| **Model** | | **RNN** | **LSTM** | **GCN-LSTM** |
| --- | --- | --- | --- | --- |
| Layer Configuration | RNN | [48, 88] | N/A | N/A |
| GCN | N/A | N/A | [10, 24] |
| LSTM | N/A | [128, 56, 64] | [108, 104] |
| Activation Function | | ReLU | ReLU | ReLU |
| Learning Rate | | 0.0282 | 0.0032 | 0.0042 |
| Dropout Rate | | 0.0123 | 0.2858 | 0.2255 |
| Batch Size | | 4 | 4 | 4 |
| Optimizer | | Adam | Adam | Adam |
| Look Back | | 9 | 2 | 7 |

| **Model** | **ARIMA** |
| --- | --- |
| Order | (0, 1, 1) |
| Seasonal Order | (0, 1, 0) |
| m | 52 |

**TABLE 2. Model Performance**

| **Model** | **Persistence** | | **ARIMA** | | **RNN** | | **LSTM** | | **GCN-LSTM** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Metric | RMSE  ( Miles) | MAPE | RMSE  ( Miles) | MAPE | RMSE  ( Miles) | MAPE | RMSE  ( Miles) | MAPE | RMSE  ( Miles) | MAPE |
| Performance | 5.7136 | 6.56% | 3.3737 | 3.74% | 7.5234 | 7.32% | 8.0782 | 8.13% | 5.5897 | 5.79% |

| **Model** | **Persistence/ARIMA** | | **Persistence/RNN** | | **Persistence/LSTM** | | **Persistence/GCN-LSTM** | | **LSTM/GCN-LSTM** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Performance Improvement** | RMSE  ( Miles) | MAPE | RMSE  ( Miles) | MAPE | RMSE  ( Miles) | MAPE | RMSE  ( Miles) | MAPE | RMSE  ( Miles) | MAPE |
| -40.95% | -42.96% | 31.68% | 11.59% | 41.39% | 23.90% | -2.17% | -11.76% | -30.80% | -28.78% |