



# 2020 DFW Metroplex NTS Functional Exercise After-Action Report / Improvement Plan

December 8, 2020



**ARRL**  
**North Texas Section**  
*Amateur Radio in North Texas*



# 2020 DFW METROPLEX NTS FUNCTIONAL EXERCISE AFTER-ACTION REPORT / IMPROVEMENT PLAN

## DECEMBER 8, 2020

This document follows the **Homeland Security Exercise and Evaluation Program**. HSEEP provides a set of guiding principles for exercise and evaluation programs, as well as a common approach to exercise program management, design and development, conduct, evaluation, and improvement planning. See <https://www.fema.gov/emergency-managers/national-preparedness/exercises/hseep> and <https://preptoolkit.fema.gov/web/hseep-resources> for more information about HSEEP, and [https://www.fema.gov/sites/default/files/2020-07/ccds\\_response-mission-area.pdf](https://www.fema.gov/sites/default/files/2020-07/ccds_response-mission-area.pdf) for more information about the response core capabilities tested.

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# Executive Summary

The 2020 DFW Metroplex NTS Functional Exercise was developed to test Situational Assessment and Operational Communications capabilities. The exercise team included the ARRL North Texas Section Traffic Manager and the Net Managers from the DFW Metroplex Traffic Net. Planning started on September 16 and concluded on October 1 when the exercise was announced. The exercise team discussed how this exercise would be the first in recent memory and how taking a long-term crawl/walk/run approach will help traffic handlers become comfortable operating in an incident environment.

Based on the exercise team discussion, the following objectives were developed for the 2020 DFW Metroplex NTS Functional Exercise:

- **Primary:** Assess the ability of the National Traffic System (NTS) in Dallas/Fort Worth to respond to a major event and relay supporting information throughout the DFW Metroplex
- **Secondary:** Assess ability to gather, consolidate, and report situational information
- **Individual:** Communicate information to traffic net via the WA5CKF repeaters

The purpose of this report is to analyze exercise results, identify strengths to be maintained and built upon, identify potential areas for further improvement, and support development of corrective actions.

## Major Strengths

The major strengths identified during this exercise are:

- Net Control Stations maintained control of the traffic net throughout the exercise, including when emergency traffic unexpectedly arrived.
- Traffic handlers relayed information with clarity, quality, and accuracy using proper traffic formats and protocols.
- The vast majority of stations were able to work the repeater with a clear quality signal. Only three stations are known to be unable, and two of those relayed via simplex to an intermediate traffic handler to facilitate delivery to the Simulation EOC despite not having a documented process on how to do so.

## Primary Areas for Improvement

Throughout the exercise, several opportunities for improvement in the NTS's ability to respond to the incident were identified. The primary areas for improvement, including recommendations, are:

- Only 66% of exercise traffic was turned in post-exercise.
- Stations unable to reach the repeater did not have a clear alternative way to relay their traffic.
- Net Control Station did not regularly announce the ask: what the net is seeking to achieve, the fact check-ins are only being accepted for this purpose, etc.

## Overall Assessment

The exercise was overall a success, relaying 30 situational reports and 4 emergency-related pieces of traffic from across the Metroplex. Future exercises should expand on traffic system operations outside

of regularly established net schedules, include relaying over simplex through newly developed plans, involve larger exercise areas, and in time coordination with multiple traffic nets and other ARRL Sections.

