

Summary

What are the most common reasons for delays and breakdowns?

- 1) The majority of breakdowns are occurring due to Mechanical Problems including, "Won't Start".
- 2) Overwhelmingly, the main cause of delays is due to Heavy Traffic.

How do delay times vary by bus company and borough?

- 1) Delay times vary greatly between bus companies. Companies with the highest delays include Selby Transportation, Little Linda Bus Co, and Pride Transportation.
- 2) The Boros with the highest delay times are the main areas of NYC. These areas with the highest concentration of people and vehicles which would account for the longer delays.

Is there a correlation between specific days of the week and the frequency of breakdowns or delays?

- 1) Gradual decrease in breakdowns throughout the week.
- 2) There is a spike in delays on Monday and lower delays on Fridays.

Conclusion & Recommendations

- 1) More precautionary maintenance done to prevent mechanical problems; Potentially served monthly.
- 2) Have buses pick up the majority of students at non-high traffic times.
- 3) The almost 14k delays caused by mechanical problems can be resolved with the breakdown plan.
- 4) Recommended to use the Delay TimeTable and Chart to compare to number of delays, boros, and total number of trips.
- 5) Delays could be due to mechanical issues that can be fixed with regular maintenance, high density boros where routes need to be reworked, or inneficient handling of company and their contract should be let go.
- 6) Schedule maintenance over weekends to limit breakdowns at the beginning of the week.
- 7) Since the majority of delays are caused by traffic, we can assume the decrease is caused by fewer people going to work or driving on a Friday.

Assumptions

- 1 Similar-sounding buss company names can be aggregated together as the same company.
- 2 One event marked "running late" did not have a delay time listed, assumed 0 min delay.
- 3 Excluded null boro's in boro delay analysis.
- 4 Removed blanks and outliers in weekday analysis.

Change Log

Versio	Details
1	Prepared document for analysis
1.1	Created copy of raw data; named "Raw Data" and "Clean Data".
1.2	Hid Raw data.
1.3	Prepared sheets for each question required for analysis, prepared organizational sheets.
2	Cleaned Data
2.1	Created "Weekday_Occured" column for the day of the week the incident occurred from the "Occurred_On" column with date-time data.
2.2	Created "Buss_Company_Name" from the "Company_Clean" column by filtering and normalizing company names.
2.3	Created "Short_Delay_Est" and "Long_Delay_Est" from the "How_Long_Delayed" column by splitting and removing string type data.
3	Pivot Table 1
3.1	Creased "Reason" sheet using "Reason" and "Breakdown_or_Running_Late" columns.
3.2	Created Pivot Table to count number of events for each reason for each delay type.
3.3	Created Column Chart for Top reasons of bus breakdowns.
3.4	Created Column Chart for Top reasons for buses running late.
4	Pivot Table 2
4.1	Created "Delay Times" sheet and pivot table using "Company_Clean" and Delay Time columns.
4.2	Created Bar chart for top 10 company delays.
4.3	Created pivot table using "Boro" and Delay Time columns.
4.4	Created Bar chart for Boro Delays.
5	Pivot Table 3
5.1	Created "Weekdays" sheet and pivot tables using "Weekday_Occured" and "Breakdown_or_Running_Late" columns.
5.2	Created Line Chart for day-of-the-week breakdowns.
5.3	Created Line Chart for day-of-the-week delays.
6	Summaries & Logs
6.1	Wrote Executive Summary and updated logs
7	Formatted sheets
7.1	Hid unnecessary columns from clean data
7.2	Created uniform formatting theme for colors/fonts

