Statewide Paratransit Scheduling and Dispatch Software Deployment

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Overview

- Background
  - Pennsylvania Shared-Ride Services
  - Software Deployment Goals
- Outcomes
  - Agency
  - Statewide/PennDOT
  - Supporting Software
- Conclusions
  - Were Goals Met?
  - Future Projects

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Background – PA Shared Ride Services

- Shared Ride services available in all 67 counties.
- 44 different service providers
- Organization types:
  - County Government
  - Transit Authority
  - Non-Profit Organization
- 6.8 million trips between July 2017 and June 2018

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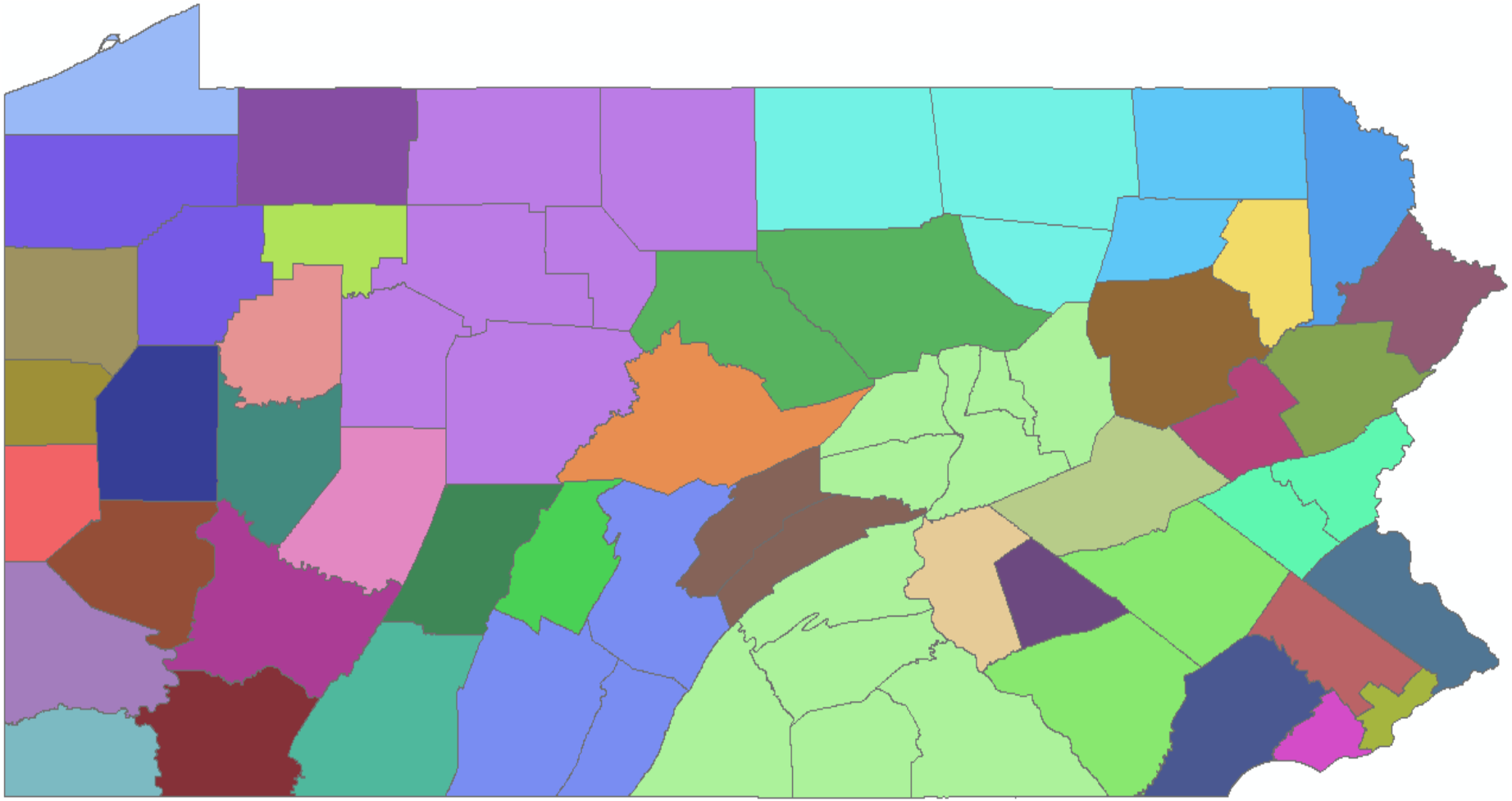
Background – PA Shared Ride Services



Left: Map of Pennsylvania colored by agency service areas.

