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December 7, 2017



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MN Autonomous Bus Team Leadership

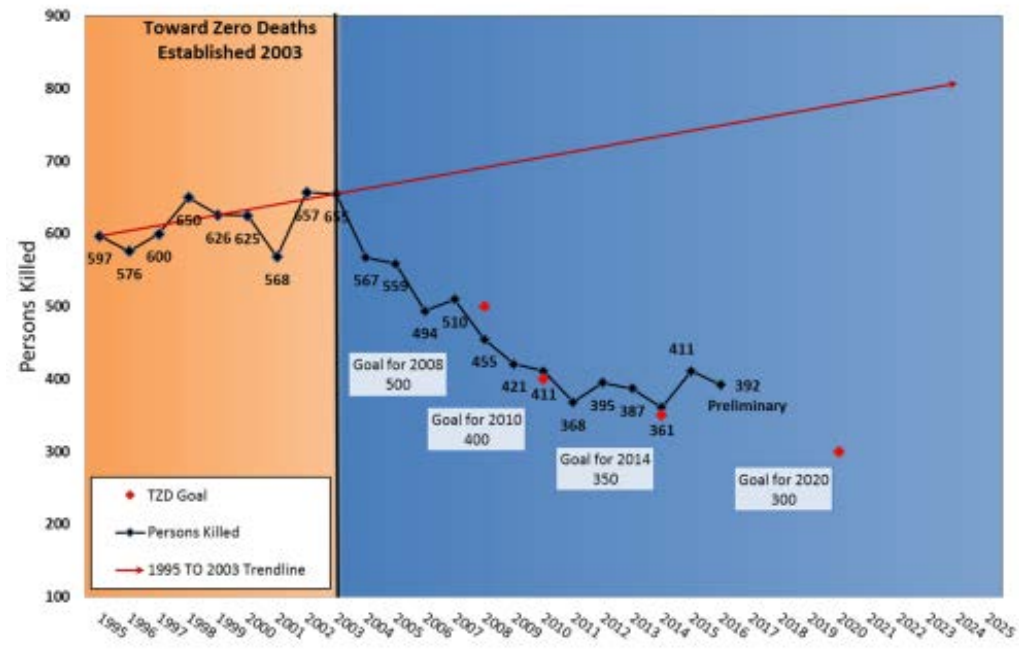
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KSabeti@wsbeng.com
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JBorgen@wsbeng.com





Minnesota Roadway Fatalities

Source: MnDOT 4/17/2017



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Snow / Ice

Salt





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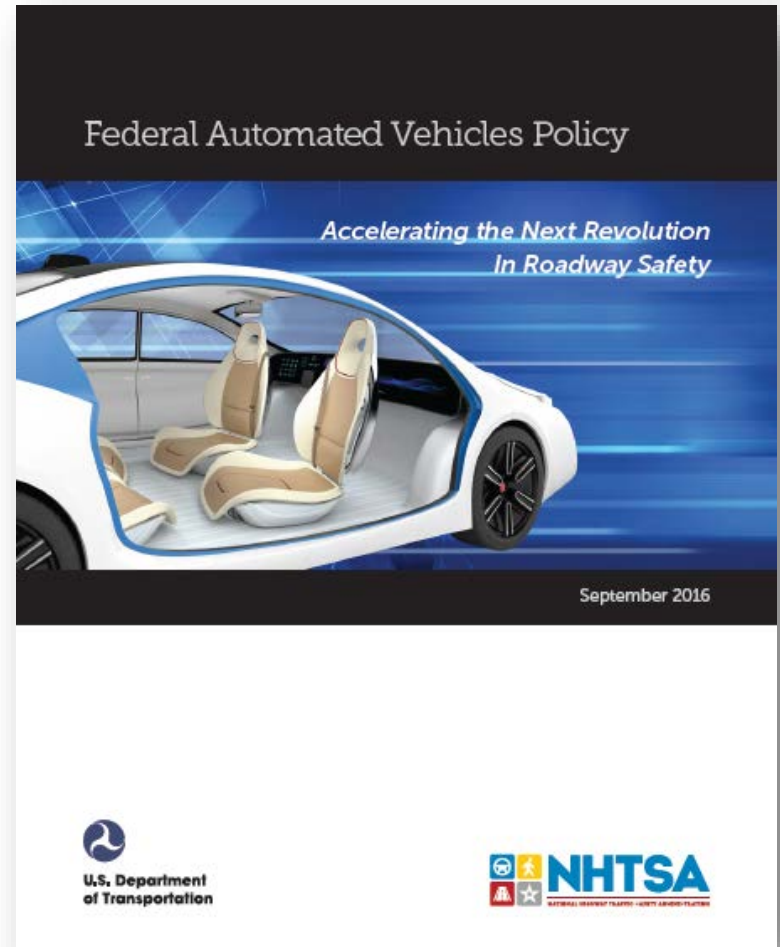
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SNOW & ICE

