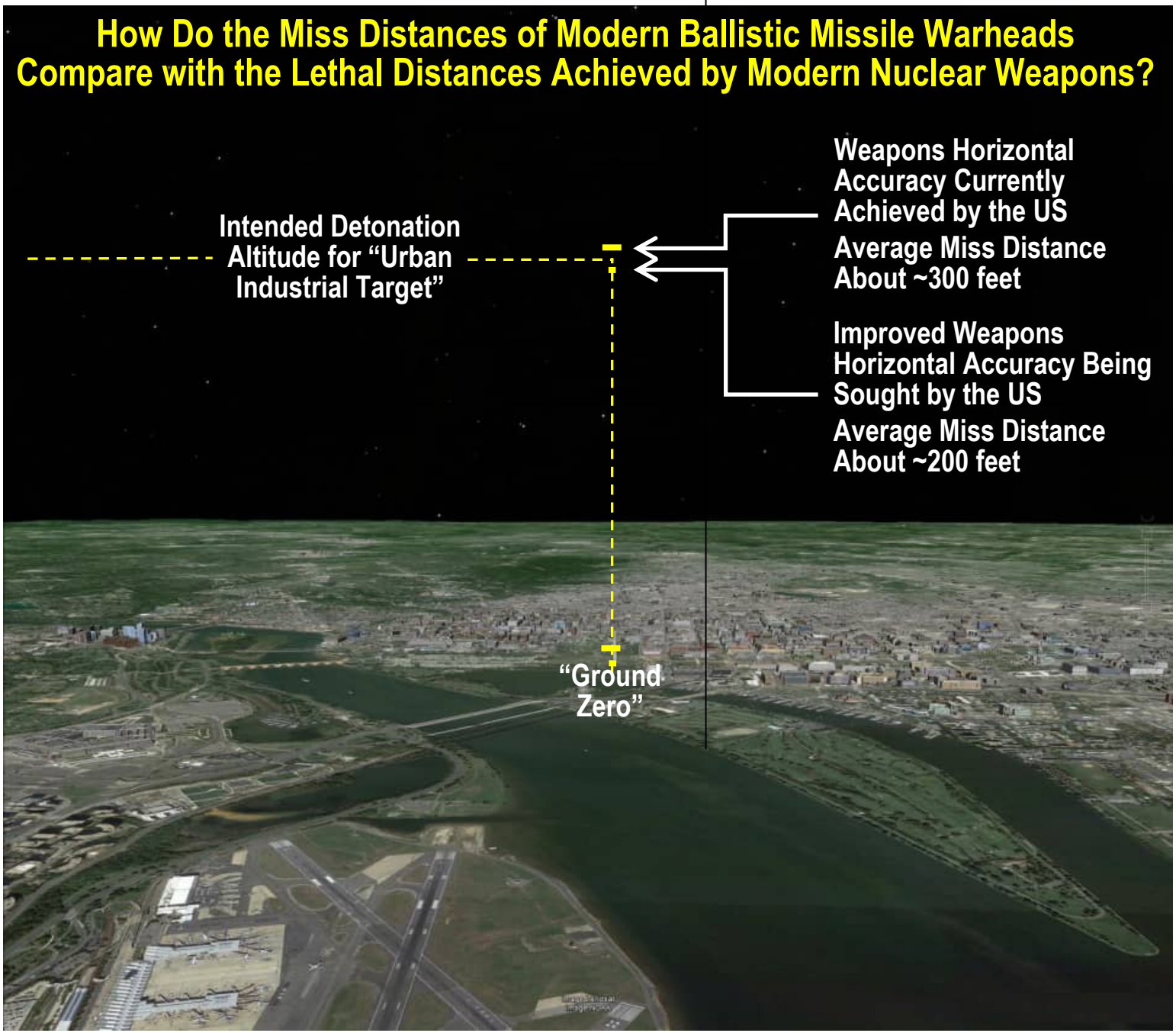
A Brief Description of the Effects of a Limited Russian Nuclear Attack on Washington DC

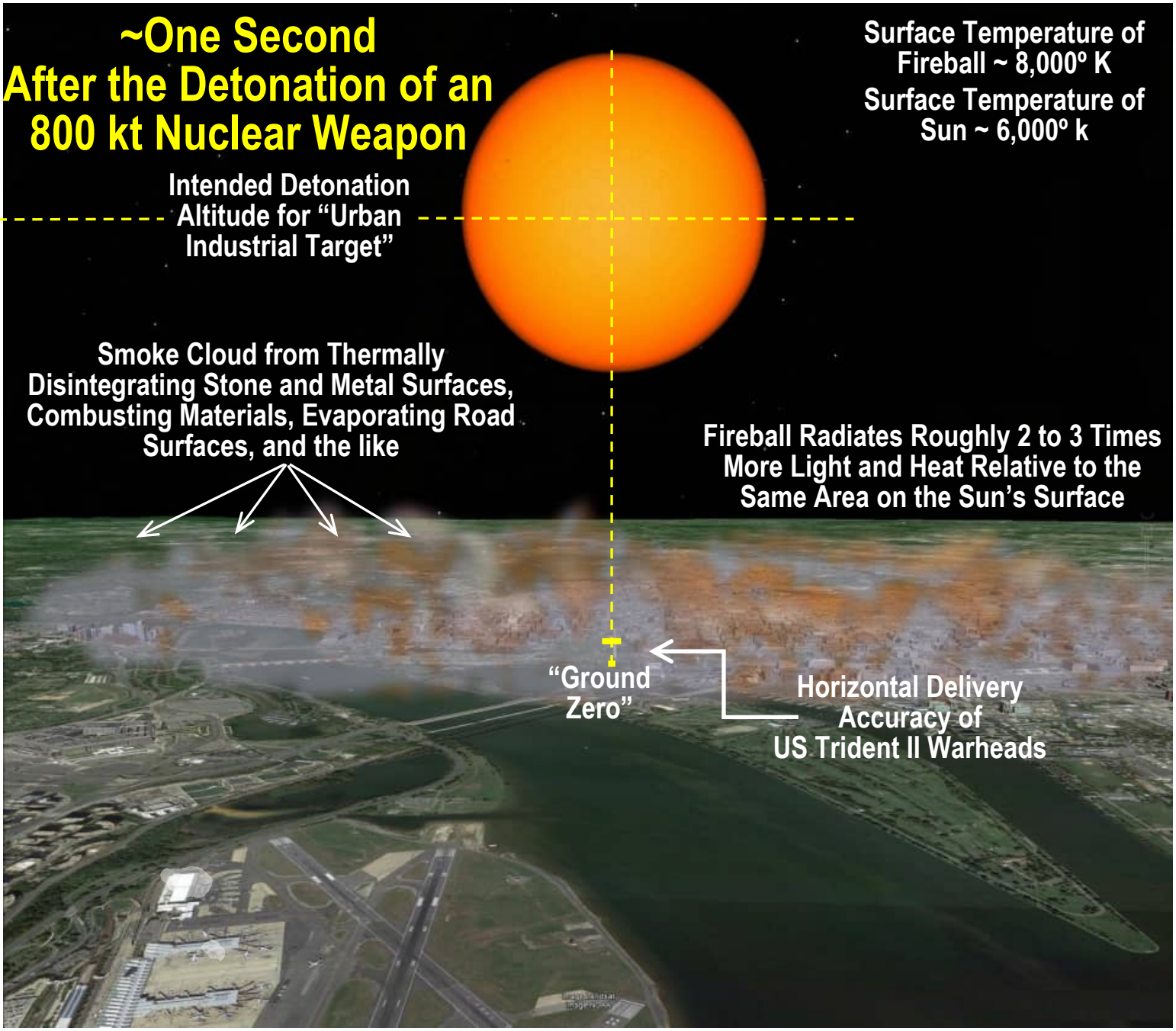
Theodore A. Postol
Professor Emeritus of Science, Technology, and National Security Policy
Massachusetts Institute of Technology
Voice: 617 543-7646; e-mail: postol@mit.edu

National Press Club Washington, DC
December 7, 2024

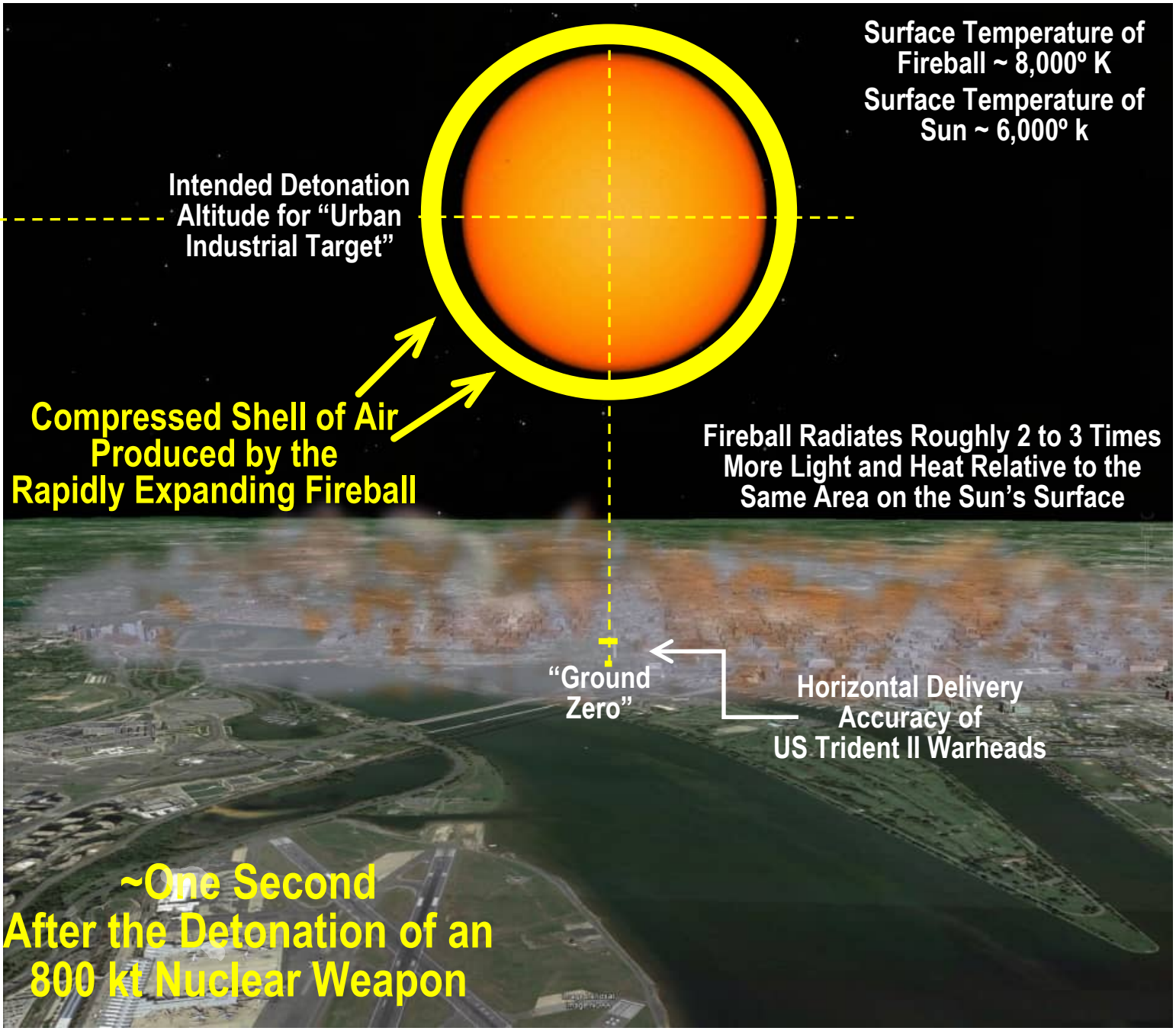
Actual Consequences of the Detonation of One Sarmat or SS-18 Nuclear Warhead over Washington, DC (Slide 1 of 5)