# Exercise Overview

## Exercise details

<b>Exercise Name</b>	2020 DFW Metroplex NTS Functional Exercise
<b>Exercise Date</b>	07 Nov 2020
<b>Scope</b>	This was a functional exercise planned for 4 hours within the Dallas/Fort Worth Metroplex on the WA5CKF repeater system.
<b>Missions Area</b>	<ul style="list-style-type: none"> <li>• <b>Response:</b> Respond quickly to save lives, protect property and the environment, and meet basic human needs in the aftermath of a catastrophic incident.</li> </ul>
<b>Core Capabilities</b>	<ul style="list-style-type: none"> <li>• <b>Situational Assessment:</b> Provide all decision makers with decision-relevant information regarding the nature and extent of the hazard, any cascading effects, and the status of the response.</li> <li>• <b>Operational Communications:</b> Ensure the capacity for timely communications in support of security, situational awareness, and operations by any and all means available, among and between affected communities in the impact area and all response forces.</li> </ul>
<b>Objectives</b>	<ul style="list-style-type: none"> <li>• <b>Primary:</b> Assess the ability of the National Traffic System (NTS) in Dallas/Fort Worth to respond to a major event and relay supporting information throughout the DFW Metroplex</li> <li>• <b>Secondary:</b> Assess ability to gather, consolidate, and report situational information</li> <li>• <b>Individual:</b> Communicate information to traffic net via the WA5CKF repeaters</li> </ul>
<b>Threat or Hazard</b>	<b>Technological:</b> Telecommunications failure
<b>Scenario</b>	Cellular service for all major carriers (Verizon, AT&T, T-Mobile) went offline at 08:35 CST on November 7, 2020 after an underground major fiber circuit was cut by a construction crew. This caused all cellular service throughout the Dallas/Fort Worth area to fail, meaning voice, text, and data are not working. Cell phone users are not able to reach 911 or otherwise contact emergency services.
<b>Sponsor</b>	ARRL North Texas Section
<b>Participating Organizations</b>	<ul style="list-style-type: none"> <li>• ARRL National Traffic System via the DFW Metroplex Traffic Net</li> <li>• Collin County ARES</li> <li>• Dallas RACES</li> <li>• Denton County ARES</li> <li>• Irving ARES/RACES</li> <li>• Mesquite RACES</li> </ul>
<b>Point of Contact</b>	Aaron Hulett (K8AMH), ARRL NTX Section Traffic Manager <a href="mailto:k8amh@arrl.net">k8amh@arrl.net</a>   469-630-2528

## Exercise team

This exercise was planned and executed by the DFW Metroplex Traffic Net managers and the ARRL North Texas Section Traffic Manager.

Sean Peoples, AA5SA

*Net Manager, DFW Metroplex Traffic Net*  
[speoples@gmail.com](mailto:speoples@gmail.com)

Korky Kathman, KG5NNA

*Assistant Net Manager, DFW Metroplex Traffic Net*  
[kg5nna@gmail.com](mailto:kg5nna@gmail.com)

Aaron Hulett, K8AMH

*Section Traffic Manager, ARRL North Texas*  
[k8amh@arrl.net](mailto:k8amh@arrl.net)

## Important websites

- **DFW Metroplex Traffic Net**  
Provided information about the traffic net, resources to learn about the radiogram format and traffic handling, and more.  
<https://www.dfwtrafficnet.org>
- **Exercise resource page**  
The main exercise page provided links to reporting forms and exercise documentation, including the Player Handbook and the Incident Briefing / Incident Action Plan.  
<https://www.dfwtrafficnet.org/2020-functional-exercise/>
- **Exercise dashboard**  
Provided real-time information about situational reports received during the exercise.  
<https://www.dfwtrafficnet.org/exercise-dashboard/>

# Exercise Design Summary

## Exercise Purpose and Design

This functional exercise was conducted to help evaluate capabilities and multiple functions using a simulated response. It helped with evaluating system readiness and allowed traffic handling stations to practice their skills in a simulated real-world scenario. It was planned and executed by the DFW Metroplex Traffic Net managers and the ARRL North Texas Section Traffic Manager as part of evaluating NTS readiness during a major event.

## Exercise Objectives, Capabilities, and Activities

Capabilities-based planning allows for exercise team to develop exercise objectives and observe exercise outcomes through a framework of specific action items. The capabilities listed below form the foundation for the ARRL North Texas Section and DFW Metroplex Traffic Net of all objectives and observations in this exercise. Additionally, each capability is linked to several corresponding activities and tasks to provide additional detail.

Based upon the identified exercise objectives below, the exercise team decided to demonstrate the following capabilities during this exercise:

- **Primary:** Assess the ability of the National Traffic System (NTS) in Dallas/Fort Worth to respond to a major event and relay supporting information throughout the DFW Metroplex
  - **Operational Communications:** Regular traffic net processes/procedures; Net Control Station handoffs; and Emergency traffic inject.
- **Secondary:** Assess ability to gather, consolidate, and report situational information
  - **Situational Assessment:** Real-time exercise dashboard updates throughout the exercise period.
- **Individual:** Communicate information to traffic net via the WA5CKF repeaters
  - **Operational Communications:** Station check-ins; proper radiogram format following exercise template; and use of proper traffic handling technique.