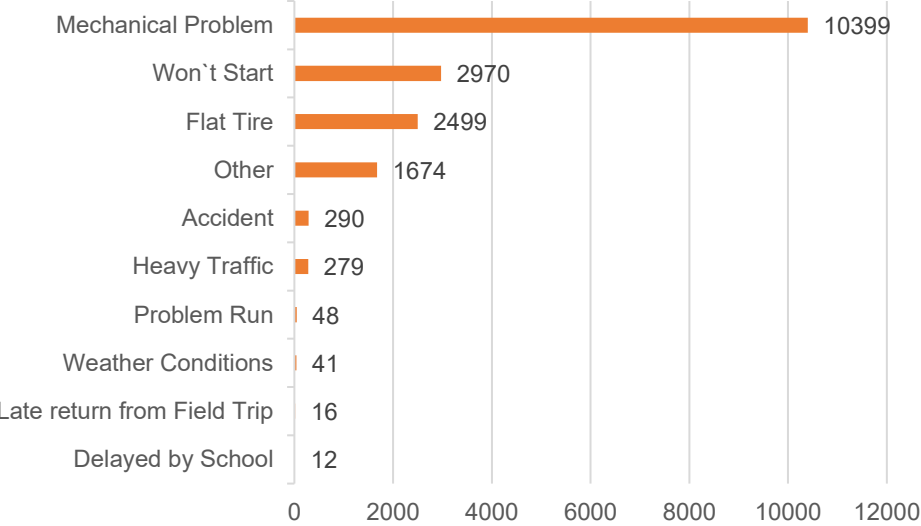
What are the most common reasons for delays and breakdowns?

Count of Reason	Column Labels	
Row Labels	Breakdown	Grand Total
Delayed by School	12	12
Field Trip	16	16
Weather Conditions	41	41
Problem Run	48	48
Heavy Traffic	279	279
Accident	290	290
Other	1674	1674
Flat Tire	2499	2499
Won't Start	2970	2970
Mechanical Problem	10399	10399
Grand Total	18228	18228

Count of Reason	Column Labels	
Row Labels	Running Late	Grand Total
Delayed by School	1737	1737
Won't Start	1932	1932
Accident	2101	2101
Field Trip	2255	2255
Flat Tire	2401	2401
Weather Conditions	4318	4318
Problem Run	10193	10193
Mechanical Problem	13695	13695
Other	49135	49135
Heavy Traffic	176196	176196
Grand Total	263963	263963

