PAVEMENT MARKINGS

NEW YORK

MARKET RESEARCH

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MARKET RESEARCH

The following research document will be focused on the Pavement and Roadway Marking landscape in New York State. Insights regarding the industry, analysis on some of the projects/bids in this segment, as well as trends which could shape the future of the Pavement Marking industry will be presented.

MARKET NEEDS

The pavement and roadway marking market is **generally driven** by the need for **safer roadways, streets, highways,** etc., the **ongoing and planned construction of new parking lots, the increasing traffic congestion, airport/factory/school markings** as well as the c**onstruction, rework and renewal of new asphalt surfaces where pedestrians and vehicles traverse**.

GlobeNewswire – a market research company's industry report alludes the **Thermoplastic Pavement and Roadway Markings** are expected to witness the **highest growth of 5.1% from 2015 to 2022 globally**. This is on account of its high-performance features such as **extended durability**, **reflectivity** and **negligible VOC (Volatile Organic Compound) emissions** which are making it a perfect solution over paints and other coatings.

The U.S. government has rolled out initiatives to enhance road infrastructure and encourage the development of durable, **high-performance coating products with enhanced visibility and skid resistance**. Facilitating vertical market integration by **launching manufacturing units for motorway marking and traffic paints** will give contractors and applicators a chance to acquire better control over cost and quality of products. These activities are expected to support regional market growth, as it is stated in Grand View Research's report on the Global Traffic Road Marking Coating Market.

The importance of pavement markings is further emphasized in a Research Paper made by the Federal Highway Administration, which states that around **21%** of traffic accidents, pedestrian fatalities, and injuries in the U.S. **are prevented** via proper Pavements and Roadway Markings.

The vast miles of roads and highways also need proper markings to ensure the safest traffic possible. The Federal Highway Administration in a report estimates that **in the United States alone**, approximately **$2 billion is spent annually** on **Pavement Markings**.

To put the potential market for pavement and roadway markings into perspective, American Road & Transportation Builders Association's website informs that currently, there are **4.12 million miles of road** in the United States, including Alaska and Hawaii. **New York State's local highway** system amasses **110,000 miles**, according to Wikipedia.

According to FindRFP – an industry leading Government request for proposal and Bid notification service, **42 Pavement Projects** were issued from 2016 until 2019 in the **State of New York**.

In order to showcase the potential of each county in New York State, an **insightful table** was created, which details the miles of road in each county, the availability of Government projects/bids in specific counties, as well as lists of competing companies in each county.

The **miles of pavement/asphalt surface** dictates the potential demand for pavement marking services. The more miles of road a county has, the larger the chances an opportunity for Pavement Marking services to arise.

The **Government bids/projects** are the best source to view and analyze the necessity of Pavement Marking services in a particular county. Here, pavement marking projects which are finished, planned, undergoing construction or in development can provide valuable insights as to **which county has most potential** for future Pavement Marking services.

There are also the **private Pavement Marking contracts**, which are hard to measure and analyze, since their dealings are usually kept private and between the two parties.

New York State's Pavement and Roadway Marking services landscape, is portrayed through lists from some of the most prominent **online databases and business directories**, such as Yellow Pages, YellowBook and Google Maps.

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Region	County Name	Opportunity for Pavement Marking Services	Projects/Bids	Competitors
New York City	**Kings County / Brooklyn**	Brooklyn has more **than 1,500 miles of roadway** and nearly 11,000 intersections.	NYS DOT - Projects in Brooklyn	Yellow Pages - Competitor List Brooklyn
				YellowBook - Competitor List Brooklyn
				Google Maps - Competitor List Brooklyn
	New York County / Manhattan	Manhattan has **490 miles of roadway** and 3,715 intersections.	NYS DOT - Projects in Manhattan	Yellow Pages - Competitor List Manhattan
				YellowBook - Competitor List Manhattan
				Google Maps - Competitor List Manhattan
	Bronx County	The Bronx has more than **790 miles of roadway** and nearly 6,500 intersections.	NYS DOT - Projects in the Bronx	Yellow Pages - Competitor List Bronx
				YellowBook - Competitor List Bronx
				Google Maps - Competitor List Bronx
	Queens County	Queens is the biggest Borough and it has nearly **2,200 miles of roadway** and over 18,000 intersections.	NYS DOT - Projects in Queens	Yellow Pages - Competitor List Queens
				YellowBook - Competitor List Queens
				Google Maps - Competitor List Queens
	Richmond County / Staten Island	So far in FY18, crews have resurfaced over **1,000 lane-miles**. It is the highest three-year output of paved lane-miles in	NYC DOT - Bids in Staten Island	YellowBook - Competitor List Staten Island

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		DOT's recorded history.	NYS DOT - Projects in Richmond County	Yellow Pages - Competitor List Staten Island
				Google Maps - Competitor List Staten Island
Capital District	**Albany County**	The Albany County, New York, Department of Public Works maintains nearly **290 miles (467 km) of roads** and 78 bridges as county routes.	BidNet Direct - Bids in Albany	Yellow Pages - Competitor List Albany
			NYS DOT - Projects in Albany	Google Maps - Competitor List Albany
				YellowBook - Competitor List Albany
	Essex County	The highway system of Essex County, New York, comprises **1,367.8 miles (2,201.3 km) of roads** maintained by the New York State Department of Transportation, the county, and its towns and villages	NYS DOT - Projects in Essex	YellowBook - Competitor List Essex
				Yellow Pages - Competitor List Essex
	Greene County	Greene County is 653.8 square miles in size with 14 municipalities and 5 Villages. It has **261.49 miles of County roads,** with 134 bridges, and 147 culvert structures measuring 4 feet in diameter or larger.	NYS DOT - Projects in Greene	YellowBook - Competitor List Greene
				Yellow Pages - Competitor List Greene

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				Google Maps - Competitor List Greene
	Rensselaer County	Map of Capital Highway Projects for the County	NYS DOT - Projects in Rensselaer	Yellow Pages - Competitor List Rensselaer
				YellowBook - Competitor List Rensselaer
				Google Maps - Competitor List Rensselaer
	Saratoga County	The Highway Division of Public Works is charged with the management and construction of the highway infrastructure for Saratoga County consisting of approximately **365 centerline miles of highway.**	NYS DOT - Projects in Saratoga	Yellow Pages - Competitor List Saratoga
				YellowBook - Competitor List Saratoga
				Google Maps - Competitor List Saratoga
	Schenectady County	Schenectady County today announced that the County's 2018 Highway Improvement Program is underway and includes fifty miles of preventative maintenance **with twenty-two miles of newly paved county roads in the towns**. In total, $4.1 million will be invested into the county highway system from federal, state and county funds.	BidNet Direct - Bids in Schenectady	Yellow Pages - Competitor List Schenectady
			NYS DOT - Projects in Schenectady	YellowBook - Competitor List Schenectady
	Schoharie County	The Highway Division is responsible for the care and	NYS DOT - Projects in	Yellow Pages - Competitor List Schoharie

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		maintenance of the County's **322 miles of road** and 91 bridges.	Schoharie	YellowBook - Competitor List Schoharie
				Google Maps - Competitor List Schoharie
	Warren County	The highway system of Warren County, New York, comprises **1,248.6 miles (2,009.4 km) of roads** maintained by the New York State Department of Transportation, the county, and its towns and villages.	BidNet Direct - Bids in Warren	Google Maps - Competitor List Warren
			NYS DOT - Projects in Warren	YellowBook - Competitor List Warren
	Washington County	The Highway Department is responsible for the maintenance of **286 miles of County highways** and 123 Country bridges. By contract, an **additional 100 miles of State highways** are maintained during the wither months for snow and ice control.	NYS DOT - Projects in Washington	Yellow Pages - Competitor List Washington
				YellowBook - Competitor List Washington
				Google Maps - Competitor List Washington
Mohawk Valley	**Fulton County**	The Transportation Division of Facilities and Transportation Services (FTS) serves the public by providing a transportation system and services that emphasize safety, quality, cost effectiveness, economic vitality and sensitivity to the environment. Scope of Maintenance Responsibilities: **548 miles of paved roads,** 16 miles of unpaved roads, 59 bridges, etc.	NYS DOT - Projects in Fulton	Yellow Pages - Competitor List Fulton
				YellowBook - Competitor List Fulton
				Google Maps - Competitor List Fulton
	Hamilton County	Hamilton County Engineer Capital improvement Plan	Hamilton County -	Yellow Pages - Competitor List Hamilton

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		2018/2019	Projects/Bids	YellowBook - Competitor List Hamilton
	Herkimer County	The Herkimer County Highway Department is responsible for the operation and maintenance of **574 miles of roads**, 66 bridges (5 co-owned with adjoining Fulton & Oneida counties), 128 large culverts (5′ > 20′), approximately 2,000 roadway culverts.	NYS DOT - Projects in Herkimer	Google Maps - Competitor List Herkimer
				Yellow Pages - Competitor List Herkimer
				YellowBook - Competitor List Herkimer
	Madison County	The Madison County Highway Department maintains **434.4 miles of road**, 124 bridges, and 143 large sized culverts (spans between 5 and 20 feet).	NYS DOT - Projects in Madison	Yellow Pages - Competitor List Madison
				Google Maps - Competitor List Madison
				YellowBook - Competitor List Madison
	Montgomery County	The County Road Division consists of 23 highway division employees whose major duties include maintenance of the County's **394.78 miles of roadway** and 91 bridges including, paving, sealing and patching, drainage and culvert installations, grading and shoulder repairs, guide rail installations, tree and brush removal, and bridge maintenance.	NYS DOT - Projects in Montgomery	Google Maps - Competitor List Montgomery
				YellowBook - Competitor List Montgomery
				Yellow Pages - Competitor List Montgomery
	Oneida County	The Highways, Bridges & Structures administration provides direct supervision of highway maintenance and reconstruction projects, snow removal and traffic control including	BidNet Direct - Bids in Oneida	Yellow Pages - Competitor List Oneida
			NYS DOT - Projects in Oneida	YellowBook - Competitor List Oneida

