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Basic Profile & Contact Info		Employment History		Education & Training		Professional Licenses		Performance & Metrics		Health & Safety		Background & Compliance		References & Endorsements		Notes & Remarks	
ID	Name	Current Employer	Previous Employers	Degree	Certifications	Licenses	Accreditation	Score	Rating	Incidents	Violations	Check Status	Clearance Level	Ref Name	Ref Title	Comments	
1	John Doe	ABC Corp	XYZ Inc	Bachelor's	Project Mgmt	Professional Engineer	ASCE	95	4.8	0	0	Active	Level 2	John Smith	Senior Engineer	Excellent performance, highly motivated.	
2	Jane Smith	DEF Ltd	GHI Corp	Master's	Advanced Analytics	Registered Nurse	ANA	88	4.5	1	0	Active	Level 1	Michael Brown	Manager	Good team player, reliable.	
3	Robert Johnson	JKL Inc	MNO Corp	PhD	Research Methods	Chartered Accountant	ICAEW	92	4.9	0	0	Active	Level 3	Sarah White	Director	Highly skilled, excellent communication.	
4	Emily Davis	PQR Ltd	STU Corp	Associate's	Customer Service	Firefighter	IFPE	85	4.2	2	1	Active	Level 1	David Green	Supervisor	Hardworking, good at problem-solving.	
5	Michael Brown	VWX Inc	YZA Corp	Bachelor's	Software Development	Registered Teacher	QTS	90	4.7	0	0	Active	Level 2	Lisa Black	Head Teacher	Excellent teacher, innovative in the classroom.	
6	Sarah White	BCD Ltd	EFG Corp	Master's	Public Health	Registered Dietitian	RD	87	4.6	1	0	Active	Level 1	James Grey	Manager	Good at working with teams, detail-oriented.	
7	David Green	HIJ Inc	KLM Corp	PhD	Biotechnology	Chartered Engineer	ICE	93	4.8	0	0	Active	Level 3	Anna Blue	Senior Engineer	Highly technical, excellent problem solver.	
8	Lisa Black	NOP Ltd	QRS Corp	Associate's	Administrative Support	Police Officer	PPS	82	4.1	3	2	Active	Level 1	Chris Red	Officer	Good at handling difficult situations.	
9	James Grey	TUV Inc	WXY Corp	Bachelor's	Marketing	Registered Financial Planner	CFP	89	4.5	1	0	Active	Level 2	Michelle Yellow	Financial Advisor	Good at building client relationships.	
10	Anna Blue	ZAB Ltd	CCD Corp	Master's	Education	Registered Nurse	ANA	86	4.4	2	1	Active	Level 1	Kevin Purple	Manager	Good at managing staff, organized.	
11	Chris Red	DEF Inc	GHI Corp	PhD	Physics	Chartered Accountant	ICAEW	91	4.7	0	0	Active	Level 3	Olivia Pink	Senior Accountant	Highly accurate, excellent attention to detail.	
12	Michelle Yellow	JKL Ltd	MNO Corp	Associate's	Customer Service	Firefighter	IFPE	84	4.3	2	1	Active	Level 1	Ben Green	Supervisor	Good at customer interaction, reliable.	
13	Kevin Purple	PQR Inc	STU Corp	Bachelor's	Software Development	Registered Teacher	QTS	90	4.7	0	0	Active	Level 2	Grace Blue	Head Teacher	Excellent teacher, innovative in the classroom.	
14	Olivia Pink	VWX Ltd	YZA Corp	Master's	Public Health	Registered Dietitian	RD	87	4.6	1	0	Active	Level 1	Henry Red	Manager	Good at working with teams, detail-oriented.	
15	Ben Green	BCD Inc	EFG Corp	PhD	Biotechnology	Chartered Engineer	ICE	93	4.8	0	0	Active	Level 3	Ivy Yellow	Senior Engineer	Highly technical, excellent problem solver.	
16	Grace Blue	HIJ Ltd	KLM Corp	Associate's	Administrative Support	Police Officer	PPS	82	4.1	3	2	Active	Level 1	Leo Purple	Officer	Good at handling difficult situations.	
17	Henry Red	NOP Inc	QRS Corp	Bachelor's	Marketing	Registered Financial Planner	CFP	89	4.5	1	0	Active	Level 2	Mia Pink	Financial Advisor	Good at building client relationships.	
18	Ivy Yellow	TUV Ltd	WXY Corp	Master's	Education	Registered Nurse	ANA	86	4.4	2	1	Active	Level 1	Noah Blue	Manager	Good at managing staff, organized.	
19	Leo Purple	ZAB Inc	CCD Corp	PhD	Physics	Chartered Accountant	ICAEW	91	4.7	0	0	Active	Level 3	Penelope Green	Senior Accountant	Highly accurate, excellent attention to detail.	
20	Mia Pink	DEF Ltd	GHI Corp	Associate's	Customer Service	Firefighter	IFPE	84	4.3	2	1	Active	Level 1	Ryan Red	Supervisor	Good at customer interaction, reliable.	
21	Noah Blue	JKL Inc	MNO Corp	Bachelor's	Software Development	Registered Teacher	QTS	90	4.7	0	0	Active	Level 2	Sophia Yellow	Head Teacher	Excellent teacher, innovative in the classroom.	
22	Penelope Green	PQR Ltd	STU Corp	Master's	Public Health	Registered Dietitian	RD	87	4.6	1	0	Active	Level 1	Thomas Blue	Manager	Good at working with teams, detail-oriented.	
23	Ryan Red	VWX Inc	YZA Corp	PhD	Biotechnology	Chartered Engineer	ICE	93	4.8	0	0	Active	Level 3	Uma Purple	Senior Engineer	Highly technical, excellent problem solver.	
24	Sophia Yellow	BCD Ltd	EFG Corp	Associate's	Administrative Support	Police Officer	PPS	82	4.1	3	2	Active	Level 1	Victor Green	Officer	Good at handling difficult situations.	
25	Thomas Blue	HIJ Inc	KLM Corp	Bachelor's	Marketing	Registered Financial Planner	CFP	89	4.5	1	0	Active	Level 2	Wendy Yellow	Financial Advisor	Good at building client relationships.	
26	Uma Purple	NOP Ltd	QRS Corp	Master's	Education	Registered Nurse	ANA	86	4.4	2	1	Active	Level 1	Xavier Blue	Manager	Good at managing staff, organized.	
27	Victor Green	ZAB Inc	CCD Corp	PhD	Physics	Chartered Accountant	ICAEW	91	4.7	0	0	Active	Level 3	Yara Green	Senior Accountant	Highly accurate, excellent attention to detail.	
28	Wendy Yellow	DEF Ltd	GHI Corp	Associate's	Customer Service	Firefighter	IFPE	84	4.3	2	1	Active	Level 1	Zoe Red	Supervisor	Good at customer interaction, reliable.	
29	Xavier Blue	JKL Inc	MNO Corp	Bachelor's	Software Development	Registered Teacher	QTS	90	4.7	0	0	Active	Level 2	Adam Blue	Head Teacher	Excellent teacher, innovative in the classroom.	
30	Yara Green	PQR Ltd	STU Corp	Master's	Public Health	Registered Dietitian	RD	87	4.6	1	0	Active	Level 1	Bella Yellow	Manager	Good at working with teams, detail-oriented.	
31	Zoe Red	VWX Inc	YZA Corp	PhD	Biotechnology	Chartered Engineer	ICE	93	4.8	0	0	Active	Level 3	Charlie Purple	Senior Engineer	Highly technical, excellent problem solver.	
32	Adam Blue	BCD Ltd	EFG Corp	Associate's	Administrative Support	Police Officer	PPS	82	4.1	3	2	Active	Level 1	Diana Green	Officer	Good at handling difficult situations.	
33	Bella Yellow	HIJ Inc	KLM Corp	Bachelor's	Marketing	Registered Financial Planner	CFP	89	4.5	1	0	Active	Level 2	Ethan Blue	Financial Advisor	Good at building client relationships.	
34	Charlie Purple	NOP Ltd	QRS Corp	Master's	Education	Registered Nurse	ANA	86	4.4	2	1	Active	Level 1	Fiona Pink	Manager	Good at managing staff, organized.	
35	Diana Green	ZAB Inc	CCD Corp	PhD	Physics	Chartered Accountant	ICAEW	91	4.7	0	0	Active	Level 3	George Yellow	Senior Accountant	Highly accurate, excellent attention to detail.	
36	Ethan Blue	DEF Ltd	GHI Corp	Associate's	Customer Service	Firefighter	IFPE	84	4.3	2	1	Active	Level 1	Hannah Red	Supervisor	Good at customer interaction, reliable.	
37	Fiona Pink	JKL Inc	MNO Corp	Bachelor's	Software Development	Registered Teacher	QTS	90	4.7	0	0	Active	Level 2	Ian Blue	Head Teacher	Excellent teacher, innovative in the classroom.	
38	George Yellow	PQR Ltd	STU Corp	Master's	Public Health	Registered Dietitian	RD	87	4.6	1	0	Active	Level 1	Jane Green	Manager	Good at working with teams, detail-oriented.	
39	Hannah Red	VWX Inc	YZA Corp	PhD	Biotechnology	Chartered Engineer	ICE	93	4.8	0	0	Active	Level 3	Kyle Purple	Senior Engineer	Highly technical, excellent problem solver.	
40	Ian Blue	BCD Ltd	EFG Corp	Associate's	Administrative Support	Police Officer	PPS	82	4.1	3	2	Active	Level 1	Laura Yellow	Officer	Good at handling difficult situations.	
41	Jane Green	HIJ Inc	KLM Corp	Bachelor's	Marketing	Registered Financial Planner	CFP	89	4.5	1	0	Active	Level 2	Mark Blue	Financial Advisor	Good at building client relationships.	
42	Kyle Purple	NOP Ltd	QRS Corp	Master's	Education	Registered Nurse	ANA	86	4.4	2	1	Active	Level 1	Nancy Pink	Manager	Good at managing staff, organized.	
43	Laura Yellow	ZAB Inc	CCD Corp	PhD	Physics	Chartered Accountant	ICAEW	91	4.7	0	0	Active	Level 3	Oscar Green	Senior Accountant	Highly accurate, excellent attention to detail.	
44	Mark Blue	DEF Ltd	GHI Corp	Associate's	Customer Service	Firefighter	IFPE	84	4.3	2	1	Active	Level 1	Peter Red	Supervisor	Good at customer interaction, reliable.	
45	Nancy Pink	JKL Inc	MNO Corp	Bachelor's	Software Development	Registered Teacher	QTS	90	4.7	0	0	Active	Level 2	Quinn Blue	Head Teacher	Excellent teacher, innovative in the classroom.	
46	Oscar Green	PQR Ltd	STU Corp	Master's	Public Health	Registered Dietitian	RD	87	4.6	1	0	Active	Level 1	Rachel Yellow	Manager	Good at working with teams, detail-oriented.	
47	Peter Red	VWX Inc	YZA Corp	PhD	Biotechnology	Chartered Engineer	ICE	93	4.8	0	0	Active	Level 3	Sam Purple	Senior Engineer	Highly technical, excellent problem solver.	
48	Quinn Blue	BCD Ltd	EFG Corp	Associate's	Administrative Support	Police Officer	PPS	82	4.1	3	2	Active	Level 1	Tina Green	Officer	Good at handling difficult situations.	
49	Rachel Yellow	HIJ Inc	KLM Corp	Bachelor's	Marketing	Registered Financial Planner	CFP	89	4.5	1	0	Active	Level 2	Umar Blue	Financial Advisor	Good at building client relationships.	
50	Sam Purple	NOP Ltd	QRS Corp	Master's	Education	Registered Nurse	ANA	86	4.4	2	1	Active	Level 1	Vivian Pink	Manager	Good at managing staff, organized.	
51	Tina Green	ZAB Inc	CCD Corp	PhD	Physics	Chartered Accountant	ICAEW	91	4.7	0	0	Active	Level 3	Walter Yellow	Senior Accountant	Highly accurate, excellent attention to detail.	
52	Umar Blue	DEF Ltd	GHI Corp	Associate's	Customer Service	Firefighter	IFPE	84	4.3	2	1	Active	Level 1	Xavier Red	Supervisor	Good at customer interaction, reliable.	
53	Vivian Pink	JKL Inc	MNO Corp	Bachelor's	Software Development	Registered Teacher	QTS	90	4.7	0	0	Active	Level 2	Yara Blue	Head Teacher	Excellent teacher, innovative in the classroom.	
54	Walter Yellow	PQR Ltd	STU Corp	Master's	Public Health	Registered Dietitian	RD	87	4.6	1	0	Active	Level 1	Zoe Green	Manager	Good at working with teams, detail-oriented.	
55	Xavier Red	VWX Inc	YZA Corp	PhD	Biotechnology	Chartered Engineer	ICE	93	4.8	0	0	Active	Level 3	Adam Purple	Senior Engineer	Highly technical, excellent problem solver.	
56	Yara Blue	BCD Ltd	EFG Corp	Associate's	Administrative Support	Police Officer	PPS	82	4.1	3	2	Active	Level 1	Bella Yellow	Officer	Good at handling difficult situations.	
57	Zoe Green	HIJ Inc	KLM Corp	Bachelor's	Marketing	Registered Financial Planner	CFP	89	4.5	1	0	Active	Level 2	Charlie Blue	Financial Advisor	Good at building client relationships.	
58	Adam Purple	NOP Ltd	QRS Corp	Master's	Education	Registered Nurse	ANA	86	4.4	2	1	Active	Level 1	Diana Pink	Manager	Good at managing staff, organized.	
59	Bella Yellow	ZAB Inc	CCD Corp	PhD	Physics	Chartered Accountant	ICAEW	91	4.7	0	0	Active	Level 3	Ethan Green	Senior Accountant	Highly accurate, excellent attention to detail.	
60	Charlie Blue	DEF Ltd	GHI Corp	Associate's	Customer Service	Firefighter	IFPE	84	4.3	2	1	Active	Level 1	Fiona Red	Supervisor	Good at customer interaction, reliable.	
61	Diana Pink	JKL Inc	MNO Corp	Bachelor's	Software Development	Registered Teacher	QTS	90	4.7	0	0	Active	Level 2	George Blue	Head Teacher	Excellent teacher, innovative in the classroom.	
62	Ethan Green	PQR Ltd	STU Corp	Master's	Public Health	Registered Dietitian	RD	87	4.6	1	0	Active	Level 1	Hannah Yellow	Manager	Good at working with teams, detail-oriented.	
63	Fiona Red	VWX Inc	YZA Corp	PhD	Biotechnology	Chartered Engineer	ICE	93	4.8	0	0	Active	Level 3	Ian Purple	Senior Engineer	Highly technical, excellent problem solver.	
64	George Blue	BCD Ltd	EFG Corp	Associate's	Administrative Support	Police Officer	PPS	82	4.1	3	2	Active	Level 1	Jane Yellow	Officer	Good at handling difficult situations.	
65	Hannah Yellow	HIJ Inc	KLM Corp	Bachelor's	Marketing	Registered Financial Planner	CFP	89	4.5	1	0	Active	Level 2	Kyle Blue	Financial Advisor	Good at building client relationships.	
66	Ian Purple	NOP Ltd	QRS Corp	Master's	Education	Registered Nurse	ANA	86	4.4	2	1	Active	Level 1	Laura Pink	Manager	Good at managing staff, organized.	
67	Jane Yellow	ZAB Inc	CCD Corp	PhD	Physics	Chartered Accountant	ICAEW	91	4.7	0	0	Active	Level 3	Mark Green	Senior Accountant	Highly accurate, excellent attention to detail.	
68	Kyle Blue	DEF Ltd	GHI Corp	Associate's	Customer Service	Firefighter	IFPE	84	4.3	2	1	Active	Level 1	Nancy Red	Supervisor	Good at customer interaction, reliable.	
69	Laura Pink	JKL Inc	MNO Corp	Bachelor's	Software Development	Registered Teacher	QTS	90	4.7	0	0	Active	Level 2	Oscar Blue	Head Teacher	Excellent teacher, innovative in the classroom.	
70	Mark Green	PQR Ltd	STU Corp	Master's	Public Health	Registered Dietitian	RD	87	4.6	1	0	Active	Level 1	Peter Yellow	Manager	Good at working with teams, detail-oriented.	
71	Nancy Red	VWX Inc	YZA Corp	PhD	Biotechnology	Chartered Engineer	ICE	93	4.8	0	0	Active	Level 3	Quinn Purple	Senior Engineer	Highly technical, excellent problem solver.	
72	Oscar Blue	BCD Ltd	EFG Corp	Associate's	Administrative Support	Police Officer	PPS	82	4.1	3	2	Active	Level 1	Rachel Green	Officer	Good at handling difficult situations.	
73	Peter Yellow	HIJ Inc	KLM Corp	Bachelor's	Marketing	Registered Financial Planner	CFP	89	4.5	1	0	Active	Level 2	Sam Blue	Financial Advisor	Good at building client relationships.	
74	Quinn Purple	NOP Ltd	QRS Corp	Master's	Education	Registered Nurse	ANA	86	4.4	2	1	Active	Level 1	Tina Pink	Manager	Good at managing staff, organized.	
75	Rachel Green	ZAB Inc	CCD Corp	PhD	Physics	Chartered Accountant	ICAEW	91	4.7	0	0	Active	Level 3	Umar Yellow	Senior Accountant	Highly accurate, excellent attention to detail.	
76	Sam Blue	DEF Ltd	GHI Corp	Associate's	Customer Service	Firefighter	IFPE	84	4.3	2	1	Active	Level 1	Vivian Red	Supervisor	Good at customer interaction, reliable.	
77	Tina Pink	JKL Inc	MNO Corp	Bachelor's	Software Development	Registered Teacher	QTS	90	4.7	0	0	Active	Level 2	Walter Blue	Head Teacher	Excellent teacher, innovative in the classroom.	
78	Umar Yellow	PQR Ltd	STU Corp	Master's	Public Health	Registered Dietitian	RD	87	4.6	1	0	Active	Level 1	Xavier Green	Manager	Good at working with teams, detail-oriented.	
79	Vivian Red	VWX Inc	YZA Corp	PhD	Biotechnology	Chartered Engineer	ICE	93	4.8	0	0	Active	Level 3	Yara Purple	Senior Engineer	Highly technical, excellent problem solver.	
80	Walter Blue	BCD Ltd	EFG Corp	Associate's	Administrative Support	Police Officer	PPS	82	4.1	3	2	Active	Level 1	Zoe Yellow	Officer	Good at handling difficult situations.	
81	Xavier Green	HIJ Inc	KLM Corp	Bachelor's	Marketing	Registered Financial Planner	CFP	89	4.5	1	0	Active	Level 2	Adam Blue	Financial Advisor	Good at building client relationships.	
82	Yara Purple	NOP Ltd	QRS Corp	Master's	Education	Registered Nurse	ANA	86	4.4	2	1	Active	Level 1	Bella Pink	Manager	Good at managing staff, organized.	
83	Zoe Yellow	ZAB Inc	CCD Corp	PhD	Physics	Chartered Accountant	ICAEW	91	4.7	0	0	Active	Level 3	Charlie Green	Senior Accountant	Highly accurate, excellent attention to detail.	
84	Adam Blue	DEF Ltd	GHI Corp	Associate's	Customer Service	Firefighter	IFPE	84	4.3	2	1	Active	Level 1	Diana Red	Supervisor	Good at customer interaction, reliable.	
85	Bella Pink	JKL Inc	MNO Corp	Bachelor's	Software Development	Registered Teacher	QTS	90	4.7	0	0	Active	Level 2	Ethan Blue	Head Teacher	Excellent teacher, innovative in the classroom.	
86	Charlie Green	PQR Ltd	STU Corp	Master's	Public Health	Registered Dietitian	RD	87	4.6	1	0	Active	Level 1	Fiona Yellow	Manager	Good at working with teams, detail-oriented.	
87	Diana Red	VWX Inc	YZA Corp	PhD	Biotechnology	Chartered Engineer	ICE	93	4.8	0	0	Active	Level 3	George Purple	Senior Engineer	Highly technical, excellent problem solver.	
88	Ethan Blue	BCD Ltd	EFG Corp	Associate's	Administrative Support	Police Officer	PPS	82	4.1	3	2	Active	Level 1	Hannah Green	Officer	Good at handling difficult situations.	
89	Fiona Yellow	HIJ Inc	KLM Corp	Bachelor's	Marketing	Registered Financial Planner	CFP	89	4.5	1	0	Active	Level 2	Ian Blue	Financial Advisor	Good at building client relationships.	
90	George Purple	NOP Ltd	QRS Corp	Master's	Education	Registered Nurse	ANA	86	4.4	2	1	Active	Level 1	Jane Pink	Manager	Good at managing staff, organized.	
91	Hannah Green	ZAB Inc	CCD Corp	PhD	Physics	Chartered Accountant	ICAEW	91	4.7	0	0	Active	Level 3	Kyle Yellow	Senior Accountant	Highly accurate, excellent attention to detail.	
92	Ian Blue	DEF Ltd	GHI Corp	Associate's	Customer Service	Firefighter	IFPE	84	4.3	2	1	Active	Level 1	Laura Red	Supervisor	Good at customer interaction, reliable.	
93	Jane Pink	JKL Inc	MNO Corp	Bachelor's	Software Development	Registered Teacher	QTS	90	4.7	0	0	Active	Level 2	Mark Blue	Head Teacher	Excellent teacher, innovative in the classroom.	
94	Kyle Yellow	PQR Ltd	STU Corp	Master's	Public Health	Registered Dietitian	RD	87	4.6	1	0	Active	Level 1	Nancy Green	Manager	Good at working with teams, detail-oriented.	
95	Laura Red	VWX Inc	YZA Corp	PhD	Biotechnology	Chartered Engineer	ICE	93	4.8	0	0	Active	Level 3	Oscar Purple	Senior Engineer	Highly technical, excellent problem solver.	
96	Mark Blue	BCD Ltd	EFG Corp														