Prepare autonomous vehicle industry for snow & ice conditions

OPERATIONS

Identify challenges and strategies for safe operation of third party autonomous vehicles on MnDOT's transportation system

MOBILITY

Prepare for improved mobility services through autonomous vehicles

INFRASTRUCTURE

Identify the infrastructure that is needed to ensure safe operation of autonomous vehicles

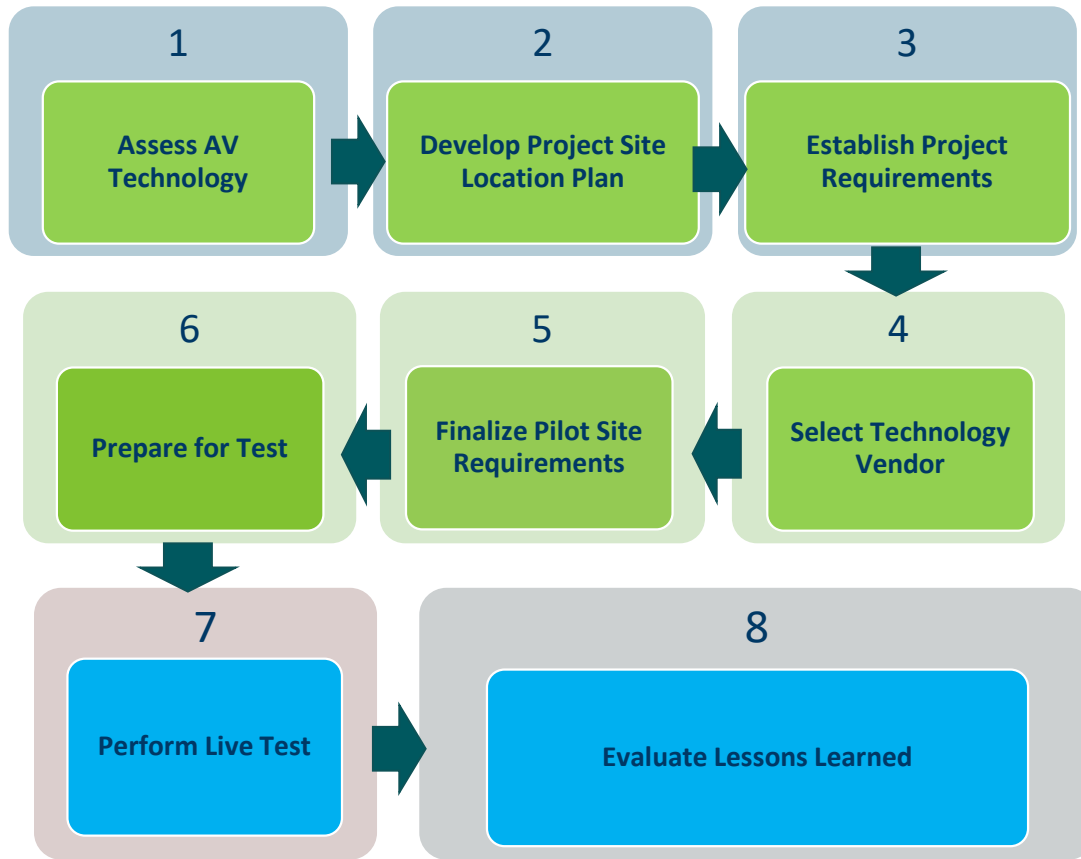
INFLUENCE

Increase Minnesota's visibility and influence on advancing autonomous & connected vehicles

