

# mXpress

Scrum 4

By Team MX

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# mXpress Real Time Vehicle Routing System



**Solving slow emergency response times in large cities as well as providing more accurate routing for general consumers**



**Fills the need for high quality, specialized routing systems for emergency dispatchers**



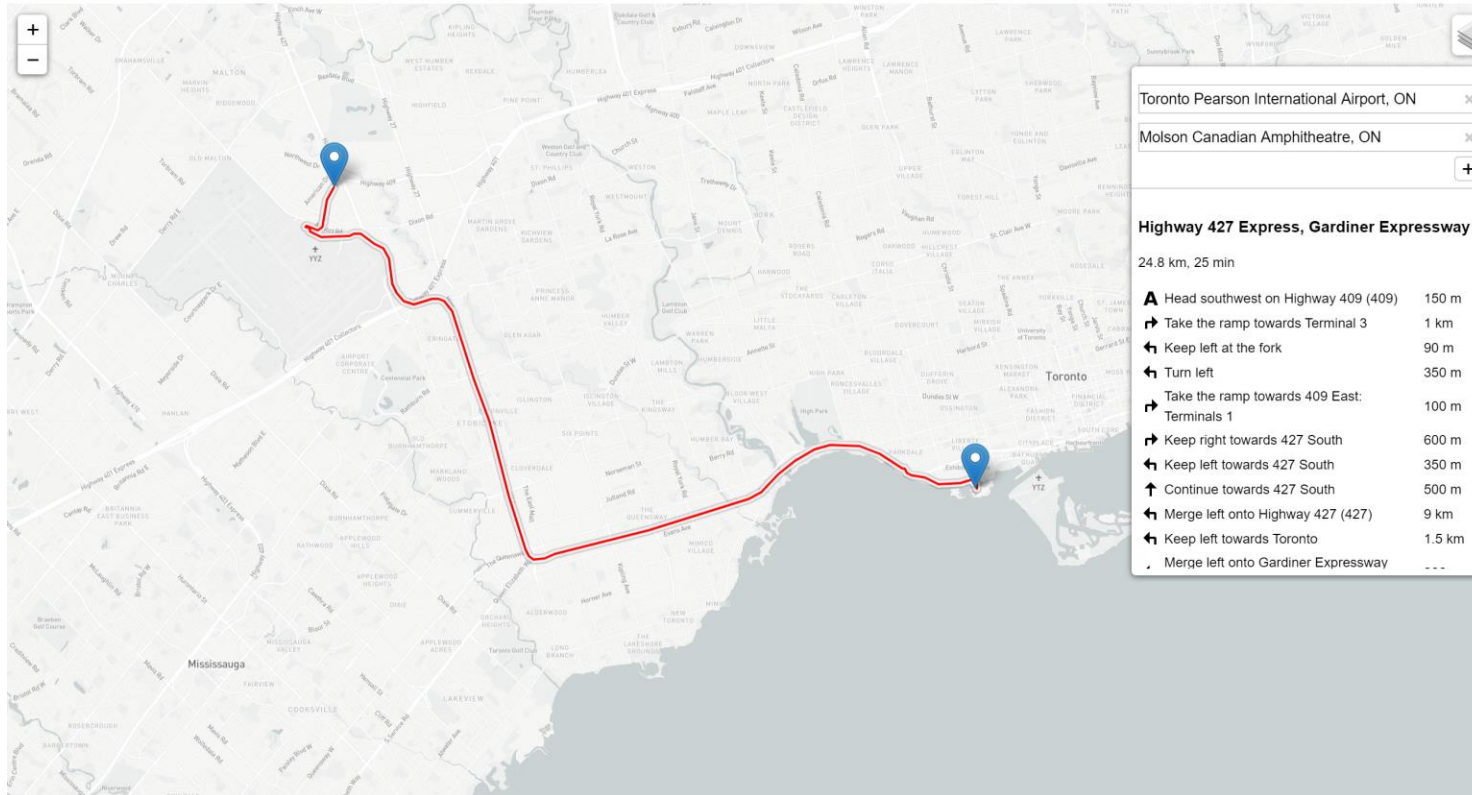
**Innovates by utilizing both batch and stream big data coupled with AI to do predictive and reactive trip planning**



**Potentially allows for consumer vehicle routing using batch data**



**Adaptable framework allows for multiple qualities of service provided**



- OSRM server reading speeds from real-time traffic database
- Customer-facing routing website version 1 complete
- Nearly completed streaming telemetry updates into real-time traffic database
- Infrastructure enhancements & fixes
- Acquired & mapped new telemetry dataset

# Project Progress

# Project Demo

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Live Mapping Server



# Next Steps

- iOS & Android App Development
- Full scale batch processing
- Containerization
- Further testing & end user documentation
- Development for real world customer
  - Ontology / performance
- Continuation of development over summer
  - Partnership with U of T / Mohamed



