



1

Tesla Model Y Benchmark Reports

\$1,000,000 Analysis for \$89,000 USD

Purchasers of this 2000+ page report will receive:

- a. Vehicle and Zone Executive Summaries
- b. Zone Eye-Catching Features
- c. Zone Quick Cost Estimate Report
- d. Zone Quick-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 report (FFQ™)**

**Individual Reports are Available for Those
Only Interested in Specific Vehicle Areas**

- | | |
|---|---------------------|
| ○ Zone 1 Body and Chassis | \$32,000 USD |
| ○ Zone 2 Controlling Electronics | \$38,000 USD |
| ○ Zone 3 Interiors and Safety | \$30,000 USD |
| ○ Zone 4 Powertrain and Battery Pack | \$45,000 USD |
| ○ Electrical Topology | \$ 5,000 USD |
| ○ Thermal Systems Report | \$15,000 USD |

2

Tesla Model 3 to Model Y Side-by-Side Report

\$400,000 Analysis for \$35,000 USD



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 with Autopilot, Carbon Fiber Spoiler, Performance Pedals, and Performance Brakes.
- ❖ Prior to Munro purchase, the car was never driven.
- ❖ Munro documented findings related to eye-catching features, weights, number of parts, materials and suppliers where possible, and conducted a complete Munro Vehicle Quick Cost Analysis.

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 will help ensure that subscribers can easily locate a wide range of materials in addition to the reports.
- ❖ The large reports utilize hyperlinks within a table of contents to facilitate the ability to easily navigate throughout the contents and quickly find specific data and information to meet user needs.



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Model Y Benchmark Report

- ❖ The Benchmark Report is highly advantageous for OEMs or Tier Suppliers looking to effectively compete and expand share in new EV markets.
- ❖ The report is a comprehensive analysis of all four Zones of the vehicle.
- ❖ This report contains descriptive and pictorial detail on every facet of the vehicle.
- ❖ Those who choose to purchase the report will receive:
 - a. Vehicle Executive and Zone Summaries
 - b. Zone Eye-Catching Features and Quick Cost Estimate Report with Zone Summary Costed Bill of Material.
 - c. Complete Vehicle Summary Costed Bill of Materials (CBOM) in PDF format with associated weights.
 - d. The Vehicle Summary and Zone Summaries consolidate Munro's technical findings as 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 and contain descriptive and pictorial detail on every facet of the Zone from manufacturing through assembly, including cost analysis.
- ❖ Individually purchased Zone Reports include:
 - a. Zone related component weights, materials and suppliers (as possible) and Munro Quick Cost estimates.
 - b. Summary Zone Quick Costed Bill of Materials (CBOM)



1b

Eye-Catching Features

❖ Munro has also identified, in each Zone, 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.



2020 Tesla Model Y Overview

Tesla has changed the body structure of their first mass production EV, the Model Y, from an aluminum structure to a steel/aluminum hybrid construction. Having to enter the market at a lower base price with superior performance, Tesla was likely required to consider a higher level and usage of steel. The Model Y body is constructed of mild, high-strength steel with aluminum flaps and fenders. Most of the body forward of the rear wheel houses is steel with an aluminum extension to fender to aluminum reliability heavy weight.

2020 Tesla Model Y Summary

The Model Y has set the standard for a performance all-electric 5-passenger sedan.

- Acceleration, top speed, and range are industry leading, especially for a 5-passenger vehicle.
- The vehicle features many EV industry first features:
 - Full Panoramic Roof from windshield to tailgate
 - Central touch
 - Multi-link rear performance
 - Future capable

Interior Summary

Model Y has a relatively 1) B-pillar primarily steel 2) Much of the vehicle 3) The Model Y drive shaft

Controlling Electronics Summary

Probably one of the most notable features of the Model Y is the 10-wire inductively-coupled cable and vehicle control architecture. The architecture eliminates differential conductors from the car, with the exception of two differential conductors for steering assist and the steering column shafts which serve as the gear selector and an activation point for cruise control, adaptive cruise, high beam headlights and turn signals. Despite all the features contained in the architecture, it is fast and reliable.