## Scenario Summary

Cellular service for all major carriers (Verizon, AT&T, T-Mobile) went offline at 08:35 CST on November 7, 2020 after an underground major fiber circuit was cut by a construction crew. This caused all cellular service throughout the Dallas/Fort Worth area to fail, meaning voice, text, and data are not working. Cell phone users are not able to reach 911 or otherwise contact emergency services.

To help understand the scope of impact, stations participating in the traffic system are asked to provide situational reports regarding local cellular network status, specifically which carrier their cell phone is using and whether their cellular service is working at their location.

# Analysis of Core Capabilities

Aligning exercise objectives and core capabilities provides a consistent taxonomy for evaluation that transcends individual exercises to support preparedness reporting and trend analysis. Table 1 includes the exercise objectives, aligned core capabilities, and performance ratings for each core capability as observed during the exercise and determined by the exercise team.

Table 1 - Summary of Core Capability Performance

Core Capability	Objective	Rating
<b>Operational Communications</b>	Primary: Assess the ability of the National Traffic System (NTS) in Dallas/Fort Worth to respond to a major event and relay supporting information throughout the DFW Metroplex	S
<b>Situational Assessment</b>	Secondary: Assess ability to gather, consolidate, and report situational information	S
<b>Operational Communications</b>	Individual: Communicate information to traffic net via the WA5CKF repeaters	S

**Ratings Definitions:**

- **Performed without Challenges (P):** The targets and critical tasks associated with the core capability were completed in a manner that achieved the objective(s) and did not negatively impact the performance of other activities. Performance of this activity did not contribute to additional health and/or safety risks for the public or for emergency workers, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws.
- **Performed with Some Challenges (S):** The targets and critical tasks associated with the core capability were completed in a manner that achieved the objective(s) and did not negatively impact the performance of other activities. Performance of this activity did not contribute to additional health and/or safety risks for the public or for emergency workers, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws. However, opportunities to enhance effectiveness and/or efficiency were identified.
- **Performed with Major Challenges (M):** The targets and critical tasks associated with the core capability were completed in a manner that achieved the objective(s), but some or all of the following were observed: demonstrated performance had a negative impact on the performance of other activities; contributed to additional health and/or safety risks for the public or for emergency workers; and/or was not conducted in accordance with applicable plans, policies, procedures, regulations, and laws.
- **Unable to be Performed (U):** The targets and critical tasks associated with the core capability were not performed in a manner that achieved the objective(s).

The following sections provide an overview of the performance related to each exercise objective and associated core capability, highlighting strengths and areas for improvement.

Primary Objective: Assess the ability of the National Traffic System (NTS) in Dallas/Fort Worth to respond to a major event and relay supporting information throughout the DFW Metroplex

The strengths and areas for improvement for each core capability aligned to this objective are described in this section.

## Core Capability: Operational Communications

### Strengths

The partial capability level can be attributed to the following strengths:

1. Net Control Stations maintained control of the traffic net throughout the exercise, including when emergency traffic unexpectedly arrived.
2. All Net Control Stations submitted exercise net logs within the required timeframe, helping ensure incident documentation is collected and archived.

### Areas for Improvement

The following areas require improvement to achieve the full capability level:

#### **Area for Improvement 1: Net Control Station handoff does not have an established process.**

**Reference:** N/A

**Analysis:** Although net control stations successfully handed off control duties, the process followed would work if the stations are in the same physical location. During the exercise, handoffs occurred with stations at different locations, and currently there is no established process for handing off a list of checked-in liaison and traffic handling stations to the upcoming NCS.

#### **Area for Improvement 2: Unclear how to handle “dead air” periods, with different net control stations taking different approaches.**

**Reference:** N/A

**Analysis:** During periods without traffic or station check-ins, it was not clear if or how net control stations should approach. For example, during Dallas SKYWARN nets, net control stations only come on the air every ten minutes to announce a net is in progress and request for reports meeting minimum reporting criteria. However, if running a traffic net on HF, periods of silence risk losing the frequency.

#### **Area for Improvement 3: Net Control Station did not regularly announce the ask: what the net is seeking to achieve, the fact check-ins are only being accepted for this purpose, etc.**

**Reference:** N/A

**Analysis:** While regularly scheduled traffic nets are open for any traffic, during this exercise we only took incident-specific traffic, but this requirement was not regularly announced. Some check-ins were from stations that did not have exercise-related traffic.

