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## TESLA MODEL Y BENCHMARK REPORTS

Email: [Sales@leandesign.com](mailto:Sales@leandesign.com) for a quote!

Purchasers of this 2,000+ page report will receive:

- a) Vehicle and Zone Executive Summaries
- b) Zone Eye-Catching Features
- c) Zone Quick Cost Estimate Report
- d) Zone Costed Bill of Material in PDF format
  - Weights and most materials and suppliers identified
- e) Electrical Topology
- f) Cooling Topology *(full details available for purchase in separate Thermal Systems Report)*
- g) Vehicle Fit, Finish & Quality Audit (FFQ™) Report
- h) Scan Data
- i) Wind Tunnel Testing

### Individual Reports are Available

*For Those Only Interested in Specific Vehicle Areas*

- ☐ Zone 1 Body and Chassis
- ☐ Zone 2 Controlling Electronics
- ☐ Zone 3 Interiors and Safety
- ☐ Zone 4 Powertrain and Battery Pack
- ☐ Electrical Topology
- ☐ Thermal Systems

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## TESLA MODEL 3 TO MODEL Y SIDE-BY-SIDE REPORT

Email: [Sales@leandesign.com](mailto:Sales@leandesign.com) for a quote!



# DESCRIPTION OF THE ANALYZED TESLA MODEL Y

## PREMIUM PACKAGE

- The Tesla Model Y vehicle which Munro analyzed is the Dual Motor All-Wheel Drive Performance model with Performance Upgrade.
- It is a Premium Package equipped with Autopilot, Carbon Fiber Spoiler, Performance Pedals, and Performance Brakes.
- Prior to Munro's purchase, the car was never driven.
- Munro conducted a complete Quick Cost Analysis of the vehicle and documented findings related to Eye-Catching Features, suppliers (where possible), weights, number of parts, and materials.

## REPORT DELIVERY

- All reports and accompanying deliverables will be made available for easy access through a secure File Transfer Protocol (FTP) site.
- A user-friendly PDF format ensures that subscribers can easily locate a wide range of materials in addition to the reports.
- The large reports feature a linked table of contents, allowing users to easily navigate the report contents and quickly locate specific data.



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## MODEL Y COMPLETE BENCHMARK REPORT

- ☐ The complete Benchmark Report is highly advantageous for OEMs or Tier Suppliers looking to effectively compete and expand their share of new EV markets.
- ☐ The report is a comprehensive analysis of all four Zones of the vehicle.
- ☐ The report contains descriptive and pictorial detail on every analyzed facet of the vehicle.
- ☐ Those who choose to purchase the complete report will receive:
  - Vehicle and Zone Executive Summaries
  - Eye-Catching Features Reports, Quick Cost Estimate Reports, and Summary Costed Bills of Material for each vehicle Zone
  - Complete Vehicle Summary Costed Bill of Materials (CBOM) in PDF format with associated weights
  - The Vehicle Summary and Zone Summaries consolidate Munro's technical findings related to features, performance, and technology implementation

**- OR -**

## INDIVIDUAL ZONE REPORTS

- ☐ Zone Reports are designed to accommodate Tier Suppliers or non-automotive companies looking to enter the EV market.
- ☐ Zone Reports are similar to the full report with descriptive and pictorial detail on every analyzed facet of the Zone from manufacturing through assembly – including cost analysis.
- ☐ Individually Zone Reports include:
  - Zone related component weights, materials and suppliers (where possible) and Munro Quick Cost estimates.
  - Summary Zone Costed Bill of Materials (CBOM)



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## EYE-CATCHING FEATURES

- In each vehicle Zone, Munro has identified specific observations of interest which are called “Eye-Catching Features”. These observations can represent both advantages or disadvantages in cost, weight, feature content, or performance as related to material choice and assembly or manufacturing process selection.





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## QUICK COST ESTIMATES

- Each Zone is broken down to systems and components for Quick Cost Estimating (QCE). QCE is Munro's proprietary methodology developed in response to the need for speed-driven results and is quickly gaining popularity. Quick Cost estimates provide the customer with approximate versus detailed costs, which are more expensive and time consuming to generate. This level of accuracy provides OEMs and Suppliers the ability to make sound comparisons and directional decisions.

### Richman from EPA:

"Munro is recognized as being technically competent, highly experienced, knowledgeable and creative in benchmarking and lean engineering of automotive and non-automotive systems. Costing models are thorough covering all elements of total production cost."