PARTNERSHIPS

Enhance partnerships between government and the autonomous vehicle industry

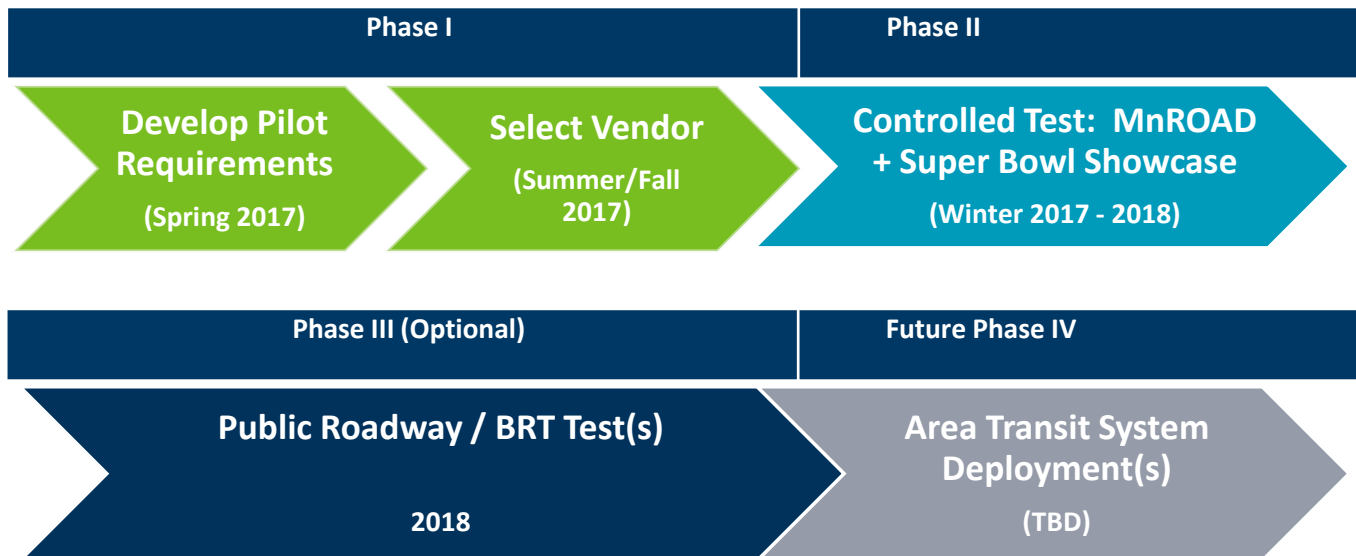
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Project Status –

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Testing Schedule – allows for testing during winter 2017 - 2018

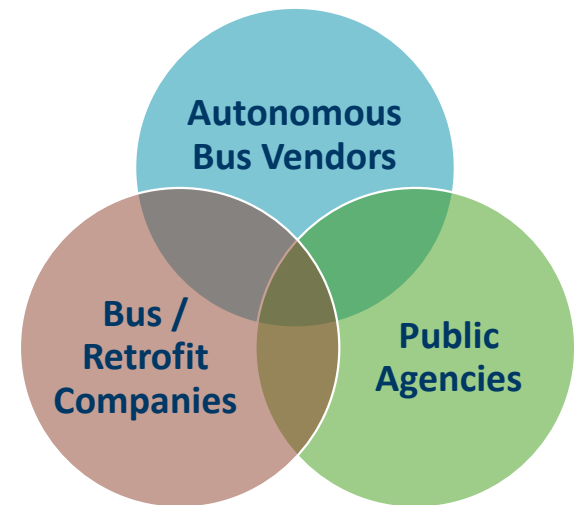


Company
Navya
EasyMile
Local Motors
2getthere
Autonomous Solutions Inc. (ASI)
Romarc Corporation
Velodyne Lidar
New Flyer Industries
Gillig
Hyundai-Kia America Technical Center, Inc. (HATCI)
SB Drive
Yutong
Proterra
DOTs – Colorado, Connecticut
Transit Agencies – RTD (Denver), MVTA & DTA (MN)
Other – Mayo Clinic, FedEx, 3M, University of MN

April 20 Industry Forum

Vendor / Stakeholder Outreach

www.dot.state.mn.us/autonomous/



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EASY
MILE



EasyMile EZ10 Shuttle

Criteria	Easy Mile
Size	13.13'
Capacity	12
Speed	Avg. 12-15 mph, up to 25 mph
SAE Autonomy Level (0-5)	4
Federal Standards	Have received exemptions
Previous Demos	Fixed Routes
Super Bowl	Prefer Private Roads
Public Opportunity to Ride	Yes
Work Plan	Includes Safety Assessments

