DEQ

Keys to Planning

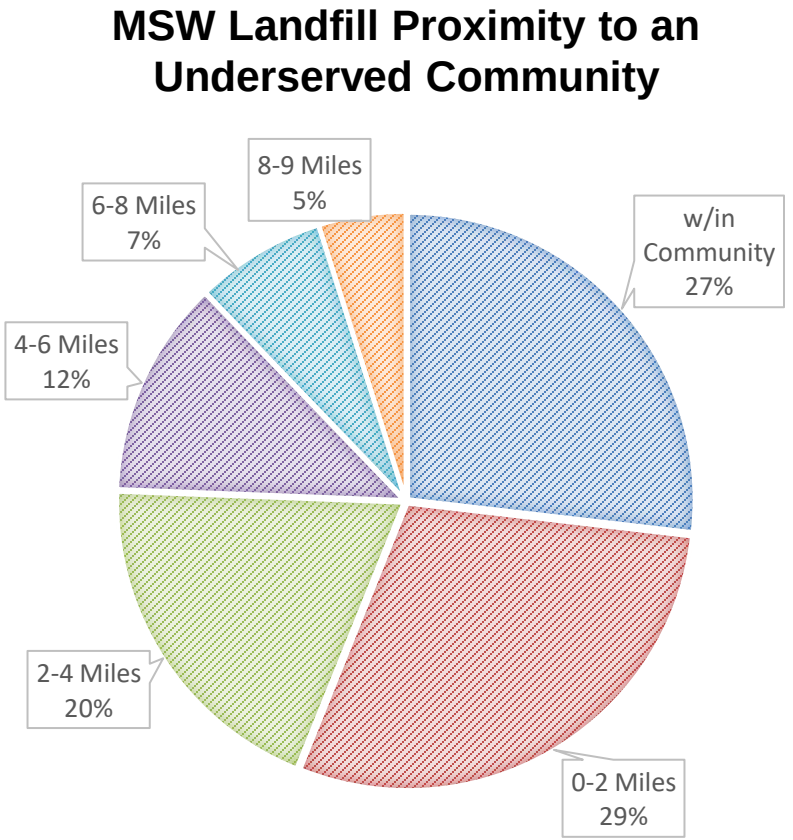
Timelines

- Historically 3-5 years to permit
- Anticipate 5-7 years to permit

Community Engagement

- Environmental justice
- Meaningful engagement
- Cumulative impacts

C&D Impacts



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Regulatory Obstacles to a New MSW Landfill

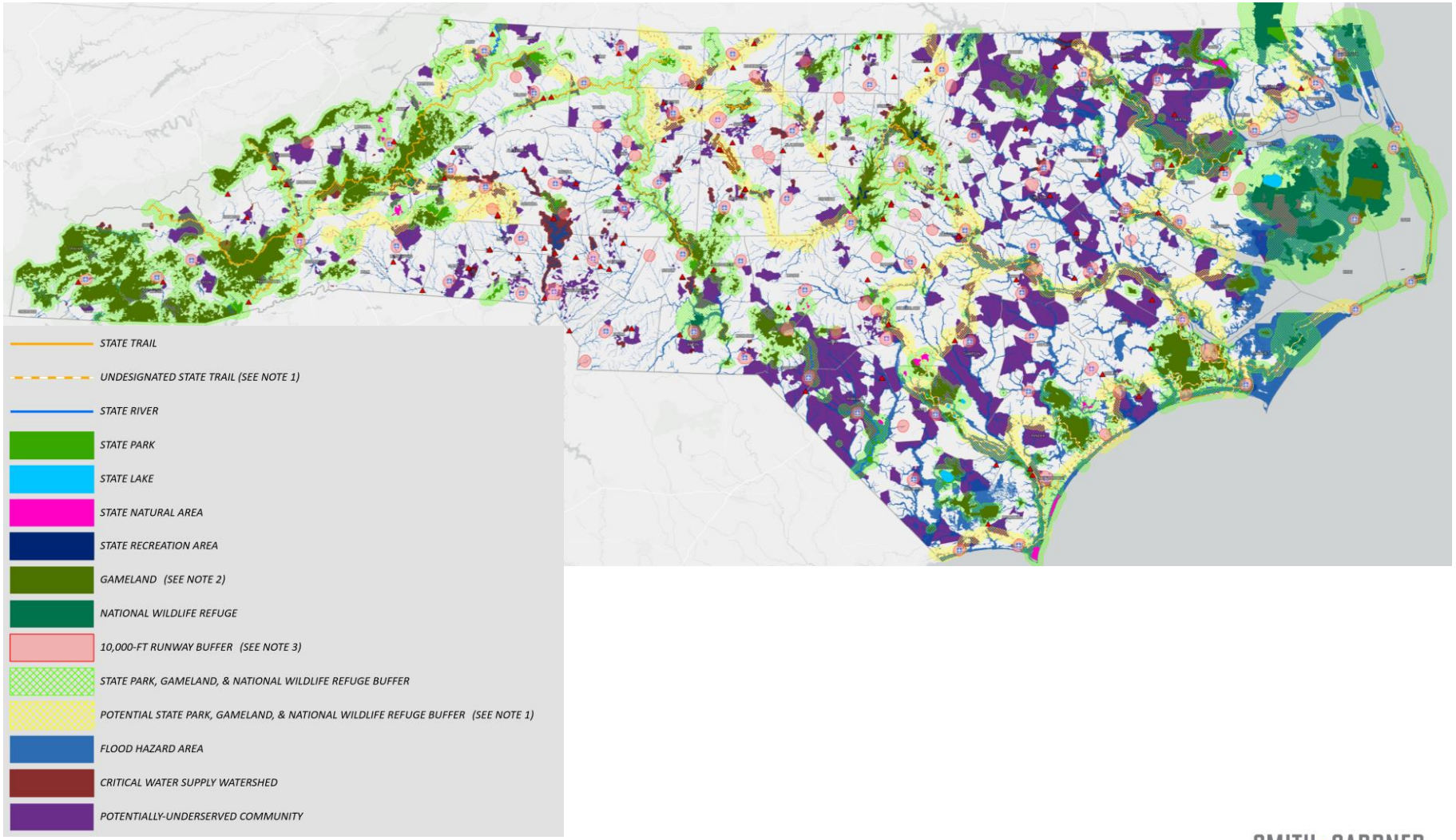
NC General Statute Siting Regulations

- Five (5) miles from National Wildlife Refuge;
- One (1) mile from State gameland;
- Two (2) miles from a component of the State Parks System;
  - *State Lakes, Natural Areas, Parks, Recreation Areas, Rivers, and Trails*
- Within 100-year flood plain (w/o a variance); and
- 200-feet from a perennial stream or wetland (w/o USACE permit)

NC Solid Waste Rules Siting Regulations

- Outside critical watershed areas; and
- Outside airport restriction areas.

Regulatory Obstacles to a New MSW Landfill



SMITH+GARDNER
1991-2021
30 YEARS

Planning Considerations

Alternatives and Recycling

- Incinerators
- New Technologies
- Increased Regionalization
- Landfills get Bigger
- Landfill are more dense

Emerging Compounds

- PFAS
- Leachate Management
- Landfill Gas