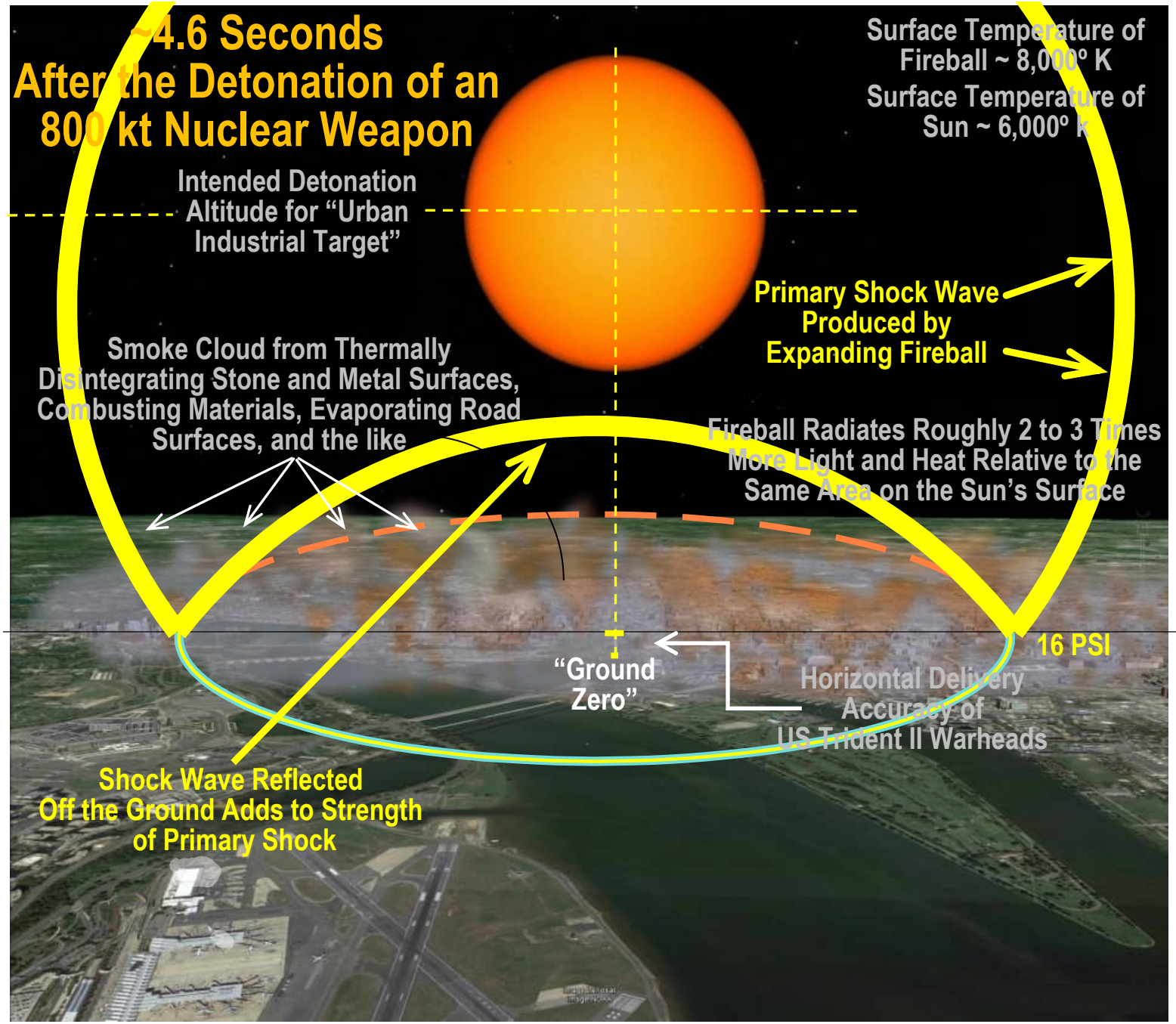
Actual Consequences of the Detonation of One Sarmat or SS-18 Nuclear Warhead over Washington, DC (Slide 2 of 5)



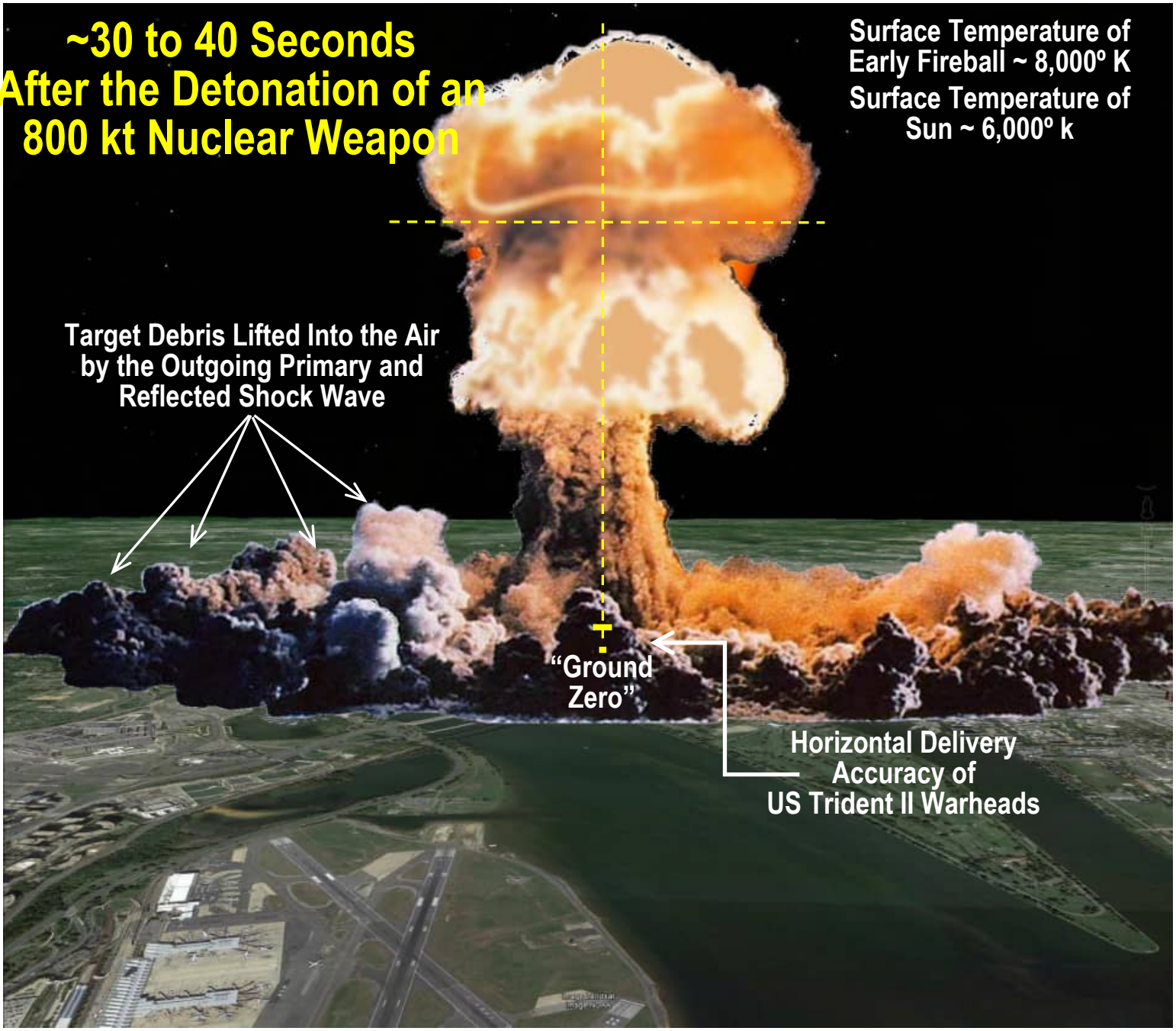
Shock Wave Breakaway from Fireball After the Fireball Reaches Its Maximum Radius (Slide 2 of 5)