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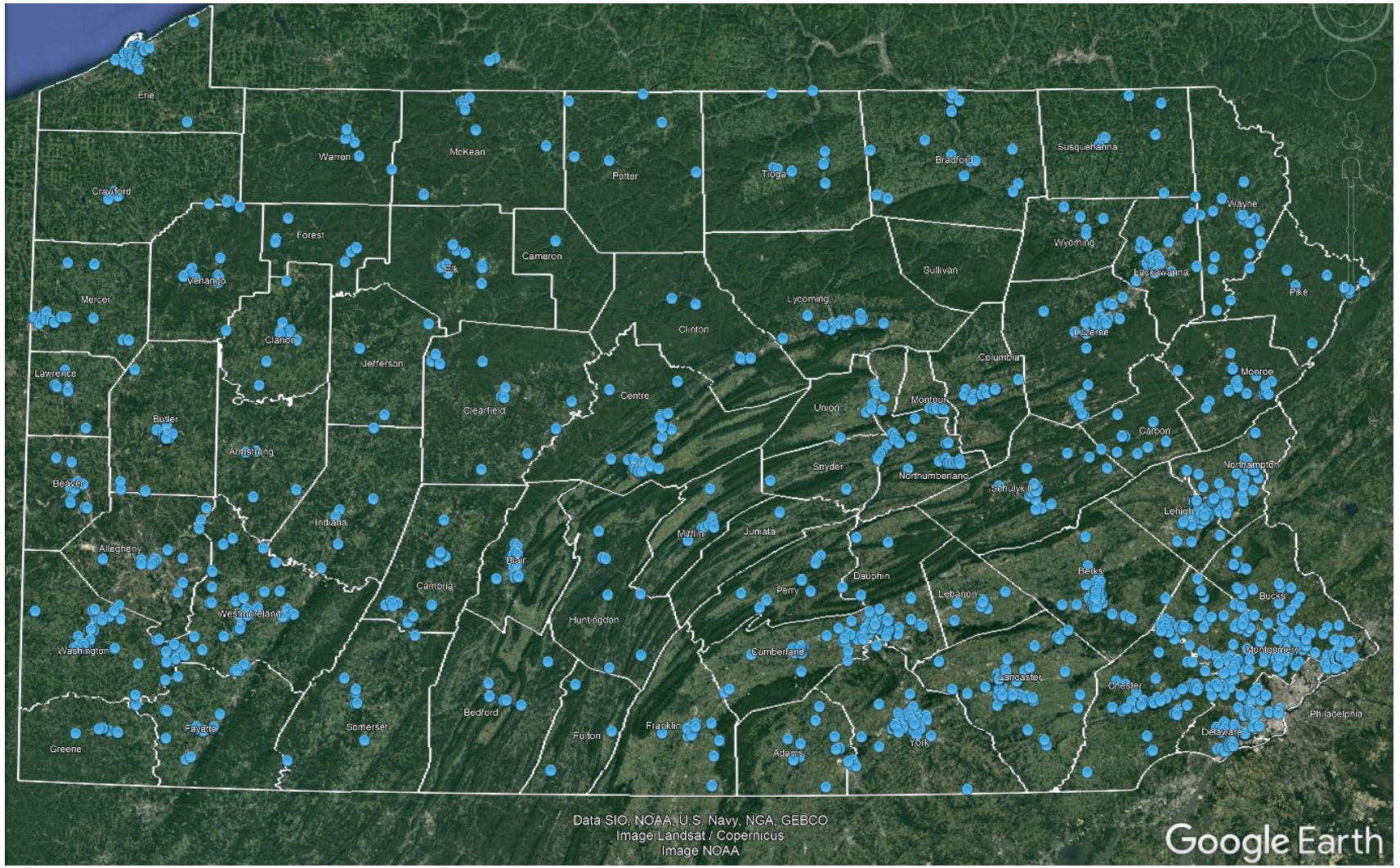
Background – Software Deployment Goals