Eye-Catching Features

Tesla has been tested for auto driving capability. The Model Y's additional driving computer chip, centered between the headlights and quarter is a self-driving computer, a camera mounted in each fender to scan a traffic or driver-less scenario and/or a fabric driver engagement is needed a backup in the environment.

Eye-Catching Features

DESCRIPTION:

- Extensive use of

Advantages:

- Laser welding is a friction spot weld
- Thinner gauge sheet can result in a box

DESCRIPTION:

- The Model Y uses a deep cycle sealed lead acid auxiliary battery which is designed for:
 - Long slow constant discharge, Low current discharge and high capacity discharge
 - Mild sulfation and a conventional automotive grade battery which is designed for:
 - Short time interval discharge, High current discharge and Low capacity discharge

Advantages:

- Longer lifespan battery compared to a conventional automotive battery.



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Quick Cost Estimates

Each Zone is then further broken down to systems and components for Quick Cost Estimating (QCE). QCE is gaining popularity due to the need for speed-driven results. In response, Munro has developed a proprietary methodology. 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 OEM’s 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.”



The image displays three overlapping screenshots from a software application used for cost estimation. The top-left screenshot, titled "Eye Catching Features", shows a seat back assembly and lists a description: "Extensive use of laser welding on seat backs." and advantages: "Laser welding is more accurate and typically faster and tradition spot welding or MIG welding." and "Thinner gauge steel can be used with laser welding car can result in a lower weight seat frame assembly." The middle screenshot, titled "Instrument Panel Trim", shows a black plastic trim piece and an "Assembly Summary" table. The bottom-right screenshot shows a detailed "Total Cost" table with columns for Supplier Name/Code, Material, Parts, Formwork, Total Weight (kg), Material Cost, Process Cost, OEM Final Ass. Cost, Supplier Final Ass. Cost, S&A and Profit, and Total Cost. The table contains numerous rows of data for various components.



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Vehicle or Zone Summary Costed Bill of Material

- ❖ The costed bill of material is a consolidated view of the information presented in the Vehicle reports or an individually purchased Zone report.
- ❖ The bill of material 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	NBR						
Rear Coil Spring	Commodity Item						
Rear Spring Top Pad	NBR						
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	0.1055	2	\$0.88	0.21
Washer, Suspension Link Toe to RR Cradle	Commodity Item	-	\$0.11	0.0278	2	\$0.22	0.05
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	-	\$0.05	0.0147	2	\$0.10	0.02
Bolt M6x1x15 ABS Sensor Wire Brit 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

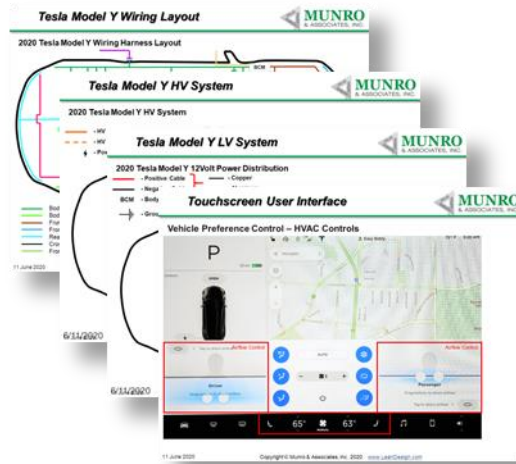
Side by Side Summary Example



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Electrical Topology

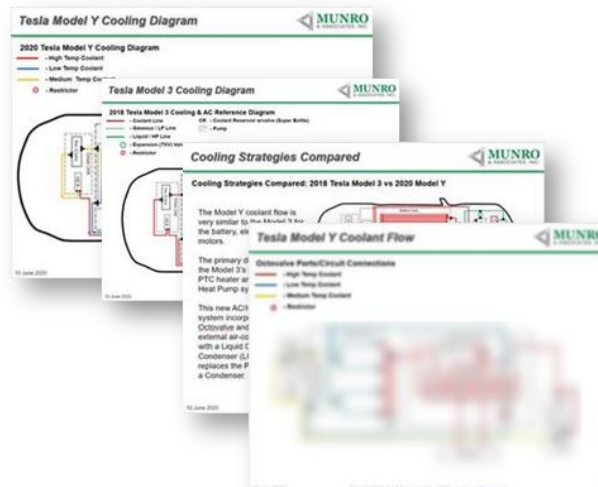
- ❖ This report includes electrical and electronic component location, major HV and LV wire harness layouts, connection points, touchscreen user interface screen shots and hydraulic brake system topology.