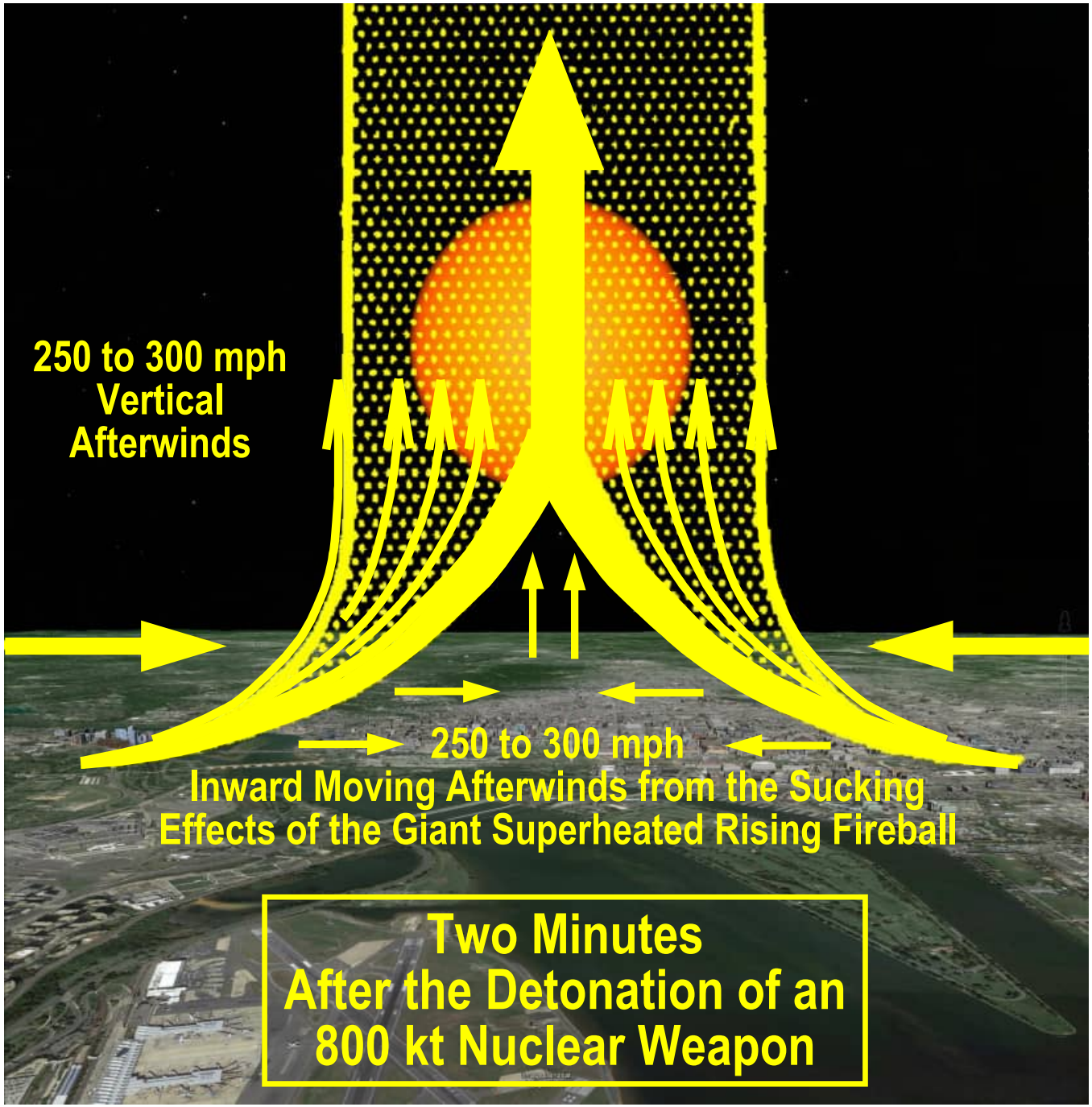
Actual Consequences of the Detonation of One Sarmat or SS-18 Nuclear Warhead over Washington, DC (Slide 3 of 5)

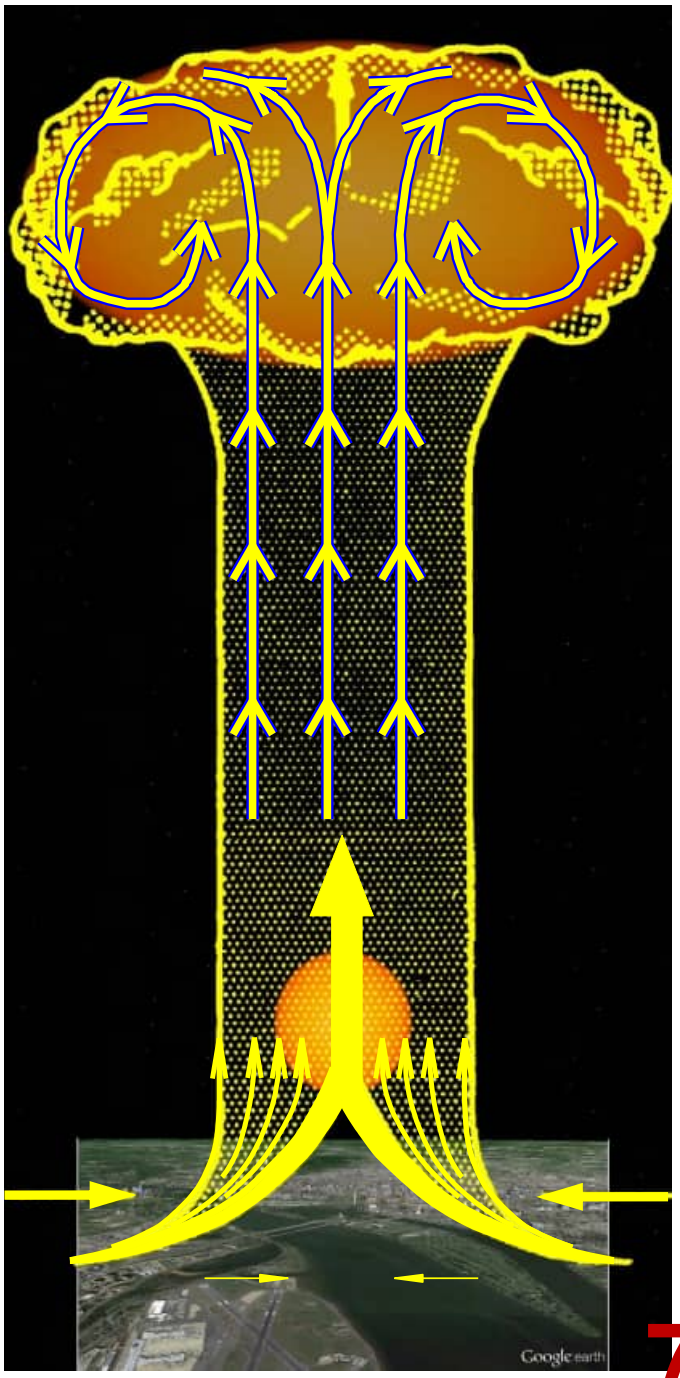


Actual Consequences of the Detonation of One Sarmat or SS-18 Nuclear Warhead over Washington, DC (Slide 4 of 5)



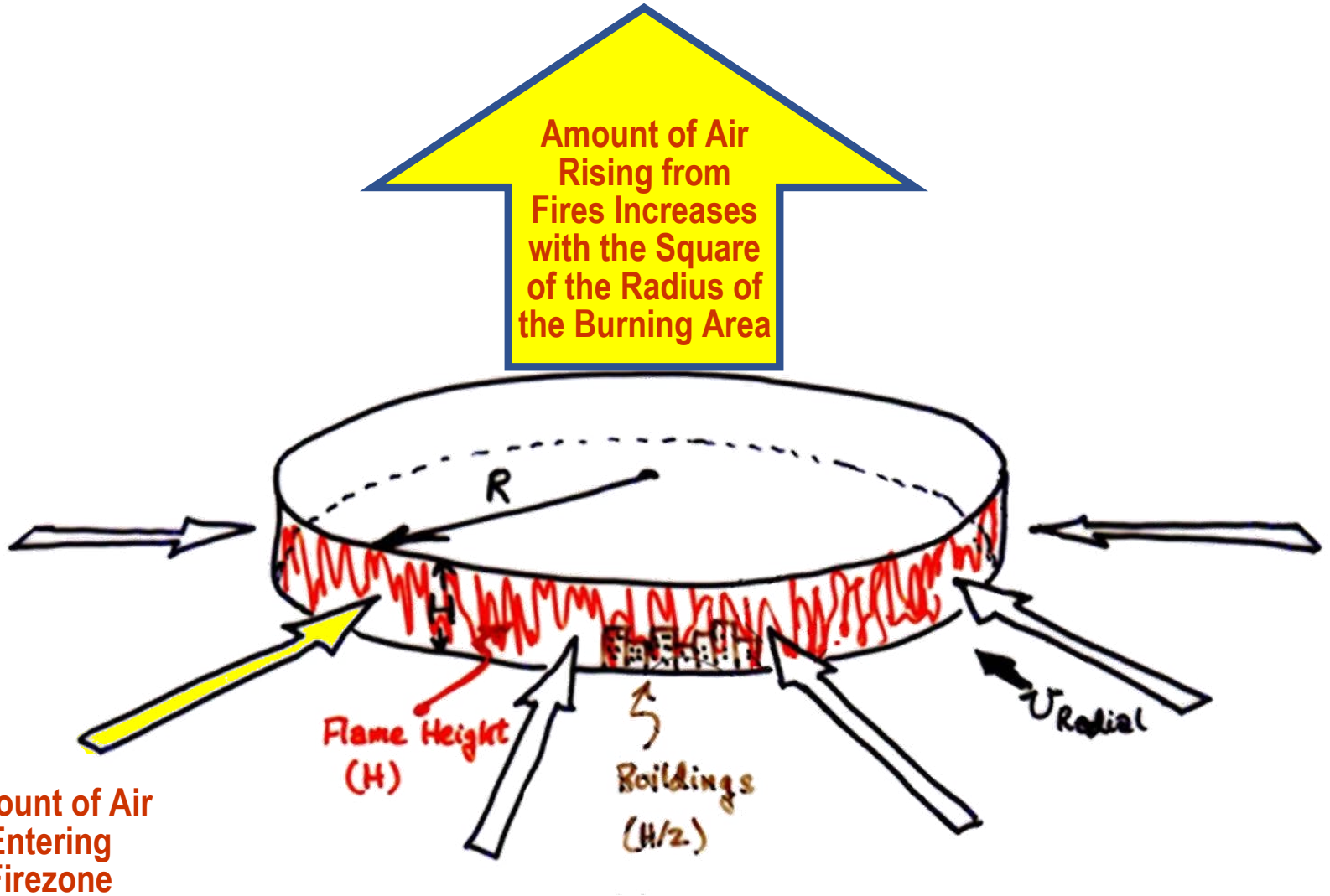
Actual Consequences of the Detonation of One Sarmat or SS-18 Nuclear Warhead over Washington, DC (Slide 5 of 5)