1. Provider access to the latest technology
2. Improve customer service
3. Standardize service levels and parameters
4. Promote regionalization/consolidation
5. Standardize/simplify fare structures
6. Standardize reporting and data definitions
7. Improve service efficiency
8. Ease information sharing
9. Ensure data consistency

Outcomes - Agency

Visibility of Operating Conditions



Left: Live location data of all Pennsylvania demand-response transportation vehicles in service as of 13:55 on 04/01/2019 (excluding SEPTA and PAAC).

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Outcomes – Agency (Case 1)

System Health

- Efficiency Score ("escore"): indicator of service quality and effectiveness of resource use.
- 8 Factor Analysis:
  - Trip per Revenue Hour
  - On-Time Performance
  - Ideal Ride Time
  - Will-Call Wait Time
  - Valid Stop Percentages
  - Trips performed per Vehicle
  - Trips per Service Hour
  - Service Hours per Vehicle

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Outcomes - Agency (Case 1)

System Health

date	Trips per revenue Hour	On time performance	Percent within Ideal Ride Times	Will call wait time	Valid Stop %	Trips performed	Vans Used per day	perf trips per van	Act serv hrs	Trips per serv hour	Service hours per van	day	x	total e score	otp stops	average trip distance	average trip duration	average wc wt	completed will calls	wc & of total completed trips
3/14/2019	3.17	94.00%	92.55%	97.97%	96.25%	470	21	22.38	172.24	2.73	8.20	Thursday		8.23	92.00%	5.94	26.40	16.32	148.00	31.49%
3/15/2019	3.09	96.00%	87.60%	99.27%	96.06%	486	23	21.13	193.21	2.52	8.40	Friday		7.98	94.00%	7.42	28.80	15.02	137.00	28.19%
3/18/2019	2.95	97.00%	92.06%	100.00%	96.33%	441	21	21.00	174.06	2.53	8.29	Monday		8.08	95.00%	6.32	26.40	10.62	140.00	31.75%
3/19/2019	2.98	94.00%	92.47%	99.28%	95.95%	436	23	18.96	176.32	2.47	7.67	Tuesday		7.98	94.00%	6.29	26.40	14.71	138.00	31.65%
3/20/2019	3.08	96.00%	89.72%	100.00%	96.67%	522	24	21.75	203.19	2.57	8.47	Wednesday		8.09	92.00%	6.82	28.80	11.60	160.00	30.65%
3/21/2019	2.86	98.00%	96.05%	99.28%	96.40%	428	22	19.45	179.19	2.39	8.15	Thursday		8.04	95.00%	5.08	22.80	12.41	139.00	32.48%
3/22/2019	2.87	95.00%	91.76%	100.00%	95.51%	461	23	20.04	191.58	2.41	8.33	Friday		7.89	94.00%	6.35	27.00	12.41	135.00	29.28%
3/25/2019	2.84	96.00%	92.48%	100.00%	95.74%	412	21	19.62	170.96	2.41	8.14	Monday		7.92	94.00%	5.98	26.40	12.47	132.00	32.04%
3/26/2019	2.74	95.00%	92.44%	100.00%	96.25%	409	22	18.59	174.90	2.34	7.95	Tuesday		7.83	94.00%	6.11	26.40	12.74	130.00	31.78%
3/27/2019	3.08	98.00%	92.15%	98.73%	96.75%	496	23	21.57	192.46	2.58	8.37	Wednesday		8.18	95.00%	6.35	26.40	10.70	157.00	31.65%
3/28/2019	2.96	98.00%	93.18%	100.00%	95.45%	440	21	20.95	177.47	2.48	8.45	Thursday		8.07	95.00%	6.06	25.20	12.46	122.00	27.73%
3/29/2019	2.82	96.00%	94.05%	99.32%	96.48%	454	23	19.74	188.62	2.41	8.20	Friday		7.96	93.00%	6.07	25.80	13.85	147.00	32.38%

Above: escore calculation for each service day in a two-week period in March 2019.