Project Information		Client Information		Contract Details		Financial Summary		Operational Metrics		Compliance & Risk		Reporting & Audit		Management & Approval		Notes & Comments	
Project ID	Project Name	Client Name	Client Address	Contract No.	Contract Date	Total Budget	Actual Spend	Progress %	Key Milestones	Compliance Status	Risk Level	Report Date	Audit Status	Manager	Approver	Notes	
P001	Project Alpha	Client A	123 Main St, New York, NY 10001	CA-001	2023-01-15	\$1,200,000	\$850,000	70%	Milestone 1: Planning	Compliant	Low	2023-03-10	Audited	J. Doe	M. Smith	Initial planning phase complete.	
P002	Project Beta	Client B	456 Elm St, Los Angeles, CA 90001	CB-002	2023-02-01	\$950,000	\$600,000	63%	Milestone 2: Development	Compliant	Medium	2023-03-10	Audited	A. Lee	K. Brown	Development progress on track.	
P003	Project Gamma	Client C	789 Oak St, Chicago, IL 60601	CC-003	2023-02-10	\$1,500,000	\$1,100,000	73%	Milestone 3: Testing	Compliant	Low	2023-03-10	Audited	S. Kim	L. White	Testing phase initiated.	
P004	Project Delta	Client D	101 Pine St, San Francisco, CA 94101	CD-004	2023-03-01	\$800,000	\$550,000	68%	Milestone 4: Deployment	Compliant	Medium	2023-03-10	Audited	R. Garcia	N. Taylor	Deployment preparation underway.	
P005	Project Epsilon	Client E	202 Cedar St, Miami, FL 33101	CE-005	2023-03-15	\$1,100,000	\$700,000	63%	Milestone 1: Planning	Compliant	Low	2023-03-10	Audited	D. Wilson	P. Martinez	Planning phase complete.	
P006	Project Zeta	Client F	303 Birch St, Seattle, WA 98101	CF-006	2023-04-01	\$900,000	\$500,000	55%	Milestone 2: Development	Compliant	Medium	2023-03-10	Audited	C. Davis	H. Evans	Development progress on track.	
P007	Project Eta	Client G	404 Maple St, Boston, MA 02101	CG-007	2023-04-10	\$1,300,000	\$900,000	69%	Milestone 3: Testing	Compliant	Low	2023-03-10	Audited	B. Miller	G. Scott	Testing phase initiated.	
P008	Project Theta	Client H	505 Spruce St, Denver, CO 80201	CH-008	2023-05-01	\$750,000	\$450,000	60%	Milestone 4: Deployment	Compliant	Medium	2023-03-10	Audited	F. Adams	I. Baker	Deployment preparation underway.	
P009	Project Iota	Client I	606 Ash St, Portland, OR 97201	CI-009	2023-05-15	\$1,050,000	\$650,000	61%	Milestone 1: Planning	Compliant	Low	2023-03-10	Audited	E. Nelson	J. Phillips	Planning phase complete.	
P010	Project Kappa	Client J	707 Hickory St, Phoenix, AZ 85001	CJ-010	2023-06-01	\$850,000	\$480,000	56%	Milestone 2: Development	Compliant	Medium	2023-03-10	Audited	M. King	O. Wright	Development progress on track.	
P011	Project Lambda	Client K	808 Walnut St, San Diego, CA 92101	CK-011	2023-06-10	\$1,250,000	\$800,000	64%	Milestone 3: Testing	Compliant	Low	2023-03-10	Audited	L. Green	Q. Young	Testing phase initiated.	
P012	Project Mu	Client L	909 Cherry St, Dallas, TX 75201	CL-012	2023-07-01	\$980,000	\$580,000	59%	Milestone 4: Deployment	Compliant	Medium	2023-03-10	Audited	V. Hill	R. Scott	Deployment preparation underway.	
P013	Project Nu	Client M	1010 Peach St, Houston, TX 77001	CM-013	2023-07-15	\$1,150,000	\$750,000	65%	Milestone 1: Planning	Compliant	Low	2023-03-10	Audited	T. Allen	S. King	Planning phase complete.	
P014	Project Xi	Client N	1111 Apple St, New Orleans, LA 70101	CN-014	2023-08-01	\$880,000	\$490,000	55%	Milestone 2: Development	Compliant	Medium	2023-03-10	Audited	W. Baker	D. Green	Development progress on track.	
P015	Project Omicron	Client O	1212 Banana St, Las Vegas, NV 89101	CO-015	2023-08-15	\$1,000,000	\$600,000	60%	Milestone 3: Testing	Compliant	Low	2023-03-10	Audited	K. Brown	F. Hill	Testing phase initiated.	
P016	Project Pi	Client P	1313 Cantaloupe St, Salt Lake City, UT 84101	CP-016	2023-09-01	\$920,000	\$520,000	56%	Milestone 4: Deployment	Compliant	Medium	2023-03-10	Audited	G. Scott	M. Taylor	Deployment preparation underway.	
P017	Project Rho	Client Q	1414 Dragonfruit St, San Jose, CA 95101	CQ-017	2023-09-15	\$1,080,000	\$680,000	62%	Milestone 1: Planning	Compliant	Low	2023-03-10	Audited	N. White	P. Young	Planning phase complete.	
P018	Project Sigma	Client R	1515 Fig St, San Antonio, TX 78201	CR-018	2023-10-01	\$800,000	\$450,000	56%	Milestone 2: Development	Compliant	Medium	2023-03-10	Audited	C. Davis	R. Scott	Development progress on track.	
P019	Project Tau	Client S	1616 Grape St, Fort Worth, TX 76101	CS-019	2023-10-15	\$1,120,000	\$720,000	64%	Milestone 3: Testing	Compliant	Low	2023-03-10	Audited	L. Green	S. King	Testing phase initiated.	
P020	Project Upsilon	Client T	1717 Honeydew St, Austin, TX 78701	CT-020	2023-11-01	\$950,000	\$550,000	58%	Milestone 4: Deployment	Compliant	Medium	2023-03-10	Audited	V. Hill	R. Scott	Deployment preparation underway.	



Project Overview										Financial Summary										Operational Metrics										Compliance & Risk										Reporting & Audit									
Project Details					Budget & Spend					Revenue & Profit					Production & Quality					Inventory & Logistics					Safety & Health					Environmental					Legal & Regulatory					Internal Controls					External Audits				
Item ID	Description	Category	Unit	Quantity	Unit Price	Total Price	Allocated Budget	Actual Spend	Variance	Revenue	Cost	Gross Profit	Units Produced	Defect Rate	Inventory Level	Logistics Cost	Safety Incidents	Health Incidents	Environmental Incidents	Legal Incidents	Regulatory Incidents	Internal Audit Score	External Audit Score	Compliance Score	Risk Level	Control Effectiveness	Audit Frequency	Audit Findings	Resolution Status																				
001	Raw Material A	Materials	kg	1000	1.50	1500.00	1500.00	1500.00	0.00	0.00	1500.00	-1500.00	1000	0.05%	1000	50.00	0	0	0	0	0	95	98	96.5	Low	High	Quarterly	Minor discrepancies in inventory counts	Resolved																				
002	Raw Material B	Materials	kg	800	2.00	1600.00	1600.00	1600.00	0.00	0.00	1600.00	-1600.00	800	0.08%	800	60.00	0	0	0	0	0	92	96	94.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
003	Raw Material C	Materials	kg	600	3.00	1800.00	1800.00	1800.00	0.00	0.00	1800.00	-1800.00	600	0.10%	600	70.00	0	0	0	0	0	90	94	92.0	Medium	Medium	Quarterly	Minor quality issues in production	Resolved																				
004	Raw Material D	Materials	kg	400	4.00	1600.00	1600.00	1600.00	0.00	0.00	1600.00	-1600.00	400	0.12%	400	80.00	0	0	0	0	0	88	92	90.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
005	Raw Material E	Materials	kg	200	5.00	1000.00	1000.00	1000.00	0.00	0.00	1000.00	-1000.00	200	0.15%	200	90.00	0	0	0	0	0	85	90	87.5	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
006	Raw Material F	Materials	kg	100	6.00	600.00	600.00	600.00	0.00	0.00	600.00	-600.00	100	0.18%	100	100.00	0	0	0	0	0	82	88	85.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
007	Raw Material G	Materials	kg	50	7.00	350.00	350.00	350.00	0.00	0.00	350.00	-350.00	50	0.20%	50	110.00	0	0	0	0	0	80	86	83.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
008	Raw Material H	Materials	kg	25	8.00	200.00	200.00	200.00	0.00	0.00	200.00	-200.00	25	0.22%	25	120.00	0	0	0	0	0	78	84	81.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
009	Raw Material I	Materials	kg	10	9.00	90.00	90.00	90.00	0.00	0.00	90.00	-90.00	10	0.25%	10	130.00	0	0	0	0	0	75	82	78.5	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
010	Raw Material J	Materials	kg	5	10.00	50.00	50.00	50.00	0.00	0.00	50.00	-50.00	5	0.28%	5	140.00	0	0	0	0	0	72	80	76.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
011	Raw Material K	Materials	kg	2	11.00	22.00	22.00	22.00	0.00	0.00	22.00	-22.00	2	0.30%	2	150.00	0	0	0	0	0	70	78	74.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
012	Raw Material L	Materials	kg	1	12.00	12.00	12.00	12.00	0.00	0.00	12.00	-12.00	1	0.32%	1	160.00	0	0	0	0	0	68	76	72.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
013	Raw Material M	Materials	kg	0.5	13.00	6.50	6.50	6.50	0.00	0.00	6.50	-6.50	0.5	0.35%	0.5	170.00	0	0	0	0	0	65	74	69.5	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
014	Raw Material N	Materials	kg	0.2	14.00	2.80	2.80	2.80	0.00	0.00	2.80	-2.80	0.2	0.38%	0.2	180.00	0	0	0	0	0	62	72	67.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
015	Raw Material O	Materials	kg	0.1	15.00	1.50	1.50	1.50	0.00	0.00	1.50	-1.50	0.1	0.40%	0.1	190.00	0	0	0	0	0	60	70	65.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
016	Raw Material P	Materials	kg	0.05	16.00	0.80	0.80	0.80	0.00	0.00	0.80	-0.80	0.05	0.42%	0.05	200.00	0	0	0	0	0	58	68	63.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
017	Raw Material Q	Materials	kg	0.02	17.00	0.34	0.34	0.34	0.00	0.00	0.34	-0.34	0.02	0.45%	0.02	210.00	0	0	0	0	0	55	65	60.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
018	Raw Material R	Materials	kg	0.01	18.00	0.18	0.18	0.18	0.00	0.00	0.18	-0.18	0.01	0.48%	0.01	220.00	0	0	0	0	0	52	62	57.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
019	Raw Material S	Materials	kg	0.005	19.00	0.095	0.095	0.095	0.00	0.00	0.095	-0.095	0.005	0.50%	0.005	230.00	0	0	0	0	0	50	60	55.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
020	Raw Material T	Materials	kg	0.002	20.00	0.04	0.04	0.04	0.00	0.00	0.04	-0.04	0.002	0.52%	0.002	240.00	0	0	0	0	0	48	58	53.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
021	Raw Material U	Materials	kg	0.001	21.00	0.021	0.021	0.021	0.00	0.00	0.021	-0.021	0.001	0.55%	0.001	250.00	0	0	0	0	0	45	55	50.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
022	Raw Material V	Materials	kg	0.0005	22.00	0.011	0.011	0.011	0.00	0.00	0.011	-0.011	0.0005	0.58%	0.0005	260.00	0	0	0	0	0	42	52	47.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
023	Raw Material W	Materials	kg	0.0002	23.00	0.0046	0.0046	0.0046	0.00	0.00	0.0046	-0.0046	0.0002	0.60%	0.0002	270.00	0	0	0	0	0	40	50	45.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
024	Raw Material X	Materials	kg	0.0001	24.00	0.0024	0.0024	0.0024	0.00	0.00	0.0024	-0.0024	0.0001	0.62%	0.0001	280.00	0	0	0	0	0	38	48	43.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
025	Raw Material Y	Materials	kg	0.00005	25.00	0.00125	0.00125	0.00125	0.00	0.00	0.00125	-0.00125	0.00005	0.65%	0.00005	290.00	0	0	0	0	0	35	45	40.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
026	Raw Material Z	Materials	kg	0.00002	26.00	0.00052	0.00052	0.00052	0.00	0.00	0.00052	-0.00052	0.00002	0.68%	0.00002	300.00	0	0	0	0	0	32	42	37.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
027	Raw Material AA	Materials	kg	0.00001	27.00	0.00027	0.00027	0.00027	0.00	0.00	0.00027	-0.00027	0.00001	0.70%	0.00001	310.00	0	0	0	0	0	30	40	35.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
028	Raw Material AB	Materials	kg	0.000005	28.00	0.00014	0.00014	0.00014	0.00	0.00	0.00014	-0.00014	0.000005	0.72%	0.000005	320.00	0	0	0	0	0	28	38	33.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
029	Raw Material AC	Materials	kg	0.000002	29.00	0.000058	0.000058	0.000058	0.00	0.00	0.000058	-0.000058	0.000002	0.75%	0.000002	330.00	0	0	0	0	0	25	35	30.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
030	Raw Material AD	Materials	kg	0.000001	30.00	0.00003	0.00003	0.00003	0.00	0.00	0.00003	-0.00003	0.000001	0.78%	0.000001	340.00	0	0	0	0	0	22	32	27.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
031	Raw Material AE	Materials	kg	0.0000005	31.00	0.0000155	0.0000155	0.0000155	0.00	0.00	0.0000155	-0.0000155	0.0000005	0.80%	0.0000005	350.00	0	0	0	0	0	20	30	25.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
032	Raw Material AF	Materials	kg	0.0000002	32.00	0.0000064	0.0000064	0.0000064	0.00	0.00	0.0000064	-0.0000064	0.0000002	0.82%	0.0000002	360.00	0	0	0	0	0	18	28	23.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
033	Raw Material AG	Materials	kg	0.0000001	33.00	0.0000033	0.0000033	0.0000033	0.00	0.00	0.0000033	-0.0000033	0.0000001	0.85%	0.0000001	370.00	0	0	0	0	0	15	25	20.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
034	Raw Material AH	Materials	kg	0.00000005	34.00	0.0000017	0.0000017	0.0000017	0.00	0.00	0.0000017	-0.0000017	0.00000005	0.88%	0.00000005	380.00	0	0	0	0	0	12	22	17.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
035	Raw Material AI	Materials	kg	0.00000002	35.00	0.0000007	0.0000007	0.0000007	0.00	0.00	0.0000007	-0.0000007	0.00000002	0.90%	0.00000002	390.00	0	0	0	0	0	10	20	15.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
036	Raw Material AJ	Materials	kg	0.00000001	36.00	0.00000036	0.00000036	0.00000036	0.00	0.00	0.00000036	-0.00000036	0.00000001	0.92%	0.00000001	400.00	0	0	0	0	0	8	18	13.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
037	Raw Material AK	Materials	kg	0.000000005	37.00	0.000000185	0.000000185	0.000000185	0.00	0.00	0.000000185	-0.000000185	0.000000005	0.95%	0.000000005	410.00	0	0	0	0	0	5	15	10.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
038	Raw Material AL	Materials	kg	0.000000002	38.00	0.000000076	0.000000076	0.000000076	0.00	0.00	0.000000076	-0.000000076	0.000000002	0.98%	0.000000002	420.00	0	0	0	0	0	3	12	7.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
039	Raw Material AM	Materials	kg	0.000000001	39.00	0.000000039	0.000000039	0.000000039	0.00	0.00	0.000000039	-0.000000039	0.000000001	1.00%	0.000000001	430.00	0	0	0	0	0	2	10	5.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
040	Raw Material AN	Materials	kg	0.0000000005	40.00	0.00000002	0.00000002	0.00000002	0.00	0.00	0.00000002	-0.00000002	0.0000000005	1.02%	0.0000000005	440.00	0	0	0	0	0	1	8	3.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																				
041	Raw Material AO	Materials	kg	0.0000000002	41.00	0.0000000082	0.0000000082	0.0000000082	0.00	0.00	0.0000000082	-0.0000000082	0.0000000002	1.05%	0.0000000002	450.00	0	0	0	0	0	0	5	2.0	1.0	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																			
042	Raw Material AP	Materials	kg	0.0000000001	42.00	0.0000000042	0.0000000042	0.0000000042	0.00	0.00	0.0000000042	-0.0000000042	0.0000000001	1.08%	0.0000000001	460.00	0	0	0	0	0	0	2	1.0	0.5	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																			
043	Raw Material AQ	Materials	kg	0.00000000005	43.00	0.00000000215	0.00000000215	0.00000000215	0.00	0.00	0.00000000215	-0.00000000215	0.00000000005	1.10%	0.00000000005	470.00	0	0	0	0	0	0	1	0.5	0.2	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																			
044	Raw Material AR	Materials	kg	0.00000000002	44.00	0.00000000088	0.00000000088	0.00000000088	0.00	0.00	0.00000000088	-0.00000000088	0.00000000002	1.12%	0.00000000002	480.00	0	0	0	0	0	0	0	0.5	0.1	0.1	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																		
045	Raw Material AS	Materials	kg	0.00000000001	45.00	0.00000000045	0.00000000045	0.00000000045	0.00	0.00	0.00000000045	-0.00000000045	0.00000000001	1.15%	0.00000000001	490.00	0	0	0	0	0	0	0	0.2	0.05	0.05	Medium	Medium	Quarterly	Consistent quality issues in production	Resolved																		
046	Raw Material AT																																																