SAE Level	Definition
Level 0	Human driver does everything
Level 1	Automated system on vehicle can sometimes assist the human driver conduct some parts of the driving task
Level 2	Automated system on the vehicle can actually conduct some parts of the driving task, while the human continues to monitor the driving environment and performs the rest of the driving task
Level 3	Automated system can both actually conduct some parts of the driving task and monitor the driving environment in some instances, but the human driver must be ready to take back control when the automated system requests
Level 4	Automated system can conduct the driving task and monitor the driving environment, and the human need not take back control, but the automated system can operate only in certain environments and under certain conditions
Level 5	Automated system can perform all driving tasks, under all conditions that a human driver could perform them

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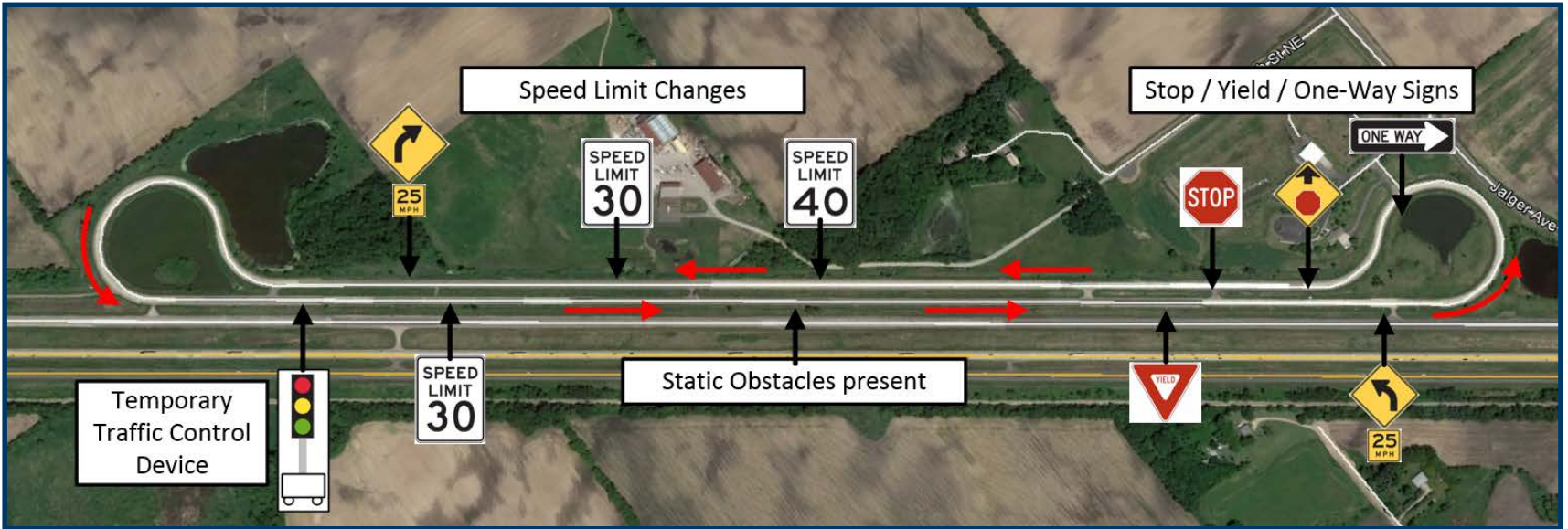