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Outcomes - Agency (Case 1)

Resource Allocation

- Scheduling Matrix
  - Tool for evaluating the agency's need for vehicles the following day

Trips	409		
Projected Lost trips	61		
Estimated Completed Trips	348		
Requested vans	22		
Estimated Performed Trips Per Van	26.77		Add A Vehicle

Score Sheet			
	Lose a van	Add a Van	ideal
Less than 20	x		
Between 21.50-22.25			x
Over 22.25		x	

Above: Scheduling Matrix showing that an additional vehicle is required to meet service level goals for the day.

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Outcomes - Agency (Case 1)

Resource Allocation

- Service Hour Matrix
  - Tool for evaluating the agency's daily need for drivers
  - Used on day of service to determine if more/fewer needed

Route	Driver	Start time	End Time	Hours	lunch
TY1		7:04	17:00	9.93	1
TY2		7:30	17:00	9.50	1
WIL		6:47	17:00	10.22	1
				0.00	
				201.97	21
Starting trips	Projected trips			10.50	
556	473			191.47	driver hours
83	lost trips				
2.47	TRIPS PER SERVICE HOURS				
189	Target hours				
2.43	Hours over/under				

Above: Service Hour Matrix showing the scheduling load for the next day.

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Outcomes - Agency (Case 1)

Resource Allocation and System Health

- The prior resources are evaluated against agency goals.
- Goals are reevaluated at least annually, and tools are updated accordingly.

Outcomes - Agency (Case 2)

Customer Service

- Data-driven responses to customer complaints:
  - Geotags are used to resolve complaints regarding pick-up/drop-off locations.
  - Timestamps are used to resolve complaints regarding missed rides/appointments and long ride times
- If rider uses service frequently, trip counts, average on-board time, and average on-time performance are communicated.
- Any patterns of poor performance are monitored and corrected.

Outcomes - Agency (Case 2)

Customer Service

Status	Complaint#	Date Received	Complaint Type	Funding Source	Submitted Thru	Summary	Resolution
Closed	2389	9/12/2018 4:47:01 PM	Standard	PDA Waiver	Phone	The client's daughter [redacted] called with the following complaint: Her mother's van arrived late to pick her up and because of this she is going to be getting home late. The client had a window of (1:45-2:15). The van arrived at 2:54 and the client arrived home at 4:21. The client was on the van for 1 hour and 27 minutes.	CLient has taken 200 trips in past year with 99% OTP and 43 minutes Avg OBT. There are circumstances beyond our control which will cause public transportation to be late.
Closed	2413	9/20/2018 2:36:53 PM	Standard	Not Specified	Phone	The client had a window of (2:30-3:00). The van arrived at 3:28 and the client arrived at his destination at 3:46 (16 minutes late).	Apologize for this trip. Client has 94% OTP and avg OBT of 24 minutes in past year.

Above: Customer Service Report with complaints and resolutions showing communication of on-time performance and on-board times.

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Outcomes – Agency (Case 3)

Interagency Coordination

- Service Regionalization
  - Multi-county and intra-county agency consolidations into regional service providers
  - Common data platform eased transfer of customer and trip data.
- Multi-Agency Mobility Management
  - Municipal authority acts as a mobility manager and transportation broker for a regional medical facility.
  - Shared scheduling platform enables the mobility manager to check service availability and schedule trips.