**Eye Catching Features**

**Description:**

- Extensive use of laser welding on seat backs.

**Advantages:**

- Laser welding is more accurate and typically faster and tradition spot welding or MIG welding.
- Thinner gauge steel can be used with laser welding can result in a lower weight seat frame assembly.

**Instrument Panel Trim**

**Assembly Summary**

Zone	Zone 2: Interior & Safety
System	Instrument Panel Trim
Part	Passenger Footwell Substrate Assy
Supplier Name/Code	Test Model 2
Material	Steel
Parts	Steel
Parameters	Steel
Total Weight (kg)	10.0
Material Cost*	\$10.0
Process Cost	\$10.0
OEM Final Assembly Cost	\$10.0
Supplier Final Assembly Cost	\$10.0
SG&A and Profit	\$10.0
Total Cost	\$10.0



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## VEHICLE OR ZONE

### SUMMARY COSTED BILL OF MATERIAL

- ❑ The Summary Costed Bill of Material (CBOM) is a consolidated view of the information presented in the complete vehicle report or an individually purchased Zone report.
- ❑ The CBOM is in an indented format and includes:
  - Part name
  - Material
  - Supplier (as available)
  - Total Cost
  - Weight
  - Quantity
  - Total Weight

2020 Tesla Model Y								
Symbol Name	Material Name	Supplier Name	Total Cost*	Weight (kg)	Item Qty	Total Cost* (Total)	Weight (kg) (Total)	
Rear Shock Assembly	Multiple							
Rear Coil Spring Assembly	Commodity Item							
Rear Spring Bottom Pad	NDR							
Rear Coil Spring	Commodity Item							
Rear Spring Top Pad	NDR							
Bolt Lwr Control Arm to Rear Cradle Assy	Commodity Item	-	\$0.93	0.1180	1	\$0.93	0.11	
Nut Lower Control Arm to Rear Cradle Assy	Commodity Item	-	\$0.60	0.1492	2	\$1.20	0.29	
Bolt, Suspension Link Toe to Rear Cradle Assy	Commodity Item	-	\$0.10	0.0322	2	\$0.20	0.06	
Bolt, Suspension Link Toe to Rear Cradle Assy	Commodity Item	-	\$0.44	0.1066	2	\$0.88	0.21	
Washer, Suspension Link Toe to RR Cradle	Commodity Item	-	\$0.11	0.0278	2	\$0.22	0.06	
Nut Suspension Link Toe to RR Cradle Assy	Commodity Item	-	\$0.06	0.0189	2	\$0.12	0.03	
Bolt Upper Top Control Arm to RR Cradle Assy	Commodity Item	-	\$0.45	0.1142	2	\$0.90	0.22	
Nut Upper Top Control Arm to Cradle	Commodity Item	-	\$0.10	0.0322	2	\$0.20	0.06	
Bolt M12 Lower Suspension Link Rear to RR Cradle	Commodity Item	-	\$0.31	0.0863	2	\$0.62	0.17	
Bolt Upper Control Arm Link to RR Cradle	Commodity Item	-	\$0.32	0.0863	2	\$0.64	0.17	
Nut Upper Control Arm Link to RR Cradle Assy	Commodity Item	-	\$0.07	0.0212	2	\$0.14	0.04	
Nut M10 Swaybar Link to Swaybar	Commodity Item	-	\$0.06	0.0147	2	\$0.10	0.02	
Bolt M6x1x15 ABS Sensor Wire Bklt to RR Knuckle	Commodity Item	-	\$0.02	0.0071	2	\$0.04	0.01	
Mounting Bracket, RR Sups. Assy, RH	Steel 1018 - Coil	-	\$0.88	0.2724	1	\$0.88	0.27	
Mounting Bracket, RR Sups. Assy, LH	Steel 1018 - Coil	-	\$1.03	0.2735	1	\$1.03	0.27	