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		accounting and records. The Highways, Bridges & Structures have three garage locations to handle the **592 miles of roads, structures, and bridges.**		Google Maps - Competitor List Oneida
Central New York	**Cayuga County**	The mission of the Cayuga County Highway Department is to **maintain 516 miles of county roads** and 43 county-owned bridges in a safe operating condition for the reasonable and prudent driver. Additionally, the department: Plows and sands approximately 125 miles of state highways	NYS DOT - Projects in Cayuga	Yellow Pages - Competitor List Cayuga
				YellowBook - Competitor List Cayuga
				Google Maps - Competitor List Cayuga
	Cortland County	The Cortland County Highway Department, a full-service agency, is responsible for all aspects of design, construction, and maintenance of roads in the **247-mile county road system**. An **additional 110 miles of state roads** are maintained in the winter.	NYS DOT - Projects in Cortland	Google Maps - Competitor List Cortland
				Yellow Pages - Competitor List Cortland
				YellowBook - Competitor List Cortland
	Onondaga County	Onondaga County Department of Transportation's mission is to provide managerial engineering and technical expertise for **808 miles of County roads.**	BidNet Direct - Bids in Onondaga	Google Maps - Competitor List Onondaga
			NYS DOT - Projects in Onondaga	YellowBook - Competitor List Onondaga
				Yellow Pages - Competitor List Onondaga
	Oswego County	The Oswego County Highway Department is responsible for	NYS DOT - Projects in	YellowBook - Competitor List Oswego

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		the maintenance and safety **of 505 miles of County roads**, 113 bridges, 4,000 culverts, 7,000 signs and 35 miles of guide railing throughout Oswego County.	Oswego	Yellow Pages - Competitor List Oswego
				Google Maps - Competitor List Oswego
	Seneca County	Seneca County has approximately **525 miles of local roads**, maintained by the County and the Towns and Villages. In addition to the locally-maintained roads, the State maintains about **160 miles of highways** in Seneca County.	NYS DOT - Projects in Seneca	YellowBook - Competitor List Seneca
				Yellow Pages - Competitor List Seneca
				Google Maps - Competitor List Seneca
	Tompkins County	The Highway Department maintains close to **302 highway miles** and 109 bridges in Tompkins County.	NYS DOT - Projects in Tompkins	Yellow Pages - Competitor List Tompkins
				YellowBook - Competitor List Tompkins
				Google Maps - Competitor List Tompkins
Genesee Valley	**Genesee County**	With 39 full-time employees, the Genesee County Highway Department is responsible for maintaining over **260 miles of county roads,** 379 bridges, and culverts, 343 county-owned vehicles and equipment.	BidNet Direct - Bids in Genesee	Google Maps - Competitor List Genesee
			NYS DOT - Projects in Genesee	Yellow Pages - Competitor List Genesee
				YellowBook - Competitor List Genesee
	Livingston County	The Livingston County Highway Department is responsible for controlling and implementing all activities required to	NYS DOT - Projects in Livingston	Google Maps - Competitor List Livingston

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		maintain and repair the County's road and bridge infrastructure, consisting of **242 miles of highway** and 72 bridges.	BitNet Direct - Bids in Livingston	Yellow Pages - Competitor List Livingston
				YellowBook - Competitor List Livingston
	Monroe County	The Monroe County Department of Transportation is responsible for the safe and efficient operation of approximately **1,500 lane miles (665 centerline miles) of county-owned highways**, 180 bridges, and 275 major culverts on the Monroe County highway system.	NYS DOT - Projects in Livingston	YellowBook - Competitor List Monroe
				Yellow Pages - Competitor List Monroe
				Google Maps - Competitor List Monroe
	Ontario County	Interactive Planned Highway Work	NYS DOT - Projects in Ontario	Yellow Pages - Competitor List Ontario
				YellowBook - Competitor List Ontario
				Google Maps - Competitor List Ontario
	Orleans County	The Orleans County Highway Department has (20) full-time employees and (1) part-time employee. This department is responsible for the maintenance and reconstruction of **196.22 miles of County roads** and 72 bridges.	NYS DOT - Projects in Orleans	Yellow Pages - Competitor List Orleans
				YellowBook - Competitor List Orleans
				Google Maps - Competitor List Orleans
	Wayne County	The Highway Department crew of 52 serves 94,000 residents and maintains **405 miles of paved roads**.	NYS DOT - Projects in Wayne	Yellow Pages - Competitor List Wayne
			BitNet Direct - Bids in Wayne	YellowBook - Competitor List Wayne County

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				Google Maps - Competitor List Wayne County
	Wyoming County	/	NYS DOT - Projects in Wyoming	Yellow Pages - Competitor List Wyoming
				YellowBook - Competitor List Wyoming County
				Google Maps - Competitor List Wyoming County
Western New York	**Cattaraugus County**	The lion's share of the financial and human resources in the Public Works Department is devoted to the maintenance of the **395 miles of road**, 265 bridges, 258 culverts and 1,530 drainage structures under County jurisdiction.	NYS DOT - Projects in Cattaraugus	Yellow Pages - Competitor List Cattaraugus
				YellowBook - Competitor List Cattaraugus County
	Chautauqua County	Chautauqua County Division of Transportation is responsible for the safe and efficient operation **of 552 center-line miles of roads**, 308 bridges, and 258 major culverts that makeup the county-owned highway system.	NYS DOT - Projects in Chautauqua	Yellow Pages - Competitor List Chautauqua
				YellowBook - Competitor List Chautauqua County
				Google Maps - Competitor List Chautauqua County

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	Erie County	The Division of Highways is responsible for the engineering and inspection of **over a thousand miles of roadways**, making ours the largest transportation design team in Western New York.	NYS DOT - Projects in Erie	Yellow Pages - Competitor List Erie YellowBook - Competitor List Erie County Google Maps - Competitor List Erie County
	Niagara County	The highway system of Niagara County, New York, comprises **1,673.2 miles (2,692.8 km) of roads** maintained by the New York State Department of Transportation, the county, and its towns and villages.	NYS DOT - Projects in Niagara	Google Maps - Competitor List Niagara County YellowBook - Competitor List Niagara County
Southern Tier/Central New York	**Allegany County**	The Allegany County Department of Public Works is responsible for the maintenance and repair of **345.74 centerline miles of County roads** and 122 bridges throughout the Country.	NYS DOT - Projects in Allegany	Yellow Pages - Competitor List Allegany YellowBook - Competitor List Allegany County
	Chemung County	The Department of Public Works mission is to provide and maintain a reasonably safe, convenient, and effective highway system for the traveling public. The county highway system is comprised of **243 miles of roads** and 148 bridges.	NYS DOT - Projects in Chemung	Yellow Pages - Competitor List Chemung YellowBook - Competitor List Chemung County

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	Schuyler County	Schuyler County Highway Department's 2018 Road and Bridge work Program	NYS DOT - Projects in Schuyler	Yellow Pages - Competitor List Schuyler
				YellowBook - Competitor List Schuyler County
				Google Maps - Competitor List Schuyler County
	Steuben County	Steuben County Public Works 2019 Road Construction Interactive Map	NYS DOT - Projects in Steuben	YellowBook - Competitor List Steuben County
				Google Maps - Competitor List Steuben County
	Yates County	The Yates County Highway Department's mission is to provide the traveling public with a reasonably safe and efficient transportation system that includes **180 miles of roads** and 40 bridges.	NYS DOT - Projects in Yates	Google Maps - Competitor List Yates County
North County	**Clinton County**	The Department conducts numerous ongoing programs in providing services to the Clinton County residents and, in general, the traveling public for the maintenance, repair, and reconstruction of the **350.75 miles of County highways** and	NYS DOT - Projects in Clinton	Yellow Pages - Competitor List Clinton
				YellowBook - Competitor List Clinton
				Google Maps - Competitor List Clinton

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		109 County-owned bridges of which 99 are active.		County
	Franklin County	/	NYS DOT - Projects in Franklin	Yellow Pages - Competitor List Franklin
				YellowBook - Competitor List Franklin County
				Google Maps - Competitor List Franklin County
	Jefferson County	The Highway Department's objective is to maintain roads and bridges on the County Highway System. The system includes **555 miles of road** and 450 drainage structures.	NYS DOT - Projects in Jefferson	Yellow Pages - Competitor List Jefferson
				YellowBook - Competitor List Jefferson County
				Google Maps - Competitor List Jefferson County
	Lewis County	/	NYS DOT - Projects in Lewis	Yellow Pages - Competitor List Lewis
				YellowBook - Competitor List Lewis County
				Google Maps - Competitor List Lewis County

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	St. Lawrence County	The St. Lawrence County Department of Highways employs 105 Full-time employees. Employees in administration, engineering, 3 maintenance areas, bridge construction, bridge maintenance, machinery shop, traffic safety, and tree crew are responsible for planning, design, construction, operation, and maintenance of **579 miles of paved roadway** and 202 bridges. They are also responsible for winter maintenance of **118 miles of State roads and 144 miles of County roads** plus 555 miles of roadside mowing during the summer months.	NYS DOT - Projects in St. Lawrence	Google Maps - Competitor List St. Lawrence County YellowBook - Competitor List St. Lawrence County
	Columbia County	/	NYS DOT - Projects in Columbia	YellowBook - Competitor List Columbia County Google Maps - Competitor List Columbia County
Hudson Valley	**Dutchess County**	The Highway Construction and Maintenance Division is responsible for maintaining the county's **395 centerline miles of roads**, 140 bridges, and 178 drainage structures.	BitNet Direct - Bids in Dutchess	Google Maps - Competitor List Duchess County YellowBook - Competitor List Dutchess County
	Orange County	/	NYS DOT - Projects in Orange	Google Maps - Competitor List Orange

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				County
				YellowBook - Competitor List Orange County
	Putnam County	The Construction and Maintenance Division is comprised of workers ranging from laborers to heavy equipment operators. This Division is responsible for **over 200 miles of roads** from the Hudson River to the Connecticut border.	NYS DOT - Projects in Putnam	Yellow Pages - Competitor List Putnam
			Procurement Portal - Putnam County	YellowBook - Competitor List Putnam County
				Google Maps - Competitor List Putnam County
	Rockland County	The Rockland County Highway Department has the responsibility for the administration, construction, maintenance, supervision, repair and care of approximately **340 lane miles (167 centerline miles) of roadways**, 83 bridges, and 115 culverts within the county jurisdiction.	Rockland County Contracts	Google Maps - Competitor List Rockland County
			NYS DOT - Projects in Rockland	YellowBook - Competitor List Rockland County
	Ulster County	/	NYS DOT - Projects in Ulster	Google Maps - Competitor List Ulster County
				YellowBook - Competitor List Ulster County
	Westchester County	The Road Maintenance division is responsible for **175.5 miles**	NYS DOT - Projects in	Google Maps - Competitor List Westchester