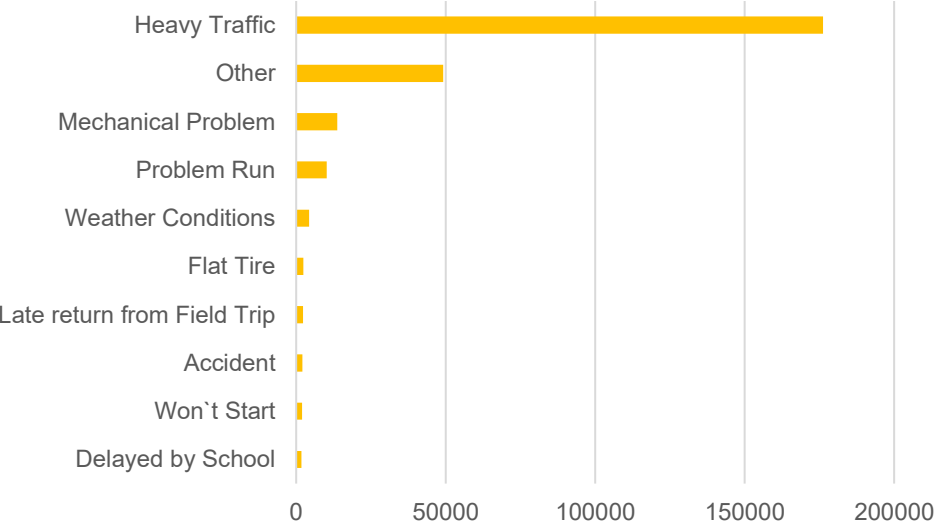
Count of Reason

Reason for Breakdowns



Count of Reason

Reason for Running Late

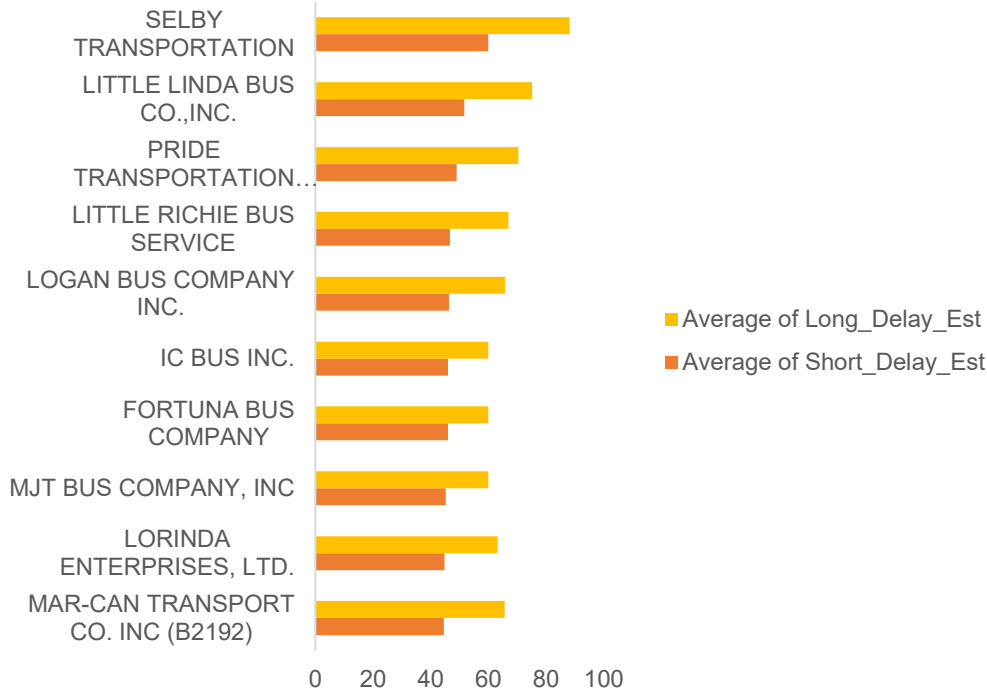


How do delay times vary by bus company and borough?

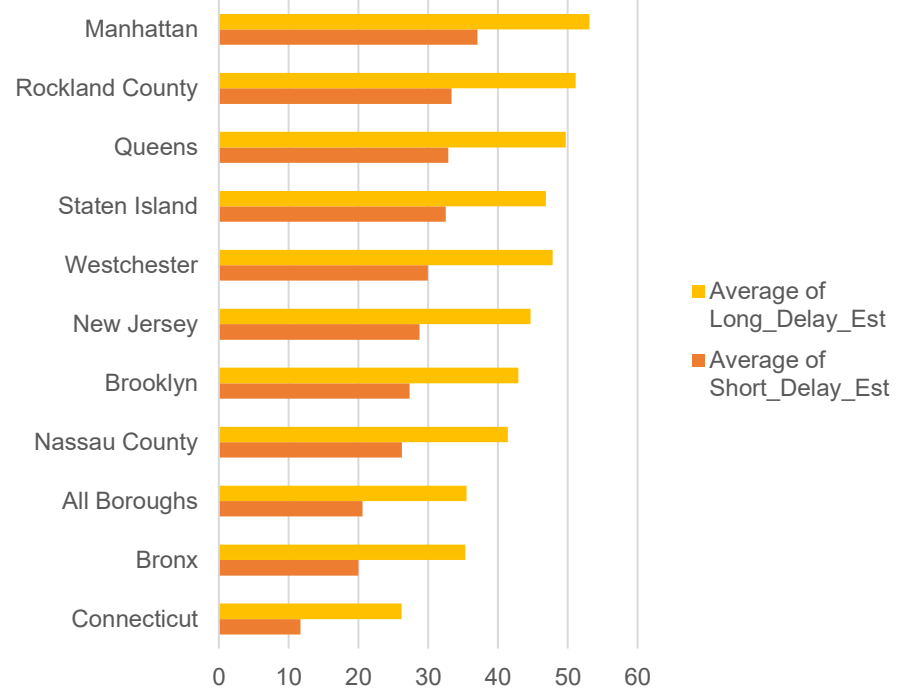
Row Labels	Short_Delay_Est	Long_Delay_Est
MAR-CAN TRANSPORT CO. INC (B2192)	45	66
LORINDA ENTERPRISES, LTD.	45	63
MJT BUS COMPANY, INC	45	60
FORTUNA BUS COMPANY	46	60
IC BUS INC.	46	60
LOGAN BUS COMPANY INC.	46	66
LITTLE RICHIE BUS SERVICE	47	67
PRIDE TRANSPORTATION (SCH AGE)	49	70
LITTLE LINDA BUS CO.,INC.	52	75
SELBY TRANSPORTATION	60	88
Grand Total	48	69