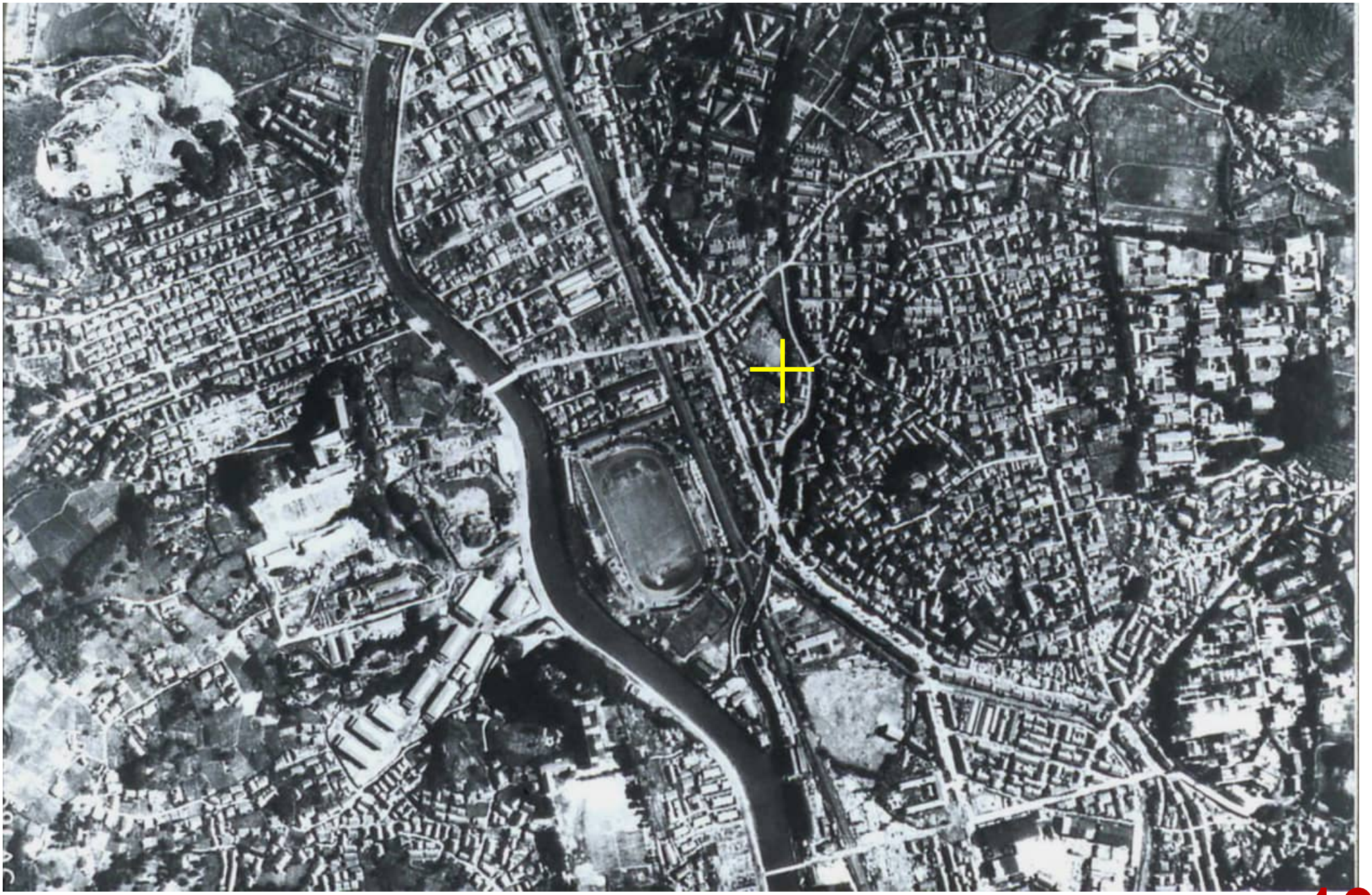


Consequences of a Single Detonation of One Sarmat or SS-18 Nuclear Warhead over Washington, DC
Roughly 100 to 150 Square Miles Destroyed by "Firestorm" (Slide 1 of 2)

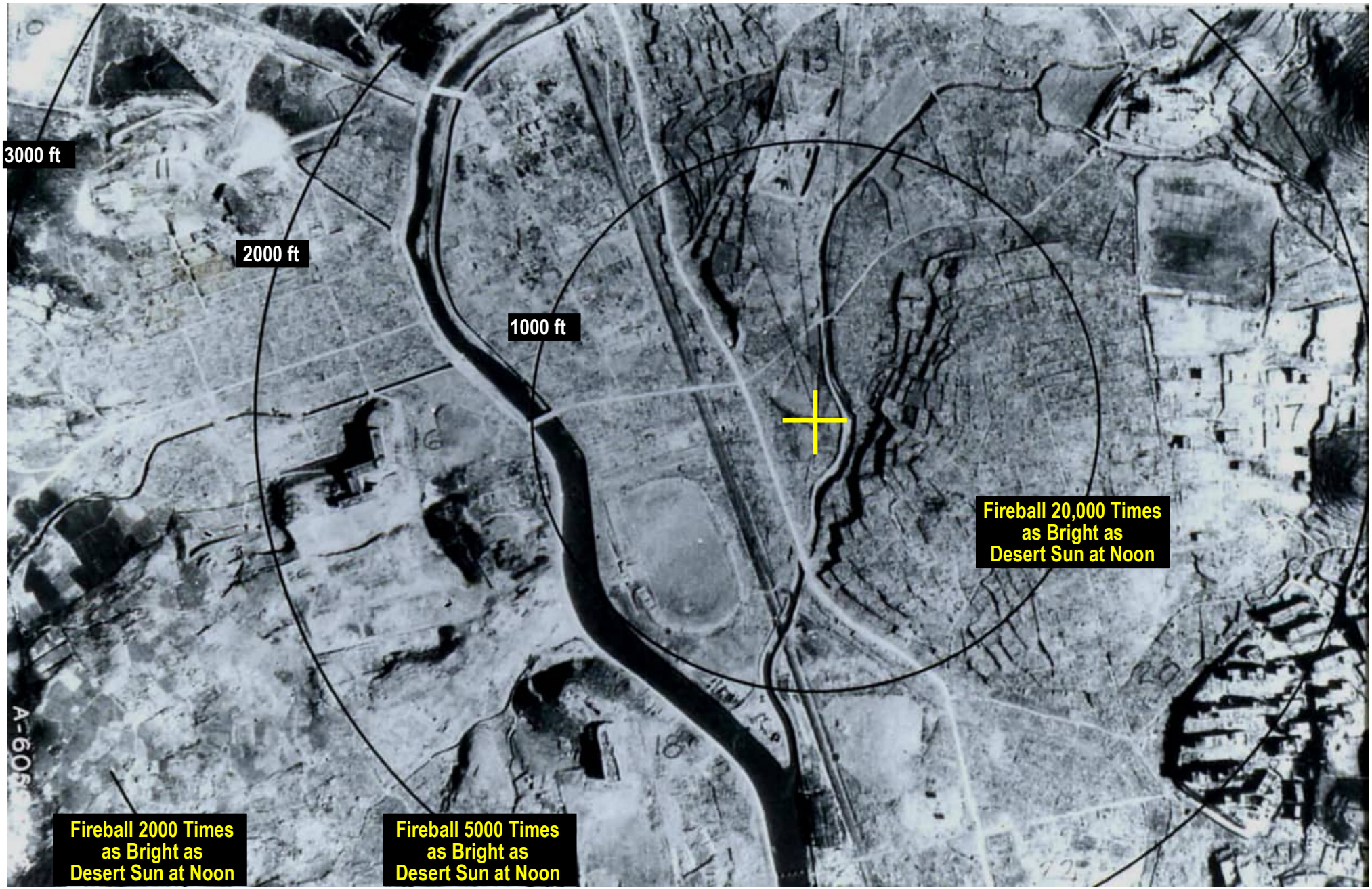
The Wind Speeds and Air Temperatures in a Large Area Fire Will Increase With the Radius of the Fire Zone – Wind Speeds of Hurricane Force and Air-Temperatures Above the Boiling Point of Water Are to be Expected for 3 to 6 Hours Following an Attack



Nagasaki, Japan Immediately Prior to Nuclear Attack and "Firestorm" from the Detonation of a 22 Kiloton Bomb on August 8, 1946 (Slide 1 of 2)



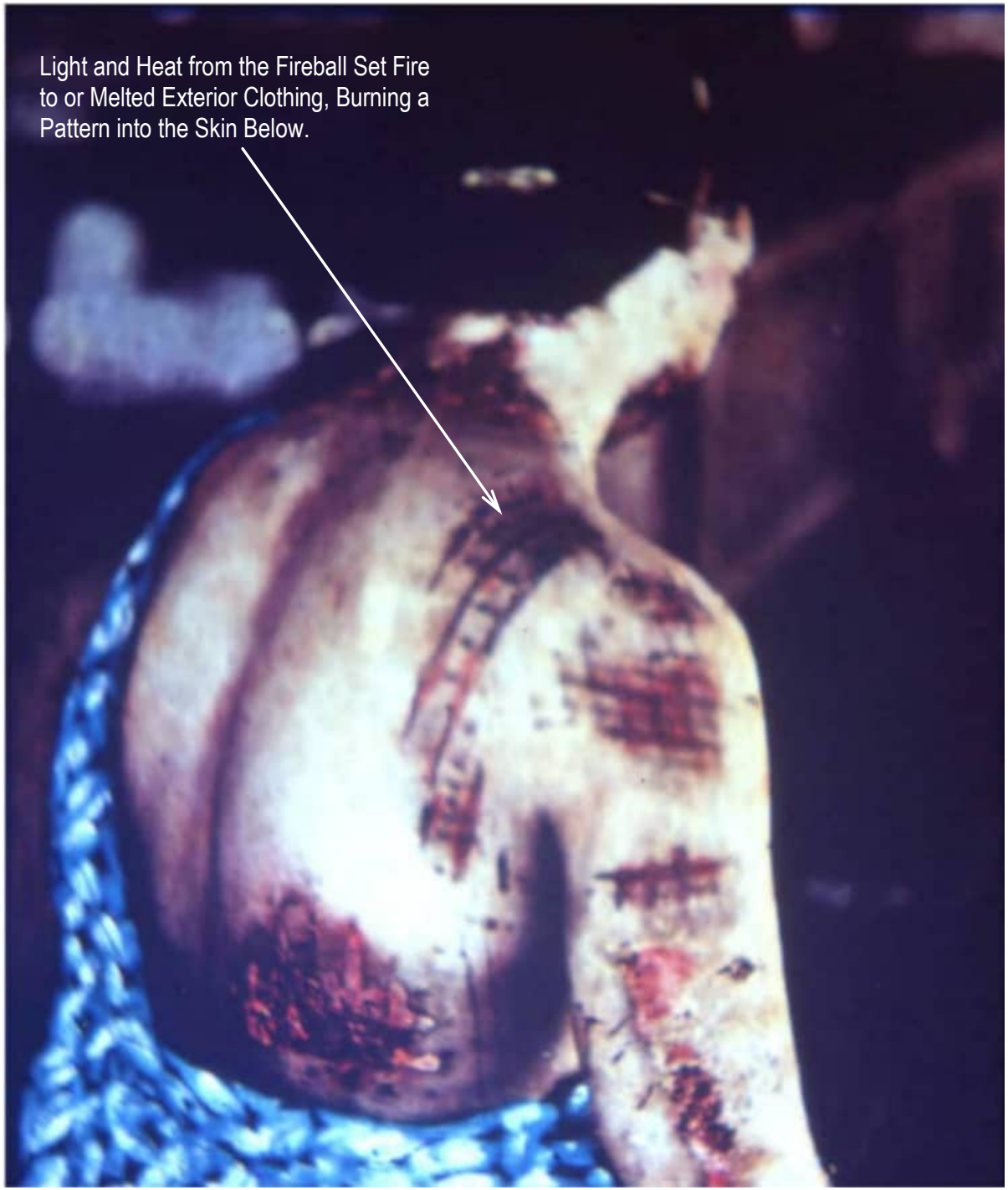
Nagasaki, Japan After a Nuclear Attack and "Firestorm" from the Detonation of a 22 Kiloton Bomb on August 8, 1946 (Slide 2 of 2)