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		of roadway (including the Bronx River Parkway) and 186 bridges under County jurisdiction.	Westchester	County
				YellowBook - Competitor List Westchester County
Southern Tier	**Broome County**	The Highway Division is responsible for the maintenance and upkeep of **343.24 centerline miles of roads** and is responsible for maintaining 105 bridges with spans of 20 feet or more and 150 culverts.	NYS DOT - Projects in Broome	Google Maps - Competitor List Broome County
				YellowBook - Competitor List Broome County
	Chenango County	The Chenango County Department of Public Works is responsible **for 308 centerline miles of roadways** and 142 bridges within Chenango County.	NYS DOT - Projects in Chenango	Google Maps - Competitor List Chenango County
				YellowBook - Competitor List Chenango County
	Delaware County	The Delaware County Department of Public Works provides a wide range of services. Among those, are the administration, construction, maintenance, supervision, repair, alteration, and care of all **260 centerline miles of County road** which also includes 291 bridges and 144 large culverts	NYS DOT - Projects in Delaware	Google Maps - Competitor List Delaware County
				YellowBook - Competitor List Delaware County
	Otsego County	The County has **2,128 miles of public roads.290 miles of the roads are state roads.477 miles are county highways, 1,324**	NYS DOT - Projects in Otsego	Yellow Pages - Competitor List Otsego
				YellowBook - Competitor List Otsego

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		miles are municipal roads		County
				Google Maps - Competitor List Otsego County
	Sullivan County	2018 Sullivan County Road & Bridge Program	NYS DOT - Projects in Sullivan	Yellow Pages - Competitor List Sullivan
				YellowBook - Competitor List Sullivan County
				Google Maps - Competitor List Sullivan County
	Tioga County	Tioga County's 2020 Adopted Strategic Plan	NYS DOT - Projects in Tioga	Yellow Pages - Competitor List Tioga Center
				YellowBook - Competitor List Tioga County
				Google Maps - Competitor List Tioga County
Long Island	**Nassau County**	/	NYS DOT - Projects in Nassau	Yellow Pages - Competitor List Nassau County
				YellowBook - Competitor List Nassau County

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	Suffolk County	Suffolk County maintains over **420 miles of County Roads**, 140 bridges, culverts, and miscellaneous structures, 300 waterways and operates 730 traffic signals.	NYS DOT - Projects in Suffolk	Yellow Pages - Competitor List New Suffolk
				YellowBook - Competitor List New Suffolk
				Google Maps - Competitor List New Suffolk

The table above indicates that the counties with the most roadway surface are:

- Queens – 2,200 miles,
- Otsego County – 2,128 miles,
- Niagara County - 1,673.2 miles,
- Kings County / Brooklyn – 1,500 miles of roadway,
- Essex County – 1,367.8 miles,
- Warren County – 1,248.6 miles of roads,
- Richmond County / Staten Island – 1,000 miles.

These counties have the most potential for future Pavement and Roadway Marking services, when are analyzed through the Pavement/Highway length prism.

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RESPONSIBLE ENTITIES

This segment of the document will present the entities which are responsible for the approval or decline of projects and bids in the Pavement Marking services in **the state and city of New York**.

A 2018 booklet indicates that the **New York State Department of Transportation** is the **responsible establishment for contracts to construct, improve, repair, and maintain roads, bridges and other transportation facilities.**

As for New York City, a document recording some of the guidelines for bids, emphasize that **Work Orders,** regarding Pavement Markings, **shall be issued** by the **New York City Department of Transportation Division of Traffic** (NYCDOT) and contain location details. Work Orders may contain the drawings or references to show what work must be done in order to complete the Work Order.

Another important body in the Pavement Marking landscape is the United States' Federal Highway Administration. Their Manual on Uniform Traffic Control Devices for Streets and Highways, or MUTCD, **defines the standards** used by road managers nationwide to **install** and **maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public travel**.

ANALYSIS OF PAVEMENT & ROADWAY MARKING BIDS

New York State's Transportation Capital Program which is federally funded, has allocated the budget in 2016 for the Highway and Bridge Program. This program's aim is to construct, renew, renovate and develop asphalt surfaces in New York State, which will also need Pavement and Roadway Markings. The project began in 2016 and is expected to end by 2020. This is how the budget was allocated:

- **Hudson Valley Region - $1,382.8 million** for the counties of Westchester, Rockland, Putnam, Dutchess, Columbia, Orange and Ulster. Of this amount, $125.6 million is subject to this agreement.
- **Long Island Region - $1,473.5 million** for the counties of Nassau and Suffolk. Of this amount, $198.7 million is subject to this agreement.

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- **Upstate Region- $4,176.7** million for all counties in New York State not specifically included in the regions outlined above. Of this amount, $351.3 million is subject to this agreement.
- **Statewide- $3,394.0 million** for all counties in New York State.

The statistics above are indicative to the size of the federal funds invested in each New York States' regions, and more importantly to the opportunity to engage in Pavement Marking services in these regions and earn sizeable profits.

New York State's Department of Transportation has enabled a very useful tool, which can be accessed on their website, detailing each project/bid in the state, which is under construction, in development, in future development or already completed.

The tool is very insightful and interactive, therefore the reader should look into browsing the website in order to avoid missing any important details and/or crucial information.

The tool showcases **New York State's 11** region segmentation, including Capital District, Mohawk Valley, Central New York, Genesee Valley, Western New York, Southern Tier/Central New York, North Country, Hudson Valley, Southern Tier, Long Island, and New York City.

With the insights from the aforementioned tool, the table below showcases the **Pavement Marking projects,** which are currently **In Development**, planned for **Future Development, Completed or Undergoing Construction** in **New York State.**

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Region Name	Counties Included in the Project	Number of Projects	In Development (Project is actively under development. Funding has been set up for planning or design activities)	Future Development (Project hasn't yet started but potential funding has been identified)	Under Construction (The construction phase has been authorized and a contract has been set and awarded)	Completed (Project is either in the final stages of closing or it's done)
Capital District	Greene, Albany, Rensselaer, Schenectady, Saratoga, Washington, Warren, Essex	4	1	2	0	1
Mohawk Valley	Montgomery, Fulton, Hamilton, Herkimer, Oneida, Madison	9	1	5	2	1
Central New York	Oswego, Onondaga, Cortland, Tompkins, Cayuga, Seneca	8	1	6	0	1
Genesee Valley	Wayne, Ontario, Monroe, Livingston, Orleans, Genesee, Wyoming	3	0	0	2	1
Western New York	Niagara, Erie, Chautauqua, Cattaraugus	**17**	1	**14**	0	2
Southern Tier/Central New York	Allegany, Steuben, Yates, Schuyler, Chemung	4	1	2	0	1
North Country	Lewis, Jefferson, St. Lawrence, Franklin, Clinton	7	1	5	0	1
Hudson Valley	Westchester, Rockland, Orange, Putnam, Ulster, Duchess, Colombia	**14**	2	**6**	5	1

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Southern Tier	Sullivan, Delaware, Schoharie, Otsego, Chenango, Broome, Tioga	8	1	6	0	1
Long Island	Suffolk, Nassau	**24**	1	**19**	2	2
New York City	Bronx, Queens, Kings, Richmond, New York	3	1	0	0	2
TOTAL		**101**	**11**	**65**	**11**	**14**

To surmise, New York State has a total of **101 Pavement Marking Projects**. Out of all these projects, **11** are **In Development**, and **65** are planned for **Future Development**. That leaves the state with **11 Completed,** and **14** projects **Under Construction**.

Furthermore, **Long Island, Hudson Valley,** and **Western New York** are the areas where the **majority** of Pavement projects are happening. **Long Island** and **Western New York** have the most projects prepared for **Future Development**.

This analysis suggests that **Long Island** and **Western New York** are the areas where the **biggest potential** for future Pavement and Roadway Markings services in **New York State** lies.

Once **the dates when the contracts (bids) were awarded and their completion dates** were analyzed for the 14 Completed Pavement projects in New York State from 2015 until 2018, the results indicated that on average, **355 days** are necessary to complete a Pavement project.

The time period necessary to complete a Pavement project greatly depends on its complexity, as well as the competence of the contractor (or its workforce). So, as a general rule of thumb, a project in the Pavement landscape is usually completed **within a year**.

The analysis regarding the construction contract costs of the projects, for all **14 Completed Pavement projects the average Construction Contract Cost is $4,430,470**.

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The results from the Contractors which completed the Pavement projects across New York State will be presented in the competition segment of the research.

Another **important source of information is New York State's Department of Transportation**, which has their transportation projects listed on their website, which is where the projects in the Pavement Marking services throughout New York State can also be browsed. This is an excerpt of how a project/bid details are presented:

Monday, April 1, 2019

**** NEW YORK STATE DEPARTMENT OF TRANSPORTATION ****
STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM (STIP)
for REGION 01

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AGENCY / PIN / AQ CODE	PROJECT DESCRIPTION / COUNTY / TOTAL PROJECT COST	FUND SOURCES FFY	TOTAL 4-YEAR PROGRAM in millions of dollars	PHASE	4-YEAR PROGRAM (FFY) Starting October 01, 2016 FFY 2017	FFY 2018	FFY 2019	FFY 2020
NYSDOT **10PS02**	NEW YORK STATE PEDESTRIAN SAFETY ACTION PLAN 10% MATCH IS HSIP-NY TOLL CREDITS. IMPROVEMENTS CAN INCLUDE HIGH VISIBILITY CROSSWALK MARKINGS, ENHANCING SIGNALS WITH EXTENDED CROSSING TIMES, COUNTDOWN TIMERS, LEADING PEDESTRIAN INTERVALS (WHICH HELP MAKE PEDESTRIANS MORE VISIBLE TO MOTORISTS BY GIVING THEM A HEAD START BEFORE TRAFFIC CAN TURN ONTO THE STREET), PAVEMENT MARKINGS, SIGNS, PEDESTRIAN REFUGE ISLANDS AND ATTENTION-GRABBING LIGHT BEACONS. THIS PROJECT IS INSTALLING SYSTEMIC SAFETY TREATMENTS QUALIFIED TO UTILIZE HSIP FUNDS.	HSIP 2017 HSIP 2019 HSIP 2019	0.100 0.330 3.300	DETLDES CONINSP CONST	0.100		0.330 3.300	
AQC:EXEMPT	MULTI **TPC :** $3.3-$5.6 M	**TOTAL 4YR COST :**	3.730		0.100	0.000	3.630	0.000

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PAVEMENT MARKINGS APPLICATION METHODS

The following information details the Standard Specifications, provided by the State of New York's Department of Transportation, for construction contracts.

These standard specifications are relevant since they hold information on some of the most commonly met Pavement Marking applications (methods), which include; Pavement Tapes, Glass Beads for Pavement Markings, Epoxy, Thermoplastic, Methyl Methacrylate (MMA), and Traffic Paint among others.