#### **Area for Improvement 4: Net Control Stations were inconsistent in the net preamble.**

**Reference:** 2020 DFW Metroplex NTS Functional Exercise Player Handbook

**Analysis:** Some stations followed the provided net script when announcing the preamble; some did not. The expectation was that all Net Control Stations would use the preamble exactly as provided in the Player Handbook.

Additionally, some gave the preamble at non-hourly timepoints versus each NCS providing the preamble at the top of the hour when taking NCS duties. There was no clear timeline provided in the exercise documentation on when to read the preamble; the only requirement was to periodically announce, at least once every ten minutes, that this was a DFW Metroplex Traffic Net Exercise in progress.

#### **Area for Improvement 5: The Simulation Emergency Operations Center (EOC) did not read back the reports it received.**

**Reference:** N/A

**Analysis:** The radiogram's check does provide some protection against errors, but not 100%. While regular traffic handling protocols do not include reading back received traffic, when taking Emergency or Priority traffic, where accuracy is paramount, taking time to verify good copy will help ensure the report was received correctly.

#### **Area for Improvement 6: There was no backup EOC liaison station.**

**Reference:** N/A

**Analysis:** For this exercise, the Section Traffic Manager served as the EOC liaison and took all exercise traffic. This was somewhat necessitated by how the exercise dashboard was set up: only he could access the appropriate software and scripts to keep it updated. In an actual incident, the EOC liaison would periodically change to allow for breaks and help minimize the chance for errors due to fatigue, and also ideally have backups and plans in place should the EOC liaison go off air.

#### **Area for Improvement 7: Some situational reports did not use the local time zone as instructed.**

**Reference:** 2020 DFW Metroplex NTS Functional Exercise Player Handbook; Incident Briefing/Incident Action Plan documentation

**Analysis:** The exercise documentation specified the format requirements for situational reports, but in some cases, stations used Coordinated Universal Time / Zulu instead of local time.

#### **Area for Improvement 8: Only one emergency traffic inject was included in the exercise plan, but two emergency traffic injects occurred.**

**Reference:** 2020 DFW Metroplex NTS Functional Exercise Player Handbook; Incident Briefing/Incident Action Plan documentation

**Analysis:** The exercise documentation only requested situational reports from participating stations. While the exercise team did coordinate with one station for an undisclosed emergency

traffic inject to test this aspect, another station unexpectedly injected emergency traffic. While well-intentioned, this second inject was not requested or expected from exercise participants.

**Area for Improvement 9: Only 66% of exercise traffic was turned in post-exercise.**

**Reference:** 2020 DFW Metroplex NTS Functional Exercise Player Handbook; Incident Briefing/Incident Action Plan documentation

**Analysis:** The exercise documentation required participating stations to submit copies of their radiogram traffic within 3 days of the end of the exercise. Of 32 pieces of traffic received, 21 (66%) were turned in.

## Secondary Objective: Assess ability to gather, consolidate, and report situational information

The strengths and areas for improvement for each core capability aligned to this objective are described in this section.

### Core Capability: Situational Assessment

#### Strengths

The partial capability level can be attributed to the following strengths:

1. Pre-planning to develop, deploy, test and correct issues exercise dashboard prior to the exercise.
2. Rapid and effective ability to extract key situational report information from received radiogram traffic.
3. Consistent dashboard updates throughout the exercise period.

#### Areas for Improvement

The following areas require improvement to achieve the full capability level:

#### **Area for Improvement 1: Dashboard updating was cumbersome, not scalable, and had considerable risk of failure.**

**Reference:** N/A

**Analysis:** While a secondary objective, the exercise team wanted to help demonstrate the value of amateur radio operators relaying situational reports. The exercise dashboard helped simulate how these reports can provide decision makers with relevant information regarding the nature and extent of the incident, what areas are seeing cellular service recovery, and what areas are not. Dashboard updates were manual, requiring extensive Excel workbook development, research on how to save Excel maps as images using consistent filenames, and authoring a Secure FTP script that, when manually executed, would upload updated maps to the dashboard.

Generally, this function would be performed by a Geographic Information System (GIS) or another appropriate team. Given such participation by a GIS, EOC, or other such government officials or personnel, this dashboard needed to be developed specifically for this exercise. While there are potentially off-the-shelf solutions available, the exercise team leveraged available software and knowledge to set up and feed data to the dashboard. Ideally, if future exercises will include this, it should use a solution built for this type of data tracking and analysis.