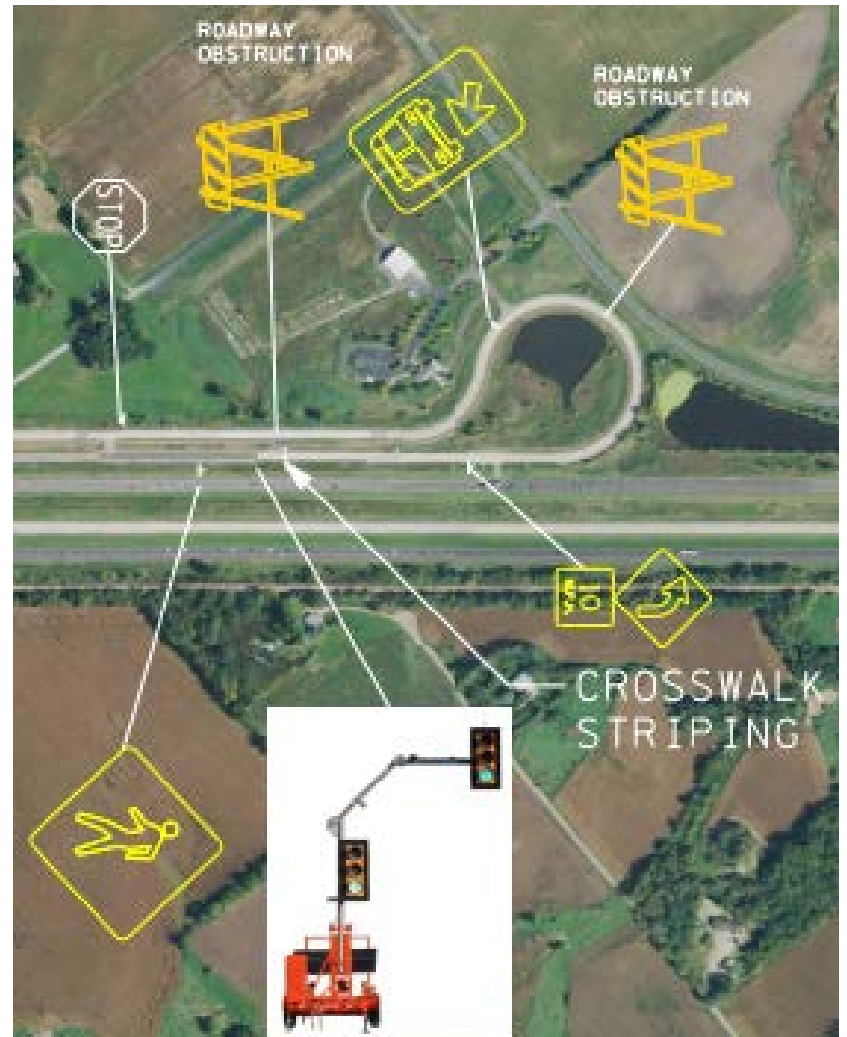
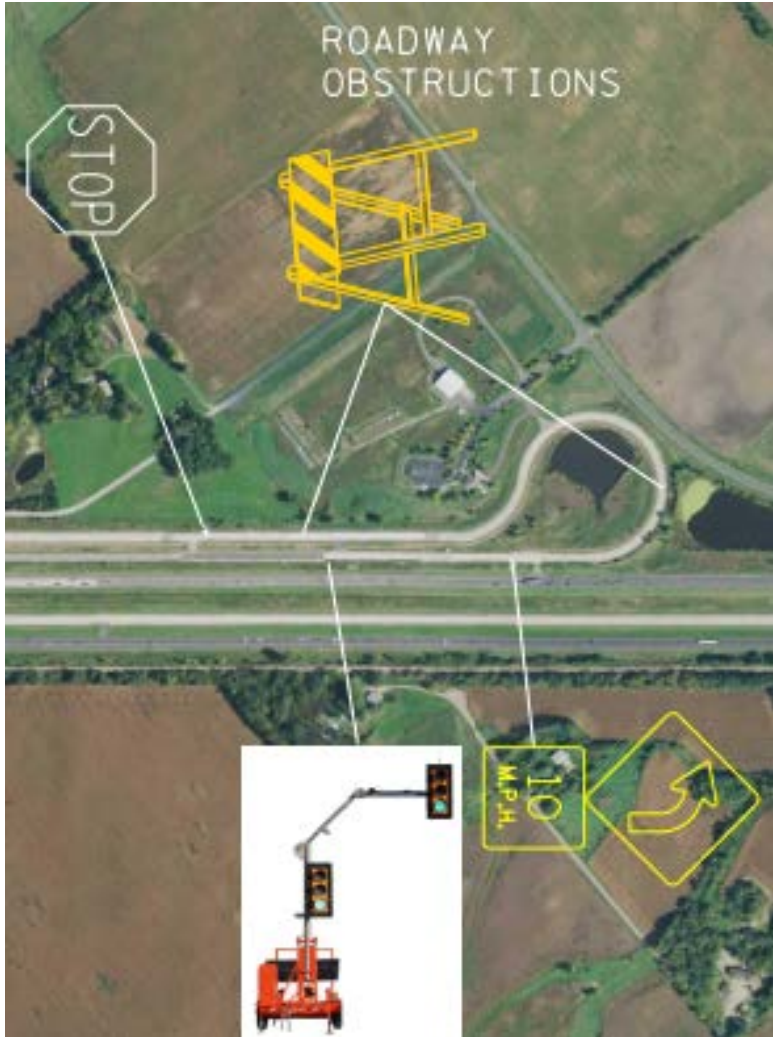
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- Low and high speed testing available (30–)
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Dry Weather	Winter / Cold Weather	Snow / Ice / Salt
Varying Visibility	Various Lighting	Obstacles
On-coming Vehicles	Slow / Stopped Vehicles	Car Following
Intersection Turns	Stop / Yield Signs	Traffic Signals
Pedestrians	Bicycles	Right-of-Way Decisions
Parking	Transit Stops	Pick-up/Drop-off Passengers
Other	Other	Other