[illegible]

Project ID	Project Name	Project Manager	Project Sponsor	Project Status	Project Location	Project Dates	Project Budget	Project Team	Project Risks	Project Notes	Project ID	Project Name	Project Manager	Project Sponsor	Project Status	Project Location	Project Dates	Project Budget	Project Team	Project Risks	Project Notes	Project ID	Project Name	Project Manager	Project Sponsor	Project Status	Project Location	Project Dates	Project Budget	Project Team	Project Risks	Project Notes	Project ID	Project Name	Project Manager	Project Sponsor	Project Status	Project Location	Project Dates	Project Budget	Project Team	Project Risks	Project Notes	Project ID	Project Name	Project Manager	Project Sponsor	Project Status	Project Location	Project Dates	Project Budget	Project Team	Project Risks	Project Notes																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
001	Project Alpha	John Doe	Jane Smith	Completed	New York	2023-01-01 to 2023-03-31	\$1,000,000	John Doe, Jane Smith, Bob Johnson	Low	Project Alpha was completed successfully on time and within budget.	002	Project Beta	Jane Smith	John Doe	In Progress	Los Angeles	2023-04-01 to 2023-06-30	\$2,500,000	Jane Smith, John Doe, Bob Johnson, Alice Brown	Medium	Project Beta is currently in progress, with some delays in the timeline.	003	Project Gamma	Bob Johnson	Jane Smith	On Hold	Chicago	2023-07-01 to 2023-09-30	\$1,500,000	Bob Johnson, Jane Smith	Medium	Project Gamma is on hold due to budget constraints.	004	Project Delta	Jane Smith	John Doe	Completed	San Francisco	2023-10-01 to 2023-12-31	\$3,000,000	Jane Smith, John Doe, Bob Johnson, Alice Brown	Low	Project Delta was completed successfully on time and within budget.	005	Project Epsilon	John Doe	Jane Smith	On Hold	London	2024-01-01 to 2024-03-31	\$2,000,000	John Doe, Jane Smith	High	Project Epsilon is on hold due to technical challenges.	006	Project Zeta	Jane Smith	John Doe	In Progress	Paris	2024-04-01 to 2024-06-30	\$1,800,000	Jane Smith, John Doe, Bob Johnson, Alice Brown	Medium	Project Zeta is currently in progress, with some delays in the timeline.	007	Project Eta	Bob Johnson	Jane Smith	On Hold	Madrid	2024-07-01 to 2024-09-30	\$1,200,000	Bob Johnson, Jane Smith	Medium	Project Eta is on hold due to resource availability.	008	Project Theta	Jane Smith	John Doe	Completed	Rome	2024-10-01 to 2024-12-31	\$2,200,000	Jane Smith, John Doe, Bob Johnson, Alice Brown	Low	Project Theta was completed successfully on time and within budget.	009	Project Iota	John Doe	Jane Smith	On Hold	Amsterdam	2025-01-01 to 2025-03-31	\$1,600,000	John Doe, Jane Smith	High	Project Iota is on hold due to market conditions.	010	Project Kappa	Jane Smith	John Doe	In Progress	Stockholm	2025-04-01 to 2025-06-30	\$1,400,000	Jane Smith, John Doe, Bob Johnson, Alice Brown	Medium	Project Kappa is currently in progress, with some delays in the timeline.	011	Project Lambda	Bob Johnson	Jane Smith	On Hold	Oslo	2025-07-01 to 2025-09-30	\$1,100,000	Bob Johnson, Jane Smith	Medium	Project Lambda is on hold due to regulatory changes.	012	Project Mu	Jane Smith	John Doe	Completed	Warsaw	2025-10-01 to 2025-12-31	\$1,300,000	Jane Smith, John Doe, Bob Johnson, Alice Brown	Low	Project Mu was completed successfully on time and within budget.	013	Project Nu	John Doe	Jane Smith	On Hold	Berlin	2026-01-01 to 2026-03-31	\$1,700,000	John Doe, Jane Smith	High	Project Nu is on hold due to economic factors.	014	Project Xi	Jane Smith	John Doe	In Progress	Vienna	2026-04-01 to 2026-06-30	\$1,500,000	Jane Smith, John Doe, Bob Johnson, Alice Brown	Medium	Project Xi is currently in progress, with some delays in the timeline.	015	Project Omicron	Bob Johnson	Jane Smith	On Hold	Prague	2026-07-01 to 2026-09-30	\$1,000,000	Bob Johnson, Jane Smith	Medium	Project Omicron is on hold due to political instability.	016	Project Pi	Jane Smith	John Doe	Completed	Brussels	2026-10-01 to 2026-12-31	\$1,200,000	Jane Smith, John Doe, Bob Johnson, Alice Brown	Low	Project Pi was completed successfully on time and within budget.	017	Project Rho	John Doe	Jane Smith	On Hold	Lisbon	2027-01-01 to 2027-03-31	\$1,400,000	John Doe, Jane Smith	High	Project Rho is on hold due to environmental concerns.	018	Project Sigma	Jane Smith	John Doe	In Progress	Madrid	2027-04-01 to 2027-06-30	\$1,600,000	Jane Smith, John Doe, Bob Johnson, Alice Brown	Medium	Project Sigma is currently in progress, with some delays in the timeline.	019	Project Tau	Bob Johnson	Jane Smith	On Hold	Amsterdam	2027-07-01 to 2027-09-30	\$1,300,000	Bob Johnson, Jane Smith	Medium	Project Tau is on hold due to technological advancements.	020	Project Upsilon	Jane Smith	John Doe	Completed	Stockholm	2027-10-01 to 2027-12-31	\$1,100,000	Jane Smith, John Doe, Bob Johnson, Alice Brown	Low	Project Upsilon was completed successfully on time and within budget.	021	Project Phi	John Doe	Jane Smith	On Hold	Oslo	2028-01-01 to 2028-03-31	\$1,500,000	John Doe, Jane Smith	High	Project Phi is on hold due to social changes.	022	Project Chi	Jane Smith	John Doe	In Progress	Warsaw	2028-04-01 to 2028-06-30	\$1,400,000	Jane Smith, John Doe, Bob Johnson, Alice Brown	Medium	Project Chi is currently in progress, with some delays in the timeline.	023	Project Psi	Bob Johnson	Jane Smith	On Hold	Berlin	2028-07-01 to 2028-09-30	\$1,200,000	Bob Johnson, Jane Smith	Medium	Project Psi is on hold due to environmental regulations.	024	Project Omega	Jane Smith	John Doe	Completed	Vienna	2028-10-01 to 2028-12-31	\$1,300,000	Jane Smith, John Doe, Bob Johnson, Alice Brown	Low	Project Omega was completed successfully on time and within budget.	025	Project A	John Doe	Jane Smith	On Hold	Prague	2029-01-01 to 2029-03-31	\$1,600,000	John Doe, Jane Smith	High	Project A is on hold due to political factors.	026	Project B	Jane Smith	John Doe	In Progress	Brussels	2029-04-01 to 2029-06-30	\$1,500,000	Jane Smith, John Doe, Bob Johnson, Alice Brown	Medium	Project B is currently in progress, with some delays in the timeline.	027	Project C	Bob Johnson	Jane Smith	On Hold	Lisbon	2029-07-01 to 2029-09-30	\$1,400,000	Bob Johnson, Jane Smith	Medium	Project C is on hold due to economic challenges.	028	Project D	Jane Smith	John Doe	Completed	Madrid	2029-10-01 to 2029-12-31	\$1,200,000	Jane Smith, John Doe, Bob Johnson, Alice Brown	Low	Project D was completed successfully on time and within budget.	029	Project E	John Doe	Jane Smith	On Hold	Amsterdam	2030-01-01 to 2030-03-31	\$1,700,000	John Doe, Jane Smith	High	Project E is on hold due to technological hurdles.	030	Project F	Jane Smith	John Doe	In Progress	Stockholm	2030-04-01 to 2030-06-30	\$1,600,000	Jane Smith, John Doe, Bob Johnson, Alice Brown	Medium	Project F is currently in progress, with some delays in the timeline.	031	Project G	Bob Johnson	Jane Smith	On Hold	Oslo	2030-07-01 to 2030-09-30	\$1,300,000	Bob Johnson, Jane Smith	Medium	Project G is on hold due to social factors.	032	Project H	Jane Smith	John Doe	Completed	Warsaw	2030-10-01 to 2030-12-31	\$1,400,000	Jane Smith, John Doe, Bob Johnson, Alice Brown	Low	Project H was completed successfully on time and within budget.	033	Project I	John Doe	Jane Smith	On Hold	Berlin	2031-01-01 to 2031-03-31	\$1,500,000	John Doe, Jane Smith	High	Project I is on hold due to environmental issues.	034	Project J	Jane Smith	John Doe	In Progress	Vienna	2031-04-01 to 2031-06-30	\$1,300,000	Jane Smith, John Doe, Bob Johnson, Alice Brown	Medium	Project J is currently in progress, with some delays in the timeline.	035	Project K										036	Project L											037	Project M											038	Project N											039	Project O											040	Project P											041	Project Q											042	Project R											043	Project S											044	Project T											045	Project U											046	Project V											047	Project W											048	Project X											049	Project Y											050	Project Z										







Only the last entry from each user counts for stats to improve the accuracy.

Daily charge level effect on degradation					
Daily charge level	How many users selected this answer?	How many of those are above the trendline?	Users above trendline	Users below trendline	Comparing which answer is better for the battery. Green shows people above the trendline. Red shows below.
50%	5	3	60.00%	40.00%	<div><div></div></div>
60%	13	9	69.23%	30.77%	<div><div></div></div>
70%	36	20	55.56%	44.44%	<div><div></div></div>
80%	124	74	59.68%	40.32%	<div><div></div></div>
90%	179	108	60.34%	39.66%	<div><div></div></div>
100%	3	2	66.67%	33.33%	<div><div></div></div>
Total	360 users	According to the data, there is no clear difference between charging to 60%, 70%, 80% or 90%.			

Supercharging frequency effect on degradation					
Supercharging frequency	How many users selected this answer?	How many of those are above the trendline?	Users above trendline	Users below trendline	Comparing which answer is better for the battery. Green shows people above the trendline. Red shows below.
A) daily	12	10	83.33%	16.67%	<div><div></div></div>
B) twice a week	28	15	53.57%	46.43%	<div><div></div></div>
C) weekly	49	28	57.14%	42.86%	<div><div></div></div>
D) twice a month	93	65	69.89%	30.11%	<div><div></div></div>
E) monthly	92	51	55.43%	44.57%	<div><div></div></div>
F) a few times a year	93	51	54.84%	45.16%	<div><div></div></div>
G) once or twice a year	4	3	75.00%	25.00%	<div><div></div></div>
H) never	3	2	66.67%	33.33%	<div><div></div></div>
Total	374 users	Supercharging more or less frequently doesn't seem to make a difference to degradation.			

Supercharger Use				
Supercharging frequency	How many users selected this answer?	Percentage of users	Per year	Total sessions
A) daily	12	3.2%	365	4380
B) twice a week	28	7.5%	104	2912
C) weekly	49	13.1%	52	2548
D) twice a month	93	24.9%	24	2232
E) monthly	92	24.6%	12	1104
F) a few times a year	93	24.9%	6	558
G) once or twice a year	4	1.1%	2	6
H) never	3	0.8%	0	0
Total	374 users			13740
Average Supercharger Use	36.7 times/year (13740 sessions / 374 users = 36.7)			

100% charge frequency effect on degradation					
100% charge frequency	How many users selected this answer?	How many of those are above the trendline?	Users above trendline	Users below trendline	Comparing which answer is better for the battery. Green shows people above the trendline. Red shows below.
A) daily	2	1	50.00%	50.00%	<div><div></div></div>

**1. Why not compare each users remaining battery capacity instead checking whether the users are above or below the trendline?**

It's because each user's mileage is different. Comparing their absolute battery capacity wouldn't make sense. But comparing users to the trendline tells us how the user is doing regardless his mileage. The trendline is the red line on charts page on the mileage/range chart. If you select your username on charts page, you can see if you are above or below the trendline. However, if you want to know exactly how much above or below you are, you can look at the table where you entered your data. Near the end of columns look for a column called "Your capacity minus chart trendline at this mileage."

**2. Why do these graphs ignore how much above or below the trendline each user is and only considers whether a user is above or below the trendline?**

Here is an example to explain the reason: Let's assume the following people said "twice a week" when asked about their supercharging frequency and their battery capacity was as follows:

John: 1.7% above trendline  
James: 0.5% above trendline  
Jane: 0.6% above trendline  
Jennifer: -3.2% below trendline

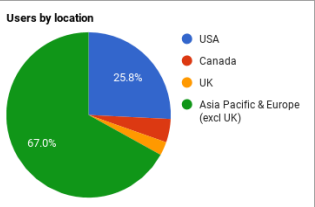
The average of their percentage numbers is -0.1 below the trendline. That would mean supercharging twice a week would be bad for the battery. However this would be wrong because 3 out of 4 people are above the trendline which means 75% of users are above the trendline. This would be represented with a line chart that is 75% green and 25% red.