Victim of the Hamburg Firestorm Who Attempted to Flee the Fire Zone Rather Than Stay in A Shelter

Victims of the Hamburg Firestorm Who Stayed in Their Shelter

Effects of the Intense Light and Heat Emitted by the Super-Hot Fireball



Effects of the Intense Light and Heat Emitted by the Super-Hot Fireball

Effects of the Intense Light and Heat Emitted by the Super-Hot Fireball

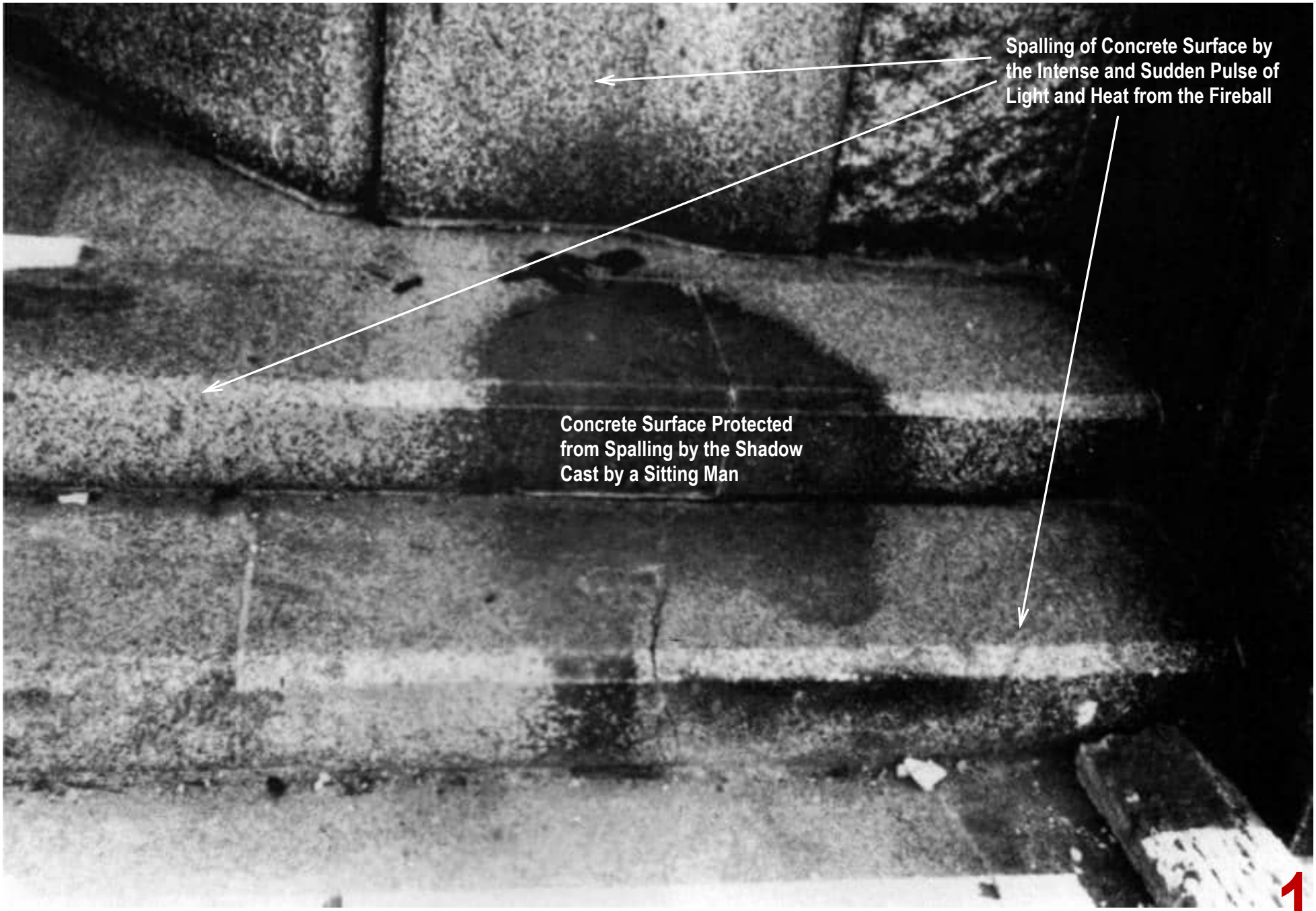
Unprotected Skin Directly Exposed to the Light and Heat of the Fireball

Tea shirt Protected Skin from Light and Heat of the Fireball

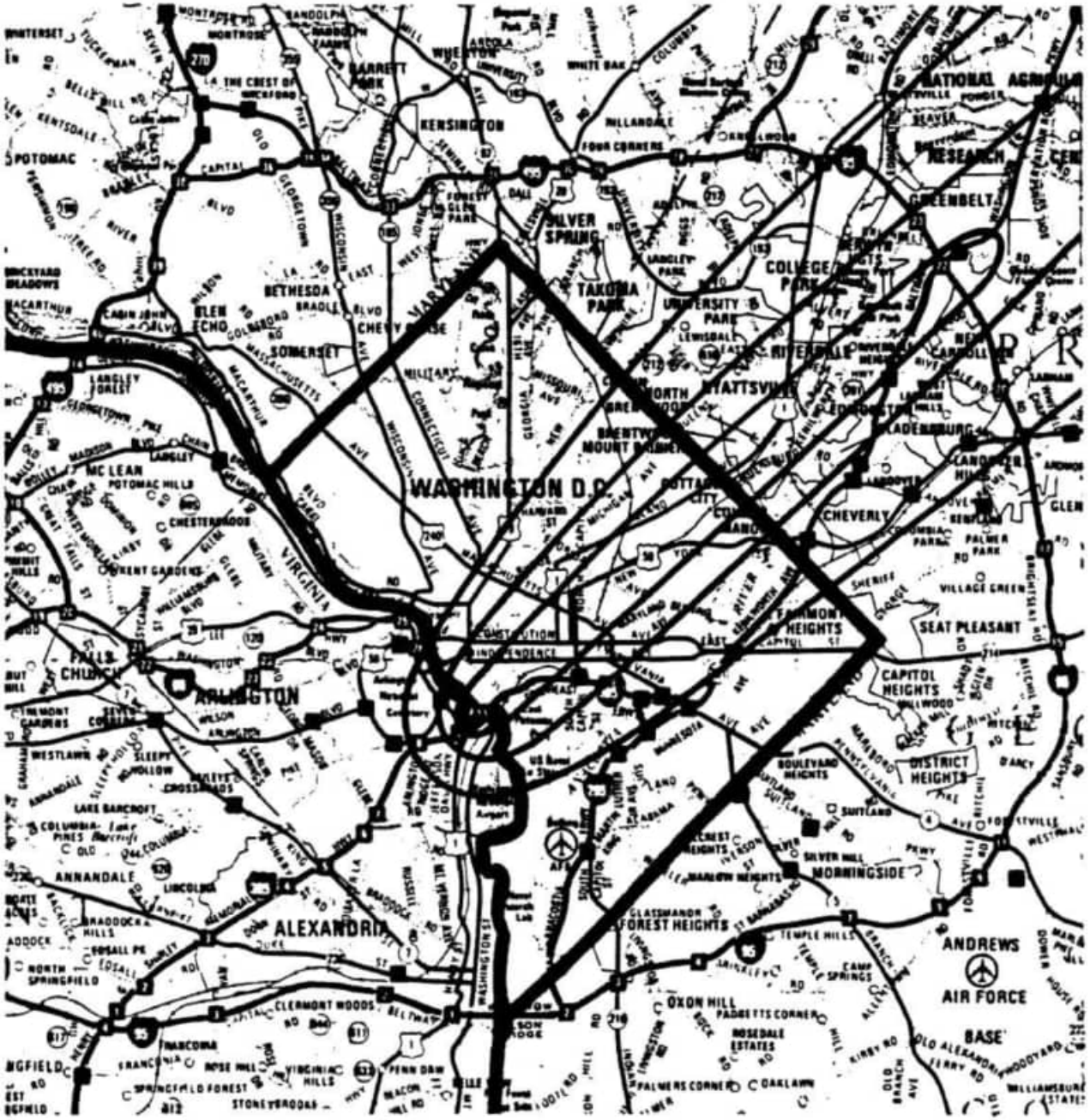
Effects of the Intense Light and Heat Emitted by the Super-Hot Fireball