# Backbone & Testing

- Load Tests
- Performance Tests
- Integration Tests
- Division of responsibility

```
spark_1@localhost:/usr/spark/spark-2.4.4-bin-hadoop2.7
File Edit View Search Terminal Tabs Help
spark_1@localhost:/usr/spark/spark-2.4.4-bin-hadoop2.7
19/10/20 13:44:00 INFO TaskSetManager: Finished task 3.0 in stage 0.0 (TID 3) in 423 ms on localhost (executor driver) (1/10)
19/10/20 13:44:00 INFO Executor: Running task 9.0 in stage 0.0 (TID 9)
19/10/20 13:44:00 INFO Executor: Running task 7.0 in stage 0.0 (TID 7)
19/10/20 13:44:00 INFO Executor: Running task 8.0 in stage 0.0 (TID 8)
19/10/20 13:44:00 INFO TaskSetManager: Finished task 1.0 in stage 0.0 (TID 1) in 442 ms on localhost (executor driver) (2/10)
19/10/20 13:44:00 INFO TaskSetManager: Finished task 4.0 in stage 0.0 (TID 4) in 444 ms on localhost (executor driver) (3/10)
19/10/20 13:44:00 INFO TaskSetManager: Finished task 0.0 in stage 0.0 (TID 0) in 472 ms on localhost (executor driver) (4/10)
19/10/20 13:44:00 INFO TaskSetManager: Finished task 2.0 in stage 0.0 (TID 2) in 447 ms on localhost (executor driver) (5/10)
19/10/20 13:44:00 INFO Executor: Finished task 6.0 in stage 0.0 (TID 6). 824 bytes result sent to driver
19/10/20 13:44:00 INFO Executor: Finished task 5.0 in stage 0.0 (TID 5). 824 bytes result sent to driver
19/10/20 13:44:00 INFO TaskSetManager: Finished task 5.0 in stage 0.0 (TID 5) in 77 ms on localhost (executor driver) (6/10)
19/10/20 13:44:00 INFO TaskSetManager: Finished task 6.0 in stage 0.0 (TID 6) in 75 ms on localhost (executor driver) (7/10)
19/10/20 13:44:00 INFO Executor: Finished task 8.0 in stage 0.0 (TID 8). 824 bytes result sent to driver
19/10/20 13:44:00 INFO TaskSetManager: Finished task 8.0 in stage 0.0 (TID 8) in 73 ms on localhost (executor driver) (8/10)
19/10/20 13:44:00 INFO Executor: Finished task 9.0 in stage 0.0 (TID 9). 824 bytes result sent to driver
19/10/20 13:44:00 INFO TaskSetManager: Finished task 9.0 in stage 0.0 (TID 9) in 76 ms on localhost (executor driver) (9/10)
19/10/20 13:44:00 INFO Executor: Finished task 7.0 in stage 0.0 (TID 7). 824 bytes result sent to driver
19/10/20 13:44:00 INFO TaskSetManager: Finished task 7.0 in stage 0.0 (TID 7) in 84 ms on localhost (executor driver) (10/10)
19/10/20 13:44:00 INFO TaskSchedulerImpl: Removed TaskSet 0.0, whose tasks have all completed, from pool
19/10/20 13:44:00 INFO DAGScheduler: ResultStage 0 (reduce at SparkPi.scala:38) finished in 0.758 s
19/10/20 13:44:00 INFO DAGScheduler: Job 0 finished: reduce at SparkPi.scala:38, took 0.834029 s
Pi is roughly 3.141779141779142
19/10/20 13:44:00 INFO SparkUI: Stopped Spark web UI at http://192.168.1.136:4040
19/10/20 13:44:00 INFO MapOutputTrackerMasterEndpoint: MapOutputTrackerMasterEndpoint stopped!
19/10/20 13:44:00 INFO MemoryStore: MemoryStore cleared
19/10/20 13:44:00 INFO BlockManager: BlockManager stopped
19/10/20 13:44:00 INFO BlockManagerMaster: BlockManagerMaster stopped
19/10/20 13:44:00 INFO OutputCommitCoordinator$OutputCommitCoordinatorEndpoint: OutputCommitCoordinator stopped!
19/10/20 13:44:00 INFO SparkContext: Successfully stopped SparkContext
19/10/20 13:44:00 INFO ShutdownHookManager: Shutdown hook called
19/10/20 13:44:00 INFO ShutdownHookManager: Deleting directory /tmp/spark-b01ef10d-2a57-4f6b-bb6f-c314444e40fd
19/10/20 13:44:00 INFO ShutdownHookManager: Deleting directory /tmp/spark-1e2bb37f-b14f-410d-9402-98b3c06edcc3
[root@localhost spark-2.4.4-bin-hadoop2.7]#
```



# Group Reflection

- Do you feel you are on track?
  - Yes, we are completed the majority of the project. After we implement the final features, we are looking to refine our infrastructure using containerization.
- Do you feel there are barriers to your success (if any)?
  - Kafka configuration problems are blocking completion of telemetry streaming component, but we are working through this
- Do you need any help going forward?
  - Nope
- Any other questions or concerns?
  - Nope