B) twice a week	3	1	33.33%	66.67%	<div><div></div></div>
C) weekly	12	9	75.00%	25.00%	<div><div></div></div>
D) twice a month	36	22	61.11%	38.89%	<div><div></div></div>
E) monthly	90	55	61.11%	38.89%	<div><div></div></div>
F) a few times a year	176	100	56.82%	43.18%	<div><div></div></div>
G) once or twice a year	45	30	66.67%	33.33%	<div><div></div></div>
H) never	9	7	77.78%	22.22%	<div><div></div></div>
Total	373 users	According to the data, charging to 100% more frequently doesn't have a negative effect on degradation but users should be aware that keeping the battery at 0% or 100% for more than 2 hours is not good for the battery. Answers that have too few entries can be ignored.			

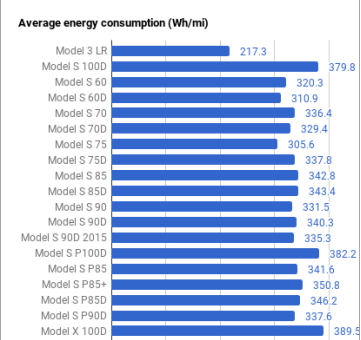
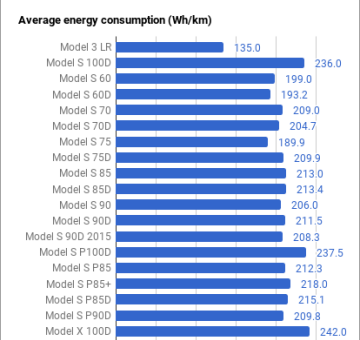
Near full discharge (8km/5mi or less) frequency effect on degradation

Near full discharge frequency	How many users selected this answer?	How many of those are above the trendline?	Users above trendline	Users below trendline	Comparing which answer is better for the battery. Green shows people above the trendline. Red shows below.
A) daily	0	0	0.00%	0.00%	
B) twice a week	0	0	0.00%	0.00%	
C) weekly	4	1	25.00%	75.00%	<div><div></div></div>
D) twice a month	12	7	58.33%	41.67%	<div><div></div></div>
E) monthly	23	15	65.22%	34.78%	<div><div></div></div>
F) a few times a year	105	57	54.29%	45.71%	<div><div></div></div>
G) once or twice a year	98	56	57.14%	42.86%	<div><div></div></div>
H) never	131	88	67.18%	32.82%	<div><div></div></div>
Total	373 users	Answers that have too few entries are less accurate and can be ignored. If we ignore the 'weekly' row and look at the rest, it shows a downward trend as the frequency increases. Therefore according to the data, near full discharge is bad for the battery.			

Users by location	
USA	107
Canada	19
UK	11
Asia Pacific & Europe (excl UK)	278
Total	415 users

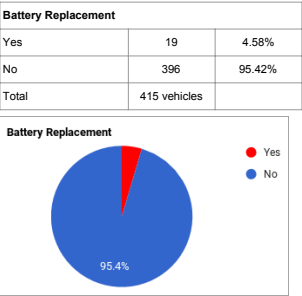


Vehicle Stats										
Model	Number of vehicles	Avr energy consumption (Wh/km)	Avr energy consumption (Wh/mi)	Usable battery capacity when new (Wh)	Average real world range when new (km)	Average real world range when new (mi)	Typical range when new (km)	EPA rated range when new (mi)	Avg real world range/Typical range	Avg real world range/EPA rated range
Model 3 LR	1	135.0	217.3	78270	579.8	360.3	499	310	116.19%	116.23%
Model S 100D	4	236.0	379.8	98400	416.9	259.1	515	335	80.95%	77.34%
Model S 60	17	199.0	320.3	58500	294.0	182.7	289	210	101.73%	87.00%
Model S 60D	5	193.2	310.9	58500	302.8	188.1	333	222	90.93%	84.73%
Model S 70	6	209.0	336.4	68800	329.2	204.5	360	234	91.44%	87.39%
Model S 70D	18	204.7	329.4	68800	336.2	208.9	365	243	92.11%	85.97%
Model S 75	15	189.9	305.6	73200	385.5	239.5	386	249	99.87%	96.18%
Model S 75D	16	209.9	337.8	73200	348.8	216.7	388	262	89.90%	82.71%
Model S 85	112	213.0	342.8	77500	363.8	226.1	400	269	90.95%	84.05%
Model S 85D	40	213.4	343.4	77500	363.2	225.7	430	273	84.47%	82.67%





Model S 90	2	206.0	331.5	81800	397.1	246.7	425	280	93.44%	88.11%
Model S 90D	44	211.5	340.3	81800	386.8	240.4	452	295	85.58%	81.49%
Model S 90D 2015	6	208.3	335.3	81800	392.6	244.0	432	280	90.88%	87.14%
Model S P100D	3	237.5	382.2	98400	414.4	257.5	488	317	84.92%	81.23%
Model S P85	57	212.3	341.6	77500	365.1	226.9	400	269	91.28%	84.35%
Model S P85+	11	218.0	350.8	77500	355.5	220.9	400	269	88.88%	82.12%
Model S P85D	20	215.1	346.2	77500	360.3	223.9	408	256	88.31%	87.46%
Model S P90D	4	209.8	337.6	81800	390.0	242.3	417	274	93.53%	88.43%
Model X 100D	7	242.0	389.5	98400	406.6	252.7	453	295	89.76%	85.66%
Model X 60D	1	215.0	346.0	62400	290.2	180.3	unknown	200		90.15%
Model X 75D	1	238.0	383.0	73200	307.6	191.1	334	237	92.10%	80.63%
Model X 90D	8	235.0	378.2	81800	348.1	216.3	405	260	85.95%	83.19%
Model X P90D	1	261.0	420.0	81800	313.4	194.7	384	250	81.61%	77.88%



Historical Stats for Battery Replacement			
Vehicles that had a battery replacement			
1 Jul 2015	9.2%	01 Oct 2017	4.7%
1 Oct 2015	8.5%	01 Jan 2018	4.0%
1 Jan 2016	7.1%		
1 Apr 2016	6.2%		
1 Jul 2016	6.6%		
1 Oct 2016	6.1%		
1 Jan 2017	5.8%		
1 Apr 2017	5.6%		
1 Jul 2017	5.3%		

How to enter your data: Select the correct tab, scroll down to the first available row and start typing. After you are done, select your username on the Charts tab.				These columns are for		
TMC topic in Dutch		<a href="https://teslamotorsclub.com/tmc/threads/maxrange.35978/">https://teslamotorsclub.com/tmc/threads/maxrange.35978/</a>		no e no e no entry need		
				New feedback message: 1		
		Hi. Scroll down to row 160 if you want to leave a message. Thanks				
Date (double click empty cell)	Username	User Feedback (For questions, comments and feature requests)		Da (do (Fo	Da (do (Fo	
28 May 2015	justroll	is it possible to include a field that registers if the car is a STOCK or DEMO car (stock = not driven ; DEMO = low milage); since I notice that my car's battery doesn't seem to perform compared to other cars in the list		421	421	
28 May 2015	Matteo	Hi. I think you mean there are some store or demo cars among entries that perform better than expected. I checked but I can't find them after looking at mileage per day and days of ownership data. I don't know which entries you mean. If you want, give some examples and I will check again. By the way, your battery performs like other cars that have the same mileage. In fact it is almost on the trendline. When comparing your car to other cars, here are some tips: 1. Compare cars with similar mileage. 2. Don't look at typical range numbers. Instead look at percentage. Typical range changes if range mode was on or off. 3. Don't compare your typical range to 85D or P85D. They displays close to 410 km at 100%. But you can still compare percentage. 4. [Update 31 May 2015: Use charts page and select your username from droplist]		421 1. C 2. D 3. D 4. [	421 1. C 2. D 3. D 4. [	
03 Jun 2015	Mayhemm	Why are the two subsequent questions about battery replacement required, even if you answer that the battery had not been replaced?		421	421	
03 Jun 2015	Matteo	Hi Mayhemm. I will try to find a better way. [Update 3 Jun 2015: This has been changed now]		421 [Up	421 [Up	
09 Jun 2015	DavidH	My car showed 271 rated miles when new, now it shows 253. That would be about 6.5% loss. Here, after I entered my data, it shows a smaller loss as it assumes the typical range when new is 265 miles.		421	421	
10 Jun 2015	Matteo	Hi David. Thanks for your feedback. I added two more questions so we can start collecting max range when the car was new. I pre filled those for you. Change it if not correct.  Tesla might have changed the algorithm. I see that you purchased over a year ago. We need to use maximum range numbers reported from newly sold cars, or to be more specific, the chart should use 100% range numbers of new cars that are sold at the time somebody made an entry. For example if somebody bought the car 2 years ago and entered their data 6 months ago, for that entry the chart should use maximum range displayed on cars 6 months ago that were new at the time. If the same person submitted another entry today, for that entry the chart should use maximum range displayed on cars that are new now. It is getting tricky but I will think how to do this best when there is more data.  In the meantime, feel free to try the trip based calculation. There are 4 questions about any recent trip you had. If you answer those you will see another percentage showing the current state of your battery.		421  Tes  In th	421  Tes  In th	
11 Jun 2015	jpgrolle	You might want to add some question(s) on the charging speed typically used (overnight charging method?). I have been told this can also impact degradation. As a matter of fact (n=1) I have been limited to a 3,7kW charging solution and it seems that my battery is holding up relatively well (knock on wood). You could ask for the power directly, or if people may have difficulty answering that ask for number of phases and current (voltage can probably be assumed from location).		421	421	
11 Jun 2015	Matteo	Hi jpgrolle. There is a question about frequency of supercharging. Some people never supercharge. Some people supercharge weekly. Before adding more questions about charge power, we would need to show that frequency of supercharging makes a difference in degradation. Right now the data is not precise enough to see these little differences assuming they exist.		421	421	

11 Jun 2015	jpgrolle	Although more than one Tesla employee has told me slower charging is better for the battery, today I have learned it might actually be the opposite.		421	421	
11 Jun 2015	Matteo	Indeed faster charging might be better. In the video below Proff Dahn said what matters is how long the battery is subject to high temperatures during charging. Therefore if charging is quicker it would be better. During discussions about that video many Model S owners said they increased their charging power. <a href="https://www.youtube.com/watch?v=9qi03QawZEK">https://www.youtube.com/watch?v=9qi03QawZEK</a>		421	421	
12 Jun 2015	Matteo	Hi bpsmits. I noticed that you made changes on your old entry from 9 months ago. I took the new data and created a new entry for you and left the old entry the way it was. This way you can see how your data changes over time if you go to the "Charts" page and select your username. Users can enter as many entries as they wish. If you are not happy with this change let me know and I will change it back.		421	421	
31 Jul 2015	jpet	I have switched to 70% daily charging 2 months ago, based on the video of Prof Dahn. Wouldn't it be interesting to plot the daily charge percentage versus battery degradation in the Stats area?		422	422	
02 Aug 2015	Matteo	Great idea. Done! Check out stats page.		422	422	
08 Aug 2015	justroll	jpgrolle/Matteo So internal battery temperature during a 3,7kW charge could be the same as during 11kW or 22kW?		422	422	
08 Aug 2015	Matteo	Hi justroll. Yes, my guess is, regardless what charging power you use, the battery never goes over 50C. There is this screenshot of the hidden touchscreen menu that shows 50C active cooling target. <a href="http://www.teslamotorsclub.com/showthread.php/32916-Battery-cooling-while-Supercharging-and-AC?p=693246&amp;viewfull=1#post693246">http://www.teslamotorsclub.com/showthread.php/32916-Battery-cooling-while-Supercharging-and-AC?p=693246&amp;viewfull=1#post693246</a> If you watch Prof Dahn from 3:42s here <a href="https://www.youtube.com/watch?v=9qi03QawZEK#t=3m42s">https://www.youtube.com/watch?v=9qi03QawZEK#t=3m42s</a> he talks about temperature and shows a graph. In the graph there is room temperature (20C) and 60C. Even at 60C there is not much degradation. Therefore if the battery was always below 50C, charge power would make little difference.  Supercharging can reach 116 kW. If charge power makes any difference, then we should see this when looking at supercharging stats. I'm working on processing stats differently using a head count method. I think it will be more accurate. I will explain later.  Update: I have now updated the stats page. When looking at supercharge stats, it doesn't show anything bad if people supercharge frequently. I also watched Dahn's video again. At 6:32 he says "time dependant parasitic reactions". Therefore it looks like the best charging is quick and cold charging. Heat is bad and long charge is bad too.		422	422	Sup Upd Sup Upd
09 Aug 2015	Matteo	jpet, check out the new daily charge versus battery degradation stats. A few rows below on this page I explained the changes. Also there is a yellow box on stats page. According to current stats I can no longer say that charging to 70% is better than 80% or 90%. 70% and 90% are the same. Oddly 80% is higher. I think we can assume 70,80 or 90% makes no difference. You have to ignore 60% because there is only 1 person in that group.		422	422	
10 Aug 2015	justroll	matteo: Thanks; I might consider then to upgrade my chargingpower! Maybe you should include a field were we can select the charging power that we use mainly (besides SuC)?		422	422	
10 Aug 2015	Matteo	OK. Charge power seems to be a popular request so I added it.		422	422	
27 Sep 2015	justroll	any idea why this is happening ? supercharging my S85 at a SuC 100% gives mee 375km of range; but driving the car itself gives after calcing (187 wH/km in ratio with the distance & power consumption) 386km range. When charging the car at home at 100% (at 220V/13A) it gives me 377km of range but after driving the range decreases instantly.		422	422	
02 Oct 2015	Matteo	Hi justroll. I recommend that you enter your trip data to the sheet. On the data table before the comments column there are 4 columns about trip data. Fill in this data and the sheet will do a second calculation for you. It also shows the calculation in detail. You can add this data to your last entry.		422	422	
26 Oct 2015	SSc3010	Hi, I was wondering if there is a correlation between Wh/km and battery degradation? A see degradation far above average while I charge to 80-90% mostly, but my energy consumption is far below average...		423	423	



28 Oct 2015	Matteo	Hi SSc3010. I checked your entries. From February 2015 to 13 Aug 2015 your typical range was like an average user. If you open this screenshot <a href="http://i.imgur.com/nUc3hkE.gif">http://i.imgur.com/nUc3hkE.gif</a> the last column shows how your typical range compares to an average user with same mileage. Until 13 Aug 2015, your range was average user but on 15 Sep 2015, you suddenly dropped -3.31%. It looks like something happened between 13 Aug 2015 and 15 Sep 2015. Unless you left the battery at 0% or 100% for long time, I don't think the sudden drop would happen because a damage caused by a change in chemistry inside the cells. It is more likely this is a rebalancing issue where the computer calculates the capacity incorrectly. To correct that, you need to drop to 0% and then charge to 100% a few times so the computer can understand how much energy the battery can store. However it is bad for the battery if you wait at 0% or 100%. Plan this so that you don't wait at the extreme ends. There is a topic here: <a href="http://www.teslamotorsclub.com/showthread.php/28533-Definitive-pack-rebalance-technique">http://www.teslamotorsclub.com/showthread.php/28533-Definitive-pack-rebalance-technique</a> although I don't agree with the 20%. I think it should be 2% or less. By the way, there is a tool called Visible Tesla that creates daily logs. You might want to check that.		423	423	
04 Nov 2015	DavidH	Just added another entry for my car. I double checked the dates, but for some reason it shows the age of my car as 84 thus the daily average is off. I tried to find if I made an errors adding my data, but can't find anything. Feel free to correct my entry.		423	423	
05 Nov 2015	Matteo	Hi David. Thanks for your message. Yes, there was an error with the formulas. I fixed it now.		423	423	
11 Nov 2015	justroll	Just to come back to my prev question regarding stock cars; I noticed that the km done per day are calculated using the mfgt date of the car; since I drive a stock car with mfgt date 15-10-2014 this does "color" my results, since I first drove the car on 3-3-2015. Should I enter the orig mfgt date, or the date first driven ?		423	423	
13 Nov 2015	Matteo	Hi justroll. The original manufacture date is the correct data because that defines the age of the battery. Don't worry about mileage per day. That's not used anywhere in calculations. The only reason it was added is because sometimes people enter incorrect dates or mileage. If mileage per day is greater than 350 km, the colour turns red. This way it is easy to see incorrect data. But it has no actual function.		423	423	
14 Dec 2015	jpet	Hi Matteo, can you take a look at entry ID 345 for user Energie Gratiz? I believe there is something strange about the way cell O348 is calculated. He now has 173200 kms on his car but received a new battery at around 77000 kms. I expected the cell O348 to be at 173200 - 77000 = 96200 but it's now at 135751 kms. How come?		423	423	
		<p>Hi Jpet. That's a good question. I'm glad you noticed this interesting detail. There is no error. It is calculated this way because most replacement batteries are refurbished and the formula calculates total mileage on the replacement battery including the mileage it had before it was attached to this car. This is what Tesla says:</p> <p>Quote "If your Battery or Drive Unit requires warranty service, Tesla will repair the unit, or replace it with a factory reconditioned unit. When replacing a Battery, Tesla will ensure that the energy capacity of the replacement Battery is at least equal to that of the original Battery before the failure occurred." Source: Tesla Model S Warranty Document page 4 <a href="https://www.teslamotors.com/sites/default/files/pdfs/model_s_quick_guide/Model_S_New_Vehicle_Limited_Warranty_NA_Touchscreen_6.2_R20150402_en_US.pdf">https://www.teslamotors.com/sites/default/files/pdfs/model_s_quick_guide/Model_S_New_Vehicle_Limited_Warranty_NA_Touchscreen_6.2_R20150402_en_US.pdf</a></p>		423	423	