Effects of the Intense Light and Heat Emitted by the Super-Hot Fireball

Effects of the Intense Light and Heat Emitted by the Super-Hot Fireball



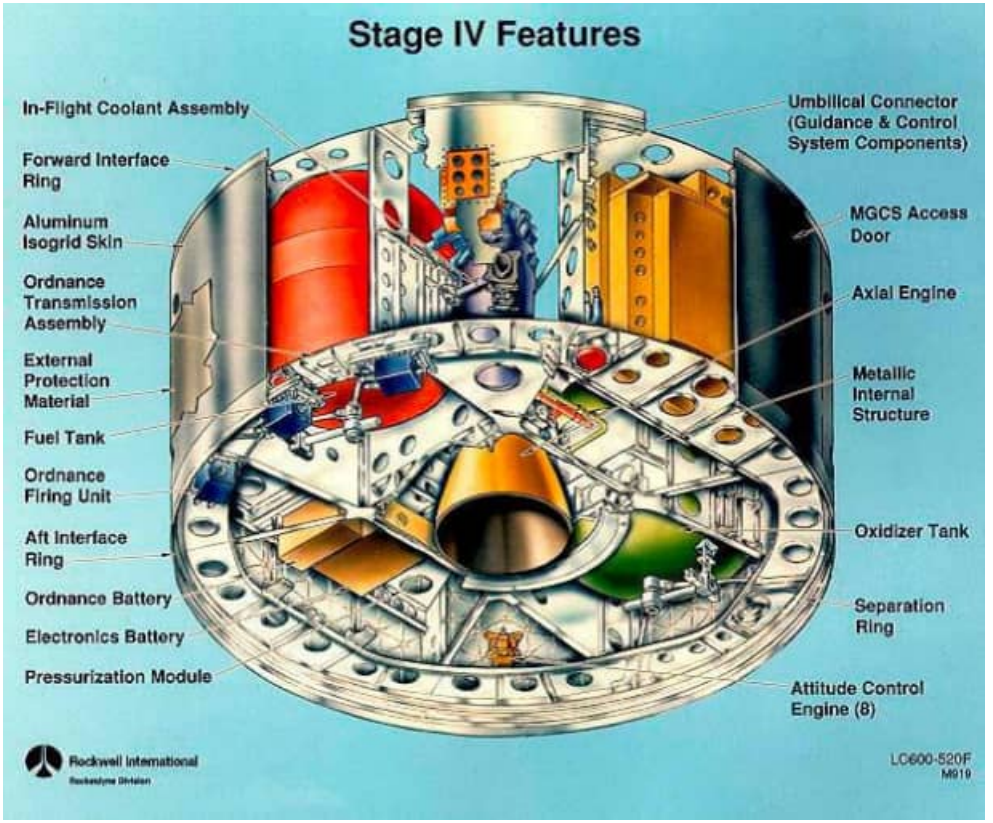
Area of Possible Fallout Contamination from a 100-Kiloton Near-Surface Burst Centered on the Pentagon



Note: The innermost contour shows the 1,000-rads-per-hour, one-hour reference time dose rate. The 300- and 100-rads-per-hour contours are the middle and outer lines, respectively. These contours define regions where people would have to be evacuated or sheltered if they were to avoid death or serious injury from exposure to radioactivity.

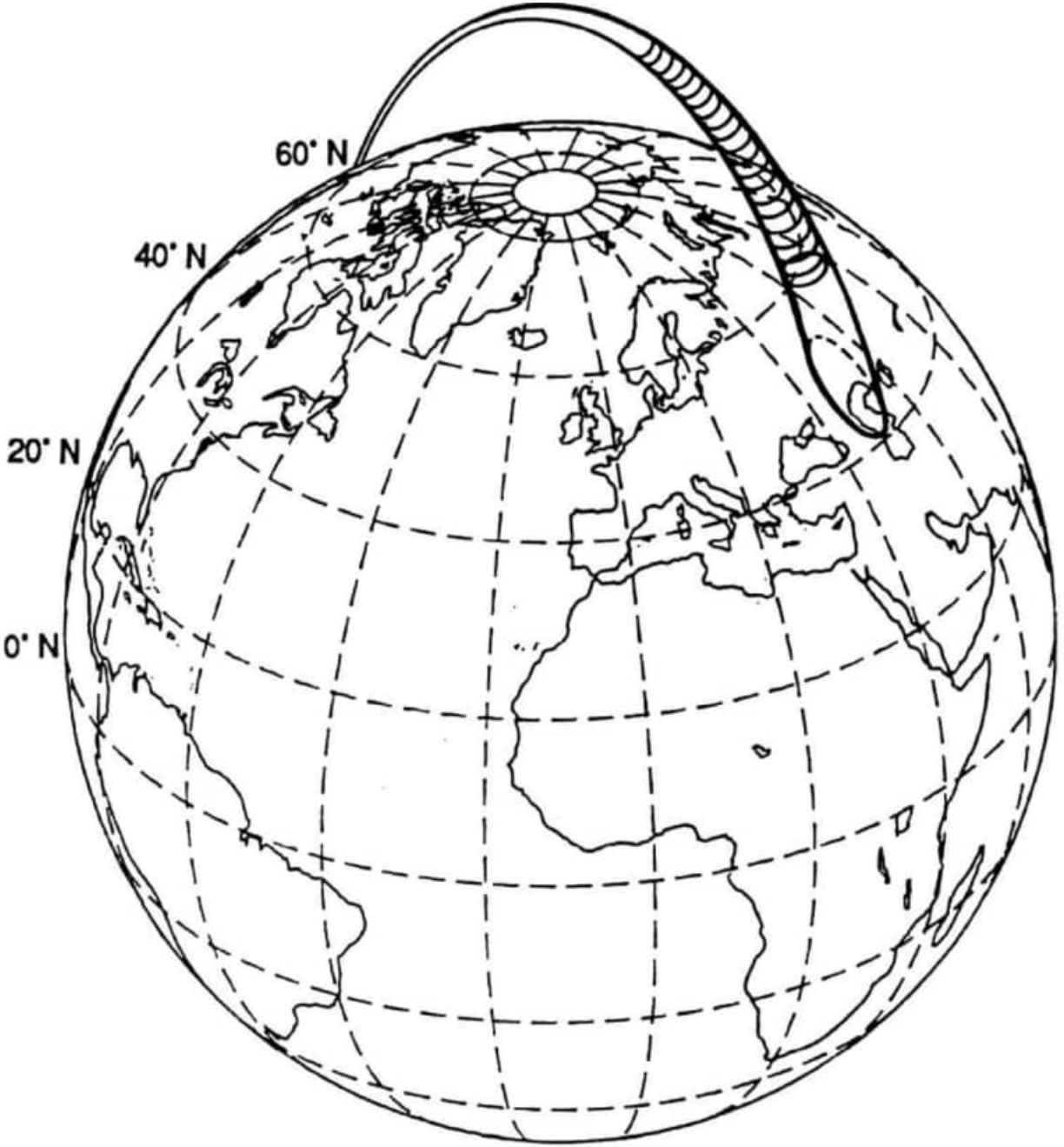
A Less "Limited" Russian Nuclear Attack on Washington DC

Peacekeeper Multiple Warhead "BUS"



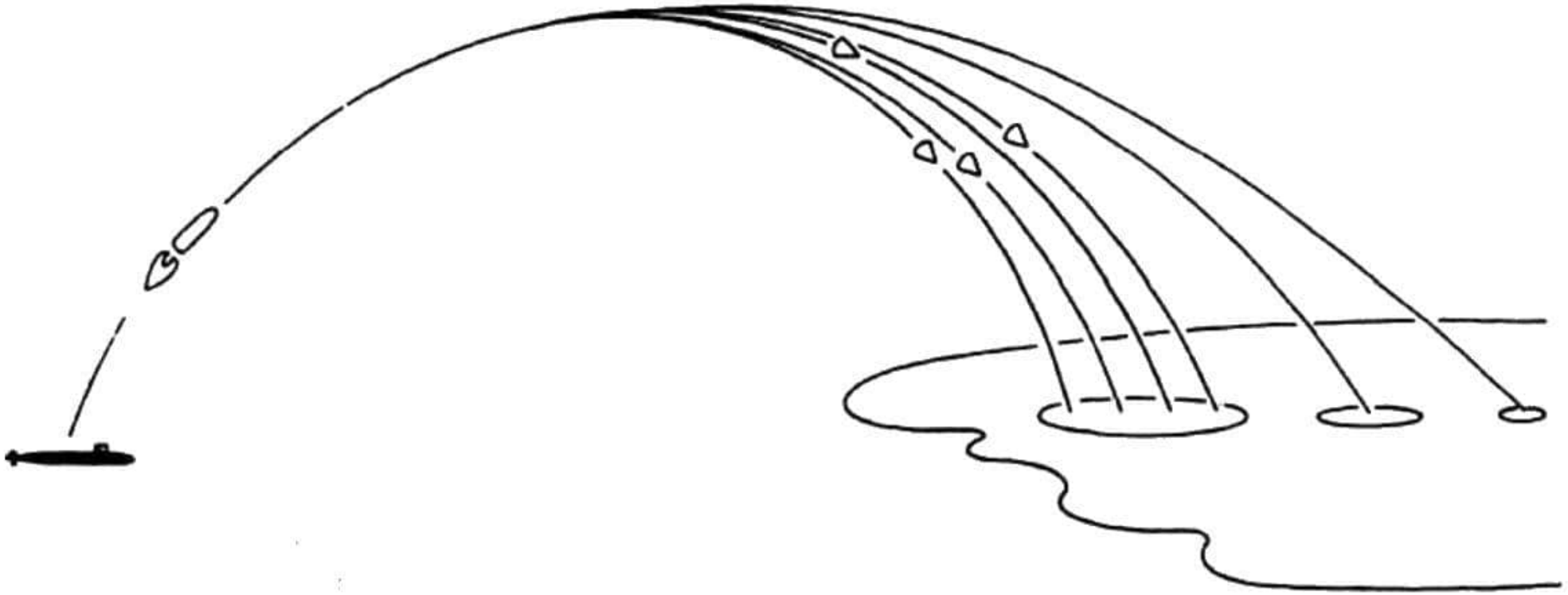
Minuteman III Multiple Warhead "BUS"

“Footprint” of a MIRVed SLBM or ICBM



Note: The footprint of a missile is the area within which a MIRVed missile can disperse warheads. It is determined in part by the amount of velocity imparted to each warhead by the post-boost vehicle ("bus"). The finite propulsive energy of the bus and the trajectory' on which the booster launches it also affect the size and shape of the footprint.

Effect of Range Increases on the Footprint of a MIRVed Missile



Note: If some of the propulsive energy in the bus is first used to extend the range at which warheads are delivered, there will be less energy available to disperse warheads at a later time. The size of the footprint at extended ranges will therefore be smaller.

Disposition of Russian Strategic Nuclear Forces As of 2024

Table 1. Russian nuclear forces, 2024.

