



# Project Alpha Phase II

2024-03-22  
Redacted



# Agenda

- Programme Update
- Vehicle & Motor Selection Alignment Discussion
- E-Motor Landscape Update
- Commercial Strategy
- Next Steps



# Programme Update


- Tesla Secured
- Test Facility Shortlisted & Available
- Storage & Workshops Available





# Predictions

*Which vehicles & real-world use cases benefit most from multi-motor?*

#	Prediction
1	<b>MOST</b> vehicles will benefit
2	<b>High-performance vehicles</b> will benefit more <i>(e.g. high-speed)</i>
3	 <b>REDACTED</b>
4	



## Prediction 1:

MOST vehicles will benefit

### Rationale:

- vehicles are designed for compromised applications
- single motors must deliver performance across entire operational envelope
- multiple motors can pull overall efficiency towards normal use

Reality: Most vehicles DID show a real benefit

REDACTED DATA



## Prediction 2:

High-performance vehicles will benefit more (e.g. high-speed)

### Rationale:

- The nominal efficiency is further from the actual use case

Reality: Higher performance vehicles DID show higher benefit

REDACTED DATA



## Prediction 3:

REDACTED



## Prediction 4:

REDACTED





## Conclusion 1:

Benefits Extend Beyond Passenger Vehicles to Commercial Vans & Trucks

## Conclusion 2:

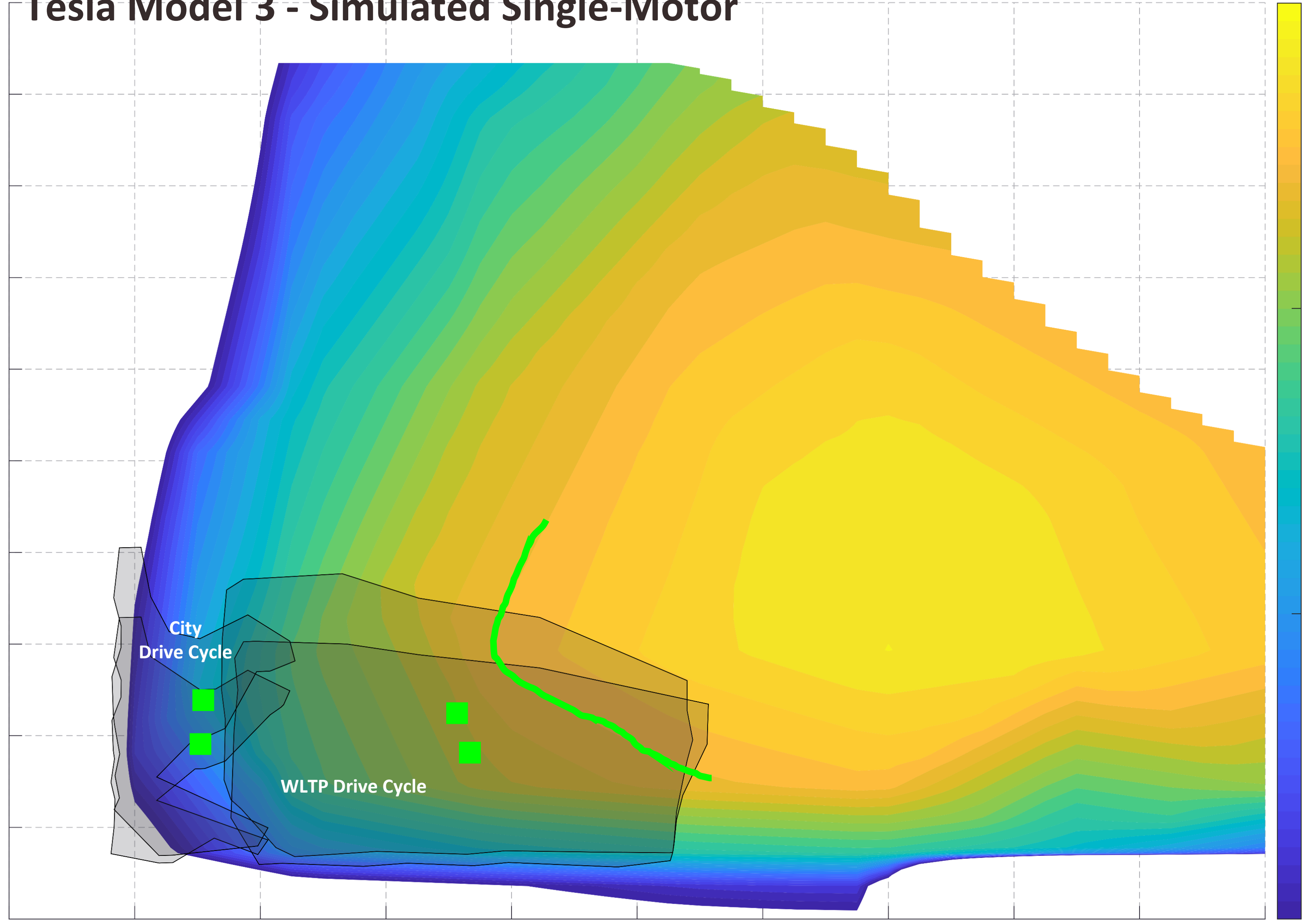
Three Potential Motor Selection Approaches:

1. Use two high-speed-optimized
  - 1x low-to medium torque
  - 1x high-torque
2. Partner with an OEM or motor supplier to develop new motor technology that is low-speed-optimized and can over-speed

3. **REDACTED**



# Tesla Model 3 - Simulated Single-Motor



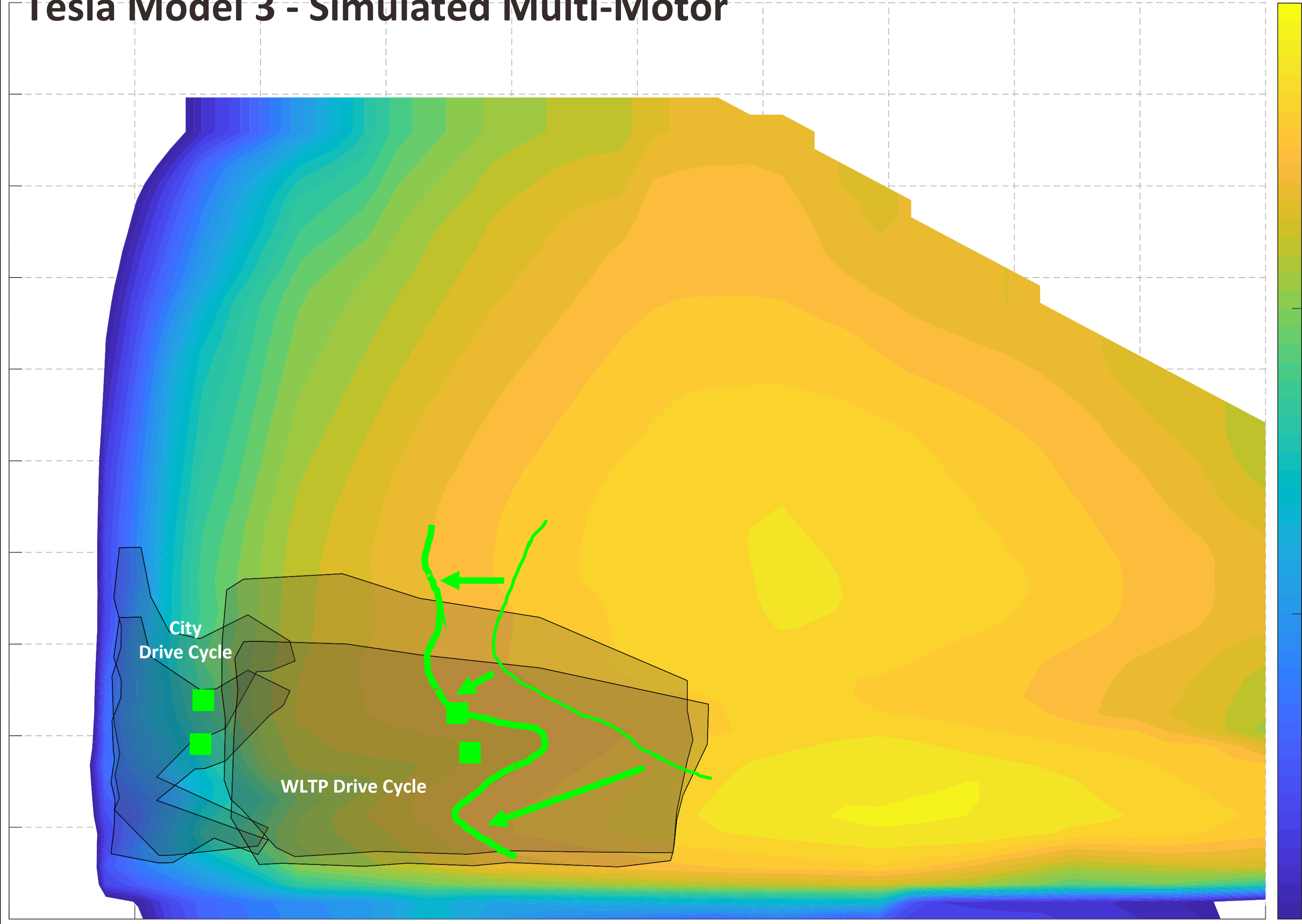
ENERGY-WEIGHTED AVERAGE



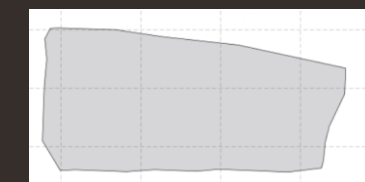
DUTY CYCLE 1 STANDARD DEVIATION FROM ENERGY-WEIGHTED AVERAGE