15 Dec 2015	Matteo	Typically what happens is, the contactor on the battery fails but the rest is fine. Tesla could keep the car for long time and wait for repairs. But instead doing that, they install a refurbished battery and use the old battery for the next warranty replacement. This is a smart move because you get a battery that is slightly better than the old one and you don't wait. However, how would the user know how much mileage was on the replacement battery? He wouldn't. Some users might not even know if the battery is new or refurbished. I made this so that we don't ask too many questions because when there are too many questions in a survey, some people just leave. But still I wanted it to calculate correct mileage whether the replacement was new or refurbished. Otherwise this would mess up the charts.				
		Let me explain with an example. A user has 23,100 km mileage. At 23,000 km his battery was replaced. His old battery had 390 km typical range at 100% charge. The replacement has 392km. The basic calculation is $23,100 - 23,000 = 100$ km on new battery and 392km range. If we used that calculation on the chart we would see lots of entries that look like a new battery with poor range. Considering that around 7% of all Teslas have battery replacements (this data is from our stats page) this would mess up things badly. Therefore we don't use a basic calculation. Instead we use a more advanced calculation which is explained in more detail at the bottom of the charts page. If the replacement was refurbished the calculation should show total mileage on this and previous car. If the replacement was new, the calculation should show mileage on this car. It is supposed to show the correct mileage either way.				
		It is entirely possible that the replacement battery Energie Gratiz has was new. However in that case his range should have increased around 20 km. If you change his setting from 8 km to 20, you will see that the calculation is closer to new battery. At the time it wasn't possible to select more than 8 km. I have now changed this thanks to your input.				
17 Dec 2015	jpet	Thanks Matteo, I will ask Energie Gratiz what the actual difference was, 8 km or more.		423	423	
17 Dec 2015	AnalysiZ	In Chart my name is AnalysiZ S70 (to make the difference with AnalysiZ which was with P85D an AnalysiZ P85 Which was wit... P85). I would like to choose the option S70 instead of 70D... First entry for this car is today at line 359		423	423	
17 Dec 2015	Matteo	Hi AnalysiZ. I added S70 as a selectable option and changed your entry to S70. If possible could you have a look at the question on column AA (What was 100% typical range when car was new?) Tesla doesn't publish typical range numbers anywhere. We don't have this data. Thanks for letting me know that S70 was missing. Somehow I had overlooked that.		423	423	
22 Jan 2016	Joel	Hi Matteo, the current location options are very broad. I would suggest to add a column with 'country' or 'state' to make this more specific. This could for example help to void out any climate differences as we know that ambient temperature has an effect on battery degradation. I think we can already see this effect in the Canada data as degradation seems to be slower in this dataset. Thanks for your effort.		423	423	

25 Jan 2016	Matteo	<p>Update: 12 Feb 2016: I have now changed the range numbers for USA and Canada of a few car models, based on answers to the survey question "What was 100% range when car was new?." The accuracy in USA and Canada should have improved.</p> <p>-----</p> <p>Hi Joel. Thanks for the feedback. I think it is likely that we will have country selections in the future. I will keep this in mind.</p> <p>Canada (and USA) scores appear high but this is because our calculation method needs more work. This is related to rated range versus typical range. Currently we convert typical range and rated range to percentage. However the accuracy of this conversion seems OK for typical range but too optimistic for rated range.</p> <p>The reason the location question exists is not because we wanted to collect location specific data. It is because it was an easy way to eliminate one extra question. Otherwise we would have to ask the user whether his range is typical range or rated range (some users might not know the difference) and whether it is km or miles. The 4 regions we have are based on rating systems and units Tesla uses. These are as follows:</p> <p>USA: EPA rated range in miles Canada: EPA rated range in km Europe (excluding the UK) and Asia Pacific: Typical range in km UK: Typical range in miles</p> <p>When a user selects one of these regions, we know the rating system (typical range or rated range) and we know the units (km or mi). It means instead two questions, we ask one. That's the only reason for location.</p> <p>However I agree that it would be interesting to figure out what kind of effect climate has on degradation, if any. There is this diagnostics screen that shows the car actively keeps the battery temperature between two limits: <a href="http://www.teslamotorsclub.com/showthread.php/32916-Battery-cooling-while-Supercharging-and-AC?p=693246&amp;viewfull=1#post693246">http://www.teslamotorsclub.com/showthread.php/32916-Battery-cooling-while-Supercharging-and-AC?p=693246&amp;viewfull=1#post693246</a> Therefore climate might have limited effect. But it would be nice to have the data to prove or disprove this.</p>		<div> 423 423 </div> <div>I ha I ha</div> <div>-----</div> <div>Hi J Hi J</div> <div>Car Can</div> <div>The The</div> <div>USA USA</div> <div>Car Can</div> <div>Eur Eur</div> <div>UK: UK:</div> <div>Whi Whe</div> <div>Hov How</div>
05 Feb 2016	fsch	<p>I was wondering why a 3rd order polynomial was selected as the trendline model. This kind of fit is prone to give the drop observed at the end, and I suspect a large standard error on the <math>x^3</math> coefficient. The data rather suggest an initial exponential drop on top of a linear decrease. Such a fit to the current data gives me:</p> $\% \text{ range remaining} = 5\% * \exp(-\text{km}/29000) + 95\% - \text{km}/60000$ <p>i.e. an initial exponential drop of 5% on the first ~30 000 km, on top of a linear drop of 1% every 60 000 km. (The standard error on the 60000 km is large, though, i.e. because of the very few points at high km, 50 000 km or 80 000 km would still give a reasonable fit.)</p>		<div> 424 424 </div> <div>% r % r</div> <div>i.e. i.e. a</div>
07 Feb 2016	Matteo	<p>Hi fsch. The reason a 3rd order polynomial was selected is because the trendline in 2nd order goes up and 4th order goes down sharply. 3rd order provides the best fit. You might say, why select a polynomial instead exponential? It is because it provides a higher R squared value. If you want, on the top menu you can select "File &gt; Make a copy", then create the graph you have in mind and post a link here and I will have a look. Cheers</p>		<div> 424 424 </div>
08 Feb 2016	fsch	<p>Hi Matteo and all. I wrote down some explanations about the fit I was talking about, plus some statistical analysis on the significance of the parameters. You can find (and comment) that at the following address: <a href="https://docs.google.com/document/d/1Ujdws3L42IZTe3JqlrneqrkmZQxdpP5h-TRPk72OV0">https://docs.google.com/document/d/1Ujdws3L42IZTe3JqlrneqrkmZQxdpP5h-TRPk72OV0</a></p>		<div> 424 424 </div> <div>http http</div>
08 Feb 2016	Matteo	<p>Hi fsch. The link you posted opens to a word document, not a spreadsheet. If you have a better trendline in mind, make a copy of this spreadsheet, create the graph you have in mind and post a link. A discussion about a trendline that's not possible has little meaning. We can change the trendline if the new trendline is possible in Google Sheets and has higher R-squared value and is based on the actual data it represents.</p>		<div> 424 424 </div>



09 Feb 2016	fsch	<p>Hi Matteo. So I did it, learning how to do non-linear fitting in google docs along the way. You can find the result here: <a href="https://docs.google.com/spreadsheets/d/1CvFsQx1raCy04BPvSEa1gfOZGDgkZkL5EbsEirx1Cos">https://docs.google.com/spreadsheets/d/1CvFsQx1raCy04BPvSEa1gfOZGDgkZkL5EbsEirx1Cos</a></p> <p>There are a few issues though. Since it is a non-linear fit, I had to install a Solver (free plug-in). Fitting the data involves running the Solver each time. Then, in order to have the solver working, I had to cut and paste the data from the 'Charts Data' sheet to a new sheet. You can see the test (sheet 'Model - Solver error') where I simply refer to them: the Solver returns an error. It works properly if I copy-paste the data and everything remains in the same sheet (sheet 'Model - Solver works'). Still, so far, it remains a solution working within the google spreadsheet, so I guess it remains acceptable. But then, there is no R^2 calculation. In fact, it is apparently a bad idea to try to compute R^2 for non-linear fitting. Please read this: <a href="http://blog.minitab.com/blog/adventures-in-statistics/why-is-there-no-r-squared-for-nonlinear-regression">http://blog.minitab.com/blog/adventures-in-statistics/why-is-there-no-r-squared-for-nonlinear-regression</a></p> <p>Plus, it's not clear if R^2 is a good predictor of fit goodness. Please read this as well: <a href="http://blog.minitab.com/blog/adventures-in-statistics/regression-analysis-how-do-i-interpret-r-squared-and-assess-the-goodness-of-fit">http://blog.minitab.com/blog/adventures-in-statistics/regression-analysis-how-do-i-interpret-r-squared-and-assess-the-goodness-of-fit</a></p> <p>Keep up the good work!</p>		424 The But Plus Keep	424 The But Plus Keep	
10 Feb 2016	Matteo	<p>Hi fsch. Thanks for the graph on your copy of the spreadsheet. The graph shows that you have a credible idea. Your trendline is similar to what we have until around 120,000 km (~400 cycles) but then it projects a slow continuous degradation. The trendline we have suggests a sharper decline. In other words, the two trendlines agree on what happened until now but differ on what will happen in the future.</p> <p>Your version could be more accurate. I would like to run some tests. I want to see things like how your version changes if I enter a bunch of low entries after 150,000 km, 200,000 km, 250,000 km etc.</p> <p>However, there is a bigger problem. Is it possible to implement your version in Google sheets dynamically? Can you talk more about how A, B and D were calculated in this formula:  <math>y = A - x/B + (1-A)*\exp(-x/D)</math></p> <p>In cells I3, I4 and I5 you have 3 fixed numbers (0.3733564999 and 325.2980403 and 165.5120492). Where did these numbers come from? Is it necessary to use the 'solver' add-on for Google sheets? Could I calculate these numbers dynamically using an excel formula? For example if the formula was something like <math>y = c0 + c1*x + c2*x^2 + c3*x^3</math>, then I could use excel's linest function to find out c0, c1, c2.</p>		424 You How y = In c	424 You How y = In c	

10 Feb 2016	fsch	<p>Hi Matteo. Indeed, I admit that it is somewhat complicated.</p> <p>- Regarding the drop in your 3rd order polynomial fit, it is in a region where there are very few or no data so the fit does what it wants, and as mention in my first comment, this kind of function will inevitably give that kind of result outside of the range where there are data. The typical capacity evolution of a battery looks like the curve on page 11 of this presentation: <a href="https://www2.unece.org/wiki/download/attachments/8126481/EVE-06-05e.pdf?api=v2">https://www2.unece.org/wiki/download/attachments/8126481/EVE-06-05e.pdf?api=v2</a> (Sometimes, however, the curve may start to decrease abruptly at some point, but these events seem to be difficult to predict. Anyway, since a Tesla has 4000+ cells, even if a few of them fail that way, it should not influence too much the complete pack degradation.) All that to say that the model I suggest is more in line with what is measured usually for Li-ion batteries performing as expected.</p> <p>- Regarding the "dynamic calculation" side of things, the problem is parameter D which is inside an exponential and makes the fit non linear. One way around would be to set this parameter to some value (e.g. 29 000 km, keeping in mind that there is an uncertainty of 20% on this value), and then, it becomes a linear fit and the spreadsheet should be able to compute the other parameters (A, B, C) dynamically. Then, periodically, I or someone else could run a full, non-linear fit to see if parameter D has evolved. Otherwise, I don't see many other solutions. Maybe an external computation (e.g. once a day, a computer downloads the data, computes the fit, and the MaxRange spreadsheet reads back the data from that server.) But it's a bit awkward.</p> <p>What do you think? I'll start trying the first solution (set D to a constant) and see if the other parameters can be fitted dynamically.</p> <p>P.S. The 3 values (0.3733564999 and 325.2980403 and 165.5120492) are a trick I used to convince the Solver to converge towards a reasonable solution. If you look at the formula to compute the parameters A, B, D, they are computed based on these 3 parameters, but it forces A to be above 80%, B to be above 30 000 km, and D to be above 10 000 km. The 3 paramters are computed by the Solver in order to minimize cell G9, which is the sum of squares of the difference between the fit and the data.</p>		424 - R6 - R6 Wh P.S	424 - Re - Re Wh P.S	
10 Feb 2016	fsch	<p>Hi again Matteo. I was able to do a fit by setting D and carrying out a fit with LINEST. I guess you were the other one editing the file at the same time, so you have seen the result. It's quite strange because if you change the value of D by hand in order to minimize the sum of squares, it is equivalent as carrying out a non-linear minimization. Doing that gives about D = 42500 km. But LINEST then returns an essentially infinite value for B (i.e. exponential drop + constant A). However, if I download the data and use Python to carry out a linear fit, I find D = 31908 km and B = 87155 km, i.e. the same values, within the uncertainty, that I reported in my previous comments. That is the kind of values the Solver in the other page was returning as well.</p> <p>So I'm puzzled. [Edit: I ment " infinite value for B", not D]</p>		424 So	424 So I	
10 Feb 2016	fsch	<p>(Sorry for posting multiple comments.) OK, I think I found a solution. In a new sheet ('model with fixed D #2'), I now arranged the fit so that the model has to reach 100% at 0 km. It gives more sensible parameters, with B, the long-term degradation parameter, being in a more reasonable range. The parameter D (initial degradation) still has to be adjusted by hand in order to minimize the sum of squared residuals. With the current values, a change of D by 500 km changes the 6th digit of the sum sq. as well as the 6th digit of R^2. This is indicative of the large (20%+) uncertainty on this parameter, but it gives at least an order of magnitude.</p> <p>Still I think this is a reasonable solution.</p>		424 Still	424 Still	
10 Feb 2016	Matteo	<p>Hi fsch. This looks good. I copied sheet D#2 to this file. That's definitely something I can work with. We already use the linest function for some calculations. For example, if you go to the Canada sheet and look at your entry in column AR, it shows the value of the trendline at your mileage.</p> <p>I'm happy that the new formula shows a very similar trendline where we have lots of data (0 to 130,000 km). It's a shame the D coefficient is not a dynamic number.</p> <p>I will do some tests and see how it goes. Thank you for your efforts. You have done a great job with the new trendline formula. Cheers Matteo</p>		424 I'm It's I wil	424 I'm It's a I wil	
10 Feb 2016	fsch	Great! And thanks a lot for your work.		424	424	

11 Feb 2016	Matteo	Hi fsch. Your idea has been implemented. I also managed to automate the D constant using a simple scscript (see top menu > tools > script editor) and some other tricks. Cheers		424	424	
21 Mar 2016	pjw65	Shouldn't the Charge Cycles and the Mileage chart trendline look the same?		424	424	
24 Mar 2016	Matteo	Yes it should but it is technically difficult. None of the default trendlines work well. Therefore we created a custom trendline but it is only for mileage chart. Cycles chart was still using a default trendline. I have now removed it. Adding the custom trendline to Cycles chart is complicated. It requires additional columns on some data tabs where the data is filtered and processed. The sheet is already slow. First I need to find ways to make the sheet faster before adding more complexity.		424	424	
30 Mar 2016	pjw65	thanks for the info. I will tell some people on german tff about this :)		424	424	
02 Apr 2016	fsch	Would you consider adding a comment column about problems/repairs regarding other parts than the battery, in order to accumulate some statistics about that as well? (e.g. door handles, battery relay, wiper mechanism, sunroof leaking, etc.)		424	424	
03 Apr 2016	Matteo	<p>Hi fsch. Repair statistics about door handles, drive units, sunroof or other parts are useful but those would require additional columns. For example, a few people mentioned drive unit replacements in comments column. This has no meaning unless people also mention if they did not have a drive unit replacement. That means we need a new column that says: "Did you have a drive unit replacement? Yes/No". Then we need other columns for door handles, wiper blades, sunroof, windshield etc.</p> <p>These could be added as optional questions but I have been trying hard to reduce the number of optional questions as well. I removed many of those in the past. The reason is because, whether it is optional or not, if a survey looks too long, many people just leave. This has a negative affect on battery statictics because we need entries from more participants. Therefore I'm not sure if adding more columns would be good or bad.</p> <p>The closest we have to what you want is the statistics about battery replacements. On Stats tab it shows that 6.2% of cars had a battery replacement. This used to be around 9% in the past.</p> <p>Why do you want this information? Are you trying to decide whether you should keep the car beyond the 4 year overall warranty period (or 8 years with the extended warranty)?</p>		424	424	The The The The Why Why
03 Apr 2016	MrBoylan	Hi, Matteo, I hope this is the right place for questions. I didn't see a place where averages on range loss are published. I believe when the study was first published, Tesla batteries were losing about 6% after 50K miles and 1% for each additional 10K miles. Is this still true?		424	424	
03 Apr 2016	MrBoylan	Second question... I see there have been over 500 responses worldwide, but the stats only show 243 users. Are some users entering data for more than one car? Or are they entering data for their own car multiple times? I'm just trying to get a sense of how many cars this represents. Thanks!		424	424	