Due to the limited amount of information available online regarding the volume of use of particular materials/methods of application in the Pavement Marking services, the beginning paragraphs of this section will generalize on the market share and expectation of each material used in Pavement Markings.

Detailing each of the Pavement Marking application methods will follow in the paragraphs below.

PAVEMENT TAPES

Information from Federal Highway Administration Research and Technology's report on the Environmental health and safety considerations, informs that there are **three types of preformed tape markings: permanent, temporary removable, and temporary non-removable.** Permanent pavement marking tapes can be either flat or patterned and may require the use of a primer or sealer as part of the installation (based on vendor instructions). Permanent tapes are generally used for longitudinal edge lines, skip lines, stop lines, crosswalks, legends, and symbols. Two of the most common types of plastics binders used for permanent tapes are urethane and pliant polymer. Temporary tapes are typically used for construction or other short-term traffic management situations.

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The Tape is applied directly on the surface and bonded with an adhesive. Pressure-sensitive adhesives work best when overlaying permanent tapes on new asphalt pavement surfaces. Contact cement or primer is often used when installing the tape on concrete or over older markings. Markings are initially bonded with a light hand roller or vehicle tire and permanently bonded by traffic wear.

PERMANENT PAVEMENT TAPES

The Standard Specifications, provided by the State of New York's Department of Transportation state that the Permanent pavement tape shall be:

- Designed to provide immediate and continuous retroreflection.
- Meet all the requirements of ASTM D4505.
- Composed of a mixture of plastics or polymeric materials, resins, pigments, and reflective beads that are uniformly distributed throughout the thickness of the material.
- Have a layer of reflective beads bonded to, or embedded in the top surface.
- Pre-coated, on its bottom side, with a pressure-sensitive adhesive for adherence to HMA or PCC surfaces.
- Of the specified dimension and shape with clean-cut, well-defined edges, of good appearance, and free of cracks or other defects.
- Weather resistant and through normal traffic wear shall show no appreciable fading, lifting or shrinkage.
- Capable of molding itself to the contours, breaks, and faults of HMA or PCC surfaces.
- Show no significant tearing, rollback, lifting or other signs of poor adhesion.
- Free from dirt and any other contaminants.

Replacement of Pavement Markings. The Contractor shall not remove existing pavement markings and leave the highway unmarked overnight.

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Application of Pavement Markings. Traffic paint shall not be applied during periods of rain or if rain is imminent. The painted pavement markings shall be uniformly applied to the pavement surface at the minimum specified wet film thickness. Immediately following paint application, reflective glass beads shall be uniformly applied to the wet paint film at the rate of 0.75 kg/L of paint. The applied pavement markings shall have clean-cut edges and true and smooth alignment.

BASIS OF PAYMENT. The accepted quantities of Pavement Markings will be paid for at the contract unit price bid, which shall include the cost of furnishing all labor, materials, and equipment to satisfactorily complete the work.

PACKAGING AND SHIPPING. Shipped to the job site in strong, substantial containers, clearly marked with the following and including:

- Manufacturer's Name
- Name of Product
- Material Specification Number
- Lot/Batch Number
- Manufacture Date
- Quantity
- Primers accompanied with written instructions for use
- Expiration Date

REMOVABLE PAVEMENT TAPE

The Standard Specifications also covers the material requirements for removable pavement marking tape and masking tape for use as interim and temporary pavement markings.

MATERIAL REQUIREMENTS. Removable pavement tape shall be:

- Composed of a mixture of plastics or polymeric materials, resins, and pigments. Have on its bottom side, a pre-applied, pressure-sensitive adhesive for adherence to HMA or PCC surfaces.

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- Of the specified dimension and shape with clean-cut, well defined-edges, of good appearance, and free of cracks or other defects.
- Weather resistant and through normal traffic wear shall show no appreciable fading, lifting or shrinkage.
- Capable of molding itself to the contours, breaks, and faults of HMA or PCC surfaces. Show no significant tearing, rollback, lifting or other signs of poor adhesion.
- Removable from HMA and PCC pavements, intact or in substantially large pieces, without the use of heat, solvents, grinding or blasting, and leaving minimal permanent marks, scars or damage to the pavement surface after removal.
- Be free from dirt and any other contaminants.

GLASS BEADS FOR PAVEMENT MARKINGS

The market research company – Market and Markets' report, on Retro-Reflective Materials indicates that the retro-reflective materials market is estimated at **US $5.58 Billion in 2018 and is projected to reach US $12.49 Billion by 2023, at a CAGR of 17.5% between 2018 and 2023.** The growth of the retro-reflective materials market can be attributed to the **increasing use of retro-reflective materials in construction & infrastructure and automotive & transportation projects,** owing to the property of offering safety by providing enhanced visibility in low light and nighttime conditions. According to PS Market Research's industry report, it is anticipated that **infrastructural connectivity projects such as expansions of road and railway networks would generate extensive demand for safety materials used in these projects.** Owing to this retro reflective market is expected to witness a **major boost in the coming years.**

Federal Highway Administration Research and Technology's report emphasizes that **Glass Beads are the most commonly utilized reflective elements used in pavement markings**. Glass beads are used to provide improved visibility of traffic markings at night. Beads are embedded into the traffic marking material and reflect light from a vehicle's headlights back to the driver.

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Spherical reflective beads are retroreflective when embedded in a traffic paint material to a depth of approximately 50%-60% of their diameter. When light strikes a bead, it is refracted and reflected.

The **bedding for the bead (paint, thermoplastic, etc.) acts as a mirror and allows the light to be reflected.** Therefore, the depth of embedment in the marking material has a significant effect on the retroreflective properties of the bead.

During bead application, it is essential to control the amount and dispersion of beads reaching the marking material and the depth of embedment in the marking.

The image above shows a bead gun with a bead shroud dropping beads on ribbon-extruded thermoplastic pavement markings.

MATERIAL REQUIREMENTS. Glass beads for pavement markings shall meet the requirements of AASHTO M247 and shall be:

- Composed of glass that is highly resistant to traffic wear and to the effects of weathering.
- Colorless, clean, transparent, free from milkiness or excessive air bubbles, and essentially free from surface scarring or scratching.
- Silica content (ASTM C169): 60% minimum.
- Refractive index: 1.50 when tested by the liquid immersion method at 25°C.
- Show no tendency to absorb moisture in storage and shall remain free of clusters and hard lumps.
- Flow freely from the dispensing equipment at any time when surface and atmospheric conditions are satisfactory for painting.

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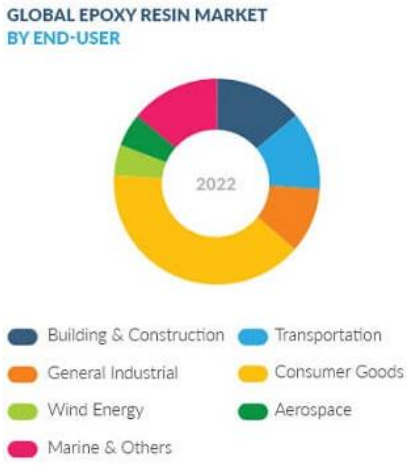
PACKAGING AND SHIPPING. Shipped to the job site in waterproof plastic lined burlap or plastic lined paper bags with the following information clearly marked on the packages:

- Manufacturer's Name
- Name of Product
- Size/Type/Coating
- Material Specification Number
- Lot/Batch Number
- Manufacture Date
- Quantity/Weight of Material

EPOXY

Information made available by Allied Market Research's report, states that the global Epoxy resin market size was valued at **$6,826 million in 2015**, and is anticipated to grow at a **CAGR** (compound annual growth rate) of **6.2%,** reaching **$10,264 million by 2022.**

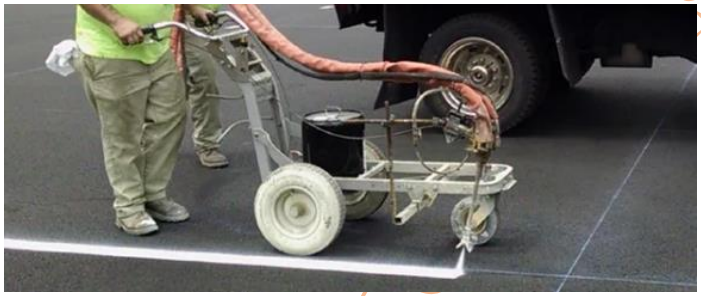
The report further showcases that among the top applications of Epoxy raisin, is the Pain and Coatings landscape.



The second image (on the right) showcases the end-users of the Epoxy resin, and it can be seen that the Consumer Goods are the leading segment, followed by the **Transportation, Building & Construction** and so on.

The Federal Highway Administration Research and Technology's report also explains that Epoxy paints are used as pavement marking materials to **increase durability**. As a two-component material consisting of a pigmented resin base and a hardener, epoxy paints are cured by an exothermic thermoset chemical reaction. Reflective elements are easily added during application.

Epoxy paint pavement markings use pigments to impart color to the marking. The pigments are ground and mixed into the resin material. Color stability under UV exposure is often difficult to achieve with epoxy markings. Because of this characteristic, the **pigment loading has to be much higher than with most other types of pavement marking technologies.**



The Standard Specifications material requirements state that Epoxy paint shall be:

- Formulated for use as a pavement marking material and for hot-spray application at elevated temperatures.
- Two-component (Part A and Part B), 100% solids type system formulated and designed to provide a simple volumetric mixing ratio (e.g., two volumes of Part A to one volume of Part B).
- VOC compliant and lead chromate free.
- Use organic yellow pigments, Color Index Pigment Yellow 65 (C.I. 11740) and/or 74 (C.I. 11741).
- Have a consistent target value of epoxy in Part A, based on ASTM D1652. Tested on a pigment-free basis and calculated as the weight per epoxy equivalent (WPE).

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- Have a consistent total amine value of Part B based on ASTM D2074, or an alternate test method for determining the amine value specified by the manufacturer subject to the approval of the Director, Materials Bureau.
- Display no bleeding on the surface upon which the paint is applied.
- Conform to current Federal, State, and Local air pollution regulations, including those for the control

Atmospheric Conditions. Epoxy pavement markings shall only be applied during conditions of dry weather and on substantially dry pavement surfaces.

Application of Epoxy Reflectorized Pavement Markings. Epoxy reflectorized pavement markings shall be placed at the width, thickness, and pattern designated by the Contract Documents.

BASIS OF PAYMENT. The accepted quantities of markings will be paid for at the contract unit price, which shall include the cost of furnishing labor, materials, and equipment to satisfactorily complete the work.