Type/NATO designation	Russian designation	Launchers	Year deployed	Warheads x yield (kilotons)	Total warheads[a]
Strategic offensive weapons					
ICBMs					
SS-18 M6 Satan	RS20V (Voevoda)	34[b]	1988	10 × 500/800 (MIRV)	340[c]
SS-19 M4	? (Avangard)	10	2019	1 × HGV	10
SS-27 Mod 1 (mobile)	RS-12M1 (Topol-M)	18	2006	1 × 800?	18
SS-27 Mod 1 (silo)	RS-12M2 (Topol-M)	60	1997	1 × 800	60
SS-27 Mod 2 (mobile)	RS-24 (Yars)	180	2010	4 × 100? (MIRV)	720[d]
SS-27 Mod 2 (silo)	RS-24 (Yars)[e]	24	2014	4 × 100? (MIRV)	96
SS-29 (silo)	RS-28 (Sarmat)	–	(2024)	10 × 500? (MIRV)	–
?	? (Sirena-M)	3	2022	Command and control module	–
Subtotal		**329[f]**			**1,244[g]**
SLBMs					
SS-N-23 M2/3	RSM-54 (Sineva/Layner)	5/80	2007	4 × 100 (MIRV)[h]	320[i]
SS-N-32	RSM-56 (Bulava)	7/112	2014	6 × 100 (MIRV)	672[j]
Subtotal		**12/192[k]**			**992[l]**
Bombers/weapons					
Bear-H6/16	Tu-95MS/MSM[m]	52	1984/2015	6–14 × AS-15A ALCMs and/or AS-23B ALCMs	430[n]
Blackjack	Tu-160/M	15	1987/2021	12 × AS-15B ALCMs or AS-23B ALCMs, [Kh-BD], bombs	156[o]
Subtotal		**67[p]**			**586[q]**
Subtotal strategic offensive forces		**588[r]**			**1,822[s]**

506 Nuclear Warheads in 128 Silos

Disposition of Russian Non-Strategic (Tactical) Nuclear Forces As of 2024

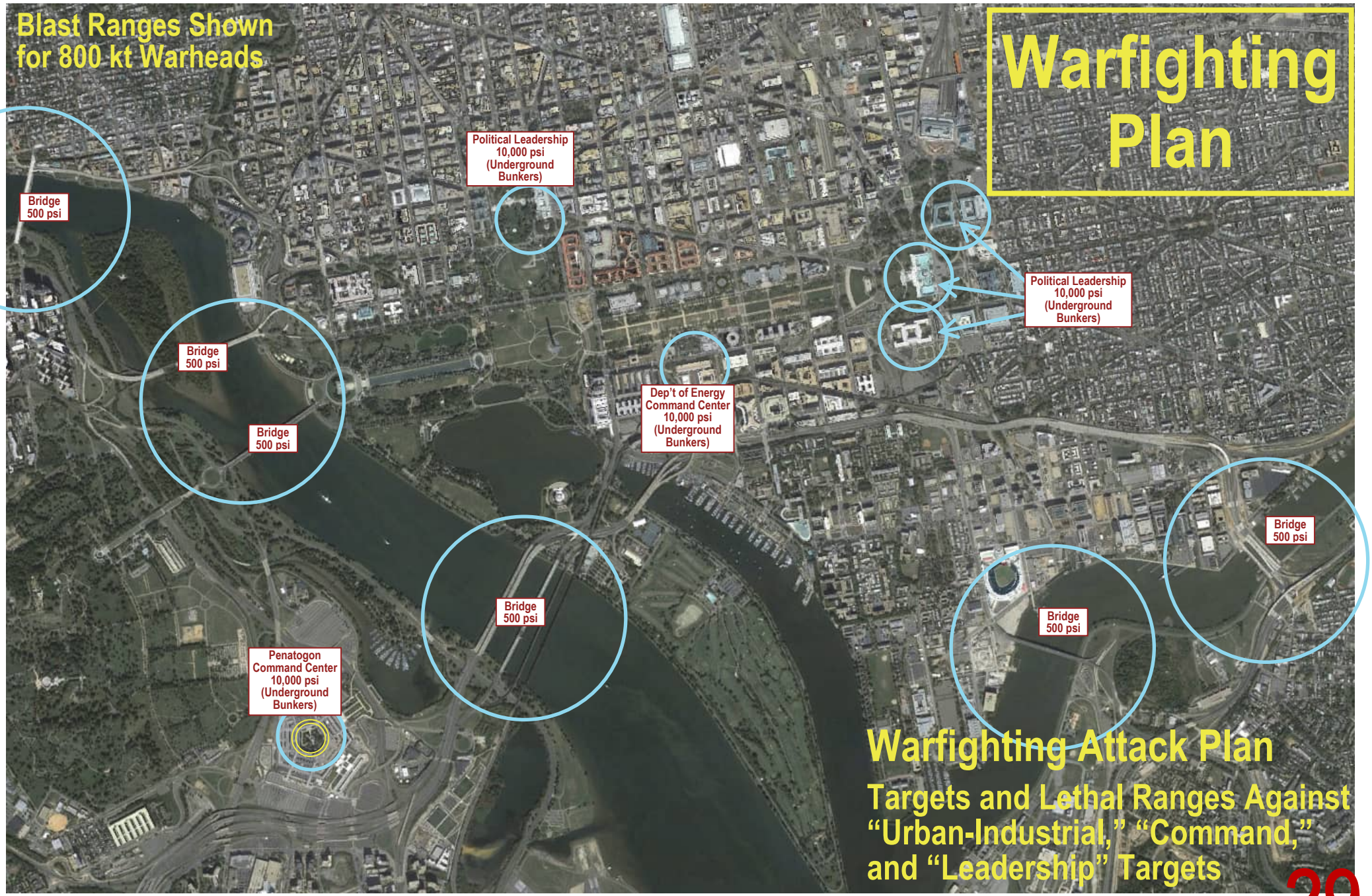
Type/NATO designation	Russian designation	Launchers	Year deployed	Warheads x yield (kilotons)	Total warheads[a]
Nonstrategic and defensive weapons					
Naval					
Submarines/surface ships/air				LACMs, SLCMs, ASWs, SAMs, DBs, torpedoes	784
Land-based air					
Bombers/fighters (Tu-22M3(M3M)/Su-24M/Su-34/MiG-31K)		289	1974–2018	ASMs, ALBMs, bombs	334
ABM/Air/Coastal defense					
S-300/S-400 (SA-20/SA-21)		750	1992/2007	1 × low	250
53T6 Gazelle		68	1986	1 × 10	68[t]
SSC-1B Sepal (Redut)		8[u]	1973	1 × 350	4
SSC-5 Stooge (SS-N-26) (K-300P/3M55)		56	2015	(1 × 10)[v]	23
Ground-based					
SS-26 Stone SSM (9K720, Iskander-M), SSC-7 Southpaw GLCM (*R*-500/9M728, Iskander-M)[x]		150	2005	1 × 10–100	75[w]
SSC-8 Screwdriver GLCM (9M729)[y]		20	2017[z]	1 × 10–100	20
Subtotal nonstrategic and defensive forces					**1,558[aa]**
Retired warheads awaiting dismantlement					**1,200**

1822 Strategic + 1558 Tactical Nuclear Warheads = 3,380

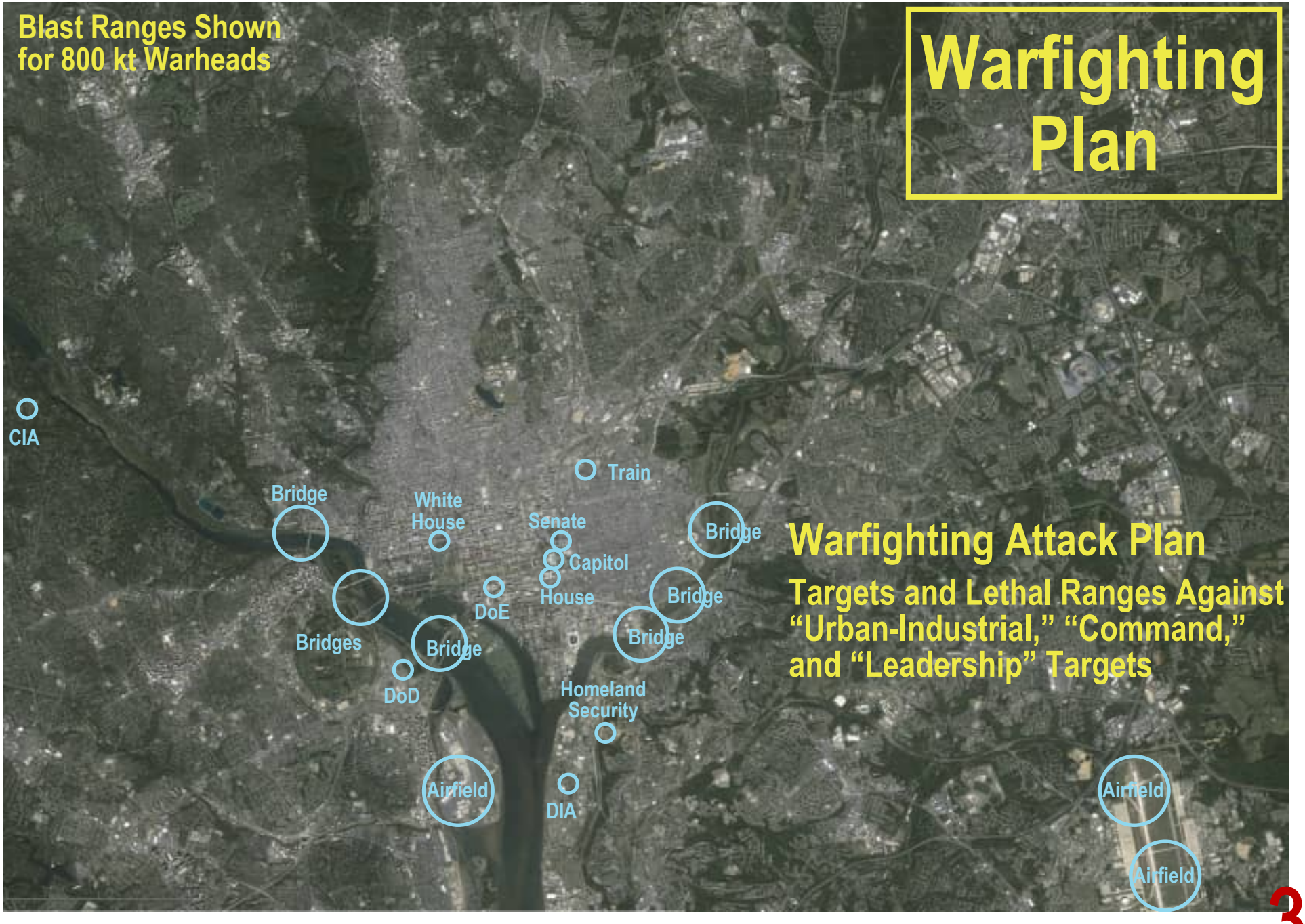
Disposition of US Strategic and Non-Strategic Nuclear Forces As of 2022