#### **Area for Improvement 2: Given the City of Dallas is such a large area, only mentioning “Dallas” in reports could lead to confusion on which Dallas areas are impacted or not.**

**Reference:** N/A

**Analysis:** Smaller cities are more easily understood when performing area impact analysis, but when reviewing a large City such as Dallas, it is not easy to determine which areas are impacted and which are not. In these cases, it may be wise to take reports that include neighborhood, or grid square, or other info that can better pinpoint.

## Individual Objective: Communicate information to traffic net via the WA5CKF repeaters

The strengths and areas for improvement for each core capability aligned to this objective are described in this section.

### Core Capability: Operational Communications

#### Strengths

The partial capability level can be attributed to the following strengths:

1. Traffic handlers relayed information with clarity, quality, and accuracy using proper traffic formats and protocols.
2. The vast majority of stations were able to work the repeater with a clear quality signal. Only three stations are known to be unable, and two of those relayed via simplex to an intermediate traffic handler to facilitate delivery to the Simulation EOC despite not having a documented process on how to do so.

#### Areas for Improvement

The following areas require improvement to achieve the full capability level:

#### **Area for Improvement 1: Some stations discovered during the exercise they were not able to reach the WA5CKF repeaters to relay traffic.**

**Reference:** N/A

**Analysis:** Some stations were not able to reach the repeater during the exercise. In some cases, it appeared to be their first attempt to try reaching the repeater, while in others the mobile nature of their stations required relocation in order to relay traffic.

#### **Area for Improvement 2: Stations unable to reach the repeater did not have a clear alternative way to relay their traffic.**

**Reference:** N/A

**Analysis:** Relaying local traffic does not require use of a repeater; stations can relay traffic via simplex frequencies. While two participating stations did this successfully during the exercise, a defined process does not currently exist.

#### **Area for Improvement 3: A few stations appeared to be passing their first piece of traffic during the exercise.**

**Reference:** NTS Methods and Practices Guidelines; ARRL North Texas NTS/Radiogram training sessions

**Analysis:** Stations bringing traffic to a traffic net need to be familiar with traffic net protocols and the radiogram format prior to the incident. It is not possible to provide training or feedback during an incident. The exercise team acknowledges this can and will occur in the future regardless of any level of preplanning or attempts to mitigate. Accordingly, processes should be created that outline how net control stations should approach, such as asking the unfamiliar

station to move to another frequency with a more knowledgeable traffic handler to work together to complete the relay.

# Appendix A: Improvement Plan

This IP has been developed specifically for the National Traffic System operating in North Texas as a result of the 2020 DFW Metroplex NTS Functional Exercise held on November 7, 2020.

Core Capability	Issue/Area for Improvement	Corrective Action	Primary Responsible Organization	Start Date	Completion Date
<b>Operational Communications</b>	Net Control Station handoff does not have an established process.	Develop an on-air handoff process, document, provide training, and practice its use during an upcoming regularly scheduled traffic net.	DFW Metroplex Traffic Net	January 2020	February 2020; ongoing training and practice.
<b>Operational Communications</b>	Unclear how to handle “dead air” periods, with different net control stations taking different approaches.	Develop an established process, document, provide training, and practice its use during future exercises.	DFW Metroplex Traffic Net	January 2020	February 2020; ongoing training and practice.
<b>Operational Communications</b>	Net Control Station did not regularly announce the ask: what the net is seeking to achieve, the fact check-ins are only being accepted for this purpose, etc.	Develop an established process, document, provide training, and practice its use during future exercises.	DFW Metroplex Traffic Net	January 2020	February 2020; ongoing training and practice.