THERMOPLASTIC

A report published by the market research company – Mordor Intelligence, writes that the thermoplastics market was valued at **US $17 billion in 2017** and is expected to expand at a **CAGR 6.24%** during the forecast period, 2018 - 2023. The increase in productive capacity has resulted in a rise in the applications in the end-user industries, such as **building & construction, automotive & transport**, and consumer goods & pharmaceuticals, and this trend is expected to remain same during the forecast period. However, the **availability of raw materials and the environment-related concerns are expected to hinder the market growth.**

Federal Highway Administration Research and Technology's report explains that the Thermoplastic pavement marking uses a block and granular material and melts it so that it can be sprayed, gravity extruded, or pressure extruded (often called ribbon extruded) onto the pavement as a line.

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Thermoplastic is a blend of solid ingredients that become liquid when heated and melted. Reflective elements are mixed into the material by the manufacturer and can be applied to the surface following application.

Three common methods for **applying thermoplastic traffic markings are a spray gun, an extrusion shoe, and a ribbon gun.** The spray gun operates much like a traffic paint spray gun. The extrusion process forces the thermoplastic material through a die or shoe riding on the pavement surface. With the ribbon gun, the thermoplastic material is forced through the system, into the gun, and onto the pavement.

The Standard Specifications writes this regarding the **Thermoplastic Primer**:

- It's specifically designed to enhance the bond of thermoplastic pavement markings to HMA and/or PCC pavements.
- Be either a one-component or two-component, cold- or hot-applied material of the type recommended by the manufacturer.
- Conform to current Federal, State and Local air pollution regulations, including those for the control (emission) of volatile organic compounds (VOC) as established by the U.S. EPA, and the NYSDEC

Atmospheric Conditions. Thermoplastic pavement markings shall be placed upon dry pavement surfaces.

Application of Thermoplastic Pavement Markings. All special markings, crosswalks, stop bars, legends, arrows, and similar patterns shall be placed with a portable applicator. Unless otherwise specified in the contract documents all center line, skip line, edge line and other longitudinal type markings may be applied with either a portable or a mobile applicator.

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BASIS OF PAYMENT. The accepted quantities of markings will be paid for at the contract unit price, which shall include the cost of furnishing all labor, materials, and equipment to satisfactorily complete the work.

METHYL METHACRYLATE (MMA)

Information available in Market Watch's report stresses out that the worldwide market for Methyl Methacrylate (MMA) is expected to **grow at a CAGR of roughly 3.1% over the next five years. From US $9.3 billion in 2019 reaching US $11.2 billion in 2024,**

Further details in Federal Highway Administration Research and Technology's report inform that MMA is a two-component durable pavement marking material. It is manufactured in two basic mix configurations:

- An impingement process (forced together by pressure in a mixing tube or chamber) or,
- Static mixer immediately prior to application.

MMA can be sprayed or extruded onto the pavement. The material forms a strong bond to the pavement surface by an exothermic reaction (release of heat) that occurs during the mixing process and is finished once applied.

However, **MMA has been shown to provide a much longer service life than standard traffic paint and is now considered to be as durable as thermoplastics and tapes**. MMA pavement markings are designed to be **resistant to oils, antifreeze**, and **other common chemicals** found on roadway surfaces.

MMA reportedly bonds well to concrete pavements, and it requires special equipment for application.

The image above showcases structured MMA application with a hand striper.

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A draft document details the attributes of **Methyl Methacrylate** for the purpose of Road Markings:

- The binder portion of the system placed as a solid application is to be applied to the road surface at 20 mils ± 1 mil in thickness on concrete/asphalt pavements within a grinded groove of 40 mils depth (or according to Engineers and manufacturer's recommendations).
- The binder portion of the system placed as a structure application is to be applied to the road surface at 120 mils ± 2 mils in thickness on concrete/asphalt pavements within a grinded groove of 40 mils depth (or according to Engineers and manufacturer's recommendations).
- MMA structure applications shall have a random, repeating pattern of peaks and valleys and provide approximately 70-80% coverage of the pavement surface.
- Markings shall be applied on properly prepared substrates or over existing Methacrylate materials.
- The Methyl Methacrylate shall be free from all foreign materials and show no evidence of caking, settling or corroding of the container.

Binder Composition

The binder used shall be 100% reactive, solvent-free, methyl methacrylate vehicle. Blends with other resins or liquid vehicles shall not be permitted.

Solvents

The bidder shall furnish the name of the appropriate solvents used for clean-up of the Methyl Methacrylate. If special solvents are required, the bidder must indicate the sources and type of solvents to be used.

Delivery, Storage and Handling

- The binder used shall be 100% reactive, solvent-free, methyl methacrylate vehicle. Blends with other resins or liquid vehicles shall not be permitted.
- When on-site storage is required, all materials shall be delivered in original Manufacturer's sealed containers with all pertinent labels intact and legible.
- Manufacturer's specific label instructions and prudent safety practices for storage and handling shall be followed at all times. The Material shall be suitable for use

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for six months after the date of receipt when stored in accordance with the Manufacturer's instructions.

- Materials shall be kept in dry protected areas between 40°F (4.4°C.) and 77°F (25°C.) out of direct sunlight, protected from open flame and with all containers grounded. Hardener component shall be stored separately from other materials.

TRAFFIC PAINT

Another industry report provided by Polaris Market Research, informs that the global traffic **road marking coating market was valued at US $4,012 million in 2017 and is anticipated to grow at a CAGR of 6.2% during the forecast period**. Traffic road marking coatings are materials used for marking roads and curbs for the efficient flow of traffic and enhanced public safety.

Federal Highway Administration Research and Technology's report also explains that traffic paints are water- or solvent-based paints that are typically sprayed as lines on the surface of the pavement. Traffic paints are the oldest and most widely used pavement marking materials in existence.

Paint is the most inexpensive of all pavement marking materials, although its cost has increased slightly as new formulations have been introduced and the market has narrowed. Paint is almost exclusively used for long-line applications.

The **Traffic Paint market has changed** alongside the architectural paint market due to regulatory impacts caused by **VOC limits and regulation regarding the use of lead-based pigments.**

The Standard Specifications material requirements regarding the Traffic paint state that they will:

- Be formulated for use as a pavement marking material.
- Be VOC compliant and lead chromate free.
- Yellow paints must use organic yellow pigments Color Index Pigment Yellow 65 (C.I. 11740) and/or 74 (C.I. 11741).
- Display no bleeding on the surface upon which the paint is applied.

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- Conform to current Federal, State and Local air pollution regulations, including those for the control (emission) of volatile organic compounds (VOC) as established by the U.S. EPA, and the NYSDEC.

PAVEMENT MARKING REMOVAL (ERADICATION)

The most common methods of pavement marking eradication (or removal) include **blasting** (hydro, sand, or shot), **grinding**, and **masking** (using paint, black tape, slurry, or surface treatment that covers or encapsulates the marking) as it is stated in Federal Highway Administration Research and Technology's report.

These eradication techniques can be used individually or in combination. **The technique used to remove pavement markings is chosen based on the type of marking to be removed, the pavement surface type, the location of the marking to be removed** (as it pertains to the needed path of travel for traffic), and **past experiences with eradication techniques.**

MARKET TRENDS

The Standard Specifications document also informs that over the past 10 to 20 years, the use of warranties on roadway construction projects has been viewed as an alternative to the standard practice of state highway agencies. Currently, the way projects are typically bid provides contractors with little opportunity for innovation. **Contractors have few opportunities to deviate from standard specifications** and, providing that the specifications are met, are not liable if a roadway is found to be defective once it is placed in service.

Despite the strict guidelines in the contractual agreements, the American Traffic Services Association's article points to a new innovative trend, **sensor technology in roadway infrastructure** - transforming roads into a digital platform for advanced mobility applications. Making use of the **sensors in both vehicles and roadway infrastructure**, which are capable of **providing information on traffic, roadway, and vehicle conditions, better preparing motorists and non-motorists for what to expect as they travel.**

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This modern technology, as well as the importance of proper Pavement Markings, are stressed by powerful corporations, such as the vehicle manufacturer General Motors. GM has reported to Congress that **pavement markings are one of the most significant infrastructure elements needed to guide automated vehicles** and realize the estimated safety benefits of such vehicles, as it is stated in an article available on United States Federal Highway Administration's website.

Another trending area of interest is the **connected vehicles,** which are currently one of the main focus points of the U.S. Department of Transportation's Intelligent Transportation Systems Joint Program Office (JPO). **Connected vehicle safety applications** will enable drivers to have **360-degree awareness** of hazards and situations they cannot even see. Through **in-car warnings,** drivers will be **alerted to imminent crash situations**, such as **unintended lane departures, unintended run off the roadway situations**, or when a vehicle ahead brakes suddenly. By communicating with enhanced or innovative infrastructure such as pavement markings, drivers will be alerted to potential safety, operational and environmental vulnerabilities well in advance, helping them to eliminate or mitigate potentially hazardous situations.

United States Federal Highway Administration's article points to another innovative way of using already existing technologies, such as the **magnetic markings or markings with Quick Response (QR) codes or radio frequency identification (RFID) tags**. These enhanced markings could be used in strategic areas such as in advance of horizontal curves. **Vehicles could read these enhanced markings and compute safe speeds** for the specific vehicle and specific roadway conditions (as opposed to one advisory speed that does not adapt to vehicles or roadway conditions).

CNET - a global interactive media and marketing company, in their article, informs on a Pavement Marking Project that could change the way traditional markings function. Opened in 2014, **500 meters of a strip** in the Netherlands, was equipped with **glow-in-the-dark lane markings** (**photoluminescent powder mixed with the road paint**). These markings would power up from the sun during the day, and shine brightly during nighttime.

Although written by Colorado's Department of Transportation, their final report titled "Cost-benefit evaluation of enhanced specifications for epoxy pavement marking material"

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explains that although more expensive, the **Epoxy** Pavement Marking solution proves to be **more durable** and **retroreflective**, when compared to the other two most popular pavement marking solutions – **tape** and **thermoplastics**. According to their conclusion, the use of Epoxy might be a trend in the future use of Pavement Markings methods.

Grand View Research's report on the Global Traffic Road Marking Coating Market further supports the notion that **Epoxy** Pavement Coating is preferred over **Plastic material,** owing to its low cost and highly reliable features.