Type/Designation	No.	Year deployed	Warheads x yield (kilotons)	Warheads (total available)[a]
ICBMs				
LGM-30 G Minuteman III				
Mk-12A	200	1979	1–3 W78 x 335 (MIRV)	600[b]
Mk-21/SERV	200	2006[c]	1 W87 x 300	200[d]
Total	**400**[e]			**800**[f]
SLBMs				
UGM-133A Trident II D5/LE 14/280[g]				
Mk-4A		2008[h]	1–8 W76-1 x 90 (MIRV)	1,511[i]
Mk-4A		2019	1–2 W76-2 x 8 (MIRV)[j]	25[k]
Mk-5		1990	1–8 W88 x 455 (MIRV)	384
Total	**14/280**			**1,920**[l]
Bombers				
B-52 H Stratofortress	87/46[m]	1961	ALCM/W80-1 x 5–150	500
B-2A Spirit	20/20	1994	B61-7 x 10–360/-11 x 400 B83-1 x low-1,200	288
Total	**107/66**[n]			**788**[o]
Total strategic forces				**3,508**
Nonstrategic forces				
F-15E, F-16C/D, DCA	n/a	1979	1–5 B61-3/-4 bombs x 0.3–170[p]	200
Total				**200**[q]
Total stockpile				**3,708**
Deployed				1,744[r]
Reserve (hedge and spares)				1,964
Retired, awaiting dismantlement				**1,720**
Total Inventory				**5,428**

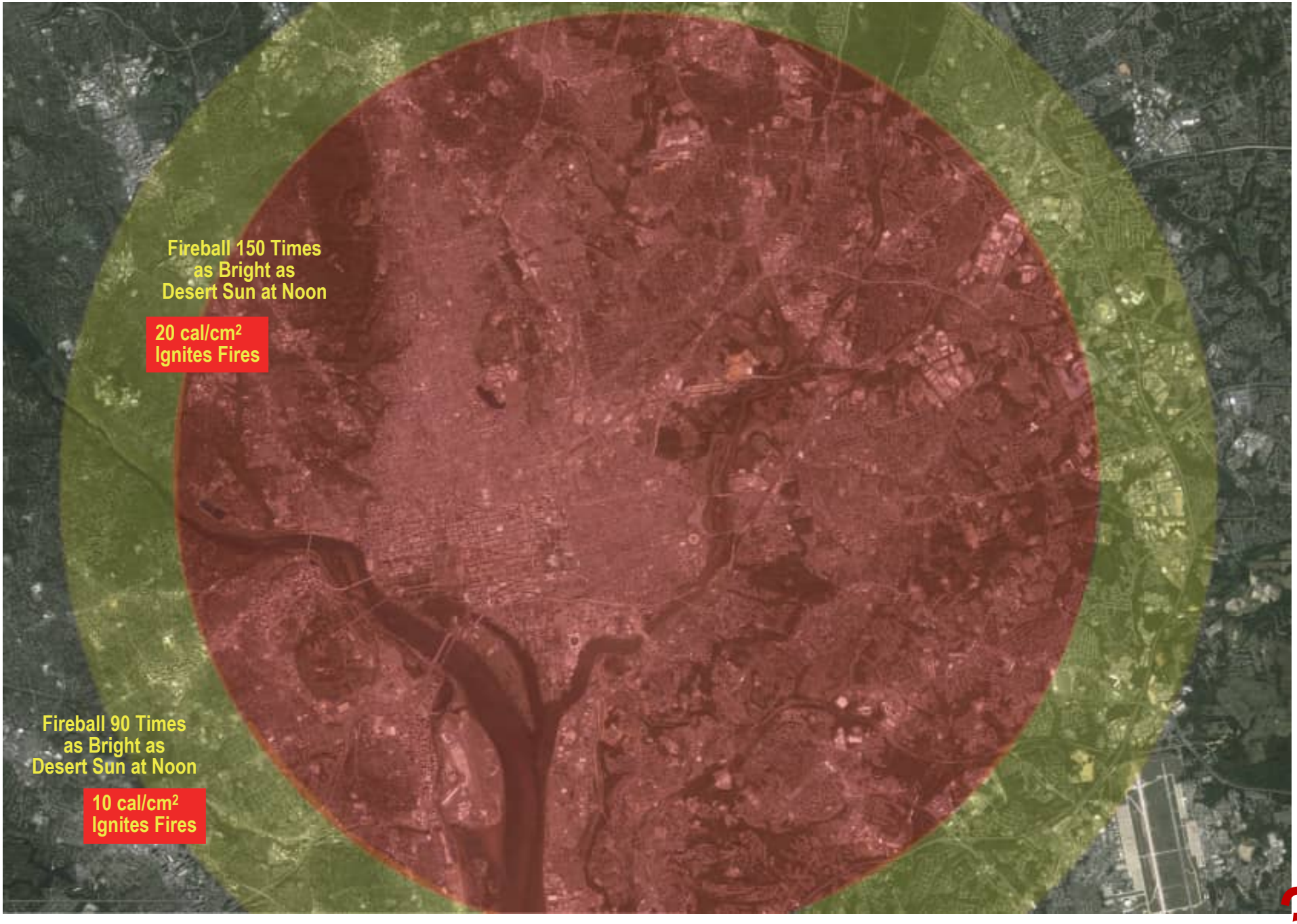
Targets Chosen on the False Theory that Nuclear Weapons Can be Used to Achieve the Same Military Objectives as Weapons in a Conventional War (Slide 1 of 2)



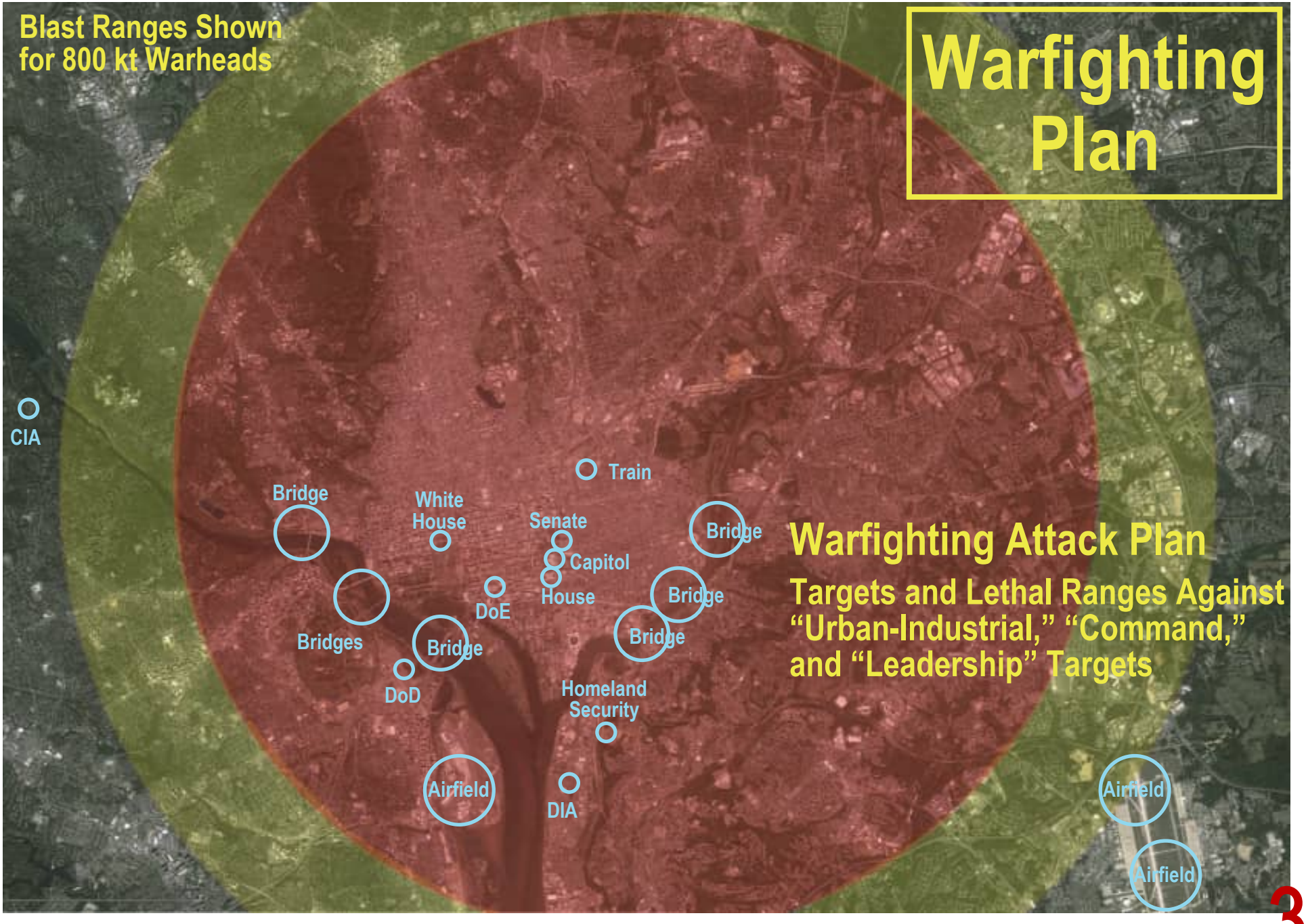
Targets Chosen on the False Theory that Nuclear Weapons Can be Used to Achieve the Same Military Objectives as Weapons in a Conventional War (Slide 2 of 2)



Consequences of a Single Detonation of One SS-18 Nuclear Warhead over Washington, DC
Roughly 100 to 150 Square Miles Destroyed by "Firestorm"



Actual Consequences of the Detonation of One SS-18 Nuclear Warhead over Washington, DC (Slide 1 of 4)



Ballistic Missile Accuracy Improvements Currently in Progress in the US Nuclear Force Modernization Program is Drastically Increasing the Killing Power of Each US Warhead