# Tesla Model 3 - Simulated Multi-Motor



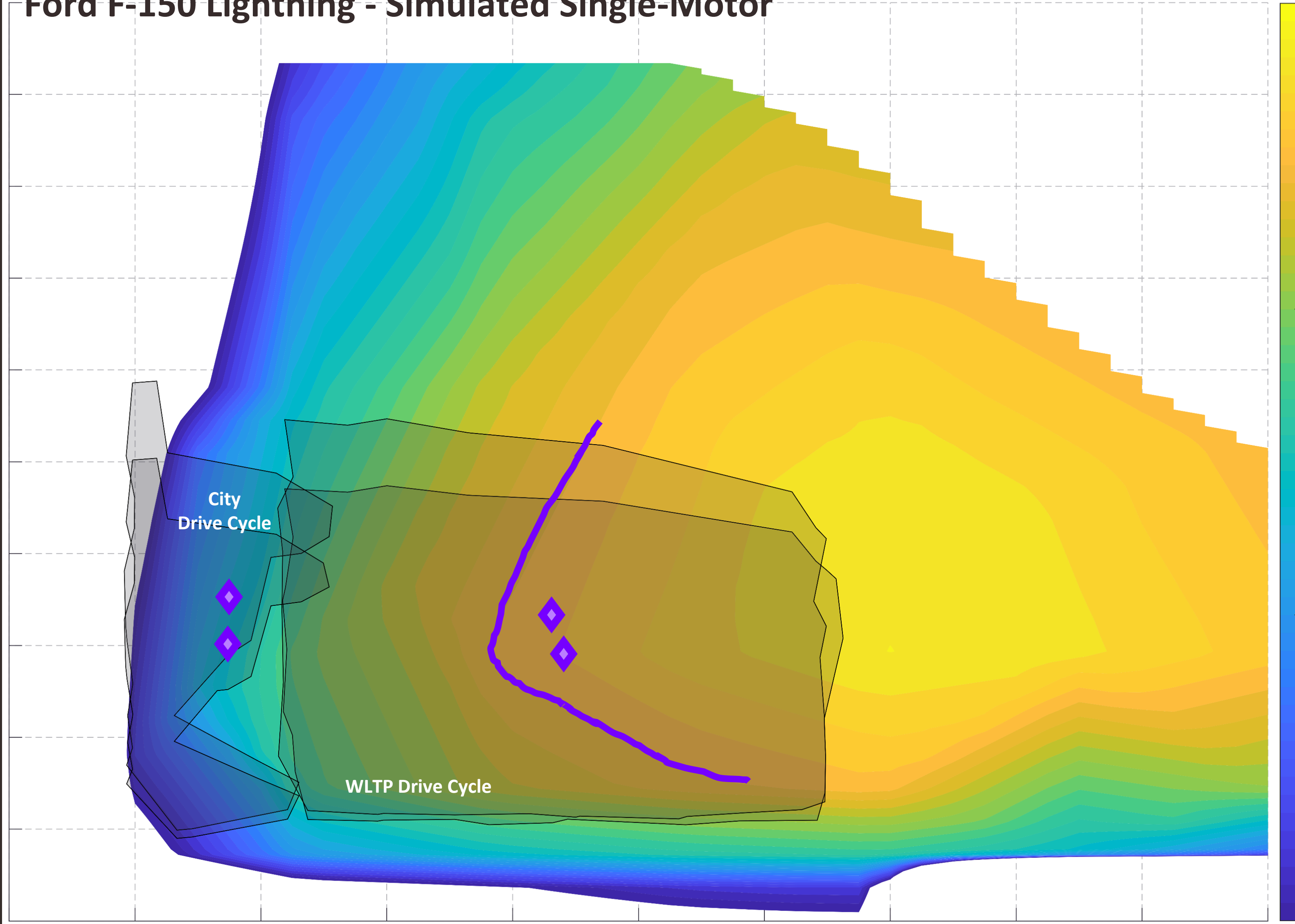
ENERGY-WEIGHTED AVERAGE



DUTY CYCLE 1 STANDARD DEVIATION FROM ENERGY-WEIGHTED AVERAGE