Another mention-worthy trend, according to the market research company Business Wire's report on the "Traffic Road Marking Coatings Market", manufacturers are coming up with initiatives to develop **temperature-sensitive paints**, **which can withstand adverse environmental conditions, such as snowfall and heavy rains**. A drawback in this research process is the danger of the paints' harmful volatile organic compounds. Generally, paints are regarded as a **major source of harmful VOC emissions.** This has resulted in the development of **thermoplastic coatings and other eco-friendly alternatives,** according to Business Wire's report**.**

The business news company - Market Watch's report, in contrast to the Traffic Paint Pavement Marking solutions, suggests that **Thermoplastics** are amongst the more commonly used surface marking materials, due to their high durability, lack of VOC (Volatile Organic Compounds), and possess **excellent reflection properties** during daytime, nighttime, as well as **in wet weather conditions**. **Cold plastics** are based on methyl methacrylate resins (MMA). These are designed for use in conditions where **resistance to wear and tear are of great importance**. Cold plastic markings are **widely used in high traffic areas** where there is high snowfall.

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COMPETITION AND SUPPLIER ANALYSIS

LISTS OF COMPETITORS

One comprehensive way of establishing some of the competing companies in New York State in the Pavement Marking landscape is through the database provided by the **Office of the State Comptroller.**

In this **database**, a plethora of bids in various other segments can be browsed, but for the purposes of this research, the analysis was focused only on the Department of Transportation, and more specifically on the bids which include Pavement Marking – related operations and tasks.

Here, the database lists the names, the beginning and expected project end dates, as well as the amount of funds spent (or planned to be spent) for each project.

Using this database, the research was able to narrow down to **128 bids/projects** in the **Pavement Markings** landscape in **New York State**.

Once the **database** from New York State's Office of the State Comptroller was processed, the following contractors were identified as the most relevant competitors:

- Accent Stripe Inc. is the company with the most contracts **(85)** awarded throughout New York State (Southern Tier, North County, Southern Tier/Central New York, Western New York, Genesee Valley, Central New York, Mohawk Valley, and Capital District). This Company's main service is Pavement Markings, therefore it is considered as the main competitor identified in this research.

There were a total of **16 Pavement Marking contractors in the State of New York, according to the database**. Presented below are the companies with the most bids/projects, therefore are considered the biggest competitors.

In the competitor analysis, the **Counties' Governments and Associations were omitted**, since there is a bigger chance that they could become a future client, therefore **the focus was on the private, as well as the public Pavement and Roadway Pavement Marking companies**.

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These are the other **more relevant companies** operating throughout New York State, according to the bids which were awarded to them. All public contracts can be browsed on New York State Comptroller's bid database.

- Denville Line Painting Inc. – No. of projects **10** (**Pavement marking**, various locations, Erie and Niagara Counties).
- Safety Marking Inc. – No. of projects **8** (**install pavement markings** at various location Nassau & Suffolk).
- Elderlee Inc. – No. of projects **2** (install Signs & **Pavement Markings** at Expressway Ramps, Genesee Livingston Monroe Ontario Counties) the company is **not offering these services as their primary profit-generating services**.
- Hi-Lite Markings Inc. – No. of projects **2** (**install** durable **pavement markings**). Its Pavement Marking services are mainly used in Airports.
- Hinck Electrical Contractor Inc. – No. of projects **1** (Pedestrian safety, **pavement markings**, mounted signal, ADA) **not offering pavement marking services as their main service**.

The other method of researching competitors in New York State in the Pavement and Roadway Marking services landscape, was through some of the most prominent **online databases and business directories**, such as Yellow Pages, YellowBook and Google Maps.

The results will be presented in the following pages.

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COMPETITOR OVERVIEW

The creation of the competitor table below included compiling lists of competitors in the **Pavement and Floor Marking Services**, **Parking Area Maintenance and Marking**, as well as in the **Pavement Striping** landscape in New York State.

These companies in **New York State** were identified through three main sources (business directories); **Yellow Pages, YellowBook and Google Maps**.

The selection process of the competing companies which were included in the table below, was aided by the aforementioned platforms, which offered **client reviews and company rankings**, therefore some of the **competitors with the highest rankings** were added in the competitor table, accounting for a total of **15 competitors in New York State**.

The competitors in the spaces below are analyzed through **brief firmographic data, which includes general information** such as the year of the Company's establishment, their Head Quarters' location, the number of employees, as well as an estimation of their revenue.

The second part of the firmographic data showcases the competitors' **product/service information**, as well as any available data on the clients they serve and news regarding the Company.

Metro Clean Express was also included in the table since the Company is also another Pavement and Roadway Marking service provider, which has the potential to significantly influence the Pavement and Roadway Marking landscape in New York State.

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General Information					Product/Service Information		
Company	**HQ**	**Year Established**	**Number of Employees**	**Revenue (millions)**	**Offering**	**Clients Served**	**Company News**
MetroClean Express	Long Island City, New York	2012	35	$3	Cleaning and Maintenance Services, Maintenance and Protection of Traffic, Equipment Rentals, Posting and Maintenance of Advertising Panels	N/A	N/A
Hi-Lite Markings Inc.	Adams Center, Jefferson County, New York	2013	150	$32	Airport Markings, Runway Rubber Removal, Surface Preparation, Pavement Maintenance, Airport Consulting, Friction Testing	AVCON, Keesler Air Force Base, Alliance Municipal Airport, Anderson Colombia Co., Inc.	Company's News
Accent Stripe Inc.	Orchard Park, Erie County, New York	1976	88	$12.6	Durable Pavement Markings	N/A	N/A
Denville Line Painting Inc.	Rockaway, Morris County, New Jersey	1967	35	$3.8	Pavement marking services (Water – Based Paint, Epoxy, Polyurea, Preformed Tape, Reflective Pavement Markers	Municipalities, state agencies, select general contractors and	Lawsuit: Denville Line Painting Crosses the

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					and Lenses and Pavement Marking Removal)	counties.	Line with Illegal Pay Practices
Safety Marking Inc.	Bridgeport, Connecticut	1973	34	$7.31	Epoxy Pavement Markings, Thermoplastic Pavement Markings, Paint Pavement Markings, Hydroblasting, and Tape Pavement Markings	Safety Marking is currently working with numerous government agencies and municipalities throughout New York, Connecticut, and Rhode Island.	N/A
Green R J Pavement Sealing & Striping	Pulaski, New York	2008	3	$0.23	Sealcoating, Striping, Pavement Marking, Blacktop Repair, Hot Tar Crack Fillers, and Snowplowing	N/A	N/A
James Kurpiel Inc.	Hackensack, New Jersey	1965	12	$1.5	Line Striping, Crack Filling, Masonry, Seal Coating, Equipment Rentals	N/A	N/A

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PaveMaster	Bay Shore, New York	1995	15	$1.7	Asphalt Milling & Reclaiming Asphalt Paving Blacktop & Pothole Repairs Parking Lot Striping & Pavement Markings, Power Sweeping Sealcoating & Crack Sealing, Site Work & Excavation, Snow Plowing Services	Hofstra University, Sherwood Equities, Inc., Basser-Kaufmann, Barrier Beach Management	N/A
Bedford Paving Company	Orleans, New York	1968	13	$1.3	Commercial and Residential Paving, Asphalt Fixes, Pavement Striping etc.	O'Dell Chiropractic, Gardner Plus Architects, PLLC,	N/A
Mark Lavallee Paving Inc	Syracuse, New York	1955	5-9	$2.2	Asphalt Removal, Milling, Replacement, & Repair Resurfacing Cutouts Private Roads Patching Walking Trails Striping	N/A	N/A

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Tarvia Seal Corporation	Syracuse, New York	1973	10-19	$4.6	Commercial & Residential Seal Coating, Line Striping, Crack Sealing.	N/A	N/A
Curb Appeal Enterprises	Hudson Falls, New York	2008	14	$1.02	Seal Coating, Line Stripping, Asphalt/Crack Repairs, Snow Plowing	N/A	N/A
Advanced Pavement Group	South Plainfield, New Jersey	2017	53	$8.02	Asphalt Milling & Paving, Asphalt Maintenance & Repair, Snow & Ice Management, etc.	N/A	Advanced Pavement Group Partners With America's Grow-a-Row
Appel Striping & Sealcoating Inc.	Brightwaters, New York	2001	51-200	$6.1	Sealcoating, Line Striping, Pot Hole Repair, Crack filling	Apple, Costco, Buffalo Wild Wings, Dollar Tree, KFC	N/A
Parker Line Striping, Inc.	De Kalb Junction, New York	1994	20	$2.9	Pavement Marking, Seal Coating, Crack Sealing.	Walmart, Sam's Club, CVS Pharmacy, Walgreens	N/A

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Seal Right, Inc.	Owego, New York	2013	1-10	$0.11	Crack Filling, Seal Coating, Line Stripping, Asphalt Repair	N/A	N/A

Competing companies were also analyzed with the use of Yellow Pages' search engine. Looking for "Pavement & Floor Marking Services" companies in each county in New York, only the ones which were **highly rated** were included in the table above. These companies include Green R J Pavement Sealing & Striping, James Kurpiel Inc., and Bedford Paving Company.

Furthermore, some of the competitors from Google Maps (in the pavement marking category) which also had higher client rankings, were also analyzed and included in the table. These are some of the Pavement Marking competitors originating from Google Maps: Mark Lavallee Paving Inc, Tarvia Seal Corporation, Curb Appeal Enterprises, Appel Striping & Sealcoating Inc., Parker Line Striping, Inc. and.

It can be seen that the majority of the competitors' **workforce counts around or less than 50 employees**, and only a few have a 100 or more. This indicates that despite a lower number of employees, the know-how, the experience as well as the quality of the deliverables, are among the key factors which will elevate the genuinely good Pavement Marking Providers from the rest.

Another conclusion drawn is that almost every competitor has **other services** apart from asphalt/pavement marking and striping. One of the more **commonly found services include asphalt seal coating, crack filling, as well as snow removal services.**

The Contractor analysis for Completed Pavement projects indicates that **Hi-Lite Markings Inc., Accent Stripe Inc**., **Denville Line Painting Inc.**, as well as **Safety Marking Inc.** are among the **closest competitors** on the Pavement and Roadway Marking market **in New York State, according to the Government bids awarded to them**.