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Future Phase –

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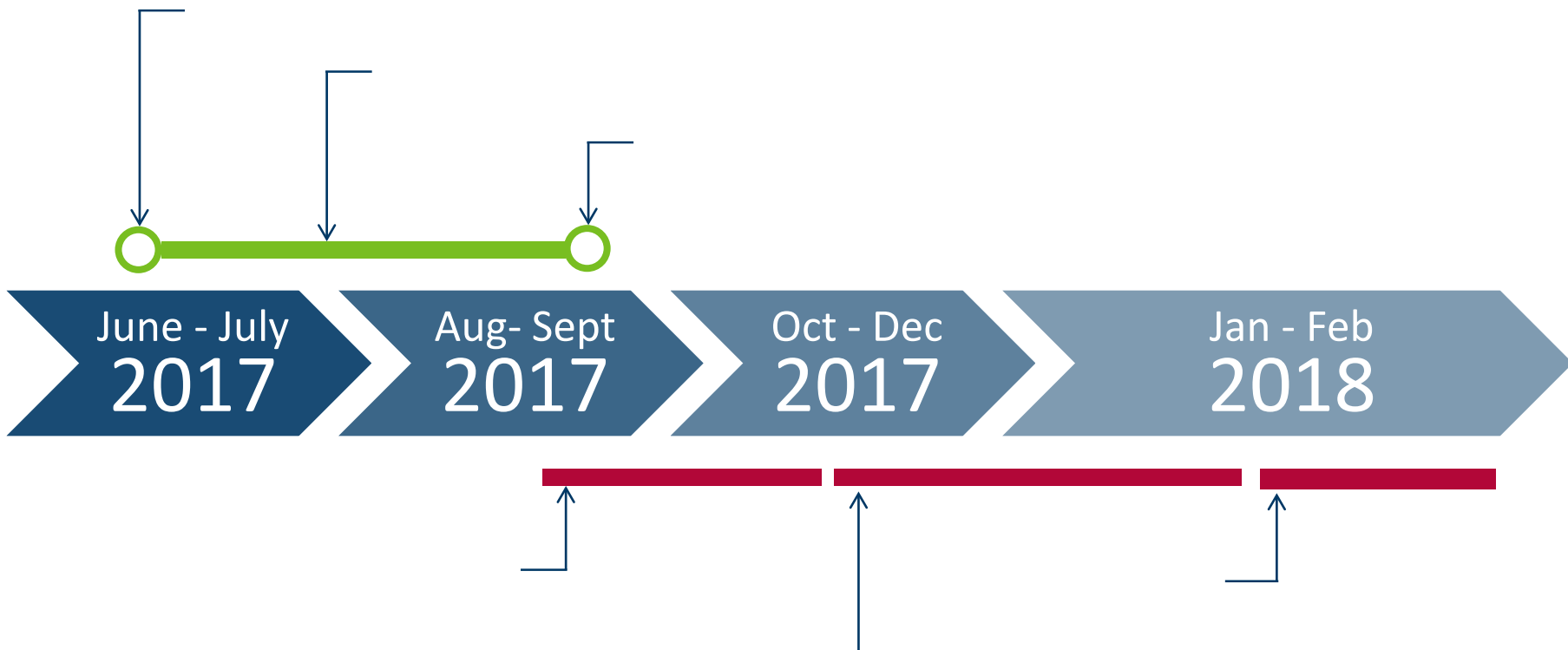
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easy
MILE



<http://easymile.com/>



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Thank You!



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