### Ford F-150 Lightning - Simulated Single-Motor



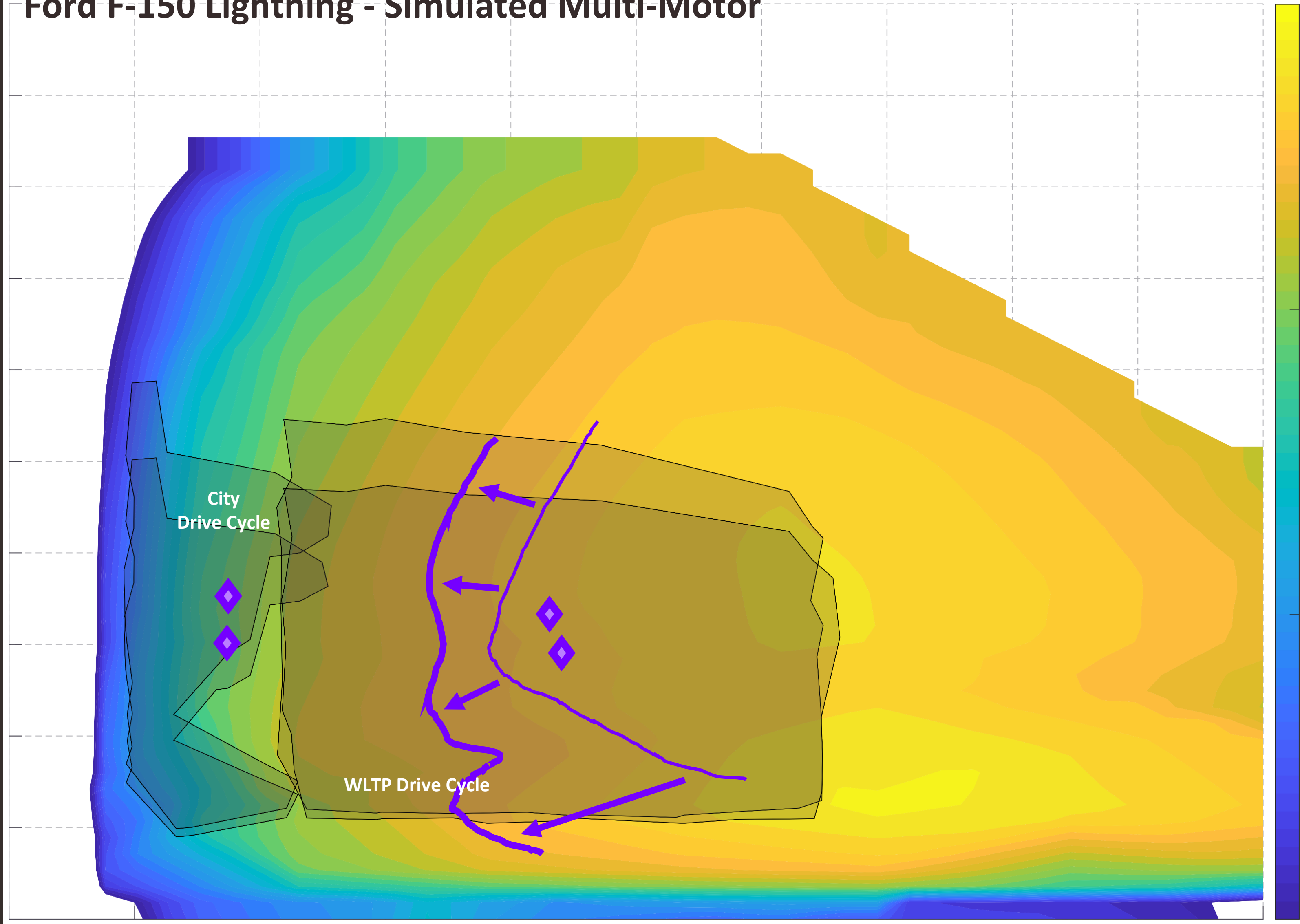
 ENERGY-WEIGHTED AVERAGE



DUTY CYCLE 1 STANDARD DEVIATION FROM ENERGY-WEIGHTED AVERAGE



# Ford F-150 Lightning - Simulated