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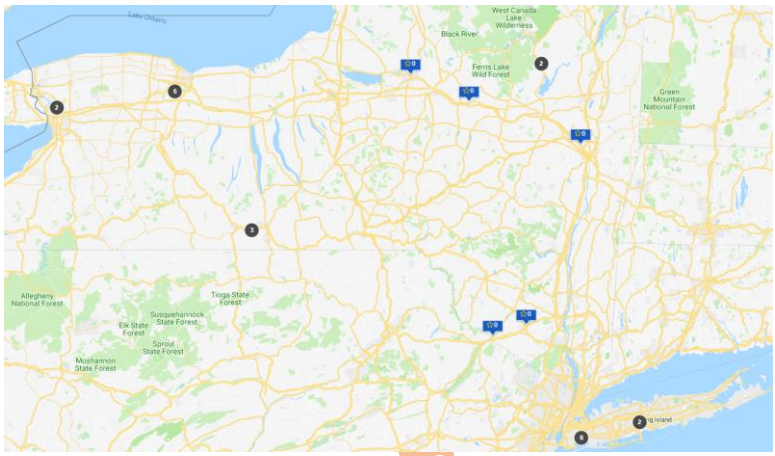
HEAT MAPS

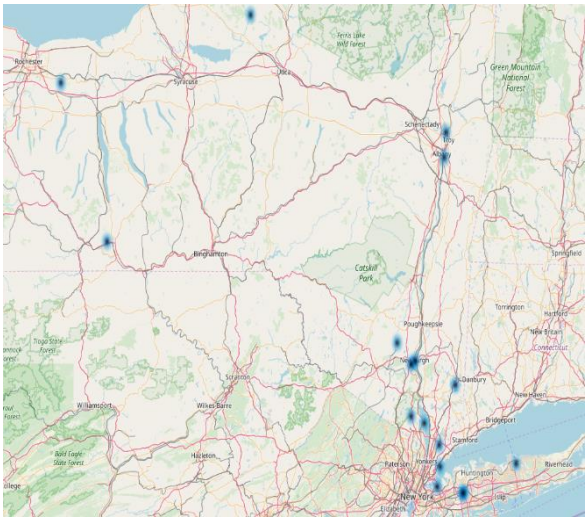
This segment of the document will visually showcase the locations of the Pavement and Roadway Marking companies in New York State, as well as in New York City. This way, a general idea of the business' location can be established.

N49 is a portal which functions similarly as **Yelp** and other online platforms which offers a brief summary of companies in specific industries, in specific countries, while providing their locations on a map.



Using their website's search engine, on a **state level**, it was concluded that **Buffalo, Rochester, Elmira, Rome, Utica, Hope, Albany, Port Jervis, and Middletown** are some of the cities which are homes to some of the Pavement Marking companies in New York State. However, **most** of the companies are residing in the **areas within New York City**.

Another source offering a glimpse into the geographical position of the competitors **in New York State** is **Brown Book**'s search engine.



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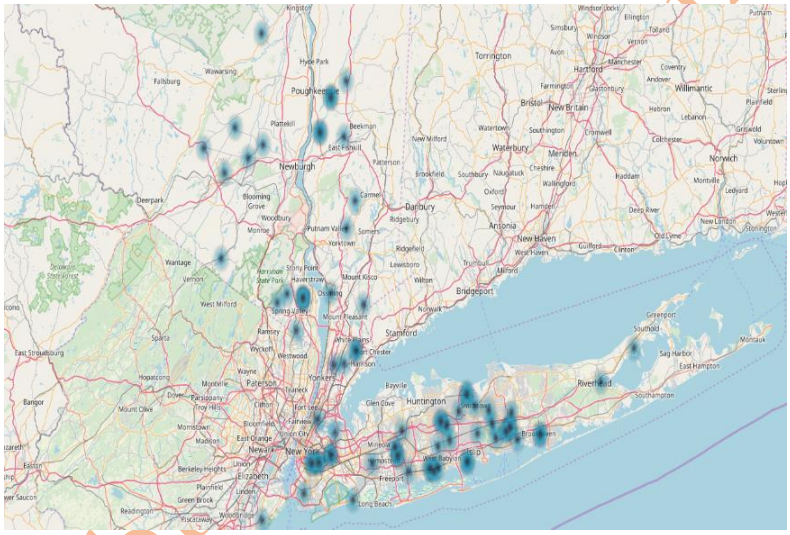
According to this source, the **majority** of competitors are located **in, or near New York City**. **A smaller number** of competitors are located in the **areas near Newburgh**, **Albany,** and **Rochester**.

Information from both sources mentioned above, suggests that the **majority** of competitors **in New York State**, tend to have their Pavement Marking businesses **located in or near New York City.**

The image in the following spaces is a representation of the companies in the Pavement Markings industry located **within New York City**.

The locations for these companies are taken from the competitor source from the paragraph above – Blue Book.



The heatmap is indicative that **Long Island and New York City** are **the main two areas** where the Pavement and Roadway Markings businesses have set up offices. **Manhattan and the Bronx** are the other two areas **where smaller numbers** of the remaining Pavement Markings companies are located.

SUPPLIER RESEARCH

The initial method for researching Pavement Marking tools and equipment suppliers, included **Yellow Pages, Blue Book, and other similar business directories** which allow insights into companies listed **as Pavement Marking Equipment Suppliers**.

This method proved unfruitful since most of the results in these directories were companies which offer Pavement Marking services, and no tools or equipment.

The second method, using Google' search engine, and the keywords "**U.S. Pavement Marking equipment**" the research was able to provide a list of Pavement Marking suppliers throughout the United States.

However, most of the companies listed weren't, in fact, relevant (or in the business of providing tools and equipment for Pavement Markings), therefore few of the suppliers with the biggest potential were picked and analyzed in the space below.

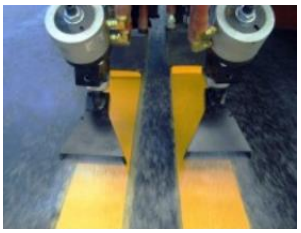
1. Graco Inc.

Graco Inc. founded in 1926 and headquartered in Minneapolis, Minnesota, is a business which designs, manufactures, and markets systems and equipment used to move, measure, control, dispense and spray fluid and powder materials worldwide.

Among the myriad of products the company offers, for the purpose of this research, the company offers **Line Strippers** – designed for striping parking lots, city streets, highways and airports among other asphalt surfaces.

2. Ennis-Flint, Inc.

Ennis-Flint Inc. was founded in 1996 and is based in Thomasville, North Carolina. The Company manufactures and supplies pavement marking materials. The business offers its clients high retroreflective **Glass Beads**, Hot-Applied **Thermoplastic**, **Traffic Paint**, **PreMark Shields,** etc.



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3. Sherwin-Williams Company

Founded in 1866 and headquartered in Cleveland, Ohio, Sherwin-Williams is an industry leader in the development of technologically advanced paint and coatings. The Company develops, manufactures, distributes, and sells paints, coatings, and related products to professional, industrial, commercial, and retail customers.

The Company's offering also includes various **water-based**, as well as **solvent-based marking products**, including **acrylics, alkyds, and chlorinated rubber coatings**.

4. EZ-Liner Industries

The company is headquartered in Orange City, Iowa, and is an original pavement marking equipment manufacturer. The Company offers various **parts, stencils, traffic paint**, and **retroreflective glass beads**, as well as **versatile line stripers** for **aviation, parking lot** and **road & highway markings**.

The suppliers in New York State were researched once more with Google's search engine, using the keywords **"Pavement Striping paint retailers New York State"**. The search resulted with a list of companies, in which unfortunately only a few were actual retailers or original equipment manufacturers (OEM) of Pavement Marking tools and equipment.

These are some of the **more relevant suppliers for New York State:**

1. VelveTop

Founded in 1968, with HQ in Huntington Station, New York, the Company is a manufacturer of both refined petroleum emulsion and

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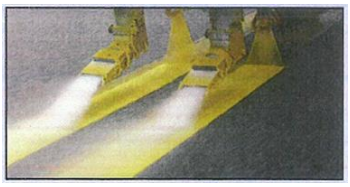
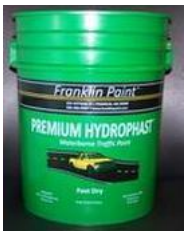
asphalt emulsion pavement sealer and many other high-quality pavement repair products. They distribute a broad range of products for pavement maintenance, tennis court construction, concrete repair, and winter de-icing.

Among their product offering, are the **retroreflective glass beads** and **line marking paints**.





2. SealMaster

The Company's a pavement maintenance product, seal coating, and equipment provider. Seal Master's Headquarters are in the State of Ohio, however, they have a plethora of distribution and retail points throughout the country. One of their retail shops is located in Albany, New York, and among their product offering, are their **acrylic traffic marking paints** with outstanding performance and durability, as well as their line striping machines.

3. GemSeal

The company was founded in 1957 and is based in Tampa, Florida. The business has 4 locations in New York State and it manufactures, supplies, and specifies pavement preservation products for commercial and industrial applications throughout the United States and Canada. GemSeal's products include pavement sealers, sealer additives, primers, patch, and crack-fill materials, traffic marking paints, tools, and equipment.

Paint **striping machinery** and **striping paints** are among the Pavement and Roadway Marking business' more important pieces of product.

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Plastic Stencils are also another vital piece of equipment, which offer shapes and directs the flow of the paint which is being sprayed onto the surface.

Using Thomas Net, a product sourcing and supplier discovery platform, a few **Stencil suppliers servicing New York** were identified. The search engine on the website allowed looking for suppliers, native only to the New York City area (Metro and Upstate).

The search features enable browsing Stencil suppliers servicing New York (Metro) – **16 suppliers**, as well as New York (Upstate) – **11 suppliers**.

The third method used in the attempts to identify suppliers was researching the **Hardware stores throughout New York State.** The majority of these Hardware stores have the general tools and equipment which would be used during the Pavement Marking services. Since the research tried to locate Hardware stores on a state level, the most insightful way to produce a list of suppliers, located throughout New York State, was via Google Maps, searching for "New York State Hardware Stores". This way the research identified around **150 Hardware stores in New York State**, which generally serve both, individual and contracting customers.

The last method included looking at the partnering companies, businesses, and firms which cooperate with the biggest competitors in the industry in New York State (Hi-Lite Markings Inc., Accent Stripe Inc., Denville Line Painting Inc., as well as Safety Marking Inc.)**.**

Using this method, the research managed to shortlist **6 suppliers.** These companies include Potters Industries (engineered glass materials producer for polymer additives markets among others), Sherwin Williams (see above), Epoplex (pavement marking systems manufacturer), Ennis Flint (pavement marking material supplier and manufacturer), 3M and Franklin Paint (paint manufacturer and supplier).

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PORTER'S FIVE FORCE ANALYSIS

Porter's Five Forces Framework is a tool for analyzing the competition of a business. It draws from industrial organization economics to derive five forces that determine the competitive intensity and, therefore, the attractiveness of an industry in terms of its profitability.