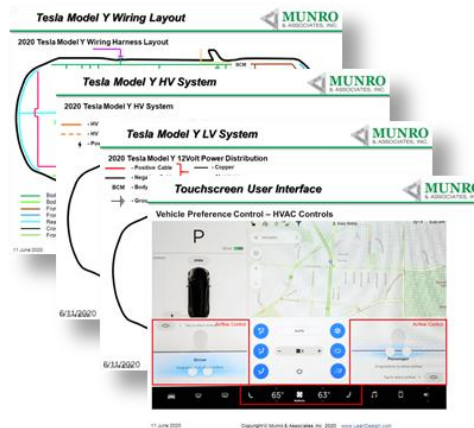




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## ELECTRICAL TOPOLOGY

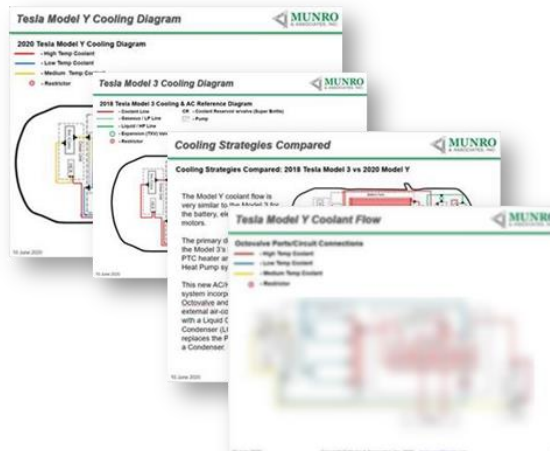
- This report includes electrical and electronic component location, major HV and LV wire harness layouts, connection points, touchscreen user interface screenshots, and hydraulic brake system topology.



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## COOLING TOPOLOGY

- This report outlines the cooling lines and connections for coolant and refrigeration fluids. Both the heating and cooling circuits are illustrated.





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## FIT, FINISH & QUALITY REPORT (FFQ™)

- ❑ The Fit, Finish & Quality Audit (FFQ™) is a thorough yet non-intrusive evaluation of the Tesla Model Y.
- ❑ The purpose is to analytically document a new buyer's "first time" experience - what they may see, hear, and feel.
- ❑ The FFQ™ contains gap and flushness dimensions, 4-corner weights, and operating forces.

**Functional Efforts**

2020 Tesla Model Y

Location	1st Readings (N)	2nd Readings (N)	3rd Readings (N)	Average (N)	Notes:
<b>External Handles</b>					
Front Door Driver (Open/Unlock)					
Front Door Driver Fully Open (L)					
Front Door Driver 1/2 Open (C)					
Front Door Driver 1/3 Open (C)					
Front Door Passenger (Open)					
Front Door Passenger Fully Op					
Front Door Passenger 1/2 Open					
Front Door Passenger 1/3 Open					
Left Rear Door (Open/Unlock)					
Left Rear Door Fully Open (Close)					
Left Rear Door 1/2 Open (Close)					
Right Rear Door (Open/Unlock)					
Right Rear Door Fully Open/Close					
Right Rear Door 1/2 Open/Close					
Liftgate (Unlock Button)					
Liftgate (Close Button)					

**Vehicle Weight and Dimensions**

2020 Tesla Model Y

**Left Rear**  
481.71 kg  
1062 lbs.  
23.84%

**Rear**  
1018.31 kg  
2245 lbs.  
50.39%

**Right Rear**  
536.60 kg  
1183 lbs.  
26.55%

11 June 2020

**Exterior Fit and Finish: Lighting**

2020 Tesla Model Y

**Left Head Lamp**

Location	Gap	Flush
1	2.5	+1
2	2.5	0
3	2.5	0
4	2.5	0
5	1	+1
6	0.5	+2
7	1	+2
8	2.5	+2
9	3	+4
10	2.5	+4
11	2.5	+3
12	2	+2
13	2.5	+2
14	2	0
15	2	+1
16	1.5	+1