Multi-Motor



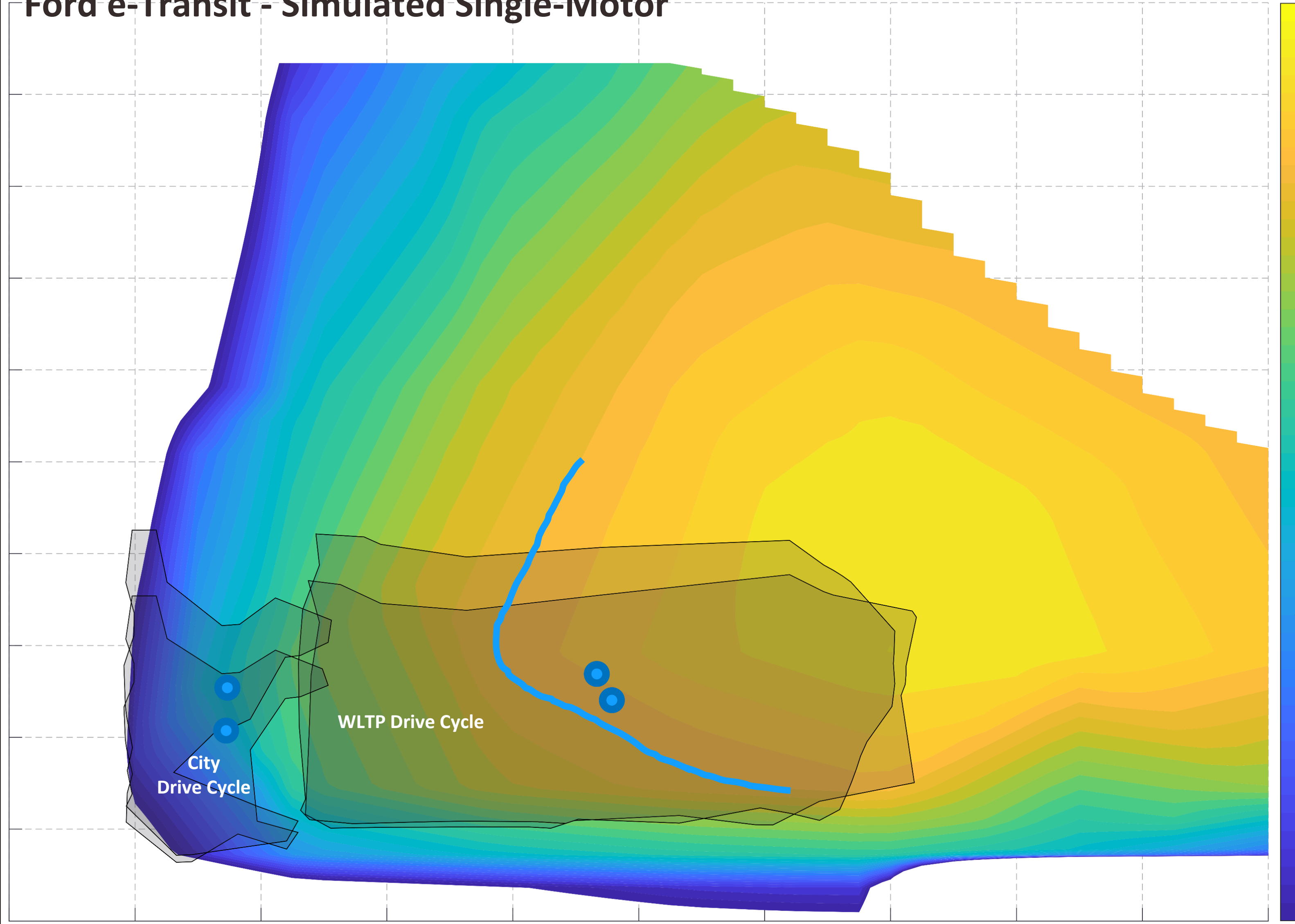
◆ ENERGY-WEIGHTED AVERAGE



DUTY CYCLE 1 STANDARD DEVIATION FROM ENERGY-WEIGHTED AVERAGE



# Ford e-Transit - Simulated Single-Motor



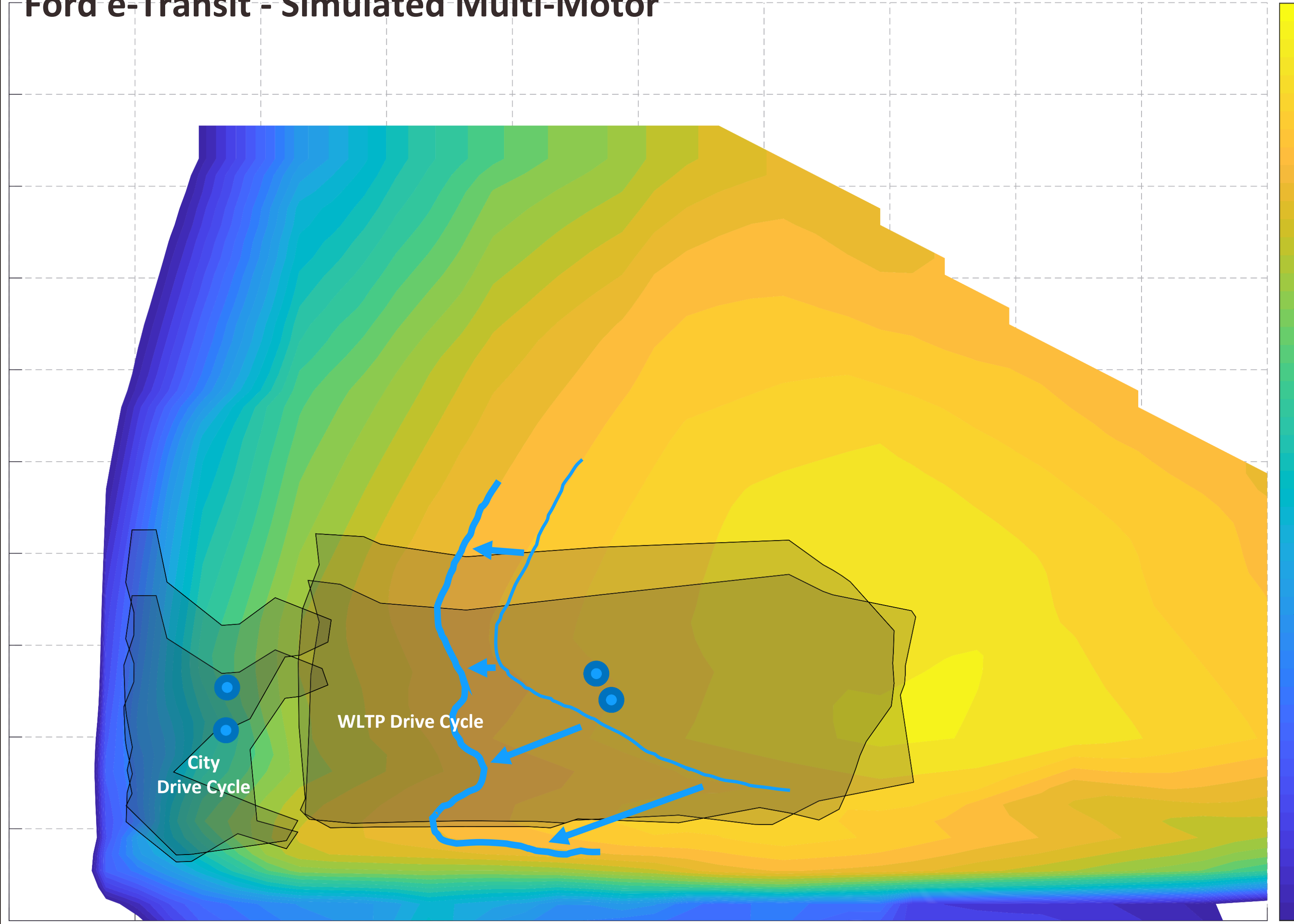