Outcomes – Statewide/PennDOT

Compliance Reviews

- Significant reduction in on-site time
- Reduction in manual processes
- Ease of data extraction
- Enhanced review capabilities

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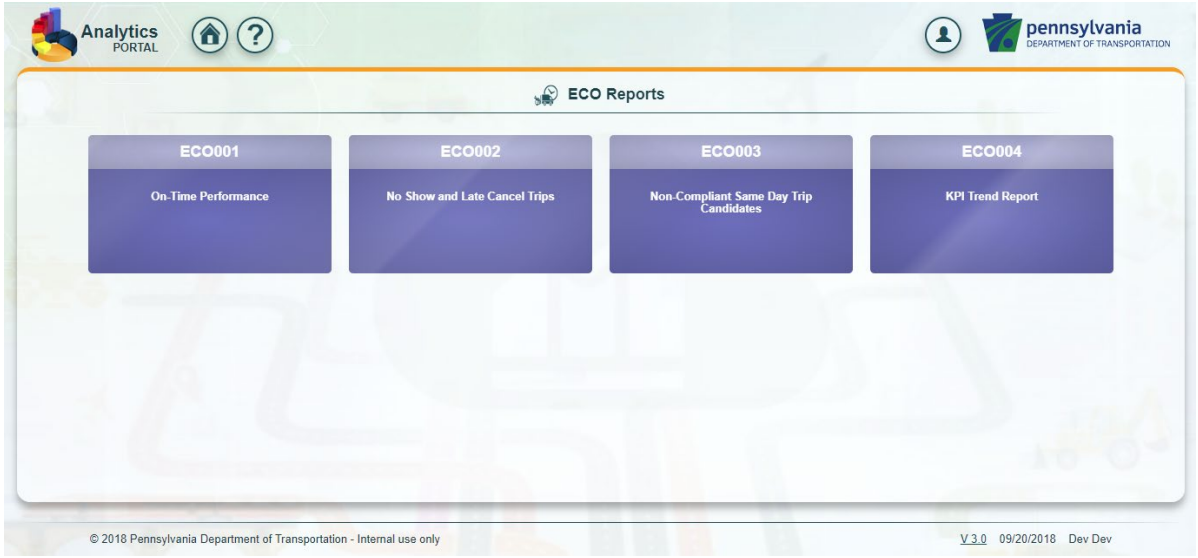
Outcomes – Statewide/PennDOT

Statewide Data Warehouse

- A centralized database for all agency data
- Enables greater export functionality and customized report building
- Current reports include:
  - Non-Compliant Same Day Trip Candidates
  - No Show and Late Cancel Trips
  - On-Time Performance
  - KPI Trend Report



Above Right: Data Warehouse dashboard

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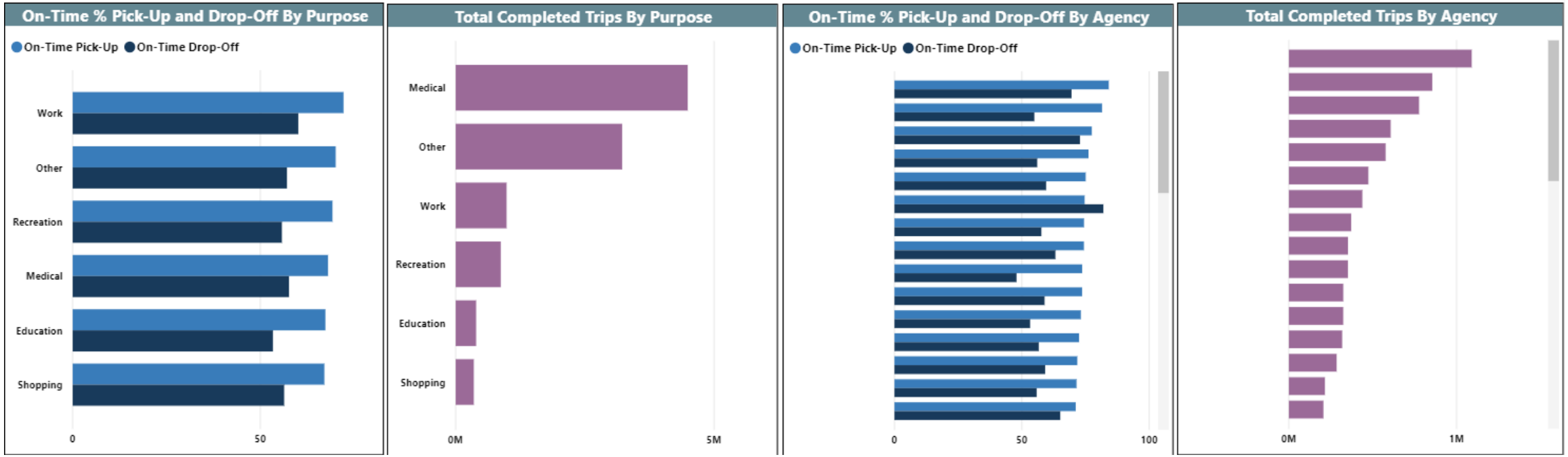
Outcomes – Statewide/PennDOT