04 Apr 2016	fsch	<p>@Mateo: No, I want to keep my car forever! But 6 doors handles have been changed on it so far, and there are little reliable data about it (i.e. some people complain on the forums, other say it's marginal, etc.) I was actually just thinking about a single comment column about other problems, no stats computed, but someone can extract (perhaps unreliable) data from that. Just an idea. I don't know about other sites accumulating systematic data. Or I should read the Consumer reports instead!</p> <p>@MrBoylan, if you check the trendline, you see that it indeed drops by 6% over the first 80 000 km or 50 000 miles, then another 2% over the next 100 000 km (or 60 000 miles), so that would make less than (1/3)% per 10 000 miles! (Actually, the fit currently predicts 1% loss every 74 000 km or 46 000 miles for the long term losses.) But more data is needed at high mileage for that conclusion to hold. And of course, this is a fit through many cars data, with some significant dispersion of the datapoints, which means that a single car can depart significantly from the trendline. Unfortunately, not everybody can be above average!</p> <p>And yes, people enter data many times for their car so if you select a username from the dropdown menu at the top of the chart, you can see the evolution of that single car.</p>		424 @M And	424 @M And	
06 Apr 2016	Matteo	<p>Hi MrBoylan.</p> <p>1) For stats you can look at the first chart in Charts page. The trendline (the red line) shows the average user. To change mileage from km to miles, select any user name from USA tab. For example select AmpedRealtor.</p> <p>2) The stats are per username. In our case each username represents a car. Many users submit multiple entries but the stats page only considers their last entry. The reason for this is because I wanted the stats to be more realistic. Imagine somebody who has very bad degradation and submits 20 entries. That would mess up stats.</p>		424 1) F 2) T	424 1) F 2) T	
06 Apr 2016	Matteo	Hi fsch. There is already a single comments column in column AG and some people did enter various issues (mostly drive unit failure) to this column. However, like I said, you would also need the opposite data. If 2 out of 100 users mentioned a problem, how would you know whether any of the other 98 didn't have the same problem unless they said they didn't have it? Therefore you need a droplist that says did you have this problem? Yes/No. By default this droplist would be blank. Then you can count yes and no answers and you will have a percentage. If you want you could create a poll on TMC (teslamotorsclub.com) with two possible answers, yes and no.		424	424	
06 May 2016	DavidH	I made some changes to my latest entry. I got a few things wrong and corrected it. Now it shows yellow. I hope that didn't break anything.		424	424	
09 May 2016	Matteo	Hi David. No that's normal. It is just a security measure against vandalism. The yellow goes away after I check the changes and compare them to old data to make sure it is not vandalism.		424	424	
04 May 2016	DavidH	There are now some apps that allow access to the internal data from the car. One interesting data point is the car's estimate how much capacity is the battery able to hold. Unfortunately this wasn't available when I got my car more than 2 years ago, but I can get the data now. It typically shows 74-75 kWh. A similar Model S I tested (same age but only 20k miles) showed 78.2 kWh. Is this data any helpful here?		424	424	
09 May 2016	Matteo	Hi David. For the purposes of this survey, this subject is not relevant because we use rated range (for North America) and typical range (for elsewhere) when collecting data and calculating the percentages. Currently the sheet is set to 268 mi rated range for a new S85 with range mode on when charged to 100%. Then it calculates your percentage based on this 268 mi number. If you submit an entry and select range mode was on and your range was 268 miles, then the results will show 100% capacity. You might say, how did you come up with the 268 mi number? That's easy. It is one of the questions in the survey. In column AA the question says "What was 100% rated range when car was new?". I look at that column and calculate a number. From time to time I check that column again to see if the numbers need adjusting.		424	424	
26 May 2016	Ruslan	Hello. Thanks for creating this resource. Would it be possible to create a chart that displays correlation between time and battery capacity?		424	425	
27 May 2016	Matteo	Hi Ruslan. We used to have a chart for battery age vs capacity. Therefore the data is still there and I added the same chart back. You can find it on Charts tab. However, the reason why it was removed in first place is because, the cycles chart made more sense. To speed up the file, I might remove things from stats page and charts page. This chart might be one of the things that gets removed in a few months. So don't be surprised if it's gone again. You can click File > Make a copy to create your own copy. Cheers		424	425	

27 May 2016	Ruslan	Thank you, Matteo.		423	425	
14 Jun 2016	Vlad	Dear Matteo, thank you for creating this resource. I would like to use the graph that shows capacity loss versus mileage for a technical report. I need to know if there is any copyright restrictions on this. Speciafically, could you please let me know if the graph can be copied and redistributed in any medium or format provided that the credit to this resource is given?		423	425	
15 Jun 2016	Matteo	Hi. No problem. You can use the chart as you wish. If you need the chart to show miles instead km, you can select a random username from the USA tab.		423	425	
17 Jun 2016	Vlad	Many thanks, Matteo.		423	425	
21 Jun 2016	fsch	Hi Mateo, I see that the guy who has an entry at 231 000 km (energie gratiz) actually indicated a battery change in his previous entry. The battery was chaged at 77 000 km, so the corrected milage for his last entry should be 154 000 km. Also, I see that you are fitting a polynomial on the exponential fit, and it results in a shoulder at high milage.		423 Also	425 Also	
24 Jun 2016	Matteo	Hi fsch. Thanks, I added the battery replacement data. As for the trendline, I implemented your idea the best way I could. Normally your method creates lots of red dots but not a trendline. To connect those and display them as a line I had to select one of the available trendline options. It works well unless there are large gaps of available data.		423	425	
17 Jul 2016	PCMc	Hi Matteo. First, thank you for publishing this and facilitating collection of data. I have a question on your published US EPA ranges for the 90D. You show a published range of 285 however the published range for my brand new 90D is listed as 294. I'm not certain, but is there a difference now for the new front end (which mine has) or latest software update? I notice in US data another pretty new 90D (L-P-G) and we both are showing >100% battery range. My initial datapoint actually shows up about 104% from data I entered based upon a range charge. If I normalize both my datapoint and that of L-P-G using the 294 published range then they both fall back to +/- 1% off of nominal 100%.		423	425	
17 Jul 2016	Matteo	Hi PCMc. Thanks for the reminder. I have now changed it to 294. The reason it was 285 is because Tesla website used to show 288mi EPA rated range for S90D (here is a screenshot <a href="http://i.imgur.com/n7kJAE1.gif">http://i.imgur.com/n7kJAE1.gif</a> ) and some owners reported seeing max 285. I will also update other models. With Tesla it's hard to keep up. The speed of innovation and change is amazing.		423	425	
31 Jul 2016	Unknown User	The chart doesn't show any more. I tried two different browsers. What am I doing wrong?		423	425	
31 Jul 2016	Matteo	Hi. I've just had a look and it works fine both in Chrome and Firefox. The droplist in Charts!E1 works fine too. I'm not sure what the problem might be but if you are using a mobile device try on a desktop computer or laptop.		423	425	
01 Aug 2016	m	It works again.!		423	425	
03 Sep 2016	Unknown User	USA section is locked to filter to Model S 90D only. Can't add new record, please fix!		423	426	
03 Sep 2016	Matteo	Sorry about that. It's back to normal now.		423	426	
01 Nov 2016	N/A	Just stumbled across this effort through an article on Electrek ( <a href="https://electrek.co/2016/11/01/tesla-battery-degradation/">https://electrek.co/2016/11/01/tesla-battery-degradation/</a> ). Love the analytics, but maybe reaching out to the owners that read Electrek or others on TMC could strengthen the model with more data points. I would love to provide information, but unfortunately I'm not an owner at this time. Good luck and thanks for the info!		423	426	

28 Nov 2016	Go4IT	<p>I am now entering my 4th winter and am pretty sure that the ambient temperature (so, to some extent, the battery temperature while charging) plays an important role, especially when charging at 100% from a 90% plateau. In my case I always charge at 90% first and schedule the daily top up to full 100% so that charging is complete shortly before leaving. In doing so, the charging from 90% to 100% is extremely sensitive to ambient temperature since the battery pack has usually cooled down since the main charging to 90%. As the charging power is always low when charging from 90% to 100%, charging by itself barely heats the pack (unlike for instance when supercharging at 120kw). I have already experienced some charging in cold weather from 20% directly to 100% which led to higher capacity than when restarting from 90% with a cold pack. Seasonal cycles can be observed from year to year just by reading my data points (capacity is higher during summers than in winters). Furthermore, during winters, the typical range reading at 90% often predicts a higher 100% capacity which cannot be reached the following (cold) morning. Hence my suggestion would be to include at least a field with ambient temperature while charging and ideally that temperature + the last plateau before charging to 100%. Just my 5 Cents as one of the highest driven mileage in the data set.</p>		427	427	
29 Nov 2016	Matteo	<p>Hi, Go4IT. It's not the ambient temperature but the battery pack temperature that would affect displayed range. However, there are multiple factors that might affect pack temperature:</p> <ol style="list-style-type: none"> <li>1. Ambient temperature</li> <li>2. Whether or not the car was just driven. For how long it was driven. At what speed it was driven.</li> <li>3. Whether range mode was on/off while driving if the car was just driven or while charging.</li> <li>4. Whether a supercharger or slower charger was used to charge to 100%.</li> </ol> <p>If we use just ambient temperature to try to guess pack temperature, the data would be less accurate than it is now because the ambient temperature is not the only factor that affects pack temperature. The weather might be cold but the pack could be still hot if somebody has just driven the car at high speed and then used the supercharger to charge to 100%. There are too many questions to ask to try to guess what the pack temperature might have been when the user read the range number. These questions are too complicated to measure. If there are too many questions, there will be fewer entries because people just go away if it looks too complicated. We already have too few entries for meaningful data on the stats page.</p> <p>Even if people answered all those, we still couldn't calculate the pack temperature because we don't know how each factor affects pack temperature. In addition, if you look at this diagnostic screen <a href="https://teslamotorsclub.com/tmc/posts/693246/">https://teslamotorsclub.com/tmc/posts/693246/</a> it shows that pack cooling or heating kicks in only if the pack temperature hits a pre-defined upper or lower limit. That further complicates things.</p> <p>Ambient temperature was one of the questions that was removed long time ago to simplify things. I'm looking for other questions I can remove from the survey. Anyway, thanks for your suggestion.</p>		427	427	<p>1. A 1. A 2. V 2. W 3. V 3. W 4. V 4. W</p> <p>If w If we Eve Eve Aml Amb</p>
04 Dec 2016	PCMc	<p>Matteo - I know in your spreadsheet you ask the question of whether range mode was on when charging, and then adjust the reported rated range upwards if that answer is No. Can you explain the source of adjustment you are using and the reason for it? I have not observed any difference on my 2016 refresh MS 90D (USA spec) in the rated miles reported based upon whether I have range mode turned on or off when I charge.</p> <p>If the logic of this adjustment to try and factor in pack temperature as inferred by your discussion with Go4IT? If so, then I could understand that maybe being a way to infer pack temp if the car had been driving for some time immediately prior to charging, but not if the car has not been driven right before charging. For example, if I charge overnight in my garage, am leaving on a long trip the next morning, I may charge to 100% in anticipation of minimizing stops. In that case, the differences in pack temp due to range mode would not seem to apply. If the adjustment is simply for this reason, then it seems like you may be adding as much noise to the data as you're trying to remove in an attempt to adjust for pack temp, similar to the comments above around ambient temp.</p> <p>Again, appreciate all your effort to coordinate this, as well as sharing your knowledge with me. Paul.</p>		427	427	<p>If th If th Aga Aga</p>



05 Dec 2016	Matteo	<p>Hi. Here is a video that shows the instant effect of range mode:  <a href="https://www.youtube.com/watch?v=MoAPDZTzxd0">https://www.youtube.com/watch?v=MoAPDZTzxd0</a></p> <p>Also, here is a discussion topic. See first sentence in message #1:  <a href="https://teslamotorsclub.com/tmc/posts/576732/">https://teslamotorsclub.com/tmc/posts/576732/</a></p> <p>This has nothing to do with temperature. The two topics are not related.</p>		427 427  http http	
07 Dec 2016	PCMc	<p>Is there any chance that this behavior has been reproduced recently? I do not question the video, but I have just repeated this exercise in my MS 90D and see no change in displayed rated miles as I toggle in and out of range mode. I could speculate this behavior might have changed with later software versions or is it potentially a difference between European versus a USA specification vehicles (with corresponding different regulations with how rated miles are calculated?).</p> <p>Here is link to video I made trying to recreate the charging experiment. Should be shared such that you can watch it.  <a href="https://drive.google.com/open?id=0B7_eZCwFA_8gTnpISmNaVEQ5ZG8">https://drive.google.com/open?id=0B7_eZCwFA_8gTnpISmNaVEQ5ZG8</a></p>		427 427  Her Her  http http	
08 Dec 2016	Matteo	<p>Hi. In the video your charge level is too low. The increase is proportional to your charge level. You could test again when you have 100% charge. You have reported 298 miles with range mode off and 300 miles with range mode on. This is consistent with what should have happened.</p> <p>In the meantime, I've asked others to comment on this here: <a href="http://www.teslamotorsclub.com/showthread.php/35978-MaxRange">http://www.teslamotorsclub.com/showthread.php/35978-MaxRange</a></p> <p>By the way, in message #1, the user here is from the USA too: <a href="https://teslamotorsclub.com/tmc/posts/576732/">https://teslamotorsclub.com/tmc/posts/576732/</a>. There was no regional difference. This worked everywhere.</p>		427 427  In th In th  By t By t	
13 Dec 2016	Matteo	PCMc, feel free to write back if you test again at 100%.		427 427	
16 Dec 2016	Beedles	Does anyone have an explanation for USA's ID=12=Groeneweg2's low data viz. 85% of original capacity at 59,224km?		427 427	
16 Dec 2016	Matteo	In USA entry #60 Pilot_51 has submitted a similarly low entry for his S60. In the comments section in column AG he describes how the service center tried to rebalance it. It sounds like a rebalancing issue. This happens if the battery is never fully discharged. The displayed range becomes inaccurate over time because the car can't guess how much energy is stored in the battery.		427 427	
24 Mar 2017	DavidH	Can you add a trend line to the other charts (number of cycles, age in days)?		428 428	
25 Mar 2017	Matteo	Hi. No problem.		428 428	
28 Mar 2017	fsch	<p>Following Go4IT comment, I tried to see if there was a correlation between the range and the time of year (more precisely between range and <math>\cos(2\pi \cdot \text{day\_of\_year}/365)</math>, which varies between +1 in January and -1 in July and should itself correlate to temperature). I would have used only the data for the North-most people but there are not enough stats from Canadians, and no way to know for the others. Anyway, considering everyone, only about 0.8% of the range change is due to the January-July variation. That's only about 2 miles or 3 km on an MS 85.</p> <p>Unrelated topic: Matteo, I understand the problems with the trendlines, but currently, the tail effect is quite intense. Here is a suggestion: two linear regressions on the model, one for data below 50000 km and one for above: <a href="https://docs.google.com/spreadsheets/d/1VpDK3H1dosidNNIFpzxSgyzz8tYIonZFWhdJfIAynew/edit#gid=154312675">https://docs.google.com/spreadsheets/d/1VpDK3H1dosidNNIFpzxSgyzz8tYIonZFWhdJfIAynew/edit#gid=154312675</a>  I understand it would complexify quite a bit your calculations of what is above and what is below trendline, but that pair of trendlines could be only for display.</p>		428 428  Unr Unr  l un l un	

29 Mar 2017	Matteo	Hi fsch. I updated the trendline for the first chart. If you look closer, now the trendline is actually constructed of lots of tiny 1 pixel red dots. The trendlines of the last two charts are still using Google's default polynomial trendlines. No matter what power level you select, they are not accurate. Switching them too will make the sheet slower. The first chart's trendline already makes things slower. So I'm trying to find a balance between improving the presentation vs speed.		428	428	
05 Apr 2017	dz1523	With Update 8.0 software, I noted an immediate drop in maximum range from 247 to 233. I have driven the car almost 10 miles past 0 and not bricked. I believe that the 8.0 software created a 14 mile buffer below 0; this might alter your calculations if people are reporting the max range reported by the car after charging.		428	428	
06 Apr 2017	Matteo	Hi. v8.0 was released in late Sep 2016. I have checked a few entries by people who submit lots of entries to see if there was any change. For example, on the USA tab the users ghurenkamp, DavidH and Benjamin Brooks have submitted entries before and after v8.0 and they don't report any sudden or unexpected drop in range.  I have then selected your username on the charts tab and your current entry is a little below the trendline but it looks normal. I think you have experienced the sharp drop that happens at early stages. If you look at the trendline on charts tab, the battery loses 4% in the first 20,000 miles but then it loses only 1% in the second 20,000 miles. When you select your username, the chart will switch from km to miles. In other words, the sharp drop was to be expected at that mileage.  I recommend submitting new entries every 5,000-7,500 miles. If you have old data from 2016, you can enter those too if you want.		428	428	I ha I ha I rel I rec
14 Apr 2017	Holmes	Trying to understand cycles better and I'm not terribly smart at this stuff. Is the formula behind cycles something that can be somewhat easily explained?		428	428	
16 Apr 2017	Matteo	Hi Holmes. I have expanded the explanation under the charts section. I also added the title "Understanding Cycles" so it's easier to see. Check out Charts tab row 114. Cheers		428	428	
19 Apr 2017	thanar	Hello. Would be interesting if you would add mean temperature to the mix, so as to see if degradation changes by the place you live. A mean temperature of each participant, or a latitude entry maybe?		428	428	
14 May 2017	Matteo	Hi thanar. Temperature used to be one of the survey questions a long time ago but it was removed because outside temperature or even ambient temperature is not relevant but battery pack temperature is and the user has no easy way to read battery pack temperature.		428	428	
21 Apr 2017	Lucas	To thanar: most important are ultra low temperatures. -10 have no impact on battery, but if you keep car discharged at -30 u are loosing warranty... From my experiences over -25C with 0% left had impact on battery like -1km on range overnight		428	428	mos mos
20 Apr 2017	Lucas	In teslalog.com is over 1000 TM with data directly API. It will be nice compare, because API data are more reliable than man entered numbers... Are u interested for that Matteo?		428	428	
14 May 2017	Matteo	Hi Lucas. If you want to compare the data, feel free to copy the data you see here. On the top right, click "File > Make a copy" to create a copy of this file. Unfortunately, I don't have much time for more collaboration. Good luck.		428	428	
01 May 2017	Unknown User	Temperature is important but I doubt selecting a region would be helpful. Here in California, themps are very very different depending on what part you live in. Even a few miles from the ocean the temps are significantly higher.		428	428	