Row Labels	Short_Delay_Est	Long_Delay_Est
Connecticut	12	26
Bronx	20	35
All Boroughs	21	36
Nassau County	26	41
Brooklyn	27	43
New Jersey	29	45
Westchester	30	48
Staten Island	33	47
Queens	33	50
County	33	51
Manhattan	37	53
Grand Total	29	45

Top 10 Companies with Highest Delay Times

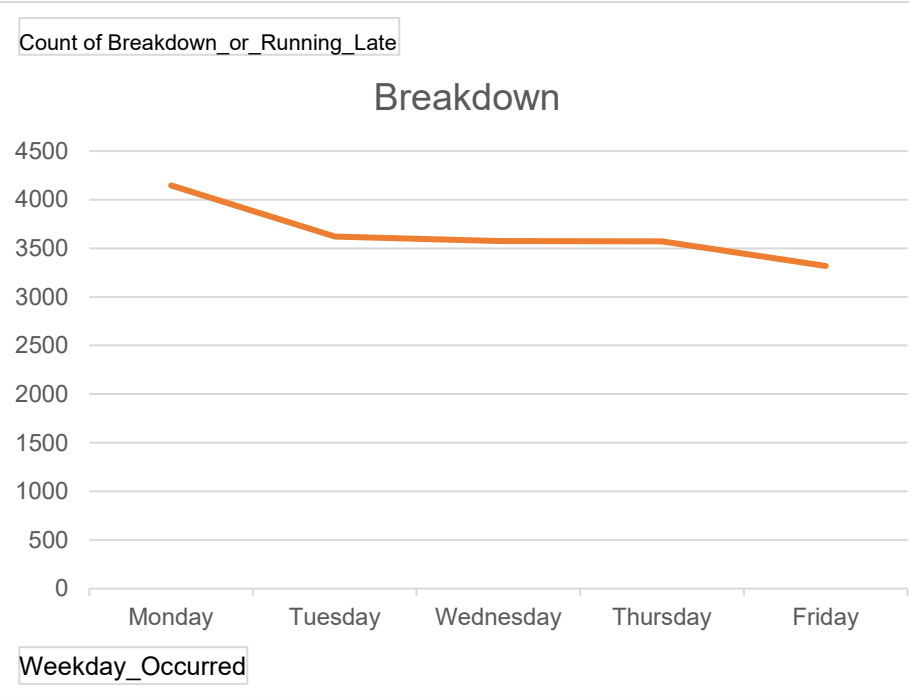


Boros by Delay Times

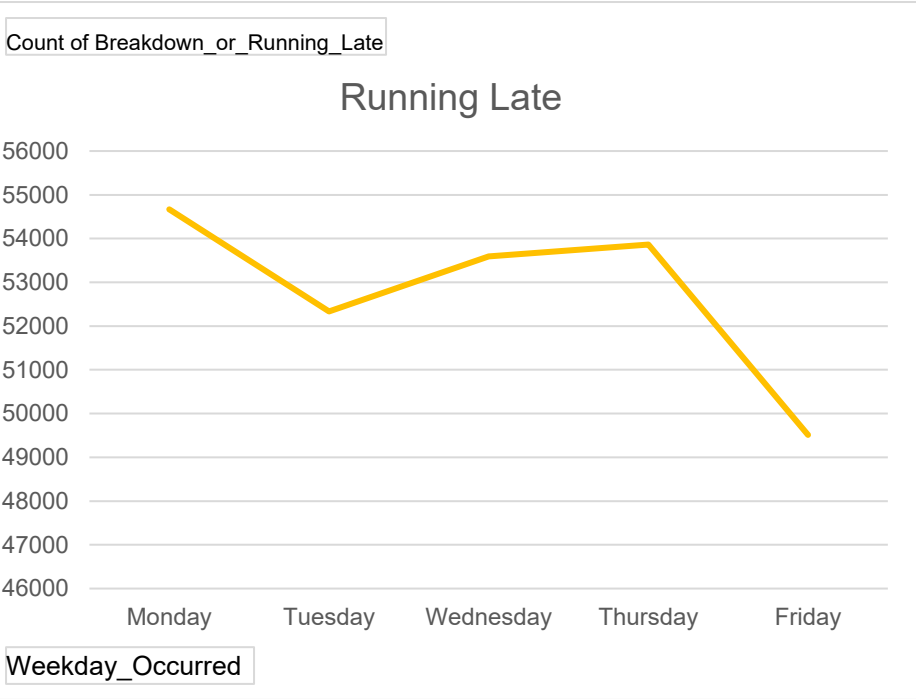


Is there a correlation between specific days of the week and the frequency of breakdowns or delays?