11 June 2020

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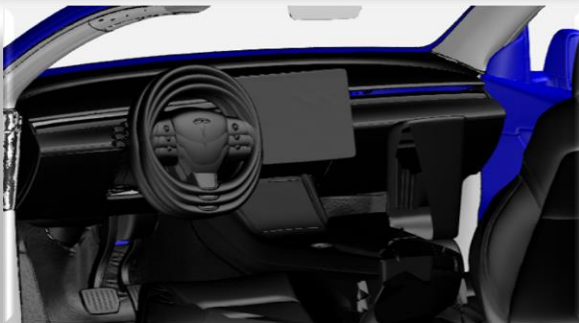
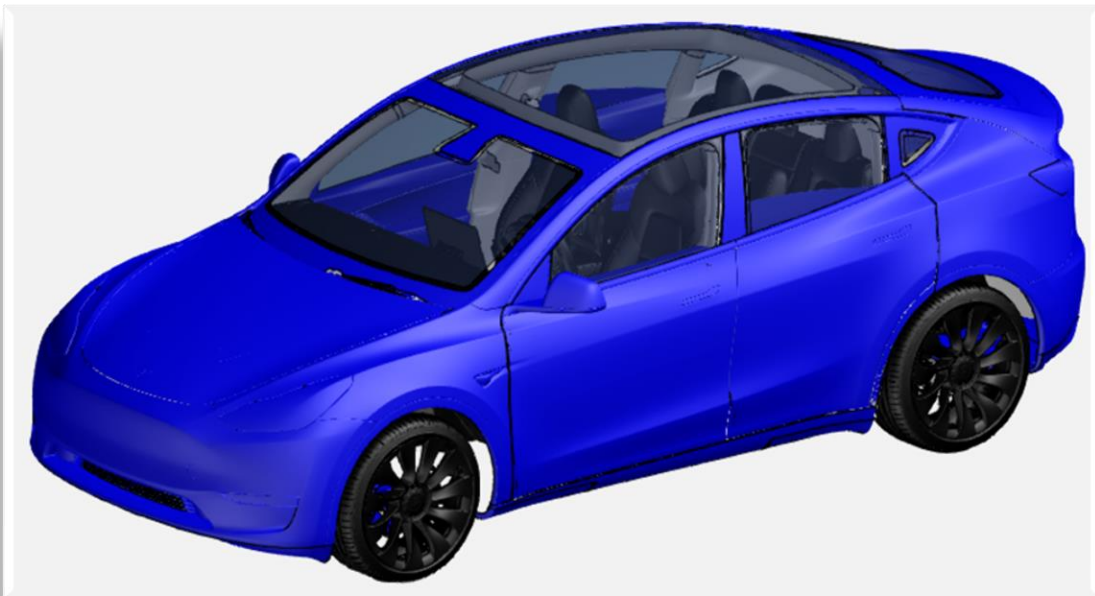




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## SCANS OF THE TESLA MODEL Y

- ☐ The purchase will receive detailed CAD .STL files of the Tesla Model Y.
- ☐ Scans include interior and exterior of the vehicle.
- ☐ Detailed scans with several Gigabytes of data.





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## WIND TUNNEL TESTING RESULTS

- ☐ The Tesla Model Y was tested at the FCA Aero Acoustic Wind Tunnel.
- ☐ Purchaser will receive data for a total of 10 runs performed with changing yaw angle.
- ☐ Active Grille Shutter in open and various shut/blocked positions.



Run	AGS	Height Lf	Height Lr	Height Rf	Height Rr	Notes
1	Open	747 mm	762 mm	748 mm	761 mm	Open Grille
2	Closed	747 mm	762 mm	748 mm	761 mm	Blocked Grille
3	Closed	747 mm	762 mm	748 mm	761 mm	Blocked Grille
4	Closed	747 mm	762 mm	748 mm	761 mm	Blocked Front Air Curtains
5	Closed	747 mm	762 mm	748 mm	761 mm	Blocked Grille
6	Closed	747 mm	762 mm	748 mm	761 mm	Blocked Grille Flush Wheel Covers
7	Closed	747 mm	762 mm	748 mm	761 mm	Blocked Grille
8	Closed	747 mm	762 mm	748 mm	761 mm	Blocked Grille
9	Closed	739 mm	754 mm	739 mm	754 mm	Blocked Grille
10	Closed	740 mm	739 mm	740 mm	738 mm	Blocked Grille

Run	AGS	Height Lf	Height Lr	Height Rf	Height Rr	Notes
8	Closed	747 mm	762 mm	748 mm	761 mm	Blocked Grille