09 May 2017	Go4IT	<p>Hi Matteo, Back in end 11/2016 I dropped a few lines about influence of pack temperature and since then included a comment related to temperature to each entry I did.</p> <p>Now I would like to discuss another aspect which I believe to have an influence on the true pack capacity and that is the "quality" of the first and last km i.e. the charge quality near 100% (the "first km") and 0% (the "last km"). When my car was new (almost 4 years ago...), I had about 400km at 100% (like most with a 85kWh battery) and I could often drive 3-5 km before km count would go down. Nowadays, I often see 3-5 km disappearing almost instantly as soon as the car is powered on and starts moving. Similarly, when car was new, I could drive to -15km or even -20km before the battery would go completely empty. Nowadays, the car turns off right at 0 km and I have to tow it to my charging point (I do this on purpose for better calibration and to get a good experience with an empty battery... but I do it very close to home!) This leads me to believe that the "quality" of the first and last km is decreasing significantly in my case, probably due to aging and to number of charging cycles. I believe this to be further demonstrated by your alternative capacity calculation which is based on an actual trip (I always use the same trip as a reference to ease comparison between my lines). Overall, my impression and usage experience is that this alternative capacity calculation is closer to reality and that I am probably well into the 15-20% capacity loss... I wanted to share this with you because I wonder if the max km is a good indication about battery capacity, especially when it comes from the vendor who may not be as neutral as it could be in this measurement... Interested to hear in your thoughts on this...</p>		428 428  Bac Bac	
14 May 2017	Matteo	<p>Hi, Go4IT. WK057 has an interesting thread about these topics here: <a href="https://teslamotorsclub.com/tmc/posts/1923792/">https://teslamotorsclub.com/tmc/posts/1923792/</a> If you read message #1, paragraph 2 that starts with "As it turns out, ...", it looks like the displayed range is a very good metric to calculate usable battery capacity. But I wonder if the non-usable part changes over time. According to WK057, the 85 kWh battery has 81.5 kWh total and 77.5 kWh usable capacity. In other words, 4 kWh is not usable. Maybe Tesla is reducing the 4 kWh over time to compensate for part of the degradation. This would explain why you were able to drive below 0 typical range but now you are not. I don't know if they are actually doing this or not but if they are, it would mean after a certain mileage, degradation will be more sudden because the 4 kWh will run out.</p>		428 428  http http	
26 Apr 2017	JCB	Could we add a column for climate zone? ( i suggest following the "plant hardiness zone, 6,7,8 etc)		428 428	
14 May 2017	Matteo	Hi. Thanks for the feedback. I'm trying to keep the survey simple because some people just close the page and go away when they see too many questions. We need more entries. Therefore I try to keep only the most relevant questions. I'm actually considering removing some existing questions. However, feel free to expand your idea a little more so I can understand it better. Cheers.		428 428	
01 May 2017	nickjhowe	Column O label on USA sheet is wrong - says km but is actually miles. Makes me wonder if the chart is correct using km...		428 428	
14 May 2017	Matteo	Thanks, Nick. Fixed. It was just a cosmetic error that happened when copying and pasting formulas between country tabs. The chart works correctly. All country tabs show mileage in km in column AP. These km numbers from column AP are put together on a single hidden tab called "Charts Data". By the way, if you want to see the numbers in miles, select any random user from the USA or UK tabs. Cheers		428 428	
04 May 2017	DavidH	Could you make it possible to select only all cars with the old battery cells and then only car with the new battery cells? I believe the new cells might degrade a little faster than the old ones.		428 428	
14 May 2017	Matteo	Hi, David. This sounds like a good idea. I will keep this in mind for the next major overhaul. Too many things are too messy right now. I need to simplify and improve things before adding new features but I like your idea. I guess old cells means the 85 kWh and the original 60 kWh. Let me know if it means something else.		428 428	

19 Jun 2017	jensk2	Excellent Survey! Some of the Asian Range numbers looks a little wrong. User jvds has a 70D and reports mostly around 360 km, but has ONE reading of 402, which COULD be the 'Estimated' mileage. Same problem COULD affect some of the 85D numbers, where 430km is impressive, but well into 90D normal Range. Given how close the different models typical numbers are, I understand that is difficult to do 'data input sanity' verification at entry. The 70D assumed error, could be caught by an alert if entered value is more than 10% off of the average for all 70D's, which is 357,4 km:-)		429	429	
20 Jun 2017	Matteo	Hi, jensk2. I like the instant alert idea. I will keep this in mind for the next major update. Thanks		429	429	
26 Jun 2017	aggregate	Hi Matteo, is it an idea to add a model selection in the chart section, so you can see an aggregation per battery size		429	429	
06 Jul 2017	Matteo	Hi, aggregate. That would be a nice feature to have. Unfortunately, Google Sheets slows down as the file gets bigger and more complicated. Therefore I try to find a balance between the features we have and how fast the file works when people enter or read data. However, I like your idea. I will test it out during the next major update to see if it is something that can be implemented. Thanks for the feedback.		429	429	
13 Jul 2017	Go4IT	Hi Matteo, please check my entries from today and yesterday (based on exact same reference trip under very similar traffic conditions). Clearly your optional calculation is a more reliable way of measuring the battery capacity as the first 3-5km after a 100% charge disappear almost instantaneously after charge completion and a brief power on move (for instance just to move the car out of garage). As mentioned in my 09/05/2017 comment above, same can be observed near the 0% charge where car goes off almost right after displaying 0km (no more grace km as in the past). In other words, the first and last 3-5 km of energy are of a "bad quality" (low energy content). Such observation cannot be inferred from a simple km reading like most do in the table. True battery degradation is to be evaluated at 100% (we knew that) measuring what the first km are really worth (almost nothing in my case with a 4 year/250.000km pack).In my opinion, this has nothing to do with the 4kWh unusable capacity Tesla keeps for protecting the pack (anti-bricking).		429	429	
13 Jul 2017	univ	Hi Matteo, great work! In the German Tesla forum we keep updating a list of the drivers with the most kilometers, per model, e.g. drivers who drove the farthest with 85, 70 or D models. It would be cool to have this kind of information here in the charts or stats as well. Or maybe a new sheet like "Hall of fame" or something like that, haha. Like, who drove the most per model (all 85 drivers, all 70(D) drivers, all D drivers, all 100 drivers etc.). And maybe who drove the most overall. Maybe per year. I guess there are many ways. :) For example (link to the German forum, text only, but you will get an idea): <a href="http://tff-forum.de/viewtopic.php?f=56&amp;t=8554">http://tff-forum.de/viewtopic.php?f=56&amp;t=8554</a>		429	429	
14 Jul 2017	Matteo	Hi, Go4IT. Thanks for the feedback. I'm glad you found the alternative method in columns AC:AH useful. Thanks for reporting about the typical range that you lose instantly near 100% and 0%. I don't know if this is a rare problem or common problem. It would be good to find out more.		429	429	
14 Jul 2017	Matteo	Hi, univ. Thanks for the feedback. I will keep this in mind for future updates.		429	429	
14 Jul 2017	Gabeincal	Hi, great data and charts. Filled it out for my S75. I don't see an S100D as a car option, perhaps you need to update the sheet for that option for other owners?		429	429	
14 Jul 2017	Matteo	Hi, Gabeincal. The Model S 100D and P100D are there. They are the last two items before the Model X list starts. Cheers		429	429	
24 Aug 2017	BennyG	Hi Matteo, I've got a new 75D after my 85 got wrecked. I assume I can just start adding the new data of the new car, right?		429	429	
24 Aug 2017	Matteo	Hi, BennyG. If you want, you could use different usernames so both cars don't appear when you select your username on the charts page. It's up to you. For example, you could change all your old entries to BennyG 85 (I can do that for you if you want) or use BennyG 75D for new entries.		429	429	
30 Aug 2017	cornoiseur	Not sure if you are aware of Google Data Studio ( <a href="http://datastudio.google.com">datastudio.google.com</a> ), but I think we could make a pretty slick dashboard with this database on that site. I can make a proof of concept if you are interested.		429	429	

30 Aug 2017	Matteo	Hi, connoisseur. Thanks for the heads up. I will check it out.		429	429	
10 Sep 2017	Hart	Not sure how I enter data, but accidentally charged my 2014 S to 100% last night. Got rated range of 259 vs. 265 when new.		429	429	
11 Sep 2017	Matteo	Hi, Hart. You can go to the USA tab and start typing to the next available row. Be aware that this will be difficult on a smartphone or tablet, therefore, using a laptop or desktop computer is recommended. Then go to the charts page and select your username. Cheers		429	429	
17 Sep 2017	PCMc	Matteo - I was looking at MS/MX entries specifically for those with 90 battery packs. Spotted the data in the USA tab for user James. His data fall as outliers. I see there has not been an update on his for about a year, but I am highly suspicious that the values he has entered are not actually 100% SOC. He lists his daily charging level as 90% and the values he lists for 100% SOC would make total sense if they were actually his 90% SOC daily readings. I am reading between the lines, but am suspicious of the validity of these datapoints.		429	429	
18 Sep 2017	Matteo	<p>Hi, PCMc. I've looked closer into this and you are right, there is a problem. However, the problem seems to be that Tesla has changed the EPA range of the 90D at some point. There are two data points to support this theory:</p> <p>1. Check out the 90D's range in these two Design Studio screenshots:  <a href="http://i.imgur.com/n7kJAE1.gif">http://i.imgur.com/n7kJAE1.gif</a>  <a href="http://i.imgur.com/XDlwDbT.gif">http://i.imgur.com/XDlwDbT.gif</a>  It was 288 mi and then it increased to 294.</p> <p>2. In column AA, there is the question that says "What was 100% rated range when the car was new?". Some users have entered 282 or 283 mi to this column.  Here is a screenshot: <a href="https://i.imgur.com/6VActp6.gif">https://i.imgur.com/6VActp6.gif</a></p> <p>The same problem happened in Europe. Some people say the 90D had 408 km when new, some say 452 km when new. It is messed up because Tesla has messed up things.</p> <p>To correct this problem, I have created a new car model called "Model S 90D 2015" with less range and then moved most of the 2015 models to this category. I'm not sure if things are 100% accurate now but I'm pretty sure they are more accurate now than before. Thanks for reporting the problem. Cheers</p>		429	429	<p>1. C 1. C  http http  http http  It w It w</p> <p>2. In 2. In  Her Her</p> <p>The The</p> <p>To ( To c</p>
26 Sep 2017	Spencer	I've created an interactive chart in Domo to show the milage vs remaining range from the data provided. Check it out if you'd like to gain more insights. <a href="https://public.demo.domo.com/cards/e31Mb">https://public.demo.domo.com/cards/e31Mb</a>		430	430	
27 Sep 2017	Matteo	Hi, Spencer. It looks good.		430	430	
14 Oct 2017	VikingC	I saw a comment about inconsistent data. It all looks OK to me. If you can be more specific I can double check the numbers.		430	430	
15 Oct 2017	Matteo	Hi, VikingC. I don't see any problem with your data.		430	430	
07 Nov 2017	Claudiu T.	Do not forget Joel's request (22 Jan 2016). A field for the county / country would be very interesting for those interested in these calculations. Thank you very much.		430	430	

09 Nov 2017	Go4IT	<p>Hello Matteo. May I draw your attention to my 25 entries covering over 4 years/275.000km of driving. Clearly one can distinguish a yearly cycle showing a min 5% reduction of battery capacity during the winter compared to summer values. All my entries are provided based on very similar charging conditions (except for the ambient temperature which I cannot control ;-)</p> <p>As you have a date for every entry, would there be any way to factor the yearly cycle effect on the graphs and the statistics?</p>		430 430	As y	As y	
13 Nov 2017	Matteo	Hi, Go4IT. I have responded in the forum here: <a href="https://teslamotorsclub.com/tmc/posts/2407284/">https://teslamotorsclub.com/tmc/posts/2407284/</a>		430 430			
01 Dec 2017	Lucas	Will be usefull split TMS and TMX charts or not count km but MWh, because TMX have higher consumption and often hauling trailers, then degradation per kilometer is much higher like 10% compare to TMS...		430 430			
03 Dec 2017	Matteo	<p>Hi Lucas. For the first chart (mileage vs battery capacity chart), in the future, we could eventually add a way to select only the models you want to see in the chart. Currently, only 9 Model X owners submitted data compared to 375 Model S owners. However, with the Model 3 things could change. Also, if the Model S/X switch to 2170 cells, it would be interesting to compare 18650 to 2170 cells.</p> <p>By the way, on the Charts tab, if you scroll down you can see the Cycles chart. This chart considers how many times the battery was charged. Efficiency and battery size play a role here. Looking at cycles instead of mileage is a way to equalize efficiency and battery size differences.</p>		430 430	By t	By t	
21 Dec 2017	Shoot72	Hi Matteo, Model S 100D at first full charge (at 150km, so new car) to 100% give me about 509 km typical (range mode off), not the reported 526 km, battery was at 100% but charging at 2kW. But I don't think it would add a other 20km of typical range.		430 430			
22 Dec 2017	Matteo	Hi, Shoot72. Because Tesla does not publish the 'Typical Range' numbers they use outside of North America, we have to ask people the question, "What was 100% typical range when the car was new?". You are the first person who answered that for the Model S 100D. Thanks. I have changed the setting for the Model S 100D based on your answer. If more people answer this question for the Model S 100D, I will update the number in the future. Cheers		430 430			
19 Jan 2018	TomB	Hi Matteo, do you think you could introduce a chart comparing how the different Batteries (60, 70, 75, 85, 90 and 100) age at certain levels? I was thinking that you could maybe have a chart for all batteries at 50k km which would then maybe return that the 75 and 100 usually did fare better in terms of capacity than say a 60, 70 or 90. Do you think that would be possible? Also we see clearly a winter penalty in range which may project a much worse picture that acutally is. I checked this with Go4IT as you have a lot of data from him. So question I guess is, can you level that somehow? I know, this one is extremely tricky becaus you can only use data from the user to level its curve.		431 431			
20 Jan 2018	Matteo	<p>Hi, TomB</p> <p>1. Different charts for different battery packs is a good idea. However, it is something that would complicate how the spreadsheet works. Adding username selections to the charts has already complicated things. In addition, we have a unique custom trendline on the Charts tab for the first chart. That trendline also complicated things a lot. I'm always trying to find a balance between features and speed. I will keep this suggestion in mind for future revisions.</p> <p>2. I agree that winter range is lower than summer range. See my response a few rows above on 13 Nov 2017. I also agree that we should try to fix it. However, I'm not sure how to do that. Do we ask everybody to enter a temperature? Is that going to be a mandatory field? Do we make it optional? I don't want to make it less convenient to enter data. Temperature is more difficult than other data like mileage or vehicle manufacture date. We could make it optional and apply a winter correction if somebody has entered the terperature and it was too cold.</p>		431 431	1. □ 1. D	2. I 2. I	
25 Jan 2018	Benjamin Brooks	Sheet doesn't support sepearte vehicle reports from single owner?		431 431			