Above: On-Time Performance Report, with agency names redacted

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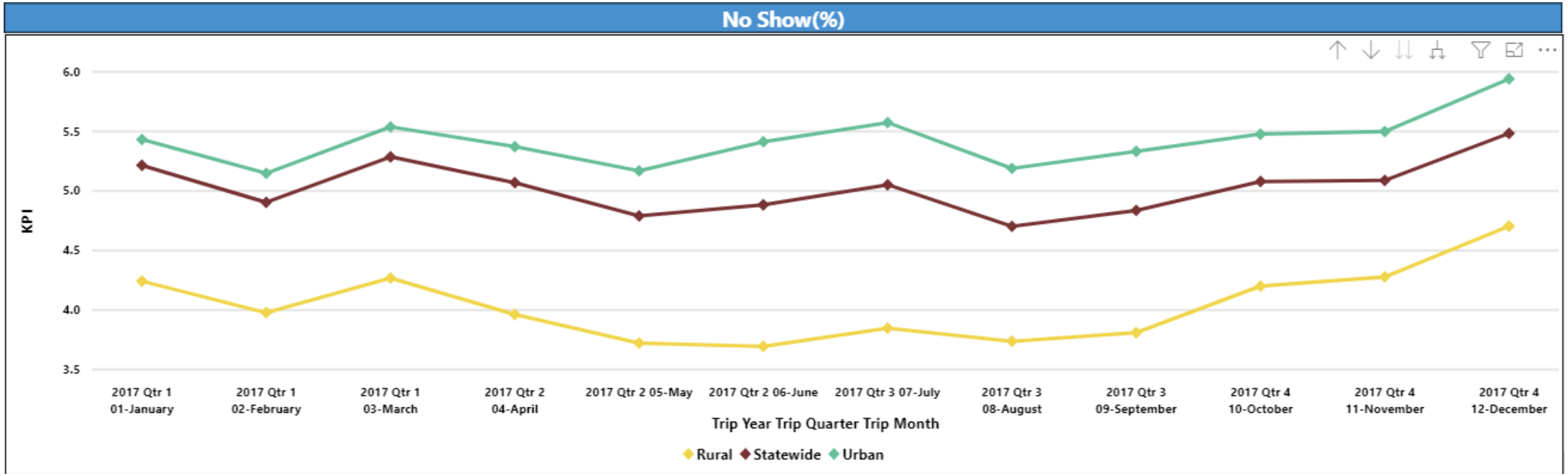
Outcomes – Statewide/PennDOT



Above: KPI Trend Report for No Show Percentage, looking at calendar year 2017 by month, comparing Urban agencies, Rural agencies, and the State as a whole.

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Outcomes – Statewide/PennDOT

Challenges in Data Warehouse Development

- Removing personally identifying information (PII)
- Mapping agency-specific terms to standard data sets
- Determining performance indicators
- Calculating performance indicators
- Comparing agencies

Conclusions

- Were goals met?
  - Provider access to the latest technology
  - Improve customer service
  - Standardize service levels and parameters
  - Promote regionalization/consolidation
  - Standardize/simplify fare structures
  - Standardize reporting and data definitions
  - Improve service efficiency
  - Ease information sharing
  - Ensure data consistency

Conclusions

- Future Plans
  - Improve data consistency and validation
  - Improve reporting
  - Encourage further best practice sharing
  - Encourage more data-driven decision-making
  - Continue to advance initiatives that utilize available software and data

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We would like to thank the following agencies for taking the time to explain their use of data in decision-making for this presentation:

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