Breakdown_or_Running_Late	Column Labels	
Row Labels	Breakdown	Grand Total
Monday	4146	4146
Tuesday	3619	3619
Wednesday	3573	3573
Thursday	3572	3572
Friday	3318	3318
Grand Total	18228	18228



Breakdown_or_Running_Late	Column Labels	
Row Labels	Running Late	Grand Total
Monday	54667	54667
Tuesday	52332	52332
Wednesday	53589	53589
Thursday	53862	53862
Friday	49512	49512
Grand Total	263962	263962



Reason	Weekday_Occurred	Boro	Company_Clean	Short_Delay_Est	Long_Delay_Est
Mechanical Problem	Monday	Manhattan	CONSOLIDATED BUS TRANSIT, INC.	0	0
Heavy Traffic	Tuesday	Brooklyn	(B2321)	31	45
Mechanical Problem	Tuesday	Brooklyn	SNT BUS INC	46	60
Heavy Traffic	Tuesday	Brooklyn	(B2321)	31	45
Mechanical Problem	Tuesday	Nassau County	LEESEL TRANSPORTATION COR	46	60
Heavy Traffic	Tuesday	Nassau County	THOMAS BUSES	16	30
Heavy Traffic	Tuesday	Westchester	VAN TRANS LLC (B2192)	31	45
Flat Tire	Tuesday	Nassau County	BORO TRANSIT, INC.	31	45
Won't Start	Tuesday	Nassau County	THOMAS BUSES	16	30
Heavy Traffic	Tuesday	Brooklyn	(B2321)	31	45
Other	Tuesday	Nassau County	BORO TRANSIT, INC.	31	45
Heavy Traffic	Tuesday	Bronx	HOYT TRANSPORTATION CORP.	0	15
Heavy Traffic	Tuesday	New Jersey	(B2321)	31	45
Heavy Traffic	Tuesday	Bronx	PIONEER TRANSPORTATION CORP	0	15
Heavy Traffic	Tuesday	Brooklyn	(B2321)	31	45
Heavy Traffic	Tuesday	Bronx	DON THOMAS BUSES, INC.	0	15
Heavy Traffic	Tuesday	Brooklyn	(B2321)	31	45
Heavy Traffic	Tuesday	Nassau County	(B2321)	31	45
Heavy Traffic	Tuesday	New Jersey	(B2321)	31	45
Won't Start	Tuesday	Nassau County	BORO TRANSIT, INC.	16	30
Mechanical Problem	Tuesday	Westchester	MAR-CAN TRANSPORT CO. INC (B2192)		
Heavy Traffic	Tuesday	Bronx	DON THOMAS BUSES, INC.	16	30
Heavy Traffic	Tuesday	Manhattan	LEESEL TRANSPORTATION COR	46	60
Won't Start	Tuesday	Manhattan	SNT BUS INC	16	30
Heavy Traffic	Tuesday	Nassau County	LEESEL TRANSPORTATION COR	46	60
Other	Tuesday	Queens	FIRST STEPS TRANS, INC	16	30
Won't Start	Tuesday	Westchester	CHILDREN'S TRANS INC. (B2321)	16	30
Heavy Traffic	Tuesday	Manhattan	LEESEL TRANSPORTATION COR	16	30
Mechanical Problem	Tuesday	Westchester	CHILDREN'S TRANS INC. (B2321)	16	30
Flat Tire	Tuesday	Nassau County	BORO TRANSIT, INC.		
Other	Tuesday	Westchester	CHILDREN'S TRANS INC. (B2321)	16	30
Heavy Traffic	Tuesday	Manhattan	LEESEL TRANSPORTATION COR	16	30
Heavy Traffic	Tuesday	Manhattan	LEESEL TRANSPORTATION COR	16	30

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