25 Jan 2018	egn	Hi Matteo, the calculation reports for my S85 about 74.9 kWh usable capacity. But in reality the BMS reports through OBD2 on the diagnostic bus 71.9 kWh usable capacity. I suppose that the degradation is underestimated considerably, and much higher than shown.		431	431	
27 Jan 2018	Matteo	Hi, Benjamin Brooks. You can use slightly different usernames. You could change just the current username or the previous one or both. Here are a few ideas: Benjamin Brooks (S) Benjamin Brooks S85 Benjamin Brooks MS Benjamin Brooks 1 I could change all of your past entries for you if you want. Cheers.  BB: sounds good to me, with S85 suffix for old records. thanks!  Matteo: Done.		431 Ben Ben Ben Ben Ben I col	431 Ben Ben Ben Ben Ben I col	
27 Jan 2018	Matteo	Hi, egn. I'm always trying to improve things. Therefore what you said sounds interesting. Here are some questions that come to my mind:  1. Could the 71.9 kWh number related to cold weather? I wonder if the number was higher in the summer? 2. I wonder what the BMS reports for a brand new Model S or X of any battery size. There is an EPA document that shows 73.2 kWh usable capacity for the 75 kWh and another document that shows 78.27 kWh for the Model 3 LR. How would these numbers compare to a BMS reading of one of these cars when it was new? I'm trying to understand if the BMS reading is lower than expected for all Tesla models or for just the 85 kWh.		431 1. C 2. I	431 1. C 2. I	
02 Feb 2018	Andrew	Hi Matteo, first off this is amazing work. I am a battery economist/engineer and would be very interested in speaking with you offline about your estimation techniques if you have some time. I've been working on battery degradation models for my PhD and may be able to bring some insight as well. For the short term, would it be possible to see the username readout when selecting a datapoint on the graphs? Instead of having to select the username from the dropdown which doesn't contain much information unless you go back and find them in the entries.		431	431	
02 Feb 2018	egn	Hi Matteo, above value is the usable capacity, nominal capacity is 75.9 kWh (4 kWh reserve). The values of a new S85 were usable 77.5 kWh and nominal 81.5 kW. <a href="https://electrek.co/2016/12/14/tesla-battery-capacity/">https://electrek.co/2016/12/14/tesla-battery-capacity/</a> So the battery of my S85 has degraded to about 93 % and not to 96 % as calculated. I assume that most vehicles BMS report a lower remaining capacity as calculated. May be others with OBD2 access to BMS can report their nominal capacity reading to verify this.		431	431	
04 Feb 2018	Matteo	Hi, egn. Here is how the percentage was calculated: In columns AE and AF, people have reported that the S85 displays 400 km typical range with range mode on when the car was new. In your last entry you said 379 km with range mode off. I'm calculating 383.8 km with range mode on. Check out these two videos about range mode: <a href="https://youtu.be/MoAPDZTzxd0?t=1">https://youtu.be/MoAPDZTzxd0?t=1</a> <a href="https://youtu.be/QUEVyw7iXNE?t=68">https://youtu.be/QUEVyw7iXNE?t=68</a> Therefore your range compared to a new S85 is $383.8/400 = 95.95\%$ . That means your usable capacity is $77,500 * 0.9595 = 74,361 \text{ Wh}$ .		431 http http The	431 http http The	

04 Feb 2018	Matteo	<p>Hi, Andrew. I tried to add the usernames as data labels when you hover over the dots but it doesn't work with scatter charts. I can add permanent username labels to all dots instead of displaying them when you hover but then the whole chart is covered with usernames and you cant see any of the dots.</p> <p>If you want to analyze the data you could copy one of the tabs into your own file. Next to the tab name click on the down arrow and select Copy to. Also, you can copy the entire file by selecting File &gt; Make a copy.</p> <p>The way the calculations work is simple. Each Tesla model has a certain range at 100% charge when it is new. For example, the Model S 85 has 265 miles EPA rated range. The survey simply asks people what their range is at 100% charge. If an S85 owner reports 260 miles, that would mean <math>260/265 = 98.1\%</math> remaining range.</p>		431	431	
				If yo	If yo	
				The	The	
04 Feb 2018	Matteo	<p>You can see 265 miles for the Model S 85 on the following page under the small car icon:  <a href="http://www.fueleconomy.gov/feg/Find.do?action=sbs&amp;id=37234">http://www.fueleconomy.gov/feg/Find.do?action=sbs&amp;id=37234</a></p> <p>You might say how about different driving habits? Wouldn't the displayed range be different for each person because everybody has a different driving style? No, it wouldn't because unlike most other EVs, Tesla cars don't display range based on your driving style. They calculate the range based on a constant for each model. For example, the Model S 75D has 73,200 Wh usable capacity and 259 miles EPA rated range in the US. It displays 1 mi per 282 Wh. Let's say the car calculates that it has 71,500 Wh usable capacity available at a certain time. It would convert this number to displayed range by calculating <math>71,500 \text{ Wh} / 282 \text{ Wh/mi} = 254 \text{ mi}</math>. It doesn't matter whether the car has the small wheels or large wheels. It doesn't matter whether the person has driven at 80 mph or 50 mph recently. It will still display the same 254 mi available range.</p>		431	431	
				You	You	
04 Feb 2018	Matteo	<p>There are a few things that can change this number. If you charge the car at night and come back in the morning, the displayed range will drop slightly because of vampire loss. If you switch the range mode setting on, the displayed range will increase instantly (usually by ~3 miles). If the weather is too cold, the displayed range at 100% charge will be slightly lower. Also, the car has sometimes trouble estimating how much energy the battery holds. Especially if the battery never dropped to close to zero or charged to 100% for many months, the car has more trouble calculating the available energy.</p> <p>Some owners know how to read data by connecting to the car's computer. There is a video here: <a href="https://www.youtube.com/watch?v=F3tF0i98Mpl">https://www.youtube.com/watch?v=F3tF0i98Mpl</a> I'm not sure the numbers you read this way would be more accurate than what the displayed range shows. Normally, the displayed range should be a direct reflection of what the car thinks is the available energy. Therefore it shouldn't make a difference. But of course, it is possible that the numbers might be more accurate if you read them directly from the car's computer. We don't use that method because if we did we would have very few entries.</p> <p>I prefer answering questions online if you have any questions. Let me know if you have any feedback if we doing something wrong etc. I'm just a Tesla enthusiast who happens to enjoy Google sheets and this file needed some attention. Cheers</p>		431	431	
				Son	Son	
				I pre	I pre	
15 Apr 2018	Matteo	<p>Editing is disabled for now because of vandalism. There is an Electrek article today with a link to this spreadsheet. That caused some trolls to target this file. We had two vandalism incidents today. <a href="https://i.imgur.com/N3vNOO1.png">https://i.imgur.com/N3vNOO1.png</a>  Update, 20 Apr: We are back to normal.</p>		432	432	
				Upd	Upd	
22 Apr 2018	Michael	<p>Hi Sir, I am wondering if you would mind me using this data in my university dissertation and if so how would you like me to reference it?</p>		432	432	
22 Apr 2018	Matteo	<p>Hi, Michael. Yes, academic use is not a problem. This is a crowdsourced project. There is a link on top of this page to a Tesla forum where the project originated from in case you want to read the discussions there.</p>		432	432	
22 Apr 2018	ticobird	<p>Am I supposed to enter a new line every time I add data or just edit the existing data I have already entered?</p>		432		data changed

[illegible]

29 May 2015	Matteo	<p>Trip based calculation is added. This performs a second percentage calculation based on trip data. The first percentage calculation is based on typical or rated range. Here is an example explaining trip based range calculation. Input data is:</p> <p>Typical range at the beginning of the trip: 381 km  Typical range at the end of the trip: 94 km  kWh consumption for this trip: 54,9 kWh  Range mode on/off when you read these trip numbers? Off</p> <p>The calculation: Typical range consumption was <math>381 - 94 = 287</math>. However, range mode was off. If range mode was on, the numbers would be <math>381 \cdot 400 / 395</math> and <math>94 \cdot 400 / 395</math>. Therefore typical range consumption that we will use is <math>(381 \cdot 400 / 395) - (94 \cdot 400 / 395) = (381 - 94) \cdot 400 / 395 = 290,6329</math> km</p> <p>If 290,6329 km typical range equals to 54,9 kWh  Then 385,82 km typical range equals to X kWh  <math>X = 385,82 \cdot 54,9 / 290,6329 = 72,88</math> kWh (By the way 385,82 km is typical range at 100% charge when range mode on. This is shown in column L. Column name is "Typical Range correction if range mode was off")</p> <p>85 kWh battery has 75,9 kWh usable capacity when new. Therefore remaining usable battery capacity is <math>72,88 / 75,9 = 0.9602 = 96,02\%</math></p>		421	421	
31 May 2015	Matteo	Username selection to charts page is added. You can display your entries in a different colour from all the other dots.		421	421	
31 May 2015	Matteo	All charts show now data from all countries.		421	421	

01 Jun 2015	Matteo	<p>The way replacement batteries are processed has been improved. This is how it works.</p> <p>If you have a replacement battery, don't be surprised if you don't recognise the mileage and battery age numbers you see above. These numbers are calculated for your replacement battery. They are different than your car mileage or vehicle age. If you want to know more about how this calculation is done, read on. Otherwise this might be too much detail.</p> <p>Let's assume somebody entered this data:</p> <ul style="list-style-type: none"> <li>■ Mileage: 30,000 km</li> <li>■ At what km did you replace battery? 24,000 km</li> <li>■ What happened to typical range after replacement? Improved 5 km</li> <li>■ Typical Range at 100% charge: 390 km</li> <li>■ Ownership duration: 350 days</li> </ul> <p>Mileage calculation for replacement battery: If the battery hadn't been replaced, typical range would be <math>390 - 5 = 385</math> km on the old battery at 30,000 km.  If 30,000 km equals to 400-385 km range loss  then X km equals to 400-390 km range loss  Cross multiply. <math>X = 30,000 * (400 - 390) / (400 - 385) = 30,000 * 10 / 15 = 20,000</math> km. The chart will display 20,000 km</p> <ul style="list-style-type: none"> <li>■ Why does the chart display 20,000 km even though actual mileage on the replacement battery is only 30,000-24,000= 6,000 km?  Because this replacement battery was refurbished and had some mileage on it.</li> <li>■ Why does the chart display 20,000 km even though mileage on the car is 30,000 km?  Because the chart displays mileage on the current battery not on the car and it has calculated that the replacement battery has 20,000 km mileage on it.</li> <li>■ How would the chart calculate age on the replacement battery?  <math>\text{Age} = 350 * (400 - 390) / (400 - 385) = 350 * 10 / 15 = 233</math> days</li> <li>■ What mileage would the chart show if the replacement battery still had 400 km range?  Even though the calculation would result in zero miles (<math>X = 30,000 * (400 - 400) / (400 - 395) = 30,000 * 0 / 5 = 0</math> km) the chart recognises that the calculation shouldn't be less than what the user reported. In this case odometer shows 30,000, replacement happened at 24,000. Therefore mileage on the replacement battery is at least 6,000 km. Therefore the chart would display 6,000 km. The age calculation for the replacement battery would result in zero days too because the typical range is still 400 km (same as a new battery). Of course zero days would be incorrect too because the battery has 6000 km on it. Again the chart wouldn't use zero and would calculate the time that corresponds to 6000 km mileage as follows:  If 30,000 km equals to 350 days  Then 6,000 km equals to X days  <math>X = 6,000 * 350 / 30,000 = 70</math> days</li> </ul>		42	421	
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17 Jun 2015	Matteo	<p>I added two new columns:  #1. Capacity at this mileage according to chart trendline  #2. Your capacity minus chart trendline at this mileage</p> <p>What do these mean? On charts page there is a chart called "Mileage vs Range". The trendline on this chart shows how range changes based on mileage considering all entries. #1 shows the trendline value at your mileage. For example if the average capacity at 25,000km is 96.9%, then #1 will show 96.9% if your mileage is 25,000km. In other words #1 shows what your battery capacity should be at this mileage if it was like other cars.</p> <p>#2 shows how much above or below of the trendline you are. For example if your mileage is 25,000km and your battery capacity is 97.1% then you are 0.2% better than the average and #2 will show 0.2%. In other words, #2 shows how your battery capacity compares to other cars. If #2 is positive, then you are doing better than the average. If #2 is negative than you are not. All this data is dynamic. The trendline changes with each new entry. #1 changes with the trendline. #2 changes with #1.</p>		421  #1. #1. #2. #2.	421  #1. #1. #2. #2.	
20 Jun 2015	Matteo	I added a stats page.		421	421	
30 Jun 2015	Matteo	I added the "Typical / Rated Range Consumption Calculator" to Range Types Explained sheet.		421	421	
06 Jul 2015	Matteo	<p>On TMC somebody asked this question: "Which is worse? 100% SOC or nearly empty?" <a href="http://www.teslamotorsclub.com/showthread.php/49434-Which-is-worse-100-SOC-or-nearly-empty">http://www.teslamotorsclub.com/showthread.php/49434-Which-is-worse-100-SOC-or-nearly-empty</a></p> <p>So I added both data to stats page. According to the data so far, charging to 100% daily or weekly makes your battery about 1% worse than people who do it a few times a year and about 2% worse than people who do it once or twice a year. However the other chart about running the battery nearly empty is inconsistent. There is a chance this will correct itself when there are entries from more people. Only the last entry from each person counts.</p>		421  So	421  So	
30 Jul 2015	Matteo	If visitors from USA select their username on charts page, the chart now shows miles instead km.		422	422	
02 Aug 2015	Matteo	Added new chart to stats page about daily charge level effect on degradation.		422	422	
09 Aug 2015	Matteo	<p>Stats page has data about 4 frequency questions. The way these are processed has changed from percentage average to head count method.</p> <p>Example: People were asked how often they supercharge. The following 4 users said they supercharge twice a week. Their battery capacity was as follows:</p> <p>John: 1.7% above trendline at their mileage  James: 0.5% above trendline at their mileage  Jane: 0.6% above trendline at their mileage  Jennifer: -3.2% above trendline at their mileage</p> <p>In the previous method, the average of these percentages would be calculated. That would be <math>(1.7+0.5+0.6-3.2)/4 = -0.1\%</math>  The group average would be -0.1%. In other words supercharging twice a week is slightly bad. The problem is, only one user has a low negative score but because it is very low it affects the entire group average. According to the new method, 3 out of 4 people in this group are above the trendline. Therefore this answer (supercharging twice a week) is 75% good.</p>		422  Exa Joh Jan Jan Jen In th	422  Exa Joh Jan Jan Jen In th	
10 Aug 2015	Matteo	Added daily charge power. Removed NEDC, battery type and firmware version.		422	422	



18 Aug 2015	Matteo	<p>I added "Average Supercharger Use" number to stats page. This is calculated from the answer people selected under "frequency of supercharging". For example "once a week" is converted to 52 times per year, "once a month" to 12 times etc. Then an average is calculated. As usual, for any stats data, only the last entry from each user counts to improve accuracy.</p> <p>Tesla's reminder letter about decreasing local supercharging is a popular discussion subject. So I thought it would be interesting to find out how many times an average user supercharges. Currently the number is 27 times per user per year.</p>		422	422	
11 Feb 2016	Matteo	The trendline for Mileage vs Battery Capacity chart was updated. We switched from a third order polynomial trendline to a partly polynomial, partly linear trendline. This screenshot shows the old and new trendlines: <a href="http://i.imgur.com/pmYQykf.gif">http://i.imgur.com/pmYQykf.gif</a>		424	424	
12 Feb 2016	Matteo	I updated the range numbers we use for USA and Canada. For example, P85D is supposed to display 253 mi EPA rated range with range mode on but it shows 256 miles on average according to answers to the survey question "What was 100% range when car was new?". Therefore I increased it from 253 to 256. S85 from 265 to 268, S70D from 240 to 243, S85D from 270 to 273. However I dropped S90D from 288 to 285. Canada numbers are the equivalent of these numbers in km. After his change the accuracy in USA and Canada sheets should have improved. In USA and Canada we had far too many entries above the trendline compared to Europe. This is now more balanced.		424	424	
17 Jul 2016	Matteo	I added range numbers for S70, S70D and made minor adjustments in existing models.		424	425	
15 Aug 2016	Matteo	Range numbers for different Tesla models have been updated based on the answer to the survey question "What was 100% range when the car was new?"		425	425	
23 Aug 2016	Matteo	We have had a vandalism incident today. A few entries were changed by somebody. In one entry the mileage was changed from 46,000 km to 460,000 km. I reversed all of them.		426	426	
20 Nov 2016	Matteo	I converted most in-cell formulas to arrayformula. This should speed up the file.		426	426	
12 Dec 2016	Matteo	I have updated usable battery capacity numbers according to the latest data posted here: <a href="https://teslamotorsclub.com/tmc/posts/1865416/">https://teslamotorsclub.com/tmc/posts/1865416/</a>		427	427	
18 Apr 2017	Matteo	18 Apr 2017, Matteo says: Editing old entries has been disabled for a while but will be re-enabled on 4 May 2017. The reason is because, I will be away and can't monitor the sheet regularly against unwanted edits.		428	428	
16 Sep 2017	Matteo	<p>I have updated the "Stats" tab. In the "Vehicle stats" table, I added these columns:</p> <p>Usable battery capacity when new (Wh)  Average real world range when new (km)  Average real world range when new (mi)  Typical range when new (km)  EPA rated range when new (mi)  Avg real world range/Typical range  Avg real world range/EPA rated range</p>		429	429	
		Matteo says: Feedback section is above. Don't write here please. Scroll up to row 93				

(1\*) Click on the number to open data source. (2\*) Based on survey question, "What was 100% typical range when car was new?".

Green = This survey uses these units  
Red = Not used in this survey.

17/07/2015	Gur	P85D from 508km to 480km for NEDC Range in Asia. Source: <a href="http://i.imgur.com/8MbyK6.png?1">http://i.imgur.com/8MbyK6.png?1</a>
18/07/2016	Matteo	I added S75, S75D and X75D. Also I updated the range numbers for S90D. It used to show 288mi EPA. Now it is 294mi. Data source for old S90D 288mi EPA <a href="http://i.imgur.com/v7XJAE1.gif">http://i.imgur.com/v7XJAE1.gif</a> Data source for new S90D 294mi EPA <a href="http://i.imgur.com/XDwDcD7.gif">http://i.imgur.com/XDwDcD7.gif</a>
15/08/2016	Matteo	The numbers above for typical range are based on the answer to the survey question "What was 100% typical range when car was new?"

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42569 Matteo I ad Data source for o Data source for n	42569 Matteo I ad Data source for o Data source for n			
42597 Matteo The	42597 Matteo The			

[1] This cell used to say 183 which appears to be an error because it is too low