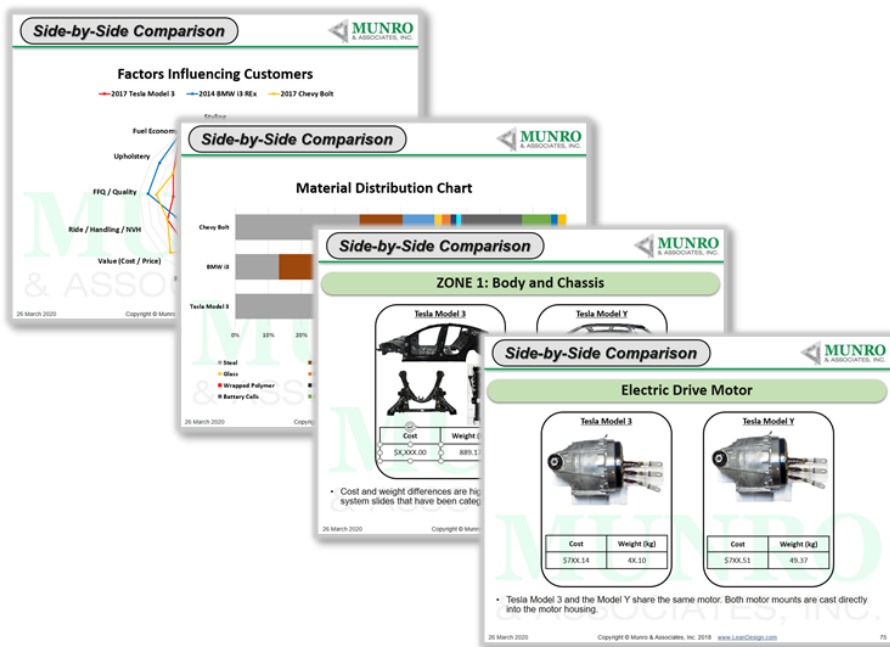
Run	Point #	Yaw Angle	MPH	CD	CL	Clf	Clr	CDA	CPM	CRM	CYM	CS
8	1	0	1.0000	0.2800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8	2	3	1.0000	0.2800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8	3	6	1.0000	0.2800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8	4	9	1.0000	0.2800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8	5	12	1.0000	0.2800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8	6	15	1.0000	0.2800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8	7	20	1.0000	0.2800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8	8	0	1.0000	0.2800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8	9	-3	1.0000	0.2800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8	10	-6	1.0000	0.2800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8	11	-9	1.0000	0.2800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8	12	-12	1.0000	0.2800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8	13	-15	1.0000	0.2800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8	14	-20	1.0000	0.2800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
8	15	0	1.0000	0.2800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000



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## SIDE-BY-SIDE REPORT

- ❑ The Side-by-Side Report is a cost comparison and description of the differences between the Tesla Model Y and Model 3.
  - ❑ Items of comparison are generally cost, weight, and part count.
- ❑ Included is a spider diagram comparing many functions that are related to fit and finish, ergonomics, and weight distribution.
  - ❑ The spider diagram also highlights additional vehicle aspects such as styling, reliability, price, safety, configuration, NVH, handling & riding, and maintenance.
- ❑ Munro also compares materials and their usage. The Material Distribution chart provides information related to usage and proportional distribution in the compared vehicles.





## FAQ (FREQUENTLY ASKED QUESTIONS)

- ☐ Was Tesla involved in the study?  
*No. Neither Tesla's proprietary costs nor any Tesla Model Y supplier's quoted costs were used in this study.*
- ☐ Is there any Tesla Model Y proprietary (stolen) IP in this report?  
*No. All data was developed through Munro's proven methodologies, analyzing Munro's purchased production-version Tesla Model Y vehicles*
- ☐ Are the components costed using USMCA costing centers?  
*Yes. Munro includes labor, factory floor cost, taxes and SG&A for OEM or Tier Suppliers.*
- ☐ Is this a Costing or Pricing report?  
*This is a Costing Report, Pricing has too many variables.*

## LEGAL DISCLAIMERS & SALES CONDITION

- ☐ How can I see the sample report before purchasing?  
*Please contact your regional Munro salesperson. They can provide sample information in digital PDF format. A list of Munro's regional contacts can be found at [www.LeanDesign.com/Contact/](http://www.LeanDesign.com/Contact/)*  
*NOTE: Critical data will be hidden in the sample.*
- ☐ Is purchaser allowed to reproduce, distribute, disseminate, photocopy, fax, or transmit report content internally within the purchaser's organization?  
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- ☐ If questions arise, is a Munro expert able to visit and explain the report's details?  
*It is not included in the price of report.*  
*Munro will visit if the customer pays for the travel and a daily fee.*
- ☐ If there are limited specific questions on the content of report, is it possible for a Munro representative to support phone or e-mail communication?  
*Yes, please contact the local area salesperson and we will respond with our answers.*