 ENERGY-WEIGHTED AVERAGE



DUTY CYCLE 1 STANDARD DEVIATION FROM ENERGY-WEIGHTED AVERAGE



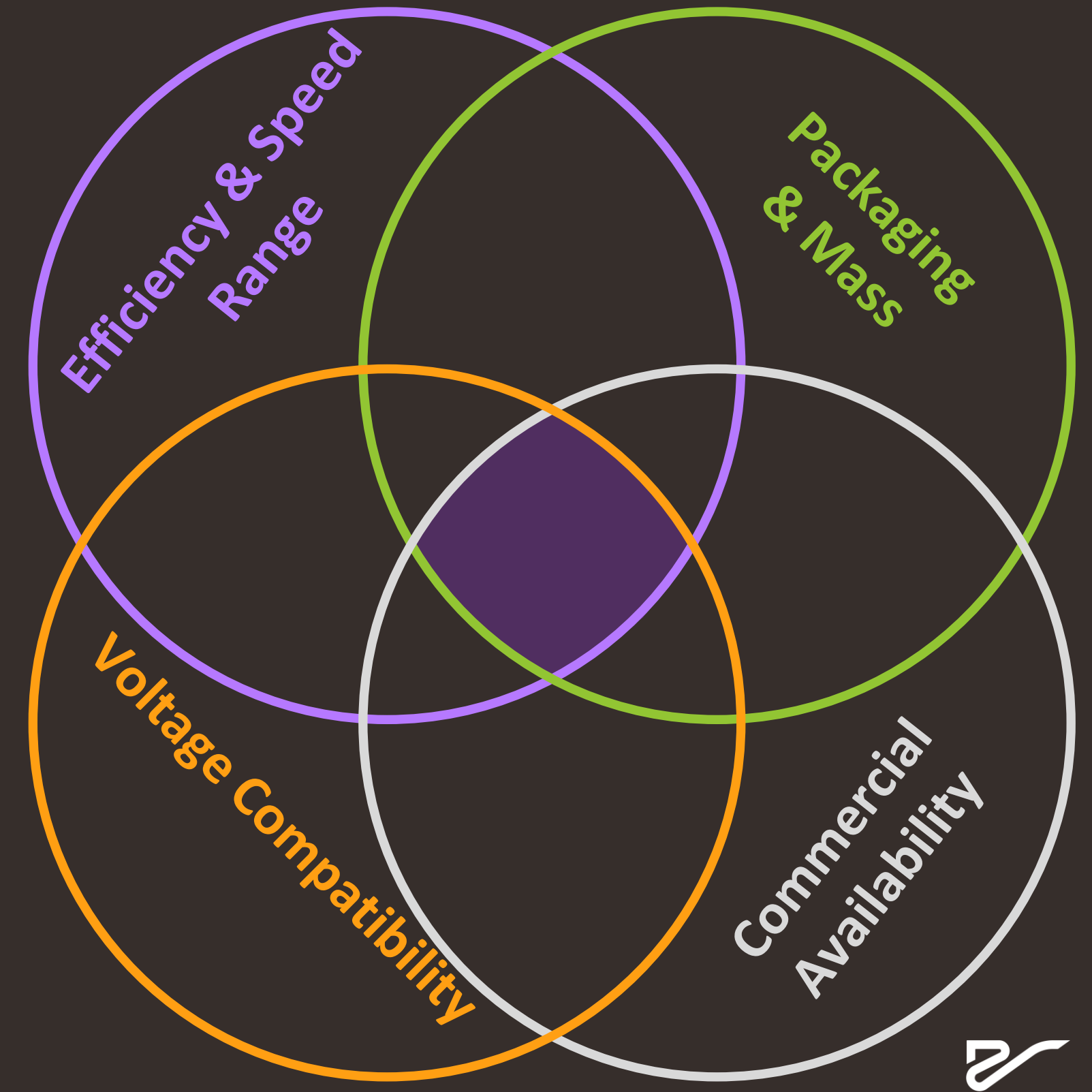
# Ford e-Transit - Simulated Multi-Motor