RIVALRY AMONG COMPETITORS

The intensity of rivalry among competitors in an industry refers to the extent to which firms within an industry put pressure on one another and limit each other's profit potential.

The perspectives which the rivalry among existing competitors is analyzed will involve: competitive pressure originating from a high concentration of competitors offering similar products and services, and the overall industry (its growth), and the fierce competition for the industry's market share among the smaller competitors.

- As it was mentioned in the competition segment of the document, the majority of competitors are offering somewhat similar services. This could mean that **small changes** (for example in prices or method of applying the Pavement Markings) **can have a noticeable impact on all competitors**.

  If a competitor rises or lowers the prices on their services, they risk being quickly undercut. **Intensive competition can place strong downward pressure on the prices**.

- The **Pavement and Roadway Marking services aren't highly diversified. This could drive the competition to distance themselves from their initial Unique Selling Propositions** (USPs) and try to amass customers through intensive advertising and marketing efforts.

- The analysis performed in the previous chapter, suggests that in New York State, the most **Government bids were awarded to Accent Stripe Inc**. This also indicates that the Company's one of the largest competitors on the market. **Among the smaller competitors, there is fierce competition, trying to take larger shares of the market for themselves.**

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- Another key takeaway is the **importance of other services, besides Pavement Marking**. Nearly all of the competitors provide **additional services**, since often there's an ongoing demand for other pavement maintenance services (hole filling, seal coating, snow removal etc.) which are **missed business opportunities for those companies choosing to specialize in only one type of pavement maintenance service**.

However, **during periods of slow industry growth, the competitors' only chance of increasing their market share is to take it from their competitors**. There is also a higher degree of protectiveness towards any existing share in the market, as once lost, it may be hard to regain.

The vigorous competition between the smaller companies, as well as the potential price strategies whose aim is to push out other competing Pavement Marking service businesses, suggests that the rivalry among competitors is high.

BARGAINING POWER OF SUPPLIERS

Strong bargaining power allows suppliers to sell higher priced or low-quality raw materials to their buyers. This directly affects the buying firms' profits because it has to pay more for materials.

There are a myriad of factors which can be used in the analysis of this particular force, however the focus in this research will be on a couple, including the size of the suppliers, competition between suppliers, the rarity of the resource being supplied, substitution of the products supplied, and the importance of the products supplied to the Pavement Marking service businesses.

- A couple of the Pavement Marking suppliers (Stencils, Paint Striping Machines, and Pavement Paint) are **bigger companies and suppliers**, therefore **they can influence the market prices more directly** and leave the smaller suppliers in a disadvantageous position.
- It can be assumed that there is a **healthy competition between the suppliers**, as well as a continuous need for Pavement Marking services, **which strengthens each suppliers' position.** There are also those smaller suppliers, supplying older equipment, or equipment with different (unstandardized) chemical composition – which could eventually decrease their business.

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- **Pavement Marking materials, tools, and equipment in general, aren't a rare distribution resource**. The majority of Paint shops have access to paint which could be used for Pavement Markings, and most of the Industry Manufacturers have the paint strippers included in their product lists.
- Regarding the **substitution of the Pavement Marking materials**, **some of the equipment could be swapped**, however attempting to substitute some of the heavier machinery could result with a less-than-ideal Pavement Markings, which could leave the customer dissatisfied **and cost the company** potential future business.
- Another way the suppliers are in a position of power is that their products are **"crucial" for the Pavement Marking's seamless operation.**

The information suggests that the bargaining power of suppliers is high, and they wield significant influence over the Pavement Marking services' landscape.

BARGAINING POWER OF BUYERS

This force analyzes to what extent the customers are able to put the company under pressure, which also affects the customer's sensitivity to price changes. The factors which are usually used to analyze this force include the number of buyers, customer switching cost, product quantity, customer knowledge when purchasing a product/service and so on:

- Generally, the contracts in the pavement marking companies come from **Government bids**, **requests by other companies, and private contracts**. These three groups of clients **aren't as diversified in their requests** (the usual tasks could include pavement corrections, parking lot or roadway markings, etc.), therefore the pavement marking companies have smaller flexibility when faced with more complex customer project.

  Pavement and Roadway Marking services are used in Government state bids/contracts, as well as private contracts. In regards to state bids and contracts, **older and bigger companies which already have a prior history with Government bids have greater chances of being awarded the bid.**

  Forbes wrote in 2015 that only **22.5% of federal contracts go to small business**.

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However, it shouldn't be forgotten that businesses no matter their size, if they manage to offer a service which rests in the intersection between cost-effectiveness and high-quality, have greater chances of winning the Government bid.

- The **low switching costs** (costs that a consumer incurs as a result of changing brands, suppliers or products) enable the customers to easily switch between competitor offerings, looking for the ones providing superior services.
- **New York State's local highway** system, which amasses **110,000 miles**, according to Wikipedia, is a valid indicator to the **quantity of Pavement and Roadway marking, striping, and potential maintenance services** which could be required to perform.
- When purchasing a service from in the Pavement Marking Landscape, the **buyer's knowledge**, especially when a Government contract is included (all details regarding the project are presented in the bid), **is usually enhanced**, since the paints and chemicals used in the Pavement Markings should uphold certain standards (small VOC emissions for example) when referring to knowledge regarding the quality of the service that's purchased.
- There's also the **non-Governmental buyers** from the **private sector** which also employ the services of Pavement and Roadway Marking companies. Private parking lots, driveways, runway marking etc. are some of the surfaces which are often in need of Pavement Marking services, and are often performed on smaller/shorter surfaces when compared to Governmental projects, which could include hundreds of miles of roadway.

The conclusion is that the bargaining power of the buyers is extremely high since there are areas where the buyers have superior influence over the Pavement Marking service providers (low switching costs, good product/service knowledge, choice to purchase service from other companies, no significant product/service diversity offered).

THREAT OF SUBSTITUTE PRODUCTS

Substitute products, as explained by Porter (1998), are those products that come from other industries and can pose as a trade-off for products in the underlying industry.

The points of view which will be used to showcase some of the threats of substitute products of the Pavement Marking landscape will include research & development of

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products/services which may act as possible substitutes, how threatening are the substitutes on the Pavement Marking's industry, and the price-performance ratio.

- A point which was made in the Market Trends segment of this document indicated that in the Netherlands strip of a **road had been covered in luminescent lines**, which charge during the day and provide superior road visibility during nighttime. This, as well as other types of **new and innovative technologies** (such as the **intelligent cars**, also mentioned above), could begin a shift in the traditional Pavement Marking services, and substitute them with new technologies. So **these technologies aren't just schematics on a blueprint, but they've already been put to use**.
- The luminescent pavement markings and intelligent vehicles might not be yet fully adopted and commercialized, but they will certainly have **a massive impact on the methods and ways that traditional Pavement and Roadway Marking services are delivered**. This could shift the business model from managing good Pavement Marking tools and equipment supplier network to hiring/outsourcing software developers, designers, and other people focused on the technology of tomorrow.
- This technology has the **potential to completely change** the way Pavement and Roadway Marking services are executed, and further development will most likely cost a **sizeable amount of money**. However, there are ways of tackling this issue, for example, **outsourcing talent** from across the globe, people who will research, develop and prototype the new Pavement Markings before they are commercialized.

This will decrease the final cost of the Pavement Marking services and therefore strive to make the price as affordable for the clients.

In our view, the threat of substitutes is neutral, due to the possibility of the substitutes costing more, the substitutes' quality and durability could well surpass the current Pavement Markings. This equalizes with the fact that these potential substitutes are only used in small margins and/or aren't fully developed yet, therefore the threat from these substitutes is still dormant.

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THREAT OF NEW ENTRANTS

The threat of new entrants Porter created affects the competitive environment for the existing competitors and influences the ability of existing firms to achieve profitability. Some of the factors used in this analysis include low start-up costs, economies of scale, product diversity, regulations, any barriers to entry, etc.

- The information available on New York State's website, states that filing for a new business in New York State costs **$200** – for the Articles of Organization and **$9** for the Biennial Statement.
- There are **variations in the cost** of pavement marking materials, depending on the manufacturer and the quantities ordered. Generally, the more material is ordered, the lower the price (economies of scale).

  Most of the companies in this industry are relying on other companies to supply them the materials necessary to execute a Pavement Marking service. For these companies, the **ability to make a favorable agreement with their supplier is what will directly influence their profitability**. The companies which manufacture their own paint and marking solutions have the costs for procuring the necessary materials, as well as the costs for operating and maintaining the machines which produce the pavement marking paint.
- The most common types of Pavement Marking services are the Traffic Paint, Epoxy, Thermoplastics, Tape and Retroreflective Glass Beads. There are also other methods of marking the pavements, however, a **proper combination of lower material costs and high-quality job deliverables, is what separates the leaders in the pavement landscape from the rest.**
- U.S. Department of Transportation, more specifically, Federal Highway Administration's 2014 report on the methods for maintaining Pavement Marking retroreflectivity, suggests that there is currently **no nationally accepted specification or standard containing established minimum retroreflectivity levels for pavement markings**, including newly installed markings or markings at the end of their service life.

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The rulings of United States' Department of Labor, or more specifically the New York State Plan, underlines a couple of **regulations** which protect and disclose the employee's rights, occupational safety, and health standards. Furthermore, there are the regulations from the Federal Motor Carrier Safety Administration, whose regulations aim to provide safety oversight of commercial motor vehicles, via reducing crashes, injuries, and fatalities involving large trucks and buses.

- Pavement marking companies can easily access, browse and download the **specifications and dimensions for various pavement markings**, uploaded on New York State Government's website.

Our opinion is that the Threat of New Entrants is low because the industry is highly regulated and that it is not that encouraging for new business to take part of the market share.

In conclusion, Porter's 5 Forces Analysis, showcases that increased rivalry among the competitors, the bargaining power of the suppliers, as well as the buyers are the most threatening aspects of the Pavement Marking services industry in New York State.

The diversification of the service portfolio, as well as the knowledge and expertise of the Pavement Marking landscape will differentiate the very best companies from the mediocre. Being aware of the local Government's Pavement and Roadway Marking projects, is an invaluable tool a Company can possess, since it can properly make preparations and plans for any potential future work.

There's a high level of competition in the Pavement Marking Landscape, as it can be seen from the numerous lists of competitors this research identified. However, once again, the quality of the service provided will be detrimental to the success of a Company entering the Pavement Marking industry.

With these insights, we believe that the New York State's Pavement and Roadway Marking services market holds great potential, and should be entered with diversified, client-oriented and focused approach.

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