How we get it required to be on our projects:

Specifications: https://iowadot.gov/specifications/new_docs/GS-15011.pdf Scroll down to page 96 (or page 86 of the pdf) For simplicity, the actual text here. (It's easier to read here compared to the "strike and replace" stuff in the link above.)

2528.F Arrow Boards. (Operations)

Furnish, place, operate, and maintain arrow boards at locations shown on the contract documents. Ensure arrow boards meet current requirements of MUTCD and Article 4188.10.1.

1.Operation.

a. When indicating a right or left lane closure, operate in a sequential chevron mode.
b. When indicating a traffic split, operate in a flashing double arrow mode.
c. When indicating caution, operate in an alternating diamond mode.

2. Remote Communications.

When using an Arrow Board for stationary work zones on the Interstate System, remote communication capabilities meeting requirements of Article 4188.10, F are required.

3. Type and Size.

Type C Arrow Boards as defined in Part 6 of the MUTCD are required for all applications.

4. Testing and Configuration.

On Interstate projects, at least 1 week before Arrow Board is deployed to a project, a testing and configuration process shall be performed with the Engineer.

4188.10 Arrow Boards (Material Specs). https://iowadot.gov/specifications/new_docs/GS-15011.pdf (Same link as above but this time scroll down to page 178 (or page 168 of the pdf) Text is cut/pasted here also:

A. General.

Arrow Boards shall be approved per Materials I.M. 486.12.

B. Power System.

1. Solar power system shall charge and maintain batteries automatically without intervention, designed for year round deployment in Iowa assuming minimal solar charging during winter months.
2. No component shall create a shadow on any portion of solar panels.
3. Battery box shall be locked.

C. Display.

1. Minimum display size shall be 96 inches wide by 48 inches tall.
2. Minimum legibility distance is 1 mile.
3. Minimum number of elements (or pixels) is 15.
4. Elements shall be capable of at least 50% dimming from full brightness. Use dimmed mode for nighttime operation.
5. Color presented by elements shall be yellow.
6. Minimum element on-time shall be 50% for flashing mode, with equal intervals of 25% for each sequential phase. Flashing rate shall be not less than 25 or more than 40 flashes per minute.

D. Controls.

Use an LCD display, keyboard, Rotary switches, or other means to set and view operating modes.

E. Operating Modes.

Following 4 modes are the minimum required. Additional modes are allowed, but not required.

- •Off. Except for charging system the entire unit is off. Solar panels will continue to charge batteries in this position
- •Sequential Chevron.
- •Flashing Double Arrow.
- •Alternating Diamond.

F. GPS and Remote Communications (When Required).

1. Arrow board shall have the ability to receive and transmit its GPS coordinates (latitude and longitude) within a 30 foot diameter of its true location.
2. Electronic communications between arrow board or arrow board's central server and the Department shall follow communication protocol defined in Materials I.M. 486.12.
3. Arrow boards shall transmit status and location as follows:
   a. Mode change within 2 minutes.
   b. Location (if moved more than 500 feet) within 2 minutes.
   c. Health check every 30 minutes.

G. Portable Dynamic Message Signs as an Arrow Board.

A portable dynamic message sign may be used to simulate an arrow board if it meets the requirements in this section

How vendors know what is required and how to get tested:

Testing Request Form: https://iowadot.gov/workzonereferencelibrary/docs/Smart-Arrow-BoardForm.pdf

Materials Instructional Memorandum: This is where the 44+ pages of communication protocols and behind the scenes details are at. Start here: https://iowadot.gov/erl/current/IM/content/486.12.htm then click on "Appendix B" link to get to the "Need/Requirements Analysis – Iowa DOT Arrow-Board Communications protocol v1.0" document.

Approved Products List: Go to our Materials Approved Product list Enterprise (MAPLE) https://maple.iowadot.gov/Search.aspx then search for "Traffic Control – Smart Arrow Boards" and click "View Report" for a listing of Arrow Board manufactures & model # that have meet the Iowa DOT specifications for a "Smart Arrow Board". (You could also look at any board that has been added since 2020 to present. Anything added prior to 2019 could not be considered a "Smart Arrow Board"). This list is constantly updated as new smart arrow boards are submitted and tested.

Seeing the results:

As of writing this (Feb 26, 2021) the Smart Arrow Boards have not been integrated into our www.511ia.org traveler information web page. That will change sometime in 2021. In the mean-time, you can visit this link to see a live version of all the Smart Arrow Board in Iowa: https://isu-intrans.maps.arcgis.com/apps/webappviewer/index.html?id=4ca460dcc5054d1db7321a1a1d2ac20b&extent=-11393518.5523%2C4643895.4522%2C-9384141.9528%2C5687108.0142%2C102100 This is a working web page, and includes all "Smart" Arrow Boards in use by contractors. (not just the ones on the Interstate). It is also a working version and may be prone to updates and outages.

Updates/Newsletters/Latest Information:

The Iowa DOT maintains a web page called "Work Zone reference Library" where we put everything going on in Iowa for Work Zones. There is a "Featured Topic" section on Smart Arrow Boards that future information will be placed there about changes or the "next device" that we convert to being "Smart". https://iowadot.gov/workzonereferencelibrary

Contact Information:

Any of the three Iowa DOT staff members can answer questions you may have:

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