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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:
External Handles					
Front Door Driver (Open Unlock)					
Front Door Driver Fully Open (I)					
Front Door Driver 1/2 Open (I)					
Front Door Driver 1/3 Open (I)					
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 Full Open (Close)					
Right Rear Door 1/2 Open (Close)					
Liftgate (Unlock Button)					
Liftgate (Close Button)					

Vehicle Weight and Dimensions

2020 Tesla Model Y

Vehicle Weight

Left Rear
481.71 kg
1062 lbs.
23.84%

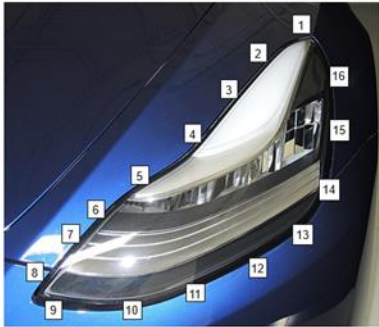
Rear
1018.31 kg
2245 lbs.
50.39%

Right Rear
536.60 kg
1183 lbs.
26.55%

Exterior Fit and Finish: Lighting

2020 Tesla Model Y

Left Head Lamp



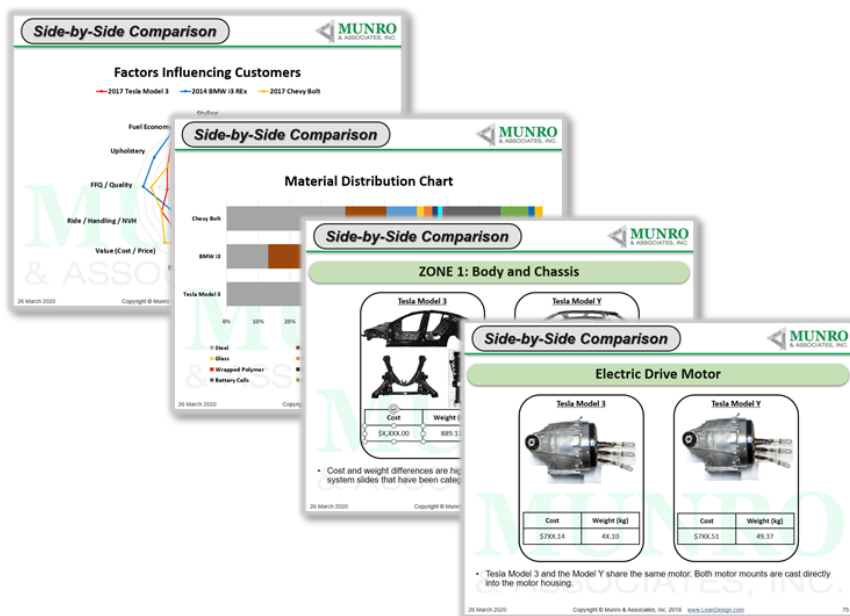
Location	Gap	Flush
1	2.5	+1
2	2.5	0
3	2.5	0
4	2.5	0
5	1	+1
6	0.5	+2
7	1	+2
8	2.5	+2
9	3	+4
10	2.5	+4
11	2.5	+3
12	2	+2
13	2.5	+2
14	2	0
15	2	+1
16	1.5	+1



2

Side by Side Analysis

- ❖ The Side by Side Report is a description and cost comparison 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 evaluates the vehicle on multiple dimensions, such as styling, reliability, price, safety, weight, configuration, NVH, handling & riding, maintenance, etc..
- ❖ Munro will also compare 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 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 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 NOTE: critical data will be hidden in the sample.
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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.