Core Capability	Issue/Area for Improvement	Corrective Action	Primary Responsible Organization	Start Date	Completion Date
<b>Operational Communications</b>	Net Control Stations were inconsistent in the net preamble.	Reinforce proper traffic net protocols and practices, reporting, and following provided instructions through ongoing training and practice at regularly scheduled traffic nets.	DFW Metroplex Traffic Net	End of exercise	Ongoing
<b>Operational Communications</b>	The Simulation Emergency Operations Center (EOC) did not read back the reports it received.	Develop an established process, document, provide training, and practice its use during future exercises.	DFW Metroplex Traffic Net and ARRL North Texas Section	January 2020	February 2020; ongoing training and practice.
<b>Operational Communications</b>	There was no backup EOC liaison station.	Ensure future exercises involving liaisons have multiple stations to serve in these roles.	DFW Metroplex Traffic Net and ARRL North Texas Section	January 2020	February 2020; ongoing training and practice.
<b>Operational Communications</b>	Some situational reports did not use the local time zone as instructed.	Reinforce proper traffic net protocols and practices, and reporting through ongoing training and practice at regularly scheduled traffic nets.	DFW Metroplex Traffic Net and ARRL North Texas Section	End of exercise	Ongoing

Core Capability	Issue/Area for Improvement	Corrective Action	Primary Responsible Organization	Start Date	Completion Date
<b>Operational Communications</b>	Only one emergency traffic inject was included in the exercise plan, but two emergency traffic injects occurred.	Reinforce proper traffic net protocols and practices, reporting, and following provided instructions through ongoing training and practice at regularly scheduled traffic nets.	DFW Metroplex Traffic Net and ARRL North Texas Section	End of exercise	Ongoing
<b>Operational Communications</b>	Only 66% of exercise traffic was turned in post-exercise.	Reinforce proper traffic net protocols and practices, reporting, and following provided instructions through ongoing training and practice at regularly scheduled traffic nets.	DFW Metroplex Traffic Net and ARRL North Texas Section	End of exercise	Ongoing
<b>Situational Assessment</b>	Dashboard updating was cumbersome, not scalable, and had considerable risk of failure.	Determine if Situational Assessment will be tested during future exercises. If so, research offerings and determine if/how they can be used during an exercise. If no other realistic (affordable, easy to use, etc.) option available, solidify the current solution so that it is more robust and easily replicated during future exercises.	ARRL North Texas Section	January 2020	February 2020; ongoing training and practice.

Core Capability	Issue/Area for Improvement	Corrective Action	Primary Responsible Organization	Start Date	Completion Date
<b>Situational Assessment</b>	Given the City of Dallas is such a large area, only mentioning "Dallas" in reports could lead to confusion on which Dallas areas are impacted or not.	Determine if Situational Assessment will be tested during future exercises. If so, determine if additional location resolution is appropriate for future exercises, and incorporate, if necessary, into those plans.	ARRL North Texas Section	January 2020	February 2020; ongoing training and practice.
<b>Operational Communications</b>	Some stations discovered during the exercise they were not able to reach the WA5CKF repeaters to relay traffic.	Build relationships with area ARES, RACES, and other amateur radio groups and clubs to encourage participation and provide training on how to handle traffic using the radiogram format.	DFW Metroplex Traffic Net and ARRL North Texas Section	End of exercise	Ongoing
<b>Operational Communications</b>	Stations unable to reach the repeater did not have a clear alternative way to relay their traffic.	Develop a clear process for relaying traffic over other repeaters and simplex frequencies within the Metroplex.	DFW Metroplex Traffic Net	January 2020	February 2020; ongoing training and practice.
<b>Operational Communications</b>	A few stations appeared to be passing their first piece of traffic during the exercise.	Develop a process for net control stations to follow should this occur, document, provide training, and practice its use during future exercises.	DFW Metroplex Traffic Net	January 2020	February 2020; ongoing training and practice.

# Appendix B: Exercise Participants

Participating Organizations
<b>ARRL Sections</b>
ARRL North Texas Section - <a href="https://arrlntx.org/">https://arrlntx.org/</a>
<b>Traffic Nets</b>
DFW Metroplex Traffic Net - <a href="https://www.dfwtrafficnet.org/">https://www.dfwtrafficnet.org/</a>
<b>ARES/RACES Organizations</b>
Collin County ARES - <a href="https://www.collinares.net/">https://www.collinares.net/</a>
Dallas RACES - <a href="http://www.dallasraces.org/">http://www.dallasraces.org/</a>
Denton County ARES - <a href="http://denton-ares.org/">http://denton-ares.org/</a>
Irving ARES/RACES - <a href="https://www.facebook.com/irvingraces">https://www.facebook.com/irvingraces</a>
Mesquite RACES - <a href="https://www.cityofmesquite.com/1214/RACES">https://www.cityofmesquite.com/1214/RACES</a>