# E-Motor Landscape

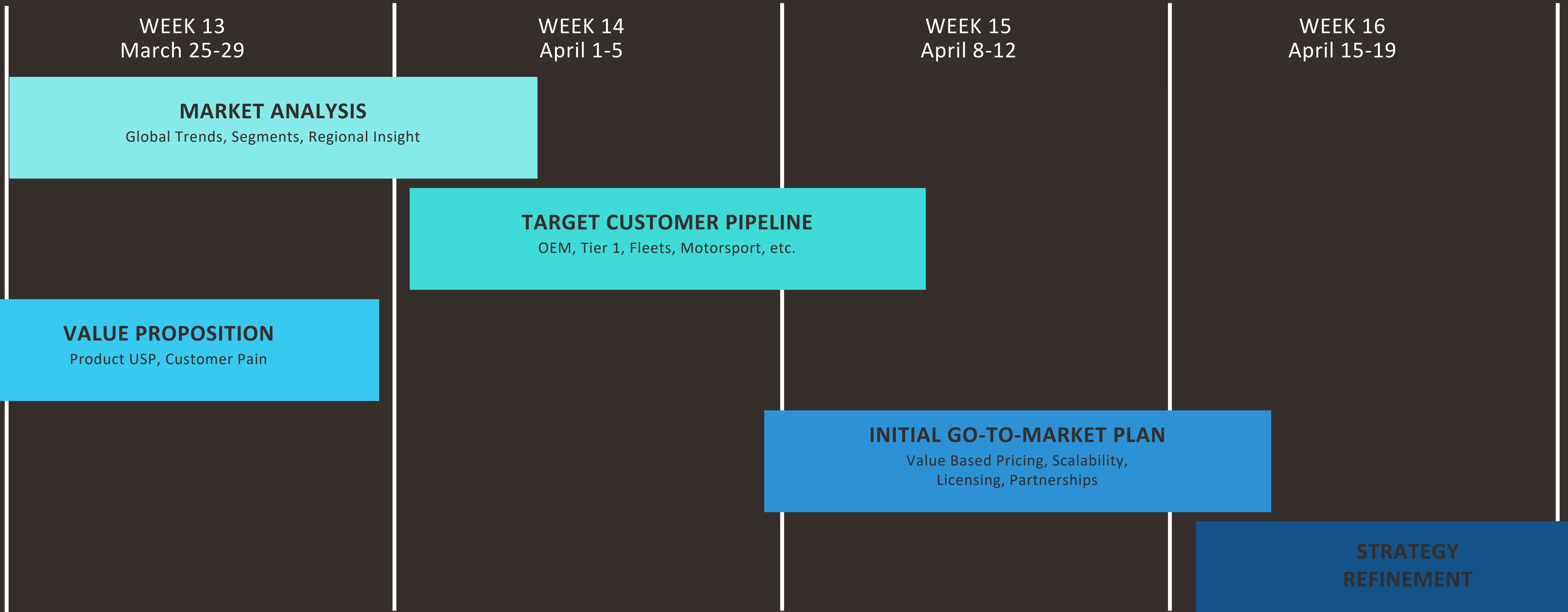
- Collecting data from e-motor suppliers  
[ REDACTED ] tors from [ REDACTED ] supplie [ REDACTED ]
- Conversations with bespoke suppliers  
[e.g. [ REDACTED ] REDACTED ]
- Shortlisting Motors







# Commercial Strategy First Pass





## Next Steps

- Vehicle Benchmarking
- Select & Benchmark Spare IDU
- Remove Primary IDU from Vehicle
- Commercial Strategy Alignment